Geotechnical Engineering Report

Planned New Health and Allied Sciences Center

University of Arkansas Pine Bluff
Pine Bluff, Arkansas
GTS Project No. 26-55012

May 14, 2026

Prepared For:

AMR
1424 Main Street, Suite 105
Little Rock, Arkansas

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GTS, Inc.
Geotechnical & Testing Services

May 14, 2026

AMR
1424 Main Street, Suite 105
Little Rock, Arkansas 72202

Attention: Ms. Heather Davis, AIA

RE: Geotechnical Engineering Report
Planned New Health and Allied Sciences Center
University of Arkansas Pine Bluff
Pine Bluff, Arkansas
GTS Project No. 26-55012

Ms. Davis:

This report provides the results of the subsurface exploration, laboratory testing, and geotechnical engineering analysis performed for the planned new Health and Allied Sciences Center to be located on the University of Arkansas Pine Bluff campus in Pine Bluff, Arkansas. The approximate project site boundaries are shown in Figure 1 within this report.

We appreciate the opportunity to be of assistance to you on this project. We encourage retaining GTS, Inc. to be involved in any pre-bid and pre-construction meetings to allow us to discuss the following findings and recommendations.

Please contact us if the assumptions stated in this report are incorrect and/or if further explanation is required for portions of the report.

Sincerely,

GTS, Inc.
Geotechnical & Testing Services

Certificate of Authorization No. 1251, expires 12/31/2027

5/14/2026
No. 11817
SHAUN P. BAKER

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Yonas Tanga
Geotechnical Practitioner

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PROJECT DESCRIPTION and INFORMATION

Introduction

Our services were performed in accordance with GTS, Inc. (GTS) Proposal No. GTS5265015, authorized on April 8, 2026, by Ms. Heather Davis, AIA, of AMR. The intent of the authorized scope of services was to explore the subsurface conditions at the project site in order to prepare recommendations for the planned building foundation systems, floor slabs, and mass grading.

Our scope of services included evaluating the subsurface conditions at four (4) boring locations, designated as Borings B-1 through B-4. The borings were drilled to maximum depths of about 25 feet below existing grade near the planned HAS Center building footprint where accessible around the existing building and new landscaping.

The following documents were provided to us by AMR:

- **UAPB Health & Allied Sciences Site Plan, prepared by AMR, dated March 19, 2026** – A conceptual site plan showing the proposed New Medical Sciences Center location and the Future Fieldhouse location.
- **UAPB Health & Allied Sciences Site Plan, prepared by AMR, undated** – An aerial image of the planned project site showing the existing buildings to be demolished and removed.

Our scope of services is concluded with the issuance of this Geotechnical Engineering Report.

Project Site

The project site is located east of LA Prexy Davis Drive and between Watson Boulevard and John Kennedy Drive in Pine Bluff, Arkansas. The proposed Health and Allied Sciences (HAS) Center is planned to the southeast of the new Student Engagement Center on the University of Arkansas Pine Bluff Campus. The site is currently under new development. Two existing buildings will be demolished and removed as part of this project. The general boundary of the project site is shown outlined in yellow in Figure 1 on the following page.

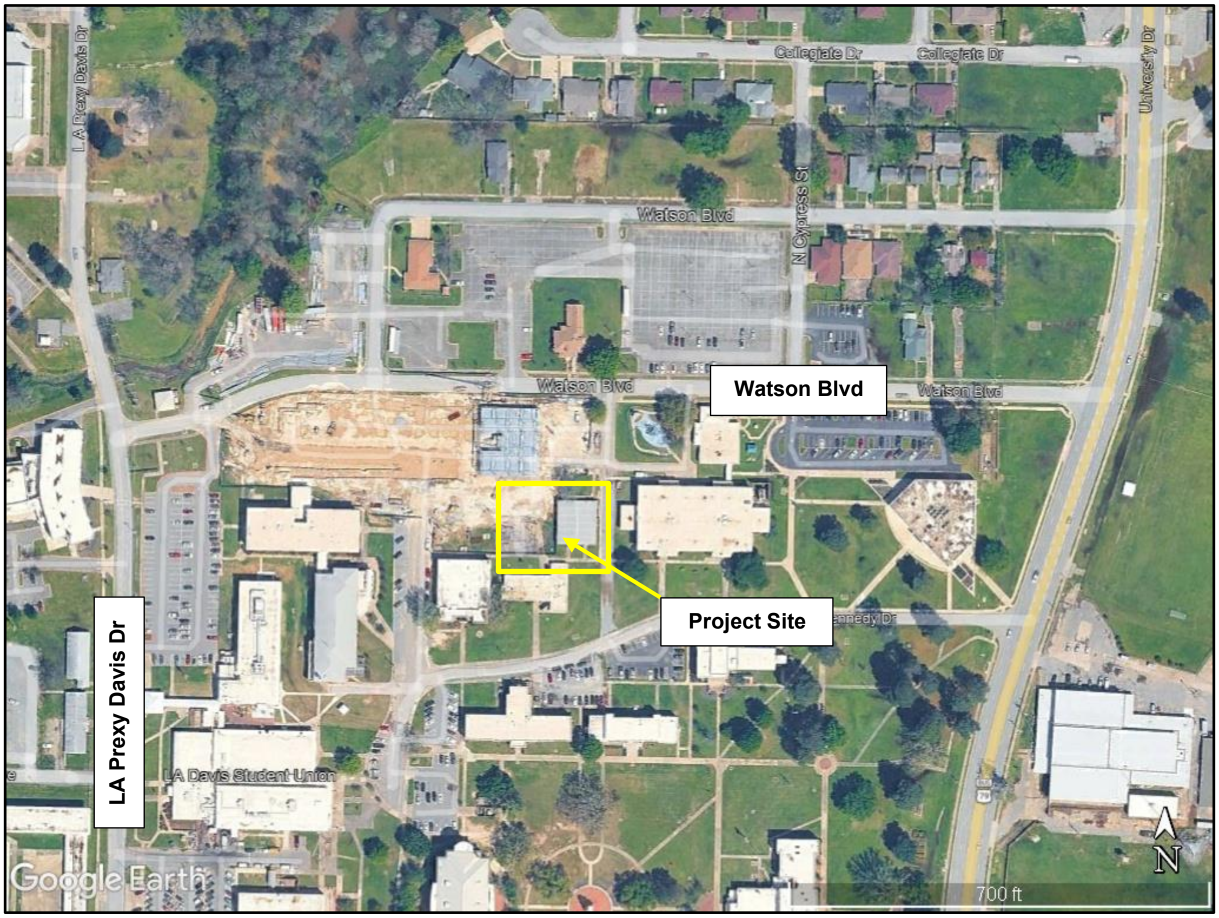


Figure 1: General Boundaries of the Project Site

Planned Development

The new HAS Center is estimated to have a footprint area of approximately 14,000 square feet. The new building will be one story in height. We assume that the building will be a metal- or wood-framed structure supported on conventional footing foundations with concrete slab-on-grade floors. Specific structural loading information was not provided to GTS prior to preparing this report. Therefore, we assume maximum column loads of 100 kips, maximum wall loads of 2 kips per foot, and maximum slab loading of 150 pounds per square foot.

Planned Site Grading

This report uses the terms “existing grade” and “finished subgrade”. Existing grade is used in this report to describe the site elevations at the time of our field drilling and sampling. Finished subgrade is used in this report to describe the Civil Engineer-designed top-of-soil elevations at the site upon completion of grading.

A site grading plan was not provided to GTS. Using Google Earth, the site appears relatively level, and we anticipate final grade in the building footprint will remain near existing grade. To prepare recommendations for this report, we assume cut and fill depths of less than 2 feet could be necessary to develop final grade within the planned building footprint.

If our understanding of the above project information and assumptions of the site grading plans are incorrect or when the preliminary or final site grading plans become available, please contact us to allow the recommendations in this report to be reviewed and, if necessary, revised.

SUMMARY of SUBSURFACE FINDINGS

Site Geology

Based on the available geologic maps, the project site is located in the geologic unit mapped as Quaternary-Pleistocene Terrace Deposits. The following description of this unit was obtained from the Stratigraphic Summary of Arkansas (Arkansas Geological Commission IC-36, 2004).

> *The Quaternary Terrace Deposits include a complex sequence of unconsolidated gravels, sandy gravels, sands, silty sands, clayey silts, and clays. The individual deposits are often lenticular and discontinuous. At least three terrace levels are recognized with the lowest being the youngest. The lower contact is unconformable. The thickness is variable.*

The subsurface soil conditions encountered at the boring locations are consistent with this geologic formation.

