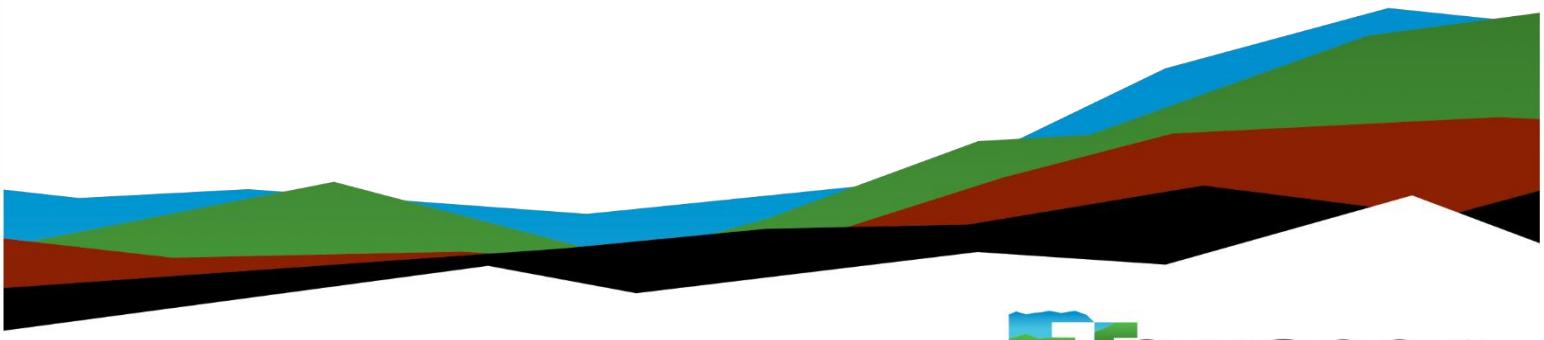
Sedona Airport Helicopter Six-Pack Reconstruction

Geotechnical and Pavement Engineering Report

Prepared for:

Dibble & Associates Consulting Engineers, Inc.
3020 E Camelback Rd, Ste. 201
Phoenix, Arizona 85016



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April 2, 2026

Dibble & Associates Consulting Engineers, Inc.
3020 E Camelback Rd, Ste. 201
Phoenix, Arizona 85016

Attn: Jim Cunningham, P.E.
P: (520) 347-4886
E: jim.cunningham@dibblecorp.com

Re: Geotechnical and Pavement Engineering Report Rev. 1
Sedona Airport Helicopter Six-Pack Reconstruction
235 Air Terminal Drive
Sedona, Arizona 86336
Terracon Project No. 65245241

Dear Mr. Cunningham:

We have completed the scope of Geotechnical and Pavement Engineering services for the above referenced project in general accordance with Terracon Proposal No. P65245241 dated October 21, 2025. This report presents the findings of the subsurface exploration and provides pavement design data only for the proposed Sedona Airport Helicopter Six-Pack Reconstruction 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

EXPIRES 12/31/2027

Benjamin Jones, E.I.T.
Senior Staff Engineer

Joseph A. Phillips, P.E.
Sr. Materials Engineer / Sr. 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 Geotechnical and Pavement Engineering services performed for the proposed reconstruction of the helicopter six pack apron to be located at 235 Air Terminal Drive in Sedona, Arizona 86336. The purpose of these services was to provide laboratory data and field exploration information relative to:

- Pavement thickness
- Subsurface conditions
- Dynamic Cone Penetrometer (DCP) results
- Pavement Condition Survey

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, and preparation of this report. We understand this information will be used to develop helicopter apron pavement alternatives for Sedona Airport.

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 and Laboratory 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	Our initial information is based on the information provided by Dibble in an email from Jim Cummingham dated November 4, 2024, and follow-up phone calls since that time.
Project Description	We understand the project consists of conducting a Preliminary data study on the existing Helicopter Six-Pack. The Helicopter Six-Pack is approximately 28,500 square feet constructed of asphalt pavement. We understand Dibble will perform the pavement design.

Item	Description
Pavements	The asphalt concrete portion of the helicopter apron is currently constructed with 2.5 inches of asphalt concrete pavement on top of 8 inches of aggregate base course.

Terracon should be notified if any of the above information is inconsistent with the planned project as modifications to our report may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at the Sedona Airport in 235 Air Terminal Drive. See Site Location and Exploration Plan for additional site location information.
Existing Improvements	Based on the information provided and review of available aerial photographs, the site is currently developed with an approximate 28,500 square feet existing asphalt paved helicopter apron.
Current Ground Cover	The helicopter apron is currently constructed with approximately 2.5 inches of asphalt concrete pavement on top of 8 inches of aggregate base course.

We also collected photographs at the time of our field exploration program. Representative photos are provided in our **Photography Log**.

Geotechnical Characterization

Subsurface Conditions

Specific conditions encountered at each boring location are indicated on the individual boring logs presented in the **Exploration and Laboratory Results** section of this report. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. The following table summarizes the pavement thickness observed and the subgrade soil conditions encountered.

Boring / Coring Location	Asphalt Concrete (AC) Thickness (inches)	Aggregate Base Course (ABC) Thickness (inches)	Subgrade Soils Underlying the Existing Pavement Structure	Depth to Bedrock Refusal (feet)
B-1	2.5	8.0	Clayey Sand with Gravel (SC)	7.5
B-2	3.5	8.0	Sandy Lean Clay (CL)	4.3
B-3	2.0	8.0	Sandy Lean Clay with Gravel (CL)	7.4
B-4	2.0	8.0	Sandy Fat Clay (CH)	8.9
Average	**2.5**	**8.0**	---	--

Based on conditions encountered in the boring locations at the project site, subsurface conditions on the project site can be generalized as follows:

Description	Approximate Depth to the Bottom of Stratum	Material Description	Relative Density / Consistency
Stratum 1	10.0 to 11.5 inches	AC: 2 to 3.5 inches ABC: 8 inches	--
Stratum 2	1 to 9 Feet (maximum depth of exploration)	Clay with variable amounts of sand, and gravel.	Loose to Very Dense

Summary of Laboratory Test Results

Laboratory tests were performed on selected soil samples and the test results are presented in the **Exploration and Laboratory Results** section of this report. The following table is a brief summary of laboratory testing performed on selected soils samples obtained from the borings:

Laboratory Test	Description of Test Results
Atterberg Limits/ Gradation	Based on the results of Atterberg Limit testing, soils at the location of the helicopter apron exhibit medium to high plasticity characteristics. Liquid Limits of the site soils range from 31 to 66, Plastic Limits range from 12

Laboratory Test	Description of Test Results
	to 19, and the Plasticity Indices range from 19 to 47. The gradation test results of these near surface soils indicate percent fines (percent passing the sieve No. 200) ranging from approximately 42 to 74 percent (with an average of 53), percent sand ranged from approximately 25 to 32 percent, and percent gravel ranged from about 1 to 30 percent.
Moisture Content	Testing of selected ring samples obtained from the borings at depths within the near surface soils (upper 5 feet) indicated in-situ moisture contents ranging from approximately 10 to 22 percent with an average of approximately 16 percent; and in-situ dry densities ranging from approximately 88 to 121 pounds per cubic foot (pcf) with an average of approximately 100 pcf.
Laboratory Moisture-Density Relationships (Std Proctor)	Two laboratory Moisture Density Relationships based on Standard Proctor criteria (ASTM D-698) indicate a maximum dry density of 113.1 pcf at an optimum moisture content of 15.8%, and 107.5 pcf at an optimum moisture content of 17.6% from samples of the on-site clayey materials.
California Bearing Ratio (CBR)	The results of CBR testing indicated a CBR of 3.9 for the on-site Clayey Sand material (boring B-1), and a CBR of 2.6 for the sandy fat clay soils (boring B-4) when compacted to a minimum of 95% of the maximum density determined in accordance with Standard Proctor criteria (ASTM D698). A design CBR value of 2.6 should be considered for reconstruction. CBR values obtained from in-place DCP testing can be found in **Dynamic Cone Penetrometer (DCP)**.
Remolded Swell	Two remolded swell tests compacted to -2% optimum moisture and 95% of the maximum density determined in accordance with Standard Proctor criteria (ASTM D698) indicate the materials experience medium to high expansion with measured swell ranging from 2.9% to 4.0%.

Frost Susceptibility

The detrimental effects of frost action on pavement may include non-uniform heave and/or a loss of soil strength during the spring-thaw period. Detrimental frost action occurs when 3 conditions exist: frost susceptible soil; freezing temperatures in that soil; and sufficient moisture to form ice lenses.

Subgrade soils for this project were evaluated for frost susceptibility and rated based on Table 2-2 Soil Frost Groups in AC 150-5320-6G as follows:

Frost Susceptibility of Subgrade			
Boring ID	**Soil Classification**	**Clay Fraction (% passing 0.02 mm)**	**Frost Group**
Boring 4	Sandy Fat Clay (CH)	50.1	FG-3

The frost design depth for pavements is based on FAA guidance and may be different than what is used for local building code requirements. To evaluate the potential for freezing in the subgrade layer the depth of frost penetration for this project location was estimated using the PCASE pavement design software developed by the USACE. The following table provides the frost design parameters and the depth of frost penetration for this location.

Frost Depth Design Parameters for Pavement Design	
Parameter	**Value**
Data From Weather Station	Sedona
Mean Annual Temperature	63.68 °F
Length of Frost Season	1.0 days
Depth of Frost Penetration1	4 inches

Frost depth determined with PCASE design software developed by USACE.

At the time of our exploration, subgrade moisture contents ranged from about 10 to 22 percent with an average moisture content of about 16%. The average value is less than the optimum moisture content and the plastic limit of the soil. The soils investigated were in an open field and did not have any existing pavement or other covering. Based on this information, free water will likely be available to the subgrade soils during the service life of the pavements.

The AC 150/5320-6G provides three methods for designing pavements for frost action: Complete Frost Protection (CFP), Limited Subgrade Frost Penetration, and Reduced Subgrade Strength (RSS). Because this project is a non-primary airport serving aircraft less than 60,000 lbs, the Reduced Subgrade Strength design method is allowed in the FAA guidelines. This method is implemented by reducing the laboratory calculated CBR by 50% for the final design.

Expansion Potential

The near surface soils encountered at the site along the helicopter apron pavements were generally comprised of clayey sand, and sandy clay. The plasticity characteristics of these site soils ranged from medium to high plasticity. Our laboratory testing also included performing standard laboratory moisture-density relationships (i.e. standard

Proctor ASTM D698) and remolded swell tests on the near surface soils sampled from our borings. The remolded swell testing on the soils indicated expansion potentials ranging from approximately 2.9 to 4.0 percent (with an average of 3.5 percent) when compacted to approximately 95 percent of their maximum dry density (ASTM D698) at a moisture content of approximately 2 percent below optimum with 144 pounds per square foot (psf) surcharge. Based on the average results of our field and laboratory testing, we anticipate the site soils to generally exhibit medium to high expansion potentials.

Dynamic Cone Penetrometer (DCP)

As part of our analyses, we performed DCP testing at each of the boring locations. The DCP testing was performed in accordance with ASTM D6951 Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Application. The following table is a brief summary of DCP testing performed at each of the borings:

Boring Location	Correlated In-Place CBR Range	Correlated In-Place CBR Representative Value
B-1	4 – 11*	7
B-2	4 – 21*	7
B-3	2 – 7*	4
B-4	4 – 9	5
*Note: Summarized DCP maximum field measurement reduced due to possible increased resistances of the small diameter test probe with possible gravel and/or cobbles.		

The individual DCP logs can be found in the **Exploration and Laboratory Results**. The DCP test results indicate higher CBR values than the remolded CBR's from laboratory testing. The laboratory CBR's were molded at optimum moisture content which was 15.8% and 17.6% but increased to 19.6% and 23.7% by soaking prior to testing, whereas the in-place DCP's were tested at in situ moisture contents ranging from 10% to 22%. These in-place moisture contents represent the conditions at the time of our exploration and may experience seasonal variability. In the case of reconstructing the asphalt pavement without disturbing the subgrade, the in-situ CBR value used for design based on the DCP results should be approximately 5.

Subgrade Parameters for Design

Subgrade Strength

Based on the test results of laboratory CBR and field DCP, and based on the other results of this investigation, a CBR of 2.6 for the clay subgrade soils is recommended for design. Due to the low CBR value and the expansive nature of the subgrade, 12 inches of subgrade stabilization is recommended.

Subgrade Stabilization

For the clay subgrade soils such as those encountered at this site, lime stabilization would be a common approach. Due to the presence of cobbles and boulders in the near surface soils at this site however, lime stabilization should only be used in conjunction with a screening operation to remove particles larger than 2” in diameter from the soils to be stabilized. A lime stabilization mix design would also need to be provided prior to implementing that approach.

Geogrid reinforced aggregate subbase at a depth of 12 inches could be used as an alternative to lime stabilized subgrade. The FAA design criteria allows geogrid to be used for airfield pavements, however it does not consider any reductions in pavement structure for the use of any geosynthetics.

General Comments

Our 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 until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

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 provided information 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 design purposes and not to estimate excavation cost. Any use of our report in that regard is done 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 damages 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:

B-1 Core

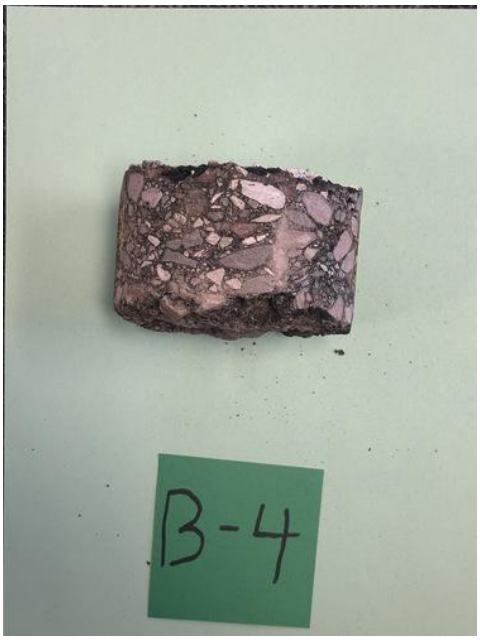
B-1 Boring

B-2 Core

B-2 Boring

B-3 Core

B-3 Boring



B-4 Core

B-4 Boring

Southwest Helipad

West Helipad

Northwest Helipad

Northeast Helipad

East Helipad

Southeast Helipad

Raveling and Weathering of Pavement

Corrugation near B-2

Longitudinal and Transverse Cracking

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
4	auger refusal from 4 to 8	Helicopter Apron Pavement

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. Approximate 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 used an asphalt core machine to obtain core samples of the asphalt concrete at each boring location to accurately measure the thickness of the asphalt and aggregate base course. We then performed DCP testing at each of the boring locations to determine the in-situ strength of the subsurface soils. Then we advanced the borings with a truck-mounted drill rig using continuous flight augers. Four samples were obtained in the upper 6 feet of each boring. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. A 3-inch O.D. split-barrel sampling spoon with 2.5-inch I.D. ring lined sampler was used for sampling in the upper 5 feet. Ring-lined, split-barrel sampling procedures are similar to standard split spoon sampling procedure; however, blow counts are typically recorded for 6-inch intervals for a total of 12 inches of penetration. Groundwater was not observed at these times in the boreholes. For safety purposes, all borings were backfilled with auger cuttings mixed with cement after their completion. Pavements were patched with high-strength, quick-setting grout.

The sampling depths, penetration distances, and other sampling information was 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
- Moisture-Density Relationship
- California Bearing Ratio (CBR)
- Remolded Swell
- Consolidation

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.

