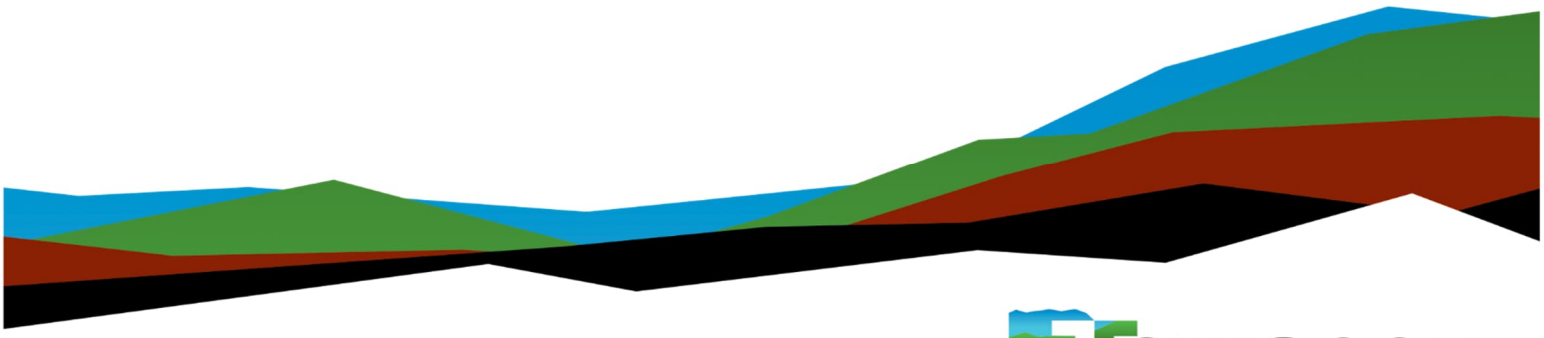
Morrilton Site Preliminary Exploration

Preliminary Geotechnical Engineering Report

April 17, 2025 | Terracon Project No. KB245046

Prepared for:

Burns & McDonnell Engineering Company Inc.
6576 Lynch's Prairie Cove, Suite B
Springdale, AR 72762



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April 17, 2025

Burns & McDonnell Engineering Company Inc.
6576 Lynch's Prairie Cove, Suite B
Springdale, AR 72762

Attn: Steven Beam
P: (479) 384-5091
E: srbeam@burnsmcd.com

Re: Preliminary Geotechnical Engineering Report
Morrilton Site Preliminary Exploration
902 N Cedar St
Morrilton, AR
Terracon Project No. KB245046

Dear Mr. Beam:

We have completed the scope of the preliminary geotechnical engineering services for the above referenced project in general accordance with Terracon Proposal No. PKB245046 dated February 6, 2025. This report presents the findings of the subsurface exploration and provides preliminary geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon
Certificate of Authorization No. 223, expires 12/31/2025

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7052
MICHAEL H. HOMAN

Aaron Baker

Aaron M. Baker, E.I.
Field Engineer

Michael H. Homan, P.E.
Office Manager / Senior Principal

Table of Contents

Figures

Attachments

Note: This report was originally delivered in a web-based format. Blue Bold text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and preliminary geotechnical engineering services performed for future light industrial development at 902 N Cedar St in Morrilton, AR. The purpose of these services was to provide information and preliminary geotechnical engineering recommendations related to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per 2018 IBC
- Earthwork
- Foundations
- Floor slabs
- Pavements

The limited geotechnical engineering scope of services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the Site Location and Exploration Plan, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs in the Exploration Results section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for pricing was provided by Steven Beam on July 25th, 2024. The request included a requested scope of work as well as a parcel map. A follow-up email was provided by Steven Beam on February 2, 2025, with a request for a formal proposal from Terracon.
Project Description	The project includes a preliminary exploration for potential light industrial development at the site.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration.

Item	Description
Parcel Information	The project is located at 902 N Cedar St in Morrilton, AR. The site encompasses ±38.1 acres Latitude/Longitude (approximate) 35.1693, -92.7556 See Site Location
Existing Improvements	It appears from Google Earth imagery that clearing of existing trees at the site has taken place within the last year and that some site grading has occurred on the southern half of the site. It is unknown whether the grading is related to the planned development.
Current Ground Cover	Grass, brushes, and trees
Existing Topography	Based on google imagery, the site slopes gently throughout with a total elevation change of ±25 feet.