Surface

The ground surface at the project site was covered by bare ground, gravel, and newly placed grass landscaping at the time of the field exploration. Grass with approximately 1 to 2 inches of topsoil was encountered at Borings B-1, B-2, and B-4. Surficial gravel was encountered at Boring B-3.

Subsurface Conditions

Stratum I – Low-Strength Soils

Native, soft to medium stiff, silty lean clay and lean clay soils were encountered beneath the grass and gravel and extended to depths of about 2 to 3 ½ feet below existing grade at the boring locations. The silty lean clay soils generally extended to a depth of about 2 feet below existing grade and were underlain by lean clays (Stratum II).

The Stratum I soils had low shear strength during the field exploration. N-values ranging from 3 to 5 blows per foot (bpf) were recorded within this stratum. Hand penetrometer tests were performed on selected, intact portions of the Stratum I clay samples from this stratum and ranged from 0.5 to 4.5 tons per square foot (tsf), although the higher values were likely due to the dry condition.

Stratum II – Medium Stiff to Hard Lean Clay Soils

Medium stiff to hard, predominantly very stiff, lean clay soils containing various amounts of sand were encountered beneath Stratum I low-strength clay soils. The Stratum II lean clays extended to depths of about 8 ½ to 18 ½ feet below existing grade.

The Stratum II soils had moderate shear strength during the field exploration. N-values ranging from 6 to 49 bpf were recorded within this stratum. Hand penetrometer test values ranged from 1.5 to greater than 4.5 tsf.

Stratum III – Silty Sand and Poorly Graded Sand Soils

Medium dense, silty sand and poorly graded sand soils were encountered directly beneath the Stratum II lean clays at the boring locations and extended to the boring termination depths of about 25 feet below existing grade. The upper portion of the Stratum III silty sand soils contained thin layers of sandy lean clay. The silt content generally decreased with depth while the grain size generally increased.

The Stratum III soils had moderate shear strength during the field exploration. N-values of 9 to 27 bpf were recorded in the Stratum III sand soils.

Auger Refusal/Hard Drilling Conditions

Difficult drilling conditions and auger refusal materials were not encountered within the planned boring termination depths of about 25 feet below existing grade.

Water Measurements

Water observations were made by the drill crew while drilling and immediately after completing the borings. No free water was observed in the borings at these times. The water level observations are shown at the bottom of each boring log. The borings were backfilled after completing the fieldwork and further water observations were not possible.

The depths to water are date-dependent measurements of groundwater levels at the time of the field exploration. Long-term observations in piezometers or observation wells sealed from the influence of surface water are often required to define groundwater levels in these soil types. The installation and periodic measurement of monitoring wells would be required to establish seasonal piezometric surfaces below this project site.

GEOTECHNICAL ENGINEERING ANALYSIS

Geotechnical Considerations

Low-Strength Soils

Low shear strength (having SPT N-values of 5 bpf or less) silty lean clay and lean clay (Stratum I) soils were encountered at each of the boring locations. The low-strength soils extended to depths of about 2 feet below existing grade at Borings B-1 and B-3 and 3 ½ feet at Borings B-2 and B-4.

Low-strength soils are unsuitable for directly supporting footing foundations, floor slabs-on-grade, and/or new fill. We recommend removing and replacing the low-strength soils full depth with tested and approved, new select fill where encountered within the building subgrade. We anticipate that low-strength soils could likely be encountered in localized areas across the site. Recommendations for further ground improvement are presented in the Mass Grading Recommendations section of this report.

Moisture-Sensitive Soils

The native silty lean clay and lean clay (Strata I and II) soils are susceptible to strength loss with increases in moisture content and/or when exposed to repetitive construction traffic. As observed by the soil conditions during the field exploration, the dry clays had higher N-values and penetrometer readings than the moist surficial clays. Even if the silty lean clay and lean clay soils are stable upon initial exposure, these soils can become unstable when wet and subjected to construction activities. Ground improvement will likely be required during moderately wet to wet periods of the year and when wet site conditions develop.

Footing Foundation Design Recommendations

Based on the subsurface conditions encountered at the boring locations and removing and replacing the low-strength (Stratum I) soils full depth with new select fill, a footing foundation system can be used to support the planned HAS Center building structure. Footing foundations for the planned new building structure may be designed using the information provided in Table 1 on the following page.

Table 1: Footing Foundation Recommendations

Maximum Net Allowable Bearing Pressure (psf)	Bearing Soils Description	Depth to Bearing Soils
2,500 (square, column)	Tested and Approved, Native, Stiff to Very Stiff Lean Clay (Stratum II) Soils or New <u>Select</u> Fill[1]	Anticipated within 18 inches of finished subgrade elevation after completing mass grading as recommended in this report
2,000 (continuous)		
[1] The recommended bearing soils should consist of relatively undisturbed, stiff to very stiff lean clay (Stratum II) soils. Foundations may also be supported on <u>select</u> fill, aggregate base material, or flowable fill placed above tested and approved native, stiff to very stiff lean clay (Stratum II) soils.		

<u>General Design Recommendations</u>

An allowable passive pressure of 750 psf may be used for footings cast directly against near-vertical sides in tested and approved, stiff to very stiff lean clay (Stratum II) soils and newly placed <u>select</u> fill or for <u>select</u> backfill compacted against the vertical footing face. Passive resistance for exterior footings should be neglected in the upper 2 feet of the soil profile unless pavement or sidewalks are constructed directly against the building exterior. We recommend an ultimate coefficient of sliding friction of 0.30 for the interaction between the base of the footing and tested and approved bearing soils.

We estimate total long-term and differential settlement of footing foundations, designed and constructed as recommended in this report and per the Mass Grading Recommendations section of this report, should be less than 1 inch and ½ inch in 50 feet, respectively.

Footing Foundation Construction Recommendations

<u>General Dimensions</u>

Continuous formed and isolated column foundations should have minimum widths of 18 inches and 30 inches, respectively. A minimum foundation depth of 18 inches below lowest adjoining final grades should be used to protect against frost heave.

<u>Allowable Backfill Materials</u>

Compacted <u>select</u> soil fill, compacted aggregate base course, and flowable fill (i.e., “lean concrete”) may be used to backfill foundation overexcavations, where required. Specifications regarding these materials are shown in the Geotechnical Report Requirements and Specifications section of this report.

Construction Guidelines

Foundation excavations should be cleaned of loose soils, debris, and water. Soils exposed at plan bearing depths should be evaluated by GTS prior to placement of approved backfill, reinforcing bar, and concrete.

If unsuitable and/or unstable soils are encountered at the base of the planned footing excavation, the excavation should be overexcavated to reach suitable recommended bearing materials. The footing overexcavation should then be backfilled with either approved select fill material, aggregate base course material, or flowable fill; structural concrete can also be used, if needed.

If select fill or aggregate base course material is used to backfill foundation overexcavations, the overexcavation should extend at least 8 inches beyond the footing perimeter for every 12 inches of depth below the bottom of footing, per Figure 2 below. Select soil fill (or aggregate base course) material should be placed and compacted as recommended in the Geotechnical Report Requirements and Specifications of this report.

If flowable fill is used to backfill foundation excavations or if the excavations are overpoured full-depth with concrete, the foundation excavations do not need to extend beyond the footing perimeter as shown in Figure 2. Flowable fill should be placed as soon as possible after foundation overexcavations are completed and the foundations have been evaluated for bearing suitability. Flowable fill should be field-sampled and laboratory tested for strength every day of placement.