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

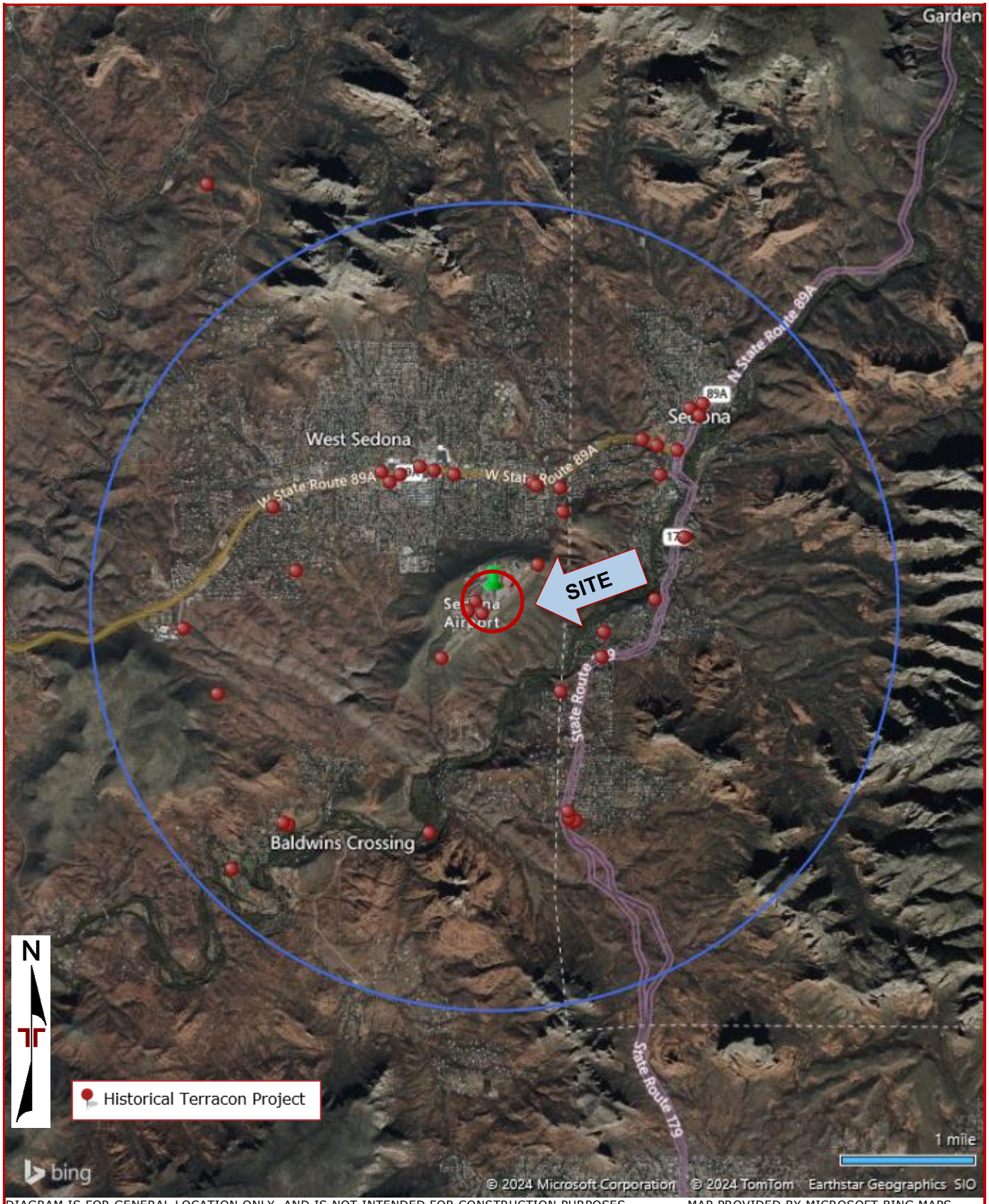


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

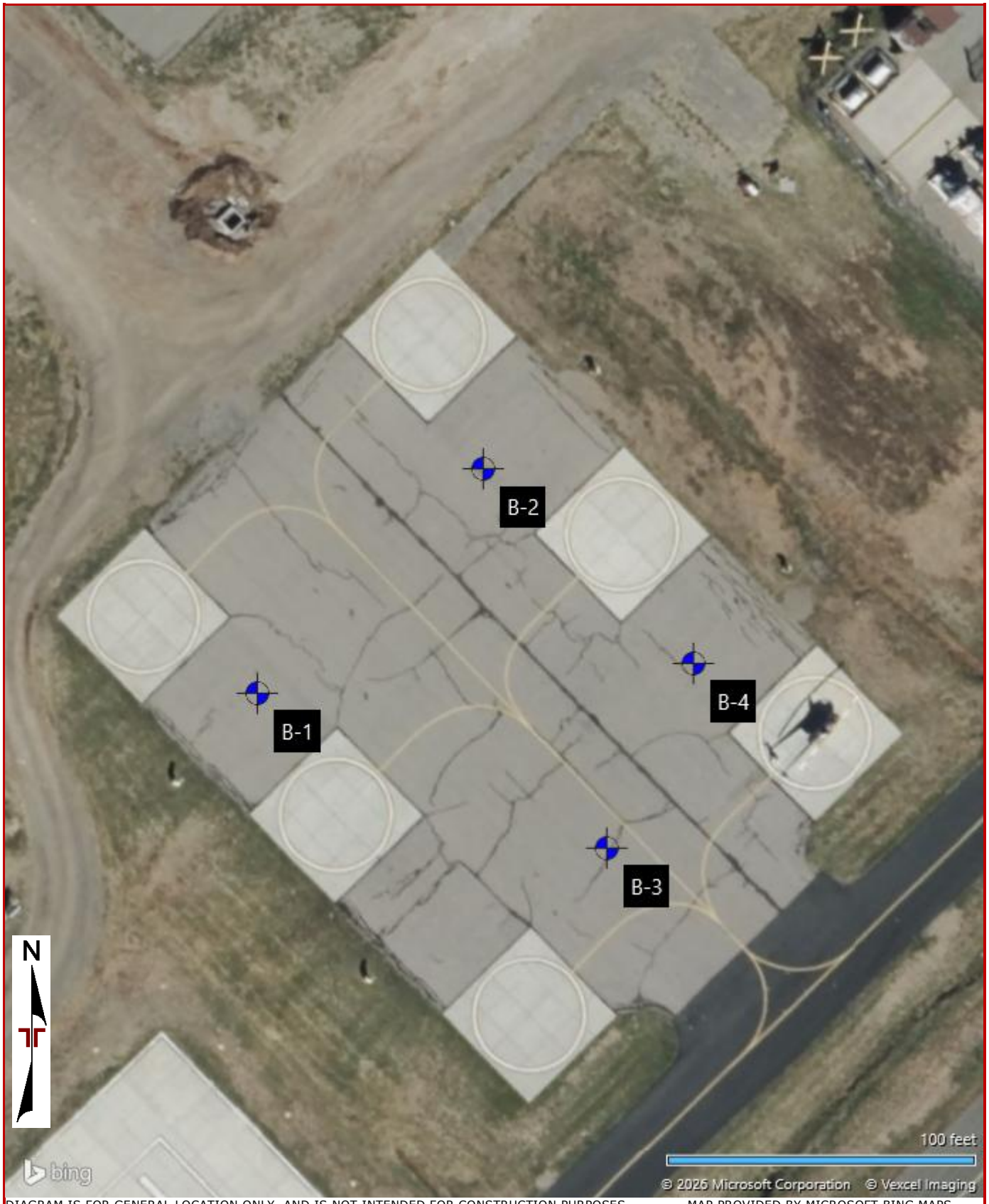


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Note: All attachments are one page unless noted above.

Sedona Helicopter Six-Pack Reconstruction
235 Air Terminal Drive, Sedona, AZ, 86336,USA
Terracon Project No. 65245241

Latitude: 34.8475° Longitude: -111.7924°

BORING LOG NO. B-01

4685 S Ash Ave., Ste. H-4
Tempe, AZ 85282-6767

Surface Elevation:
4764.24(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf.)	Percent Fines	Swell/Collapse (%)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
1		0.3	**ASPHALT**, Approximately 2.5 inches **AGGREGATE BASE COURSE**, approximately 8 inches		4764.0									
		1.0			4763.2									
2			**CLAYEY SAND WITH GRAVEL (SC)**, trace gravel, fine to medium grained sand, fine to coarse grained gravel, brown, loose to medium dense, Weak cementation, Fine to Coarse gravel, high plasticity				9-5	9.9	100.0	47	2.91	31	12	19
		5.0		5	4759.2		50/5''							
3			**CLAYEY SAND WITH GRAVEL (SC)**, fine to medium grained sand, fine to coarse grained gravel, brown, very dense, Moderate cementation, Medium plasticity				12-34-50/5''			44		43	14	29
			Boring Refusal at 7.5 Ft											

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.

Notes
Elevation Reference: Elevation obtained from Google Earth Pro

Water Level Observations
Groundwater not encountered

Advancement Method
0-6 Ft. 8" Hollow Stem Auger

Abandonment Method
Boring backfilled with cement grout upon completion.

Drill Rig
Subcontractor - CME-55

Hammer Type
Automatic

Logged By
C.Hartke

Boring Started
12/18/2025

Boring Completed
12/18/2025

Sedona Helicopter Six-Pack Reconstruction
235 Air Terminal Drive, Sedona, AZ, 86336,USA
Terracon Project No. 65245241

Latitude: 34.8476° Longitude: -111.7921°

BORING LOG NO. B-02

4685 S Ash Ave., Ste. H-4
Tempe, AZ 85282-6767

Surface Elevation:
4764.21(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Field Test Results	Percent Fines	Atterberg Limits LL	PL	PI
1		0.3	**ASPHALT**, approximately 3.5 inches		4763.9						
			AGGREGATE BASE COURSE, approximately 8 inches								
		1.0			4763.2						
2			**SANDY LEAN CLAY (CL)**, fine to medium grained sand, brown, hard, weak cementation, High plasticity				50/4''	57.5	48	15	33
							50/4''				
			Boring Refusal at 4.33 Ft								

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.

Notes
Elevation Reference: Elevation obtained from Google Earth Pro

Water Level Observations
Groundwater not encountered

Advancement Method
0-4.5 Ft. 8" Hand Auger

Abandonment Method
Boring backfilled with cement grout upon completion.

Drill Rig
Subcontractor - CME-55

Hammer Type
Automatic

Logged By
C.Hartke

Boring Started
12/18/2025

Boring Completed
12/18/2025

Sedona Helicopter Six-Pack Reconstruction
235 Air Terminal Drive, Sedona, AZ, 86336,USA
Terracon Project No. 65245241

Latitude: 34.8473° Longitude: -111.7920°

BORING LOG NO. B-03

Terracon
4685 S Ash Ave., Ste. H-4
Tempe, AZ 85282-6767

Surface Elevation:
4764.93(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf.)	Percent Fines	Atterberg Limits LL	PL	PI
1		0.2	**ASPHALT**, approximately 2 inches **AGGREGATE BASE COURSE**, approximately 8 inches		4764.8								
		1.0			4763.9								
2			**SANDY LEAN CLAY WITH GRAVEL (CL)**, fine to medium grained sand, fine to coarse grained gravel, brown, medium stiff, weak cementation, High Plasticity				8-13	15.8	87.7	52.0	43	13	30
		5.0		5	4759.9								
			SANDY FAT CLAY WITH GRAVEL (CH), fine to medium grained sand, fine to coarse grained gravel, brown brown, hard, moderate cementation, medium to high plasticity				15-50/3''			53.2	54	14	40
							50/5''						
			Boring Refusal at 7.42 Ft										

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.

Notes
Elevation Reference: Elevation obtained from Google Earth Pro

Water Level Observations
Groundwater not encountered

Advancement Method
0-7.5 Ft. 8" Hollow Stem Auger

Abandonment Method
Boring backfilled with cement grout upon completion.

Drill Rig
Subcontractor - CME-55

Hammer Type
Automatic

Logged By
C.Hartke

Boring Started
12/18/2025

Boring Completed
12/18/2025

Sedona Helicopter Six-Pack Reconstruction
235 Air Terminal Drive, Sedona, AZ, 86336,USA
Terracon Project No. 65245241

Latitude: 34.8475° Longitude: -111.7919°

BORING LOG NO. B-04

4685 S Ash Ave., Ste. H-4
Tempe, AZ 85282-6767

Surface Elevation:
4765.58(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Field Test Results	Water Content (%)	Dry Unit Weight (pcf.)	Percent Fines	Swell/Collapse (%)	Atterberg Limits LL	PL	PI
1		0.2	**ASPHALT**, approximately 2 inches		4765.4									
2			**AGGREGATE BASE COURSE**, approximately 8 inches											
		1.0			4764.6									
3			**SANDY FAT CLAY (CH)**, fine to medium grained sand, brown, soft, moderate cementation, High plasticity				2-3	22.4	90.3	73.8	4.03	66	19	47
		5.0		5	4760.6									
4			**CLAYEY GRAVEL WITH SAND (GC)**, fine to coarse grained gravel, fine to coarse grained sand, brown, medium dense, Moderate cementation, Medium plasticity				8-20	14.7	121.0	42.3		50	13	37
		8.0	very dense		4757.6		28-50/5" N = 120							
			Boring Refusal at 8.92 Ft											

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.

Notes
Elevation Reference: Elevation obtained from Google Earth Pro

Water Level Observations
Groundwater not encountered

Advancement Method
0-8.92 Ft. 8" Hollow Stem Auger

Abandonment Method
Boring backfilled with cement grout upon completion.

Drill Rig
Subcontractor - CME-55

Hammer Type
Automatic

Logged By
C.Hartke

Boring Started
12/18/2025

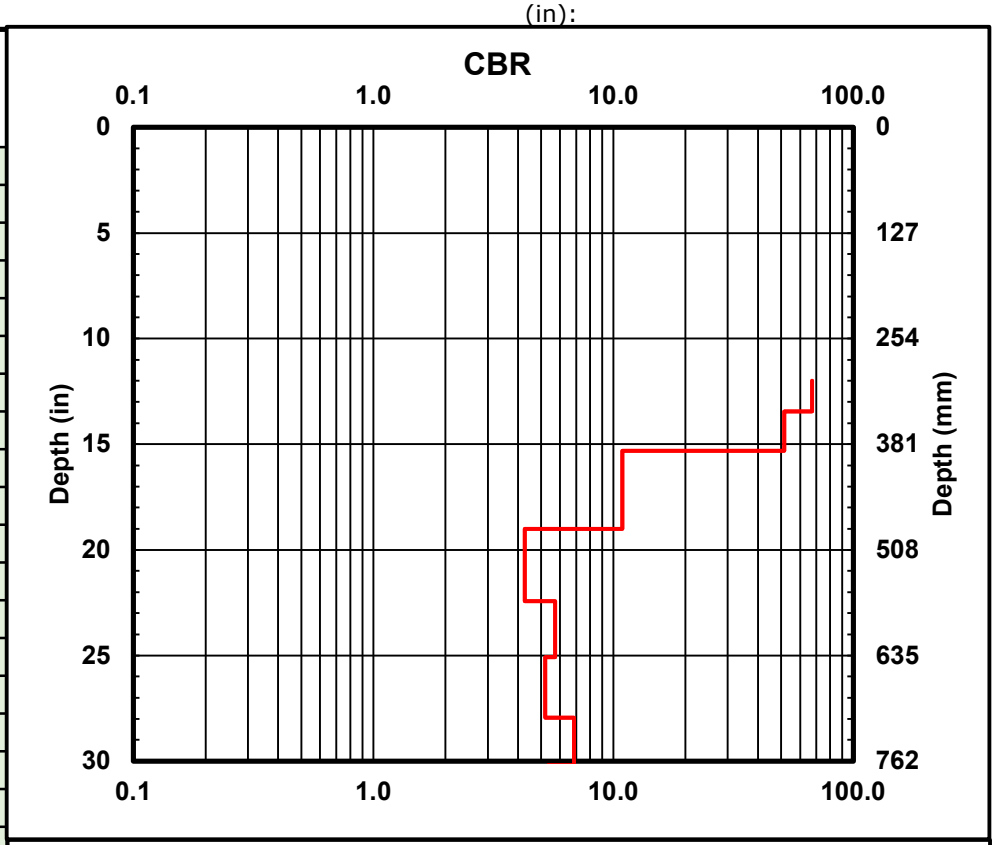
Boring Completed
12/18/2025

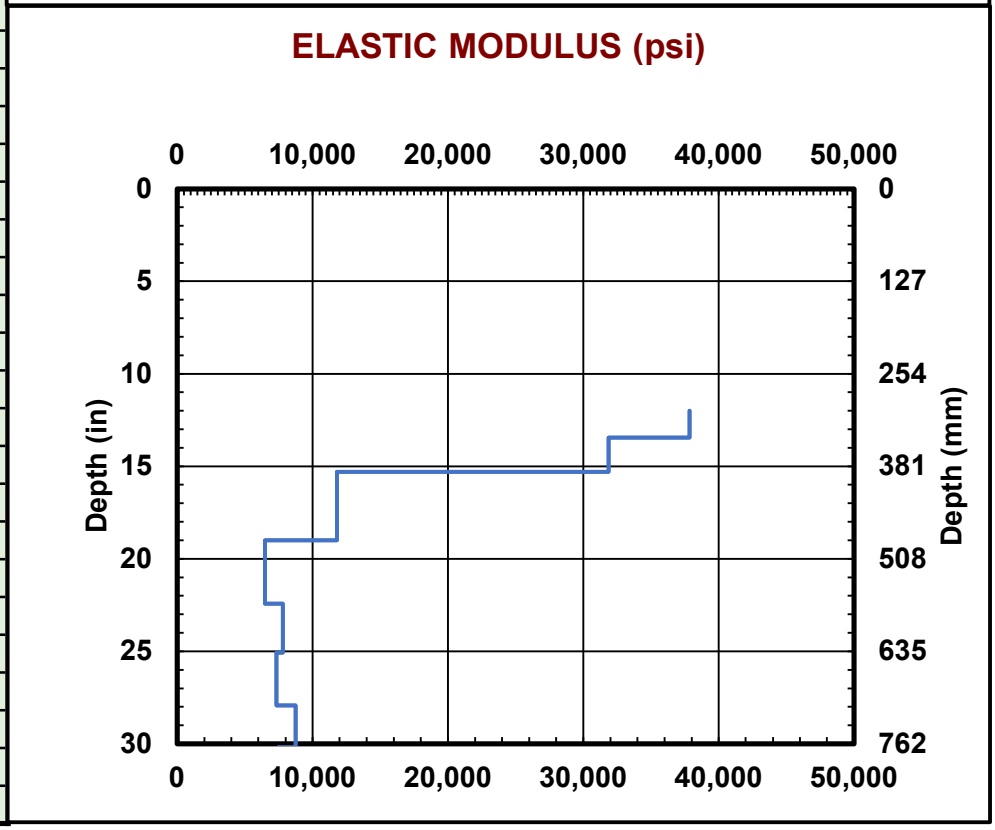
DYNAMIC CONE PENETROMETER RESULTS

Project:	Sedona Helicopter Six-Pack
Location:	B-1
Date:	12/18/2025

Hammer Type:	Dual Mass (17.6 lbs)
Soil Type:	Other (Not CL or CH)
Pavement Thickness (in):	12

