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PRELIMINARY SOILS INVESTIGATION/
SOIL, GEOLOGY, AND GEOLOGIC HAZARD STUDY
MERIDIAN ROAD AND STAPLETON DRIVE
PARCEL NO. 52000-00-016
EL PASO COUNTY, COLORADO

Prepared for

Kyle Geditz
16022 Fox Mesa Court
Monument, Colorado 80132

March 11, 2022

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

COLORADO REGISTERED
JOSEPH COLLIN GOODE JR.
23725
3-11-2022
PROFESSIONAL ENGINEER

Reviewed by:

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President

LLL/jhr

Encl.

Entech Job No. 220093
AAprojects/2022/220093 countysoil/geo

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1.0 SUMMARY

Project Location

The project site lies in the NE¼ of Section 36, Township 12 South, Range 65 West of the 6th Principal Meridian in the eastern portion of El Paso County, Colorado. The site is located in the southwest of the intersection of Meridian Road and Stapleton Drive.

Project Description

Total acreage involved in the project is approximately 160 acres to be subdivided potential mixed-use commercial in the northeastern area of the site and residential in the remaining area of the site. The development is anticipated to utilize central sewer and water.

Scope of Report

This report presents the results of our preliminary geologic evaluation and treatment of engineering geologic hazard study.

Land Use and Engineering Geology

This site was found to be suitable for development. Areas were encountered where the geologic conditions will impose some constraints on development and land use. These include areas of artificial fill, areas of erosion, potentially expansive soils, potentially seasonal shallow and seasonally shallow groundwater areas, and radioactivity. Shallow bedrock was encountered across the site. Development plans were not available at the time of this investigation; however, it appears that these areas will have some impact on the development. These conditions will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either avoided or properly mitigated. All recommendations are subject to the limitations discussed in the report. Additional investigation will be required once development/grading plans are determined.

2.0 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in portions of the NE¼ of Section 36, Township 12 South, Range 65 West of the 6th Principal Meridian in the northern portion of El Paso County, Colorado. The site is located southwest of the intersection of Meridian Road and Stapleton Drive. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is generally gradually sloping to the southeast with moderate slopes along the rolling hills in the western portion of the site. Several minor drainages were observed on the site that southerly direction through the property. Water was not observed flowing in any of the drainages at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included grazing and pasture land. The site contains primarily contains field grasses, and weeds. Site photographs taken on January 20, 2022 are included in Appendix A. The approximate locations and directions of the photographs are indicated on Figure 3. A development plan was not available at the time of this investigation.

Total acreage involved in the proposed development is approximately 160 acres to be subdivided into commercial and residential lots. The area is anticipated to be serviced by central sewer and water. The proposed Site Plan/Testing Location Map is presented in Figure 3.

3.0 SCOPE OF THE REPORT

The scope of this report includes:

- A general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.
- Preliminary foundation recommendations for residential and single-story commercial buildings.

4.0 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements and air photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development.

Ten (10) test borings were drilled across the site to determine the soils classification and engineering characteristics. The borings were drilled to depths of 18 to 20 feet using a truck-mounted, continuous flight auger drilling rig supplied and operated by Entech Engineering, Inc. The locations of the test borings are indicated on the Site Plan/Testing Location Map, Figure 3. The Test Boring Logs are presented in Appendix B. Laboratory testing was performed on the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422, Atterberg Limits, ASTM D-4318, and Swell/Consolidation Testing. Results of the laboratory testing are Summarized in Table 1, and are included in Appendix C.

5.0 SOIL, GEOLOGY AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 15 miles to the west is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southeastern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be gently dipping in a northerly direction. The rocks in the area of the site are sedimentary in nature, and typically Tertiary to Upper Cretaceous in age. The bedrock underlying the site consists of the Dawson Arkose Formation. Overlying this formation are unconsolidated deposits of residual, colluvial, man-made, and alluvial soils of the Quaternary Age. The residual soils are produced by the in-situ action of weathering of the bedrock on site. Some colluvial soils exist which are deposited

by gravity and sheetwash. Man-made soils exist as an earthen dam in the southeastern portion of the site. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Survey

The Natural Resource Conservation Service (Reference 2), previously the Soil Conservation Service (Reference 3) has mapped two soil types on the site (Figure 4). In general, they vary from coarse sandy loam to sandy loam. The soils are described as follows:

Type	Description
71	Pring Coarse Sandy Loam, 3-8% slopes
83	Stapleton Sandy Loam, 3-8% slopes

Complete descriptions of each soil type are presented in Appendix D. The soils have generally been described to typically have moderate to rapid permeabilities. Limitations described for local soils include shrink-swell potential. Roads may need to be designed to minimize frost-heave potential. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation, erosion control blankets, and waddles. The majority of the soils have been described to have moderate erosion hazards.

5.3 Site Stratigraphy

The Falcon Quadrangle Geology Map is presented in Figure 5 (Reference 4). These maps in conjunction with site specific mapping were used to prepare the site Geology Map. The Geology Map prepared for the site is presented in Figure 6. Three mappable units were identified on this site which are identified as follows:

Qaf **Artificial Fill of Holocene Age**: These are man-made fill deposits associated with small earthen dam in the southeastern portion of the site.

Qa_3 **Alluvium three of late Pleistocene Age:** This material consists of lower stream terrace deposits. The Alluvium three typically consists of silty to clayey gravelly sands. This deposit is usually highly stratified and may contain lenses of silt, clay or cobbles. Alluvium three correlates with the Broadway Alluvium in the Denver area.

Qc/Tkd **Colluvium of Quaternary Age overlying Dawson Arkose of Tertiary to Cretaceous Age:** These materials consist of silty to clayey sands, cobbles and boulders deposited by the action of sheetwash and gravity. Some alluvial soils deposited by water and residual soil from in-situ weathering exist in this mapping. These soils are overlying the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Falcon Quadrangle* distributed by the Colorado Geological Survey in 2012 (Reference 4), and the *Geologic Map of the Pueblo 1^0 x 2^0 Quadrangle*, distributed by the US Geological Survey in 1978 (Reference 5). The Test Borings were also used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

5.4 Soil Conditions

The soils encountered in the test borings can be grouped into three general soil types. The soils were classified using the Unified Soil Classification System (USCS). Descriptions of the soil types are discussed as follows:

Soil Type 1: consists of silty sand (SM). The sands were encountered in all of the test borings at the existing surface grade extending to depths ranging from 1 to 8 feet bgs. These soils were encountered at medium dense to dense states and moist conditions. Samples tested had 16 to 30 percent of the soil size particles passing the No. 200 Sieve. Atterberg limits testing resulted in the being non-plastic results. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade concrete degradation due to sulfate attack

Soil Type 2: consists of silty sandstone bedrock (SM). The sandstone was encountered in all of the test borings at depths ranging from 1 to 8 feet bgd and extending to depths of 9 feet and to the termination of the test borings (18 to 20 feet). Samples tested had 13 to 21 percent of the soil size particles passing the No. 200 Sieve. Atterberg limits testing resulted in non-plastic results.

Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 3: consists of sandy claystone bedrock (CL). The claystone was encountered in Test Boring No. 7 at depth 9 feet bgs and extending to the termination of the test boring (20 feet). The claystone was encountered at hard consistencies and moist conditions. The sample tested had 65 percent of the soil size particles passing the No. 200 Sieve. Swell/Consolidation Testing of the claystone indicated a volume change of 0.8 percent which is in the low expansion range. Highly expansive claystone and siltstone are common in the area.

The Test Boring Logs are presented in Appendix B. Laboratory Test Results are presented in Appendix C.

5.5 Groundwater

Groundwater was encountered in Test Boring Nos. 4, 6, 8, 9, and 10 at depths of 7 to 16.5 feet below existing ground surface. Groundwater depths are shown on the Test Boring Map, Figure 3, and on Table 2. Areas of seasonal and potentially seasonal shallow groundwater have been mapped in low-lying areas and in the drainages on-site. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time.

It should be noted that in the sandy materials on site, some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock. Builders and planners should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site and deal with each individual problem as necessary at the time of construction.

6.0 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

As mentioned previously, detailed mapping has been performed on this site to produce a Geology/Engineering Geology Map (Figure 6). This map shows the location of various geologic conditions of which the developers should be cognizant during the planning, design and construction stages of the project. These hazards and the recommended mitigation techniques are as follows:

Artificial Fill – Constraint

These are areas of man-made fill associated with earthen dams on-site.

Mitigation: The earthen dams lie within defined drainages and should be avoided as building sites. Foundations may penetrate smaller berms on site. Should any uncontrolled fill be encountered in other portions of the site beneath foundations, removal and recompaction at 95% of its maximum Modified Procter Dry Density, ASTM D-1557 will be required.

Erosion – Constraint

This is an area that is undergoing erosion by water producing gullies and rill erosion in the east-central portion of the site along a minor drainage.

Mitigation: Due to the nature of the soils on this site, virtually all the soils are subject to erosion by wind and water. Areas of erosion can occur across the entire site, particularly if the soils are disturbed during construction. Vegetation reduces the potential for erosion. The areas identified where erosion is actually taking place may require check dams, regrading and revegetation using channel lining mats to anchor vegetation. Further recommendations for erosion control are discussed under Section 8.0 "Erosion Control" of this report. Recommendations pertaining to revegetation may require input from a qualified landscape architect and/or the Natural Resource Conservation Service (previously Soil Conservation Service).

Expansive Soils – Constraint

Expansive soils were encountered in one of the test borings drilled on site. The Dawson Sandstone in the area is commonly interbedded expansive claystone and siltstone. The

expansive soils encountered on site are sporadic, therefore, none have been indicated on the map. Expansive soils can cause differential movement in the structure foundations.

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils may include overexcavation and replacement with non-expansive structural fill at 95% of its maximum Modified Proctor Dry Density, ASTM D-1557. Drilled pier foundation systems are another option in areas of highly expansive soils. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement with compacted non-expansive soils has been successful in minimizing slab movements. Final recommendations should be determined after additional investigation of each building site.

Groundwater and Drainage Areas

Groundwater was encountered in five of the test borings at depths ranging from 7 to 16.5 feet. Areas within the minor drainages on-site have been identified as seasonal and potentially seasonal shallow groundwater. Water was not observed in the drainages or in the pond at the time of our investigation. No floodplains have been mapped on the site according to FEMA Map Nos. 08041CO551G and 08041CO551G, (Figure 7, Reference 6). Exact floodplain location and drainage studies are beyond the scope of this report. Groundwater areas are discussed as follows:

- Potentially Seasonal Shallow Groundwater Area – Constraint

In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils. The majority of these areas lie within minor drainage areas which will likely be filled with future site grading. Construction in any portions of these areas, if required, should follow these precautions.

