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CONSULTING GEOTECHNICAL,
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ENGINEERS

GEOTECHNICAL EXPLORATION AND ENGINEERING REPORT I FOUNDATION DESIGN AND BUILDING PAD PREPARATION

PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING ALLEGHENY COUNTY, PENNSYLVANIA

For:

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May 24, 2024
GBBE 16123A

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May 24, 2024

Mr. Geoff Phillips, P.E.
Phillips & Associates, Inc.
1122 Mosside Boulevard
Wall, PA 15148

Subject: Geotechnical Exploration and Engineering Report – Part I
Foundation Design & Building Pad Preparation
Proposed Quaker Valley High School Building
Leet Township, Allegheny County, Pennsylvania
Garvin Boward Beitko Project 16123A

Dear Mr. Phillips:

We are pleased to present Part I of our geotechnical report outlining the geotechnical exploration we completed for the proposed school. This report is provided in general accordance with our revised proposal, 16123A-2, dated June 7, 2023. Part I addresses foundation design and building pad preparation. Part I of the report includes a brief review of the project background, a description of our field procedures along with the subsurface conditions encountered, and our evaluation of those conditions with respect to the proposed building. Part II addresses the site grading issues and has been provided to Leet Township as part of the preliminary/final approval as defined by Leet Township.

EXECUTIVE SUMMARY

We completed a geotechnical exploration at the site to provide foundation design parameters and building pad preparation recommendations to the design team. The exploration revealed that:

- The new building can be supported on shallow spread footings bearing at normal frost protection depths.

- The building floor slabs can be designed and constructed as soil-supported slabs-on-grade.

- It appears that an approximate 10-foot undercut and replacement of the soil/bedrock beneath the entire footprint of the new school will be needed and appropriate for several reasons including:

    1. Promoting uniform settlement across the different areas of the school thereby reducing the potential for differential settlement.

    2. Generating a significant volume of granular fill (sand and sandstone fragments) that will be needed to construct the reinforced slopes needed to develop the site.

    3. Facilitating subfloor utility construction as excavating trenches in intact, in-situ, hard sandstone bedrock can be problematic and expensive.

    4. Reducing the risks associated with potentially expansive minerals (PEMs). The upper sandstone topping this ridge has a proclivity for containing random, intermittent seams of PEMs. PEMs typically do not cause issues if they are located at least 10 feet below structures. The recommended undercut and replacement will eliminate PEMs from the upper 10 feet.

    5. Providing a suitable use for the landslide prone redbed-derived soils that will be undercut from the planned embankment areas as this redbed-derived soil material, when compacted, is suitable for building support and utility trench construction.

BACKGROUND INFORMATION

Project background information was provided by: Mr. John Orsini of BSHM Architects, Inc. (BSHM), the project architect; Mr. Geoff Phillips, PE of Phillips & Associates (PHILLIPS), the site/civil engineer; and by Mr. Tyler J. McGrady, PE of Barber & Hoffman, Inc. (B&H), the structural engineer. We understand that Quaker Valley School District (QVSD or District) retained BSHM to design a new school on the former Tull property and other properties that have been combined to form the new QVSD HS campus. The new school will have an irregularly-shaped footprint as shown on the appended Figure 2 - Field Exploration Plan. As shown on the plan, the school will have three different levels, and each level will have at-grade

access. The northern-most wing will have a finished floor elevation (FFE) of approximately 1096 FT (project datum). The southern-most wing will have a FFE of approximately 1082 FT. The attached storm shelter, generally located at the eastern edge of the southern wing, will have a FFE on the order of 1070 FT.

The structure will be framed with load bearing masonry and steel columns. We understand that wall and column loads will not exceed 24 kips per lineal foot and 250 kips, respectively. There will be an internal retaining wall between the upper and lower levels and another internal retaining wall between the main lower level and the storm shelter level. There will also be external retaining walls placed strategically around the exterior of the new school to facilitate the necessary grade changes in the courtyard and pavement areas.

The information outlined in this section reflects our understanding of the project and was instrumental in our evaluation. If our understanding is inaccurate, or if additional information becomes available, we should be given the opportunity to review our evaluation and recommendations in light of the new or revised information.

PURPOSE AND SCOPE OF EXPLORATION

This geotechnical exploration helped to characterize the general soil and bedrock conditions within the planned construction area, so those conditions could be evaluated with respect to the new school building that is planned at this site. Test Boring Services, Inc. (TBS), drilled approximately 136 widely spaced test borings at locations we suggested, throughout the planned campus and improvement areas to facilitate our evaluation. Of those, approximately 35 were drilled in and around the proposed building area.

Test Boring Records (TBRs) were prepared based on visual classification of the samples, the driller's field logs, and laboratory test results in some cases. We then evaluated the results of the field testing using generally accepted empirical relationships pertaining to soil strength/compressibility characteristics. Field and laboratory testing was completed in general accordance with applicable standards. The assessment of site environmental conditions for the presence of recognized environmental conditions in the soil, rock, and groundwater was beyond our scope of services for this project.

SITE CONDITIONS

A geologist or engineer from our office visited the site to observe test drilling operations and document surface conditions that could affect our evaluation and recommendations. The appended Figure 1 - Site Location Plan, shows the approximate site location and the approximate limits of the property. Figure 1 also shows the approximate location of the proposed school relative to the large property itself. The site encompasses approximately 159 acres. A brief review of the United States Geological Survey (USGS) Ambridge, PA, Quadrangle topographic map reveals the ground surface elevation in the project area is on the order of 1122 to 760 feet above Mean Sea Level. This interval generally matches the elevation intervals shown on the appended Figure 2, that was surveyed by the project team. Hence, the project datum appears to coincide with the USGS datum.

The site of the proposed high school campus occupies a generally east-west running ridge with moderately steep to gentle slopes that span the border between Leet Township, Leetsdale Borough and Edgeworth Borough. Camp Meeting Road borders the property on the west. The proposed school will be located at the top of the ridge near its eastern border with Edgeworth Borough. The appended Figure 2 – Field Exploration Plan, shows the proposed building, and building area, with more detail. That area is mostly flat-lying along the ridge top with gentle slopes on the north and south side of the ridge, with a partially paved roadway and two unoccupied houses. The ridge and the slopes are heavily wooded except for the area near the easternmost abandoned house in the vicinity of the proposed school, where there already exists a large clearing.

GEOLOGIC SETTING

Available published references indicate the proposed school campus site lies with the Allegheny Plateaus Physiographic Province. The bedrock at the site is within the Lower Casselman to Upper Glenshaw Formations in the Conemaugh Group of the Pennsylvanian System. The rocks in these formations include thick sandstone and claystone units and thin shale and limestone units, most of which were encountered during drilling. The site lies on the eastern flank of the north-south trending Crows Run Anticline. The bedrock dips gently at 10 feet/mile toward the southeast. Based upon our in-house references, the Ames Limestone daylights below the ridgetop. The Ames was not encountered during this phase of drilling because the borings were either terminated before the Ames was reached, or started below the elevation of the Ames. However, the Ames Limestone was encountered in multiple test borings during earlier phases of

drilling. The Ames Limestone is a well-known marker bed that typically defines the top of the Pittsburgh Redbeds, a well-known claystone unit that is associated with many landslides in this area. This unit was encountered during all drilling phases, but will likely have the most effect primarily on the western half of the site where the lower access road is proposed, and will be a major consideration during site design but should not have much effect on the building foundation design. The reference also shows the historical landslide activity at this site. In many borings that were drilled in the vicinity of the proposed lower access road, colluvial deposits were encountered. Colluvial deposits are soil deposit created from the downslope movement of soil and rock. The colluvium encountered during drilling ranged in thickness of 6 feet to 54 feet. The existence of these thick landslide deposits will be a major consideration in site design, but should not affect the building design.

MINING CONDITONS

According to "Coal Resources of Allegheny County," Clifford Dodge, 1985, The Pittsburgh Coal is eroded at this site. The next mineable coal seam, the Upper Freeport, lies at an elevation of approximately 690 feet above MSL. According to the published information, the Upper Freeport Coal is not mined beneath the site.

SUBSURFACE CONDITIONS

Procedures

Over time, and under the direction of GBBE, TBS has drilled approximately 136 test borings in the proposed construction areas to help predict the general subsurface soil, rock, and groundwater conditions at the site. Of those, approximately 35 were drilled in the vicinity of the planned building and are shown on Figure 2 – Field Exploration Plan in the Appendix. The test boring locations/surface elevations were surveyed by PHILLIPS. Although not specifically related to the building, additional test borings will be drilled along and below Camp Meeting Road after the County provides guidance and input relative to their roadway.

The test borings were drilled in general accordance with the procedures outlined in American Society of Testing Materials (ASTM) Test Designation D 420. Standard Penetration Tests (SPTs) were performed at three-foot vertical intervals in the soil mantle in general accordance with the procedures outlined in ASTM D 1586. When properly interpreted, the SPT resistances

provide an indication of the in-place consistency of cohesive soil or relative density of predominately granular soil. They also provide soil samples for laboratory evaluation.

The subsurface conditions encountered are summarized on the test boring records in the Appendix. The test boring records represent our interpretation of subsurface conditions at the time of drilling based on the driller's field logs and visual classification of the field samples by an engineer or geologist in general accordance with ASTM D 2488. In some cases, the classification was supplemented by limited laboratory testing. The lines designating the interfaces between various strata on the test boring records represent the approximate interface locations and the actual transitions between strata may be gradual. Groundwater levels shown on the test boring records represent the conditions only at the time of our exploration.

Soil Conditions

The site elevations drop significantly from the ridge top to the south and the north. However, the proposed school building area is underlain by decomposed sandstone and sandstone. As such, the individual test boring records should be reviewed for the soil and rock conditions at specific locations. In general, there are pockets of fill in some areas that are likely associated with previous construction at the site. The fill soils appear to be a mixture of reworked, on-site residual soil. The fill soils overlie residual soils that were formed in place by the decomposition of the parent bedrock. The residual soils gradually become more competent with depth as they gradually transition into bedrock. The underlying sedimentary bedrock intercepted in the planned building area borings generally consists of sandstone with occasional shaly seams. Some of the isolated shaly seams contain PEMs that should be addressed during construction (select removal and stockpiling). In general, the soil and bedrock conditions indicated by the test borings appear consistent with those predicted by published references.

Groundwater Conditions

The borings did not intercept the groundwater table (as defined by 100 percent saturation below the phreatic surface). However, the borings did intercept wet zones that are likely the result of perched water. In addition, there may be other pockets of perched water (not intercepted by the borings) within fill zones, and atop less permeable soil/bedrock layers. Such perched water could be encountered during construction operations. It should be understood that groundwater levels can vary with seasonal climatic changes, variations in surface runoff patterns, and construction activity. Potential groundwater below the bedrock surface could not be clearly delineated as the drill water used for rock coring operations obscured groundwater below the bedrock surface.

GEOTECHICAL EVALUATION

The proposed building may be supported on shallow spread footings. However, some undercutting of bedrock, and soil, will be required for many reasons as discussed previously.

Building Undercut & Replacement

The soil and bedrock, mostly bedrock, should be undercut to at least 10 feet below each respective finished floor elevation as shown on Figures 4 and 5 in the Appendix. This equates to an undercut elevation of 1086 FT in the upper level with a finished floor elevation of 1096 FT. It also equates to an undercut elevation of 1072 FT in the lower level that has a FFE of 1082 FT, and an undercut elevation of 1060 FT in the storm shelter footprint as the FFE in that portion of the school is 1070 FT. The lateral extent of the undercut and replacement (for the building only) should be determined by a superimposed line drawn down and away from the outside edge of the footings, at a 45-degree angle to the horizonal, until the appropriate undercut elevation for each building section is intersected by that line.

Assuming the building pad is prepared in accordance with our recommendations, the entire structure can be supported on shallow spread footings. The floor slabs in each of those areas may be designed and constructed as soil-supported slabs-on-grade.

BUILDING PAD PREPARATION

All topsoil and organic matter should be stripped from the building construction area and stockpiled separately for future use in landscaped areas. Excavation should continue to the different undercut elevations and lateral limits as shown on Figures 4 and 5 in the Appendix. As evidenced on Figure 2 - Field Exploration Plan, there are existing buildings, partially constructed concrete foundations, and likely several existing utilities that cross beneath the proposed school. All remnants of previous construction and utilities should be abandoned and completely removed from beneath the new school. All foundations, floor slabs, or other remnants of previous construction should also be removed from the new school footprint. Excavation should continue until all previously placed fill (associated with abandoned utilities or foundation construction/earthwork related to previous structures) has been removed from the footprint of the new school.

Selective Stockpiling of Undercut Materials

As inferred above, excavation will be required to reach the recommended undercut elevations/depths. The undercut material should generally consist of sand and sandstone fragments, and large sandstone boulders. However, there are pockets of finer grained soils, PEMs, and potentially other soil types not conducive to engineering purposes.

Proofrolling

Proofrolling will be needed beneath all planned pavement and hard stands. It may also be needed if there is an extended period of time between placement of the building area fill and construction of the floor slabs/foundations for the school building. Once natural undisturbed soils are exposed (after initial stripping and cutting to the bottom of old fill layer), they should be thoroughly proofrolled with overlapping passes of a fully-loaded tandem axle dump truck or approved equivalent. The proofrolling is needed to help delineate soils that may not be suitable for building or floor slab support.

The proofrolling will also help to identify remnants of previous construction, pockets of previously placed fill, and abandoned utilities that may have been missed during initial stripping operations. Any "pumping," soft, wet, or otherwise unsuitable soils should be removed and replaced with engineered fill as described later in this report. Proofrolling should be performed after a suitable period of dry weather to avoid degrading a previously acceptable subgrade and should be observed and documented by a geotechnical engineer or a field representative working under the direction of a geotechnical engineer.

The actual amount of undercutting and replacement can only be determined by the geotechnical engineer during construction. As such, the construction contract should be set up to account for the inherent variability. This can be accomplished by establishing a baseline amount of undercutting/replacement along with a unit rate to adjust accordingly for either more or less undercutting/replacement.

Engineered Fill

The proofrolled and approved excavation can be backfilled to final subgrade elevations with engineered fill. Engineered fill is defined as a soil with adequate material properties that has been placed and compacted with engineering control such that the end-result properties of the in-place material are conducive to structural support. Extensive grading (cut areas as potential fill

source) is planned for this project. Therefore, we anticipate that some suitable fill soil will be available on site. However, we did encounter pockets of soil that will not be suitable. Therefore, the contractor will have to selectively stockpile suitable cut soils and haul unsuitable cut soils from the site. It is possible that some importing of suitable soil will be required. The geotechnical engineer should be afforded the opportunity to evaluate all proposed fill soils, whether obtained from on-site or off-site borrow sources. In general, engineered fill material should consist of inorganic, low-plasticity soil with a liquid limit (LL) less than 30 and a plasticity index (PI) of less than 10. Engineered fill material should be free of topsoil, carbonaceous shale, pyritic/marcasitic minerals, organic matter, slag, "red-dog," other deleterious material, and rock fragments larger than 3 inches in diameter. Inert (non-pyritic/marcasitic) decomposed shale and sandstone are commonly used as engineered fill in this area. If the contractor elects to utilize this type of material, it is likely that some effort will be required to break down the rock fragments into a well-graded mixture suitable for re-use. We anticipate that the contractor will have to spread such material in thin layers and pulverize it with large, track-mounted equipment, sheep-foot rollers, and large vibratory compactors.

As indicated previously, an abandoned concrete foundation at the site will be demolished. We understand that the demolition contract will require the contractor to crush/process acceptable demolition debris such as bricks and concrete into small sizes meeting PennDOT 2A gradation. This material will not be acceptable for use beneath the new building but should be suitable for reuse beneath pavement. This issue will be addressed in Part II of the geotechnical report.

Before filling operations begin, representative samples of each proposed fill material should be collected and submitted to our geotechnical engineer for his review. The geotechnical engineer will require that laboratory testing be completed by an approved testing laboratory prior to final approval. The laboratory testing will include laboratory compaction tests (ASTM D 1557) or relative density tests (ASTM D 4253 and D 4254) as appropriate, and tests to determine the gradation and plasticity of the soil. These tests are needed for quality control during compaction operation and to determine if the fill material is acceptable.

Frozen soils should not be used for engineered fill. The owners and contractors/subcontractors of this project are cautioned to recognize that some local soils may be difficult to compact during prolonged periods of cold or wet weather. It may be necessary to import granular fill if the construction schedule mandates earthwork during inclement weather.

We generally recommend that engineered fill be constructed by spreading acceptable soil in loose layers not more than eight inches thick. However, some of the engineered fill on this project will be constructed in small, confined utility trenches where large compaction equipment

cannot be used. As such, it may be necessary to limit the loose layer thickness to four to six inches in order to achieve the recommended degree of compaction. All fill beneath future buildings or parking areas should be compacted to at least 95 percent of its maximum dry density as determined by the modified Proctor test (ASTM D 1557). The moisture content of the fill soils should be maintained near the optimum moisture as determined by ASTM D 1557. This may require the contractor to dry the soils during periods of wet weather, or wet the soils during the hot summer months. Laboratory compaction testing (Proctor) is not applicable to some types/gradations of granular fill material (crushed limestone meeting AASHTO No. 57 gradation, etc.). These material types should be compacted to at least 70 percent of the maximum relative density as determined in accordance with ASTM D 4253 and D 4254.

The fill surface should be adequately maintained during construction in order to achieve an acceptable engineered fill. Areas on which fill is to be placed should by scarified prior to fill placement. We recommend that the fill surface be sloped to achieve adequate drainage and to prevent water from ponding on the fill. If precipitation is expected, engineered fill construction should be temporarily halted and the surface should be rolled with rubber-tired or steel-drummed equipment to improve surface run-off. If the surface soils become excessively wet or frozen, they should be removed prior to additional fill placement.

Fill construction should be observed and tested by a geotechnical engineer or a field representative working under the direction of a geotechnical engineer. The geotechnical engineer should observe and document the contractor's procedures, and should perform periodic field density tests. At least one field density test should be performed for every 2000 square feet (or fraction thereof) of area in each lift of fill. Tests should be completed every 50 feet (or fraction thereof) and in each lift of fill when backfilling narrow trenches or behind retaining walls. Significant deviations, either from the specifications or good practice, should be brought to the attention of the owner.

SPREAD FOOTINGS

Design Considerations – Condition 1 – 3000 PSF/3 KSF

A brief review of the test boring records indicates that once the upper portions of the site are cut to planned undercut elevations and then backfilled with engineered fill, the new spread footings will bear directly on the engineered fill with up to 10 feet of engineered fill beneath any given footing. The engineered fill will be underlain by essentially incompressible (relative to the loads applied) bedrock. Those spread footings bearing on up to 10 feet of engineered fill may be designed using an allowable bearing pressure of 3 kips per square foot (KSF). Given the

maximum column load of 250 kips, and a maximum wall load of 16 KLF, provided by the structural engineer, calculations indicate total settlement should be an inch or less with differential settlements approximately half that amount. Calculations indicate the settlement will be due to the compression of the engineered fill between the footing bottoms and the top of bedrock.

Design Considerations – Condition 2 – 4000 PSF/4 KSF

Discussions with the structural engineer indicated a substantial savings in footing size could be realized if some of the heavier loaded footings could be designed for 4 KSF, as opposed to the previously mentioned 3 KSF. Those footing locations are shown graphically on Figure 3 in the Appendix. Given the heavier wall load of 24 KLF provided by the structural engineer, calculations indicate total settlement should be an inch or less with differential settlements approximately half that amount, if the engineered fill thickness beneath these footings can be limited to 7 feet, as opposed to the 10-foot limit allowed for the 3 KSF bearing pressure.

Undercutting Requirements

The need for the previously mentioned 10-foot undercut and replacement, below the floor elevation in any section of the building, is driven by several issues, not just the foundation performance. Therefore, the planned undercut bottom elevation cannot be changed to reduce the engineered fill thickness between the foundation bottoms and the top of bedrock. Instead, the foundation itself must be designed to bear lower in the profile.

Additional Foundation Design Considerations

Foundations along exterior walls or unheated space should be maintained at least 3.5 feet below final adjacent grade to reduce the potential for frost penetration into the supporting soils/bedrock. Interior footings may bear at nominal depths. We recommend minimum footing widths of 18 and 24 inches for strip footings and column footings, respectively, in order to reduce the potential for localized shear failures.

Spread footings may be stepped down no steeper than 1H:1V or 45 degrees to lower the bearing surfaces when approaching internal retaining walls. Further, and as shown on Figures 4 and 5, no foundations should bear above a 45-degree line sloped up and away from retaining wall foundations unless those walls have been specifically designed to resist the additional lateral pressures generated by nearby spread footings.

Foundation Construction Considerations

Footing and or mud-wall excavations (see retaining wall foundations) should be observed and evaluated by a geotechnical engineer or his representative to determine if the intended bearing strata has been reached. In general, the footing excavation should be free of loose material, water, mud, and debris. Water should not be permitted to stand at the bottom of footing excavations. The contractor should be prepared to remove water from any source to avoid degrading previously acceptable bearing surfaces. Concrete for foundations should be placed the same day the excavation is prepared. If foundation concrete cannot be placed, and precipitation appears imminent, the excavation bottoms should be protected with lean concrete.

Seismic Site Class

The site may be considered Site Class C.

