ROANE COUNTY BOARD OF EDUCATION
ROANE COUNTY, WEST VIRGINIA

NEW SPENCER MIDDLE SCHOOL

ADDENDUM #1

JUNE 15, 2022

THRASHER PROJECT #060-10259

TO WHOM IT MAY CONCERN:

A Pre-Bid Conference was held on Tuesday, June 14, 2022 on the above-referenced project, a copy of the sign in sheet is included in this Addendum. The following are clarifications and responses to questions posed by contractors for the above reference project.

A. GENERAL

1. **THE BID DATE HAS BEEN EXTENDED TO 1:30 P.M. ON THURSDAY, JULY 14, 2022.**

2. The Geotech report has been added to this addendum as it was accidentally omitted from the electronic version.

B. SPECIFICATIONS

1. None on this Addendum

C. DRAWINGS

1. None on this Addendum

D. QUESTIONS AND RESPONSES

1. None on this Addendum

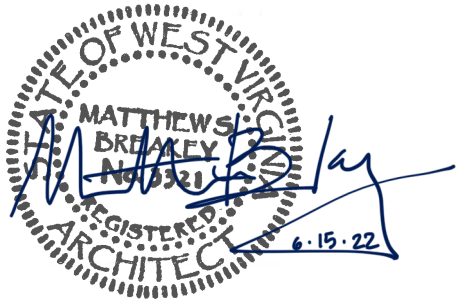
E. CLARIFICATIONS

1. None on this Addendum

If you have any questions or comments, please feel free to contact our office at your earliest convenience. As a reminder, bids will be received until 1:30 p.m. on Tuesday, July 14, 2022 at Roane County Board of Education, 813 Capital Street, Spencer, WV. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.



Matthew Breakey, AIA, NCARB
Project Manager

ROANE COUNTY BOARD OF EDUCATION
ROANE COUNTY, WEST VIRGINIA
NEW SPENCER MIDDLE SCHOOL

MANDATORY PRE-BID CONFERENCE
Tuesday, June 14, 2022

Thrasher Project #060-10259

Name	Representing	Phone #	Email Address
Joe Hill	MES Construction	304-925-3190	estimating@mesconstruction.com
Beau Henderson	City Construction	304-623-2573	beau@cccwv.us
Jason McQuain	City Construction	623-2573	Jason@cccwv.us
Dustin Palmer	Finnie Plumbing	304-250-7100	Jbfinnieplumbing@hotmail.com
BETH NEIGHBORGALL	NEIGHBORGALL CONST.	304-525-5181	estimating@neighborgall.com
Ben Bragg	WV Paving	304-550-6583	ben.bragg@wvpaving.com
Matt Selders	Kanawha Stone Company, Inc.	304-755-8271	matt.selders@kanawhastone.com
Richard Duncan	RCBOE	(304) 927-6400	rdduncan@k12.wv.us
Jeffrey Garrett	G+M 2 Finish const	304-531-2143	jeffreyG&Fconst@outlook.com

Name	Representing	Phone #	Email Address
BILL RATCLIFFE	TTG		
MARK MILLER	SBA via PHONE		

American Geotech, Inc.
601 Ohio Avenue
Charleston, WV 25302
(304) 340-4277
Fax 340-4278

AMERICAN GEOTECH, INC.

Geotechnical, Environmental and Testing Engineers

REPORT OF
GEOTECHNICAL EXPLORATION & ENGINEERING ANALYSIS
PROPOSED NEW SPENCER MIDDLE SCHOOL
NORTH SIDE OF EXISTING ROANE COUNTY HIGH SCHOOL
SPENCER, ROANE COUNTY, WEST VIRGINIA

Prepared For

THE THRASHER GROUP, INC.
CHARLESTON, WEST VIRGINIA
FEBRUARY - 2022

(This report contains 13 pages, plus appendices)

AMERICAN GEOTECH, INC.
GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS

601 OHIO AVENUE
CHARLESTON, WV 25302
(304) 340-4277
Fax (304) 340-4278

February 2, 2022

Ms. Amanda Cheuvront
The Thrasher Group, Inc.
300 Association Drive
Charleston, WV 25311

Re: Report of Geotechnical Exploration and Engineering Analysis
Proposed New Spencer Middle School
North Side of Existing Roane County High School
Spencer, Roane County, West Virginia

Dear Ms. Cheuvront:

In accordance with your request and authorization, American Geotech, Inc. (AGI) has performed a geotechnical subsurface exploration and engineering analysis for the proposed new Spencer Middle School, to be located on the north end of the existing Roane County High School in Spencer, Roane County, West Virginia. The detailed geotechnical report is attached herewith.

It is recommended that the contract documents must follow International Building Code (IBC) requirements, including a Schedule of Special Inspection Services for soils and foundations in the plans. At a minimum, the Geotechnical Engineer of Record (GER) shall provide on-site observations, testing, and special inspection during site grading, soil compaction, drilled pier installation, and floor slab construction.

We appreciate the opportunity of providing these services to you. If you have any questions concerning the information in this report, or should questions develop as the design proceeds, please contact our office at 304-340-4277.

Thank you for your consideration.

Respectfully Submitted,

AMERICAN GEOTECH, INC.

Kanti S. Patel, M.S.C.E., P.E.
Principal Engineer

GEOTECHNICAL ENGINEERING EXPLORATION AND ANALYSIS

PROPOSED SPENCER MIDDLE SCHOOL
SPENCER, WEST VIRGINIA

EXECUTIVE SUMMARY

A brief summary of our recommendations for this project is presented below. This summary should be read in context with the entire report for proper interpretation.

Special Issues

- It is recommended that the contract documents must follow International Building Code (IBC) requirements, including a Schedule of Special Inspection Services for soils and foundations in the plans. At a minimum, the Geotechnical Engineer of Record (GER) shall provide on-site observations, testing, and special inspection during site grading, soil compaction, drilled pier installation, and floor slab construction.
- The site is a previously filled split hollow underlain by wet and soft colluvial soils.
- The proposed building footprint straddles both sides of the filled hollow. Within the currently proposed building location, shallow bedrock is present over the approximate southwestern third of the building and a filled hollow containing up to 33 feet of unengineered soil and rock fill is present over the approximate eastern two-thirds of the building.
- It is our opinion that the proposed building can be supported on a combination foundation system, consisting of conventional spread footings within the areas where bedrock is present within a depth of 7 feet below the proposed subgrade elevation, and drilled piers bearing on bedrock within the areas of deeper, unengineered fill.
- Approximately 30% of the building foundations around the south corner and western end can bear directly on the shale bedrock using conventional footings with some limited over-excavation to follow the sloping rock surface.
- A system of end-bearing drilled concrete piers and grade beams should be used throughout the remaining foundation sections to provide bearing on the underlying bedrock.
- Settlement of up to 2.5 inches for the slab-on-grade over the life of the building would have to be expected and future maintenance will be required.

Foundations

- The proposed building should be supported on grade beams and grouted drilled piers extended to bedrock throughout the filled hollow sections. We recommend that the foundation system be designed by a structural engineer.
- All walls and columns should be supported on 30-inch diameter drilled piers extended into bedrock with a minimum 6 foot rock socket.
- Drilled piers should be designed for 24,000 pounds-per-square-foot (PSF) end bearing capacity, which includes skin friction within the 6 foot rock socket.