Mitigation: In these locations, foundation in areas subject to severe frost heave potential should penetrate to a sufficient depth so as to discourage the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth of 30 inches is recommended for frost protection. In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the seepage of water into areas located below grade. Any grading in these areas should be done in a manner

that directs surface flow around construction to avoid areas of ponded water. Areas of organic material will require removal before any filling is done. Groundwater may be at sufficient depth as to not affect foundations. Further investigation is recommended prior to construction in these areas to further delineate groundwater depths.

- Seasonal Shallow Groundwater Area – Constraint

This area is located in the small pond behind the earthen dam in the southeastern portion of the site. Water was not observed at the time of this investigation, however, vegetation and soils observed indicate water is near or at the surface during periods of high moisture. These areas also contain frost heave potential and highly organic soils.

Mitigation: Because the majority of the areas mapped as seasonally wet lie within defined drainages, we do not recommend structures be built within these areas. Lots are of sufficient size that these areas can be avoided as building sites. Should foundations encroach on seasonal shallow groundwater areas, the recommendations for potentially seasonal shallow groundwater mitigation should be followed. Additionally, basements would not be recommended in these areas. Any construction in these areas should be done in a manner that does not create ponded water. Where roadways or driveways cross drainages, adequately sized culverts should be installed. No areas of the site are mapped within any floodplain zones according to the FEMA Map No. 08041CO551G and 08041CO553G, Figure 10 (Reference 6). Specific floodplain locations and drainage studies are beyond the scope of this report.

Radioactivity

Radon levels for the area have been reported by the Colorado Geologic Survey in the Open-File, Report No. 91-4 (Reference 10). Average radon levels of 4.50 pCi/l have been measured in the area. The following is a table of radon levels in this area.

0<4 pci/l	0.00%
4<10 pci/l	100.00%
10<20 pci/l	0.00%
>20 pci/l	0.00%

Only one reading has been taken in the area. The minimal information from this report is not sufficient to determine if radon levels are higher for this site. An occurrence of radioactive minerals has been identified approximately 8 miles northwest of the site (Reference 11). This occurrence is associated with a limonite deposit in the Dawson Formation. No known occurrences exist on the site, however, radon gas originating in the bedrock underlying the site could migrate up into the upper soil profile.

Mitigation: The potential exists for radon gas to build up in areas of the site. Build-ups of radon gas can be mitigated by providing increased ventilation of basements and crawlspaces and sealing of joints. Specific requirements for mitigation should be based on-site specific testing after the site has been developed.

6.1 Relevance of Geologic Conditions to Land Use Planning

The development will consist of commercial and residential lots. It is our opinion that the existing geologic and engineering geologic conditions will impose some minor constraints on the development and construction of the site. A development plan was not available at the time of this investigation. The most significant problems affecting development will be those associated with the minor drainages on site that will likely be regraded and filled during the development of the site. Other hazards on site may be satisfactorily mitigated through proper engineering design and construction practices or avoidance.

The upper materials are typically at medium dense to dense states. The medium dense to dense granular soils and dense sandstone encountered in the test borings should provide good support for foundations. Loose soils, if encountered beneath foundations or slabs, will require removal of the upper 2 to 3 feet of loose material and recompaction. Expansive soils, although sporadic, were encountered. Shallow bedrock was encountered in the majority of the test borings. Expansive clayey sandstone and claystone are common in the Dawson Formation, which may require mitigation if encountered at or near foundation grade.

Foundations anticipated for the site are standard spread footings being on granular site soils or sandstone. Overexcavation in areas of expansive soils or loose soils may be required. Areas of artificial fill, if encountered beneath foundations will require penetration or recompaction. Areas

containing arkosic sandstone will have high allowable bearing conditions. Expansive layers may also be encountered in the soil and bedrock on this site. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas of seasonal shallow groundwater and potentially seasonal shallow groundwater were observed on site. The site is not mapped in a floodplain zone (Figure 7, Reference 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These areas lie within low-lying areas along the minor drainages across the site. Water was not observed in any of the minor drainages or pond at the time of our site investigation. Regrading can also mitigate some minor drainages on the site. Structures should not block drainages. Any site grading should be done in such a manner as to not create areas of ponded water around structures. Finished floor levels must be a minimum of one foot above the floodplain level. Specific floodplain locations and drainage studies are beyond the scope of this report.

In summary, development of the site can be achieved if the items mentioned above are mitigated. These items can be mitigated through proper design and construction or through avoidance. Investigation on each lot is recommended prior to construction.

7.0 ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 9), the area is mapped with floodplain, valley fill and upland deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 10), areas of the site are mapped with Alluvial Fan deposits: sand and probable aggregate resource (A3). According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 11), the area of the site has been mapped as “Good” for industrial minerals. However, considering the abundance of similar materials through the region and the close proximity to developed land, they would be considered to have little significance as an economic resource.

According to *the Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 11), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "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 (Reference 11).

The site has been mapped as "Fair" for oil and gas resources (Reference 11). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

8.0 EROSION CONTROL

The soil types observed on the site are mildly to highly susceptible to wind erosion, and moderately to highly susceptible to water erosion. A minor wind erosion and dust problem may be created for a short time during and immediately after construction. Should the problem be considered severe enough during this time, watering of the cut areas or the use of chemical palliative may be required to control dust. However, once construction has been completed and vegetation re-established, the potential for wind erosion should be considerably reduced.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where

ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

9.0 EMBANKMENT CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for embankment construction. Groundwater may be encountered in deeper cuts on the site. If excavations encroach on the groundwater level unstable soil conditions may be encountered.

Any areas to receive fill should have all topsoil, organic material or debris removed. Fill must be properly benched and compacted to minimize potentially unstable conditions in slope areas. Fill slopes should be 3:1 or flatter on the upstream faces or 2.5:1 or flatter on the downstream face. The subgrade should be scarified and moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557, prior to placing new fill. Areas receiving fill may require stabilization with rock or fabric if shallow groundwater conditions are encountered.

New fill should be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95% of its maximum Modified Proctor Dry Density, ASTM D-1557. These materials should be placed at a moisture content conducive to compaction, usually 0 to ±2% of Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech

during construction. Entech should approve any import materials prior to placing or hauling them to the site.

10.0 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some minor constraints on development and construction of the site. The majority of these conditions can be avoided by construction. Others can be mitigated through proper engineering design and construction practices. The proposed development and use is consistent with anticipated geologic and engineering geologic conditions.

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Additional investigation is recommended when grading/development plans are available. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

This report has been prepared for Kyle Geditz for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

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TABLES

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

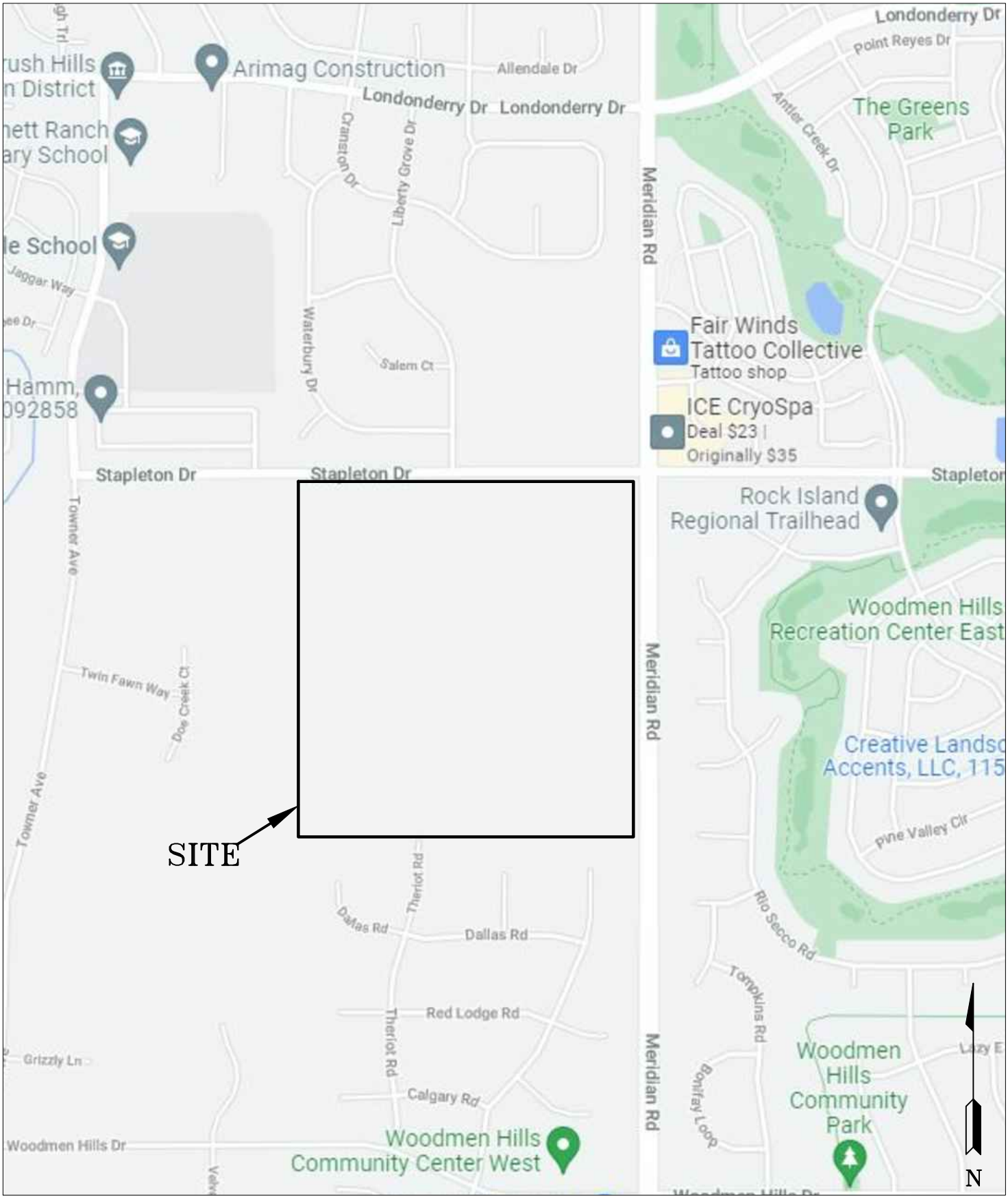
CLIENT KYLE GEDITZ
PROJECT MERIDIAN AND STAPLETON
JOB NO. 220093

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	2-3			19.5	NV	NP	<0.01			SM	SAND, SILTY
1	2	5			21.2						SM	SAND, SILTY
1	4	2-3			29.6						SM	SAND, SILTY
1	8	2-3			15.8	NV	NP				SM	SAND, SILTY
2	3	10			18.4	NV	NP	<0.01			SM	SANDSTONE, SILTY
2	5	5			15.2	NV	NP				SM	SANDSTONE, SILTY
2	6	5			12.7						SM	SANDSTONE, SILTY
2	9	10			21.4						SM	SANDSTONE, SILTY
2	10	2-3			13.3						SM	SANDSTONE, SILTY
3	7	10	14.9	105.8	65.4					0.8	CL	CLAYSTONE, SANDY

