



**ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED**

Job No. 175706

July 2, 2021

Lorson Ranch Metropolitan District No.1
212 N. Wahsatch Ave, Ste. 301
Colorado Springs, CO 80903

Re: Response to Colorado Geological Survey and El Paso County Review Comments
The Ridge at Lorson Ranch
Fontaine Bl
The Ridge at Lorson Ranch
El Paso County, Colorado

Dear Jeff Mark:

RMG – Rocky Mountain Group (RMG) prepared the *Soils and Geology Study* (RMG Job No. 175706, last dated March 21, 2021) for the proposed development project comprising 994 single-family detached residential units located along both sides of Fontaine Boulevard to the east of Lamprey Drive in El Paso County, Colorado. The report was reviewed by personnel of the Colorado Geological Survey (CGS) and personnel of El Paso County (EPC).

The purpose of this letter is to provide RMG's response to the review comments. For clarity and ease of review we have provided a copy of each comment followed by our response.

CGS Comment:

4. In reviewing RMG's laboratory testing, the water content of a sandy clay sample from 4 ft. depth in boring F-36 is 39.9 percent, and the water content of a claystone sample from 14 ft. depth in boring F-34 is 36.9 percent which is unusually high compared to other samples. If these moisture contents are correct, saturated conditions may be encountered during construction that may require soil stabilization. Additionally, in Figure No. 25, boring D-41 contains a water content of 648.9, which is a typo, and boring D-42 is missing relevant lab data. CGS recommends that RMG verify and, if necessary, correct their lab test values.

RMG Response:

The noted moisture values have been corrected. The results of the laboratory tests performed on boring D-42 were presented in the previous report referenced above.

CGS Comment:

1. RMG states (page 13) that the proposed cuts and fills located within the building envelopes are anticipated to vary between 10 and 20 feet. Also noted on page 13, "the excavations are anticipated (to) encounter sandy clay and claystone. The on-site soils can generally be used as site-grading fill, though the use of claystone within the fill should be avoided where the fill will be located below the proposed foundations." Based on RMG's boring logs, expansive bedrock was encountered near the existing ground surface in some borings. CGS agrees with RMG that claystone should be avoided in the subexcavation and replacement section beneath foundations, implying that these materials should not be placed within the fill section beneath structures.

However, this contradicts statements indicated on pages 15 and 17 of RMG's report regarding removal and replacement beneath the foundation or floor slab bearing levels. For example, on page 15, "This can be accomplished through "mass" subexcavation and replacement with moisture-conditioned expansive soils/bedrock during land development operations." CGS recommends that RMG clarify if the use of claystone beneath structures is acceptable during overlot site grading.

RMG Response:

The verbiage on page 13 was incorrect, and has been revised. It is the developer's intent to moisture-condition and re-use the on-site claystone where permissible. Provided that the claystone materials are processed and placed as described on page 17, the use of claystone beneath structures during overlot grading is considered acceptable. Note, lot-specific subsurface soil investigations are still required at the time of construction to verify that the expansive potential of the claystone has been reduced to acceptable levels by the recommended moisture-conditioning and replacement operations.

CGS Comment:

3. RMG states on page 14, "It is our opinion that the existing geologic and engineering conditions can be satisfactorily mitigated through proper engineering, design and contraction practices." Should this be "...proper engineering, design, and construction practices..."?

RMG Response:

"Contraction" was a typographic error and has been updated to "construction".

EPC Comment:

upto 60 feet of fall an
no topo map with
roads and lots
shown..... ??

Structure Sections Required.

Where 3-dimensional relationships are significant but cannot be described satisfactorily in words alone, the geology and soils report should be accompanied by 1 or more appropriately positioned structure sections.

what lots are
impacted by water
(high moisture
contact? topography,
bedrock?)

RMG Response:

Regarding 60 feet of fall and no topo map:

The report references a total elevation difference of approximately 40 to 60 feet. Given the relatively large area included in this investigation (an estimated "average" width and length of approximately 1,300 feet and 4,300 feet, respectively), an elevation difference of 40 to 60 feet from the highest point to the lowest point is not uncommon. It is our opinion that a topo map with roads and lots shown was not necessary to our evaluation of the site for the purposes of this investigation, nor would it have substantially altered our recommendations.

Regarding which lots are impacted by water:

Generally speaking, this portion of Lorson Ranch is higher than the surrounding areas. Conditions consistent with a wide-spread shallow groundwater table were not encountered nor observed within the lots of the proposed development, nor have we encountered significant signs of a wide-spread shallow groundwater table in the course of investigations we have performed on the surrounding properties.

Shallow groundwater conditions were not encountered in the test boring performed for this study, or during the previously reviewed geotechnical engineering/geologic investigations. If shallow groundwater conditions are found to exist on a few lots at the time of the site specific subsurface soil investigations, the feasibility of basement construction and/or any recommended mitigation measures for those lots are to be addressed at that time. However, this is not anticipated to affect more than a small percentage of the lots, if any, and does not warrant large-scale or development-wide mitigation. Based on our knowledge of the area and engineering design and construction techniques employed in the El Paso County area, there is insufficient reason to preclude full-depth basements on any of the lots in this subdivision at this time. Likewise, it is our opinion that the installation of an "under drain" below the street (or any other development-wide subsurface dewatering system) is not necessary for the subject site.

The purpose of this report is to address geologic conditions (either hazards or constraints) that are anticipated to affect the proposed development and to provide preliminary information regarding what foundation concepts are anticipated to be suitable for the proposed residential structures. The purpose of this report is not to provide lot-specific construction recommendations. Furthermore, it is anticipated that groundwater levels at any given location will fluctuate (possibly going up and/or down over time) as the land development operations are performed and as homes are constructed on nearby lots.

Regarding structural sections required:

The purpose of geologic structural sections is not to graphically depict surficial contours of localized hills, but to address conditions where the 3-dimensional relationships between bedding layers of the subsurface materials are significant but cannot be described satisfactorily in words alone. This is typically the case where there are dips, folds, thrusts, faults, etc. that cause discontinuities in the bedding layers, such that they are fragmented, misaligned, overlapping, etc. Those types of features cannot be readily described by words alone, and a visual depiction can clarify the various relationships between the features on either side of the discontinuities. No such discontinuities exist below the subject site. This site is generally composed of generally horizontal bedding layers of clay overlying relatively shallow claystone. A structural section depicting this would not provide data pertinent to the investigation being performed.

EPC Comment:

content, dry density, grain-size analyses, Atterberg Limits and Swell/Consolidation tests. A Summary of Laboratory Test Results is presented in Figure 72 (13 pages). Soil Classification Data is presented in Figures 73 through 81. Swell/Consolidation Test Results are presented in Figures 82 through 143. Laboratory testing was not performed on the 13 preliminary test borings.

Why not- is that not typical practice-were some followed up?

5.2 Groundwater

Groundwater was not encountered in the test borings during the field exploration. Follow-up water checks were not performed on the test borings.

Based on our knowledge of the area and engineering design and construction techniques commonly employed in the El Paso County area at this time, it is our opinion that there is insufficient reason to preclude full-depth basements on any of the lots in this subdivision at this time.

RMG Response:

It is typical to perform follow-up water checks in areas where groundwater conditions are known to exist, or in areas where groundwater was encountered at the time of drilling. Neither condition applies in this case. Based on our knowledge of the surrounding area, the elevation of this site relative to the surrounding filings, and the conditions encountered at the time of drilling, follow-up groundwater checks were not considered necessary.

EPC Comment:

classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

6.2 Bedrock Conditions

In general, the bedrock (as mapped by Colorado Geologic Survey - CGS) beneath the site is considered to be part of the Pierre Shale formation. Bedrock was encountered in the majority of test borings performed for this investigation. Bedrock conditions are anticipated to be encountered in the excavations or utility trenches for the proposed development.

Bedrock was encountered, how will basements be excavated- explosives or standrd equipment- provide geo note and the mitigation technique on PUDSP plan. Identify lot th are impacted unless its entire area...?

RMG Response:

The bedrock conditions encountered are consistent with those that have been encountered in other areas of Lorson Ranch East. Generally, these materials can be readily excavated with typical construction equipment such as front-end loaders, and even more readily so for the standard construction scrapers that the developer will likely use for the proposed mass subexcavation below most or all of the buildable lots. The use of explosives is not anticipated for this site.

EPC Comment:

The site plan provided by Matrix has the interior roadways classified as Residential Urban Collectors and the extension of Fontaine Boulevard as a typical 100' R.O.W section. *The actual pavement section design for individual streets will be completed following overlot grading and rough cutting of the street subgrade.*

The Lorson Ranch area has generally preferred to construct the roadways with a composite roadway section consisting of Hot Mix Asphalt over Cement-Treated Subgrade (CTS). For purposes of this report, we anticipate the subgrade soils will primarily have American Association of State Highway and Transportation Officials (AASHTO) Soil Classifications of A-6(14-21), and A-6-7(19-43) with an estimated design subgrade "R-values" on the order of approximately 3 to 5.

they are asking to install wet utilities now....dont wen need the design now to verify depth

RMG – Rocky Mountain Group

14

RMG Job No. 174669

RMG Response:

As noted in the El Paso County Engineering Criteria Manual (ECM), the soil investigation associated with a pavement design report occurs after the roadways are graded and the deepest utility is installed.

Section 2.3.1-2.3.1

C. Pavement Design Report

A Pavement Design Report is required to be submitted and approved before paving any County road. The final pavement design may be submitted after the ECM Administrator approval of the associated roadway, profile, drainage, and final construction plans. The Pavement Design Report shall conform to the requirements of Appendix D. The soil investigation associated with this report occurs after the roadways are graded and the deepest utility is installed.

2.3 ROADWAY DESIGN

I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,

RMG – Rocky Mountain Group



Kelli Zigler
Project Geologist

Reviewed by,

RMG – Rocky Mountain Group

Tony Munger, P.E.
Geotechnical Project Manager



Architecture
Structural
Geotechnical



Materials Testing
Forensic
Civil/Planning

**ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED**

SOILS AND GEOLOGY STUDY

**The Ridge at Lorson Ranch
El Paso County, Colorado**

PREPARED FOR:

**Lorson Ranch Metropolitan District No.1
212 N. Wahsatch Ave, Ste. 301
Colorado Springs, CO 80903**

JOB NO. 175706

**March 22, 2021
Revised July 2, 2021**

**Respectfully Submitted,
RMG – Rocky Mountain Group**

**Reviewed by,
RMG – Rocky Mountain Group**

A handwritten signature in blue ink that reads "Kelli Zigler".

**Kelli Zigler
Project Geologist**



**Tony Munger, P.E.
Geotechnical Project Manager**

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APPENDIX A

Additional Reference Documents

APPENDIX B

RMG Preliminary Test Borings

APPENDIX C

Guideline Site Grading Specifications

1.0 GENERAL SITE AND PROJECT DESCRIPTION

1.1 Project Location

The project lies in the southern half of Section 13, Township 15 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

1.2 Existing Land Use

The site currently consists of a portion of one parcel. The total area of the proposed site is to be 206.473 acres as denoted on CSO1 of the Planned Unit Development & Preliminary Plan for The Ridge at Lorson Ranch. The parcel included are:

- The site is a portion of: Schedule No. 5500000371 which currently consists of 276.97 acres and is currently not developed.

The current and proposed zoning is "PUD" (Planned Unit Development).

1.3 Project Description

The proposed site development is to consist of 994 single-family detached residential units. The lot areas range from 3,825 to 6,600 square feet. Entrance into the subdivision is to be provided from the north by extending the existing Grayling Drive, Fontaine Boulevard and from the south by extending the existing Lorson Boulevard. Additional proposed land usage includes, landscaped easements, parks, open space, trail corridors, utility easements, and seven Tracts: A, B, C, H, I, U, and V. The Proposed Lot Layout with Test Boring Locations plan is presented in Figure 2.

The streets within the subdivision are to be public Residential Urban Local with a 50' to 64' R.O.W and constructed to El Paso County standards. The extension of Fontaine Boulevard is to be a typical 100' R.O.W. The streets are to be maintained by El Paso County Department of Transportation.

The development is to utilize sewer and water services provided by Widefield Water and Sanitation District. Neither individual wells nor on-site wastewater treatment systems are proposed.

2.0 QUALIFICATIONS OF PREPARERS

This Geology and Soils Study was prepared by a professional geologist as defined by Colorado Revised Statutes section 34-1-201(3) and by a qualified geotechnical engineer as defined by policy statement 15, "Engineering in Designated Natural Hazards Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. (Ord. 96-74; Ord. 01-42)

The principle investigators for this study are Kelli Zigler P.G., and Tony Munger, P.E. Ms. Zigler is a Professional Geologist as defined by State Statute (C.R.S 34-1-201) with over 20 years of experience in the geological and geotechnical engineering field. Ms. Kelli Zigler holds a B.S. in Geology from the University of Tulsa. Ms. Zigler has supervised and performed numerous geological and geotechnical field investigations throughout Colorado.

Tony Munger is a licensed professional engineer with over 20 years of experience in the construction engineering (residential) field. Mr. Munger holds a Bachelor of Science in Architectural Engineering from the University of Wyoming.

3.0 STUDY OVERVIEW

The purpose of this investigation is to characterize the general geotechnical and geologic site conditions, and present our opinions of the potential effect of these conditions on the proposed development of single-family residences within the referenced site. As such, our services exclude evaluation of the environmental and/or human, health-related work products or recommendations previously prepared, by others, for this project.

Revisions to the conclusions presented in this report may be issued based upon submission of the Development Plan. This study has been prepared in accordance with the requirements outlined in the El Paso County Land Development Code (LDC) specifically Chapter 8 last updated August 27, 2019 applicable sections include 8.4.8 and 8.4.9. and the Engineering Criteria Manual (ECM), specifically Appendix C last updated July 9, 2019.

This report presents the findings of the study performed by RMG relating to the geotechnical and geologic conditions of the above-referenced site. Revisions and modifications to the conclusions and recommendations presented in this report may be issued subsequently by RMG based upon additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report.

3.1 Scope and Objective

The scope of this study is to include a physical reconnaissance of the site and a review of pertinent, publically available documents including (but not limited to) previous geologic and geotechnical reports, overhead and remote sensing imagery, published geology and/or hazard maps, design documents, etc. Our services exclude the evaluation of the environmental and/or human, health-related work products or recommendations previously prepared, by others, for this project.

The objectives of our study are to:

- Identify geologic conditions that are present on this site,
- Analyze the potential negative impacts of these conditions on the proposed site development,
 - Analyze the potential negative impacts to the surrounding properties and/or public services resulting from the proposed site development as it relates to existing geologic hazards,
 - Provide our opinion of suitable techniques that may be utilized to mitigate the potential negative impacts identified herein.

This report presents the findings of the study performed by RMG relating to the geologic conditions of the above-referenced site. Revisions and modifications to this report may be issued subsequently by RMG, based upon:

- Additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report,
- Review of pertinent documents (development plans, plat maps, drainage reports/plans, etc.) not available at the time of this study,

- Comments received from the governing jurisdiction and/or their consultants subsequent to submission of this document.

3.2 Site Evaluation Techniques

The information included in this report has been compiled from:

- Field reconnaissance
- Geologic and topographic maps
- Review of selected publicly available, pertinent engineering reports
- Available aerial photographs
- Exploratory soil test borings by RMG
- Laboratory testing of representative site soil and rock samples by RMG
- Geologic research and analysis
- Site development plans prepared by others

Geophysical investigations were not considered necessary for characterization of the site geology. Monitoring programs, which typically include instrumentation and/or observations for changes in groundwater, surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

3.3 Additional Documents

Additional documents reviewed during the performance of this study are included in Appendix A.

4.0 SITE CONDITIONS

4.1 Existing Site Conditions

The entire site is undeveloped. Tract A is to remain an easement for the overhead power lines that are located west of the site. The easement transverses from the northeast to the southwest along the western property boundary.

4.2 Topography

Based on our site reconnaissance and the *Early Overlot Grading / Erosion Control Plans* referenced herein, the site topography is generally rolling hills. The elevation varies by approximately 40 to 60 feet across the site, generally sloping from the northeast to the southwest.

4.3 Vegetation

The majority of the site consists of low lying native grasses and weeds.

4.4 Aerial photographs and remote-sensing imagery

Personnel of RMG reviewed aerial photos available through Google Earth Pro dating back to 1999, CGS surficial geologic mapping, and historical photos by historicaerials.com dating back to 1947. Historically, the

site has remained generally undisturbed since 1947, other than the construction of the overhead power lines that were put in place prior to 1969.

5.0 FIELD INVESTIGATION AND LABORATORY TESTING

The subsurface conditions within the property were explored by drilling 134 exploratory test borings to depths of approximately 10 to 25 feet below the existing ground surface. Of the 134 exploratory test borings, 13 (labeled A-1 through A-13) were drilled as preliminary borings to determine the depth of bedrock prior to this investigation. The number of borings is in excess of the minimum one test boring per 10 acres of development up to 100 acres and one additional boring for every 25 acres of development above 100 acres as required by the ECM, Section C.3.3.

The test borings were drilled with a power-driven, continuous-flight auger drill rig. Samples were obtained during drilling of the test boring in general accordance with ASTM D-1586 and D-3550, utilizing a 2-inch O.D. Split Barrel Sampler and a 2½-inch O.D. California sampler, respectively. Results of the penetration tests are shown on the drilling logs. The proposed lot layout is shown on the Proposed Lot Layout with Test Boring Locations plan, Figure 2. An Explanation of Test Boring Logs is shown in Figure 4, and the Test Boring Logs are shown in Figures 5 through 71. The thirteen preliminary borings are presented in Appendix B.

5.1 Laboratory Testing

Soil laboratory testing was performed as part of this investigation. The laboratory tests included moisture content, dry density, grain-size analyses, Atterberg Limits and Swell/Consolidation tests. A Summary of Laboratory Test Results is presented in Figure 72 (13 pages). Soil Classification Data is presented in Figures 73 through 81. Swell/Consolidation Test Results are presented in Figures 82 through 143. Laboratory testing was not performed on the 13 preliminary test borings.

5.2 Groundwater

Groundwater was not encountered in the test borings during the field exploration. Follow-up water checks were not performed on the test borings.

Based on our knowledge of the area and engineering design and construction techniques commonly employed in the El Paso County area at this time, it is our opinion that there is insufficient reason to preclude full-depth basements on any of the lots in this subdivision at this time.

Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels.

6.0 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

The site is located within the western flank of the Colorado Piedmont section of the Great Plains physiographic province. The Colorado Piedmont, formed during Late Tertiary and Early Quaternary time (approximately 2,000,000 years ago), is a broad, erosional trench which separates the Southern Rocky Mountains from the High Plains. During the Late Mesozoic and Early Cenozoic Periods (approximately 70,000,000 years ago), intense tectonic activity occurred, causing the uplifting of the Front Range and associated downwarping of

the Denver Basin to the east. Relatively flat uplands and broad valleys characterize the present-day topography of the Colorado Piedmont in this region.

6.1 Subsurface Soil Conditions

The subsurface materials encountered in the test borings performed for this study were classified within the laboratory using the Unified Soil Classification System (USCS). The materials were identified and classified as native clayey sand (SC), sandy clay (low to high plasticity, CL-CH), and sandy claystone (low to high plasticity, CL-CH),

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the logs are based upon the engineer's classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

6.2 Bedrock Conditions

In general, the bedrock (as mapped by Colorado Geologic Survey - CGS) beneath the site is considered to be part of the Pierre Shale formation. Bedrock was encountered in the majority of test borings performed for this investigation. Bedrock conditions are anticipated to be encountered in the excavations or utility trenches for the proposed development.

6.3 U.S. Soil Conservation Service

The U.S. Soil Conservation Service along with United States Department of Agriculture (USDA) has identified the soils on the property as:

- 52 – Manzanst clay loam, 0 to 3 percent slopes. The Manzanst clay loam was mapped by the USDA to encompass an area within the northwestern corner of the property. The Manzanst clay loam encompasses approximately 21.7 acres for a total of 10.6 percent of the property. Properties of the clay loam include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be low, frequency of flooding is none, and landforms include terraces and drainageways.
- 54 – Midway clay loam, 3 to 25 percent slopes. The Midway clay loam was mapped by the USDA to encompass an area in the north central portion of the property. The Midway clay loam encompasses approximately 31.9 acres for a total of 15.6 percent of the property. Properties of the clay loam include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be low, frequency of flooding is none, and landforms include terraces and drainageways.
- 56 – Nelson-Tassel fine sandy loam, 3 to 18 percent slopes. The Nelson-Tassel fine sandy loam was mapped by the USDA to encompass a large area in the eastern and southern portion of the property. The Nelson-Tassel fine sandy loam encompasses the majority of the property with approximately 115.6 acres for a total of 56.7 percent of the property. Properties of the sandy loam include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be medium, frequency of flooding is none, and landforms include hills.

- 75 – Razor-Midway complex. The Razor-Midway complex was mapped by the USDA to encompass an area in the northern portion of the property. The Razor-Midway complex encompasses approximately 29.3 acres for a total of 14.4 percent of the property. Properties of the complex include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be medium, frequency of flooding is none, and landforms include hills.
- 108 – Wiley silt loam, 3 to 9 percent slopes. The Wiley silt loam was mapped by the USDA to encompass an area along the southern, most easterly portion of the property. The Wiley silt loam encompasses approximately 5.3 acres for a total of 2.6 percent of the property. Properties of the clay loam include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be low, frequency of flooding is none, and landforms include hills.

The USDA Soils Survey Map is presented in Figure 144.

6.4 General Geologic Conditions

Based on our field observations, the USDA map, and the Geologic Map of the Fountain Quadrangle, an interpreted geologic map of significant surficial deposits and features was mapped for the site. The identified geologic conditions affecting the development are presented in the Engineering and Geology Map, Figure 143.

The site generally consists of sandy clay overlying claystone. Two geologic units were mapped at the site as:

- *Qav – Valley-fill alluvium (Holocene)* – unsorted to poorly sorted, weakly stratified, sandy to silty clay deposited as valley fill in broad drainage swales on low hillsides of the central and eastern parts of the quadrangle where underlain by Pierre Shale. Unit typically contains dispersed small gravel clasts composed of fine to medium pebble-gravel. The unit contains expansive clays and may be prone to swelling. The valley fill alluvium is estimated to be about 5 feet in narrower drainageway and up to 20 feet in the wider swales. Differentiating the valley fill from the alluvium was not visible to the eye in the recovered samples. Based on review of the aerial photographs the majority of the valley fill for this site appears to be within narrow drainageways with an estimated depth of less than 5 feet.
- *Kp – Pierre Shale, cone-in-cone zone of Lavington (1933)* dark-gray to tan-gray to olive-gray, subblocky to finely fissile non-calcareous shale, silty shale with thin bentonite beds and very fine grained-grained sandstone. Thickness of this zone is approximately 2,290 (Scott and Cobban, 1986). Residual clay and claystone were encountered in all the borings across the site up to depths of 20 feet.

6.5 Structural Features

Structural features such as schistosity, folds, zones of contortion or crushing, joints, shear zones or faults were not observed on the site, in the surrounding area, or in the soil samples collected for laboratory testing.

6.6 Surficial (Unconsolidated) Deposits

Lake and pond sediments, swamp accumulations, sand dunes, marine terrace deposits, talus accumulations, creep, or slope wash were not observed on the site. Slump and slide debris were also not observed on the site. The alluvial deposits are non-marine terrace deposits that have been reworked from either conglomerates in the Dawson Formation up-valley along Jimmy Camp Creek or reworked from gravel-capped mesas from the Pleistocene.

6.7 Engineering Geology

Charles Robinson and Associates (1977) have mapped one environmental engineering unit at the site as:

- 2A – Stable alluvium, colluvium and bedrock on flat to gentle to moderate slopes (5 to 12%).

The engineering geology is presented in the Engineering and Geology Map, Figure 143.

6.8 Features of Special Significance

Features of special significance such as accelerated erosion, (advancing gully head, badlands, or cliff reentrants) were not observed on the property. Features indicating settlement or subsidence such as fissures, scarplets, and offset reference features were not observed on the property or surrounding areas.

Features indicating creep, slump, or slide masses in bedrock and surficial deposits were not observed on the property.

6.9 Drainage of Water and Groundwater

The site generally slopes down from the northeast to the southwest. Groundwater was not encountered in the test borings performed for this investigation. Groundwater water depths are anticipated to be greater than 25 feet in the area and are not anticipated to affect basement foundation construction. Indications of groundwater or seasonally shallow groundwater were not observed in the test borings performed for this investigation at the time of drilling.

7.0 ECONOMIC MINERAL RESOURCES

Under the provision of House Bill 1529, it was made a policy by the State of Colorado to preserve for extraction commercial mineral resources located in a populous county. Review of the *El Paso Aggregate Resource Evaluation Map, Master Plan for Mineral Extraction, Map 2* indicates the site is identified as valley fill comprised of sand and gravel with silt and clay deposited by water in one or a series of stream valley. Extraction of the sand and gravel resources are not considered to be economical compared to materials available elsewhere within the county.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands*, the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped "Poor" for coal resources, no active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site.

8.0 IDENTIFICATION AND MITIGATION OF POTENTIAL GEOLOGIC CONDITIONS

The El Paso County Engineering Criteria Manual recognizes and delineates the difference between hazards and constraints. A geologic hazard is one of several types of adverse geologic conditions capable of causing significant damage or loss of property and life. Geologic hazards are defined in Section C.2.2 Sub-section E.1 of the ECM. A geologic constraint is one of several types of adverse geologic conditions capable of

limiting or restricting construction on a particular site. Geologic constraints are defined in Section C.2.2 Sub-section E.2 of the ECM (1.15 Definitions of Specific Terms and Phrases). The following geologic constraints were considered in the preparation of this report, and are not anticipated to pose a significant risk to the proposed development:

- Avalanches
- Debris Flow-Fans/Mudslides
- Floodplains
- Ground Subsidence
- Hydrocompactive Soils
- Landslides
- Rockfall
- Ponding water
- Steeply Dipping Bedrock
- Unstable or Potentially Unstable Slopes
- Scour, Erosion, accelerated erosion along creek banks and drainageways
- Springs and High Groundwater
- Corrosive Minerals

The following sections present geologic constraints that have been identified on the property:

8.1 Expansive Soils and Bedrock

Shallow foundations are anticipated for the majority of the development, and it is our understanding a mass subexcavation is proposed for most or all of the buildable lots. Subexcavation and replacement with moisture-conditioned structural fill is a commonly utilized method of mitigating expansive soils. Based on the test borings performed by RMG for this investigation, the clayey sand generally possess low swell potential and the sandy clay and claystone generally possess low to very high swell potential.

Mitigation

Our subexcavation recommendations are presented in Section **13.0 Subexcavation and Replacement** of this report and the attached Figure 3, Subexcavation Recommendations.

Note, the recommended subexcavation and replacement process does not guarantee that the swell potential will be reduced to acceptable levels. It is possible that the expansive material will retain swell potential in excess of the allowable value presented herein, even after processing and moisture-conditioning. If (at the time of the lot-specific subsurface soil investigation and/or the open excavation observation) the soil is found to possess swell potential in excess of acceptable levels for the foundation system and design parameters proposed for construction at that time, overexcavation and replacement of some or all of the previously placed fill material may be required.

Post-Tensioned Slab Foundations

As an alternative to reduce the total recommended depth of subexcavation, post-tensioned slab-on-grade (PT slab) foundations may be utilized. For PT slab foundations supported atop subexcavated and replaced material (as described herein) extended to a minimum of 5 feet below the lowest foundation component, we anticipate design parameters to be in the range of those presented below. The design parameters shall be based on the methodology

presented in *Design of Post-Tensioned Slabs-on-Ground, 3rd Edition* by the Post-Tensioning Institute (PTI).

Expansive Case:

	Edge Lift	Center Lift
e_m	2 to 4 feet	4 to 6 feet
y_m	1 to 2 inches	2.5 to 3.5 inches

Provided that appropriate mitigations and/or foundation design adjustments are implemented, the presence of expansive soils or bedrock is not considered to pose a risk to the proposed structures.

8.2 Faults and Seismicity

Based on review of the Earthquake and Late Cenozoic Fault and Fold Map Server provided by CGS located at <http://dnrwebmapgdev.state.co.us/CGSOnline/> and the recorded information dating back to November of 1900, Colorado Springs has not experienced a recorded earthquake with a magnitude greater than 1.6 during that time period. The nearest recorded earthquakes over 1.6 occurred in December of 1995 in Manitou Springs, which experienced magnitudes ranging between 2.8 to 3.5. Additional earthquakes over 1.6 occurred between 1926 and 2001 in Woodland Park, which experienced magnitudes ranging from 2.7 to 3.3. Both of these locations are in the vicinity of the Ute Pass Fault, which is greater than 10 miles from the subject site.

Earthquakes felt at this site will most likely result from minor shifting of the granite mass within the Pikes Peak Batholith, which includes pull from minor movements along faults found in the Denver basin. It is our opinion that ground motions resulting from minor earthquakes may affect structures (and the surrounding area) at this site if minor shifting were to occur.

Mitigation

The Pikes Peak Regional Building Code, 2017 Edition, indicates maximum considered earthquake spectral response accelerations of 0.185g for a short period (S_s) and 0.059g for a 1-second period (S_1). Based on the results of our experience with similar subsurface conditions, we recommend the site be classified as Site Class B, with average shear wave velocities ranging from 2,500 to 5,000 feet per second for the materials in the upper 100 feet.

8.3 Radon

"Radon Act 51 passed by Congress set the natural outdoor level of radon gas (0.4 pCi/L) as the target radon level for indoor radon levels.

Southern El Paso County and the 80925 zip code located in Lorson Ranch, has an EPA assigned Radon Zone of 1. A radon zone of 1 predicts an average indoor radon screening level greater than 4 pCi/L, which is above the recommended levels assigned by the EPA. Lorson Ranch is located in a high risk area of the country. *The EPA recommends you take corrective measures to reduce your exposure to radon gas.*

Most of Colorado is generally considered to have the potential of high levels of radon gas, based on the information provided at: http://county-radon.info/CO/El_Paso.html. There is not believed to be unusual hazardous levels of radon from naturally occurring sources at this site.

Mitigation

Radon hazards are best mitigated at the building design and construction phases. Providing increased ventilation of basements, crawlspaces, creating slightly positive pressures within structures, and sealing of joints and cracks in the foundations and below-grade walls can help mitigate radon hazards.

8.4 Erosion

Due to the fine-grained nature of the soils on the site, the upper sands encountered at the site are susceptible to erosion by wind and flowing water.

Mitigation:

Minor wind erosion and dust problems may arise during and immediately after construction. If the problem becomes severe during this time, watering of the cut areas may be required to control dust. Installation of erosion protection or vegetation after completion of the structures is anticipated to mitigate the majority of the erosion and dust problems.

8.5 Proposed Grading, Erosion Control, Cuts and Masses of Fill

It is the developer's intent to moisture-condition and re-use the on-site claystone where permissible. Provided that the claystone materials are processed and placed as described on page 17, the use of claystone beneath structures during overlot grading is considered acceptable. Note, lot-specific subsurface soil investigations are still required at the time of construction to verify that the expansive potential of the claystone has been reduced to acceptable levels by the recommended moisture-conditioning and replacement operations.

The *Early Overlot Grading and Erosion Control Plan for The Ridge at Lorson Ranch*, referenced herein, was reviewed and considered in the preparation of this report. Proposed cuts and fills located within the proposed building envelopes are anticipated to vary between 10 and 20 feet.

Prior to placement of overlot fill or removal and recompaction of the existing materials, topsoil, low-density native soil, fill and organic matter should be removed from the fill area. The subgrade should be scarified, moisture conditioned to within 2% of the optimum moisture content, and recompacted to the same degree as the overlying fill to be placed. The placement and compaction of fill should be periodically observed and tested by a representative of RMG during construction.

If unsuitable fill soils are encountered at the time of construction for the single-family residences, they should be removed (overexcavated) and replaced with compacted structural fill. The zone of overexcavation shall extend to the bottom of the unsuitable fill zone and shall extend at least that same distance beyond the building perimeter (or lateral extent of any fill, if encountered first). Provided that this recommendation is implemented, the presence of this fill is not considered to pose a risk to proposed structures.

Mitigation

We anticipate that the deepest excavation cuts for post-tension, crawlspace, or garage level construction will be approximately 3 to 4 feet below the existing ground surface, and for basement level construction will be approximately 6 to 8 feet below the existing ground surface. We believe the surficial soils will classify as Type C materials as defined by OSHA in 29CFR Part 1926, dated January 2, 1990. OSHA requires temporary slopes made in Type C materials be laid back at ratios no steeper than 1.5:1 (horizontal to vertical) unless the excavation is shored or braced. Long term cut slopes in the upper soil should be limited to no steeper than 3:1 (horizontal to vertical). Flatter slopes will likely be necessary should groundwater conditions occur. It is recommended that long term fill slopes be no steeper than 3:1 (horizontal to vertical).

Guideline Site Grading Specifications are included in the Appendix B.

9.0 BEARING OF GEOLOGIC CONDITIONS UPON PROPOSED DEVELOPMENT

Geologic hazards (as described in Section 8 of this report) were not found to be present at this site. Geologic constraints (also as described in section 8 of this report) such as: expansive soils and bedrock, faults, seismicity, radon and erosion, were found on the site. Where avoidance is not readily achievable, it is our opinion that the existing geologic and engineering conditions can be satisfactorily mitigated through proper engineering, design, and construction practices.

10.0 BURIED UTILITIES

Based upon the conditions encountered in the test borings, we anticipate that the soils encountered in individual utility trench excavations will consist mostly of native or moisture conditioned and recompacted sandy clay and claystone. It is anticipated the sands will be encountered at loose to medium dense relative densities, the sandy clay at stiff to very stiff densities and claystone at medium hard to very hard relative densities. Bedrock conditions are anticipated within the utility trenches.

We believe the sand will classify as Type C materials and the clay as Type B materials as defined by OSHA in 29 CFR Part 1926. OSHA requires that temporary excavations made in Type B and C materials be laid back at ratios no steeper than 1:1 (horizontal to vertical) and 1½:1 (horizontal to vertical), respectively, unless the excavation is shored and braced. Excavations deeper than 20 feet, or when water is present, should always be braced or the slope designed by a professional engineer.

11.0 PAVEMENTS

The proposed roadways within this development will require a new pavement design prepared in accordance with the El Paso County regulations.

The site plan provided by Matrix has the interior roadways classified as Residential Urban Collectors and the extension of Fontaine Boulevard as a typical 100' R.O.W section. ***The actual pavement section design for individual streets will be completed following overlot grading and rough cutting of the street subgrade.***

The Lorson Ranch area has generally preferred to construct the roadways with a composite roadway section consisting of Hot Mix Asphalt over Cement-Treated Subgrade (CTS). For purposes of this report, we anticipate the subgrade soils will primarily have American Association of State Highway and Transportation Officials (AASHTO) Soil Classifications of A-6(14-21), and A-6-7(19-43) with an estimated design subgrade "R-values" on the order of approximately 3 to 5.

The ECM notes that mitigation measures may be required for expansive soils, shallow ground water, subgrade instability, etc. Based on the AASHTO classification of the soils in the subdivision and laboratory swell testing, the subgrade soils are expected to encounter low to very high expansive potential. Therefore, special mitigation measures may be necessary for subgrade preparation.

Pavement materials should be selected, prepared, and placed in accordance with the El Paso County specification and the Pikes Peak Region Asphalt Paving Specifications. Tests should be performed in accordance with the applicable procedures presented in the final design.

12.0 ANTICIPATED FOUNDATION SYSTEMS

Based on the information presented previously, conventional shallow foundation systems are anticipated to be suitable for the proposed residential structures. It is our understanding that post tension slabs are being considered, in addition to the more “traditional” spread footing (crawl space and basement) foundations for these lots. Typical foundation cuts are anticipated to be approximately 3 to 4 feet below the final ground surface for post tension slab, crawl space, and garage foundations and 6 to 8 feet below the final ground surface for basement foundations, not including the depth of subexcavation.

Expansive soils and/or bedrock are anticipated to be encountered in all of the excavations at foundation or floor slab bearing levels. Removal and replacement with structural fill is anticipated. This can be accomplished through “mass” subexcavation and replacement with moisture-conditioned expansive soils/bedrock during land development operations, lot-specific overexcavation and replacement with structural fill during construction, or a combination of the two. However, it should be noted that the use of subexcavated and moisture-conditioned expansive soils as fill below foundations may result in a condition that is not suitable for all shallow foundations.

If loose sands are encountered, they may require additional compaction to achieve the allowable bearing pressure as indicated in a site specific subsurface soil investigation. In some cases, removal and recompaction may be required for loose soils.

It must be understood that the subexcavation and replacement process does not guarantee that the swell potential will be reduced to acceptable levels. It is possible that the expansive material will retain swell potential in excess of the allowable value presented herein, even after processing and moisture-conditioning. In such a case, the material will need to be removed, reconditioned, and replaced until the swell potential is reduced to the stated value.

If (at the time of the lot-specific subsurface soil investigation and/or the open excavation observation) the soil is found to possess swell potential in excess of acceptable levels for the foundation system and design parameters proposed for construction at that time, overexcavation and replacement of some or all of the previously placed fill material may be required.

It is also possible that material that was properly conditioned, placed, and compacted during the subexcavation process will require removal (overexcavation) and replacement at the time of construction. The swell potential of the moisture-conditioned structural fill is dependent on many factors, including (but not limited to) density/degree of compaction, moisture content (particularly changes that occur in the moisture content from the time of placement to the time of actual foundation construction), etc. Additionally, various construction processes which can adversely affect the performance of moisture-conditioned structural fill are completed at times before and after our observations, as well as between the time of land development and when the lot-specific foundation is constructed.

While the subexcavation and replacement process is generally considered suitable for use with shallow foundation types, it may result in design parameters that are not consistent with the future builder(s)' pre-existing foundation designs. In such a case, the builder would either need to obtain a foundation designed for

parameters consistent with the subsurface soil conditions present at that time, or perform additional mitigation (in most cases, this consists of overexcavation and replacement with material suitable to provide the design parameters utilized in that pre-existing foundation design).

The final foundation design parameters are to be determined based on lot-specific subsurface soil investigations performed at the time of construction. However, for a structure supported atop moisture-conditioned structural fill, the maximum allowable bearing pressures are anticipated to be in the range of 2,000 to 3,000 psf with (for spread-footing style foundations) minimum dead loads in the range of 800 to 1,500 psf. For a structure supported atop granular, non-expansive structural fill, the maximum allowable bearing pressures are anticipated to range from 2,000 to 2,400 psf with no minimum dead load requirement.

The foundation designs should be prepared by a qualified Colorado Registered Professional Engineer using the recommendations presented in this report. This foundation system should be designed to span a minimum of 10 feet under the design loads. The bottoms of exterior foundations should be at least 30 inches below finished grade for frost protection.

13.0 SUBEXCAVATION AND REPLACEMENT

All of the proposed lots within The Ridge at Lorson Ranch contain expansive clay and claystone bedrock at depths that are anticipated to effect the performance of foundations and floor slabs. Sub-excavation of the expansive soils and bedrock and replacement as moisture-conditioned structural fill is considered an acceptable alternative to the typical lot-by-lot overexcavations that have been performed for previous filings with in the Lorson Ranch area.

13.1 Subexcavation

Sub-excavation below the lots and replacement with moisture conditioned and recompactd onsite material is the best alternative to reduce heave risk and enhance the performance of the foundations, roadways and flat work.

Where sub-excavation is to be performed, vegetation, organic and deleterious material shall be cleared and disposed of in accordance with applicable requirements prior to performing excavation and/or filling operations. The subexcavation should extend to minimum depths of 5 to 10 feet (as indicated on Figure 3, Subexcavation Recommendations) below the bottom of all proposed foundations components, and at least those same distances (laterally) beyond the proposed "buildable" area on each lot. Before the placement of moisture-conditioned fill, the underlying subgrade shall be scarified, moisture conditioned to within 2% of the optimum moisture content and compacted to the degree specified for the overlying fill material.

13.2 Moisture-Conditioned Structural Fill

Subexcavation and replacement with moisture-conditioned (on-site) structural fill is commonly utilized throughout the region. This approach may be combined with the use of an intermittent (voided) spread-footing foundation system or with a post-tensioned slab-on-grade foundation system.

Areas to receive moisture-conditioned expansive soils used as structural fill should have topsoil, organic material, or debris removed. The upper 6 inches of the exposed surface soils should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 98 percent of the maximum dry density as determined by the Standard Proctor

test (ASTM D-698) or to a minimum of 95 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557) prior to placing structural fill.

Moisture-conditioned structural fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

Moisture conditioned structural fill shall consist of a moisture-conditioned, on-site cohesive fill material. The fill material shall be moisture conditioned and replaced as follows:

- Fill shall be free of deleterious material and shall not contain rocks or cobbles greater than 6 inches in diameter.
- Claystone fill shall be thoroughly "pulverized" and shall not contain claystone chunks greater than 1 1/2 inches in diameter.
- When claystone is to be incorporated, the fill materials shall be processed in a stockpile (**processing these materials in the excavations will not be permitted**). These stockpiled fill materials shall be moisture-conditioned to a minimum of 1 percent to 4 percent above optimum moisture content (as determined by the Standard Proctor test, ASTM D-698), with an average of not less than 1 1/2 percent above optimum moisture content. These materials, once moisture conditioned and thoroughly mixed, should rest in the stockpile a minimum of 24 hours to ensure proper distribution of the moisture through the material. After resting, the materials should be re-wet and re-mixed to replace the surficial moisture lost to evaporation during the resting period. Fill materials not containing claystone do not require processing in a stockpile.
- Fill materials shall be moisture-conditioned to a minimum of 1 percent to 4 percent above optimum moisture content (as determined by the Standard Proctor test, ASTM D-698), with an average of not less than 1 1/2 percent above optimum moisture content.
- The moisture-conditioned materials should be placed in maximum 6" compacted lifts. These materials should be compacted to a minimum of 98 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698). Material not meeting the above requirements shall be reprocessed.

Materials used for moisture-conditioned structural fill should be approved by RMG prior to use. Moisture-conditioned structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

To verify the condition of the compacted soils, density tests should be performed during placement. The first density tests should be conducted when 24 inches of fill have been placed.

The existing soils will require the addition of water to achieve the required moisture content. The fill soils should be thoroughly mixed or disked to provide uniform moisture content through the fill. It should be noted, that the clay soils compacted at the above moisture contents are likely to result in wet, slick conditions. We recommend that the excavation contractor retained to perform this work have significant experience processing sub-excavation and moisture-conditioned soils.

Frequent moisture content and density tests shall be performed in the field to verify conformance with the above specifications. Furthermore, representative samples of the moisture-conditioned fill shall be obtained by personnel of RMG on a daily basis for follow-up swell testing to demonstrate that the swell potential has been reduced to not more than 1 percent swell when saturated under a 1,000 psf surcharge pressure. Areas where the follow-up swell tests indicate swells higher than that value shall have the fill material removed, reprocessed, recompact, and retested. The scope, spacing, and frequency of moisture content/density and swell testing are to be determined at the time of construction, but should be sufficient to demonstrate the general efficacy of the subexcavation process.

RMG should be contacted a minimum of 3 days prior to initiation of sub-excavation and moisture conditioning processes in order to schedule appropriate field services. Fill shall not be placed on frozen subgrade or allowed to freeze during processing. The time of the year when night temperatures are above freezing are the most optimal period for a sub-excavation operation.

Following completion of the sub-excavation and moisture conditioning process, it is imperative that the "as-compacted" moisture content be maintained prior to construction and establishment of landscape irrigation. This may require reprocessing of materials and addition of supplemental water to prevent remobilization of swell potential within the fill.

13.3 Granular Structural Fill

Areas to receive granular (non-expansive) structural fill should have topsoil, organic material, or debris removed. The upper 6 inches of the exposed surface soils should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698) or to a minimum of 92 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557) prior to placing structural fill.

Structural fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

Structural fill shall consist of granular, non-expansive material. It should be placed in loose lifts not exceeding 8 to 12 inches, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 92 percent of the maximum dry density as determined by the Modified Proctor test, ASTM D-1557. The materials should be compacted by mechanical means.

Materials used for structural fill should be approved by RMG prior to use. Structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

13.4 Foundation Drains

A subsurface perimeter drain is recommended around portions of the structures which will have habitable or storage space located below the finished ground surface. This includes crawlspace areas but not the walkout trench, if applicable.

Shallow groundwater conditions were not encountered in the test boring performed for this study, or during the previously reviewed geotechnical engineering/geologic investigations. If shallow groundwater conditions are found to exist on a few lots at the time of the site specific subsurface soil investigations, the feasibility of basement construction and/or any recommended mitigation measures for those lots are to be addressed at that

time. However, this is not anticipated to affect more than a small percentage of the lots, if any, and does not warrant large-scale or development-wide mitigation. Based on our knowledge of the area and engineering design and construction techniques employed in the El Paso County area, there is insufficient reason to preclude full-depth basements on any of the lots in this subdivision at this time. Likewise, it is our opinion that the installation of an "under drain" below the street (or any other development-wide subsurface dewatering system) is not necessary for the subject site.

It must be understood that the drain systems are designed to intercept some types of subsurface moisture and not others. Therefore, the drains could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement area.

14.0 ADDITIONAL STUDIES

The findings, conclusions and recommendations presented in this report were provided to evaluate the suitability of the site for future development. Unless indicated otherwise, the test borings, laboratory test results, conclusions and recommendations presented in this report are not intended for use for design and construction. We recommend that a *lot-specific* subsurface soil investigation be performed for the proposed structures.

The lot-specific subsurface soil investigation should consider the proposed structure type, anticipated foundation loading conditions, location within the property, and local construction methods. Recommendations resulting from the investigations should be used for design and confirmed by on-site observation and testing during development and construction.

15.0 CONCLUSIONS

Based upon our evaluation of the geologic conditions, it is our opinion that the proposed development is feasible. The geologic conditions identified (expansive soils and bedrock, faults, seismicity, radon, and erosion) are not considered unusual for the Front Range region of Colorado. Mitigation of geologic conditions is most effectively accomplished by avoidance. However, where avoidance is not a practical or acceptable alternative, geologic conditions should be mitigated by implementing appropriate planning, engineering, and local construction practices.

In addition to the previously identified mitigation alternatives, surface and subsurface drainage systems should be implemented. Exterior, perimeter foundation drains should be installed around below-grade habitable or storage spaces. Surface water should be efficiently removed from the building area to prevent ponding and infiltration into the subsurface soil.

The foundation systems for the proposed single family structures should be designed and constructed based upon recommendations developed in a site-specific subsurface soil investigation.

Foundation selection and design should consider the potential for subsurface expansive soil-related movements. Mitigation techniques commonly used in the El Paso County area include overexcavation and replacement with structural fill, sub-excavation and replacement with on-site moisture-conditioned soils, and/or the installation of deep foundation systems all of which are considered common construction practices for this area.

We believe the surficial sand soils will classify as Type C materials and the clay soils will classify as Type B as defined by OSHA in 29CFR Part 1926, date January 2, 1990. OSHA requires temporary slopes made in Type C materials be laid back at ratios no steeper than 1.5:1 (horizontal to vertical) and slopes made in Type B materials be laid back at ratios no steeper than 1:1 (horizontal to vertical) unless the excavation is shored or braced. Flatter slopes will likely be necessary should groundwater conditions occur.

Long term cut slopes in the upper soil should be limited to no steeper than 3:1 (horizontal to vertical). Flatter slopes will likely be necessary should groundwater conditions occur. It is recommended that long term fill slopes be no steeper than 3:1 (horizontal to vertical).

Revisions and modifications to the conclusions and recommendations presented in this report may be issued subsequently by RMG based upon additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report.

16.0 CLOSING

This report is for the exclusive purpose of providing geologic hazards information and preliminary geotechnical engineering recommendations. The scope of services did not include, either specifically or by implication, evaluation of wild fire hazards, environmental assessment of the site, or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to, biological or toxicological issues, are beyond the scope of this report. If the owner is concerned about the potential for such contamination or conditions, other studies should be undertaken.

This report has been prepared for **Lorson Ranch Metropolitan District No. 1** in accordance with generally accepted geotechnical engineering and engineering geology practices. The conclusions and recommendations in this report are based in part upon data obtained from review of available topographic and geologic maps, review of available reports of previous studies conducted in the site vicinity, a site reconnaissance, and research of available published information, soil test borings, soil laboratory testing, and engineering analyses. The nature and extent of variations may not become evident until construction activities begin. If variations then become evident, RMG should be retained to re-evaluate the recommendations of this report, if necessary.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied, is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

If we can be of further assistance in discussing the contents of this report or analysis of the proposed development, from a geotechnical engineering point-of-view, please feel free to contact us.

FIGURES



⊕ DENOTES APPROXIMATE LOCATION
OF TEST BORINGS PERFORMED FOR
THIS INVESTIGATION

● DENOTES APPROXIMATE LOCATION
OF PRELIMINARY TEST BORINGS TO
DETERMINE THE DEPTH OF BEDROCK



NOT TO SCALE



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THE RIDGE AT LORSON RANCH
EL PASO COUNTY, COLORADO
LORSON RANCH METROPOLITAN
DISTRICT NO. 1

ENGINEER:	TM
DRAWN BY:	KZ
CHECKED BY:	TM
ISSUED:	3-22-2021

PROPOSED LOT LAYOUT
WITH TEST BORINGS
LOCATIONS



SUBEXCAVATION TO:
6 FEET BELOW AND 6 FEET
(LATERALLY) BEYOND SPREAD
FOOTING FOUNDATION COMPONENTS
OR
5 FEET BELOW AND 5 FEET
(LATERALLY) BEYOND FT SLAB
FOUNDATION COMPONENTS

SUBEXCAVATION TO:
8 FEET BELOW AND 8 FEET
(LATERALLY) BEYOND SPREAD
FOOTING FOUNDATION COMPONENTS
OR
5 FEET BELOW AND 5 FEET
(LATERALLY) BEYOND FT SLAB
FOUNDATION COMPONENTS

SUBEXCAVATION TO:
10 FEET BELOW AND 10 FEET
(LATERALLY) BEYOND SPREAD
FOOTING FOUNDATION COMPONENTS
OR
5 FEET BELOW AND 5 FEET
(LATERALLY) BEYOND FT SLAB
FOUNDATION COMPONENTS



NOT TO SCALE

JOB No. 175706

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THE RIDGE AT LORSON RANCH
EL PASO COUNTY, COLORADO
LORSON RANCH METROPOLITAN
DISTRICT NO. 1

ENGINEER:	TM
DRAWN BY:	KZ
CHECKED BY:	TM
ISSUED:	3-22-2021

SUBEXCAVATION
RECOMMENDATIONS

SHEET No.
FIG-3

SOILS DESCRIPTION



CLAYEY SAND



CLAYSTONE



SANDY CLAY



SHALE

UNLESS NOTED OTHERWISE, ALL LABORATORY
TESTS PRESENTED HEREIN WERE PERFORMED BY:
RMG - ROCKY MOUNTAIN GROUP
2910 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, COLORADO

SYMBOLS AND NOTES



XX

STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).



XX

UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).



FREE WATER TABLE



DEPTH AT WHICH BORING CAVED



BULK DISTURBED BULK SAMPLE



AUG AUGER "CUTTINGS"

4.5

WATER CONTENT (%)

ROCKY MOUNTAIN GROUP

Architectural
Structural
Forensics



Geotechnical
Materials Testing
Civil, Planning

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Colorado Springs, CO 80918
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





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EXPLANATION OF TEST BORING LOGS

JOB No. 175706

FIGURE No. 4

DATE Mar/22/2021

TEST BORING: D-1 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-2 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff to hard, moist	5			30	9.7	CLAY, SANDY, light brown, very stiff, moist	5			23	8.5
	10			45	10.2		10			23	9.6
CLAYSTONE, SANDY, brown, very stiff to hard, moist	15			50/6"	10.6	CLAYSTONE, SANDY, light brown, hard, moist	15			50	9.0
							20			50/6"	--

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TEST BORING LOG

JOB No. 175706

FIGURE No. 5

DATE Jul/02/2021

TEST BORING: D-3 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-4 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50	10.9	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/7"	8.2
	10			50/6"	11.4		10			50/4"	9.9

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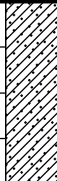




TEST BORING LOG

JOB No. 175706

FIGURE No. 6

DATE Jul/02/2021

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TEST BORING: D-7 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-8 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown with rust staining, hard, moist	5			50/7"	11.0	CLAY, SANDY, brown, stiff, moist	5			15	14.2
	10			50/4"	10.7	CLAYSTONE, SANDY, brown, medium hard to hard, moist	10			50/11"	13.3
							15			50/10"	16.7
							20			50/7"	11.9

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TEST BORING LOG

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FIGURE No. 8

DATE Jul/02/2021

TEST BORING: D-9 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-10 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, weathered to hard, moist	5			31	12.5	CLAYSTONE, SANDY, brown, firm to hard, moist	5			21	9.2
	10			37	12.8		10			50/10"	16.0
	15			50/8"	12.8		15			50/8"	10.6
	20			50/9"	15.0						

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TEST BORING LOG

JOB No. 175706

FIGURE No. 9

DATE Jul/02/2021

TEST BORING: D-11 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-12 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			47	13.3	CLAYSTONE, SANDY, brown with rust staining, medium hard, moist	5			50/8"	9.0
	10			50/9"	11.2		10			50/5"	9.6
	15			50/7"	11.1						

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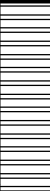





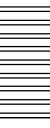

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TEST BORING LOG

JOB No. 175706

FIGURE No. 10

DATE Jul/02/2021

TEST BORING: D-13 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-14 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, hard, moist	5			44	8.8	CLAYSTONE, SANDY, brown with rust staining, very hard, moist	5			50/9"	11.6
	10			50/10"	8.5		10			50/5"	8.8
CLAYSTONE, SANDY, brown, hard, moist	15			50/4"	10.5						

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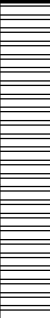

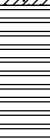

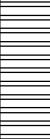

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TEST BORING LOG

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FIGURE No. 11

DATE Jul/02/2021

TEST BORING: D-15 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-16 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			23	7.4	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/8"	9.5
CLAYSTONE, SANDY, brown, hard, moist	10			50/6"	8.6		10			50/5"	10.7

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FIGURE No. 12

DATE Jul/02/2021

TEST BORING: D-17 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-18 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, light brown to brown, hard, moist	5			43	7.8	CLAY, SANDY, light brown, very stiff, moist	5			22	8.1
	10			50/9"	10.3		10			35	9.2
	15			50/6"	11.5	CLAYSTONE, SANDY, brown, hard, moist	15			50/7"	12.5
							20				12.8

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
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FIGURE No. 13

DATE Jul/02/2021

TEST BORING: D-19 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-20 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, dark brown to light brown, hard, moist	5			40	8.4	CLAY, SANDY, brown with rust staining, hard, moist	5			50	13.2
	10			50/9"	11.0		10			50/6"	11.3
CLAYSTONE, SANDY, brown with rust staining, very hard, moist	15			50/5"	14.6						

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TEST BORING LOG

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FIGURE No. 14

DATE Jul/02/2021

TEST BORING: D-21 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-22 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, hard, moist	5			50	14.3	CLAYSTONE, SANDY, medium hard to hard, brown, moist	5			50	12.6
	10			50/6"	14.2		10			50/6"	12.2

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FIGURE No. 15

DATE Jul/02/2021

TEST BORING: D-23 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-24 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to hard, moist						CLAYSTONE, SANDY, brown, hard, moist					
	5			50	12.7		5			45	14.4
	10			50/10"	13.0		10			50/6"	13.9
	15			50/10"	12.6						
	20			50/6"	10.6						

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

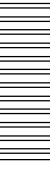

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TEST BORING LOG

JOB No. 175706

FIGURE No. 16

DATE Jul/02/2021

TEST BORING: D-25 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-26 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown to dark brown, very stiff, moist	5			23	8.0	CLAY, SANDY, brown with rust staining, hard, moist	5			50/7"	10.8
	10			50/7"	8.8		10			50/6"	11.6
CLAYSTONE, SANDY, brown with rust staining, hard, moist	15			50/5"	10.8						

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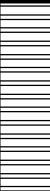







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TEST BORING LOG

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FIGURE No. 17

DATE Jul/02/2021

TEST BORING: D-27 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-28 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown with rust staining, hard, moist	5			50/10"	7.2	CLAYSTONE, SANDY, brown, hard to very hard, moist	5			50/11"	15.5
	10			50/7"	9.1		10			50/5"	14.1
CLAYSTONE, SANDY, brown with rust staining, very hard, moist	15			50/5"	13.9						

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TEST BORING LOG

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FIGURE No. 18

DATE Jul/02/2021

TEST BORING: D-29 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-30 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, firm to very hard, moist	5			25	11.4	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5		36	9.8	
	10			50/9"	11.2		10		50/8"	7.9	
	15			50/7"	9.6		15		50/5"	8.9	

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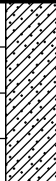

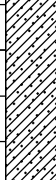
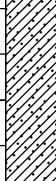

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FIGURE No. 19

DATE Jul/02/2021

TEST BORING: D-31 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-32 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown with rust staining, medium hard, moist	5			50/8"	14.2	CLAY, SANDY, brown with rust staining, very stiff to hard, moist	5		39		9.0
	10			50/6"	11.4		10		50/9"		11.2
						CLAYSTONE, SANDY, brown with rust staining, medium hard, moist	15		50/8"		10.1
							20		50/6"		12.2

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FIGURE No. 20

DATE Jul/02/2021

TEST BORING: D-33 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-34 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			39	8.2	CLAY, SANDY, dark brown with rust staining, hard, moist	5			50/9"	10.8
	10			50/10"	10.4		10			50/8"	11.8
CLAYSTONE, SANDY, brown, hard, moist	15			50/8"	10.1	CLAYSTONE, SANDY, dark brown with rust staining, hard, moist	15			50/5"	13.2

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TEST BORING LOG

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FIGURE No. 21

DATE Jul/02/2021

TEST BORING: D-35 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-36 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			46	14.5	CLAYSTONE, SANDY, brown, medium hard, moist	5			50/11"	15.0
	10			50/9"	13.9		10			50/9"	14.3
	15			50/7"	17.2		15			50/9"	14.0
	20			50/6"	15.9		20			50/9"	21.2

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FIGURE No. 22

DATE Jul/02/2021

TEST BORING: D-37	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-38	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20						DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20					
CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50	13.5	CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50	13.1
	10			50/10"	15.8		10			50/8"	13.5
	15			50/6"	13.6		15			50/8"	15.6
							20			50/8"	15.2

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TEST BORING LOG

JOB No. 175706

FIGURE No. 23

DATE Jul/02/2021

TEST BORING: D-39 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-40 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, hard to very hard, moist	5			50/8"	15.4	CLAY, SANDY, brown, very stiff, moist	5			35	8.8
	10			50/4"	10.8	CLAYSTONE, SANDY, brown with rust staining, very hard, moist	10			50/4"	13.6

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TEST BORING LOG

JOB No. 175706

FIGURE No. 24

DATE Jul/02/2021

TEST BORING: D-41 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-42 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, light brown, medium hard to hard, moist	5			50/10"	8.8	CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50/11"	14.0
	10			50/6"	9.5		10			50/6"	15.3

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

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TEST BORING LOG

JOB No. 175706

FIGURE No. 25

DATE Jul/02/2021

TEST BORING: D-43 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-44 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50/10"	13.0	CLAYSTONE, SANDY, brown, hard, moist	5			42	11.8
	10			50/6"	13.5		10			50/6"	12.9

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TEST BORING LOG

JOB No. 175706

FIGURE No. 26

DATE Jul/02/2021

TEST BORING: D-45 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-46 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, dark brown with rust staining, hard, moist						CLAYSTONE, SANDY, brown, hard, moist					
	5			50/9"	14.6		5			50/9"	9.9
	10			50/8"	14.2		10			50/6"	9.7
	15			50/8"	16.1						
	20			50/9"	15.8						
	25			50/6"	16.3						

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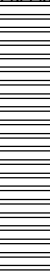



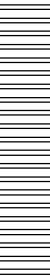

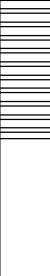



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TEST BORING LOG

JOB No. 175706

FIGURE No. 27

DATE Jul/02/2021

TEST BORING: D-47 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-48 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown with rust staining, very stiff, moist	5			32	8.6	CLAY, SANDY, light brown, very stiff, moist	5			35	7.9
CLAYSTONE, SANDY, brown with rust staining, very hard, moist	10			50/9"	9.2	CLAYSTONE, SANDY, brown with rust staining, hard, moist	10			37	11.1
	15			50/8"	12.2		15			50/6"	11.4
	20			50/6"	16.4						

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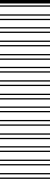
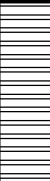
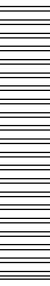
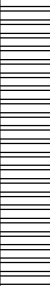
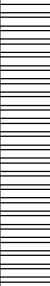
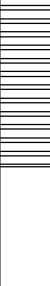
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TEST BORING LOG

JOB No. 175706

FIGURE No. 28

DATE Jul/02/2021

TEST BORING: D-49	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-50	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20						DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20					
CLAYSTONE, SANDY, brown, hard, moist	5			50	10.6	CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			42	10.1
	10			50/6"	9.0		10			50/7"	13.1
							15			42	15.6
							20			50/10"	10.2

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FIGURE No. 29

DATE Jul/02/2021

TEST BORING: D-51 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-52 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown to dark brown with rust staining, hard, moist	5			48	8.6	CLAY, SANDY, brown, very stiff to hard, moist	5			33	9.9
	10			50/10"	9.2		10			44	10.2
	15			50/10"	12.2		15			50/8"	12.5
	20			45	16.4						

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TEST BORING LOG

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FIGURE No. 30

DATE Jul/02/2021

TEST BORING: D-53	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-54	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20						DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20					
CLAYSTONE, SANDY, brown with rust staining, hard, moist	5			50/9"	11.3	CLAYSTONE, SANDY, dark brown with rust staining, hard, moist	5			50/10"	13.4
	10			50/8"	13.3		10			50/9"	16.9
	15			50/6"	16.9		15			50/9"	18.1

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TEST BORING LOG

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FIGURE No. 31

DATE Jul/02/2021

TEST BORING: D-55 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-56 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, hard, moist	5			50/7"	14.9	CLAYSTONE, SANDY, brown with rust staining, medium hard to very hard, moist	5			50/9"	11.8
	10			50/6"	15.8		10			50/4"	13.0

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TEST BORING LOG

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FIGURE No. 32

DATE Jul/02/2021

<p>ROCKY MOUNTAIN GROUP</p> <div><p>ARCHITECTS</p><p>RMG</p><p>ENGINEERS</p></div> <p><i>Colorado Springs: (Corporate Office)</i> 2910 Austin Bluffs Parkway Colorado Springs, CO 80918 (719) 548-0600</p> <p>SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO</p>	<p>TEST BORING LOG</p>	<p>JOB No. 175706</p> <p>FIGURE No. 33</p> <p>DATE Jul/02/2021</p>
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TEST BORING: D-59 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-60 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown with rust staining, hard, moist	5			50/6"	11.1	CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist	5			50	9.3
	10			50/5"	12.9		10			50/5"	11.7

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





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TEST BORING LOG

JOB No. 175706

FIGURE No. 34

DATE Jul/02/2021

TEST BORING: D-61 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-62 DATE DRILLED: 9/20/20 NO GROUNDWATER ON 9/20/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, hard, moist	5			50/8"	14.1	CLAY, SANDY, brown, very stiff, moist	5			35	9.9
	10			50/6"	13.0	CLAYSTONE, SANDY, brown with rust staining, medium hard to very hard, moist	10			50	10.7
							15			50/10"	13.5
							20			50/5"	11.6

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FIGURE No. 35

DATE Jul/02/2021

TEST BORING: D-63					TEST BORING: D-64				
DATE DRILLED: 9/20/20 NO GROUNDWATER ON 9/20/20					DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20				
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist					CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist				
5			50/5"	5.4	5			45	17.5
10			50/9"	9.8	10			50/10"	16.6
15			50/4"	10.5	15			50/5"	10.5

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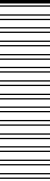

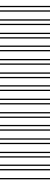

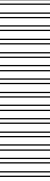
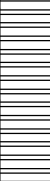
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TEST BORING LOG

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FIGURE No. 36

DATE Jul/02/2021

TEST BORING: D-65 DATE DRILLED: 9/26/20 NO GROUNDWATER ON 9/26/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-66 DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, dark brown, hard, moist	5			50/11"	13.6	CLAY, SANDY, brown, very stiff, moist	5			22	11.6
	10			50/10"	16.5		10			46	9.9
	15			40	19.0	CLAYSTONE, SANDY, brown, firm to medium hard, moist	15			47	15.7

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FIGURE No. 37

DATE Jul/02/2021

TEST BORING: D-67	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-68	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20						DATE DRILLED: 9/2/20 NO GROUNDWATER ON 9/2/20					
CLAYSTONE, SANDY, brown, firm to hard, moist	5			46	16.7	CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			39	13.1
	10			50/10"	17.9		10			50/9"	12.8
	15			50/10"	17.7		15			50/6"	10.9

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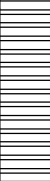
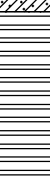
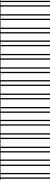
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FIGURE No. 38

DATE Jul/02/2021

TEST BORING: D-69 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: D-70 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, light brown, very stiff to hard, moist	5			33	11.0	CLAY, SANDY, brown, very stiff, moist	5			18	9.6
	10			17	9.6	CLAYSTONE, SANDY, brown, firm to hard, moist	10			40	10.8
CLAYSTONE, SANDY, brown, firm to very hard, moist	15			47	9.4		15			50/11"	11.5
	20			50/6"	10.7		20			38	10.9

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


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FIGURE No. 39

DATE Jul/02/2021

TEST BORING: F-1	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-2	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20						DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20					
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/9"	12.2	CLAYSTONE, SANDY, brown, hard to very hard, moist	5			50/9"	9.8
	10			50/5"	12.9		10			50/4"	9.4

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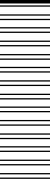

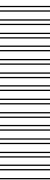

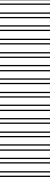
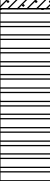
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TEST BORING LOG

JOB No. 175706

FIGURE No. 40

DATE Jul/02/2021

TEST BORING: F-3	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-4	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20						DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20					
CLAYSTONE, SANDY, brown, hard to very hard, moist	5			50/11"	9.9	CLAY, SANDY, brown, very stiff, moist	5			17	8.9
	10			50/8"	8.7	CLAYSTONE, SANDY, brown, medium hard, moist	10			50/8"	9.0
	15			50/4"	10.1		15			38	16.0

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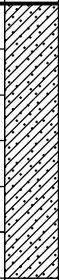

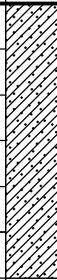







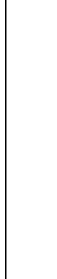

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TEST BORING LOG

JOB No. 175706

FIGURE No. 41

DATE Jul/02/2021

TEST BORING: F-5 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-6 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			27	10.6	CLAY, SANDY, light brown, stiff, moist	5			15	9.2
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	10			50/9"	9.8	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	10			44	11.0
	15			50/6"	11.0		15			50/4"	9.0

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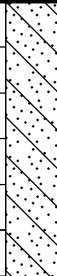









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TEST BORING LOG

JOB No. 175706

FIGURE No. 42

DATE Jul/02/2021

TEST BORING: F-7 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-8 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
SAND, CLAYEY, tan, medium dense, moist	5			18	7.5	SAND, CLAYEY, tan, medium dense, moist	5			11	6.1
CLAYSTONE, SANDY, brown, medium dense to hard, moist	10			50/8"	7.3	SAMPLER REFUSAL DUE TO COBBLE	10				6.8
	15			50/9"	11.7	CLAYSTONE, SANDY, brown, medium hard, moist	15			50/8"	17.0

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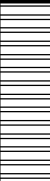

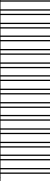

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TEST BORING LOG

JOB No. 175706

FIGURE No. 43

DATE Jul/02/2021

TEST BORING: F-9 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-10 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, dark brown, very stiff, moist	5			21	9.4	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/10"	11.3
	10			24	9.7		10			50/4"	11.4
CLAYSTONE, SANDY, brown, medium hard, moist	15			50/7"	11.0						
AUGER REFUSAL AT 18 FEET DUE TO VERY HARD BEDROCK											

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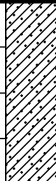

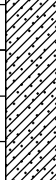



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TEST BORING LOG

JOB No. 175706

FIGURE No. 44

DATE Jul/02/2021

TEST BORING: F-11	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-12	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20						DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20					
CLAYSTONE, SANDY, brown, firm to very hard, moist	5			43	12.1	CLAY, SANDY, light brown, very stiff, moist	5			18	8.0
	10			50/9"	11.3	CLAYSTONE, SANDY, brown, firm, moist	10			34	9.2
	15			50/8"	10.2		15			28	10.3
	20			50/6"	10.8						

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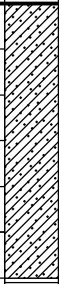

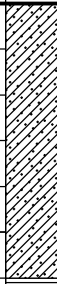







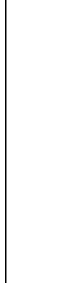

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TEST BORING LOG

JOB No. 175706

FIGURE No. 45

DATE Jul/02/2021

TEST BORING: F-13 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-14 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, light brown, very stiff, moist	5			20	6.5	CLAY, SANDY, light brown, very stiff, moist	5			18	7.8
CLAYSTONE, SANDY, brown, medium hard to hard, moist	10			50/10"	8.2	CLAYSTONE, SANDY, brown, medium brown to very hard, moist	10			47	13.3
	15			50/9"	13.2		15			50/5"	9.7

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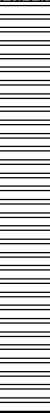

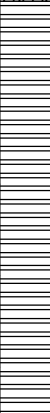







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TEST BORING LOG

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FIGURE No. 46

DATE Jul/02/2021

TEST BORING: F-15 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-16 DATE DRILLED: 9/9/20 NO GROUNDWATER ON 9/9/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			24	8.7	CLAY, SANDY, light brown, very stiff, moist	5			17	8.0
CLAYSTONE, SANDY, brown, firm to very hard, moist	10			45	8.6	CLAYSTONE, SANDY, brown, firm to hard, moist	10			50/10"	10.3
	15			50/6"	13.2		15			28	11.2
							20			50/9"	11.1

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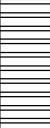

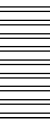

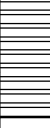

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TEST BORING LOG

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FIGURE No. 47

DATE Jul/02/2021

TEST BORING: F-17 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-18 DATE DRILLED: 9/25/20 NO GROUNDWATER ON	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, stiff to very stiff, moist	5			16	11.0	CLAY, SANDY, brown, stiff, moist	5			17	6.8
	10			24	9.3	CLAYSTONE, SANDY, brown, firm to medium hard, moist	10			40	11.0
CLAYSTONE, SANDY, brown, firm, moist	15			42	10.9		15			50/10"	11.7