Pre-Existing Site Conditions

The site was accessible to our drill crew with the majority of ground cover being maintained short to medium height grasses. Our track rig managed to access all locations without difficulties.

Subsurface Conditions

Site Geology and Published Soil Mapping

The site lays atop the Atoka Formation, formed during the Pennsylvanian age. This formation consists of varying sequences of marine sandstones, siltstones, and shales, and is primarily found in the Boston Mountains, Arkansas River Valley, and Ouachita Mountains of Arkansas. The Atoka Formation is as thick as 25,000 feet in certain areas.

Soil strata underlying the formation is typically comprised of lean clay soils overlying shale bedrock. Sandstone capstone is possible in some areas.

The soil survey for Conway County, Arkansas was prepared by the Natural Resource Conservation Service (NRCS). The NRCS identifies 4 predominant soil types that cover over 86% of the site's total area.

Soil Map Unit	Percentage of Site Area	Description
Leadvale Silt Loam, 1 to 3 percent slopes	33.1	Silt loam to 10 inches, silty clay loam to 72 inches
Linker Fine Sandy Loam, 3 to 8 percent slopes	23.2	Fine sandy loam to 14 inches, sandy clay loam to 37 inches, bedrock below 37 inches
Mountainburg gravelly fine sandy loam, 3 to 8 percent slopes	19.9	Gravelly fine sandy loam to 3 inches, very gravelly fine sandy loam to 6 inches, very cobbly loam to 18 inches, bedrock below 18 inches
Mountainburg stony fine sandy loam, 12 to 40 percent slopes, rocky	10.1	Stony fine sandy loam to 5 inches, very stony fine sandy loam to 16 inches, bedrock below 16 inches

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the Exploration Results and the GeoModel can be found in the Figures attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Lean Clay	Encountered between 0 and 2 feet bgs (below ground surface); Red, brown, light brown, reddish brown, and gray in color; soft to stiff

2	Fat Clay	Encountered up to 5 feet bgs; gray, light brown, and reddish brown in color; stiff to hard
3	Clayey Sand	Red, light brown, and brown in color; dense
4	Shaley Lean Clay	Light gray, brown, and reddish brown in color; very stiff to hard
5	Shale	Highly weathered to non-weathered; brown and dark gray in color; very weak

Groundwater

The borings were advanced using solid stem augers that allow for short term groundwater observations while drilling in all borings except for PB-4. Groundwater was not measured in boring PB-4 due to the introduction of drilling fluid into the hole during drilling operations. Groundwater seepage was encountered in borings PB-1, PB-2, PB-3, and PB-5 at depths ranging from 3.5 to 15 feet bgs. The specific depths at which groundwater was encountered in each boring is shown on the attached boring logs. Groundwater conditions may be different at the time of construction. Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties observed at the site and as described on the exploration logs and results, our professional opinion is for that a Seismic Site Classification of D be considered for the project. Subsurface explorations at this site were extended to a maximum depth of 35 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

Geotechnical Overview

The subsurface materials generally consisted of lean to fat clay underlain by clayey sand, shaley lean clay and highly weathered shale to the top of dark gray shale bedrock. Groundwater levels encountered in our borings are shown on the attached boring logs and ranged from depths of 3.5 to 15 feet bgs.

Based on the conditions encountered, the site appears suitable for construction.

Due to the subsurface conditions encountered at the site, our lack of information regarding the proposed development, and site grading information, we strongly recommend that Terracon perform additional geotechnical exploration, laboratory testing and engineering services during the design phase of the project. This report should not be used as the basis for design of foundations, floor slabs, pavements, or site grading/earthwork.

During our preliminary study, the following geotechnical considerations were identified:

- Low-strength surficial soils
- Soil volume change potential

The following discussions address these items and provide preliminary information and recommendations regarding these considerations.

Low-Strength Surficial Soils: Surficial, low to moderate strength, lean to fat clay with blow count values of 2 to 9 blows per foot were observed to a depth of about 2 feet below the ground surface in the borings. This type of soil realizes a sharp decrease in shear strength with small increases in moisture content. They are difficult to stabilize in place due to the thickness of the stratum. Typically, these soils are removed from the construction area and replaced with a low volume change (LVC) fill. In their present state, these soils are unsuitable for supporting new fill, foundations, on-grade floor slabs, and pavements, and should be corrected by removing and replacing them with new engineered fill, if they cannot be improved in place.