No. of Blows	Reading (mm)	Cum. Pen. (mm)
0	336	0
10	373	37
10	420	84
5	514	178
2	601	265
2	668	332
2	741	405
2	798	462
3	905	569



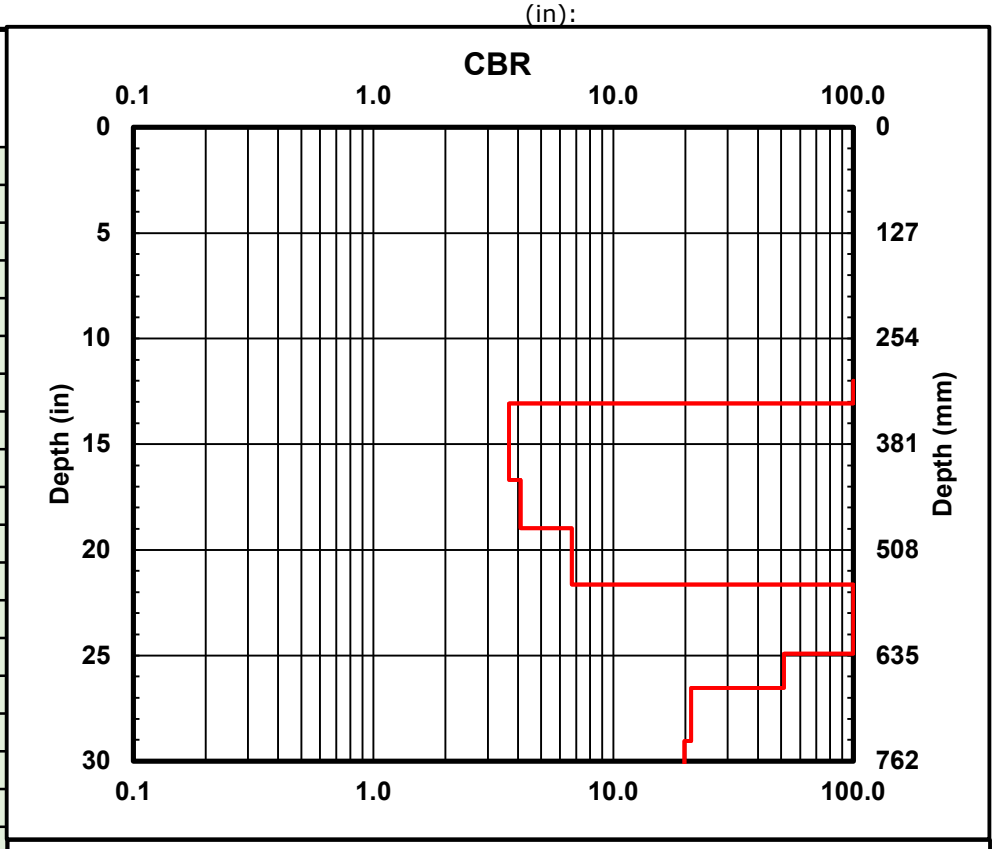


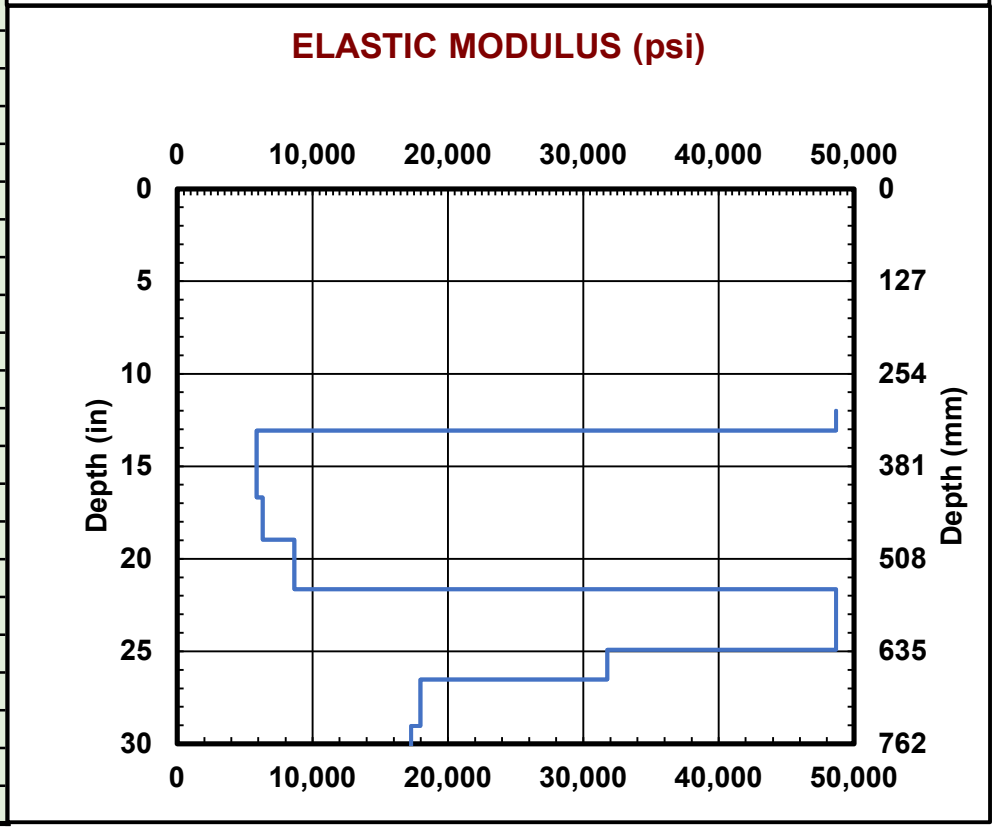
DYNAMIC CONE PENETROMETER RESULTS

Project:	Sedona Helicopter Six-Pack
Location:	B-2
Date:	12/18/2025

Hammer Type:	Dual Mass (17.6 lbs)
Soil Type:	CL
Pavement Thickness (in):	12

No. of Blows	Reading (mm)	Cum. Pen. (mm)
0	391	0
7	418	27
3	510	119
2	568	177
3	636	245
10	662	271
10	678	287
10	696	305
5	719	328
5	760	369
5	824	433
5	890	499



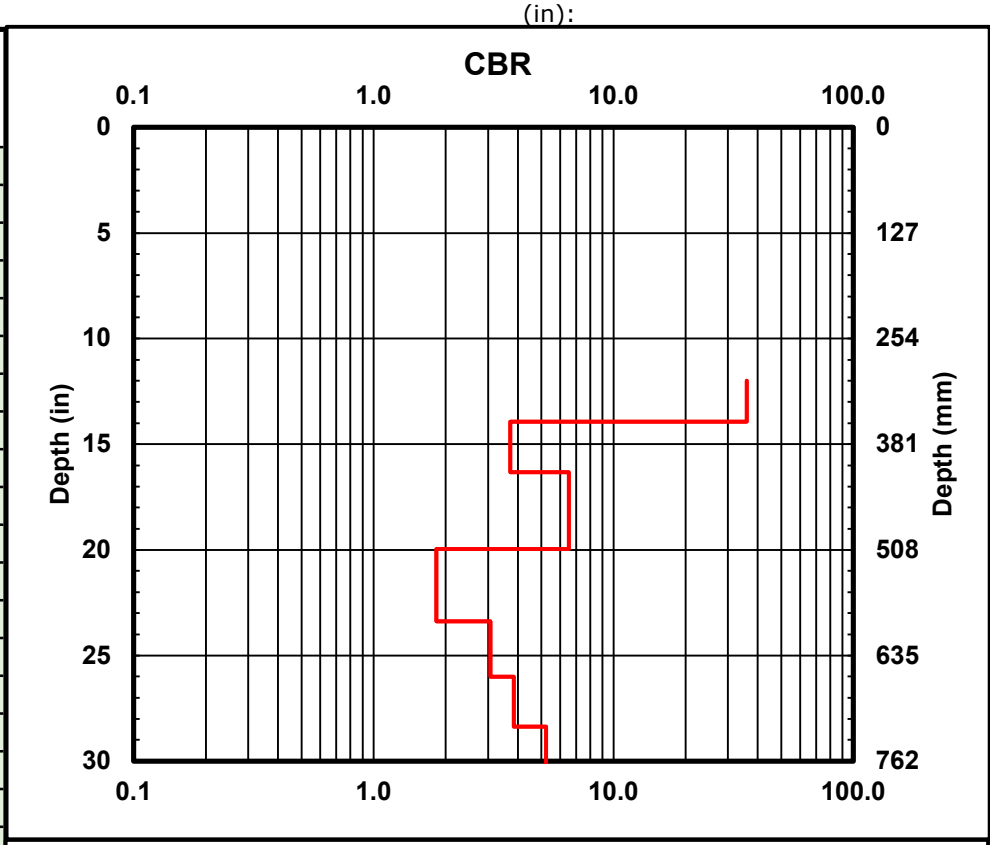


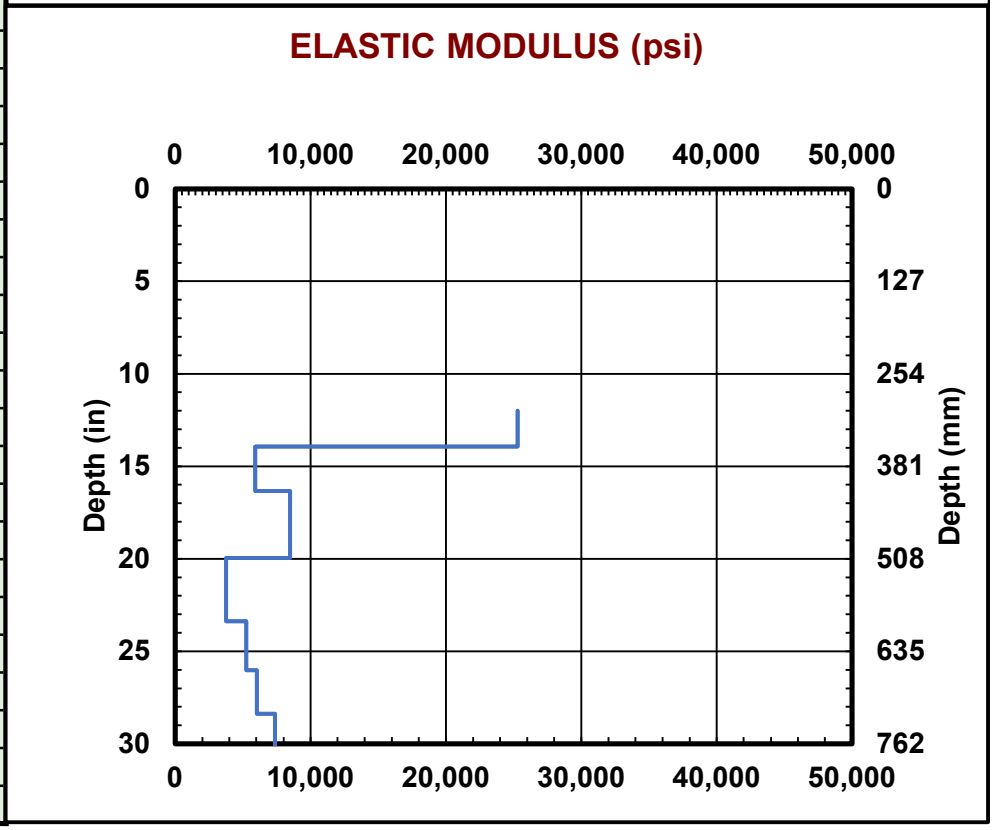
DYNAMIC CONE PENETROMETER RESULTS

Project:	Sedona Helicopter Six-Pack
Location:	B-3
Date:	12/18/2025

Hammer Type:	Dual Mass (17.6 lbs)
Soil Type:	CL
Pavement Thickness (in):	12

No. of Blows	Reading (mm)	Cum. Pen. (mm)
0	408	0
5	457	49
2	518	110
4	610	202
2	697	289
2	764	356
2	824	416
3	901	493



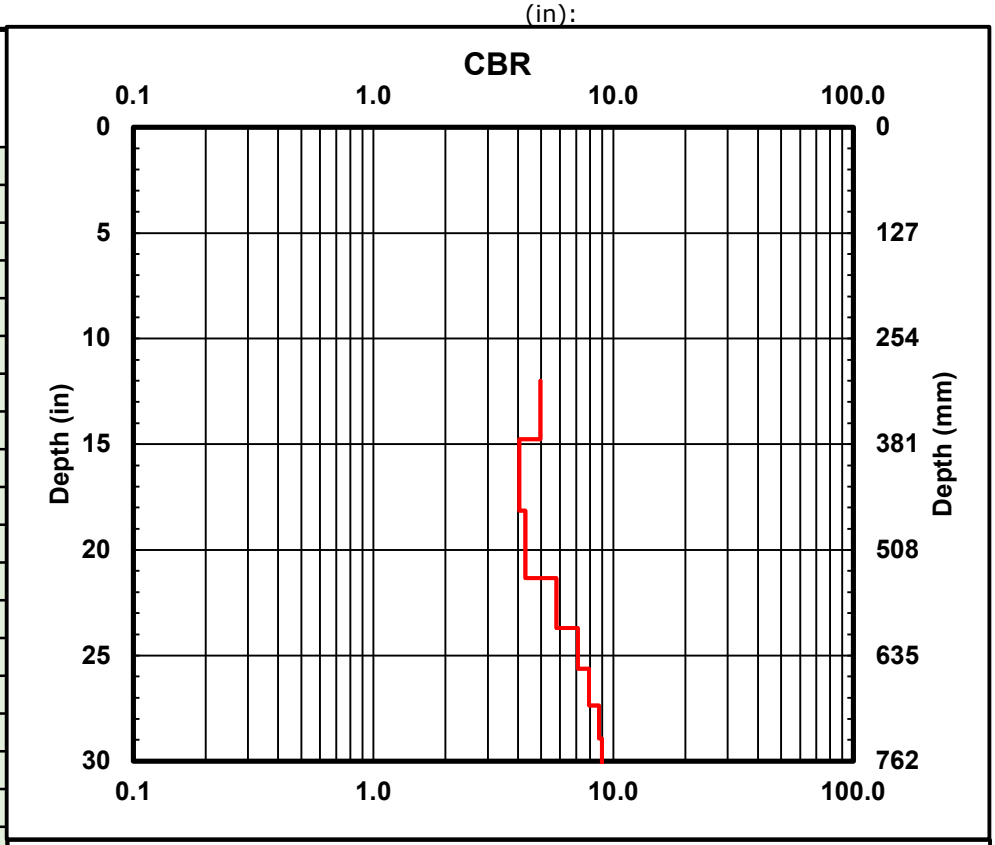


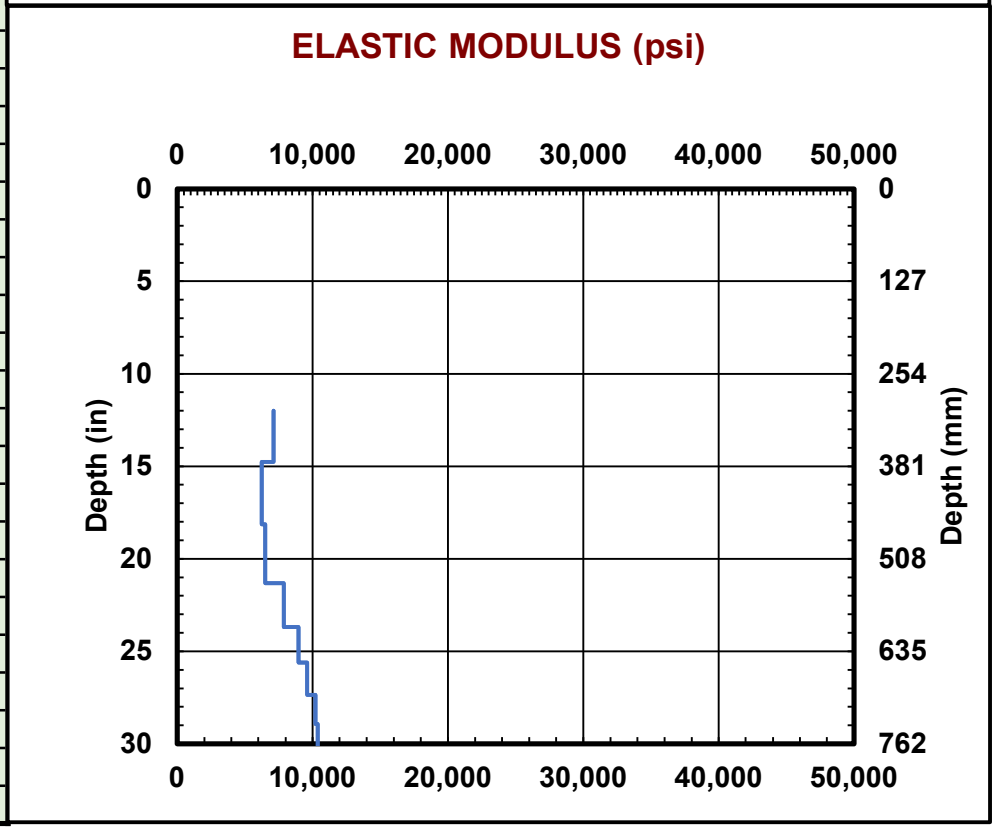
DYNAMIC CONE PENETROMETER RESULTS

Project:	Sedona Helicopter Six-Pack
Location:	B-4
Date:	12/18/2025

Hammer Type:	Dual Mass (17.6 lbs)
Soil Type:	CH
Pavement Thickness (in):	12

No. of Blows	Reading (mm)	Cum. Pen. (mm)
0	400	0
1	470	70
1	556	156
1	637	237
1	697	297
1	746	346
1	790	390
1	830	430
1	869	469
1	905	505