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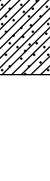



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TEST BORING LOG

JOB No. 175706

FIGURE No. 48

DATE Jul/02/2021

TEST BORING: F-19 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-20 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/28/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff to hard, moist	5			38	7.7	CLAY, SANDY, brown with rust staining, very stiff, moist	5			23	6.2
	10			50/10"	9.5		10			40	7.8
	15			50/7"	9.0		15			50/6"	10.7

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
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TEST BORING LOG

JOB No. 175706

FIGURE No. 49

DATE Jul/02/2021

TEST BORING: F-21 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-22 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			31	10.1	CLAY, SANDY, brown, very stiff, moist	5			25	7.1
	10			25	10.0	CLAYSTONE, SANDY, brown, firm to very hard, moist	10			45	9.4
	15			50/8"	10.5		15			50/4"	12.0
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	20			50/5"	10.7						

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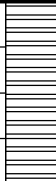







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TEST BORING LOG

JOB No. 175706

FIGURE No. 50

DATE Jul/02/2021

TEST BORING: F-23 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-24 DATE DRILLED: 10/1/20 NO GROUNDWATER ON 10/1/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/10"	13.2	CLAYSTONE, SANDY, brown, firm to very hard, moist	5			49	8.2
	10			50/8"	14.2		10			50/6"	9.8
	15			50/5"	15.2						

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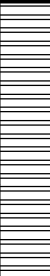

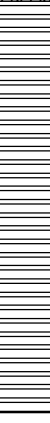





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TEST BORING LOG

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FIGURE No. 51

DATE Jul/02/2021

TEST BORING: F-25 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-26 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, hard, moist	5			47	11.3	CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			34	10.4
CLAYSTONE, SANDY, brown, hard to very hard, moist	10			50/10"	11.2		10			50/6"	9.9
	15			50/6"	12.0						

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TEST BORING LOG

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FIGURE No. 52

DATE Jul/02/2021

TEST BORING: F-27 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-28 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, firm to very hard, moist	5			29	12.5	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/11"	14.7
	10			50/11"	15.8		10			50/11"	14.2
	15			50/7"	14.6		15			50/8"	12.5
	20			50/6"	12.4		20			50/8"	13.2
							25			50/7"	13.2

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TEST BORING LOG

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FIGURE No. 53

DATE Jul/02/2021

TEST BORING: F-29 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/28/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-30 DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/28/30	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist						CLAYSTONE, SANDY, brown, medium hard to very hard, moist					
	5			50	10.6		5			40	13.0
	10			50/9"	12.0		10			50/8"	12.6
	15			50/7"	11.3		15			50/5"	11.8
	20			50/6"	12.3						

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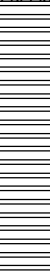



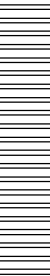

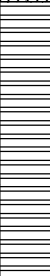





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TEST BORING LOG

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FIGURE No. 54

DATE Jul/02/2021

TEST BORING: F-31	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-32	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20						DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20					
CLAY, SANDY, brown, hard, moist	5			33	9.7	CLAY, SANDY, brown, stiff, moist	5			16	8.3
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	10			50/10"	13.1		10			9	9.7
	15			50/9"	11.8	CLAYSTONE, SANDY, brown, medium hard to hard, moist	15			34	9.3
	20			50/4"	11.4		20			50/9"	9.5

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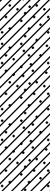

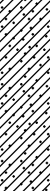
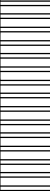
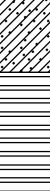
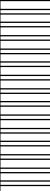
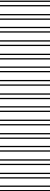

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TEST BORING LOG

JOB No. 175706

FIGURE No. 55

DATE Jul/02/2021

TEST BORING: F-33 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-34 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, stiff to very stiff, moist	5			14	8.1	CLAY, SANDY, brown, very stiff, moist	5			29	10.2
	10			19	8.6	CLAYSTONE, SANDY, brown, medium hard to hard, moist	10			50/11"	11.0
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	15			44	9.1		15			50/11"	10.6
	20			50/8"	10.0		20			50/8"	11.3
	25			50/4"	9.5		25			50/9"	10.8

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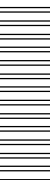



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Civil, Planning

TEST BORING LOG

JOB No. 175706

FIGURE No. 56

DATE Jul/02/2021

TEST BORING: F-35 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-36 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			23	8.7	CLAY, SANDY, brown, very stiff, moist	5			18	10.4
	10			36	9.1	CLAYSTONE, SANDY, brown, medium hard, moist	10			33	12.3
CLAYSTONE, SANDY, brown, medium hard to hard, moist	15			50/11"	9.8		15			50/11"	11.6
	20			50/10"	11.6						

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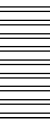

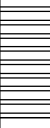

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TEST BORING LOG

JOB No. 175706

FIGURE No. 57

DATE Jul/02/2021

TEST BORING: F-37 DATE DRILLED: 9/19/20 NO GROUNDWATER ON 9/19/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: F-38 DATE DRILLED: 9/12/20 NO GROUNDWATER ON 9/12/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, stiff to very stiff, moist	5			15	8.1	CLAY, SANDY, brown, very stiff, moist	5			33	7.7
	10			27	11.6		10			26	10.6
CLAYSTONE, SANDY, brown, hard, moist	15			50/11"	15.4	CLAYSTONE, SANDY, brown, very hard, moist	15			50/4"	8.8

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TEST BORING LOG

JOB No. 175706

FIGURE No. 58

DATE Jul/02/2021

TEST BORING: F-39	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-1	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 9/25/20 NO GROUNDWATER ON 9/25/21						DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21					
CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50/10"	12.1	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/8"	14.2
	10			50/6"	15.0		10			50/6"	13.2
							15			50/5"	7.3

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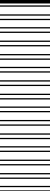







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TEST BORING LOG

JOB No. 175706

FIGURE No. 59

DATE Jul/02/2021

TEST BORING: H-2 DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-3 DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, hard to very hard, moist	5			50/10"	13.2	CLAY, SANDY, brown, very stiff, moist	5			14	9.3
	10			50/5"	11.7		10			50	10.1
	15			50/6"	11.6	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	15			50/6"	10.8
	20			50/9"	13.4		20			50/5"	9.2

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TEST BORING LOG

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FIGURE No. 60

DATE Jul/02/2021

TEST BORING: H-4 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-5 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, hard to very hard, moist	5			50/9"	10.1	CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50	11.8
	10			50/6"	11.3		10			50/10"	12.4
	15			50/5"	12.3		15			50/6"	14.4
						SHALE, SANDY, blue to gray, very hard, moist	20			50/6"	12.5

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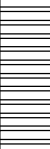
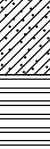
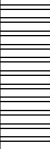
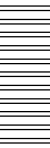
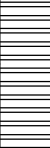
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TEST BORING LOG

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FIGURE No. 61

DATE Jul/02/2021

TEST BORING: H-6 DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-7 DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			20	10.1	CLAY, SANDY, brown to gray, with rust staining, hard, moist	5			32	11.3
	10			30	7.8	CLAYSTONE, SANDY, brown to gray, hard to very hard, moist	10			50/8"	12.7
CLAYSTONE, SANDY, brown, medium hard, moist	15			50	8.6		15			50/7"	10.6
				41	--		20			50/7"	13.3
							25			50/5"	10.3

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TEST BORING LOG

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FIGURE No. 62

DATE Jul/02/2021

TEST BORING: H-8 DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-9 DATE DRILLED: 2/22/21 NO GROUNDWATER ON 2/22/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, moist						CLAY, SANDY, brown, moist					
CLAYSTONE, SANDY, brown, with rust staining, medium hard to very hard, moist	5			50/11"	13.6	CLAYSTONE, SANDY, brown, to gray, medium hard to very hard, moist	5			50/8"	11.0
	10			50/8"	12.8		10			50/8"	12.9
	15			50/5"	11.2		15			50/5"	12.6
	20			50/6"	12.9		20			50/8"	15.0

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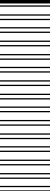







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TEST BORING LOG

JOB No. 175706

FIGURE No. 63

DATE Jul/02/2021

TEST BORING: H-10 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-11 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			40	14.4	CLAY, SANDY, brown, very stiff to hard, moist	5			16	9.1
	10			50/10"	15.8		10			31	9.9
	15			50/6"	12.5		15			40	10.8
	20			50/6"	10.4	CLAYSTONE, SANDY, olive to brown, hard, moist	20			50/9"	13.4

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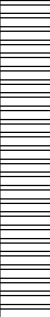
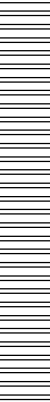
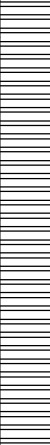


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TEST BORING LOG

JOB No. 175706

FIGURE No. 64

DATE Jul/02/2021

TEST BORING: H-12 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-13 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5		■	16	8.6	CLAY, SANDY, brown, moist	5		■	24	9.1
	10		■	29	11.0	CLAYSTONE, SANDY, brown, with rust staining, firm to hard, moist	10		▲	50/11"	9.7
CLAYSTONE, SANDY, brown, medium hard to hard, moistmed	15		▲	50/8"	10.4		15		■	50/10"	13.1
	20		▲	50/5"	8.8		20		▲	50/7"	10.2

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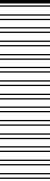







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TEST BORING LOG

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FIGURE No. 65

DATE Jul/02/2021

TEST BORING: H-14 DATE DRILLED: 2/18/21 NO GROUNDWATER ON 2/18/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-15 DATE DRILLED: 2/17/21 NO GROUNDWATER ON 2/17/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, firm to hard, moist	5			44	7.8	CLAY, SANDY, brown with rust staining, very stiff, moist	5			23	10.2
	10			50/9"	10.2		10			25	11.1
	15			50/10"	15.5	CLAYSTONE, SANDY, brown, medium hard to hard, moist	15			50/9"	12.0
	20			50/9"	13.3		20			50/9"	12.9

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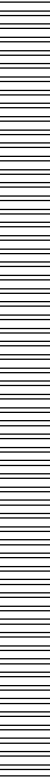







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TEST BORING LOG

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FIGURE No. 66

DATE Jul/02/2021

TEST BORING: H-16 DATE DRILLED: 2/17/21 NO GROUNDWATER ON 2/17/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-17 DATE DRILLED: 2/17/21 NO GROUNDWATER ON 2/17/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, hard, moist	5			40	15.5	CLAY, SANDY, brown, very stiff, moist	5			21	10.2
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	10			50/9"	13.9	AUGER REFUSAL DUE TO RIG MALFUNCTIONS					
	15			50/8"	12.7						
	20			50/9"	13.8						
	25			50/4"	10.3						

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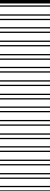

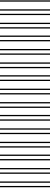

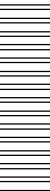
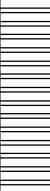
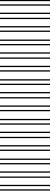
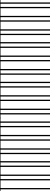
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TEST BORING LOG

JOB No. 175706

FIGURE No. 67

DATE Jul/02/2021

TEST BORING: H-18	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-19	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21						DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21					
CLAYSTONE, SANDY, brown, firm to hard, moist	5			47	8.7	CLAY, SANDY, brown, very stiff, moist	5			30	9.2
	10			50/9"	9.7	CLAYSTONE, SANDY, brown, firm to hard, moist	10			39	8.5
	15			50/7"	14.5		15			50/11"	9.0
	20				13.1		20			50/8"	11.2

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TEST BORING LOG

JOB No. 175706

FIGURE No. 68

DATE Jul/02/2021

TEST BORING: H-20 DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-21 DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50/10"	13.8	CLAY, SANDY, brown, stiff, moist	5			15	10.6
	10			50/10"	15.7		10			15	11.2
	15			50/6"	12.8	CLAYSTONE, SANDY, brown, medium hard, moist	15			50/9"	12.3
	20			50/10"	13.9		20			50/9"	13.4
							25			50	11.3

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



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TEST BORING LOG

JOB No. 175706

FIGURE No. 69

DATE Jul/02/2021

TEST BORING: H-22 DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-23 DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff to hard, moist	5			30	8.8	CLAY, SANDY, brown, very stiff to hard, moist	5			34	8.3
	10			39	8.8		10			26	8.0
	15			40	8.6		15			35	8.6
CLAYSTONE, SANDY, brown, hard, moist	20			50/11"	9.1		20			33	9.2

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TEST BORING LOG

JOB No. 175706

FIGURE No. 70

DATE Jul/02/2021

TEST BORING: H-24 DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: H-25 DATE DRILLED: 2/16/21 NO GROUNDWATER ON 2/16/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff to hard, moist						CLAY, SANDY, brown, moist					
						CLAYSTONE, SANDY, brown to gray, hard to very hard, moist					
	5			19	8.3		5			50/9"	11.0
	10			32	8.7		10			50/9"	11.2
	15			20	9.3		15			50/5"	11.8
	20			34	10.3		20			50/7"	13.1

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TEST BORING LOG

JOB No. 175706

FIGURE No. 71

DATE Jul/02/2021

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
D-1	4.0	9.7								
D-1	9.0	10.2								
D-1	14.0	10.6	102.8	41	26		79.0		- 0.5	CL
D-2	4.0	8.5								
D-2	9.0	9.6								
D-2	14.0	9.0								
D-2	19.0	8.9	112.2	43	29		95.8		7.7	CL
D-3	4.0	10.9	125.5						0.8	
D-3	9.0	11.4								
D-4	4.0	8.2								
D-4	9.0	9.9								
D-5	4.0	12.8								
D-5	9.0	9.6								
D-6	4.0	9.1								
D-6	9.0	7.7	110.0						1.0	
D-7	4.0	11.0	106.1	42	25		86.7		0.3	CL
D-7	9.0	10.7								
D-8	4.0	14.2								
D-8	9.0	13.3	122.8	55	37		96.3		7.3	CH
D-8	14.0	16.7								
D-8	19.0	11.9								
D-9	4.0	12.5								
D-9	9.0	12.8							5.1	
D-9	14.0	12.8								
D-9	19.0	15.0								
D-10	4.0	9.2								
D-10	9.0	16.0	120.2						- 4.5	
D-10	14.0	10.6								
D-11	4.0	13.3								
D-11	9.0	11.2	98.3						- 1.6	
D-11	14.0	11.1								
D-11	19.0	11.9								
D-12	4.0	9.0								
D-12	9.0	9.6							1.9	

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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 175706
FIGURE No. 72
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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
D-13	4.0	8.8								
D-13	9.0	8.5								
D-13	14.0	10.5	120.3						0.3	
D-14	4.0	11.6								
D-14	9.0	8.8	125.0						0.4	
D-15	4.0	7.4	107.3						1.9	
D-15	9.0	8.6								
D-16	4.0	9.5								
D-16	9.0	10.7								
D-17	4.0	7.8								
D-17	9.0	10.3								
D-17	14.0	11.5	137.0	49	37		98.8		5.9	CL
D-18	4.0	8.1								
D-18	9.0	9.2								
D-18	14.0	12.5								
D-18	19.0	12.8								
D-19	4.0	8.4								
D-19	9.0	11.0								
D-19	14.0	14.6	99.8						- 0.5	
D-20	4.0	13.2								
D-20	9.0	11.3	115.6						2.4	
D-21	4.0	14.3								
D-21	9.0	14.2								
D-22	4.0	12.6								
D-22	9.0	12.2	123.6						- 1.2	
D-23	4.0	12.7								
D-23	9.0	13.0								
D-23	14.0	12.6								
D-23	19.0	10.6	116.3	45	26		98.1		7.6	CL
D-24	4.0	14.4							2.4	
D-24	9.0	13.9								
D-25	4.0	8.0								
D-25	9.0	8.8								
D-25	14.0	10.8	124.1						- 4.2	

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
D-26	4.0	10.8								
D-26	9.0	11.6		46	31		93.9			CL
D-27	4.0	7.2								
D-27	9.0	9.1								
D-27	14.0	13.9	120.3	43	27		90.7		2.6	CL
D-28	4.0	15.5								
D-28	9.0	14.1	121.2						7.6	
D-29	4.0	11.4								
D-29	9.0	11.2	116.6						5.8	
D-29	14.0	9.6								
D-30	4.0	9.8								
D-30	9.0	7.9	97.8	39	25		84.5		- 4.9	CL
D-30	14.0	8.9								
D-31	4.0	14.2								
D-31	9.0	11.4	120.9						1.1	
D-32	4.0	9.0								
D-32	9.0	11.2								
D-32	14.0	10.1								
D-32	19.0	12.2	105.6						- 5.3	
D-33	4.0	8.2								
D-33	9.0	10.4								
D-33	14.0	10.1	118.4						0.9	
D-34	4.0	10.8								
D-34	9.0	11.8								
D-34	14.0	13.2	112.5	54	37		95.7		5.2	CH
D-35	4.0	14.5								
D-35	9.0	13.9								
D-35	14.0	17.2								
D-35	19.0	15.9							5.7	
D-36	4.0	15.0								
D-36	9.0	14.3								
D-36	14.0	14.0								
D-36	19.0	21.2	107.5						4.3	
D-37	4.0	13.5								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
D-37	9.0	15.8								
D-37	14.0	13.6	122.3						5.3	
D-38	4.0	13.1								
D-38	9.0	13.5								
D-38	14.0	15.6								
D-38	19.0	15.2							1.9	
D-39	4.0	15.4								
D-39	9.0	10.8	118.3						- 0.7	
D-40	4.0	8.8		38	24		83.6			CL
D-40	9.0	13.6								
D-41	4.0	8.8								
D-41	9.0	9.5							5.3	
D-42	4.0	14.0							6.5	
D-42	9.0	15.3								
D-43	4.0	13.0								
D-43	9.0	13.5		52	34	0.0	91.5		4.9	CH
D-44	4.0	11.8							6.0	
D-44	9.0	12.9								
D-45	4.0	14.6								
D-45	9.0	14.2								
D-45	14.0	16.1								
D-45	19.0	15.8								
D-45	24.0	16.3	79.0						0.2	
D-46	4.0	9.9								
D-46	9.0	9.7	119.7						3.6	
D-47	4.0	8.6								
D-47	9.0	9.2								
D-47	14.0	12.2		56	38		96.7			CH
D-47	19.0	16.4	116.2						5.5	
D-48	4.0	7.9								
D-48	9.0	11.1								
D-48	14.0	11.4	117.7						4.0	
D-49	4.0	10.6								
D-49	9.0	9.0	97.7						- 4.9	

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
D-50	4.0	10.1								
D-50	9.0	13.1								
D-50	14.0	15.6								
D-50	19.0	10.2								
D-51	4.0	8.6								
D-51	9.0	9.2								
D-51	14.0	12.2	121.8	55	38		96.7		2.6	CH
D-51	19.0	16.4								
D-52	4.0	9.9								
D-52	9.0	10.2	126.0						3.5	
D-52	14.0	12.5								
D-53	4.0	11.3	109.9						5.1	
D-53	9.0	13.3								
D-53	14.0	16.9								
D-54	4.0	13.4								
D-54	9.0	16.9								
D-54	14.0	18.1								
D-54	19.0	19.6	105.9						0.0	
D-55	4.0	14.9								
D-55	9.0	15.8	110.8						6.7	
D-56	4.0	11.8								
D-56	9.0	13.0	121.4						3.5	
D-57	4.0	9.2								
D-57	9.0	11.6								
D-57	14.0	13.9	109.4	48	32		87.7		- 0.4	CL
D-58	4.0	9.8								
D-58	9.0	11.0	108.0						0.3	
D-59	4.0	11.1	107.5						- 0.5	
D-59	9.0	12.9								
D-60	4.0	9.3								
D-60	9.0	11.7	116.2						5.3	
D-61	4.0	14.1	106.6						4.5	
D-61	9.0	13.0								
D-62	4.0	9.9								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
D-62	9.0	10.7								
D-62	14.0	13.5	121.0						9.3	
D-62	19.0	11.6								
D-63	4.0	5.4								
D-63	9.0	9.8	124.2	43	29		92.1		4.0	CL
D-63	14.0	10.5								
D-64	4.0	17.5	114.9						- 0.4	
D-64	9.0	16.6								
D-64	14.0	10.5								
D-65	4.0	13.6								
D-65	9.0	16.5								
D-65	14.0	19.0	82.8						3.1	
D-66	4.0	11.6	114.1						6.4	
D-66	9.0	9.9								
D-66	14.0	15.7								
D-67	4.0	16.7		70	46		85.2		10.3	CH
D-67	9.0	17.9								
D-67	14.0	17.7								
D-68	4.0	13.1								
D-68	9.0	12.8								
D-68	14.0	10.9	116.0						5.3	
D-69	4.0	11.0								
D-69	9.0	9.6								
D-69	14.0	9.4							- 4.1	
D-69	19.0	10.7								
D-70	4.0	9.6								
D-70	9.0	10.8							3.3	
D-70	14.0	11.5								
D-70	19.0	10.9								
F-1	4.0	12.2								
F-1	9.0	12.9	110.5	36	22		76.8		2.1	CL
F-2	4.0	9.8								
F-2	9.0	9.4	107.7	40	27		83.3		- 0.8	CL
F-3	4.0	9.9								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
F-3	9.0	8.7								
F-3	14.0	10.1	111.7						2.4	
F-4	4.0	8.9								
F-4	9.0	9.0	124.3						3.6	
F-4	14.0	16.0								
F-5	4.0	10.6								
F-5	9.0	9.8	114.2						3.1	
F-5	14.0	11.0								
F-6	4.0	9.2								
F-6	9.0	11.0								
F-6	14.0	9.0	126.9	38	24		88.6		3.2	CL
F-7	4.0	7.5								
F-7	9.0	7.3	128.3						5.7	
F-7	14.0	11.7								
F-8	4.0	6.1								
F-8	9.0	6.8								
F-8	14.0	17.0	115.5						4.7	
F-9	4.0	9.4								
F-9	9.0	9.7					76.8			
F-9	14.0	11.0	112.3						4.3	
F-10	4.0	11.3								
F-10	9.0	11.4	120.0						0.4	
F-11	4.0	12.1								
F-11	9.0	11.3								
F-11	14.0	10.2								
F-11	19.0	10.8	122.8	42	26		83.0		4.1	CL
F-12	4.0	8.0								
F-12	9.0	9.2	116.0	35	22		76.0		1.5	CL
F-12	14.0	10.3								
F-13	4.0	6.5								
F-13	9.0	8.2	127.4						5.5	
F-13	14.0	13.2								
F-14	4.0	7.8								
F-14	9.0	13.3								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
F-14	14.0	9.7	94.0						- 2.4	
F-15	4.0	8.7								
F-15	9.0	8.6								
F-15	14.0	13.2	126.6						9.2	
F-16	4.0	8.0								
F-16	9.0	10.3	127.6	42	28		82.4		5.0	CL
F-16	14.0	11.2								
F-16	19.0	11.1								
F-17	4.0	11.0								
F-17	9.0	9.3								
F-17	14.0	10.9	124.1						- 10.3	
F-18	4.0	6.8								
F-18	9.0	11.0								
F-18	14.0	11.7	117.0	42	25		90.5		3.2	CL
F-19	4.0	7.7								
F-19	9.0	9.5								
F-19	14.0	9.0	122.0						5.0	
F-20	4.0	6.2								
F-20	9.0	7.8	118.8						5.6	
F-20	14.0	10.7								
F-21	4.0	10.1								
F-21	9.0	10.0								
F-21	14.0	10.5								
F-21	19.0	10.7	119.7						1.0	
F-22	4.0	7.1								
F-22	9.0	9.4	97.3	43	25		87.3		6.7	CL
F-22	14.0	12.0								
F-23	4.0	13.2								
F-23	9.0	14.2								
F-23	14.0	15.2								
F-24	4.0	8.2								
F-24	9.0	9.8	120.9						4.5	
F-25	4.0	11.3								
F-25	9.0	11.2								

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SUMMARY OF LABORATORY TEST RESULTS

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FIGURE No. 72
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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
F-25	14.0	12.0		47	31	0.0	87.8		5.1	CL
F-26	4.0	10.4								
F-26	9.0	9.9							5.1	
F-27	4.0	12.5								
F-27	9.0	15.8								
F-27	14.0	14.6	111.6						0.5	
F-27	19.0	12.4								
F-28	4.0	14.7								
F-28	9.0	14.2	90.9						2.2	
F-28	14.0	12.5								
F-28	19.0	13.2								
F-28	24.0	13.2		46	29		93.4			CL
F-29	4.0	10.6								
F-29	9.0	12.0	120.8						4.8	
F-29	14.0	11.3								
F-29	19.0	12.3								
F-30	4.0	13.0								
F-30	9.0	12.6								
F-30	14.0	11.8	115.0	46	28	0.0	95.4		3.1	CL
F-31	4.0	9.7								
F-31	9.0	13.1	90.8						- 5.1	
F-31	14.0	11.8								
F-31	19.0	11.4								
F-32	4.0	8.3	112.8						0.9	
F-32	9.0	9.7								
F-32	14.0	9.3								
F-32	19.0	9.5								
F-33	4.0	8.1								
F-33	9.0	8.6								
F-33	14.0	9.1								
F-33	19.0	10.0							4.9	
F-33	24.0	9.5								
F-34	4.0	10.2								
F-34	9.0	11.0								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
F-34	14.0	10.6								
F-34	19.0	11.3		47	32	0.3	84.8		5.6	CL
F-34	24.0	10.8								
F-35	4.0	8.7								
F-35	9.0	9.1								
F-35	14.0	9.8							5.5	
F-35	19.0	11.6								
F-36	4.0	10.4								
F-36	9.0	12.3								
F-36	14.0	11.6							3.9	
F-37	4.0	8.1								
F-37	9.0	11.6							2.4	
F-37	14.0	15.4								
F-38	4.0	7.7				0.0	86.2		1.2	
F-38	9.0	10.6								
F-38	14.0	8.8								
F-39	4.0	12.1								
F-39	9.0	15.0	116.2						4.3	
H-1	4.0	14.2								
H-1	9.0	13.2								
H-1	14.0	7.3	118.7	47	32	0.0	82.0		1.7	CL
H-2	4.0	13.2								
H-2	9.0	11.7	102.8						- 1.9	
H-2	14.0	11.6								
H-2	19.0	13.4								
H-3	4.0	9.3								
H-3	9.0	10.1								
H-3	14.0	10.8								
H-3	19.0	9.2	121.2						5.5	
H-4	4.0	10.1								
H-4	9.0	11.3								
H-4	14.0	12.3	81.5						0.9	
H-5	4.0	11.8								
H-5	9.0	12.4								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
H-5	14.0	14.4								
H-5	19.0	12.5								
H-6	4.0	10.1								
H-6	9.0	7.8	109.9	38	25	0.0	82.4		5.2	CL
H-6	14.0	8.6								
H-7	4.0	11.3								
H-7	9.0	12.7								
H-7	14.0	10.6								
H-7	19.0	13.3								
H-7	24.0	10.3							2.8	
H-8	4.0	13.6								
H-8	9.0	12.8								
H-8	14.0	11.2	107.2						4.3	
H-8	19.0	12.9								
H-9	4.0	11.0	114.1	46	32	0.0	89.3		1.6	CL
H-9	9.0	12.9								
H-9	14.0	12.6								
H-9	19.0	15.0								
H-10	4.0	14.4	112.3						3.0	
H-10	9.0	15.8								
H-10	14.0	12.5								
H-10	19.0	10.4								
H-11	4.0	9.1								
H-11	9.0	9.9	101.2	39	23	0.0	91.7		0.2	CL
H-11	14.0	10.8								
H-11	19.0	13.4								
H-12	4.0	8.6								
H-12	9.0	11.0								
H-12	14.0	10.4								
H-12	19.0	8.8	106.9	47	30	0.0	89.7		- 0.2	CL
H-13	4.0	9.1								
H-13	9.0	9.7	110.5						- 3.5	
H-13	14.0	13.1								
H-13	19.0	10.2								

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
H-14	4.0	7.8								
H-14	9.0	10.2								
H-14	14.0	15.5	107.8						0.7	
H-14	19.0	13.3								
H-15	4.0	10.2								
H-15	9.0	11.1								
H-15	14.0	12.0	122.1	47	33	0.0	93.1		6.9	CL
H-15	19.0	12.9								
H-16	4.0	15.5								
H-16	9.0	13.9								
H-16	14.0	12.7								
H-16	19.0	13.8								
H-16	24.0	10.3	113.7						2.8	
H-17	4.0	10.2		43	28	0.0	88.2			CL
H-18	4.0	8.7								
H-18	9.0	9.7	106.2						- 2.1	
H-18	14.0	14.5								
H-18	19.0	13.1								
H-19	4.0	9.2								
H-19	9.0	8.5	112.6	35	20	0.0	86.3		3.2	CL
H-19	14.0	9.0								
H-19	19.0	11.2								
H-20	4.0	13.8								
H-20	9.0	15.7								
H-20	14.0	12.8	110.1	49	32	0.0	94.3		- 1.0	CL
H-20	19.0	13.9								
H-21	4.0	10.6								
H-21	9.0	11.2								
H-21	14.0	12.3								
H-21	19.0	13.4								
H-21	24.0	11.3	120.2						2.5	
H-22	4.0	8.8								
H-22	9.0	8.8	95.3	37	23	0.0	86.9		- 2.9	CL
H-22	14.0	8.6								

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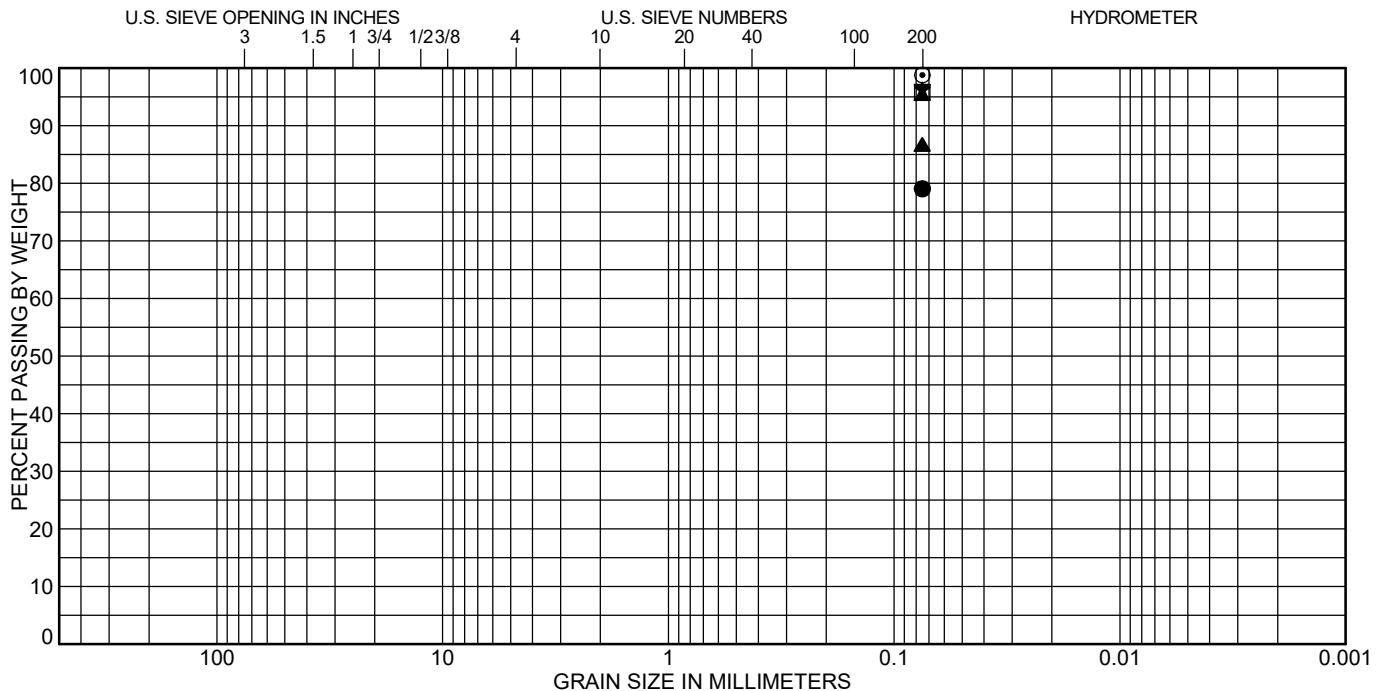
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SUMMARY OF LABORATORY TEST RESULTS

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
H-22	19.0	9.1								
H-23	4.0	8.3								
H-23	9.0	8.0								
H-23	14.0	8.6	117.6						3.8	
H-23	19.0	9.2								
H-24	4.0	8.3								
H-24	9.0	8.7	114.1	35	21	0.0	88.6		1.0	CL
H-24	14.0	9.3								
H-24	19.0	10.3								
H-25	4.0	11.0	106.3						- 3.9	
H-25	9.0	11.2								
H-25	14.0	11.8								
H-25	19.0	13.1								
Subex From Adj. Filing	0.0					1.1	87.3			



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● D-1	14.0	LEAN CLAY with SAND(CL)	41	15	26
☒ D-2	19.0	LEAN CLAY(CL)	43	14	29
▲ D-7	4.0	LEAN CLAY(CL)	42	17	25
★ D-8	9.0	FAT CLAY(CH)	55	18	37
⊙ D-17	14.0	LEAN CLAY(CL)	49	12	37

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● D-1	14.0			79.0	
☒ D-2	19.0			95.8	
▲ D-7	4.0			86.7	
★ D-8	9.0			96.3	
⊙ D-17	14.0			98.8	

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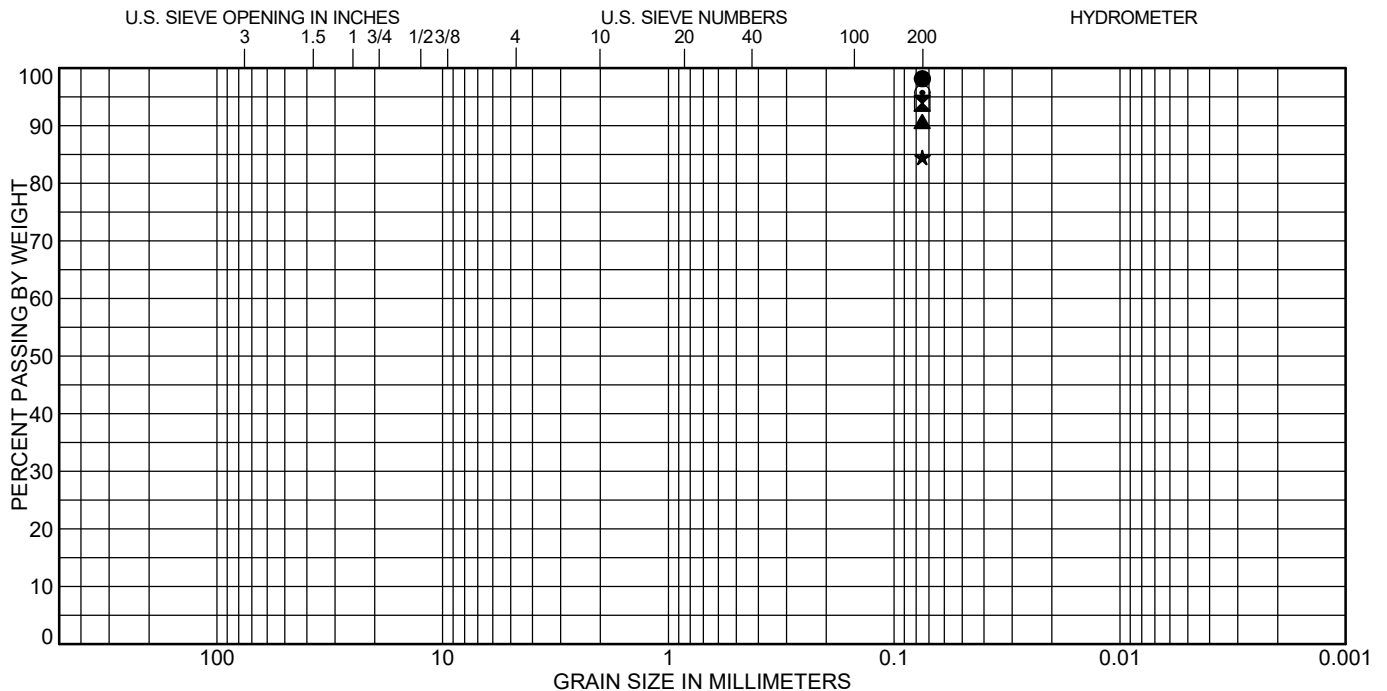
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FIGURE No. 73

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● D-23	19.0	LEAN CLAY(CL)	45	19	26
☒ D-26	9.0	LEAN CLAY(CL)	46	15	31
▲ D-27	14.0	LEAN CLAY(CL)	43	16	27
★ D-30	9.0	LEAN CLAY with SAND(CL)	39	14	25
⊙ D-34	14.0	FAT CLAY(CH)	54	17	37

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● D-23	19.0			98.1	
☒ D-26	9.0			93.9	
▲ D-27	14.0			90.7	
★ D-30	9.0			84.5	
⊙ D-34	14.0			95.7	

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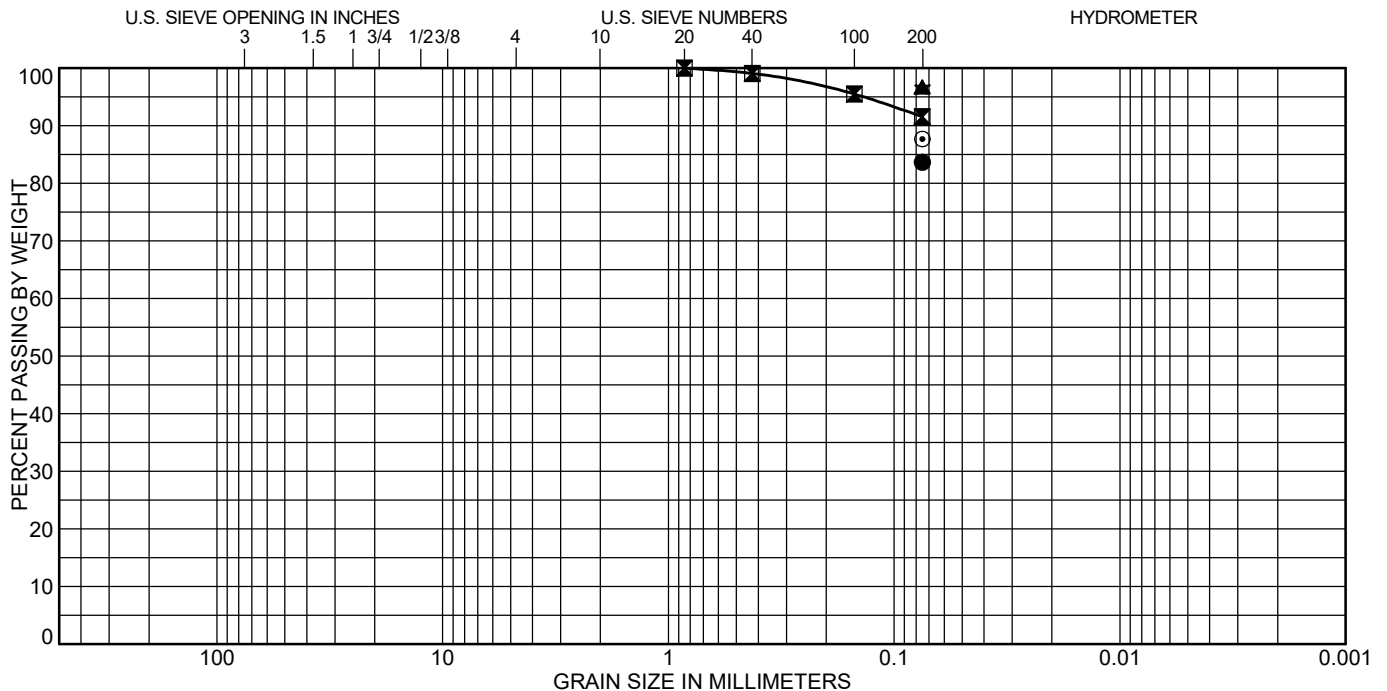
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FIGURE No. 74

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● D-40	4.0	LEAN CLAY with SAND(CL)	38	14	24
⊠ D-43	9.0	FAT CLAY(CH)	52	18	34
▲ D-47	14.0	FAT CLAY(CH)	56	18	38
★ D-51	14.0	FAT CLAY(CH)	55	17	38
⊙ D-57	14.0	LEAN CLAY(CL)	48	16	32

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● D-40	4.0			83.6	
⊠ D-43	9.0	0.0	8.5	91.5	
▲ D-47	14.0			96.7	
★ D-51	14.0			96.7	
⊙ D-57	14.0			87.7	

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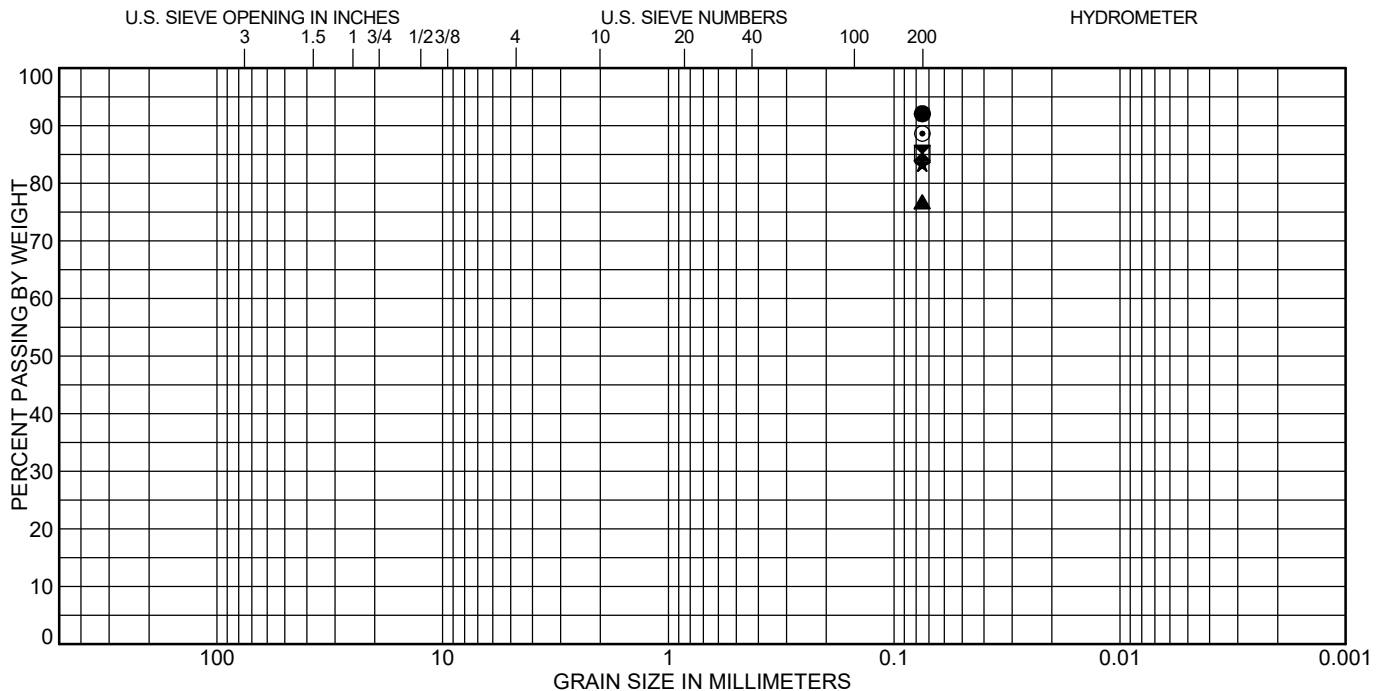
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SOIL CLASSIFICATION DATA

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FIGURE No. 75

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification				LL	PL	PI
● D-63	9.0	LEAN CLAY(CL)				43	14	29
☒ D-67	4.0	FAT CLAY(CH)				70	24	46
▲ F-1	9.0	LEAN CLAY with SAND(CL)				36	14	22
★ F-2	9.0	LEAN CLAY with SAND(CL)				40	13	27
⊙ F-6	14.0	LEAN CLAY(CL)				38	14	24
Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay			
● D-63	9.0			92.1				
☒ D-67	4.0			85.2				
▲ F-1	9.0			76.8				
★ F-2	9.0			83.3				
⊙ F-6	14.0			88.6				

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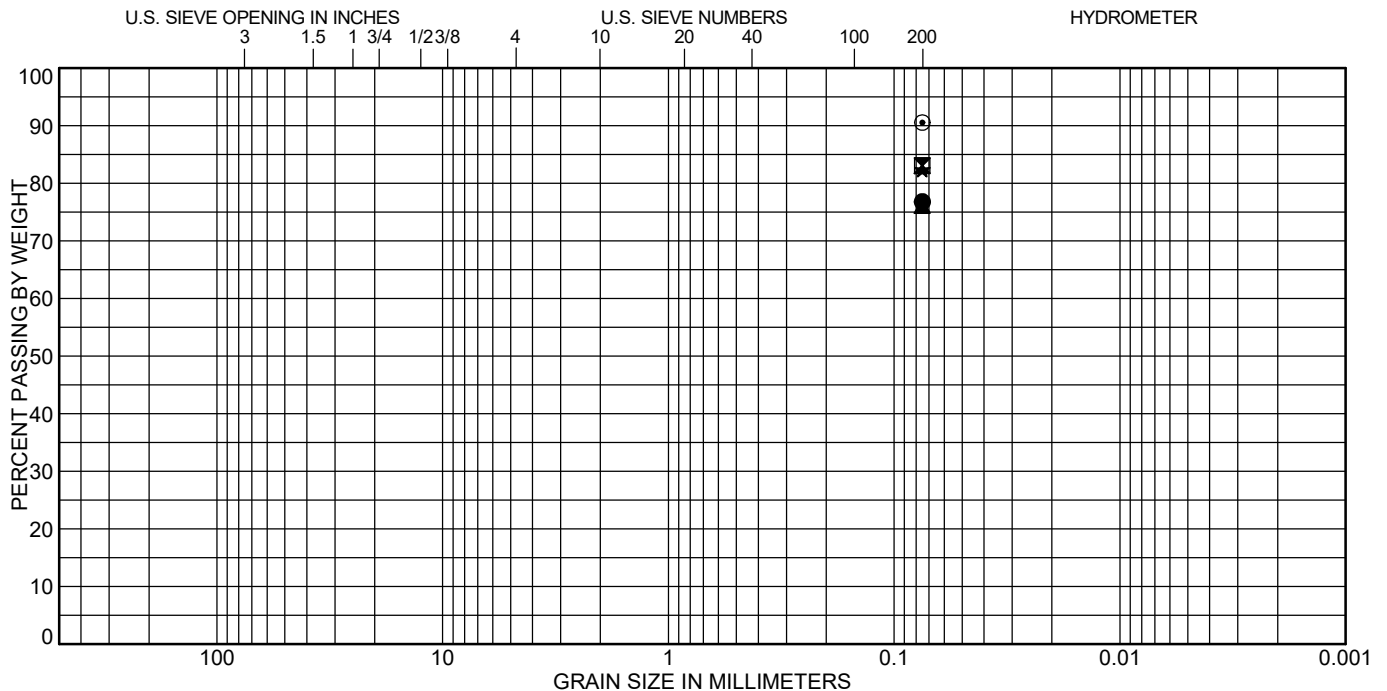
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FIGURE No. 76

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification				LL	PL	PI
● F-9	9.0							
☒ F-11	19.0	LEAN CLAY with SAND(CL)				42	16	26
▲ F-12	9.0	LEAN CLAY with SAND(CL)				35	13	22
★ F-16	9.0	LEAN CLAY with SAND(CL)				42	14	28
⊙ F-18	14.0	LEAN CLAY(CL)				42	17	25
Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay			
● F-9	9.0			76.8				
☒ F-11	19.0			83.0				
▲ F-12	9.0			76.0				
★ F-16	9.0			82.4				
⊙ F-18	14.0			90.5				

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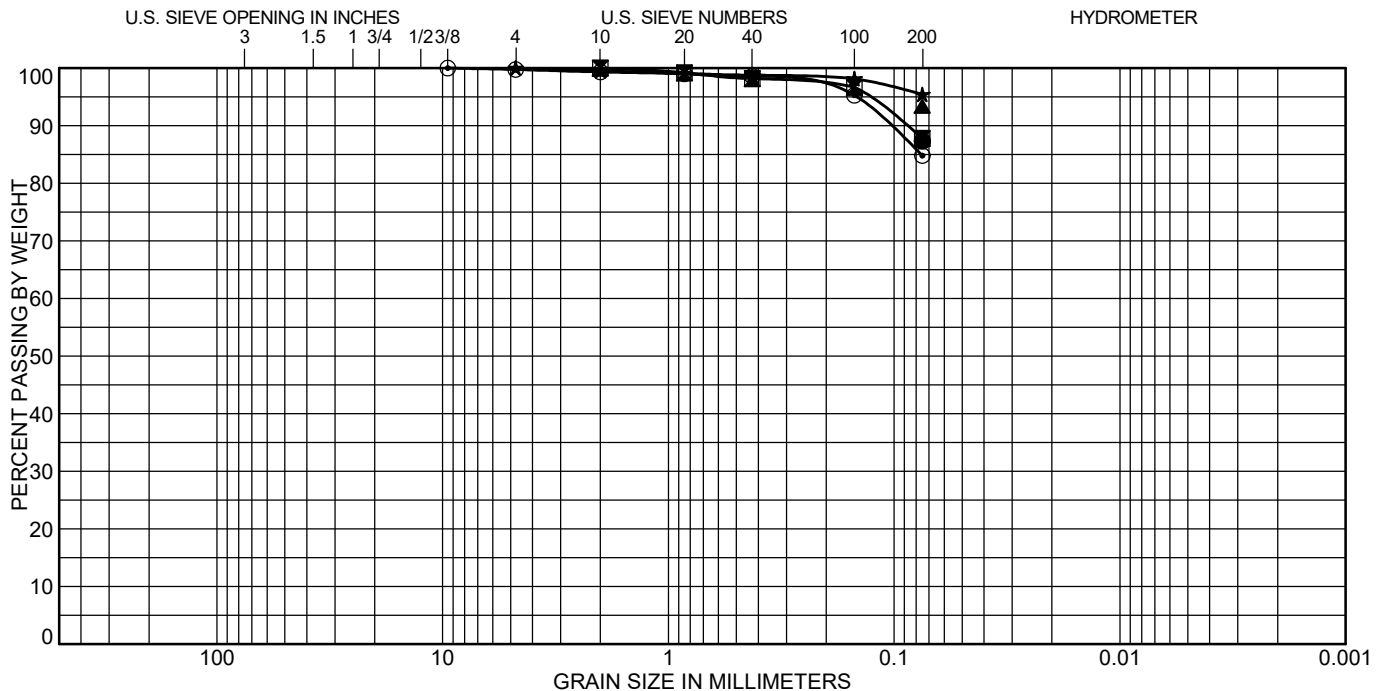
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification			LL	PL	PI
● F-22	9.0	LEAN CLAY(CL)			43	18	25
☒ F-25	14.0	LEAN CLAY(CL)			47	16	31
▲ F-28	24.0	LEAN CLAY(CL)			46	17	29
★ F-30	14.0	LEAN CLAY(CL)			46	18	28
⊙ F-34	19.0	LEAN CLAY with SAND(CL)			47	15	32
Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay		
● F-22	9.0			87.3			
☒ F-25	14.0	0.0	12.2	87.8			
▲ F-28	24.0			93.4			
★ F-30	14.0	0.0	4.6	95.4			
⊙ F-34	19.0	0.3	14.9	84.8			

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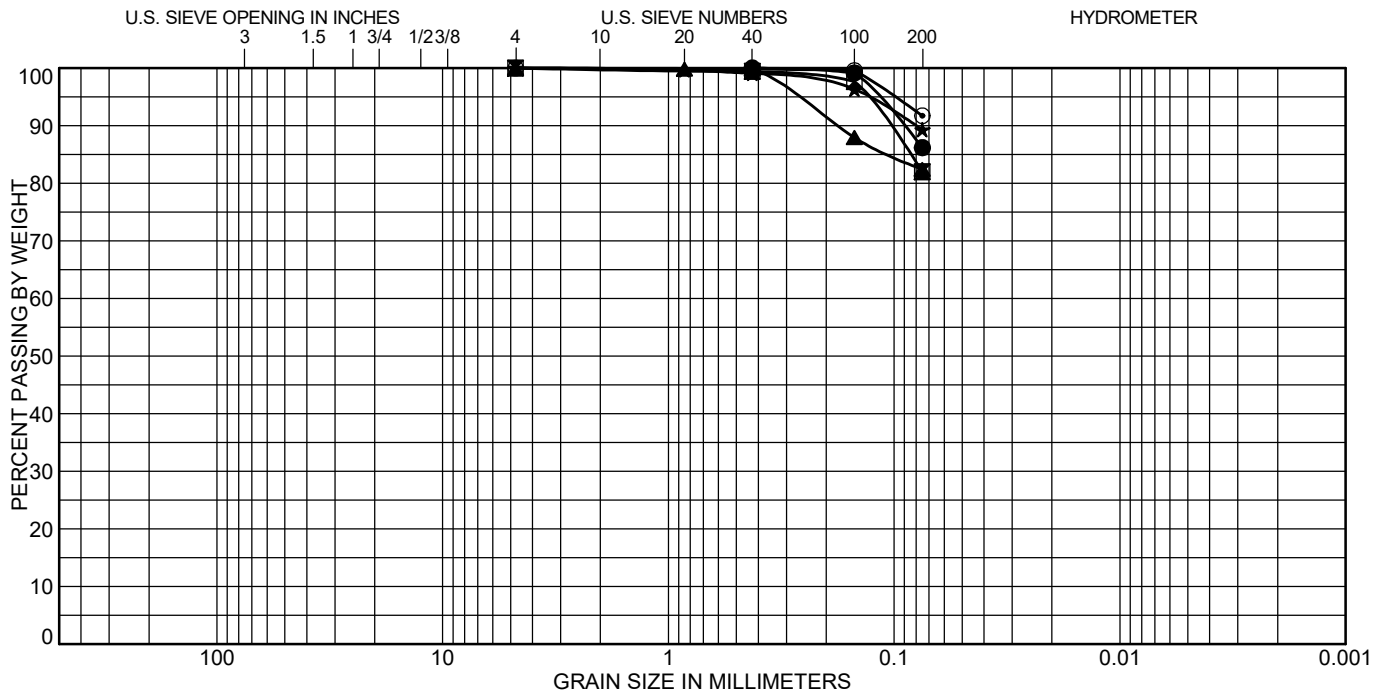
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FIGURE No. 78

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● F-38	4.0				
☒ H-1	14.0	LEAN CLAY with SAND(CL)	47	15	32
▲ H-6	9.0	LEAN CLAY with SAND(CL)	38	13	25
★ H-9	4.0	LEAN CLAY(CL)	46	14	32
⊙ H-11	9.0	LEAN CLAY(CL)	39	16	23

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● F-38	4.0	0.0	13.8	86.2	
☒ H-1	14.0	0.0	18.0	82.0	
▲ H-6	9.0	0.0	17.6	82.4	
★ H-9	4.0	0.0	10.7	89.3	
⊙ H-11	9.0	0.0	8.3	91.7	

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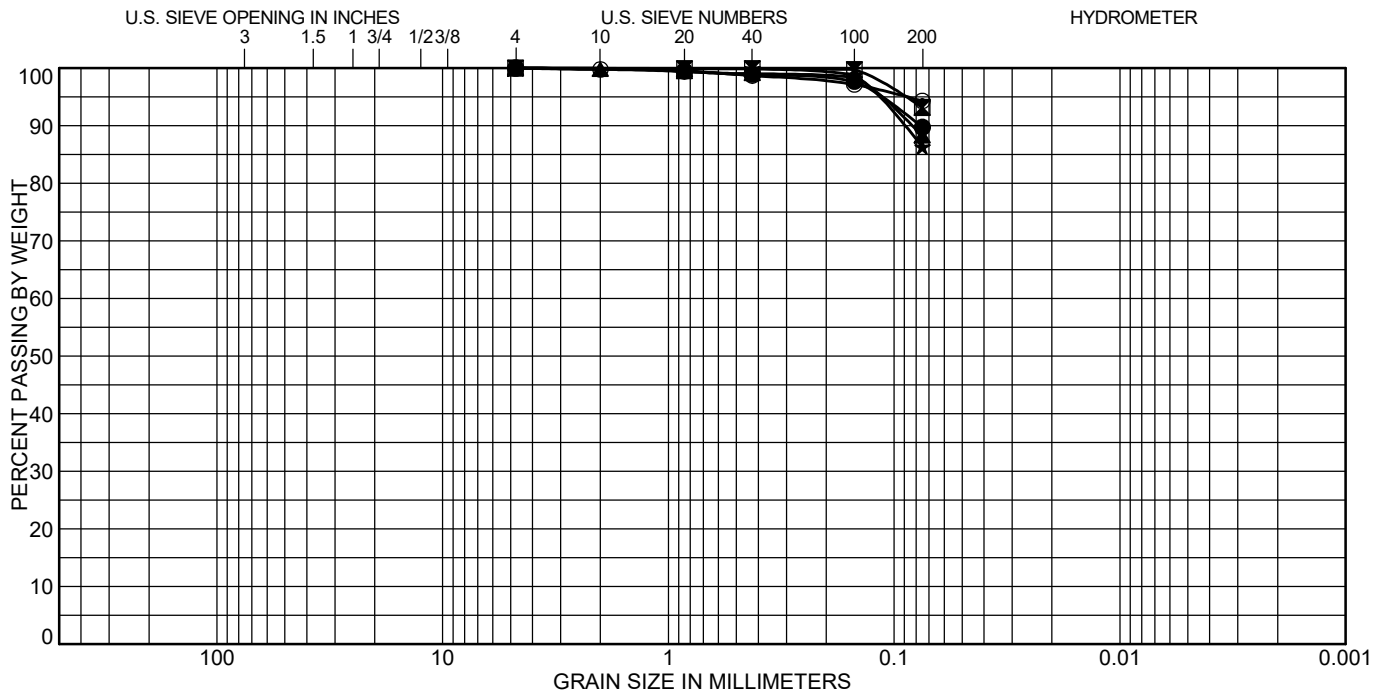
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FIGURE No. 79

DATE Mar/22/2021



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● H-12	19.0	LEAN CLAY(CL)	47	17	30
☒ H-15	14.0	LEAN CLAY(CL)	47	14	33
▲ H-17	4.0	LEAN CLAY(CL)	43	15	28
★ H-19	9.0	LEAN CLAY(CL)	35	15	20
⊙ H-20	14.0	LEAN CLAY(CL)	49	17	32

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● H-12	19.0	0.0	10.3	89.7	
☒ H-15	14.0	0.0	6.9	93.1	
▲ H-17	4.0	0.0	11.8	88.2	
★ H-19	9.0	0.0	13.7	86.3	
⊙ H-20	14.0	0.0	5.7	94.3	

ROCKY MOUNTAIN GROUP

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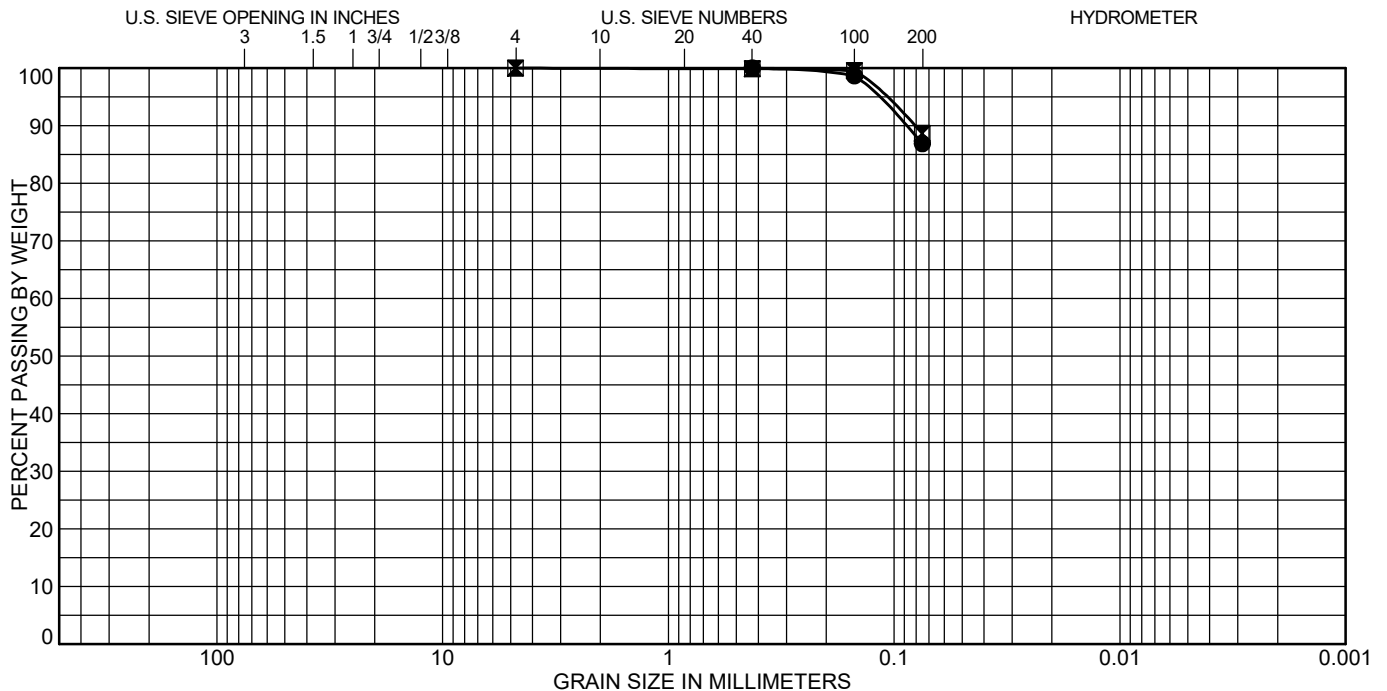
Geotechnical
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SOIL CLASSIFICATION DATA

JOB No. 175706

FIGURE No. 80

DATE Mar/22/2021



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● H-22	9.0	LEAN CLAY(CL)	37	14	23
☒ H-24	9.0	LEAN CLAY(CL)	35	14	21

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● H-22	9.0	0.0	13.1	86.9	
☒ H-24	9.0	0.0	11.4	88.6	

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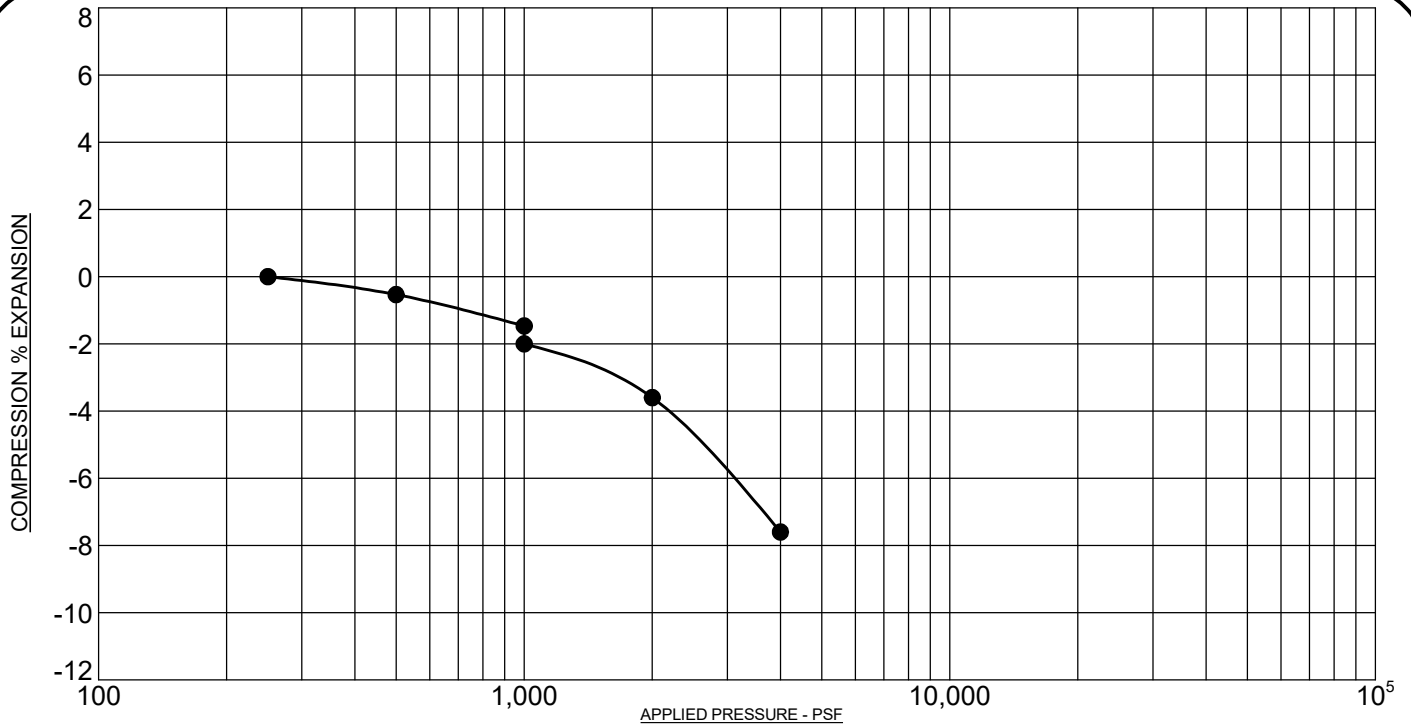
Geotechnical
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SOIL CLASSIFICATION DATA

JOB No. 175706

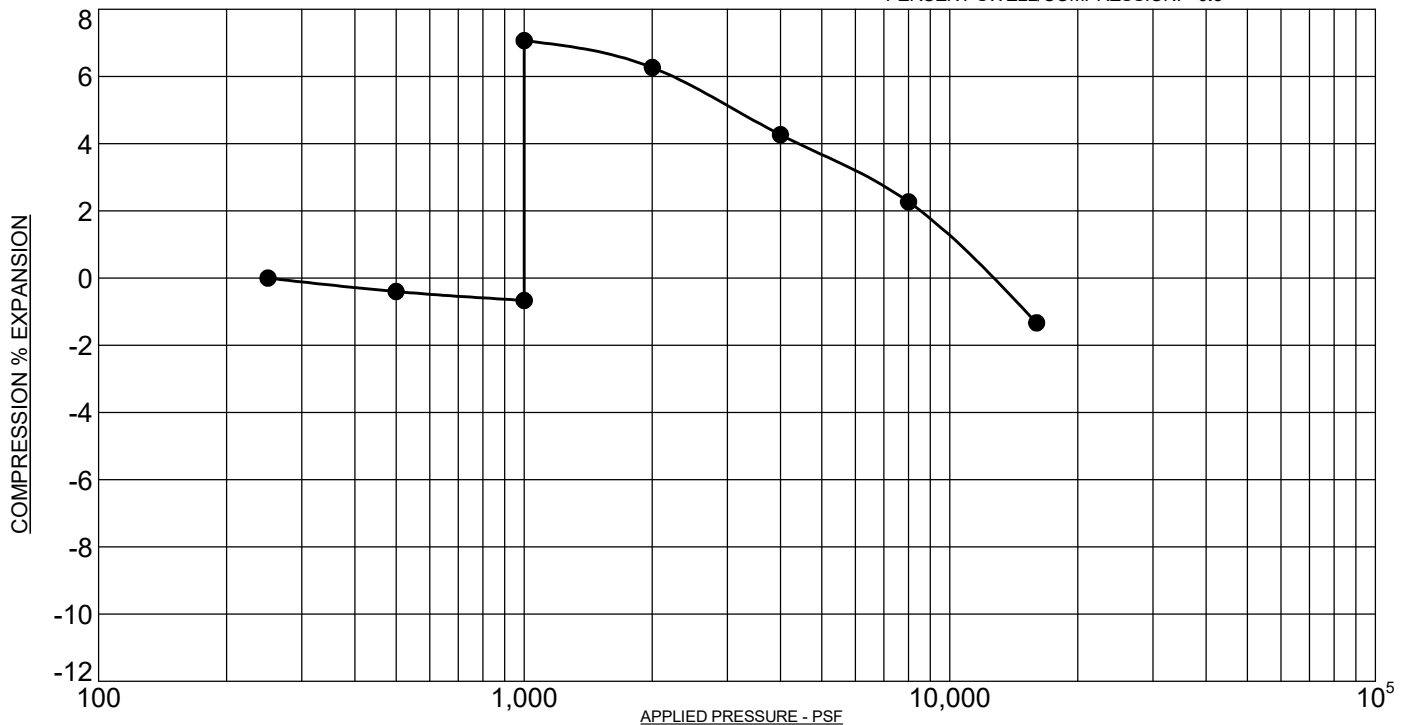
FIGURE No. 81

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-1 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **102.8 PCF**
 NATURAL MOISTURE CONTENT: **10.6%**
 PERCENT SWELL/COMPRESSION: **- 0.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-2 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **112.2 PCF**
 NATURAL MOISTURE CONTENT: **8.9%**
 PERCENT SWELL/COMPRESSION: **7.7**

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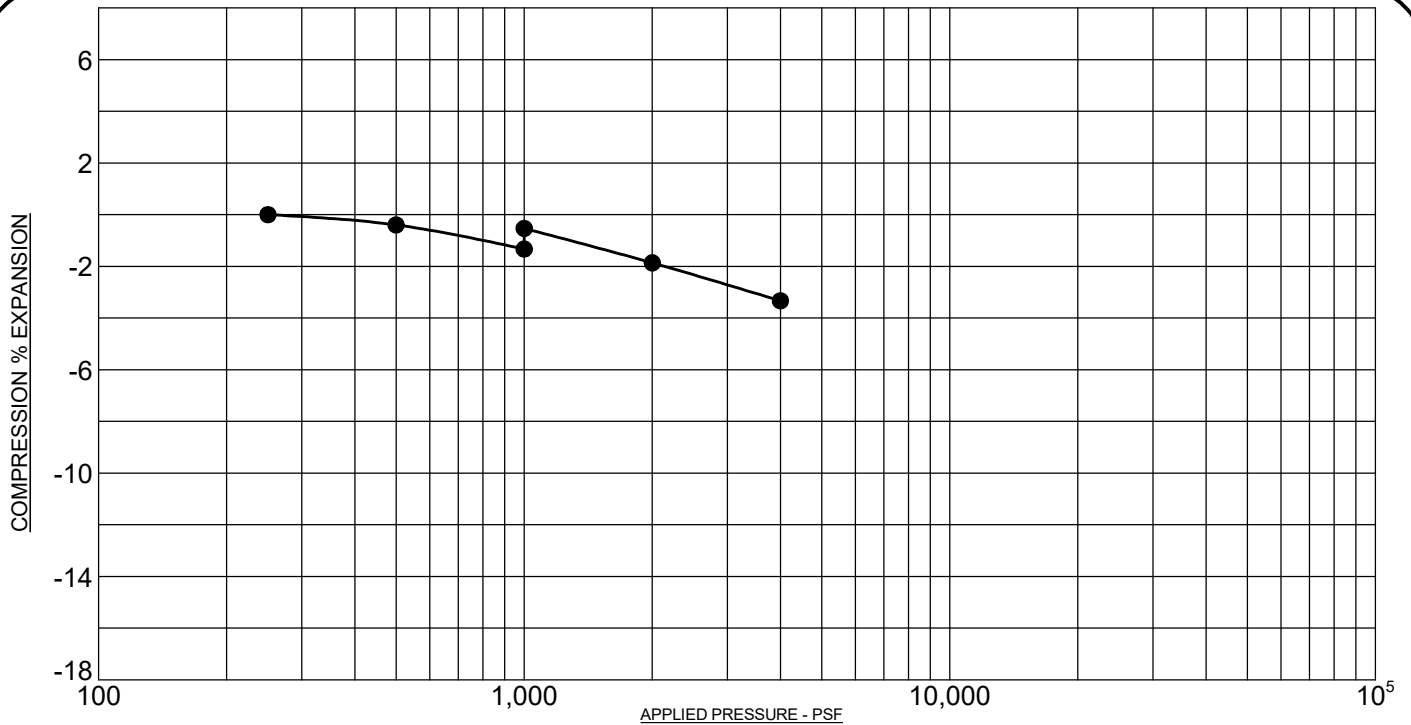
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