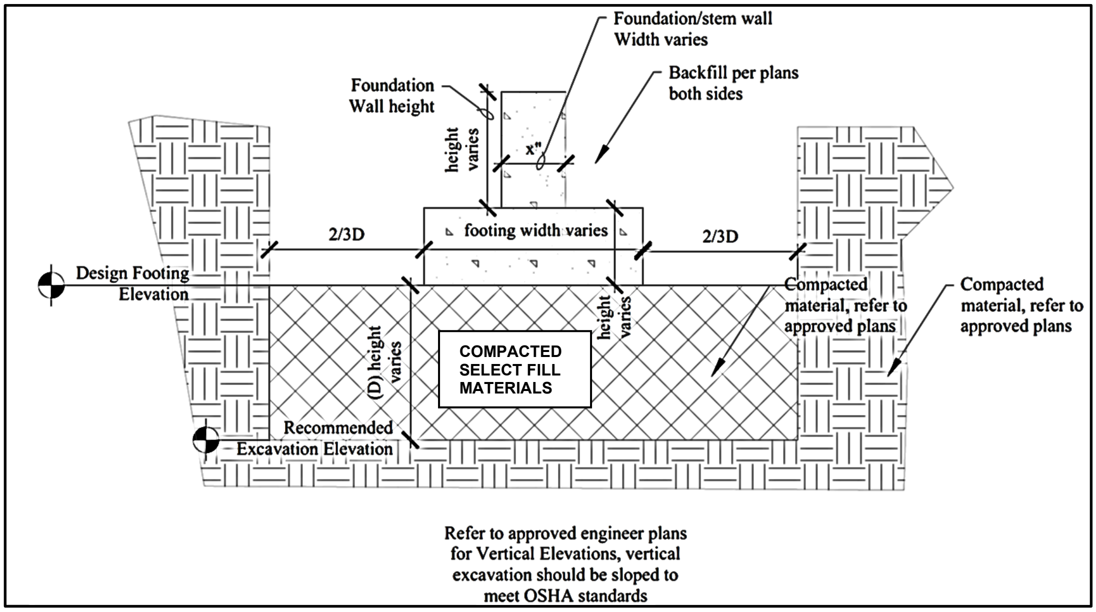


Figure 2: Foundation Backfill Detail for Select Soil Fill

Where newly placed and compacted fill material is exposed at plan bottom of foundation elevations, we recommend the fill be recompacted with a jumping jack or similar type of compaction equipment. After compaction, the fill exposed in the bottom of foundation excavations should be retested for in-place density each lift for every 25 feet of continuous foundation length, at every individual column foundation location, and again immediately before the placement of reinforcing bar and concrete. Flowable fill, if used to backfill foundation overexcavations, should be tested for compressive strength each day of placement.

Slab-On-Grade Floor Design Recommendations

Based on preparing the building subgrade as recommended in the Mass Grading Recommendations section of this report, we expect that floor slabs will be supported on tested and approved, new select fill and/or native medium stiff to very stiff, lean clay (Stratum II) soils. Again, the Stratum I low-strength soils should be removed and replaced full depth within the building footprint during site preparation.

Concrete floor slabs constructed as slab-on-grade and supported on tested and approved, select fill materials and native, stiff to very stiff, lean clay (Stratum II) soils, prepared as recommended in this report, can be designed using a modulus of subgrade reaction (k) value of 100 pounds per square inch, per inch.

We recommend that a minimum of 4 inches of free draining gravel or sand be placed beneath the slab-on-grade to act as a capillary break. This layer is termed a “subbase” layer. To be effective as a capillary break, the subbase should have a maximum of 5 percent by dry weight passing the No. 200 sieve. The modulus of subgrade reaction value applies to the top of the subbase layer. The top of the subbase should be compacted using a vibratory plate.

If rutting of the subbase layer is a concern for concrete placement, the subbase layer may be topped with an additional 2 to 4 inches of gravel or sand having sufficient fines to allow compaction. The optional topping layer is termed the “base” layer. The base layer, if used, should be compacted to a minimum of 95 percent Standard Proctor maximum dry density (ASTM D698) at a workable moisture content that allows the density to be achieved. The base layer should have a percent passing the No. 100 sieve ranging from 10 to 30 percent by dry weight. ARDOT Class 7 Aggregate Base Course material is acceptable to use in the base layer.

A vapor barrier having a minimum thickness of 10 mil is recommended immediately below the concrete unless otherwise recommended by the finished flooring manufacturer or other members of the design team.

The general components of a floor slab, inclusive of the optional base course, are shown in Figure 3. The shown reinforcing steel location provides general guidance only. The location and composition of reinforcing steel should be determined by a structural engineer.

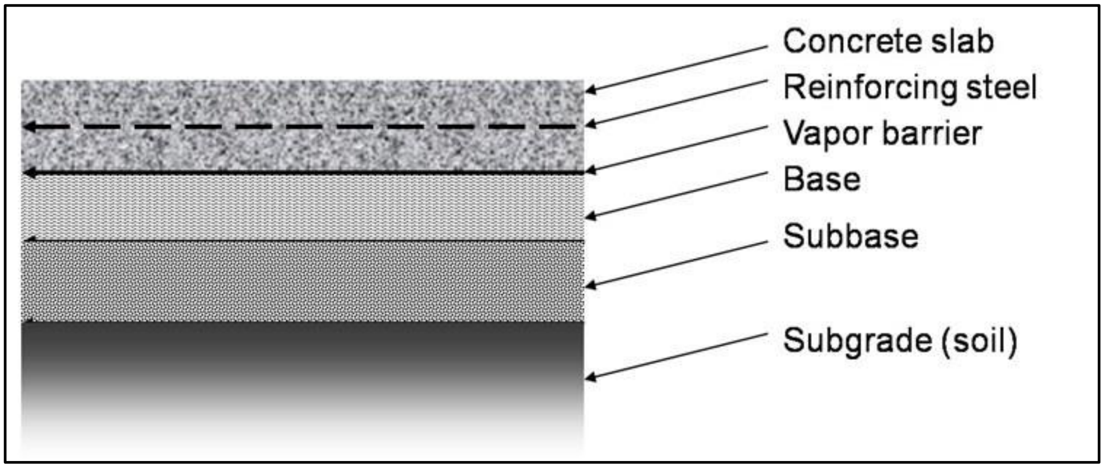


Figure 3: General Floor Slab-on-Grade Section

IBC Site Classification

Based on our knowledge of the regional geology and the subsurface conditions encountered at the boring locations, the subsurface conditions at this project site are consistent with a Site Class D per the International Building Code (IBC), 2021 Edition.

The following mapped acceleration parameters may be used in design for Site Class D.

- S_s: 0.297g
- S_1: 0.136g
- F_a: 1.562
- F_v: 2.329
- S_{DS}: 0.310g
- S_{D1}: 0.210g
- PGA_m: 0.228g

These values were obtained using online seismic design maps and tools provided by the Structural Engineers Association of California (SEAOC/OSHPD) at https://seismicmaps.org for ASCE7-16.

MASS GRADING RECOMMENDATIONS

Stripping of Surface Materials and Organics

Mass grading should extend a minimum of 5 feet outside of the building footprint in all directions.

At a minimum, the surface organics, topsoil, and root mat, and any surface or subsurface structures, if any, should be removed from the areas of planned new construction. We estimate a 6-inch stripping depth to remove the surficial vegetation, root zone, and gravel.

We expect that the existing building and pavements will be demolished and removed. At a minimum, the existing building structure, pavements, and any other surface or subsurface structures from previous site use should be removed from the areas of planned new construction. We recommend removing the foundations, floor slabs, and pavement sections full depth. Excavations to remove these structures should be backfilled as recommended in this report. The pavement and concrete may be crushed, stockpiled, and re-used as fill material in non-structural areas, at the discretion of the design team.

It is our experience that properties with previously existing structures have a higher potential for encountering unknown conditions during mass grading and construction. These conditions include backfilled tanks, trash pits, concrete foundations, and underground utilities associated with the previous structures. We recommend that test pits be performed within the footprints of the pre-existing buildings prior to or during construction to evaluate for the presence of any remaining structures or deleterious materials.

Buried utility lines (if any) should be relocated or abandoned, as necessary. Excavations after removing buried utilities should be backfilled with new select fill as recommended in this report. Abandoned utility lines should be grouted and plugged.

Recommended Undercuts

Low-strength soils were encountered to depths of about 2 to 3 ½ feet below existing grade at the boring locations. We anticipate that localized zones of surficial, low-strength soils could be encountered within the planned building footprint away from the boring locations. Also as previously discussed, the silty lean clay and lean clay (Strata I and II) soils are moisture-sensitive and highly susceptible to strength loss when they become wet and/or when subjected to repetitive construction traffic. As stated previously, the low-strength soils should be undercut and replaced full depth with new select fill within the planned building footprint. We recommend budgeting for an undercut depth of 3 ½ feet to remove the low-strength Stratum I soils.

After completing the recommended undercuts, GTS should evaluate the exposed soils prior to placing new fill as described in the following section. The undercut in the building footprint should be backfilled with new select fill.

General Mass Grading

After stripping surface materials, removing any surface or subsurface structures, completing the cuts necessary for grading as well as the recommended undercuts to remove the low-strength (Stratum I) soils, and before placing new fill, the exposed subgrade materials should be evaluated for stability by GTS.