SLAB-ON-GRADE DESIGN AND CONSTRUCTION CONSIDERATIONS

Assuming the subgrade soils are prepared as described in the previous section of this report, the slabs may be designed using a modulus of subgrade reaction of 150 lb/cu inch. Any soil-supported slabs should be jointed around column and continuous wall foundations (and any other load-bearing members) to reduce the potential for damage from differential movement. A minimum six-inch-thick layer of free-draining granular material (such as crushed limestone meeting AASHTO No. 57 gradation requirements and PennDOT requirements for Type C coarse aggregate) should be placed beneath the slab to provide uniform support and to permit lateral drainage. A vapor retarder may be placed assuming it is placed in accordance with ACI recommendations. A geotechnical engineer or a field representative working under the direction of a geotechnical engineer should observe and document the condition of the floor slab subgrade immediately prior to aggregate and concrete placement.

RETAINING WALL DESIGN CONSIDERATIONS

Restrained Internal Walls

We understand there will be internal transition walls that will function as retaining walls. The transition/basement walls should be designed as retaining walls that are not free to rotate or deflect. Given the engineered fill soil planned to backfill the over-excavation and replacement,

the compacted in-place density should be assumed as 135 pounds per cubic foot (PCF). The basement walls should be designed using an at-rest pressure coefficient Ko of 0.56 and a passive pressure coefficient, Kp, of 2.5. The designer may assume a frictional coefficient of 0.3 for sliding resistance. Any surcharges and floor loads should also be considered when designing the walls.

External Walls – Free to Rotate

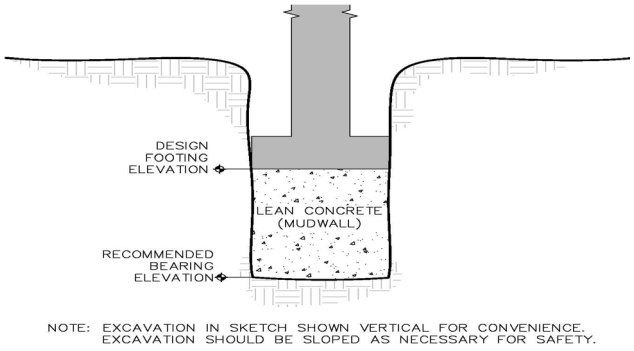
Given the plethora of different soil types on the site that might be used as engineered fill soil to backfill the exterior walls, the compacted in-place density should be assumed as 135 pounds per cubic foot (PCF). An active pressure coefficient, Ka, of 0.4 may be used for exterior retaining walls that are free to rotate. Any surcharges and floor loads should also be considered when designing the walls. The designer may assume a frictional coefficient of 0.3 for sliding resistance.

The recommended soil density and pressure coefficients assume the walls will be properly drained. Proper drainage would consist of a minimum 1-foot thick (perpendicular to wall) layer of free-draining aggregate that extends at least ¾ of the wall height. The free-draining layer should be tied into a slotted drain pipe at the wall base that is designed to withstand the overburden pressures and sloped to provide positive drainage to an appropriate outlet. The free-draining layer should be wrapped in a monofilament woven geotextile such as Mirafi FW402 to reduce the potential for migration of fine-grained soil into the free-draining matrix.

Exterior Retaining Walls AA and BB Foundation Design Considerations

Exterior retaining walls AA and BB, as shown on Figure 2, Field Exploration Plan will abut the existing building on either side of the planned loading dock. The building system retaining walls, and the abutting site retaining walls should be constructed separately with joint details that allow independent movement of the two different retaining wall types. If constructed at normal frost protection depths, the bottom of the footings for both AA and BB will be constructed near elevation 1075 FT, which is about 4 feet below the footings for the immediately adjacent building foundation that is located near elevation 1079 FT. That operation will likely entail underpinning of the building foundation in that area, assuming the building walls are constructed first. In addition, that would place AA and BB foundations directly over about 3 feet of engineered fill that will be placed above the underlying bedrock as part of the previously described building undercuts (1072 ft). However, those, essentially linear strip footings will begin to bear directly on bedrock as the building undercutting only extends a short distance beyond the exterior building walls. Those extremely different bearing conditions could lead to

differential settlement over short distances which can be problematic. As such, we recommend that the exterior retaining wall foundations be extended to bear directly on bedrock via lean concrete "mud-walls" as shown schematically below and with additional detail on Figure 13 in the Appendix. The "mud-wall" work should only be required for a short distance away from the building walls; however, it appears that additional "mud-wall" work will be needed near the eastern end of retaining wall AA, down to about elevation 1069 FT.



Because these site retaining walls will be bearing on bedrock, directly or indirectly via mud-walls, the allowable bearing capacity design may be increased to 10 KSF.

Exterior Retaining Wall CC Foundation Design Considerations

As shown on Figure 2, exterior retaining wall CC directly abuts the storm shelter portion of the building that has a finished floor elevation near 1070 FT. The building wall in that area is also acting as a retaining wall and should bear at approximate elevation 1067 FT. As indicated previously for site walls AA and BB, the building system retaining walls, and the abutting site retaining walls should be constructed separately with joint details that allow independent movement of the two different retaining wall types. Retaining wall CC has a top elevation on the order of 1081 FT. If the retaining wall CC is set at normal frost protection depth of 3.5 feet, it appears that it will bear near elevation 1070.5 FT, which is well above the immediately subjacent building foundation of 1067 FT and would place additional pressure on that basement wall. As such, the foundation for exterior wall CC should be lowered to at least an elevation that matches the building wall of about 1067 FT. At that elevation, the retaining wall foundation would still be bearing on about 7 feet of engineered fill placed atop bedrock, while a short distance away it will bear on directly on incompressible bedrock (relative to the range of loads from this structure). That could lead to excessive differential settlement. As such, we

recommend that the exterior retaining wall CC foundations be extended to bear directly on bedrock via lean concrete "mud-walls" as shown schematically above and with additional detail on Figure 13 in the Appendix. The "mud-wall" work will likely be required for most of retaining wall CC.

MUD-WALLS

As discussed above, a brief review of the test boring records indicates that very dense residual soil/bedrock will be located below the "as-designed" foundation levels of the site retaining walls, AA, BB, and CC in some areas. When this occurs, the foundation loads should be transferred to the more competent strata via mud-walls as described above. The actual elevation of suitable bearing material should be judged by the geotechnical engineer during construction. The resulting over-excavations (excavations down to very dense residual soil/bedrock) should then be backfilled with lean concrete "mud-walls" up to the initially planned bearing elevations. We have included a Typical Mud-Wall Construction Detail as Figure 13 in the Appendix of this report. Because the actual amount of "mud-wall" construction cannot be determined until construction, we recommend setting up the contract to account for the inherent variability. This can be accomplished by establishing a baseline bid amount of mud-wall construction (the baseline bid amount should be determined by estimating the distance to the top of bedrock along the foundation alignment and considering the design footing widths + 6 inches in any direction). The final payment amount could then be adjusted based on the same unit rate used to calculate cost for the baseline bid amount. The same unit rate should be applied regardless of whether the actual amount of mud-walls is more or less than the baseline amount. We recommend that the unit be defined as the volume between and directly beneath the footing (plus 6 inches from each footing edge) and the surface of the very dense residual soil/bedrock as judged by the geotechnical engineer.

POTENTIALLY EXPANSIVE MINERAL CONSIDERATIONS

As mentioned above, there were seams of PEMs in some of the test borings in and around the planned building area. The PEMs are generally identifiable as dark gray, coaly, shales. However, even light gray sedimentary bedrock, such as the rock we have at this site, can contain PEMs. PEM-laden layers can heave sufficiently to lift floor slabs and lightly loaded foundations when exposed to oxygen and moisture (humid air). Given the current state of the profession, and considering the proclivity of PEM concentrations to vary significantly over extremely short distances, it is not possible to accurately estimate the potential for future heaving. As such, the

layer should be removed when possible or otherwise accounted for in the design and construction of the new project. Because of the planned 10-foot undercut beneath the entire school, these PEMs should not present much of an issue relative to actual school construction. However, these PEMs will have to be stockpiled separately during the undercut and replacement operations for the building. In addition, the PEMs will have to be managed relative to the site retaining walls and buried site utilities. We noted heavy concentrations of PEM bedrock in test borings SB-16 and SB-17. We have included some generalized subsurface profiles on Figures 6, 7, and 8 in the Appendix of this report that identify other potential PEM-laden seams we observed during drilling.

There are mitigation techniques that can be implemented to reduce the risk of future problems in the new school campus. In general, the heaving is caused by a reaction between the PEMs (iron disulfide or pyrite), oxygen, and water. The newly formed minerals occupy many times the original volume and can heave or lift floor slabs, lightly loaded foundations, pavement, etc. Most preventive measures focus on reducing the potential exposure of PEMs to the known triggering mechanisms of oxygen and water (humid air).

We have included typical mitigation (risk-reducing) details in the Appendix of this report. These mitigation techniques generally focus on limiting the exposure time of PEMs to oxygen and water (humid air) to 48 hours or less. The sealing will reduce the risk of triggering expansion in PEM layers that either extend back beneath the new construction at the site such as pavement, sidewalks, or hard stands (equipment pads). The seals should extend at least 6 inches beyond the edge of PEM-containing layers.

PEM CONSIDERATIONS ALONG BURIED UTILITY ROUTES

As indicated previously, portions of this site are underlain by a near surface layer of PEM containing bedrock. The construction of buried utilities will likely expose the layered PEMs along utility trench sidewalls and trench bottoms. These layers should be sealed with sulfate-resistant concrete to reduce the potential for causing damage to the newly installed lines or to the pavement structure in the vicinity of the trench. We have included details for such seals in the Appendix of this report. As an alternate to the labor-intensive details, and if acceptable to the owner, it would also be possible to backfill the trenches with sulfate-resistant controlled low strength material (CLSM). CLSM is high slump, low strength, cementitious mixture typically batched by concrete suppliers. The compressive strength can typically be set low enough to allow excavation with traditional backhoes/trackhoes if the lines must be accessed in the future. We suggest a minimum compressive strength requirement of 100 psi and a maximum

compressive strength of 200 psi if considering this option. The extent of needed sealing can be estimated by reviewing utility line locations, invert elevations, the location of the PEM layer, and the anticipated trench widths. As such, the estimating work cannot be completed until the subsurface utility alignments and profiles are finalized.

EXCAVATION CONSIDERATIONS

This project will require excavations during removal of previously placed fill soils and to construct the foundations and utilities. The majority of the soils and upper bedrock we encountered should be readily excavatable by traditional means such as backhoes and trackhoes. Some harder seams, and relatively confined excavations (i.e. utility trenches in bedrock), may require hoe-ramming, jack-hammering, or controlled blasting. All temporary excavations should be designed and protected in accordance with Occupational Safety and Health Administration (OSHA) standards. Nobody should enter mud-wall excavations for any reason unless the excavations are properly shored. The mud-walls should be constructed entirely from ground surface. The soils at this site should generally be considered OSHA Type C. The contractor typically assumes responsibility for excavation protection.

GROUNDWATER CONSIDERATIONS

Groundwater control does not appear to be a major issue for this project; however, it is likely that some perched groundwater will be encountered. The contractor should be prepared to protect exposed soils from surface runoff, water tables, perched water, or other sources of water. Dewatering system design and installation is typically the responsibility of the general contractor. However, if dewatering is needed, it can sometimes be accomplished by trenching around the construction area and pumping groundwater from sump pits.

BASIS FOR EVALUATION AND FIELD DOCUMENTATION

This report has been prepared using field and laboratory techniques and analysis methods conforming to commonly accepted geotechnical engineering practices. All recommendations and/or conclusions herein pertain only to this specific project and should not be used or interpreted by others for modifications to this project, or for other projects or sites. Even within the project context, subsurface conditions depicted herein are representative only at the boring locations; actual conditions between/beyond the borings will vary. Due in part to such

variability in subsurface conditions, the implementation of recommended measures must be inspected by qualified personnel under the direction of a professional (licensed) geotechnical engineer to confirm that the subsurface conditions encountered during construction are consistent with the test borings and our engineering analysis, and verify that the subgrades and all other geo-materials used are behaving as anticipated. Some conditions or material/subgrade behavior and/or performance may require modifications to our recommendations, which can typically only be determined "on-the-spot" by one of our engineers. Therefore, we will assume no responsibility or professional liability for the performance and/or suitability of any foundations, structures, slabs, slopes, appurtenances, or related project areas affected by geotechnical elements inspected by others. The selected construction-phase field evaluation/ testing agency must take full responsibility for proper selection, implementation, and performance of the project geotechnical recommendations implemented on the site.

CLOSURE

We enjoyed assisting you on this project and trust this report will satisfy your immediate needs. If you have any questions or comments concerning this report, please feel free to contact us.

Sincerely,

GARVIN BOWARD BEITKO ENGINEERING, INC.

Miles A. Walker, E.I.T.
Engineering Associate

Douglas A. Beitko, P.E.
Principal Engineer

DAB:MAW/db

COMMONWEALTH OF PENNSYLVANIA
REGISTERED
Professional
Douglas A. Beitko
ENGINEER
050545-E
7/12/24

APPENDIX

Figure 1 - Site Location Plan
Figure 2 – Field Exploration Plan
Definition of Soil and Rock Classification Terms
Test Boring Records (Building Area)
Figure 3 – Foundations Designed Using 4 KSF Allowable Bearing Pressure

APPENDIX

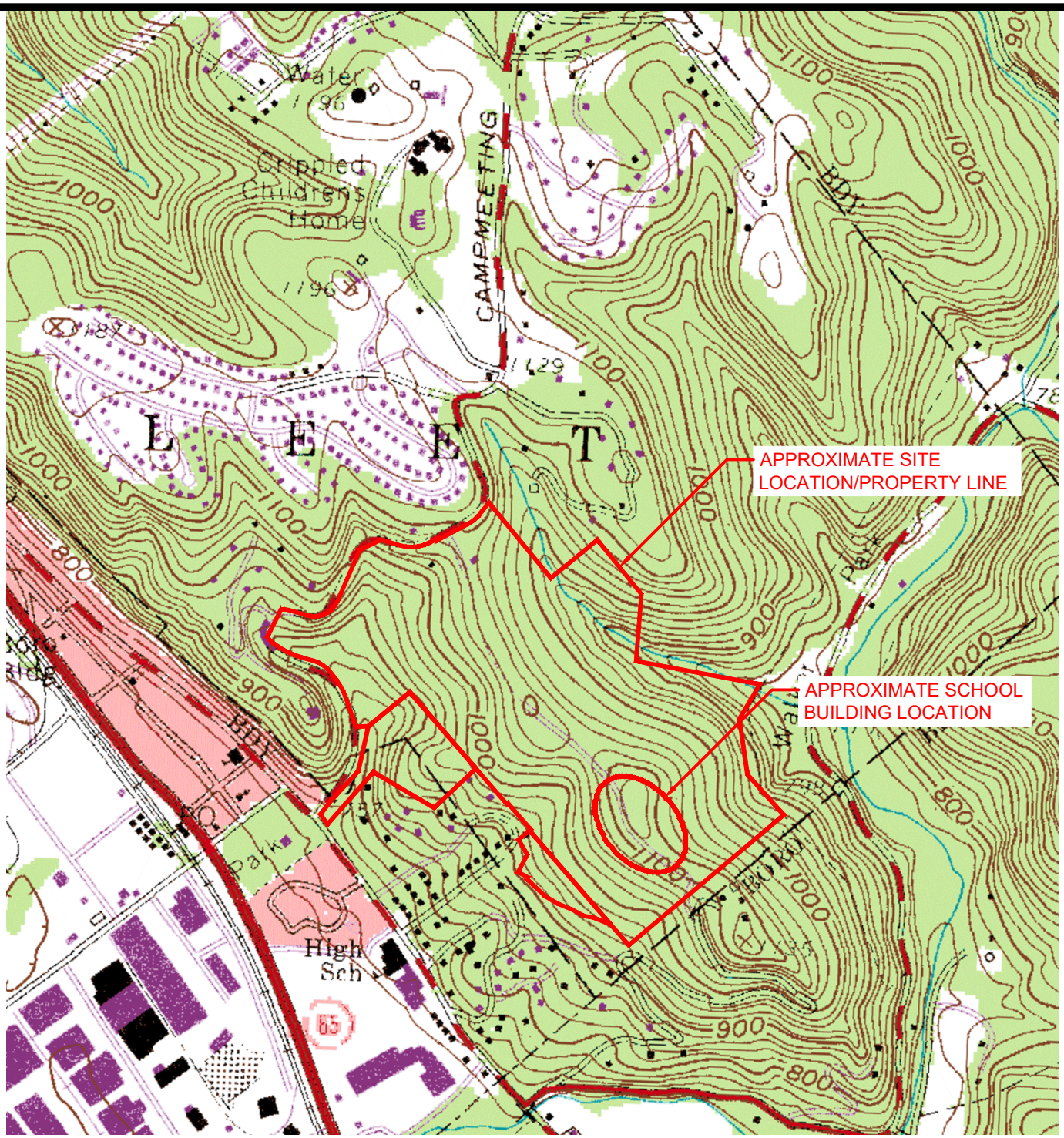


FIGURE 1 - SITE LOCATION PLAN

0 1000 2000 3000

APPROX. SCALE: 1" = 1000'

REFERENCE:
EXCERPT FROM THE UNITED STATES GEOLOGICAL SURVEY (USGS) AMBRIDGE, PA, TOPOGRAPHIC QUADRANGLE MAP (1960); PHOTOREVISED 1990.

GARVIN

BOWARD BEITKO

GARVIN BOWARD BEITKO ENGINEERING, INC.
PITTSBURGH, PA

GEOTECHNICAL EXPLORATION & ENGINEERING REPORT PART 1

FOUNDATION DESIGN & BUILDING PAD PREPARATION PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING

GBBE PROJECT: 16123A

PROPOSED SCHOOL BUILDING

EXISTING BUILDING TO BE DEMOLISHED BUILDING

TWO-STORY NORTHERN WING LOWEST FFL 1096 FT

TWO-STORY SOUTHERN WING LOWEST FFL 108

ONE-STORY SOUTHERN WING LOWEST FFL 1082 FT

STORM SHELTER AREA LOWEST FFL 1070 FT

AUX GYM ALTERNATE

DISTRICT ADMIN ALTERNATE

COURTYARD

ELEVATOR

TOP OF SLOPED SEATING

8" SLAB-ON-GRADE

SLAB ON GEOFOAM TIERED SEATING

4" SLAB-ON-GRADE SLOPED SEATING

LOWEST FFL 1079.33 FT

8" REINFORCED MASONRY WALL

LOADING DOCK RETAINING WALL AB

SITE RETAINING WALL AA

SITE RETAINING WALL BB

SITE RETAINING WALL CC

TW 1099.50
BW 1078.40

TW 1098.98
BW 1080.01

TW 1089.00
BW 1085.41

TW 1083.00
BW 1079.62

TW 1083.00
BW 1083.00

1:1 REINFORCED F-SLOPE

TOP OF SLOPE

Emergency Generator

Utility Transformer

ACH-1

ACH-2

PROPOSED GRADING IN THIS AREA WAS PROVIDED BY PHILLIPS & ASSOCIATES, INC. FROM A PLAN COMPLETED BY CIVIL AND ENVIRONMENTAL CONSULTANTS DATED MAY 3, 2024

B-84 B-85 B-86 B-87 B-88 B-89 B-94 B-95 B-96 B-97 B-98

SB-1 SB-2 SB-3 SB-4 SB-5 SB-6 SB-7 SB-8 SB-9 SB-10 SB-11 SB-12 SB-13 SB-14 SB-15 SB-16 SB-17 SB-18 SB-19 SB-20 SB-21 SB-22 SB-23 SB-24 SB-25 SB-26 SB-27

LEGEND

B–XX GBBE BORING NUMBER DRILLED JULY 19, 2023 TO AUGUST 4, 2023

SB–XX GBBE BORING NUMBER DRILLED JULY 13-19, 2023

APPROXIMATE GBBE TEST BORING LOCATION

APPROX. LIMITS OF INTACT REDBED TYPE LAYER BASED ON INITIAL BORINGS

1090 EXISTING MAJOR GROUND SURFACE CONTOUR (FT-MSL)

EXISTING MINOR GROUND SURFACE CONTOUR (FT-MSL)

1090 PROPOSED MAJOR GROUND SURFACE CONTOUR (FT-MSL)

PROPOSED MINOR GROUND SURFACE CONTOUR (FT-MSL)

X X APPROXIMATE CROSS-SECTION LOCATION

0+00 0+70

REFERENCE:
BASE DRAWING PROVIDED BY PHILLIPS AND ASSOCIATES, INC.

FIGURE 2 - FIELD EXPLORATION PLAN - SCHOOL

0 20 40 60
APPROX. SCALE: 1" = 20'

GARVIN BOWARD BEITKO

SCALE:	AS NOTED
DATE:	05/23/2024
REVISED:	
DRAWN BY:	MAW
APPROVED BY:	DAB

GARVIN BOWARD BEITKO ENGINEERING, INC.
BUILT ON REPUTATION
180 BILMAR DRIVE, SUITE IV
PITTSBURGH, PA 15205
PHONE: 412-922-4440

GEOTECHNICAL EXPLORATION & ENGINEERING REPORT - PART 1
FOUNDATION DESIGN & BUILDING PAD PREPARATION - PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING

FOR: PHILLIPS & ASSOCIATES, INC.