Table 2: Summary Test Boring Results

Test Boring No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.) 2/7/22	Depth to Groundwater (ft.) 3/10/22
1	3	>20	>20
2	8	>20	>20
3	6	>19.5	>19
4	4	16.5	Caved at 16
5	1	>20	>18
6	1	13	14
7	1	>19	Caved at 17.5
8	7	16	16
9	3	15	16
10	1	7	12

FIGURES



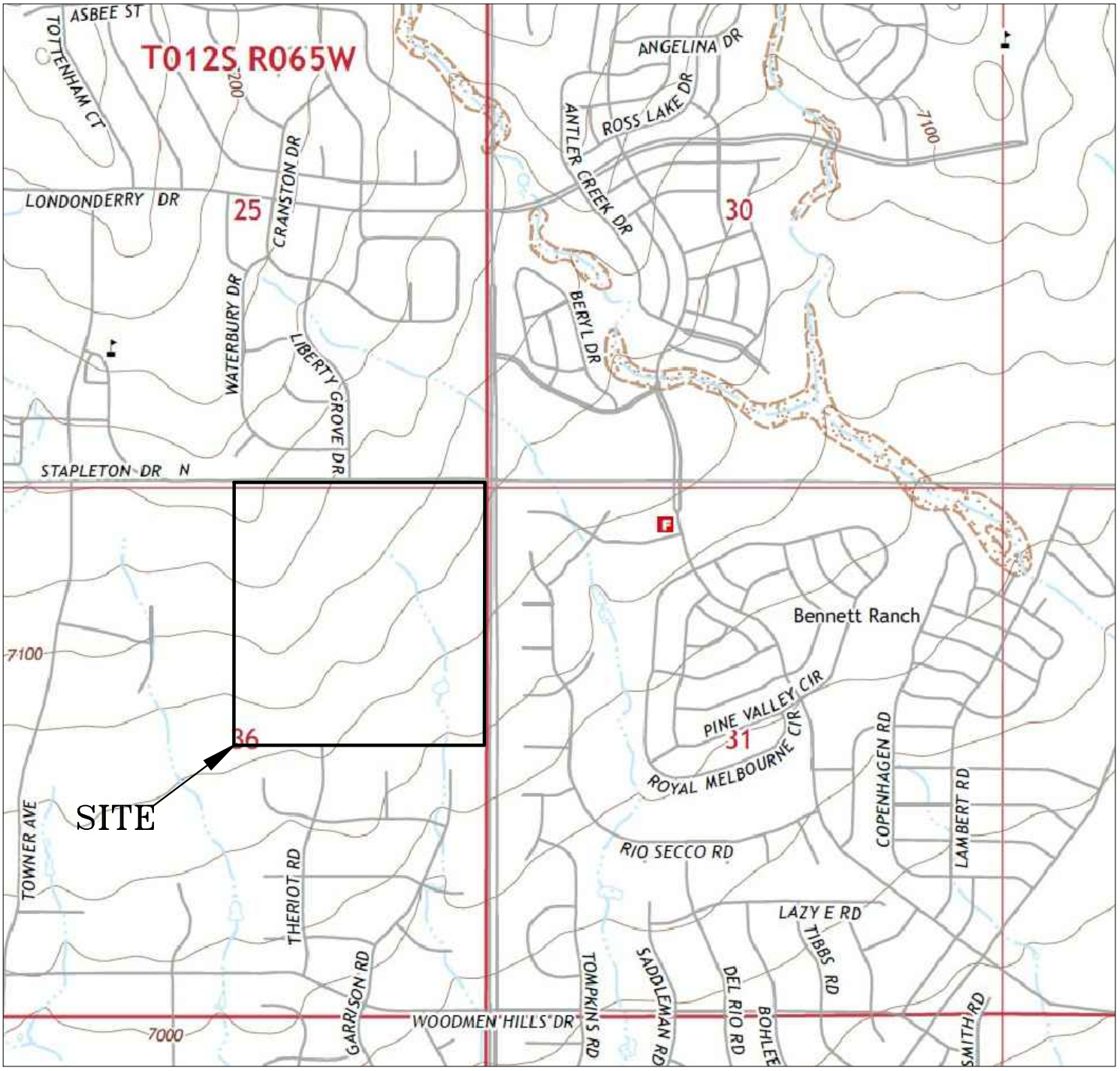
ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

VICINITY MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN:	DATE:	CHECKED:	DATE:
JHR	2/11/22	LLL	

JOB NO.: 220093

FIG NO.: 1



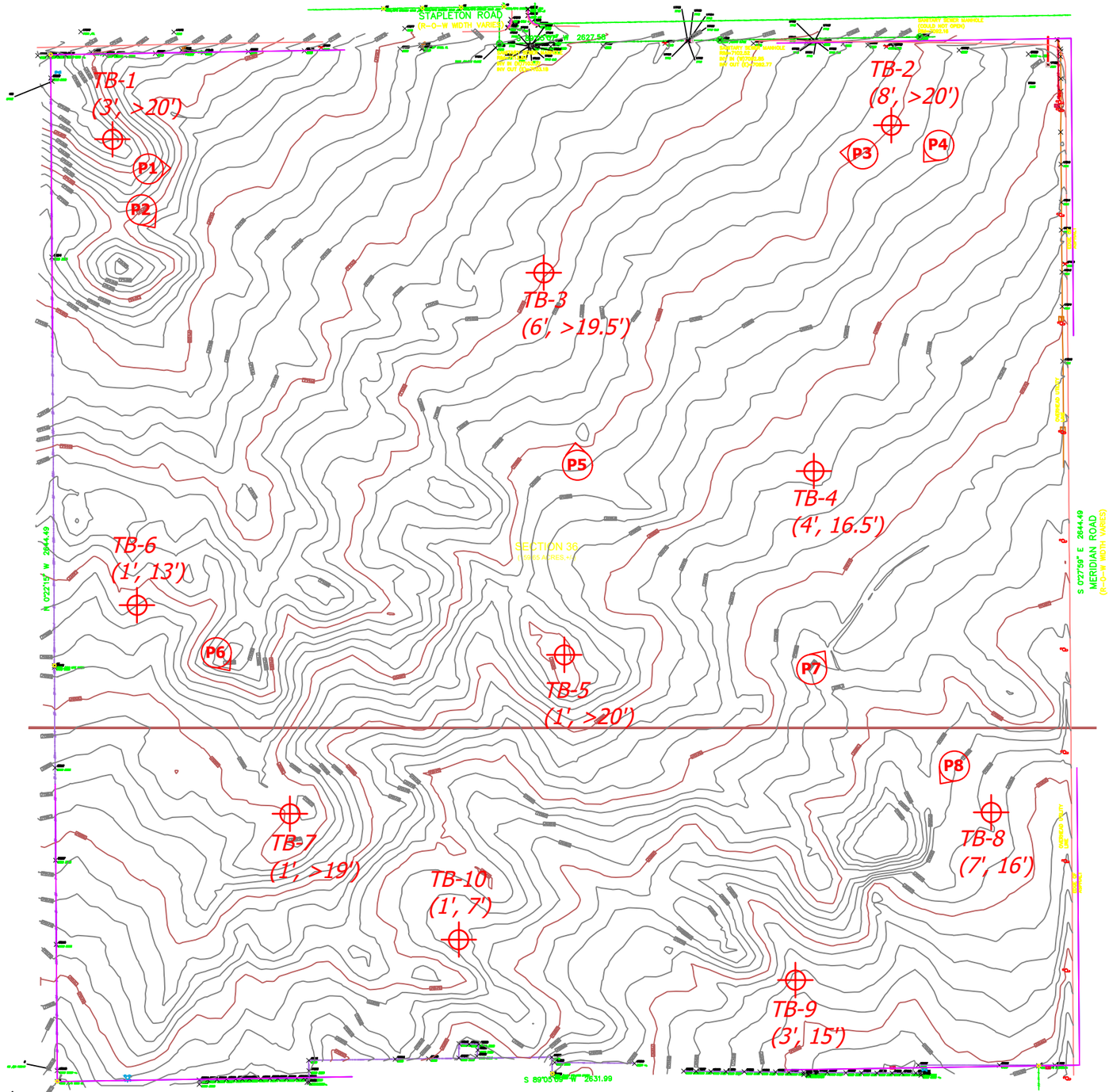
ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

USGS MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN:	DATE:	CHECKED:	DATE:
JHR	2/11/22	LLL	

JOB NO.: 220093

FIG NO.: 2



LEGEND:

- TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (DEPTH TO BEDROCK, DEPTH TO GROUNDWATER)
- P2 - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

N

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ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907
(719) 531-5599

SITE MAP/TEST BORING LOCATION MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN	JHR
CHECKED	LLL
DATE	3/10/22
SCALE	AS SHOWN
JOB NO.	220093
FIGURE No.	3

