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SOILS AND GEOLOGY STUDY
LATIGO TRAILS – FILING NO. 10
BUFFALO RIVER TRAIL AND OREGON WAGON TRAIL
EL PASO COUNTY, COLORADO

Prepared for:
BRJM, LLC
P.O. Box 60069
Colorado Springs, Colorado 80960

Attn: Robert Irwin

May 7, 2024

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Sr. Geologist

Reviewed by:

COLORADO LICENSED JOSEPH COLLIN GOODE 23725 PROFESSIONAL ENGINEER

Digitally signed by Joseph C. Goode Jr.
Date: 05/06/24

Joseph C. Goode Jr., P.E.
President

LLL

EPC PCD No.

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1 SUMMARY

Project Location

The project lies in portions of the SW¼ of Section 16 and the SE¼ of Section 17, Township 12 South, Range 64 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 6½ miles northeast of Colorado Springs in northern El Paso County, Colorado, south of the intersection of Buffalo River Trail and Oregon Wagon Trail in the Latigo Trails Subdivision.

Project Description

Latigo Trails – Filing No. 10 will consist of the development of approximately 130 acres with forty-three (43) single family rural residential lots and other associated site improvements. The proposed development is to be serviced Meridian Hills Metropolitan District for water and individual on-site wastewater treatment systems (OWTS).

Scope of Report

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

Land Use and Engineering Geology

This site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose some minor constraints on development and land use. These include areas of artificial fill, potentially expansive soils, shallow bedrock, potentially seasonal shallow groundwater and seasonally shallow groundwater areas, and the potential for elevated radon levels. Based on the proposed development plan, 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.

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The project lies in portions of the SW¼ of Section 16 and the SE¼ of Section 17, Township 12 South, Range 64 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 6½ miles northeast of Colorado Springs in northern El Paso County, Colorado, south of the intersection of Buffalo River Trail and Oregon Wagon Trail in the Latigo Trails Subdivision. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is gently rolling hills and valleys with a general southeast-sloping trend. Several drainages are located across the site, with an existing detention pond in the southwestern portion of the site, a pond in the central portion site. Vegetation consisted of field grasses and weeds. Existing residences and proposed developments are located to the north, south, and west, and Eastonville Road to the east. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have consisted of undeveloped grazing and pastureland. Site photographs, taken March 27, 2024, are included in Appendix A.

Latigo Trails – Filing No. 10 will consist of the development of approximately 130 acres with forty-three (43) single family rural residential lots and other associated site improvements. The proposed development is to be serviced Meridian Hills Metropolitan District for water and individual on-site wastewater treatment systems (OWTS). Site grading will be mostly associated with the roadways and drainage improvements. The Site and Exploration Plan Map is presented in Figure 3.

3 SCOPE OF THE REPORT

The scope of the report will include 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.

4 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 Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on February 1, 2024.

Twelve test borings were drilled as part of the investigation to determine general soil and bedrock characteristics. Test boring logs are included in Appendix B, and laboratory testing summary and results is included in Appendix C. The locations of the test borings are indicated on the Site and Exploration Plan, Figure 3. Results of this testing will be discussed later in this report.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 17 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 very gently dipping in a northerly direction (Reference 1). 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 Formation. Overlying this formation are unconsolidated deposits of colluvial and residually weathered soils, alluvial soils, and artificial fill of Holocene and Quaternary Age. The alluvial soils were deposited by water on site along the drainages located on the site. Man-placed soils exist as fill associated with grading and existing drainage improvements located in the southwestern 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 2). In general, the soils classify as coarse sandy loam. The soils are described as follows:

Type	Description
83	Stapleton Sandy Loam, 3 to 8% slopes

Complete descriptions of each soil type are presented in Appendix C. The soils have generally been described to have moderate to moderately rapid permeabilities. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The majority of the soils have been described to have moderate erosion hazards

5.3 Site Stratigraphy

The Geologic Maps of the Eastonville and Falcon Quadrangles showing the site location is shown in (Figure 5, References 4 and 5). The Geology/Engineering Geology Map prepared for the site is presented in Figure 6. Three mappable units were identified on this site which are described as follows:

Qaf **Artificial Fill of Holocene Age:** These are man placed fills associated with the recent grading operations for the on-going development to the west, existing drainage improvements, and earthen embankments observed on the site.

Qa_2 **Alluvium Two of late Holocene Age:** These are water deposited along the active drainage as stream terrace deposits that typically consist of silty to clayey sands and may contain clay layers. The Alluvium one correlates with the Post-Piney Creek Alluvium.

TKda **Dawson Arkose Formation of Tertiary to Cretaceous Age:** The Dawson Formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone, and claystone. Overlying this formation is a variable layer of residual soil. The residual soils were derived from the in-situ weathering of the bedrock materials on-site. These soils consisted of silty sands and may contain layers of sandy clays.

The soils listed above were mapped from site-specific mapping, the *Geologic Maps of the Eastonville and Falcon Quadrangles* distributed by the Colorado Geological Survey in 2012 and 20012 (References 4 and 5), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1981 (Reference 6), and the *Geologic Map of the Denver 1^0 x 2^0 Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 7). The test borings used in evaluating the site are included in Appendix B. The Geology/Engineering Geology Map prepared for the site is presented in Figure 6.

5.4 Soil Conditions

The soils and bedrock encountered in the test borings can be grouped into three general soil types. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 classified as medium dense to dense silty sand, sand with silt, and clayey sand (SM, SW-SM, SC). The sand was encountered in all the borings at the existing grade extending to depths ranging from 4 to 11 feet. Swell Collapse testing on a sample of the clayey sand resulted in a volume change of -0.6%, indicating a low collapse potential. Sulfate testing on samples of Soil Type 1 indicated a negligible degradation potential due to sulfate attack.

Soil Type 2 classified as dense to very dense extremely weak to moderately weathered sandstone with varying amounts of clay and silt (SM, SW-SM, SC). The sandstone was encountered in all the borings at depths ranging from 4 to 15 feet and extended to the termination of the borings 20 feet. Swell Collapse testing on a sample of the silty sandstone resulted in a volume change of -1.8%, indicating a low to moderate collapse potential. Sulfate testing on a sample of Soil Type 2 indicated a negligible degradation potential due to sulfate attack.

Soil Type 3 classified as hard extremely weak sandy claystone (CL). The claystone was encountered in TB-3 and TB-8 at 8 to 11 feet and extending to depths of 14 and 15 feet. Swell Collapse testing on a sample of the silty sandstone resulted in a volume change of 0.0%, indicating a low expansion potential. Moderate to highly expansive claystone is common in the area. Sulfate testing on a sample of Soil Type 3 indicated a negligible degradation potential due to sulfate attack.

The Test Boring Logs are presented in Appendix B, and Depth to Groundwater and Bedrock is presented in Table B-1. Laboratory Test Results are presented in Appendix C, and a Summary of Laboratory Test Results is presented in Table C-1.

5.5 Groundwater

Groundwater was not encountered in the test borings to the depths drilled. Areas of ponded water, potentially seasonal shallow, and seasonally shallow groundwater were observed in drainages across the site. These areas are further 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 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

Detailed mapping has been performed on this site to produce a Geology/Engineering Geology Map Figure 7. 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 minor areas of existing roadway grading in the southwestern portion of the site, drainage improvements, and an earthen berm in the central portion of the site.

Mitigation: These existing embankments are located within proposed drainage easements and will be avoided. Any uncontrolled fill encountered beneath foundations will require removal and recompaction at a minimum of 95% of its maximum Modified Procter Dry Density, ASTM D-1557.

Expansive Soils – Constraint

Expansive soils were encountered in the test borings drilled on site. These occurrences are typically sporadic; therefore, none have been indicated on the maps. The clays and claystone, if encountered at foundation grade, can cause differential movement in structures. These occurrences should be identified and dealt with on an individual basis.

Mitigation Should expansive soils be encountered beneath foundations; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation 3 to 5 feet and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be determined after additional investigation of the building sites.

Shallow Bedrock – Constraint

Bedrock was encountered in all the test borings at depths ranging from 4 to 11 feet. Shallow bedrock will be likely be encountered in cuts and excavations across the site. Where claystone or sandstone are encountered, excavation/grading may be difficult requiring track-mounted excavators.

Groundwater and Floodplain Areas – Constraint

The site is not mapped within floodplain zones according to the FEMA Map Nos. 08041CO339G and 08041CO552G, (Figure 7, Reference 8) Several drainages are located across the site, with an existing detention pond in the southwestern portion of the site, a pond in the central portion site. Two of the drainages in the western and central portions of the site as shown on Figure 8 (Reference 9) have been classified in the U.S. Fish and Wildlife Service National Wetlands Inventory as R4SBC – Riverine (R), Intermittent (4), Streambed (SB), Seasonally Flooded (C), and the pond in the central portion of the site has been classified as PUSC – Palustrine (P), Unconsolidated Shore (US), Seasonally Flooded (C).

Most of the drainages and ponds on the site are located within drainage easements and will be avoided by the proposed residential development. Culverts are proposed where the drainages cross roadways. These areas are discussed as follows:

Potentially Seasonal and Seasonal Shallow Groundwater Areas – Constraint

In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils. These areas are associated with the drainages across the site that are located along proposed drainage easements and will be avoided by construction on the lots. Construction of the roadway crossings of the drainages and utility installation may encounter shallow groundwater and may require the use of temporary dewatering measures.

Mitigation: Foundations must have a minimum 30-inch depth for frost protection. Foundations should be placed a minimum of 3 feet above the highest anticipated groundwater level. Investigation of each lot prior to construction will be required, at which point specific construction and drainage recommendations should be made. Subsurface perimeter drains are recommended in any areas below grade usable space including basements or crawlspaces typical perimeter drain details are presented in Figure 9. Shallow water should not impact basement construction, however, basement feasibility should be determined on a lot by lot basis with future investigations of the building areas.

In areas along or adjacent to drainages may experience higher groundwater levels during period of higher precipitation where water can flow through permeable sands on top of less permeable bedrock materials. Where shallow groundwater is encountered, underslab drains or interceptor drains may be necessary. Typical drain details are presented in Figures 9 through 11. Specific recommendations should be made after additional investigation of the lots has been completed.

Radon – Hazard

Radon levels for the area have been reported by the Colorado Geologic Survey in the open file, Report No. 91-4 (Reference 11). Average Radon levels for the 80831-zip code is 4.50 pCi/l. The following is a table of radon levels in this area:

	80831
0 < 4 pCi/l	0.00%
4 < 10 pCi/l	100.00%
10 < 20 pCi/l	0.00%
> 20 pCi/l	0.00%

Mitigation:

The potential for high radon levels is present for the site. Build-up of radon gas can usually be mitigated by providing increased ventilation of basement and crawlspace and sealing joints. Specific requirements for mitigation should be based on site specific testing.

6.1 Relevance of Geologic Conditions to Land Use Planning

We understand that the development will be single-family residential. It is our opinion that the existing geologic and engineering geologic conditions will impose some minor constraints on the proposed development and construction. The constraints affecting development will be those associated with the artificial fill, potentially expansive soils, shallow bedrock, potentially seasonal shallow groundwater and seasonally shallow groundwater areas, and the potential for elevated radon levels that can be satisfactorily mitigated through proper engineering design and construction practices or avoidance. Shallow groundwater areas will be encountered during road construction across the drainages. The majority of the drainages identified with psw and sw constraints are located within the proposed drainage easements.

The upper residual soils are typically at medium to very dense states. The granular soils encountered in the upper soil profiles of the test borings should provide good support for foundations.

