

Carvana - Fountain, CO – New Parking Area

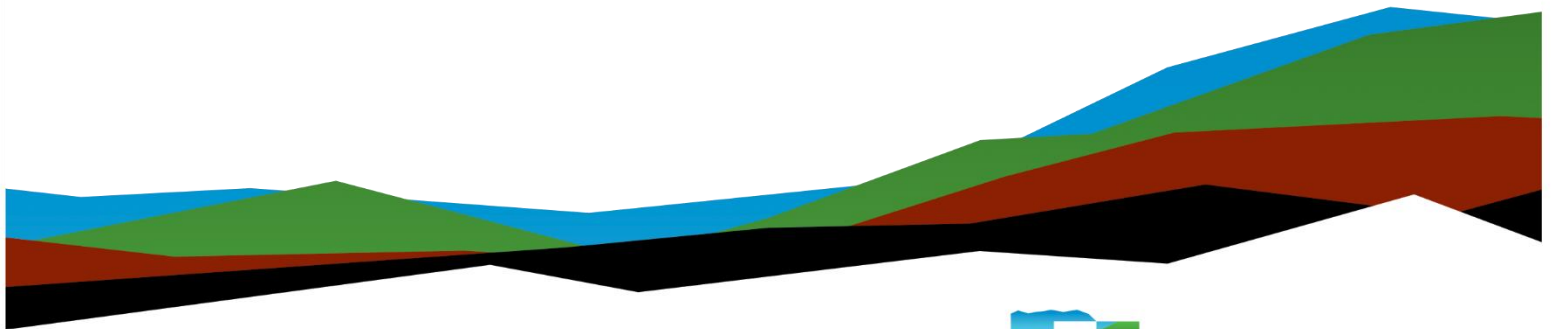
Geotechnical Engineering Report

South Charter Oak Ranch Road and Champlin Drive

May 22, 2026 | Terracon Project No. 23265036A

Prepared for:

ATWELL, LLC
5847 50th Street
Lubbock, Texas 79424



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Re: Geotechnical Engineering Report
Carvana - Fountain, CO – New Parking Area
Northwest of South Charter Oak Ranch Road and Champlin Drive
Fountain, Colorado
Terracon Project No. 23265036A


Mr. Georges:

We have completed the scope of Geotechnical Engineering services for the project referenced above in general accordance with Purchase Order No. 20260783 dated April 13, 2026, which incorporates Terracon Proposal No. P23265036A dated April 2, 2026. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and pavements 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



Nick M. Novotny, P.G., C.E.G.
Geotechnical Department Manager



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Regional Geotechnical Manager

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Supporting Information

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.

Report Summary

Topic ¹	Overview Statement ²
<p>Project Description</p>	<p>We understand the proposed project consists of the design and construction of a new parking area and access roads. The southern access road will include a new bridge to connect this site to the existing Carvana facility to the south. We also understand new below-grade detention tanks are planned in the southeastern portion of the new parking lot.</p>
<p>Geotechnical Characterization</p>	<p>Subsurface conditions encountered in the exploratory borings generally consisted of about 3 to 8 inches of topsoil. About 4½ inches of asphalt was encountered exclusively in Boring No. P-7. Existing fill material consisting of clay with varying amounts of sand was encountered at Boring Nos. P-3, P-5, P-6, and P-7 below the topsoil or asphalt to depths of about 2 to 4 feet below ground surface (bgs). Below the topsoil and existing fill materials, native soils consisting of clay with varying amounts of sand and silt, and sand with varying amounts of clay, silt, and gravel were encountered to the maximum depths explored in Boring Nos. P-1 to P-7 of about 7 to 10 feet below ground surface (bgs). Claystone bedrock was encountered at depths of about 7 to 8 feet in Boring Nos. BC-1 and DT-1 below the native sand soils to the maximum depths explored of about 20 to 40 feet bgs.</p> <p>Groundwater was not encountered in the exploratory borings at the time of our exploration to the maximum depths explored of about 40 feet bgs.</p>
<p>Existing Fill Materials</p>	<p>Up to about 4 feet of fill materials were encountered in portions of the site. Pavements constructed on the on-site existing fill materials will have a moderate risk of movement. To improve performance, we recommend pavement subgrades be over-excavated to a depth of at least 1 foot, moisture conditioned, and recompacted to grade.</p>
<p>Excavation Considerations</p>	<p>We anticipate excavations for the proposed improvements can be accomplished with conventional earthmoving equipment; however, specialized heavy-duty equipment capable of ripping or jack hammering may be required for bedrock excavation to facilitate rock breakup and removal, particularly in the area of the proposed below-grade tanks. Consideration should be given</p>

Topic ¹	Overview Statement ²
	to obtaining a unit price for difficult excavation in the contract documents for the project.
Expansive Soils and Bedrock	<p>Laboratory testing indicates the clay fill materials, native clay soils, and claystone bedrock have low to moderate expansive potential. The native sand soils are considered to be non-expansive.</p> <p>This report provides recommendations to help mitigate the effects of soil and bedrock shrinkage and expansion. However, even if these procedures are followed, some movement and cracking in the pavements and flatwork should be anticipated. The severity of pavement cracking and other damage such as uneven slabs will likely increase if any modification of the site results in excessive wetting or drying of the expansive soils and bedrock.</p>
Foundation Recommendations	Based on our engineering analysis, we recommend the proposed box culvert be constructed on a zone of new engineered fill provided the owner can accept the associated risk of movement.
Pavements	Pavements constructed on the on-site existing fill materials and expansive materials will have a moderate risk of movement. To improve performance, we recommend pavement subgrades be over-excavated to a depth of at least 1 foot, moisture conditioned, and recompacted to grade.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed Carvana - Fountain, CO – New Parking Area to be located Northwest of the intersection of South Charter Oak Ranch Road and Champlin Drive in Fountain, Colorado. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface conditions
- Groundwater conditions
- Earthwork
- Grading and drainage
- Foundation design and construction
- Seismic site classification
- Lateral earth pressures
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of nine test borings (designated as Boring Nos. BC-1, DT-1, and P-1 to P-7) to depths ranging from approximately 5 to 40 feet below existing site grades, laboratory testing, geotechnical analysis, and preparation of this report. Exploratory Boring No. BC-2 was originally proposed as part of our field exploration for this project to the south of the proposed box culvert. However, due to access constraints, this boring location was not accessible.

Plans 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 and bedrock samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the [Exploration Results](#) section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. Our final understanding of the project conditions is as follows:

Item	Description
Information Provided	<p>An email request for proposal was received from ATWELL on March 30, 2026. The request included general project information for improvements to the north of the existing Carvana facility in Fountain, Colorado.</p> <ul style="list-style-type: none"> ■ Carvana Fountain CO – Concept Site Plan.pdf
Project Description	<p>We understand the proposed project consists of the design and construction of a new parking area and access roads. The southern access road will include a new bridge to connect this site to the existing Carvana facility to the south. We also understand new below-grade detention tanks are planned in the southeastern portion of the new parking lot.</p>
Proposed Construction	<p>We anticipate the new bridge will be a mutli-cell concrete box culvert with cast-in-place concrete wing walls.</p> <p>We anticipate new detention tanks will be of galvanized steel construction.</p>
Grading/Slopes	<p>A grading plan was not available at the time of this report. We anticipate cuts and fills on the order of about 5 feet (+/-) max to achieve final site grades.</p>
Excavation Depth	<p>2.5 feet for frost-depth foundations and up to about 15 feet for the proposed detention tanks.</p>
Below-Grade Structures	<p>New underground detention tanks are planned at the southeast portion of the site. The proposed detention tanks are anticipated to be and about 10 feet in diameter, installed to a depth of about 14 feet below finished grade.</p>
Wing Walls	<p>We anticipate wing walls for the proposed box culvert will be on the order of about 10 to 15 feet in height. The proposed wing walls will likely consist of cast-in-place concrete cantilever retaining walls on a spread footing foundation system.</p>

Item	Description
Pavements	<p>New pavements will likely consist of flexible asphalt and rigid concrete pavement. Traffic loads were not available at the time of this proposal. We will assume traffic loads consistent with that of similar use. Unless information is provided prior to the report, we assume that the traffic classification will consist of:</p> <ul style="list-style-type: none"> ■ Automobile Parking: Parking stalls for passenger vehicles and pickup trucks ■ Main Traffic Corridors: Traffic consisting of passenger vehicles, single-unit delivery trucks, fire trucks, and garbage trucks <p>The pavement design period is 20 years.</p>
Building Code	2021 International Building Code (IBC)

Terracon should be notified if any of the above information is inconsistent with the planned construction, particularly the assumed grading efforts, as revised and/or additional geotechnical recommendations may be required.

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	<p>The project is located northwest of the intersection of South Charter Oak Ranch Road and Champlin Drive in Fountain, Colorado.</p> <p>Latitude/Longitude (approximate): 38.6817°N, 104.7179°W See Site Location</p>
Existing Improvements	The site is currently undeveloped. An existing transmission line borders the site to the adjacent east.
Current Ground Cover	Ground cover at the site currently consists of light to moderate vegetation and barren ground.
Existing Topography	The site slopes down to the south and east with an elevation difference of about 60 feet. A steep sloped drainage feature is present at the southern portion of the site. This drainage feature appears to connect runoff from Fort Carson to the west to Fountain Creek to the east.

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 noted in [General Comments](#), the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Subsurface Profile

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	Topsoil	About 3 to 8 inches thick
2	Asphalt	About 4.5 inches thick
3	Fill	Existing fill materials consisting of clay soils with varying amounts of sand; various stiffnesses
4	Native Clay	Native clay soils with varying amounts of sand and silt; stiff to very stiff
5	Native Sand	Native sand soils with varying amounts of clay, silt, and gravel; loose to dense
6	Bedrock	Bedrock consisting of claystone; firm to very hard

Stratification boundaries on the boring logs represent the approximate location of changes in soil and material types; in situ, the transition between materials may be gradual. Further details of the borings can be found on the boring logs in the [Exploration Results](#).

Based on the results of the laboratory testing and our experience in the area, the clay fill materials, native clay soils, and claystone bedrock have low to moderate expansive potential, while the native sand soils are considered to be non-expansive. A summary of laboratory test results is included in the [Exploration Results](#).

Groundwater Conditions

The borings were observed while drilling and upon completion of drilling for the presence and level of groundwater. Groundwater was not encountered in the exploratory borings to the maximum depths explored of about 40 feet below the ground surface at the time of exploration.

These observations represent groundwater conditions at the time of field exploration and may not be indicative of other times or at other locations.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Groundwater levels during construction or at other times in the life of the structures may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project, particularly in the area of the proposed box culvert.

Laboratory Soluble Sulfate

The table below lists the results of laboratory soluble sulfate testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Soluble Sulfate Results Summary

Boring No.	Sample Depth (feet)	Soluble Sulfate (%)
BC-1	1 - 4	<0.1
DT-1	1 - 4	<0.1
P-2	1 - 4	<0.1

Results of water-soluble sulfate testing indicate samples of the on-site soils have an exposure class of S0 when classified in accordance with the American Concrete Institute (ACI) Design Manual. The results of the testing indicate ASTM Type I portland or Type IL portland-limestone cement is suitable for project concrete in contact with on-site soils. However, if there is no (or minimal) cost differential, use of ASTM Type II portland cement is recommended for additional sulfate resistance of construction concrete. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318.

Imported fill materials may have significantly different properties than the site materials noted above and should be evaluated if expected to be in contact with materials used for construction.

Geotechnical Overview

Based on subsurface conditions encountered in the borings, the site appears suitable for the proposed construction from a geotechnical point of view provided certain precautions and design and construction recommendations outlined in this report are followed. We have identified geotechnical conditions that could impact design and construction of the proposed parking/driveway area and other site improvements.

Existing Fill Materials

Up to about 4 feet of fill materials were encountered in portions of the site. In addition, apparent stockpiles of existing fill materials were observed at the site. The approximate extents of the existing fill materials are shown on the **Exploration Plan**. It should be noted that fill depths presented in the boring logs are approximate and the depth, lateral extents, and composition of fill should be expected to vary. We do not possess any information regarding whether the fill was placed under the observation of a geotechnical engineer.

We do not anticipate existing fill will be encountered below the proposed box-culvert or wing walls. However, if existing fill is encountered below these elements, it is our opinion any existing fill should be removed to native soil and replaced with new engineered fill.

We recommend over-excavating a portion of the existing fill materials below these elements, then processing, moisture conditioning and compacting the materials back to subgrade elevation.

It should be noted that there exists the potential for construction debris and/or domestic trash to be encountered within the fill on some portions of the site. Asphalt debris was encountered within the borings. Therefore, potential for encountering construction debris is considered to be high, while the potential for encountering domestic trash is considered to be low. The fill materials should be observed for the presence of trash and debris during site grading and construction.

The existing fill can be reused as engineered fill below foundations, exterior slabs-on-grade, and pavements, as well as backfill for the culvert and wing walls, provided the material meets the requirements of imported soils in the **Material Types** subsection in **Earthwork** and any deleterious materials are removed. Some removal and replacement may be required if unsuitable or soft materials are exposed.

Expansive Soils and Bedrock

Laboratory testing indicates the clay fill materials, native clay soils, and claystone bedrock have low to moderate expansive potential. The native sand soils are considered to be non-expansive.

This report provides recommendations to help mitigate the effects of soil and bedrock shrinkage and expansion. However, even if these procedures are followed, some movement and cracking in the pavements and flatwork should be anticipated. The severity of cracking and other damage will likely increase if any modification of the site results in excessive wetting or drying of the expansive soils and bedrock. Eliminating the risk of movement and distress is generally not feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. It is imperative the recommendations presented in the **Grading and Drainage** subsection of **Earthwork** in this report be followed to reduce movement.

Loose Soils

Test boring data indicate loose soils may be locally present. Consequently, loose soils could be encountered below foundations or other improvements and these conditions will likely require some corrective work. Corrective work could involve removal and re-compaction or replacement, in-place soil densification, or deepening excavations to suitable materials. In any event, Terracon should be contacted to observe foundation excavations to evaluate bearing conditions and to provide guidance concerning corrective work (if needed).

Shoring

Excavations as deep as 15 feet are anticipated for the proposed below-grade detention tanks. Due to the depth of the tanks, shoring may be necessary to reach the planned excavation depth. The depth of excavation and subsurface soils will influence the type of shoring system that may be used. A qualified shoring contractor should be contacted to design and install the shoring system.

The lateral earth pressure parameters provided in this report may be used for temporary shoring design; however, the use of these parameters is at the discretion of the designer. It has been our experience that shoring designers have proprietary or various earth pressure diagrams to base the shoring design. It is up to the shoring designer to interpret the provided parameters.

Difficult Excavations

we anticipate excavations for the proposed improvements can be accomplished with conventional earthmoving equipment; however, specialized heavy-duty equipment may be required for bedrock excavation to facilitate rock breakup and removal, particularly in the area of the proposed below-grade tanks. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

Earthwork

The following sections present recommendations for site preparation, excavation, subgrade preparation, and placement of engineered fills on the project. All earthwork on the project should be observed and evaluated by Terracon.

Site Preparation

Strip and remove existing vegetation, organics, fill stockpiles, and other deleterious materials from proposed construction areas. All exposed surfaces should be free of mounds and depressions that could prevent uniform compaction.