N

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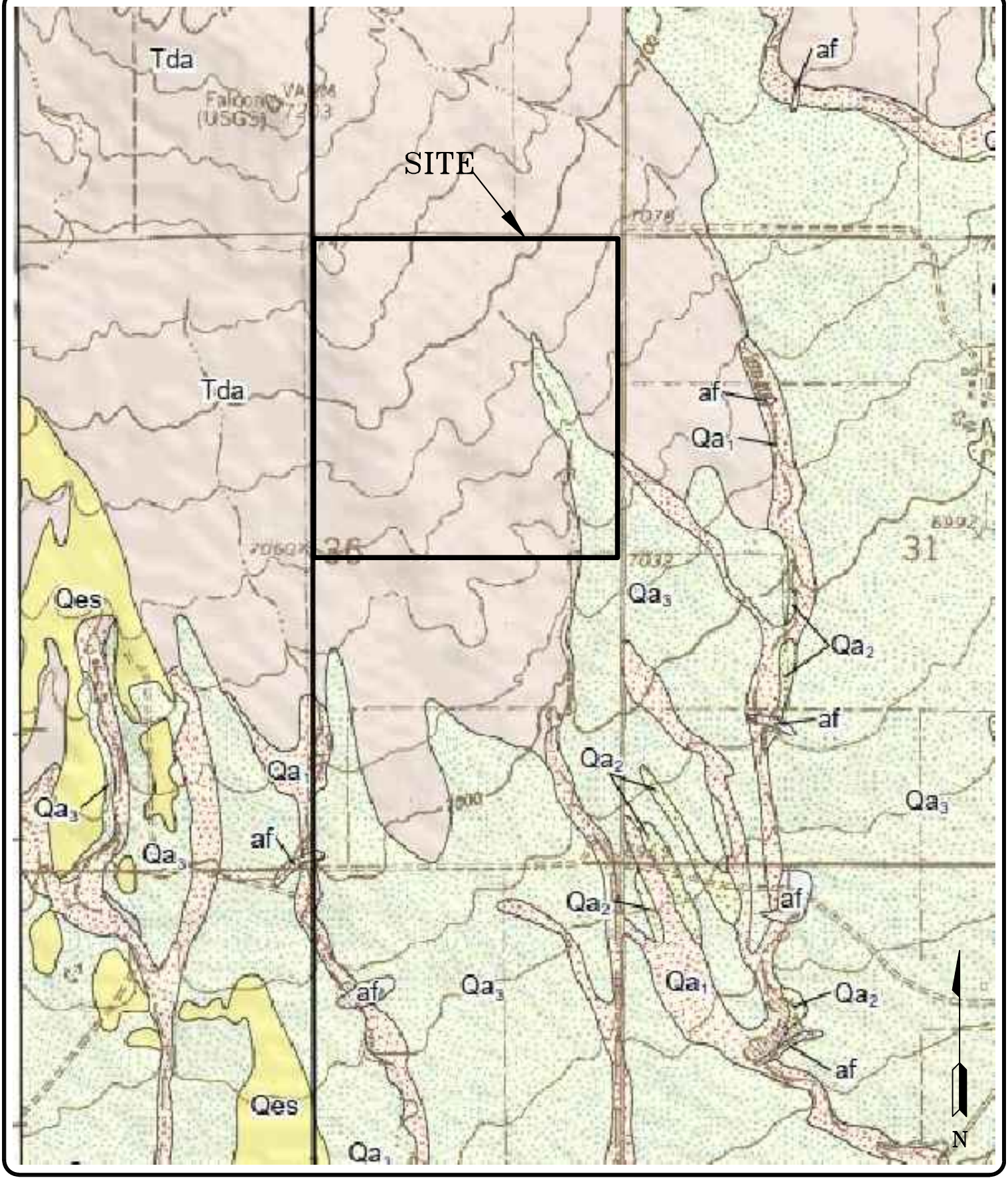
COLORADO SPRINGS, CO. 80907 (719) 531-5599

SOIL SURVEY MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN:	DATE:	CHECKED:	DATE:
JHR	2/11/22	LLL	

JOB NO.: 220093

FIG NO.: 4



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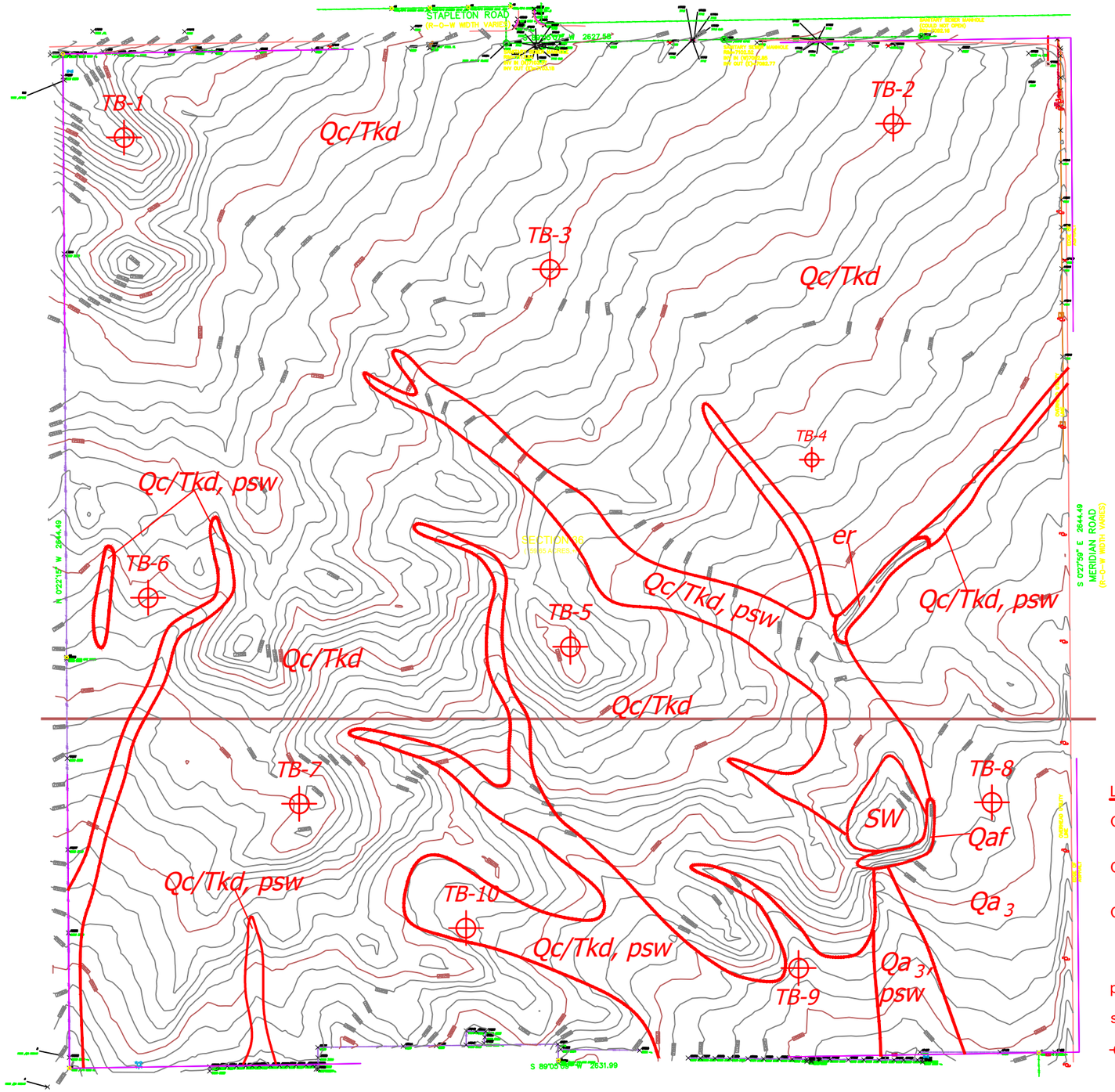
COLORADO SPRINGS, CO. 80907 (719) 531-5599

FALCON QUADRANGLE GEOLOGIC MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN:	DATE:	CHECKED:	DATE:
JHR	2/11/22	LLL	

JOB NO.: 220093

FIG NO.: 5



LEGEND:

Qaf - Artificial Fill of Holocene Age:
man-made fill deposits associated with an earthen dam

Qa_3 - Alluvium Three of late Pleistocene Age:
recent water deposited sediment along dam spill way

Qc/Tkd - Colluvium of Quaternary Age Overlying the Dawson Formation of Tertiary to Cretaceous Age:
Sheetwash and residual soil deposits overlying arkosic sandstone with interbedded siltstone and claystone.

psw - potentially seasonal wet areas

sw - seasonal wet area

⊕ - approximate test boring location

N

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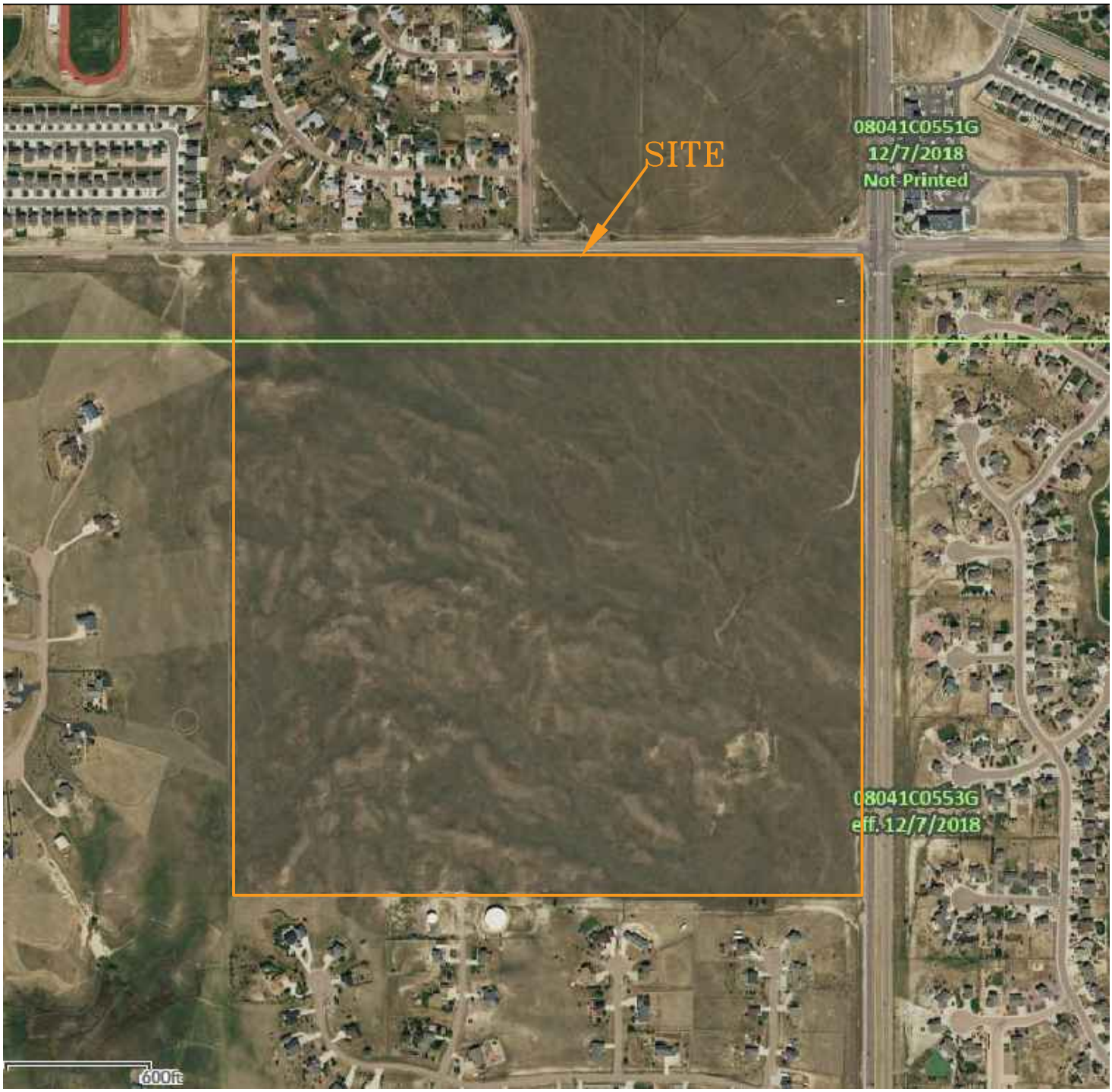
GEOLOGY/ENGINEERING GEOLOGY MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN	JHR
CHECKED	LLL
DATE	3/10/22
SCALE	AS SHOWN
JOB NO.	220093
FIGURE No.	6