- The drilled pier depths at this site should range from approximately 13 to 55 feet below the bottom of the grade beams.
- Surrounding the southern corner and western end of the new building, the foundations can bear directly on shallow bedrock.
- We recommend all foundations surrounding the southwestern third of the building be over-excavated, where necessary, to follow the sloping bedrock surface to a maximum depth of 7.0 feet below the final surface elevation. All over-excavations should be backfilled to the design bearing elevation using 1,000 PSI lean concrete.
- The base of all footings/grade beams should be at least 36 inches below the final exterior grade for adequate frost protection.

Floor Slab Support

- The new engineered fill will be considered suitable for floor slab support, following the recommended heavy duty proof-rolling and subgrade preparation activities. We recommend that any soft or yielding materials within the building footprint be removed to the level of the underlying firm materials and replaced with controlled, compacted, engineered fill.
- After the subgrade has been proof-rolled and prepared according to the guidelines in the Site Preparation section, the slab-on-grade sections can be designed based on a subgrade modulus of 100 PCI, bearing on new engineered fill soils.
- Periodic raising or leveling of slabs-on-grade will be required within the floor slab sections overlying the filled hollow. Slabs can be lifted back into place using pressurized injection of lime paste grout slurry, often referred to as mud jacking.

INTRODUCTION

This report presents the results of our geotechnical subsurface exploration and engineering analysis for the proposed new Spencer Middle School in Spencer, West Virginia. The purpose of this exploration was to generally define the subsurface conditions at this site and to characterize these conditions for the proposed structure.

This exploration included the drilling of an additional seven (7) Standard Penetration Test borings, visual observations of the general project site, the associated laboratory testing of the representative samples, and the report preparation. The exploration was authorized by Ms. Amanda Cheuvront, of Thrasher Group, and the work was performed in accordance with our verbal proposal/agreement.

This report is intended to provide detailed information concerning subsurface conditions within the proposed construction site, sufficient for the basic design of the foundation system, and to provide geotechnical engineering recommendations for the site preparation, site drainage, foundation design, and floor slab support.

PROJECT INFORMATION

It is proposed to construct a new middle school at the existing high school site, located on the western side of U.S. Route 119 in Spencer, West Virginia. Presently, the site area planned for the new middle school is located on the northern end of the existing Roane County High School. The proposed site is occupied by an asphalt parking lot, driveways, sidewalks, and open lawn space with several mature trees and shrubs. All utilities are located underground within the new school footprint and will require relocation. Existing site grades within the new school area range from 814 feet to 817 feet. The new school floor elevation will match with the existing building floor at 817.33 feet, which will require 1 to 4 feet of new engineered fill to achieve finished grade. The new building will consist of one and two-story sections constructed of load-bearing masonry walls with a brick exterior veneer. The ground floor will be an industry standard concrete slab-on-grade, with the second floor being concrete slab on metal decking.

Preparation of the existing level high school site required significant modification of the original ground and earthwork. This resulted in the filling of former sidehill hollows with unengineered fill consisting of shot rock and soil. The back (western) portion of the site was leveled by constructing a highwall cut. Prior to the mass grading operations, a split drainage swale crossed the site near the central parking lot area and converged before running southeast. Up to 35 feet of existing fill over a layer of shot rock may be present in the old swale/hollow area near the southeastern corner of the proposed middle school building.

SUBSURFACE EXPLORATION

Seven (7) additional Standard Penetration Test soil borings (B-9 to B-15) were drilled by AGI at the approximate locations shown on the attached Test Boring Location Plan. The test borings

were drilled using a track-mounted drill rig on January 27 and 28, 2022. Seven (7) SPT soil borings (B-1 to B-7) were drilled at this site during our preliminary geotechnical exploration on November 18 and 19, 2021. The test borings were staked in the field by AGI personnel, referencing the existing site features. The test borings were advanced, and the bore holes were stabilized, using 2.25-inch interior diameter hollow stem augers. Sampling was accomplished in the undisturbed material below the bottom of the augers using a split-spoon sampler. The split-spoon sampler, having an exterior diameter of 2.0-inches and an interior diameter of 1⅜-inch, was driven with a 140-pound automatic hammer falling 30 inches, in accordance with ASTM D 1586. The soil samples were recovered at 2.5 foot intervals within the upper 10 feet. The test borings were drilled to completion depths ranging from 3.8 to 47.0 feet below the present site grades.

Upon completion of the test borings, the holes were backfilled using the auger cuttings and the soil samples were returned to our soil mechanics laboratory, where they were visually examined by the project engineer and grouped for laboratory testing. The laboratory test program included natural moisture contents and pocket penetrometer readings on the representative soil samples.

The attached test boring logs were then prepared by the project engineer, using the results of the laboratory tests, recovered soil samples, and notes taken by the drill foreman during the drilling operations. The classified logs and the basis for recommendations are included in the appendix. Each log gives the depth, thickness, and visual description of the soil strata penetrated, along with the sample identification data.

SUBSURFACE CONDITIONS

The subsurface conditions are somewhat complex as a result of the past cutting and filling with mine related fill materials. These complex conditions are characterized by weathered bedrock just below the ground surface on the western end of the new building to unengineered soil and rock fill extending to depths of up to approximately 33 feet within an old hollow over the southeastern corner of the new building area. Unengineered fill materials were encountered in all test borings to depths ranging from 1.0 foot to 33.0 feet below the present surface grades.

The unengineered fill can generally be described as uneven mixtures of silty clay, sandy clay, rock fragments, cobbles, boulders, and organics. In B-7, B-10, and B-13, below roughly 7 to 8 feet of soil and rock fill, boulders were present just above the level of natural soil. In B-14, a 5.5 feet thick layer of weathered rock fill was present overlying damp and soft natural clay. The existing fill materials were noted as moist, with moisture contents varying from 8.6% to 24.6%. Pocket penetrometer readings varied from 1.5 to 4.5 tons-per-square-foot (tsf). An unconfined compressive strength test of a fill sample from B-6 produced a result of 1.27 tsf. SPT N-values were erratic and varied from 4 to 46 blows-per-foot (bpf), which are classified as soft to very stiff in consistency. It should be noted that SPT results above 15 are undoubtedly due to the presence of larger rock pieces in the fill and should not be viewed as accurate representations of fill density. Recovery in the split spoon sampler was highly variable and ranged from 0% to 100% with an average of 60%. There was no indication of any systematic and well monitored compaction of the existing fill at this site. Although, it appears that some areas have received

some degree of compaction, likely from repetitive traffic from heavy equipment. It appears, as would be expected, that the relative density of the existing unengineered fill is highly variable.