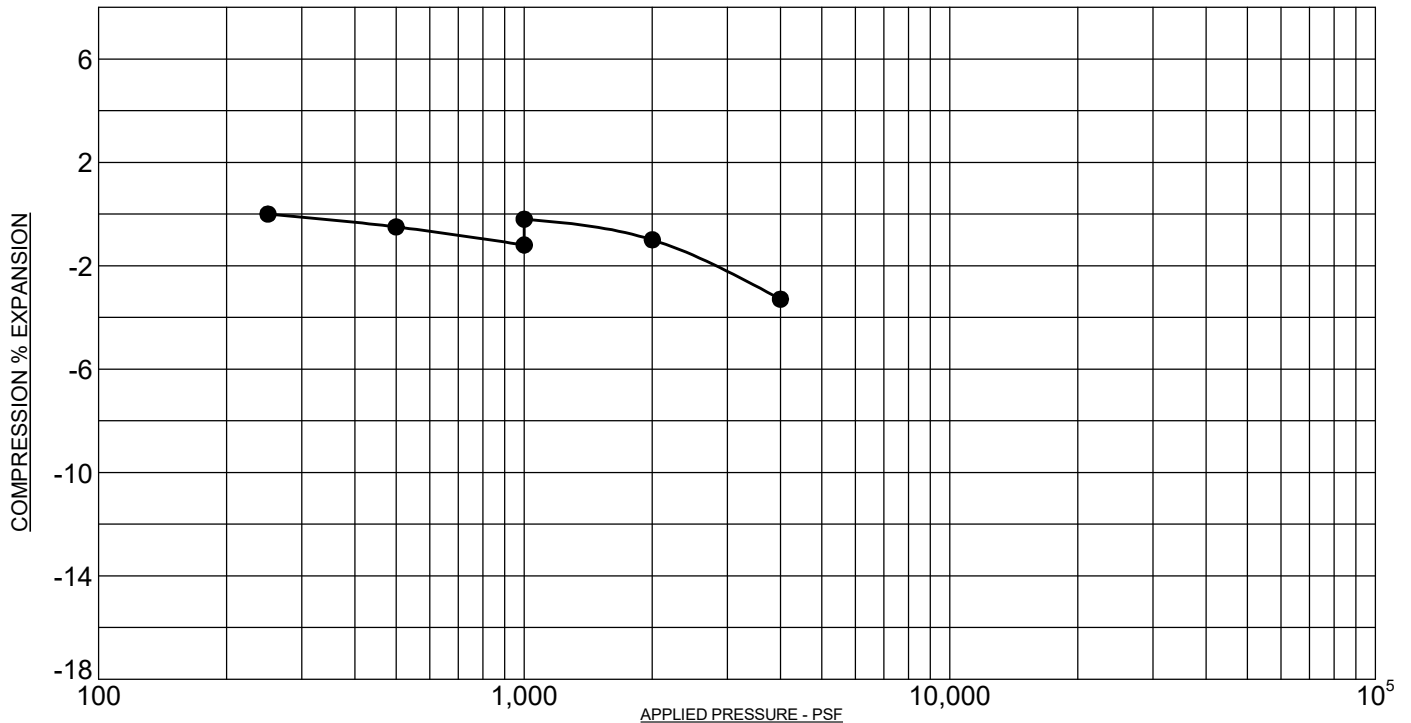
FIGURE No. 82

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-3 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **125.5 PCF**
 NATURAL MOISTURE CONTENT: **10.8%**
 PERCENT SWELL/COMPRESSION: **0.8**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-6 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **110.0 PCF**
 NATURAL MOISTURE CONTENT: **7.7%**
 PERCENT SWELL/COMPRESSION: **1.0**

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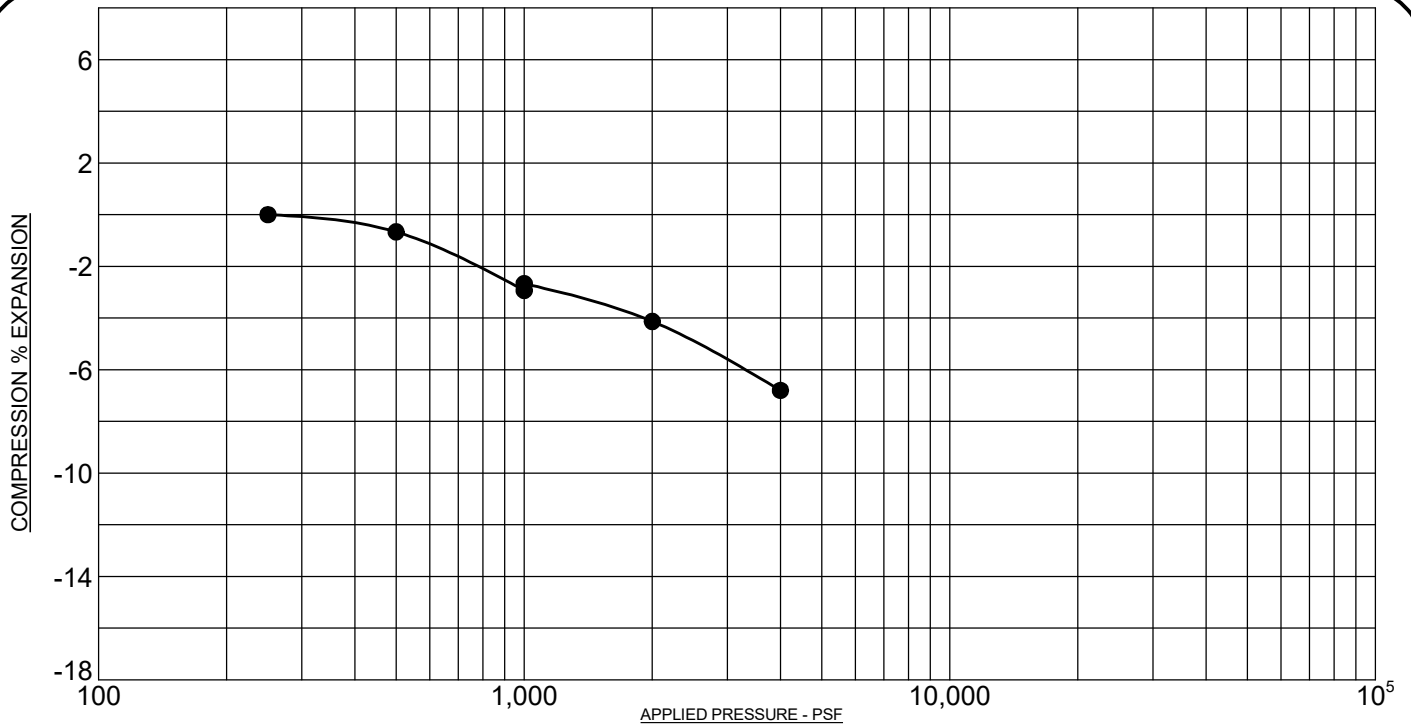
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

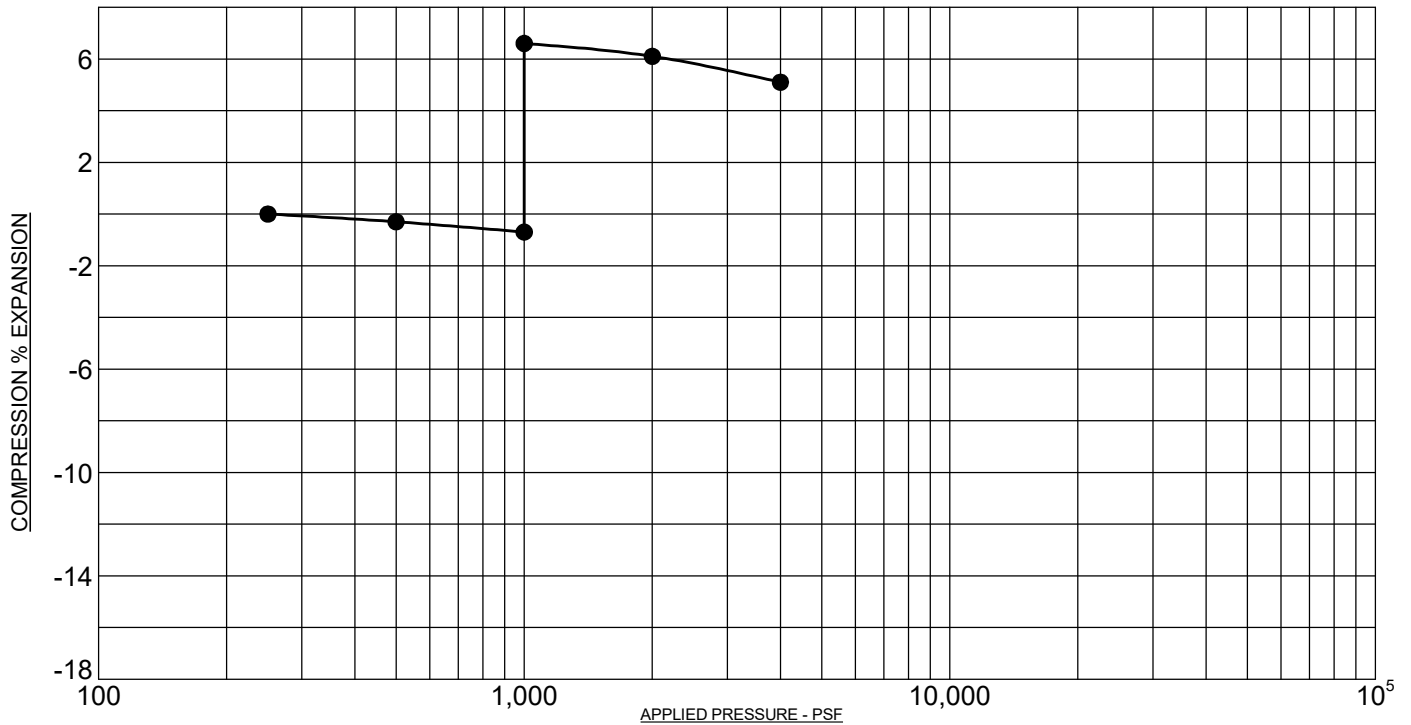
FIGURE No. 83

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-7 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **106.1 PCF**
 NATURAL MOISTURE CONTENT: **10.9%**
 PERCENT SWELL/COMPRESSION: **0.3**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-8 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **122.8 PCF**
 NATURAL MOISTURE CONTENT: **13.3%**
 PERCENT SWELL/COMPRESSION: **7.3**

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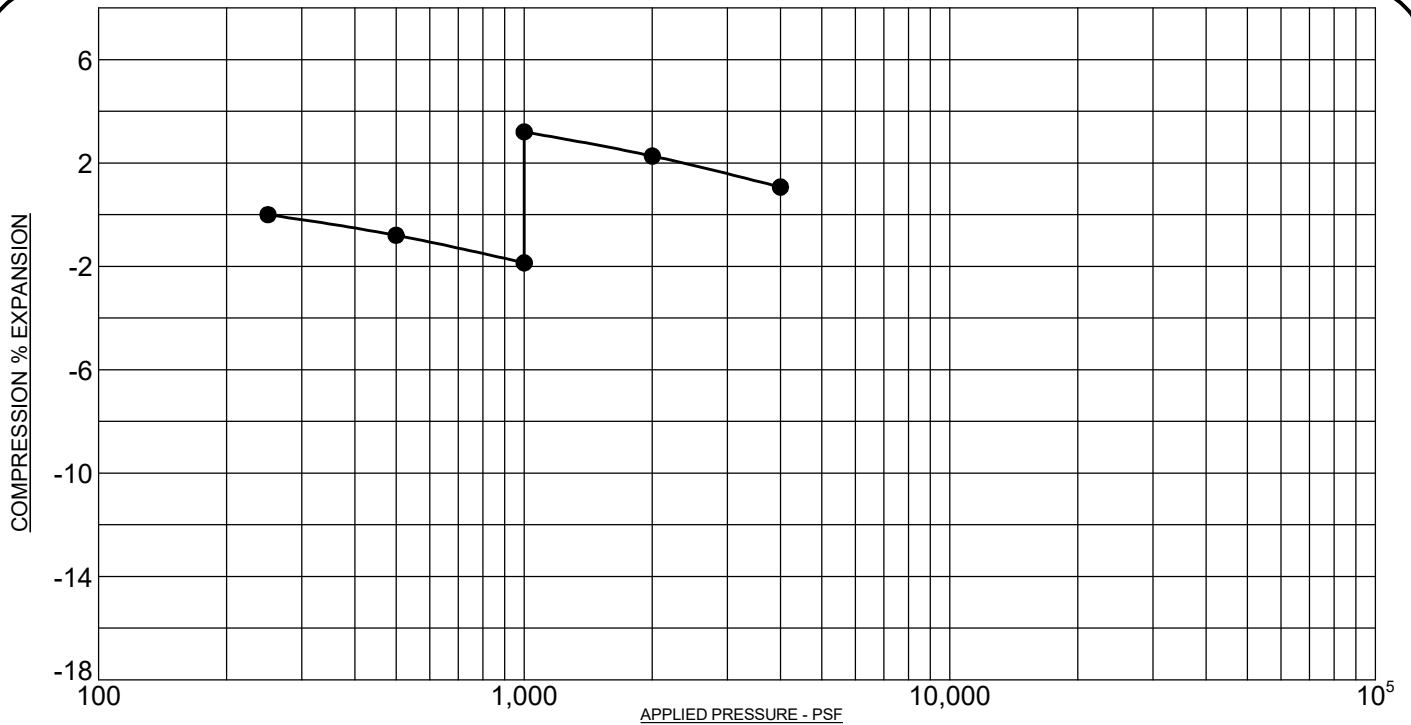
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

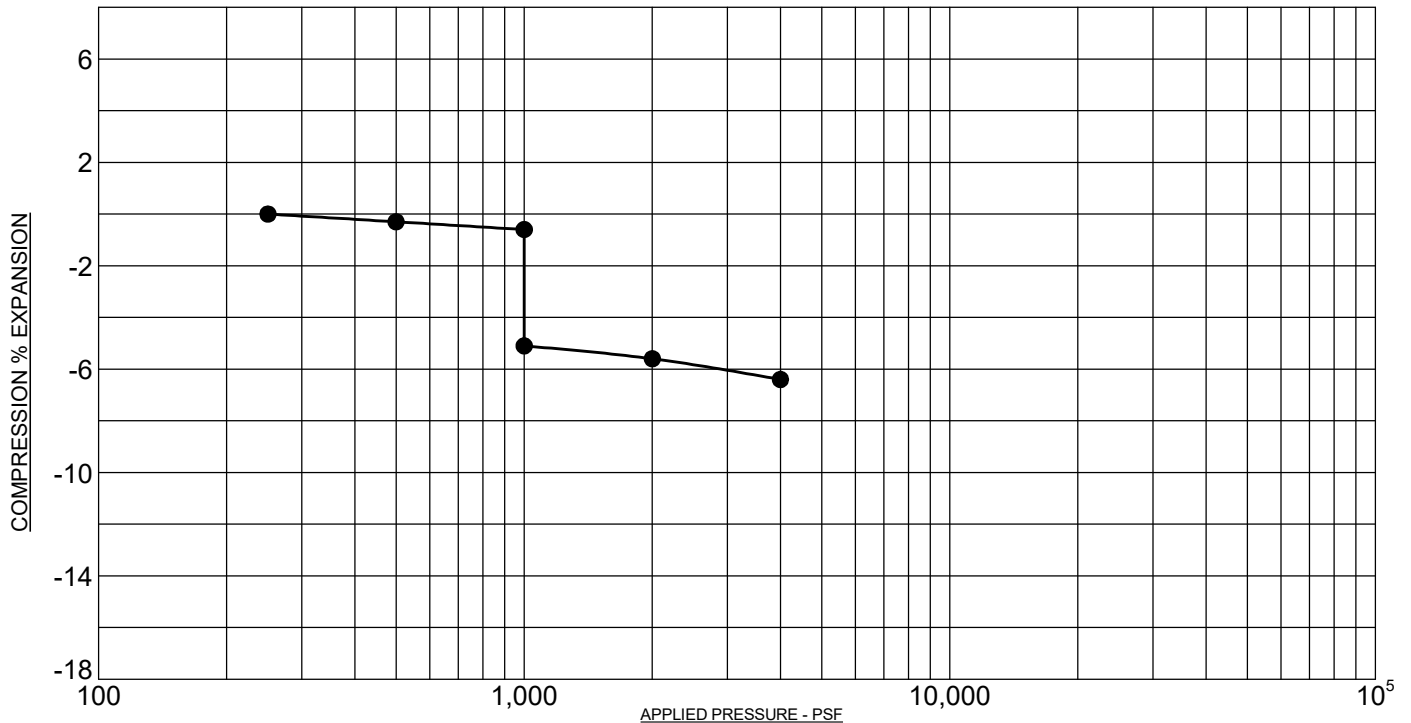
FIGURE No. 84

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-9 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **12.8%**
 PERCENT SWELL/COMPRESSION: **5.1**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-10 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **120.2 PCF**
 NATURAL MOISTURE CONTENT: **16.0%**
 PERCENT SWELL/COMPRESSION: **- 4.5**

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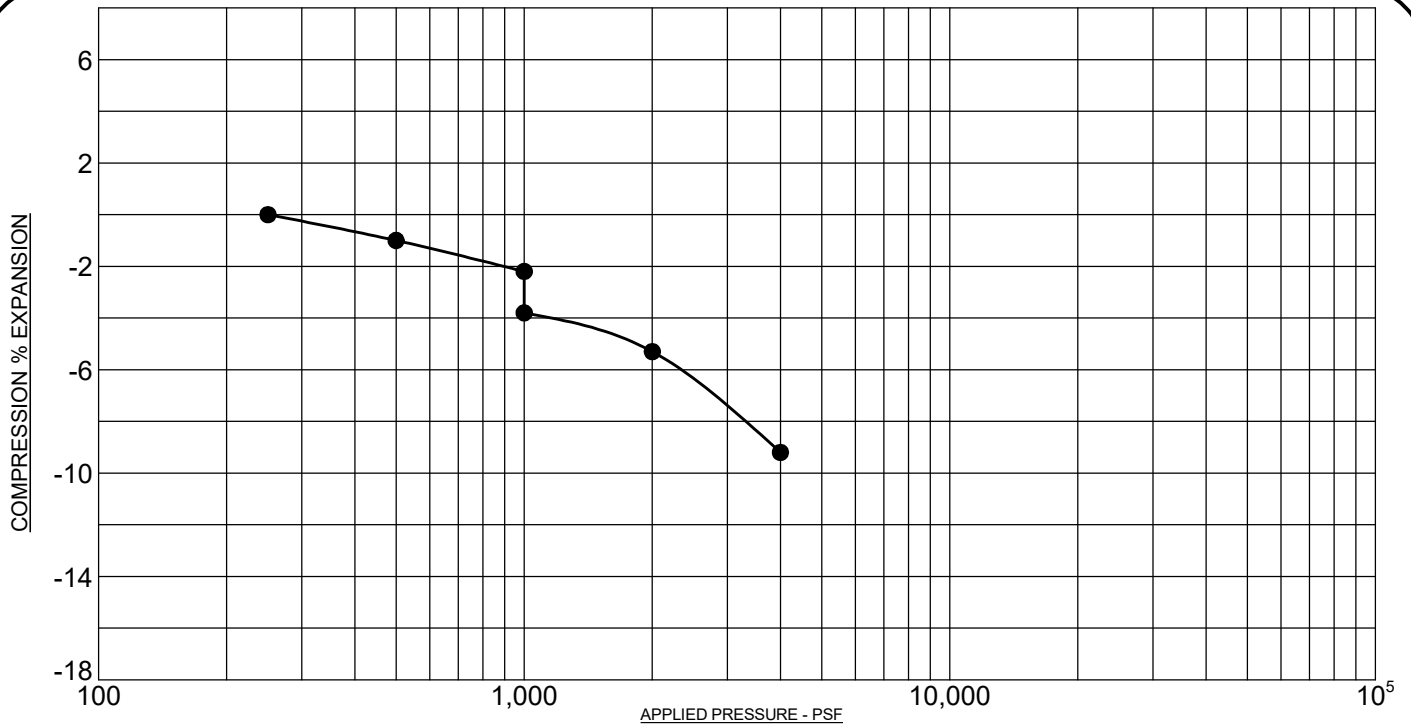
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

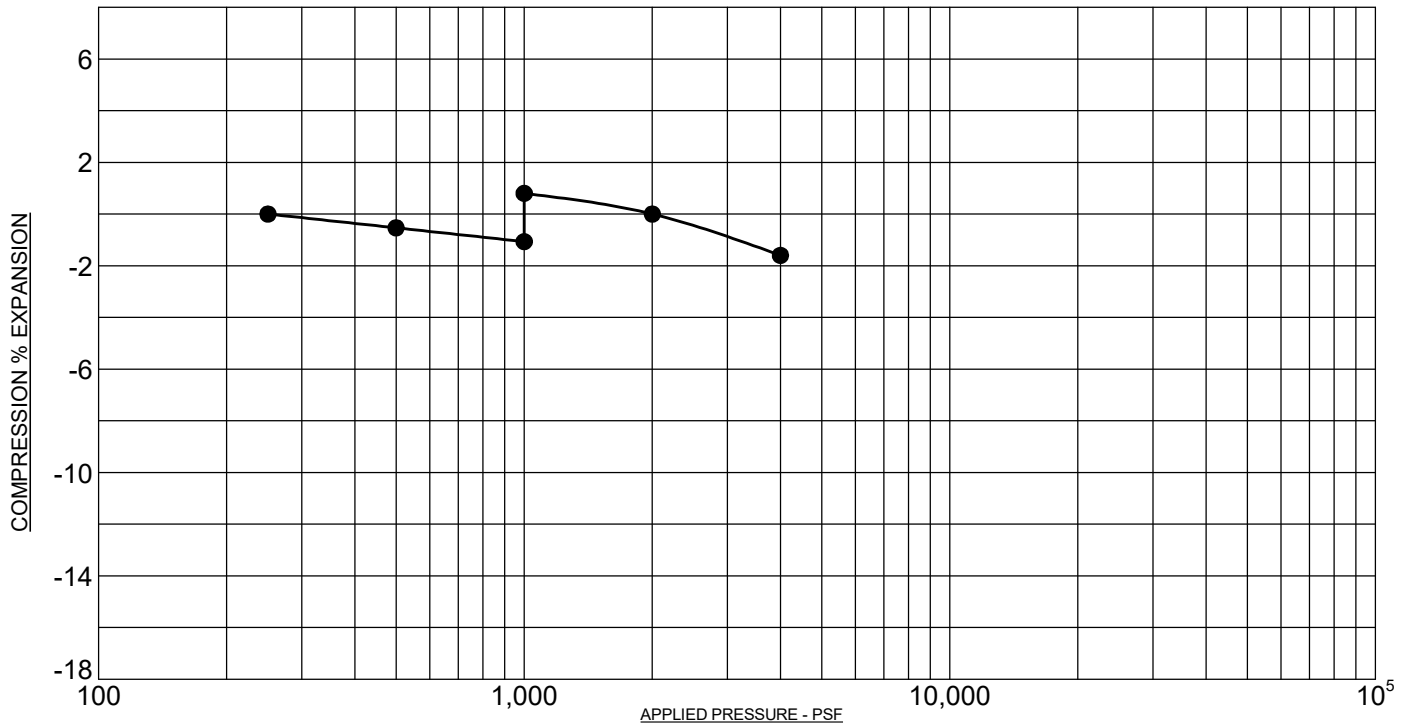
FIGURE No. 85

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-11 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **98.3 PCF**
 NATURAL MOISTURE CONTENT: **11.2%**
 PERCENT SWELL/COMPRESSION: **- 1.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-12 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **9.6%**
 PERCENT SWELL/COMPRESSION: **1.9**

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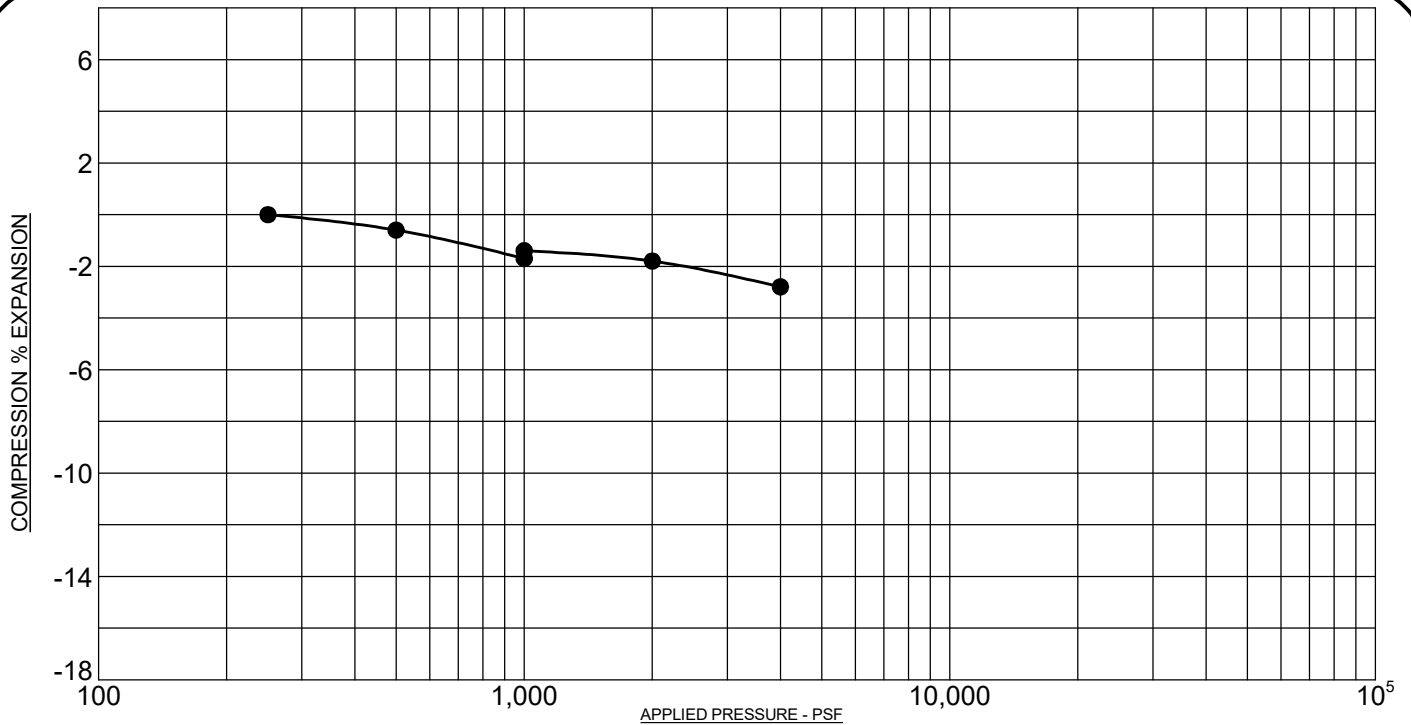
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

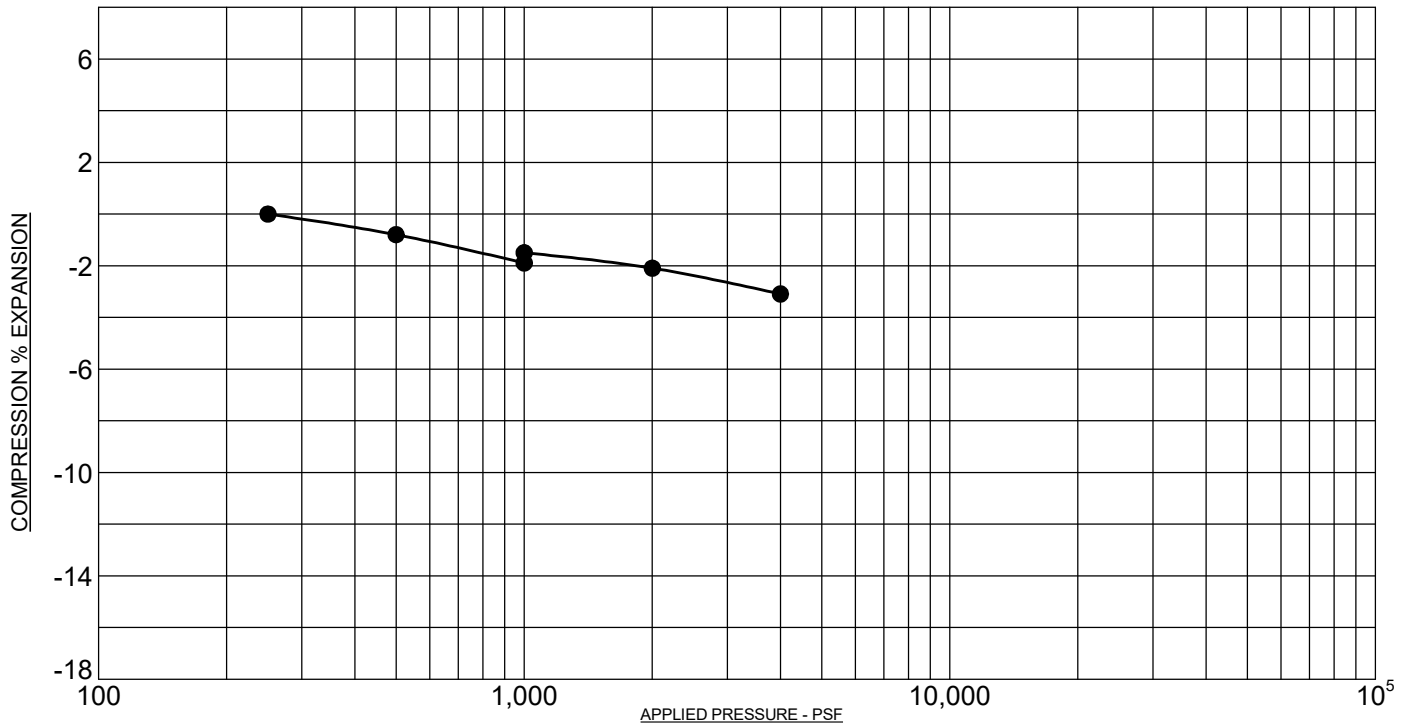
FIGURE No. 86

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-13 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **120.3 PCF**
 NATURAL MOISTURE CONTENT: **10.5%**
 PERCENT SWELL/COMPRESSION: **0.3**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-14 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **125.0 PCF**
 NATURAL MOISTURE CONTENT: **8.8%**
 PERCENT SWELL/COMPRESSION: **0.4**

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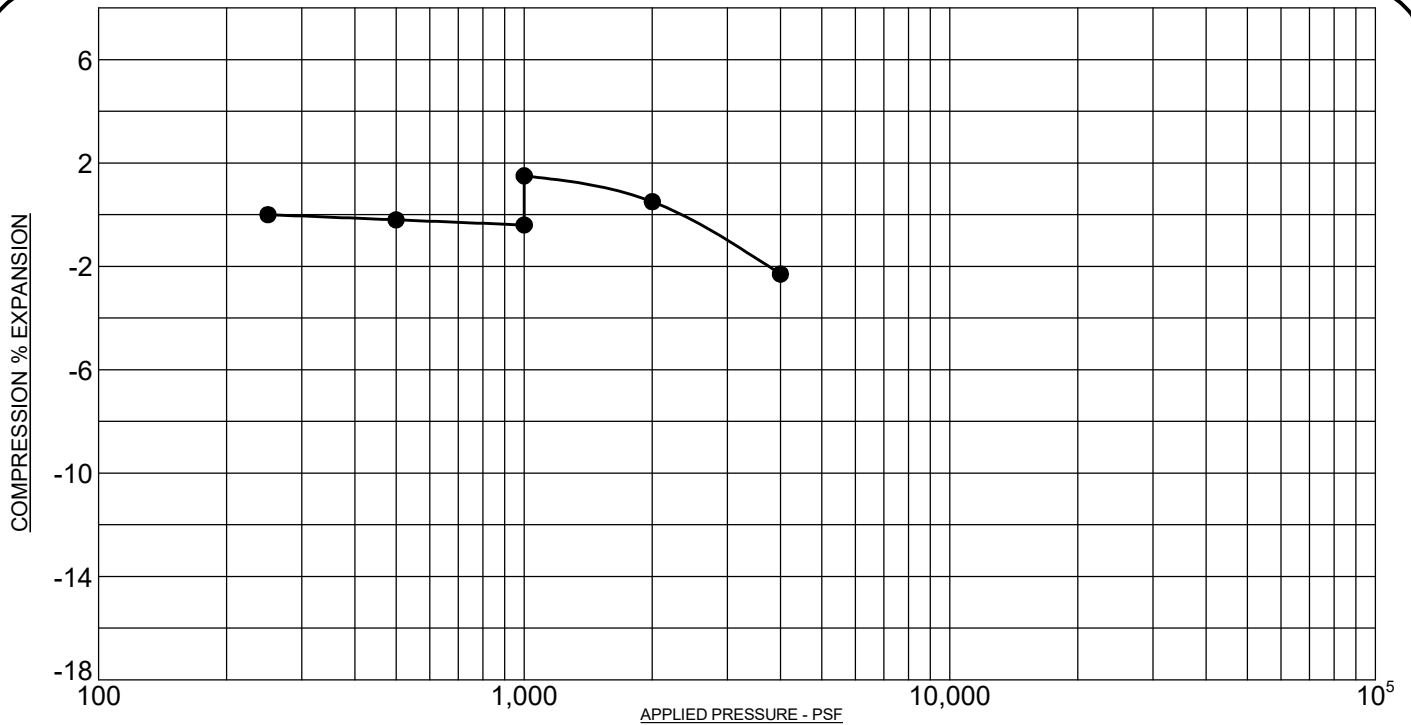
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

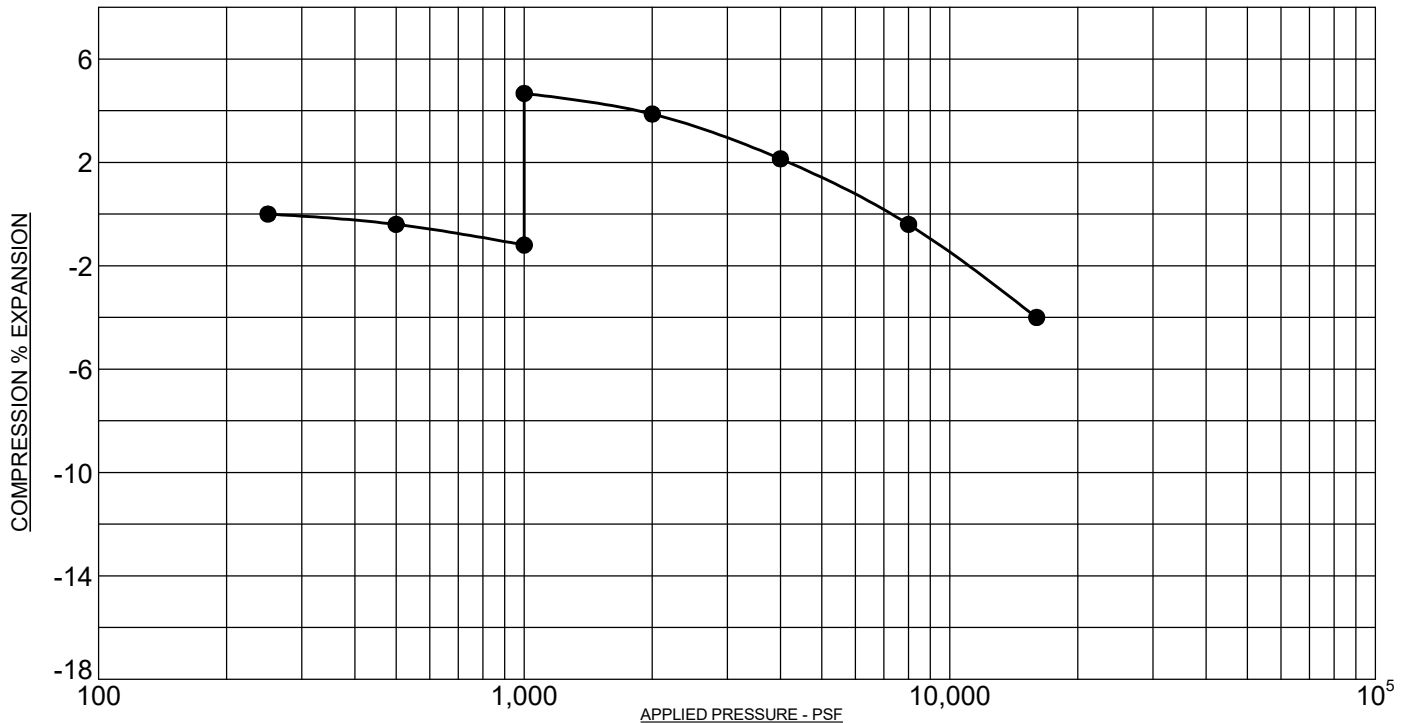
FIGURE No. 87

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-15 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **107.3 PCF**
 NATURAL MOISTURE CONTENT: **7.4%**
 PERCENT SWELL/COMPRESSION: **1.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-17 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **137.0 PCF**
 NATURAL MOISTURE CONTENT: **11.5%**
 PERCENT SWELL/COMPRESSION: **5.9**

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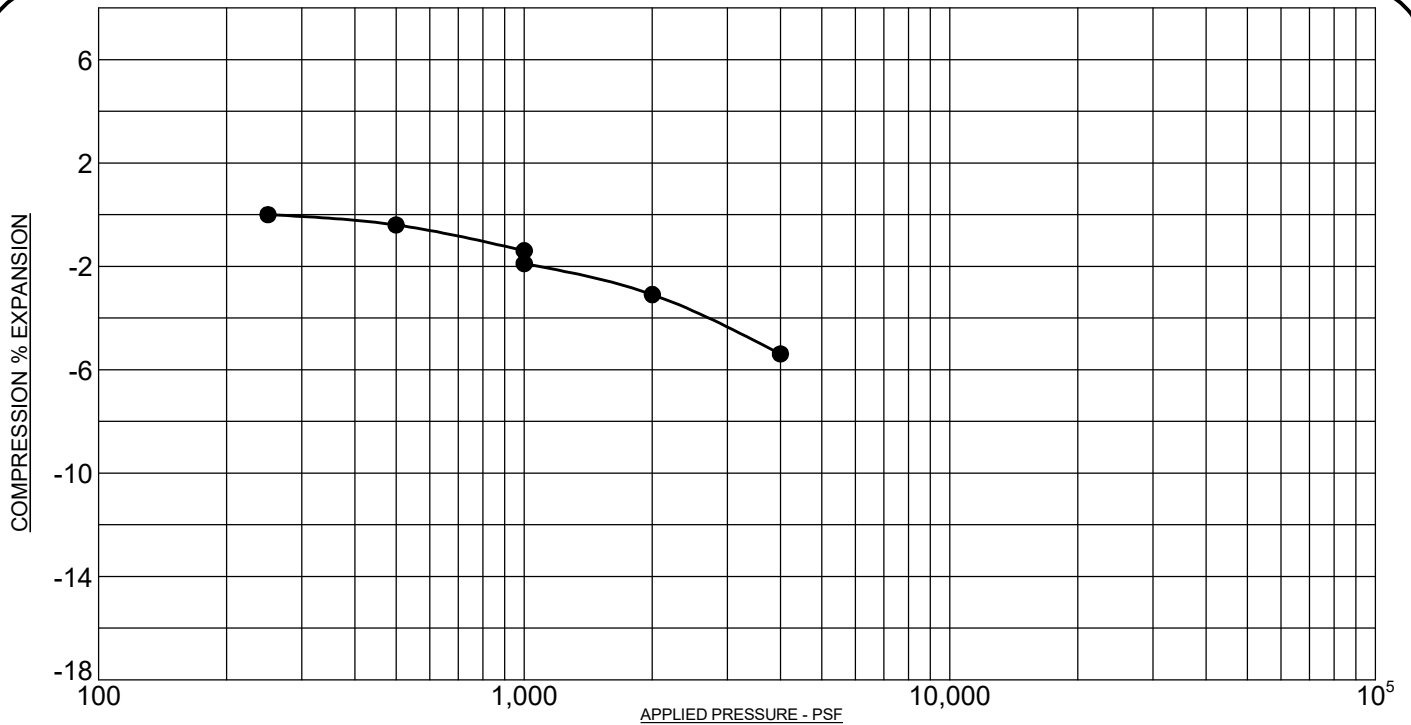
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

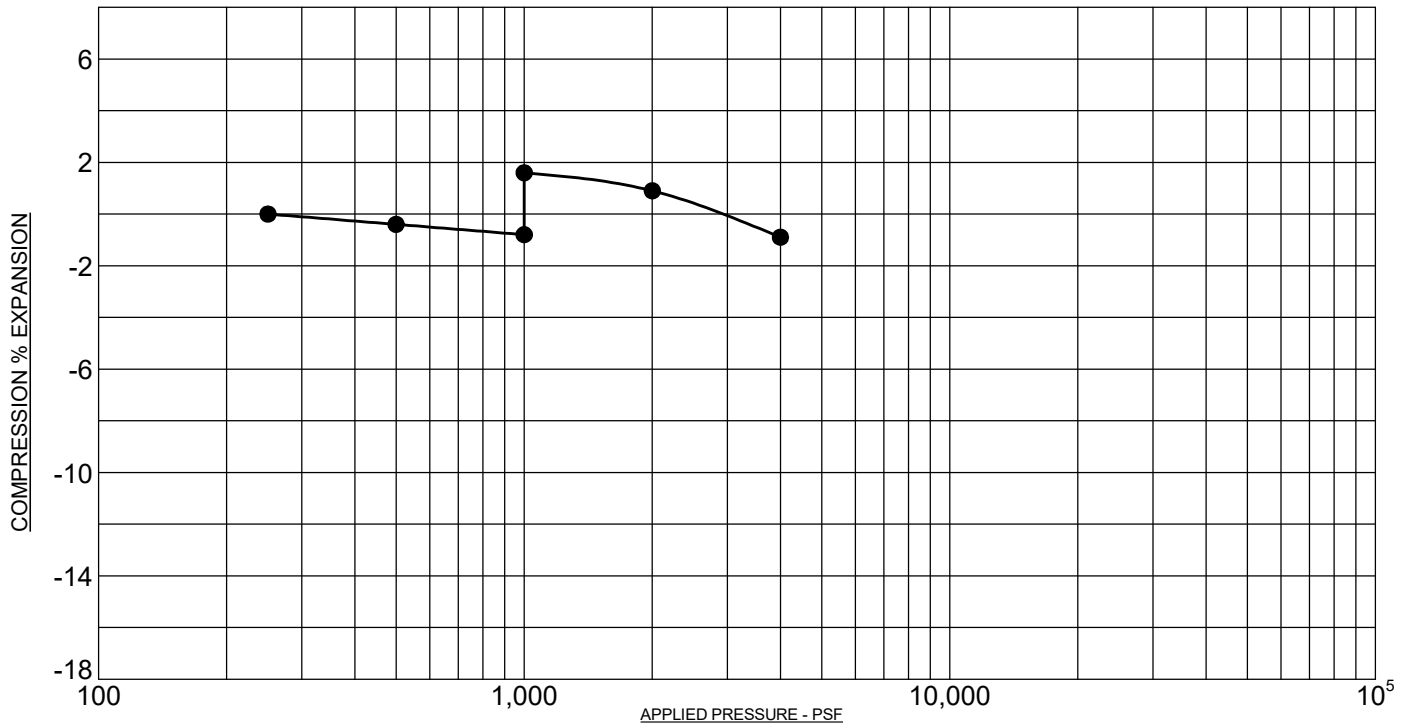
FIGURE No. 88

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-19 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **99.8 PCF**
 NATURAL MOISTURE CONTENT: **14.6%**
 PERCENT SWELL/COMPRESSION: **- 0.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-20 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **115.6 PCF**
 NATURAL MOISTURE CONTENT: **11.3%**
 PERCENT SWELL/COMPRESSION: **2.4**

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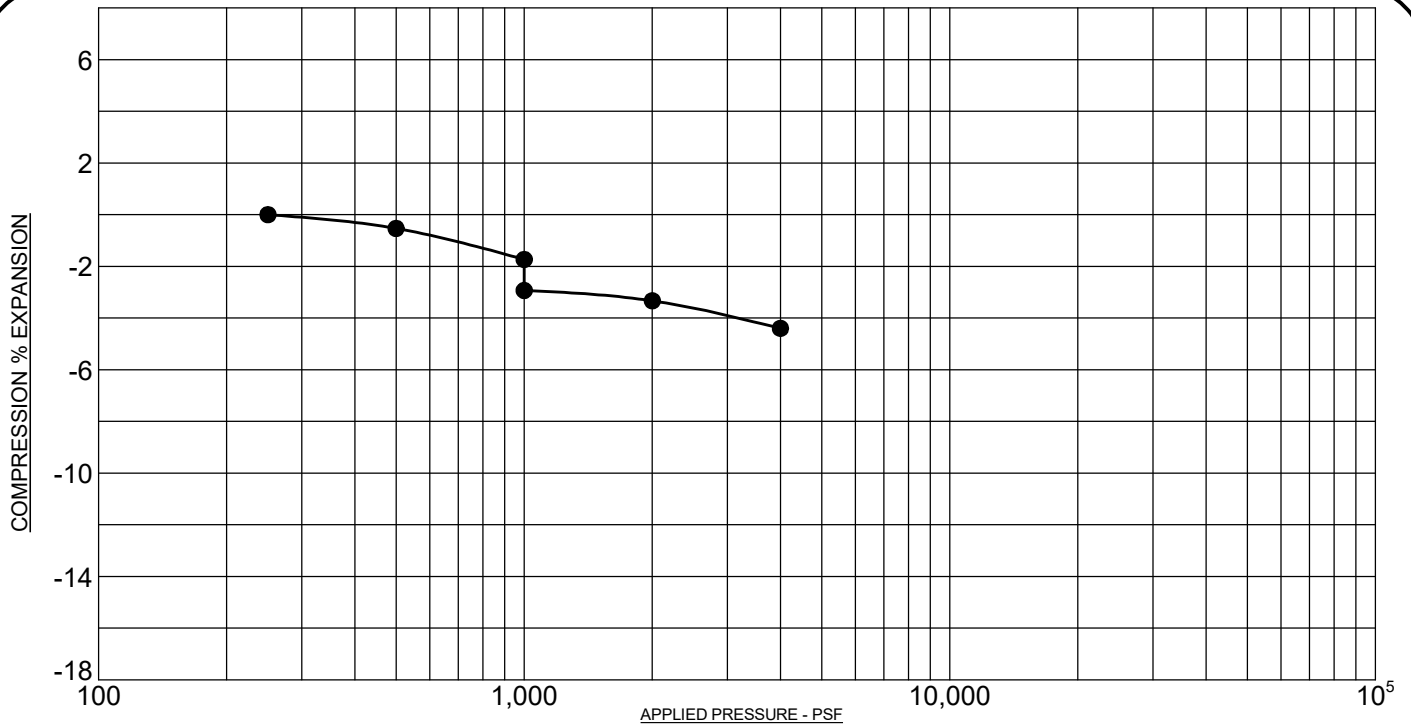
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

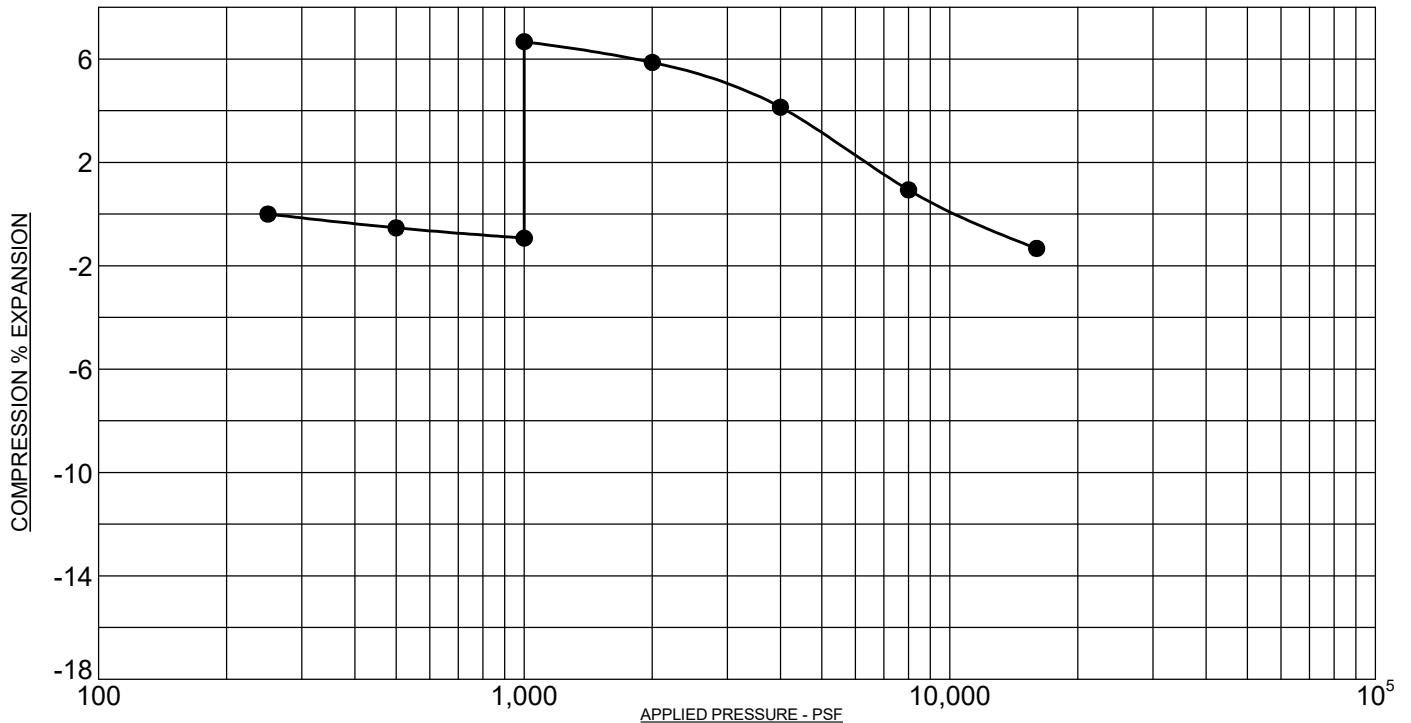
FIGURE No. 89

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-22 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **123.6 PCF**
 NATURAL MOISTURE CONTENT: **12.2%**
 PERCENT SWELL/COMPRESSION: **- 1.2**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-23 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **116.3 PCF**
 NATURAL MOISTURE CONTENT: **10.6%**
 PERCENT SWELL/COMPRESSION: **7.6**

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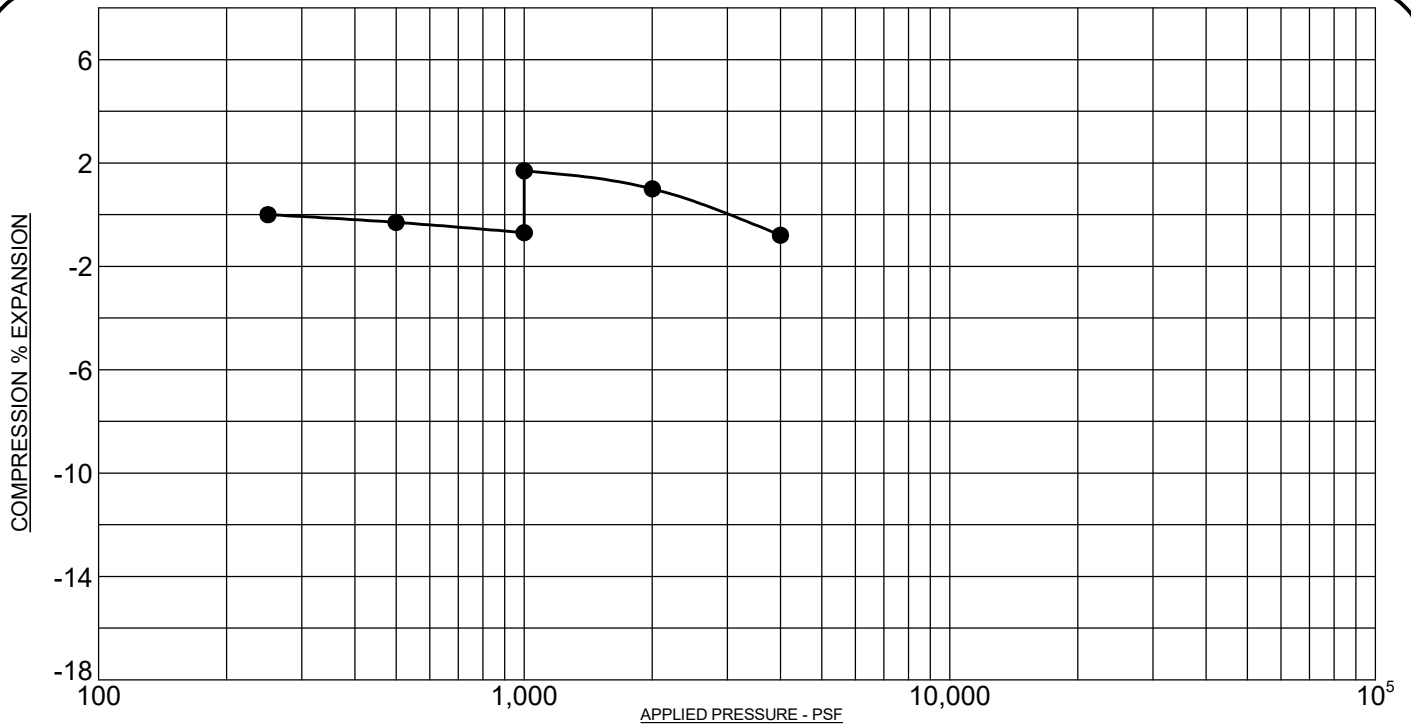
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Civil, Planning

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JOB No. 175706

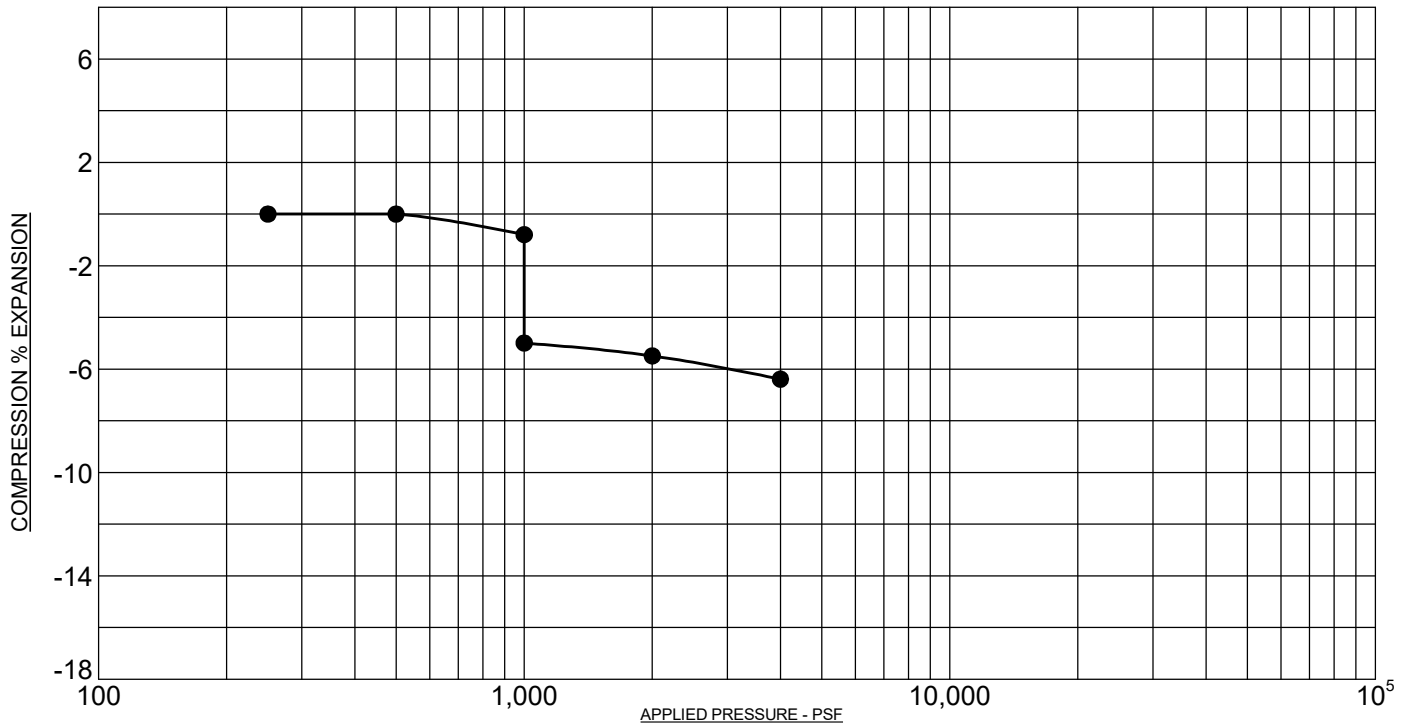
FIGURE No. 90

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-24 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **14.4%**
 PERCENT SWELL/COMPRESSION: **2.4**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT PSF**

SAMPLE LOCATION: **D-25 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **124.1 PCF**
 NATURAL MOISTURE CONTENT: **10.8%**
 PERCENT SWELL/COMPRESSION: **- 4.2**

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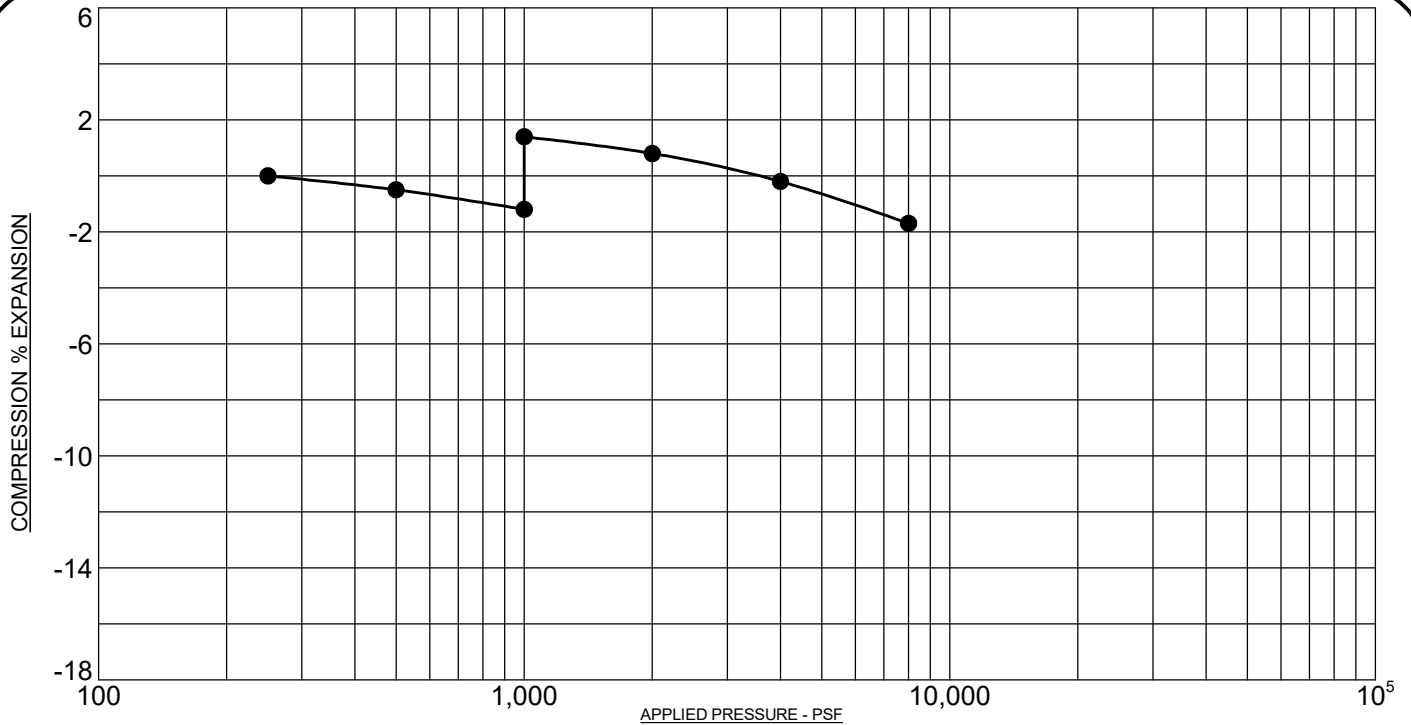
Geotechnical
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

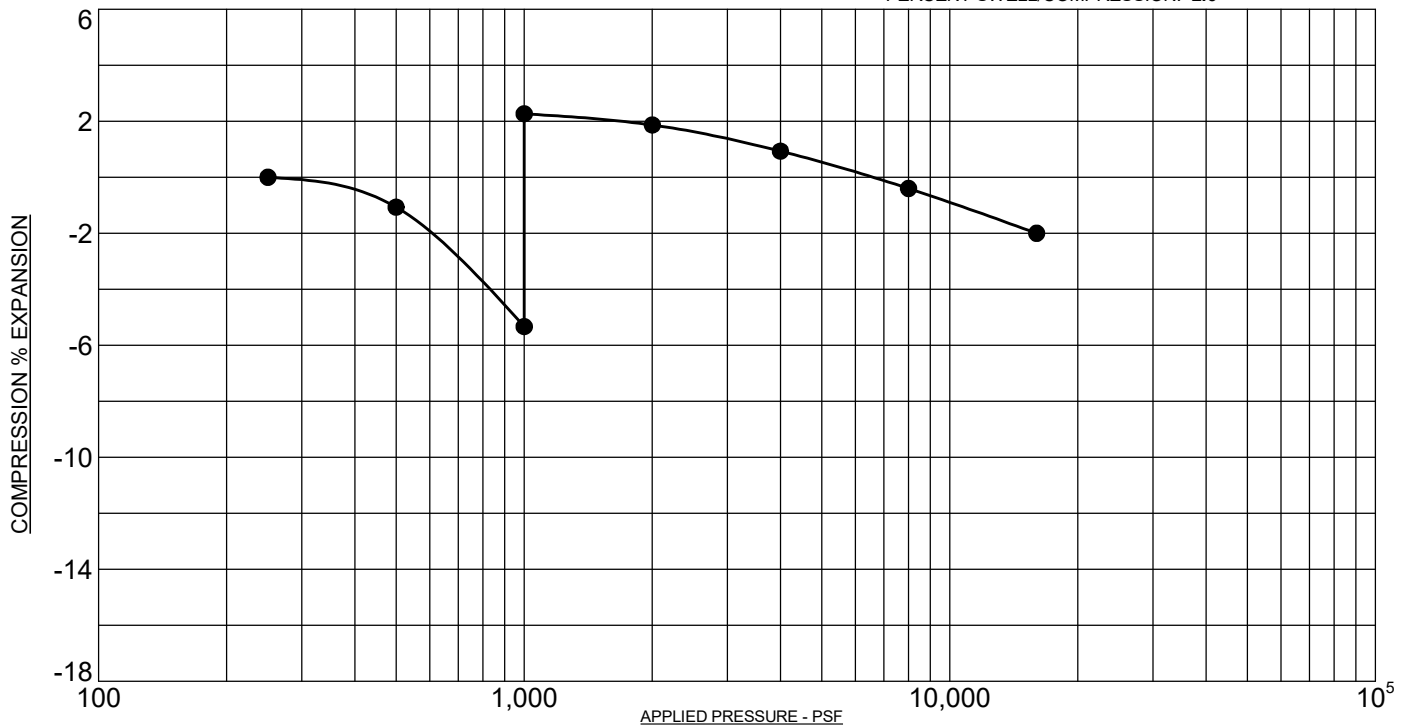
FIGURE No. 91

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-27 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **120.3 PCF**
 NATURAL MOISTURE CONTENT: **13.8%**
 PERCENT SWELL/COMPRESSION: **2.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-28 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **121.2 PCF**
 NATURAL MOISTURE CONTENT: **14.1%**
 PERCENT SWELL/COMPRESSION: **7.6**

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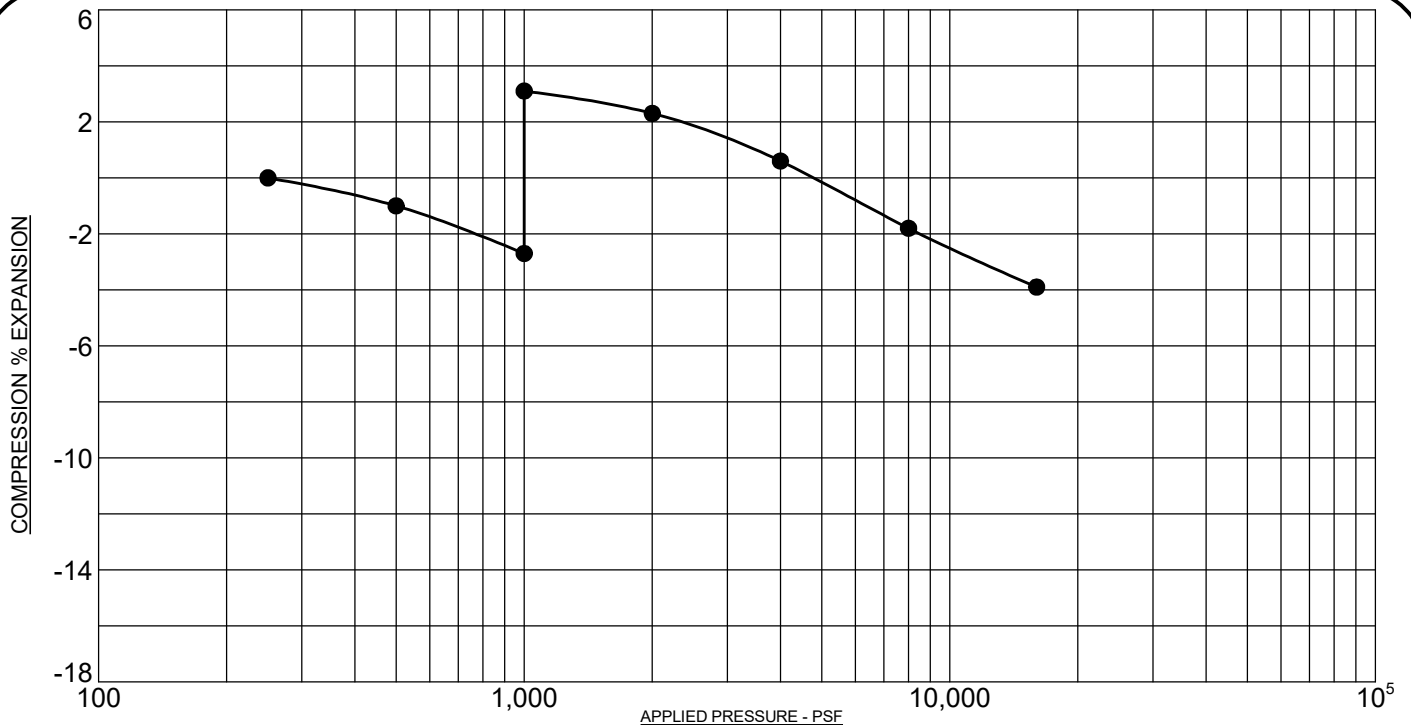
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

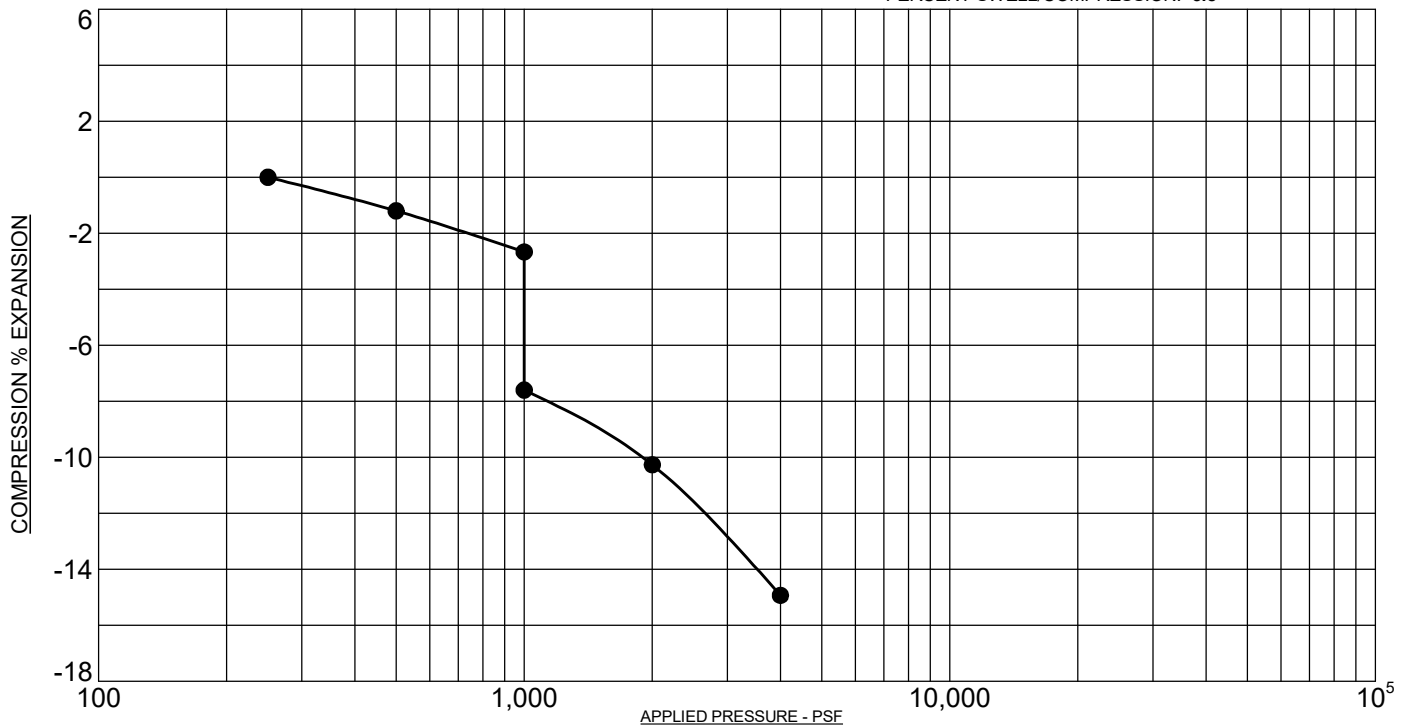
FIGURE No. 92

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-29 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **116.6 PCF**
 NATURAL MOISTURE CONTENT: **11.1%**
 PERCENT SWELL/COMPRESSION: **5.8**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-30 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **97.8 PCF**
 NATURAL MOISTURE CONTENT: **9.0%**
 PERCENT SWELL/COMPRESSION: **- 4.9**