Stripped materials consisting of vegetation, unsuitable fills, and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

Where possible, the site should be initially graded to create a relatively level surface to receive fill and to provide for a relatively uniform thickness of fill beneath the proposed improvement areas. All exposed areas that will receive fill, once properly cleared, should be scarified to a minimum depth of 12 inches, conditioned to near optimum moisture content, and compacted. It is imperative the moisture content of prepared materials be protected from moisture loss.

Although evidence of underground facilities was not observed during our exploration, 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.

We anticipate excavations for the proposed construction can be accomplished with conventional earthmoving equipment. However, heavy-duty construction equipment will likely be necessary when excavating into very hard claystone bedrock.

Depending upon seasonal conditions, surface water may infiltrate into the excavations on the site. Water seeping into excavations at this site could most likely be controlled by shallow trenches leading to a sump pit where the water could be removed by pumping.

The stability of subgrade soils may be affected by precipitation, repetitive construction traffic, or other factors. If unstable conditions are encountered or develop during construction, workability may be improved by over-excavation of wet zones and mixing these soils with crushed gravel. Use of geotextiles could also be considered as a stabilization technique. Lightweight excavation equipment may be required to reduce subgrade pumping.

Material Types

Fill for this project should consist of engineered fill. Engineered fill is fill that meets the criteria presented in this report and has been properly documented.

Engineered fill should meet the following material property requirements:

Fill Type ^{1,2}	AASHTO Classification	Acceptable location for placement
On-site clay soils	A-6, A-7-6	On-site clay soils are considered suitable for reuse as engineered fill below exterior slabs-on-grade, pavement areas, and as general fill for this project.
On-site sand soils mixed with clay ^{3,4}	A-1-a, A-1-b, A-4	On-site sand soils mixed with clay soils are considered suitable for reuse as engineered fill below exterior slabs-on-grade, pavement areas, and as general fill for this project.
Processed claystone bedrock ⁴	N/A	The processed on-site claystone bedrock is considered suitable for engineered fill below exterior slabs-on-grade, pavement areas, and as general fill for this project.
Aggregate Base Course	CDOT Class 5 or 6	Aggregate base course meeting the requirements of a Colorado Department of Transportation (CDOT) Class 5 or 6 aggregate base course may be used as engineered fill for this project beneath foundations and behind retaining walls.
Imported soils	Varies	Imported soils meeting the gradation presented herein can be considered acceptable for use as engineered fill beneath pavements.

1. Engineered fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation.

Fill Type ^{1,2}	AASHTO Classification	Acceptable location for placement
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2. Care should be taken during the fill placement process to avoid zones of dis-similar fill. Improvements constructed over varying fill types are at a higher risk of differential movement compared to improvements over a uniform fill zone.
3. On-site sand soils should be mixed with on-site clay soils to meet the gradation requirements presented below for imported soils.
4. Granular soils should not be used in the overexcavation zone below the buildings, slabs, or pavement areas.
5. On-site claystone bedrock materials should be staged separately from excavated soils and processed to a soil-like consistency with a maximum particle size of 3 inches.

Imported soils and on-site materials for engineered fill (if required) should meet the following material property requirements:

Gradation	Percent finer by weight (AASHTO T-27)
3"	100
¾"	50-100
No. 4 Sieve	50-100
No. 200 Sieve	35-75

- Liquid Limit..... 35 (max.)
- Plasticity Index..... 15 (max.)
- Maximum Expansive Potential (%)..... 1.0*

*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at optimum water content. The sample is confined under a 200-psf surcharge and submerged.

Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift.

Item	Description
Fill lift thickness	8-inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6-inches in loose thickness when hand-guided equipment (i.e. jumping jack, plate compactor) is used

Item		Description
Compaction requirements ^{1,2}	AASHTO A-1 to A-5 Soils	Minimum of 95% of the material's modified Proctor maximum dry density (AASHTO T180).
Compaction requirements ^{1,2}	AASHTO A-6 to A-7 Soils	Minimum of 92% of the material's modified Proctor maximum dry density (AASHTO T180).
Moisture content	AASHTO A-1 to A-5 Soils	-3 to +3% of the optimum moisture content
Moisture content	AASHTO A-6 to A-7 Soils	-1 to +3% of the optimum moisture content

1. We recommend engineered fill be tested for water content and compaction during placement. Should the results of the in-place density tests indicate the specified water or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified water and compaction requirements are achieved.
2. Water levels should be maintained low enough to allow for satisfactory compaction to be achieved without the compacted fill material pumping when proofrolled.
3. Subgrade soils exposed to the elements for a significant period of time should be checked for density and moisture content prior to placing additional fills and/or paving.
4. Due to the potential variable nature of soils blended with properly processed demolition debris, additional testing methods may be required at the time of placement in order to determine acceptable compaction effort.

Excavation

Excavations into the subsurface soils and bedrock will encounter a variety of conditions. The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards.

Soils and bedrock penetrated by the proposed excavations may vary significantly across the site. The soil and bedrock classifications are based solely on the materials encountered in the exploratory borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

Grading and Drainage

All grades must be adjusted to provide positive drainage away from the improvements during construction and maintained throughout the life of the proposed project. Infiltration of water into utility excavations must be prevented during construction. Landscaped irrigation adjacent to the foundation systems should be minimized or eliminated. Water permitted to pond near or adjacent to the perimeter of the structures (either during or post-construction) can result in significantly higher soil movements than those discussed in this report. As a result, any estimations of potential movement described in this report cannot be relied upon if positive drainage is not obtained and maintained, and water is allowed to infiltrate the fill and/or subgrade.

Earthwork Construction Considerations

Upon completion of grading operations, care should be taken to maintain the moisture content of the subgrade prior to construction of slabs-on-grade, pavements, etc. Construction traffic over prepared subgrade should be minimized and avoided to the extent practical. Construction traffic over processed clay subgrade will eventually reduce the moisture content and increase the density of the subgrade. Subsequent wetting of these materials will result in undesirable movement.

The site should also be graded to prevent ponding of surface water on prepared subgrade or in excavations. In areas where water is allowed to pond over a period of time, the affected area should be removed and allowed to dry out; however, allowing the clay soils to dry out below the optimum moisture content is not recommended. If constraints do not allow for moisture conditioning of affected clays as recommended in this report, the affected area should be over-excavated and replaced with engineered fill. As an alternative, geotextiles could also be considered as a stabilization technique.

The Geotechnical Engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during overexcavation operations, excavations, subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of box culvert and detention tanks.

Culvert and Wing Wall Design Recommendations

Based on the results of our field exploration and observations at the site, it is our opinion construction of a new box culvert and wing walls on native soils without corrective work, may result in excessive foundation settlement. To reduce total settlement to about 1 to 1½ inches, we recommend the culverts and wing walls be constructed on a 3-foot zone of new engineered fill consisting of CDOT Class 5 or 6

materials over a layer of BX1100 geogrid or equivalent meeting the requirements of Section 504 of the CDOT Standard and Specifications. The zone of reinforced engineered fill should extend 5 feet beyond the limits of the culverts and wing walls. We anticipate the majority of the settlement will occur during construction and post-construction settlement will be about 1 inch or less.

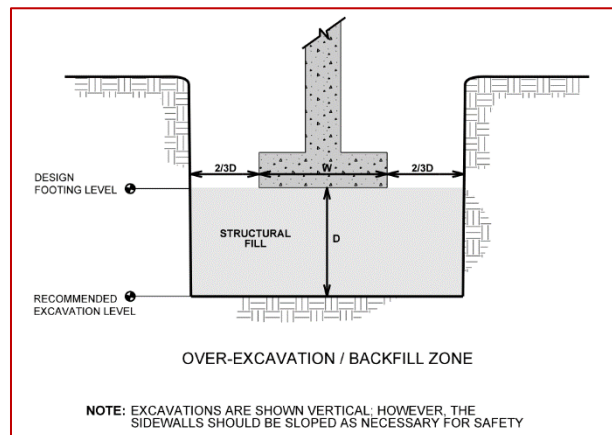
New box culverts and wing walls may be constructed on improved on-site soils, provided the owner is willing to accept the associated risk of movement.

Design recommendations for the box culverts and wing walls are presented in the following table and paragraphs.

Description		Value
Supporting Stratum		Modified on-site soils (3-foot zone of new engineered fill) ¹
Maximum Nominal (Ultimate) Bearing Resistance ¹	Box Culvert	2,000 psf
	Wing Walls	3,500 psf
Bearing Resistance Factor		0.45
Sliding Resistance Factor		0.80
Nominal Passive Lateral Earth Pressure ²		350 psf/ft
Nominal (Ultimate) Coefficient of Sliding Friction at Base of Footing		0.50
Minimum Embedment Below Finished Grade for Frost Protection ³		30 inches
Approximate Total Movement ⁴		About 1 to 1½ inches
Estimated Differential Movement ⁴		About ½ to ¾ of total movement

1. The bearing resistance assumes any existing fill or lower strength soils, if encountered, will be excavated and replaced with engineered fill.
2. Backfill must be compacted to at least 95 percent of the maximum dry density as determined by AASHTO T180 for the passive earth pressure value to be valid.
3. Additional embedment may be necessary to account for potential scour and erosion. A hydraulic engineer should be retained to provide additional recommendations.
4. Foundation movement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the foundations, the thickness of engineered fill, and the quality of the earthwork operations and footing construction. Total movement refers to estimated post-construction movement.
5. Culverts and wing walls should be protected from scour.

Over-excavation of loose or soft soils below culverts and wing walls (if encountered or developed during construction) should extend laterally beyond all edges of the footings at least 8 inches per foot of over-excavation depth below footing base elevation. The over-excavation should then be backfilled up to the footing base elevation with approved fill placed in lifts of 8 inches or less in loose thickness (6 inches or less if using hand-guided compaction equipment) and compacted to at least 95 percent of the material's standard effort maximum dry density (AASHTO T180). The over-excavation and backfill with geosynthetic procedure is described in the following figure.



The base of all foundation excavations should be free of water and loose soil prior to concrete placement. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Should the soils at bearing level become excessively dry, disturbed or saturated, or frozen, the affected soil should be removed prior to placing concrete.

Culvert wing walls should be detailed and reinforced as necessary to reduce the potential for distress caused by differential foundation movement.

Detention Tank Foundation Recommendations

Spread footing and/or mat foundation systems may be considered for support of the proposed detention tanks when constructed on a 2-foot zone of new engineered fill, provided the potential for movement can be tolerated. The below-grade tanks may also be placed directly on ground if foundations are not needed. New fill materials beneath tank foundations should be placed and compacted as described in the [Earthwork](#) section of this report.

Design recommendations for spread footing foundation systems (if needed) are presented in the following table and paragraphs.

Description	Value
Thickness of Zone Of New Engineered Fill	Minimum of 2 feet below bottom of lowest foundation element
Lateral Extent of Zone Of New Engineered Fill	5 feet outside tank footprint
Supporting Stratum	New engineered fill
Maximum Allowable Bearing Pressure ¹	3,000 psf
Modulus of Subgrade Reaction	<p><u>Square:</u></p> $K_{(BxB)} = k_1 \left(\frac{B + 1}{2B} \right)^2$ <p><u>Rectangle:</u></p> $K_{(BXL)} = k_1 \left(\frac{1 + 0.5B/L}{1.50} \right)$ <p>$k_1 = 120$ pounds per square inch per inch (psi/in.)</p> <p>Where: k_1 = modulus of subgrade reaction of a foundation measuring 1 ft. x 1 ft. $K_{(BxB)}$ = modulus of subgrade reaction for a foundation having a square dimension B $K_{(BXL)}$ = modulus of subgrade reaction for a foundation having dimensions of B by L</p>
Coefficient of Friction (Sliding)	0.3
Minimum Footing Dimensions ²	Isolated footings: 24 inches Continuous footings: 18 inches
Minimum Embedment Below Finished Grade for Frost Protection ³	3 feet
Approximate Total Movement ⁴	About 1 to 1-1/2 inches
Estimated Differential Movement ^{4,5}	About ¾ to 1 inch

Description	Value
<ol style="list-style-type: none"> 1. The recommended maximum allowable bearing pressure assumes that any existing fill or lower strength soils, if encountered, will be excavated and replaced with engineered fill. 2. Not applicable for mat foundations or stiffened structural slab-on-grade. 3. For perimeter footings, footings beneath unheated areas, and footings that will be exposed to freezing conditions during construction. 4. Foundation movement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of engineered fill, and the quality of the earthwork operations and footing construction. 5. Footings should be proportioned on the basis of equal total dead load pressure to reduce differential movement between adjacent footings. 	

Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction and throughout the life of the structure. Failure to maintain the proper drainage as recommended in the **Grading and Drainage** section of **Earthwork** will nullify the movement estimates provided above.

Unstable subgrade conditions should be observed by the Geotechnical Engineer to assess the subgrade and provide suitable alternatives for stabilization. Stabilized areas should be proofrolled prior to continuing construction to assess the stability of the subgrade.

The base of all foundation excavations should be free of water and loose soil prior to concrete placement. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Should the soils at bearing level become excessively dry, disturbed or saturated, or frozen, the affected soil should be removed prior to placing concrete.

Footings, foundations, and masonry walls should be detailed and reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

Seismic Considerations

Based on our subsurface exploration and laboratory testing, it is our opinion that soils have a low risk of liquefaction. The following table presents the seismic site classification based on the 2020 AASHTO LRFD Bridge Design Specifications, and the subsurface conditions encountered within the borings:

Code Used	Site Classification
2020 AASHTO LRFD Bridge Design Specifications ^{1,2}	D

1. In general accordance with the 2020 AASHTO LRFD Bridge Design Specifications, Section 3.10.

2. The 2020 AASHTO LRFD Bridge Design Specifications requires a site subsurface profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100-foot subsurface profile determination. The deepest borings of this exploration extended to a maximum depth of about 40 feet and this seismic site class definition considers that similar subsurface conditions exist below the maximum depth of the subsurface exploration.

Exterior Flatwork

Exterior slabs-on-grade and flatwork constructed on the on-site existing fill materials and expansive materials will have a moderate risk of movement. The risk of movement can be slightly reduced if the subgrade soils below exterior slabs-on-grade are over-excavated to a depth of at least 1 foot, moisture conditioned, and recompacted to grade. New fill materials beneath slabs-on-grade should be placed and compacted as described in the **Earthwork** section of this report.

For structural design of exterior concrete slabs-on-grade, a modulus of subgrade reaction of 120 pci may be used for point or limited area loads for exterior slabs-on-grade at this site.

Additional slab design and construction recommendations are as follows:

- Minimizing moisture increases in the backfill.
- Controlling moisture-density during placement of backfill.
- Positive separations and/or isolation joints should be provided to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Exterior slabs should not be constructed on frozen subgrade
- Other design and construction considerations, as outlined in Section 302.1R of the ACI Design Manual, are recommended.

Movements of exterior slabs-on-grade using the above technique will likely be reduced and tend to be more uniform. Additional movement could occur should the subsurface soils and bedrock become wetted to significant depths, which could result in potential excessive movement causing uneven exterior slabs and severe cracking. This could be due to over watering of landscaping, poor drainage, and/or broken utility lines.

Therefore, it is imperative that the recommendations outlined in the **Grading and Drainage** subsection of **Earthwork** be followed.