Natural soil materials were encountered in B-4, B-7, B-9, B-14, and B-15 below depths of 0.7 to 33.0 feet below the present surface grades. The natural material in B-4 and B-14 consisted of gray silty clay with organics and was reminiscent of soils found in natural drainage features. A thin coal seam was present below this stratum in B-4 and a layer of plastic clay was present at approximately 15.3 feet below the existing surface. In B-7 and B-9, the natural soils consisted of orangish-brown, brown, reddish-brown and gray silty clay with rock fragments. B-15 encountered tan, gray and maroon clay with shale fragments below a depth of 8.5 feet. The natural soils were noted as moist to wet, with moisture contents of 17.2% to 19.8%. SPT N-values were on the order of 12 to 13 bpf. B-4 was extended to a completion depth of 16.5 feet. The natural soil layers in B-7, B-9, B-14, and B-15 extended to depths of approximately 2.0 to 42.0 feet below the surface, whereupon weathered bedrock was encountered.

Weathered bedrock materials were encountered at depths ranging from 1.0 to 42.0 feet below the present surface in B-1 to B-3, B-7, B-9, B-11, B-14 and B-15. These bedrock materials consisted of primarily of gray, brown, grayish-brown, tan and maroon shale, sandy shale, and silty shale. Iron-staining of the shale was noted as a few locations, indicating the possible presence of pyritic sulfur. In B-7 and B-15, the upper weathered bedrock consisted of dark gray and black carbonaceous shale. These weathered bedrock materials were classified as very soft to medium hard in relative hardness. Below a depth of 46.0 feet in B-14, hard gray sandstone was encountered. Most of the referenced test borings were terminated at depths of 3.8 to 16.5 feet below the existing surface grades without encountering auger refusal. Auger refusal occurred at depths of 47.0 feet in B-14 and 27.0 feet in B-15 below the existing site grades.

Groundwater was present while drilling at a depth of 36.0 feet in B-14. Groundwater was encountered within the fractured shale formation in B-1 and B-14 at depths of 11.0 and 45.0 feet. Groundwater was not noted during, or at the completion of, the drilling in the other test boring. We should state, however, that fluctuations in the location of the groundwater table, as well as perched or trapped water, can occur as a result of seasonal variations in precipitation, evaporation, surface runoff, and other factors not immediately apparent at the time of our exploration.

ANALYSIS AND RECOMMENDATIONS

The site is a previously filled split hollow underlain by damp and soft colluvial soils. The proposed middle school footprint straddles both sides of the hollow. On the rear western side of the hollow our exploration encountered shallow rock near the surface. Up to 35 feet of existing fill over a layer of shot rock may be present in the old swale/hollow area near the southeastern corner of the proposed middle school building. Extensive relocation of existing utility lines will be required prior to beginning earthwork activities.

If the structure is supported on a conventional spread footing foundation, settlement through the middle of the building overlying the filled hollow can be up to 4 inches. We recommend a

drilled pier foundation system extended to bedrock to support the proposed building through the filled hollow sections. Approximately 30% of the building foundations around the south rear corner and western end can bear directly on the shale bedrock using conventional footings with some limited over-excavation to follow the sloping rock surface.

Site Preparation

All structural areas (as defined by the limits of the new building and 10 feet beyond in all directions) should be stripped of all asphaltic pavement, concrete sidewalks and curbs, topsoil, soft/wet soils, utilities and related backfill, trees and vegetation, lightpoles, structures, and any otherwise deleterious materials. Extensive removal and relocation of existing underground utilities will be required within the new building footprint. Upon completion of the stripping operations and prior to the placement of engineered fill required to achieve the proposed subgrade elevation, the exposed surface area should be proof-rolled using a fully loaded off-road articulating dump truck, under the supervision of qualified geotechnical personnel. The proof-rolling equipment should weigh at least 60 tons and make passes over the entire subgrade area in each of two perpendicular directions. This process can reduce settlement on the order of 33%. At least two days should be allocated for subgrade proof-rolling and consolidation operations. Localized soft or yielding areas identified during the proof-rolling activities should then be undercut and replaced with controlled, compacted, engineered fill as needed, in order to provide a firm subgrade.

It is recommended that all engineered fill or backfill required to reach the subgrade elevation within the building footprint be placed in maximum 8-inch lifts and compacted to at least 98% of the standard Proctor maximum density, as determined by ASTM D-698, and substantiated by onsite testing. The lift thickness should be reduced to 4 inches wherever hand operated equipment is used. The fill materials should be maintained within ±3% of the optimum moisture content during placement. All engineered fill materials should have a liquid limit less than 40, a plasticity index less than 15, and a maximum aggregate particle size of 4 inches in any dimension. The existing soil materials can be reused as structural fill or backfill provided that the materials conform to the stated particle size limitation.

Utility Installation and Backfilling

New utility lines should be bedded using #8 limestone chips to at least 6 inches above the top of the pipe. All utility trenches, including drop inlets and manholes, can be backfilled from the top of the gravel bedding to the final subgrade elevation using 150 to 200 PCI CLSM/flowable fill for best long-term performance.

Foundation Design

Within the currently proposed building location, shallow bedrock is present over the approximate southwestern third of the building and a filled hollow containing up to 33 feet of unengineered soil and rock fill is present over the approximate eastern two-thirds of the building. We recommend that the proposed building be supported on the underlying bedrock, either by bearing the footers directly on the rock or extending to the bedrock within the deep filled hollow area

using deep foundations. Deep foundations are recommended given the magnitude of potential settlement produced by the deep hollow fill and underlying soft soils at this site.

We recommend all foundations surrounding the general southwestern third of the building be over-excavated, where necessary, to follow the bedrock surface to a maximum depth of 7.0 feet below the final surface elevation. All over-excavations should be backfilled to within 36 inches of the final exterior grade using 1,000 PSI lean concrete. Foundations bearing directly on excavated shale can be designed for an allowable bearing capacity of 3,000 pounds-per-square-foot (psf). Care should be taken to not undermine the foundations of the existing building when over-excavations are performed adjacent to existing footings. Temporary bracing or shoring of existing shallow spread footings may be required.

The sections of the proposed building overlying the filled hollow can be founded on a drilled pier and grade beam foundation system bearing on the underlying bedrock. It is our opinion that a drilled pier (caisson) foundation system is the most suitable deep foundation option to support the proposed building, given the need to penetrate subsurface obstructions across the site. The caissons should be a minimum of 30-inches in diameter to provide adequate lateral stability and no pile caps are required. The caissons should bear within the underlying bedrock, with expected drilled caisson lengths ranging from 13 to 55 feet including the 6 foot rock socket. Carbonaceous shale was encountered at 10 to 14 feet below the surface on the eastern section where the caissons will penetrate through this layer.

Design Recommendations

The straight-shafted drilled caissons should bear on the underlying bedrock with expected shaft lengths of 13 to 55 feet. Our experience indicates that the bedrock at this site can be penetrated using earth augers, at least through the weathered zone. Rock augers are often required in unweathered shale, and depending upon the possible presence of any boulders, core barrels may also be needed. Boulders and other obstructions related to the prior filling of the building area may create problems for new foundation installation. Excavating and removing shallow boulders or obstructions may be required within some foundation areas, or the obstructions can be penetrated using a core barrel.

The drilled caissons should be extended into the competent bedrock, penetrating through the weathered rock by means of auger refusal. Auger refusal is herein defined as the inability to progress the earth auger under the 40,000 pounds of positive crowd force, and an available measured torque at the Kelly bar of 45,000 ft.-lbs. Based upon the results of our subsurface exploration, the drilled caisson lengths are estimated to range from 13 feet to 55 feet. After meeting true refusal on bedrock (not boulders), the drilled piers should be socketed a minimum of 6 feet into bedrock.