Expansive soils were encountered on portions of the site that would mitigation in encountered in building areas. Foundations anticipated for the site are standard spread footings possibly in conjunction with overexcavation in areas of expansive soils. Expansive layers may also be encountered in the soil and bedrock on this site. Areas of expansive soils encountered on site are sporadic; therefore, none have been indicated on the maps. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas containing arkosic sandstone will have high allowable bearing conditions. Difficult excavation should be anticipated in areas of shallow bedrock. Bearing capacities of 2000 to 2400 psf for granular soils or structural fill, and 3000 to 3500 psf for undisturbed sandstone are anticipated. Site specific subsurface investigations will need to be conducted and recommendations provided prior to construction on each lot.

Areas of potential seasonal and seasonal shallow groundwater were observed on site. These areas are mostly located within drainage easements and will be avoided by the construction on the lots, however, construction of the roadway crossing drainages and utility installation may encounter shallow groundwater, and may require the use of temporary dewatering measures. Subsurface perimeter drains will be recommended for all useable below grade spaces consisting of basements or crawlspaces; typical perimeter drain details are presented in Figure 9. If shallow groundwater is encountered, underslab drains or interceptor drains may be necessary. Typical drain details are presented in Figures 9 through 11. Specific drainage recommendations should be made after additional investigation of the lots has been completed.

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 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 12) and the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 13), the area is mapped with U4-upland deposits (probable aggregate resource) and A3-Alluvial Fan deposits (sand, fine aggregate resource).

According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 14), the area of the site has been mapped as “Fair” for industrial minerals. However, considering the silty nature of much of these materials and 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 14), 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-site (Reference 14).

The site has been mapped as “Fair” for oil and gas resources (Reference 14). 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 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 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 ROADWAY, EMBANKMENT, AND STORMWATER DETENTION FACILITY CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for the proposed roadways and embankments. Groundwater was not encountered in the borings, however, groundwater may be encountered in deep cuts and along drainages and low-lying areas. Additional investigation is recommended when specific lot/ road development plans are completed. If excavations encroach on the groundwater level unstable soil conditions may be encountered. Excavation of saturated soils will be difficult with rubber-tired equipment. Stabilization using shot rock or geogrids may be necessary.

Any areas to receive fill should have all topsoil, organic material or debris removed. Prior to fill placement Entech should observe the subgrade. Fill must be properly benched and compacted to minimize potentially unstable conditions in slope areas. Fill slopes should be 3:1 or flatter. 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. Additional investigation will be required for pavement designs once roadway grading is completed and utilities are installed.

10 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some constraints on development and construction of the site. The majority of these conditions can be mitigated through proper engineering design and construction practices. The proposed development and use are 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. Individual investigations for building sites will be required prior to construction. 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 BRJM, LLC. 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.

11 REFERENCES

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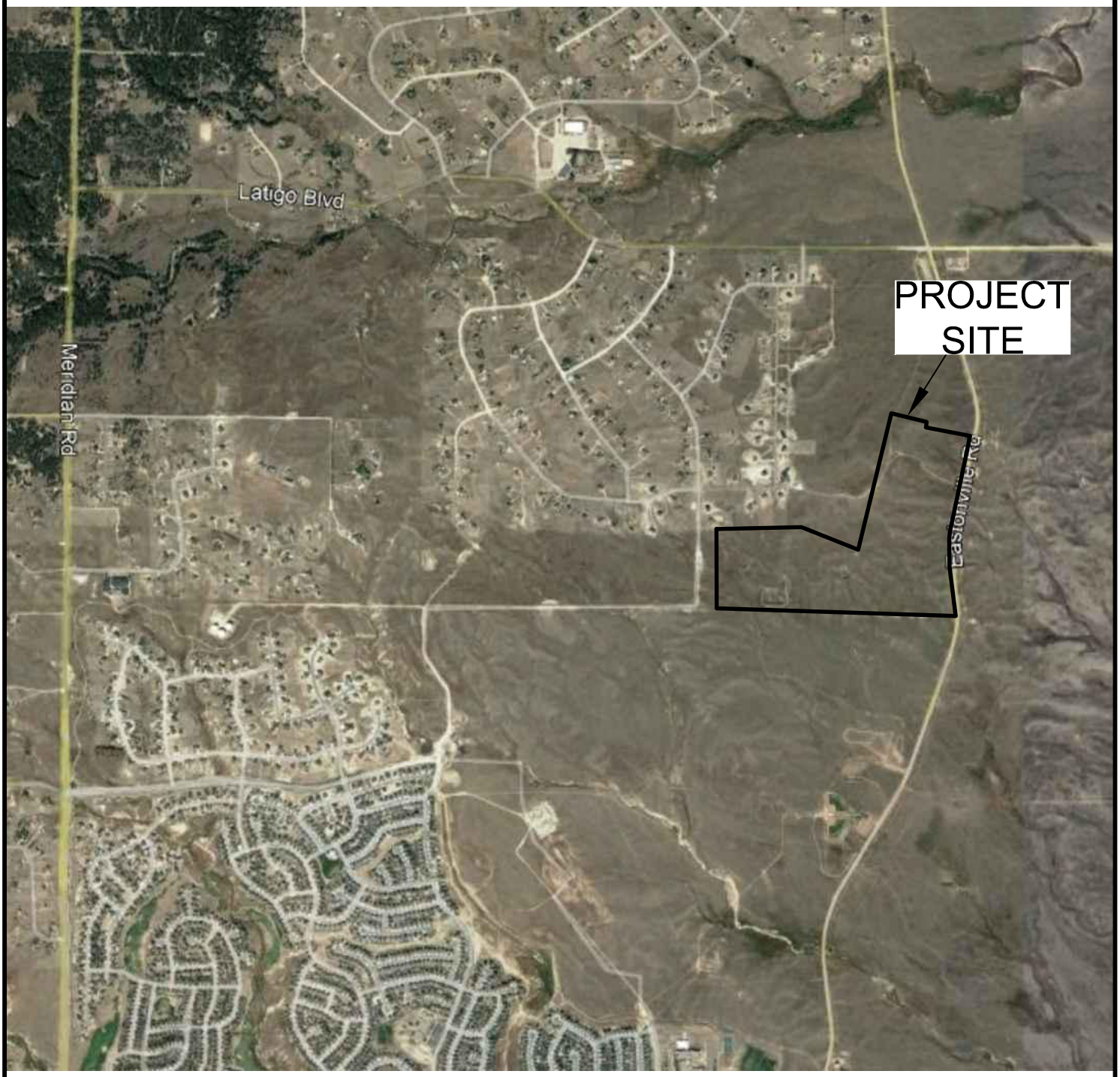
FIGURES



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VICINITY MAP

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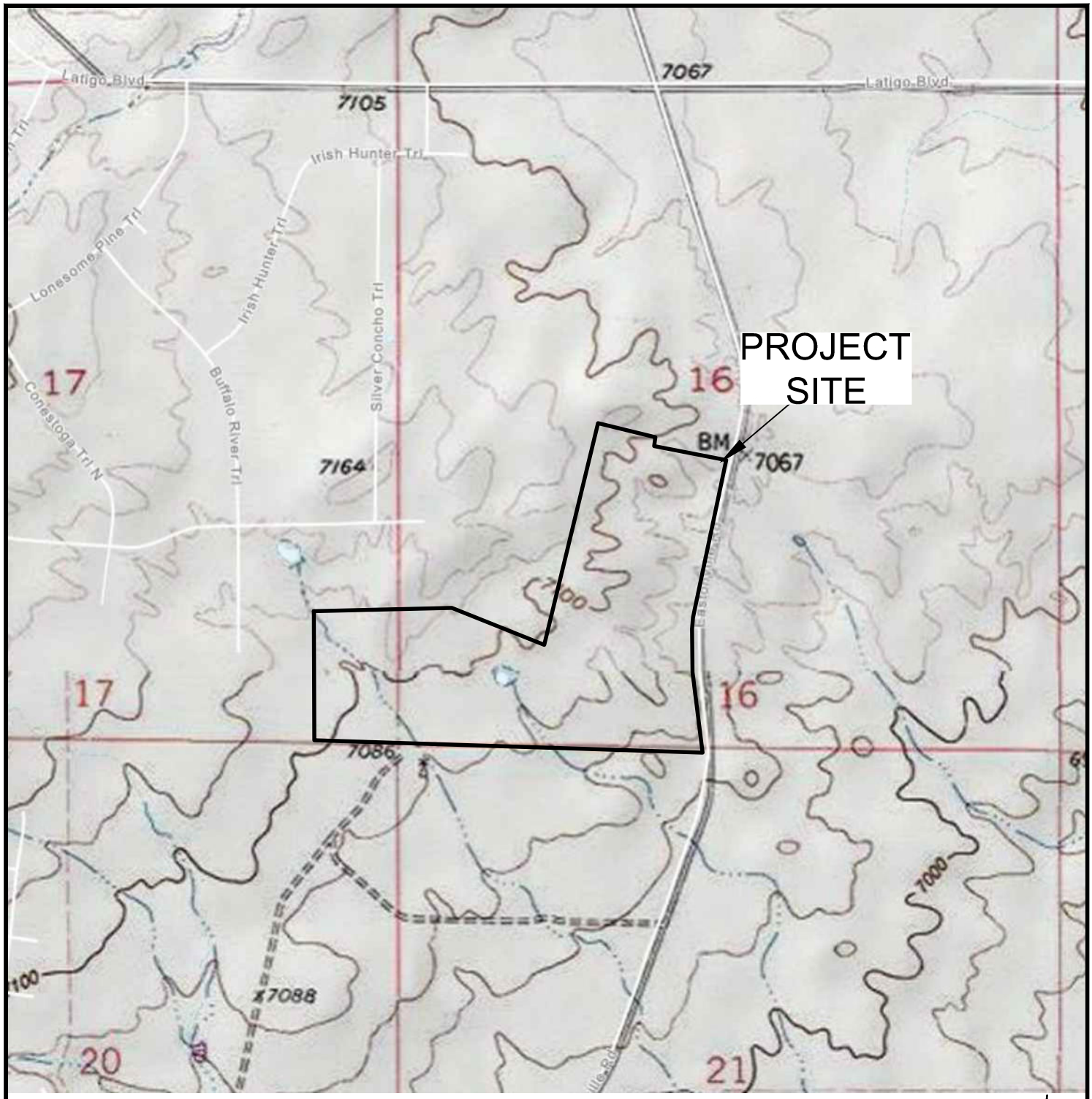
FIG. 1