The exposed soils should be evaluated for stability through proofrolling with a loaded, tandem-axle dump truck weighing at least 25 tons. In areas inaccessible to proofrolling, the exposed subgrade soils should be evaluated by GTS using hand probes, static cone penetrometer testing, and/or dynamic cone penetrometer testing.

Where unstable soils are identified by proofrolling or other testing methods, they should be scarified, moisture conditioned, and compacted, or removed and replaced full depth with new select fill if they cannot be stabilized in place. Other ground improvement measures may be taken as discussed in the Weather and Instability Considerations section below.

After proofrolling/testing and removing and replacing any unstable or unsuitable soils, the exposed subgrade soils within 2 feet of finished subgrade elevations should be scarified a minimum depth of 9 inches, moisture conditioned and compacted as recommended in the Geotechnical Report Requirements and Specifications section of this report. The native soils exposed at depths below 2 feet of finished subgrade elevations do not require scarification and compaction provided that they are stable. After scarification and compaction, the exposed soils are suitable for the placement and compaction of new approved, select fill material.

If the prepared subgrade should become saturated, desiccated, frozen, or otherwise damaged prior to construction of the on-grade slabs, the affected subgrade material should be scarified, moisture-conditioned and compacted prior to placing the aggregate base course. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab aggregate base course material.

Weather and Instability Considerations

Soil stability is directly related to the moisture within and below the exposed soils. The on-site silty clay and lean clay (Strata I and II) soils encountered at this site are moisture-sensitive and prone to strength loss with increases in moisture content and when exposed to repetitive construction traffic. Even if the soils are stable upon initial exposure, these soils can become unstable when wet and subjected to construction activities.

If the exposed subgrade soils are unstable but otherwise suitable to remain in-place based on their classification, they may be scarified and allowed to dry to achieve stability if the construction timeframe and prevailing weather conditions allow. Alternatively, the unstable soils could be undercut and replaced full depth with new select fill. For budgeting purposes, an average undercut depth of 2 feet below existing grade is anticipated during moderately wet to wet periods of the year. Even after undercuts are completed, the underlying, stable lean clays can become unstable if they become wet. **Performing site grading operations during warm, dry periods of the year would help reduce the amount of subgrade stabilization required.**

Other ground improvement methods could be provided during construction based on the actual site conditions at that time. These methods could include chemically treating the on-site soils, use of geotextile/geogrid with aggregate, or other alternatives. The appropriate method of improvement, if required, would depend on factors such as schedule, weather, the size of area to be improved, and the nature of the instability. Again, performing site grading operations during warm, dry periods would help reduce the amount of subgrade stabilization required.

Fill Placement

Lifts of fill material required to reach plan finished subgrade elevations should be composed of tested and approved fill material and placed per the specifications shown in this report. Fill should be placed in near-horizontal lifts beginning in areas requiring the deepest amount of fill. The fill should be benched into the existing fill materials and native soils each lift. Fill should not be placed on frozen, saturated, desiccated, or unstable soils.

The requirements to meet for select fill material, general fill material, aggregate base course material, and flowable fill are provided in the Geotechnical Report Requirements and Specifications section of this report.

Re-Use of On-Site Soils as Fill

The near-surface, native, silty lean clay (portion of Stratum I) soils should not be re-used as select fill within the upper 2 feet of finished subgrade elevations in the building footprint because of the high susceptibility to strength loss and frost action.

The Stratum II lean clays are suitable for re-use as select fill.

We expect that the on-site Stratum I silty clays and Stratum II lean clays soils will be difficult to discern visually and will likely be intermixed during mass grading and excavation. We anticipate that the intermixed soils will not meet the requirements for select fill. We recommend budgeting for imported fill to be used within the building footprint.

If the contractor would like to re-use the intermixed soils as fill, the excavated, on-site native soils should be thoroughly mixed and then tested. Larger bulk samples of the on-site soils proposed for use as fill by the contractor should be sampled by GTS during mass grading and laboratory tested to confirm the apparent classification of these soils prior to re-use.

Imported soils should be tested and approved before use for fill material. Fill containing rock will need to be crushed into pieces no greater than 3 inches in any dimension prior to re-use.

Utility Trench Backfill

All trench excavations should be made with sufficient working space to permit construction including backfill placement and compaction. Utility trenches are a common source of water infiltration and migration. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 inches of cohesive fill to reduce the infiltration and conveyance of surface water through the trench backfill.

Grading and Drainage

During construction, grades should be developed to direct surface water flow away from or around the site. Exposed subgrades should be sloped to provide positive drainage so that saturation of the subgrade is avoided. Surface water should not be permitted to accumulate on the site to reduce the potential for strength loss of the subgrade soils.

Final grades should be sloped away from the building on all sides to promote effective drainage and prevent water from ponding. Downspouts should discharge water a minimum of 10 feet beyond the footprint of the building. This can be accomplished by using splash-blocks and downspout extensions. As an alternative, the drains could be designed to discharge to a storm water collection system. Also, the interface between the building and pavements or sidewalks should be effectively sealed to prevent water from infiltrating into the floor slab-on-grade subgrade.

No free water was observed at the boring locations. Temporary dewatering could likely be necessary during wet periods of the year to mitigate perched surface water. We anticipate that sump pits and suction pumps could be used to remove water from excavations, if encountered.

Difficult Excavation Potential

We expect that the native silty lean clay and lean clay soils (Strata I and II) encountered at this site can be excavated with conventional earthwork equipment.

Temporary excavations will be required during grading and site development operations. The contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards.

GEOTECHNICAL REPORT REQUIREMENTS and SPECIFICATIONS

Unless otherwise stated in this report, the recommendations contained in this report are based on the compaction specifications and material types noted in Table 2, Table 3, and the paragraphs on the following page.

Table 2: Compaction Criteria

Type of Material	Moisture-Density Specification	Minimum Dry Density (percentage of Proctor)	Range from Optimum Moisture Content (%)
Soil Fill Material – Building Subgrade	ASTM D698 (Standard Proctor)	95	-2 to +2
Soil Fill Material – Non-Structural Areas Outside of Building Subgrade	ASTM D698 (Standard Proctor)	92	-2 to +2
Scarified and Recompacted Native Soils – Within Building Subgrade	ASTM D698 (Standard Proctor)	95	-2 to +2
ARDOT Class 7 Aggregate Base Course	ASTM D1557 (Modified Proctor)	95	Adequate to Achieve Compaction
Flowable Fill Material	ARDOT Section 206	Not applicable	Flowable Fill Material

Table 3: Soil Fill Material Requirements

Type of Soil Fill	Location/Use	Maximum LL	Maximum PI	USCS Classifications
Select	All Areas	40	7 ≤ PI ≤ 18	CL, SC, SP, SW, GC, GP, GP-GC, and GW
General	All Areas, at least 2 feet below planned finished building subgrade elevations	45	20	CL, CL-ML, ML, SM, SC, SP, SW, GM, GC, GP, and GW

Fill material should have a maximum nominal aggregate size of 3 inches or less after placement and compaction. If there are questions regarding the effectiveness of compaction equipment breaking down the fill material, a test pad should be constructed using the fill material and observed by GTS during compaction.

Fill needed for site grading should be placed in loose lifts not exceeding 9 inches in thickness (compacted lift thickness of approximately 6 to 7 inches). We recommend the fill be tested for density every lift during site grading, with a minimum of one test every 2,500 square feet of building area.

Where select fill materials or aggregate base materials are used to backfill foundation overexcavations up to plan bottom of foundation elevations, the fill should be tested each lift, at each column location and every 25 linear feet of continuous foundation. Additionally, we recommend that the new fill material is tested for in-place density immediately before placement of reinforcing bar and concrete.

Flowable fill, if used to backfill foundation overexcavations, should have a minimum compressive strength of 400 psi and should be tested for compressive strength each day of placement.

The recommended moisture content and compaction of the fill should be maintained until fills are completed and floor slabs are constructed.

SUBSURFACE EXPLORATION and PROCEDURES

The subsurface exploration consisted of evaluating and sampling at four (4) boring locations, designated as Borings B-1 through B-4. The borings were drilled to maximum depths of about 25 feet below existing grade near the planned HAS Center building footprint where accessible around the existing building and new landscaping.