The minimum diameter of these shafts has been specified as 30 inches due to the lateral stability on the V-shaped valley and negative skin friction. The minimum caisson embedment depth into hard rock should be 6 feet and the drilled caisson lengths are estimated to range from 13 to 55 feet below the proposed grade. Drilled piers should be designed for 24,000 pounds-per-square-

foot (PSF) end bearing capacity, which includes skin friction between the concrete and rock within the socket.

As wide variations in the top of competent rock elevation will occur over the building footprint, it is recommended that the bottom elevations for the caissons be estimated based on our test boring logs. As the dominant rock formation within the area is weathered shale, significant differences in the depth of intact bedrock could occur due to the possible presence of detached boulders above the intact rock elevation.

Installation

Temporary steel casings will be required as fill and boulder/cobble conditions or seepage may allow caving of the holes. Seepage will occur, especially at the fill/natural soil and soil/bedrock interfaces. The foundation contractor should have casings available at the site.

The base of each caisson should be inspected and approved by the geotechnical engineer/geotechnical personnel prior to placement of concrete. No more than two (2) inches of water should be allowed to collect at the bottom of the caisson prior to concreting. Otherwise, the water should be pumped out or the concrete should be placed using a tremie. A concrete slump of 4 to 6 inches is recommended and care should be taken to maintain an adequate head of concrete above the tip of the casing as it is being withdrawn.

For a foundation system designed and constructed as recommended above, the differential settlement should be on the order of 0.25 inch. This would result in an angular distortion of approximately 0.001 inch-per-inch across a distance of 20 feet. The potential for cracking in masonry walls can be minimized by providing control/construction joints at critical locations and every 20 feet along the walls. At a minimum, the control/construction joints should be placed where changes in the wall height or loading conditions occur.

Floor Slab Support

The new engineered fill materials will be suitable for floor slab support following the recommended subgrade preparation activities. We recommend that any existing soft/wet materials or deposits of demolition debris within the building footprint be removed to the level of the underlying firm materials and be replaced with controlled, compacted, engineered fill.

The floor slab subgrade should be prepared as outlined in the previous Site Preparation section. The subgrade should be proof-rolled using a fully loaded tandem-axle dump truck under the supervision of the geotechnical engineer, or his authorized representative, to identify any areas in need of undercutting and replacement with controlled, compacted, engineered fill. A floor slab-on-grade underlain with a subgrade prepared as outlined above can be designed utilizing a modulus of subgrade reaction of 100 pounds-per-cubic-inch (pci).

A minimum 4 inch thick free-draining granular base course (#8 limestone chips) is recommended beneath the floor slab. The stone base material should be compacted to 85% of the maximum relative density. Prior to the placement of the slab concrete, we also recommend

that a vapor barrier conforming to ASTM E 1745 be placed on top of the compacted granular base material to provide moisture protection. The floor slab should be isolated from the building foundation so that any differential settlements would not induce shear stresses on the slab. This can be accomplished through the proper use and placement of construction joints. The surface curing of the slab should also be given attention, so as to minimize the width and propagation of any shrinkage cracks which may develop near the surface of the slab. Settlement of up to 2.5 inches for the slab-on-grade over the life of the building would have to be expected. Systematic proof-rolling can reduce the future settlement on the order of 33%. Periodic raising or leveling of slabs-on-grade will be required within the floor slab sections overlying the filled hollow. Slabs can be lifted back into place using pressurized injection of lime paste grout slurry, often referred to as mud jacking.

Seismic Soils Classification and Seismic Hazard Evaluation

Site Class D is recommended for the seismic design considerations, based upon our test borings, our knowledge and understanding of the area geology, and Table 1613.5.2 of the 2015 International Building Code (IBC). The overburden soils at this site are identified as Site Class D. The depth of weathered bedrock at this site varies widely below the present surface and belongs to Site Class B. Although the IBC site classification is based on the average soil conditions within the top 100 feet of the subsurface profile, the IBC permits the soil properties to be estimated by a geotechnical engineer based upon known regional geologic conditions where site-specific data is not available to the depth of 100 feet. A 100 foot deep test boring, possibly in conjunction with more sophisticated laboratory testing or field geophysical testing, would be required to more accurately determine the soil properties and soil site class. The actual seismic design should be performed by a structural engineer. The following potential seismic hazards resulting from earthquake motions have been evaluated.

1. A slope stability analysis was not included in the scope of this exploration. The ground surface within the building area is level and appears to be stable. Any exterior fill slopes planned for this project should be no steeper than 3H:1V with respect to potential instability resulting from earthquake motions.

2. The groundwater table was encountered during our subsurface exploration. Because the foundations will be supported on bedrock materials, liquefaction of the bearing soils due to earthquake motions will not be an issue.

3. As no ponds, slopes or low lying areas are present within the proposed building vicinity, lateral spreading is unlikely.

4. As no faults are present within the site area, surface rupture is unlikely.

The following seismic design recommendations are offered based on seismic design maps prepared and provided by IBC 2015.

- Mapped Acceleration Parameters
  $S_S = 0.124$

$S_1 = 0.064$

- Site Coefficients
  $F_a = 1.6$
  $F_v = 2.4$
- Seismic Design Parameters
  $S_{MS} = 0.199$
  $S_{M1} = 0.153$
  $S_{DS} = 0.133$
  $S_{D1} = 0.102$

Construction Considerations

The exposed subgrade soils can deteriorate and lose support when exposed to construction activity and environmental changes (this is particularly true for the fine grained fill soils). Subgrade soil deterioration can occur in the form of freezing, erosion, softening from ponded water, and rutting from construction traffic. If the exposed subgrade surface in the slab areas becomes softened and deteriorated, it must be properly repaired through scarification and re-compaction immediately prior to stone placement. If this has to be performed during wet weather conditions, it would be worthwhile to consider undercutting the disturbed soil and stabilizing with Portland cement, or providing a flowable fill "mud mat" working surface.

Construction Monitoring

Close testing and monitoring by geotechnical personnel will be a critical aspect of this project. At a minimum, these services should be provided during site preparation, structural fill placement, drilled pier installation, reinforcing steel installation, foundation construction, and floor slab construction.