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USGS TOPOGRAPHY MAP

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FIG. 2

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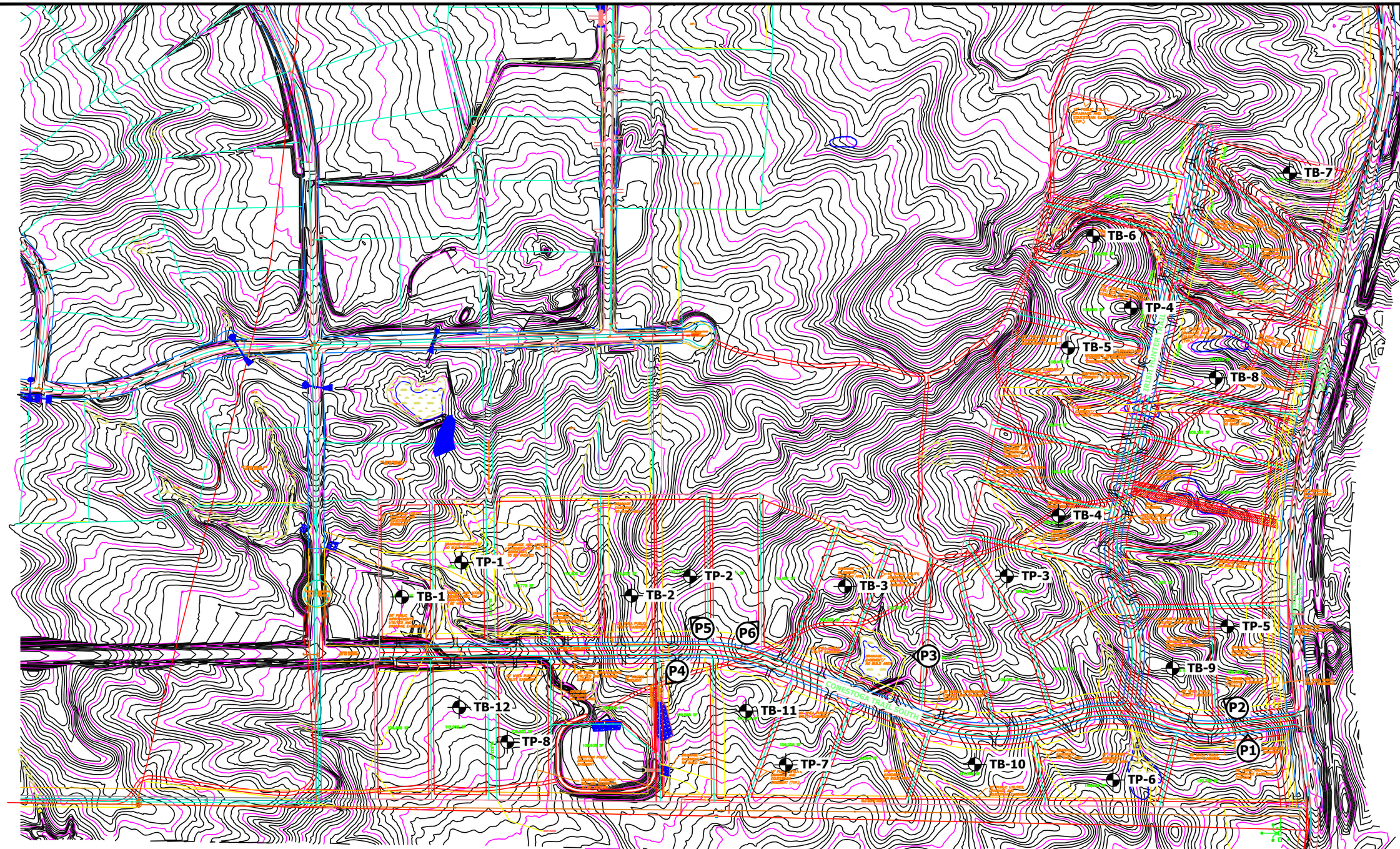

- APPROXIMATE TEST BORING LOCATION AND NUMBER

P2 - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN

LATIGO TRAILS - FILING NO. 10
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FIG. 3

ENTECH ENGINEERING, INC.

SOIL SURVEY MAP

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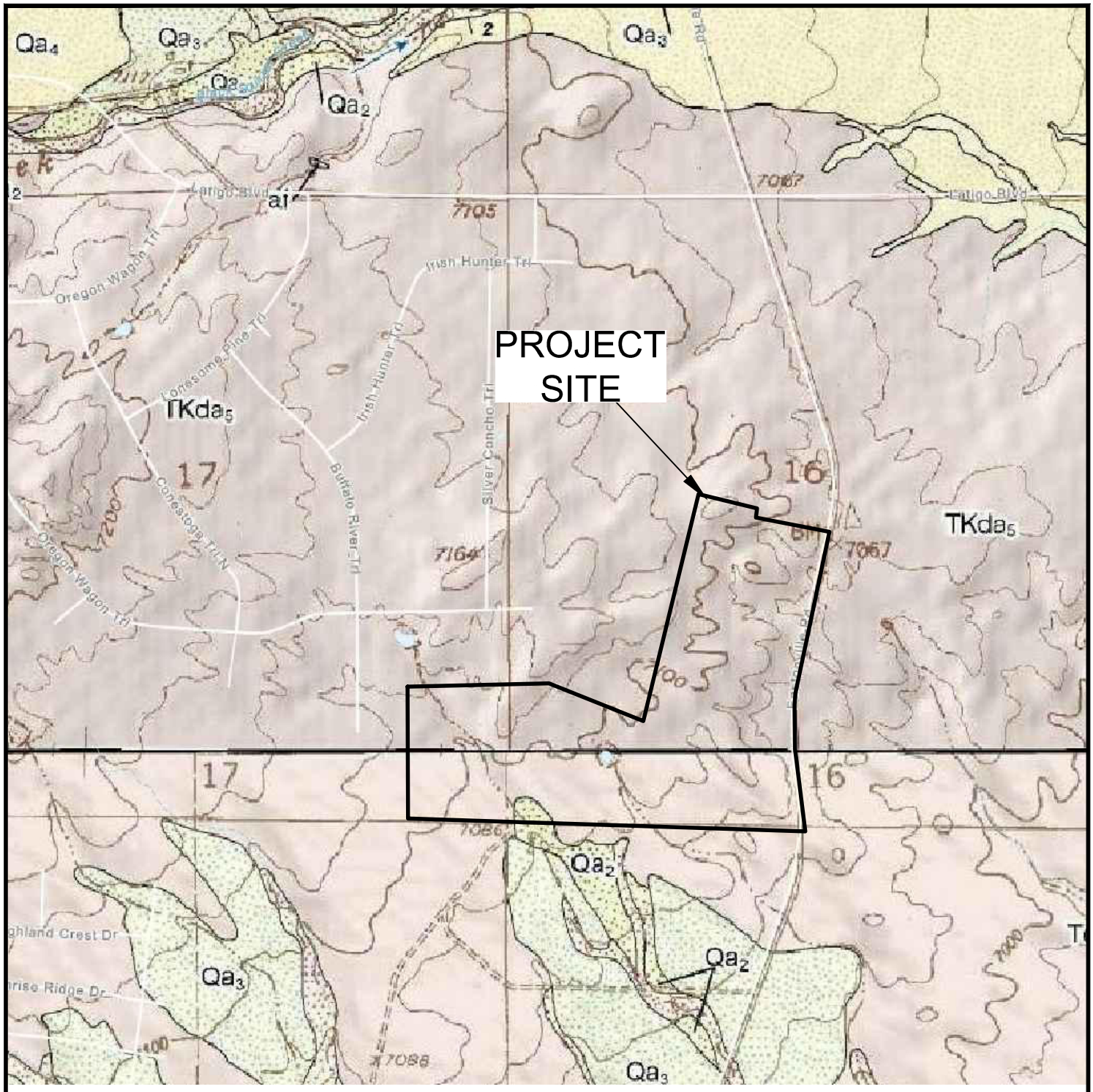
FIG. 4



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GEOLOGIC MAP OF EASTONVILLE & FALOCON QUADRANGLES

LATIGO TRAILS - FILING NO. 10

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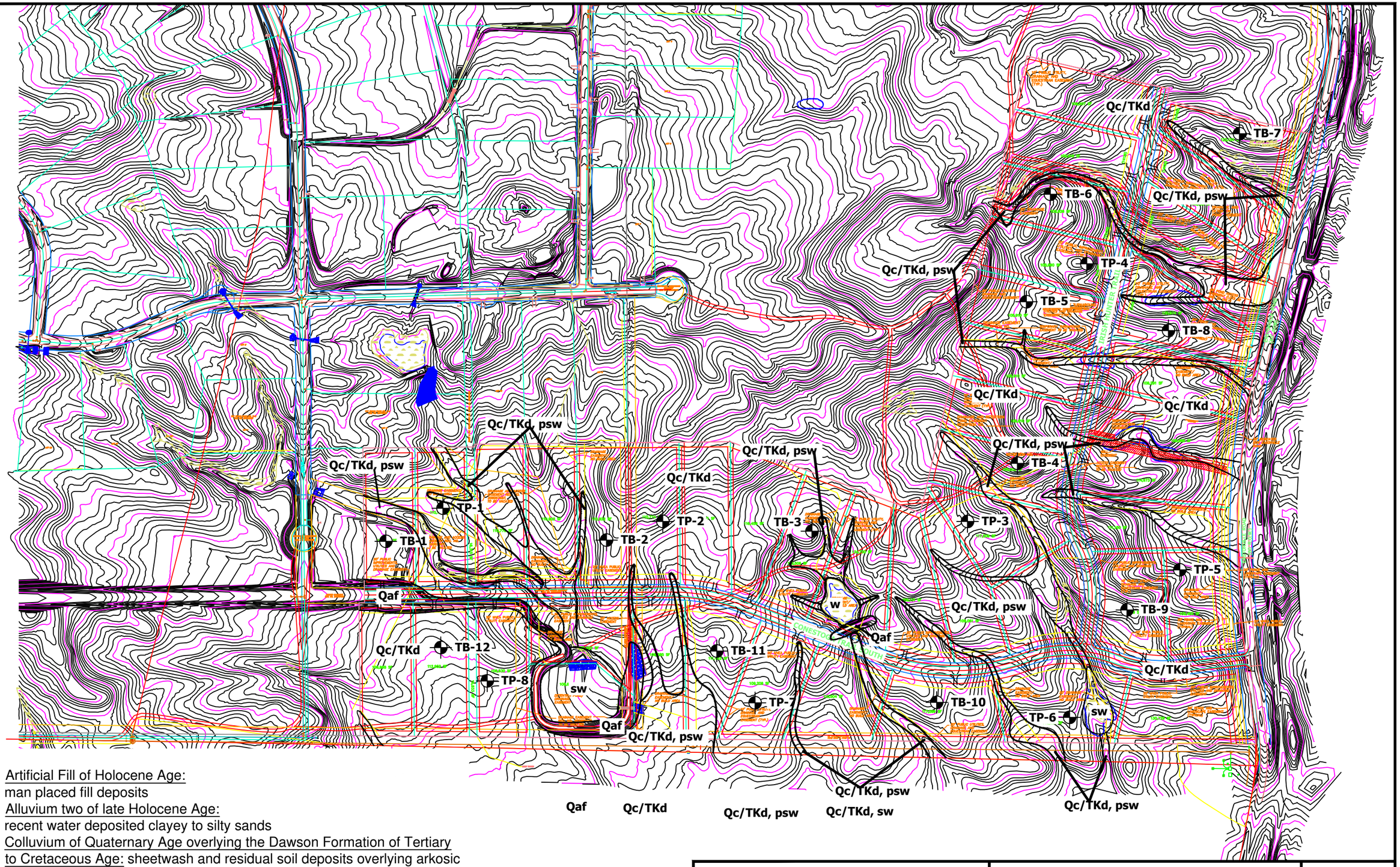
FIG. 5



Legend:

Qaf - Artificial Fill of Holocene Age:
man placed fill deposits

Qa_2 - Alluvium two of late Holocene Age:
recent water deposited clayey to silty sands

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

psw - potentially seasonal shallow groundwater
sw - seasonal shallow groundwater area
w - ponded water