GBBE PROJECT NUMBER: 16123A

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DEFINITION OF SOIL AND ROCK CLASSIFICATION TERMS

SOIL

Consistency and Relative Density of soils, based on the Standard Penetration Test[1] (SPT) blow counts over the last foot of penetration, N, are generally determined as follows:

Consistency of Cohesive Soils

CONSISTENCY	N (blows/foot)	UNCONFINED COMPRESSIVE STRENGTH, Q_u(tsf)
Very soft	0 – 2	<0.25
Soft	3 – 4	0.25 – 0.5
Medium	5 – 7	0.5 – 1.0
Stiff	8 – 15	1.0 – 2.0
Very stiff	16 – 30	2.0 – 4.0
Extremely stiff	>30	>4.0
Hard (if friable or brittle)	>30	>4.0

Relative Density of Granular Soils

RELATIVE DENSITY	N (blows/foot)
Very loose	0 – 4
Loose	5 – 10
Firm	11 – 14
Medium dense	15 – 30
Dense	31 – 50
Very dense	>50

The percents by weight of constituents present in soil are as follows:

Trace:	indicates particles are present, but estimated to be less than 5%
Few:	indicates 5 to 10%
Little:	indicates 15 to 25%
Some:	indicates 30 to 45%
Mostly (and):	indicates 50 to 100%

Criteria for describing moisture content:

MOISTURE CONDITION	CRITERIA
Dry (Humid)	Absence of moisture, dusty, dry to touch
Damp	Apparent moisture in soil
Moist	Moist to touch, but no visible water
Wet	Visible free water

ROCK

Hardness of rock is based on the following:

Very soft – crushes under finger pressure
Soft – crushes easily under one hammer blow
Medium hard – breaks under one hammer blow
Hard – resistant to breaking under hammer blow
Very hard – resisting to breaking under several hammer blows

	SPACING OF FRACTURES AND/OR DISCONTINUITES
Extremely or very broken	<1”
Moderately broken	1” – 3”
Occasionally broken or blocky	3” – 6”
Massive	>6”

[1] STANDARD PENETRATION TEST (SPT) – defined as the number of blows (N) required to drive a two-inch outside diameter split-barrel sampling tube a depth of one foot with a 140-pound hammer falling 30 in. in accordance with American Society of Testing and Materials (ASTM) Test Designation: D1586.

GARVIN BOWARD BEITKO

Test Boring Record

B-84

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-21-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-21-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partyle sunny, 74 Degrees
Water Level Upon Completion: 13.8'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1092'	Brown and gray SANDSTONE FRAGMENTS (GP), some sand, very loose, moist		S-1	27	1-1-2 (3)				
	(COLLUVIAL) 3.0								
	Brown-orange DECOMPOSED SANDSTONE sampled as sandstone fragments, few sand, dense to very dense, dry		S-2	100	19-19-13 (32)				
1087		5							
	(RESIDUAL) 6.6		S-3	100	34-50/0.1'				
	Orange-brown medium to coarse-grained SANDSTONE, moderately weathered, medium bedded, moderately broken to massive, hard, few vugs		R-1	100 (0)					
1082	-lost water at 9.5'	10	R-2	92 (50)					
	-MOHs 8.5 at 10'								
	▼ 14.0		R-3	75 (0)					
1077	Boring Terminated at 14.0 feet Boring collapsed at 2.2' after 24 Hours. Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.	15							
1072		20							
1067		25							
1062		30							
1057		35							

GARVIN BOWARD BEITKO

Test Boring Record

B-85

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-21-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-21-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 69 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1102'	TOPSOIL 0.3								
	Brown randomly oriented SANDSTONE FRAGMENTS (GP), few silt, very loose to medium dense, moist		S-1	67	1-1-1 (2)				
			S-2	100	20-16-17 (33)				
1097	**(COLLUVIAL)** 5.0	5							
	Brown and gray DECOMPOSED SANDSTONE sampled as sandstone fragments, little sand, dense, moist		S-3	100	16-23-17 (40)				
	(RESIDUAL) 9.0								
1092	Brown-gray DECOMPOSED SHALE sampled as shale fragments, few silt, trace clay, medium dense, dry 10.1	10	S-4	100	20-12-27 (39)				
	(RESIDUAL)								
	Orange-brown DECOMPOSED SANDSTONE sampled as sandstone fragments, few sand, dense to very dense, dry		S-5	100	30-28-22 (50)				
1087	**(RESIDUAL)** 15.1	15							
	Boring Terminated at 15.1 feet Boring collapsed at 13.2' after 24 Hours. Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.		S-6	100	50/0.1'				
1082		20							
1077		25							
1072		30							
1067		35							

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GARVIN BOWARD BEITKO

Test Boring Record

B-86

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-21-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-21-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partly sunny, 69 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1086'	TOPSOIL 0.4								
	Brown sandy SILT (ML), few clay, very soft, moist		S-1	100	1-1-1 (2)				
	(COLLUVIAL) 3.0								
	Brown and gray randomly oriented SANDSTONE FRAGMENTS (GP), some sand, medium dense, moist		S-2	100	18-19-17 (36)				
1081		5							
	(COLLUVIAL) 6.0								
	Brown DECOMPOSED SANDSTONE sampled as sandstone fragments, few sand, medium to very dense, dry to moist		S-3	100	12-11-11 (22)				
	-moist from 6.0' to 7.5'								
1076	**(RESIDUAL)** 9.9	10	S-4	100	41-50/0.4'				
	Boring Terminated at 9.9 feet Boring collapsed at 12.8' after 24 Hours. Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.								
1071		15							
1066		20							
1061		25							
1056		30							
1051		35							

GARVIN BOWARD BEITKO

Test Boring Record

B-87

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-21-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-21-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 68 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1081'		TOPSOIL 0.3								
		Brown clayey SILT (ML), some sand, very soft, moist (COLLUVIAL) 2.0		S-1	67	1-1-1 (2)				
		Yellow-brown SANDSTONE FRAGMENTS (GP), some sand, trace silt, medium dense, moist		S-2	100	14-11-10 (21)				
1076		(COLLUVIAL) 6.0	5							
		Orange-brown and gray DECOMPOSED SANDSTONE sampled as sandstone fragments, few sand, medium dense to dense, dry		S-3	100	9-14-19 (33)				
1071			10	S-4	100	24-20-23 (43)				
		(RESIDUAL) 13.2		S-5	100	6-3-12 (15)				
		Black DECOMPOSED carbonaceous SHALE sampled as carbonaceous shale fragments, loose, dry 13.4								
1066		(RESIDUAL)	15							
		Brown and orange-brown DECOMPOSED medium to coarse-grained SANDSTONE sampled as sandstone fragments, few sand, medium to very dense, dry, some carbonaceous inclusions		S-6	100	36-16-9 (25)				
		(RESIDUAL) 18.2		S-7	100	50/0.2'				
		Boring Terminated at 18.2 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.								
1061			20							
1056			25							
1051			30							
1046			35							

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GARVIN BOWARD BEITKO

Test Boring Record

B-88

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-21-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-21-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 76 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1089'		TOPSOIL 0.3								
		Brown SANDSTONE FRAGMENTS (GP), few sand, trace clay, very loose, moist		S-1	67	1-1-1 (2)				
		(COLLUVIAL) 3.0								
		Brown SANDSTONE FRAGMENTS (GP), few to little sand, medium dense, dry		S-2	100	8-15-11 (26)				
1084			5							
				S-3	100	6-6-9 (15)				
		(RESIDUAL) 9.0								
1079		Brown DECOMPOSED SANDSTONE sampled as sandstone fragments, few sand, very dense, dry 9.3	10	S-4	100	50/0.3'				
		(RESIDUAL)								
		Boring Terminated at 9.3 feet								
		Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.								
1074			15							
1069			20							
1064			25							
1059			30							
1054			35							

GARVIN BOWARD BEITKO

Test Boring Record

B-89

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-19-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-19-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 70's, Cloudy
Water Level Upon Completion: 3.7'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1116'	Brown and gray ROCK FRAGMENTS (GP) (sandstone), little sand, few silt, medium dense, dry		S-1	80	7-9-12 (21)				
	(RESIDUAL) 3.0								
	Brown clayey SILT (ML), trace sand, stiff, dry		S-2	80	16-7-6 (13)				
1111	**(RESIDUAL)** 6.0	5							
	Brown to orange-brown SAND (SM), some silt, few rock fragments, dense, dry		S-3	100	30-14-19 (33)				
	(RESIDUAL) 9.0								
1106	Gray-brown DECOMPOSED SANDSTONE sampled as sandstone fragments, little to few sand, few to trace silt, very dense, dry	10	S-4	100	20-37-50/0.3'				
			S-5	100	17-50/0.3'				
1101	**(RESIDUAL)** 15.2	15	S-6	100	50/0.2'				
	Gray and brown medium- to coarse-grained SANDSTONE, moderately to highly weathered, very broken to massive (generally very broken to moderately broken), medium hard to hard, few carbonaceous laminations, some water staining, vuggy -MOHs 6.5 at 16.5'		R-1	90 (0)					
1096	-clay seam from 20.3' to 20.4'	20							
	-MOHs 7.5 at 22'		R-2	100 (16)					
1091		25							
	26.0								
	Dark gray and brown-gray CARBONACEOUS SHALE, highly weathered, very broken and fractured, very soft to soft -MOHs 3.5 at 27'		R-3	100 (0)					
1086	29.9	30							
	Gray fine-grained SANDSTONE, slightly weathered, very broken to massive, medium hard to hard, many carbonaceous laminations		R-4	167 (53)					
	-MOHs 7.5 at 32'								
	33.2								
	Boring Terminated at 33.2 feet								
1081		35							

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GARVIN BOWARD BEITKO

Test Boring Record

B-94

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-19-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-19-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours: 16.4'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1047'	Brown and gray rock fragments, some sand, little silt, loose, dry		S-1	53	1-2-4 (6)		12.3		
	(COLLUVIAL) 3.0								
1042	Brown SAND (SM), some silt, few rock fragments (generally small and coarse sand-sized sandstone and shale), loose, moist	5	S-2	80	2-3-4 (7)		7.1		
	(COLLUVIAL) 6.0								
	Brown-gray and brown SANDSTONE FRAGMENTS, little to some sand, few silt, medium dense to dense, dry		S-3	47	9-9-16 (25)		5.2		
1037		10	S-4	100	8-8-13 (21)		6.7		
			S-5	100	40-31-12 (43)		9.7		
1032	**(COLLUVIAL)** 15.0	15							
	Gray and orange-brown mottled CLAY to silty CLAY (CL/ML), very stiff, moist, (completely decomposed claystone)		S-6	100	5-7-11 (18)		21.4		
		20	S-7	100	13-16-15 (31)		19.9		
1027			S-8	80	7-12-17 (29)		18.1		
	(RESIDUAL) 24.0								
1022	Gray and light brown DECOMPOSED shaley CLAYSTONE, sampled as clay, little to some sand, trace gravel (claystone fragments), extremely stiff, dry	25	S-9	100	49-50/0.4'	73.17	11.5	36	22
	(RESIDUAL) 27.6		S-10	100	37-50/0.1'		8.5		
1017	Boring Terminated at 27.6 feet Bench was cut into slope for rig. Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.	30							
1012		35							

GARVIN BOWARD BEITKO

Test Boring Record

B-95

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-20-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-20-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Cloudy, 70's
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1066'		Light brown clayey SILT (ML), few rock fragments (shale, pink shale, orange-brown sandsotne), stiff, moist		S-1	67	1-4-5 (9)				
		(COLLUVIAL) 3.0								
1061		Orange-brown and light brown SANDSTONE FRAGMENTS (GP), little sand, few silt, loose, moist, micaceous	5	S-2	100	7-4-5 (9)				
		(POSSIBLE COLLUVIAL/RESIDUAL) 6.0								
		Orange-brown and light brown DECOMPOSED SANDSTONE sampled as sandstone fragments, few to little sand, few silt, very dense, moist, micaceous		S-3	100	5-20-50/0.4'				
		(RESIDUAL) 9.2								
1056		Boring Terminated at 9.2 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project. Boring collapsed at 3.8' after 24 Hours	10	S-4	100	50/0.2'				
1051			15							
1046			20							
1041			25							
1036			30							
1031			35							

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GARVIN BOWARD BEITKO

Test Boring Record

B-96

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-20-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-20-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Cloudy, 70's
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1067'		Brown SAND (SM), some silt, little rock fragments (shale, orange sandstone, red sandstone), loose to medium dense, moist		S-1	53	1-4-5 (9)				
				S-2	67	9-11-9 (20)				
1062			5							
				S-3	100	26-8-9 (17)				
		(COLLUVIAL) 9.0								
1057		Reddish-brown and brown to gray-brown DECOMPOSED SANDSTONE sampled as sandstone fragments, few sand, few silt, very dense, dry	10	S-4	100	50/0.3'				
		(RESIDUAL) 12.2		S-5	100	50/0.2'				
1052		Boring Terminated at 12.2 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project. Boring collapsed at 4.2' after 24 Hours	15							
1047			20							
1042			25							
1037			30							
1032			35							

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GARVIN BOWARD BEITKO

Test Boring Record

B-97

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-20-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-20-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Cloudy, 70's
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours: 11.7'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1067.3'	Light brown SILT (ML), little sand, trace small rock fragments (orange sandstone, shale), medium, dry		S-1	80	1-2-3 (5)				
	(COLLUVIAL) 3.0								
1062	Orange-brown and brown SANDSTONE FRAGMENTS (GP), little to some sand, few silt, micaceous, loose to very dense, dry	5	S-2	100	13-12-8 (20)				
			S-3	100	11-7-7 (14)				
	(COLLUVIAL) 9.0								
1057	Orange-brown and brown DECOMPOSED SANDSTONE sampled as sandstone fragments, little to some sand, few silt, micaceous, loose to very dense, dry	10	S-4	100	16-50/0.4'				
			S-5	53	33-18-22 (40)				
1052		15	S-6	100	11-13-15 (28)				
			S-7	100	9-7-3 (10)				
1047		20							
	(COLLUVIAL) 22.0		S-8	100	8-20-20 (40)				
	Orange-brown and brown DECOMPOSED SANDSTONE sampled as sandstone fragments, little to some sand, few silt, micaceous, dense to very dense, dry								
	(RESIDUAL) 24.3		S-9	100	50/0.3'				
1042	Boring Terminated at 24.3 feet	25							
1037		30							
1032		35							

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GARVIN BOWARD BEITKO

Test Boring Record

B-98

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-20-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-20-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Cloudy, 80's
Water Level Upon Completion:
Drilling Method: 3 1/4-inch HSA
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1064'	Light brown SILT (ML), some sand, few small rock fragments (orange-brown shale, shale, sandstone), very soft, moist		S-1	40	1-1-1 (2)		11.6		
	(COLLUVIAL) 3.0								
	Light orange-brown SAND (SM), little silt, little rock fragments (sandstone), medium dense, moist		S-2	100	19-10-9 (19)		7.8		
1059		5				20.1			
			S-3	100	16-9-9 (18)		6.9		
	(POSSIBLE COLLUVIAL/RESIDUAL) 9.0								
1054	Brown and orange-brown DECOMPOSED SANDSTONE sampled as sandstone fragments, little sand, medium dense to very dense, dry	10	S-4	100	13-13-17 (30)				
			S-5	80	9-13-20 (33)				
1049		15							
	(RESIDUAL) 15.9		S-6	100	37-50/0.4'				
	Boring Terminated at 15.9 feet Boring collapsed at 4.5' after 24 Hours								
1044		20							
1039		25							
1034		30							
1029		35							

GARVIN BOWARD BEITKO

Test Boring Record

SB-1

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-14-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-14-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1084.1'	TOPSOIL 0.3								
	Brown-yellow SILT (ML), some sand, trace rock fragments, medium, dry		S-1	67	1-1-5 (6)		10.3		
	(RESIDUAL) 3.5								
	Yellow-brown SAND (SM), some silt, little gravel, iron staining, relic bedding, medium dense, dry		S-2	100	4-14-17 (31)		9.0		
1079		5				32.42			
	(RESIDUAL) 7.5		S-3	100	13-12-8 (20)		7.2		
	Brown-gray DECOMPOSED SANDSTONE; sampled as sandstone fragments, some sand, very dense, dry to moist								
	(RESIDUAL) 9.4		S-4	100	50/0.4'				
1074	Brown-gray medium-grained SANDSTONE, moderately weathered, extensive iron staining, medium bedded, moderately broken, medium hard	10							
	-MOHs 7.5 at 11'		R-1	58 (0)					
	-lost water return at 12.0'								
1069		15							
			R-2	80 (14)					
	-few O.5" to 1.0" vugs from 18.0' to 22.0'								
1064		20							
			R-3	84 (32)					
	-MOHs 7.5 at 23.5'								
	24.4								
1059	Boring Terminated at 24.4 feet Boring collapsed at 4.9' after 24 Hours	25							
1054		30							
1049		35							

GARVIN BOWARD BEITKO

Test Boring Record

SB-2

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 70's, Hazy
Water Level Upon Completion: 9.5'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours: 5.2'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1095.1'	FILL: sampled as brown silty sand, little rock and brick fragments, loose, moist		S-1	80	1-2-4 (6)				
	(FILL) 3.0								
	Brown DECOMPOSED SHALE; sampled as shale fragments (GP), few silt, few clay, medium dense, moist		S-2	100	10-10-9 (19)				
1090	**(RESIDUAL)** 6.0	5							
	Brown DECOMPOSED sandy SHALE; sampled as shale fragments (GP), medium to very dense, dry		S-3	80	7-7-8 (15)				
1085	**(RESIDUAL)** 10.1	10	S-4	100	16-32-50/0.1'				
	Brown fine- to medium-grained micaceous SANDSTONE, moderately weathered, medium bedded, very broken to massive, medium hard to hard		R-1	100 (46)					
	-vugs from 12.4' to 13.4'								
1080		15							
	-MOHs 8.5 at 16'		R-2	98 (66)					
1075		20							
	21.0								
	Brown and gray medium- to coarse-grained SANDSTONE, moderately weathered, medium to thickly bedded, broken to massive, hard		R-3	96 (46)					
1070	-MOHs 8.5 at 24' 25.1	25							
	Boring Terminated at 25.1 feet								
1065		30							
1060		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-3

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-19-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Partly sunny, 77 Degrees
Water Level Upon Completion: 4.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G./L. Barnes, E.I.T.
Water Level After 24 Hours: 7.5'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1100'	FILL: sampled as brown silty sand, few yellow-brown rock fragments (sandstone, shale), dry		S-1	53	1-2-2 (4)				
	-trace organics from 0.0' to 1.5'								
			S-2	100	5-7-11 (18)				
1095	**(FILL)**	5							
	Light gray and orange-brown DECOMPOSED medium to coarse-grained SANDSTONE; sampled as sandstone fragments, little sand, medium dense, dry	6.0 / 7.0	S-3	100	11-18-21 (39)				
	(RESIDUAL)								
	Dark gray DECOMPOSED SANDSTONE; sampled as sandstone fragments, little sand, medium dense, dry	9.0							
1090	**(RESIDUAL)**	10	S-4	100	20-32-38 (70)				
	Brown-gray DECOMPOSED SHALE; sampled as shale fragments, very dense, dry								
	(RESIDUAL)	12.0	S-5	100	50/0.4'				
	Brown DECOMPOSED fine-grained SANDSTONE; sampled as sandstone fragments, trace sand, very dense, dry								
1085	**(RESIDUAL)**	15.2 / 15	S-6	100	50/0.2'				
	Brown medium to coarse-grained SANDSTONE, moderately weathered, very broken to massive (generally massive), medium to hard (generally hard)		R-1	100 (68)					
	-MOHs 6.5 at 16'								
1080		20							
			R-2	100 (88)					
1075		25							
	-MOHs 7.5 at 26'								
	-vertical fracture from 26.8' to 26.9'		R-3	82 (26)					
	-high angle fracture from 28.5' to 28.7'								
1070	-very broken to blocky from 26.6' to 30.2' with water stained fractures	30.2 / 30							
	Boring Terminated at 30.2 feet Offset Appox. 7' downslope. Ground Surface Elevation Estimated Based On Ground Surface Elevation At Originally-Staked Location & The Topographic Mapping Provided For Project.								
1065		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-4

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Hazy, 74 to 78 Degrees
Water Level Upon Completion: 44.3'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1115'	FILL: sampled as brown and gray rock fragments (sandstone, shale), few sand, few silt, very loose, moist		S-1	53	3-2-2 (4)				
	(FILL)	3.0							
	FILL: sampled as brown rock fragments (sandstone, red shale), little to some sand, loose to firm, dry to wet		S-2	80	4-6-7 (13)				
1110		5	S-3	100	11-6-5 (11)				
1105		10	S-4	100	9-7-5 (12)				
			S-5	100	3-4-7 (11)				
1100		15	S-6	100	10-4-5 (9)				
			S-7	100	6-3-2 (5)				
1095		20							
	-wet from 21.0' to 22.0'		S-8	80	3-3-5 (8)				
	(FILL)	22.0							
	Brown coarse-grained SANDSTONE FRAGMENTS (GP), some sand, firm, dry								
	(RESIDUAL)	24.7							
1090	Brown-gray clayey SILT (ML), trace shale fragments, stiff, moist	25	S-9	100	11-8-8 (16)				
	(RESIDUAL)	27.0							
	Gray-brown DECOMPOSED SHALE; sampled as soft shale fragments, little silt, few clay, medium dense, moist	28.3	S-10	100	11-12-17 (29)				
	(RESIDUAL)								
1085	Gray and brown-orange DECOMPOSED SANDSTONE; sampled as sandstone fragments, some sand, very dense, dry	30							
	(RESIDUAL)	30.4	S-11	100	50/0.4'				
	Brown fine to medium-grained SANDSTONE, highly weathered, thickly laminated, very broken, soft -MOHs <2 at 31' -no drill water return from 30.4' to 45.4'	33.0	R-1	54 (0)					
	Brown INTERBEDDED fine-grained SANDSTONE and SHALE, moderately weathered, thinly to thickly laminated, very broken to	34.5							
1080		35							