LIMITATIONS

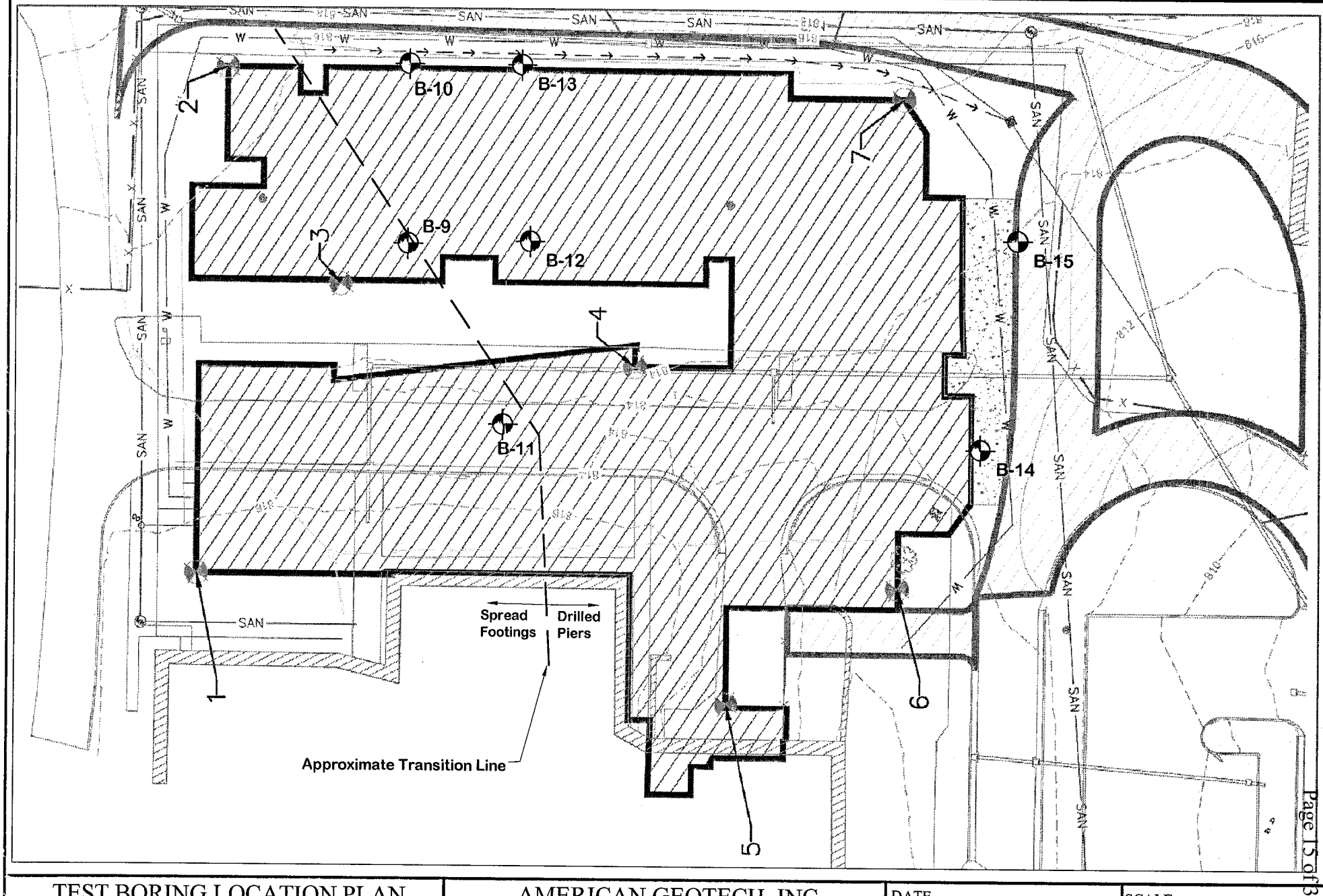
This report was prepared for use by Thrasher Group to aid in the design of this project. The report has been prepared in accordance with accepted geotechnical engineering practices and no other warranties, either expressed or implied, are made. The recommendations stated herein are contingent on American Geotech observing and evaluating all geotechnical aspects of the required work. We cannot be held responsible for any misinterpretations or improper implementation of our recommendations by other firms providing quality control services.

The recommendations presented in this report are based on data obtained from test borings made at the approximate locations shown on the Test Boring Location Plan. Variations which may exist between the test borings may not become evident until during construction. If significant variations are noted, we should be contacted so that the field conditions can be examined and the applicable recommendations revised, if necessary. Similarly, in the event of changes in the nature, design or location of the structure, or if other developments are planned, we should be notified so that we may review such changes to verify or make appropriate modifications to our previous conclusions and recommendations, which may be invalidated by any such changes.

We recommend that this complete report be provided to the various design team members, the contractors and the project owner. Potential contractors should be informed of this report in the "Instructions to Bidders" section of the bid documents. The report should not be included or referenced in the actual contract documents.

TEST BORING LOCATION

American Geotech, Inc.
601 Ohio Avenue
Charleston, West Virginia 25302



TEST BORING LOCATION PLAN

New Spencer Middle School
Roane County High School
Spencer, West Virginia

AMERICAN GEOTECH, INC.
601 OHIO AVENUE
CHARLESTON, WV 25302
(304) 340-4277

DATE 2-1-22	SCALE NONE
DRAWN BY CLM	CHECKED BY KSP
ADAPTED BY RDJ	SHEET 1 OF 1

Soil Test Boring Logs and Laboratory Data

American Geotech, Inc.
601 Ohio Avenue
Charleston, West Virginia 25302

Test Boring Log: Terminology and Symbols

Terminology

Grain Size

Soil Fraction		Particle Size	U.S. STD. Sieve Size
Boulders		Larger than 12"	Larger than 12"
Cobbles		3" to 12"	3" to 12"
Gravel	Coarse	¾" to 3"	¾" to 3"
	Fine	4.75 mm to ¾"	#4 to ¾"
Sand	Coarse	2.00 to 4.75 mm	#10 to #4
	Medium	0.425 to 2.00 mm	#40 to #10
	Fine	0.075 to 0.475 mm	#200 to #40
Fines	Clays & Silts	smaller than 0.075 mm	smaller than #200

Plasticity characteristics differentiate between silts and clays

Relative Density

Term	"N" Value
very loose	0 - 4
loose	5 - 10
medium dense	11 - 30
dense	31 - 50
very dense	over 50

Consistency

Term	ID Procedures	"N" Value
Soft	Easily penetrated by thumb	0 - 4
Medium Stiff	Penetrated by thumb with moderate effort	5 - 8
Stiff	Penetrated by thumb with great effort	9 - 15
Very Stiff	Readily indented by thumbnail	16 - 30
Hard	Indented by thumbnail with difficulty	31 - 50
Very Hard		over 50

Relative Moisture Description

Dry	Soil noticeably below optimum moisture
Moist	near optimum, but less then liquid limit
Damp	near or exceeding liquid limit
Wet	soil below water table

Symbols

Drilling and Sampling

RC - Rock Coring: Sizes AW, BW, NW, NQ
RQD - Rock Quality Designator
DC - Drive Casing
HSA - Hollow Stem Auger
FA - Flight Auger
AG - Auger
HA - Hand Auger
SS - 2" diameter Split Barrel Sampler
ST - 3" diameter Thin-Walled Tube Sampler
AS - Auger Sample
WS - Wash Sample
NR - No Recovery
S- Sounding
ATV - All Terrain Vehicle

Laboratory Tests

PP - Pocket Penetrometer Reading, Tons/ft^2
QU - Unconfined Strength, Tons/ft^2
W - Moisture Content, %
LL - Liquid Limit, %
PL - Plastic Limit,%
D - Dry Unit Weight, lbs/ft^3

Standard Penetration Test

The penetration resistance, or N-value as it is commonly referred to, is the summation of the number of blows required to drive the last two successive 6" penetrations of the 2" diameter -18" long split barrel sampler. The sampler is driven with a 140 lb. weight falling 30". The standard penetration test is performed in compliance with procedures as set forth in ASTM D-1586