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GEOLOGY / ENGINEERING MAP

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FIG. 6

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FEMA FLOODPLAIN MAP

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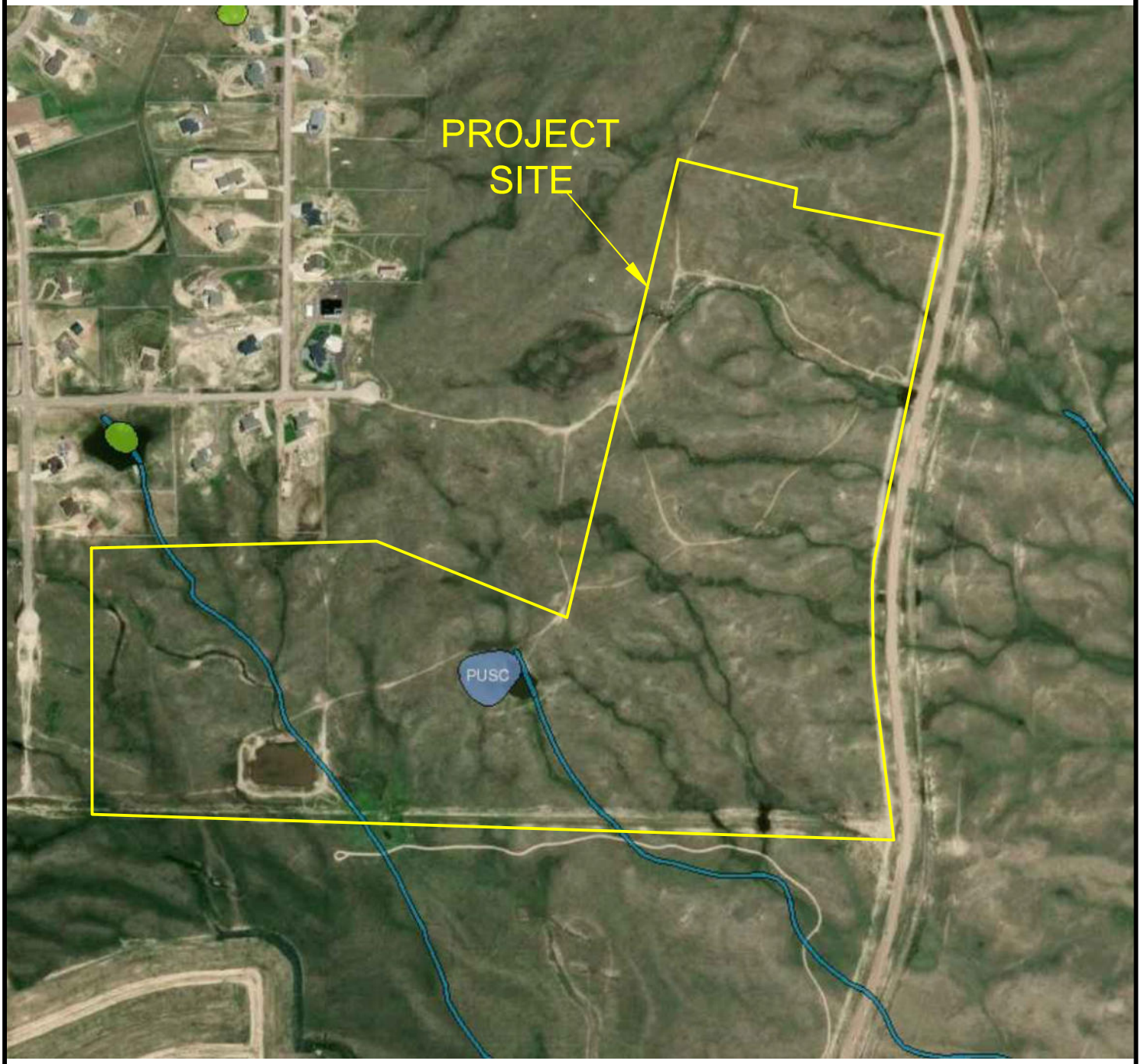
FIG. 7



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USFWS WETLANDS MAP

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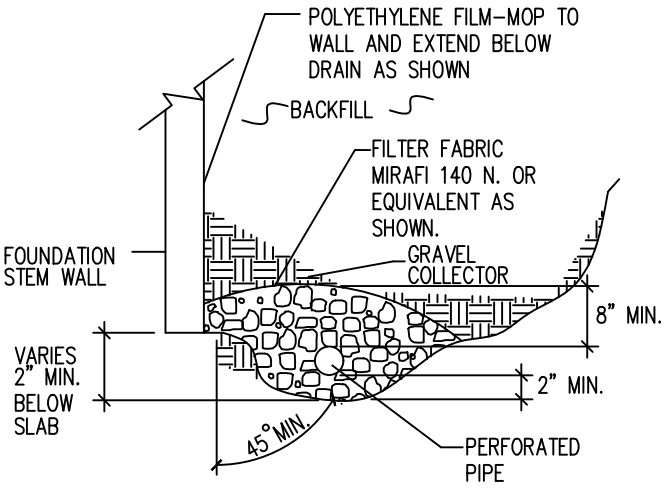
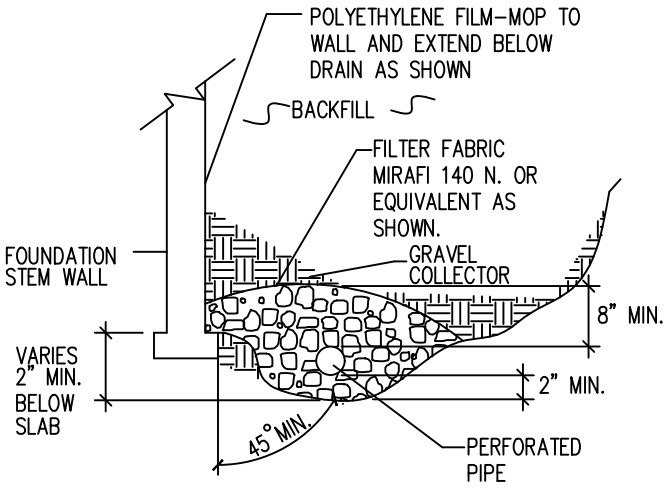
JOB NO.
240519

FIG. 8





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.

ENTECH ENGINEERING, INC.

PERIMETER DRAIN DETAIL

LATIGO TRAILS - FILING NO. 10
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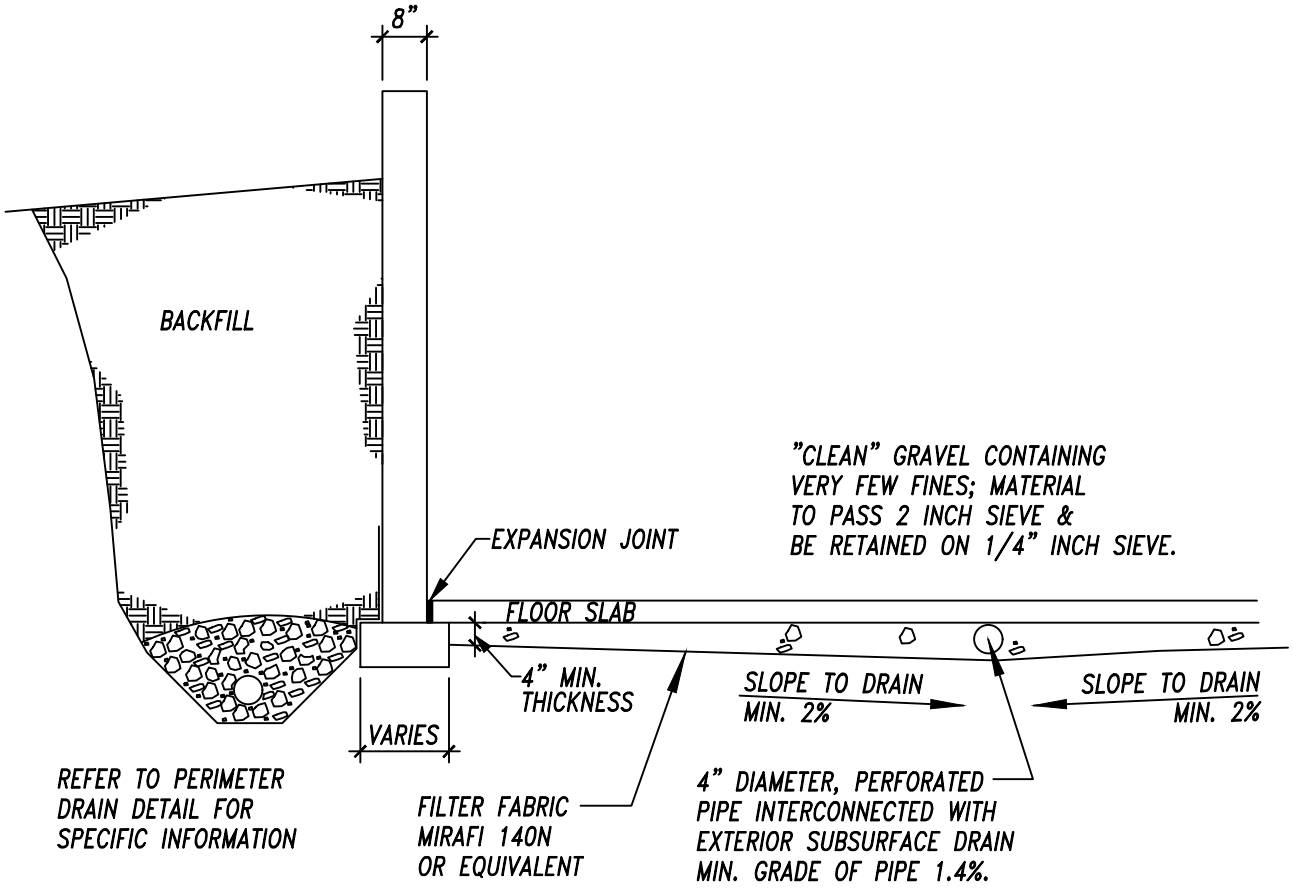
FIG. 9



ENTECH ENGINEERING, INC.

TYP. UNDERSLAB DRAINAGE LAYER (CAPILLARY BREAK)

LATIGO TRAILS - FILING NO. 10

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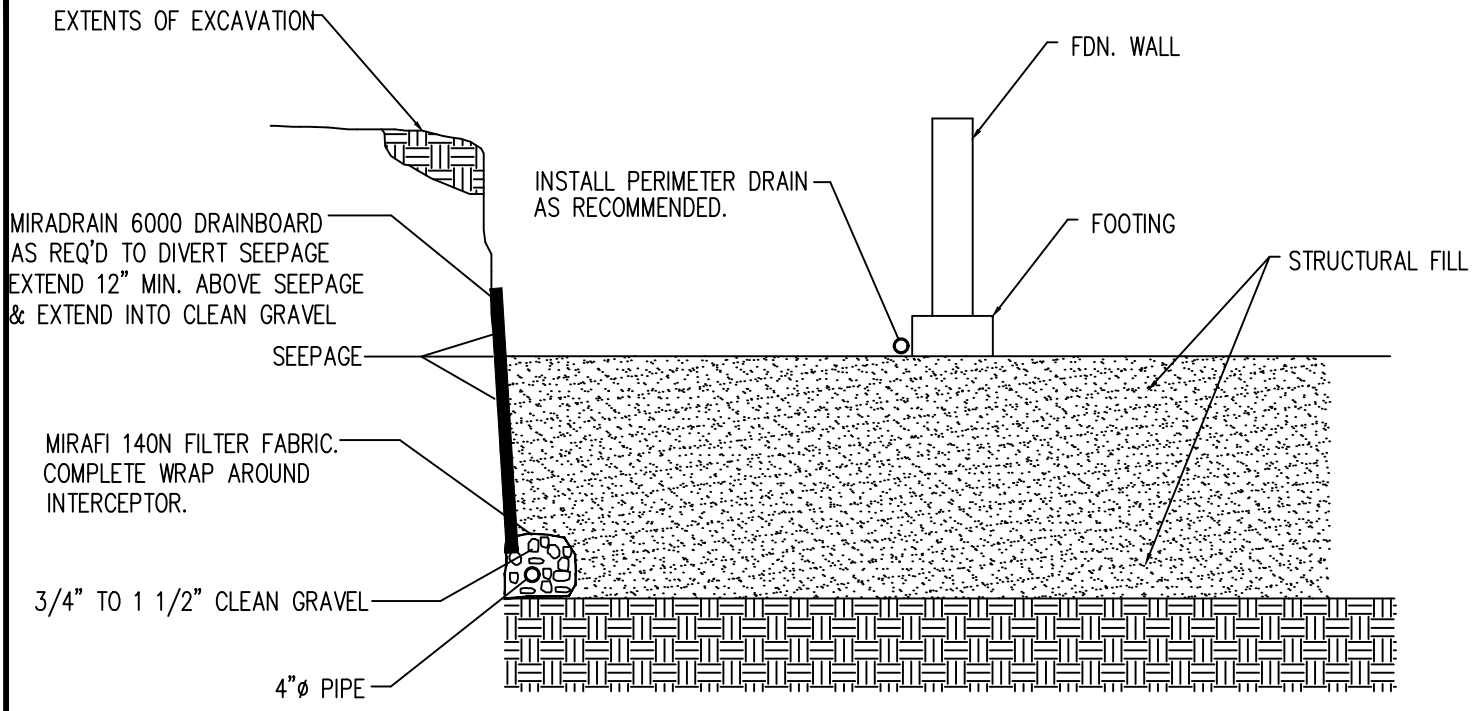
JOB NO. 240519

FIG. 10



NOTE:
EXTEND INTERCEPTOR DRAIN TO UNDERDRAIN OR TO SUMP.
BENCH DRAIN INTO NATIVE SOILS 12 INCHES MINIMUM.