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Terracon
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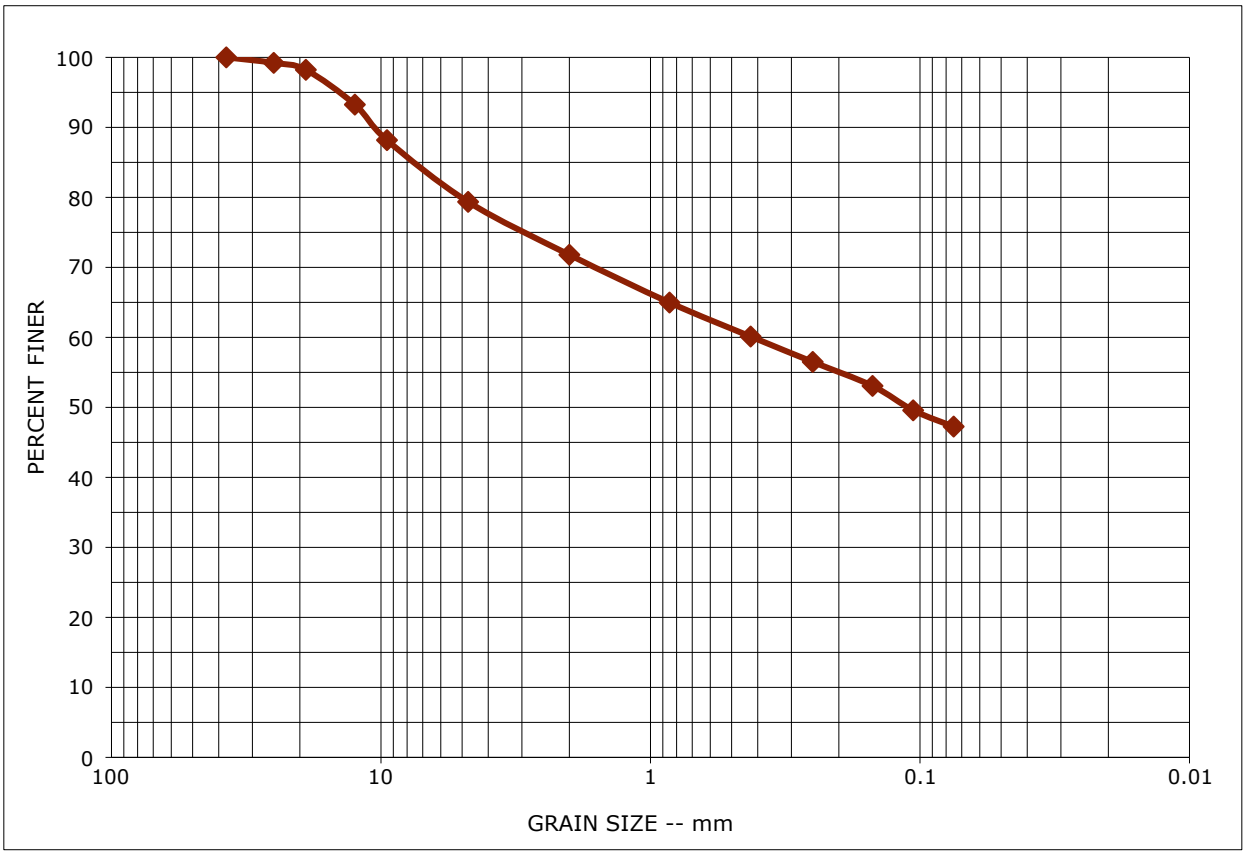
Particle-Size Distrubution of Soils Using Sieve Analysis

ASTM D6913 - Single Set Method



Boring ID	Depth (Ft.)	Description	USCS	% Cobbles	% Gravel	% Sand	% Fines
B-01	1 - 5	Clayey Sand with Gravel	SC	0.0	20.6	32.1	47.3

Sieve	% Finer	Sieve	% Finer	Coefficients	
5"		#20	65.0	C_C	
4"		#40	60.1		
3"		#60	56.5	C_U	
2"		#100	53.1		
1 1/2"	100.0	#140	49.6		
1"	99.2	#200	47.3		
3/4"	98.2	Grain Size		Remarks	
1/2"	93.3	D_{100}	37.500		
3/8"	88.2	D_{60}	0.418		
#4	79.4	D_{30}			
#10	71.8	D_{10}			

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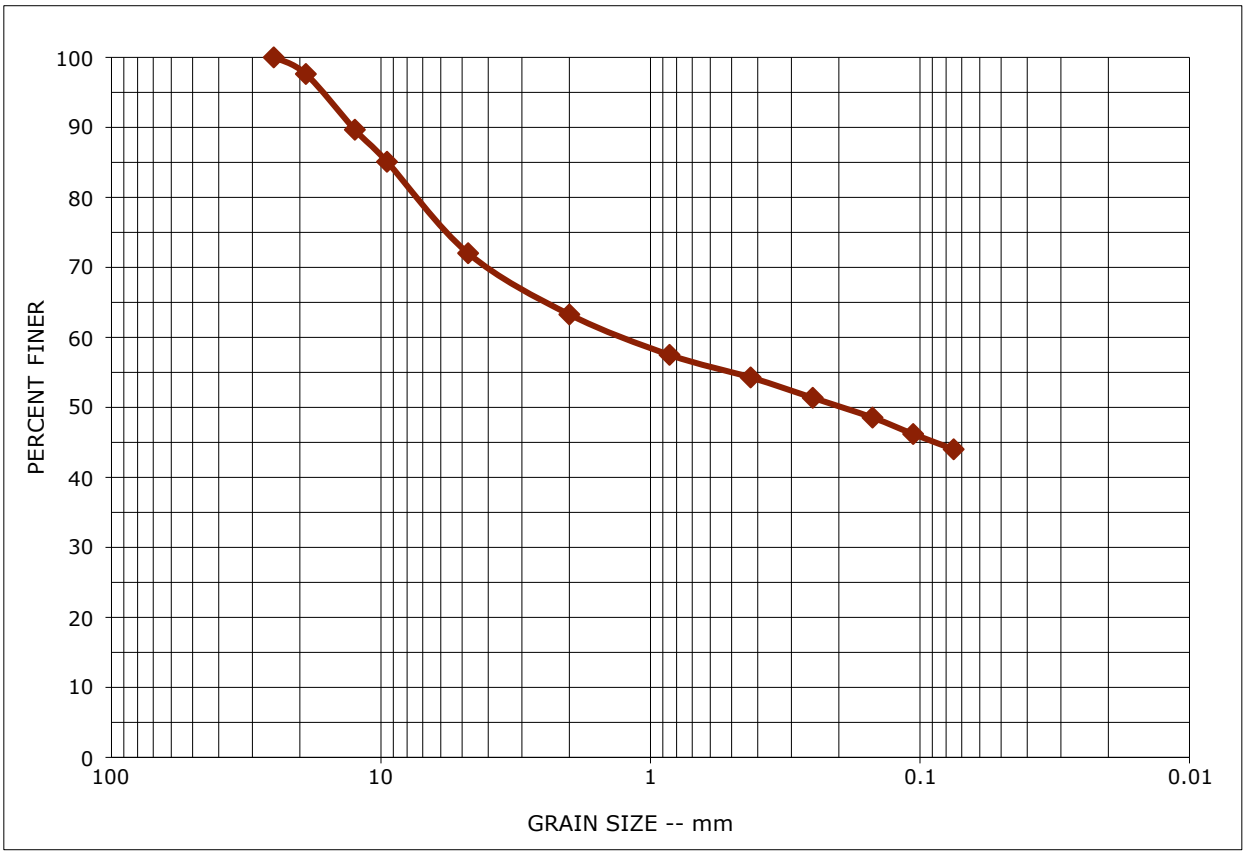
Particle-Size Distrubution of Soils Using Sieve Analysis

ASTM D6913 - Single Set Method



Boring ID	Depth (Ft.)	Description	USCS	% Cobbles	% Gravel	% Sand	% Fines
B-01	5 - 7.5	Clayey Sand with Gravel	SC	0.0	28.0	28.0	44.0

Sieve	% Finer	Sieve	% Finer	Coefficients	
5"		#20	57.5	C_C	
4"		#40	54.3		
3"		#60	51.4	C_U	
2"		#100	48.5		
1 1/2"		#140	46.2		
1"	100.0	#200	44.0		
3/4"	97.6	Grain Size		Remarks	
1/2"	89.7	D_{100}	25.000		
3/8"	85.1	D_{60}	1.231		
#4	72.0	D_{30}			
#10	63.3	D_{10}			

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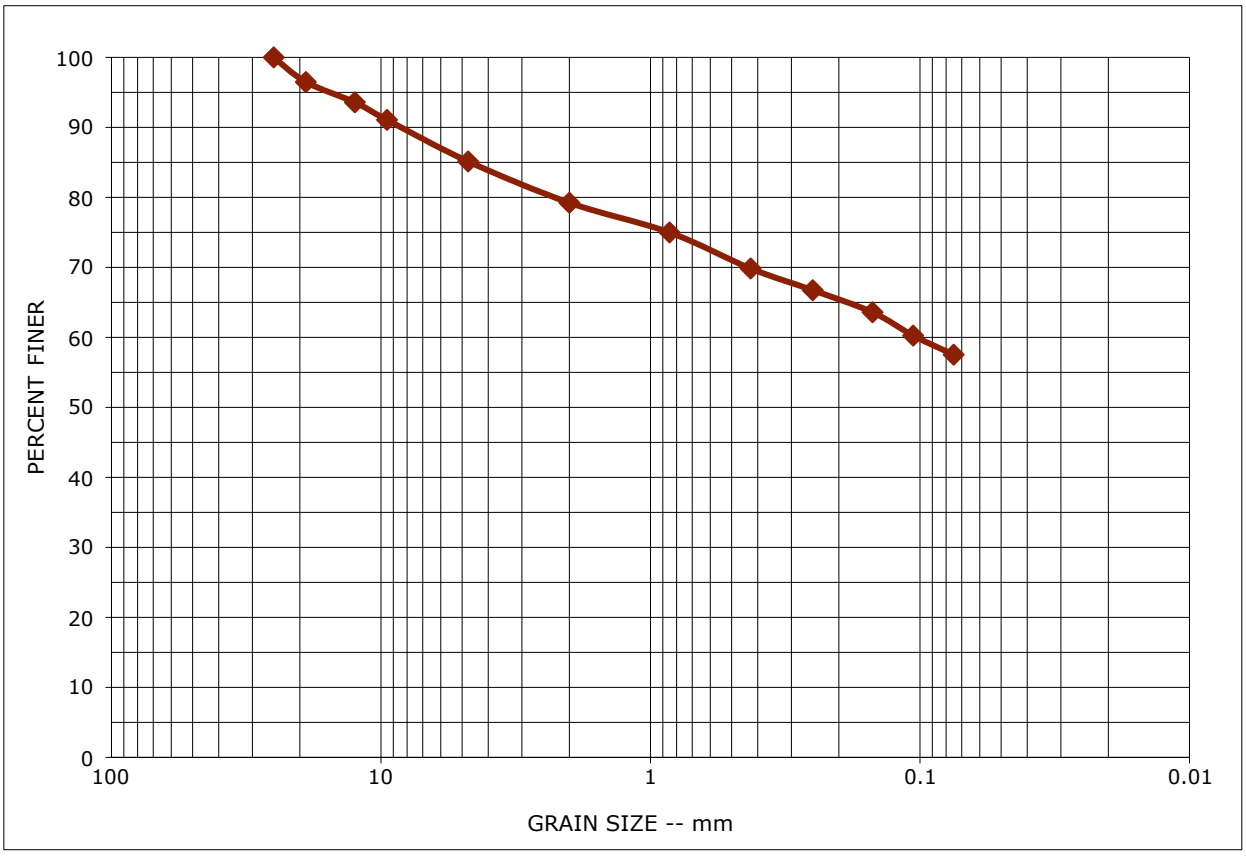
Particle-Size Distrubution of Soils Using Sieve Analysis

ASTM D6913 - Single Set Method



Boring ID	Depth (Ft.)	Description	USCS	% Cobbles	% Gravel	% Sand	% Fines
B-02	1 - 4.33	Sandy Lean Clay	CL	0.0	14.9	27.6	57.5

Sieve	% Finer	Sieve	% Finer	Coefficients	
5"		#20	75.0	C_C	
4"		#40	69.8		
3"		#60	66.7	C_U	
2"		#100	63.6		
1 1/2"		#140	60.3		
1"	100.0	#200	57.5		
3/4"	96.5	Grain Size		Remarks	
1/2"	93.6	D_{100}	25.000		
3/8"	91.1	D_{60}	0.103		
#4	85.1	D_{30}			
#10	79.2	D_{10}			

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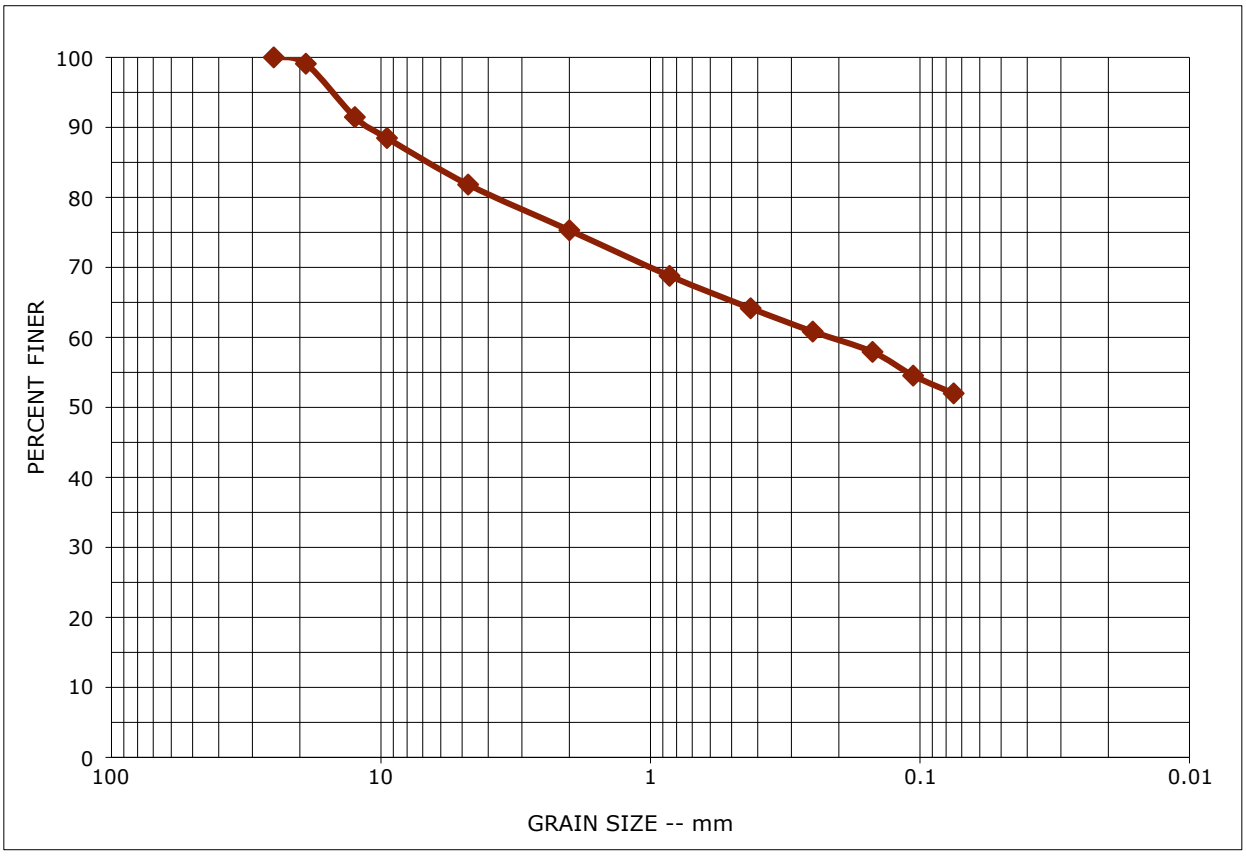
Particle-Size Distrubution of Soils Using Sieve Analysis