(Continued Next Page)

GARVIN BOWARD BEITKO

Test Boring Record

SB-4

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Hazy, 74 to 78 Degrees
Water Level Upon Completion: 44.3'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		moderately broken, medium hard -MOHs 3.5 at 33.5'								
		Brown fine to medium-grained SANDSTONE, moderately weathered, medium bedded, moderately broken to massive, hard *(continued)* -MOHs 8.5 at 37.5'		R-2	82 (40)					
1075			40							
		-soft, highly weathered shale 40.4' to 40.7'		R-3	100 (50)					
1070		-MOHs >9 at 45'	45							
		45.4 Boring Terminated at 45.4 feet Offset 15' Uphill. Ground Surface Elevation Estimated Based On Ground Surface Elevation At Originally-Staked Location & The Topographic Mapping Provided For Project. Boring collapsed at 4.2' after 24 Hours								
1065			50							
1060			55							
1055			60							
1050			65							
1045			70							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-5

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 70's
Water Level Upon Completion: 28'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1079.1'	Light brown SILT (ML), little to some sand, few to little gravel, trace roots, medium, moist		S-1	100	1-2-3 (5)	58.05	12.8		
	(COLLUVIAL)	3.0							
	Orange-brown SAND (SM), little silt, some gravel, firm to medium dense, moist		S-2	100	14-17-13 (30)		9.4		
1074		5							
			S-3	100	9-8-6 (14)	16.06	12.5		
1069		10	S-4	100	10-8-7 (15)		12.7		
	(POSSIBLE COLLUVIAL/RESIDUAL)	12.0							
	Orange-brown and gray-brown mottled silty CLAY (CL/ML), relic bedding, hard, dry		S-5	100	15-23-48 (71)				
1064	**(RESIDUAL)**	15.0	15						
	Orange-brown SAND (SM), some silt, little rock fragments, moist	15.8	S-6	100	17-50/0.3'				
	(RESIDUAL)								
	Orange-brown medium to coarse-grained SANDSTONE, moderately to highly weathered, very broken to massive, soft to hard, vuggy in places, micaceous -MOHs 2.5 at 16' -vertical fracture from 17.0' to 17.7'		R-1	88 (26)					
1059		20							
	-very soft silty sand seam from 20.0' to 20.2' -grading to brown at 20.0'								
	-MOHs 6.5 at 22'		R-2	94 (26)					
1054		25							
	-vertical fracture from 24.7' to 25.5'								
	-grading to gray and brown at 26.4', water stained, few low angle fractures -MOHs 7.5 at 26'		R-3	100 (56)					
1049		30							
		30.8							
	Boring Terminated at 30.8 feet Boring collapsed at 15.2' after 24 Hours								
1044		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-6

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-14-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-14-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Overcast, 80's
Water Level Upon Completion: 31.6'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1103.1'	TOPSOIL 0.4								
	Orange brown SAND (SP), medium-grained, loose, moist		S-1	80	1-1-2 (3)				
	(RESIDUAL) 3.5								
1098	Brown-gray DECOMPOSED SANDSTONE; sampled as sandstone fragments (GP), some gray sand, dense to very dense, moist	5	S-2	93	6-12-10 (22)				
			S-3	100	12-11-11 (22)				
1093	**(RESIDUAL)** 9.8	10	S-4	100	34-50/0.3'				
	Brown gray SANDSTONE, slightly weathered to moderately weathered, medium to coarse-grained, moderately broken, medium hard, extensive iron staining, micaceous, medium bedded to massive		R-1	46 (26)					
1088	-MOHs >9 at 11'	15							
			R-2	72 (10)					
1083		20							
	-MOHs 7.5 at 22'		R-3	100 (56)					
1078		25							
			R-4	100 (46)					
1073	-vertical fracture from 29.7' to 30.5'	30							
	-MOHs 8.5 at 31'		R-5	100 (47)					
	32.8								
1068	Boring Terminated at 32.8 feet	35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-7

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partly sunny, 85 Degrees
Water Level Upon Completion: 36.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours: 42.1'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1115.7'	Brown micaceous SANDSTONE FRAGMENTS (GP), few to little sand, loose, dry		S-1	67	2-3-5 (8)				
			S-2	87	7-6-4 (10)				
1111	**(RESIDUAL)**	5							
	Brown DECOMPOSED SANDSTONE; sampled as micaceous sandstone fragments, few sand, trace silt, medium dense to very dense, dry	6.0	S-3	100	5-6-12 (18)				
1106	**(RESIDUAL)**	10.0	S-4	100	50/0.2'				
	Brown fine to medium-grained micaceous SANDSTONE, moderately weathered, thinly bedded, moderately broken to blocky, hard -no drill water return from 10.0' to 44.0' -medium to coarse-grained from 11.6' to 15.0' -MOHs 8.5 at 12'	10	R-1	76 (30)					
1101		15							
		17.0	R-2	76 (0)					
	Brown SHALE, completely weathered, very broken, very soft -MOHs <2 at 17.5'	18.0							
1096	Black CARBONACEOUS SHALE, highly weathered, thinly lamianted, very broken, very soft -MOHs 2.5 at 18.2'	20.0	20						
	Gray DECOMPOSED SHALE, highly weathered, thinly laminated, very soft -MOHs <2 at 22'	22.4	R-3	100 (32)					
1091	Brown fine to medium-grained SANDSTONE, highly to moderately weathered, thinly to medium bedded, very broken to massive, medium hard to hard -MOHs 4.5 at 22.6' -MOHs 6.5 at 24'	24.8	25						
	Brown medium to coarse-grained SANDSTONE, moderately weathered, moderately broken to blocky, hard -heavily water stained, high angle fracture from 25.4' to 26.0' -MOHs 7.5 at 29'		R-4	92 (22)					
1086	-few vugs from 32.0' to 35.0'	30							
	-MOHs 8.5 at 34'		R-5	68 (18)					
1081		35.0	35						

(Continued Next Page)

GARVIN BOWARD BEITKO

Test Boring Record

SB-7

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partly sunny, 85 Degrees
Water Level Upon Completion: 36.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours: 42.1'

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1076		Brown fine to medium-grained SANDSTONE, moderately weathered, thinly to medium bedded, moderately broken to massive, hard	40	R-6	94 (52)					
		-MOHs 7.5 at 37'		R-7	80 (100)					
		44.0								
1071		Boring Terminated at 44.0 feet	45							
1066			50							
1061			55							
1056			60							
1051			65							
1046			70							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-8

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion: 17.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1115'	TOPSOIL 0.4		S-1	80	1-3-5 (8)				
	Orange-brown medium-grained SAND (SP), trace silt, loose, moist								
	(RESIDUAL) 3.0								
	Orange-brown SAND (SM), little silt, few gravel gravel (sandstone fragments), firm to medium dense, moist		S-2	100	8-8-8 (16)		9.4		
1110		5				21.08			
			S-3	80	8-6-6 (12)		9.5		
	(RESIDUAL) 8.0								
	Gray DECOMPOSED SANDSTONE; sampled as sandstone fragments (GP), some sand, medium dense to very dense, moist								
1105		10	S-4	100	9-11-12 (23)				
			S-5	100	8-50/0.4'				
1100	**(RESIDUAL)** 15.3	15	S-6	100	50/0.3'				
	Brown-gray medium-grained SANDSTONE, moderately weathered, micaceous, medium bedded, soft to medium hard 15.8								
	Gray CLAYSTONE, slightly weathered, micaceous, medium bedded, very soft		R-1	50 (0)					
1095	-MOHs <2 at 17'	20							
	-lost water return at 21.0'		R-2	86 (0)					
	Medium-gray clayey SHALE, slightly weathered, micaceous, thinly to medium bedded, soft 21.8								
1090	-MOHs 3.5 at 24' 24.7	25							
	Gray SANDSTONE, slightly weathered, thinly to medium bedded, carbonaceous laminations, some iron staining, slightly broken, medium hard		R-3	100 (0)					
1085	-MOHs 7.5 at 27'	30							
	-moderately weathered, broken, and extensive iron staining from 30.5' to 32.8'		R-4	80 (22)					
1080	-MOHs 8.5 at 34'	35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-8

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion: 17.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1075		Gray SANDSTONE, slightly weathered, thinly to medium bedded, carbonaceous laminations, some iron staining, slightly broken, medium hard *(continued)*	40	R-5	100 (56)					
		-MOHs 8.5 at 41'								
		43.3		R-6	58 (8)					
1070		Boring Terminated at 43.3 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.	45							
1065			50							
1060			55							
1055			60							
1050			65							
1045			70							

GARVIN BOWARD BEITKO

Test Boring Record

SB-9

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Hazy
Water Level Upon Completion: 45.8'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1117.5'	Fill: sampled as brown rock fragments, (sandstone, shale), little to some sand, loose, moist		S-1	27	3-5-4 (9)				
			S-2	80	4-4-4 (8)				
1113		5							
			S-3	80	9-6-5 (11)				
1108		10	S-4	40	4-4-3 (7)				
	(FILL)	12.0							
	Brown SANDSTONE FRAGMENTS (GP), little sand, loose to firm, moist		S-5	100	5-7-11 (18)				
1103	**(RESIDUAL)**	15.0 15							
	Brown and gray DECOMPOSED SANDSTONE; sampled as sandstone fragments (GP), little sand, medium dense to very dense, moist		S-6	100	12-10-11 (21)				
			S-7	100	7-9-11 (20)				
1098		20							
			S-8	100	23-50/0.4'				
	(RESIDUAL)								
1093		24.8 25	S-9	100	35-50/0.3'				
	Brown SANDSTONE, completely weathered, very soft	25.0							
	Brown-gray SHALE, completely to highly weathered, thinly laminated, very broken to broken, very soft to soft -completely weathered, very soft from 25.0' to 27.3' -MOHs 2.5 at 26'		R-1	100 (0)					
1088		30							
		31.0							
	Brown and gray interbedded fine-grained SANDSTONE and SHALE, slightly to moderately weathered, thinly to thickly laminated, very broken to blocky, few carbonaceous laminations, medium hard to hard -MOHs 4.5 at 31.5' -MOHs 7.5 at 34'		R-2	100 (8)					
1083		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-9

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Hazy
Water Level Upon Completion: 45.8'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Brown and gray interbedded fine-grained SANDSTONE and SHALE, slightly to moderately weathered, thinly to thickly laminated, very broken to blocky, few carbonaceous laminations, medium hard to hard *(continued)*								
		-vertical fracture and soft from 37.5' to 41.0'		R-3	50 (20)					
		-lost drill water return at 37'								
		39.5								
1078		Brown fine- to medium-grained SANDSTONE, moderately weathered, medium bedded, broken to massive, soft to medium hard, few coarse-grained zones	40							
		-few carbonaceous laminations		R-4	84 (46)					
		-MOHs >9 at 41'								
1073			45							
		-soft from 45.5' to 45.7'		R-5	100 (58)					
		46.0								
		Boring Terminated at 46.0 feet Boring collapsed at 21.9' after 24 Hours								
1068			50							
1063			55							
1058			60							
1053			65							
1048			70							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-10

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 70's
Water Level Upon Completion: 24.5'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1096'	TOPSOIL 0.3								
	Light brown SAND (SM), some silt, trace fine roots, loose to firm, moist		S-1	87	2-2-3 (5)				
			S-2	100	9-7-7 (14)				
1091		5							
	(COLLUVIAL) 6.0								
	Light brown and gray silty CLAY (CL/ML), few rock fragments (sandstone, shale), trace roots, very stiff, moist		S-3	100	8-9-16 (25)				
	(RESIDUAL) 9.0								
1086	Brown and orange-brown silty CLAY (CL/ML), trace fine sand, relic bedding, hard, dry	10	S-4	100	13-18-19 (37)				
	(RESIDUAL) 12.1								
	Gray-brown shaley SANDSTONE, moderately weathered, very broken to moderately broken, medium hard to hard		S-5	100	50/0.1'				
	-MOHs 7,5 at 14'		R-1	97 (0)					
1081	14.6	15							
	Brown medium to coarse-grained SANDSTONE, moderately to highly weathered, very broken to blocky, vuggy, medium hard to hard		R-2	100 (34)					
	-MOHs 8.5 at 18.5'								
1076	-several 0.5"-1.0"-diameter vugs from 18.0' to 22.0'	20							
	-very broken and fractured from 22.0' to 24.0'		R-3	72 (0)					
1071	25.1	25							
	Boring Terminated at 25.1 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project. Boring collapsed at 7.2' after 24 Hours								
1066		30							
1061		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-11

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Partly cloudy, 75 to 77 Degrees
Water Level Upon Completion: 22.7'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1105.2'	ASPHALTIC CONCRETE 0.2'								
	Orange-brown SANDSTONE FRAGMENTS (GP), few sand, firm, dry		S-1	53	1-4-9 (13)				
	(RESIDUAL) 3.0'								
	Brown DECOMPOSED SANDSTONE; sampled as sandstone fragments, few sand, medium dense to very dense, dry		S-2	80	21-9-7 (16)				
1100		5							
			S-3	100	26-15-23 (38)				
1095	**(RESIDUAL)** 9.9'	10	S-4	100	36-50/0.4'				
	Orange-brown medium to coarse-grained SANDSTONE, moderately weathered, thinly bedded, very broken to moderately broken, soft to medium hard		R-1	42 (0)					
	-MOHs 8.5 at 10.2'								
1090	15.0'	15							
	Gray and orange-brown fine to medium-grained micaceous SANDSTONE, highly to moderately weathered, thickly laminated to thinly bedded, moderately broken to blocky, soft to hard		R-2	56 (10)					
	-highly weathered, soft from 15.0' to 17.6'								
	-MOHs 5.5 at 17' 17.6'								
	Brown medium to coarse-grained SANDSTONE, moderately weathered, medium bedded, very broken to massive, hard								
1085		20							
	-MOHs >9 at 20.5'		R-3	82 (14)					
	-lost drill water return at 21'								
1080		25							
	-MOHs >9 at 25'		R-4	100 (26)					
	-vuggy zones from 31' to 33'								
1075		30							
	-MOHs >9 at 32'		R-5	94 (16)					
	33.0'								
	Boring Terminated at 33.0 feet								
1070		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-12

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 78°-84°, Partly Sunny
Water Level Upon Completion: 29.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1114'	TOPSOIL 0.5		S-1	67	2-2-3 (5)				
	Orange-brown micaceous SANDSTONE FRAGMENTS (GP), few sand, trace silt, loose, dry								
	(RESIDUAL) 3.0								
	Orange-brown SAND (SM), little silt, few gravel (sandstone fragments), medium dense, dry		S-2	100	12-12-12 (24)		5.4		
1109		5				24.47			
			S-3	100	14-11-10 (21)		5.3		
	(RESIDUAL) 9.0								
1104	Orange-brown micaceous DECOMPOSED SANDSTONE; sampled as sandstone fragments, few sand, trace silt, medium dense to very dense, dry	10	S-4	100	50/0.4'				
	(RESIDUAL) 12.2		S-5	100	50/0.2'				
	Brown and gray medium- to coarse-grained SANDSTONE, moderately to completely weathered, thinly to medium bedded, very broken to broken, very soft to medium hard		R-1	71 (0)					
1099	-vertical fracture from 13.0' to 13.5'	15							
	-MOHs 5.5 at 13.6'								
	-no drill water return from 12.2' to 42.0'		R-2	80 (0)					
	-very soft, completely weathered from 16.0' to16.5' 16.5								
	Brown interbedded fine-grained SANDSTONE and SHALE, highly weathered, thinly to thickly laminated, very broken, soft								
1094	-MOHs <2 at 17'	20							
	21.0		R-3	84 (0)					
	Brown medium- to coarse-grained SANDSTONE, moderately weathered, thinly to medium bedded, very broken to massive, hard, some cross bedding								
	-highly weathered from 21.0' to 30.0'								
	-vugs from 22.0' to 23.0'								
1089	-MOHs >9 at 24'	25							
	-vugs from 27.0' to 27.3'		R-4	100 (60)					
	-MOHs 8.5 at 28'								
1084		30							
			R-5	100 (64)					
1079	-vugs from 34.0' to 34.7'	35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-12

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 78°-84°, Partly Sunny
Water Level Upon Completion: 29.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Brown medium- to coarse-grained SANDSTONE, moderately weathered, thinly to medium bedded, very broken to massive, hard, some cross bedding *(continued)*								
				R-6	100 (56)					
1074		-MOHs 8.5 at 38'	40							
				R-7	30 (25)					
			42.0							
		Boring Terminated at 42.0 feet Offset Approx. 11.5' North. Ground Surface Elevation Estimated Based On Ground Surface Elevation At Originally-Staked Location & The Topographic Mapping Provided For Project. Boring collapsed at 32.9' after 24 Hours								
1069			45							
1064			50							
1059			55							
1054			60							
1049			65							
1044			70							

GARVIN BOWARD BEITKO

Test Boring Record

SB-13

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Partly cloudy, 70 to 74 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1113.1'	Brown DECOMPOSED SANDSTONE; sampled as sandstone fragments, few sand, medium to very dense, dry		S-1	67	1-7-20 (27)				
			S-2	100	17-50/0.1'				
1108		5							
	(RESIDUAL) 6.2		S-3	100	50/0.2'				
	Brown fine to medium-grained micaceous SANDSTONE, highly to moderately weathered, thinly bedded, very broken to blocky, soft to hard		R-1	80 (10)					
	-lost water return at 7.0'								
1103	-soft from 8.0' to 8.7'	10							
	-MOHs 6.5 at 10'								
	11.3								
	Brown medium to coarse-grained micaceous SANDSTONE, moderately weathered, very broken to blocky, hard		R-2	92 (16)					
	-few fractured zones								
1098		15							
	-MOHS 6.5 at 14'								
	17.4								
	Brown fine to medium-grained SANDSTONE, highly to moderately weathered, thinly bedded, very broken to moderately broken, soft to medium hard		R-3	90 (0)					
1093	-soft, highly weathered from 19.4' to 19.9'	20							
	20.8								
	Black CARBONACEOUS SHALE, highly weathered, thinly laminated, very broken, soft, possible pyrite 21.5								
	-MOHs 2.5 at 21'								
	Gray-brown SHALE, highly to completely weathered, thinly laminated, very broken to moderately broken, soft 24.0		R-4	100 (0)					
1088	-MOHs <2 at 22'	25							
	Brown fine to medium-grained SANDSTONE, moderately weathered, moderately broken, medium hard to hard 26.2								
	-MOHs 8.5 at 25'								
	-vuggy from 25.5' to 26.0' 27.0								
	Dark gray SHALE, moderately weathered, thinly laminated, very broken, soft		R-5	100 (12)					
1083	Brown medium to coarse-grained SANDSTONE, moderately weathered, medium bedded, moderately broken to massive, hard, few vertical fractures	30							
	-many vugs and carbonaceous inclusions from 31.3' to 34.5'								
	-MOHs >9 at 31.5'		R-6	100 (16)					
1078		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-13

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Partly cloudy, 70 to 74 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Brown medium to coarse-grained SANDSTONE, moderately weathered, medium bedded, moderately broken to massive, hard, few vertical fractures *(continued)*								
1073		-MOHs 8.5 at 38'	40	R-7	96 (0)					
		41.0								
		Boring Terminated at 41.0 feet Boring collapsed at 15' after 24 Hours								
1068			45							
1063			50							
1058			55							
1053			60							
1048			65							
1043			70							

BORING LOG - GARVIN - GARVIN.GDT - 2-14-24 07:43 - \\10.87.1.5\SHARED DOCUMENTS\GINT (NEW)\PROJECTS\2016\16123A QVSD.GPJ

GARVIN BOWARD BEITKO

Test Boring Record

SB-14

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Partly cloudy, 67 to 70 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1113.4'	Brown DECOMPOSED micaceous SANDSTONE; sampled as sandstone fragments, few sand, medium dense to very dense, dry		S-1	80	1-4-17 (21)				
			S-2	100	16-40-50/0.3'				
1108		5							
	(RESIDUAL)								
		6.3	S-3	100	50/0.3'				
	Brown fine to medium-grained micaceous SANDSTONE, moderately weathered, thinly bedded, very broken to blocky, medium hard		R-1	82 (8)					
	-MOHs 4.5 at 8.5'								
1103		10							
		11.1							
	Brown SHALE, completely to highly weathered, thinly laminated, very broken, very soft		R-2	74 (0)					
		13.0							
	Brown fine to medium-grained SANDSTONE, moderately weathered, thinly bedded, very broken to blocky, hard								
1098		15							
	-few vugs, medium to coarse-grained from 14.0' to 15.0'								
	-MOHs 7.5 at 19'		R-3	100 (0)					
1093		20							
		20.4							
	Brown to dark gray SHALE, highly weathered, thinly laminated, very broken, soft								
	-MOHs <2 at 21.2'	21.5							
	Brown INTERBEDDED fine-grained SANDSTONE and SHALE, moderately weathered, thinly to thickly laminated, very broken to massive, medium hard , some carbonaceous laminations		R-4	100 (10)					
	-MOHs 2.5 at 22.3'								
1088		25							
	-few vertically fractured zones								
	-MOHs 6.5 at 24'								
		27.0							
	Brown medium to coarse-grained SANDSTONE, moderately weathered, moderately broken to massive, hard, few carbonaceous laminations		R-5	92 (28)					
1083		30							
	-MOHs 8.5 at 31'								
			R-6	100 (32)					
1078		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-14