Water Level Measurement

NW - No water encountered
WD - While drilling
BCR - Before casing removal
ACR - After casing removal
CW - Caved and wet
CM - Caved and moist
BP - Backfilled upon completion

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 9

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/28/22

BORING LOCATION As shown on plan **DATE COMP.** 1/28/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE				
			NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0	0.7' Asphalt(4") and gravel(4").					
	0.7	Brown and reddish-brown silty 1.3' clay with rock fragments, moist, stiff.	1	ss	0.0' – 1.5'	NS	
	2.0	1.8' Tan and brown shale, highly weathered, soft to tough.	2	ss	2.5' – 3.8'	39-31-$^{30}/_{3"}$	14"
	3.8	Split spoon refusal @ 3.8 feet. Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 10

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/28/22

BORING LOCATION As shown on plan **DATE COMP.** 1/28/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE				
			NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0	0.7' Asphalt(4") and gravel(4").					
	0.7	Tan, brown and maroon silty clay with rock fragments, trace boulders (FILL), moist, stiff.	1	ss	0.0' – 1.5'	NS	
			2	ss	2.5' – 4.0'	4-7-7	14"
			3	ss	5.0' – 6.5'	5-5-6	14"
	8.3'		4	ss	7.5' – 9.0'	6-27-9	12"
	9.0	Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 11

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/27/22

BORING LOCATION As shown on plan **DATE COMP.** 1/27/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE				
			NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0						
		1.0' Asphalt(6") and gravel(6").					
	1.0						
		Tan and brown shale and sandy	1	ss	0.0' – 1.5'	NS	
	4.0'	shale, highly weathered, soft to tough.	2	ss	2.5' – 3.8'	30-45-$^{25}/_{3}$"	15"
	5.0						
		Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 12

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/28/22

BORING LOCATION As shown on plan **DATE COMP.** 1/28/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE				
			NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0	0.8' Asphalt(4") and gravel(5").					
	0.8						
		Reddish-brown silty clay with	1	ss	0.0' – 1.5'	NS	
	7.2'	rock fragments (FILL), moist,	2	ss	2.5' – 4.0'	6-15-9	12"
		very stiff to medium stiff.	3	ss	5.0' – 6.5'	3-5-3	8"
	8.0						
		Brown and grayish-brown silty					
	1.0'	clay with rock fragments, trace	4	ss	7.5' – 9.0'	3-8-7	17"
		organics (FILL), moist, stiff.					
	9.0						
		Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 13

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/28/22

BORING LOCATION As shown on plan **DATE COMP.** 1/28/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE				
			NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0						
		0.7' Asphalt(4.5") and gravel(4").					
	0.7						
		Maroon, brown and tan silty clay	1	ss	0.0' – 1.5'	NS	
		7.3' with rock fragments, trace	2	ss	2.5' – 4.0'	7-8-7	7"
		organics and boulders (FILL),	3	ss	5.0' – 6.5'	4-5-3	10"
		moist, stiff to medium stiff.					
	8.0						
		1.0' Tan shale boulder (FILL),	4	ss	7.5' – 9.0'	6-25-21	18"
		medium dense.					
	9.0						
		Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 14

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/27/22

BORING LOCATION As shown on plan **DATE COMP.** 1/27/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0						
		0.8' Asphalt(4.5") and gravel(4.5").					
	0.8						
		Brown to maroon silty clay with	1	ss	0.0' – 1.5'	NS	
	9.5'	sand and rock fragments, trace	2	ss	2.5' – 4.0'	3-5-7	13"
		cobbles (FILL), moist, stiff.	3	ss	5.0' – 6.5'	3-12-14	12"
			4	ss	7.5' – 9.0'	5-8-7	13"
	10.3						
		Tan, gray and brownish-gray silty					
	17.2'	clay with rock fragments (FILL),	5	ss	10.0' – 11.5'	3-6-8	13"
		moist, stiff.					
	27.5						
		Gray and brown sandstone and					
	5.5'	shale rock (FILL), moist,					
		medium dense.					
	33.0						
	▼	9.0' Gray silty clay with sand, damp					
		to wet, soft.					
	42.0						
		4.0' Brown shale, weathered, soft.					
	▼						
	46.0						
		1.0' Gray sandstone, hard.					
	47.0						
		Auger refusal @ 47.0 feet.					
		Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE(▼) 36.0 FT.
AT COMPLETION(▼) 45.0 FT.
AFTER CW HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 15

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/27/22

BORING LOCATION As shown on plan **DATE COMP.** 1/27/22

ELEV. REF. None available **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE				
			NO.	TP	DEPTH	BLOWS/6"	REC.
	0.0						
		0.8' Asphalt(3.5") and gravel(6").					
	0.8						
		4.2' Gray silty clay with sand and cobbles (FILL), moist, very stiff.	1	ss	0.0' – 1.5'	NS	
			2	ss	2.5' – 4.0'	4-10-20	16"
	5.0						
		3.5' Tan and gray silty clay with rock fragments (FILL), moist, stiff.	3	ss	5.0' – 6.5'	4-4-6	14"
			4	ss	7.5' – 9.0'	3-5-7	7"
	8.5						
		2.0' Tan, gray and maroon clay with shale fragments, moist, stiff.					
	10.5						
		4.5' Dark gray to black carbonaceous shale, clayey, very soft.	5	ss	10.0' – 11.5'	3-8-8	11"
	15.0						
		5.0' Gray to brown shale, highly weathered, soft.					
	20.0						
		7.0' Gray shale, medium hard.					
	27.0	Auger refusal @ 27.0 feet. Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

AMERICAN GEOTECH, INC.
601 Ohio Avenue
Charleston, West Virginia 25302

The Thrasher Group, Inc.
Proposed Spencer Middle School
Spencer, West Virginia

TABULATION OF TEST DATA

Hole No.	Sample No.	Depth (ft.)	Unconfined Compressive Strength (tsf)	Failure Strain (%)	Dry Density (pcf)	Water Content (%)	Pocket Penetrometer (tsf)
B-10	S-2	2.5 - 4.0				20.7	3.25
	S-3	5.0 - 6.5				18.6	4.25
B-12	S-2	2.5 - 4.0				13.9	4.0
	S-3	5.0 - 6.5				22.1	3.25
B-13	S-2	2.5 - 4.0				15.4	4.5
	S-3	5.0 - 6.5				20.6	2.75
B-14	S-2	2.5 - 4.0				16.0	4.0
	S-3	5.0 - 6.5				19.1	4.25
	S-4	7.5 - 9.0				17.1	4.0
B-15	S-2	2.5 - 4.0				19.9	2.75

AMERICAN GEOTECH, INC.
601 Ohio Avenue
Charleston, West Virginia 25302

The Thrasher Group, Inc.
Proposed Spencer Middle School
Spencer, West Virginia

TABULATION OF TEST DATA

Hole No.	Sample No.	Depth (ft.)	Unconfined Compressive Strength (tsf)	Failure Strain (%)	Dry Density (pcf)	Water Content (%)	Pocket Penetrometer (tsf)
	S-3	5.0 - 6.5				21.8	2.75
	S-4	7.5 - 9.0				19.8	4.0

AMERICAN GEOTECH, INC.
GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS
601 OHIO AVENUE
CHARLESTON, WV 25302
(304) 340-4277
Fax (304) 340-4278

February 28, 2022

Ms. Amanda Cheuvront
The Thrasher Group, Inc.
300 Association Drive
Charleston, WV 25311

Re: Addendum #1
Pyritic Sulfur Content and Recommendations
Proposed New Spencer Middle School
North Side of Existing Roane County High School
Spencer, Roane County, West Virginia

Dear Ms. Cheuvront:

American Geotech, Inc. (AGI) performed a series of test borings at the above referenced site and submitted our geotechnical report on February 3, 2022. Several borings encountered two (2) carbonaceous shale layers below the surface at this site. The uppermost carbonaceous shale layer is around 811± to 815± feet and the second lower carbonaceous shale layer is around 799± to 804± feet, as compared to the finished floor elevation of 817.33 feet.