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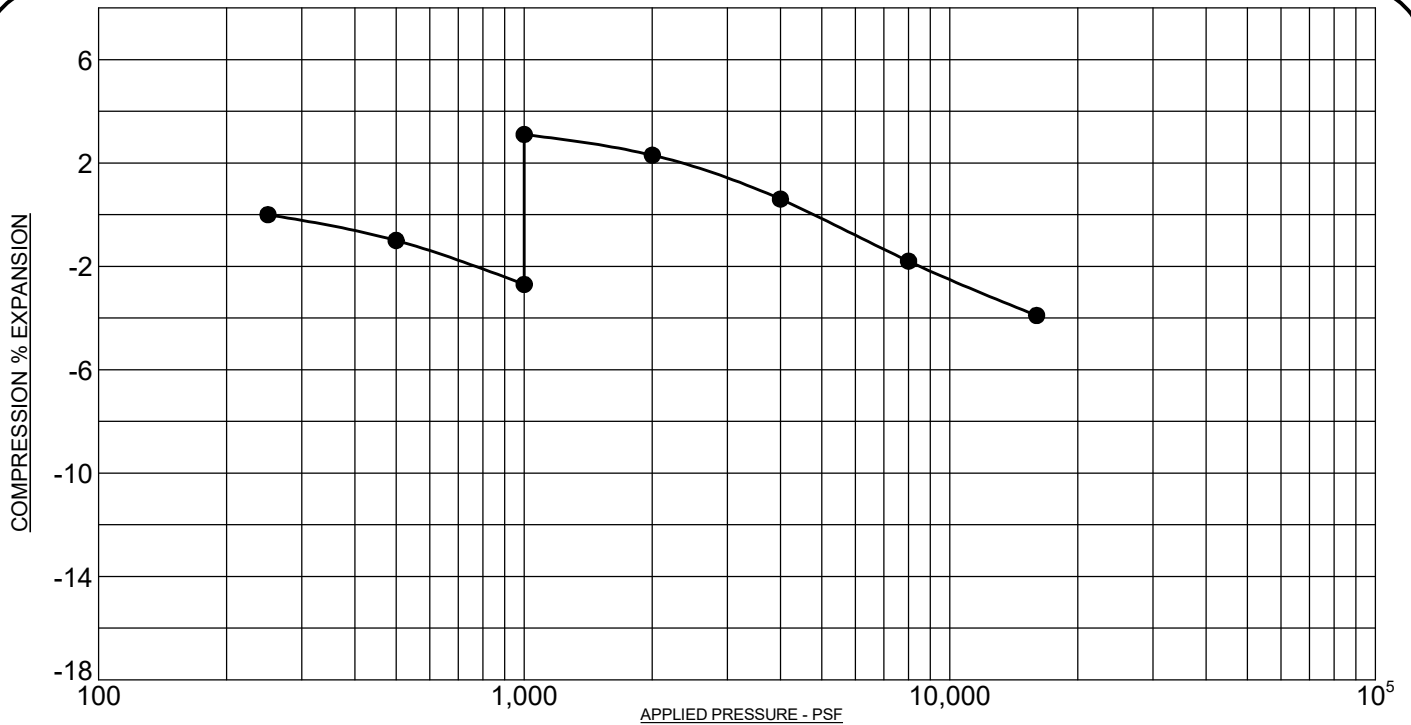
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

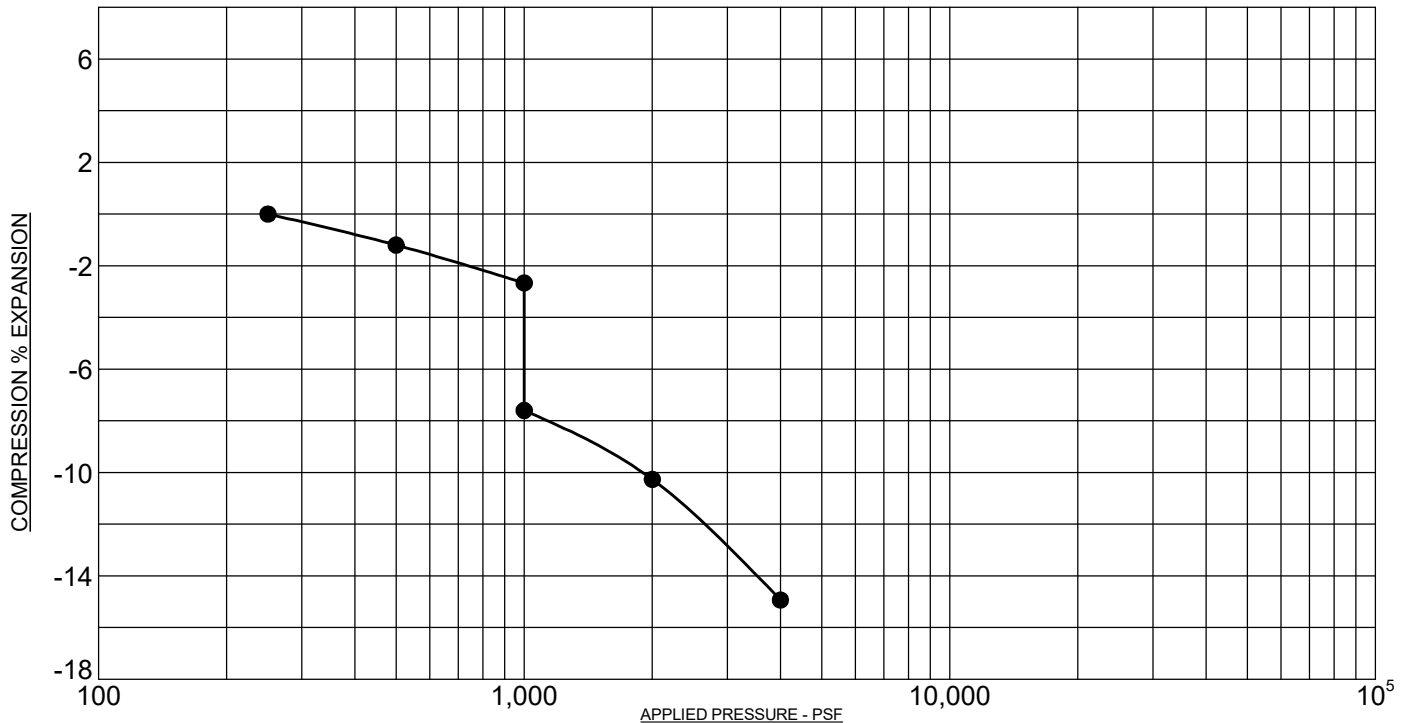
FIGURE No. 93

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-29 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **116.6 PCF**
 NATURAL MOISTURE CONTENT: **11.1%**
 PERCENT SWELL/COMPRESSION: **5.8**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-30 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **97.8 PCF**
 NATURAL MOISTURE CONTENT: **9.0%**
 PERCENT SWELL/COMPRESSION: **- 4.9**

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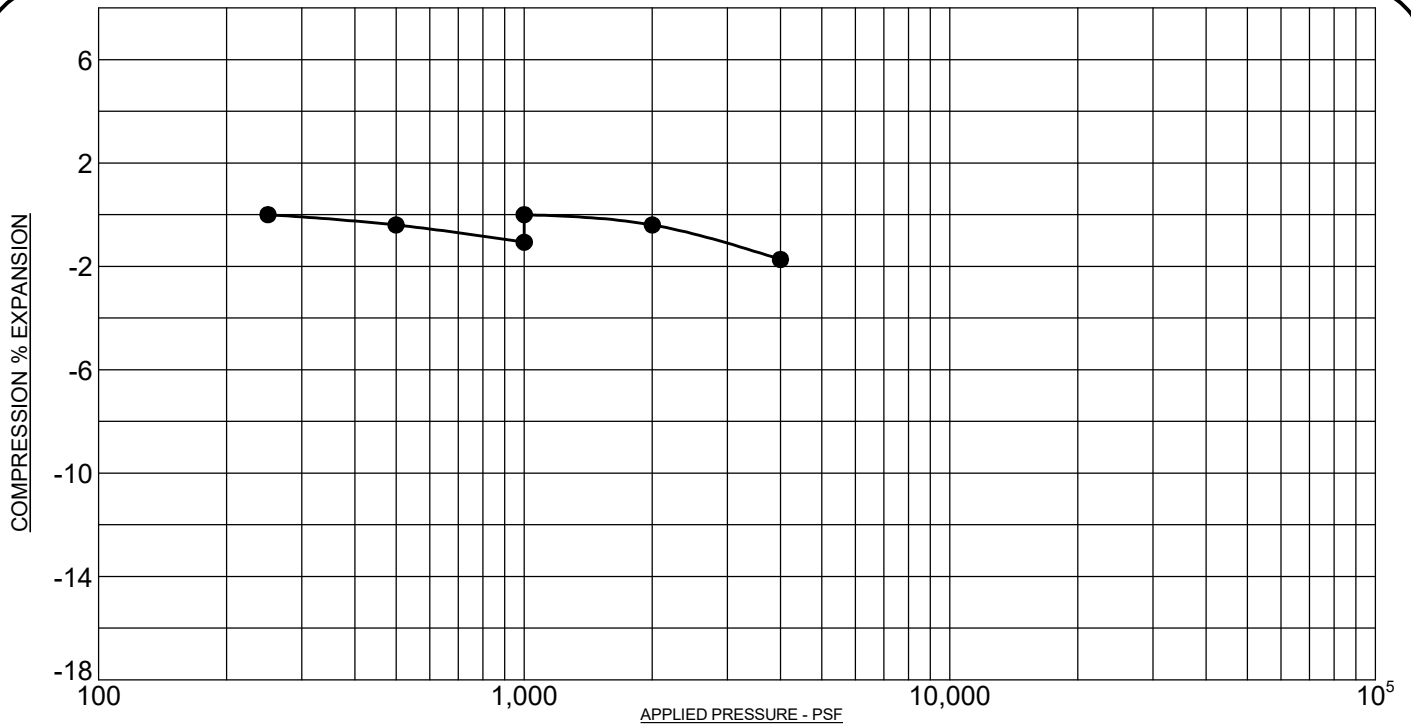
Geotechnical
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

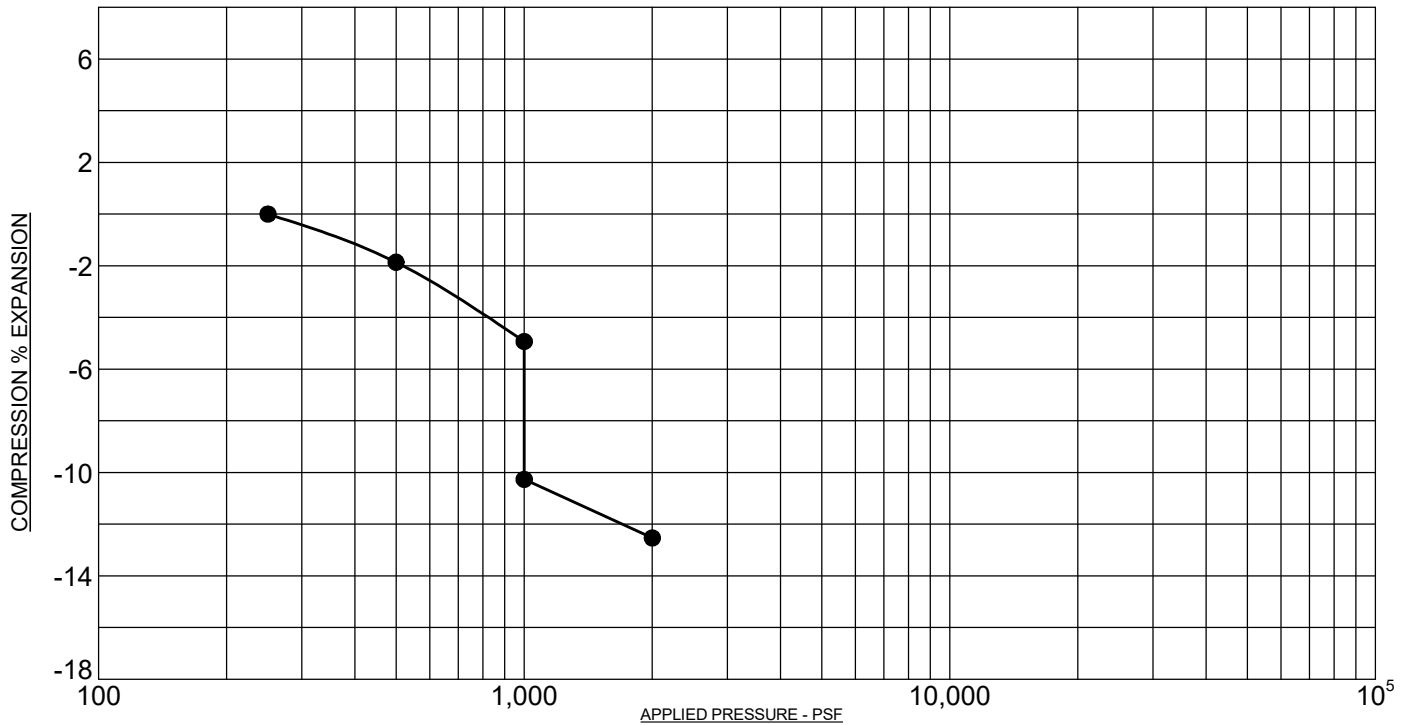
FIGURE No. 93

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-31 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **120.9 PCF**
 NATURAL MOISTURE CONTENT: **11.3%**
 PERCENT SWELL/COMPRESSION: **1.1**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-32 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **105.6 PCF**
 NATURAL MOISTURE CONTENT: **12.1%**
 PERCENT SWELL/COMPRESSION: **- 5.3**

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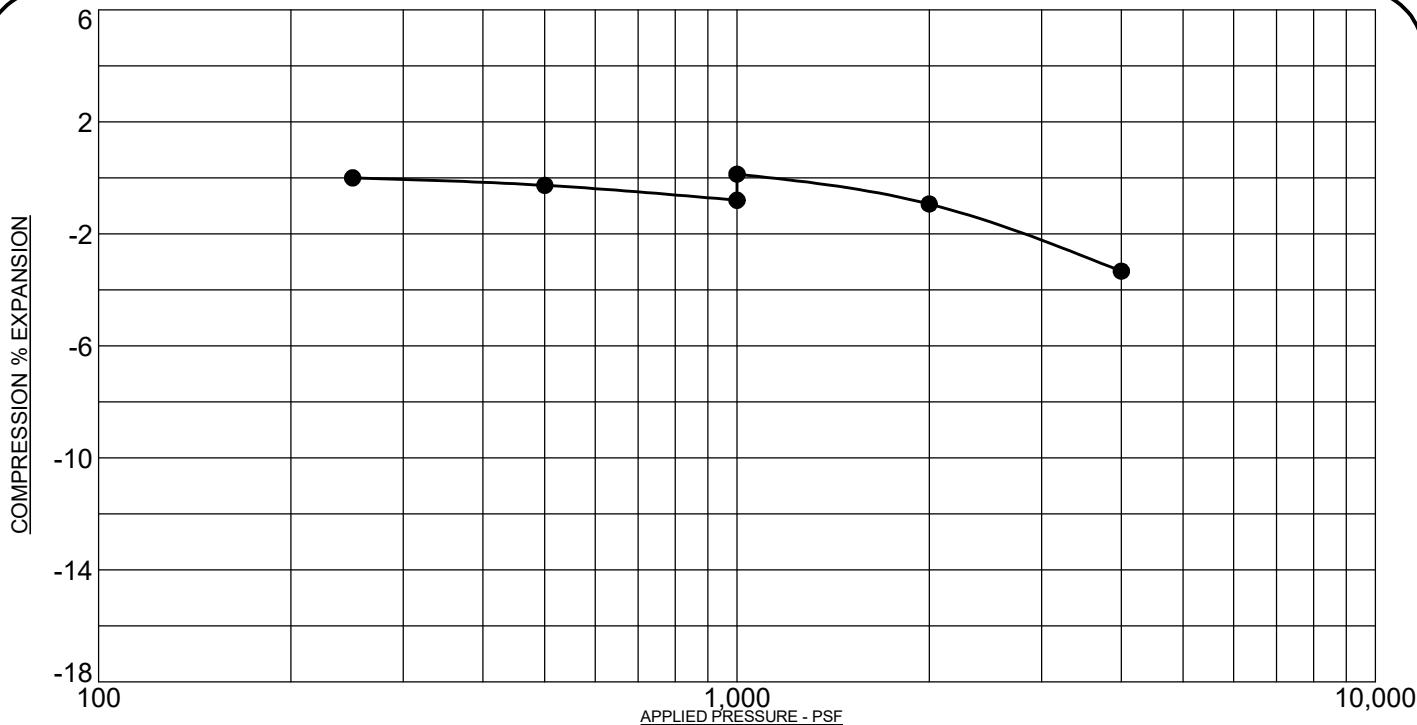
Geotechnical
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

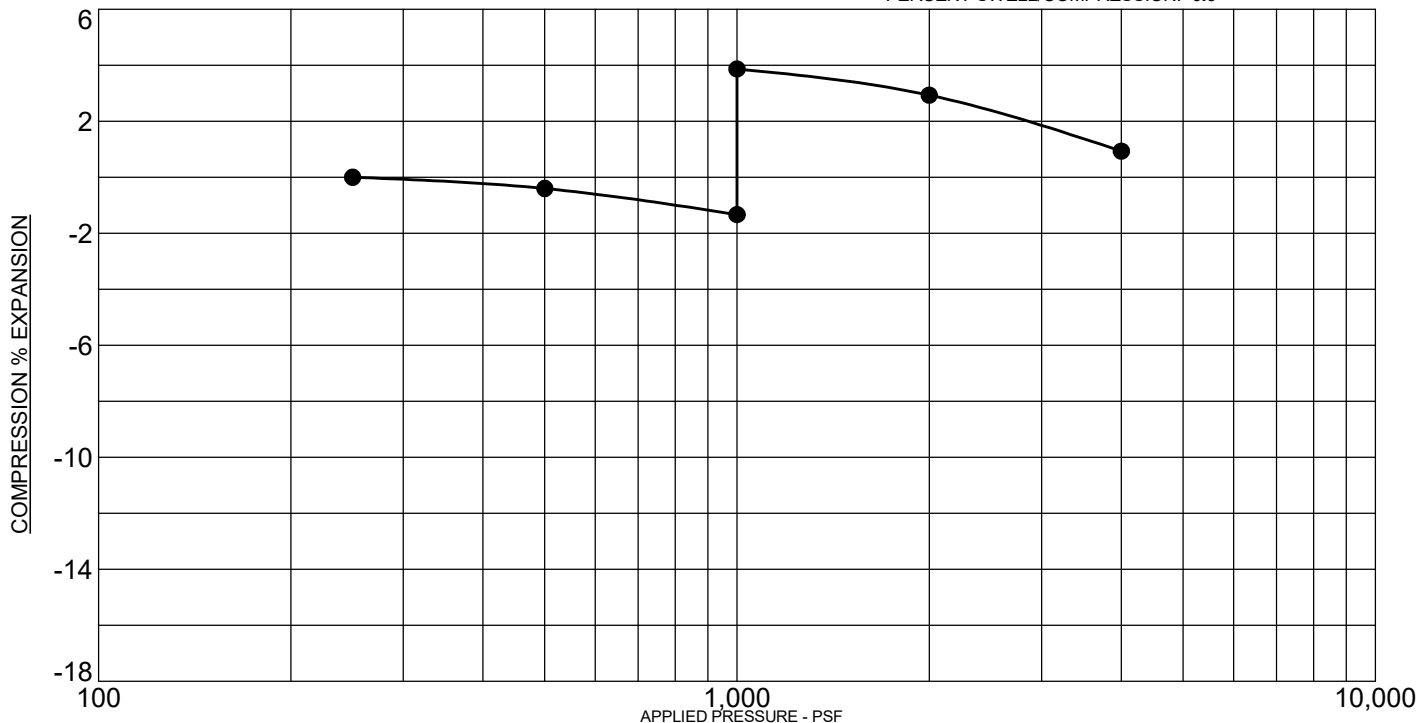
FIGURE No. 94

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-33 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **118.4 PCF**
 NATURAL MOISTURE CONTENT: **10.1%**
 PERCENT SWELL/COMPRESSION: **0.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-34 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **112.5 PCF**
 NATURAL MOISTURE CONTENT: **13.2%**
 PERCENT SWELL/COMPRESSION: **5.2**

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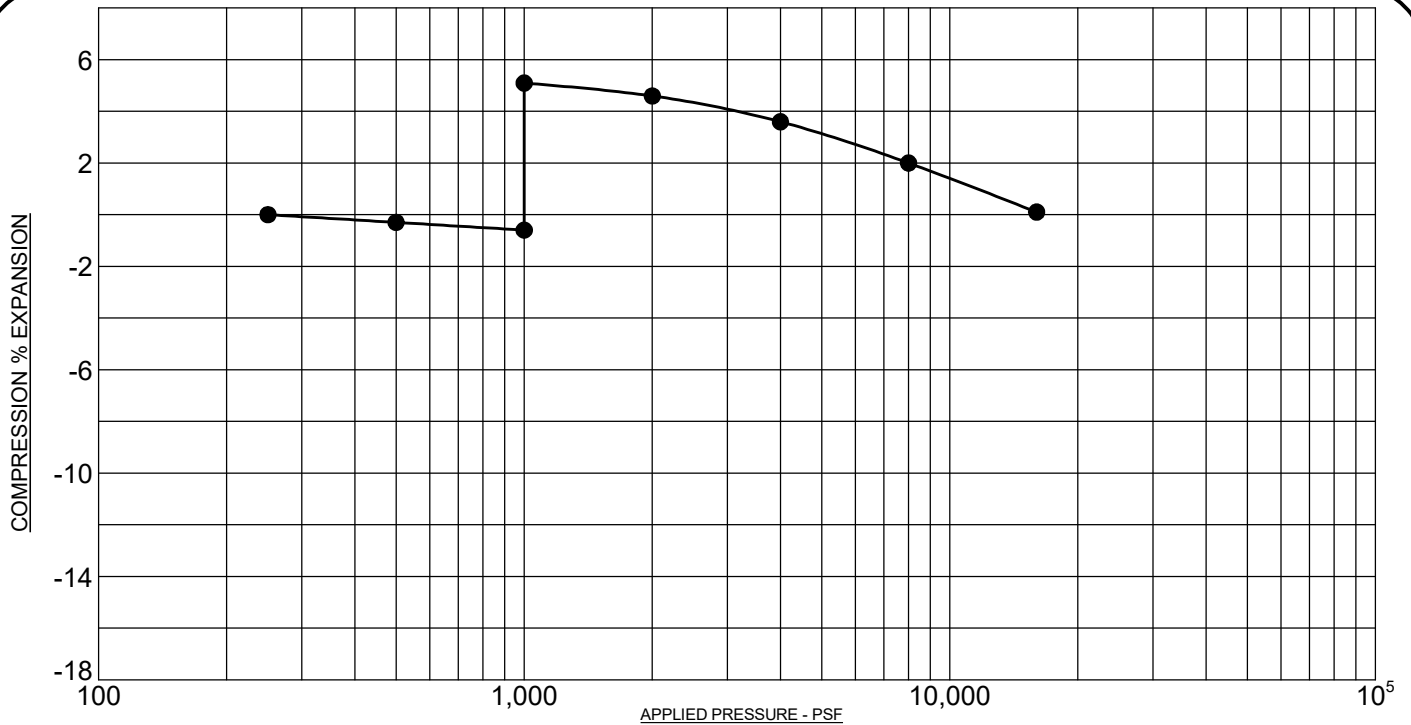
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

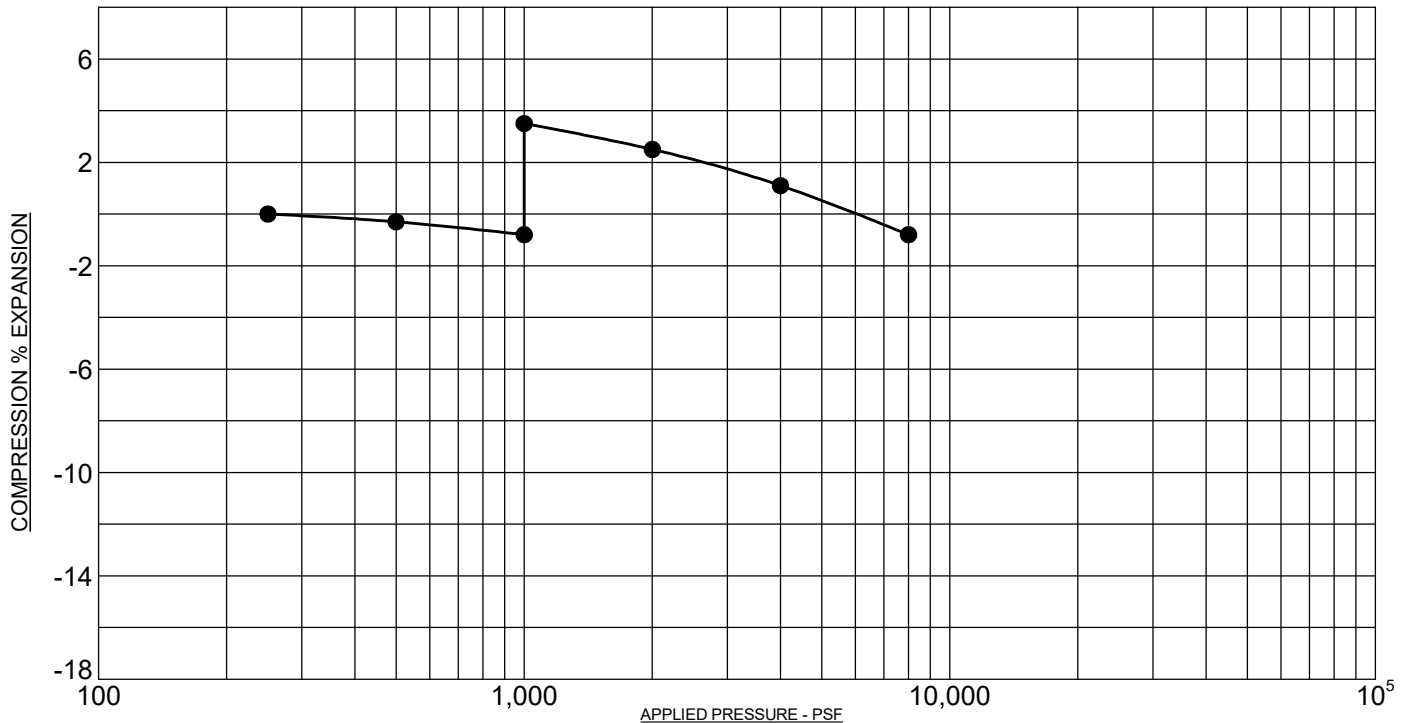
FIGURE No. 95

DATE Mar/23/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-35 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **15.9%**
 PERCENT SWELL/COMPRESSION: **5.7**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-36 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **107.5 PCF**
 NATURAL MOISTURE CONTENT: **21.2%**
 PERCENT SWELL/COMPRESSION: **4.3**

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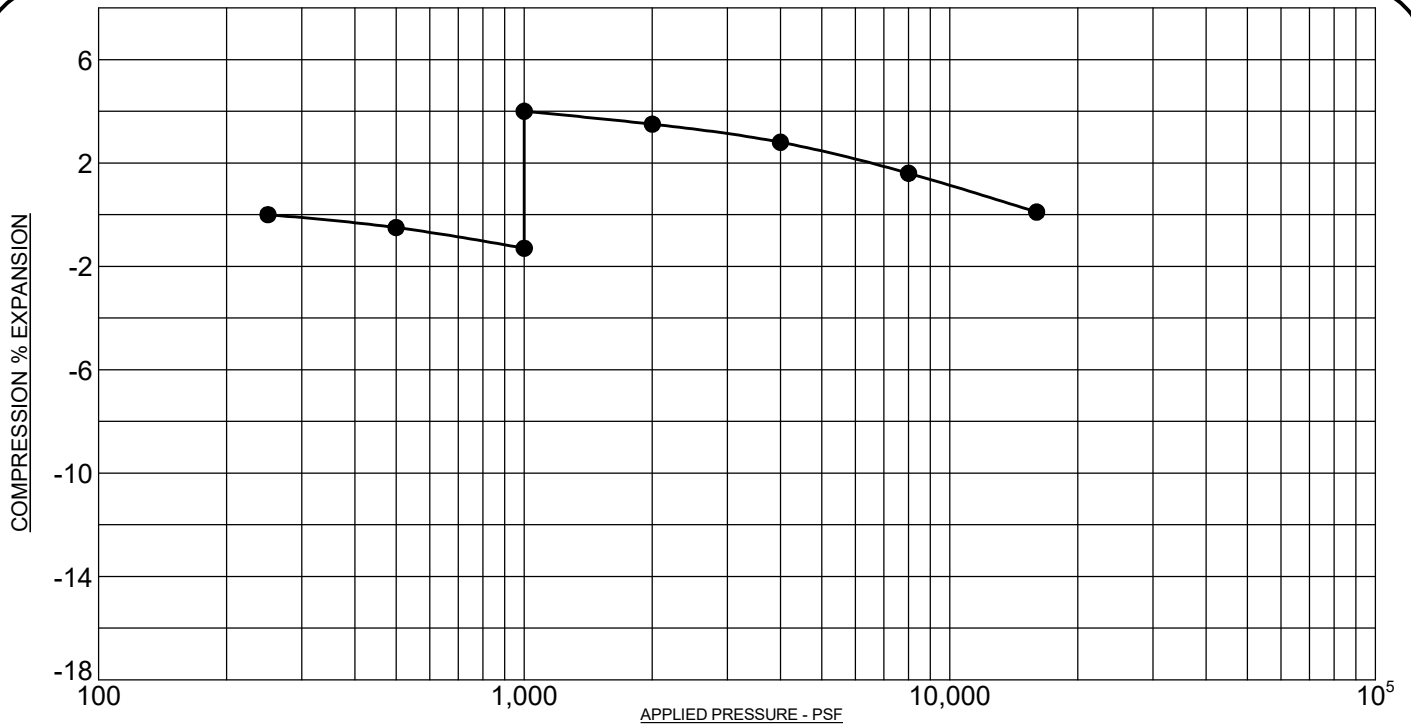
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

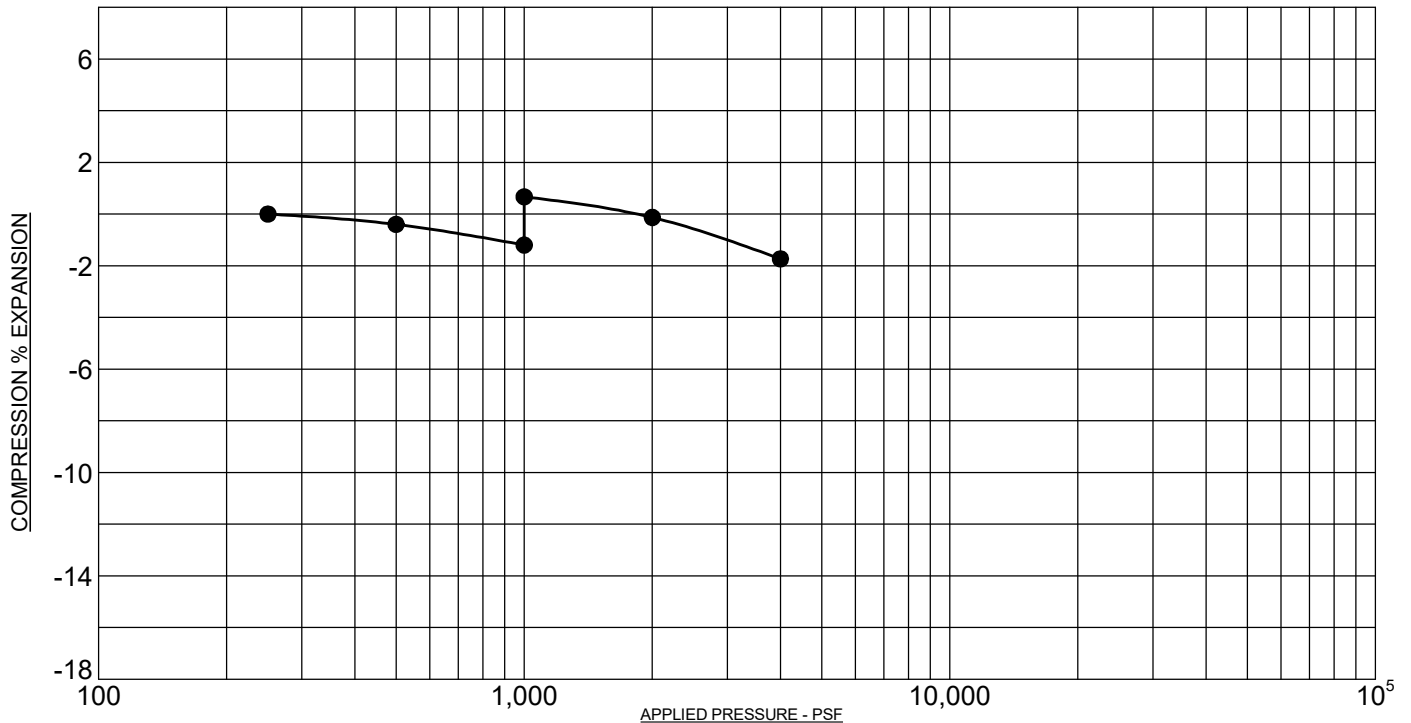
FIGURE No. 96

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-37 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **122.3 PCF**
 NATURAL MOISTURE CONTENT: **13.6%**
 PERCENT SWELL/COMPRESSION: **5.3**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-38 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **15.2%**
 PERCENT SWELL/COMPRESSION: **1.9**

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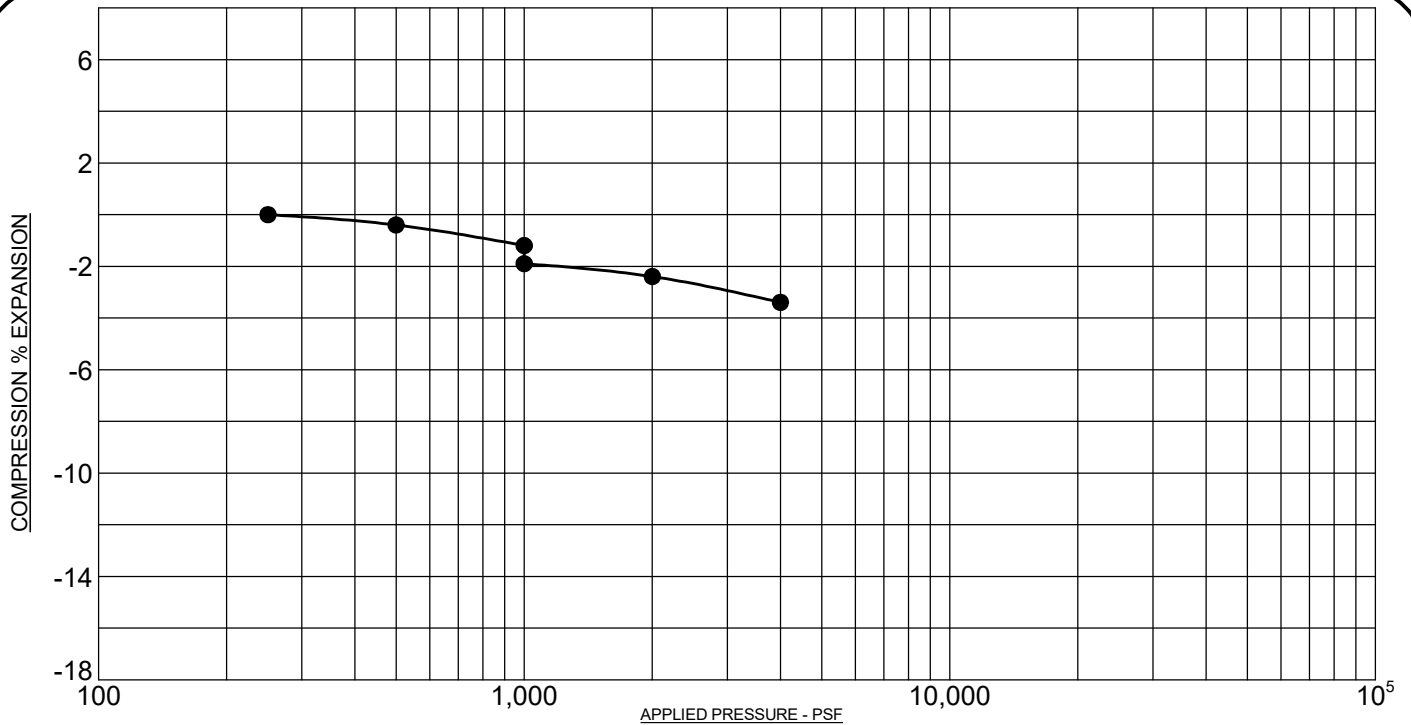
Geotechnical
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JOB No. 175706

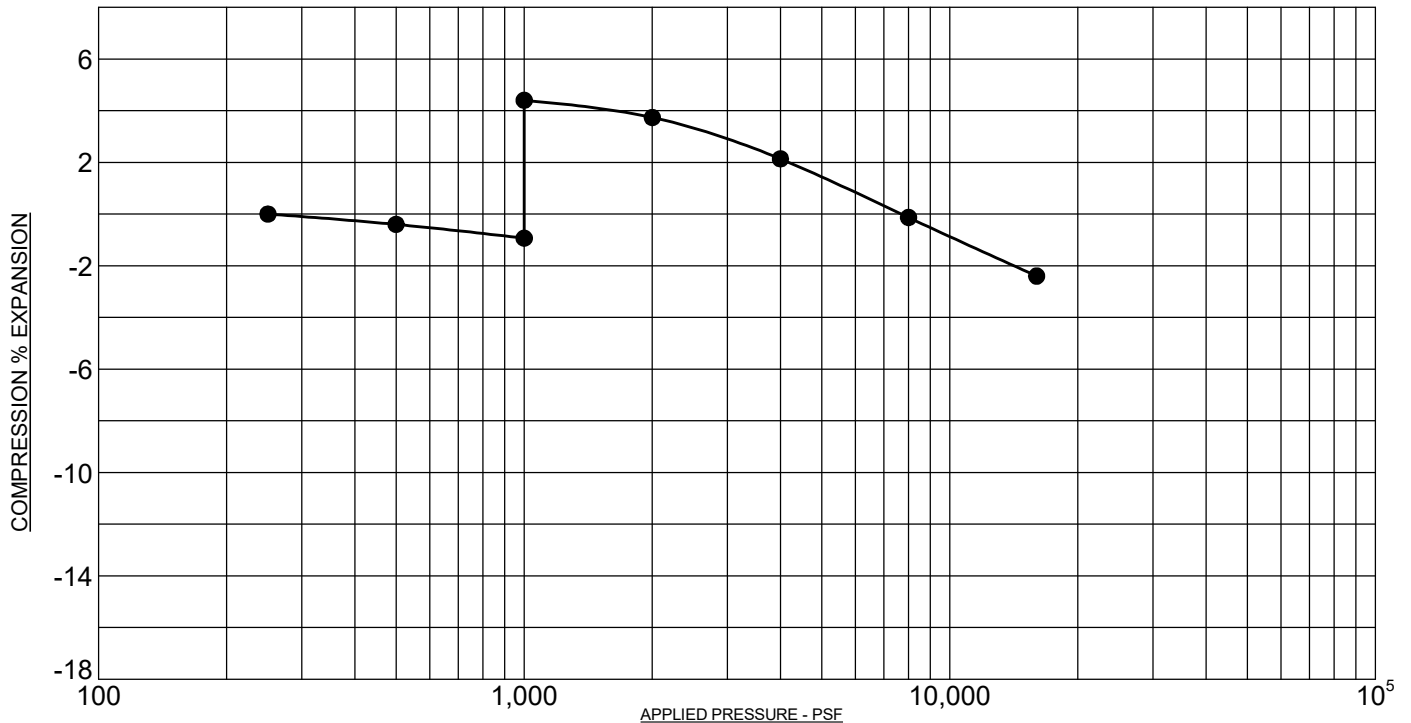
FIGURE No. 97

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-39 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **118.3 PCF**
 NATURAL MOISTURE CONTENT: **10.7%**
 PERCENT SWELL/COMPRESSION: **- 0.7**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-41 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **49.3%**
 PERCENT SWELL/COMPRESSION: **5.3**

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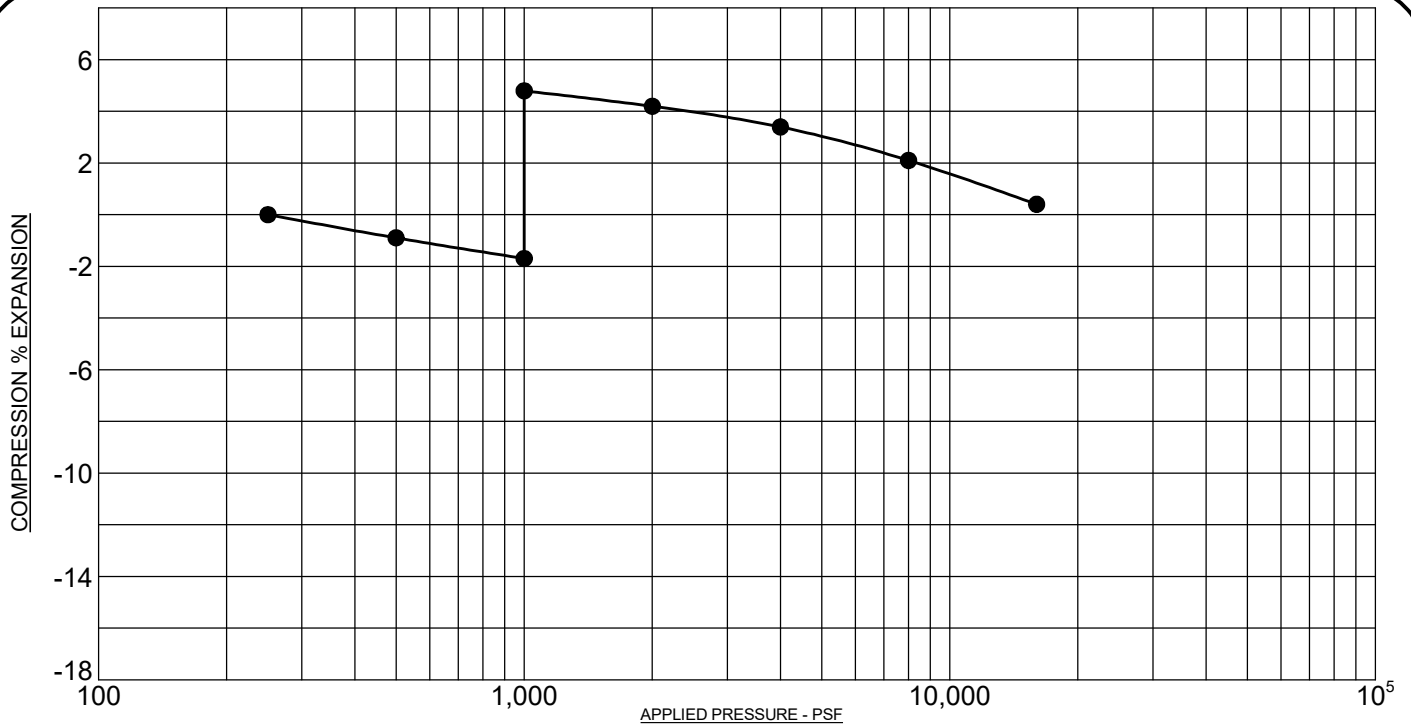
Geotechnical
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Civil, Planning

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JOB No. 175706

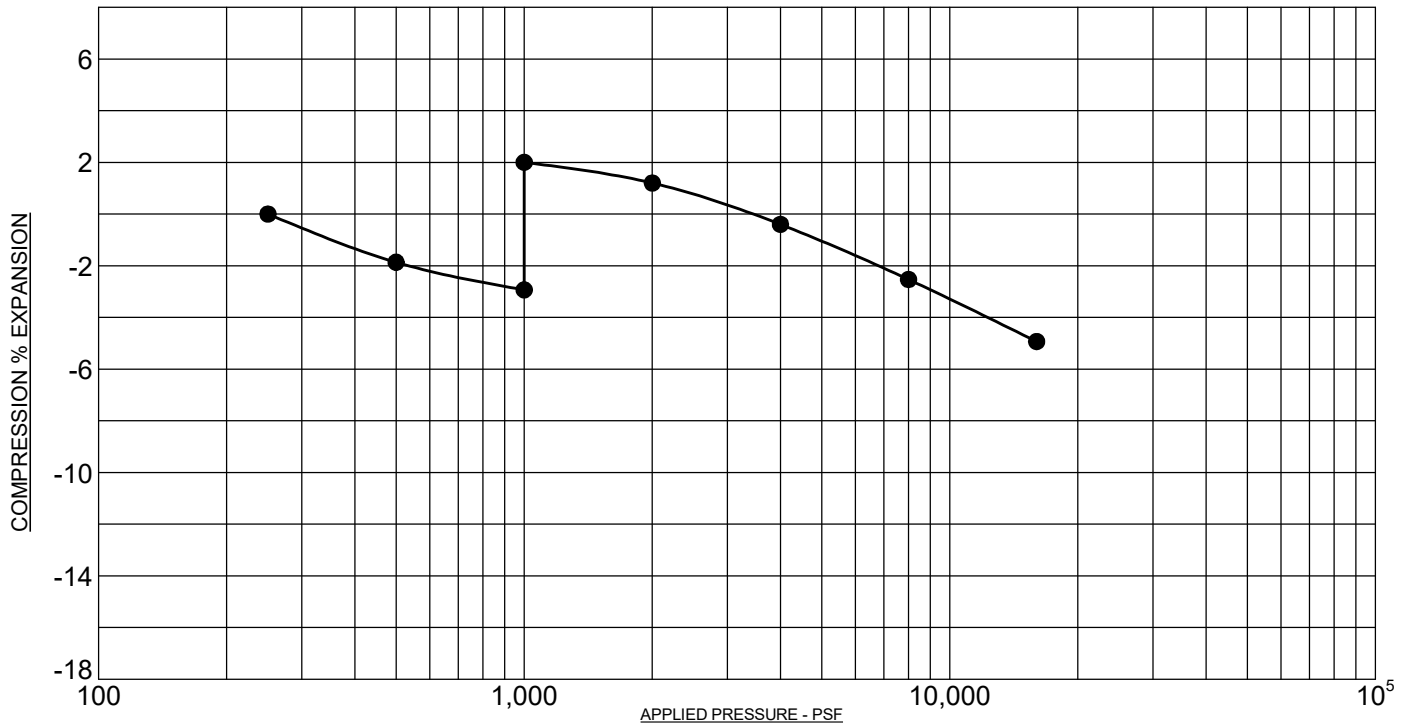
FIGURE No. 98

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-42 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **14.0%**
 PERCENT SWELL/COMPRESSION: **6.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-43 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **13.5%**
 PERCENT SWELL/COMPRESSION: **4.9**

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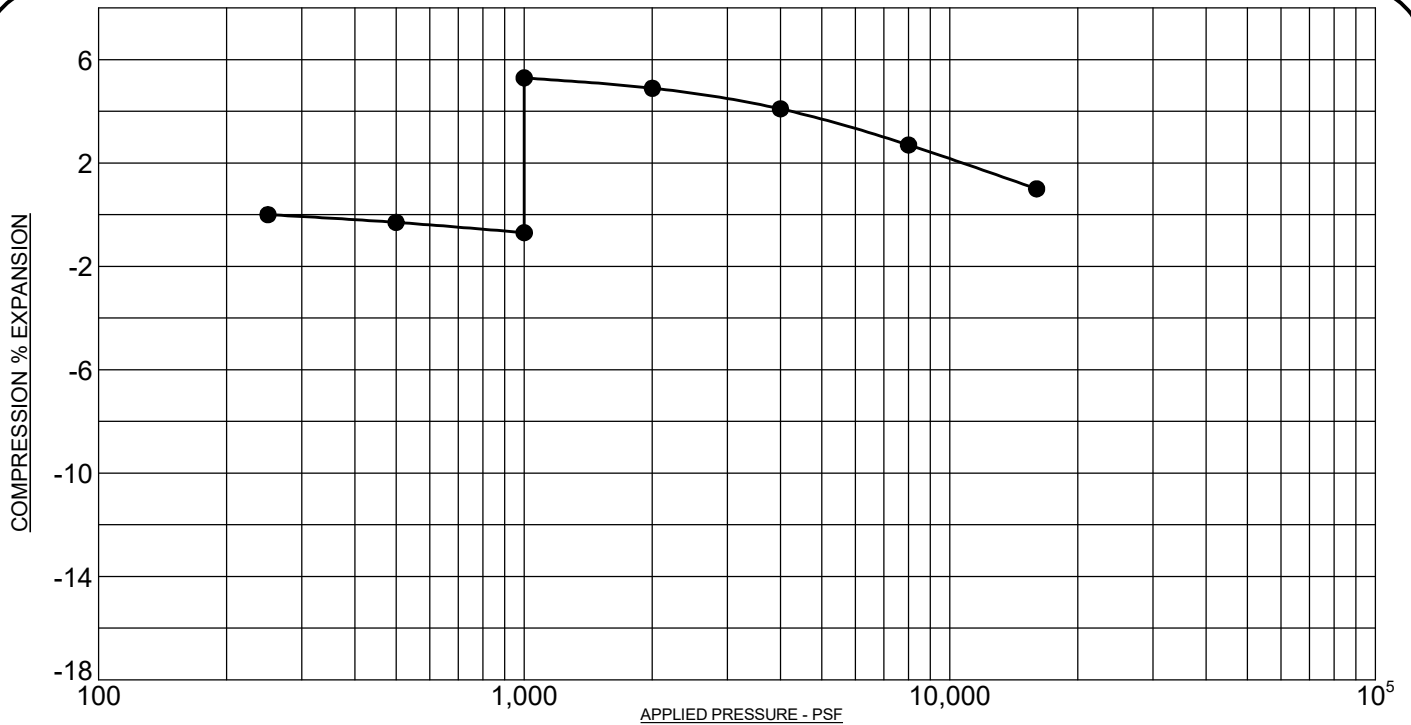
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

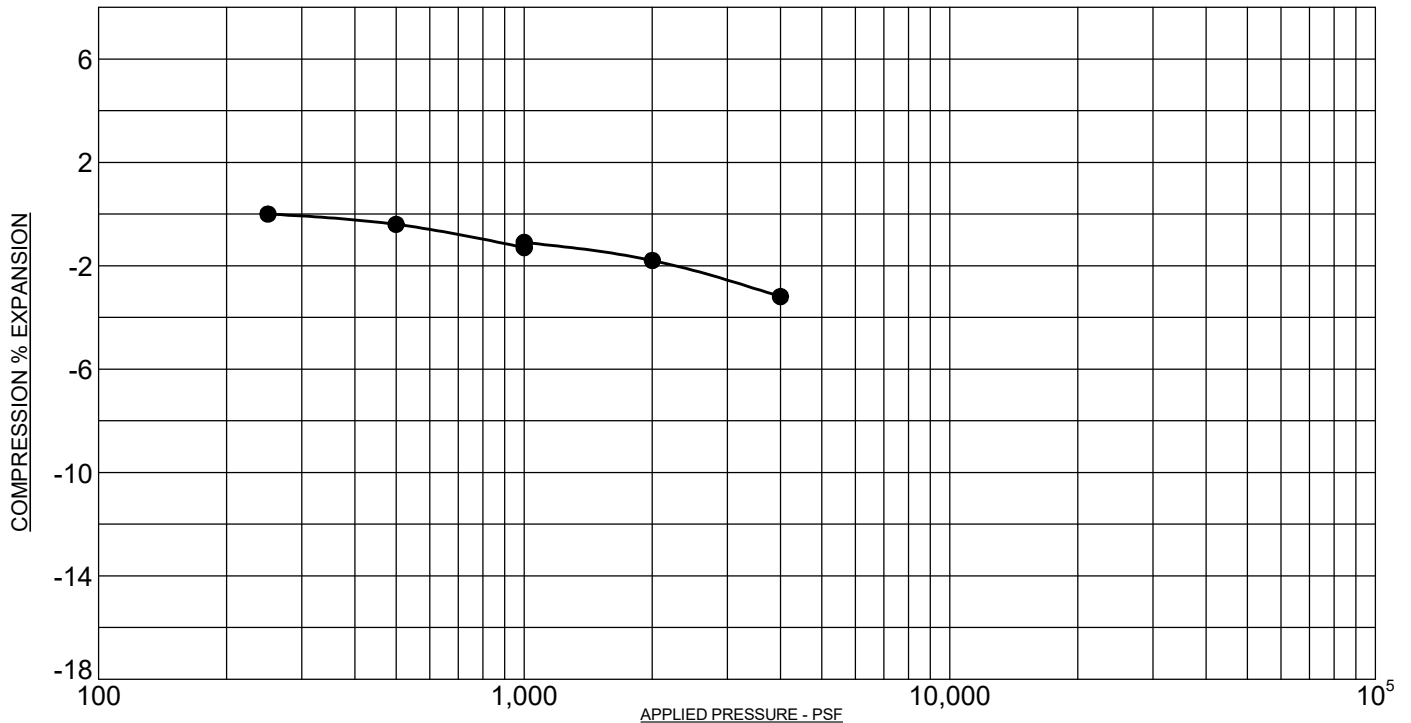
FIGURE No. 99

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-44 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **11.7%**
 PERCENT SWELL/COMPRESSION: **6.0**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-45 @ 24 FT**
 NATURAL DRY UNIT WEIGHT: **79.0 PCF**
 NATURAL MOISTURE CONTENT: **16.2%**
 PERCENT SWELL/COMPRESSION: **0.2**

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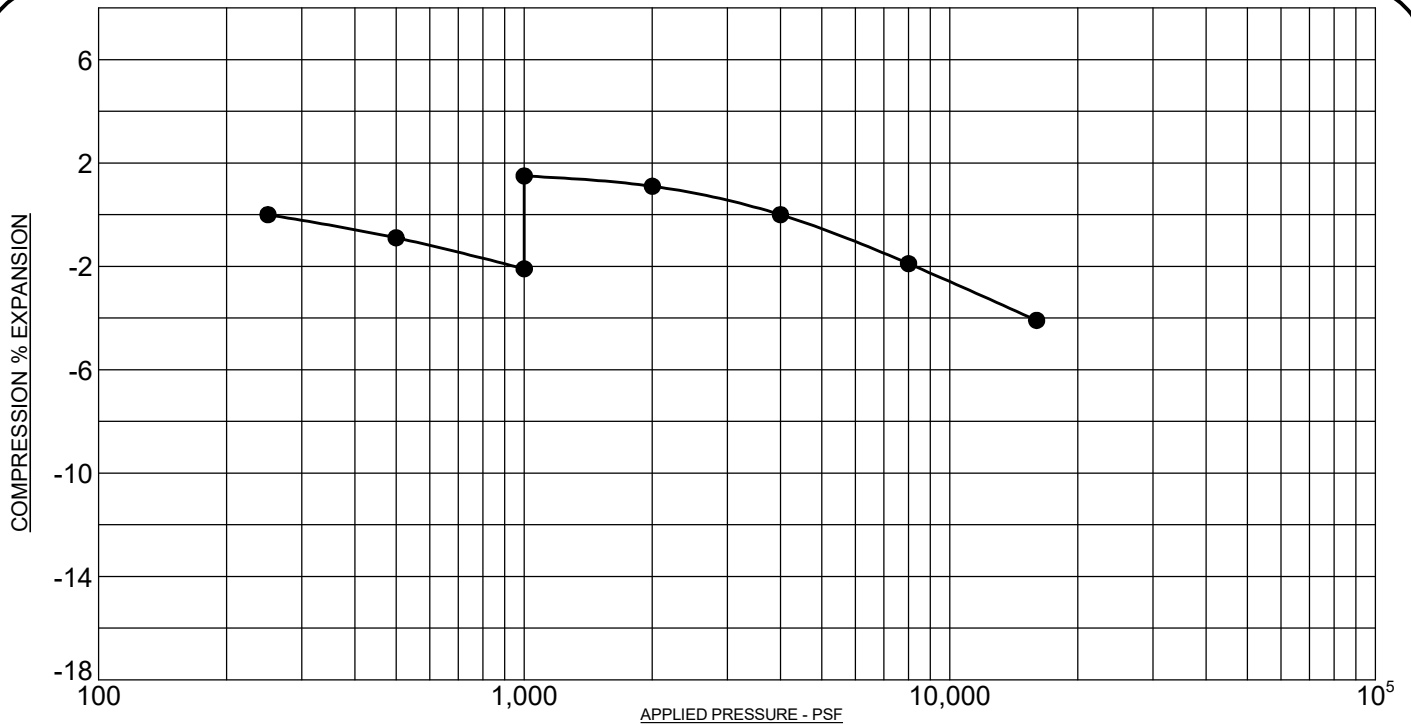
Geotechnical
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JOB No. 175706

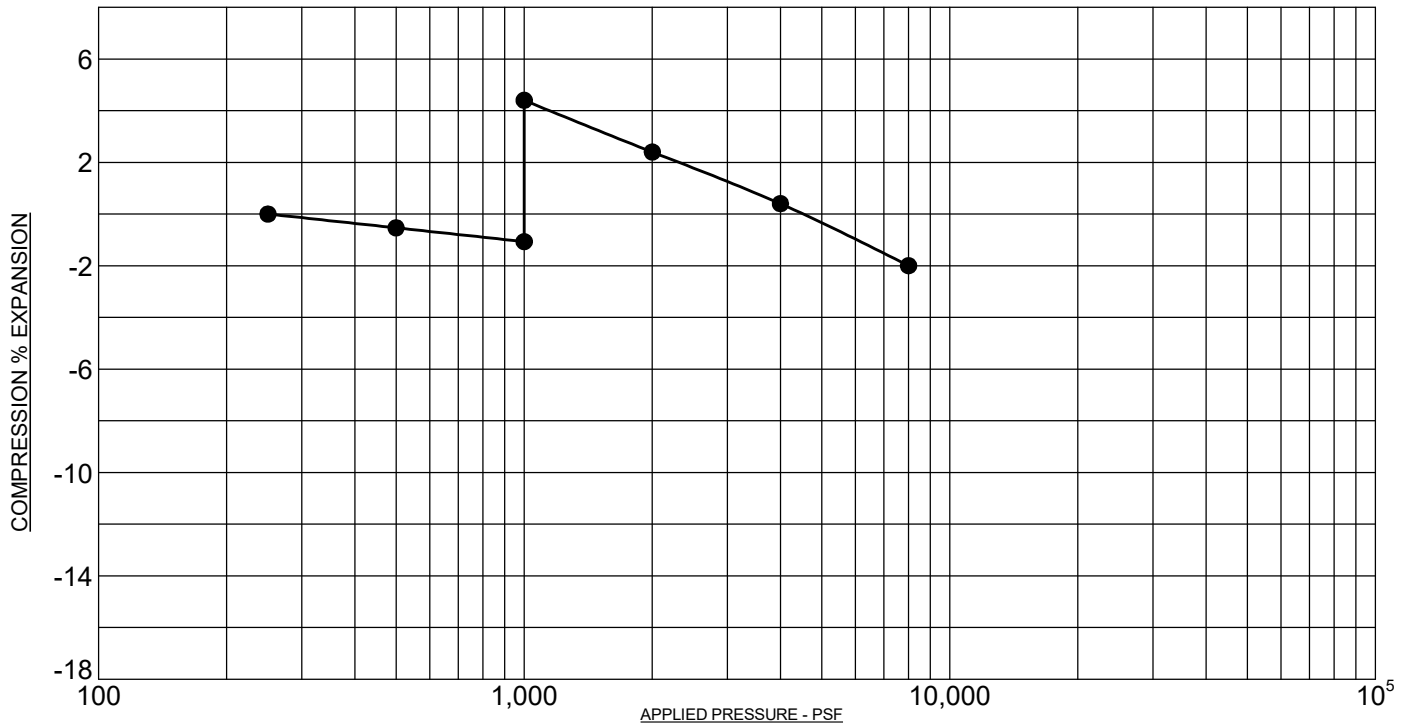
FIGURE No. 100

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-46 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **119.7 PCF**
 NATURAL MOISTURE CONTENT: **9.7%**
 PERCENT SWELL/COMPRESSION: **3.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-47 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **116.2 PCF**
 NATURAL MOISTURE CONTENT: **16.4%**
 PERCENT SWELL/COMPRESSION: **5.5**

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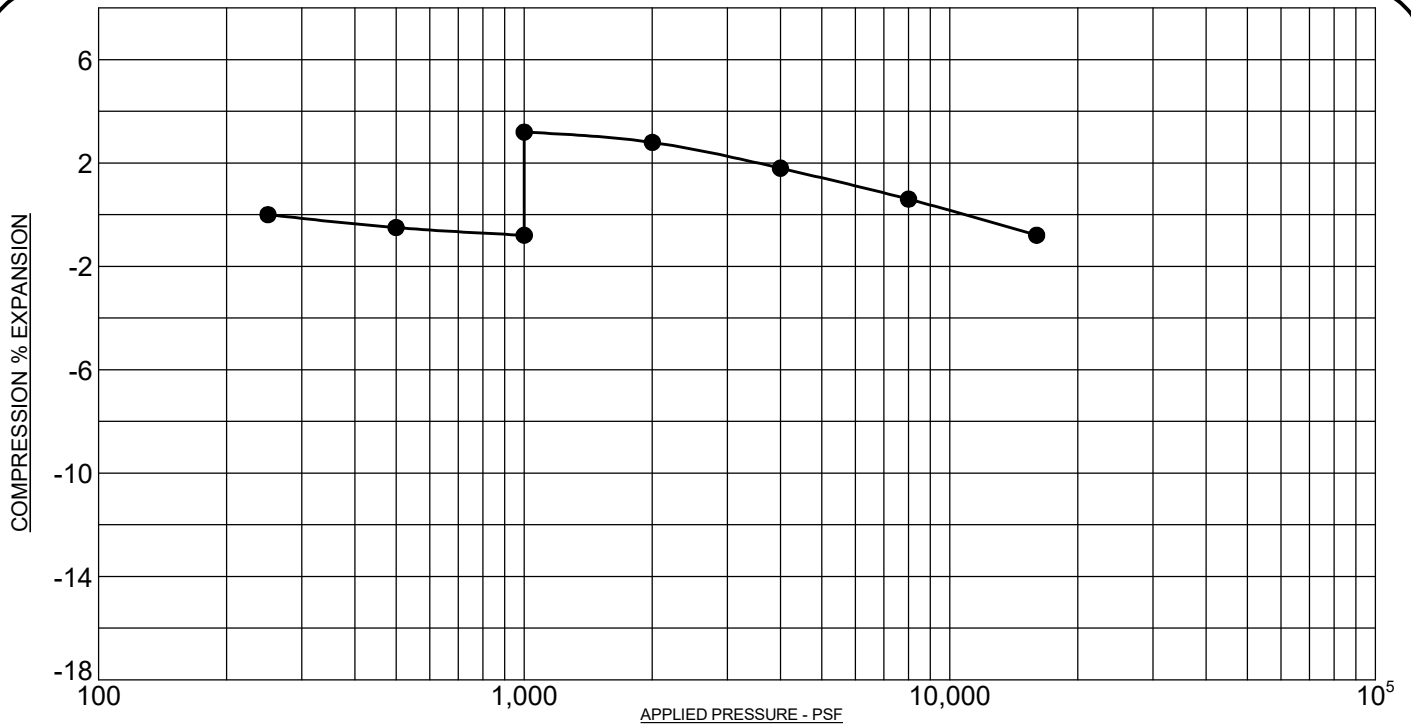
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

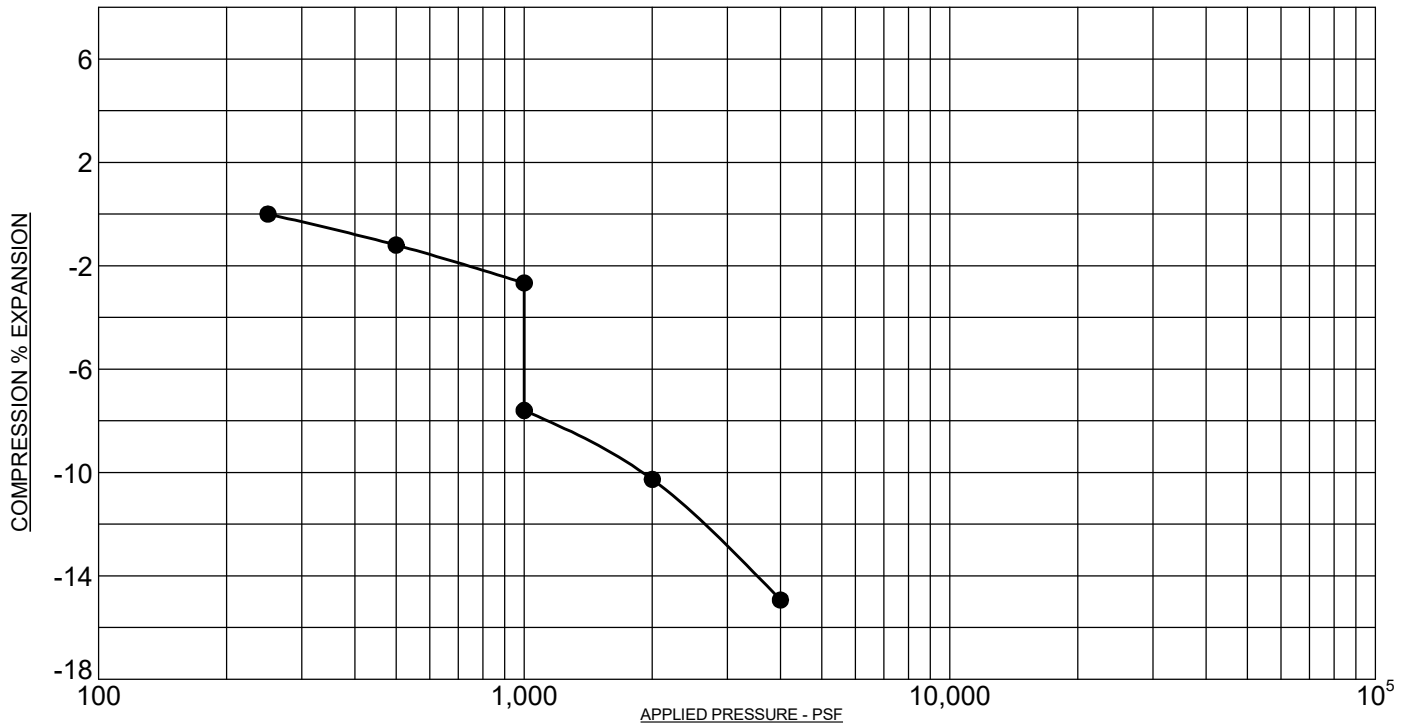
FIGURE No. 101

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-48 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **117.7 PCF**
 NATURAL MOISTURE CONTENT: **11.4%**
 PERCENT SWELL/COMPRESSION: **4.0**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-49 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **97.7 PCF**
 NATURAL MOISTURE CONTENT: **9.1%**
 PERCENT SWELL/COMPRESSION: **- 4.9**

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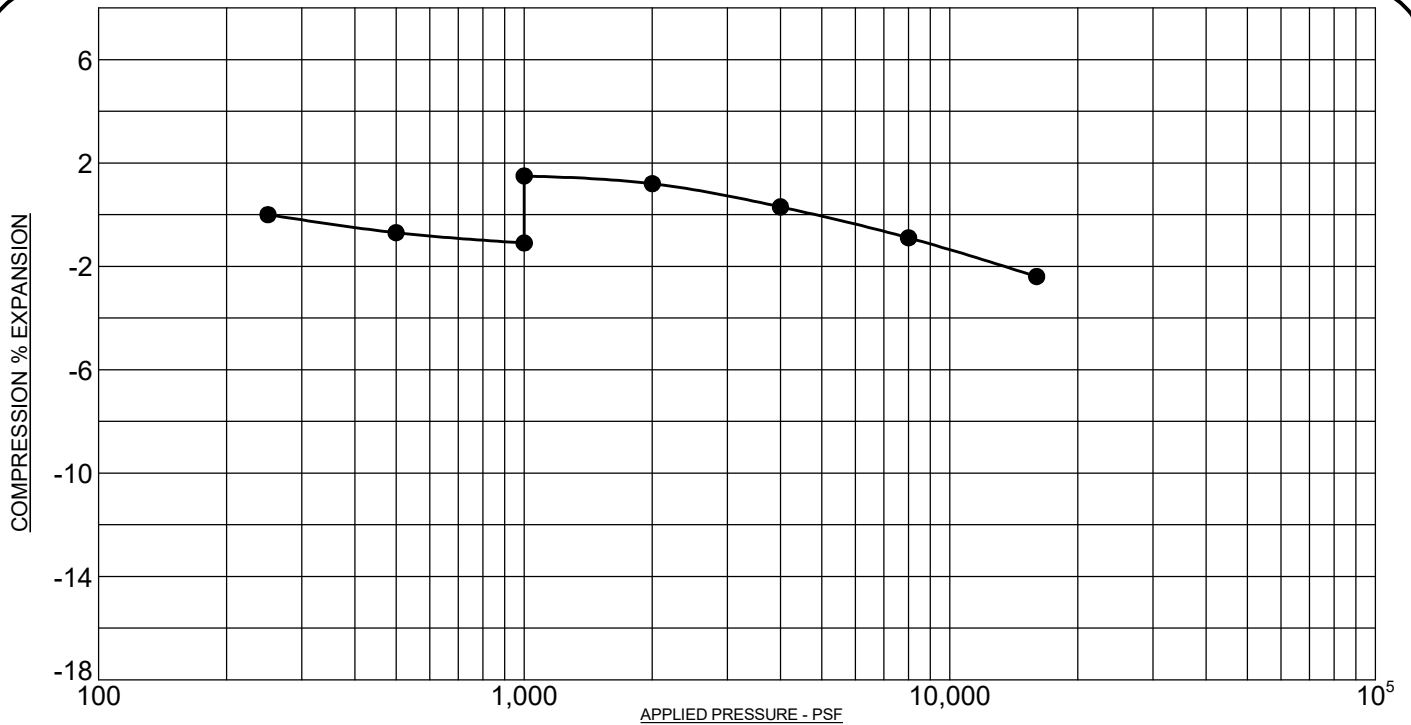
Geotechnical
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