The boring locations were established in the field by GTS using a recreation-grade hand-held GPS unit and measuring from the existing building using a measuring wheel. The approximate boring locations are shown on the Boring Location Diagrams provided in Appendix A. The locations of the borings should be considered accurate only to the degree implied by the methods used to define them. The boring logs are also presented in Appendix A.

The borings were drilled with a track-mounted Geoprobe 7822DT drill rig. Disturbed samples and estimates of the in-situ shear strengths of the soils were obtained using an automatic-hammer-driven split-barrel sampler in general accordance with the Standard Penetration Test (SPT) at the boring locations.

An automatic SPT-hammer was used to advance the split-barrel sampler in the boreholes. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The soil samples obtained in the field were sealed to reduce moisture loss and taken to the GTS soil laboratory for further examination, testing, and classification. The results of laboratory tests on select samples are shown on the boring logs in Appendix A.

Field logs were prepared during the drilling and sampling of the borings. These logs report sampling methods, sampling intervals, soil, and groundwater conditions, and notes regarding soil and drilling conditions observed between sample depths. The final boring logs, included in Appendix A, have been prepared based on the field logs and have been modified, where appropriate, based on the results of the laboratory observation.

LABORATORY TESTING and PROCEDURES

The soil samples were examined in the laboratory by an experienced geotechnical engineer and classified based on the soil's texture and plasticity, in accordance with the Unified Soil Classification System. The estimated Unified Soil Classification System group symbols are shown on the boring logs.

Hand penetrometer tests were performed on select intact cohesive samples. Unfactored hand penetrometer test values are shown on the boring logs as filled squares.

The laboratory testing was performed by GTS in general accordance with the American Society for Testing and Materials (ASTM) test designations shown in the table below:

Table 4: Laboratory Test Method Designations

Laboratory Test	Test Designation	Method (if applicable)
Moisture Content of Soil	ASTM D2216-10	Method A
Visual Classification of Soil Types	ASTM D2488	
USCS Classification	ASTM D2487	
Atterberg Limits	ASTM D4318	Method A

The test results are presented on the boring logs in Appendix A and in Appendix B.

GEOTECHNICAL REPORT LIMITATIONS

The recommendations contained in this report are based on our interpretation of subsurface conditions encountered at the discrete boring locations. Variations between the subsurface conditions anticipated in this report and actual project site conditions may occur away from the boring locations.

If significant differences between the findings of the borings and site conditions are observed, GTS, Inc. should be contacted to assess the variation and, if necessary, reevaluate the recommendations contained in this report.

ENVIRONMENTAL EXCLUSION

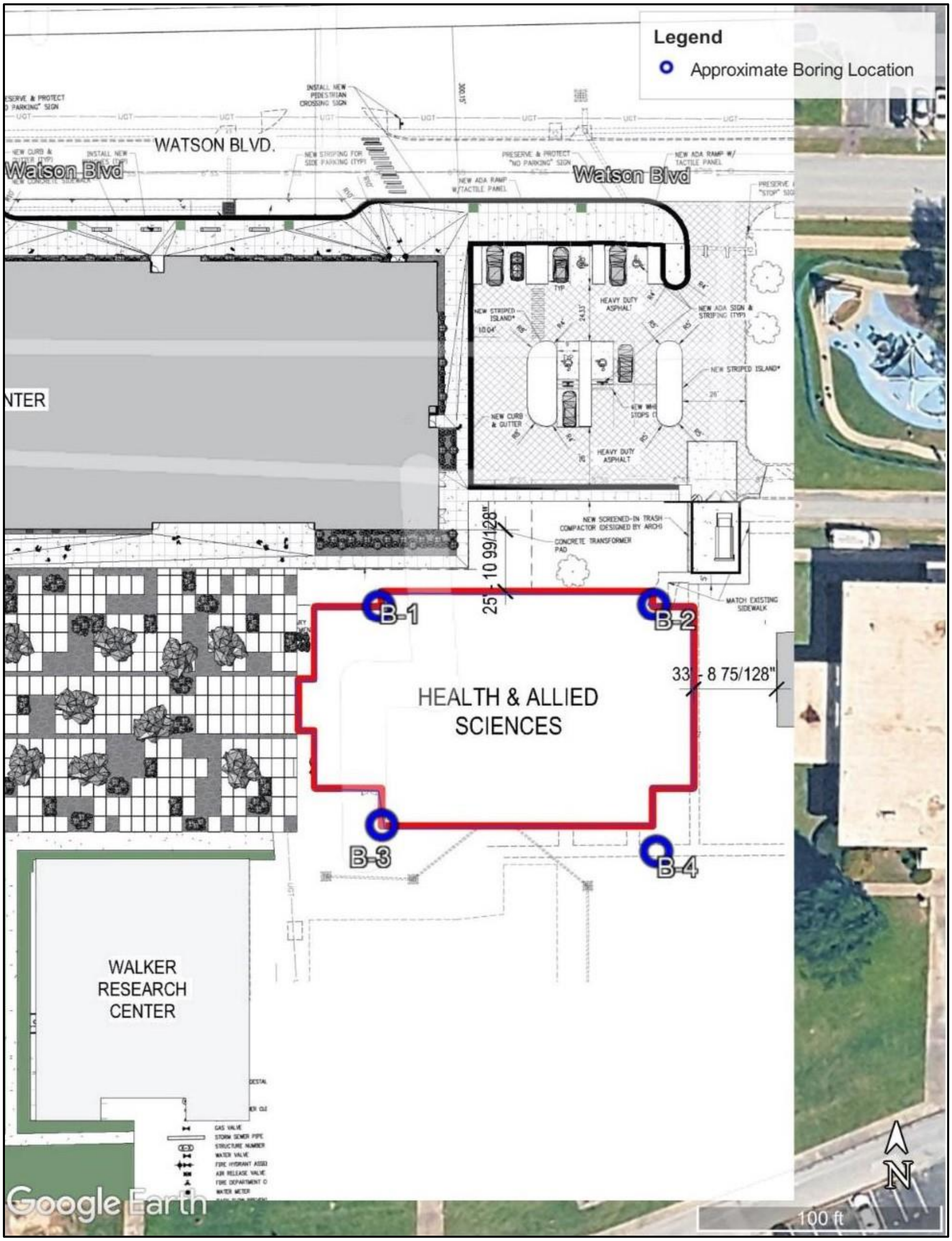
A Geotechnical Engineering Report assesses the engineering properties of soil. No environmental assessment of a project site is performed during a geotechnical exploration. If the owner is concerned about the potential for environmental hazards at the project site, additional studies should be performed by GTS, Inc.