It is known that carbonaceous shale is associated with pyritic sulfur and oxidation of pyritic sulfur can cause swelling or heaving. Representative samples of both carbonaceous shale layers were sent to Standard Laboratories, Inc. to determine the pyrite content by analyzing the pyritic sulfur content.

Pyrite Test Results

Boring	Sample Depth (ft)	Pyritic Sulfur
B-2	2.5' - 4.0'	0.18% (dry basis)
B-15	10.0' - 11.5'	0.10% (dry basis)

The pyritic sulfur contents derived from the tests indicate the existence of pyrite in both carbonaceous shale layers. When oxidized (subjected to oxygen, moisture, and worsened by heat), new material can form which takes on a much larger volume. Expansive forces and heave can occur from these minerals. Oxidation of the iron sulfide minerals (often characterized by the mineral pyrite) to sulfate minerals causes a volume increase of 8 to 11 fold of the layer of the mineral formation, or up to 350% of the volume expansion randomly. This process can sometimes take a long time to occur as a delayed reaction as the pyrite chemically weathers.

Some researchers have determined that sulfide mineral contents as low as about 0.1% can result in structural heave. Our tests indicated (pyritic sulfur) contents on the orders of 0.1% to 0.18% sulfide mineral on a dry basis.

In order for oxidation of the sulfide mineral to occur, it needs oxygen, moisture, and building heat. If the mineral and its formation are left alone and not disturbed, chances of exposure to oxygen, water, and heat are minimal. The footing excavations and utility trenches are the major sources of water infiltration under buildings. The upper layer of carbonaceous shale is at shallow depth and within the footing and utility trench excavation zone. The uppermost carbonaceous shale layer shall be systematically removed and disposed of within the area of shallow foundations. The deeper carbonaceous shale layer can be left in place, but the drilled piers must penetrate through the lower carbonaceous shale layer. It should be noted that the research has indicated the expansive forces of this mineral are from 9,000 PSF to 12,000 PSF. The end bearing capacity of the caissons is recommended to be 24,000 PSF; but if actual stress on any caisson is less than 12,000 PSF, it must penetrate the lower carbonaceous shale layer.

We appreciate the opportunity to be of services on this project. If you have any questions or require additional services, please feel free to contact us.

Respectfully Submitted,

AMERICAN GEOTECH, INC.

Kanti S. Patel, P.E.
Principal Engineer

ANALYTICAL TEST RESULTS

American Geotech, Inc.
601 Ohio Avenue
Charleston, West Virginia 25302

STANDARD LABORATORIES, INC.
147 11th Ave, South Charleston, WV 25303, (304)744-5472

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

CERTIFICATE OF ANALYSIS

CERTIFICATE OF ANALYSIS 2179.06-1 TESTING

Date Received: 2/2/2022
Report Date: 2/25/2022

Sample ID:	30-2200171001
Sample# B-2-2 Spencer Middle School	

Customer Name: American Geotech Inc
Customer Address: 601 Ohio Ave
Charleston WV, 25302

Respectfully Submitted: jlutsy

Sample Weight Unit: G
Sample Date: 1/27/22

Sampled By: Customer
Sample Weight: 249.7

PROXIMATE ANALYSIS				
				Method
% Moisture	1.12			D3173
	As Received	Dry	MAF	
BTU/LB	X	X	X	D5865
% Ash	X	94.06		D3174
% Sulfur	X	0.04		D4239
% Volatile	X	X		D3175
% Fixed Carbon	X	X		D3172
lbs SO_2/MM BTU	X			
lbs ASH/MM BTU	X			

SULFUR FORMS*			
	As Received	Dry	Method
% Sulfate	X	0.01	D2492
% Pyritic	X	0.18	
% Organic	X	0.01	
Total	0	0.18	

* Indicates test not covered by accreditation.

N/D indicates result was under detectable range.

Data Applicable to Material Received

STANDARD LABORATORIES, INC.
147 11th Ave, South Charleston, WV 25303, (304)744-5472

ACCREDITED ISO/IEC 17025 TESTING LABORATORY

CERTIFICATE OF ANALYSIS

Date Received: 2/2/2022
Report Date: 2/25/2022

Sample ID:	30-2200171002

Sample# B-15-5 Spencer Middle School

Customer Name: American Geotech Inc
Customer Address: 601 Ohio Ave
Charleston WV, 25302

Respectfully Submitted: jlutsy

Sample Weight Unit: G
Sample Date: 1/27/22

Sampled By: Customer
Sample Weight: 227.5

PROXIMATE ANALYSIS				
				Method
% Moisture	3.74			D3173
	As Received	Dry	MAF	
BTU/LB	X	X	X	D5865
% Ash	X	88.67		D3174
% Sulfur	X	0.07		D4239
% Volatile	X	X		D3175
% Fixed Carbon	X	X		D3172
lbs SO_2/MM BTU	X			
lbs ASH/MM BTU	X			

SULFUR FORMS*			
	As Received	Dry	Method
% Sulfate	X	0.02	D2492
% Pyritic	X	0.10	
% Organic	X	0.01	
Total	0	0.12	

* Indicates test not covered by accreditation.

N/D indicates result was under detectable range.

Data Applicable to Material Received

TEST BORING LOG

American Geotech, Inc.
601 Ohio Avenue
Charleston, West Virginia 25302

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 2

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 11/19/21

BORING LOCATION As shown on plan **DATE COMP.** 11/19/21

ELEV. REF. Estimated from site plan provided by the client **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE NO.	TP	DEPTH	BLOWS/6"	REC.
816±	0.0	0.3' Topsoil.					
815.7	0.3	Maroon silty clay with rock fragments (FILL), moist, medium stiff.	1	ss	0.0' – 1.3'	6-8-$^{50}/_{3}$"	14"
815.0	1.0						
814±	Bearing	3.5' Gray and brown shale, iron-stained, weathered, soft.	2	ss	2.5' – 4.0'	11-28-37	18"
811.5	4.5	3.4' Gray shale, weathered, sandy @ 7 ft, tough.	3	ss	5.0' – 5.4'	$^{50}/_{5}$"	5"
			4	ss	7.5' – 7.9'	$^{50}/_{5}$"	3"
808.1	7.9	Boring completed.					