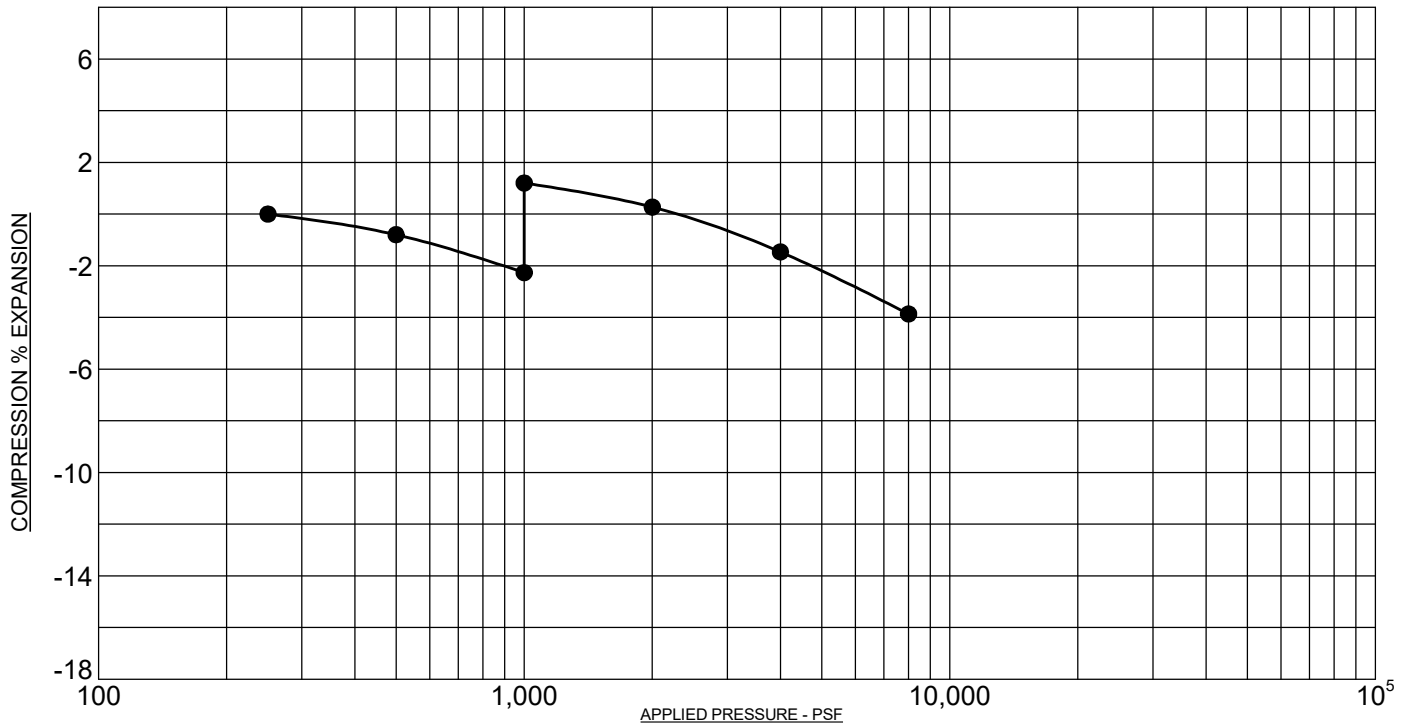
FIGURE No. 102

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-51 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **121.8 PCF**
 NATURAL MOISTURE CONTENT: **12.1%**
 PERCENT SWELL/COMPRESSION: **2.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-52 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **126.0 PCF**
 NATURAL MOISTURE CONTENT: **10.2%**
 PERCENT SWELL/COMPRESSION: **3.5**

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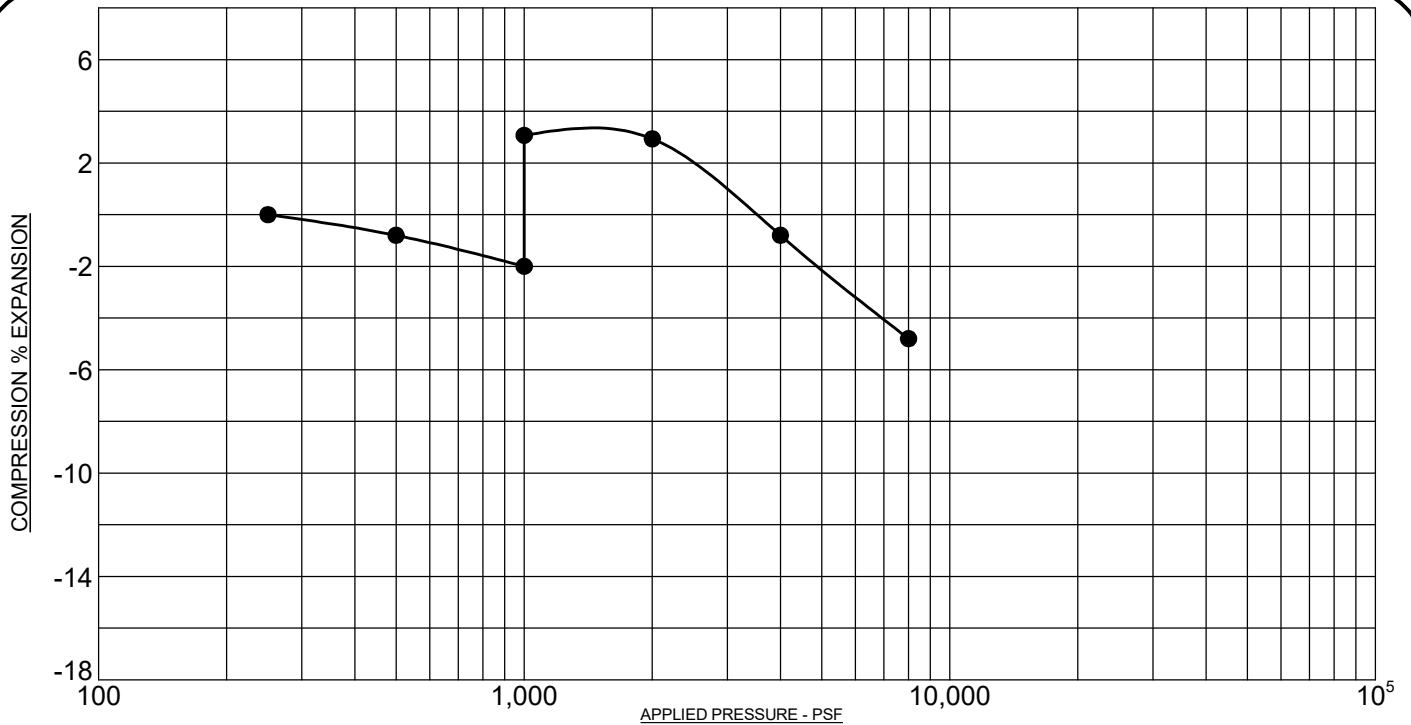
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JOB No. 175706

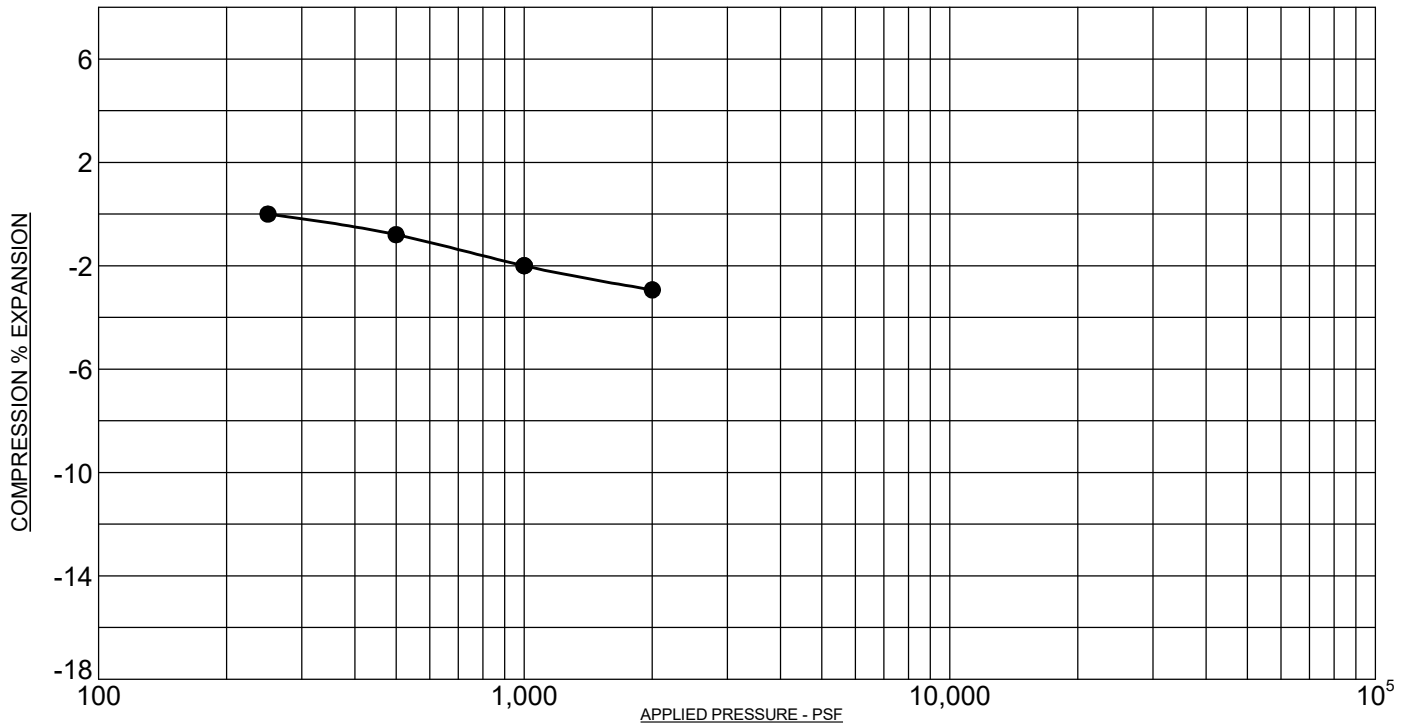
FIGURE No. 103

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-53 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **109.9 PCF**
 NATURAL MOISTURE CONTENT: **11.3%**
 PERCENT SWELL/COMPRESSION: **5.1**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-54 @ FT**
 NATURAL DRY UNIT WEIGHT: **105.9 PCF**
 NATURAL MOISTURE CONTENT: **19.6%**
 PERCENT SWELL/COMPRESSION: **0.0**

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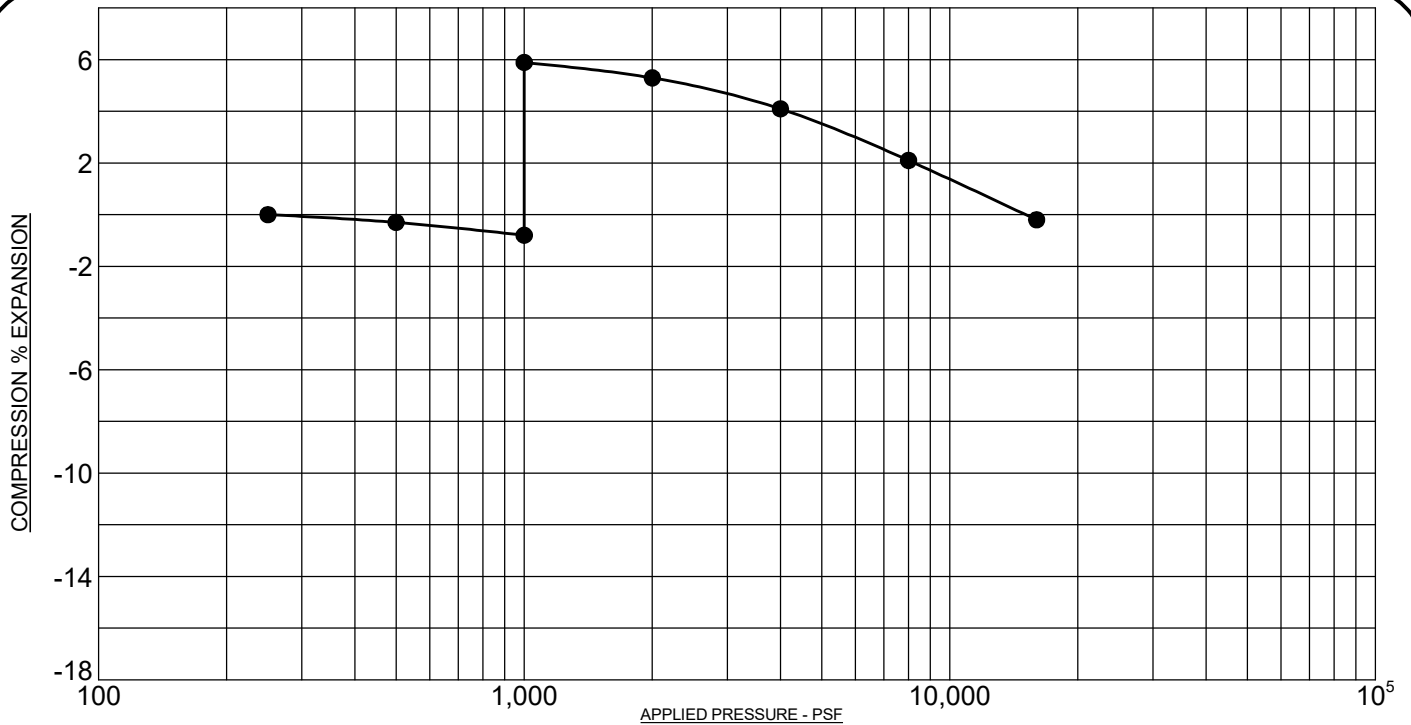
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JOB No. 175706

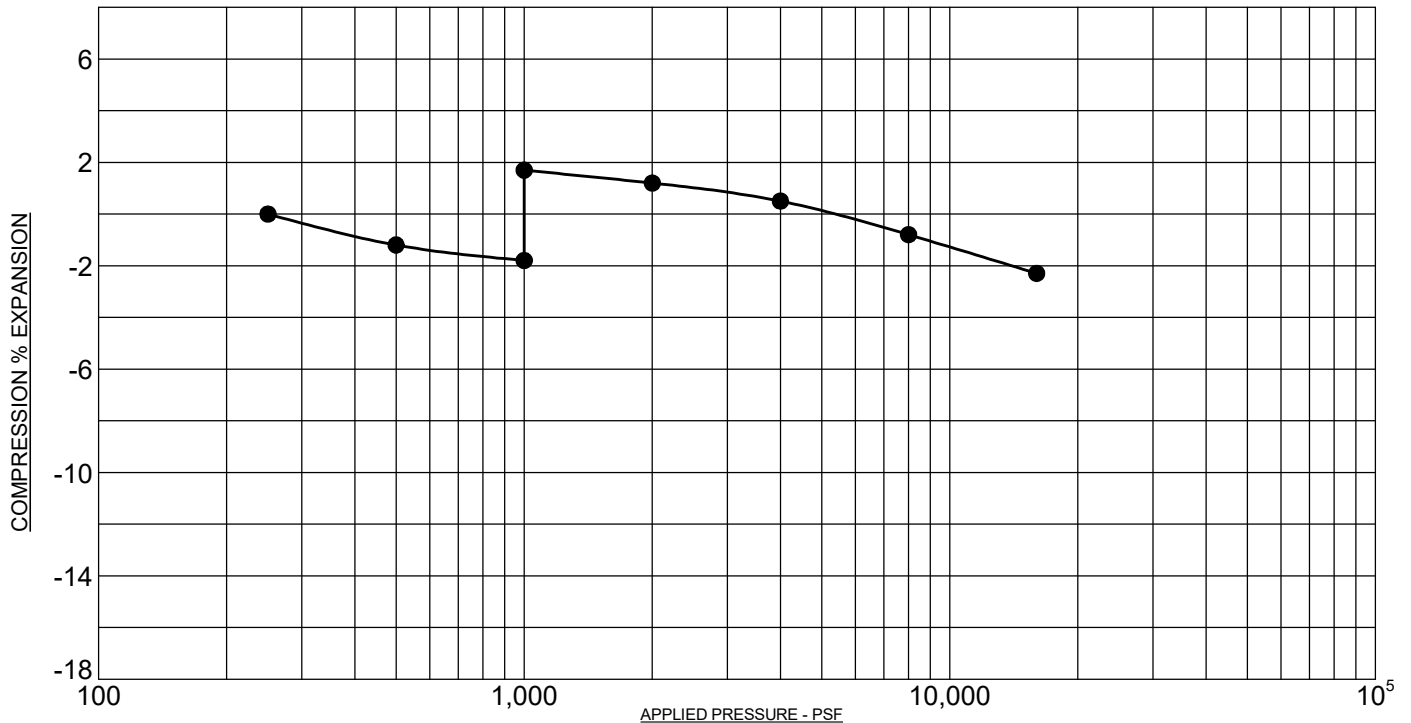
FIGURE No. 104

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-55 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **110.8 PCF**
 NATURAL MOISTURE CONTENT: **15.8%**
 PERCENT SWELL/COMPRESSION: **6.7**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-56 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **121.4 PCF**
 NATURAL MOISTURE CONTENT: **12.9%**
 PERCENT SWELL/COMPRESSION: **3.5**

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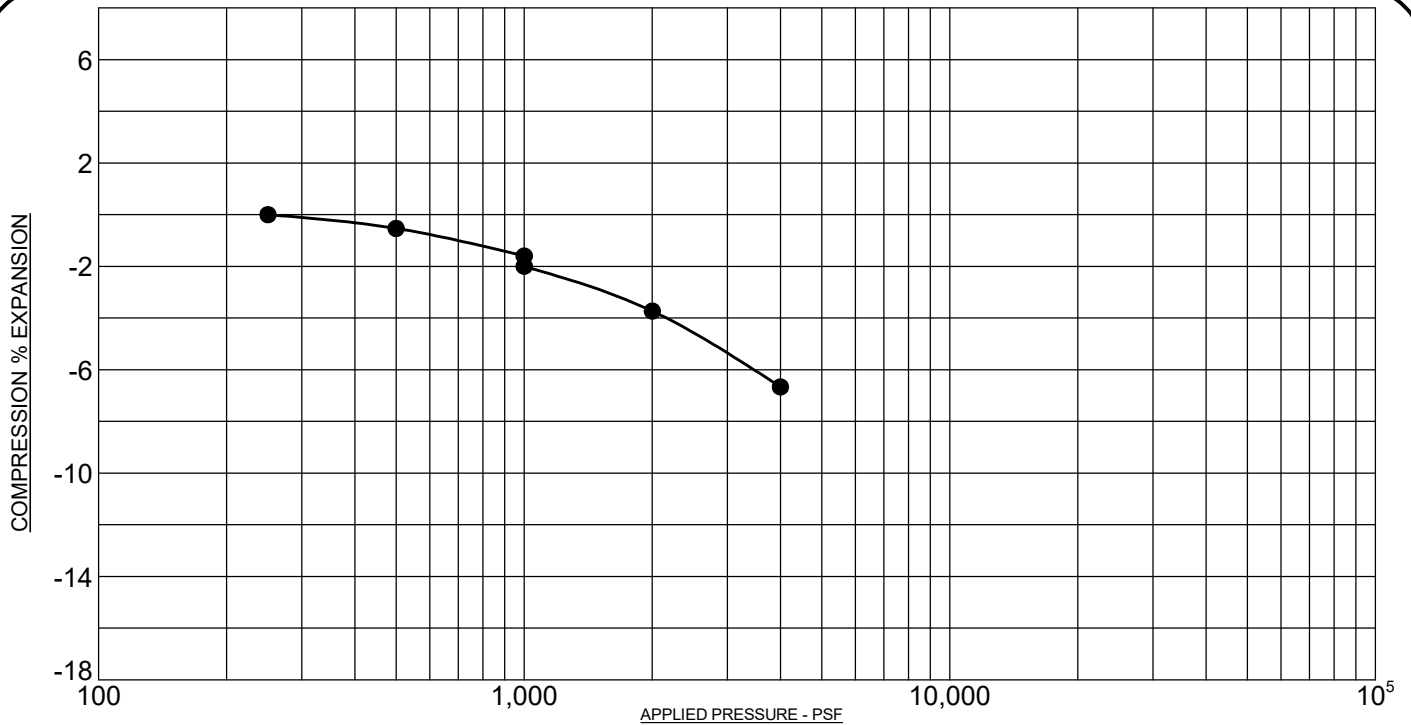
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JOB No. 175706

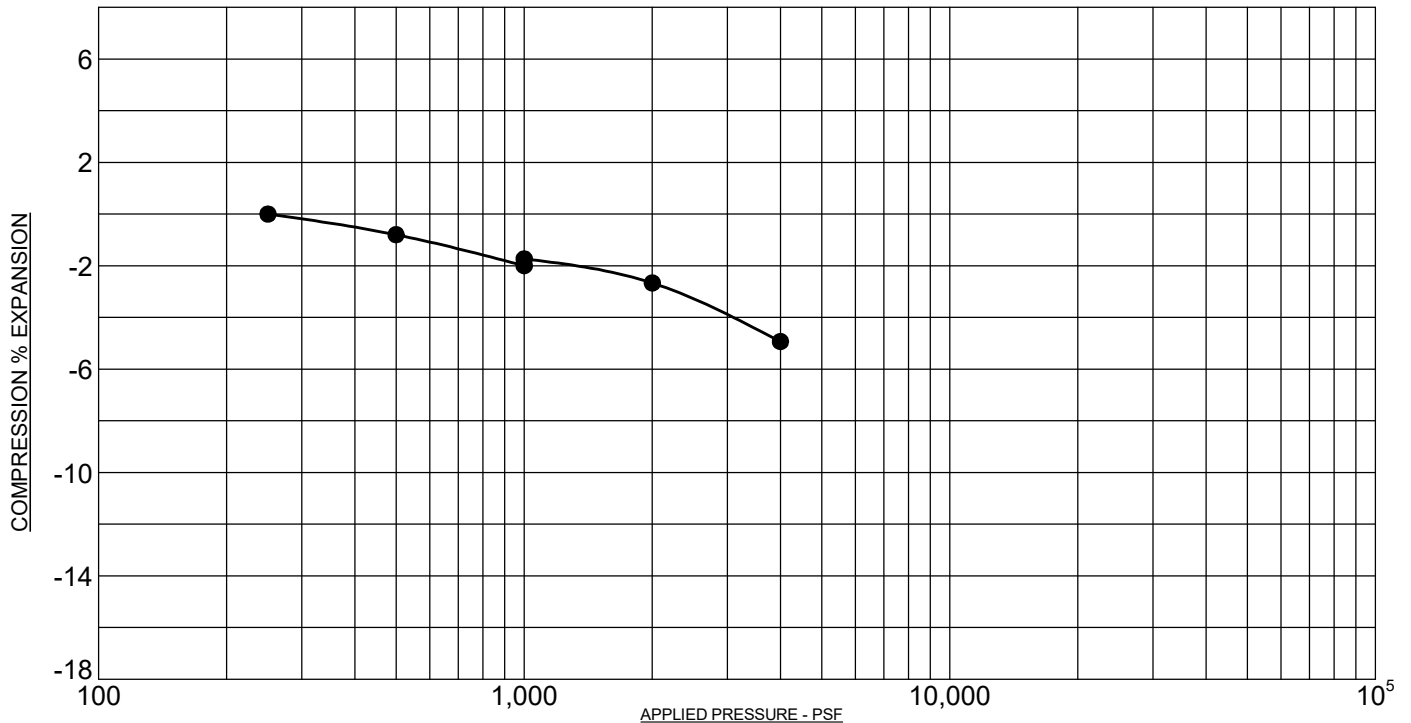
FIGURE No. 105

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-57 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **109.4 PCF**
 NATURAL MOISTURE CONTENT: **13.8%**
 PERCENT SWELL/COMPRESSION: **- 0.4**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-58 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **108.0 PCF**
 NATURAL MOISTURE CONTENT: **11.0%**
 PERCENT SWELL/COMPRESSION: **0.3**

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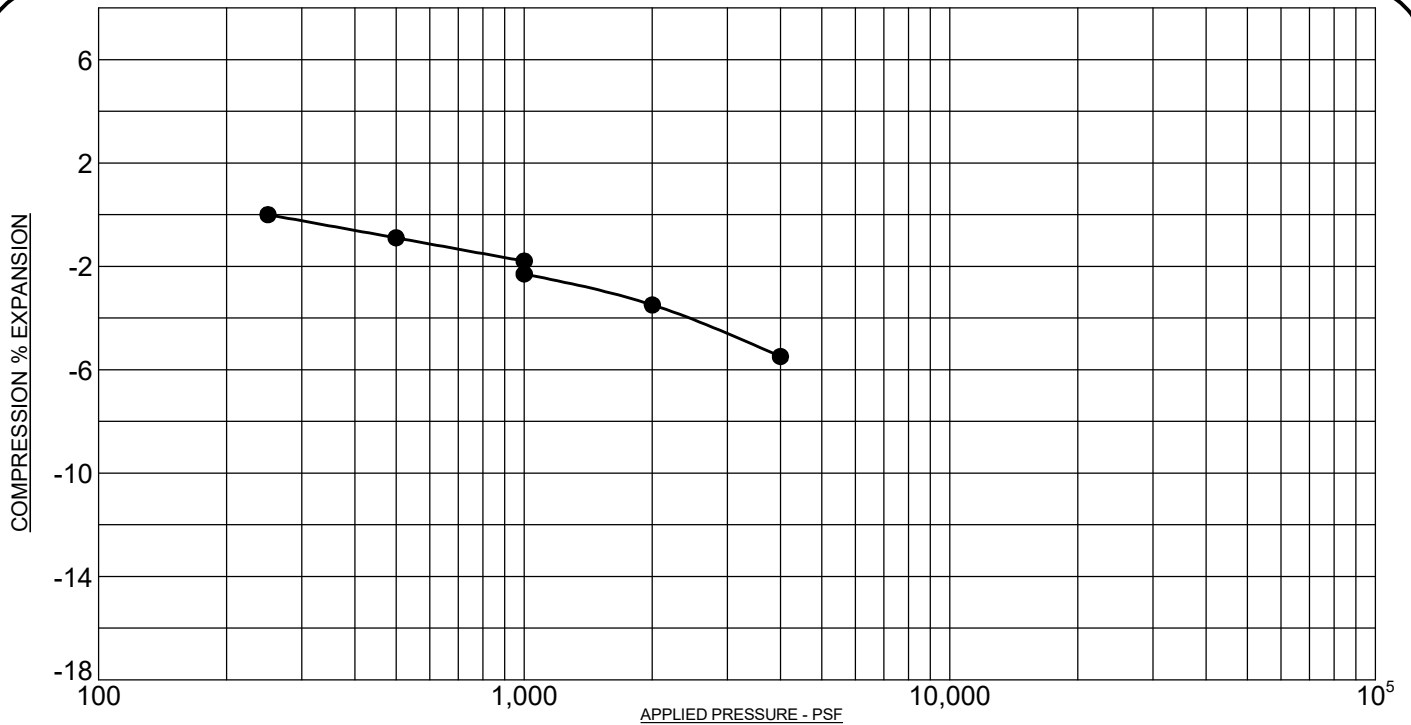
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JOB No. 175706

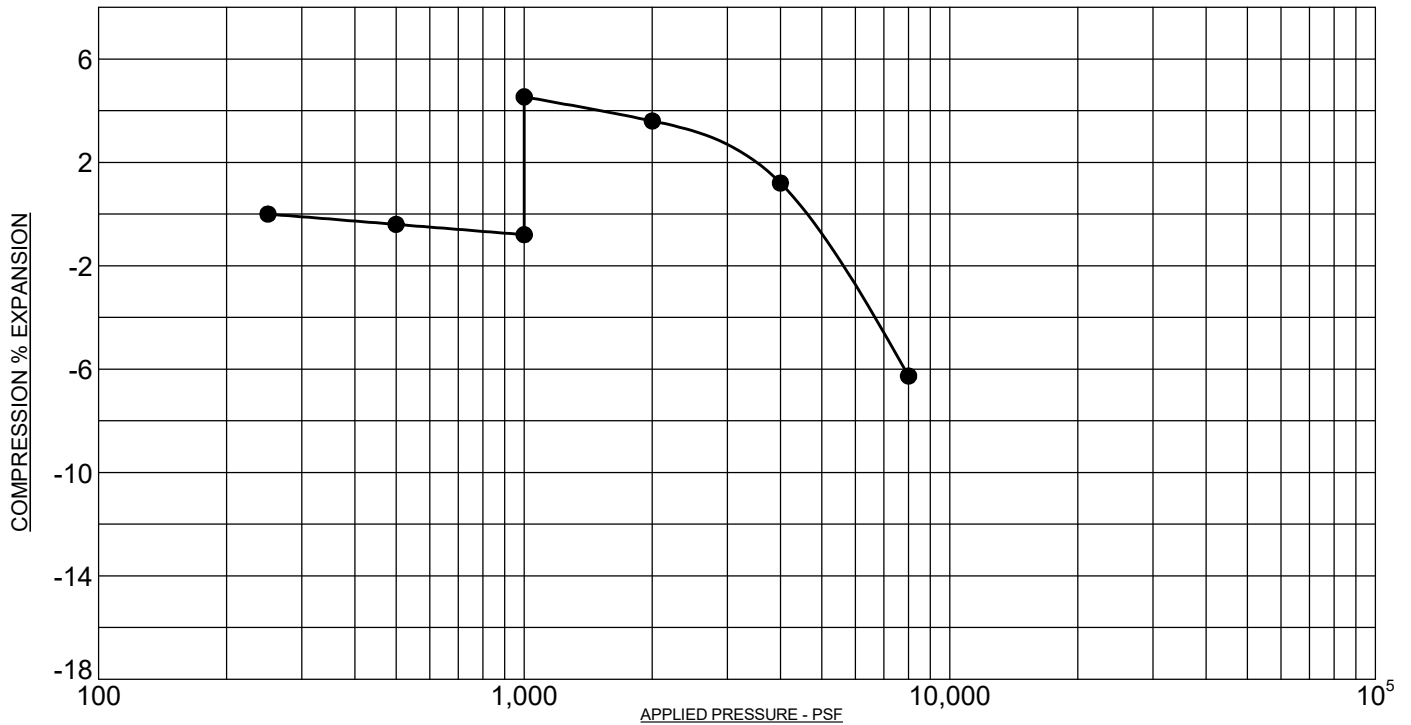
FIGURE No. 106

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-59 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **107.5 PCF**
 NATURAL MOISTURE CONTENT: **11.1%**
 PERCENT SWELL/COMPRESSION: **- 0.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-60 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **116.2 PCF**
 NATURAL MOISTURE CONTENT: **11.6%**
 PERCENT SWELL/COMPRESSION: **5.3**

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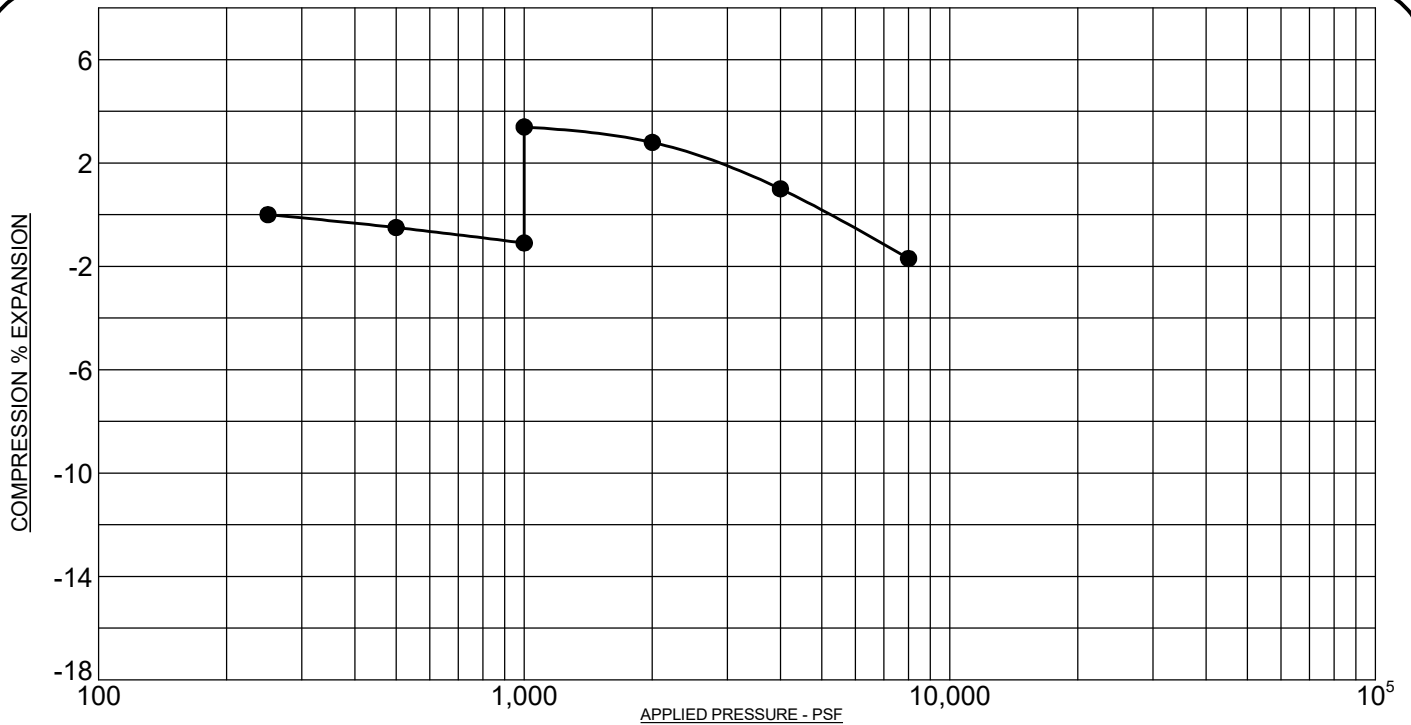
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JOB No. 175706

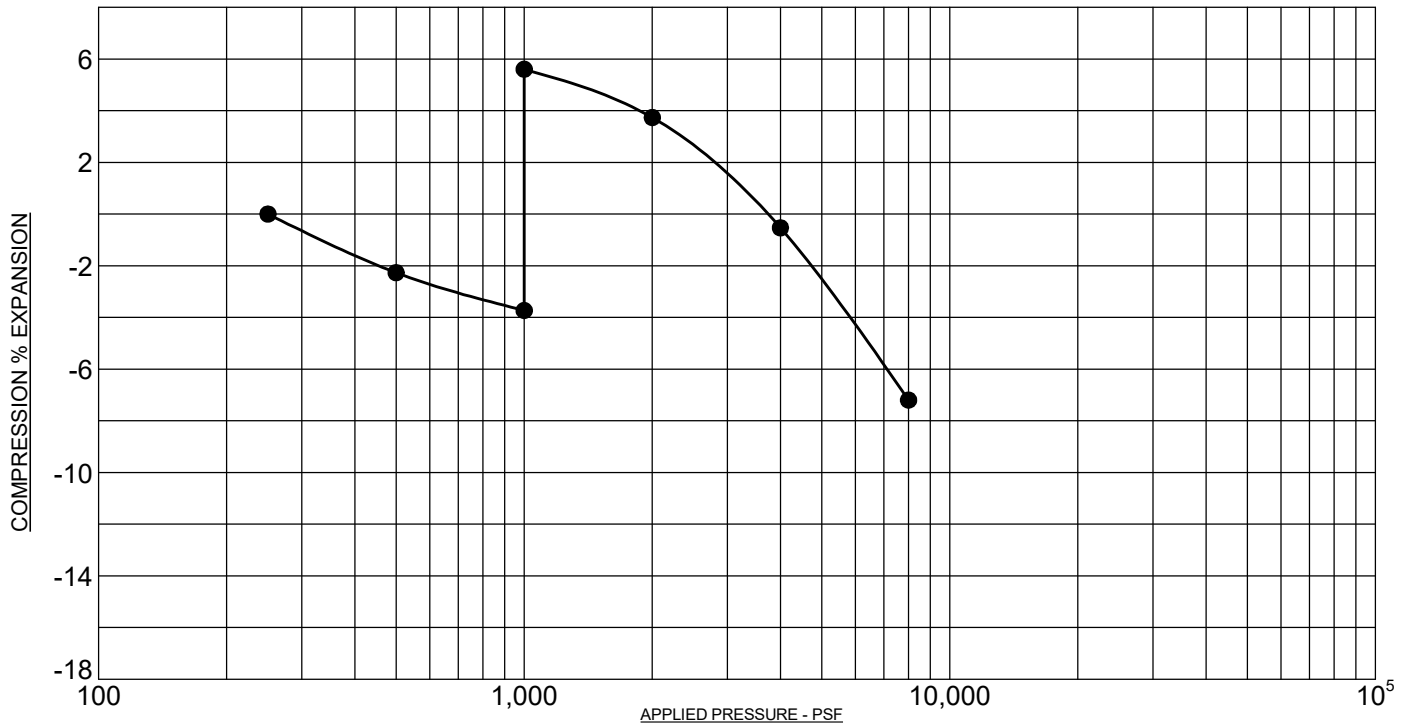
FIGURE No. 107

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-61 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **106.6 PCF**
 NATURAL MOISTURE CONTENT: **14.1%**
 PERCENT SWELL/COMPRESSION: **4.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-62 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **121.0 PCF**
 NATURAL MOISTURE CONTENT: **13.5%**
 PERCENT SWELL/COMPRESSION: **9.3**

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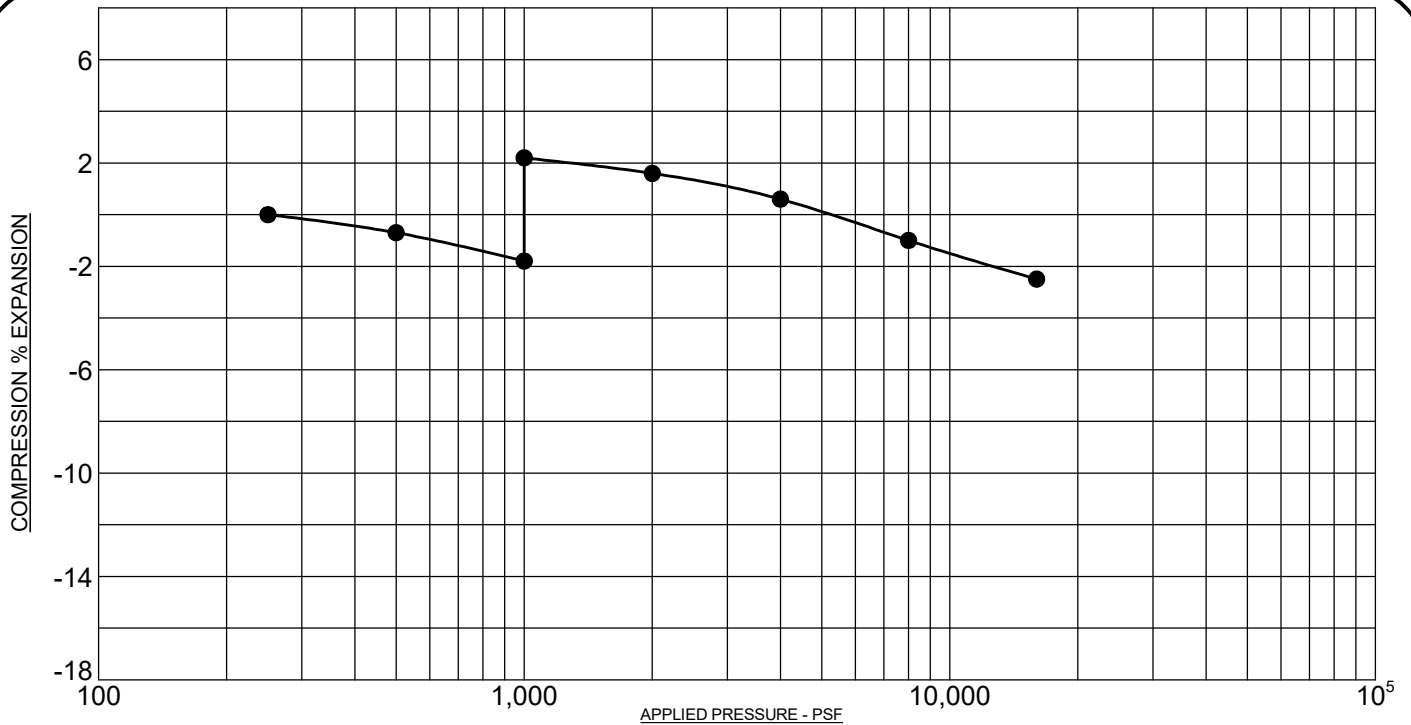
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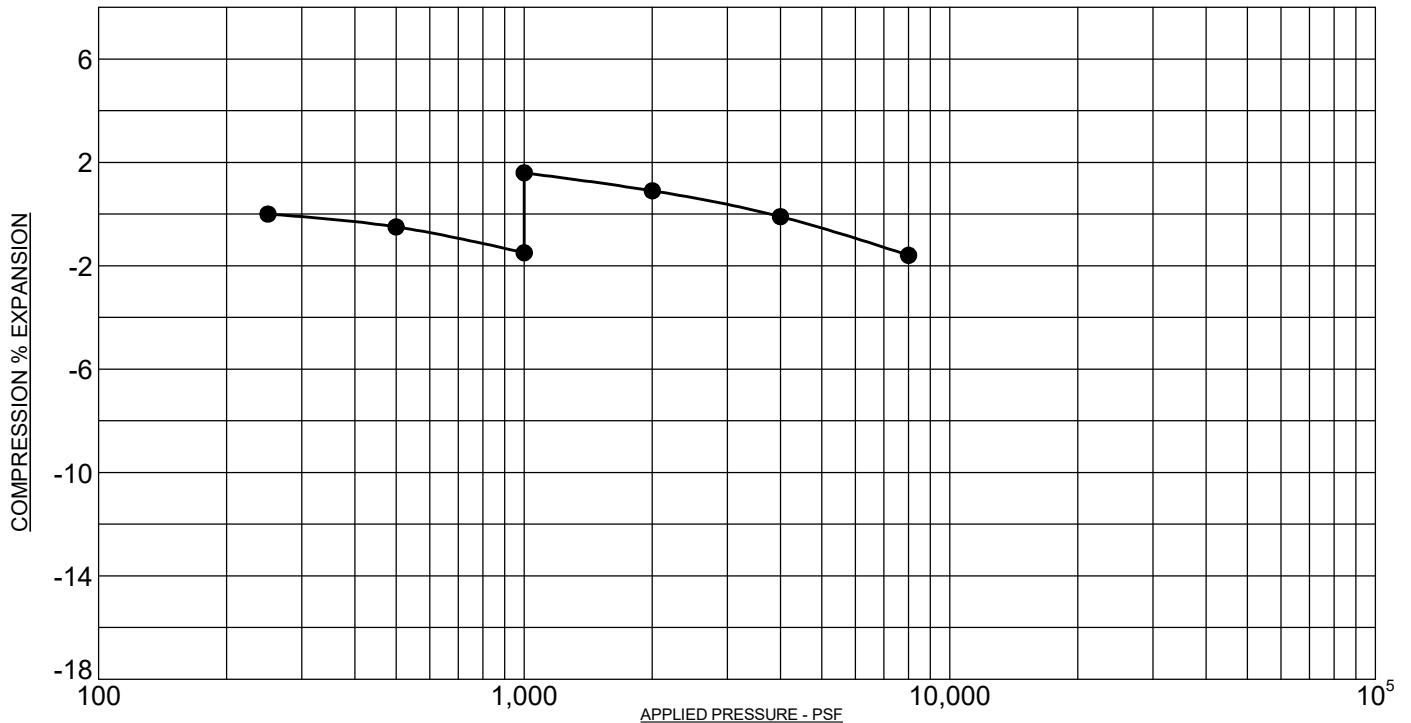
FIGURE No. 108

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-63 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **124.2 PCF**
 NATURAL MOISTURE CONTENT: **9.8%**
 PERCENT SWELL/COMPRESSION: **4.0**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-65 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **82.8 PCF**
 NATURAL MOISTURE CONTENT: **18.9%**
 PERCENT SWELL/COMPRESSION: **3.1**

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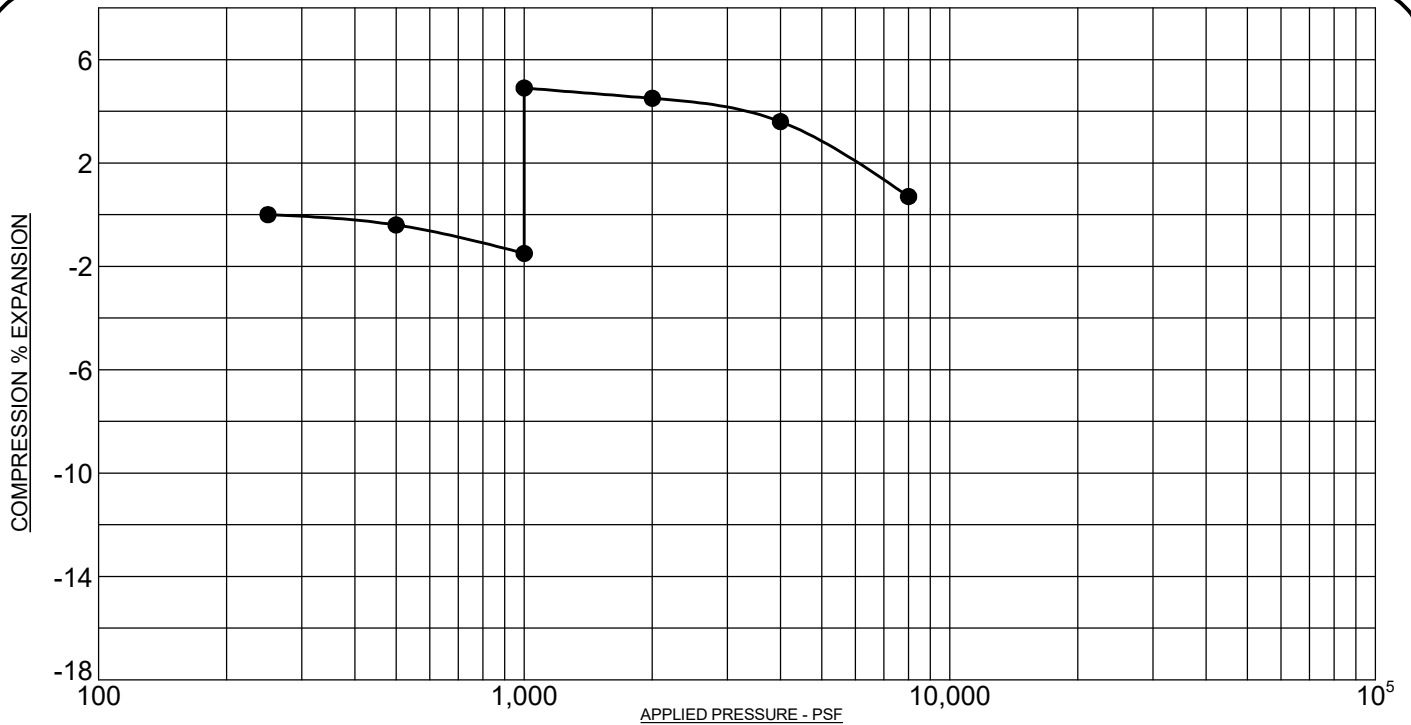
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

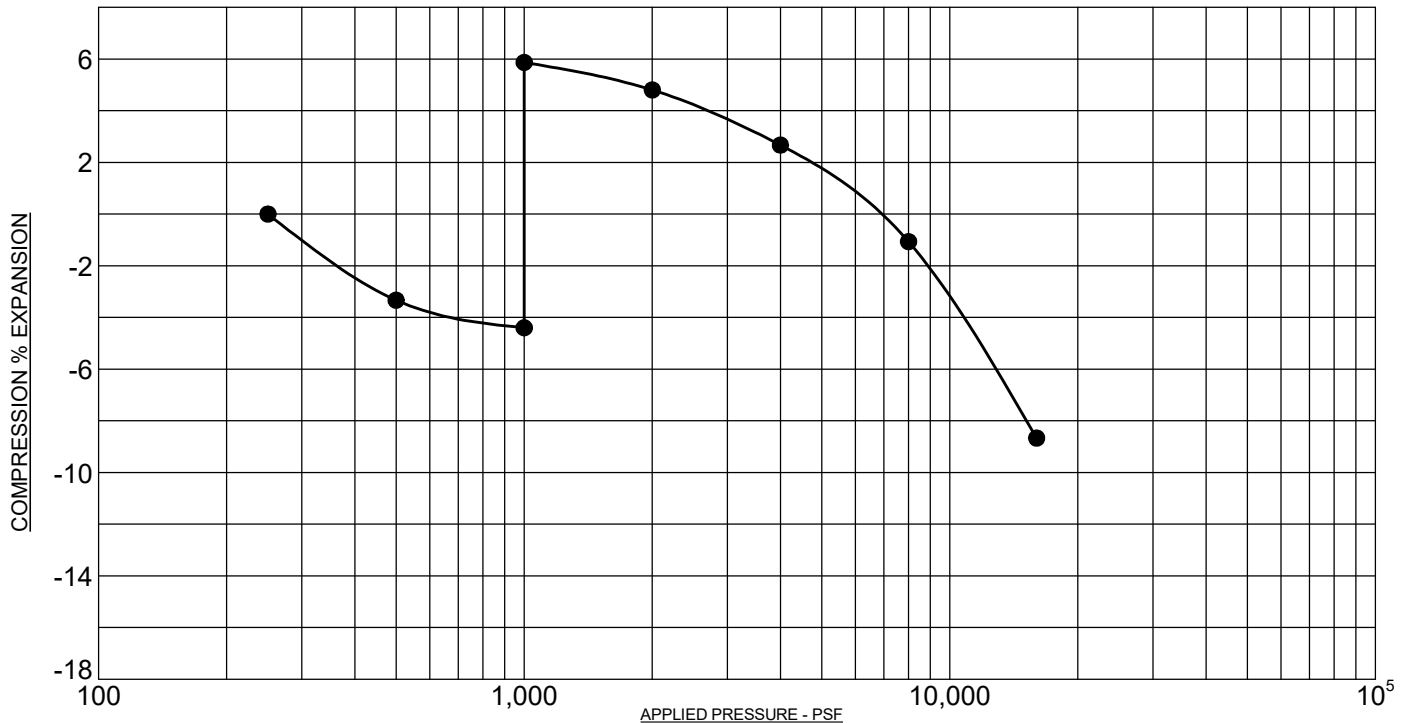
FIGURE No. 109

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-66 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **114.1 PCF**
 NATURAL MOISTURE CONTENT: **11.6%**
 PERCENT SWELL/COMPRESSION: **6.4**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-67 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **16.6%**
 PERCENT SWELL/COMPRESSION: **10.3**

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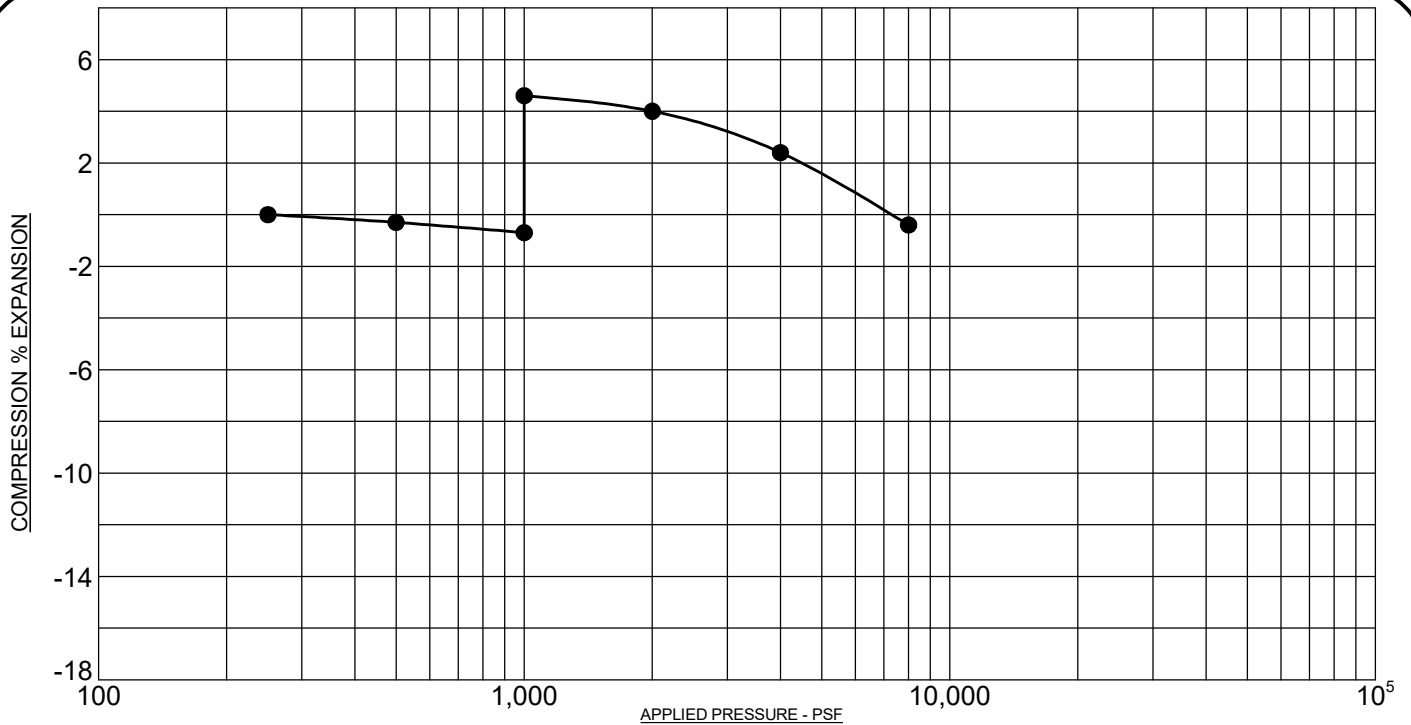
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

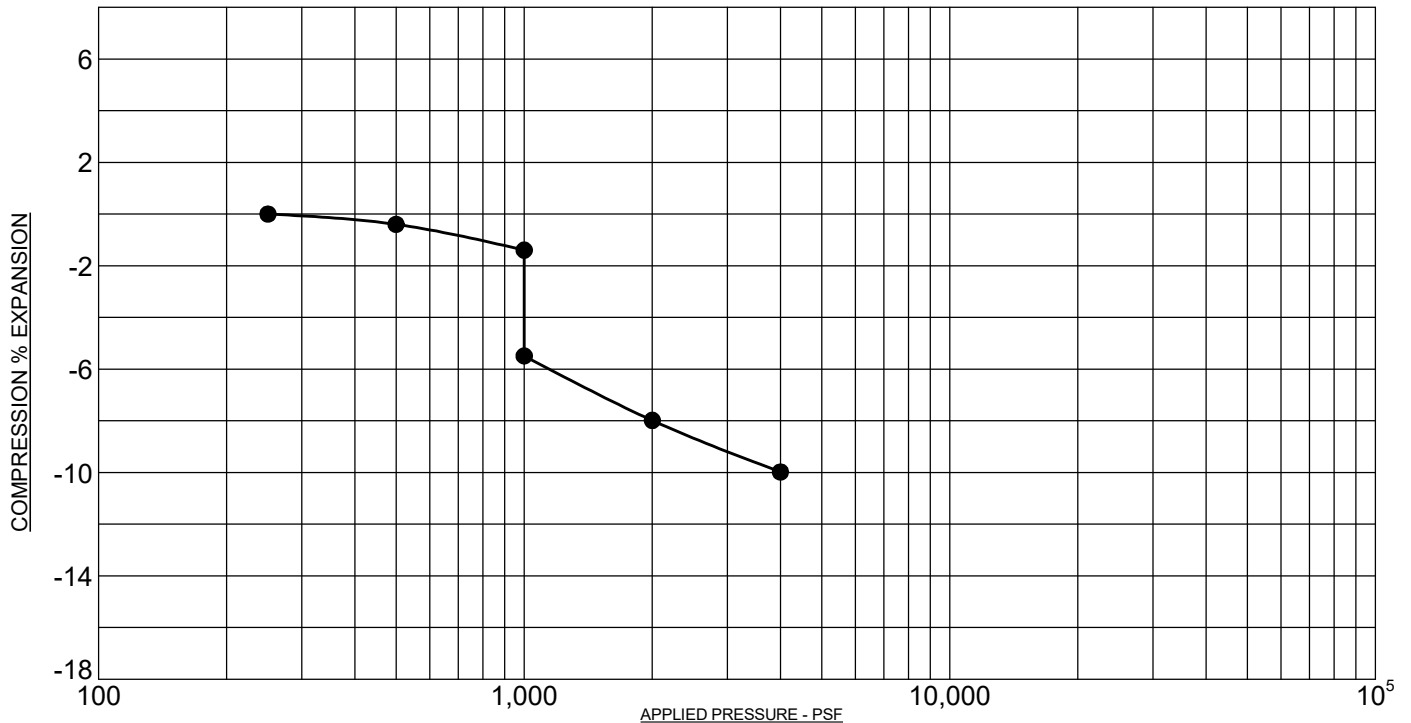
FIGURE No. 110

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-68 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **116.0 PCF**
 NATURAL MOISTURE CONTENT: **10.9%**
 PERCENT SWELL/COMPRESSION: **5.3**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-69 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **9.4%**
 PERCENT SWELL/COMPRESSION: **- 4.1**

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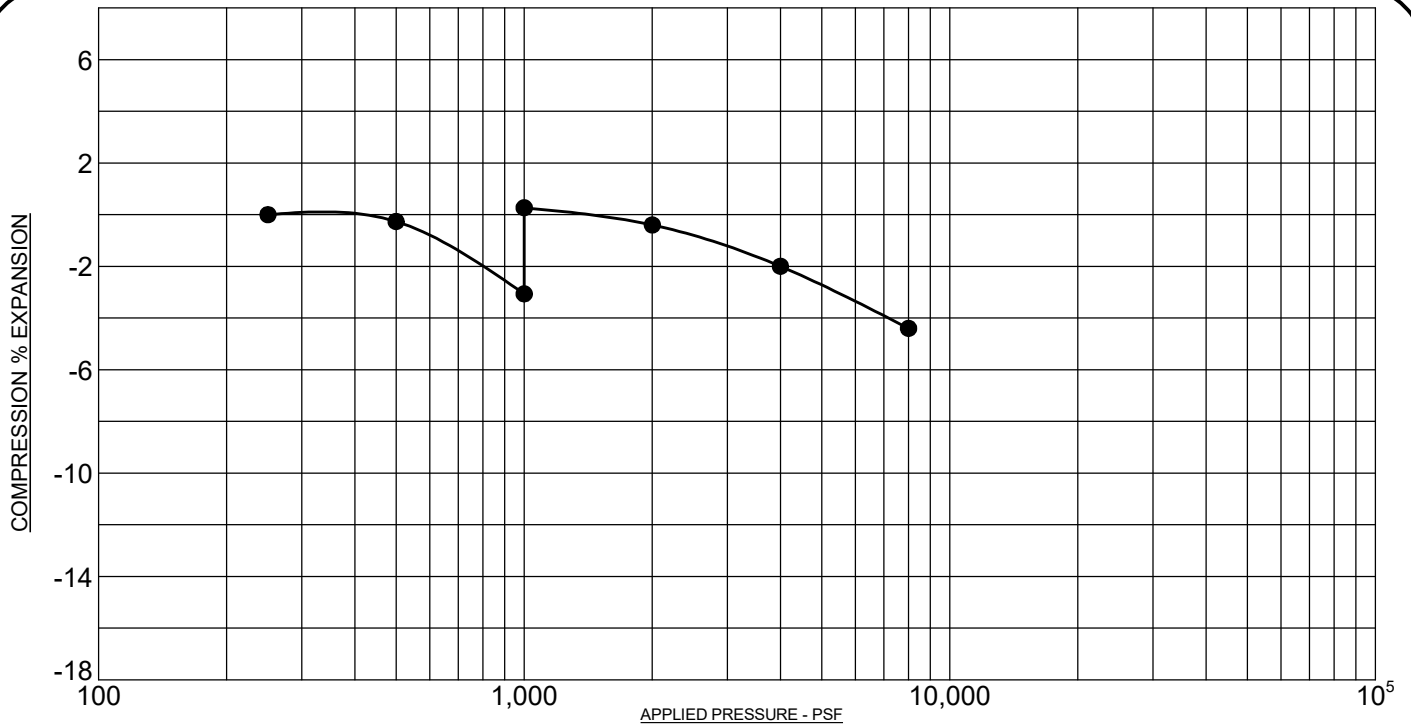
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

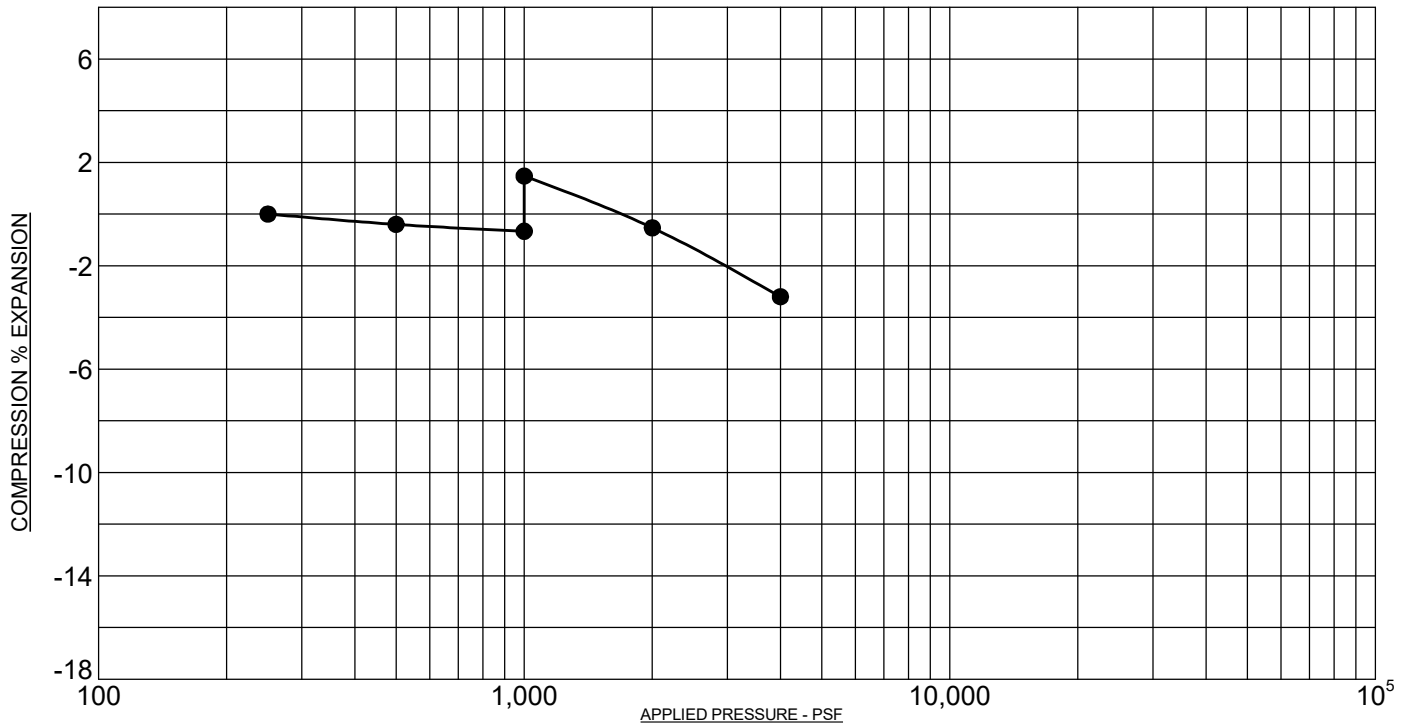
FIGURE No. 111

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **D-70 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **10.8%**
 PERCENT SWELL/COMPRESSION: **3.3**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-1 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **110.5 PCF**
 NATURAL MOISTURE CONTENT: **12.9%**
 PERCENT SWELL/COMPRESSION: **2.1**

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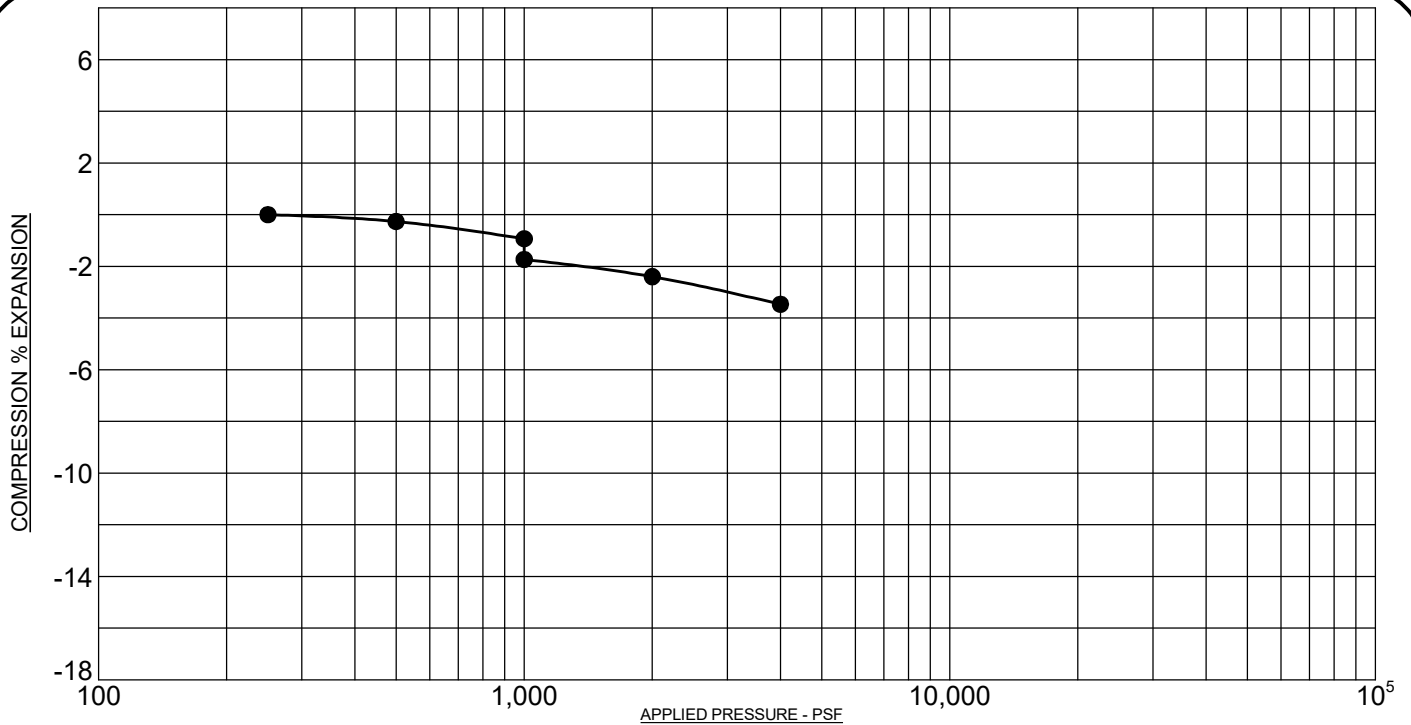
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

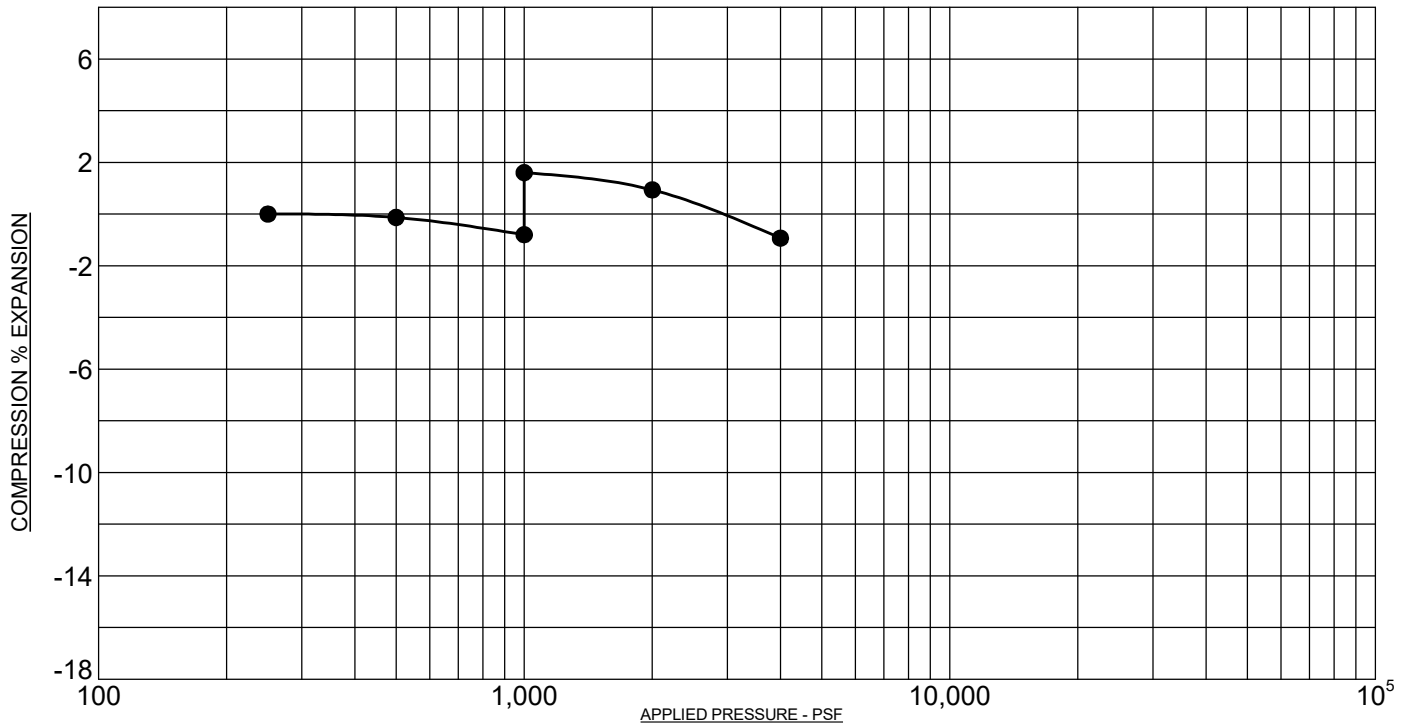
FIGURE No. 112

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-2 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **107.7 PCF**
 NATURAL MOISTURE CONTENT: **9.4%**
 PERCENT SWELL/COMPRESSION: **- 0.8**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-3 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **111.7 PCF**
 NATURAL MOISTURE CONTENT: **10.0%**
 PERCENT SWELL/COMPRESSION: **2.4**