ASTM D6913 - Single Set Method



Boring ID	Depth (Ft.)	Description	USCS	% Cobbles	% Gravel	% Sand	% Fines
B-03	1 - 5	Sandy Lean Clay with Gravel	CL	0.0	18.2	29.8	52.0

Sieve	% Finer	Sieve	% Finer	Coefficients	
5"		#20	68.8	C_C	
4"		#40	64.2		
3"		#60	60.8	C_U	
2"		#100	57.9		
1 1/2"		#140	54.5		
1"	100.0	#200	52.0		
3/4"	99.1	Grain Size		Remarks	
1/2"	91.5	D_{100}	25.000		
3/8"	88.5	D_{60}	0.216		
#4	81.8	D_{30}			
#10	75.3	D_{10}			

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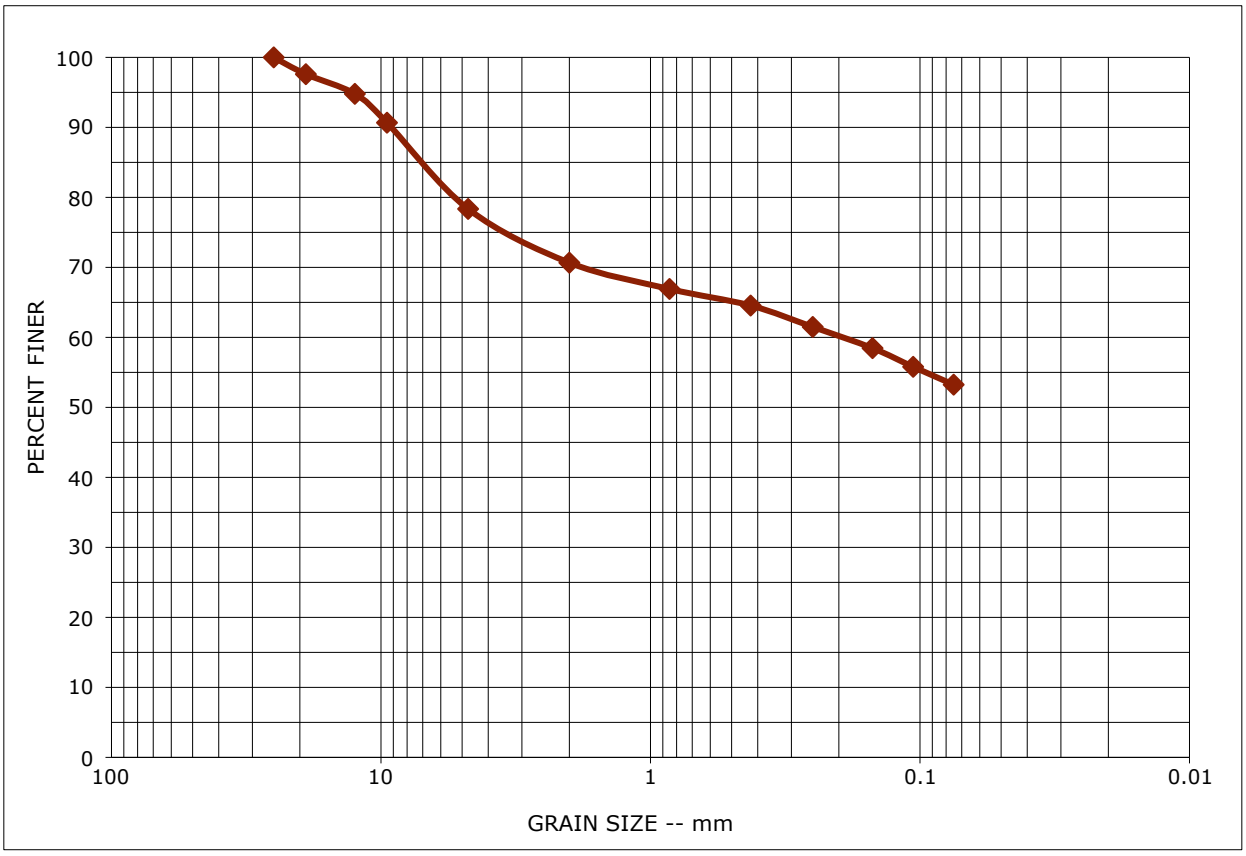
Particle-Size Distrubution of Soils Using Sieve Analysis

ASTM D6913 - Single Set Method



Boring ID	Depth (Ft.)	Description	USCS	% Cobbles	% Gravel	% Sand	% Fines
B-03	5 - 7.42	Sandy Fat Clay with Gravel	CH	0.0	21.7	25.1	53.2

Sieve	% Finer	Sieve	% Finer	Coefficients	
5"		#20	66.9	C_C	
4"		#40	64.5		
3"		#60	61.5	C_U	
2"		#100	58.5		
1 1/2"		#140	55.8		
1"	100.0	#200	53.2		
3/4"	97.6	Grain Size		Remarks	
1/2"	94.8	D_{100}	25.000		
3/8"	90.7	D_{60}	0.194		
#4	78.3	D_{30}			
#10	70.7	D_{10}			

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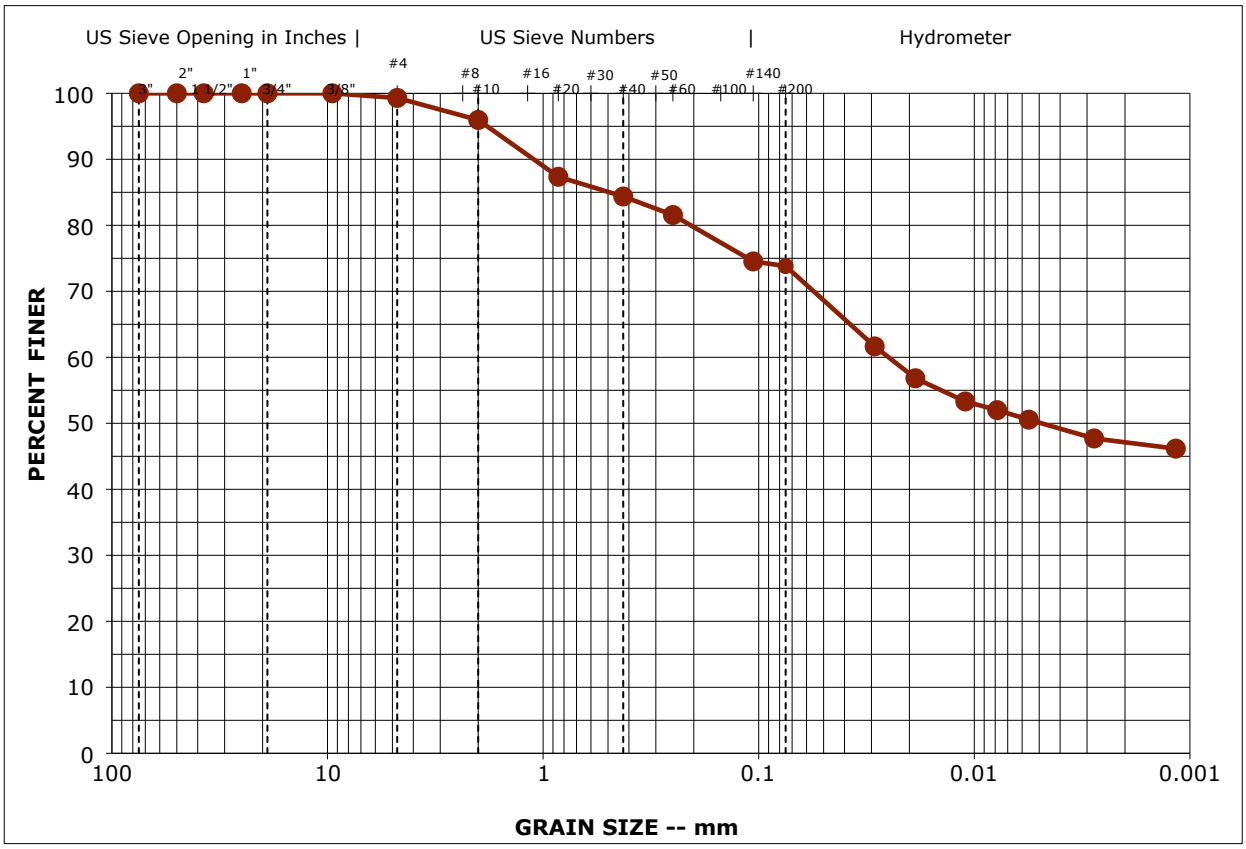
Particle-Size Distribution of Soils Using Sieve Analysis

ASTM D422-Method B



Boring ID	Depth (Ft.)	Description	USCS	Assumed Specific Gravity
B-04	1 - 5	Sandy Fat Clay	CH	2.65

% Cobbles	% Gravel	% Sand	% Fines	% Silt	% Clay
0.0	0.7	25.5	73.8	23.7	50.1

Sieve	% Finer	Sieve	% Finer
3"	100.0	#40	84.4
2"	100.0	#60	81.6
1 1/2"	100.0	#140	74.5
1"	100.0	#200	73.8
3/4"	100.0		
3/8"	100.0		
#4	99.3		
#10	96.0		
#20	87.4		

Grain Size		Coefficients	
D_{100}	9.500	C_C	
D_{60}	0.025		
D_{30}		C_U	
D_{10}			

Remarks

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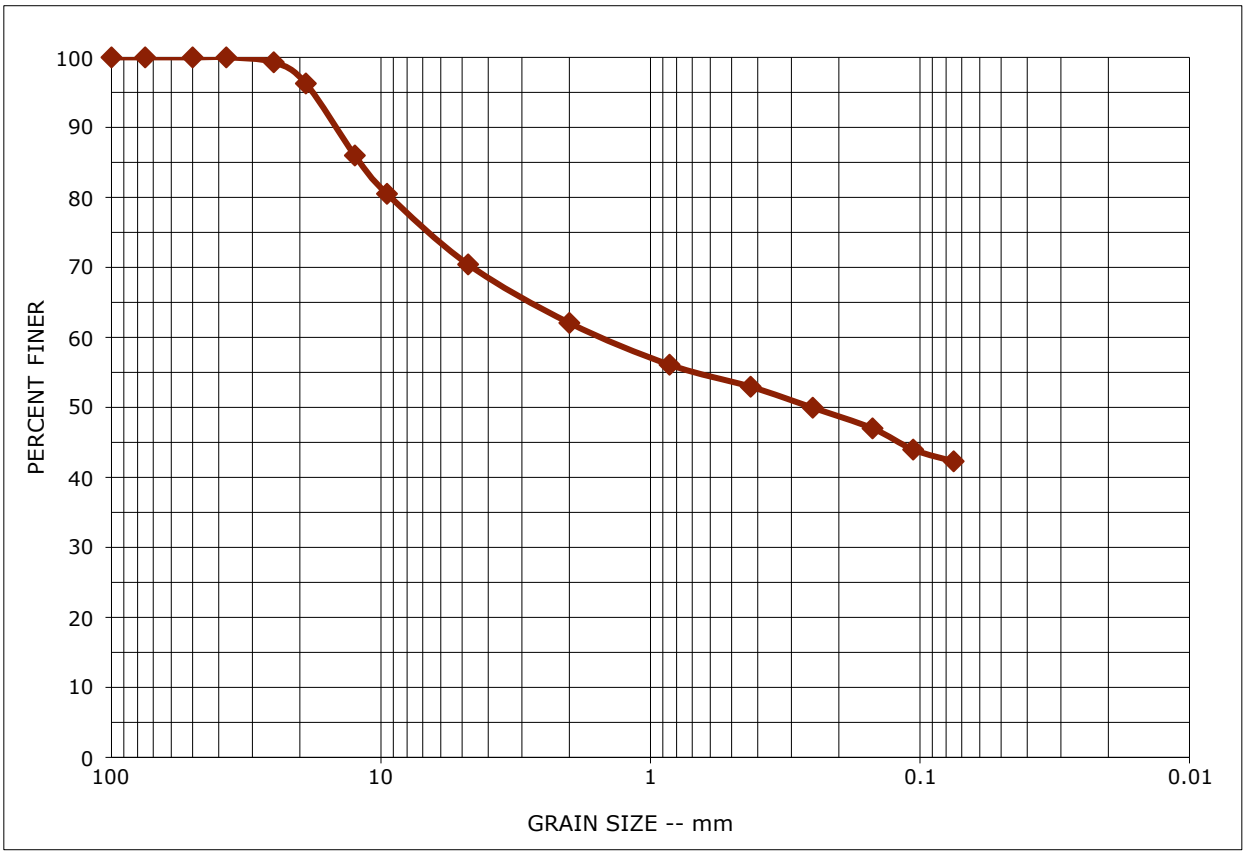
Particle-Size Distrubution of Soils Using Sieve Analysis

ASTM D6913 - Single Set Method



Boring ID	Depth (Ft.)	Description	USCS	% Cobbles	% Gravel	% Sand	% Fines
B-04	5 - 8.92	Clayey Gravel with Sand	GC	0.0	29.6	28.1	42.3

Sieve	% Finer	Sieve	% Finer	Coefficients	
5"	100.0	#20	56.1	C_C	
4"	100.0	#40	53.0		
3"	100.0	#60	50.0	C_U	
2"	100.0	#100	47.0		
1 1/2"	100.0	#140	44.0		
1"	99.3	#200	42.3		
3/4"	96.3	Grain Size		Remarks	
1/2"	86.0	D_{100}	37.500		
3/8"	80.5	D_{60}	1.487		
#4	70.4	D_{30}			
#10	62.1	D_{10}			

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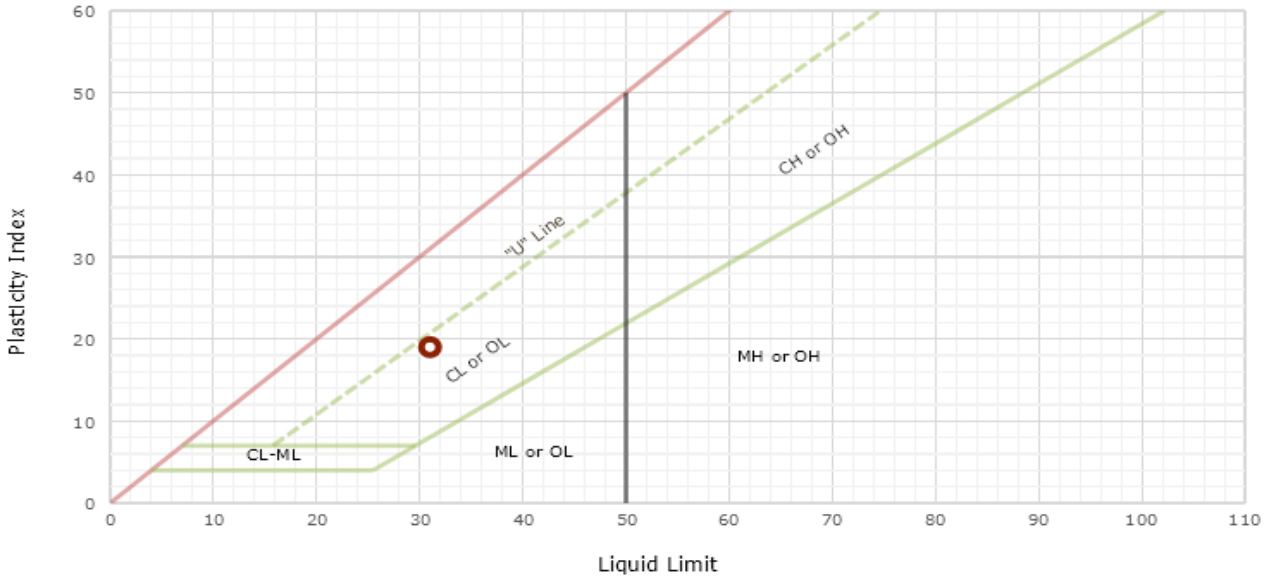
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-01	1-5	31	12	19	47	Clayey Sand with Gravel	SC