Below-Grade Structures

New detention tanks considered for this project will be about 10 feet in diameter and are anticipated to be installed to a depth of about 14 feet below finished grade. Groundwater was not encountered in our exploratory borings to the maximum depths explored of about 40 feet below the ground surface. We understand excavations for the proposed detention tanks will be on the order of about 15 feet in depth. Based on the anticipated excavation depth, the risk of hydrostatic forces due to groundwater on the structures is anticipated to be low. We recommend a 2-foot thick clay cap be placed above the proposed below-grade tanks to reduce the risk of surface water infiltrating the tank excavation.

Based on the subsurface conditions encountered in our field exploration, excavations for the detention tanks will encounter claystone bedrock. Therefore, we anticipate excavations for the proposed detention tanks will require heavy-duty earthmoving equipment.

Excavations as deep as 15 feet are anticipated for the detention tanks. Due to the depth of the tanks, shoring may be necessary to reach the planned excavation depth. The depth of excavation and subsurface soils will influence the type of shoring system that may be used. A qualified shoring contractor should be contacted to design and install the shoring system.

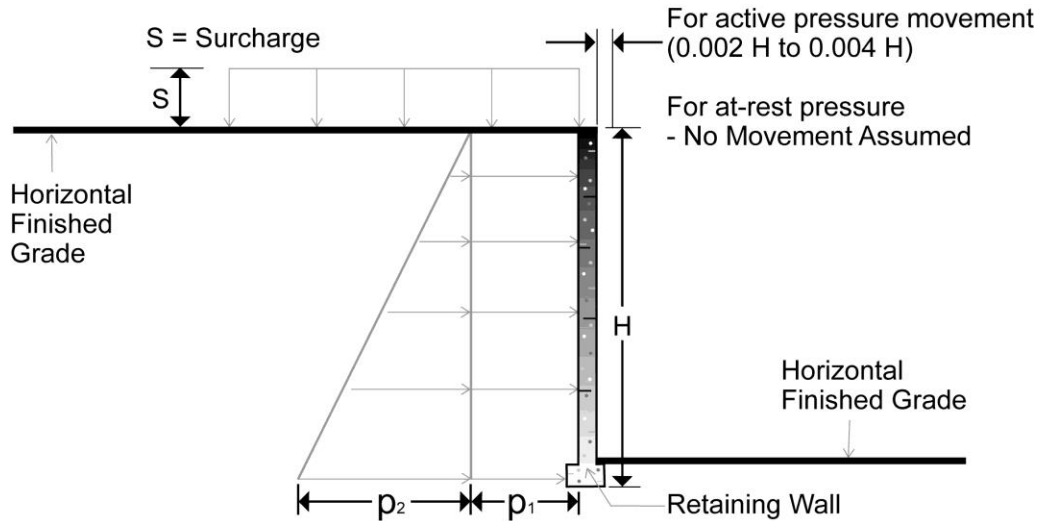
A perforated rigid plastic drain line installed at the base of the excavation for the below-grade tanks and extending below adjacent grade is recommended to reduce the risk of wetting the underlying expansive claystone bedrock. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5% passing the No. 200 sieve, such as No. 57 aggregate. The free-draining aggregate should be encapsulated in a filter fabric. The granular fill around the tank should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the tank excavation.

Lateral Earth Pressures

Design Parameters

We understand excavations as deep as 15 feet are anticipated for the detention tanks and we anticipate the culvert and wing walls will be up to about 10 to 15 feet in height from the bottom of the creek. Excavations and walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls,

conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



Earth Pressure Conditions	Lateral Earth Pressure Coefficient	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (K_a)	0.47	60	$(0.47)S$	$(60)H$
At-Rest (K_o)	0.64	80	$(0.64)S$	$(80)H$
Passive (K_p)	2.1	250	---	---

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 H to 0.004 H, where H is wall height
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance.
- Uniform surcharge, where S is surcharge pressure
- In-situ soil backfill weight a maximum of 120 pcf
- Horizontal backfill, compacted to at least 95 percent of standard Proctor maximum dry density
- Loading from heavy compaction equipment not included
- No hydrostatic pressures acting on wall
- No dynamic loading
- No safety factor included in soil parameters

The above pressures do not include the influence of surcharge, equipment, or vehicle loading, which should be added. Heavy equipment should not operate within a distance closer than the exposed height of culvert walls to prevent lateral pressures more than those provided.

To reduce hydrostatic loading for retaining and culvert wing walls, a subsurface drain system should be placed behind the wall system. The drain system should consist of a perforated rigid plastic drain line installed behind the base of the wall. The invert of a drain line around a retaining wall should be placed near the foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5% passing the No. 200 sieve, such as No. 57 aggregate. The free-draining aggregate should be encapsulated in a filter fabric. As an alternative to the drain line, weep holes may be used to drain the water from behind the wall. If selected, weep holes should be placed at regular intervals in a grid pattern along the wall. Granular fill associated with either the drain line or weep holes should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the drain system.

Pavements

Design of privately maintained pavements for the project has been based on the procedures outlined by the Asphalt Institute (AI) and the American Concrete Institute (ACI).

Design Traffic

We assumed the following design parameters for Asphalt Institute flexible pavement thickness design:

- Automobile Parking Areas
 - Parking stalls and parking lots for cars and pick-up trucks, up to 50 stalls
- Main Traffic Corridors
 - Parking lots with a maximum of 5 trucks per day
- Subgrade Soil Characteristics
 - USCS Classification – CL to SP (poor to good subgrade)

We assumed the following design parameters for ACI rigid pavement thickness design based upon the average daily truck traffic (ADTT):

- Automobile Parking Areas
 - ACI Category A-1: Automobile parking with an ADTT of 1 over 20 years (AI Class I)

- Main Traffic Corridors
 - ACI Category B: Commercial entrance and service lanes with an ADTT of 25 over 20 years (AI Class III)
- Subgrade Soil Characteristics
 - USCS Classification – CL to SP (low to medium support)
- Concrete modulus of rupture value of 500 psi

We should be contacted to confirm and/or modify the recommendations contained herein if actual traffic volumes differ from the assumed values shown above.

Subgrade Soils

Laboratory test results indicate the site subgrade materials classified as A-1-a, A-1-b, and A-4 with group indexes of 0 and 2 and A-6 and A-7-6 soils with group indexes of 7, 8, 9, and 32 for material types according to the AASHTO classification system. A California Bearing Ratio (CBR) test performed on sample obtained from Boring No. P-1, had a CBR value of 2.4. Based on the subsurface conditions, the CBR value, and to account for seasonal fluctuations, a resilient modulus (M_R) of 3,500 psi and a modulus of subgrade reaction of 85 pci was used for the pavement thickness designs.

Subgrade Preparation

Based on the results of our laboratory testing, the subgrade soils are expansive and require swell mitigation. It is our opinion new pavements constructed on native soils and existing fill materials will have a low to moderate risk of movement. To improve performance, we recommend the subgrade soils below pavements be over-excavated to a depth of at least 1 foot, moisture conditioned, and compacted to grade. Subgrade soils at the base of the over-excavation and new fill materials beneath slabs-on-grade should be placed and compacted as described in the **Earthwork** section of this report.

Recommended Minimum Pavement Sections and Materials

Recommended alternatives for flexible and rigid pavements are summarized for each traffic area as follows:

Traffic Area	Alternative	Preliminary Pavement Thickness (Inches)			
		Asphalt Concrete Surface	Aggregate Base Course	Portland Cement Concrete	Total
	A	5	--	--	5
	B	4	6	--	10

Traffic Area	Alternative	Preliminary Pavement Thickness (Inches)			
		Asphalt Concrete Surface	Aggregate Base Course	Portland Cement Concrete	Total
Automobile Parking (AI Class I and ACI Category A)	C ¹	--	--	5	5
Main Traffic Corridors (AI Class III and ACI Category B)	A	6	--	--	6
	B	4	8	--	12
	C ¹	--	--	6	6

1. The minimum pavement section thickness per ACI

Each alternative should be investigated with respect to current material availability and economic conditions. A minimum 7-inch thickness of rigid reinforced concrete pavement is recommended at the location of dumpsters where trash trucks park and load, and in areas of tight turning radius.

Concrete pavement joint spacing and reinforcement should be in accordance with specifications in ACI 330R-08.

For analysis of pavement costs, the following specifications should be considered for each pavement component:

Pavement Component	Colorado Department of Transportation Criteria
Asphalt Concrete Surface	Grading S or SX
Aggregate Base Course	Class 5 or 6
Portland Cement Concrete	Class P

Drainage Adjacent to Pavements

Clay subgrade materials will expand and/or lose stability with increases in moisture content. To reduce pavement distress due to wetting of the subgrade in areas of water intensive landscaping or other nearby water sources (or if aggregate base course is used) located adjacent to pavements, edge drains should be considered.

Pavement Maintenance

Future performance of pavements constructed at this site will be dependent upon several factors, including:

- Maintaining stable moisture content of the subgrade soils both before and after pavement construction.
- Providing for a planned program of preventative maintenance.

The performance of all pavements can be enhanced by minimizing excess moisture, which can reach the subgrade soils. The following recommendations should be implemented:

- Site grading at a minimum 2 percent grade onto or away from the pavements.
- Water should not be allowed to pond behind curbs.
- Compaction of any utility trenches for landscaped areas to the same criteria as the pavement subgrade.
- Sealing all landscaped areas in or adjacent to pavements or providing drains to reduce the risk of moisture migration to subgrade soils.
- Placing compacted backfill against the exterior side of curb and gutter.
- Placing curb, gutter, and/or sidewalk directly on subgrade soils without the use of base course materials.

Preventative maintenance should be planned and provided for an ongoing pavement management program in order to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration.

Preventative maintenance consists of both localized maintenance (e.g. crack sealing and patching) and global maintenance (e.g. surface sealing). Preventative maintenance is usually the first priority when implementing a planned pavement maintenance program.

Pavement Construction Considerations

Site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, or rainfall. As a result, the pavement subgrade may not be suitable for pavement construction and corrective action will be required. The subgrade should be carefully evaluated at the time of pavement construction for signs of disturbance or excessive rutting. If disturbance has occurred, pavement subgrade areas should be reworked, moisture conditioned, and properly compacted to the recommendations in this report immediately prior to paving.

We recommend the pavement areas be rough graded and then thoroughly proofrolled with a loaded tandem axle dump truck prior to final grading and paving. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills. All pavement areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to paving.

The placement of a partial pavement thickness for use during construction is not recommended without a detailed pavement analysis incorporating construction traffic. In addition, if the actual traffic varies from the assumptions outlined above, we should be contacted to confirm and/or modify the pavement thickness recommendations outlined above.

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

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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.

Geotechnical Engineering Report

Carvana - Fountain, CO – New Parking Area | Fountain, Colorado
May 22, 2026 | Terracon Project No. 23265036A

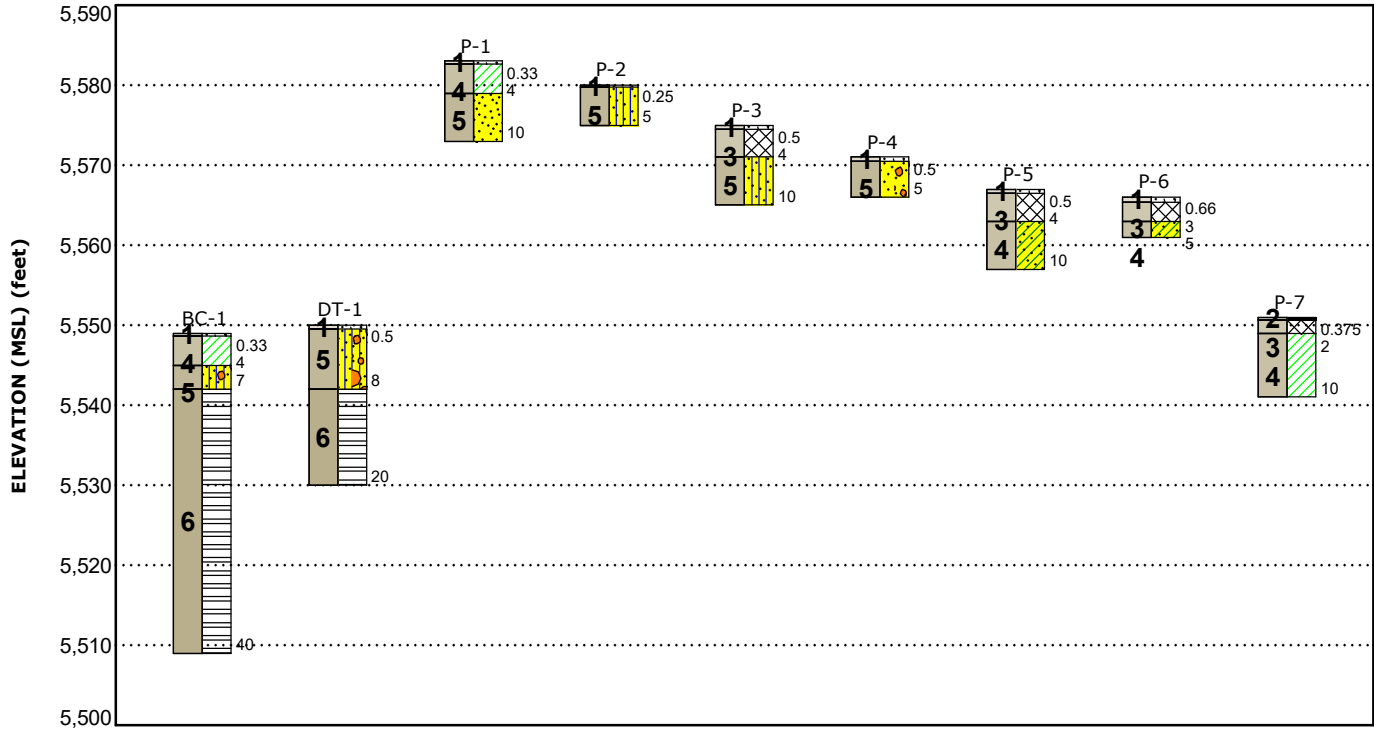


Figures

Contents:

GeoModel

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	Legend	
1	Topsoil	About 3 to 8 inches thick	Topsoil	Lean Clay
2	Asphalt	About 4.5 inches thick	Silty Sand with Gravel	Claystone
3	Fill	Existing fill materials consisting of clay soils with varying amounts of sand; various stiffnesses	Poorly-graded Sand	Silty Sand
4	Native Clay	Native clay soils with varying amounts of sand and silt; stiff to very stiff	Fill	Poorly-graded Sand with Gravel
5	Native Sand	Native sand soils with varying amounts of clay, silt, and gravel; loose to dense	Sandy Lean Clay	Disintegrated Asphalt
6	Bedrock	Bedrock consisting of claystone; firm to very hard		

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.

Geotechnical Engineering Report

Carvana - Fountain, CO - New Parking Area | Fountain, Colorado

May 22, 2026 | Terracon Project No. 23265036A



Attachments

Exploration and Testing Procedures

Field Exploration

Boring Layout and Elevations: The locations of the borings are presented in the [Site Location and Exploration Plans](#). The borings were located in the field by overlaying the site plan on Google Earth, recording the latitude and longitude coordinates, and staking the borings using a handheld, recreational-grade GPS unit. The accuracy of the latitude and longitude values is typically about +/- 25 feet when obtaining the values using this method. Surface elevations at the borings were obtained from Google Earth Pro. The accuracy of the boring locations and surface elevations should only be assumed to the level implied by the methods used.