Soil Volume Change Potential: Gray and reddish brown, highly plastic, fat clay was encountered in boring PB-5 to 5-foot depth. We anticipate that some amount of low volume change material will need to be constructed beneath any floor slabs in this area and in other areas with similar soil to minimize the shrink/swell potential of the native soils and beneath the pavements to provide proper pavement section support.

Earthwork

Earthwork is anticipated to include clearing and grubbing, excavations, and engineered fill placement. The following sections provide preliminary recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering preliminary evaluation for foundations, floor slabs, and pavements.

Site Preparation

Prior to placing fill, existing vegetation, topsoil, and root mats should be removed. Complete striping of the topsoil should be performed in any proposed building and parking/driveway areas.

Although no evidence of fill or underground facilities (such as septic tanks, cesspools, basements, and utilities) was observed during the exploration and site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

Low strength lean to fat clay exposed during site grading will need to be removed within proposed building and paving areas and replaced with LVC material. Some on-site soil may be suitable to be used as structural fill materials.

The subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by scarification and recompaction, bridging or removal and replacement, as is appropriate for the given situation.

Based upon the subsurface conditions determined from geotechnical exploration, subgrade soil is anticipated to be relatively workable; however, the workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors.

Excavations

We anticipate that excavations in the overburden soil can be accomplished with conventional earthmoving equipment. Areal excavations into the shaley lean clay and highly weathered shale should be able to be accomplished with bulldozers with single-tooth rippers. Small or isolated excavations in the highly weathered shale and weathered

shale may require the use of a pneumatic hoe ram. The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, and in accordance with any applicable local and/or state regulations.

Fill Material Types

Fill required to achieve design grade should be classified as structural low volume change fill (LVC) and general fill. Structural LVC fill is material used below, or within 5 feet of structures or pavements. General fill is material used to achieve grade outside of these areas.

Soil Type [1]	USCS Classification	Acceptable Parameters
Imported Materials [2]	CL, SC, GC LL ≤ 45 & PI ≤ 20	All locations and elevations
On-Site Soils [2]	CH, CL LL ≥ 45 or PI ≥ 20	Not recommended for use as structural fill
	CL, SC LL ≤ 45 & PI ≤ 20	All locations and elevations
Granular [2,3]	GW/GM	Subbase beneath floor slabs and pavements

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. Maximum rock size in the fill should not exceed 3 inches.
2. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.
3. ArDOT Class 7 aggregate base course or similar

Earthwork Construction Considerations

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the

affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Foundations

We anticipate that conventional shallow footing foundations could be used to support a lightly loaded buildings with maximum column loads of about 100 kips. Footings designed to bear in the overburden soils or on tested and approved structural fill could be designed for maximum net allowable bearing pressures of 2,000 to 2,500 psf. For heavily loaded buildings with column loads exceeding the about 100 kips, deep foundations such as drilled piers that are designed to bear in the gray shale could be designed for maximum net allowable bearing pressures of 25,000 to 35,000 psf. Further geotechnical exploration and evaluation should be performed in any proposed building and structure areas to evaluate the recommended maximum net allowable bearing pressure and thickness of engineered fill for designing footings. Footings should be designed to bear at least 24 inches below the lowest adjacent finished grade.

Floor Slabs and Pavements

We anticipate that overexcavation of the weak surficial lean to fat clay and construction of a structural fill building pad will be required to provide proper subgrade support for any building floor slab. Some of the clay encountered at the near surface is highly plastic. We recommend considering at least 18 to 24 inches of low volume change structural fill (LVC) material beneath the building floor slab to reduce the potential vertical rise to 0.75-inch, or less. Further testing is required to refine the required thickness of LVC material.

Depending on pavement design grade, overexcavation of the surficial, soft to medium stiff, lean to fat clay soil and replacement with structural fill may be necessary to provide proper support of pavements.