Remarks	

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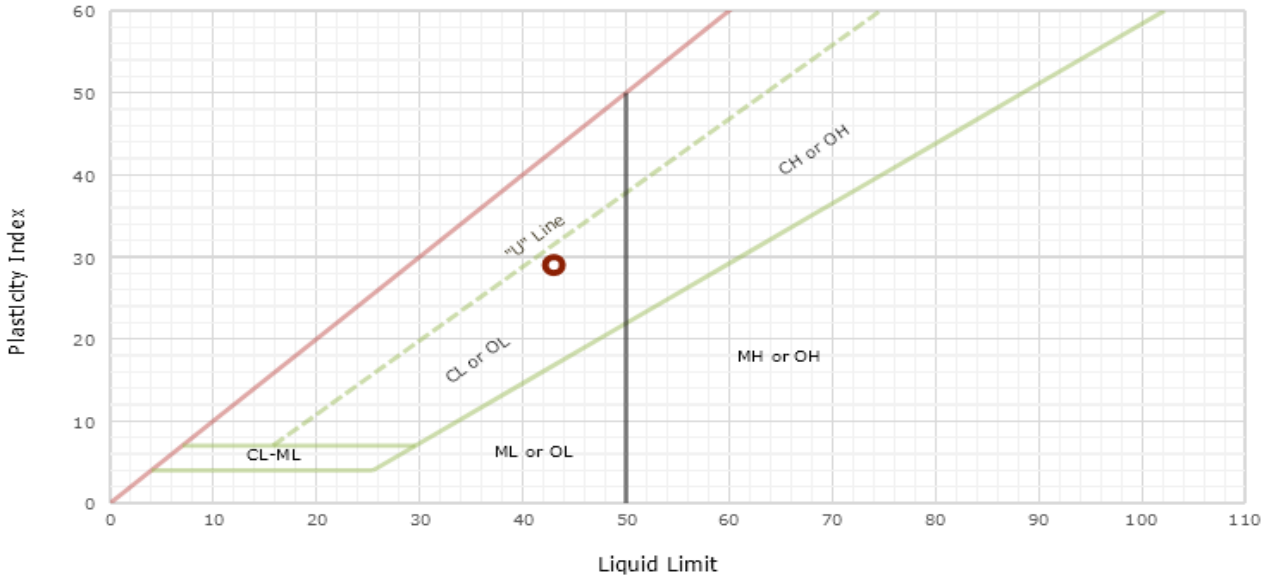
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-01	5-7.5	43	14	29	44	Clayey Sand with Gravel	SC

Remarks	

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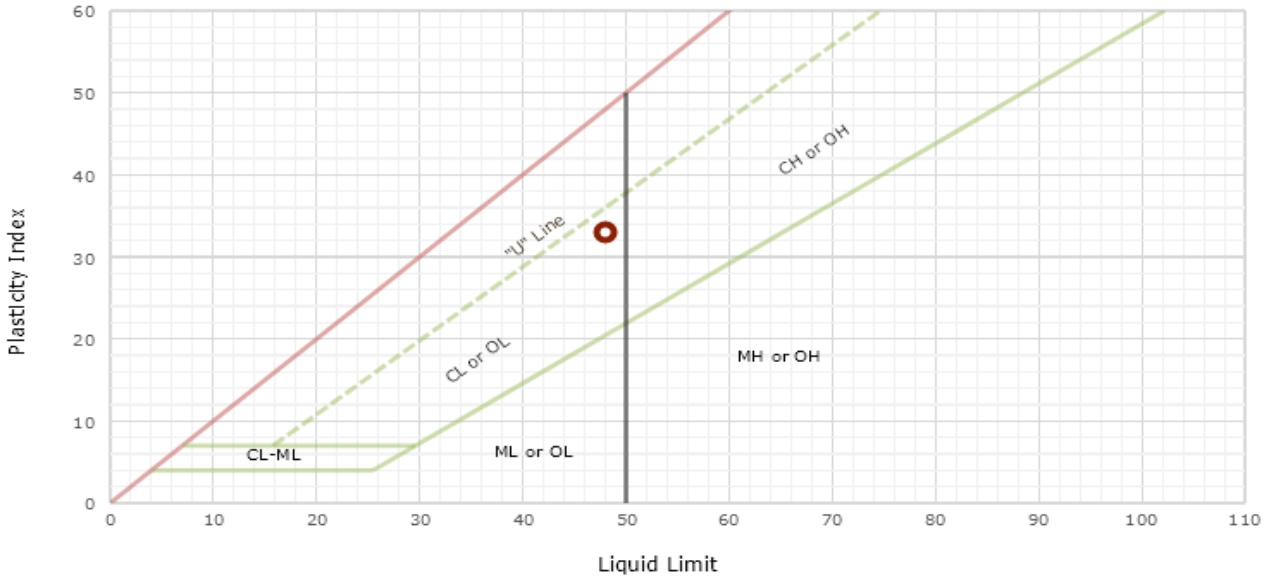
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-02	1-4.33	48	15	33	58	Sandy Lean Clay	CL

Remarks	

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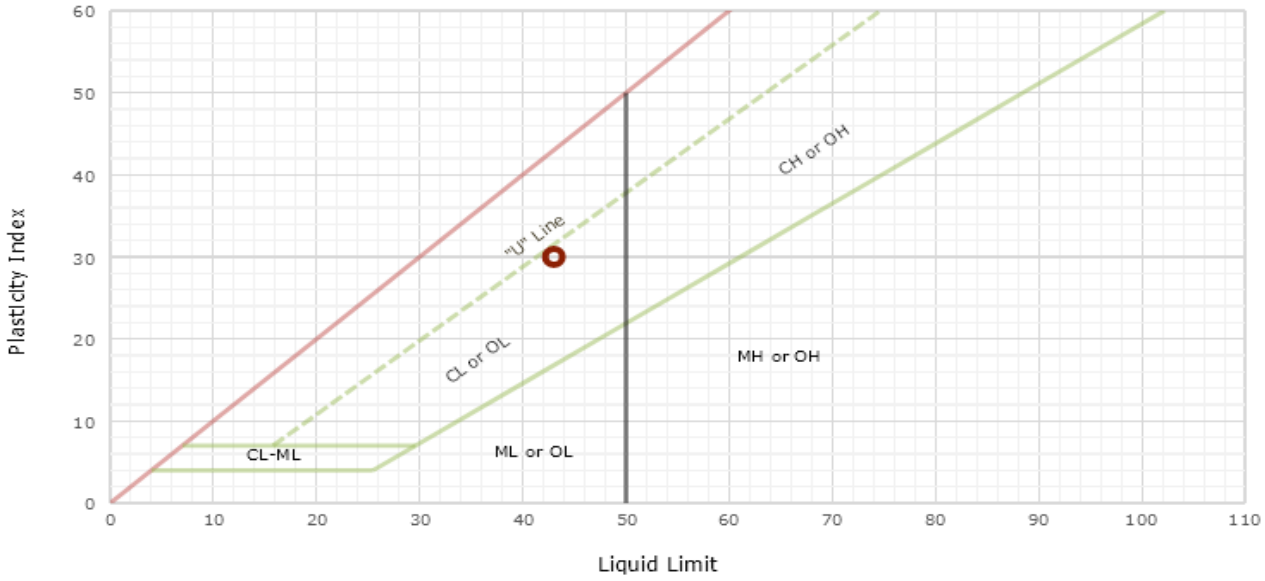
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-03	1-5	43	13	30	52	Sandy Lean Clay with Gravel	CL

Remarks	

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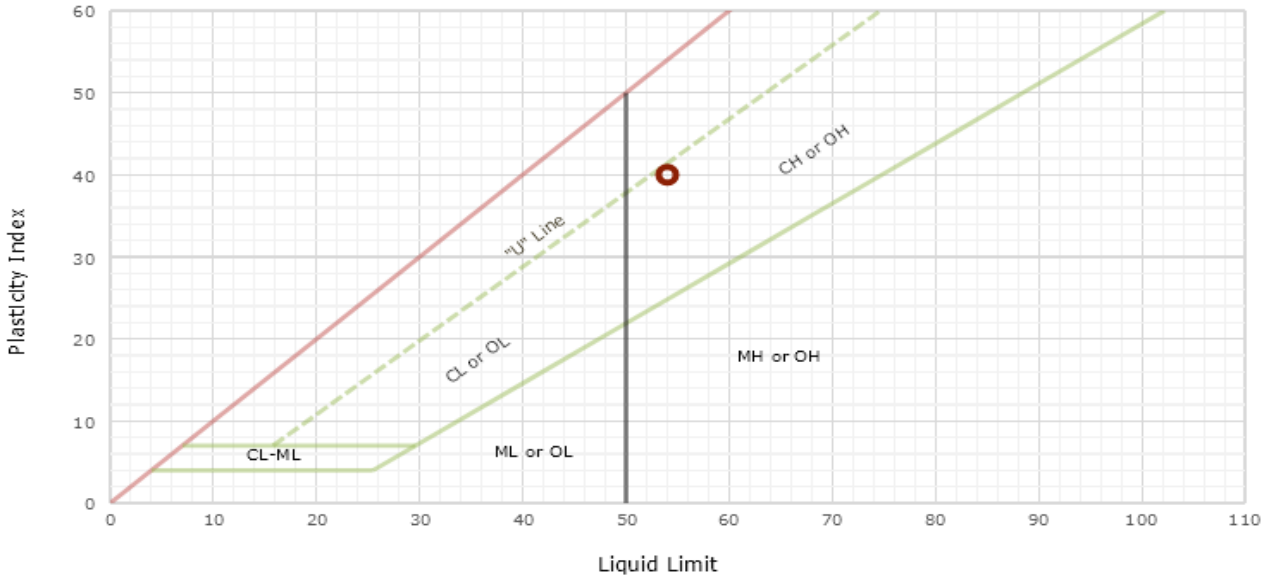
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-03	5-7.42	54	14	40	53	Sandy Fat Clay with Gravel	CH

Remarks	

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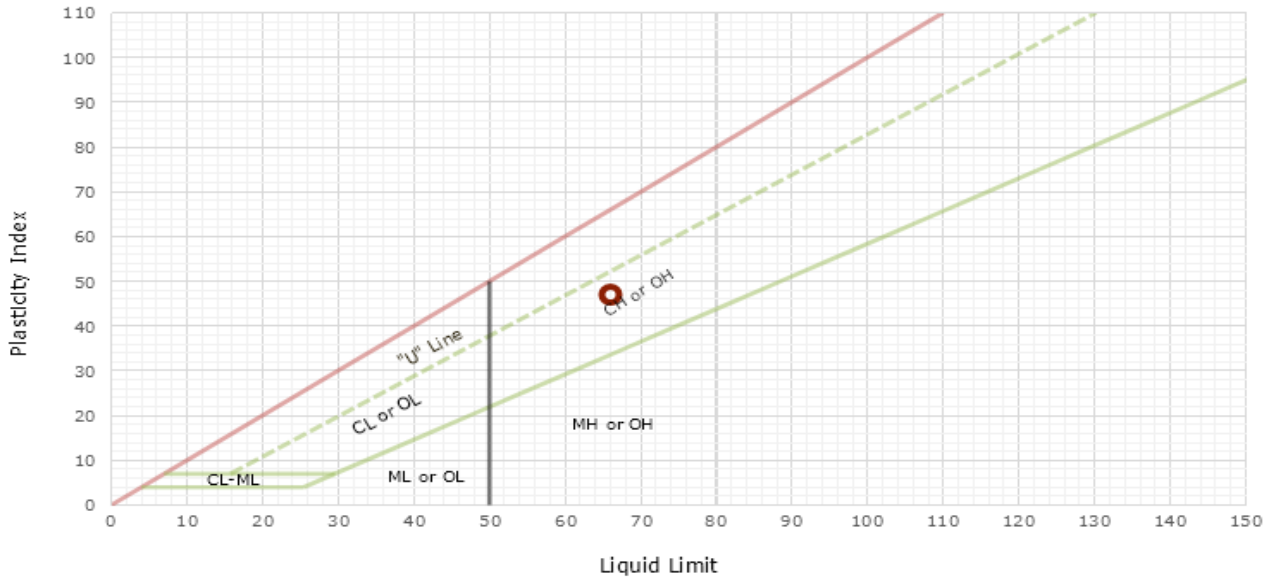
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-04	1-5	66	19	47	70	Sandy Fat Clay	CH

Remarks	

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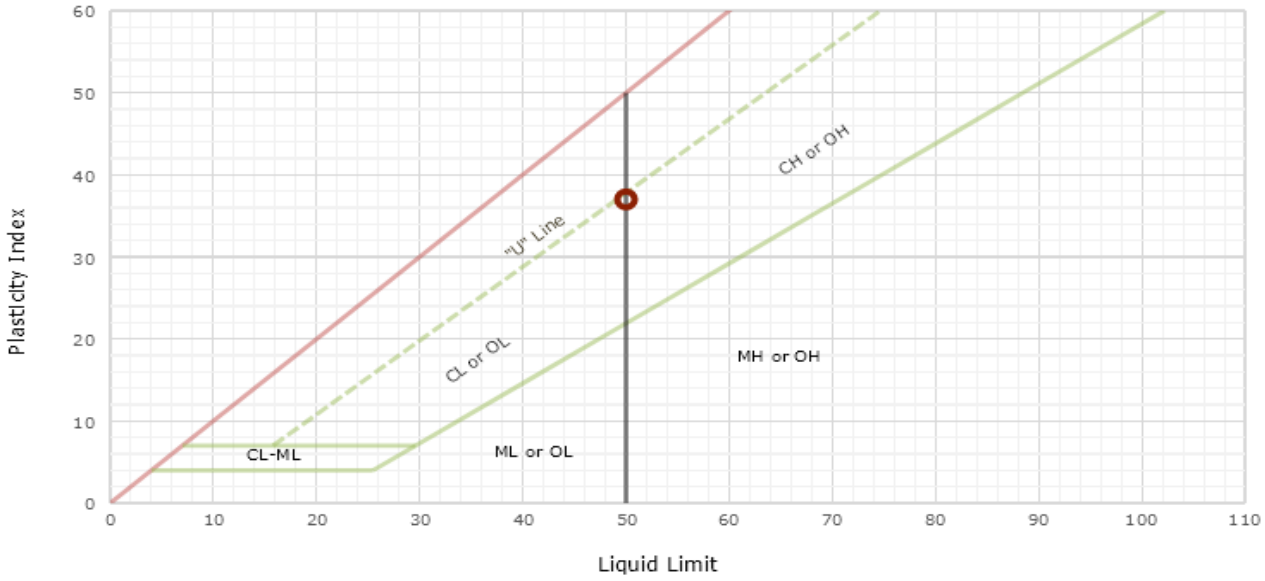
Liquid Limit, Plastic Limit and Plasticity Index of Soils

ASTM D4318



Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
B-04	5-8.92	50	13	37	42	Clayey Gravel with Sand	GC

Remarks	

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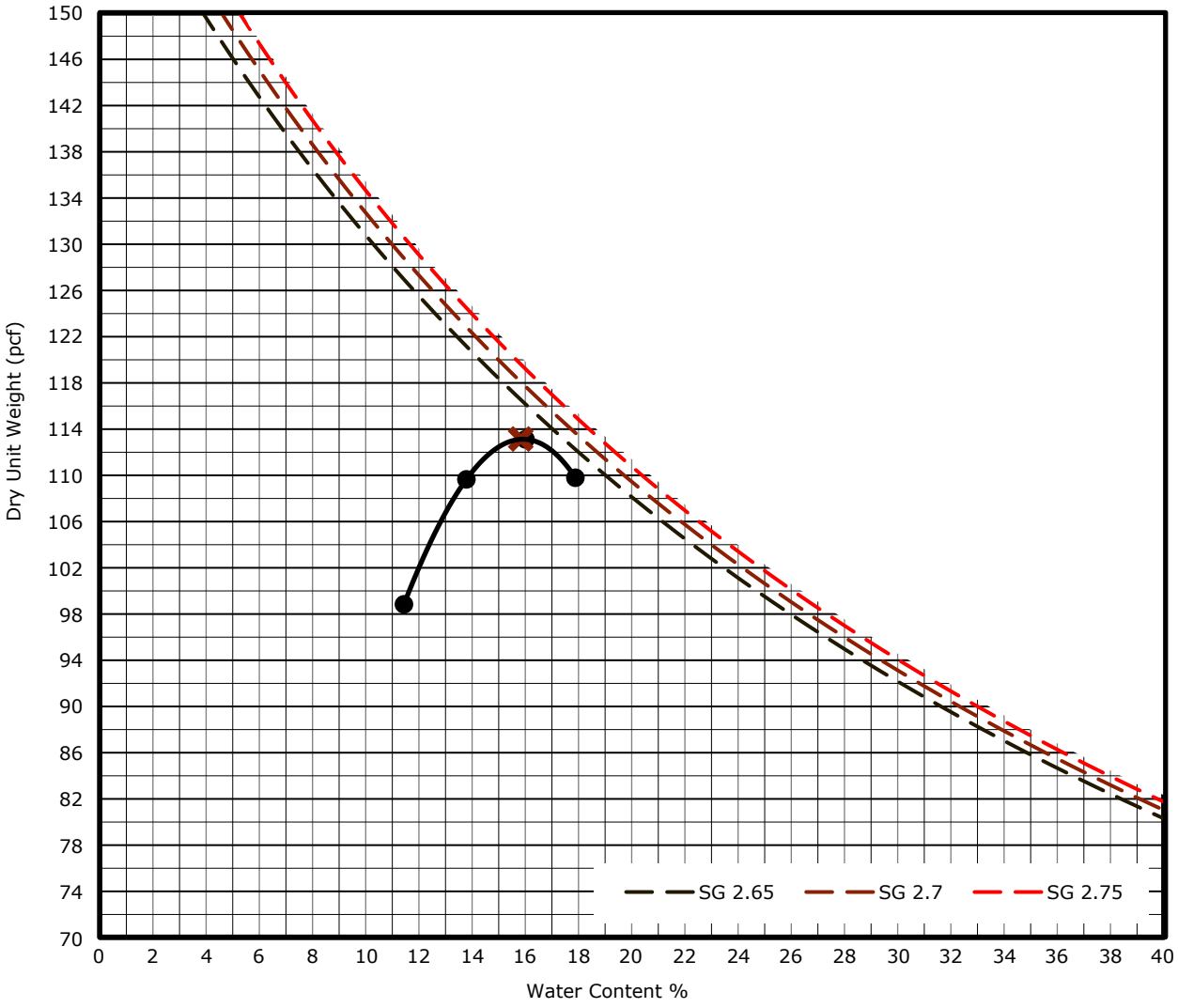
Laboratory Compaction Characteristics of Soil Using Standard Effort