Subsurface Exploration Procedures: The borings were drilled with a truck-mounted drill rig with solid-stem augers. During the drilling operations, lithologic logs of the borings were recorded by the field geologist. Relatively undisturbed samples were obtained at selected intervals utilizing a 2-inch outside diameter standard split spoon sampler and a 2½-inch outside diameter modified California barrel sampler. Bulk samples were obtained from auger cuttings. Penetration resistance values were recorded in a manner similar to the standard penetration test (SPT). This test consists of driving the sampler into the ground with a 140-pound hammer free falling through a distance of 30 inches. The number of blows required to advance the barrel sampler 12 inches (18 inches for standard split-spoon samplers, final 12 inches are recorded) or the interval indicated is recorded and can be correlated to the standard penetration resistance value (N-value). The blow count values are indicated on the boring logs at the respective sample depths. Modified California barrel sampler blow counts are not considered N-values.

An automatic hammer was used to advance the samplers in the borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the soil moisture content. In addition, considerable care should be exercised in interpreting the N-values in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Groundwater measurements were obtained in the borings at the time of drilling. Due to safety concerns, the borings were backfilled with auger cuttings and patched with cold patch asphalt after drilling. Some settlement of the backfill and patches may occur and should be repaired as soon as possible.

Laboratory Testing

Samples retrieved during the field exploration were returned to the laboratory for observation by the Geotechnical Engineer and were classified in general accordance with the Unified Soil Classification System presented in the **Supporting Information**.

At this time, an applicable laboratory-testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of the laboratory testing, the field descriptions were confirmed or modified as necessary, and the boring logs were prepared. The boring logs are included in the **Exploration Results**.

Laboratory test results are included in the **Exploration Results**. These results were used for the geotechnical engineering analyses and the development of foundation, earthwork, and pavement recommendations. All laboratory tests were performed in general accordance with the applicable local or other accepted standards.

Selected soil and bedrock samples were tested for the following engineering properties:

- Water content
- Dry density
- Grain size distribution
- Atterberg limits
- Swell/consolidation
- Water-soluble sulfate content
- Standard Proctor
- California bearing ratio (CBR)

Site Location and Exploration Plans

Contents:

Site Location Plan

Exploration Plan with Aerial Image

Exploration Plan with Project Overlay

Note: All attachments are one page unless noted above.

Site Location



Exploration Plan with Aerial Image

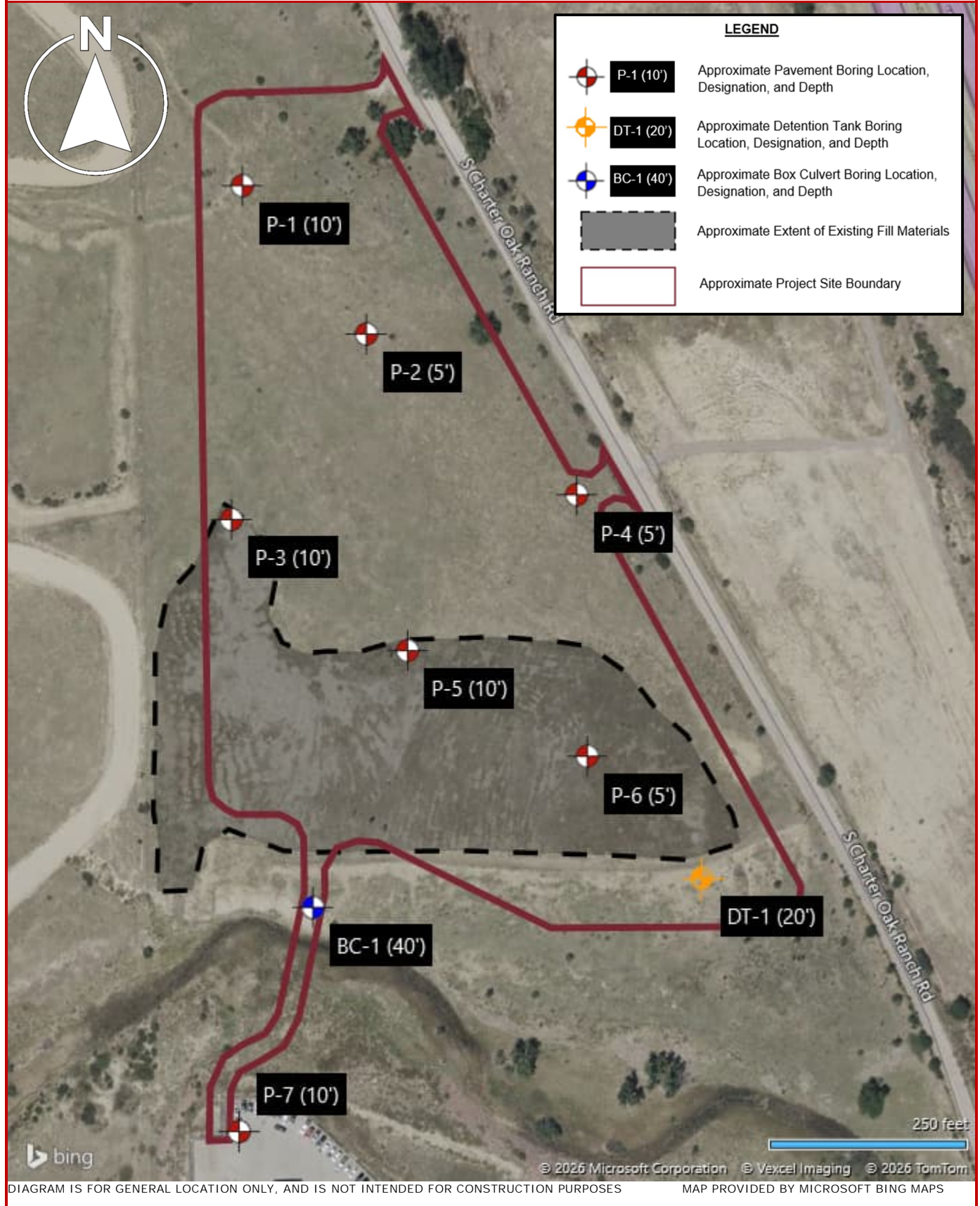
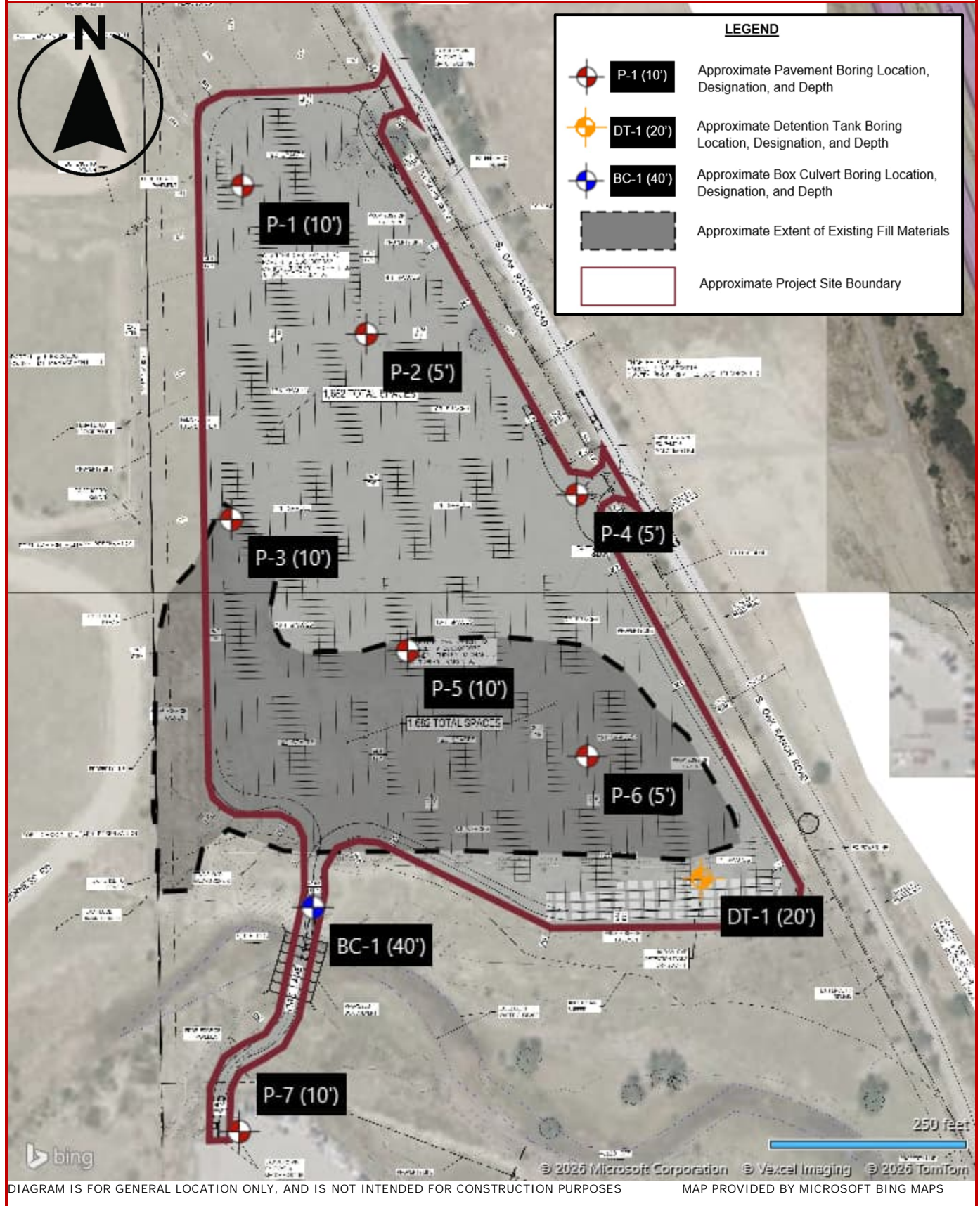


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Exploration Plan with Project Overlay



Exploration and Laboratory Results

Contents:

- Boring Logs (Boring Nos. BC-1, DT-1, and P-1 to P-7)
- Swell Consolidation Test (7 pages)
- Grain Size Distribution (2 pages)
- Atterberg Limit Results
- Standard Proctor Result
- CBR Result
- Summary of Laboratory Test Results

Note: All attachments are one page unless noted above.

Boring Log No. BC-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6805° Longitude: -104.7183°	Depth (Ft.)	Approximate Elevation: 5549 (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
											LL-PL-PI	Percent Fines
1			0.3	5548.67								
4		TOPSOIL , about 4 inches thick										
4		LEAN CLAY (CL) , with sand, olive gray to brown, medium stiff					2-4		12.9	97	39-21-18	73
5		SILTY SAND (SM) , with gravel, fine to coarse grained, orangish brown, dense	4.0	5545			50/9"					
5		CLAYSTONE , olive gray to dark gray, firm to very hard	7.0	5542			11-16		16.0	101		
6			10				50/11"	+2.5 @ 500 psf	15.3	110		
			15				19-31					
			20				50/7"		12.7	112	52-23-29	98
			25				50/5"					
			30				50/4"		11.4	119		
			35				50/5"					
			40.0	5509			50/3"					
Boring Terminated at 40 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: Ground surface elevation obtained from Google Earth Pro.

Water Level Observations
 Groundwater not encountered

Drill Rig
 B-57 Truck

Hammer Type
 Automatic Hammer
 efficiency: 77.9%
Driller
 Terracon

Notes

Advancement Method
 4-inch diameter, solid-stem, continuous-flight power auger


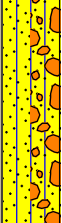

Logged by
 DG

Boring Started
 04-14-2026

Boring Completed
 04-14-2026

Abandonment Method
 Boring backfilled with auger cuttings upon completion.

Boring Log No. DT-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6806° Longitude: -104.7166° Depth (Ft.) Approximate Elevation: 5550 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
										LL-PL-PI	Percent Fines
1		0.5	5549.5								
		TOPSOIL , about 6 inches thick									
5		SILTY SAND (SM) , with gravel, varies to well graded sand with silt and gravel, fine to coarse grained, brown to light orangish brown, loose to medium dense	5	6-7	X						
			5	13-12	X			1.2	131	NP	11
			8.0	50/5"	X						
			10	50/10"	X			15.9	106		
6		CLAYSTONE , gray to dark gray, medium hard to very hard	15	16-27	X		+2.2 @ 500 psf	15.3	112		
			20	50/6"	X			12.4	111		
		Boring Terminated at 20 Feet	20								

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: Ground surface elevation obtained from Google Earth Pro.

Water Level Observations
 Groundwater not encountered

Drill Rig
 B-57 Truck

Hammer Type
 Automatic Hammer
 efficiency: 77.9%
Driller
 Terracon

Notes

Advancement Method
 4-inch diameter, solid-stem, continuous-flight power auger

Logged by
 DG

Abandonment Method
 Boring backfilled with auger cuttings upon completion.

Boring Started
 04-14-2026
Boring Completed
 04-14-2026

Boring Log No. P-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6830° Longitude: -104.7186°	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
										LL-PL-PI	Percent Fines
		Depth (Ft.) Approximate Elevation: 5583 (Ft.)									
1		0.3 TOPSOIL , about 4 inches thick	5582.67								
4		LEAN CLAY (CL) , with sand, brown to dark brown, stiff	4.0	X	5-5		+3.7 @ 200 psf	7.6	105	33-20-13	76
5		POORLY GRADED SAND (SP) , with silt and gravel, fine to coarse grained, light brown, loose to medium dense	5.0	X	8-12			1.6	116		
		10.0 Boring Terminated at 10 Feet	5573	X	5-6						

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Ground surface elevation obtained from Google Earth Pro.</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig B-57 Truck</p> <p>Hammer Type Automatic Hammer efficiency: 77.9%</p> <p>Driller Terracon</p>
<p>Notes</p>	<p>Advancement Method 6-inch diameter, solid-stem, continuous-flight power auger</p> <p>Abandonment Method Boring backfilled with auger cuttings upon completion.</p>	<p>Logged by DG</p> <p>Boring Started 04-14-2026</p> <p>Boring Completed 04-14-2026</p>

Boring Log No. P-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6825° Longitude: -104.7181° Depth (Ft.) _____ Approximate Elevation: 5580 (Ft.) _____	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
4		0.3' TOPSOIL , about 3 inches thick	5579.75								
5		SILTY SAND (SM) , fine to coarse grained, brown, loose to medium dense	5.0 5575	5	X	3-4		1.4	114	NP	19
		Boring Terminated at 5 Feet			X	8-7		1.9	118		

<p>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: Ground surface elevation obtained from Google Earth Pro.</p> <p>Notes</p>	<p>Water Level Observations Groundwater not encountered</p> <p>Advancement Method 6-inch diameter, solid-stem, continuous-flight power auger</p> <p>Abandonment Method Boring backfilled with auger cuttings upon completion.</p>	<p>Drill Rig B-57 Truck</p> <p>Hammer Type Automatic Hammer efficiency: 77.9%</p> <p>Driller Terracon</p> <p>Logged by DG</p> <p>Boring Started 04-14-2026</p> <p>Boring Completed 04-14-2026</p>
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Boring Log No. P-3

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6818° Longitude: -104.7187° Depth (Ft.) Approximate Elevation: 5575 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
										LL-PL-PI	Percent Fines
1		0.5 TOPSOIL , about 6 inches thick	5574.5								
3		FILL - SANDY LEAN CLAY (CL) , brown	4.0			6-7	-2.4 @ 200 psf	7.9	87	33-19-14	64
5		SILTY SAND (SM) , fine to coarse grained, light brown, loose to medium dense	10.0			4-8		3.7	101		
Boring Terminated at 10 Feet			5565			7-8					

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: Ground surface elevation obtained from Google Earth Pro.