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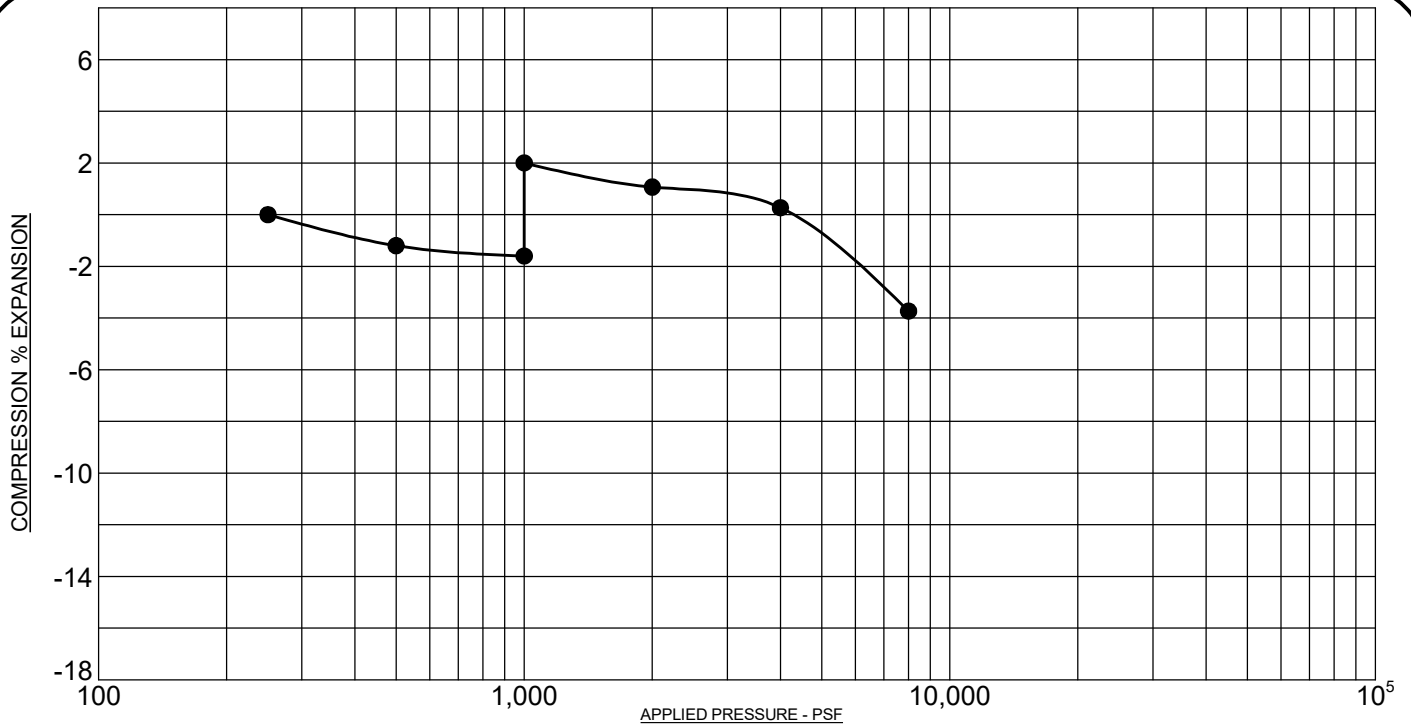
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

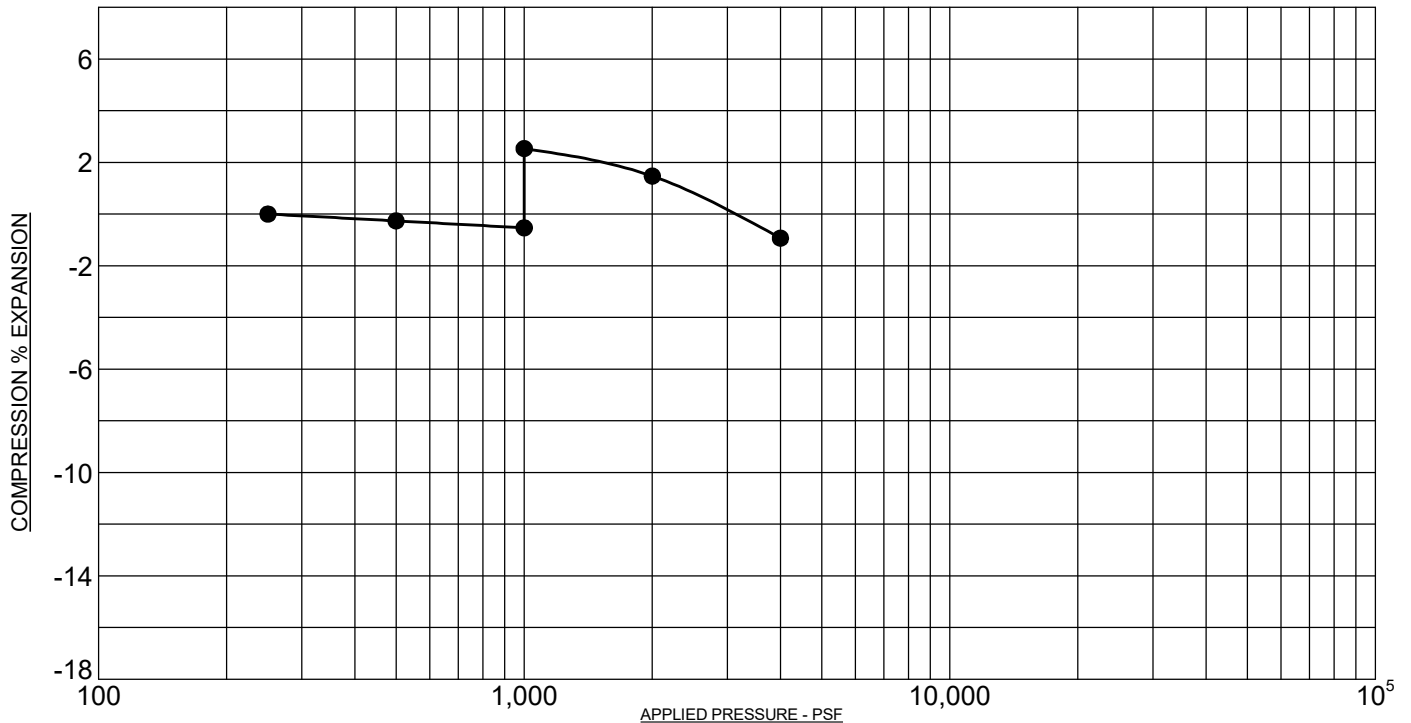
FIGURE No. 113

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-4 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **124.3 PCF**
 NATURAL MOISTURE CONTENT: **8.9%**
 PERCENT SWELL/COMPRESSION: **3.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-5 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **114.2 PCF**
 NATURAL MOISTURE CONTENT: **9.7%**
 PERCENT SWELL/COMPRESSION: **3.1**

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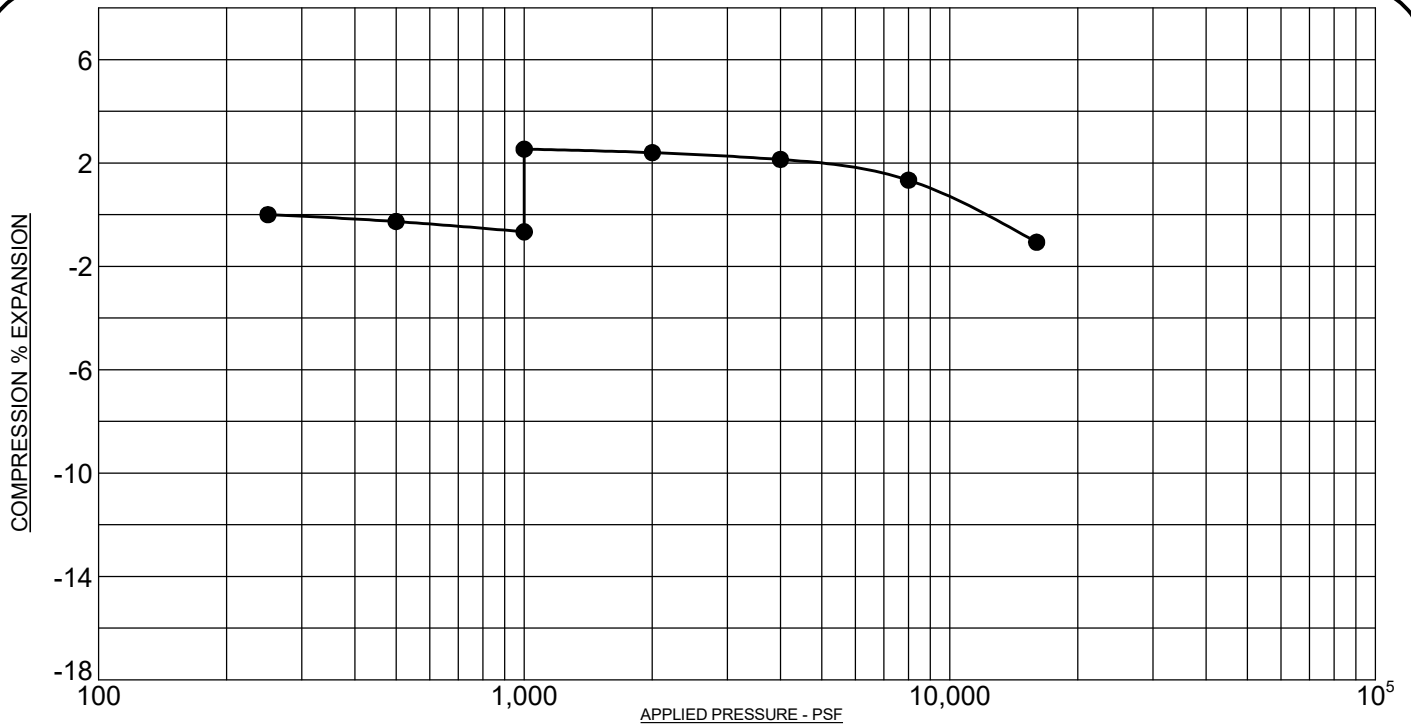
Geotechnical
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JOB No. 175706

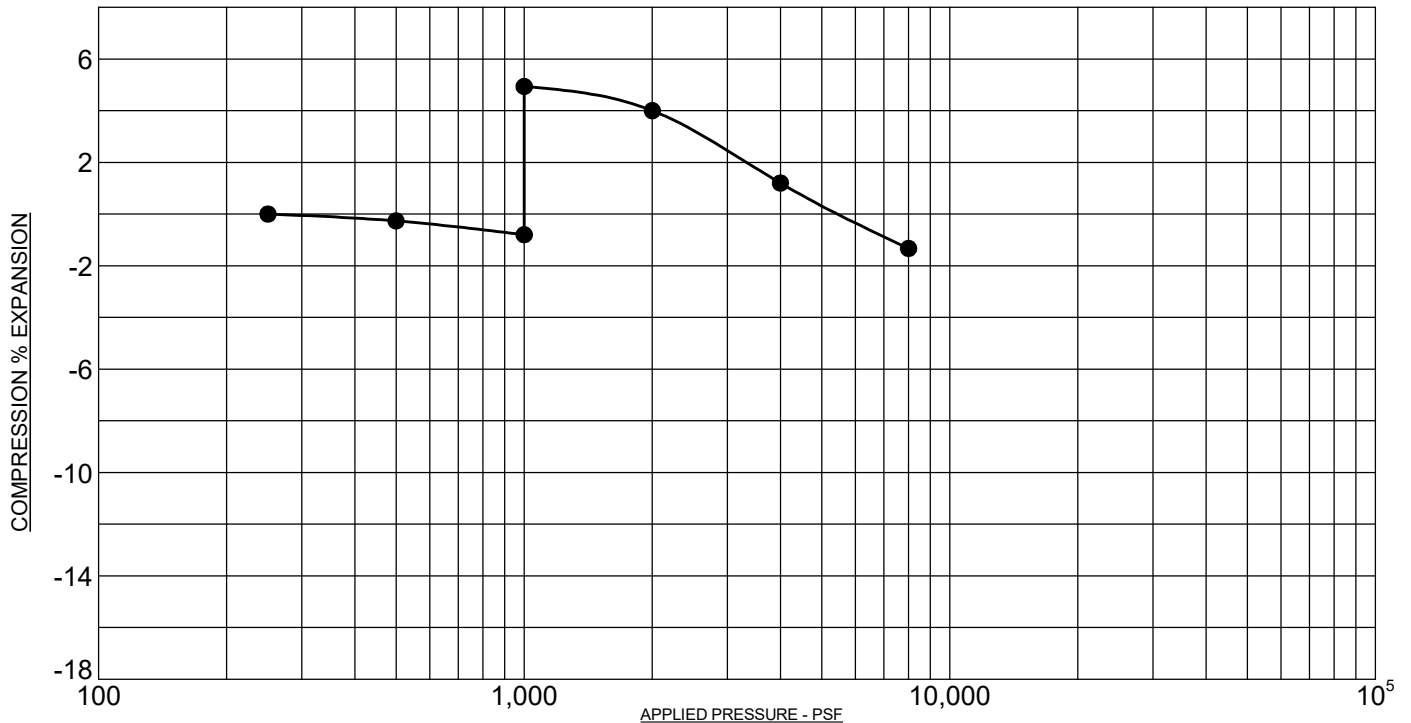
FIGURE No. 114

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-6 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **126.9 PCF**
 NATURAL MOISTURE CONTENT: **8.9%**
 PERCENT SWELL/COMPRESSION: **3.2**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-7 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **128.3 PCF**
 NATURAL MOISTURE CONTENT: **7.3%**
 PERCENT SWELL/COMPRESSION: **5.7**

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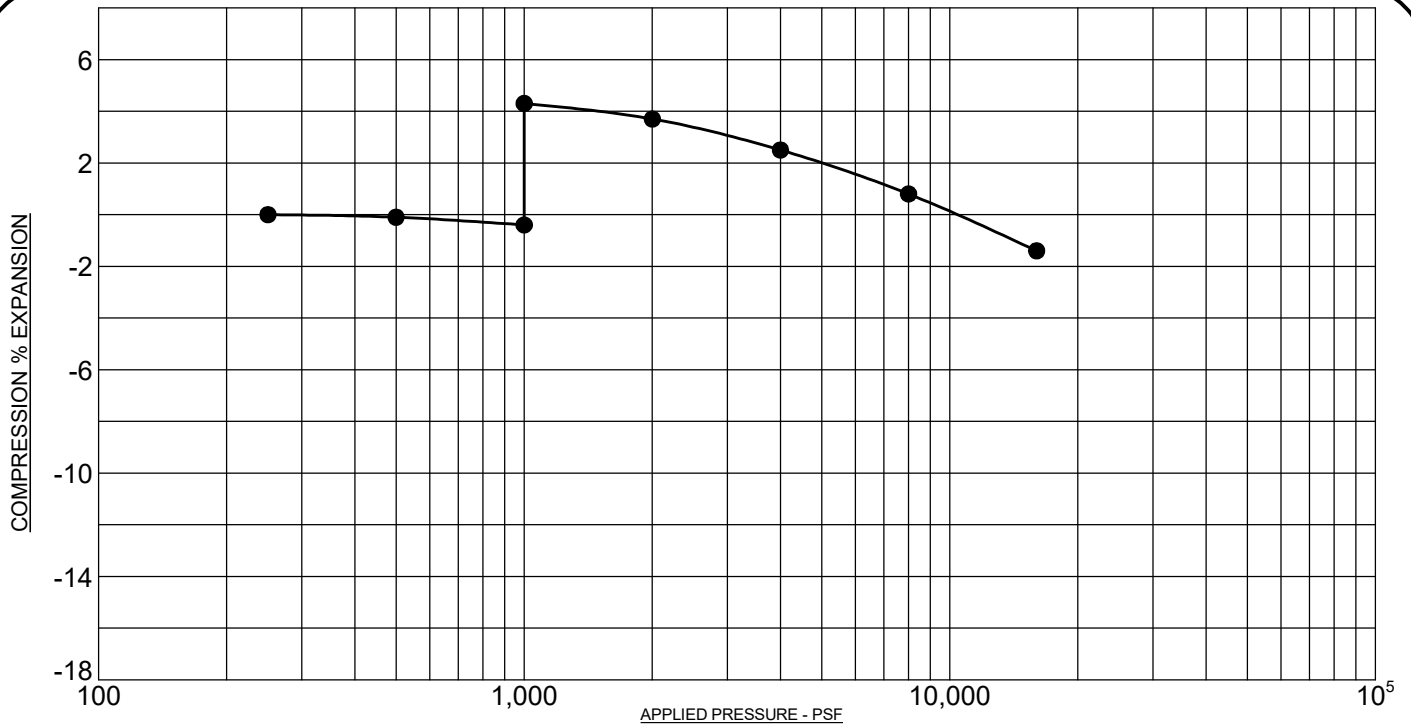
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

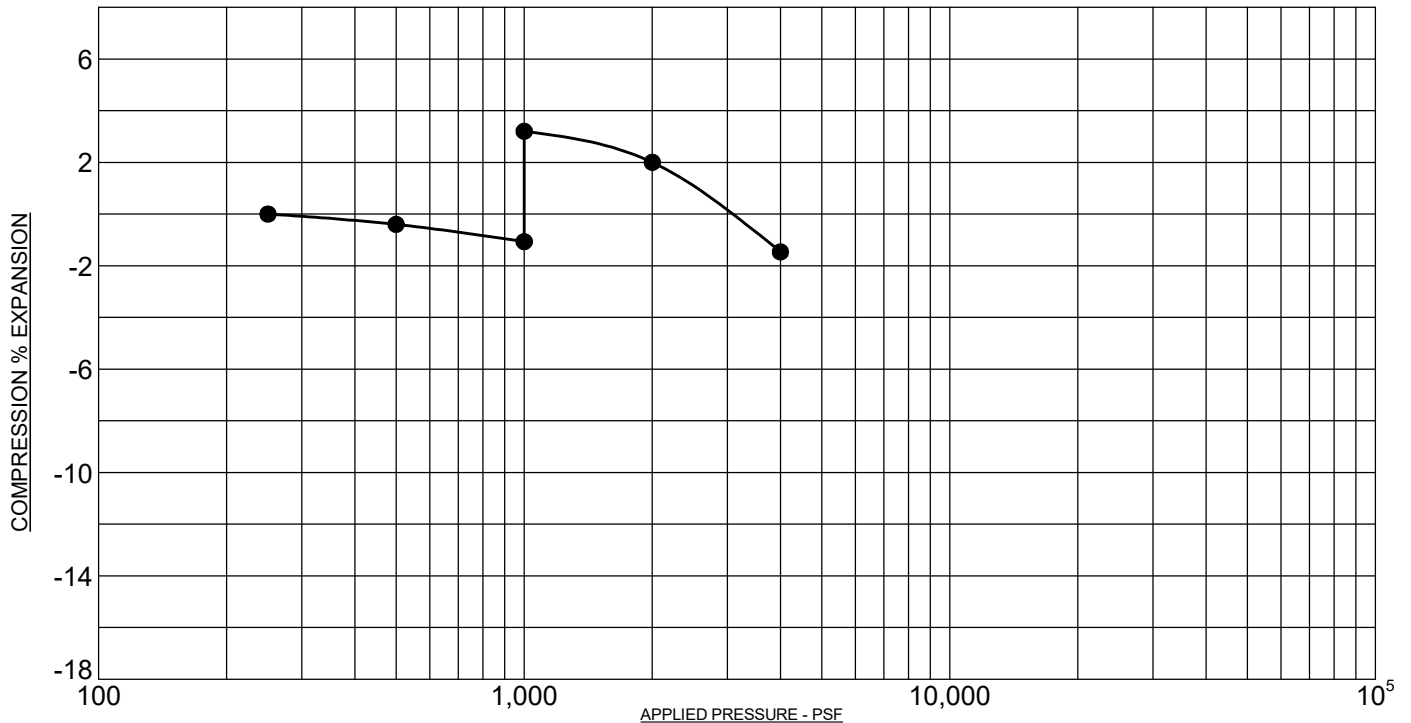
FIGURE No. 115

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-8 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **115.5 PCF**
 NATURAL MOISTURE CONTENT: **17.0%**
 PERCENT SWELL/COMPRESSION: **4.7**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-9 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **112.3 PCF**
 NATURAL MOISTURE CONTENT: **11.0%**
 PERCENT SWELL/COMPRESSION: **4.3**

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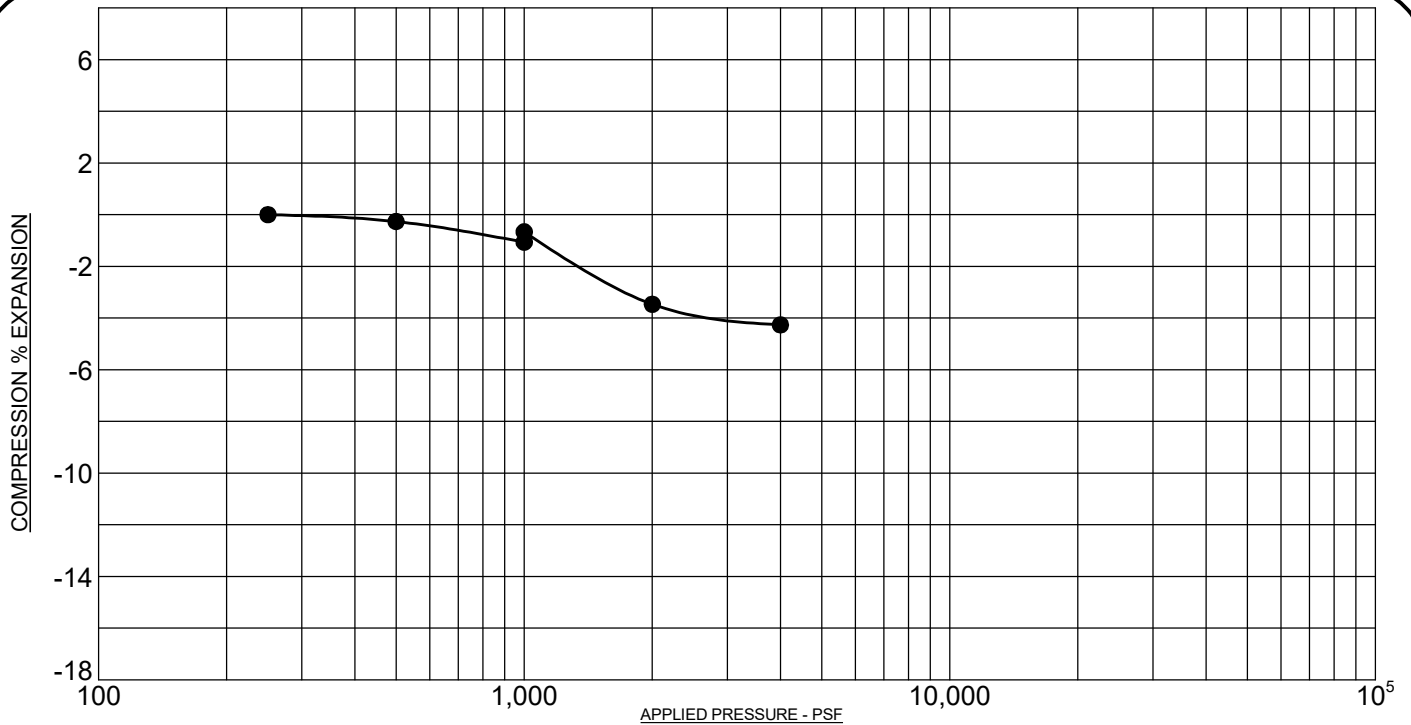
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

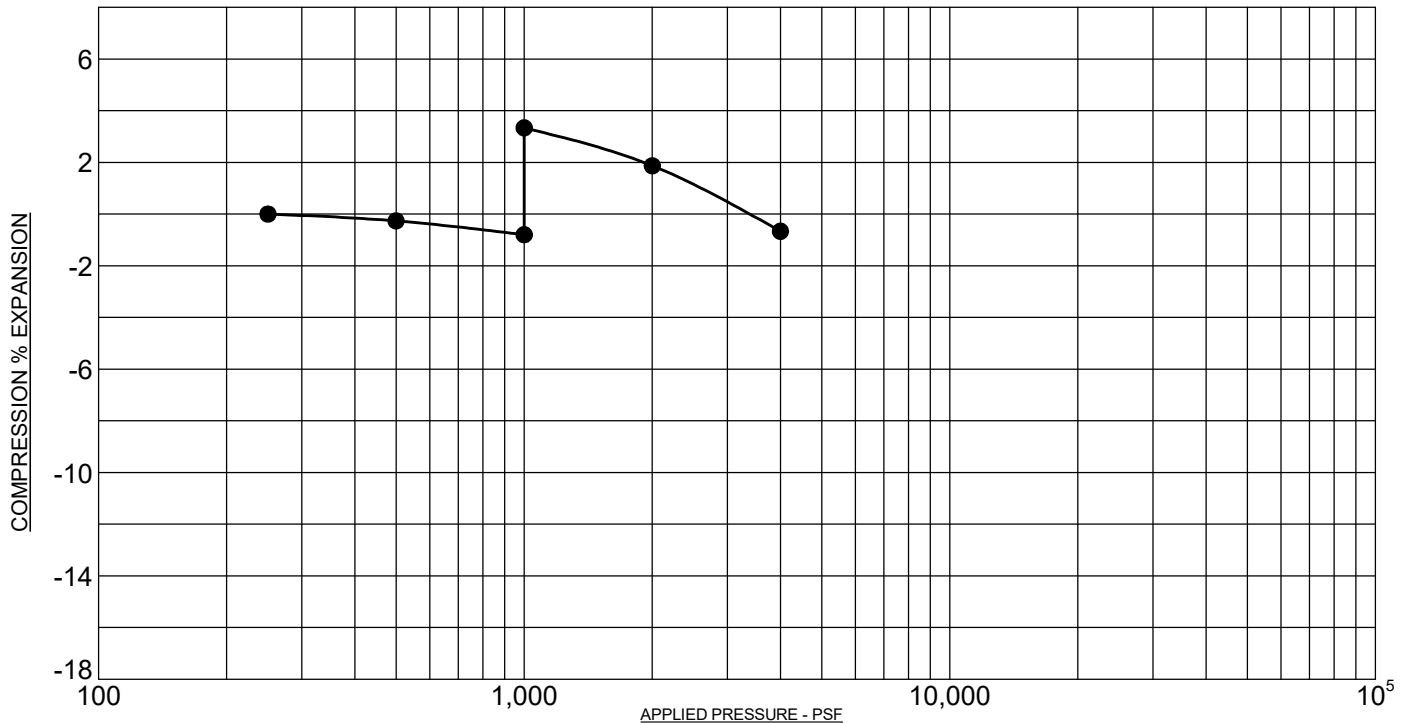
FIGURE No. 116

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-10 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **122.0 PCF**
 NATURAL MOISTURE CONTENT: **11.4%**
 PERCENT SWELL/COMPRESSION: **0.4**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-11 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **122.8 PCF**
 NATURAL MOISTURE CONTENT: **10.8%**
 PERCENT SWELL/COMPRESSION: **4.1**

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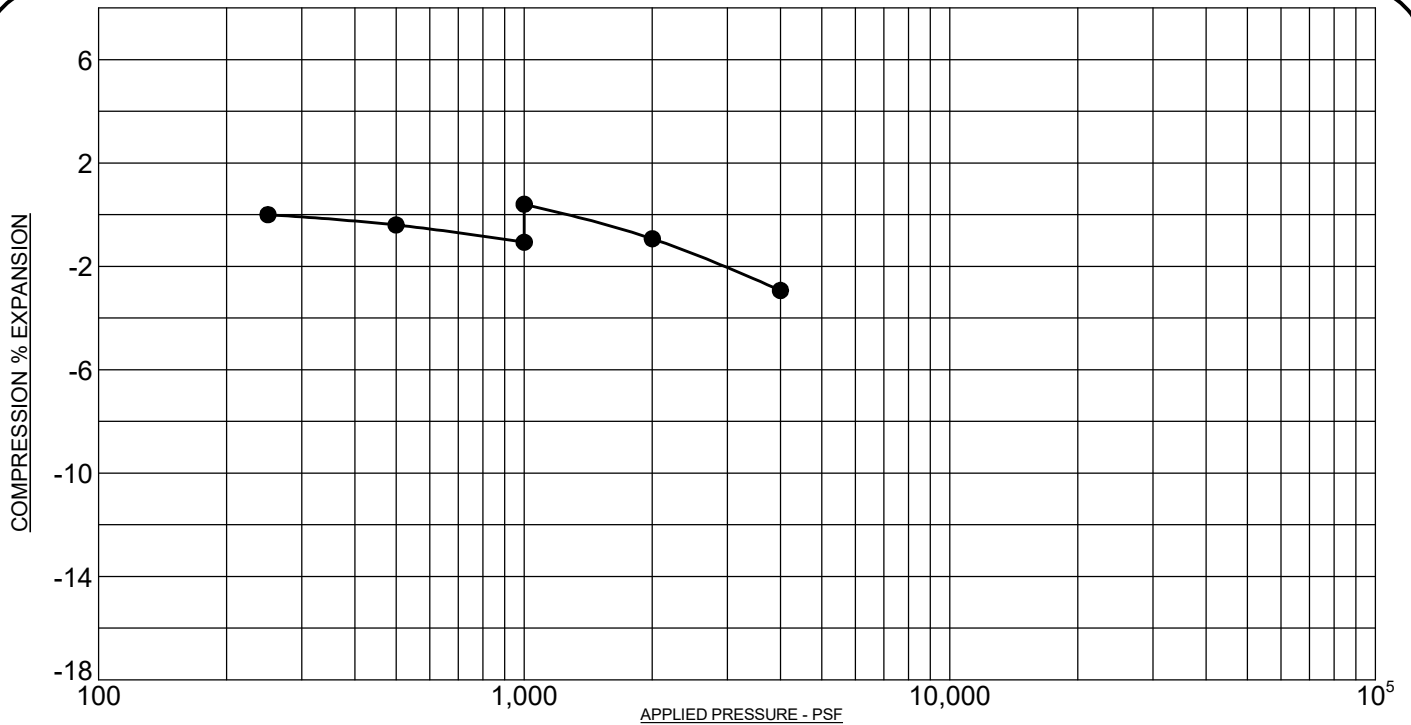
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

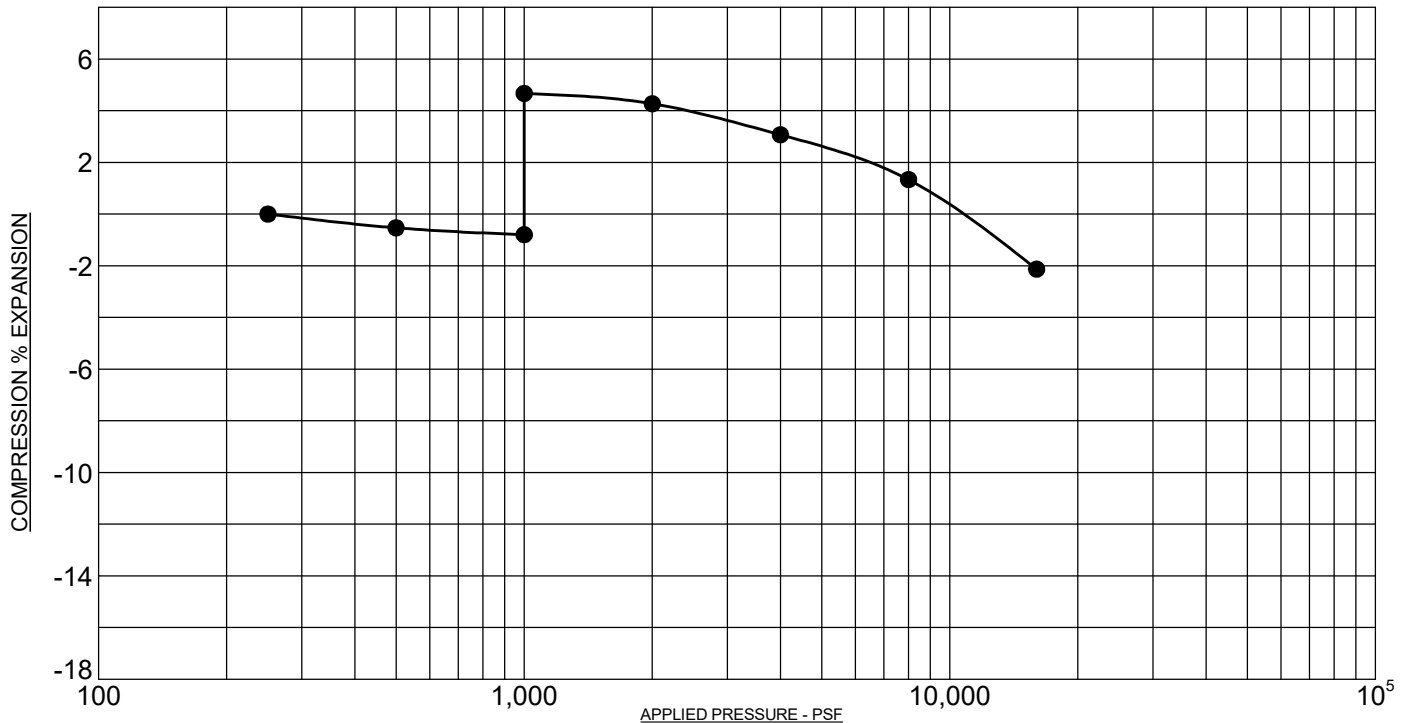
FIGURE No. 117

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-12 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **116.0 PCF**
 NATURAL MOISTURE CONTENT: **9.2%**
 PERCENT SWELL/COMPRESSION: **1.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-13 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **127.4 PCF**
 NATURAL MOISTURE CONTENT: **8.2%**
 PERCENT SWELL/COMPRESSION: **5.5**

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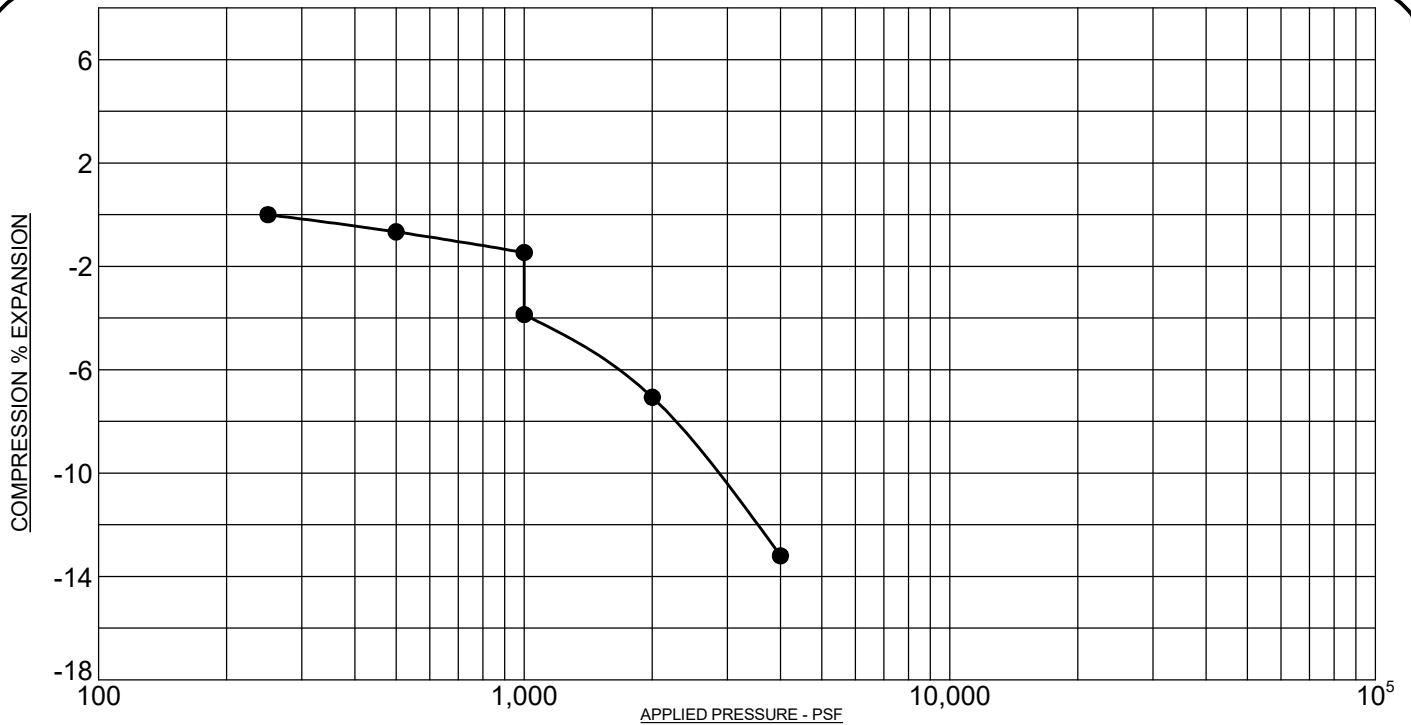
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

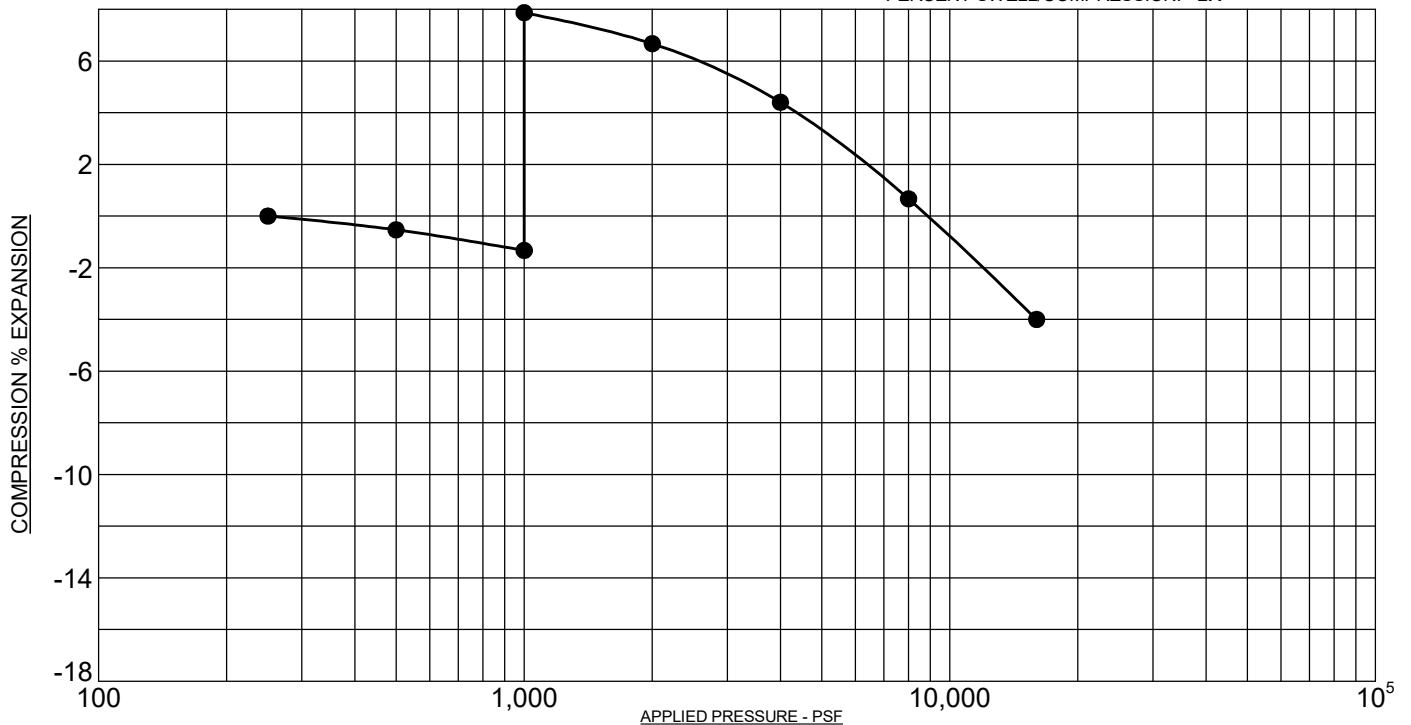
FIGURE No. 118

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-14 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **94.0 PCF**
 NATURAL MOISTURE CONTENT: **9.7%**
 PERCENT SWELL/COMPRESSION: **- 2.4**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-15 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **126.6 PCF**
 NATURAL MOISTURE CONTENT: **13.2%**
 PERCENT SWELL/COMPRESSION: **9.2**

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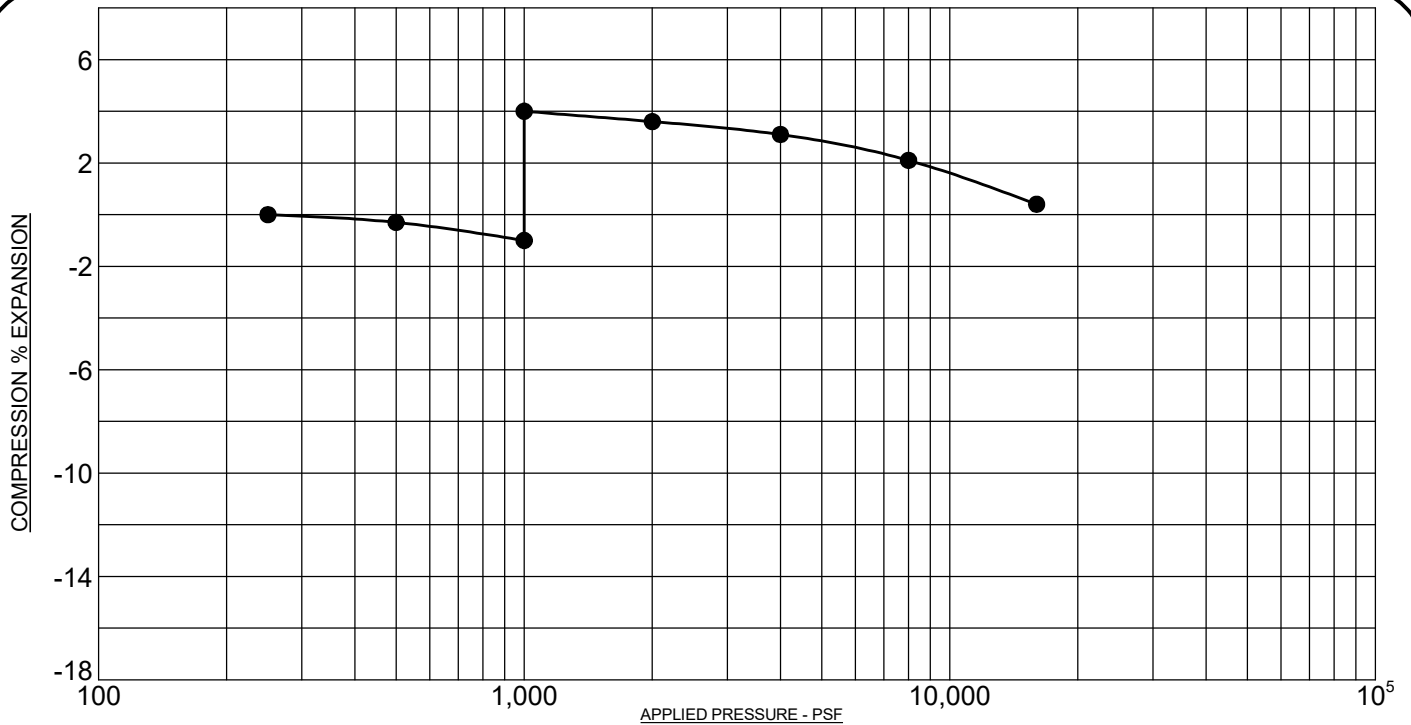
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

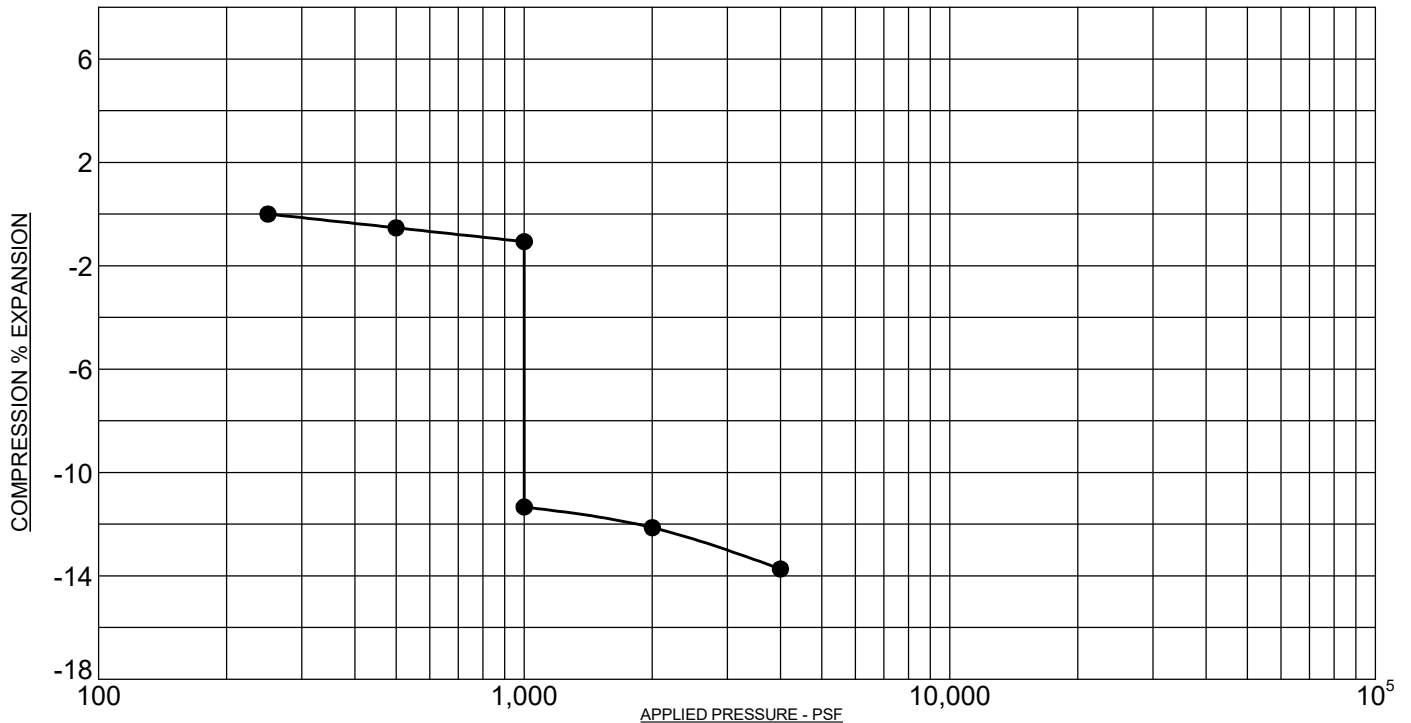
FIGURE No. 119

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-16 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **127.6 PCF**
 NATURAL MOISTURE CONTENT: **10.3%**
 PERCENT SWELL/COMPRESSION: **5.0**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-17 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **124.1 PCF**
 NATURAL MOISTURE CONTENT: **10.9%**
 PERCENT SWELL/COMPRESSION: **- 10.3**

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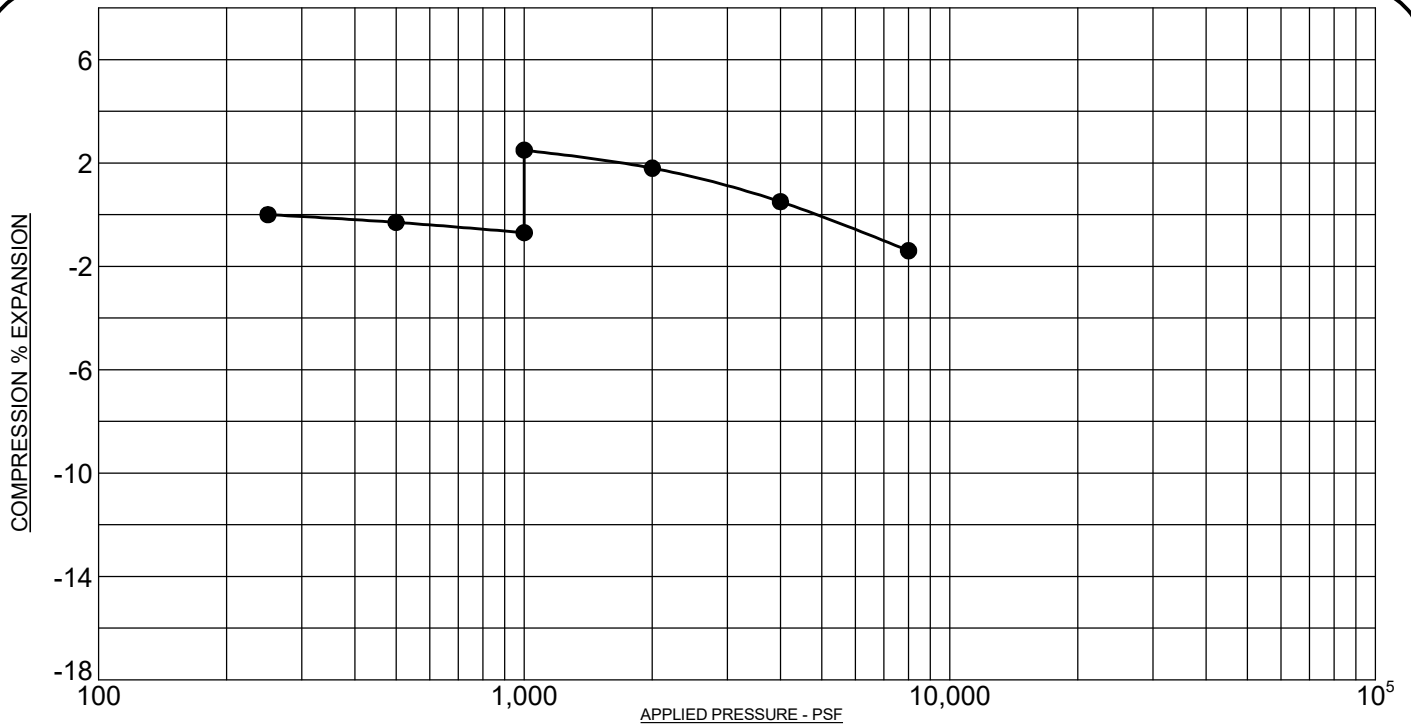
Geotechnical
Materials Testing
Civil, Planning

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JOB No. 175706

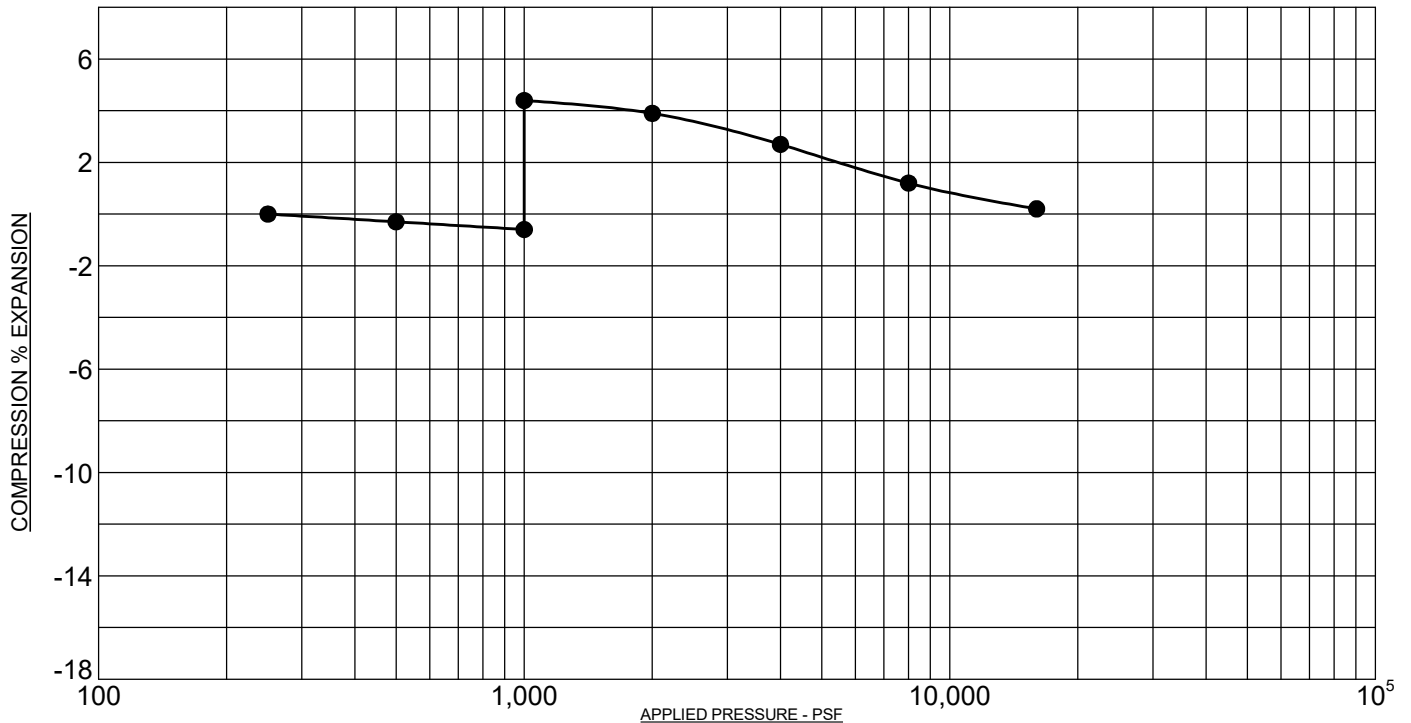
FIGURE No. 120

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-18 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **117.0 PCF**
 NATURAL MOISTURE CONTENT: **11.7%**
 PERCENT SWELL/COMPRESSION: **3.2**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-19 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **122.0 PCF**
 NATURAL MOISTURE CONTENT: **8.9%**
 PERCENT SWELL/COMPRESSION: **5.0**

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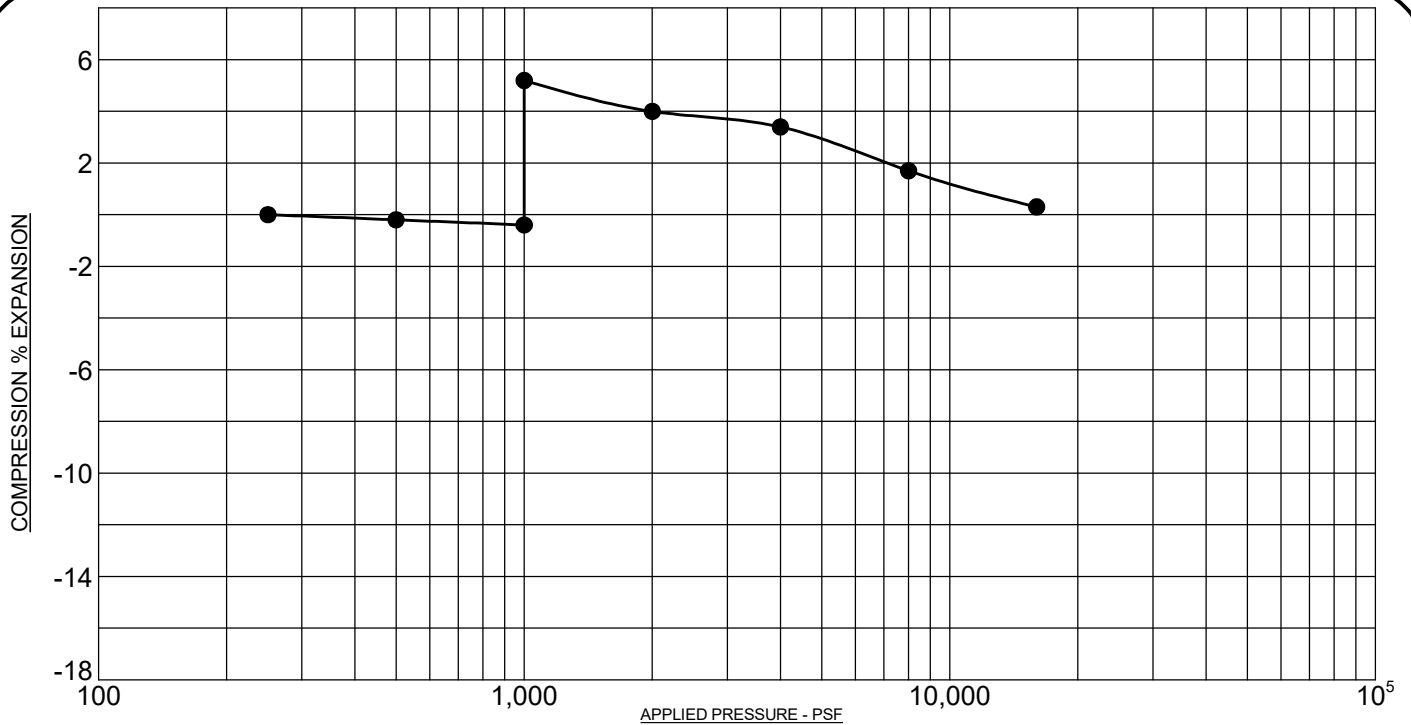
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

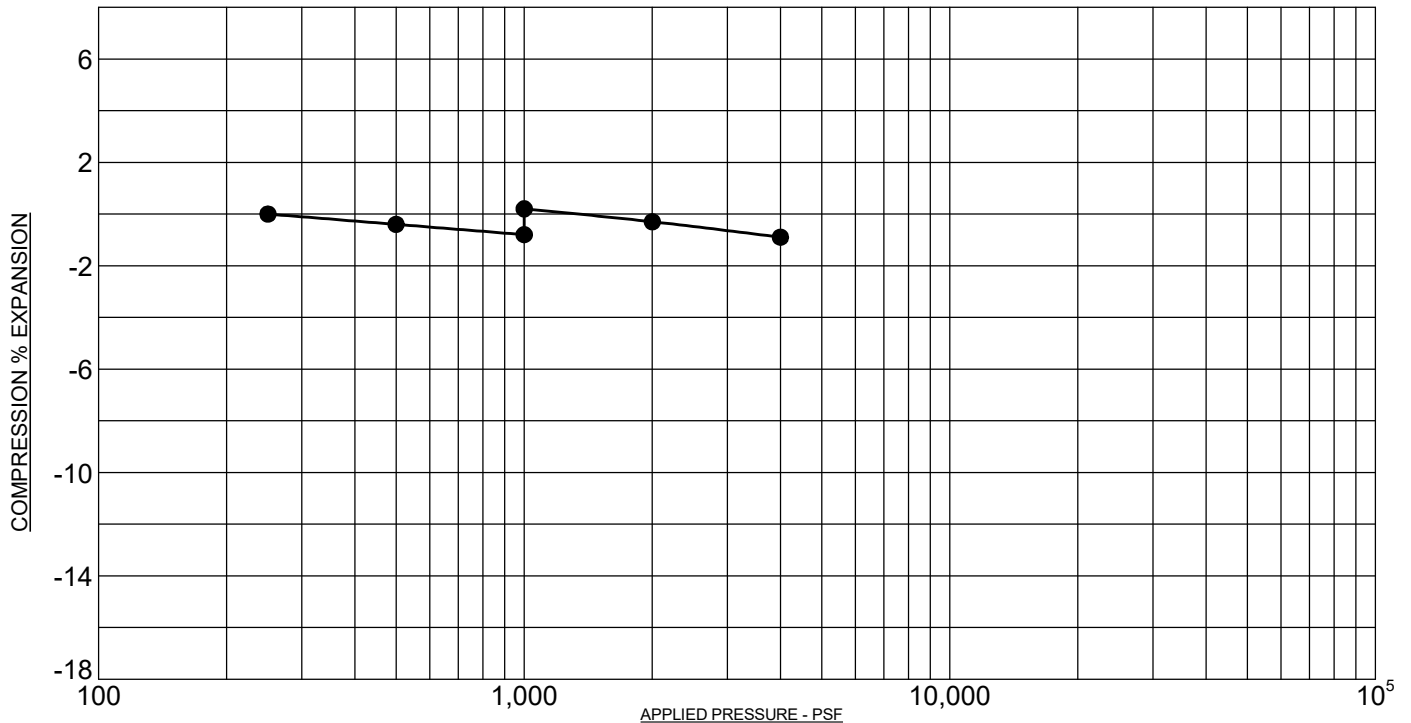
FIGURE No. 121

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-20 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **118.8 PCF**
 NATURAL MOISTURE CONTENT: **7.7%**
 PERCENT SWELL/COMPRESSION: **5.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-21 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **119.7 PCF**
 NATURAL MOISTURE CONTENT: **10.7%**
 PERCENT SWELL/COMPRESSION: **1.0**

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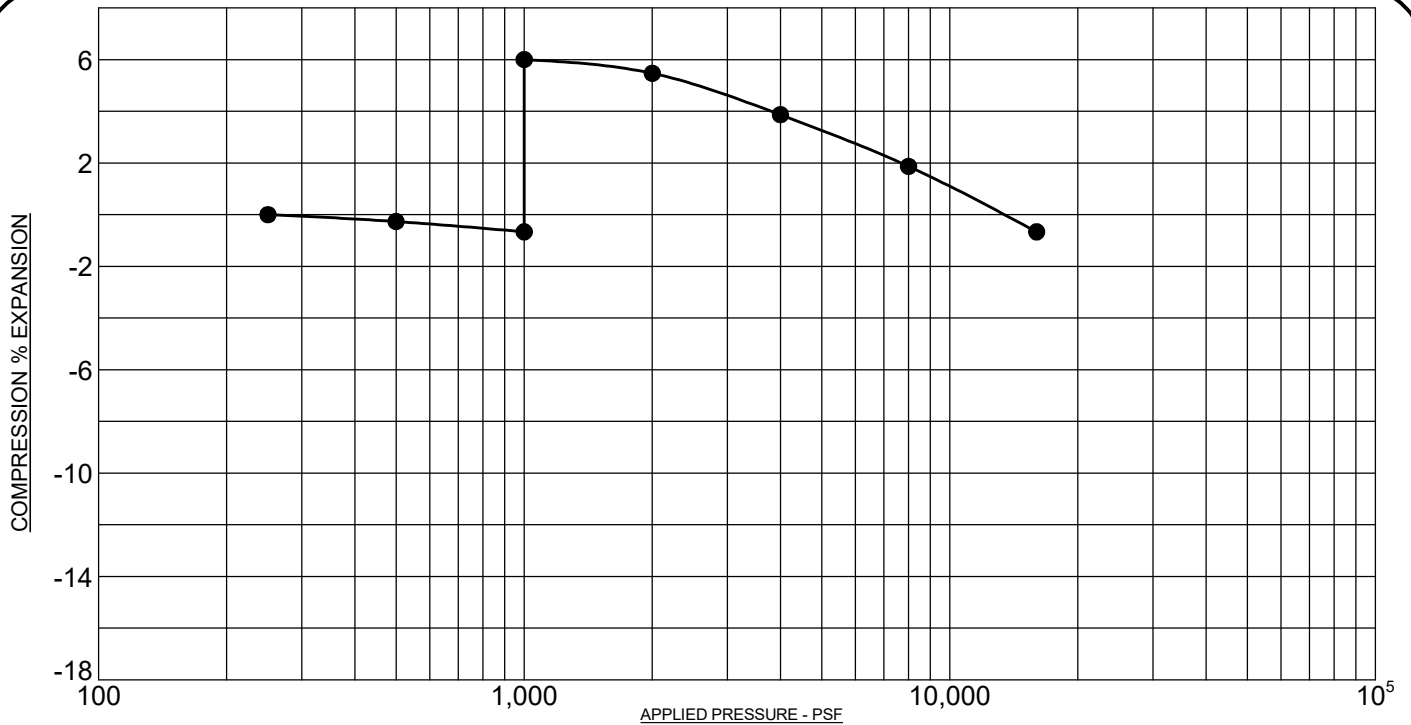
Geotechnical
Materials Testing
Civil, Planning

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JOB No. 175706

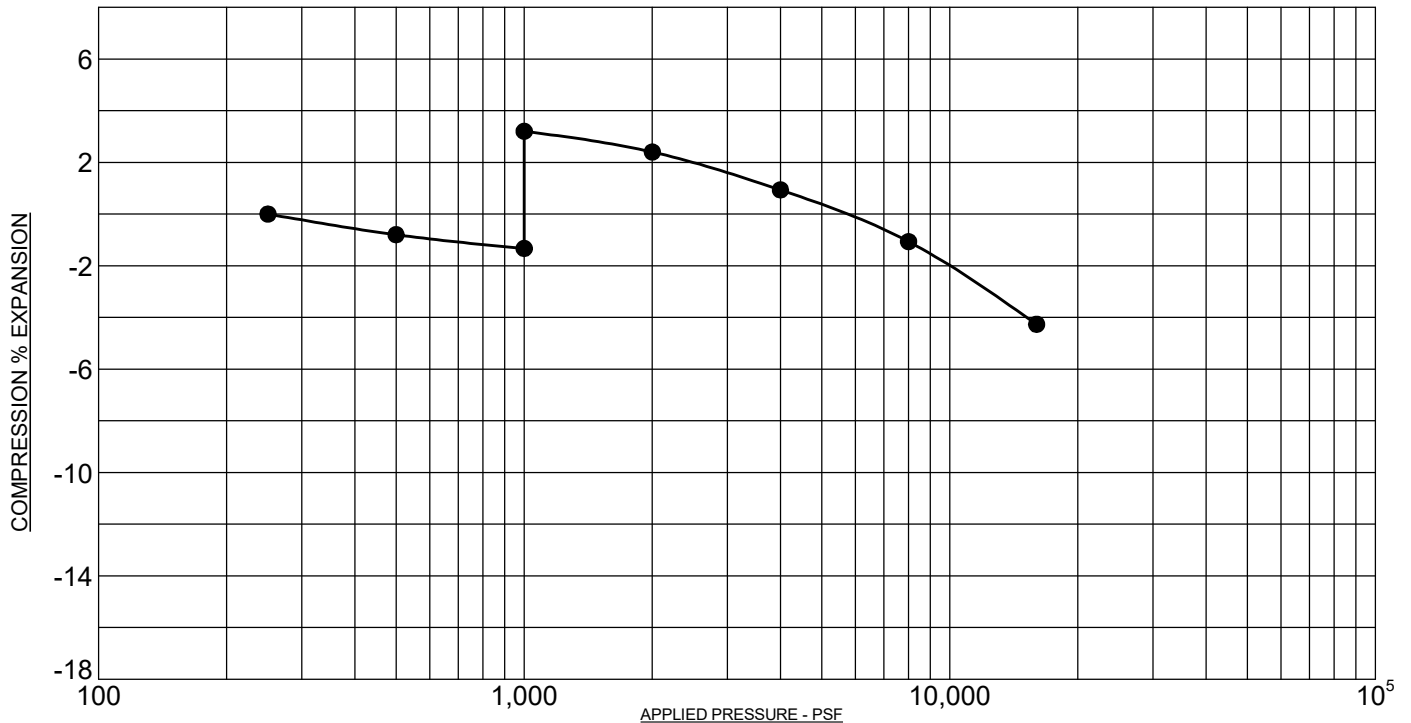
FIGURE No. 122

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-22 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **97.3 PCF**
 NATURAL MOISTURE CONTENT: **9.3%**
 PERCENT SWELL/COMPRESSION: **6.7**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-24 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **120.9 PCF**
 NATURAL MOISTURE CONTENT: **9.8%**
 PERCENT SWELL/COMPRESSION: **4.5**

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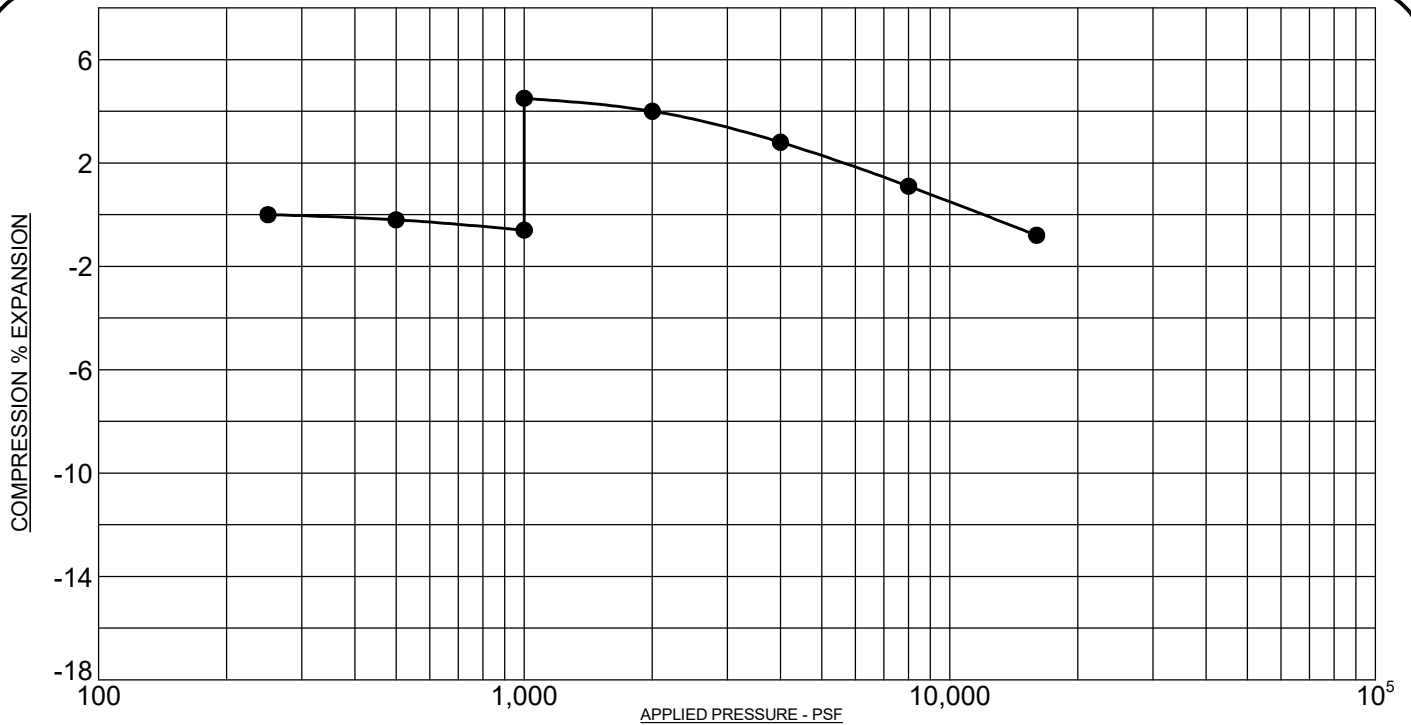
Geotechnical
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