General Comments

This is a preliminary report based on limited data and is meant to be used in the due diligence phase of the project. This report is not meant to be used during the design

phase of the project. Additional borings, laboratory testing and analysis are required to assist in the design and construction of this project. Our preliminary analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident during or after construction. Terracon should be retained as the Geotechnical Engineer during the design phase.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the information provided by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for due diligence purposes and not to estimate excavation cost. Any use of our report in that regard is made at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damage due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

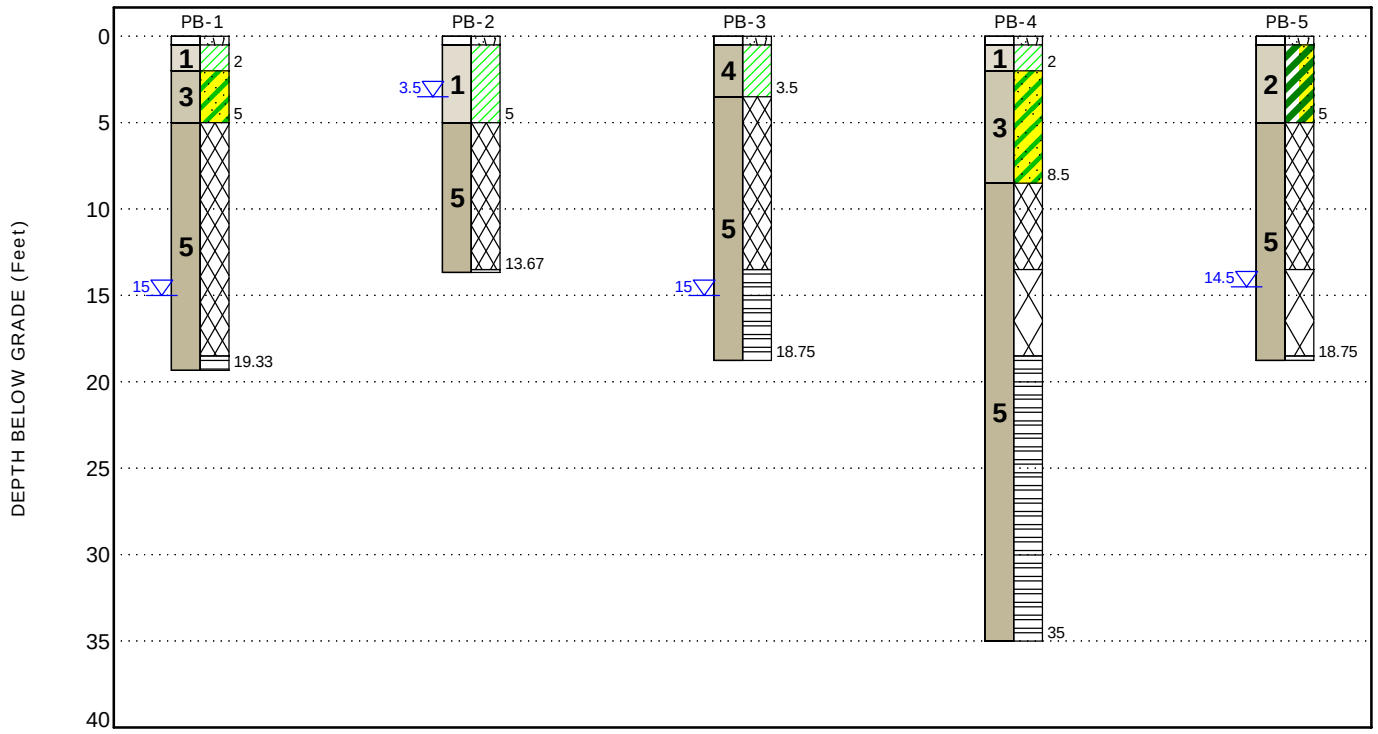
Figures

Contents:

Morrilton Site - Burns & McDonnell
902 N Cedar St | Morrilton, AR
Terracon Project No. KB245046

1003 Century St
Springdale, AR

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Lean Clay	Red, brown, light brown, reddish brown, and gray in color; soft to stiff
2	Fat Clay	Gray, light brown, and reddish brown in color; stiff to hard
3	Clayey Sand	Red, light brown, and brown in color; dense to very dense
4	Shaley Lean Clay	Light gray, brown, and reddish brown in color; very stiff to hard
5	Shale	Highly weathered to non-weathered; brown and dark gray in color; very weak

Legend

- Topsoil
- Lean Clay
- Clayey Sand
- Highly Weathered Shale
- Shale
- Weathered Shale
- Fat Clay with Sand

▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Run 1 and Run 2

Run 3

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
4	13.5 to 20	Throughout the subject property
1	35	Within the subject property

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Ground surface elevations were estimated using Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted rotary drill rig using continuous flight augers (solid stem and/or hollow stem, as necessary, depending on soil conditions). Five samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

Rock coring was conducted using standard NQ/NX rock coring techniques. Recovery and RQD of the rock core samples were measured in the field and the samples were stored in appropriate containers and transported to a Terracon laboratory for further classification and testing.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater levels observed during drilling and sampling are shown on the attached boring logs.