Water Level Observations
 Groundwater not encountered

Drill Rig
 B-57 Truck

Hammer Type
 Automatic Hammer
 efficiency: 77.9%
Driller
 Terracon

Notes

Advancement Method
 6-inch diameter, solid-stem, continuous-flight power auger

Logged by
 DG

Boring Started
 04-14-2026

Boring Completed
 04-14-2026

Abandonment Method
 Boring backfilled with auger cuttings upon completion.

Boring Log No. P-4

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6819° Longitude: -104.7171° Depth (Ft.) _____ Approximate Elevation: 5571 (Ft.) _____	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		TOPSOIL , about 6 inches thick	0.5								
5		POORLY GRADED SAND (SP) , with silt and gravel, varies to clayey sand, fine to coarse grained, yellowish brown to light gray, loose to medium dense	5.0	5	X	12-9		1.8	105	NP	11
		Boring Terminated at 5 Feet	5.0			8-6		6.3	108		

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Ground surface elevation obtained from Google Earth Pro.</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig B-57 Truck</p> <p>Hammer Type Automatic Hammer efficiency: 77.9%</p> <p>Driller Terracon</p>
<p>Notes</p>	<p>Advancement Method 6-inch diameter, solid-stem, continuous-flight power auger</p> <p>Abandonment Method Boring backfilled with auger cuttings upon completion.</p>	<p>Logged by DG</p> <p>Boring Started 04-14-2026</p> <p>Boring Completed 04-14-2026</p>

Boring Log No. P-5

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6814° Longitude: -104.7179°	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
										LL-PL-PI	Percent Fines
1		Depth (Ft.) Approximate Elevation: 5567 (Ft.) TOPSOIL , about 6 inches thick	0.5								
3		FILL - SANDY SILTY CLAY (CL-ML) , fine to coarse grained, brown	4.0	5566.5	2-3			11.5	98	27-20-7	58
4		LEAN CLAY WITH SAND (CL) , brown, very stiff	5	5563	8-11	+1.5 @ 200 psf		11.5	91		
		Boring Terminated at 10 Feet	10	5557	12-17						

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: Ground surface elevation obtained from Google Earth Pro.

Water Level Observations
 Groundwater not encountered

Drill Rig
 B-57 Truck

Hammer Type
 Automatic Hammer
 efficiency: 77.9%
Driller
 Terracon

Notes

Advancement Method
 6-inch diameter, solid-stem, continuous-flight power auger

Logged by
 DG

Boring Started
 04-14-2026

Boring Completed
 04-14-2026

Abandonment Method
 Boring backfilled with auger cuttings upon completion.

Boring Log No. P-6

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6810° Longitude: -104.7171°	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
										LL-PL-PI	Percent Fines
1		0.7 TOPSOIL , about 8 inches thick	5565.34								
3		FILL - SANDY LEAN CLAY (CL) , dark brown	3.0		X	3-5		6.2	102	37-20-17	62
4		SANDY LEAN CLAY (CL) , brown, stiff	5.0		X	8-9	+4.1 @ 200 psf	7.8	97		
		Boring Terminated at 5 Feet		5							

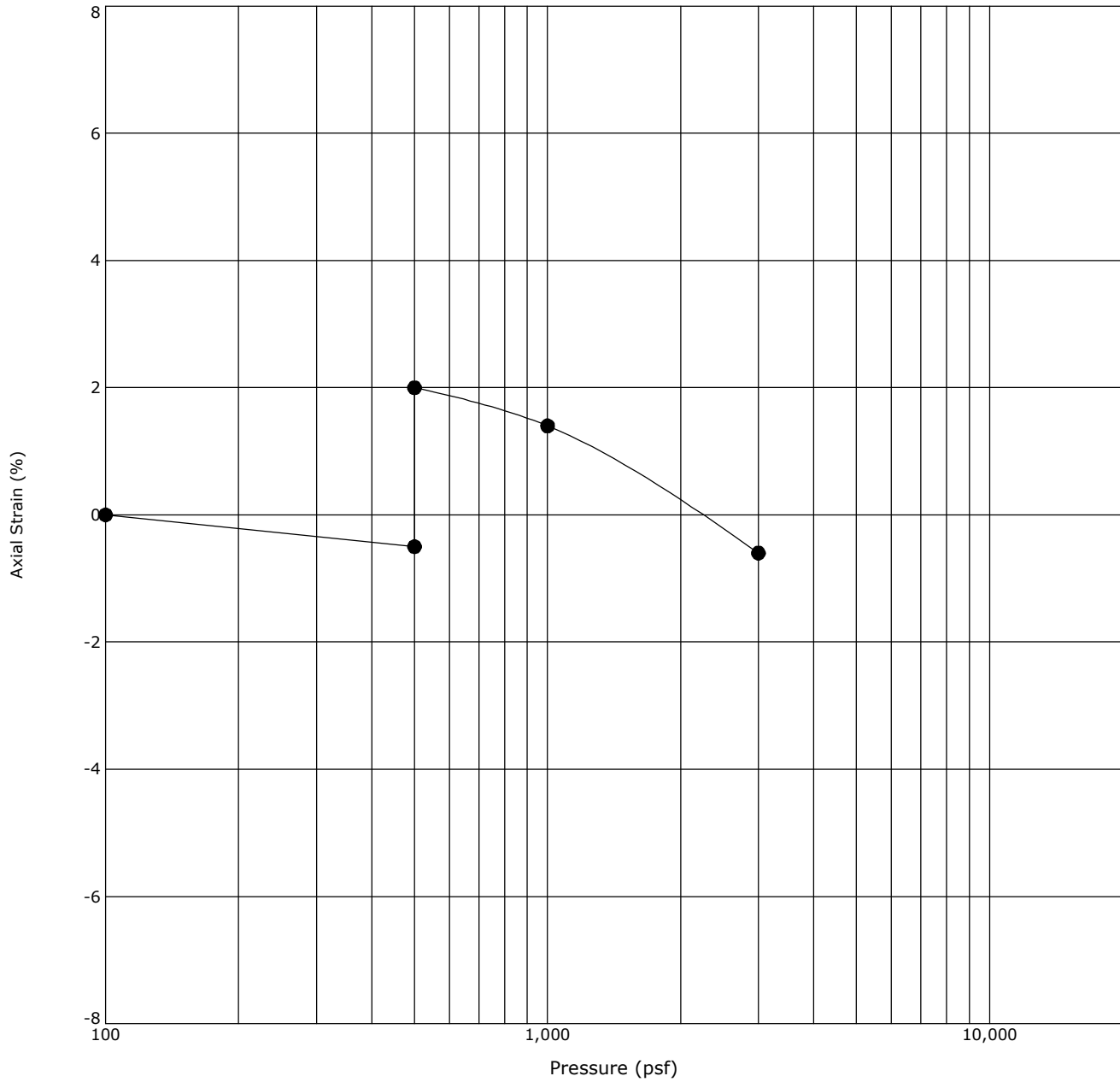
<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any). See Supporting Information for explanation of symbols and abbreviations. Elevation Reference: Ground surface elevation obtained from Google Earth Pro.</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig B-57 Truck</p> <p>Hammer Type Automatic Hammer efficiency: 77.9%</p> <p>Driller Terracon</p>
<p>Notes</p>	<p>Advancement Method 6-inch diameter, solid-stem, continuous-flight power auger</p> <p>Abandonment Method Boring backfilled with auger cuttings upon completion.</p>	<p>Logged by DG</p> <p>Boring Started 04-14-2026</p> <p>Boring Completed 04-14-2026</p>

Boring Log No. P-7

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.6797° Longitude: -104.7187°	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Swell (%)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	
										LL-PL-PI	Percent Fines
		Depth (Ft.) Approximate Elevation: 5574 (Ft.)									
2	Asphalt	0.4 Asphalt, about 4.5 inches thick	5573.63								
3	FILL - SANDY LEAN CLAY (CL)	2.0 FILL - SANDY LEAN CLAY (CL), brown	5572								
4	LEAN CLAY (CL)	LEAN CLAY (CL), with silt, brown to dark brown, medium stiff				5-6	+0.3 @ 200 psf	15.1	100		
			5		4-5						
					4-3						
		10.0 Boring Terminated at 10 Feet	5564								

<p>See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).</p> <p>See Supporting Information for explanation of symbols and abbreviations.</p> <p>Elevation Reference: Ground surface elevation obtained from Google Earth Pro.</p>	<p>Water Level Observations Groundwater not encountered</p>	<p>Drill Rig CME 55 Track</p> <p>Hammer Type Automatic Hammer efficiency: 91.3%</p> <p>Driller Terracon</p>
<p>Notes</p>	<p>Advancement Method 4-inch diameter, solid-stem, continuous-flight power auger</p> <p>Abandonment Method Boring backfilled with auger cuttings and surface capped with cold-patch asphalt upon completion.</p>	<p>Logged by JP</p> <p>Boring Started 04-22-2026</p> <p>Boring Completed 04-22-2026</p>

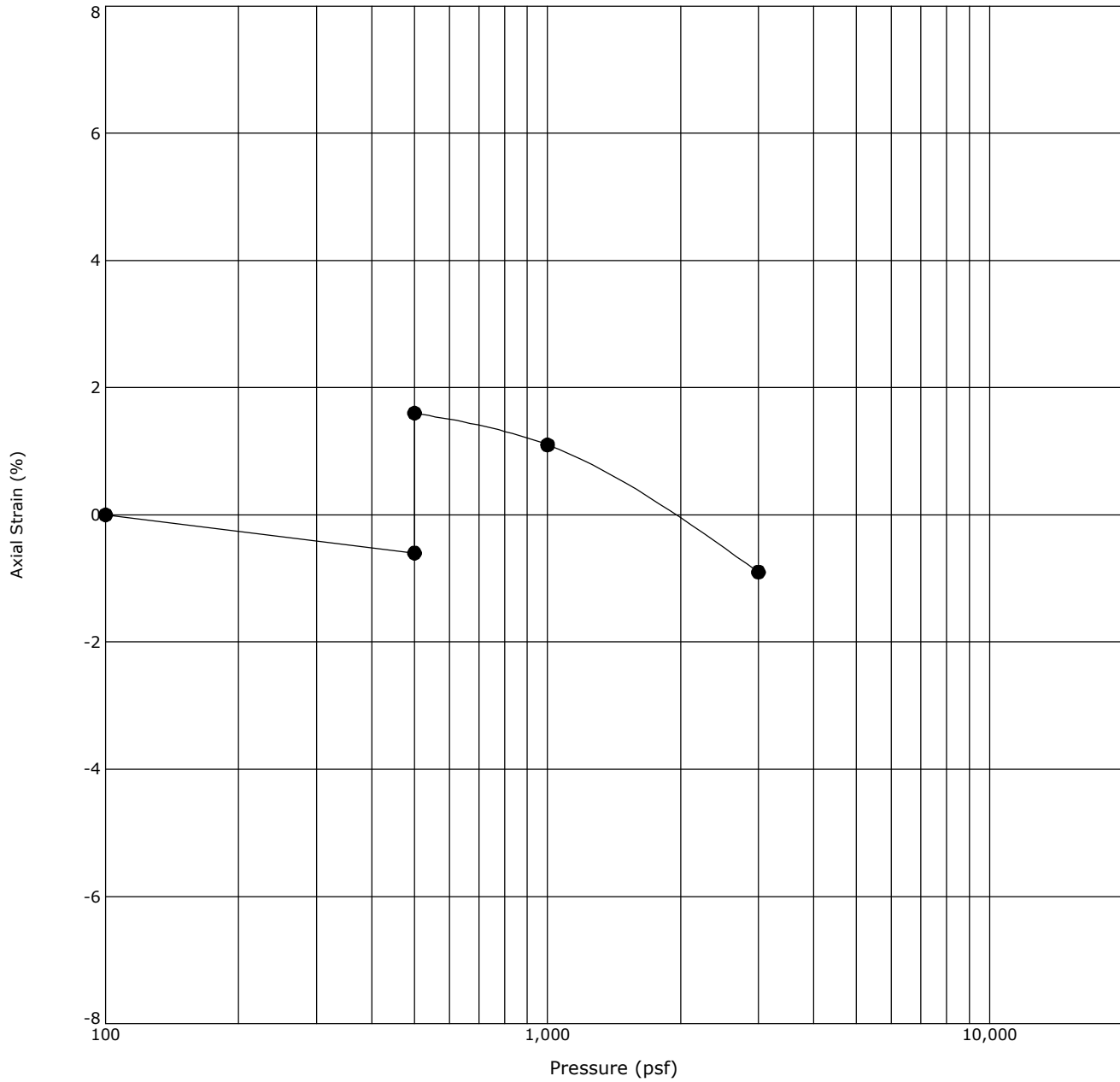
One-Dimensional Swell or Collapse



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● BC-1	9 - 10	CLAYSTONE		110	15.3

Notes: Sample exhibited about 2.5 percent swell upon wetting under an applied pressure of about 500 psf.

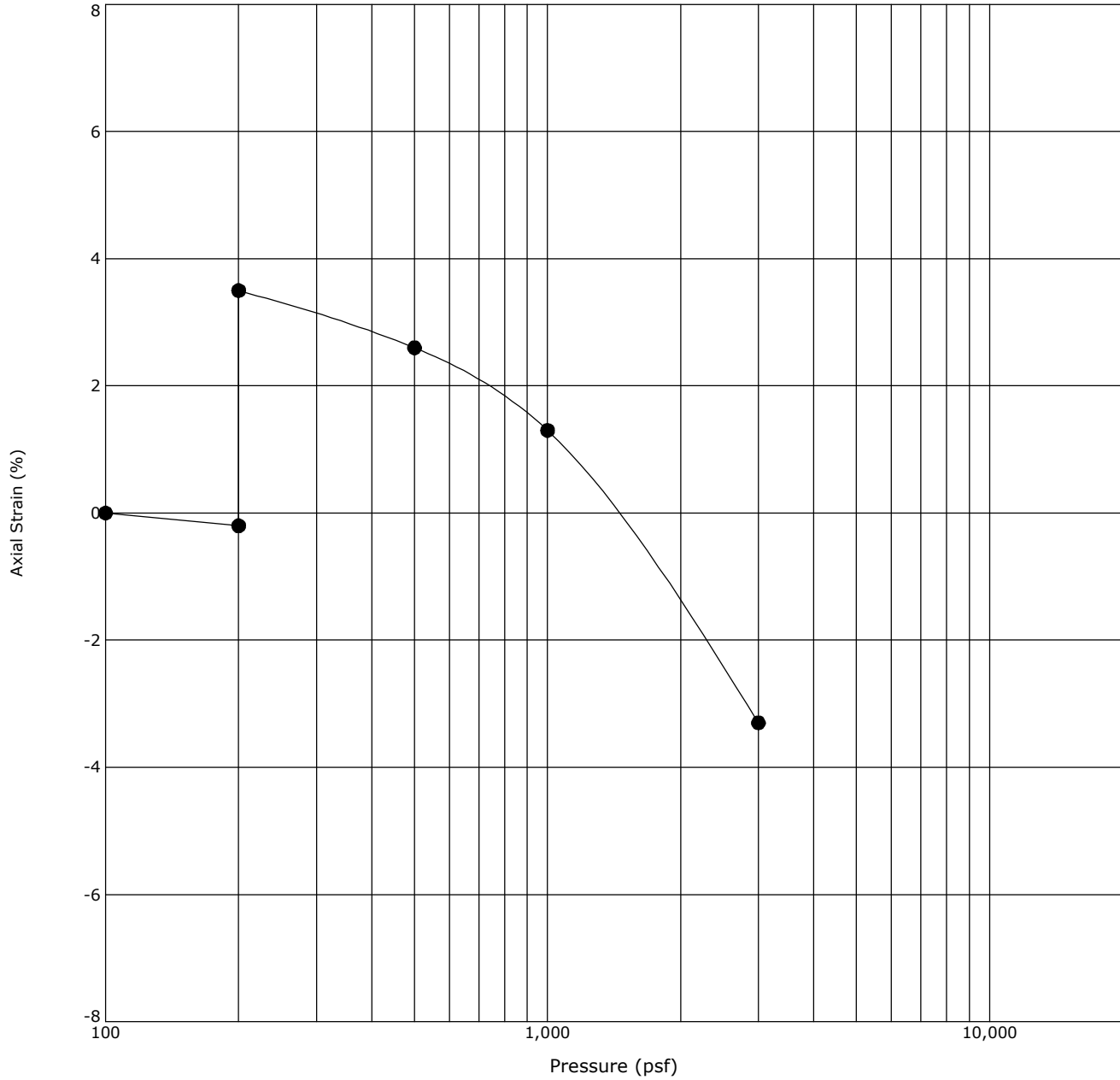
One-Dimensional Swell or Collapse



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● DT-1	14 - 15	CLAYSTONE		112	15.3

Notes: Sample exhibited about 2.2 percent swell upon wetting under an applied pressure of about 500 psf.