ASTM D698



Boring ID	Depth (ft)	Description of Materials	USCS	Fines (%)	LL	PL	PI
B-01	1 - 5	Composite sample of B-01 @ 1-5 and B-01 @ 5-10	SC	47.3	31	12	19

Test Method	Sample Prep	Rammer	Maximum Dry Density (pcf)	Optimum Water Content (%)
C	Wet	Manual - Circular Face	113.1	15.8

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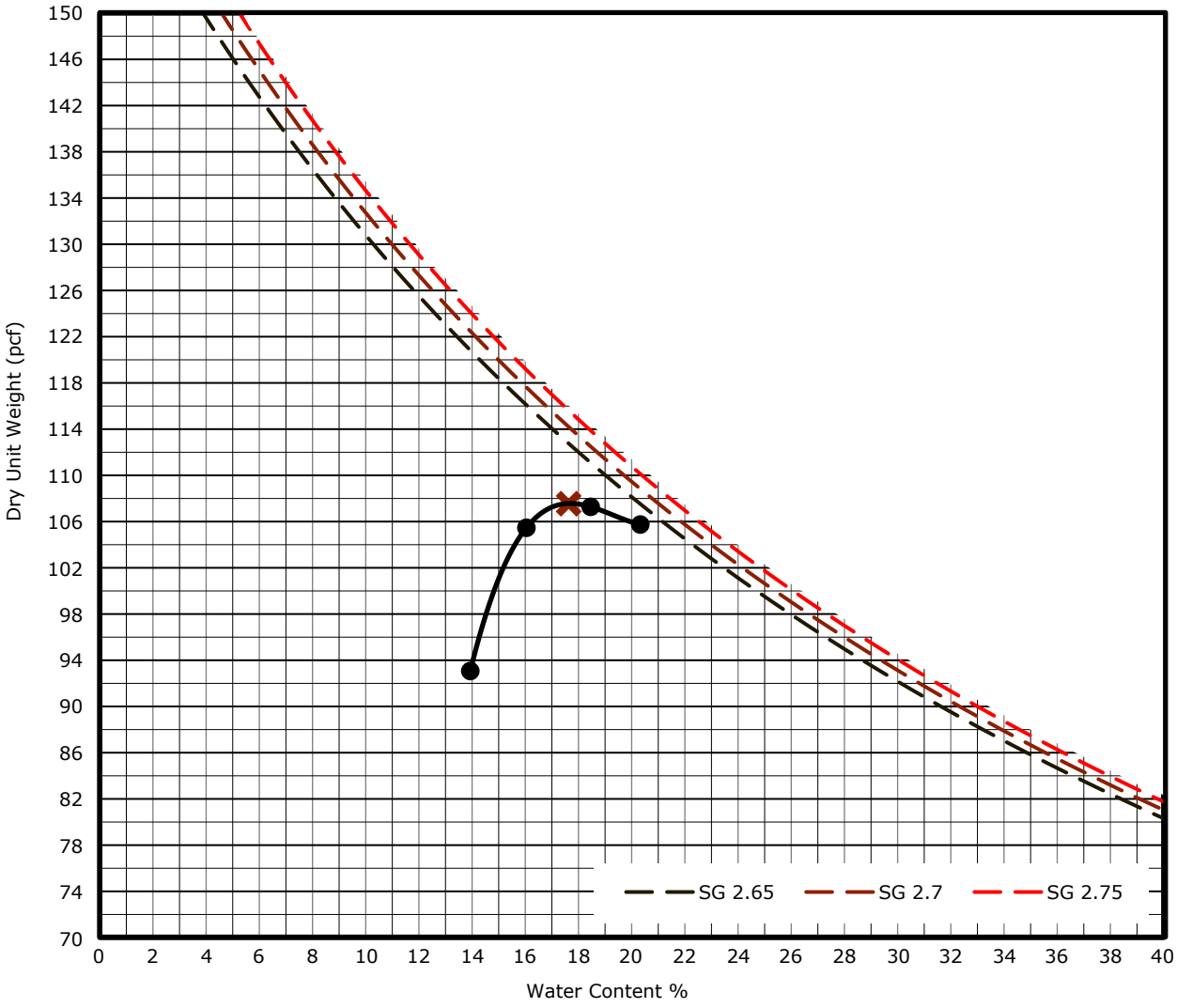
Laboratory Compaction Characteristics of Soil Using Standard Effort

ASTM D698



Boring ID	Depth (ft)	Description of Materials	USCS	Fines (%)	LL	PL	PI
B-04	1 - 5	Composite sample of B-04 @ 1-5 and B-04 @ 5-10	CH	69.7	66	19	47

Test Method	Sample Prep	Rammer	Maximum Dry Density (pcf)	Optimum Water Content (%)
C	Wet	Manual - Circular Face	107.5	17.6

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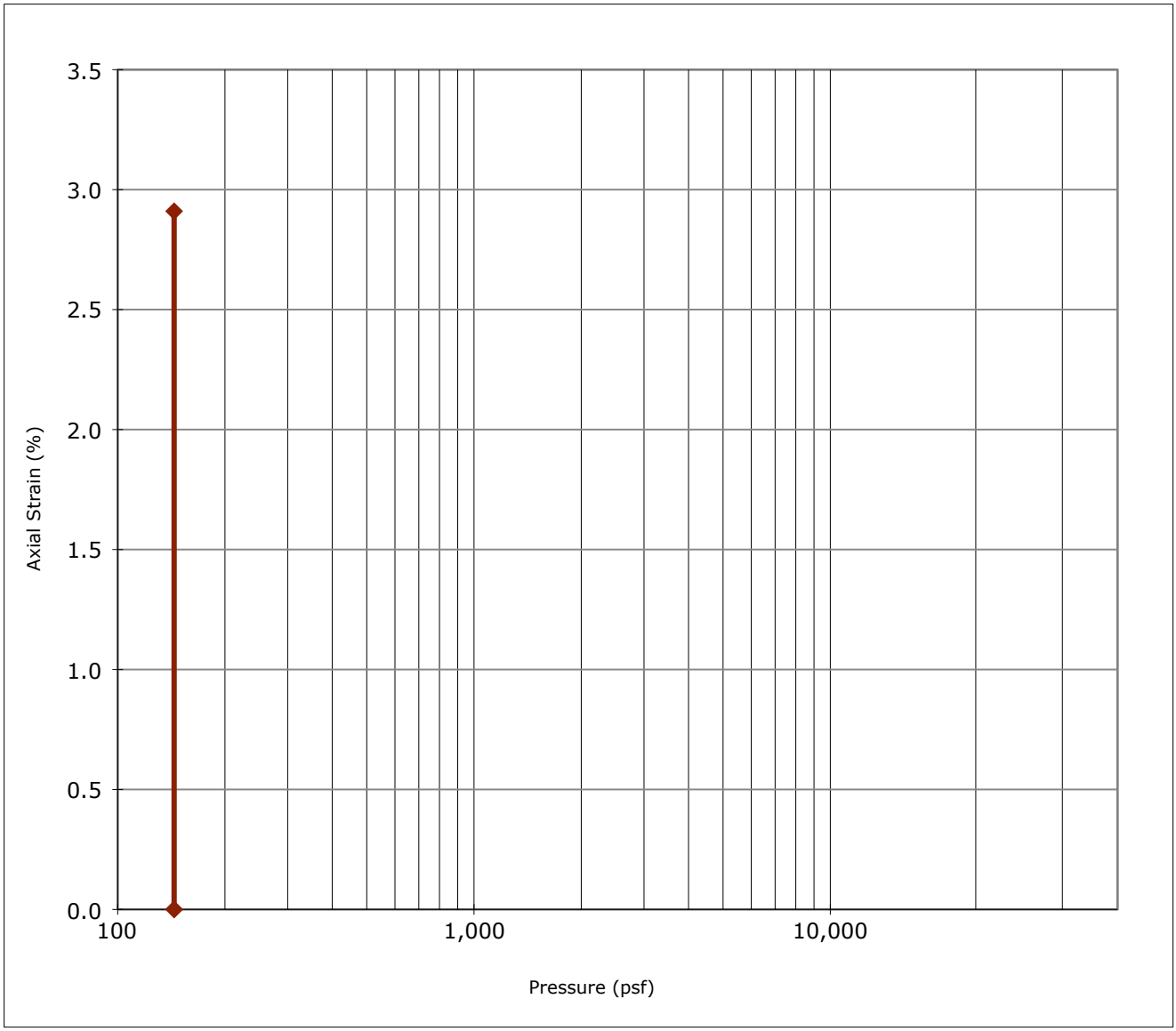
One-Dimensional Swell or Collapse of Soils

Denver Swell Method



Boring ID	Depth (Ft)	Material Description	USCS
B-01	1 - 5	Clayey Sand with Gravel	SC

Specimen Type	Initial Dry Density (pcf)	Initial Moisture (%)	Swell (%)
Remolded	99.5	17.6	2.9

Notes

For D698, D4546, and D1883: B-01 @ 1-5 was blended with B-01 @ 5-10. Remolded density and moisture content are based on rock corrected D698 values.

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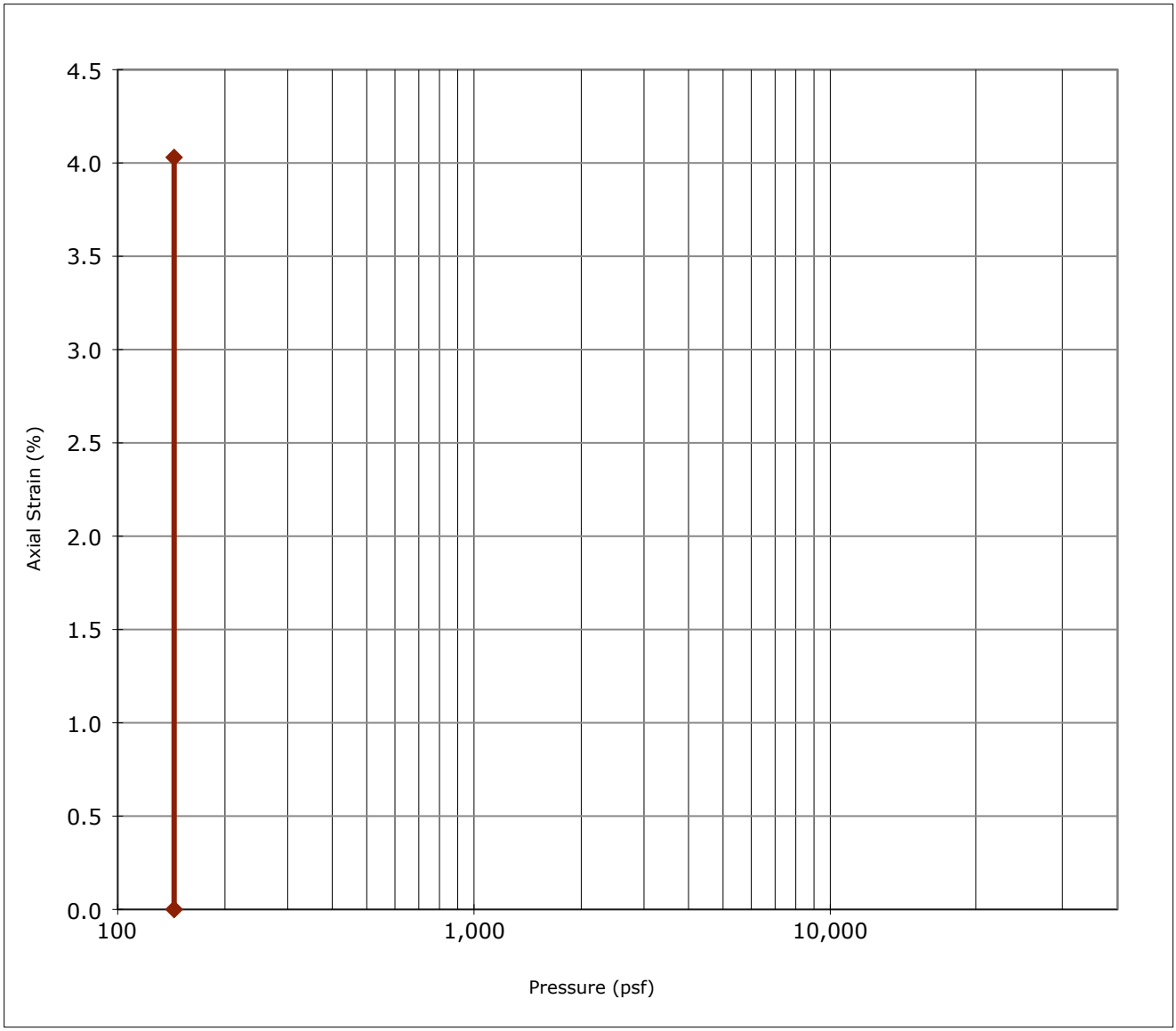
One-Dimensional Swell or Collapse of Soils

Denver Swell Method



Boring ID	Depth (Ft)	Material Description	USCS
B-04	1 - 5	Sandy Fat Clay	CH

Specimen Type	Initial Dry Density (pcf)	Initial Moisture (%)	Swell (%)
Remolded	95.4	19.0	4.0

Notes

For D698, D4546, and D1883: B-04 @ 1-5 was blended with B-04 @ 5-10. Remolded density and moisture content are based on rock corrected D698 values.