APPENDIX A

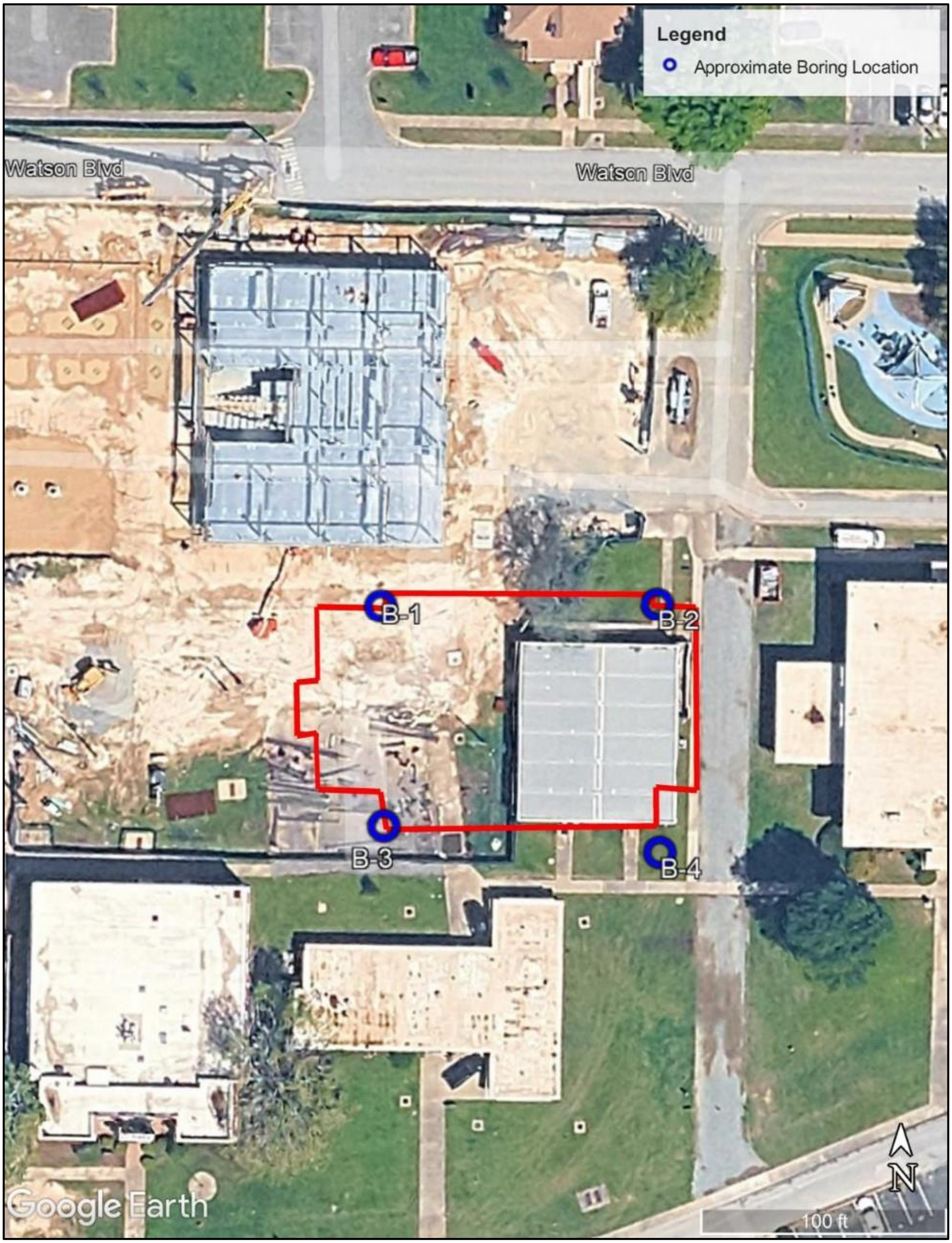
Boring Location Diagrams

Boring Logs

Soil Classification Legend



Boring Location Diagram – Site Plan Overlain on Google Earth Imagery



Boring Location Diagram – Google Earth Imagery – New Building outlined in Red

LOG OF BORING NO.B-1

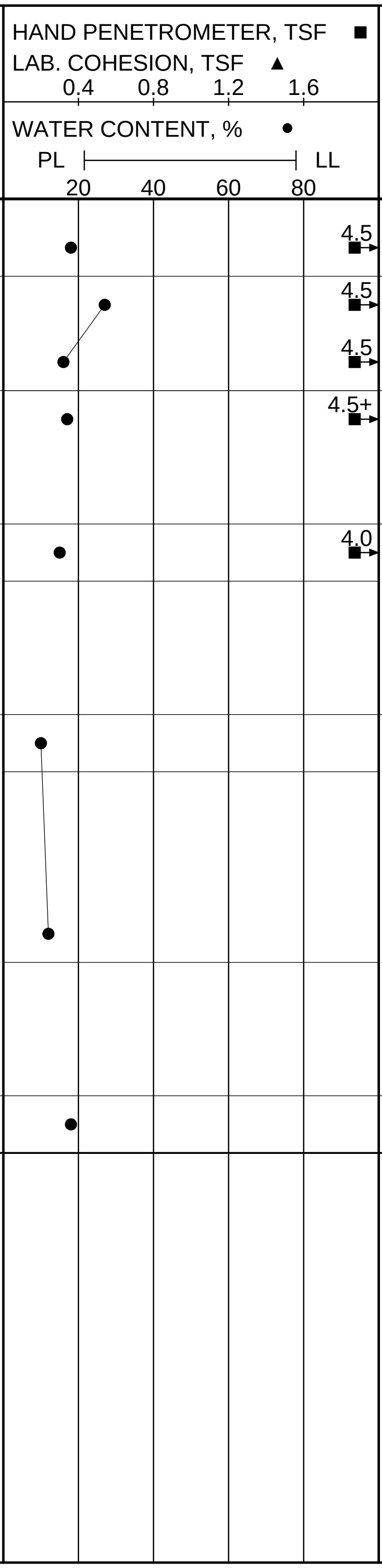
Planned Health and Applied Sciences Building
UAPB, Pine Bluff, Arkansas

GTS, Inc.
Geotechnical & Testing Services
Fayetteville, AR

Project No.: 26-55012 Location: Refer to Boring Location Diagram

Surface Description=Grass
Topsoil=2 inches

DEPTH, FT	SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	%<#200	HAND PENETROMETER, TSF	BLOWS PER FT
0	1	10	SILTY LEAN CLAY medium stiff, light gray and light brown, dry	CL-ML		4.5	5
	2	10	LEAN CLAY medium stiff to stiff, light gray, grayish brown, and light brown, dry	CL		4.5	8
	3	6				4.5	6
5	4	10	LEAN CLAY hard, light gray and light brown, dry	CL		4.5+	49
10	5	12	LEAN CLAY very stiff, orange-brown, light brownish gray, and light gray	CL		4.0	13
15	6	17	SILTY SAND medium dense, light brown, brown, and light gray, with thin sandy lean clay seams, fine grained	SM			9
20	7	15					20
25	8	16	POORLY GRADED SAND medium dense, brown, fine to medium grained	SP			18
30			BOTTOM OF BORING AT ABOUT 25 FEET				
35							



COMPLETION DEPTH: 25 ft.
DATE: 4/28/2026
RIG: Geoprobe DT7822, Rubber-Track-Mounted Rig, Automatic Hammer

DEPTH TO WATER: DURING DRILLING: Dry
AT COMPLETION: Dry
AT 24 HOURS: Backfill

LOG OF BORING NO.B-2

Planned Health and Applied Sciences Building
UAPB, Pine Bluff, Arkansas

GTS, Inc.
Geotechnical & Testing Services
Fayetteville, AR

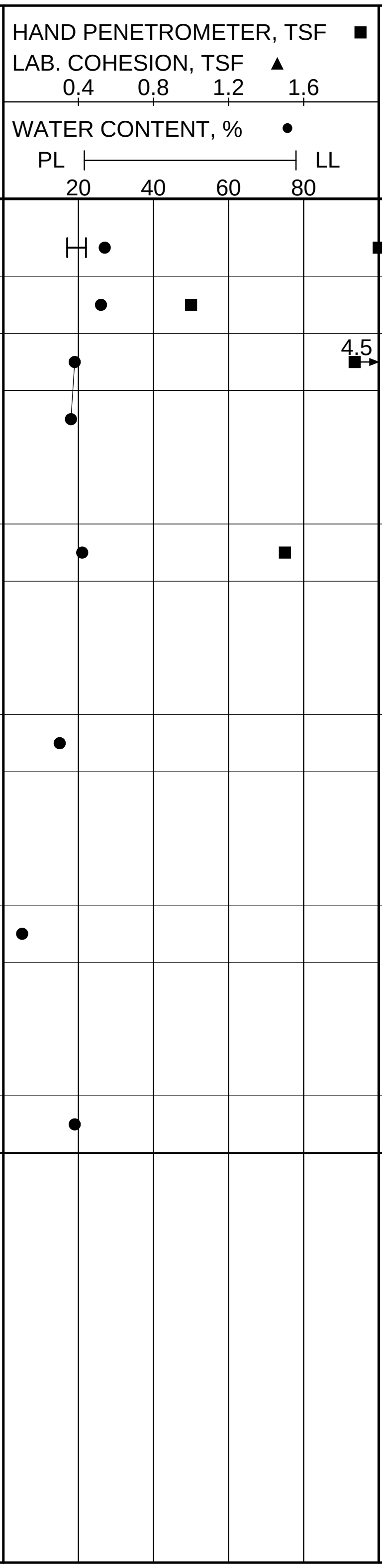
Project No.: 26-55012

Location: Refer to Boring Location Diagram

Surface Description=Grass
Toposoil=1 inch

SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	%<#200	BLOWS PER FT
1	15	SILTY LEAN CLAY soft, light grayish brown with dark brown mottling, moist	CL-ML		3
2	15	LEAN CLAY soft, light gray, light brown, and yellowish brown, moist	CL		4
3	16	LEAN CLAY very stiff to hard, light gray and light brown, dry	CL		21
4	15				34
5	17	LEAN CLAY medium stiff, light brownish gray with dark brown ferrous mottling, moist	CL		6
6	12	SANDY LEAN CLAY very stiff, light gray and brown with dark brown ferrous mottling, with thin silty sand seams	CL		15
7	18	SILTY SAND medium dense, light brown, light gray, and yellowish brown, fine grained	SM		19
8	16	POORLY GRADED SAND, with silt medium dense, light brown and yellowish brown, fine to medium grained	SP-SM		15
		BOTTOM OF BORING AT ABOUT 25 FEET			