N

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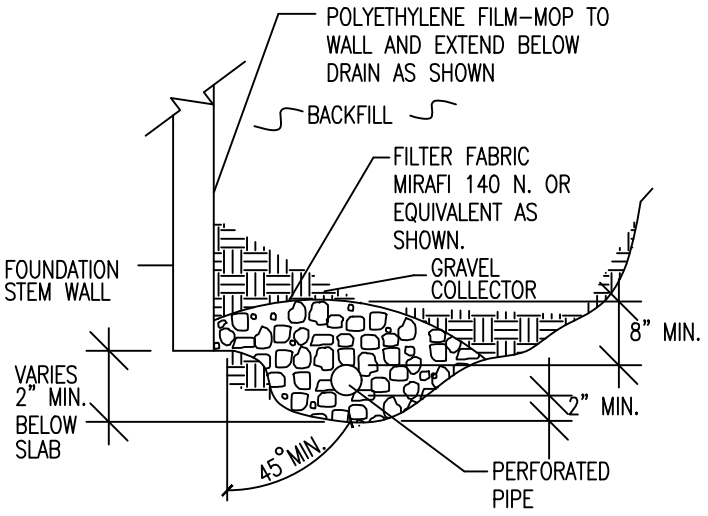
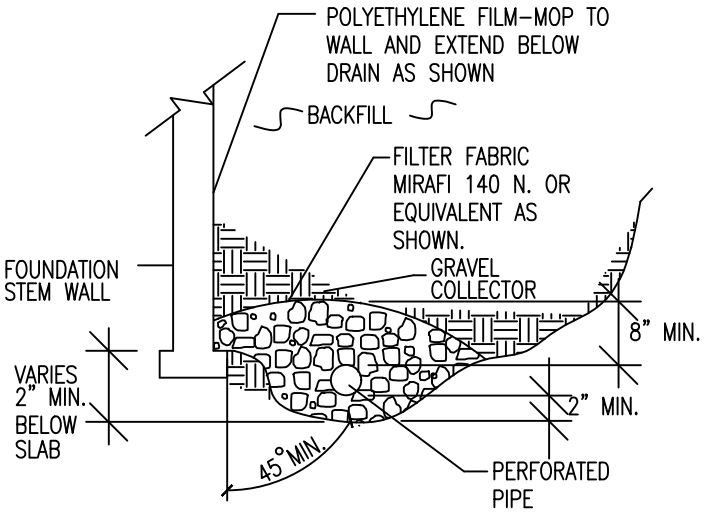
FLOODPLAIN MAP
PARCEL NO. 52000-00-016
MERIDIAN ROAD AND STAPLETON DRIVE
EL PASO COUNTY, CO.
FOR: KYLE GEDITZ

DRAWN:	DATE:	CHECKED:	DATE:
JHR	2/11/22	LLL	

JOB NO.: 220093

FIG NO.: 7





NOTES:

–GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS–85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

–PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4–INCH DIAMETER IS MOST OFTEN USED.

–ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON–PERFORATED PIPE.

–FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

–MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

–DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUT FALL IS NOT AVAILABLE.

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PERIMETER DRAIN DETAIL

DRAWN:	DATE:	DESIGNED:	CHECKED:

JOB NO.: 220093

FIG NO.: 8

APPENDIX A: Site Photographs

1

Looking east from the northwestern portion of the site.

January 20, 2022

2

Looking southeast from northwestern portion of the site.

January 20, 2022

Job No. 220093

3

Looking west from the northeastern portion of the site.

January 20, 2022

4

Looking southwest from the northeastern portion of the site.

January 20, 2022

Job No. 220093

5

Looking northeast from the central portion of the site.

January 20, 2022

6

Looking southeast from the western portion of the site.

January 20, 2022

Job No. 220093

7

Looking northeast towards area of erosion in the east-central portion of the site.

January 20, 2022

8

Looking at the earthen dam in the southeastern portion of the site.

January 20, 2022

Job No. 220093

APPENDIX B: Test Boring Logs

TEST BORING NO. 1
DATE DRILLED 1/27/2022
Job # 220093

REMARKS

WATER @ 19.5', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			39	4.3	1
			50/5"	8.1	2
5					
			50/6"	10.9	2
10					
			50/4"	8.2	2
15					
			50/5"	9.0	2
20					

SAND, SILTY, FINE TO COARSE GRAINED, TAN, DENSE, MOIST

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

TEST BORING NO. 2
DATE DRILLED 1/27/2022
CLIENT KYLE GEDITZ
LOCATION MERIDIAN AND STAPLETON

REMARKS

WATER @ 20', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	3.5	1
			16	4.3	1
5					
			50/4"	7.2	2
10					
			50/6"	7.8	2
15					
			50/4"	10.1	2
20					

SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093
FIG NO.: B- 1

TEST BORING NO. 3
DATE DRILLED 1/27/2022
Job # 220093

REMARKS

WATER @ 19.5', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			36	4.2	1	SAND, SILTY, FINE TO COARSE GRAINED, TAN, DENSE, MOIST
5			44	7.6	1	
			50/5"	9.2	2	SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET
10						
			50/5"	8.3	2	
15						
			50/3"	8.4	2	
20						

TEST BORING NO. 4
DATE DRILLED 1/27/2022
CLIENT KYLE GEDITZ
LOCATION MERIDIAN AND STAPLETON

REMARKS

WATER @ 16.5', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			23	10.0	1	SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST
5			50/5"	12.4	2	SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET
10			50/5"	10.1	2	
15			50/5"	5.3	2	
						AUGER REFUSAL AT 18'
20						

ENTECH
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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LL	2/8/22

JOB NO.: 220093
FIG NO.: B- 2

TEST BORING NO. 5
DATE DRILLED 2/4/2022
Job # 220093

REMARKS

WATER @ 20', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/10"	3.8	2
5			50/6"	6.8	2
10			50/5"	4.4	2
15			50/5"	10.2	2
20			50/3"	5.0	2

SAND, SILTY, TAN
SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

TEST BORING NO. 6
DATE DRILLED 1/31/2022
CLIENT KYLE GEDITZ
LOCATION MERIDIAN AND STAPLETON

REMARKS

WATER @ 14.5', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/9"	2.8	2
5			50/6"	6.8	2
10			50/6"	38.0	2
15			50/5"	10.6	2
20			50/3"	13.6	2

SAND, SILTY, TAN
SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/9/22

JOB NO. 220093
FIG NO. B- 3

TEST BORING NO. 7
DATE DRILLED 1/31/2022
Job # 220093

REMARKS

WATER @ 19', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/7"	6.6	2
5			50/4"	8.2	2
10			50/4"	12.5	3
15			50/5"	14.5	3
20			50/6"	14.1	3

SAND, SILTY, TAN

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

TEST BORING NO. 8
DATE DRILLED 2/4/2022
CLIENT KYLE GEDITZ
LOCATION MERIDIAN AND STAPLETON

REMARKS

WATER @ 17', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	7.3	1
5			24	6.5	1
10			50/7"	8.4	2
15			50/2"	8.6	2
20			50/8"	13.7	2

SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093
FIG NO.: B- 4

TEST BORING NO. 9
DATE DRILLED 2/4/2022
Job # 220093

REMARKS

WATER @ 16.5', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			47	5.3	1
			50/6"	6.5	2
5					
			50/5"	8.8	2
10					
			50/6"	10.5	2
15					
			50/3"	10.6	2
20					

SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN, DENSE, MOIST

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST

TEST BORING NO. 10
DATE DRILLED 1/31/2022
CLIENT KYLE GEDITZ
LOCATION MERIDIAN AND STAPLETON

REMARKS

WATER @ 9.5', 2/7/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/10"	5.9	2
5			50/10"	9.8	2
10			50/7"	10.3	2
15			50/5"		2
20			50/5"	11.5	2

SAND, SILTY, TAN

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO WET

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ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