GENERAL NOTES
DRILLER J. Francis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 3

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 11/19/21

BORING LOCATION As shown on plan **DATE COMP.** 11/19/21

ELEV. REF. Estimated from site plan provided by the client **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE NO.	TP	DEPTH	BLOWS/6"	REC.
815±	0.0	0.5' Asphalt(3") and gravel(3").					
814.5	0.5	0.5' Maroon silty clay with rock fragments (FILL), moist, stiff.					
814.0	1.0						
	Bearing	3.5' Brown to gray shale, weathered, tough.	1	ss	0.5' – 1.9'	11-42-$^{50}/_{5}$"	17"
			2	ss	2.5' – 3.4'	24-$^{50}/_{5}$"	11"
810.5	4.5	2.0' Brown shale, weathered, iron-stained, soft.	3	ss	5.0' – 6.5'	14-32-22	18"
808.5	6.5	Boring completed.					

GENERAL NOTES
DRILLER J. Francis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 7

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 11/18/21

BORING LOCATION As shown on plan **DATE COMP.** 11/18/21

ELEV. REF. Estimated from site plan provided by the client **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE NO.	TP	DEPTH	BLOWS/6"	REC.
815±	0.0	0.5' Asphalt(3") and gravel(3").					
814.5	0.5						
814±	Bearing	Brown to reddish-brown silty clay	1	ss	0.5' – 2.0'	2-3-5	18"
		4.0' with rock fragments (FILL),	2	ss	2.5' – 4.0'	2-2-3	7"
		moist, medium stiff.					
810.5	4.5						
		Brown sandy clay with rock	3	ss	5.0' – 6.5'	3-4-3	9"
		6.0' fragments (FILL), moist,	4	ss	7.5' – 7.7'	$^{50}/_{2"}$	0"
		medium stiff.					
		- Boulder @ 7 to 8.5 ft.					
804.5	10.5						
		Orangish-brown and gray silty					
		3.5' clay with rock fragments, moist,	5	ss	10.0' – 11.5'	10-6-7	12"
		stiff.					
801.0	14.0						
		2.5' Dark gray to black carbonaceous	6	ss	15.0' – 16.5'	2-7-7	11"
		shale, weathered, very soft.					
798.5	16.5						
		Boring completed.					

GENERAL NOTES
DRILLER J. Francis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

LOG OF TEST BORING

CLIENT Thrasher Group, Inc. **BORING NO.** B – 15

PROJECT Proposed New Spencer Middle School – Spencer, WV **DATE START** 1/27/22

BORING LOCATION As shown on plan **DATE COMP.** 1/27/22

ELEV. REF. Estimated from site plan provided by the client **PO. NO.**

ELEV. FT.	DEPTH FT.	DESCRIPTION OF MATERIALS	SAMPLE NO.	TP	DEPTH	BLOWS/6"	REC.
814±	0.0						
	Bearing	0.8' Asphalt(3.5") and gravel(6").					
813.2	0.8	4.2' Gray silty clay with sand and cobbles (FILL), moist, very stiff.	1	ss	0.0' – 1.5'	NS	
			2	ss	2.5' – 4.0'	4-10-20	16"
809.0	5.0	3.5' Tan and gray silty clay with rock fragments (FILL), moist, stiff.	3	ss	5.0' – 6.5'	4-4-6	14"
			4	ss	7.5' – 9.0'	3-5-7	7"
805.5	8.5	2.0' Tan, gray and maroon clay with shale fragments, moist, stiff.					
803.5	10.5	4.5' Dark gray to black carbonaceous shale, clayey, very soft.	5	ss	10.0' – 11.5'	3-8-8	11"
799.0	15.0	5.0' Gray to brown shale, highly weathered, soft.					
794.0	20.0	7.0' Gray shale, medium hard.					
787.0	27.0	Auger refusal @ 27.0 feet. Boring completed.					

GENERAL NOTES
DRILLER H. Lewis
RIG NO. CME-45
RIG TYPE Track
METHOD HSA/SS

AMERICAN GEOTECH, INC.
Geotechnical, Environmental & Testing Engineers
601 Ohio Avenue
Charleston, WV 25302
304-340-4277

WATER LEVEL OBSERVATIONS
IMMEDIATE NW FT.
AT COMPLETION NW FT.
AFTER BP HRS. NW FT.
WATER USED IN DRILLING NW FT.

TIE PROPOSED SIDEWALK INTO EXISTING SIDEWALK

EXISTING BUILDING

PROPOSED ADDITION

PROPOSED 24'-WIDE PAVED ACCESS ROAD

PROPOSED PARKING SPACES (18'x9')

24'

PROPOSED 16'-WIDE LOADING BAY

TIE PROPOSED ASPHALT TO EXISTING ROAD

16'

PROPOSED CONCRETE STAIRS

25'

PROPOSED 5'-WIDE CONCRETE SIDEWALK (TYP)

TIE PROPOSED ASPHALT TO EXISTING PARKING LOT

R40'

R65'

TIE PROPOSED ASPHALT TO EXISTING ROAD

30' 0 30' 60'

PLAN LEGEND

- EXISTING CONTOURS
- EXISTING EDGE OF ASPHALT
- W — EXISTING WATER LINE
- SAN — EXISTING SANITARY SEWER LINE
- EXISTING STORM LINE
- EXISTING BUILDING
- EXISTING BASEBALL FIELD
- EXISTING ASPHALT
- PROPOSED CONTOURS
- UE — PROPOSED UNDERGROUND ELECTRIC
- W — PROPOSED WATER LINE
- SAN — PROPOSED SANITARY SEWER LINE
- PROPOSED STORM LINE
- PROPOSED STORM LINE
- PROPOSED DITCH LINE
- PROPOSED BUILDING
- PROPOSED ASPHALT
- PROPOSED CONCRETE

PLAN NOTES

1. THE ENTIRETY OF THE PROJECT SITE IS WITHIN THE BOUNDARIES OF THE FOLLOWING PROPERTY:

   DISTRICT 7 - SPENCER DISTRICT
   TAX MAP 27, PARCEL 6.8
   BOARD OF EDUCATION
   DB 0341, PG 0384
   49.85 ACRES

THRASHER
600 WHITE OAKS BLVD.
P.O. BOX 940
BRIDGEPORT, WV 26330

P (304) 624-4108
F (304) 624-7831

www.thethrashergroup.com

NO.	BY	DATE	DESCRIPTION

THE NEW SPENCER MIDDLE SCHOOL

ROANE COUNTY SCHOOL
SPENCER, WV
DECEMBER 14, 2021
DESIGN DEVELOPMENT DOCUMENTS

DRAWN: CLM DATE: 12/14/21
CHECKED: JLG DATE: 03/04/22
APPROVED: JLG DATE: 03/04/22

PROJECT No.
060-10259

OVERALL SITE PLAN

SHEET No.
C2.01

LAYOUT TAB: Layout1
CAD FILE: R:\060\060-10259.00-New Spencer Middle School-Roane County-Roane County Board Of Education-\Drawing\Civil\10259_SITE PLAN.dwg
PLOT DATE/TIME: 3/15/2022 11:41 AM