DEPTH, FT: 0, 5, 10, 15, 20, 25, 30, 35



COMPLETION DEPTH: 25 ft.
DATE: 4/28/2026
RIG: Geoprobe DT7822, Rubber-Track-Mounted Rig, Automatic Hammer

DEPTH TO WATER: DURING DRILLING: Dry
AT COMPLETION: Dry
AT 24 HOURS: Backfill

LOG OF BORING NO.B-3

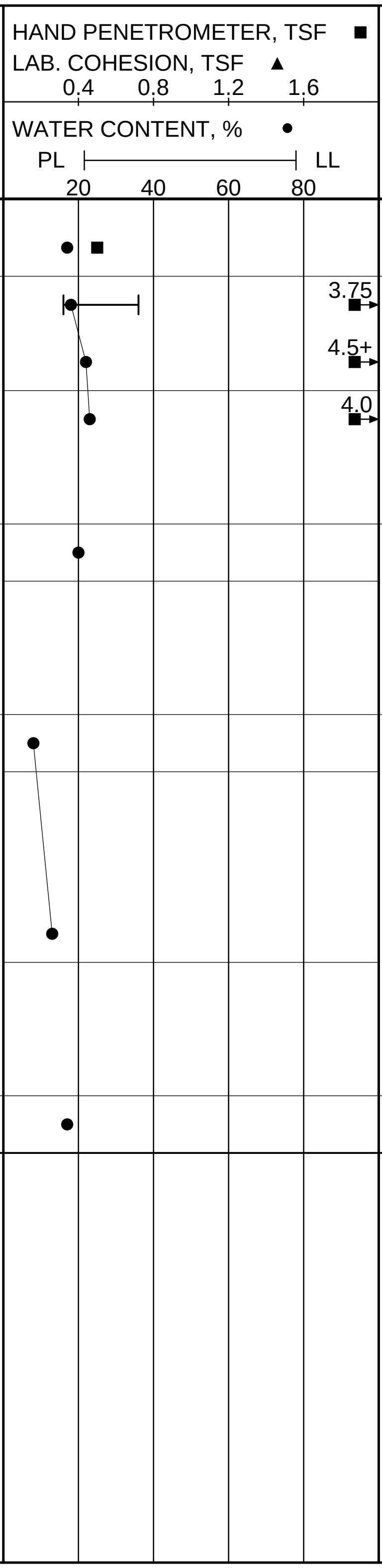
Planned Health and Applied Sciences Building
UAPB, Pine Bluff, Arkansas

GTS, Inc.
Geotechnical & Testing Services
Fayetteville, AR

Project No.: 26-55012 Location: Refer to Boring Location Diagram

Surface Description=Gravel

DEPTH, FT	SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	%<#200	HAND PENETROMETER, TSF ■	BLOWS PER FT
0	1	18	SILTY LEAN CLAY soft, gray, moist	CL-ML			3
	2	18	LEAN CLAY very stiff, brown and gray, moist - changing to light brown, light gray, and yellowish brown, dry below about 3½ feet	CL		3.75	14
5	3	16				4.5+	25
	4	14				4.0	26
10	5	17	SANDY LEAN CLAY very stiff, light brown, light yellowish brown, and brown	CL			13
15	6	16	SILTY SAND medium dense, light brown, light gray, and brown, with thin sandy clay seams	SM			15
20	7	15					27
25	8	14	POORLY GRADED SAND medium dense, light brown and light gray, fine to medium grained	SP			19
			BOTTOM OF BORING AT ABOUT 25 FEET				
30							
35							



COMPLETION DEPTH: 25 ft.
DATE: 4/28/2026
RIG: Geoprobe DT7822, Rubber-Track-Mounted Rig, Automatic Hammer

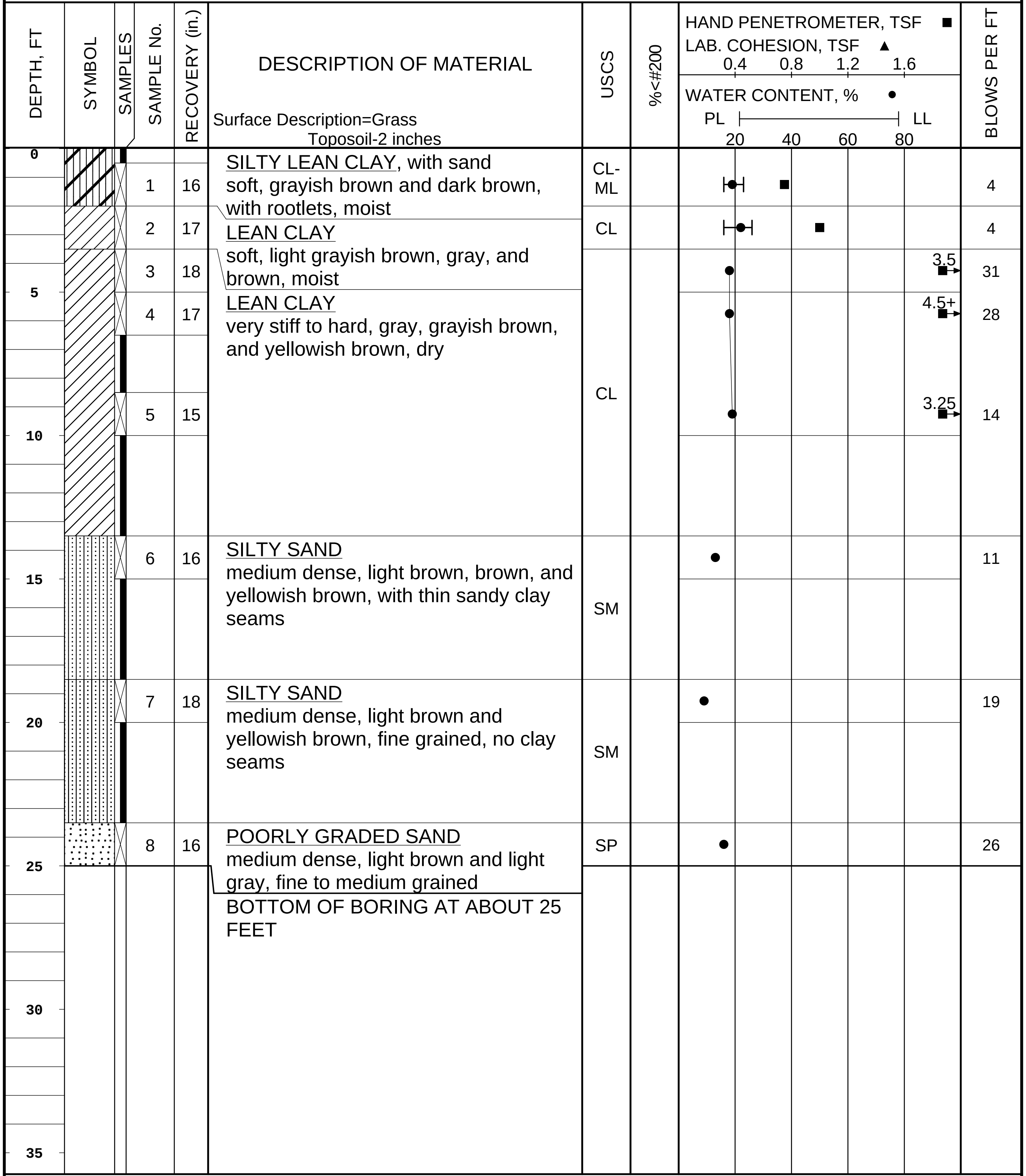
DEPTH TO WATER: DURING DRILLING: Dry
AT COMPLETION: Dry
AT 24 HOURS: Backfill