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: Partly cloudy, 67 to 70 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Brown medium to coarse-grained SANDSTONE, moderately weathered, moderately broken to massive, hard, few carbonaceous laminations *(continued)*								
1073			40	R-7	74 (46)					
		-MOHs 8.5 at 41'								
		41.3								
		Boring Terminated at 41.3 feet Boring collapsed at 4.2' after 24 Hours								
1068			45							
1063			50							
1058			55							
1053			60							
1048			65							
1043			70							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-15

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-14-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-14-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1114.3'		TOPSOIL 0.4		S-1	67	1-2-6 (8)				
		Orange-brown medium-grained SAND (SP), loose, moist								
		(RESIDUAL) 3.0								
		Gray DECOMPOSED SANDSTONE; sampled as sandstone fragments, some sand, medium dense to very dense, iron stained, moist		S-2	100	3-11-13 (24)				
1109			5	S-3	100	11-17-14 (31)				
1104			10	S-4	100	34-44-33 (77)				
				S-5	100	50/0.4'				
1099		**(RESIDUAL)** 15.4	15	S-6	100	50/0.4'				
		Brown-gray medium- to coarse-grained SANDSTONE, moderately weathered, medium bedded, micaceous, iron stained, slightly broken, medium hard		R-1	80 (30)					
		-MOHs 5.5 at 16'								
1094			20							
		22.3		R-2	100 (14)					
		Medium gray CLAYSTONE, fresh, medium bedded, very soft 23.2								
		Medium gray SILTSTONE, slightly weathered to fresh, medium bedded, slightly broken, medium hard								
1089		-shaley zone from 24.3' to 24.4'	25							
		-MOHs 6.5 at 25'		R-3	100 (36)					
		27.6								
		Gray fine- to medium-grained SANDSTONE, moderately weathered to fresh, iron stained, highly broken and weathered, hard								
1084			30							
		-MOHs 8.5 at 29'		R-4	100 (0)					
		-iron stained, vertical fracture, microlaminated from 34.8' to 35.9'								
1079			35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-15

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-14-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-14-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Gray fine- to medium-grained SANDSTONE, moderately weathered to fresh, iron stained, highly broken and weathered, hard *(continued)*								
		-coarse-grained, highly broken, vuggy, and fractured from 35.0' to 37.0'		R-5	46 (0)					
1074		-MOHs >9 at 36'	40							
		-vertical fracture from 41.9' to 42.5'		R-6	100 (0)					
		43.4								
1069		Boring Terminated at 43.4 feet	45							
1064			50							
1059			55							
1054			60							
1049			65							
1044			70							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-16

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 70's, Hazy
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1109'	Brown and orange-brown SAND (SM), some silt, little rock fragments (sandstone), loose, dry		S-1	67	2-3-4 (7)				
	(RESIDUAL) 3.0								
	Gray-brown DECOMPOSED SANDSTONE; sampled as medium- to course-grained sandstone fragments, little to some sand, little to few silt, dense to very dense, dry		S-2	100	11-21-36 (57)				
1104		5							
			S-3	100	28-23-15 (38)				
	(RESIDUAL) 9.4		S-4	100	50/0.4'				
1099	Orange-brown coarse-grained SANDSTONE, highly weathered, very broken to moderately broken, medium hard to hard, vuggy 10.4	10							
	-MOHs >9 at 10'		R-1	68 (0)					
	Gray and brown CARBONACEOUS fine sandy SHALE, moderately to highly weathered, very broken to moderately broken, very soft to medium hard								
	-clay seam from 10.6' to 10.8'								
1094	-MOHs 7.5 at 14.5'	15	R-2	100 (0)					
	18.8								
1089	Medium gray CARBONACEOUS fine- to medium-grained shaley SANDSTONE, moderately weathered, very broken to blocky, medium hard to hard	20							
	-MOHs >9 at 20'		R-3	82 (0)					
	21.9 Gray and brown fine- to medium-grained SANDSTONE, few to many carbonaceous laminations, moderately to highly weathered, very broken to moderately broken, soft to hard (generally medium hard), shaley in zones								
1084	-MOHs 3.5 at 22.2'	25							
	-MOHs 7.5 at 25'		R-4	94 (38)					
1079		30							
	30.6								
	Orange-brown medium- to coarse-grained SANDSTONE, highly weathered, very broken to massive, medium hard to hard		R-5	80 (36)					
	-MOHs >9 at 31'								
	-highly weathered, driller noted soft zones while coring R-5								
1074	-vuggy from 31.0' to 34.0'	35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-16

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 70's, Hazy
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Orange-brown medium- to coarse-grained SANDSTONE, highly weathered, very broken to massive, medium hard to hard *(continued)*		R-6	67 (43)					
		-MOHs >9 at 37' 37.4								
		Boring Terminated at 37.4 feet Offset 5' South. Ground Surface Elevation Estimated Based On Ground Surface Elevation At Originally-Staked Location & The Topographic Mapping Provided For Project; no water return								
1069			40							
1064			45							
1059			50							
1054			55							
1049			60							
1044			65							
1039			70							

GARVIN BOWARD BEITKO

Test Boring Record

SB-17

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 70's, Hazy
Water Level Upon Completion: 31.5'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1102.6'	TOPSOIL 0.4		S-1	67	1-2-3 (5)				
	Gray-brown SAND (SM), some silt, few rock fragments (brown and red sandstone, coal), loose, dry **(COLLUVIAL)** 3.0								
1098	Light brown to orange-brown SAND (SM), some silt, few rock fragments (sandstone), firm, dry **(RESIDUAL)** 6.0	5	S-2	100	10-7-7 (14)				
	Gray and rust-brown decomposed CARBONACEOUS SHALE; sampled as very thinly laminated shale fragments, little silt, few sand, micaceous, medium dense to very dense, dry to moist		S-3	87	12-11-10 (21)				
1093		10	S-4	100	22-43-50/0.4'				
	(RESIDUAL) 12.4		S-5	100	50/0.4'				
	Gray-brown CARBONACEOUS SHALE, moderately to highly weathered, very broken, soft to medium hard, fine sandy		R-1	96 (0)					
1088	-MOHs 2.5 at 13.5'	15							
	-MOHs 2.5 at 19'		R-2	100 (8)					
1083	20.6	20							
	Gray fine- to medium-grained SANDSTONE, moderately weathered, very broken to moderately broken, medium hard to hard, few to many carbonaceous laminations		R-3	100 (0)					
	-MOHs 6.5 at 22'								
1078	25.3	25							
	Brown medium-grained SANDSTONE, moderately to slightly weathered, very broken to massive, medium hard to hard, trace carbonaceous laminations, some water staining -high angle water stained fracture from 25.5' to 25.8' -lost water ~26.0' -MOHs 5.5 at 26' -clay seam at 30.4'		R-4	92 (18)					
1073	30.5	30							
	Brown medium- to coarse-grained SANDSTONE, moderately weathered, very broken to massive, medium hard to hard, vuggy -MOHs 7.5 at 31' 32.5		R-5	50 (26)					
	Boring Terminated at 32.5 feet Boring collapsed at 28.8' after 24 Hours								
1068		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-18

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 70's
Water Level Upon Completion: 31.6'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours: 28'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1078'	Light brown SAND (SM), some silt, trace rock fragments (red sandstone, brown sandstone), loose, moist		S-1	100	1-5-5 (10)				
	(COLLUVIAL)	3.0							
	Brown, grayish-brown, and orange-brown silty CLAY (CL/ML), trace fine sand, relic bedding, stiff, dry		S-2	100	11-7-7 (14)				
1073	**(RESIDUAL)**	5							
		6.0							
	Reddish-brown and orange-brown SANDSTONE FRAGMENTS (GP), little sand, trace silt, loose, dry		S-3	100	6-4-4 (8)				
	(RESIDUAL)	9.0							
1068	Orange-brown DECOMPOSED SANDSTONE sampled as sandstone fragments, little sand, very dense, dry	9.3 10	S-4	100	50/0.3'				
	(RESIDUAL)		R-1	80 (0)					
	Brown and orange-brown medium to coarse-grained SANDSTONE, moderately to highly weathered, very broken to moderately broken, medium hard to hard, vuggy		R-2	98 (0)					
	-no water return -MOHs 7.5 at 11' -vertical fracture from 15.3' to 15.5'								
1063	-completely weathered from 15.7' to 16.0' -black clay seam at 16.0'	15							
		16.3							
	Gray and brown medium-grained SANDSTONE, moderately weathered, very broken to massive, medium hard to hard, some water staining, micaceous, few low angle fractures		R-3	98 (50)					
1058	-MOHs 7.5 at 21'	20							
	-clay seam at 23.0' -clay seam at 24.0'		R-4	96 (0)					
		24.5							
1053	Gray fine- to medium-grained SANDSTONE, moderately to slightly weathered, very broken to massive, medium hard to hard, some water staining, micaceous, few carbonaceous laminations	25							
			R-5	100 (58)					
1048	-MOHs 8.5 at 28'	30							
			R-6	100 (58)					
1043		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-18

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-18-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 70's
Water Level Upon Completion: 31.6'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours: 28'

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Gray fine- to medium-grained SANDSTONE, moderately to slightly weathered, very broken to massive, medium hard to hard, some water staining, micaceous, few carbonaceous laminations *(continued)*		R-7	100 (86)					
1038			40							
		-MOHs 8.5 at 40'		R-8	100 (77)					
			41.4							
		Medium gray fine sandy SILTSTONE, slightly weathered to fresh, very broken to blocky, medium hard to hard	42.8							
		-clay seam at 41.5' -MOHs 6.5 at 41.6'								
1033		Boring Terminated at 42.8 feet Offset Approximately 5' South (downslope). Ground Surface Elevation Estimated Based On Ground Surface Elevation At Originally-Staked Location & The Topographic Mapping Provided For Project.	45							
1028			50							
1023			55							
1018			60							
1013			65							
1008			70							

GARVIN BOWARD BEITKO

Test Boring Record

SB-19

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 70's. Partly Sunny
Water Level Upon Completion: 25.6'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1122'	TOPSOIL 0.3		S-1	73	2-5-4 (9)				
	FILL: sampled as orange-brown rock fragments (shale, sandstone), few gravel, trace clay, loose, moist **(FILL)** 3.0								
	Brown SAND (SM), little silt, little gravel (sandstone fragments), medium dense, moist		S-2	100	16-15-14 (29)		8.6		
1117	-moist from 3.0' to 7.5'	5				21.53			
			S-3	100	10-8-8 (16)		9.1		
	(RESIDUAL) 9.0								
1112	Brown micaceous DECOMPOSED SANDSTONE; sampled as sandstone fragments, few sand, trace silt, medium to very dense, dry	10	S-4	100	50/0.3'				
	(RESIDUAL) 12.4		S-5	100	50/0.4'				
1107	Brown fine- to medium-grained micaceous SANDSTONE, moderately weathered, thickly laminated to medium bedded, very broken to massive, medium hard to hard, few soft seams	15	R-1	81 (0)					
	-MOHs 7.5 at 16.5'		R-2	100 (0)					
1102	-very water stained, medium to coarse-grained, thinly bedded, massive, hard from 20.0' to 30.8'	20							
			R-3	96 (54)					
1097	-MOHs 7.5 at 25'	25							
			R-4	92 (38)					
1092	-MOHs 6.5 at 32'	30							
	32.7		R-5	94 (12)					
1087	-MOHs 5.5 at 35'	35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-19

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 70's. Partly Sunny
Water Level Upon Completion: 25.6'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Brown and gray fine- to medium-grained SANDSTONE and SHALE, moderately weathered, thinly laminated to thinly bedded,very broken to moderately broken, medium hard, some carbonaceous laminations, possible pyrite *(continued)*	36.0	R-6	100 (0)					
		Boring Terminated at 36.0 feet Boring Collapsed at 22.7' after 24 Hours								
1082			40							
1077			45							
1072			50							
1067			55							
1062			60							
1057			65							
1052			70							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-20

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 2
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1116.8'	TOPSOIL 0.4								
	Yellow-brown SAND (SP), little angular sandstone fragments, very loose to firm, moist		S-1	67	1-1-2 (3)				
			S-2	100	8-5-6 (11)				
1112		5							
	(RESIDUAL) 7.0		S-3	100	6-7-8 (15)				
	Brown-orange-gray DECOMPOSED SANDSTONE (GP); sampled as sandstone fragments, little sand, loose to very dense, moist								
1107		10	S-4	100	15-27-50/0.4'				
	(RESIDUAL) 12.1		S-5	100	50/0.1'				
	Gray medium-grained SANDSTONE, moderately weathered, thinly bedded, moderately broken, medium hard to hard, iron stained		R-1	76 (0)					
	-MOHs 7.5 at 13'								
1102	15.0	15							
	Light gray CLAYSTONE, slightly weathered, medium bedded, very soft								
	-MOHs <2 at 16'								
	-lost water return at 17.0' 17.5		R-2	66 (0)					
	Brown-gray SANDSTONE, medium-grained, micaceous, moderately broken, iron stained, carbonaceous streaks, hard								
1097		20							
	-MOHs 7.5 at 19'								
	22.3		R-3	100 (26)					
	Dark gray sandy CLAYSTONE, moderately weathered, thinly bedded, very soft 22.7								
	Gray medium-grained SANDSTONE, slightly weathered, iron stained, slightly broken, soft to hard								
1092		25							
	-MOHs 2.5 at 23'								
	-MOHs 7.5 at 24' 25.2								
	26.4		R-4	100 (8)					
	Gray sandy SHALE, slightly weathered, thinly bedded, iron stained, slightly broken, soft								
	-MOHs <2 at 25.5'								
	28.4								
	Gray medium-grained SANDSTONE, slightly weathered, thinly bedded, slightly broken, soft to medium hard								
1087	-MOHs 5.5 at 27'	30							
	-iron stained vertical fracture from 28.3' to 28.5' 30.0		R-5	(20)					
	Medium gray SILTSTONE, slightly to moderately weathered, iron stained, vertically fractured, slightly broken, medium hard								
	-MOHs 4.5 at 29' 32.0								
	Gray medium-grained SANDSTONE, slightly weathered to fresh, micaeous, carbonaceous laminations, sub-vertical fracture, moderately broken, hard								
1082	-MOHs 8.5 at 31'	35							

(Continued Next Page)

GARVIN BOWARD BEITKO

Test Boring Record

SB-20

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 2 of 2

Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:

Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:

Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion:

Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours:

Ground Elevation (ft)	Graphic Log	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
		Boring Terminated at 32.0 feet Boring collapsed at 7' after 24 Hours								
1077			40							
1072			45							
1067			50							
1062			55							
1057			60							
1052			65							
1047			70							

GARVIN BOWARD BEITKO

Test Boring Record

SB-21

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-13-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-13-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 80's, Sunny
Water Level Upon Completion: 3.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: C. Ledney
Water Level After 24 Hours: 2.3'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1107.1'	TOPSOIL 0.4		S-1	67	1-1-1 (2)				
	Brown-orange medium-grained SAND (SM), little silt, trace sandstone fragments, very loose, moist **(RESIDUAL)** 3.0								
	Yellow-brown SAND (SP), some sandstone fragments, loose, moist		S-2	100	4-3-5 (8)				
1102	**(RESIDUAL)** 6.0	5							
	Gray DECOMPOSED SANDSTONE; sampled as sandstone fragments, little sand, medium dense to very dense, moist		S-3	100	18-12-9 (21)				
1097		10	S-4	100	20-35-50/0.4'				
	(RESIDUAL) 12.4		S-5	100	50/0.4'				
	Gray medium-grained SANDSTONE, moderately weathered, thinly to medium bedded, micaceous, moderately broken, medium hard		R-1	100 (0)					
1092	-MOHs 4.5 at 13.3'	15							
	16.4		R-2	100 (0)					
	Gray CLAYSTONE, slightly weathered to fresh, medium bedded, very soft -MOHs <2 at 17.5' 18.0								
	Gray sandy SHALE, slightly weathered, iron stained, thinly bedded, slightly broken, very soft to soft 19.4								
1087	Gray with dark gray streaked shaley SANDSTONE, slightly weathered, microlaminated, thinly to medium bedded, moderately broken, medium hard 21.0	20	R-3	100 (25)					
	-MOHs 5.5 at 20'								
	Boring Terminated at 21.0 feet								
1082		25							
1077		30							
1072		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-22

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-14-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-14-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partly sunny, 74 to 77 Degrees
Water Level Upon Completion:
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1113.6'	Brown DECOMPOSED micaceous SANDSTONE; sampled as sandstone fragments, few sand, medium to very dense, dry		S-1	100	3-6-10 (16)				
			S-2	100	17-29-38 (67)				
1109		5							
			S-3	100	33-20-19 (39)				
	(RESIDUAL) 9.1								
1104	Brown to light gray fine to medium-grained SANDSTONE, moderately weathered, thinly bedded, very broken to blocky, hard	10	S-4	100	50/0.1'				
			R-1	44 (0)					
	-MOHs >9 at 12'		R-2	90 (8)					
1099		15							
	-light gray/brown, soft vertical fracture from 16.0' to 17.0'		R-3	96 (0)					
	-MOHs 8.5 at 20.6'								
1094		20							
	-vertical fracture from 20.0' to 20.5'								
	-few vertical fractures from 21.4' to 24.7' 22.0		R-4	98 (16)					
	Brown and gray INTERBEDDED fine-grained SANDSTONE and SHALE, moderately weathered, thinly laminated, very broken to moderately broken, medium hard, numerous carbonaceous laminations								
1089		25							
	-MOHs 6.5 at 26'		R-5	93 (0)					
	28.0								
	Boring Terminated at 28.0 feet								
1084		30							
1079		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-23

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-19-23
Water Level During Drilling:
Drilled By: W. Ewing (Test Boring Services, Inc.)
Completion Date: 7-19-23
Water Level Before Coring:
Drilling Rig: Acker Rebel Track Mounted Rig
Weather: 70's, Cloudy
Water Level Upon Completion: 15.9'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1103.3'	Brown clayey SILT (ML), trace fine sand, medium, moist		S-1	67	1-1-4 (5)				
	(RESIDUAL) 3.0								
1098	Gray and brown SANDSTONE FRAGMENTS (GP), some sand, little silt, medium dense, moist, micaceous	5	S-2	80	5-7-8 (15)				
	(RESIDUAL) 6.5								
	Gray and brown DECOMPOSED SANDSTONE; sampled as sandstone fragments, some sand, little silt, dense to very dense, moist, micaceous		S-3	80	7-30-10 (40)				
	(RESIDUAL) 9.4		S-4	100	50/0.4'				
1093	Brown medium- to coarse-grained micaceous SANDSTONE, moderately to highly weathered, very broken to moderately broken, medium hard	10	R-1	60 (0)					
	-vertical fracture from 10.6' to 11.6'								
	-MOHs 6.5 at 11'								
	14.2								
1088	Gray and orange-brown SHALE, highly weathered, very soft	15	R-2	100 (10)					
	-MOHs <2 at 15.5'								
	17.7								
	Gray and brown shaley fine- to medium-grained SANDSTONE, highly weathered, very broken to massive (generally very broken to moderately broken), very soft to hard (generally medium hard) 19.4								
1083	-MOHs 6.5 at 18'	20							
	Boring Terminated at 19.4 feet								
1078		25							
1073		30							
1068		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-24

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-17-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-17-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: 80's, Hazy
Water Level Upon Completion: 25.7'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: L. Barnes, E.I.T.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1113.7'	Brown CLAY (CL) with gray mottling, stiff, dry		S-1	87	9-5-9 (14)				
	(RESIDUAL) 3.0								
	Gray and brown DECOMPOSED SANDSTONE; sampled as sandstone fragments, little sand, few silt, very dense, dry		S-2	100	50/0.4'				
1109	**(RESIDUAL)** 6.1	5							
	Gray and brown medium- to coarse-grained SANDSTONE, moderately to highly weathered, very broken to moderately broken, medium hard to hard, some water staining, few low angle fractures, vuggy in places -MOHs 5.5 at 8'		S-3	100	50/0.1'				
1104		10	R-1	94 (0)					
1099		15	R-2	100 (0)					
	-MOHs 8.5 at 16.8' -clay seam at 17.3' -gray and brown claystone and clayshale interbeds from 17.7' to 21.1'		R-3	72 (0)					
1094	21.4	20							
	Medium gray and brown CARBONACEOUS fine sandy SHALE, moderately to highly weathered, very broken and fractured, very soft to medium hard -MOHs 5.5 at 24.5'		R-4	88 (0)					
1089	25.5	25							
	Gray fine- to medium-grained SANDSTONE, slightly weathered, very broken to massive (generally moderately broken to blocky), medium hard to hard, vuggy, many carbonaceous laminations -MOHs 8.5 at 27' -water stained from 29.6' to 29.8'		R-5	100 (30)					
1084	30.1	30							
	Boring Terminated at 30.1 feet								
1079		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-25