The sampling depths, penetration distances, and other sampling information were recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a geotechnical engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our

interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Sieve Analysis
- Atterberg Limits
- Unconfined compressive strength of rock

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Rock classification was conducted using locally accepted practices for engineering purposes; petrographic analysis may reveal other rock types. Rock core samples typically provide an improved specimen for this classification. Boring log rock classification was determined using the Description of Rock Properties.

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

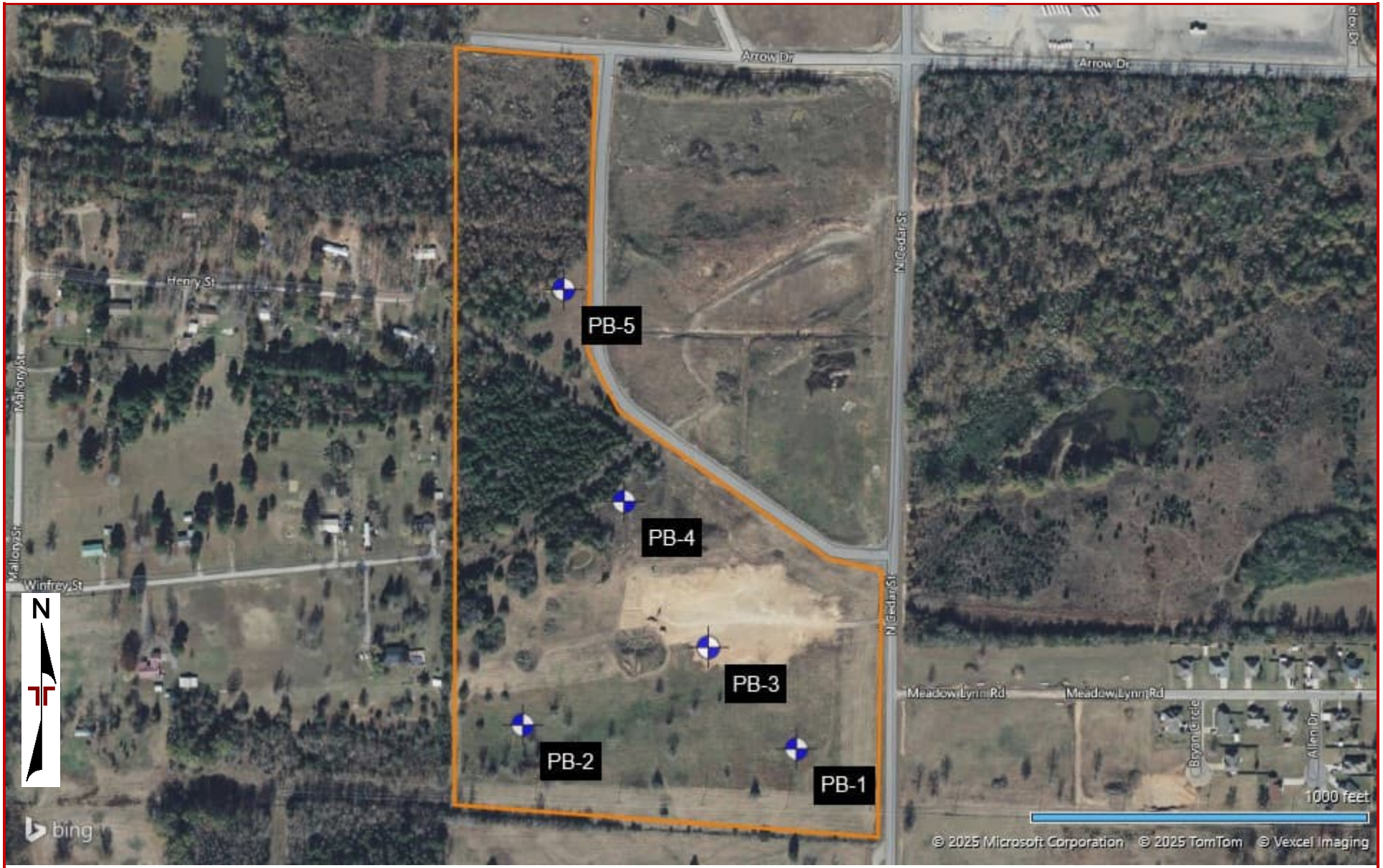


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (PB-1 through PB-5)

Note: All attachments are one page unless noted above.