INTERCEPTOR DRAIN DETAIL

N.T.S.

ENTECH ENGINEERING, INC.

INTERCEPTOR DRAIN DETAIL

LATIGO TRAILS - FILING NO. 10
BRJM, LLC

JOB NO.
240519

FIG. 11

APPENDIX A: Site Photographs

1

Looking north from the southeast portion of the site.

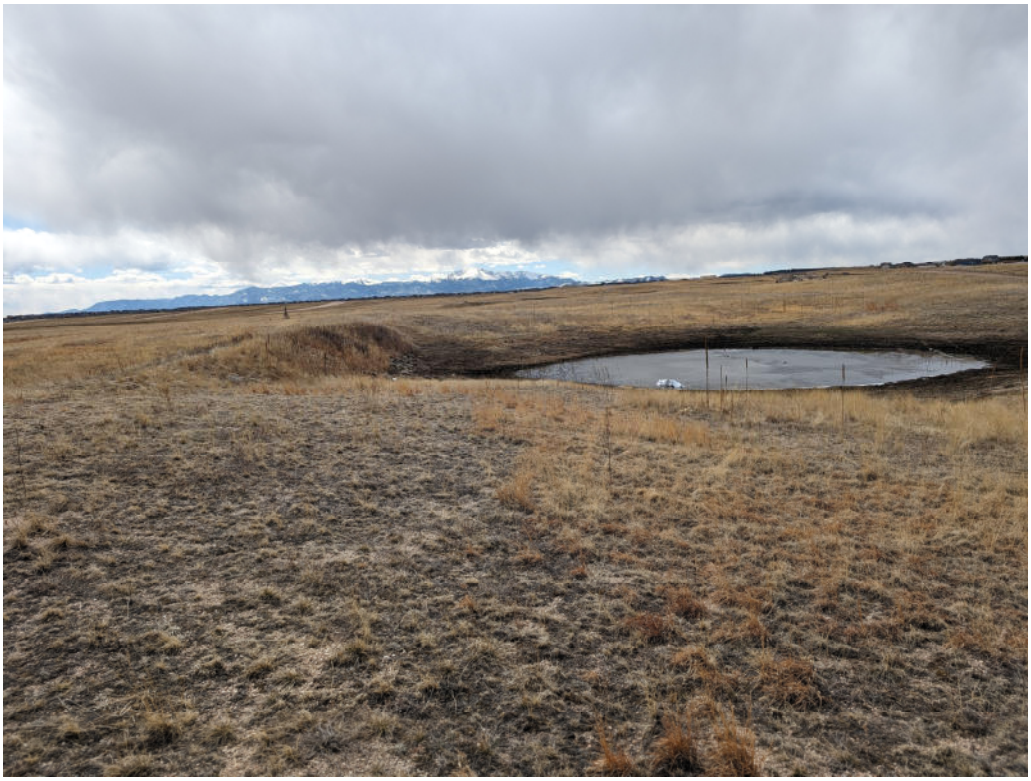
March 27, 2024

2

Looking northwest from the southeast portion of the site.

March 27, 2024

Job No. 240519



3

Looking west towards pond in the central portion of the site.

March 27, 2024

4

Looking southwest towards existing detention pond.

March 27, 2024

Job No. 240519

5

Looking northwest from central portion of the site.

March 27, 2024

6

Looking northeast from the central portion of the site.

March 27, 2024

Job No. 240519

APPENDIX B: Test Boring Logs

TABLE B-1

DEPTH TO GROUNDWATER & BEDROCK

TEST BORING	DEPTH TO GROUNDWATER (ft.)	DEPTH TO BEDROCK (ft.)
1	>19.5	11
2	>19	7
3	>19	9
4	>19	6
5	>19.5	7
6	>20	9
7	>19.5	6
8	>20	8
9	>19.5	4
10	>19.5	7
11	>20	6
12	>20	7

TEST BORING 1
DATE DRILLED 3/27/2024

REMARKS

DRY TO 19.5', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	TOPSOIL 0-4",SAND, SILTY, TAN, DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)		40	4.4	1
5			40	9.9	1
10			33	10.6	1
	SANDSTONE, VERY WEAK, OLIVE, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)				
15			50/6"	7.1	2
20			50/10"	10.4	2

TEST BORING 2
DATE DRILLED 3/27/2024

REMARKS

DRY TO 19', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	TOPSOIL 0-4", SAND, SILTY, TAN, MEDIUM DENSE to DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)		24	6.2	1
5			34	4.5	1
10	SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)		50	9.0	2
15	SANDSTONE, EXTREMELY WEAK, OLIVE, MODERATELY WEATHERED (SAND, CLAYEY, VERY DENSE, MOIST)		50	13.2	2
20			50/6"	11.9	2

ENTECH ENGINEERING, INC.

TEST BORING LOGS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. B-1

TEST BORING 3
DATE DRILLED 3/27/2024

REMARKS

DRY TO 19', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			36	5.3	1
5			41	7.5	1
10			50	13.5	3
15			50/8"	5.8	2
20			50/8"	13.5	2

TOPSOIL 0-6", SAND, SILTY, TAN, DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

CLAYSTONE, EXTREMELY WEAK, OLIVE, HIGHLY WEATHERED (CLAY, SANDY, HARD, MOIST)

SANDSTONE, VERY WEAK, TAN, MODERATELY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

TEST BORING 4
DATE DRILLED 3/27/2024

REMARKS

DRY TO 19', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			28	4.2	1
5			38	9.1	1
10			50/9"	8.0	2
15			50/3"	8.4	2
20			50/10"	15.2	2

TOPSOIL 0-4", SAND, SILTY, TAN, MEDIUM DENSE to DENSE,

SANDSTONE, VERY WEAK, OLIVE to TAN, MODERATELY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

ENTECH ENGINEERING, INC.

TEST BORING LOGS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. B-2

TEST BORING 5
DATE DRILLED 3/28/2024

REMARKS

DRY TO 19.5', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			31	4.2	1
5			42	12.7	1
10			50/8"	10.6	2
15			50/10"	7.7	2
20			50/8"	7.0	2

TOPSOIL 0-4", SAND, SILTY, TAN, DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

SAND, CLAYEY, OLIVE DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

SANDSTONE, VERY to EXTREMELY WEAK, TAN to OLIVE, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

TEST BORING 6
DATE DRILLED 3/28/2024

REMARKS

DRY TO 20', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			24	9.0	1
5			34	8.7	1
10			50	14.8	2
15			50/7"	12.7	2
20			50/7"	9.5	2

TOPSOIL 0-8", SAND, SILTY, TAN, MEDIUM DENSE to DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

SANDSTONE, VERY WEAK, OLIVE, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

ENTECH ENGINEERING, INC.

TEST BORING LOGS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. B-3

TEST BORING 7
DATE DRILLED 3/28/2024

REMARKS

DRY TO 19.5', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			40	4.5	1
5			40	9.9	1
10			50/9"	9.3	2
15			50/8"	9.8	2
20			50	14.9	2

TOPSOIL 0-6", SAND, SILTY, TAN, DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

SANDSTONE, VERY WEAK, OLIVE, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

TEST BORING 8
DATE DRILLED 3/28/2024

REMARKS

DRY TO 20', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			20	2.7	1
5			37	8.0	1
10			50/11"	11.4	3
15			50	13.3	3
20			50	9.8	2

TOPSOIL 0-4", SAND, SILTY, TAN, MEDIUM DENSE to DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

CLAYSTONE, EXTREMELY WEAK, OLIVE, HIGHLY WEATHERED (CLAY, SANDY, HARD, MOIST)

SANDSTONE, VERY WEAK, OLIVE, HIGHLY WEATHERED (SAND, CLAYEY to SILTY, VERY DENSE, MOIST)

ENTECH ENGINEERING, INC.

TEST BORING LOGS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. B-4

TEST BORING 9
DATE DRILLED 3/27/2024

REMARKS

DRY TO 20', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	6.4	1
5			50/11"	5.6	2
10			50/10"	9.4	2
15			50/10"	11.3	2
20			50/7"	4.5	2

TOPSOIL 0-4", SAND, SILTY, TAN, MEDIUM DENSE, MOIST

SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)

TEST BORING 10
DATE DRILLED 3/27/2024

REMARKS

DRY TO 20', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			21	2.1	1
5			36	7.6	1
10			50/7"	6.9	2
15			50	11.0	2
20			50/4"	6.5	2

TOPSOIL 0-4", SAND, SILTY, TAN, MEDIUM DENSE to DENSE, DRY to MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)

SANDSTONE, VERY WEAK, TAN to OLIVE, HIGHLY WEATHERED (SAND, SILTY to CLAYEY, VERY DENSE, MOIST)

CLAYEY LENS

ENTECH ENGINEERING, INC.

TEST BORING LOGS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. B-5

TEST BORING 11
DATE DRILLED 3/27/2024

REMARKS

DRY TO 20', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	TOPSOIL 0-4", SAND, WITH SILT, TAN, DENSE, DRY to MOIST (SANDSTONE, VERY WEAK,		46	2.4	1
5			48	6.9	1
	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)				
10			50/10"	9.3	2
15			50/5"	9.4	2
20			50/10"	9.4	2

TEST BORING 12
DATE DRILLED 3/27/2024

REMARKS

DRY TO 20', 4/2/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	TOPSOIL 0-4", SAND, WITH SILT, TAN, MEDIUM DENSE to DENSE, MOIST (SANDSTONE, VERY WEAK, RESIDUAL SOIL)		12	6.0	1
5			35	7.1	1
	SANDSTONE, EXTREMELY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)				
10			50/10"	6.5	2
15			50/6"	6.4	2
20			50/10"	8.4	2

ENTECH ENGINEERING, INC.