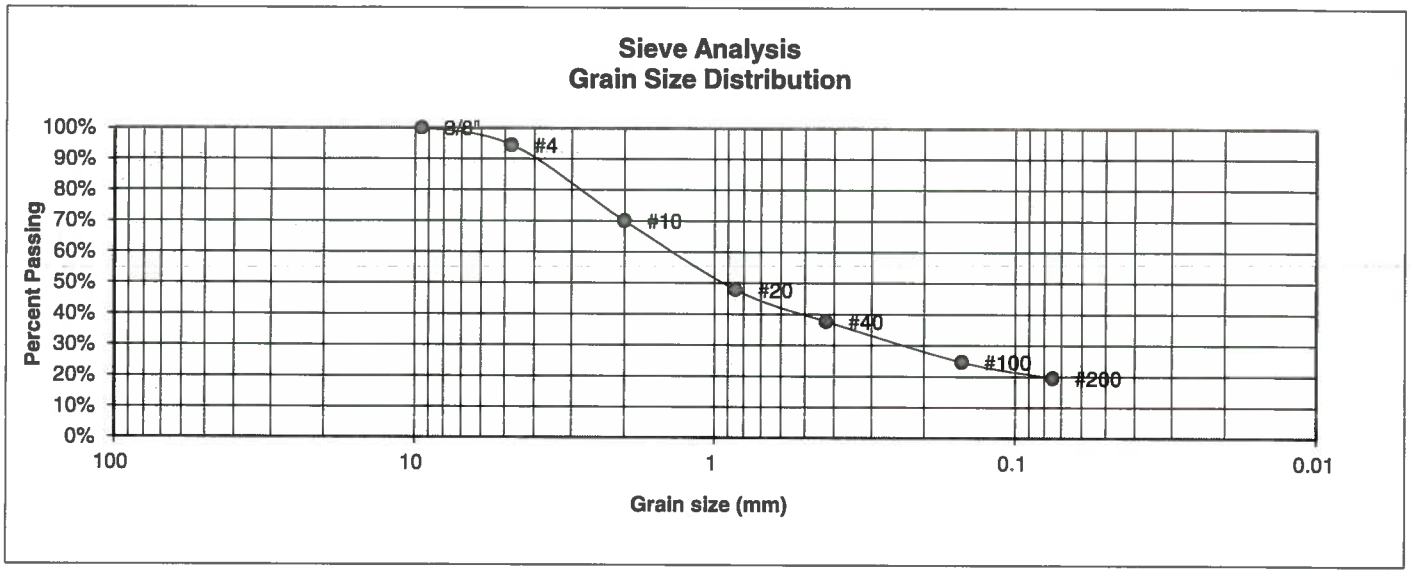
TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093
FIG NO.: B- 5

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	1	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	1	JOB NO.	220093
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.4%
10	70.0%
20	47.9%
40	37.7%
100	24.7%
200	19.5%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

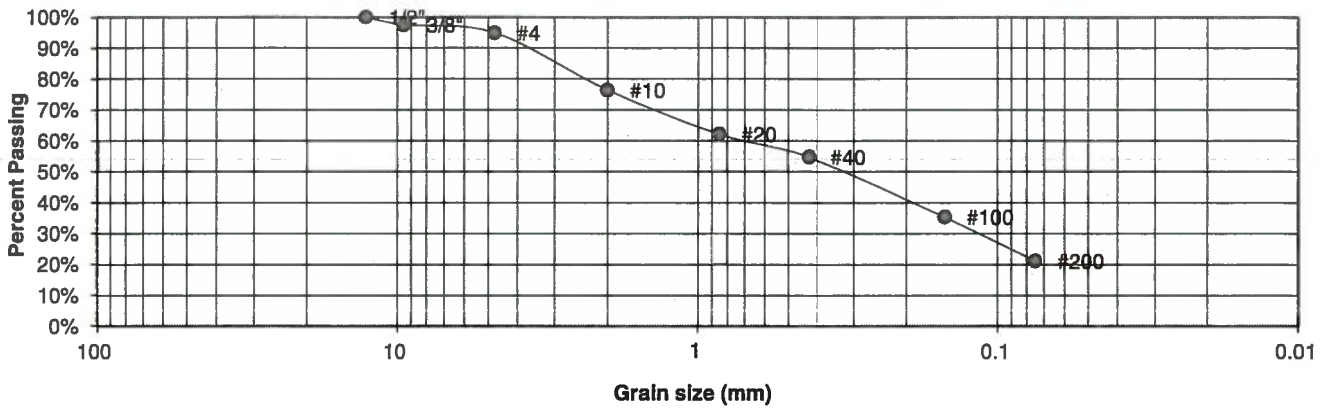
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-1

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	1	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	2	JOB NO.	220093
DEPTH (FT)	5	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.4%
4	94.9%
10	76.4%
20	62.1%
40	54.7%
100	35.3%
200	21.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

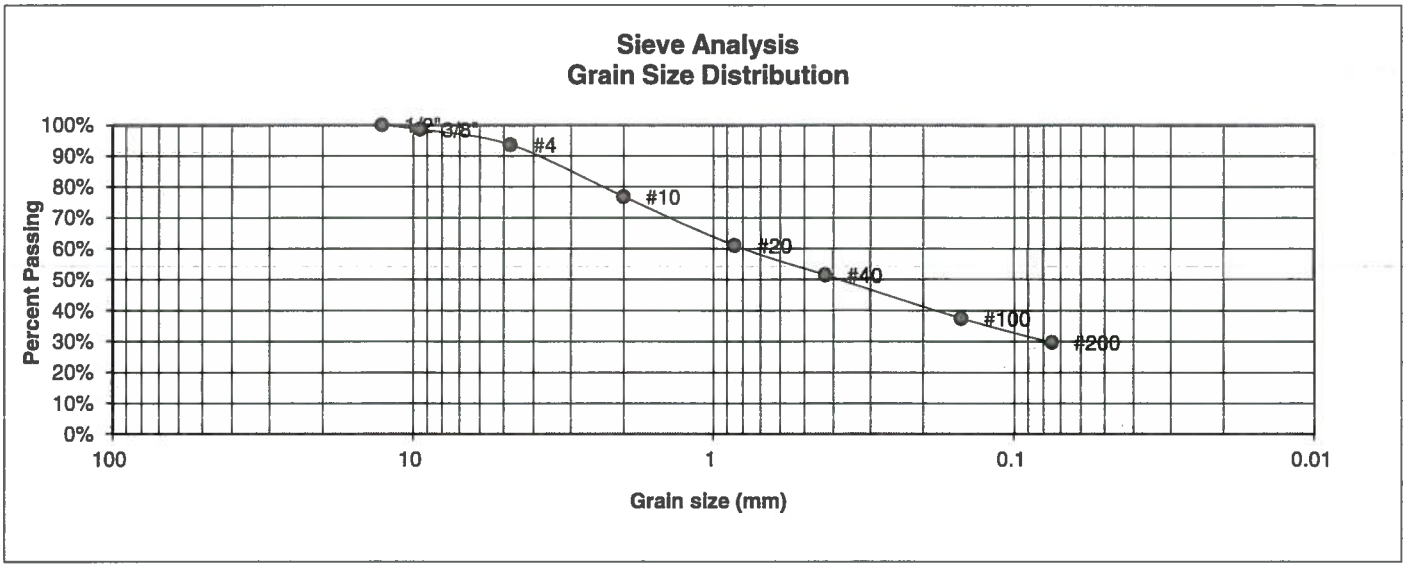
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	7/8/22

JOB NO.: 220093

FIG NO.: C-2

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	1	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	4	JOB NO.	220093
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.6%
4	93.6%
10	76.8%
20	61.0%
40	51.5%
100	37.4%
200	29.6%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

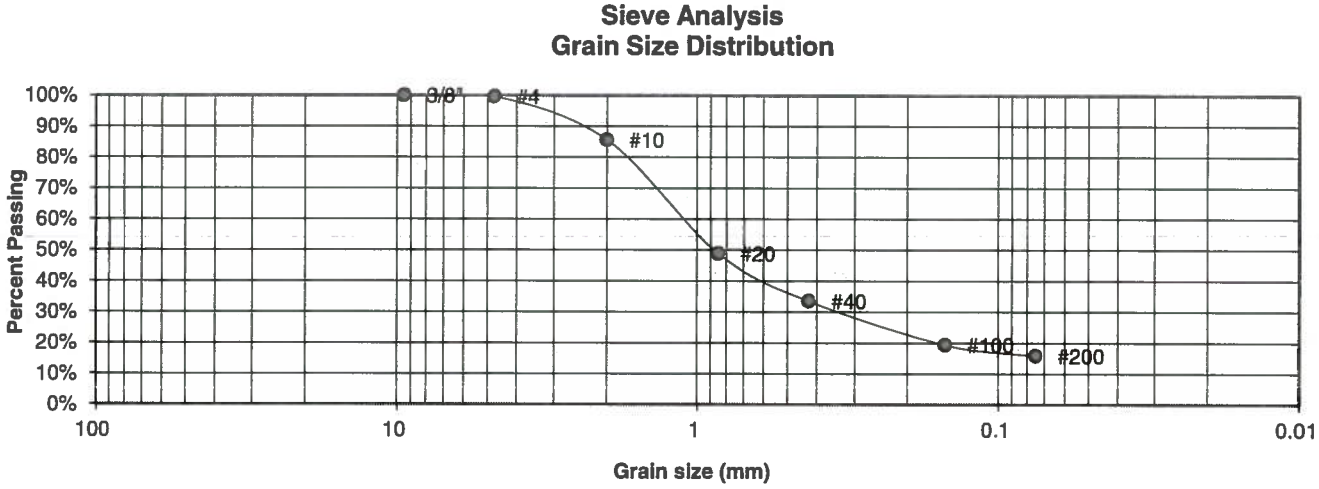
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-3

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	1	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	8	JOB NO.	220093
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.6%
10	85.6%
20	48.9%
40	33.5%
100	19.4%
200	15.8%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