LOG OF BORING NO.B-4

Planned Health and Applied Sciences Building
UAPB, Pine Bluff, Arkansas

GTS, Inc.
Geotechnical & Testing Services
Fayetteville, AR

Project No.: 26-55012 Location: Refer to Boring Location Diagram



Surface Description=Grass
Toposoil-2 inches

SAMPLE No.	RECOVERY (in.)	DESCRIPTION OF MATERIAL	USCS	%<#200	HAND PENETROMETER, TSF	BLOWS PER FT
1	16	SILTY LEAN CLAY, with sand soft, grayish brown and dark brown, with rootlets, moist	CL-ML			4
2	17	LEAN CLAY soft, light grayish brown, gray, and brown, moist	CL			4
3	18	LEAN CLAY very stiff to hard, gray, grayish brown, and yellowish brown, dry	CL		3.5	31
4	17				4.5+	28
5	15				3.25	14
6	16	SILTY SAND medium dense, light brown, brown, and yellowish brown, with thin sandy clay seams	SM			11
7	18	SILTY SAND medium dense, light brown and yellowish brown, fine grained, no clay seams	SM			19
8	16	POORLY GRADED SAND medium dense, light brown and light gray, fine to medium grained	SP			26
		BOTTOM OF BORING AT ABOUT 25 FEET				

COMPLETION DEPTH: 25 ft.
DATE: 4/28/2026
RIG: Geoprobe DT7822, Rubber-Track-Mounted Rig, Automatic Hammer

DEPTH TO WATER: DURING DRILLING: Dry ▽
AT COMPLETION: Dry ▽
AT 24 HOURS: Backfill ▼

SOIL CLASSIFICATION LEGEND

APPARENT CONSISTENCY OF COHESIVE SOILS (PECK, HANSON & THORNBURN 1974, AASHTO 1988)

Descriptor	SPT N_{60} (blows/foot)*	Pocket Penetrometer, Qp (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 2	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	2 – 4	0.25 – 0.50	0.12 – 0.25	Easily penetrated several inches by thumb
Medium Stiff	5 – 7	0.50 – 1.0	0.25 – 0.50	Penetrated several inches by thumb w/moderate effort
Stiff	8 – 11	1.0 – 2.0	0.50 – 1.0	Readily indented by thumbnail
Very Stiff	12 – 29	2.0 – 4.0	1.0 – 2.0	Indented by thumb but penetrated only with great effort
Hard	≥ 30	> 4.0	> 2.0	Indented by thumbnail with difficulty

* Using SPT N_{60} is considered a crude approximation for cohesive soils.

APPARENT DENSITY OF COHESIONLESS SOILS (AASHTO 1988)

Descriptor	SPT N_{60} Value (blows/foot)
Very Loose	0 – 3
Loose	4 – 8
Medium Dense	9 – 29
Dense	30 – 49
Very Dense	≥ 50

MOISTURE (ASTM D2488-06)

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch, well below optimum moisture content (per ASTM D698 or D1557)
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table, well above optimum moisture content (per ASTM D698 or D1557)

PERCENT OR PROPORTION OF SOILS (ASTM D2488-06)

Descriptor	Criteria
Trace	Particles are present but estimated < 5%
Few	5 – 10%
Little	15 – 25%
Some	30 – 45%
Mostly	50 – 100%
Percentages are estimated to nearest 5% in the field. Use "about" unless percentages are based on laboratory testing.	

SOIL PARTICLE SIZE (ASTM D2488-06)

Descriptor	Size
Boulder	> 12 inches
Cobble	3 to 12 inches
Gravel - Coarse Fine	¾ inch to 3 inches No. 4 sieve to ¾ inch
Sand - Coarse Medium Fine	No. 10 to No. 4 sieve (4.75mm) No. 40 to No. 10 sieve (2mm) No. 200 to No. 40 sieve (.425mm)
Silt and Clay ("fines")	Passing No. 200 sieve (0.075mm)

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2488)

Major Division			Group Symbol	Description
Coarse Grained Soils (more than 50% retained on #200 sieve)	**Gravel** (50% or more retained on No. 4 sieve)	Clean Gravel	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		Gravel with fines	GM	Silty gravels and gravel-sand-silt mixtures
			GC	Clayey gravels and gravel-sand-clay mixtures
	Sand (> 50% passing No. 4 sieve)	Clean sand	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly-graded sands and gravelly sands, little or no fines
		Sand with fines	SM	Silty sands and sand-silt mixtures
			SC	Clayey sands and sand-clay mixtures
Fine Grained Soils (50% or more passing #200 sieve)	**Silt and Clay** (liquid limit < 50)		ML	Inorganic silts, rock flour and clayey silts
			CL	Inorganic clays of low-medium plasticity, gravelly, sandy & lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silt and Clay (liquid limit > 50)		MH	Inorganic silts and clayey silts
			CH	Inorganic clays or high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

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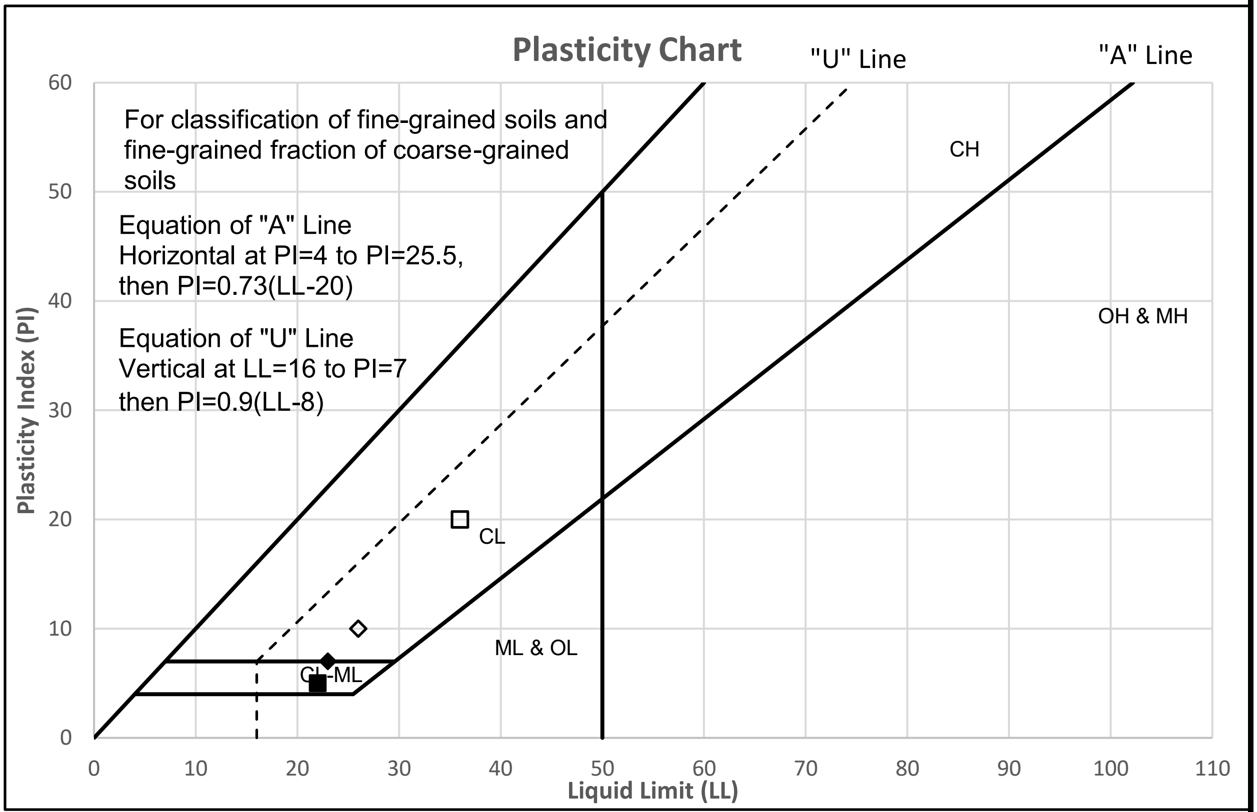
GRAPHIC SYMBOL LEGEND

SPT	☒	Standard Penetration Test (2" OD), ASTM D1586
GRAB	◢	Grab Sample
ST	□	Shelby Tube, ASTM D1587 (pushed)
AUGER	▮	Boring Advanced Through Drilling
CORE	▯	Rock coring

APPENDIX B

Results of Laboratory Classification Tests

Results of Laboratory Classification Tests



	Boring No	Depth (ft)	LL	PL	PI	% Fines	USCS Classification
■	B-2 , S-1	0.5 - 2	22	17	5	---	Silty Lean Clay, CL-ML
□	B-3 , S-2	2 - 3.5	36	16	20	---	Lean Clay, CL
◆	B-4 , S-1	0.5 - 2	23	16	7	---	Silty Lean Clay, CL-ML
◇	B-4 , S-2	2 - 3.5	26	16	10	---	Lean Clay, CL