TEST BORING LOGS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. B-6

APPENDIX C: Laboratory Testing Results

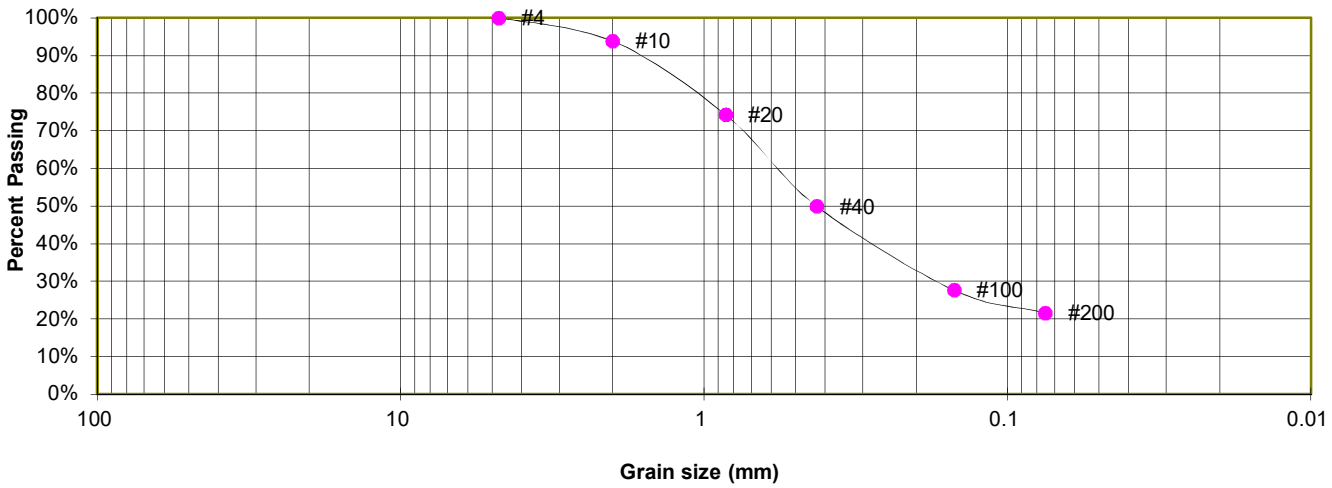
ENTECH ENGINEERING, INC.

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	1	5			21.5	NV	NP	NP			SM	SAND, SILTY
1	3	2-3			19.7						SM	SAND, SILTY
1	5	5	12.3	102.2	34.4				<0.01	-0.6	SC	SAND, CLAYEY
1	6	2-3			19.8				<0.01		SM	SAND, SILTY
1	11	2-3			7.4	NV	NP	NP			SW-SM	SAND, WITH SILT
2	1	15	13.1	91.3	19.4	NV	NP	NP		-1.8	SM	SANDSTONE (SAND, SILTY)
2	2	15			36.8	32	18	14			SC	SANDSTONE (SAND, CLAYEY)
2	4	10			40.7						SM	SANDSTONE (SAND, SILTY)
2	9	20			21.1	NV	NP	NP			SM	SANDSTONE (SAND, SILTY)
2	10	15			49.0	36	21	15			SC	SANDSTONE (SAND, CLAYEY)
2	12	15			11.3	NV	NP	NP			SW-SM	SANDSTONE (SAND, WITH SILT)
2	7	10			23.0				<0.01		SM	SANDSTONE (SAND, SILTY)
3	3	10	14.2	96.4	78.5	42	19	23		0.0	CL	CLAYSTONE (CLAY, WITH SAND)
3	8	10			69.7	44	19	25	0.00		CL	CLAYSTONE (CLAY, SANDY)

Project: Latigo Trails, Filing No. 10
Client: BRJM, LLC
Job No: 240519

TEST BORING	1	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	93.8%
20	74.3%
40	50.0%
100	27.7%
200	21.5%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

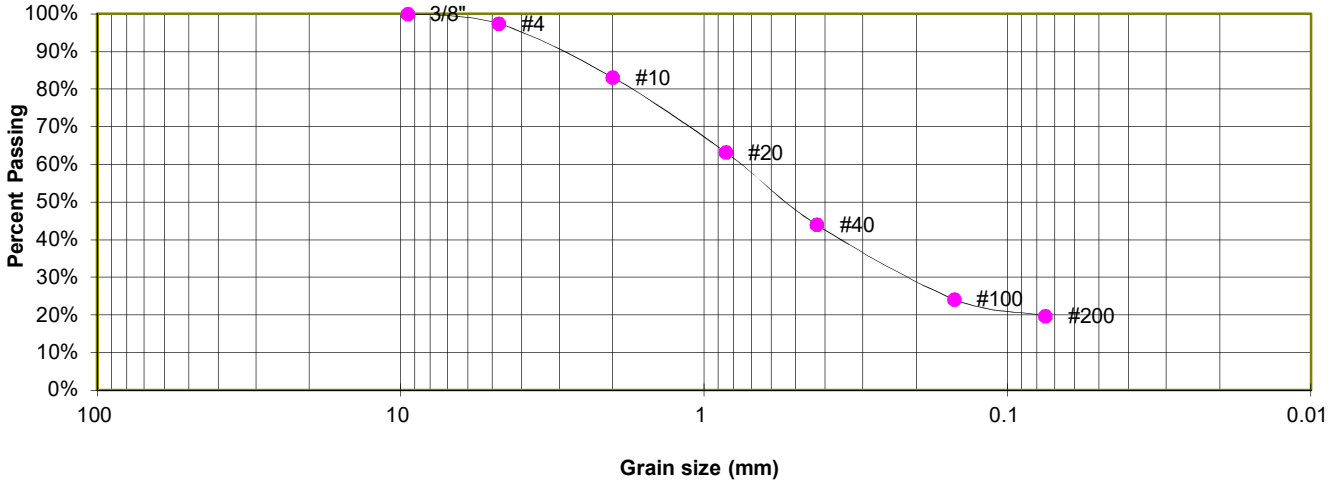
LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. C-1

TEST BORING	3	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.4%
10	83.1%
20	63.2%
40	44.0%
100	24.2%
200	19.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

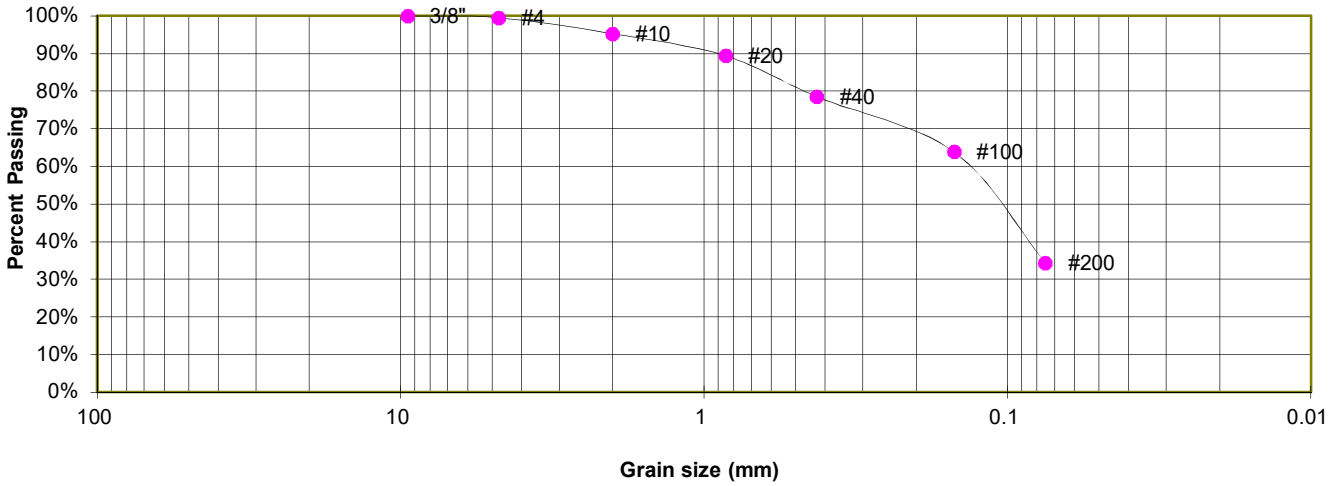
LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. C-2

TEST BORING	5	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	95.3%
20	89.4%
40	78.5%
100	63.9%
200	34.4%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

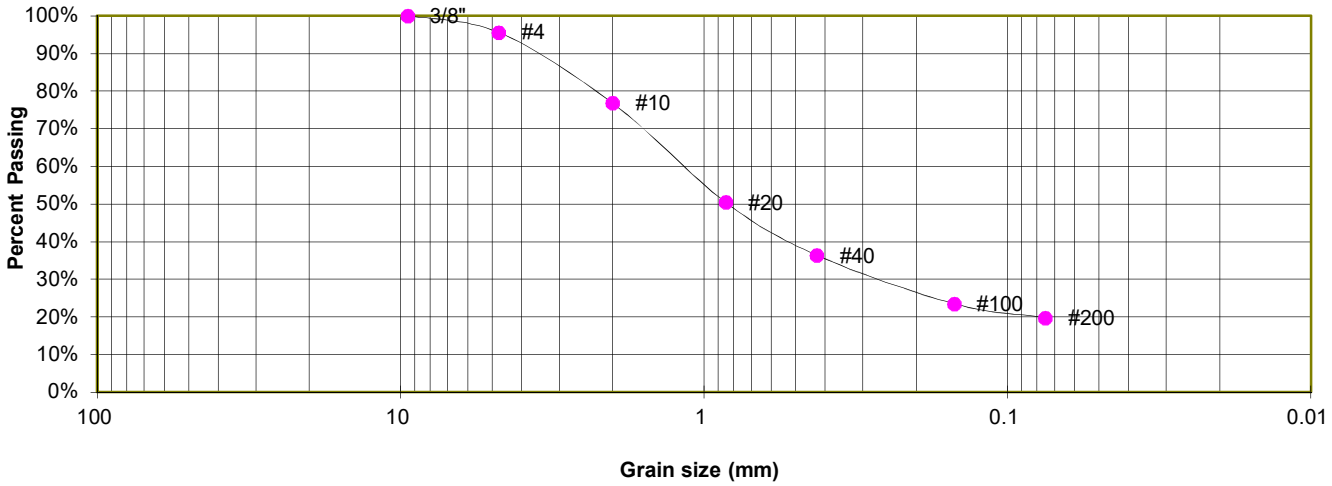
LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. C-3

TEST BORING	6	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.6%
10	76.8%
20	50.5%
40	36.4%
100	23.5%
200	19.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

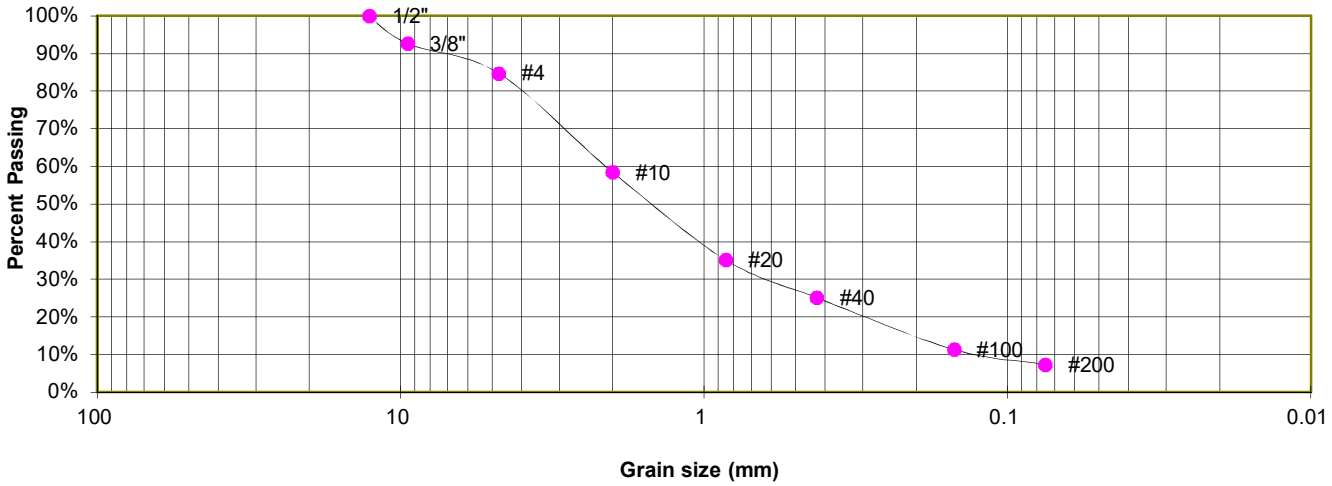
LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. C-4