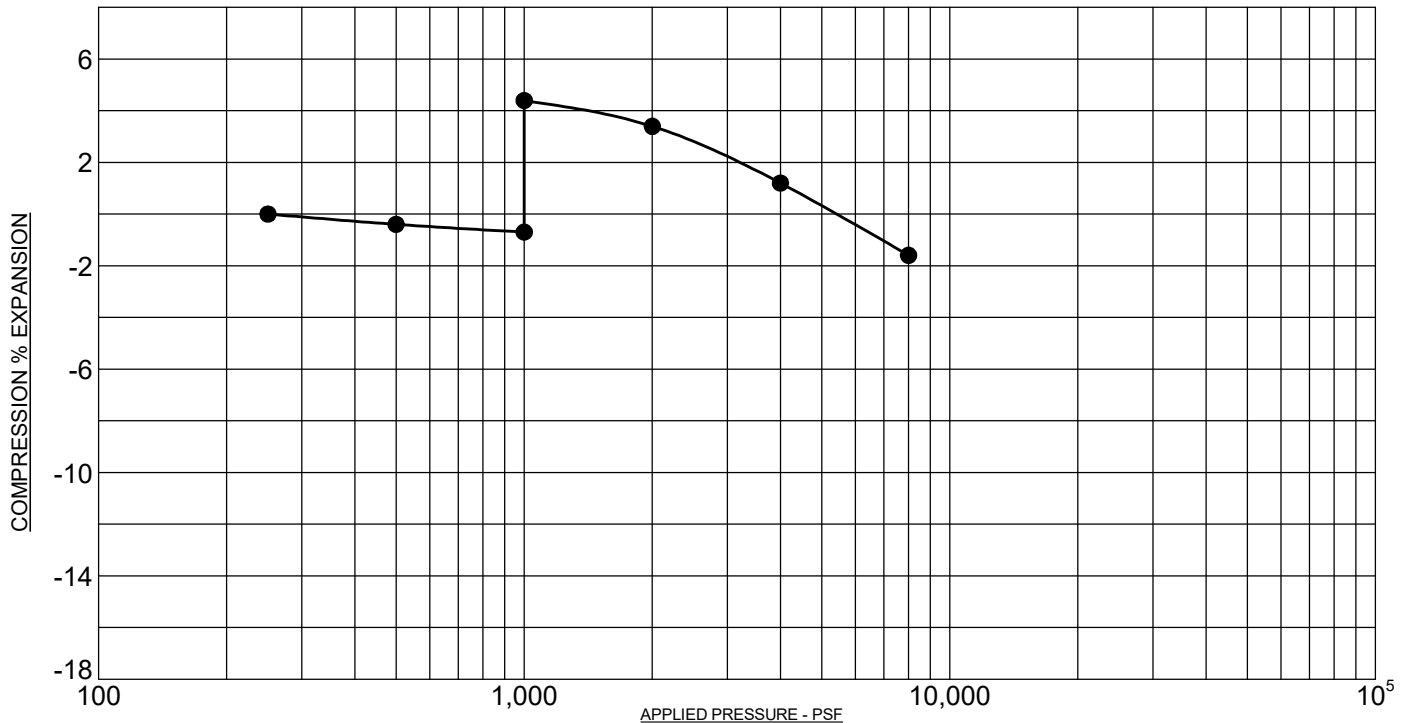
FIGURE No. 123

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-25 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **12.0%**
 PERCENT SWELL/COMPRESSION: **5.1**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-26 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **9.9%**
 PERCENT SWELL/COMPRESSION: **5.1**

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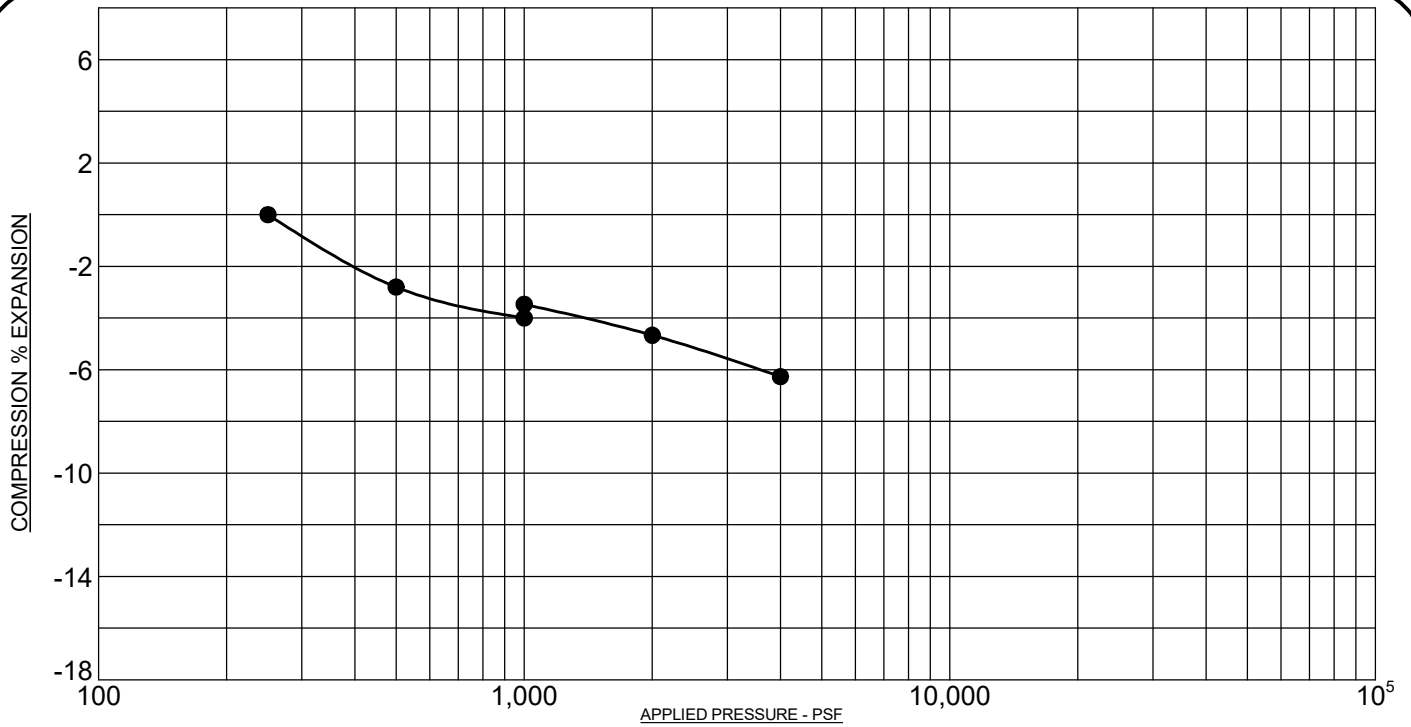
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

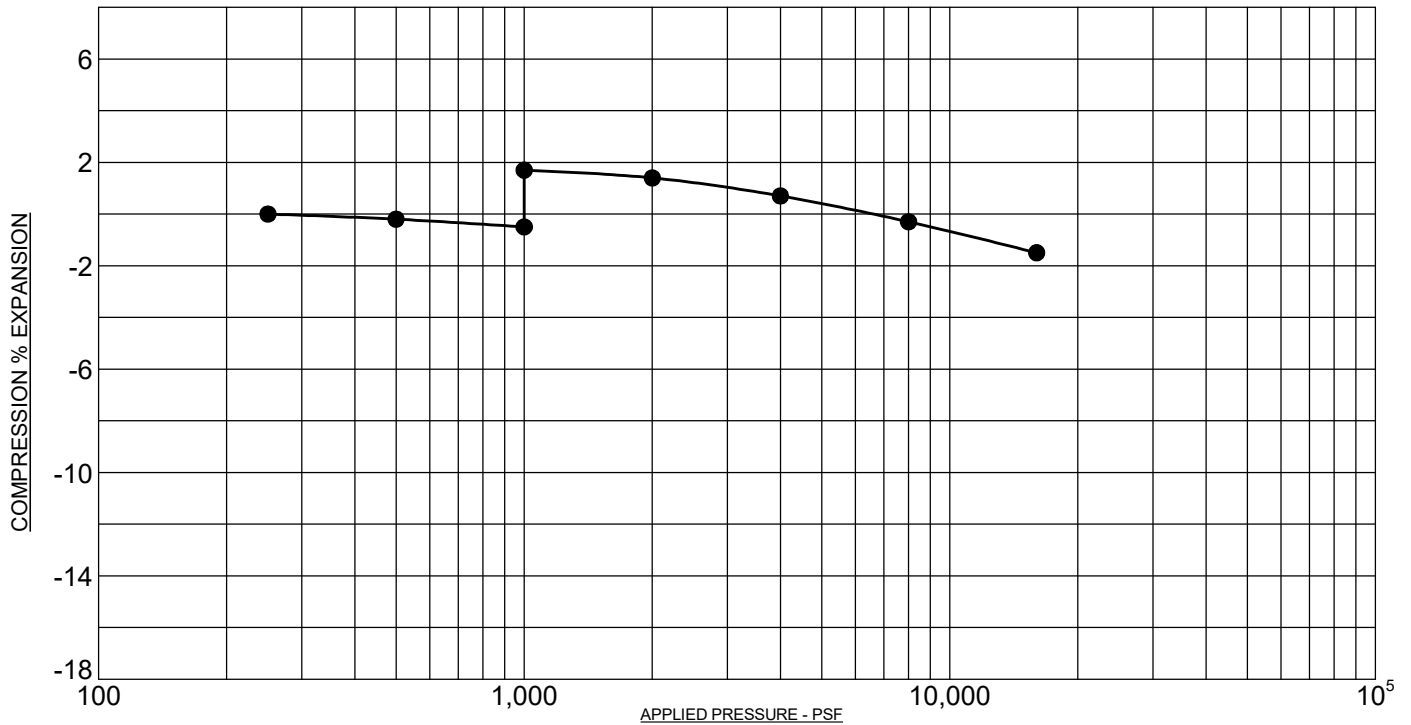
FIGURE No. 124

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-27 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **111.6 PCF**
 NATURAL MOISTURE CONTENT: **14.6%**
 PERCENT SWELL/COMPRESSION: **0.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-28 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **90.9 PCF**
 NATURAL MOISTURE CONTENT: **14.2%**
 PERCENT SWELL/COMPRESSION: **2.2**

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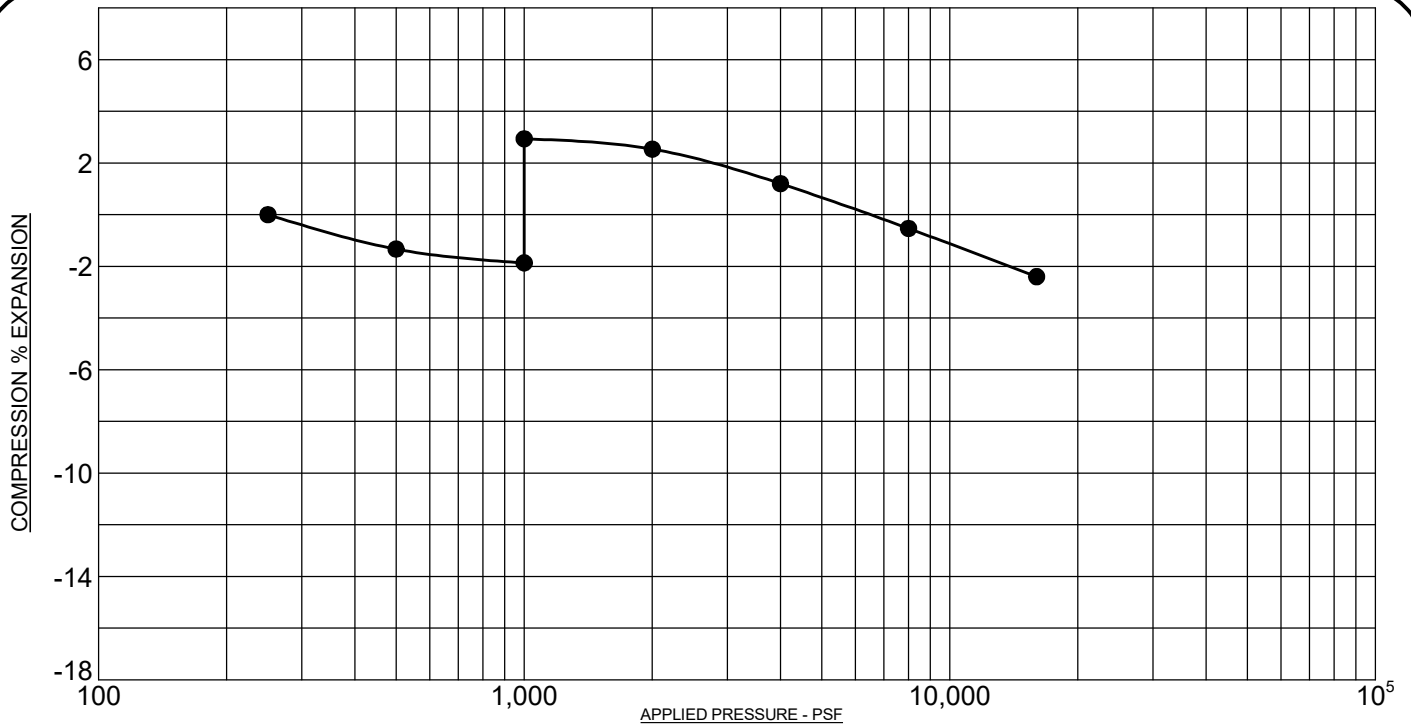
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

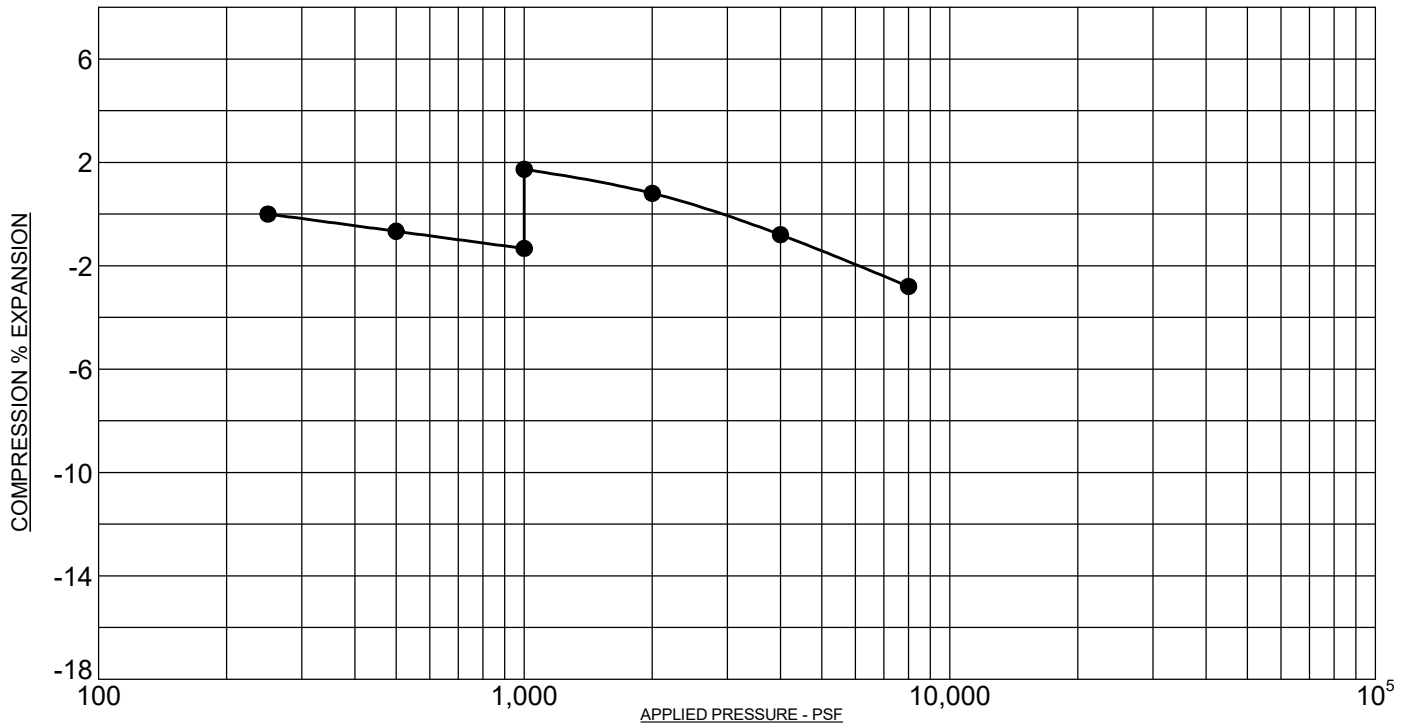
FIGURE No. 125

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-29 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **120.8 PCF**
 NATURAL MOISTURE CONTENT: **11.9%**
 PERCENT SWELL/COMPRESSION: **4.8**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-30 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **115.0 PCF**
 NATURAL MOISTURE CONTENT: **11.7%**
 PERCENT SWELL/COMPRESSION: **3.1**

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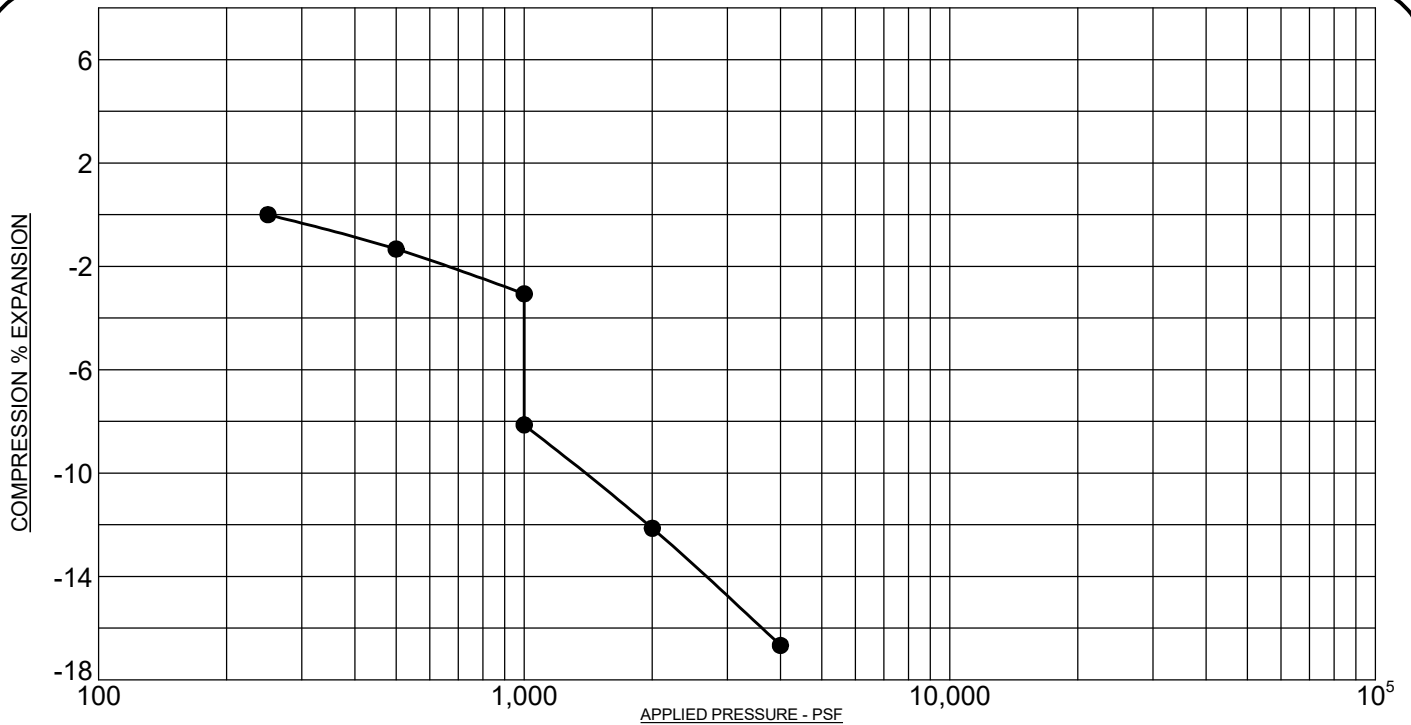
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

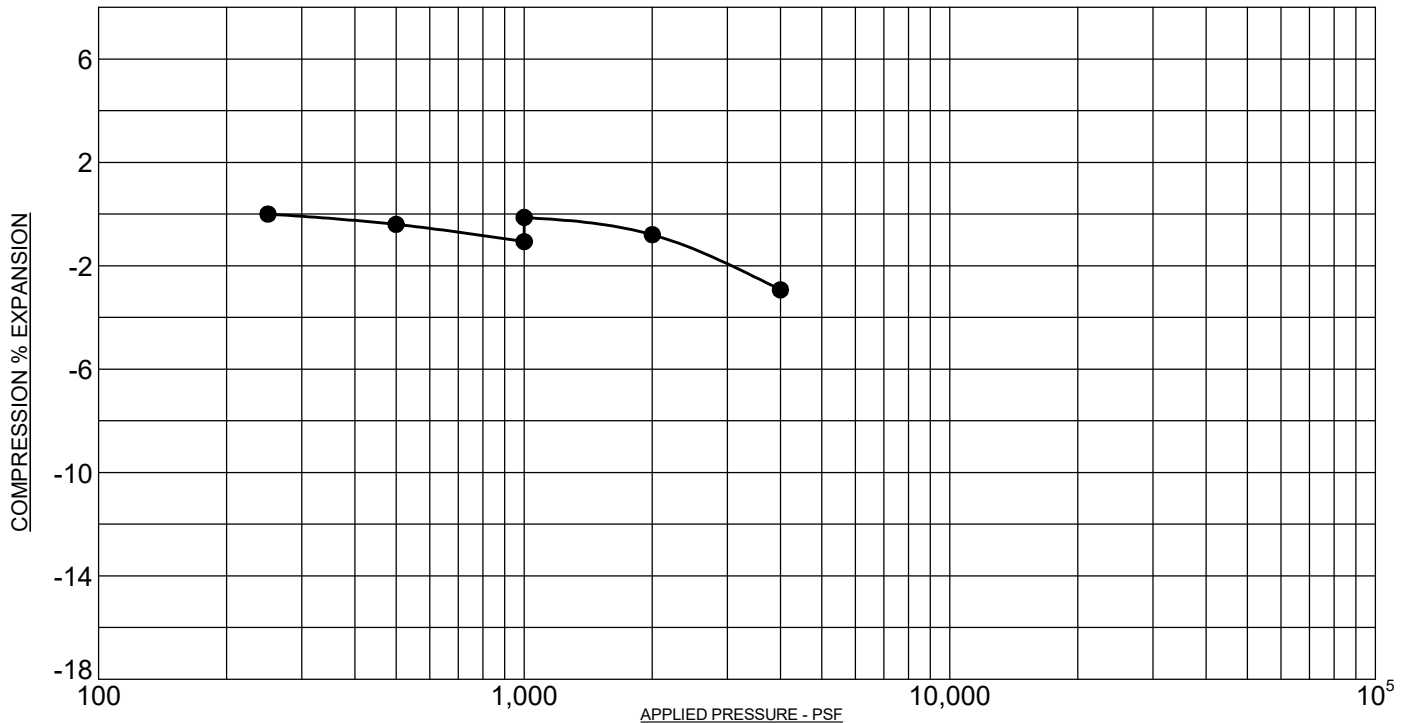
FIGURE No. 126

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-31 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **90.8 PCF**
 NATURAL MOISTURE CONTENT: **13.1%**
 PERCENT SWELL/COMPRESSION: **- 5.1**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-32 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **112.8 PCF**
 NATURAL MOISTURE CONTENT: **8.3%**
 PERCENT SWELL/COMPRESSION: **0.9**

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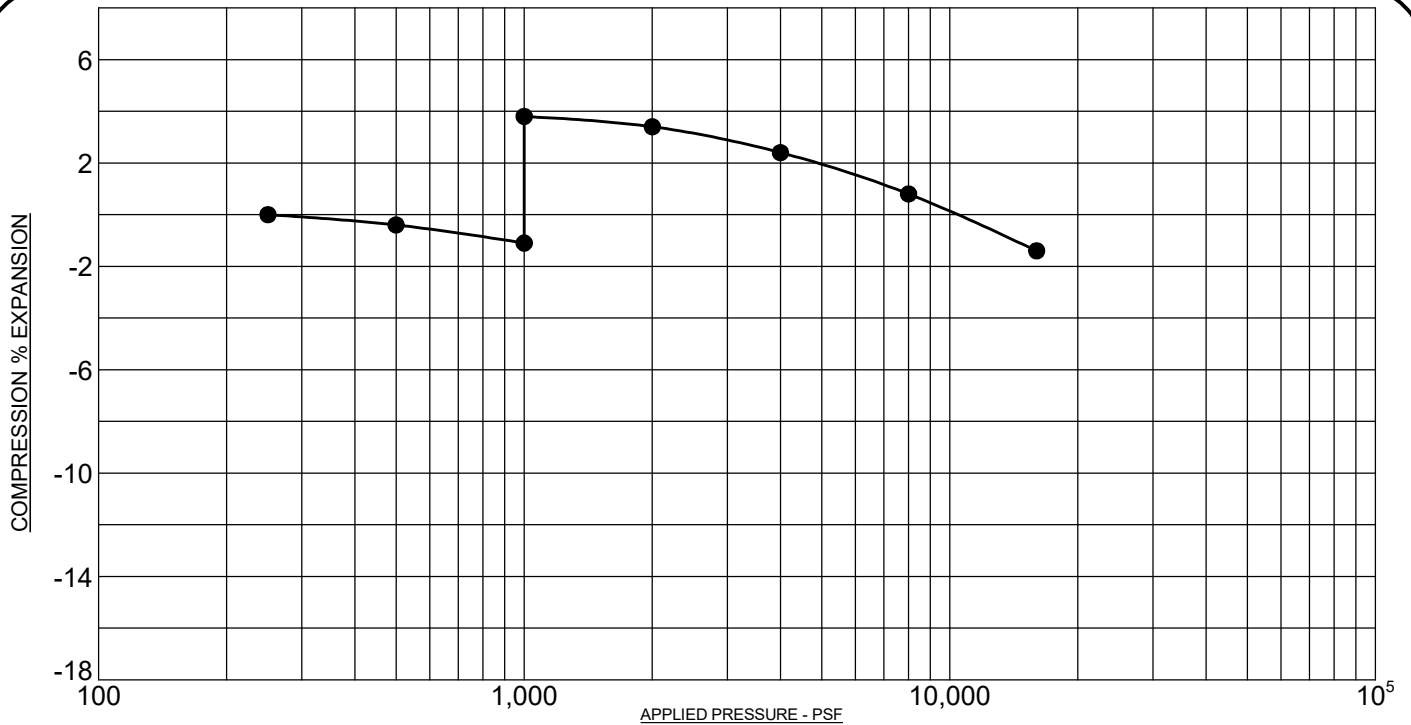
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

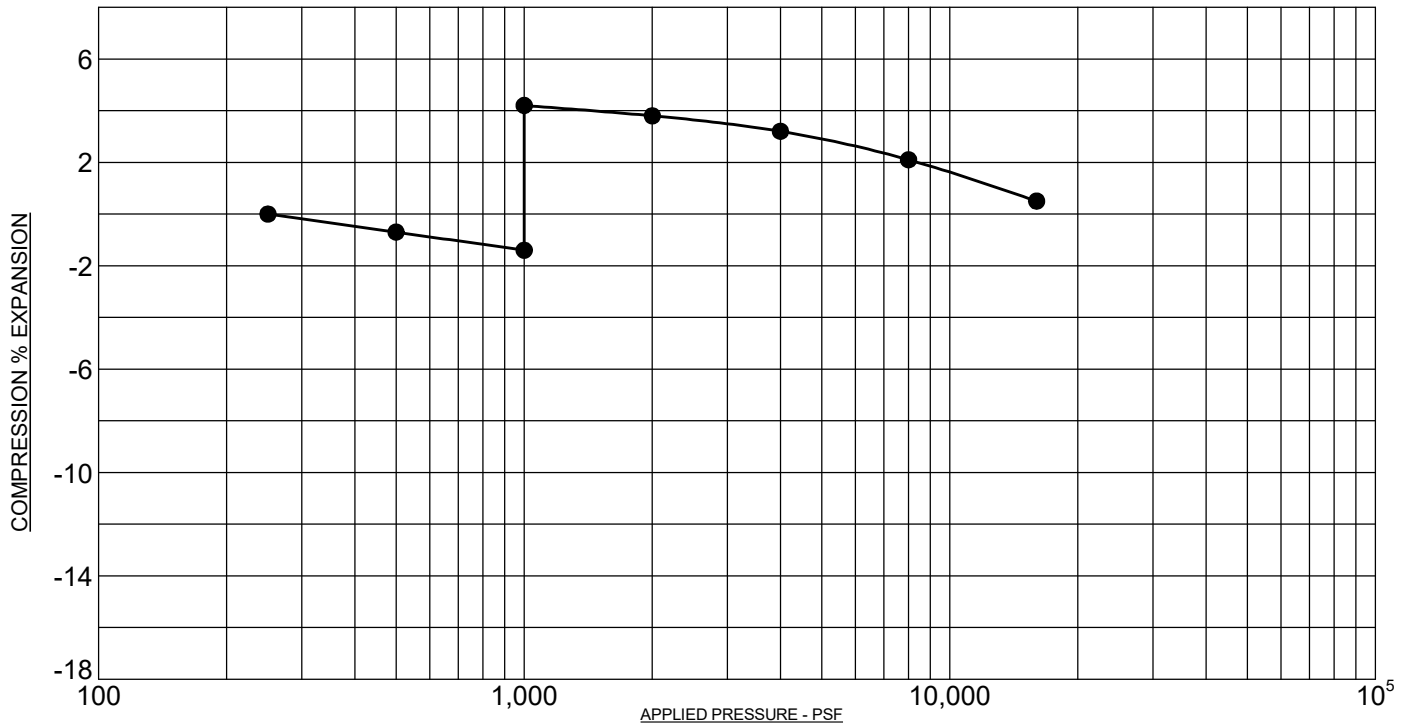
FIGURE No. 127

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-33 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **10.0%**
 PERCENT SWELL/COMPRESSION: **4.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-34 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **11.3%**
 PERCENT SWELL/COMPRESSION: **5.6**

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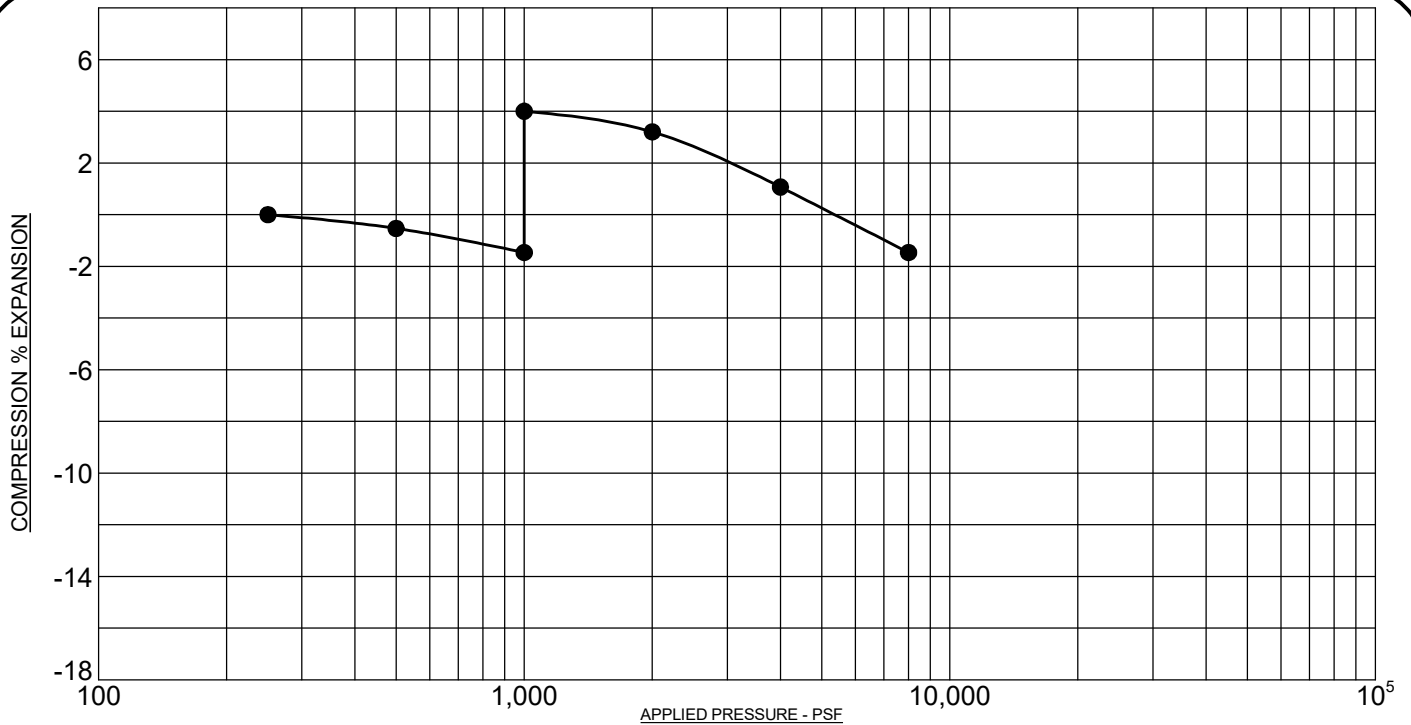
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

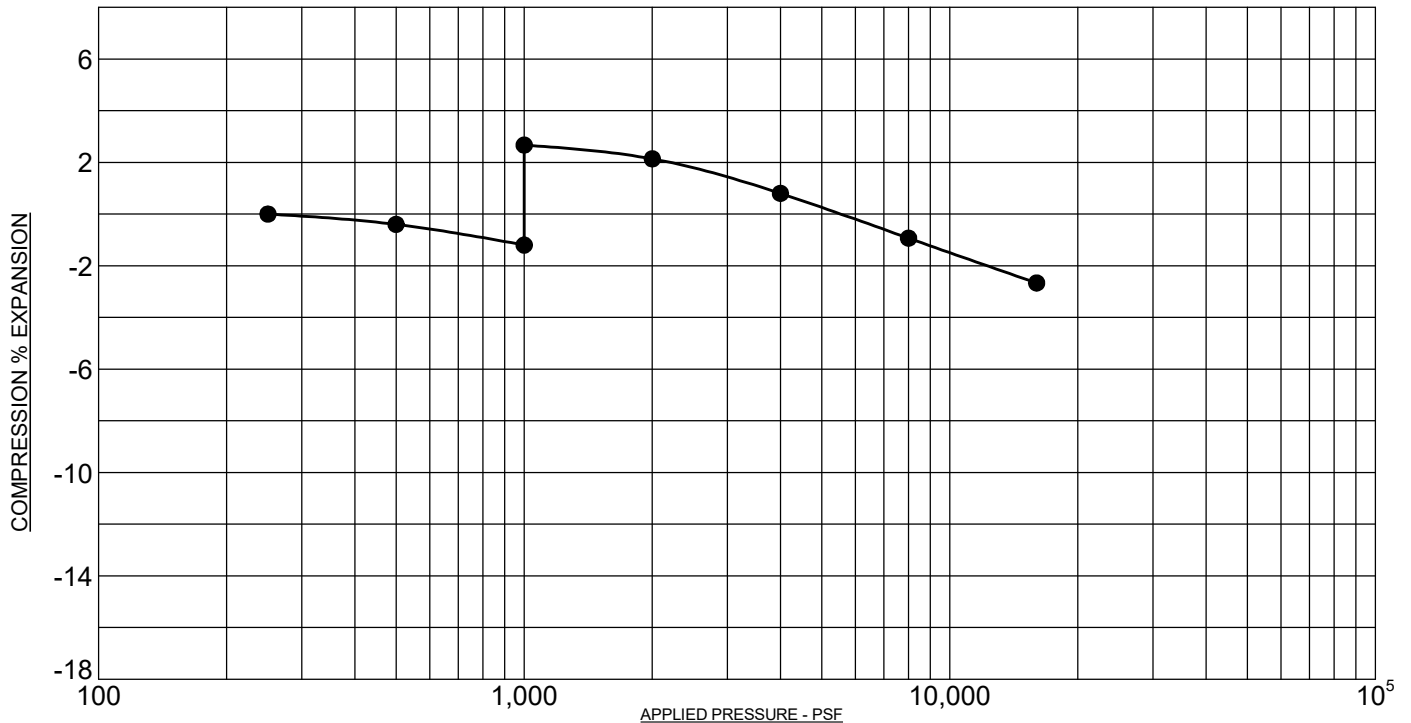
FIGURE No. 128

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-35 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **9.8%**
 PERCENT SWELL/COMPRESSION: **5.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-36 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **11.5%**
 PERCENT SWELL/COMPRESSION: **3.9**

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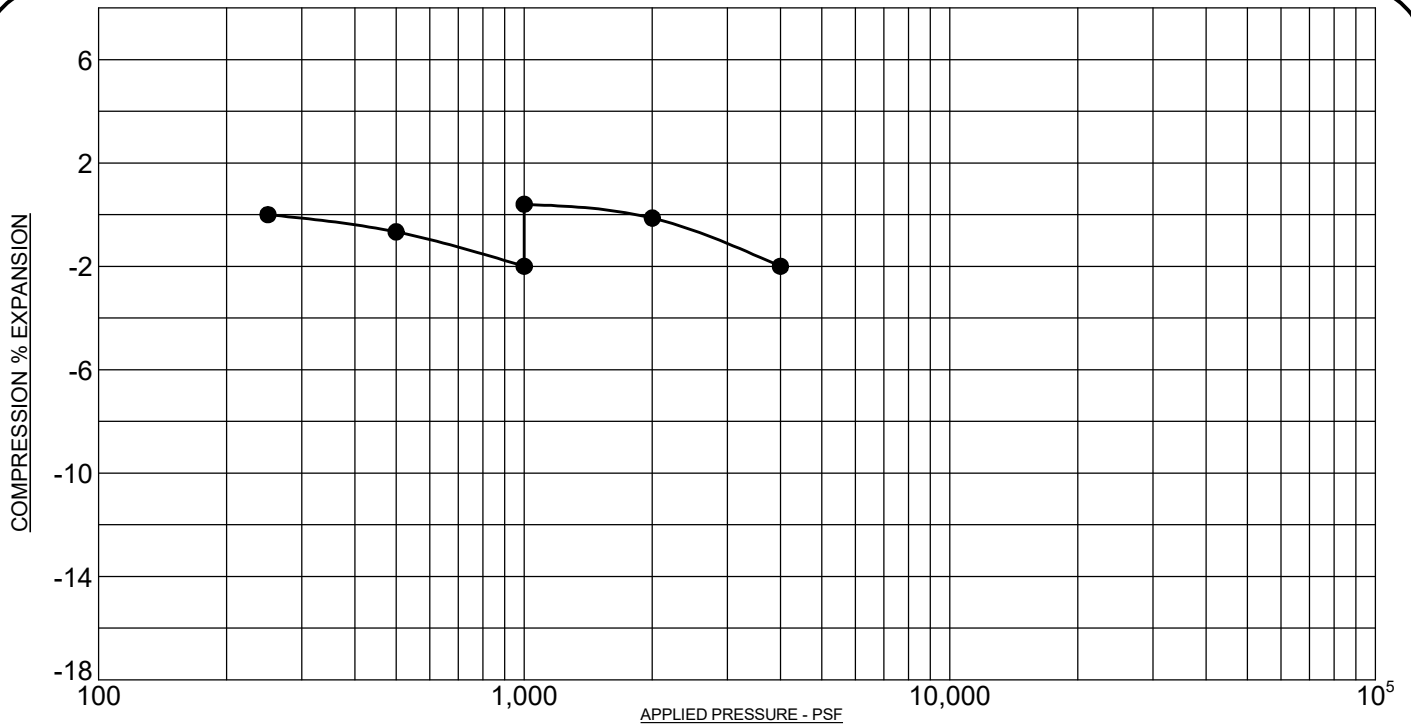
Geotechnical
Materials Testing
Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

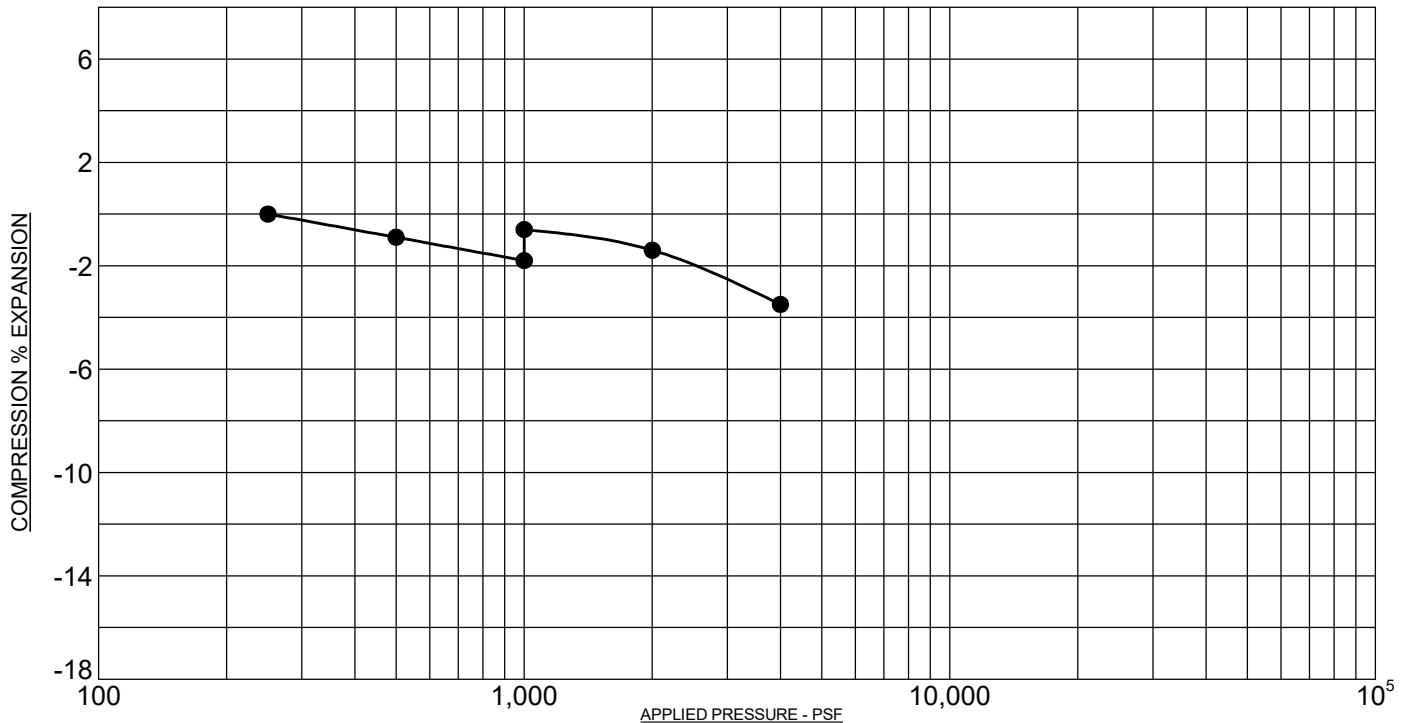
FIGURE No. 129

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-37 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **11.6%**
 PERCENT SWELL/COMPRESSION: **2.4**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-38 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **7.7%**
 PERCENT SWELL/COMPRESSION: **1.2**

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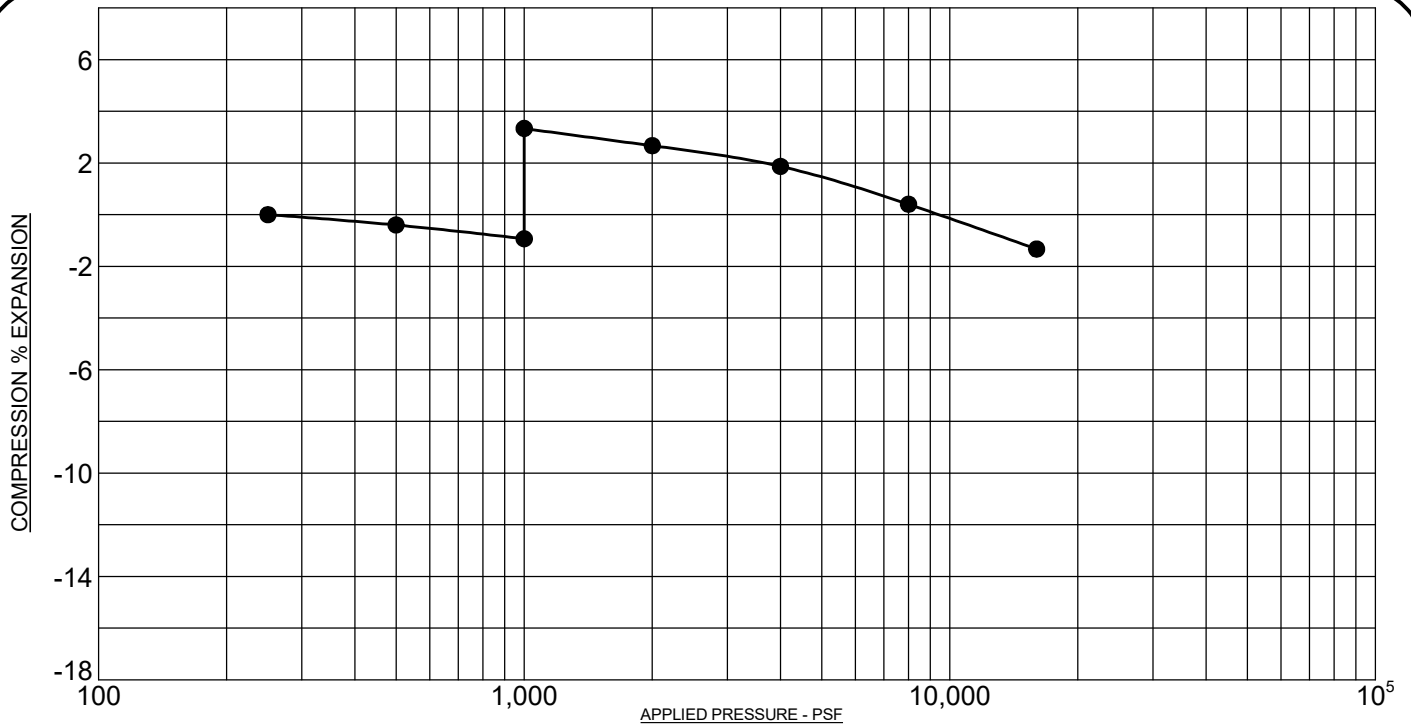
Geotechnical
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Civil, Planning

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JOB No. 175706

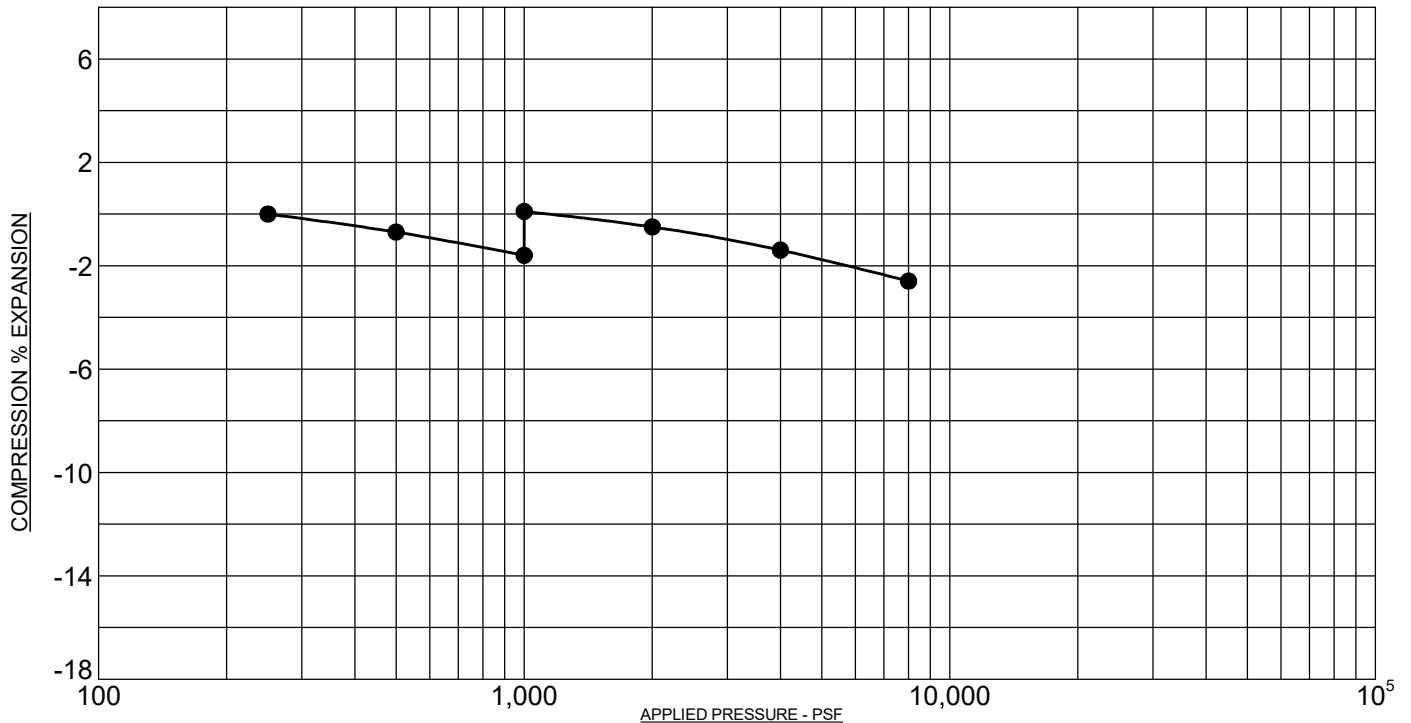
FIGURE No. 130

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **F-39 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **116.2 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **4.3**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-1 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **118.7 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **1.7**

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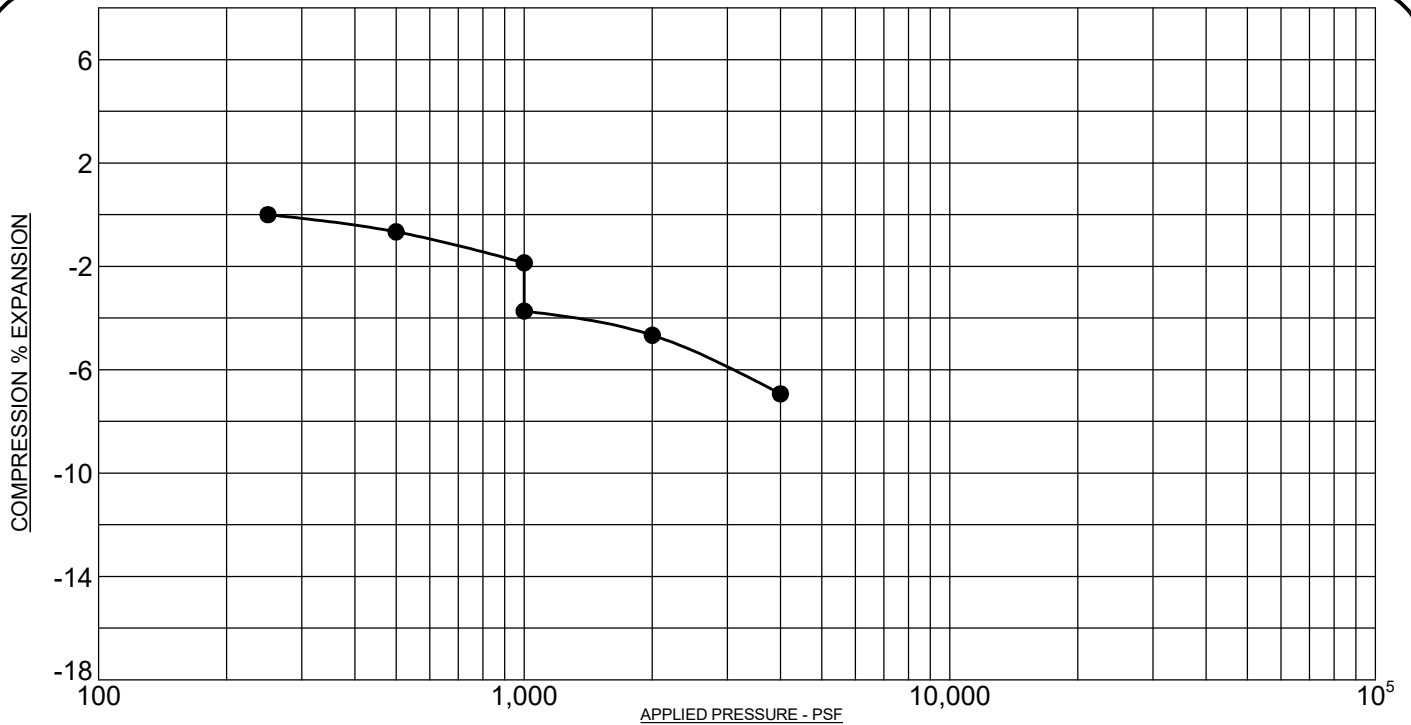
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

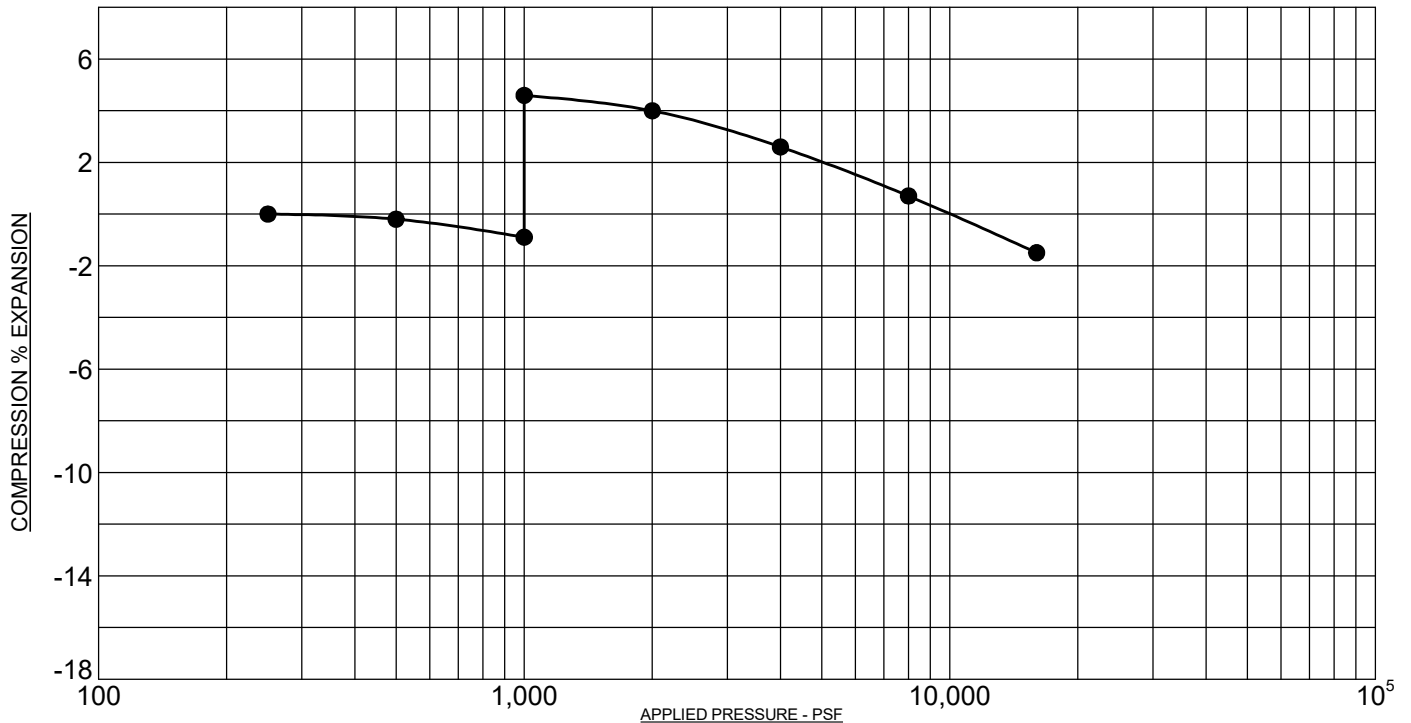
FIGURE No. 131

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-2 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **102.8 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **- 1.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1000 PSF**

SAMPLE LOCATION: **H-3 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **121.2 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **5.5**

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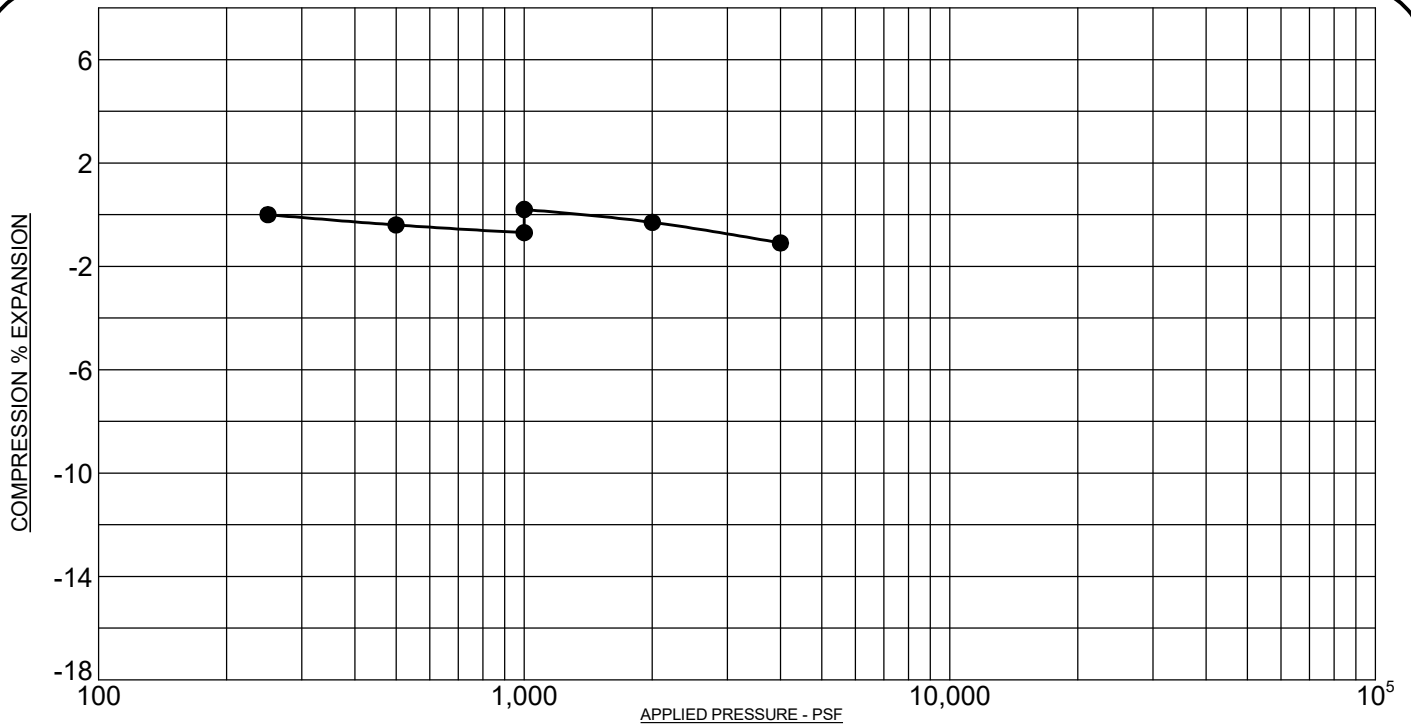
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

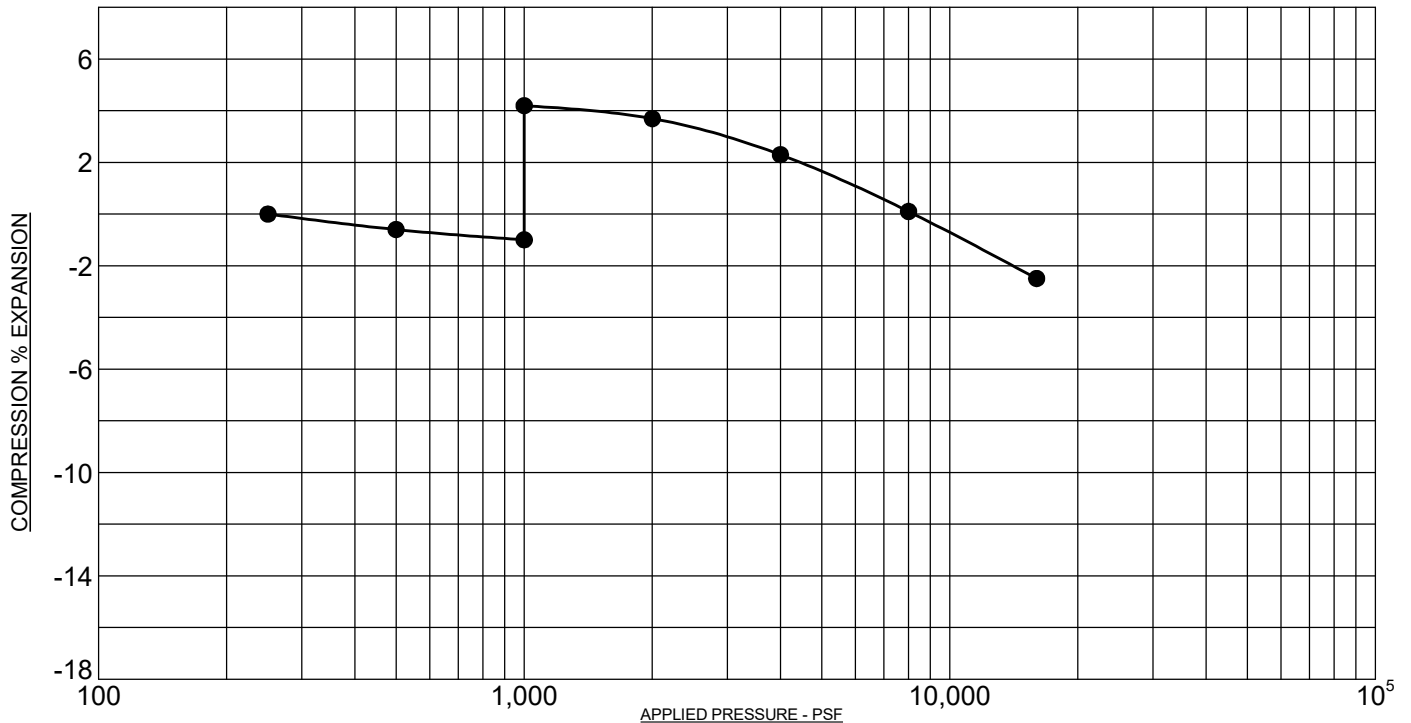
FIGURE No. 132

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1000 PSF**

SAMPLE LOCATION: **H-4 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **81.5 PCF**
 NATURAL MOISTURE CONTENT: **15.5%**
 PERCENT SWELL/COMPRESSION: **0.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1000 PSF**

SAMPLE LOCATION: **H-6 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **109.9 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **5.2**

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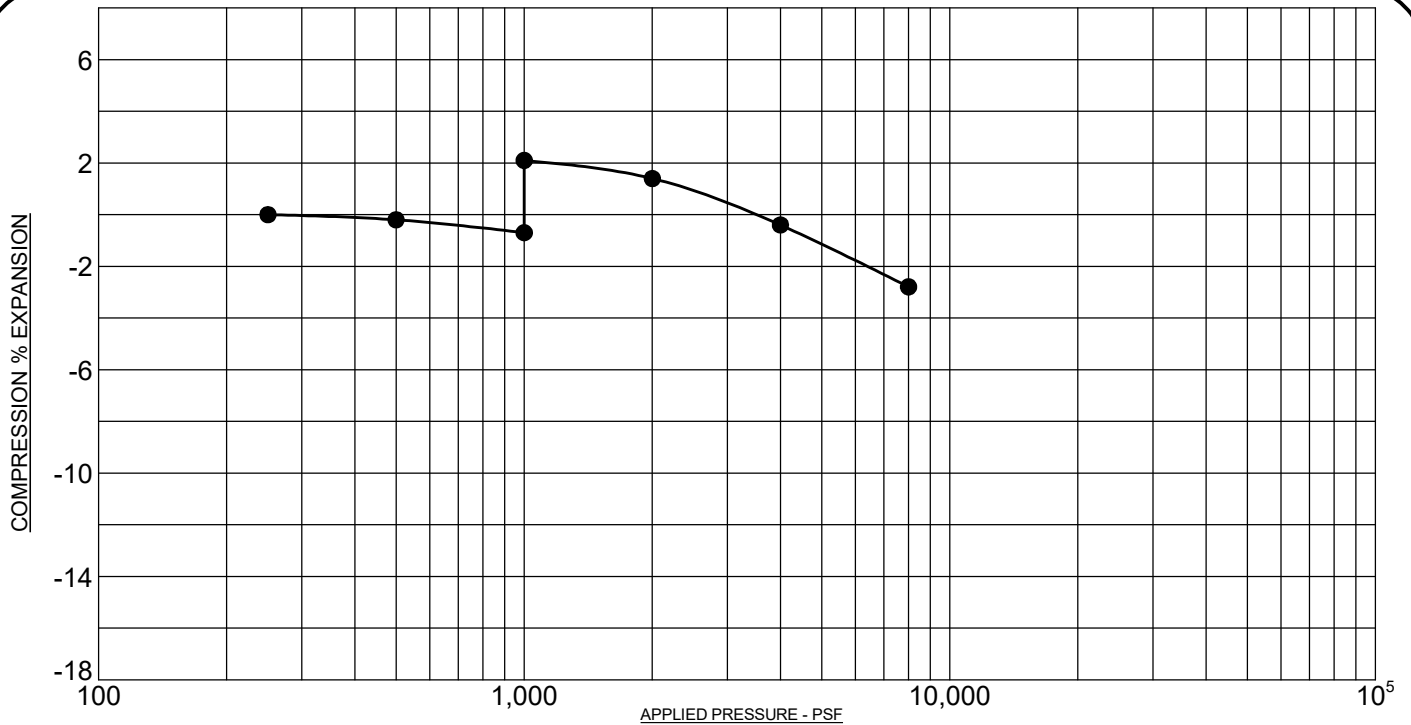
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

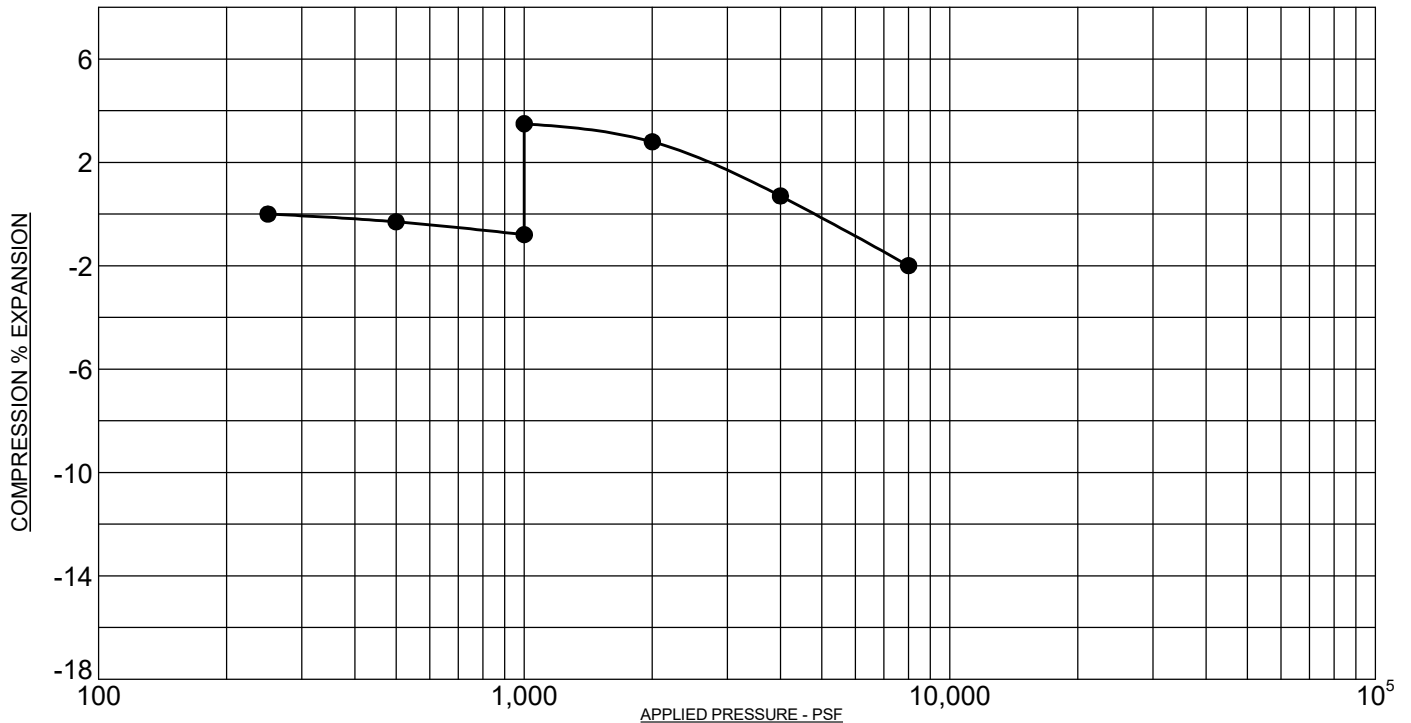
FIGURE No. 133

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-7 @ 24 FT**
 NATURAL DRY UNIT WEIGHT: **PCF**
 NATURAL MOISTURE CONTENT: **%**
 PERCENT SWELL/COMPRESSION: **2.8**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-8 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **107.2 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **4.3**