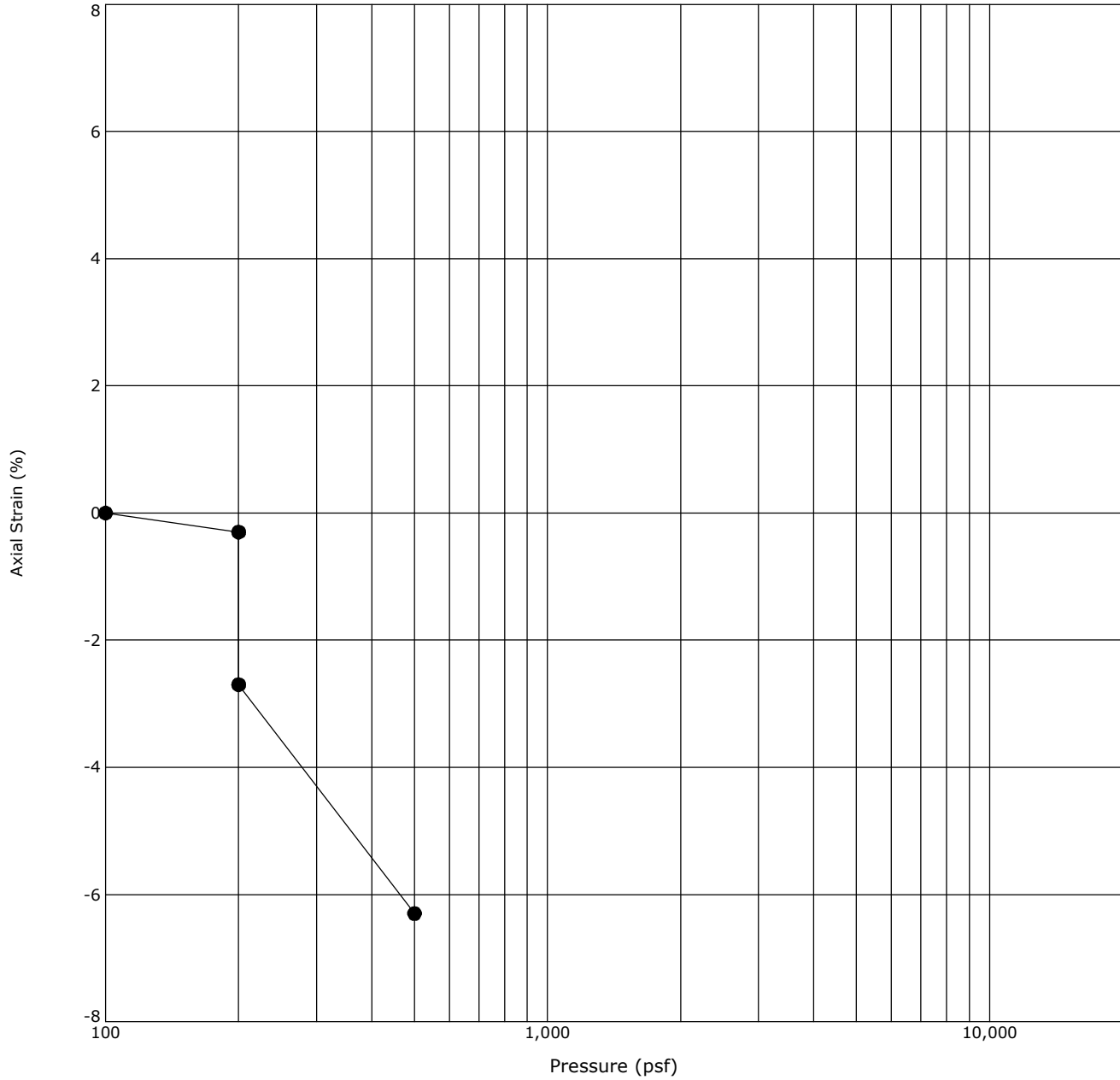
One-Dimensional Swell or Collapse



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● P-1	2 - 3	LEAN CLAY with SAND	CL	105	7.6

Notes: Sample exhibited about 3.7 percent swell upon wetting under an applied pressure of about 200 psf.

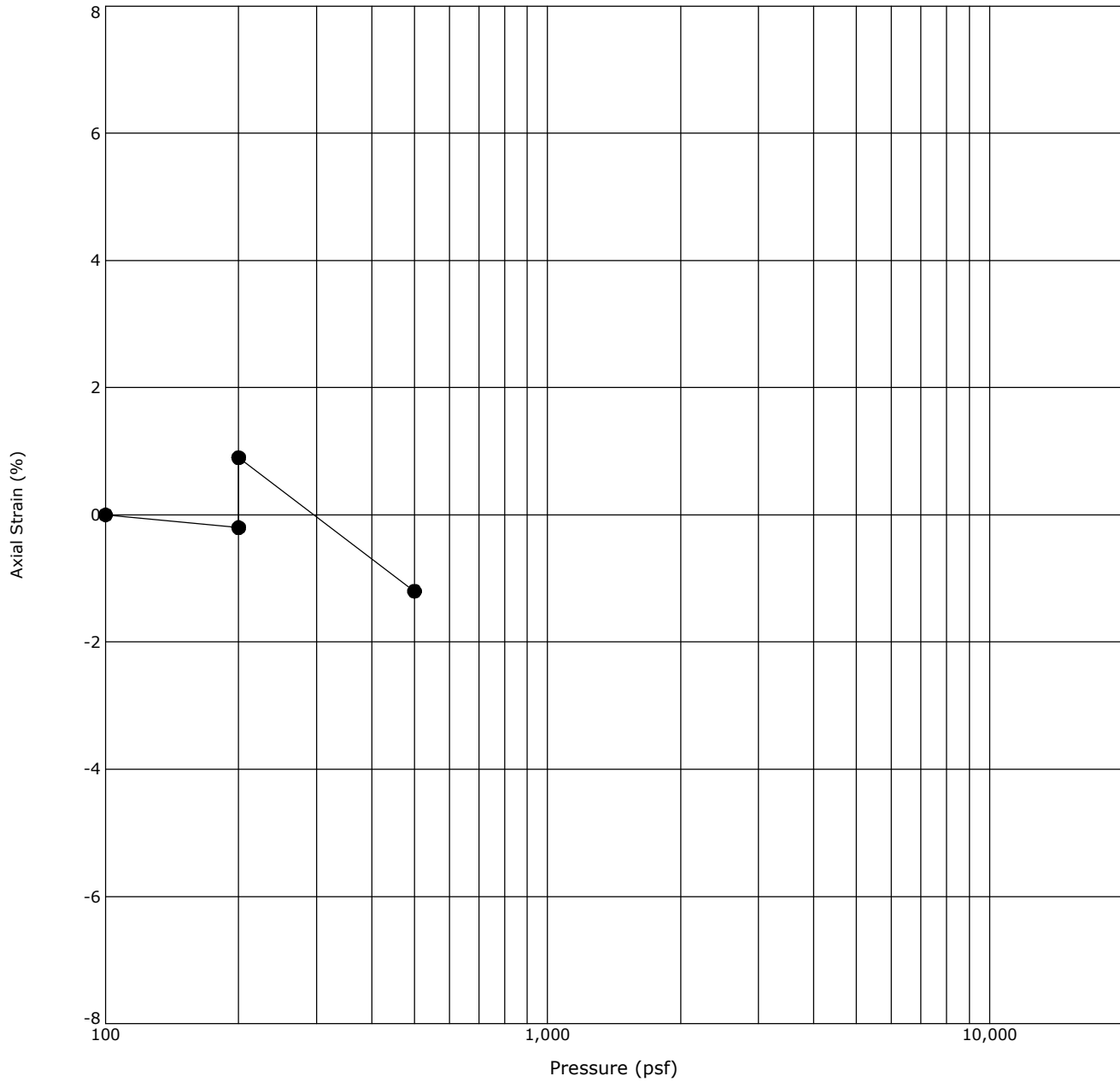
One-Dimensional Swell or Collapse



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● P-3	2 - 3	FILL - SANDY LEAN CLAY	CL	87	7.9

Notes: Sample exhibited about 2.4 percent collapse upon wetting under an applied pressure of about 200 psf.

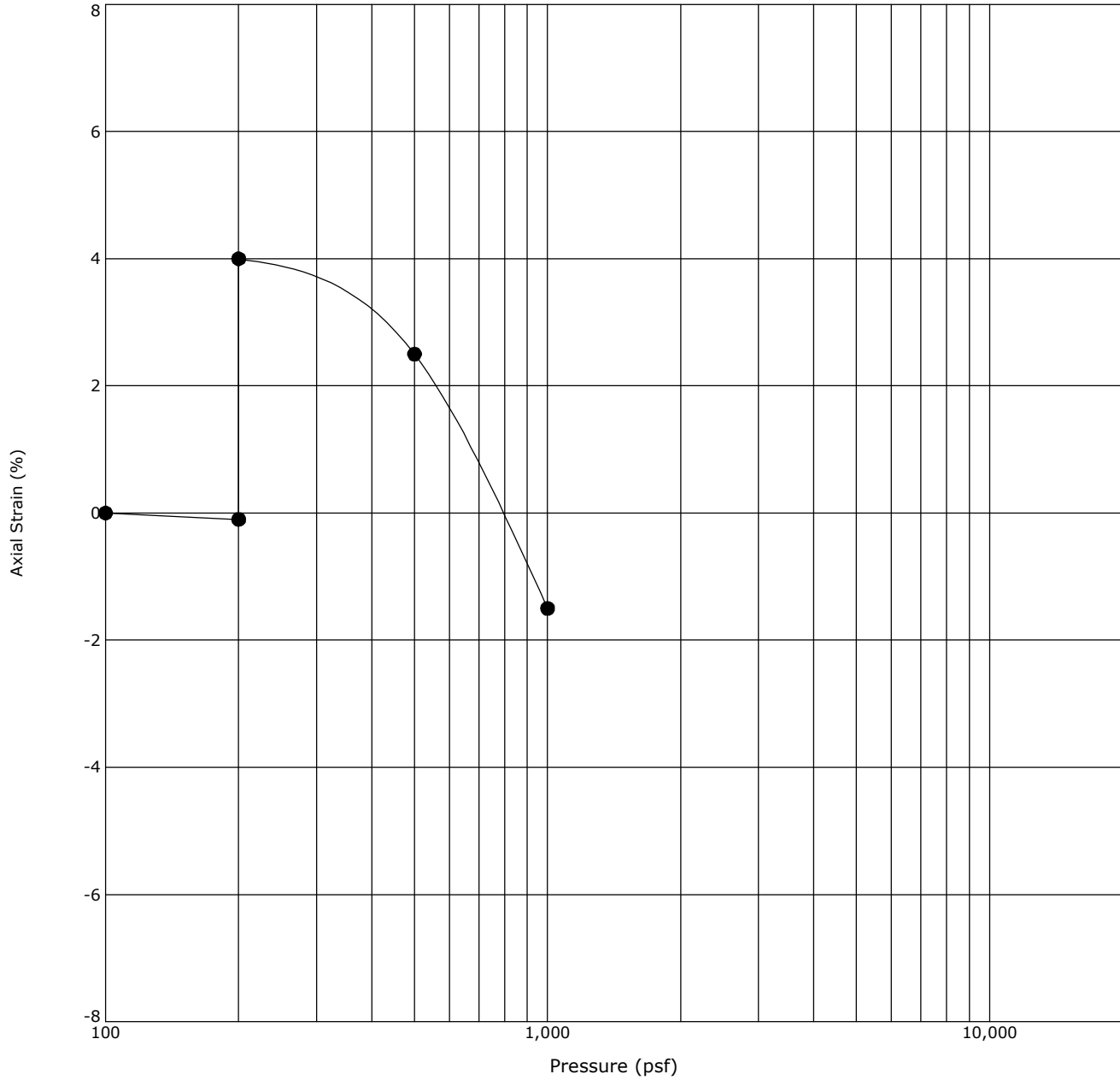
One-Dimensional Swell or Collapse



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● P-5	4 - 5	LEAN CLAY with SAND	CL	91	11.5

Notes: Sample exhibited about 1.1 percent swell upon wetting under an applied pressure of about 200 psf.