TEST BORING	11	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	92.6%
4	84.7%
10	58.5%
20	35.2%
40	25.1%
100	11.3%
200	7.4%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
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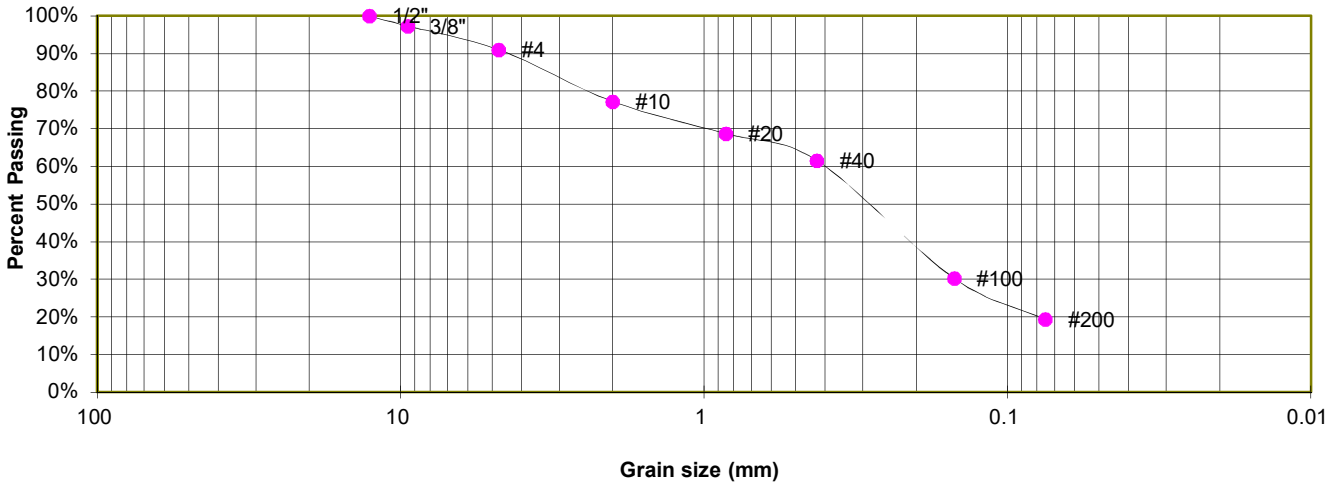
FIG. C-5

TEST BORING	1	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	15	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.3%
4	91.0%
10	77.2%
20	68.7%
40	61.6%
100	30.3%
200	19.4%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
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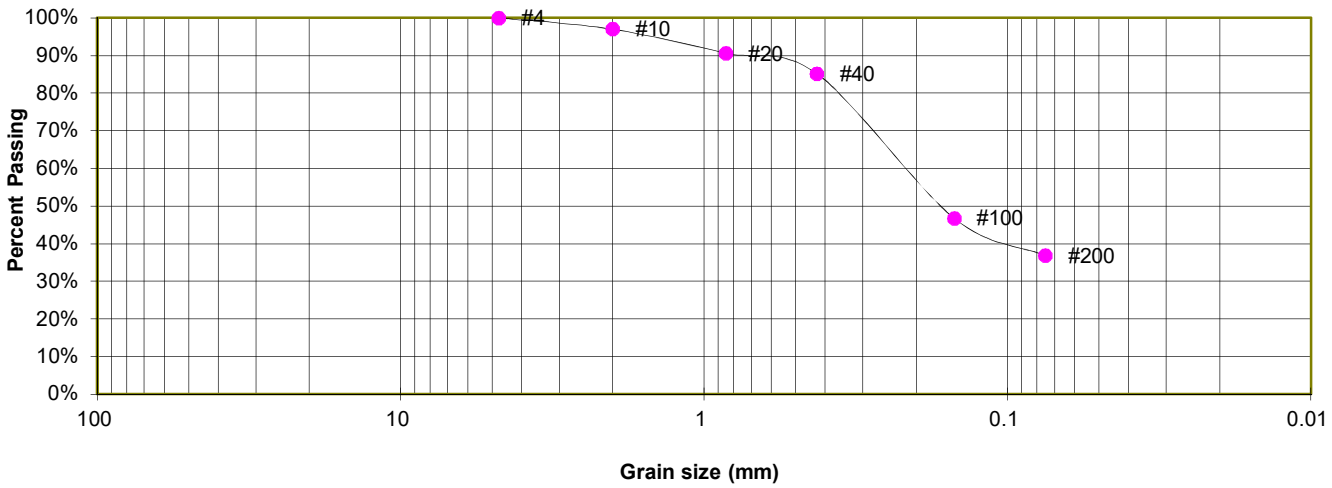
JOB NO. 240519

FIG. C-6

TEST BORING	2	SOIL DESCRIPTION	SANDSTONE (SAND, CLAYEY)
DEPTH (FT)	15	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	97.0%
20	90.7%
40	85.2%
100	46.8%
200	36.8%

ATTERBERG LIMITS

Plastic Limit	18
Liquid Limit	32
Plastic Index	14

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

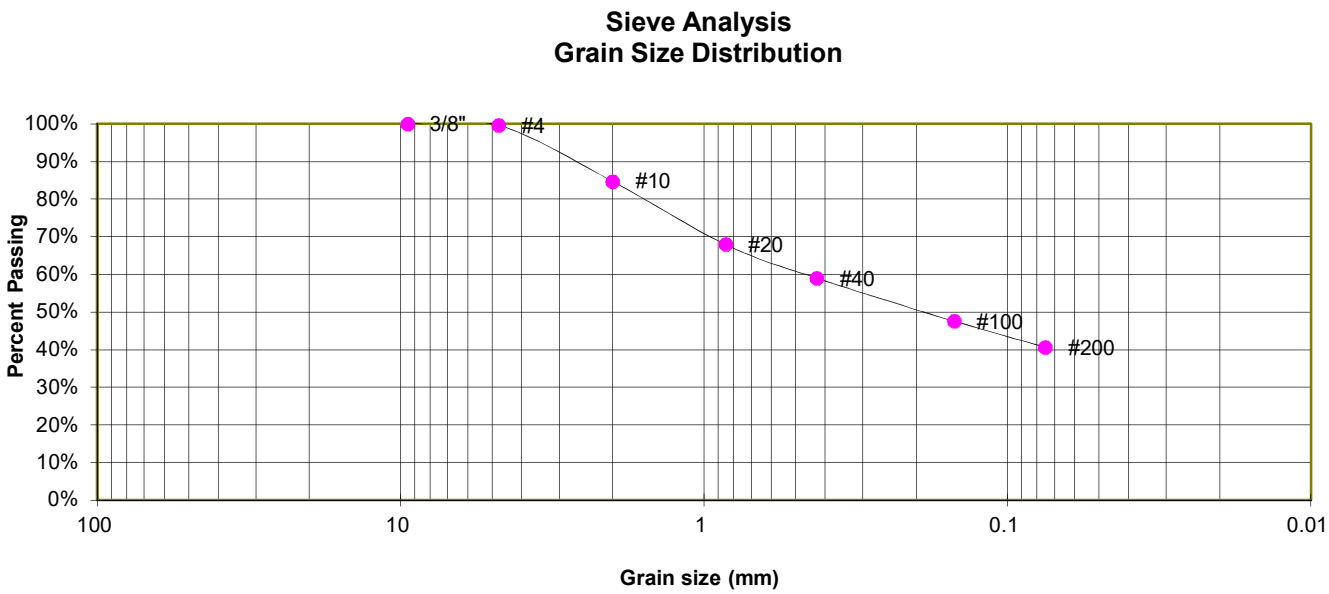
LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

JOB NO. 240519

FIG. C-7

TEST BORING	4	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	10	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.6%
10	84.7%
20	68.0%
40	59.0%
100	47.6%
200	40.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

LATIGO TRAILS, FILING NO. 10
BRJM, LLC

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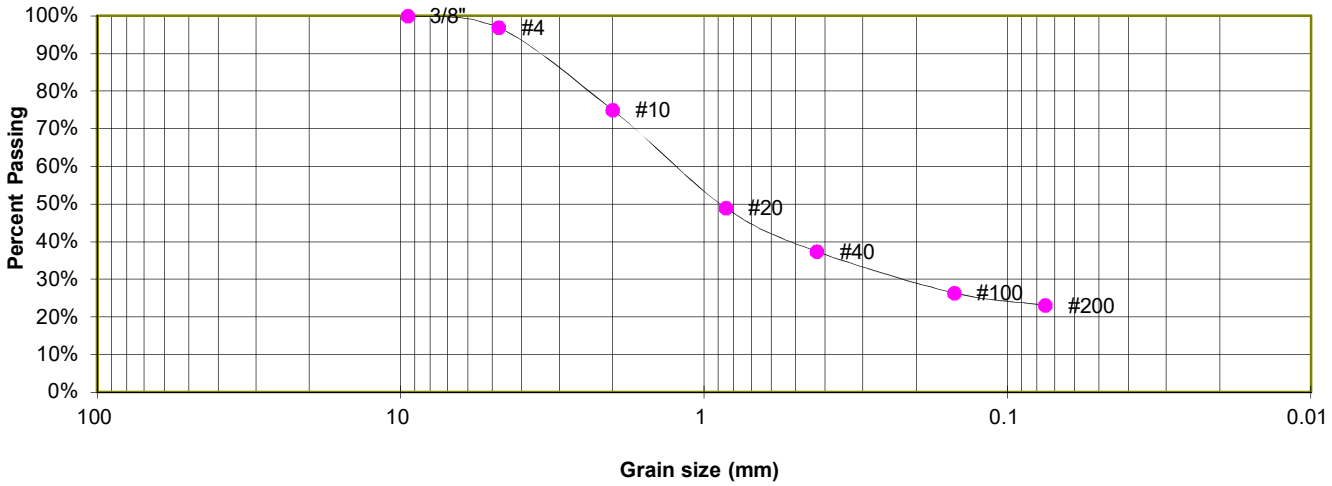
FIG. C-8

TEST BORING	7	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	10	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.9%
10	75.0%
20	49.0%
40	37.4%
100	26.4%
200	23.0%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

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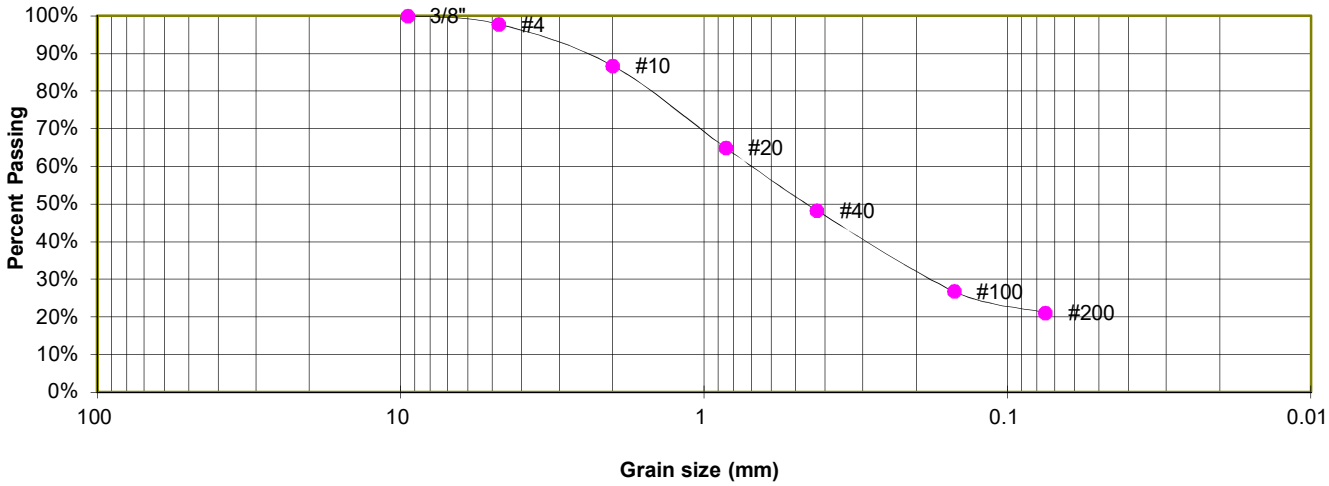
FIG. C-9