Morrilton Site - Burns & McDonnell
902 N Cedar St | Morrilton, AR
Terracon Project No. KB245046

Terracon
1003 Century St
Springdale, AR

Boring Log No. PB-1

Location: See Exploration Plan

Latitude: 35.1675° Longitude: -92.7544°

Depth (Ft.)	Graphic Log	Material Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (psi)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL-PL-PI	Percent Fines
0.5		TOPSOIL											
2.0		LEAN CLAY (CL), red and brown, medium stiff				2-3-4 N=7				23.2			
5.0		CLAYEY SAND (SC), red and brown, dense				9-30-19 N=49				17.9			29.7
						6-50/3"				22.5			
			5			50/2"				9.2			
		HIGHLY WEATHERED SHALE, light gray and brown, hard, very weak				14-33-46 N=79				11.6			
			10										
				▽		30-28-47 N=75				9.3			
			15										
18.5													
19.3		SHALE, dark gray, very weak				39-50/4"				21.6			
		Boring Terminated at 19.33 Feet											

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were estimated using Google Earth

Water Level Observations
▽ 15' while drilling

Drill Rig
1316

Hammer Type
Automatic

Driller
TK

Logged by
MR

Boring Started
03-26-2025

Boring Completed
03-26-2025

Notes

Advancement Method
Solid Stem Augers

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Morrilton Site - Burns & McDonnell
902 N Cedar St | Morrilton, AR
Terracon Project No. KB245046

1003 Century St
Springdale, AR

Boring Log No. PB-2

Graphic Log	Location: See Exploration Plan Latitude: 35.1677° Longitude: -92.7571° Depth (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (psi)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL-PL-PI	Percent Fines
	0.5 TOPSOIL											
	LEAN CLAY (CL), gray and reddish brown, stiff to very stiff				1-4-5 N=9				23.7			
	-contains gravel fragments below 2'				7-8-9 N=17				30.3			
			▽		3-6-7 N=13				30.3		32-21-11	89.0
	5.0 HIGHLY WEATHERED SHALE, brown, hard, very weak	5			18-50/5"				8.9			
					20-50/5"				7.3			
		10										
	13.5 13.7 SHALE, dark gray, very weak *Refusal at 13.67 Feet*				50/2"				19.6			

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were estimated using Google Earth

Water Level Observations
▽ 3.5' while drilling

Drill Rig
1316

Hammer Type
Automatic

Driller
TK

Logged by
MR

Boring Started
03-26-2025

Boring Completed
03-26-2025

Notes

Advancement Method
Solid Stem Augers

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Morrilton Site - Burns & McDonnell
902 N Cedar St | Morrilton, AR
Terracon Project No. KB245046

Terracon
1003 Century St
Springdale, AR

Boring Log No. PB-3

Location: See Exploration Plan

Latitude: 35.1683° Longitude: -92.7553°

Depth (Ft.)	Description	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (psi)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL-PL-PI	Percent Fines
0.5	TOPSOIL								
	SHALEY LEAN CLAY (CL), reddish brown, very stiff to hard	5-10-12 N=22				12.4			
		6-14-27 N=41				11.4			
3.5	HIGHLY WEATHERED SHALE, brown to gray, very weak	18-43-48 N=91				10.6			
		16-50/4"							
		50/5"				9.7			
13.5	SHALE, dark gray, very weak	50/3"				11.4			
18.8	wet	50/3"				26.5			
	Boring Terminated at 18.75 Feet								

Water Level Observations: ▽ 15' while drilling

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were estimated using Google Earth

Notes

Advancement Method
Solid Stem Augers

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
1316

Hammer Type
Automatic

Driller
TK

Logged by
MR

Boring Started
03-26-2025

Boring Completed
03-26-2025

Morrilton Site - Burns & McDonnell
902 N Cedar St | Morrilton, AR
Terracon Project No. KB245046