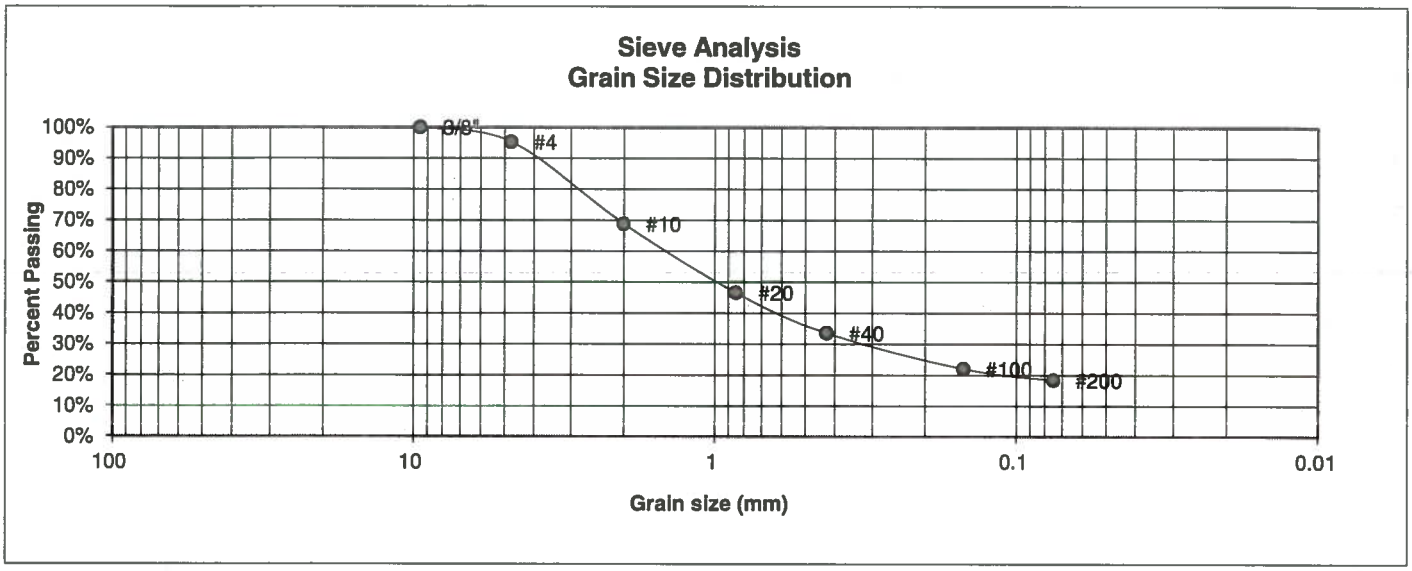
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-4

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	2	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	3	JOB NO.	220093
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.3%
10	68.8%
20	46.6%
40	33.5%
100	22.0%
200	18.4%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

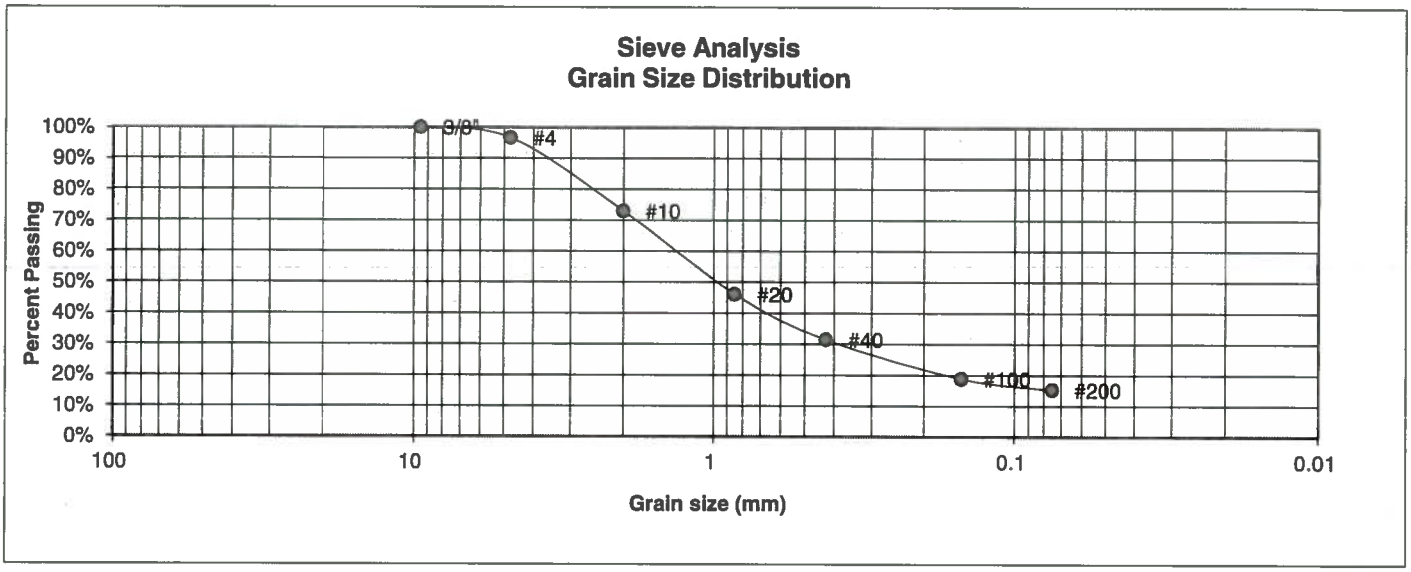
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: L-5

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	2	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	5	JOB NO.	220093
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.6%
10	73.0%
20	46.1%
40	31.4%
100	18.8%
200	15.2%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

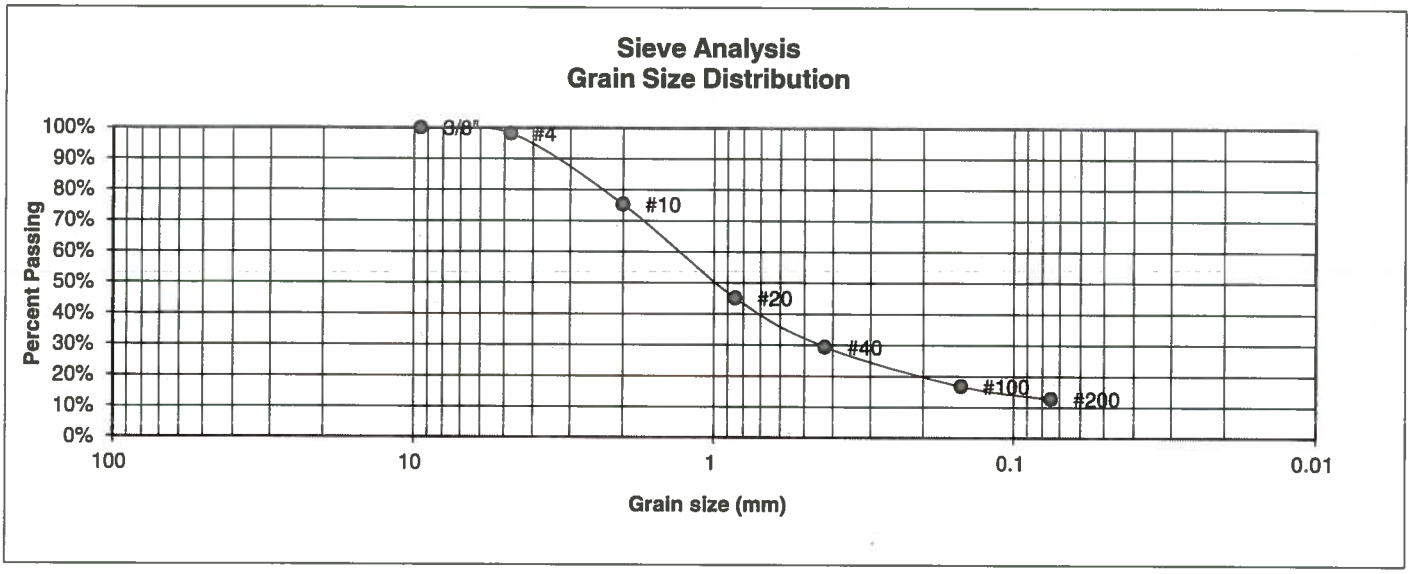
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-6

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	2	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	6	JOB NO.	220093
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.1%
10	75.3%
20	45.1%
40	29.4%
100	16.8%
200	12.7%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

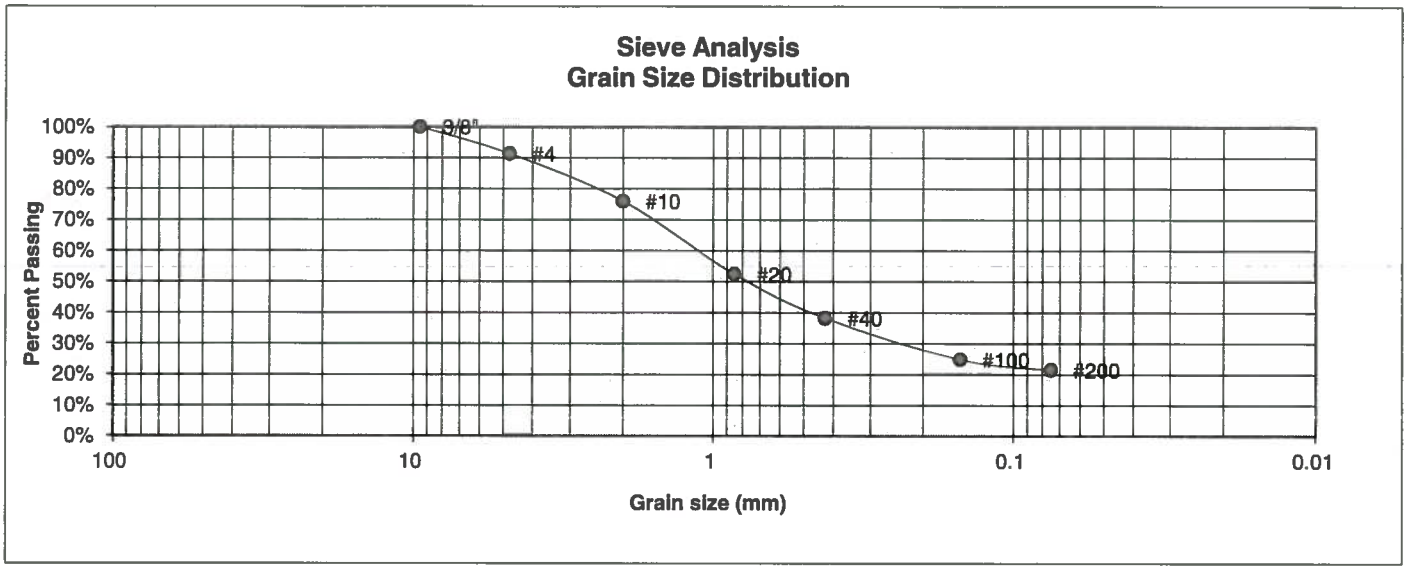
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-7

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	2	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	9	JOB NO.	220093
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.3%
10	76.0%
20	52.4%
40	38.2%
100	24.8%
200	21.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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COLORADO SPRINGS, COLORADO 80907