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-19-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-19-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partly cloudy, 71 Degrees
Water Level Upon Completion: 16.9'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1103'	TOPSOIL 0.3		S-1	87	1-3-4 (7)				
	Tan sandy SILT (ML), medium, dry								
	(RESIDUAL) 3.0								
	Brown SANDSTONE FRAGMENTS (GP), some sand, loose to very dense, dry		S-2	100	9-9-5 (14)				
1098		5							
			S-3	100	6-5-4 (9)				
	(RESIDUAL) 9.3		S-4	100	50/0.3'				
1093	Brown fine to medium-grained micaceous SANDSTONE, moderately weathered, thinly bedded, very broken to massive, hard, few carbonaceous laminations	10	R-1	98 (40)					
	-MOHs 8.5 at 10.5 13.3								
1088	Gray INTERBEDDED fine-grained micaceous SANDSTONE and SHALE, slightly weathered, moderately broken to hard, some carbonaceous laminations	15	R-2	100 (0)					
	-lost drill water at 14'								
	-MOHs 8.5 at 17.5' 18.0								
	Boring Terminated at 18.0 feet Offset Approx. 9' NE. Ground Surface Elevation Estimated Based On Ground Surface Elevation At Originally-Staked Location & The Topographic Mapping Provided For Project.								
1083		20							
1078		25							
1073		30							
1068		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-26

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-18-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-19-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Cloudy, 69 Degrees
Water Level Upon Completion: 19.2'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry/L. Barnes
Water Level After 24 Hours:

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1110'	Light brown SILT (ML), little sand, few rock fragments, trace roots, stiff, dry		S-1	87	1-4-8 (12)		4.4		
	(POSSIBLE COLLUVIAL/RESIDUAL) 3.0								
	Gray and brown SAND (SM), little silt, little to some gravel (sandstone fragments), medium dense, dry		S-2	100	13-12-13 (25)		4.4		
1105		5				21.88			
			S-3	100	10-9-7 (16)		5.2		
	(RESIDUAL) 9.0								
1100	Gray to gray and brown DECOMPOSED SANDSTONE; sampled as sandstone fragments, few sand, few silt, very dense, dry 9.8	10	S-4	38	32-50/0.3'				
	(RESIDUAL)								
	Brown and gray medium to coarse-grained SANDSTONE, slightly to moderately weathered, medium bedded, very broken to massive, hard		R-1	94 (48)					
1095	-MOHs >9 at 15'	15							
	16.5								
	Brown and gray fine to medium-grained micaceous SANDSTONE, slightly weathered, thinly laminated to very thinly bedded, very broken to massive, hard		R-2	96 (44)					
1090	-MOHs >9 at 21'	20							
	22.0								
	Gray INTERBEDDED fine-grained SANDSTONE and SHALE, slightly weathered, thinly to thickly laminated, moderately broken to massive, hard, few carbonaceous laminations		R-3	100 (60)					
1085	-MOHs 8.5 at 24' 24.8	25							
	Boring Terminated at 24.8 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.								
1080		30							
1075		35							

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GARVIN BOWARD BEITKO

Test Boring Record

SB-27

Project Number: 16123A
Project Name: Proposed QVSD High School
Sheet: 1 of 1
Project Location: Edgeworth, Leet Twp., Leetsdale, PA
Start Date: 7-14-23
Water Level During Drilling:
Drilled By: J. Powell (Test Boring Services, Inc.)
Completion Date: 7-14-23
Water Level Before Coring:
Drilling Rig: Diedrich D-50 Track Mount
Weather: Partly sunny, 78 to 80 Degrees
Water Level Upon Completion: 27.9'
Drilling Method: 3 1/4 HSA & NQ2 Core
Logged By: K. Thiry, P.G.
Water Level After 24 Hours: 19.8'

Ground Elevation (ft)	Material Description	Depth (ft)	Sample Type Number	Recovery % (RQD)	Blow Counts (N Value)	%< #200 Sieve	Water Content (%)	Liquid Limit	Plastic Limit
1115'	Brown micaceous SANDSTONE FRAGMENTS (GP), few sand, trace silt, firm, dry		S-1	27	3-7-5 (12)				
	(RESIDUAL) 2.0								
	Brown DECOMPOSED SANDSTONE sampled as fine- to medium-grained sandstone fragments, few sand, trace silt, dense to very dense, dry		S-2	100	18-22-21 (43)				
1110		5							
			S-3	100	20-41-44 (85)				
1105	**(RESIDUAL)** 10.1	10	S-4	136	38-40-50/0.1'				
	Brown fine to medium-grained micaceous SANDSTONE, highly to moderately weathered, thinly laminated, very broken to moderately broken, soft to medium hard -soft, highly weathered from 10.2' to 10.4' -MOHs 5.5 at 12'		R-1	90 (0)					
1100	14.9	15							
	Brown and orange-brown medium to coarse-grained SANDSTONE, moderately weathered, thinly bedded, moderately broken to blocky, medium hard to hard, few carbonaceous laminations, vertical fractures throughout -MOHs 6.5 at 16'		R-2	94 (12)					
1095	19.8	20							
	Brown to gray INTERBEDDED fine-grained SANDSTONE and SILTSTONE, highly to slightly weathered, thinly to thickly laminated, very broken to massive, medium hard -soft, highly weathered from 21.0' to 22.0'		R-3	100 (20)					
1090	=MOHs 6.5 at 23'	25							
	-gray to dark gray from 22.0' to 27.0' -light gray from 27.0' to 30.1'		R-4	100 (0)					
1085	-MOHs 7.5 at 29' 30.1	30							
	Boring Terminated at 30.1 feet Ground surface estimated based on ground surface elevation at originally-staked location and the topographic mapping provided for the project.								
1080		35							

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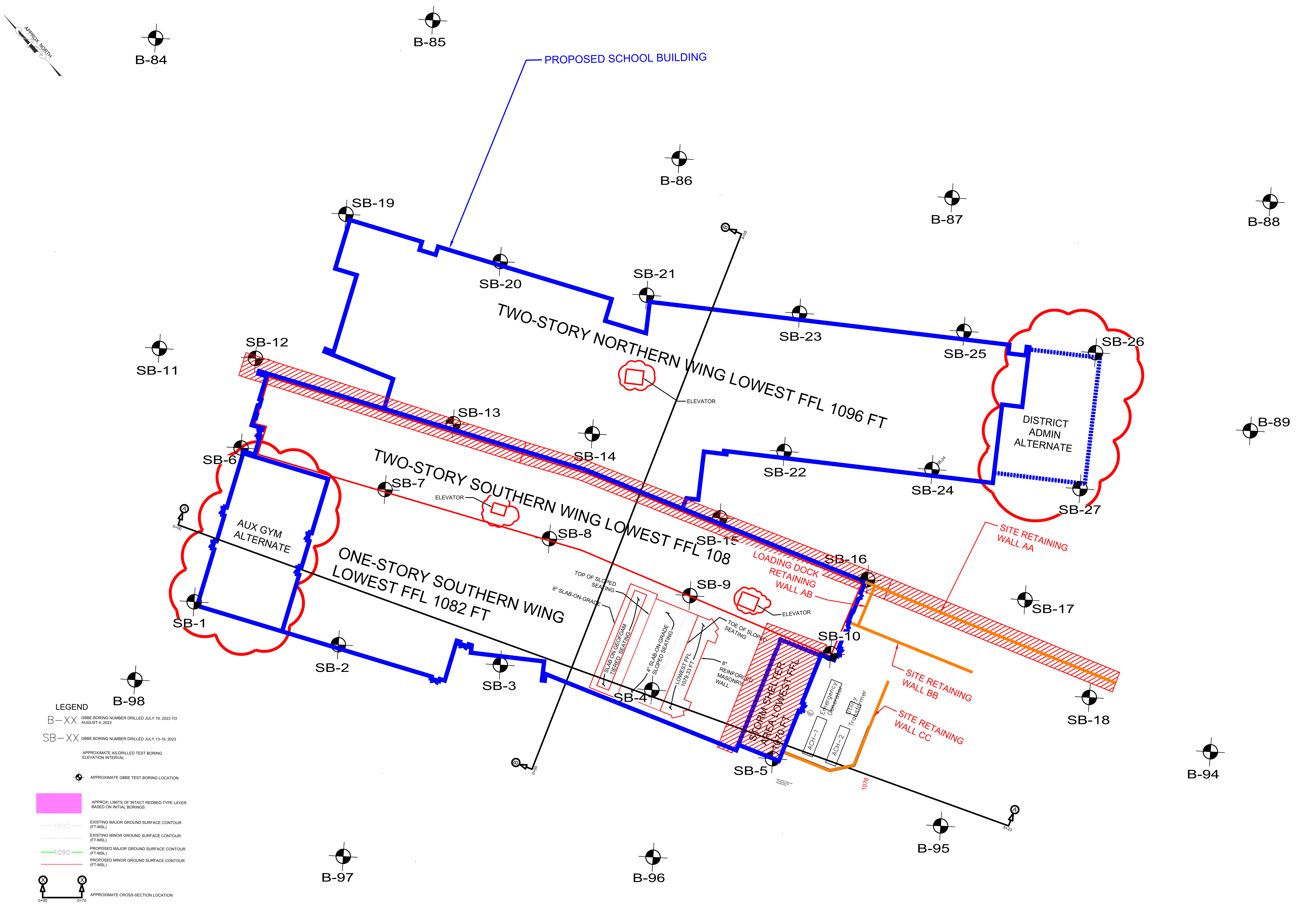
APPROX. NORTH
PROPOSED SCHOOL BUILDING
TWO-STORY NORTHERN WING LOWEST FFL 1096 FT
TWO-STORY SOUTHERN WING LOWEST FFL 108
ONE-STORY SOUTHERN WING
LOWEST FFL 1082 FT
AUX GYM
ALTERNATE
DISTRICT
ADMIN
ALTERNATE
ELEVATOR
ELEVATOR
ELEVATOR
LOADING DOCK
RETAINING
WALL AB
SITE RETAINING
WALL AA
SITE RETAINING
WALL BB
SITE RETAINING
WALL CC
STORM SHELTER
AREA - LOWEST FFL
1079 FT
TOP OF SLOPED
SEATING
8" SLAB-ON-GRADE
SLAB ON GEOFOAM
TIERED SEATING
4" SLAB-ON-GRADE
SLOPED SEATING
LOWEST FFL
1079.33 FT
8"
REINFORCED
MASONRY
WALL
TOE OF SLOPED
SEATING
Emergency
Generator
Utility
Transformer
ACH-1
ACH-2
1076
B-84
B-85
B-86
B-87
B-88
B-89
B-94
B-95
B-96
B-97
B-98
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
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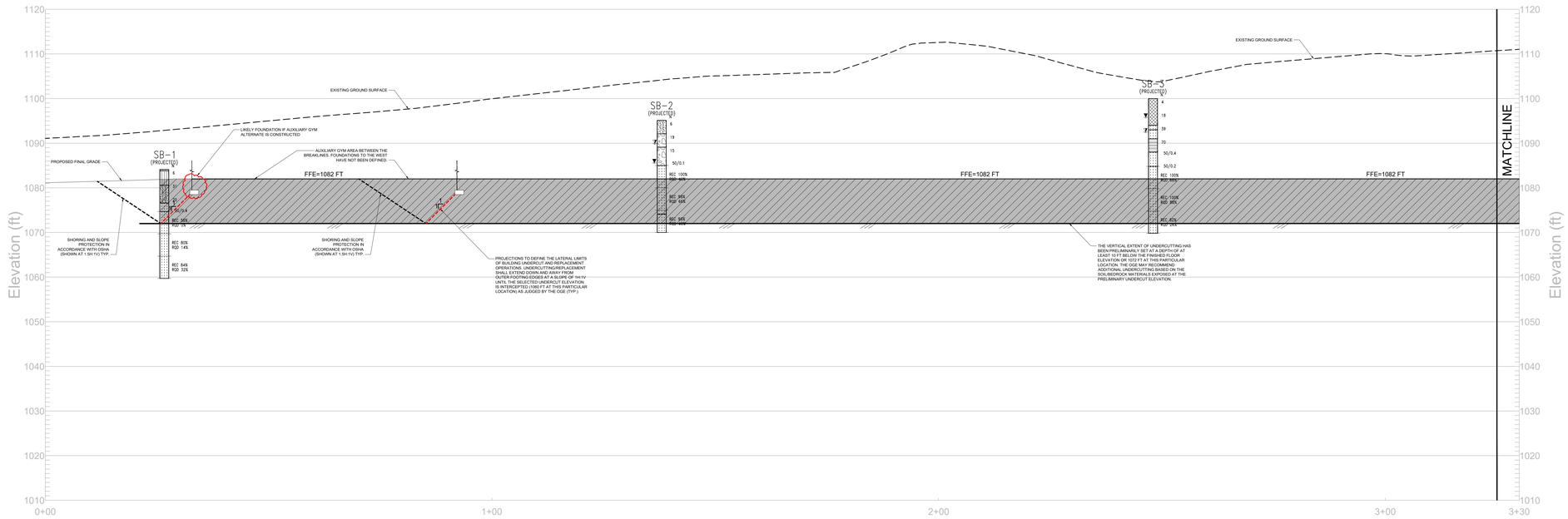
SB-16
SB-17
SB-18
SB-19
SB-20
SB-21
SB-22
SB-23
SB-24
SB-25
SB-26
SB-27
LEGEND
B–XX GBBE BORING NUMBER DRILLED JULY 19, 2023 TO AUGUST 4, 2023
SB–XX GBBE BORING NUMBER DRILLED JULY 13-19, 2023
APPROXIMATE AS-DRILLED TEST BORING ELEVATION INTERVAL
APPROXIMATE GBBE TEST BORING LOCATION
APPROX. LIMITS OF INTACT REDBED TYPE LAYER BASED ON INITIAL BORINGS
1090 EXISTING MAJOR GROUND SURFACE CONTOUR (FT-MSL)
EXISTING MINOR GROUND SURFACE CONTOUR (FT-MSL)
1090 PROPOSED MAJOR GROUND SURFACE CONTOUR (FT-MSL)
PROPOSED MINOR GROUND SURFACE CONTOUR (FT-MSL)
0+00
0+70
APPROXIMATE CROSS-SECTION LOCATION
4KSF ALLOWABLE BEARING PRESSURE AREAS

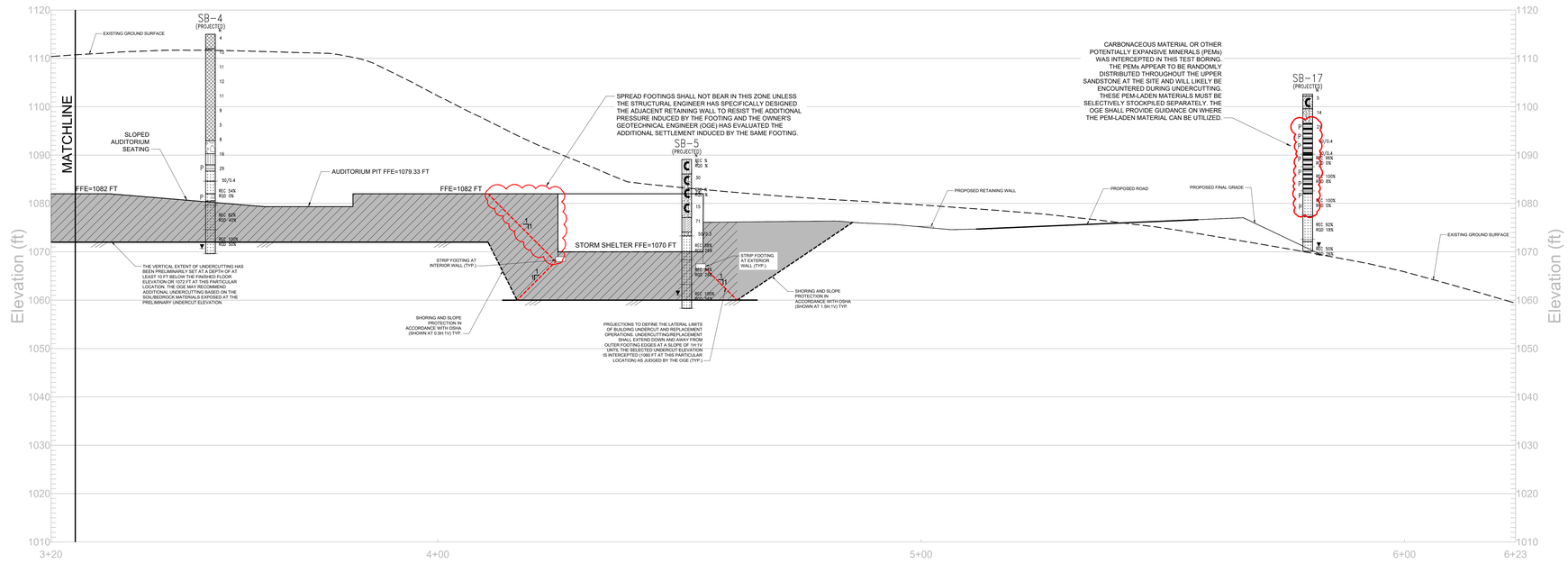
FIGURE 3 - FOUNDATION DESIGNED USING 4 KSF ALLOWABLE BEARING PRESSURE

0 20 40 60
APPROX. SCALE: 1" = 20'

REFERENCE:
BASE DRAWING PROVIDED BY PHILLIPS AND ASSOCIATES, INC.

GARVIN BOWARD BEITKO	SCALE: AS NOTED	GARVIN BOWARD BEITKO ENGINEERING, INC. *BUILT ON REPUTATION*	180 BILMAR DRIVE, SUITE IV PITTSBURGH, PA 15205 PHONE: 412-922-4440
	DATE: 05/23/2024		
	REVISED:	GEOTECHNICAL EXPLORATION & ENGINEERING REPORT - PART 1 FOUNDATION DESIGN & BUILDING PAD PREPARATION - PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING	
	DRAWN BY: MAW		
	APPROVED BY: DAB	FOR: PHILLIPS & ASSOCIATES, INC.	GBBE PROJECT NUMBER: 16123A





LEGEND

LITHOLOGIC SYMBOLS (UNIFIED SOIL CLASSIFICATION SYSTEM)

- ASPHALT
- TOPSOIL
- SILTY GRAVEL
- POORLY GRADED GRAVEL
- FILL
- LOW PLASTICITY CLAY
- CLAYEY SILT TO SILTY CLAY
- CLAYEY GRAVEL
- SILTY SAND
- SILT
- CLAYEY SAND
- HIGH PLASTICITY CLAY
- WELL-GRADED GRAVEL
- POORLY-GRADED SAND
- ORGANIC SILT
- VOID
- CLAYSTONE
- COAL
- SILTSTONE
- SHALE
- SANDSTONE
- LIMESTONE

- WATER LEVEL AT END OF DRILLING
- WATER LEVEL DURING DRILLING
- WATER LEVEL AFTER 24 HR
- C DENOTES COLLUVIAL SOIL
- GRAPHIC WITH THICK, BOLD LINE(S) REPRESENTS CARBONACEOUS SOIL/ROCK
- GRAPHIC WITH DUAL SYMBOL REPRESENTS SOIL/ROCK THAT IS INTERBEDDED

SAMPLE GENERALIZED SOIL/ROCK PROFILE

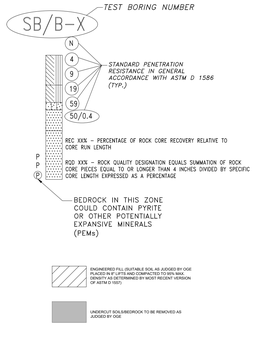


FIGURE 4 - CONCEPTUAL BUILDING UNDERCUT/REPLACEMENT AT CROSS-SECTION A-A

0 10 20 30

APPROX. HORZ. & VERT. SCALE: 1" = 10'

GARVIN BOWARD BEITKO	SCALE: AS NOTED
	DATE: 05/23/2024
	REVISED:
	DRAWN BY: MAW
	APPROVED BY: DAB

GARVIN BOWARD BEITKO ENGINEERING, INC.
BUILT ON REPUTATION
180 BILMAR DRIVE, SUITE IV
PITTSBURGH, PA 15205
PHONE: 412-922-4440

GEOTECHNICAL EXPLORATION & ENGINEERING REPORT - PART 1
FOUNDATION DESIGN & BUILDING PAD PREPARATION - PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING

FOR: PHILLIPS & ASSOCIATES, INC.