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Terracon Project No. 65245241

Terracon
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California Bearing Ratio

ASTM D1883 - 1 Point Method

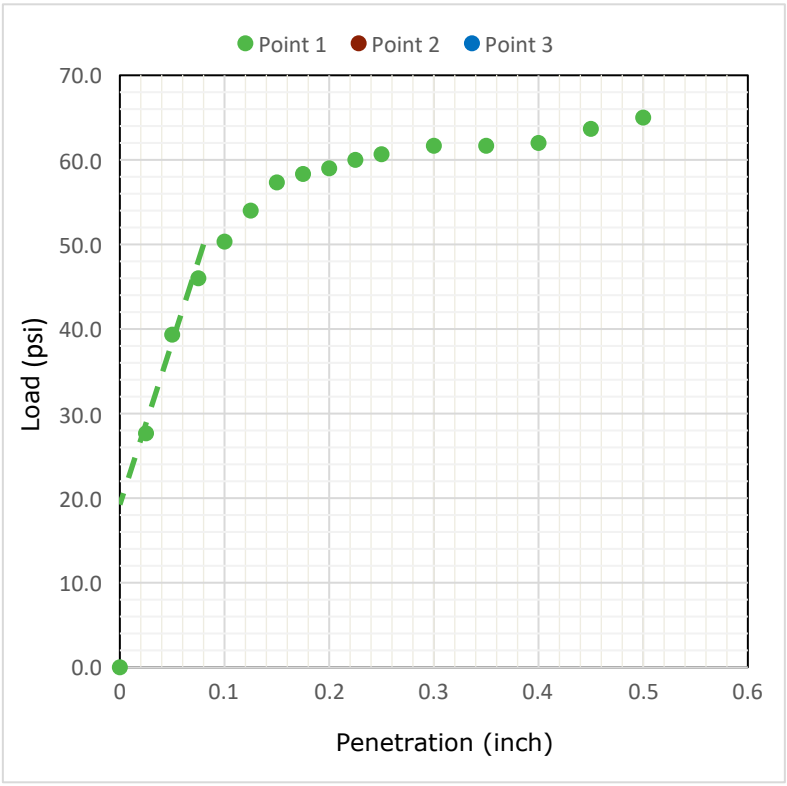
Sample Number:		Proctor Method:	ASTM D698 - Method C
Boring / Depth:	B-01 @ 1	Maximum Dry Density (pcf):	113.1
Sample Location:	Sedona Helicopter Six-Pack	Optimum Moisture:	15.8
Material Description:	Clayey Sand with Gravel	Liquid Limit:	31
		Plasticity Index:	19

CBR Test Method	1 Point

CBR TEST DATA	Point 1		
CBR Value at 0.100 inch	5.0		
CBR Value at 0.200 inch	3.9		
Surcharge Weight (lbs)	10	10	10
Soaking Condition	0		
Length of Soak (hours)	96		
Swell (%)			

DENSITY DATA	Point 1		
Density Before Soak (pcf)	107.5		
% Compaction	95.1		

MOISTURE DATA	Point 1		
Before Compaction	15.8%		
After Compaction	15.9%		
Top 1" After Soaking	19.6%		
Average After Soaking	0.0%		



Comments

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California Bearing Ratio

ASTM D1883 - 1 Point Method

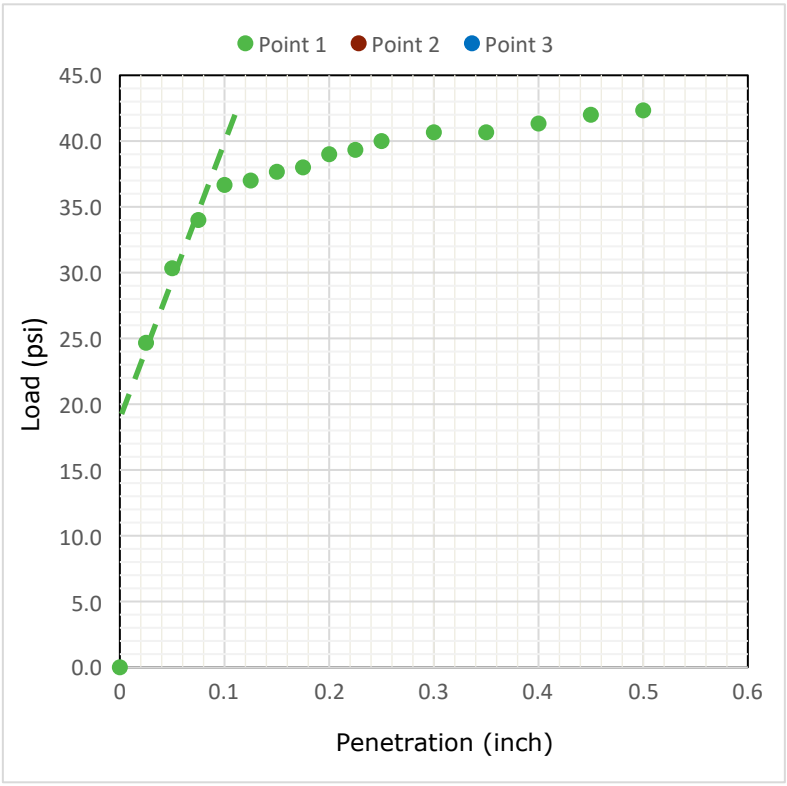
Sample Number:		Proctor Method:	ASTM D698 - Method C
Boring / Depth:	B-04 @ 1	Maximum Dry Density (pcf):	107.5
Sample Location:	Sedona Helicopter Six-Pack	Optimum Moisture:	17.6
Material Description:	Sandy Fat Clay	Liquid Limit:	66
		Plasticity Index:	47

CBR Test Method	1 Point

CBR TEST DATA	Point 1		
CBR Value at 0.100 inch	3.7		
CBR Value at 0.200 inch	2.6		
Surcharge Weight (lbs)	10	10	10
Soaking Condition	0		
Length of Soak (hours)	96		
Swell (%)			

DENSITY DATA	Point 1		
Density Before Soak (pcf)	102.3		
% Compaction	95.1		

MOISTURE DATA	Point 1		
Before Compaction	17.6%		
After Compaction	17.6%		
Top 1" After Soaking	23.7%		
Average After Soaking	0.0%		



Comments

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Density & Unit Weight of Soil Specimens

ASTM D7263

Sample Information	
Boring ID:	B-04
Boring Depth:	1
Sample ID:	0

Lab Testing Information	
Test Date:	12/30
Testing Tech:	ZW
Test Number:	-

LAB TEST DATA

Specimen Condition and Description

Type:	Intact
Shape:	Cylindrical

Visual Soil Classification	CH	Sandy Fat Clay

Moisture Content Determination (ASTM D2216 Method B)

Moisture Content Source:	Tested Specimen

Moisture (%)	22.4

RESULTS SUMMARY - Method B - Direct Measurement

Moist (Total) Density (g/cm^3)	Dry Density (g/cm^3)	Moist (Total) Unit Weight (lbf/ft^3)	Dry Unit Weight (lbf/ft^3)
1.771	1.447	110.6	90.3

Remarks

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Density & Unit Weight of Soil Specimens

ASTM D7263

Sample Information	
Boring ID:	B-04
Boring Depth:	5
Sample ID:	0

Lab Testing Information	
Test Date:	12/30
Testing Tech:	ZW
Test Number:	-

LAB TEST DATA

Specimen Condition and Description

Type:	Intact
Shape:	Cylindrical

Visual Soil Classification	GC	Clayey Gravel with Sand

Moisture Content Determination (ASTM D2216 Method B)

Moisture Content Source:	Tested Specimen

Moisture (%)	14.7

RESULTS SUMMARY - Method B - Direct Measurement

Moist (Total) Density (g/cm^3)	Dry Density (g/cm^3)	Moist (Total) Unit Weight (lbf/ft^3)	Dry Unit Weight (lbf/ft^3)
2.223	1.938	138.8	121.0

Remarks

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Density & Unit Weight of Soil Specimens

ASTM D7263

Sample Information	
Boring ID:	B-01
Boring Depth:	1
Sample ID:	0

Lab Testing Information	
Test Date:	12/30
Testing Tech:	ZW
Test Number:	-

LAB TEST DATA

Specimen Condition and Description

Type:	Intact
Shape:	0

Visual Soil Classification	SC	Clayey Sand with Gravel

Moisture Content Determination (ASTM D2216 Method B)

Moisture Content Source:	Tested Specimen

Moisture (%)	9.9

RESULTS SUMMARY - Method B - Direct Measurement

Moist (Total) Density (g/cm^3)	Dry Density (g/cm^3)	Moist (Total) Unit Weight (lbf/ft^3)	Dry Unit Weight (lbf/ft^3)
1.760	1.601	109.9	100.0

Remarks

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Density & Unit Weight of Soil Specimens

ASTM D7263

Sample Information	
Boring ID:	B-03
Boring Depth:	1
Sample ID:	0

Lab Testing Information	
Test Date:	12/30
Testing Tech:	ZW
Test Number:	-

LAB TEST DATA

Specimen Condition and Description

Type:	Intact
Shape:	Cylindrical

Visual Soil Classification	CL	Sandy Lean Clay with Gravel

Moisture Content Determination (ASTM D2216 Method B)

Moisture Content Source:	Tested Specimen

Moisture (%)	15.8

RESULTS SUMMARY - Method B - Direct Measurement

Moist (Total) Density (g/cm^3)	Dry Density (g/cm^3)	Moist (Total) Unit Weight (lbf/ft^3)	Dry Unit Weight (lbf/ft^3)
1.627	1.405	101.6	87.7

Remarks

sample came with big voids-MD run with somewhat packed voids

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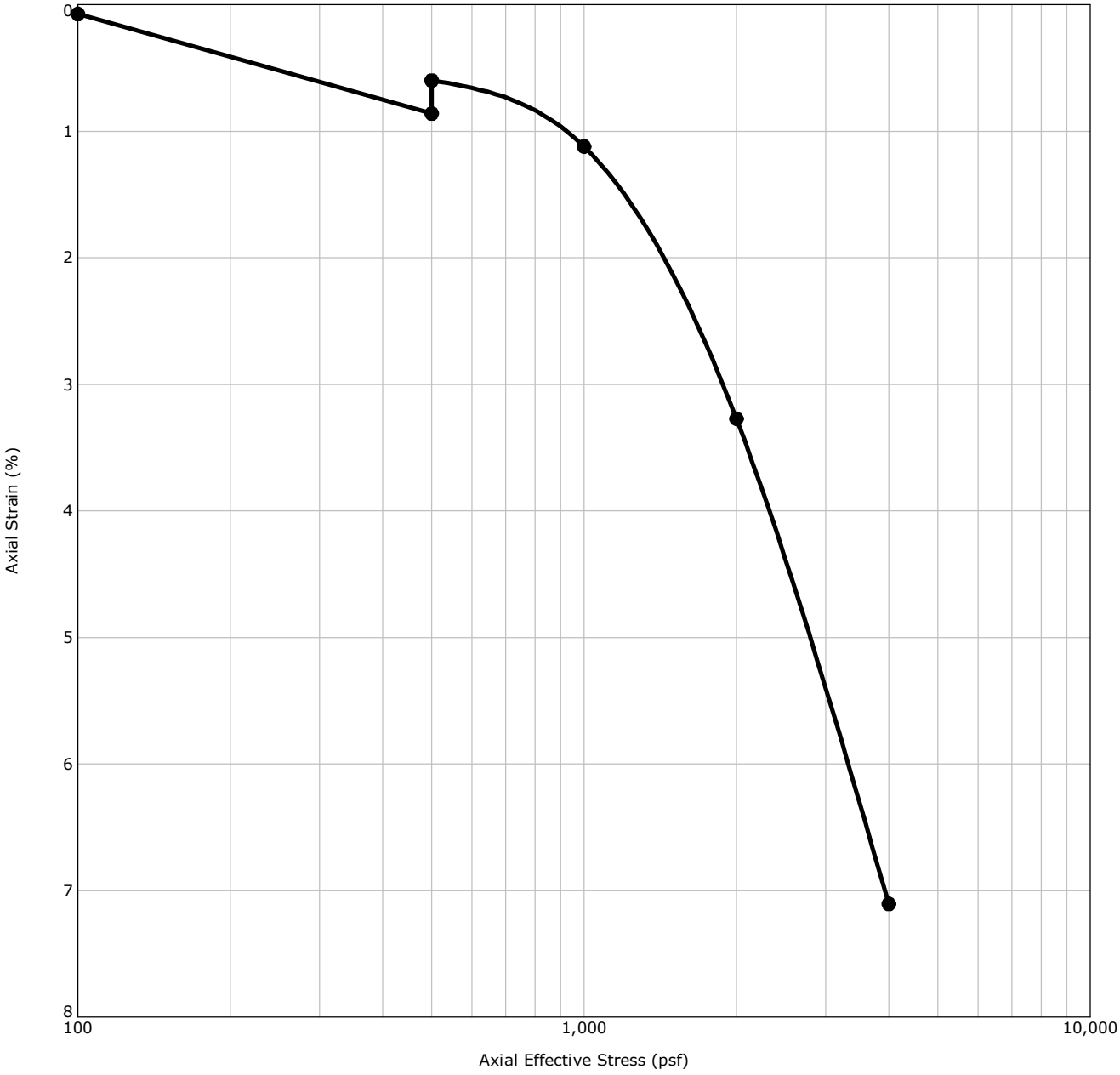
One-Dimensional Consolidation Test

D2435



Boring ID	Depth (Ft)	Specimen #	Material Description	USCS	AASHTO
B-01	1 - 2		CLAYEY SAND(SC)	SC	A-6

Natural		Initial Dry Density (pcf)	LL	PI	Specific Gravity	Overburden (psf)	P_c (psf)	C_c (% / log stress)	C_r (% / log stress)	Initial Void Ratio
Saturation (%)	Moisture (%)									
	19.6	96.5	31	19		144				

Notes:

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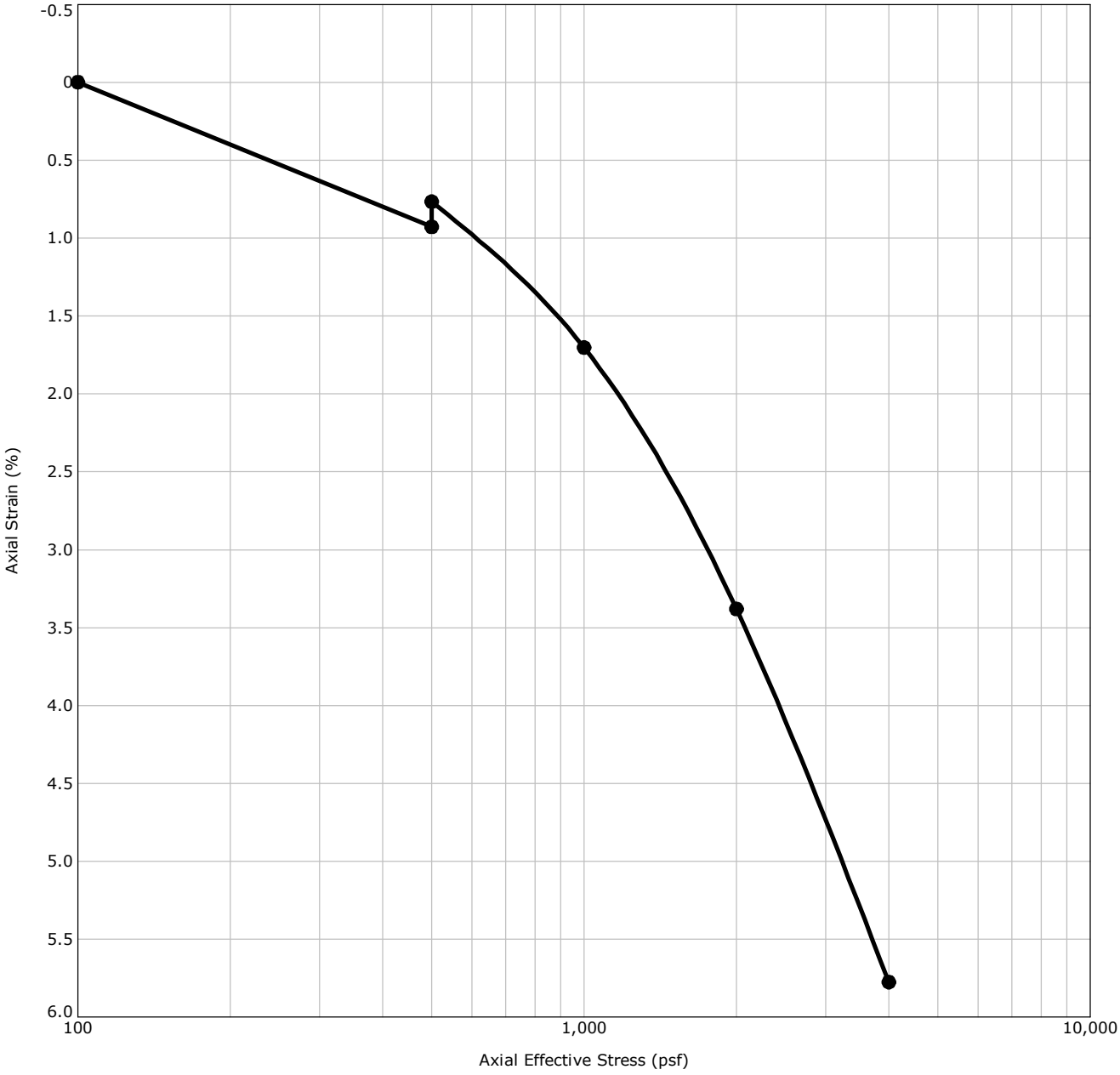
One-Dimensional Consolidation Test

D2435



Boring ID	Depth (Ft)	Specimen #	Material Description	USCS	AASHTO
B-04	1 - 2		SANDY FAT CLAY(CH)	CH	A-7-6

Natural		Initial Dry Density (pcf)	LL	PI	Specific Gravity	Overburden (psf)	P_c (psf)	C_c (% / log stress)	C_r (% / log stress)	Initial Void Ratio
Saturation (%)	Moisture (%)									
	21.2	99.0	66	47		144				

Notes:

Supporting Information

Contents:

Note: All attachments are one page unless noted above.

General Notes

Sampling			Water Level	Field Tests	
Auger Cuttings	Modified California Ring Sampler	Rock Core	Water Initially Encountered	N	Standard Penetration Test Resistance (Blows/Ft.)
Dynamic Cone Penetrometer	Modified Dames & Moore Ring Sampler	Dual Sampler SPT	Water Level After a Specified Period of Time	(HP)	Hand Penetrometer
Grab Sample	GeoProbe Macro Core or Large Bore	No Recovery	Water Level After a Specified Period of Time	(T)	Torvane
Ring Sampler	Shelby Tube	Standard Penetration Test	Cave In Encountered	(DCP)	Dynamic Cone Penetrometer
Split Spoon	Texas Cone Penetrometer	Vane Shear	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.	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		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		
Relative Density	**Standard Penetration or N-Value (Blows/Ft.)**	**Consistency**	**Unconfined Compressive Strength Qu (tsf)**	**Standard Penetration or N-Value (Blows/Ft.)**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	5 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	9 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	16 - 30
		Hard	> 4.00	> 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. 200 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.