Terracon
1003 Century St
Springdale, AR

Boring Log No. PB-4

Location: See Exploration Plan

Latitude: 35.1695° Longitude: -92.7561°

Depth (Ft.)	Graphic Log	Material Description	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (psi)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL-PL-PI	Percent Fines
0.5		TOPSOIL										
		LEAN CLAY (CL), light brown, soft			1-1-1 N=2				22.4			
2.0		CLAYEY SAND (SC), light brown, dense to very dense			8-16-16 N=32				13.2		34-21-13	45.3
					6-11-21 N=32				19.1			
5					27-38-43 N=81				11.0			
8.5		HIGHLY WEATHERED SHALE, dark gray, very weak			33-50/5"				7.7			
10												
13.5		WEATHERED SHALE, dark gray, wet, very weak			50/5"				26.3			
15												
18.5		-tricone drill bit refusal at 18.5'										
		SHALE, dark gray										
20		-rock coring beginning at 20'			REC: 93% RQD: 62%		6621					
25												

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were estimated using Google Earth

Water Level Observations
Not observed due to introduction of drilling fluid to the boring

Drill Rig
1316

Hammer Type
Automatic

Driller
TK

Logged by
MR

Boring Started
03-26-2025

Boring Completed
03-26-2025

Notes

Advancement Method
0' - 18.5' : Mud Rotary
18.5' - 35' : Rock Coring

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Terracon
1003 Century St
Springdale, AR

Boring Log No. PB-4

Location: See Exploration Plan

Latitude: 35.1695° Longitude: -92.7561°

Depth (Ft.)	Graphic Log	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (psi)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL-PL-PI	Percent Fines
	SHALE, dark gray *(continued)*										
				REC: 86% RQD: 86%		11693					
30											
				REC: 98% RQD: 98%		8215					
35.0											
35	*Boring Terminated at 35 Feet*										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were estimated using Google Earth

Water Level Observations
Not observed due to introduction of drilling fluid to the boring

Notes

Advancement Method
0' - 18.5' : Mud Rotary
18.5' - 35' : Rock Coring

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
1316

Hammer Type
Automatic

Driller
TK

Logged by
MR

Boring Started
03-26-2025

Boring Completed
03-26-2025

Morrilton Site - Burns & McDonnell
902 N Cedar St | Morrilton, AR
Terracon Project No. KB245046

1003 Century St
Springdale, AR

Boring Log No. PB-5

Location: See Exploration Plan

Latitude: 35.1712° Longitude: -92.7567°

Depth (Ft.)	Graphic Log	Material Description	Water Level Observations	Sample Type	Field Test Results	Strength Test: Test Type	Strength Test: Compressive Strength (psi)	Strength Test: Strain (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits: LL-PL-PI	Percent Fines
0.5		TOPSOIL										
		FAT CLAY WITH SAND (CH), reddish brown and gray, stiff to hard			3-4-5 N=9				21.7		50-28-22	83.4
					4-5-5 N=10				32.7			
					8-13-18 N=31				15.2			
5.0		HIGHLY WEATHERED SHALE, brown and gray, very weak			17-50/5"				9.5			
					12-50/4"				10.1			
13.5		WEATHERED SILTY SHALE, dark gray, very weak	▽		50/5"				7.1			
18.5												
18.8		SHALE, dark gray, very weak			50/3"				22.0			
		Boring Terminated at 18.75 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were estimated using Google Earth

Water Level Observations
▽ 14.5' while drilling

Drill Rig
1316

Hammer Type
Automatic

Driller
TK

Logged by
MR

Boring Started
03-26-2025

Boring Completed
03-26-2025

Notes

Advancement Method
Solid Stem Augers

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Supporting Information

Contents:

Note: All attachments are one page unless noted above.

1003 Century St
Springdale, AR

General Notes

Sampling

Rock Core

Standard Penetration Test

Water Level

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Cave In Encountered

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils

(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils

(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (psi)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 3.50	0 - 1
Soft	3.5 to 7.0	2 - 4
Medium Stiff	7.0 to 14.0	5 - 8
Stiff	14.0 to 28.0	9 - 15
Very Stiff	28.0 to 55.5	16 - 30
Hard	> 55.5	> 30

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 4 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried}$ < 0.75	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried}$ < 0.75	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.