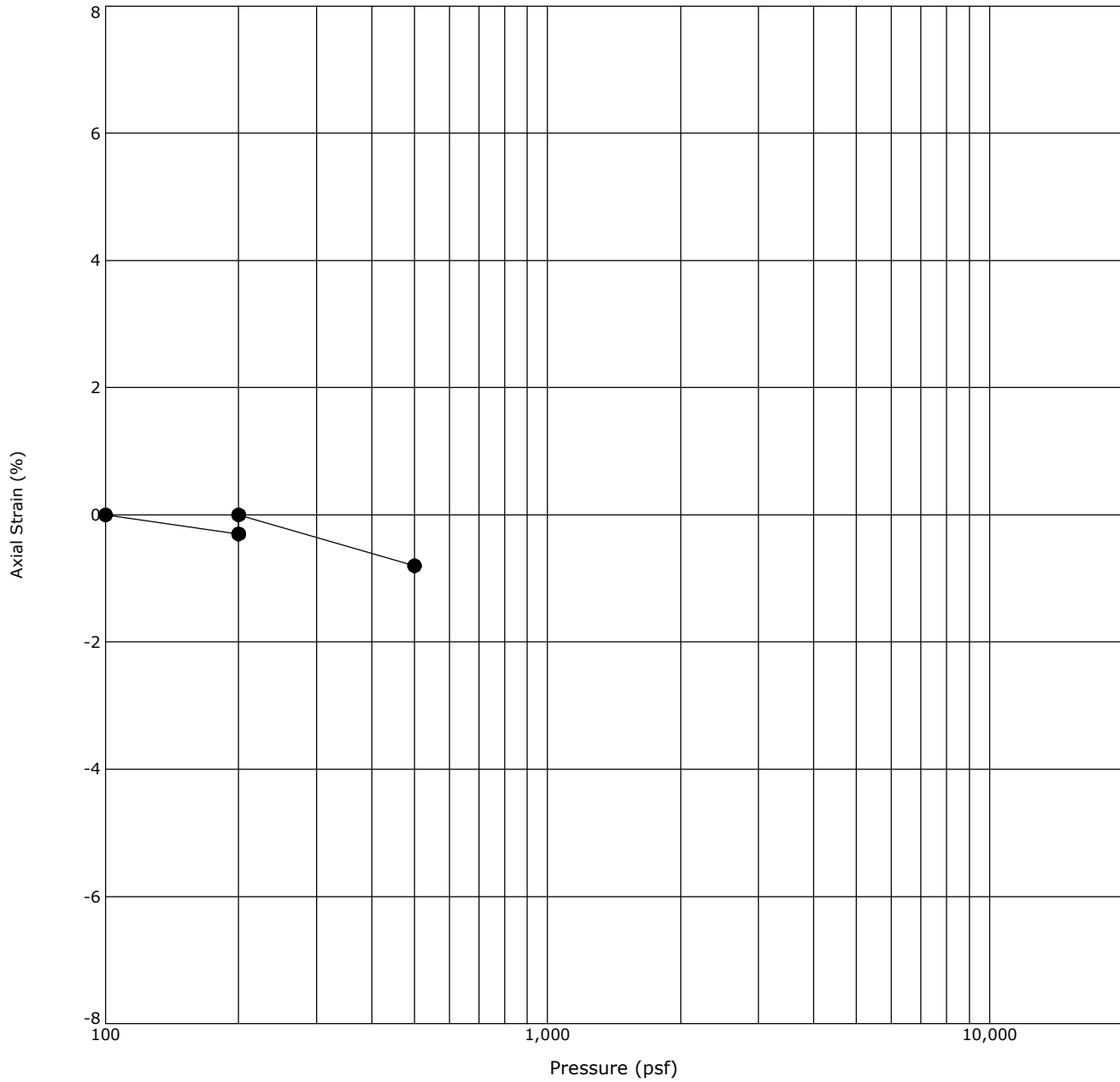
One-Dimensional Swell or Collapse



Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● P-6	4 - 5	SANDY LEAN CLAY	CL	94	7.3

Notes: Sample exhibited about 4.1 percent swell upon wetting under an applied pressure of about 200 psf.
 Sample was remolded to about in-situ moisture content and density.

One-Dimensional Swell or Collapse

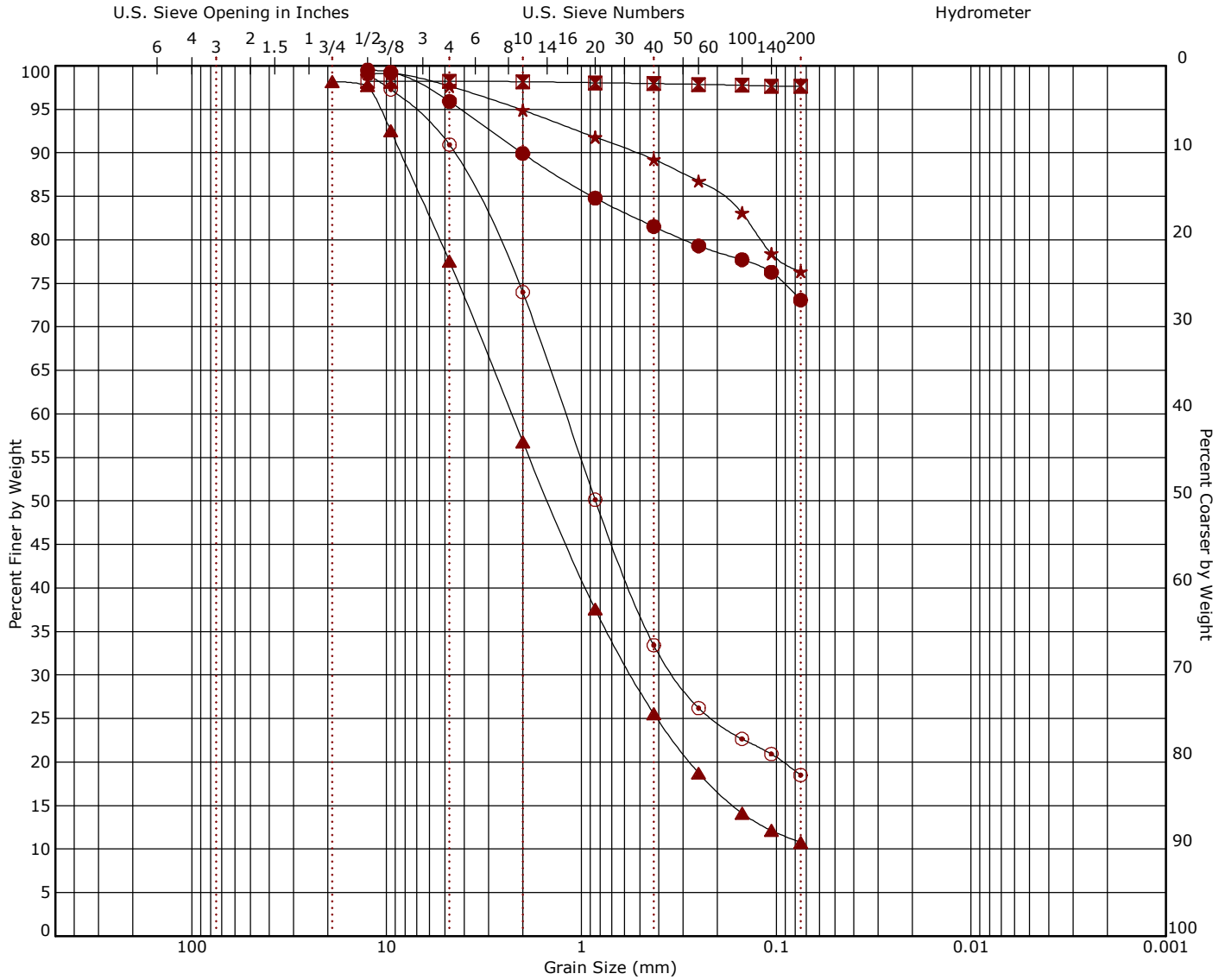


Boring ID	Depth (Ft)	Description	USCS	γ_d (pcf)	WC (%)
● P-7	2 - 3	SANDY LEAN CLAY	CL	100	15.1

Notes: Sample exhibited about 0.3 percent swell upon wetting under an applied pressure of about 200 psf.

Grain Size Distribution

ASTM D422 / ASTM C136



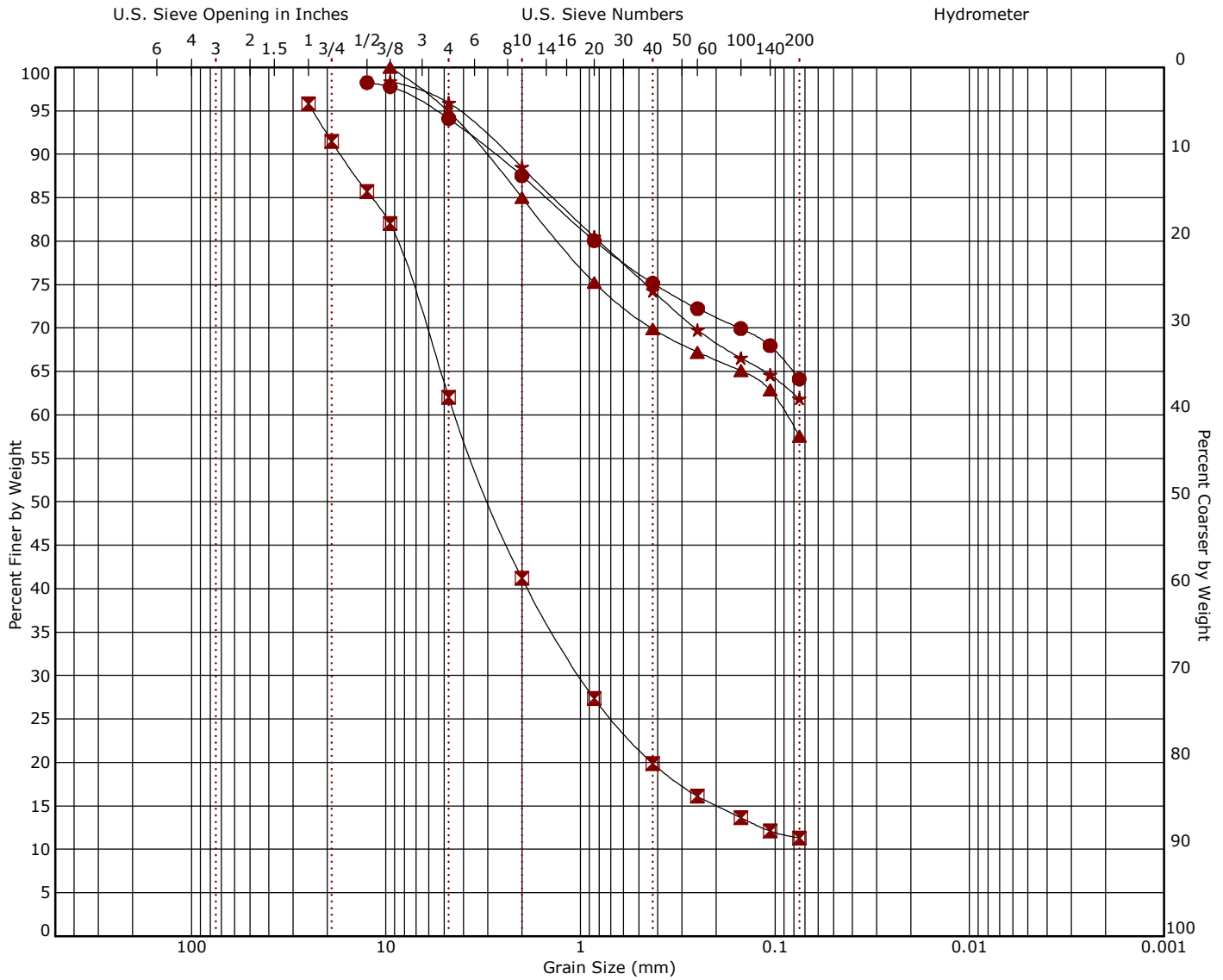
Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● BC-1	1 - 4	LEAN CLAY with SAND	CL	A-6 (12)	39	21	18		
☒ BC-1	19 - 20	CLAYSTONE		A-7-6 (32)	52	23	29		
▲ DT-1	4 - 5	WELL-GRADED SAND with SILT and GRAVEL	SW-SM	A-1-b (0)	NP	NP	NP	2.14	37.14
★ P-1	1 - 4	LEAN CLAY with SAND	CL	A-6 (9)	33	20	13		
⊙ P-2	1 - 4	SILTY SAND	SM	A-1-b (0)	NP	NP	NP		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● BC-1	1 - 4	12.5					3.6	22.8	73.1		
☒ BC-1	19 - 20	12.5					0.0	0.6	97.6		
▲ DT-1	4 - 5	19	2.285	0.549			20.6	66.8	10.8		
★ P-1	1 - 4	12.5					1.4	21.3	76.3		
⊙ P-2	1 - 4	12.5	1.211	0.331			8.1	72.4	18.5		

Grain Size Distribution

ASTM D422 / ASTM C136



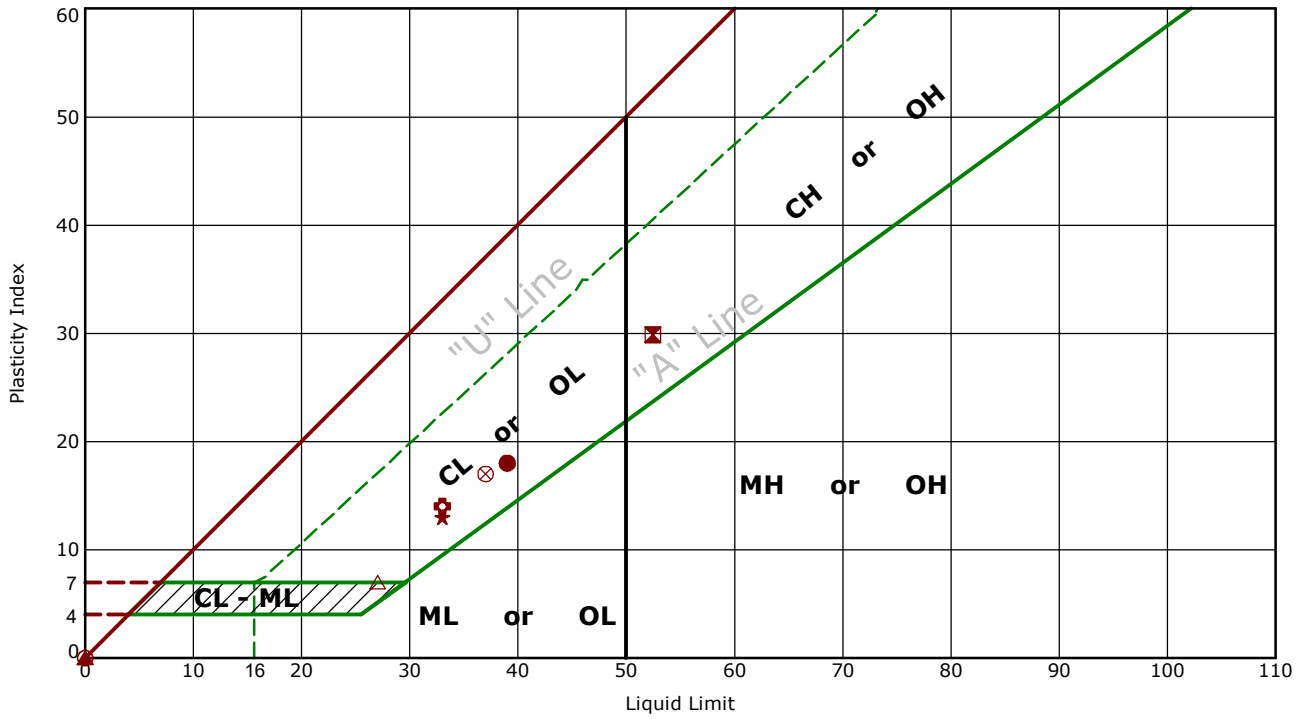
Cobbles	Gravel					Sand			Silt or Clay	
	coarse	fine	coarse	medium	fine					

Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
● P-3	1 - 4	SANDY LEAN CLAY	CL	A-6 (7)	33	19	14		
☒ P-4	1 - 4	POORLY GRADED SAND with SILT and GRAVEL	SP-SM	A-1-a (0)	NP	NP	NP	5.53	105.46
▲ P-5	1 - 4	SANDY SILTY CLAY	CL-ML	A-4 (2)	27	20	7		
★ P-6	1 - 4	SANDY LEAN CLAY	CL	A-6 (8)	37	20	17		

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● P-3	1 - 4	12.5					4.2	30.0	64.1		
☒ P-4	1 - 4	25	4.369	1			33.8	50.7	11.3		
▲ P-5	1 - 4	9.5	0.088			0.0	5.1	37.3	57.6		
★ P-6	1 - 4	9.5					2.5	34.1	61.9		