GBBE PROJECT NUMBER: 16123A

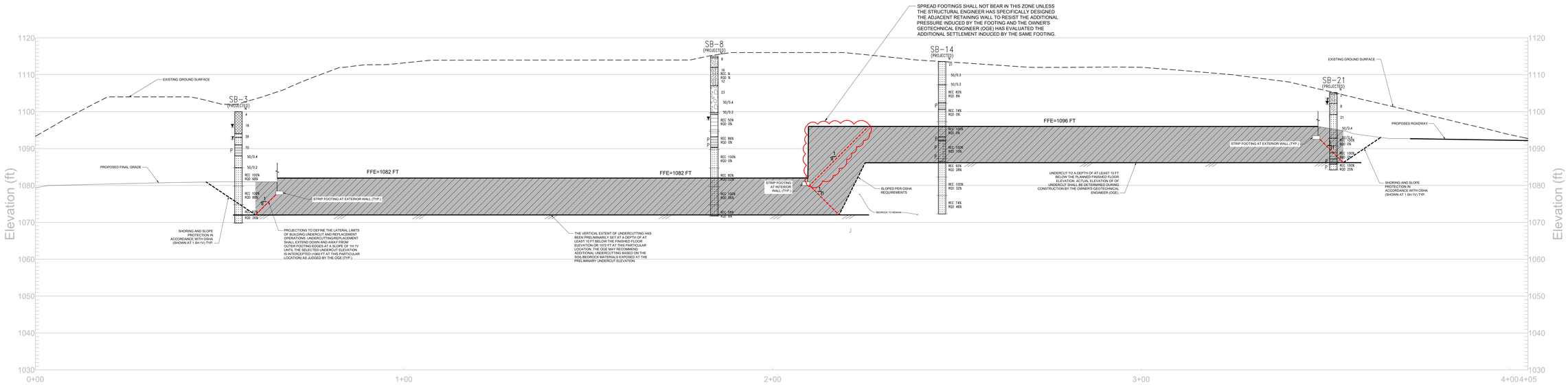


FIGURE 5 - CONCEPTUAL BUILDING UNDERCUT/REPLACEMENT AT CROSS-SECTION B-B

0 10 20 30

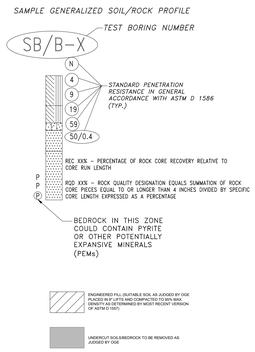
APPROX. HORZ. & VERT. SCALE: 1" = 10'

LEGEND

LITHOLOGIC SYMBOLS (UNIFIED SOIL CLASSIFICATION SYSTEM)

- ASPHALT
- TOPSOIL
- SILTY GRAVEL
- POORLY GRADED GRAVEL
- FILL
- LOW PLASTICITY CLAY
- CLAYEY SILT TO SILTY CLAY
- CLAYEY GRAVEL
- SILTY SAND
- SILT
- CLAYEY SAND
- HIGH PLASTICITY CLAY
- WELL-GRADED GRAVEL
- POORLY-GRADED SAND
- ORGANIC SILT
- VOID
- CLAYSTONE
- COAL
- SILTSTONE
- SHALE
- SANDSTONE
- LIMESTONE
- WATER LEVEL AT END OF DRILLING
- WATER LEVEL DURING DRILLING
- WATER LEVEL AFTER 24 HR
- C DENOTES COLLUVIAL SOIL
- GRAPHIC WITH THICK, BOLD LINE(S) REPRESENTS CARBONACEOUS SOIL/ROCK
- GRAPHIC WITH DUAL SYMBOL REPRESENTS SOIL/ROCK THAT IS INTERBEDDED

SAMPLE GENERALIZED SOIL/ROCK PROFILE



GARVIN BOWARD BEITKO	SCALE: AS NOTED	GARVIN BOWARD BEITKO ENGINEERING, INC. *BUILT ON REPUTATION*	180 BILMAR DRIVE, SUITE IV PITTSBURGH, PA 15205 PHONE: 412-922-4440
	DATE: 05/23/2024	GEOTECHNICAL EXPLORATION & ENGINEERING REPORT - PART 1 FOUNDATION DESIGN & BUILDING PAD PREPARATION - PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING	
	REVISED:		
	DRAWN BY: MAW		
	APPROVED BY: DAB	FOR: PHILLIPS & ASSOCIATES, INC.	GBBE PROJECT NUMBER: 16123A

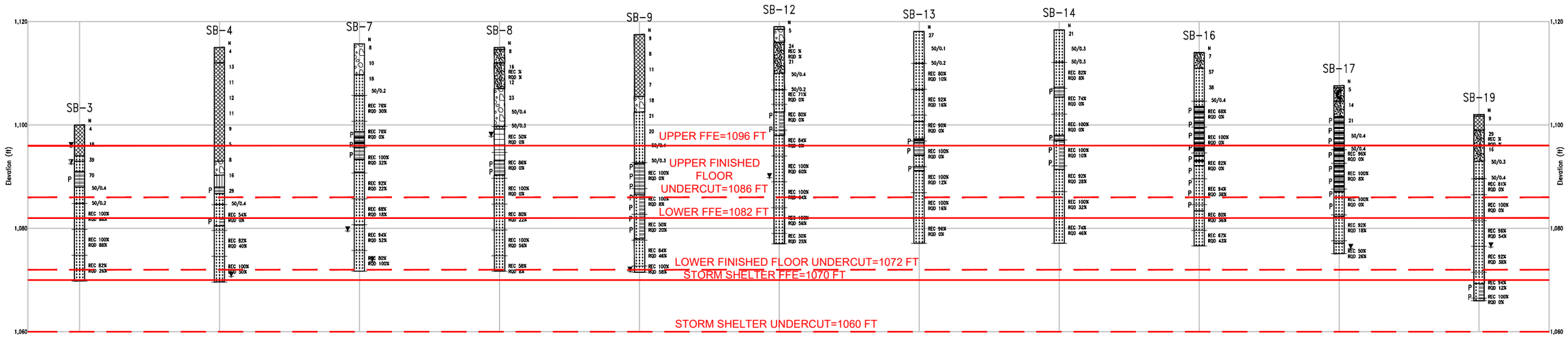


FIGURE 6 - GENERALIZED SUBSURFACE PROFILE - BUILDING AREA - SHOWING ZONES OF POTENTIALLY EXPANSIVE MINERALS (PEMs)

0 20 40 60

APPROX. VERT. SCALE: 1" = 20'

NOTES:
1. SOLID RED LINE INDICATES FINISHED FLOOR ELEVATION.
2. DASHED LINE INDICATES UNDERCUT ELEVATION.

LEGEND

LITHOLOGIC SYMBOLS (UNIFIED SOIL CLASSIFICATION SYSTEM)

- ASPHALT
- TOPSOIL
- SILTY GRAVEL
- POORLY GRADED GRAVEL
- FILL
- LOW PLASTICITY CLAY
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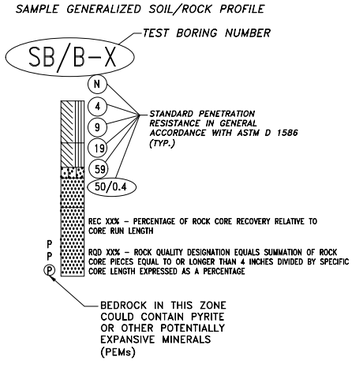
- WATER LEVEL AFTER 24 HR
- DENOTES COLLUVIAL SOIL
- GRAPHIC WITH THICK, BOLD LINE(S) REPRESENTS CARBONACEOUS SOIL/ROCK
- GRAPHIC WITH DUAL SYMBOL REPRESENTS SOIL/ROCK THAT IS INTERBEDDED

SAMPLE GENERALIZED SOIL/ROCK PROFILE



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GEOTECHNICAL EXPLORATION & ENGINEERING REPORT PART 1

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PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING

GBBE PROJECT: 16123A

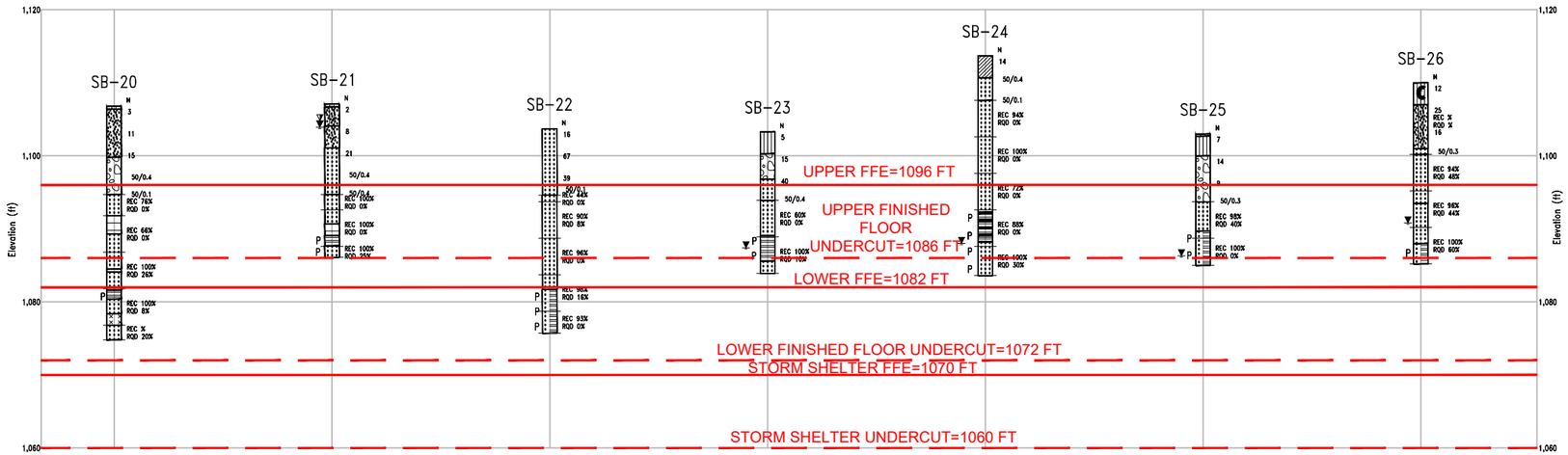

FIGURE 7 - GENERALIZED SUBSURFACE PROFILE - BUILDING AREA - SHOWING ZONES OF POTENTIALLY EXPANSIVE MINERALS (PEMs)

0 20 40 60

APPROX. VERT. SCALE: 1" = 20'

NOTES:
1. SOLID RED LINE INDICATES FINISHED FLOOR ELEVATION.
2. DASHED LINE INDICATES UNDERCUT ELEVATION.

LEGEND

LITHOLOGIC SYMBOLS (UNIFIED SOIL CLASSIFICATION SYSTEM)

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- TOPSOIL
- SILTY GRAVEL
- POORLY GRADED GRAVEL
- FILL
- LOW PLASTICITY CLAY
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- CLAYEY GRAVEL
- SILTY SAND
- SILT
- CLAYEY SAND
- HIGH PLASTICITY CLAY
- WELL-GRADED GRAVEL
- POORLY-GRADED SAND
- ORGANIC SILT
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- CLAYSTONE
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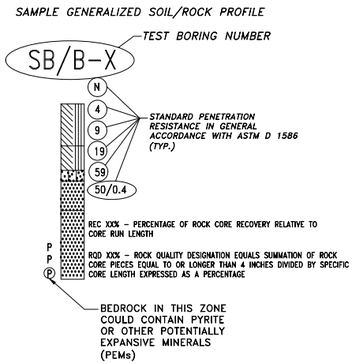
- GRAPHIC WITH DUAL SYMBOL REPRESENTS SOIL/ROCK THAT IS INTERBEDDED

SAMPLE GENERALIZED SOIL/ROCK PROFILE



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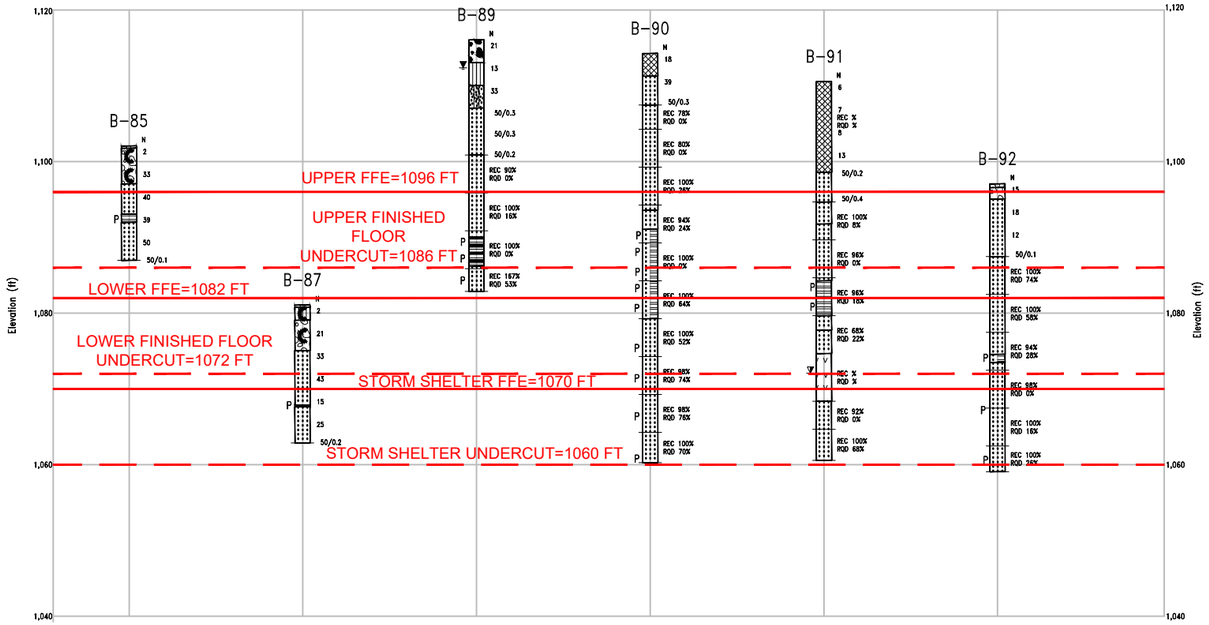

FIGURE 8 - GENERALIZED SUBSURFACE PROFILE - BUILDING AREA - SHOWING ZONES OF POTENTIALLY EXPANSIVE MINERALS (PEMs)

LEGEND

LITHOLOGIC SYMBOLS (UNIFIED SOIL CLASSIFICATION SYSTEM)

- ASPHALT
- TOPSOIL
- SILTY GRAVEL
- POORLY GRADED GRAVEL
- FILL
- LOW PLASTICITY CLAY
- CLAYEY SILT TO SILTY CLAY
- CLAYEY GRAVEL
- SILTY SAND
- SILT
- CLAYEY SAND
- HIGH PLASTICITY CLAY
- WELL-GRADED GRAVEL
- POORLY-GRADED SAND
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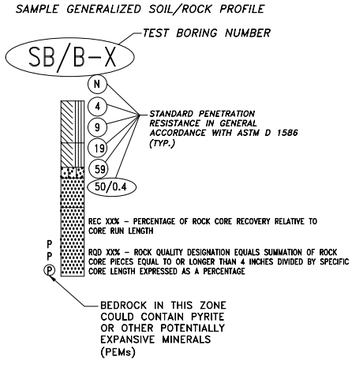
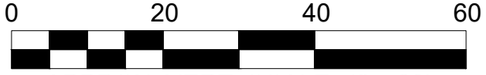
- GRAPHIC WITH DUAL SYMBOL REPRESENTS SOIL/ROCK THAT IS INTERBEDDED

SAMPLE GENERALIZED SOIL/ROCK PROFILE





APPROX. VERT. SCALE: 1" = 20'

NOTES:

1. SOLID RED LINE INDICATES FINISHED FLOOR ELEVATION.
2. DASHED LINE INDICATES UNDERCUT ELEVATION.

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PROPOSED QUAKER VALLEY HIGH SCHOOL BUILDING

GBBE PROJECT: 16123A

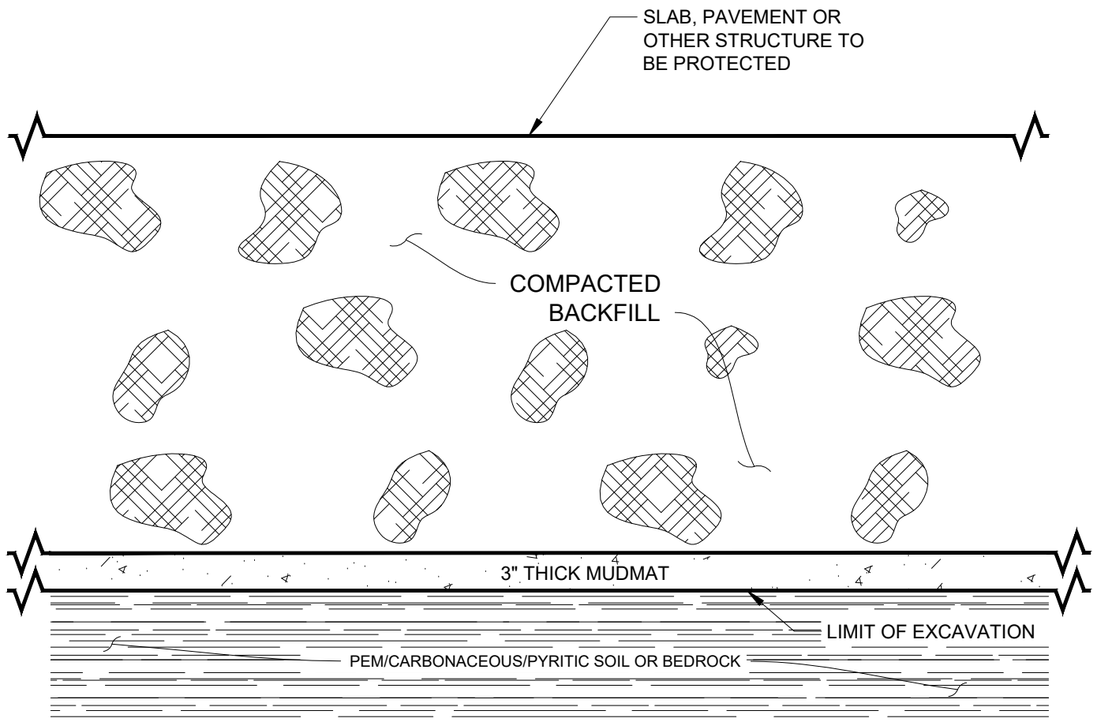
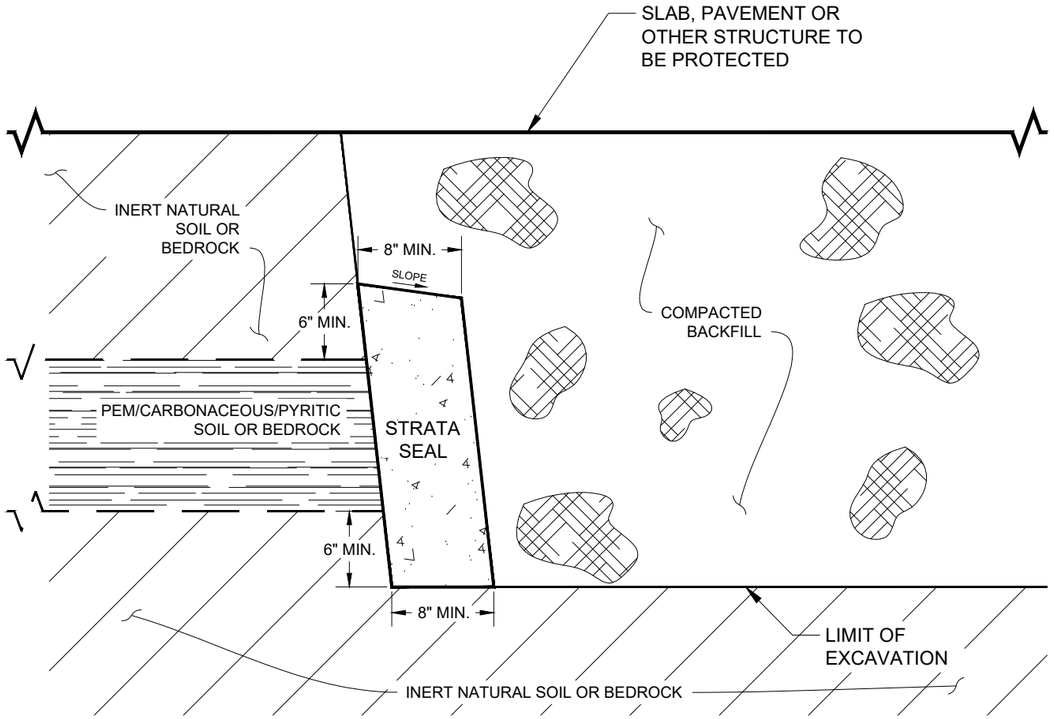


FIGURE 9 - TYPICAL CARBONACEOUS/PYRITIC/PEM STRATA SEAL WITH MUDMAT

(NOT TO SCALE)

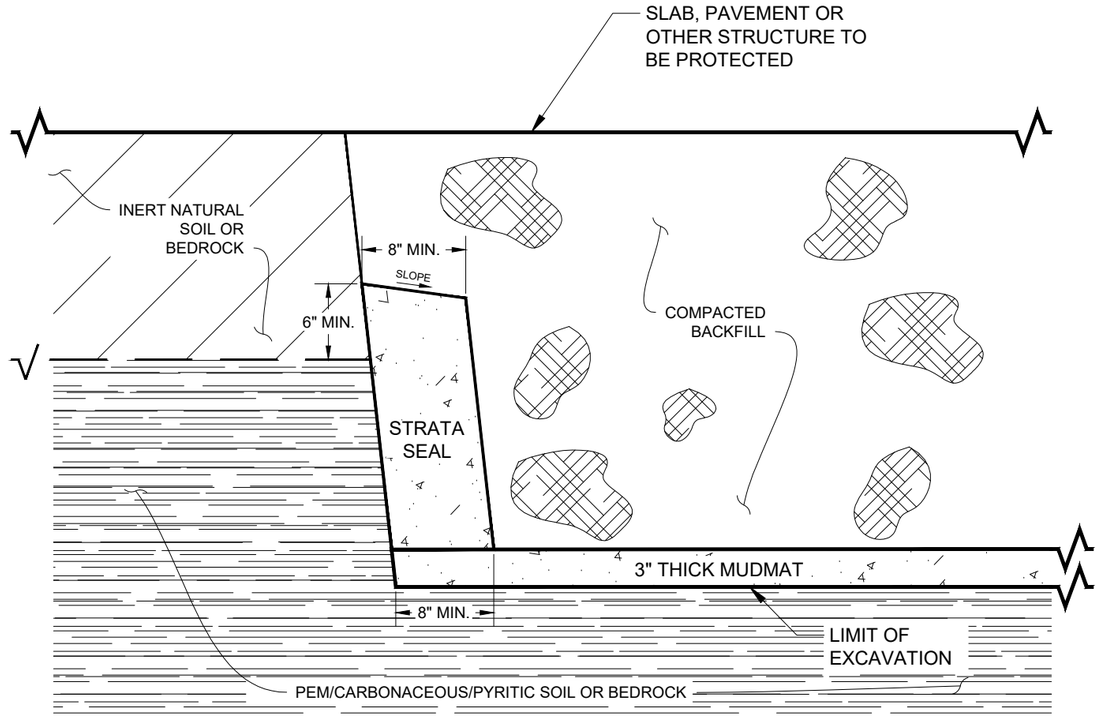
NOTES:

1. HORIZONTAL SURFACES EXPOSING PEM/PYRITIC/CARBONACEOUS MATERIAL SHOULD BE CUT TO A FLAT PLANE.
2. ALL LOOSE MATERIAL AND WATER MUST BE REMOVED AND THE SURFACES THOROUGHLY CLEANED WITH AIR COMPRESSORS AND/OR BROOMS PRIOR TO SEALING.
3. MUDMAT MUST CONSIST OF SULFATE-RESISTANT CONCRETE.
4. A MINIMUM OF 3 INCH THICK MUDMAT SHOULD BE INSTALLED ON ALL HORIZONTAL PEM/PYRITIC/CARBONACEOUS SURFACES.
5. PEM/PYRITIC/CARBONACEOUS STRATA MUST BE SEALED WITHIN 48 HOURS OF INITIAL EXPOSURE.
6. IF 48 HOUR EXPOSURE TIME LIMIT IS EXCEEDED, 8 IN. OF PEM/PYRITIC/CARBONACEOUS STRATA MUST BE REMOVED TO EXPOSE A "FRESH" FACE.