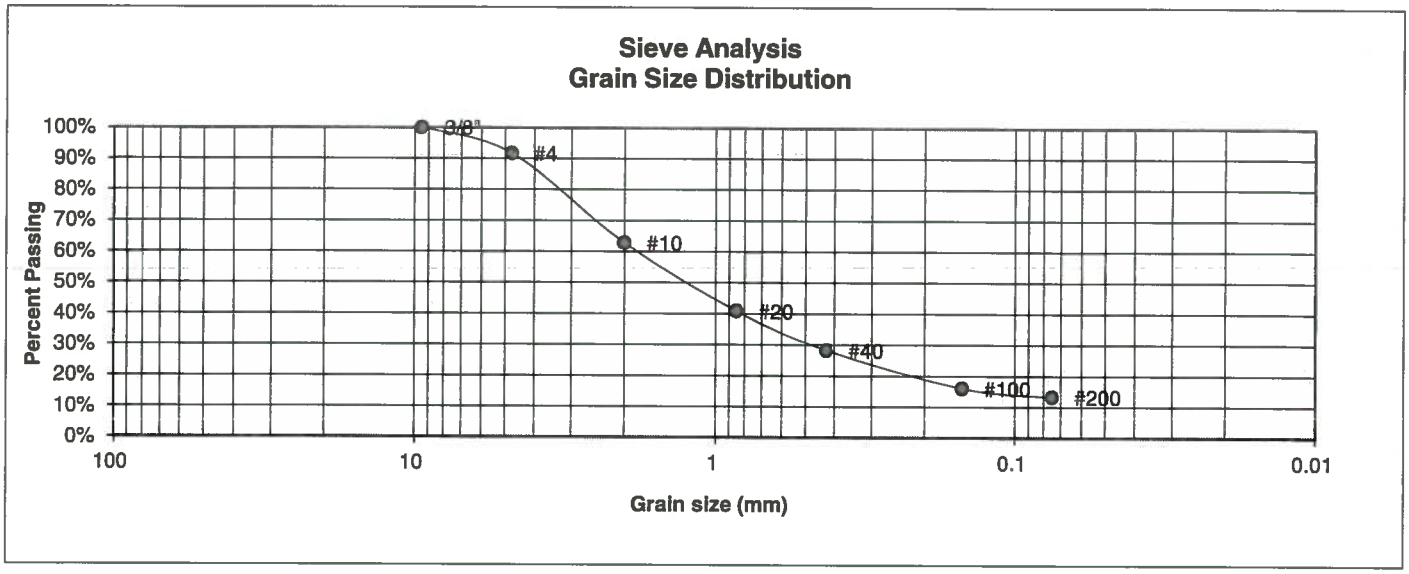
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: L-8

UNIFIED CLASSIFICATION	SM	CLIENT	KYLE GEDITZ
SOIL TYPE #	2	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	10	JOB NO.	220093
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.6%
10	62.8%
20	40.8%
40	28.2%
100	16.0%
200	13.3%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

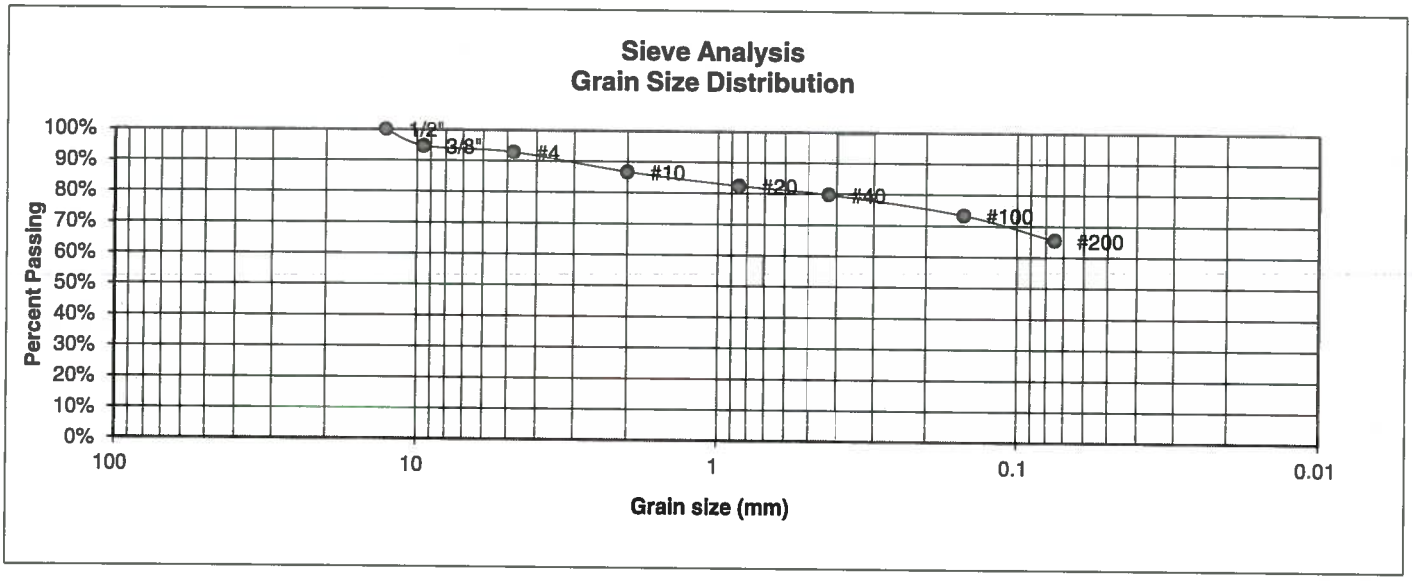
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-9

UNIFIED CLASSIFICATION	CL	CLIENT	KYLE GEDITZ
SOIL TYPE #	3	PROJECT	MERIDIAN AND STAPLETON
TEST BORING #	7	JOB NO.	220093
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	94.6%
4	92.8%
10	86.6%
20	82.4%
40	79.7%
100	73.3%
200	65.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

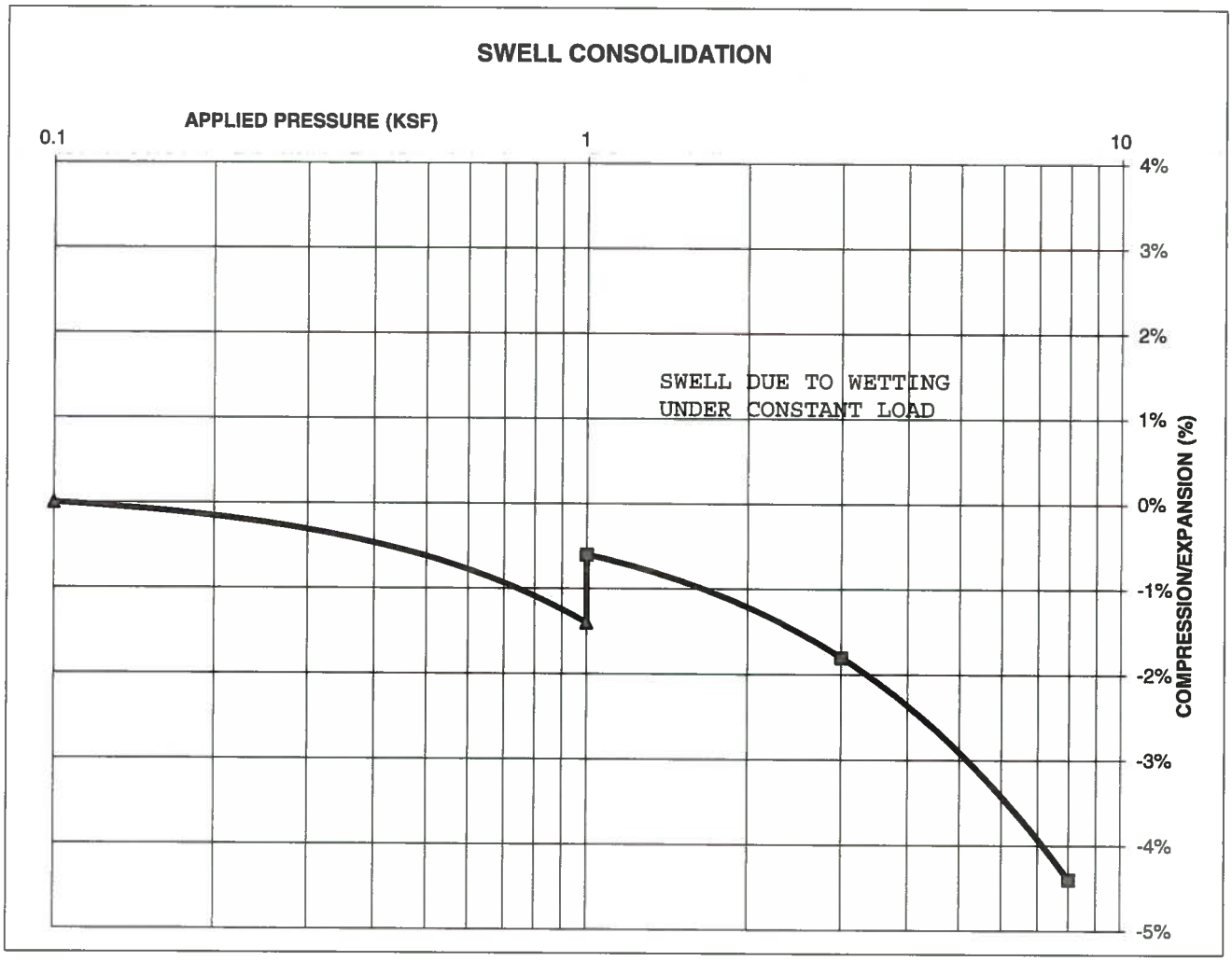
JOB NO.: 220093

FIG NO.: C-10

CONSOLIDATION TEST RESULTS

TEST BORING #	7	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	3
NATURAL UNIT DRY WEIGHT (PCF)			106
NATURAL MOISTURE CONTENT			14.9%
SWELL/CONSOLIDATION (%)			0.8%

JOB NO. 220093
CLIENT KYLE GEDITZ
PROJECT MERIDIAN AND STAPLETON



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SWELL CONSOLIDATION TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093
FIG NO.: C-11

CLIENT	KYLE GEDITZ	JOB NO.	220093
PROJECT	MERIDIAN AND STAPLETON	DATE	2/8/2022
LOCATION	MERIDIAN AND STAPLETON	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-1	2-3	1	SM	<0.01
TB-3	10	2	SM	<0.01

QC BLANK PASS

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COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST SULFATE RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/8/22

JOB NO.: 220093

FIG NO.: C-12

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

El Paso County Area, Colorado

83—Stapleton sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369z
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Stapleton and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stapleton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

A - 0 to 11 inches: sandy loam
Bw - 11 to 17 inches: gravelly sandy loam
C - 17 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils
Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021