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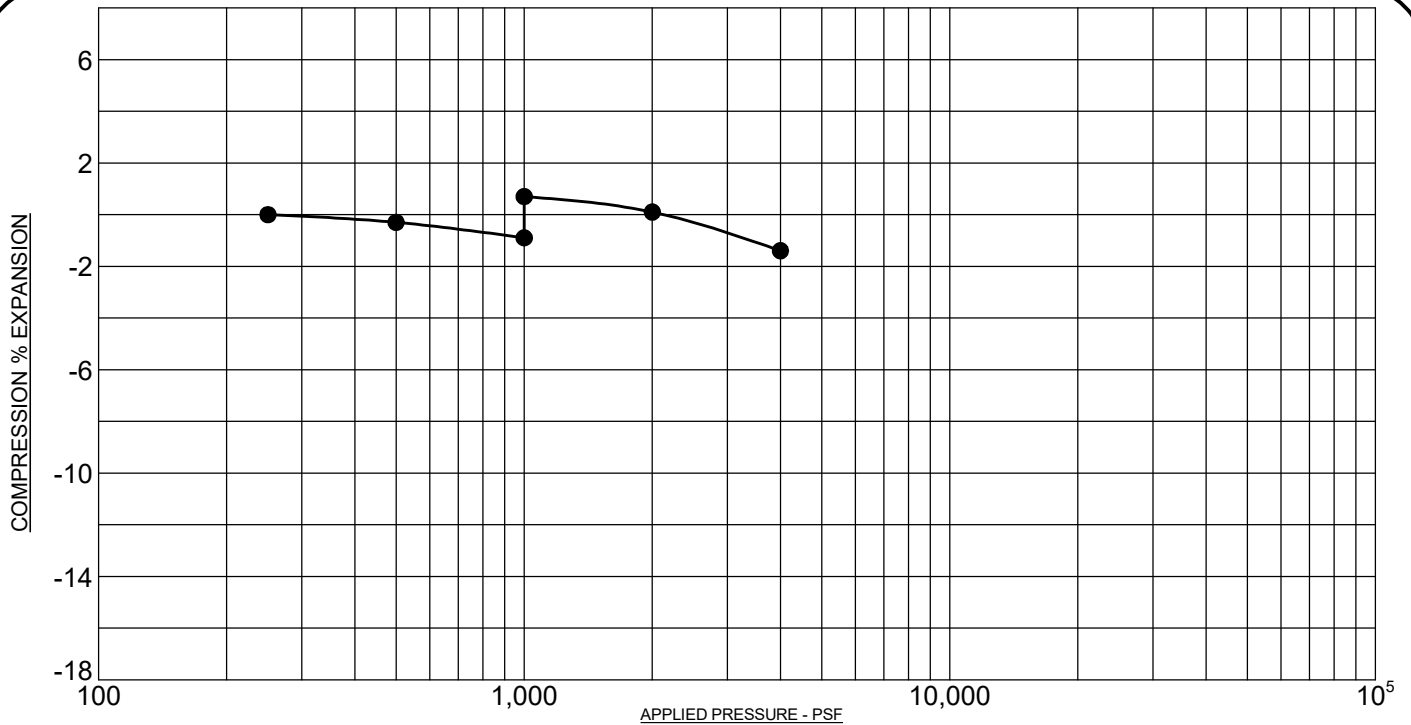
Geotechnical
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Civil, Planning

SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

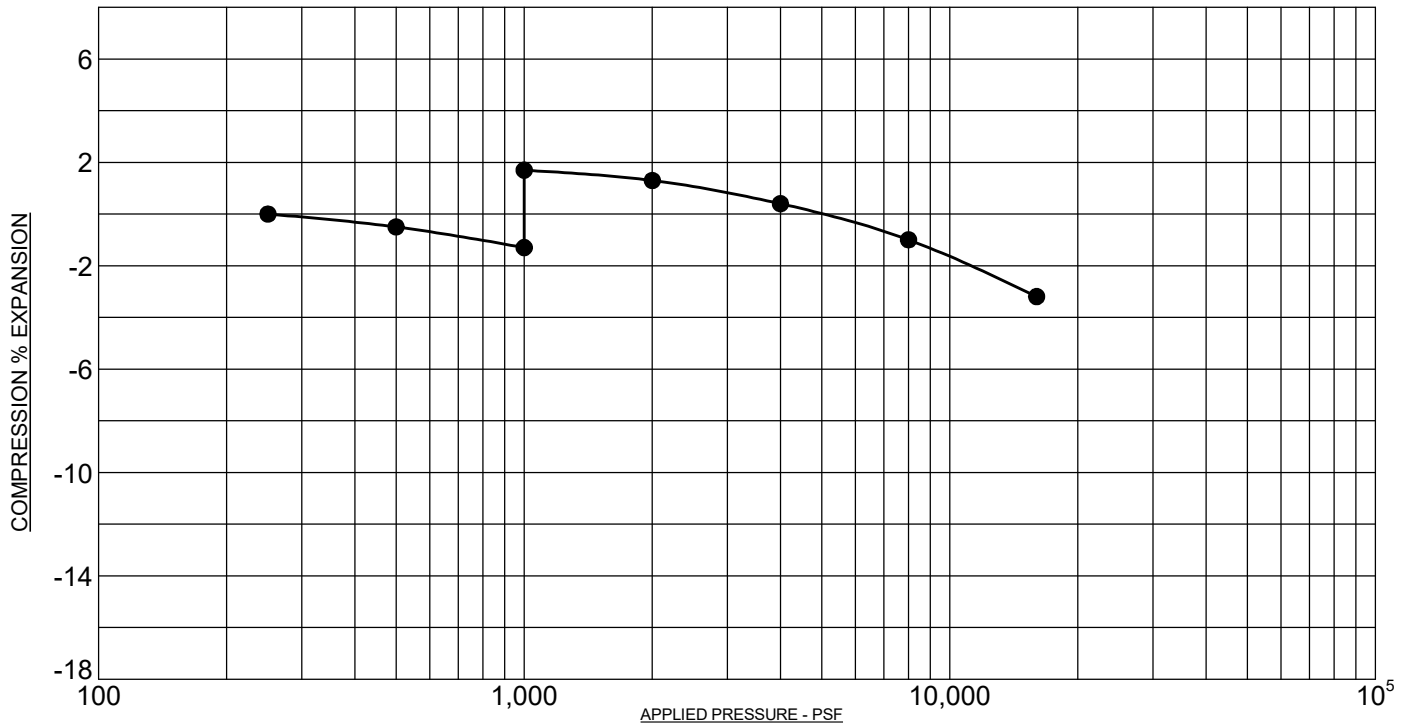
FIGURE No. 134

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-9 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **114.1 PCF**
 NATURAL MOISTURE CONTENT: **15.0%**
 PERCENT SWELL/COMPRESSION: **1.6**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-10 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **112.3 PCF**
 NATURAL MOISTURE CONTENT: **14.4%**
 PERCENT SWELL/COMPRESSION: **3.0**

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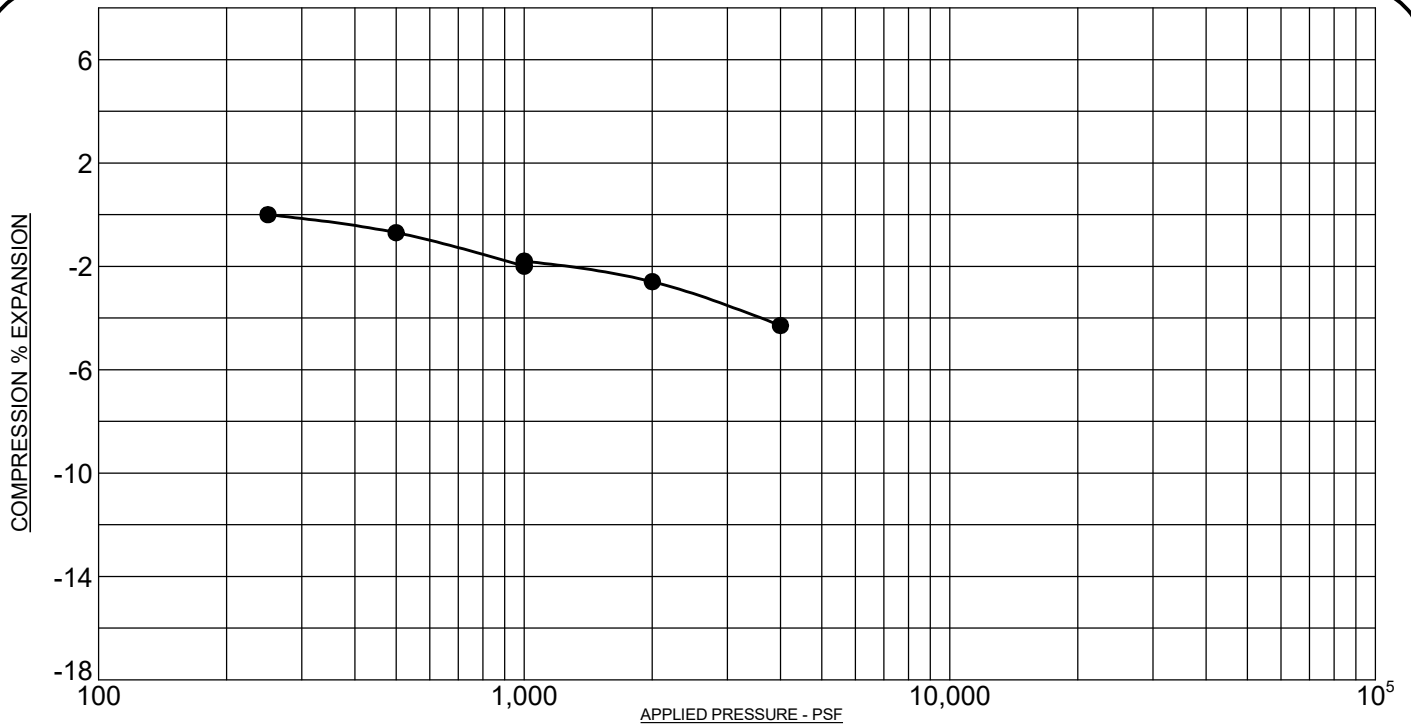
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

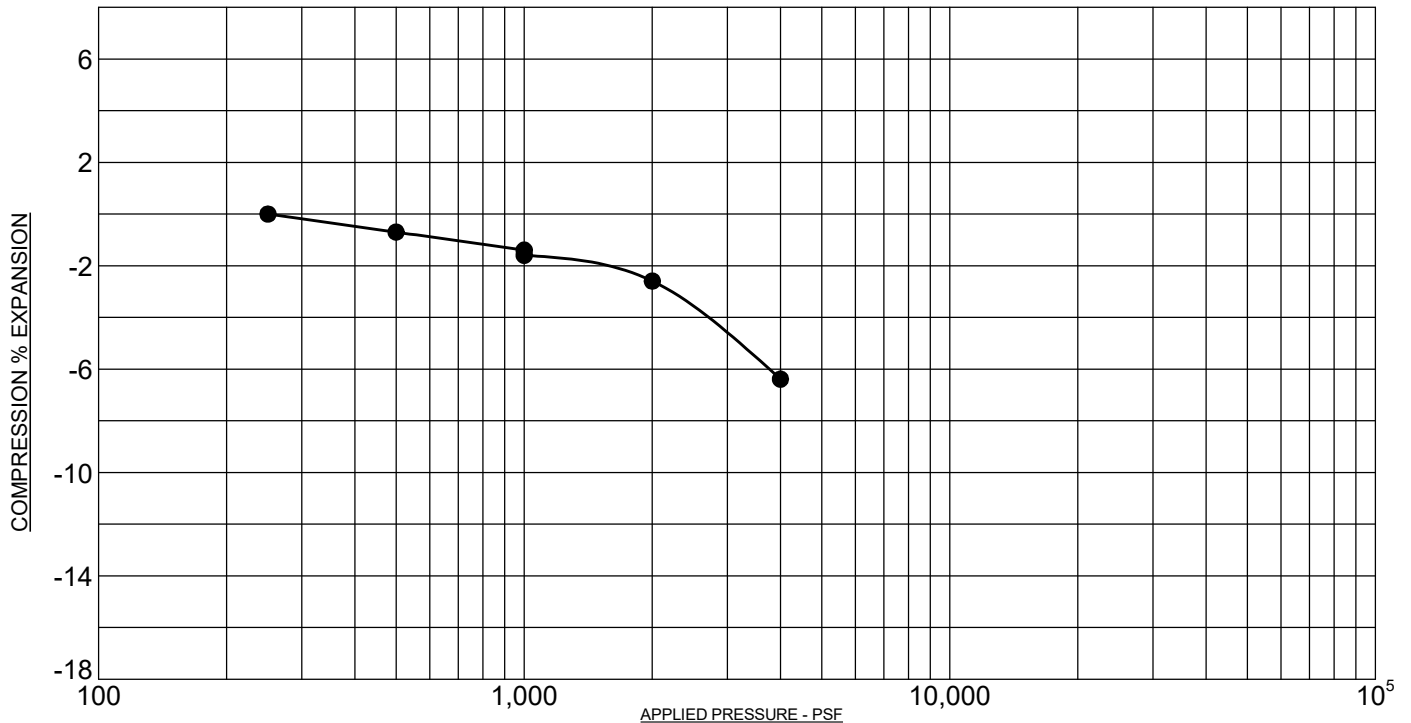
FIGURE No. 135

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-11 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **101.2 PCF**
 NATURAL MOISTURE CONTENT: **9.9%**
 PERCENT SWELL/COMPRESSION: **0.2**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-12 @ 19 FT**
 NATURAL DRY UNIT WEIGHT: **106.9 PCF**
 NATURAL MOISTURE CONTENT: **15.6%**
 PERCENT SWELL/COMPRESSION: **- 0.2**

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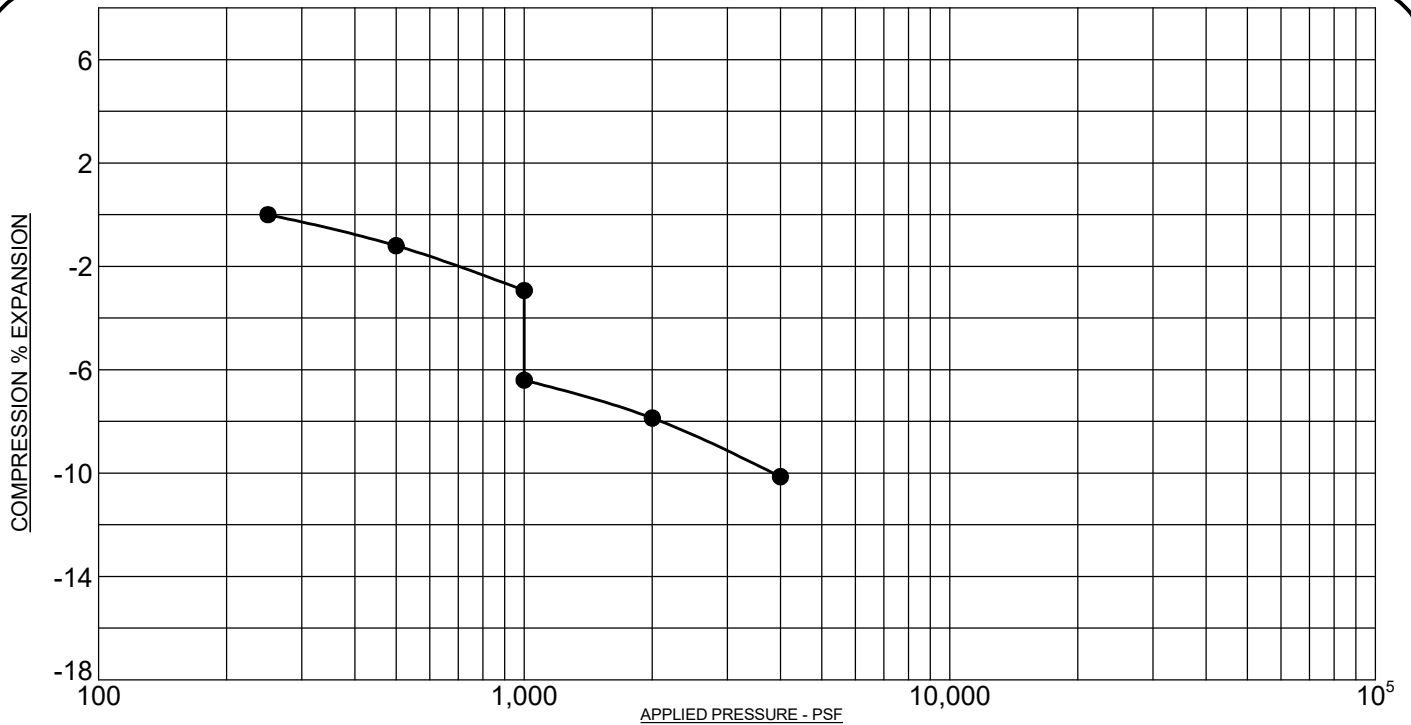
Geotechnical
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Civil, Planning

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JOB No. 175706

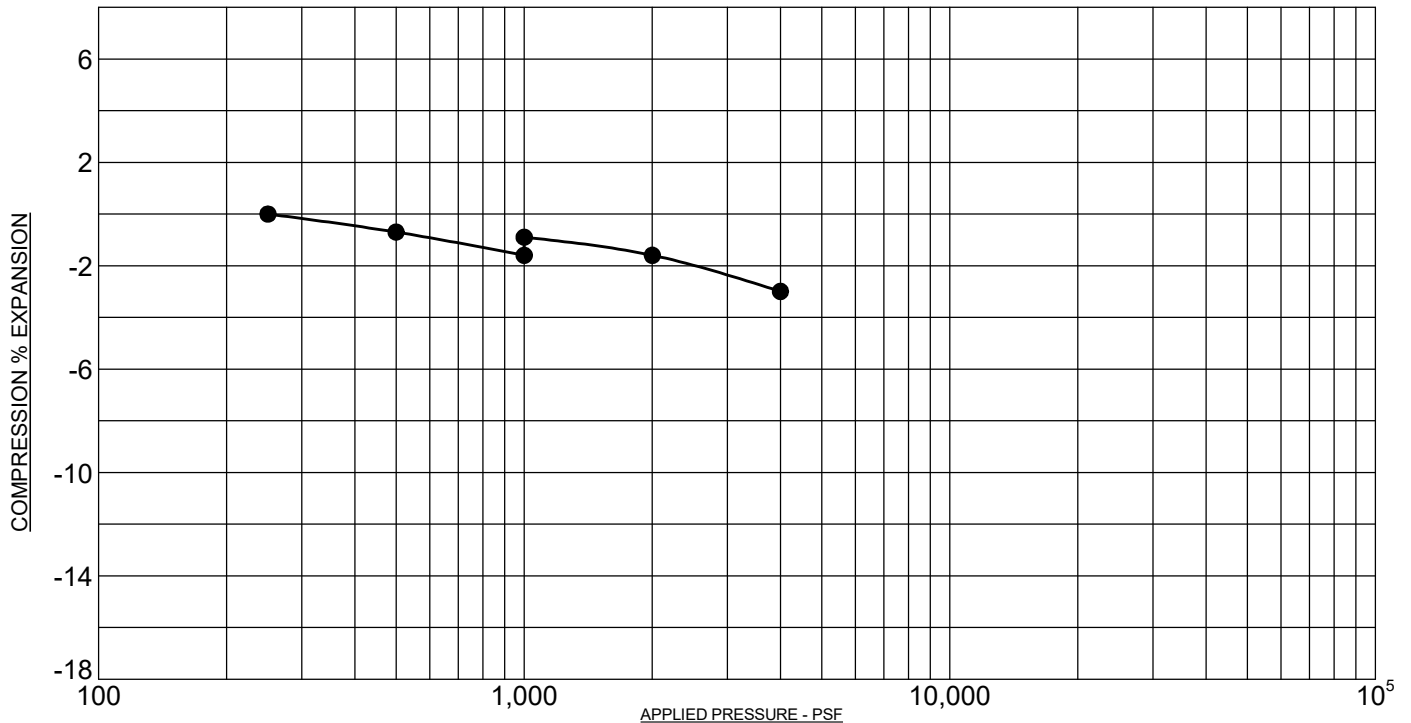
FIGURE No. 136

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-13 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **110.5 PCF**
 NATURAL MOISTURE CONTENT: **9.7%**
 PERCENT SWELL/COMPRESSION: **- 3.5**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-14 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **107.8 PCF**
 NATURAL MOISTURE CONTENT: **15.5%**
 PERCENT SWELL/COMPRESSION: **0.7**

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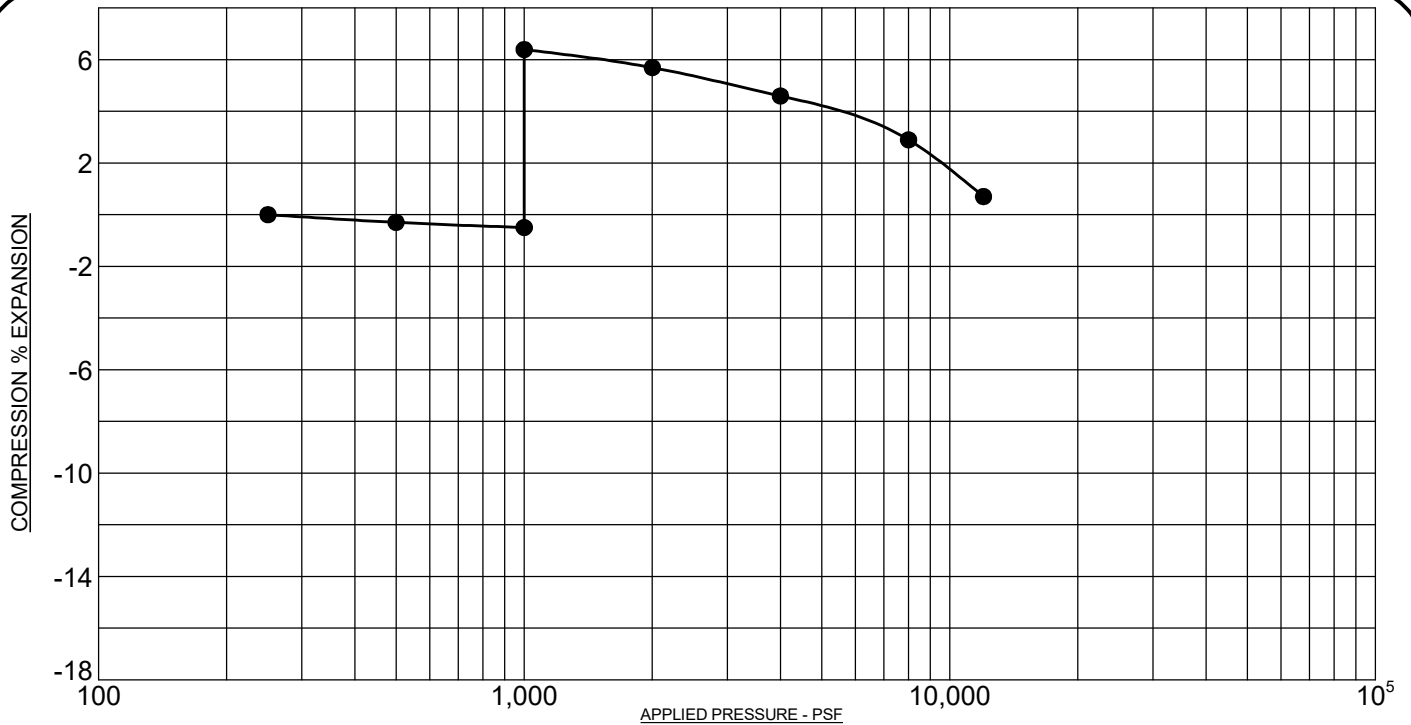
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JOB No. 175706

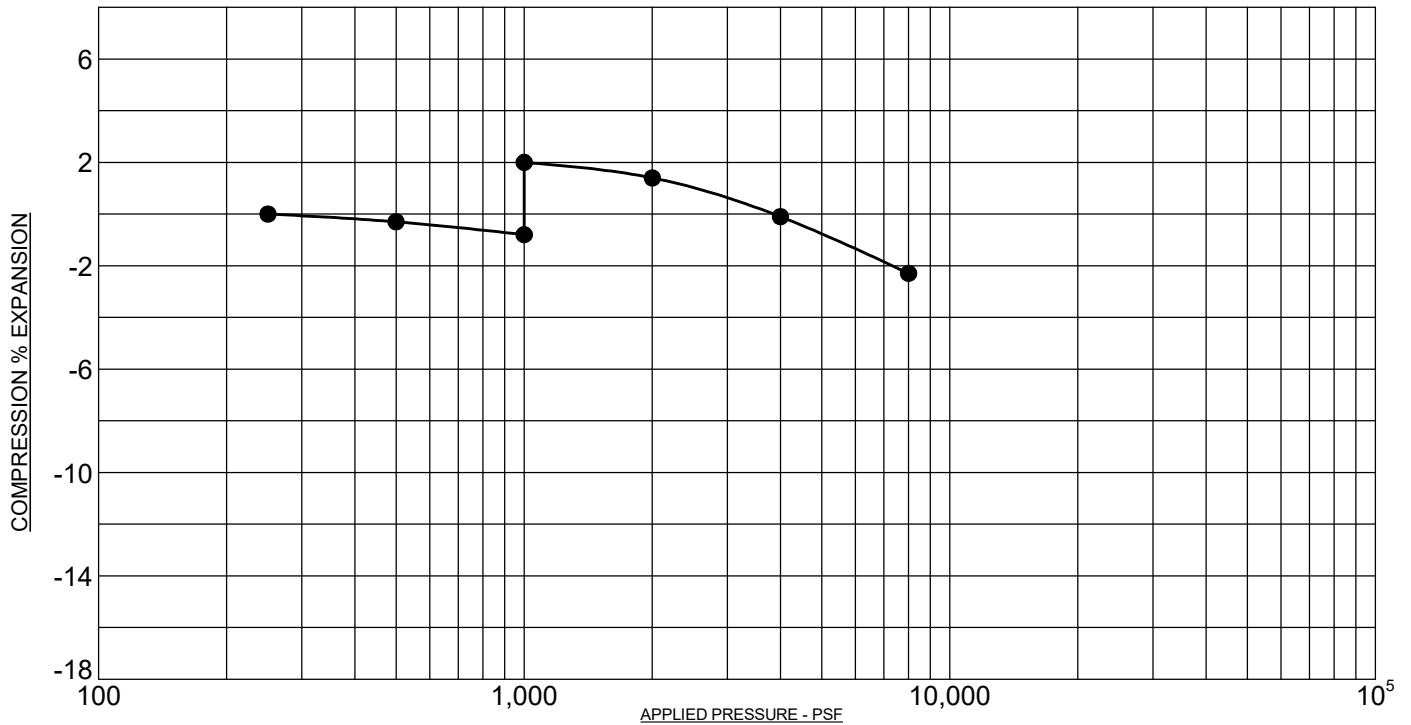
FIGURE No. 137

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-15 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **122.1 PCF**
 NATURAL MOISTURE CONTENT: **12.0%**
 PERCENT SWELL/COMPRESSION: **6.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-16 @ 24 FT**
 NATURAL DRY UNIT WEIGHT: **113.7 PCF**
 NATURAL MOISTURE CONTENT: **15.5%**
 PERCENT SWELL/COMPRESSION: **2.8**

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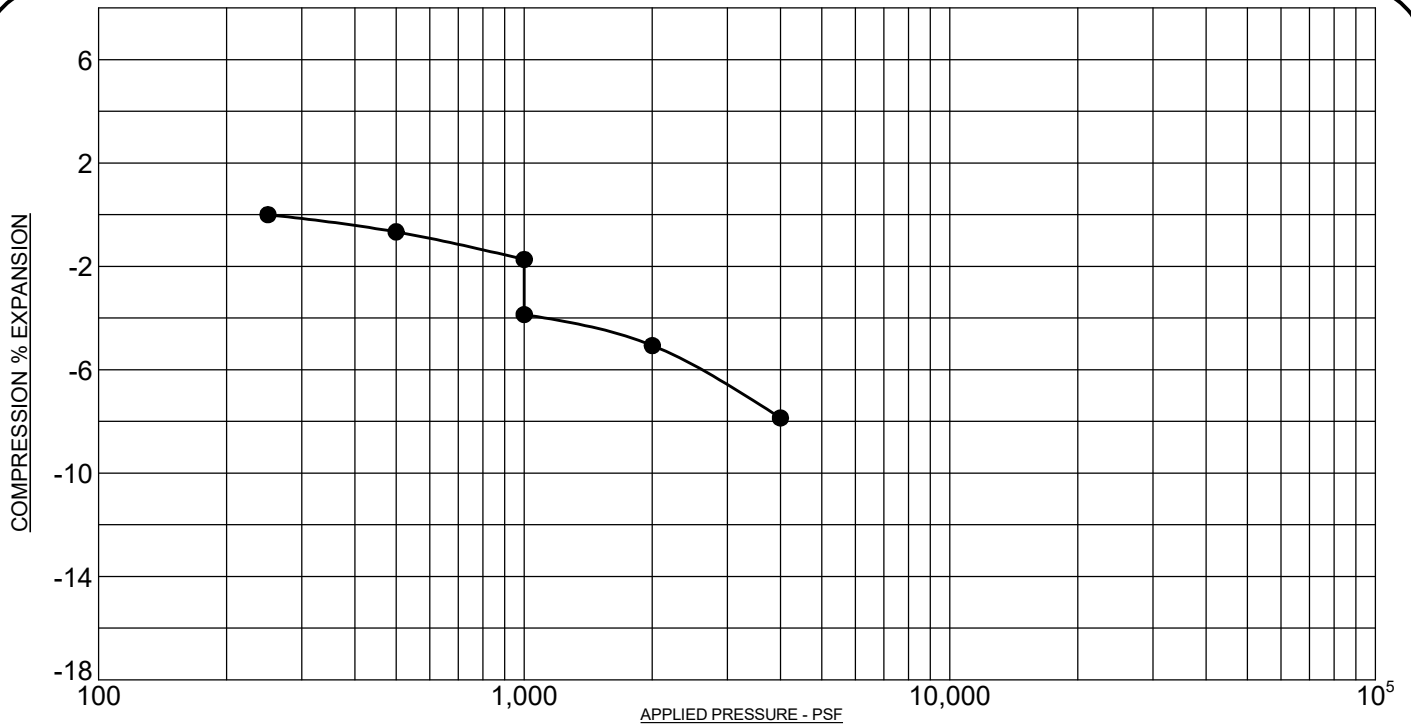
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

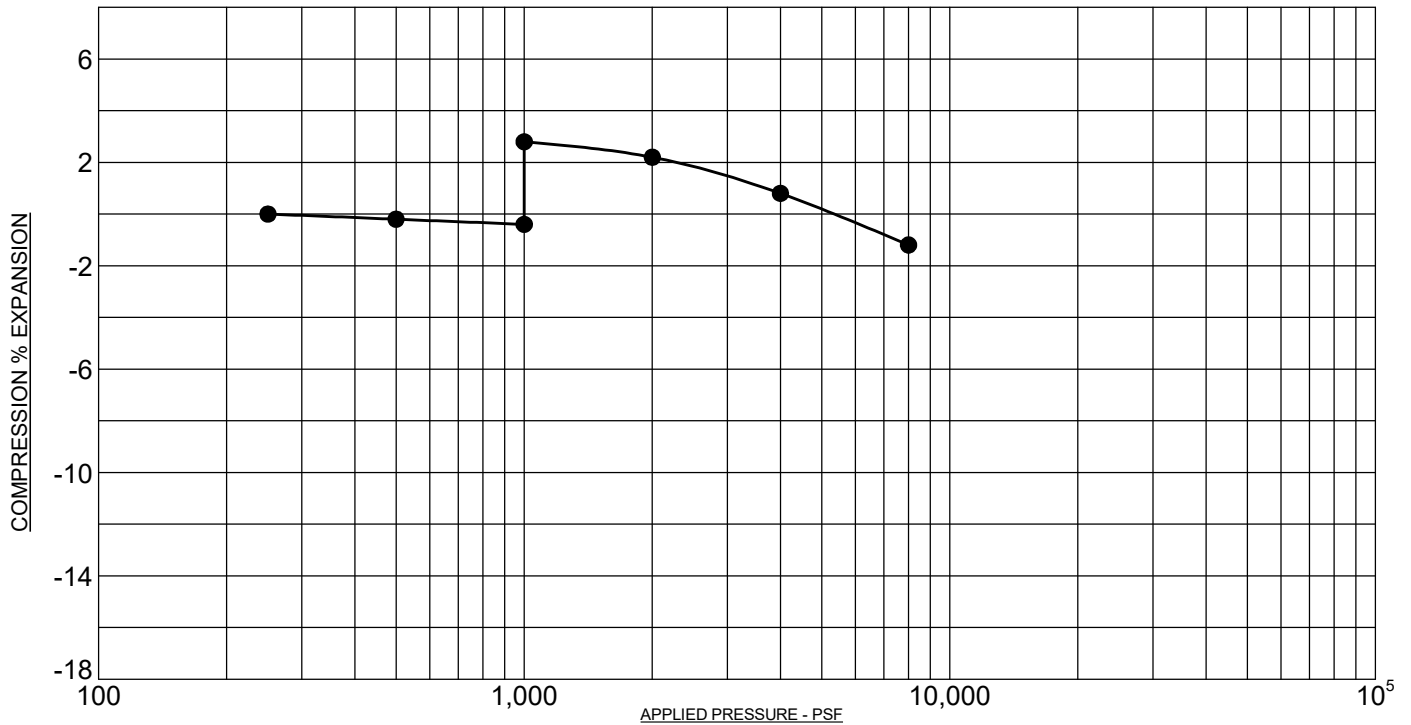
FIGURE No. 138

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-18 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **106.2 PCF**
 NATURAL MOISTURE CONTENT: **9.7%**
 PERCENT SWELL/COMPRESSION: **- 2.1**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-19 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **112.6 PCF**
 NATURAL MOISTURE CONTENT: **8.5%**
 PERCENT SWELL/COMPRESSION: **3.2**

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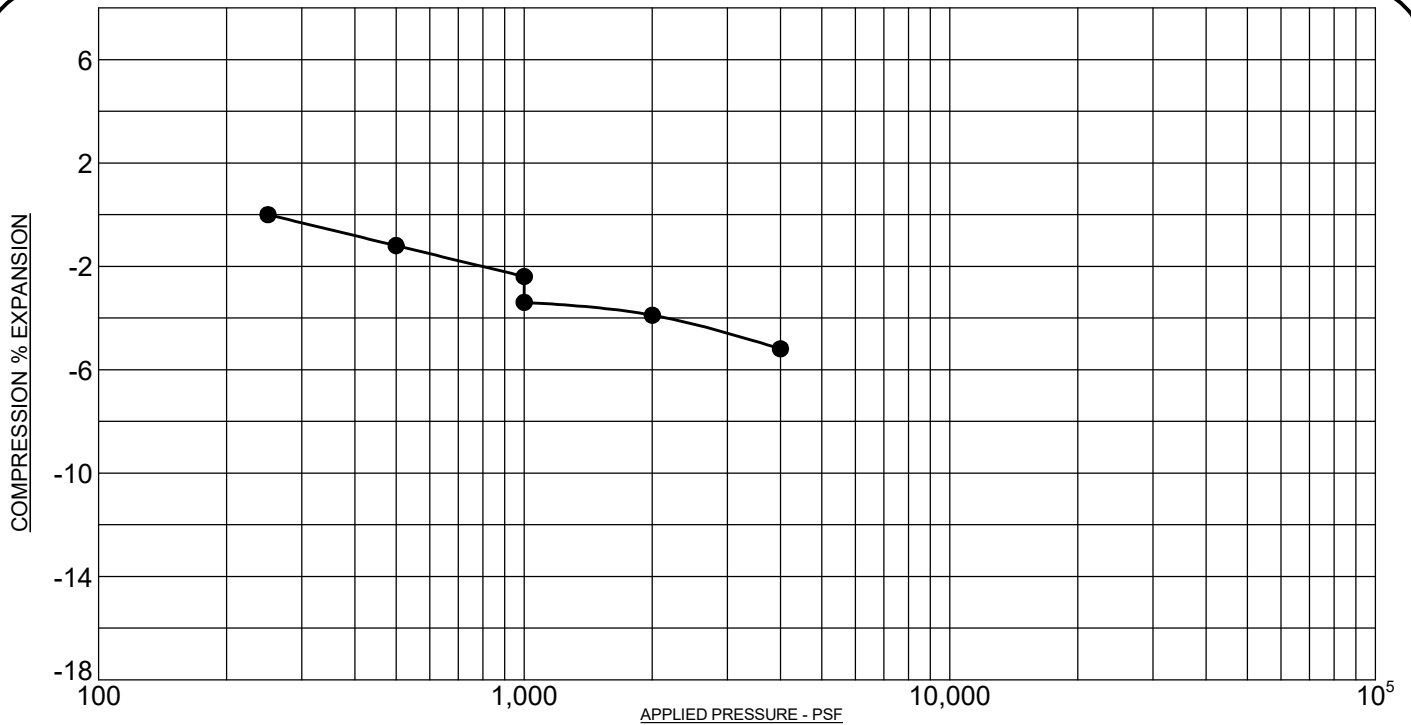
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SWELL/CONSOLIDATION TEST RESULTS

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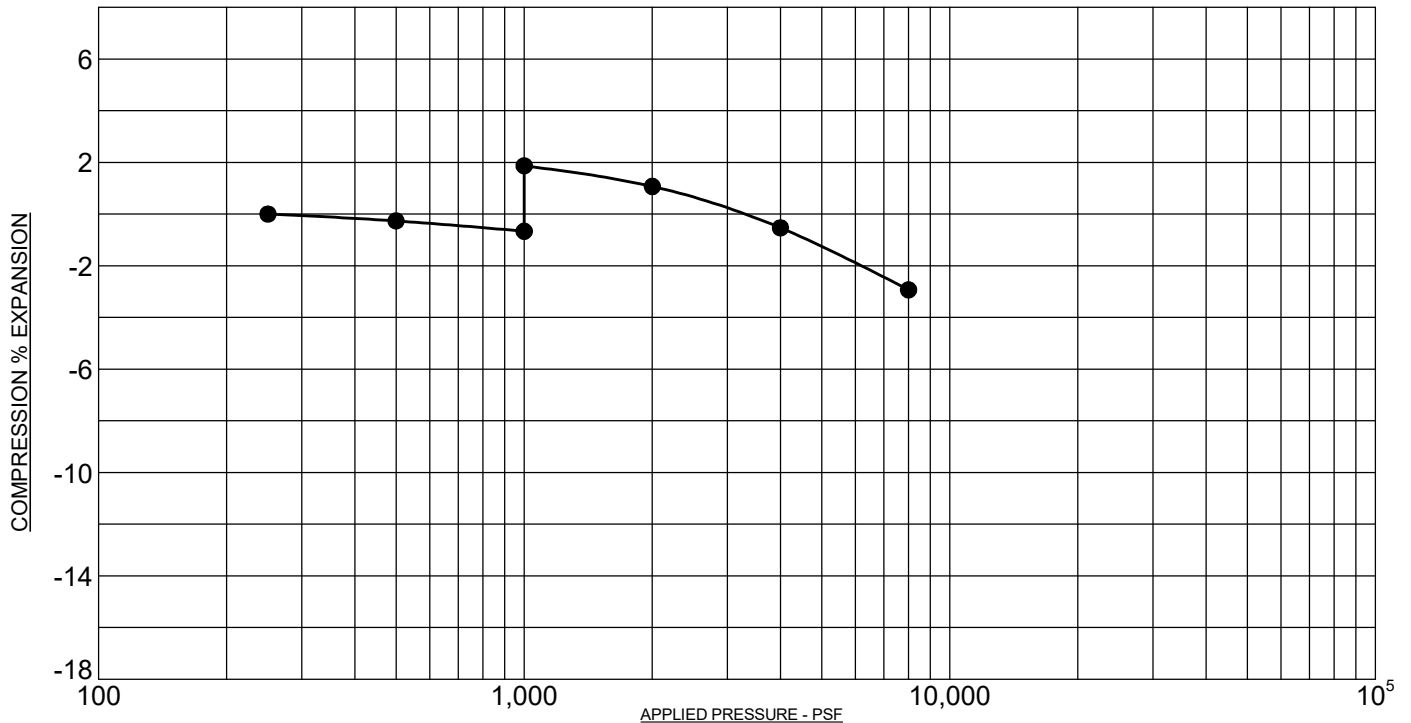
FIGURE No. 139

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-20 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **110.1 PCF**
 NATURAL MOISTURE CONTENT: **12.7%**
 PERCENT SWELL/COMPRESSION: **- 1.0**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-21 @ 24 FT**
 NATURAL DRY UNIT WEIGHT: **120.2 PCF**
 NATURAL MOISTURE CONTENT: **11.3%**
 PERCENT SWELL/COMPRESSION: **2.5**

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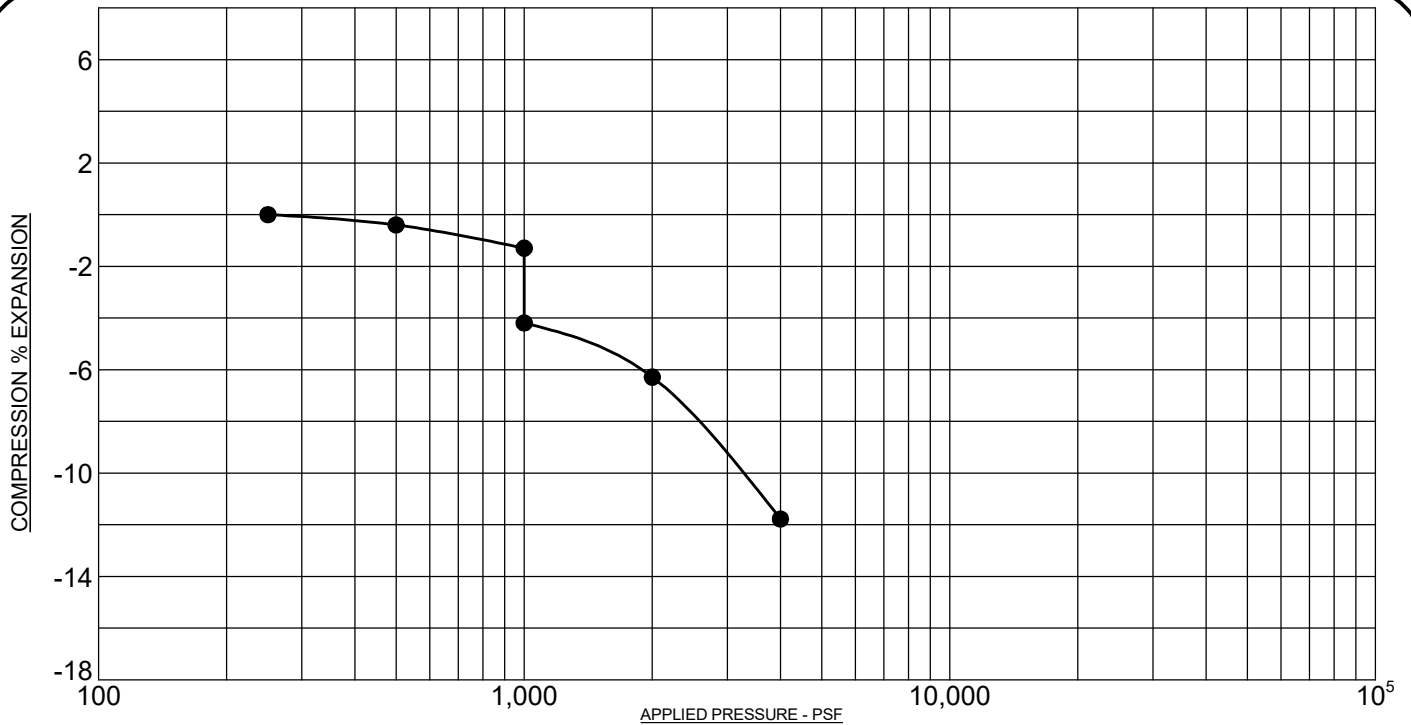
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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 175706

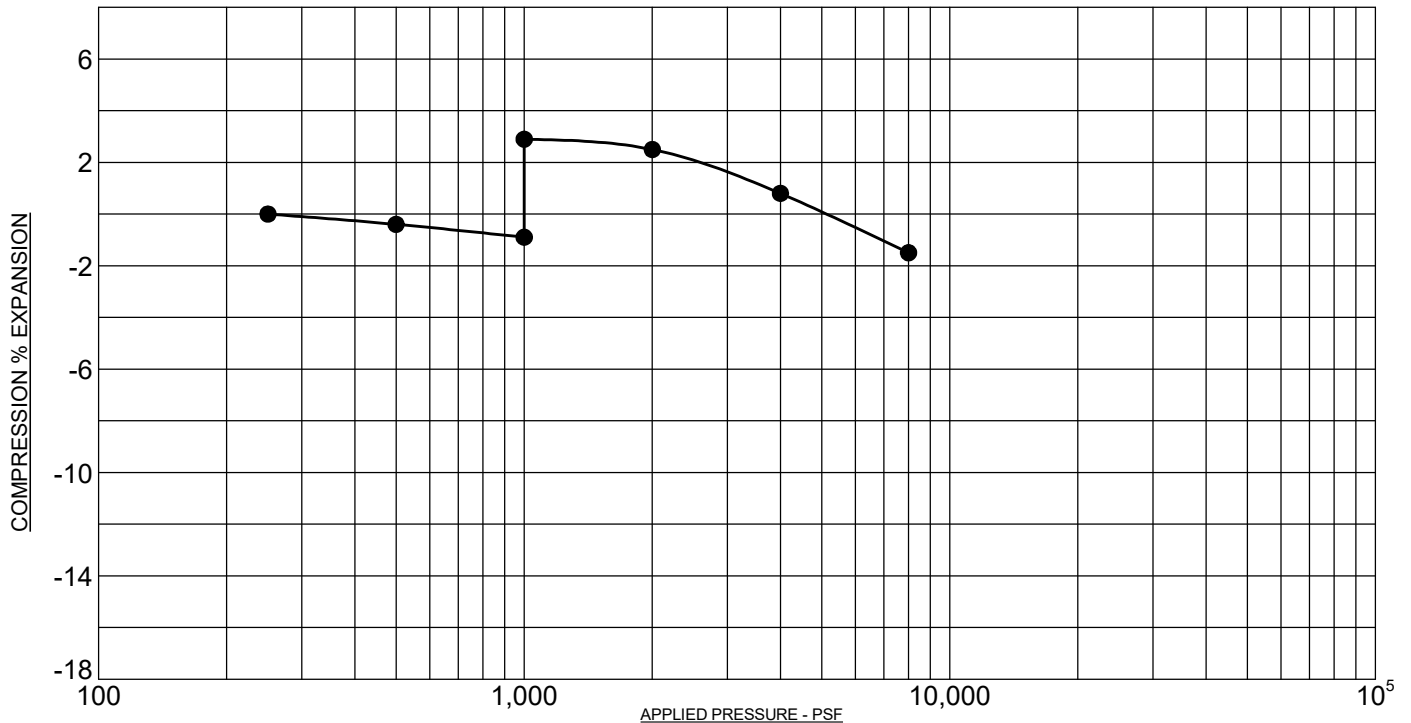
FIGURE No. 140

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-22 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **95.3 PCF**
 NATURAL MOISTURE CONTENT: **8.8%**
 PERCENT SWELL/COMPRESSION: **- 2.9**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-23 @ 14 FT**
 NATURAL DRY UNIT WEIGHT: **117.6 PCF**
 NATURAL MOISTURE CONTENT: **8.6%**
 PERCENT SWELL/COMPRESSION: **3.8**

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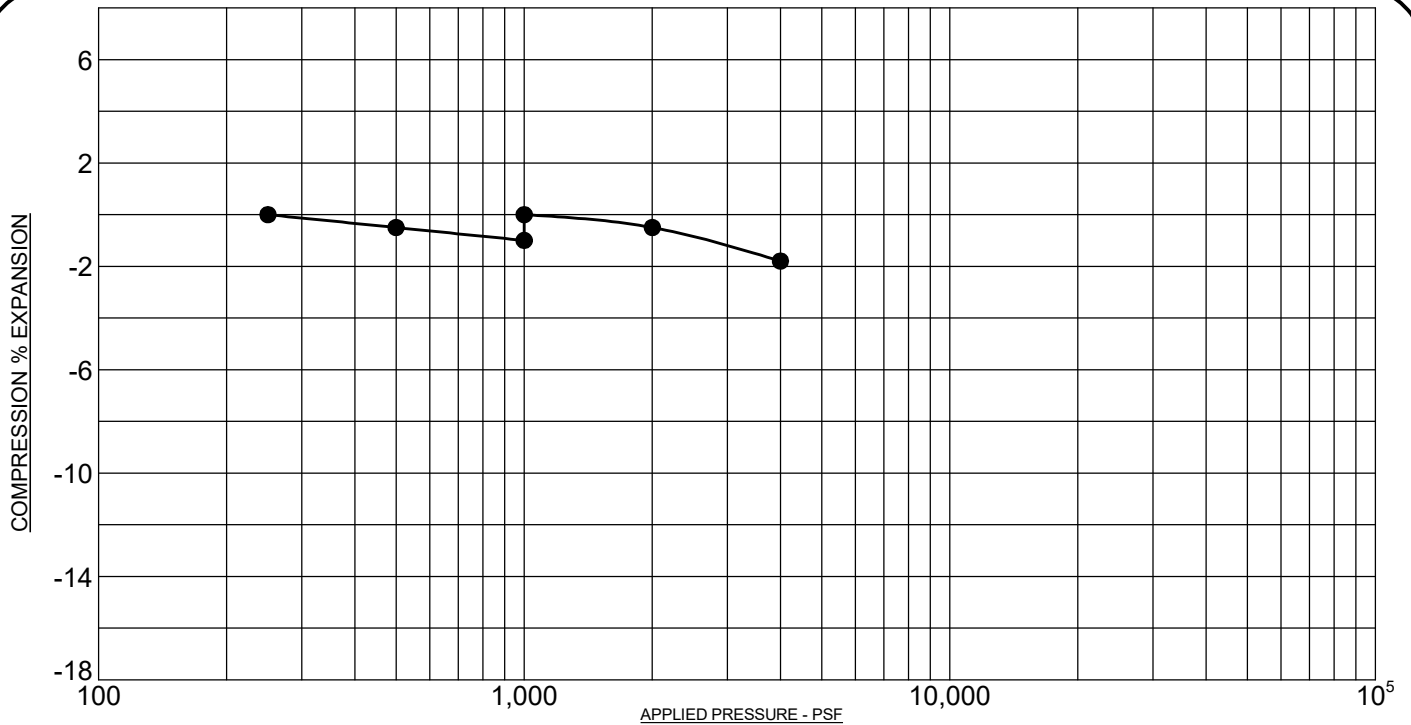
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JOB No. 175706

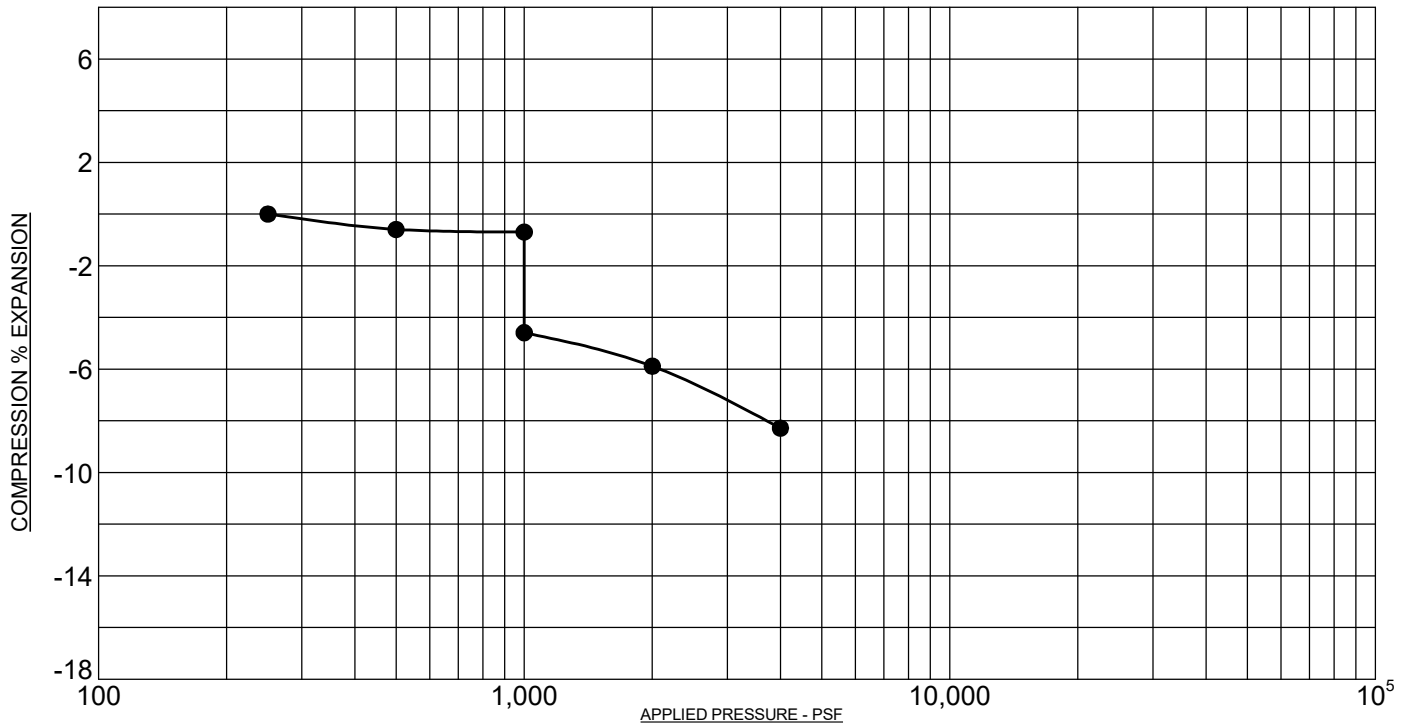
FIGURE No. 141

DATE Mar/22/2021



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAY, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-24 @ 9 FT**
 NATURAL DRY UNIT WEIGHT: **114.1 PCF**
 NATURAL MOISTURE CONTENT: **8.7%**
 PERCENT SWELL/COMPRESSION: **1.0**



PROJECT: **The Ridge at Lorson Ranch El Paso County, Colorado**
 SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
 NOTE: **SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF**

SAMPLE LOCATION: **H-25 @ 4 FT**
 NATURAL DRY UNIT WEIGHT: **106.3 PCF**
 NATURAL MOISTURE CONTENT: **11.0%**
 PERCENT SWELL/COMPRESSION: **- 3.9**

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JOB No. 175706

FIGURE No. 142

DATE Mar/22/2021



Geologic

Qav - Valley-fill alluvium (Holocene) - unsorted to poorly sorted, weakly stratified, sandy to silty clay deposited as valley fill in broad drainage swales on low hillsides of the central and eastern parts of the quadrangle where underlain by Pierre Shale

Kp - Pierre Shale, cone-in-cone zone of Lavington (1933) dark-gray to tan-gray to olive-gray, subblocky to finely fissile non-calcareous shale, silty shale with thin bentonite beds and very fine grained-grained sandstone. Thickness of this zone is approximately 2,290 (Scott and Cobban, 1986). Residual clay and claystone were encountered in all the borings across the site up to depths of 20 feet.

Engineering

2A - Stable alluvium, colluvium and bedrock on flat to gentle to moderate slopes (5 to 12%).



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Northern Office:
Greeley / Evans, CO 80620
(970) 330-1071
Woodland Park Office:
(719) 687-6077
Monument Office:
(719) 488-2145
Pueblo / Canon City:
(719) 544-7750

THE RIDGE AT LORSON RANCH
EL PASO COUNTY, COLORADO
LORSON RANCH METROPOLITAN
DISTRICT NO. 1

ENGINEER: TM
DRAWN BY: KZ
CHECKED BY: TM

ISSUED:

ENGINEERING AND
GEOLOGY MAP

SHEET No.

FIG-143



Soil Map may not be valid at this scale.



NOT TO SCALE

- 52 - Mansanet clay loam, 0 to 3% slopes
- 54 - Midway clay loam, 0 to 25% slopes
- 56 - Nelson-Tassel, fine sandy loam 3 to 18% slopes
- 75 - Razor-Midway complex
- 108 - Wiley silt loam, 3 to 9% slopes



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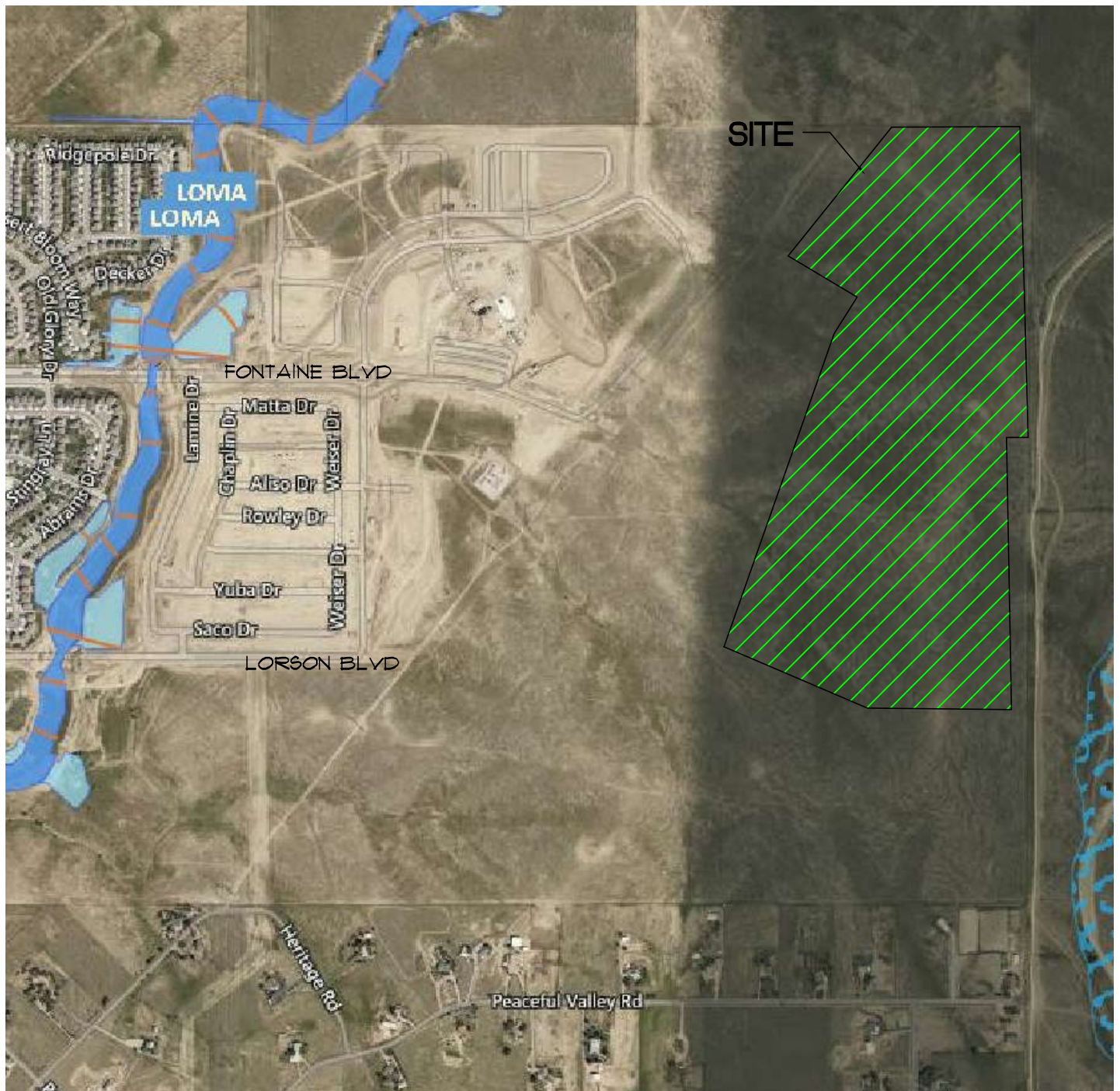
USDA SOILS SURVEY MAP

THE RIDGE AT LORSON RANCH
EL PASO COUNTY, COLORADO
LORSON RANCH METROPOLITAN
DISTRICT NO. 1

JOB No. 175706

FIG No. 144

DATE 3-22-2021



NOT TO SCALE
BASE MAP PROVIDED BY PIKES PEAK REGIONAL



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(970) 330-1071

PIKES PEAK REGIONAL FLOODPLAIN MAP

THE RIDGE AT LORSON RANCH
EL PASO COUNTY, COLORADO
LORSON RANCH METROPOLITAN
DISTRICT NO. 1

JOB No. 175706

FIG No. 145

DATE 3-22-2021

APPENDIX A

Additional Reference Documents

1. *PUD & Preliminary Plan, The Ridge at Lorson Ranch, El Paso County, Colorado*, prepared by Matrix, Project No. 20.1129.001, last dated March 26, 2021.
2. *The Ridge at Lorson Ranch, Early Overlot Grading and Erosion Control Plan, El Paso County Colorado*, prepared by Core Engineering Group, Project No. 100.064, last dated March 26, 2021.
3. *Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Areas, Community Panel No. 081041C0975G*, Federal Emergency Management Agency (FEMA), effective December 7, 2018.
4. *Geologic Map of the Fountain quadrangle, El Paso County, Colorado*, Jonathan L. White, Kassandra O. Lindsey, Matthew L. Morgan, and Shannon A. Mahan. Colorado Geological Survey Open-File Report OF-17-05.
5. *Fountain, Quadrangle, Environmental and Engineering Geologic Map for Land Use*, compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
6. *Fountain, Quadrangle, Map of Potential Geologic Hazards and Surficial Deposits*, compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
7. *Geologic map of the Pueblo 1 degree x 2 degrees quadrangle, south-central Colorado*, Scott, G.R., Taylor, R.B., Epis, R.C., and Wobus, R.A., 1976.
8. *Pikes Peak Regional Building Department*: <https://www.pprbd.org/>.
9. <https://property.spatalest.com/co/elpaso/#/property/5522105006> Schedule No.: 5522105006.
10. *Colorado Geological Survey, USGS Geologic Map Viewer*: <http://coloradogeologicalsurvey.org/geologic-mapping/6347-2/>.
11. *Historical Aerials*: <https://www.historicaerials.com/viewer>, Images dated 1947, 1960, 1969, 1999, 2005, 2009, 2011, 2013, and 2015.
12. *USGS Historical Topographic Map Explorer*: <http://historicalmaps.arcgis.com/usgs/> Colorado Springs Quadrangles dated 1950, 1951, 1958, 1963, 1969, 1970, 1975, 1978, 1981, 1994, 2013 and 2016.
13. *Google Earth Pro*, Imagery dated 1999, 2003, 2004, 2005, 2006, 2011, 2015, and 2017.

APPENDIX B
RMG Preliminary Test Borings

TEST BORING: A-1 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: A-2 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/11"	--	CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/8"	--
	10			50/4"	--		10			50/4"	--
	15			50/4"	--		15			50/5"	--

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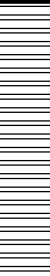



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TEST BORING LOG

JOB No. 175706

FIGURE No. 1

DATE Mar/22/2021

TEST BORING: A-3 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: A-4 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/10"	--	CLAY, SANDY, brown, very stiff, moist	5			30	--
	10			50/7"	--		10			50/6"	--
	15			50/5"	--	CLAYSTONE, SANDY, brown, hard, moist	15			50/6"	--

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TEST BORING LOG

JOB No. 175706

FIGURE No. 2

DATE Mar/22/2021

TEST BORING: A-5 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: A-6 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAYSTONE, SANDY, brown, medium hard to hard, moist	5			50/10"	--	CLAY, SANDY, brown, very stiff, moist	5			20	--
	10			50/6"	--		10			27	--
	15			50/6"	--	CLAYSTONE, SANDY, brown, medium hard, moist	15			50/11"	--
							20			50/9"	--

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TEST BORING LOG

JOB No. 175706

FIGURE No. 3

DATE Mar/22/2021

TEST BORING: A-7 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: A-8 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			29	--	CLAY, SANDY, brown, very stiff, moist	5			37	--
	10			31	--	CLAYSTONE, SANDY, brown, medium hard to hard, moist	10			50/9"	--
CLAYSTONE, SANDY, brown, medium hard, moist	15			50/9"	--		15			50/6"	--
	20			50/9"	--						

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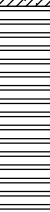







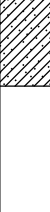

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JOB No. 175706

FIGURE No. 4

DATE Mar/22/2021

TEST BORING: A-9 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: A-10 DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
CLAY, SANDY, brown, very stiff, moist	5			21	--	CLAY, SANDY, brown, very stiff to hard, moist	5			45	--
CLAYSTONE, SANDY, brown, medium hard to hard, moist	10			50	--		10			32	--
	15			50/6"	--		15			23	--
							20			41	--

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FIGURE No. 5

DATE Mar/22/2021

TEST BORING: A-11	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: A-12	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20						DATE DRILLED: 3/18/20 NO GROUNDWATER ON 3/18/20					
CLAYSTONE, SANDY, brown, medium hard to very hard, moist	5			50/8"	--	CLAYSTONE, SANDY, brown, with rust staining, medium hard to very hard, moist	5			50/11"	--
	10			50/6"	--		10			50/7"	--
	15			50/5"	--		15			50/5"	--

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JOB No. 175706

FIGURE No. 6

DATE Mar/22/2021

<p>TEST BORING: A-13</p> <p>DATE DRILLED: 3/18/20</p> <p>NO GROUNDWATER ON 3/18/20</p>	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	
<p>CLAYSTONE, SANDY, brown, with rust staining, medium hard to very hard, moist</p>	<p>5</p> <p>10</p> <p>15</p>			<p>50/8"</p> <p>50/6"</p> <p>50/5"</p>	<p>--</p> <p>--</p> <p>--</p>	

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TEST BORING LOG

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FIGURE No. 7

DATE Mar/22/2021

APPENDIX C

Guideline Site Grading Specifications

Description: Unless specified otherwise by local or state regulatory agencies, these guideline specifications are for the excavation, placement and compaction of material from locations indicated on the plans, or staked by the Engineer, as necessary to achieve the required elevations. These specifications shall also apply to compaction of materials that may be placed outside of the project.

General: The Geotechnical Engineer shall approve fill materials, method of placement, moisture contents and percent compactions, and shall give written approval of the compacted fill.

Clearing Site: The Contractor shall remove trees, brush, rubbish, vegetation, topsoil and existing structures before excavation or fill placement is commenced. The Contractor shall dispose of the cleared material to provide the Owner with a clean job site. Cleared material shall not be placed in areas to receive fill or where the material will support structures. Clearing shall also include removal of existing fills that do not meet the requirements of this specification and existing structures.

Preparation of Slopes or Drainage Areas to Receive Fill: Natural slopes or slopes of drainage gullies where grades are 20 percent (5:1, horizontal to vertical) or steeper shall be benched prior to fill placement. Benches shall be at least 10 feet wide. Benches may require additional width to accommodate excavation or compaction equipment. At least one bench shall be provided for each 5 feet or less of vertical elevation difference. The bench surface shall be essentially horizontal perpendicular to the slope or at a slight incline into the slope.

Scarifying: Topsoil and vegetation shall be removed from the ground surface in areas to receive fill. The surface shall be plowed or scarified a minimum of 12 inches until the surface is free from ruts, hummocks or other uneven features which would prevent uniform compaction by the equipment to be used.

Compacting Area to Receive Fill: After the area to receive fill has been cleared and scarified, it shall be disked or bladed until it is free from large clods, moisture conditioned to a proper moisture content and compacted to the maximum density as specified for the overlying fill. Areas to receive fill shall be worked, stabilized, or removed and replaced, if necessary, in accordance with the Geotechnical Engineer's recommendations in preparation for fill.

Fill Materials: Fill material shall be free from organic material or other deleterious substances, and shall not contain rocks or lumps having a diameter greater than six inches. Fill materials shall be obtained from cut areas shown on the plans or staked in the field by the Engineer or imported to the site and shall be approved by the Geotechnical Engineer prior to placement. It is recommended that the fill materials have nil to low expansion potential, i.e., consist of silty to slightly clayey sand.

- The moisture-conditioned materials should be placed in maximum 6" compacted lifts. These materials should be compacted to a minimum of 92 percent of the maximum

- Modified Proctor dry density or 95 percent of the maximum Standard Proctor dry density. Material not meeting the above requirements shall be reprocessed.

Materials used for moisture-conditioned structural fill should be approved by RMG prior to use. Moisture-conditioned structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

Moisture Content: Fill materials shall be moisture conditioned to within limits of optimum moisture content specified. Sufficient laboratory compaction tests shall be made to determine the optimum moisture content for the various soils encountered in borrow areas or imported to the site.

The contractor may be required to add moisture to the excavation materials in the borrow area if, in the opinion of the Geotechnical Engineer, it is not possible to obtain uniform moisture content by adding water to the fill material during placement. The Contractor may be required to rake or disk the fill soils to provide uniform moisture content through the soils.

The application of water to embankment materials shall be made with watering equipment, approved by the Geotechnical Engineer, which will give the desired results. Water jets from the spreader shall not be directed at the embankment with such force that fill materials are eroded.

Should too much water be added to the fill, such that the material is too wet to permit the desired compaction to be obtained, compacting and work on that section of the fill shall be delayed until the material has been allowed to dry to the required moisture content. The Contractor will be permitted to rework the wet material in an approved manner to hasten its drying.

Compaction of Fill Areas: Selected fill material shall be placed and mixed in evenly spread layers. After each fill layer has been placed, it shall be uniformly compacted to not less than the specified percentage of maximum density. Fill materials shall be placed such that the thickness of loose material does not exceed 10 inches and the compacted lift thickness does not exceed 6 inches.

Compaction, as specified above, shall be obtained by the use of sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other equipment approved by the Geotechnical Engineer. Granular fill shall be compacted using vibratory equipment or other equipment approved by the Geotechnical Engineer. Compaction shall be accomplished while the fill material is at the specified moisture content. Compaction of each layer shall be continuous over the entire area.

Moisture Content and Density Criteria:

- A. Fill placed in roadways and utility trenches should be moisture conditioned and compacted in accordance with El Paso County Specifications.
- B. Fill placed outside of roadways and utility trenches should be compacted to at least 92% of the maximum Modified Proctor density (ASTM D-1557) or at least 95% of the maximum Standard Proctor density (ASTM D-698) at a moisture content within 2% of optimum.

Compaction of Slopes: Fill slopes shall be compacted by means of sheepfoot rollers or other suitable equipment. Compaction operations shall be continued until slopes are stable, but not too dense for planting, and such that there is no appreciable amount of loose soil on the slopes. Compaction of slopes may be done progressively in increments of three to five feet in height or after the fill is brought to its total height. Permanent fill slopes shall not exceed 3:1 (horizontal to vertical).

Density Testing: Field density testing shall be performed by the Geotechnical Engineer at locations and depths of his choosing. Where sheepfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted material below the disturbed surface. When density tests indicate the density or moisture content of any layer of fill or portion thereof is below that required, the particular layer or portion shall be reworked until the required density or moisture content has been achieved.

Observation and Testing of Fill: Observation by the Geotechnical Engineer shall be sufficient during the placement of fill and compaction operations so that he can declare the fill was placed in general conformance with Specifications. All observations necessary to test the placement of fill and observe compaction operations will be at the expense of the Owner.

Seasonal Limits: No fill material shall be placed, spread or rolled while it is frozen, thawing, or during unfavorable weather conditions. When work is interrupted by heavy precipitation, fill operations shall not be resumed until the Geotechnical Engineer indicates the moisture content and density of previously placed materials are as specified.

Reporting of Field Density Tests: Density tests made by the Geotechnical Engineer shall be submitted progressively to the Owner. Dry density, moisture content, percent compaction, and approximate location shall be reported for each test taken.