DETAIL "A"

(PEM/CARBONACEOUS/PYRITIC MATERIAL
EXPOSED ONLY IN VERTICAL SURFACES)



DETAIL "B"

(PEM/CARBONACEOUS/PYRITIC MATERIAL EXPOSED
IN VERTICAL & HORIZONTAL SURFACES)

NOTES:

1. HORIZONTAL SURFACES EXPOSING PEM/PYRITIC/CARBONACEOUS MATERIAL SHOULD BE CUT TO A FLAT PLANE.
2. ALL LOOSE MATERIAL AND WATER MUST BE REMOVED AND THE SURFACES THOROUGHLY CLEANED WITH AIR COMPRESSORS AND/OR BROOMS PRIOR TO SEALING.
3. STRATA SEAL AND MUDMAT MUST CONSIST OF SULFATE-RESISTANT CONCRETE.
4. STRATA SEAL MUST EXTEND A MINIMUM OF 6 INCHES ABOVE AND BELOW THE PEM/PYRITIC/CARBONACEOUS MATERIAL.
5. A MINIMUM OF 3 INCH THICK MUDMAT SHOULD BE INSTALLED ON ALL HORIZONTAL PEM/PYRITIC/CARBONACEOUS SURFACES.
6. PEM/PYRITIC/CARBONACEOUS STRATA MUST BE SEALED WITHIN 48 HOURS OF INITIAL EXPOSURE.
7. IF 48 HOUR EXPOSURE TIME LIMIT IS EXCEEDED, 8 IN. OF PEM/PYRITIC/CARBONACEOUS STRATA MUST BE REMOVED TO EXPOSE A "FRESH" FACE.

FIGURE 10 - TYPICAL PEM/CARBONACEOUS/PYRITIC STRATA EXCAVATION SIDEWALL SEALS

(NOT TO SCALE)

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FOUNDATION DESIGN &
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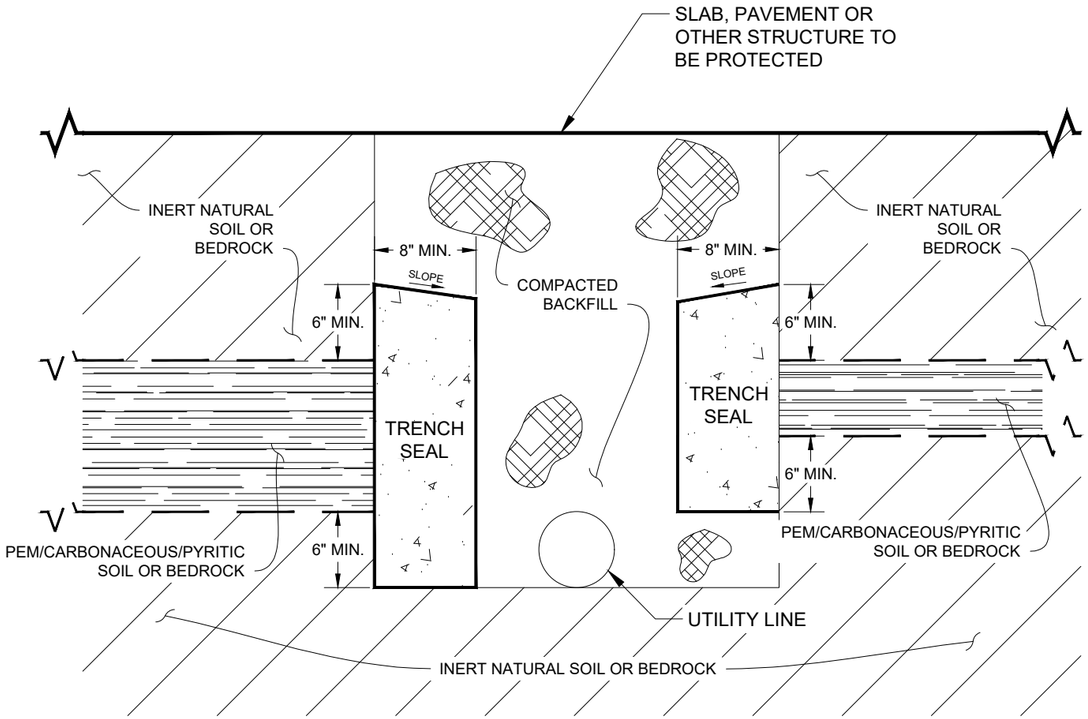
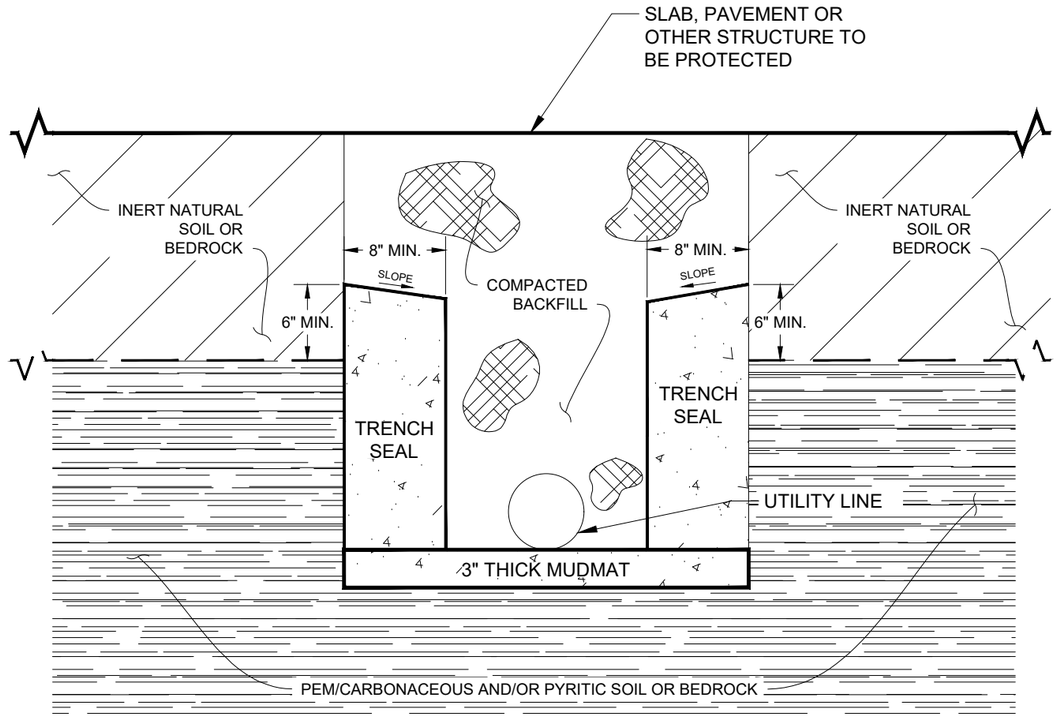
PROPOSED QUAKER VALLEY
HIGH SCHOOL BUILDING

GBBE PROJECT: 16123A



DETAIL "A"

(PEM/CARBONACEOUS/PYRITIC MATERIAL
EXPOSED ONLY IN VERTICAL SURFACES)



DETAIL "B"

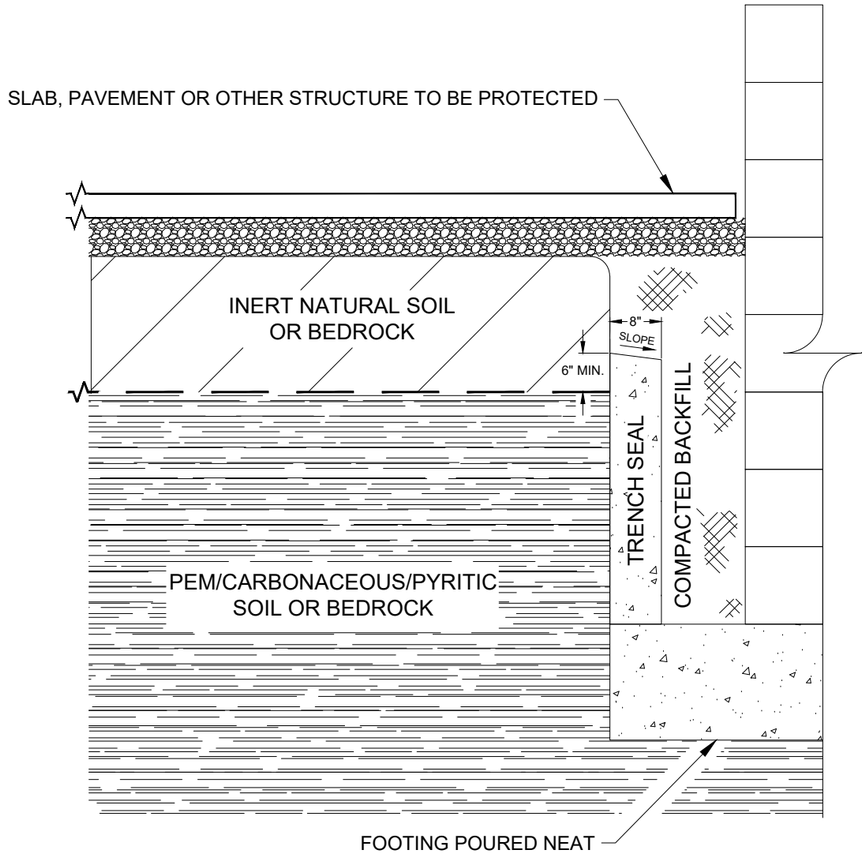
(PEM/CARBONACEOUS/PYRITIC MATERIAL
EXPOSED IN VERTICAL & HORIZONTAL SURFACES)

NOTES:

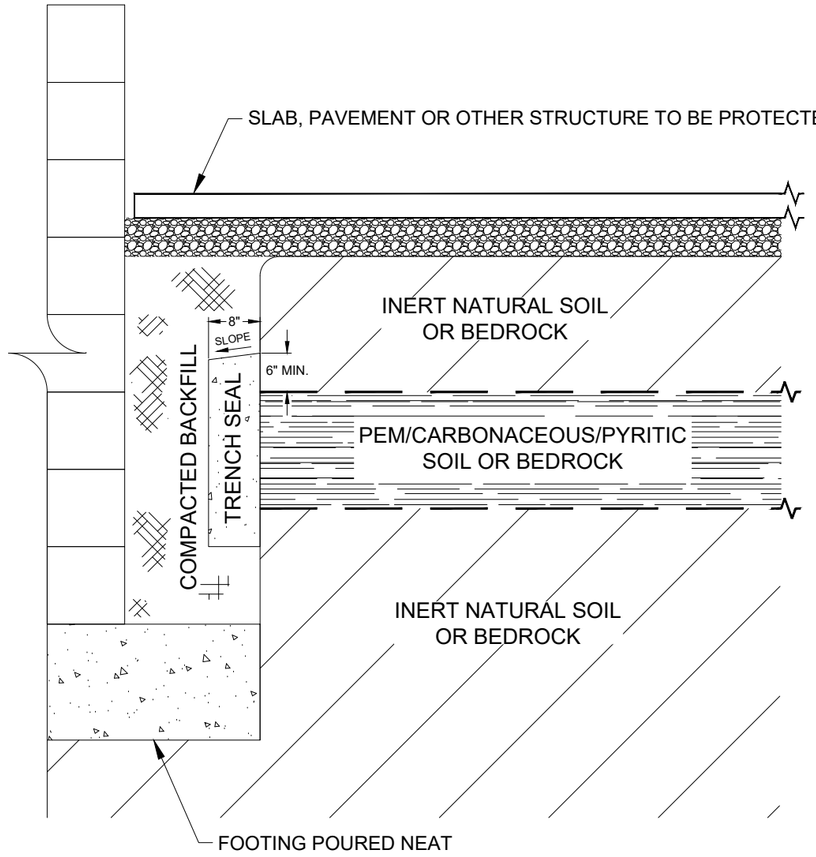
1. HORIZONTAL SURFACES EXPOSING PEM/PYRITIC/CARBONACEOUS MATERIAL SHOULD BE CUT TO A FLAT PLANE.
2. ALL LOOSE MATERIAL AND WATER MUST BE REMOVED AND THE SURFACES THOROUGHLY CLEANED WITH AIR COMPRESSORS AND/OR BROOMS PRIOR TO SEALING.
3. TRENCH SEALS MUST CONSIST OF SULFATE-RESISTANT CONCRETE.
4. TRENCH SEAL MUST EXTEND A MINIMUM OF 6 INCHES ABOVE AND BELOW THE PEM/PYRITIC/CARBONACEOUS MATERIAL.
5. A MINIMUM OF 3 INCH THICK MUDMAT SHOULD BE INSTALLED ON ALL HORIZONTAL PEM/PYRITIC/CARBONACEOUS SURFACES.
6. AS AN ALTERNATIVE TO APPLYING CONCRETE SEALS AS SHOWN ON DETAIL "B", THE ENTIRE TRENCH COULD BE BACKFILLED WITH CONCRETE, IF PERMISSIBLE BY THE OWNER.
7. PEM/PYRITIC/CARBONACEOUS STRATA MUST BE SEALED WITHIN 48 HOURS OF INITIAL EXPOSURE.
8. IF 48 HOUR EXPOSURE TIME LIMIT IS EXCEEDED, 8 IN. OF PEM/PYRITIC/CARBONACEOUS STRATA MUST BE REMOVED TO EXPOSE A "FRESH" FACE.

FIGURE 11 - TYPICAL PEM/CARBONACEOUS/PYRITIC UTILITY TRENCH SEALS

(NOT TO SCALE)



DETAIL "A"



DETAIL "B"

NOTES:

1. HORIZONTAL SURFACES EXPOSING PEM/PYRITIC/CARBONACEOUS MATERIAL SHOULD BE CUT TO A FLAT PLANE.
2. ALL LOOSE MATERIAL AND WATER MUST BE REMOVED AND THE SURFACES THOROUGHLY CLEANED WITH AIR COMPRESSORS AND/OR BROOMS PRIOR TO PLACING CONCRETE FOOTING AND TRENCH SEAL.
3. STRATA SEAL AND MUDMAT MUST CONSIST OF SULFATE-RESISTANT CONCRETE.
4. STRATA SEAL MUST EXTEND A MINIMUM OF 6 INCHES ABOVE AND BELOW THE PEM/PYRITIC/CARBONACEOUS MATERIAL, IF APPLICABLE.
5. PEM/PYRITIC/CARBONACEOUS STRATA MUST BE SEALED WITHIN 48 HOURS OF INITIAL EXPOSURE.
6. IF 48 HOUR EXPOSURE TIME LIMIT IS EXCEEDED, 8 IN. OF PEM/PYRITIC/CARBONACEOUS STRATA MUST BE REMOVED TO EXPOSE A "FRESH" FACE.

FIGURE 12 - TYPICAL FOOTING TRENCH SEALS

(NOT TO SCALE)

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GBBE PROJECT: 16123A

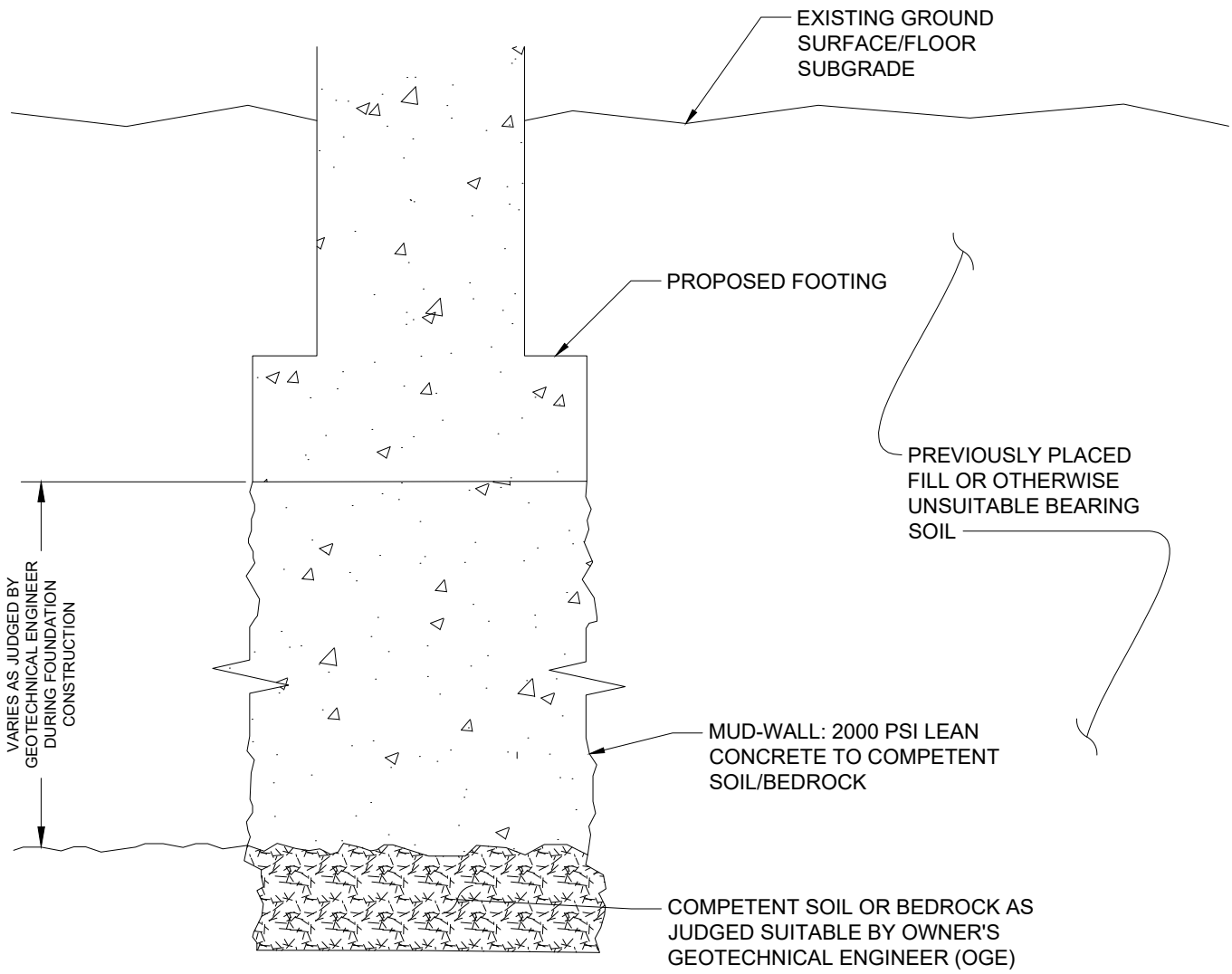

FIGURE 13 - TYPICAL MUD-WALL CONSTRUCTION DETAIL

(NOT TO SCALE)