Atterberg Limit Results

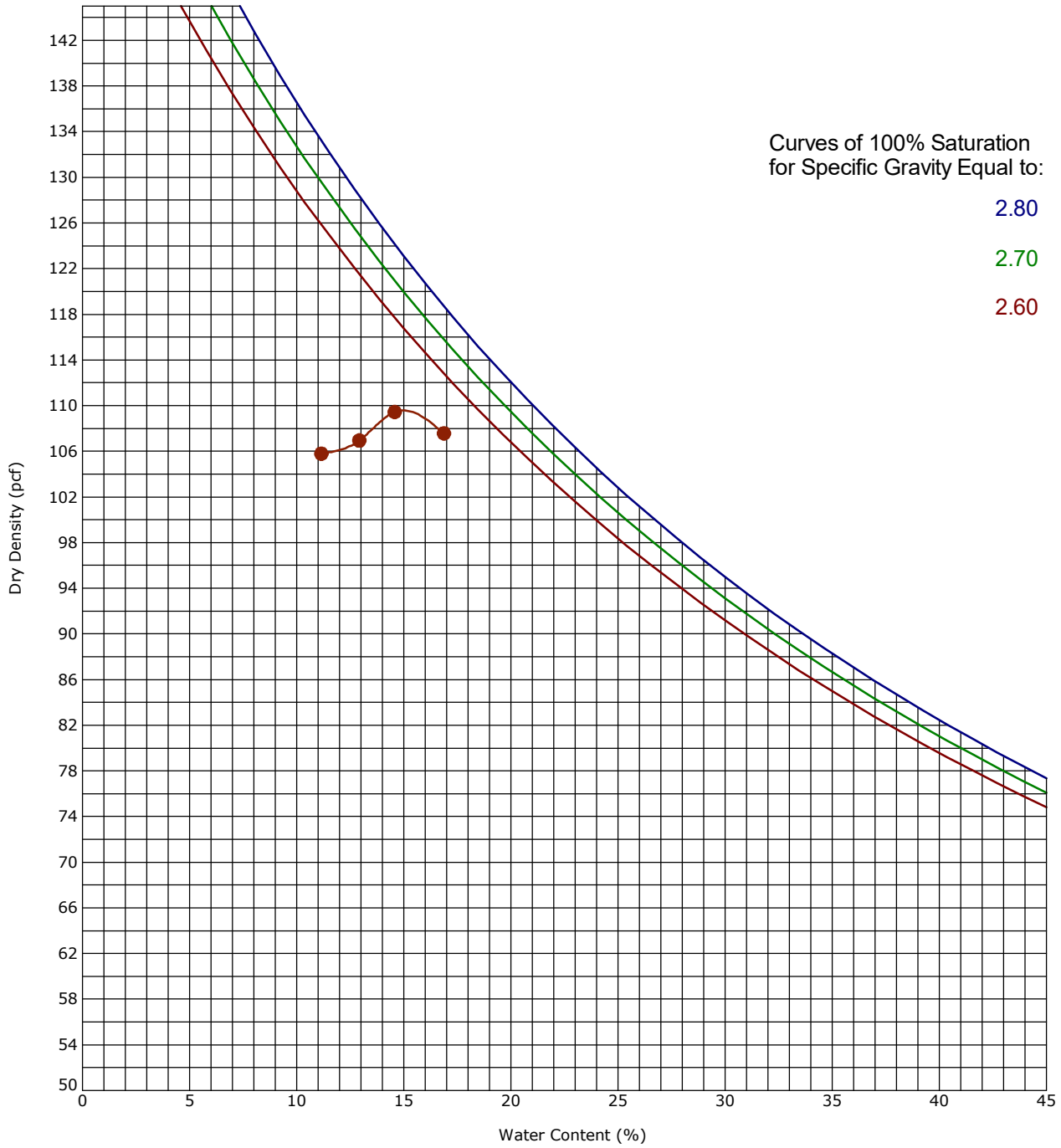
ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	BC-1	1 - 4	39	21	18	73.1	CL	LEAN CLAY with SAND
⊠	BC-1	19 - 20	52	23	29	97.6		CLAYSTONE
▲	DT-1	4 - 5	NP	NP	NP	10.8	SW-SM	WELL-GRADED SAND with SILT and GRAVEL
★	P-1	1 - 4	33	20	13	76.3	CL	LEAN CLAY with SAND
⊙	P-2	1 - 4	NP	NP	NP	18.5	SM	SILTY SAND
⊕	P-3	1 - 4	33	19	14	64.1	CL	SANDY LEAN CLAY
○	P-4	1 - 4	NP	NP	NP	11.3	SP-SM	POORLY GRADED SAND with SILT and GRAVEL
△	P-5	1 - 4	27	20	7	57.6	CL-ML	SANDY SILTY CLAY
⊗	P-6	1 - 4	37	20	17	61.9	CL	SANDY LEAN CLAY

Moisture-Density Relationship

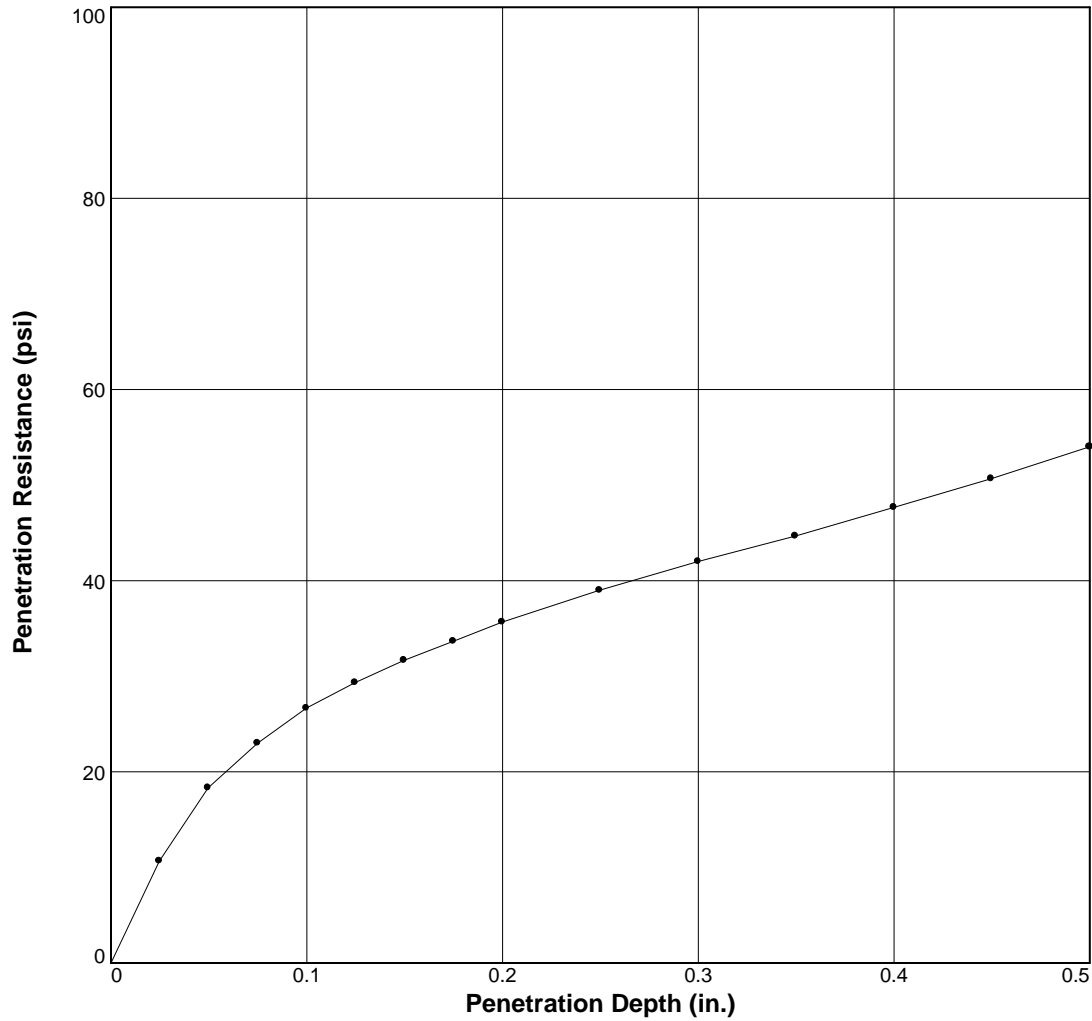
ASTM D698-Method B



Boring ID	Depth (Ft)	Description of Materials				
P-1	1 - 4	LEAN CLAY with SAND(CL)				
Fines (%)	LL	PL	PI	Test Method	Maximum Dry Density (pcf)	Optimum Water Content (%)
76	33	20	13	ASTM D698-Method B	109.6	14.9

BEARING RATIO TEST REPORT

ASTM D1883-16



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	104.0	94.9	15.1	102.2	93.2	20.0	2.7	2.4	0.000	10	1.8
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
CL, Lean Clay with Sand	CL	109.6	14.9	33	13

Project No: 23265036A
Project: Carvana - Fountain, CO North Site Improvements
Location: P-1
Depth: 1.0'-4.0'
Date: 4/30/2026

Test Description/Remarks:
 Prepared according to ASTM D698 compaction efforts.



Client

Atwell LLC
Scottsdale, AZ

Project

Carvana Fountain, CO - New Parking Area
23265036A

Date Received: 4/24/2026

Results from Sulfate Testing

Sample Location	BC-1	DT-1	P-2	
Sample Depth (ft.)	1 - 4	1 - 4	1 - 4	
Water Soluble Sulfate (SO ₄), AASHTO T290, (%)	0.02	<0.01	<0.01	

Analyzed By:

Daryl Lee
Laboratory Supervisor

The tests were performed in general accordance with applicable ASTM and AASHTO test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

SUMMARY OF LABORATORY TEST RESULTS
 Carvana Fountain, CO - New Parking Area | Fountain, Colorado
 Terracon Project No. 23265036A

Boring No.	Depth (ft)	USCS Class.	Initial Water Content (%)	Initial Dry Density (pcf)	Swell/Consolidation		CBR (%)		Moisture-Density Relationship			Particle Size Distribution, Percent Passing by Weight						Atterberg Limits		Water Soluble Sulfates (%)	Remarks	
					Surcharge (ksf)	Swell (%)	0.10 in.	0.20 in.	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	ASTM Test Method	1-1/2"	1"	3/4"	#4	#10	#40	#200	LL			PI
BC-1	1 - 4	CL										100	100	100	96	90	82	73	39	18	0.02	
BC-1	2	CL	12.9	97																		4
BC-1	7	SM	16.0	101																		4
BC-1	9		15.3	110	0.5	+2.5																3,4
BC-1	19		12.7	112								100	100	100	98	98	98	98	52	29		4
BC-1	29		11.4	119																		4
DT-1	1 - 4	SM																			<0.01	
DT-1	4	SM	1.2	131								100	100	98	78	57	26	11	NV	NP		4
DT-1	9		15.9	106																		4
DT-1	19		15.3	112	0.5	+2.2																3,4
P-1	1 - 4	CL					2.7	2.4	109.6	14.9	D698B	100	100	100	98	95	89	76	33	13		6
P-1	2	CL	7.6	105	0.2	+3.7																3,4
P-1	4	SP	1.6	116																		4
P-2	1 - 4	SM										100	100	100	91	74	33	19	NV	NP	<0.01	
P-2	2	SM	1.4	114																		4
P-2	4	SM	1.9	118																		4
P-3	1 - 4	CL										100	100	100	94	88	75	64	33	14		
P-3	2	CL	7.9	87	0.2	-2.4																3,4
P-3	4	SM	3.7	101																		4
P-4	1 - 4	SP										100	96	92	62	41	20	11	NV	NP		
P-4	2	SP	1.8	105																		4
P-4	4	SP	6.3	108																		4
P-5	1 - 4	CL-ML										100	100	100	95	85	70	58	27	7		
P-5	2	CL-ML	11.5	98																		4
P-5	4	CL	11.5	91	0.2	+1.5																3,4
P-6	1 - 4	CL										100	100	100	96	89	74	62	37	17		
P-6	2	CL	6.2	102																		4
P-6	4	CL	7.8	97	0.2	+4.1																3,4
P-7	2	CL	15.1	100	0.2	+0.3																3,4

Notes:

Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
 * = Partially disturbed sample
 - = Compression/settlement
 NV = no value
 NP = non-plastic

Remarks:

- 1 Remolded Compacted density (about 95% of ASTM D698 maximum density near optimum moisture content)
- 2 Remolded Compacted density (about 95% of ASTM D1557 maximum density near optimum moisture content)
- 3 Water added to sample
- 4 Dry density and/or moisture content determined from one ring of a multi-ring sample
- 5 Minus #200 Only
- 6 Moisture-Density Relationship Test Method ASTM D698/AASHTO T99
- 7 Moisture-Density Relationship Test Method ASTM D1557/AASHTO T180

Geotechnical Engineering Report

Carvana - Fountain, CO – New Parking Area | Fountain, Colorado
May 22, 2026 | Terracon Project No. 23265036A










Supporting Information

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

General Notes

Sampling	Water Level	Field Tests
 Auger Cuttings  Modified California Ring Sampler  Standard Penetration Test	 Water Level 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.	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 <small>(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance</small>			Consistency of Fine-Grained Soils <small>(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</small>				Bedrock		
Relative Density	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)	Consistency	Standard Penetration or N-Value (Blows/Ft.)	Ring Sampler (Blows/Ft.)
Very Loose	0 - 3	0 - 5	Very Soft	less than 0.25	0 - 1	< 3	Weathered	< 20	< 24
Loose	4 - 9	6 - 14	Soft	0.25 to 0.50	2 - 4	3 - 5	Firm	20 - 29	24 - 35
Medium Dense	10 - 29	15 - 46	Medium Stiff	0.50 to 1.00	4 - 8	6- 10	Medium Hard	30 - 49	36 - 60
Dense	30 - 50	47 - 79	Stiff	1.00 to 2.00	8 - 15	11 - 18	Hard	50 - 79	61 - 96
Very Dense	> 50	≥ 80	Very Stiff	2.00 to 4.00	15 - 30	19 - 36	Very Hard	>79	> 96
			Hard	> 4.00	> 30	> 36			

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	$Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E	GW	Well-graded gravel ^F
		Gravels with Fines: More than 12% fines ^C	$Cu < 4$ and/or $[Cc < 1$ or $Cc > 3.0]$ ^E	GP	Poorly graded gravel ^F
			Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}
		Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	Fines classify as CL or CH	GC
	$Cu \geq 6$ and $1 \leq Cc \leq 3$ ^E			SW	Well-graded sand ^I
	Sands with Fines: More than 12% fines ^D		$Cu < 6$ and/or $[Cc < 1$ or $Cc > 3.0]$ ^E	SP	Poorly graded sand ^I
			Fines classify as ML or MH	SM	Silty 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
PI < 4 or plots below "A" line ^J				ML	Silt ^{K, L, M}
Organic:			$\frac{LL \text{ oven dried}}{LL \text{ not dried}} < 0.75$	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
PI plots below "A" line		MH			Elastic silt ^{K, L, M}
Organic:		$\frac{LL \text{ oven dried}}{LL \text{ not dried}} < 0.75$		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	

- ^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 $\geq 15\%$ 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 $\geq 15\%$ 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 $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.
- ^M If soil contains $\geq 30\%$ 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.