TEST BORING	9	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	20	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.8%
10	86.8%
20	65.0%
40	48.3%
100	26.9%
200	21.1%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

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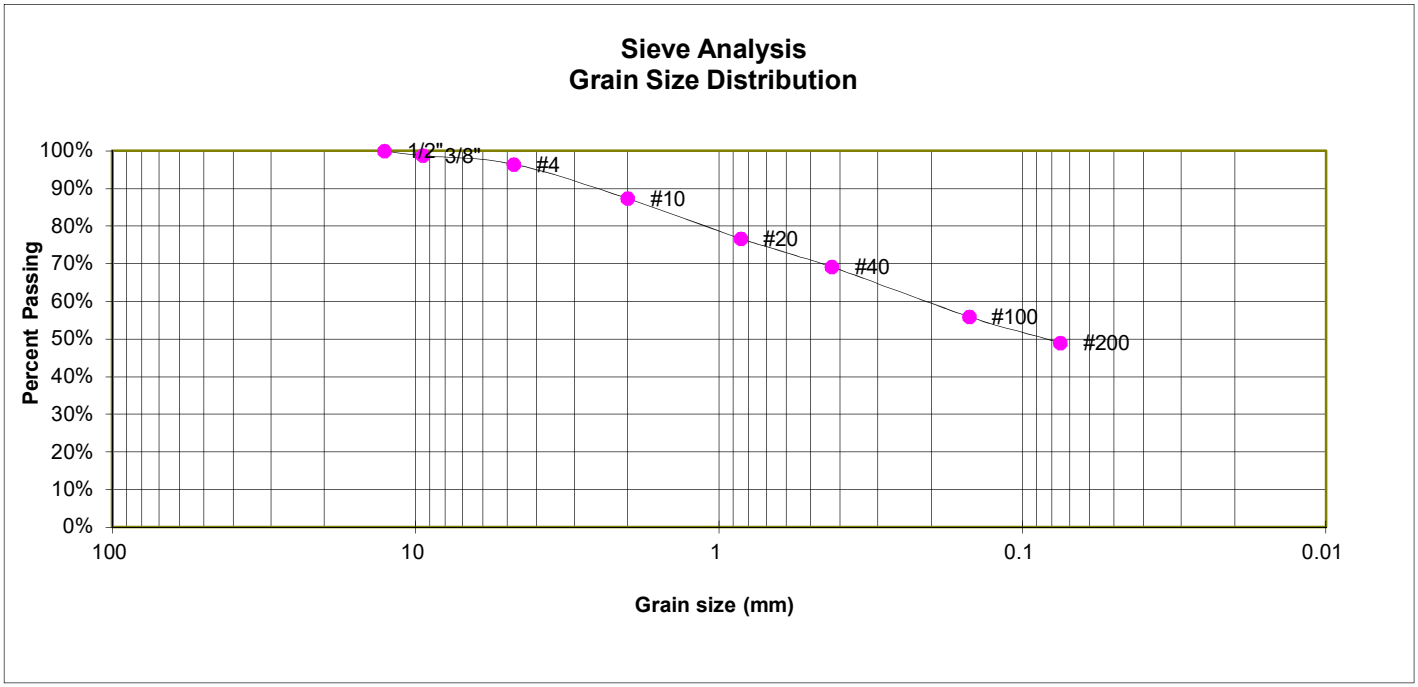
FIG. C-10

TEST BORING	10	SOIL DESCRIPTION	SANDSTONE (SAND, CLAYEY)
DEPTH (FT)	15	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.8%
4	96.5%
10	87.4%
20	76.7%
40	69.1%
100	56.0%
200	49.0%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	36
Plastic Index	15

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

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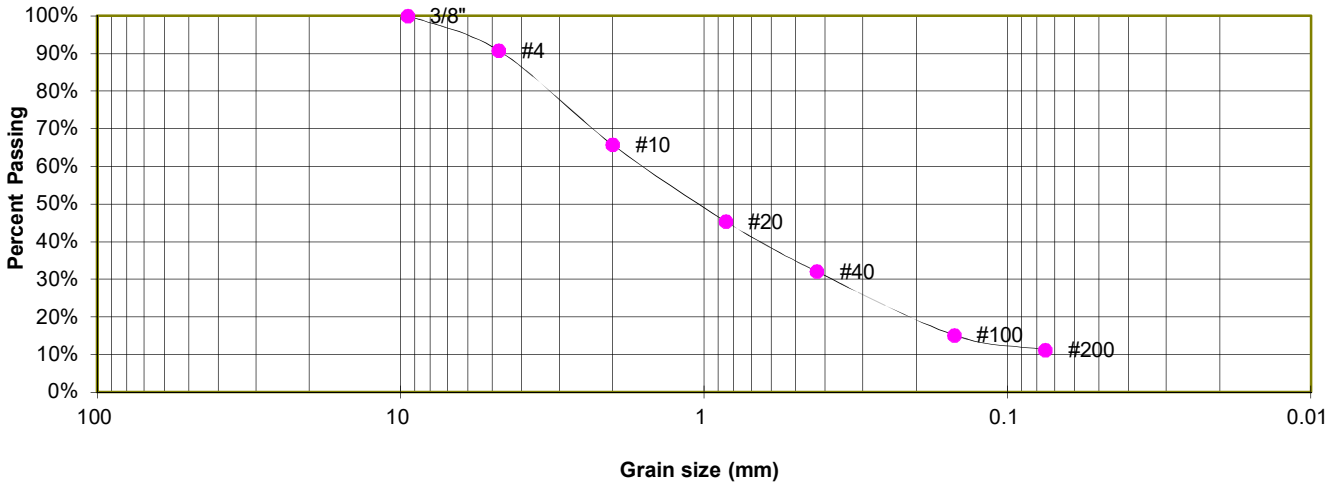
FIG. C-11

TEST BORING	12	SOIL DESCRIPTION	SANDSTONE (SAND, WITH SILT)
DEPTH (FT)	15	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	90.8%
10	65.8%
20	45.4%
40	32.0%
100	15.2%
200	11.3%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

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LABORATORY TEST RESULTS

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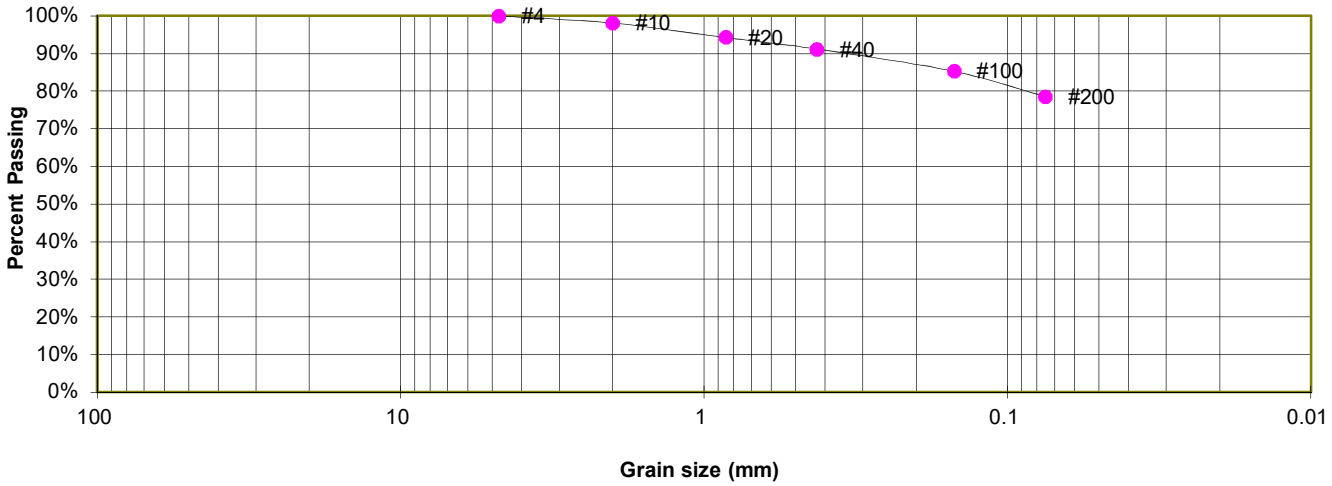
FIG. C-12

TEST BORING	3	SOIL DESCRIPTION	CLAYSTONE (CLAY, WITH SAND)
DEPTH (FT)	10	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.1%
20	94.3%
40	91.2%
100	85.3%
200	78.5%

ATTERBERG LIMITS

Plastic Limit	19
Liquid Limit	42
Plastic Index	23

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

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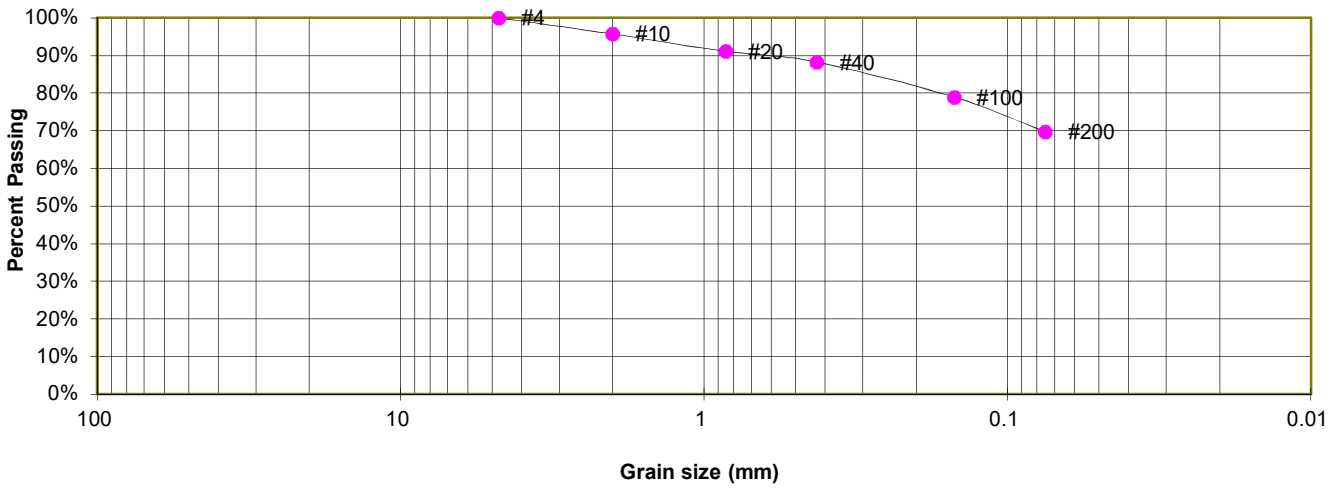
FIG. C-13

TEST BORING	8	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	10	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	95.7%
20	91.1%
40	88.3%
100	78.9%
200	69.7%

ATTERBERG LIMITS

Plastic Limit	19
Liquid Limit	44
Plastic Index	25

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

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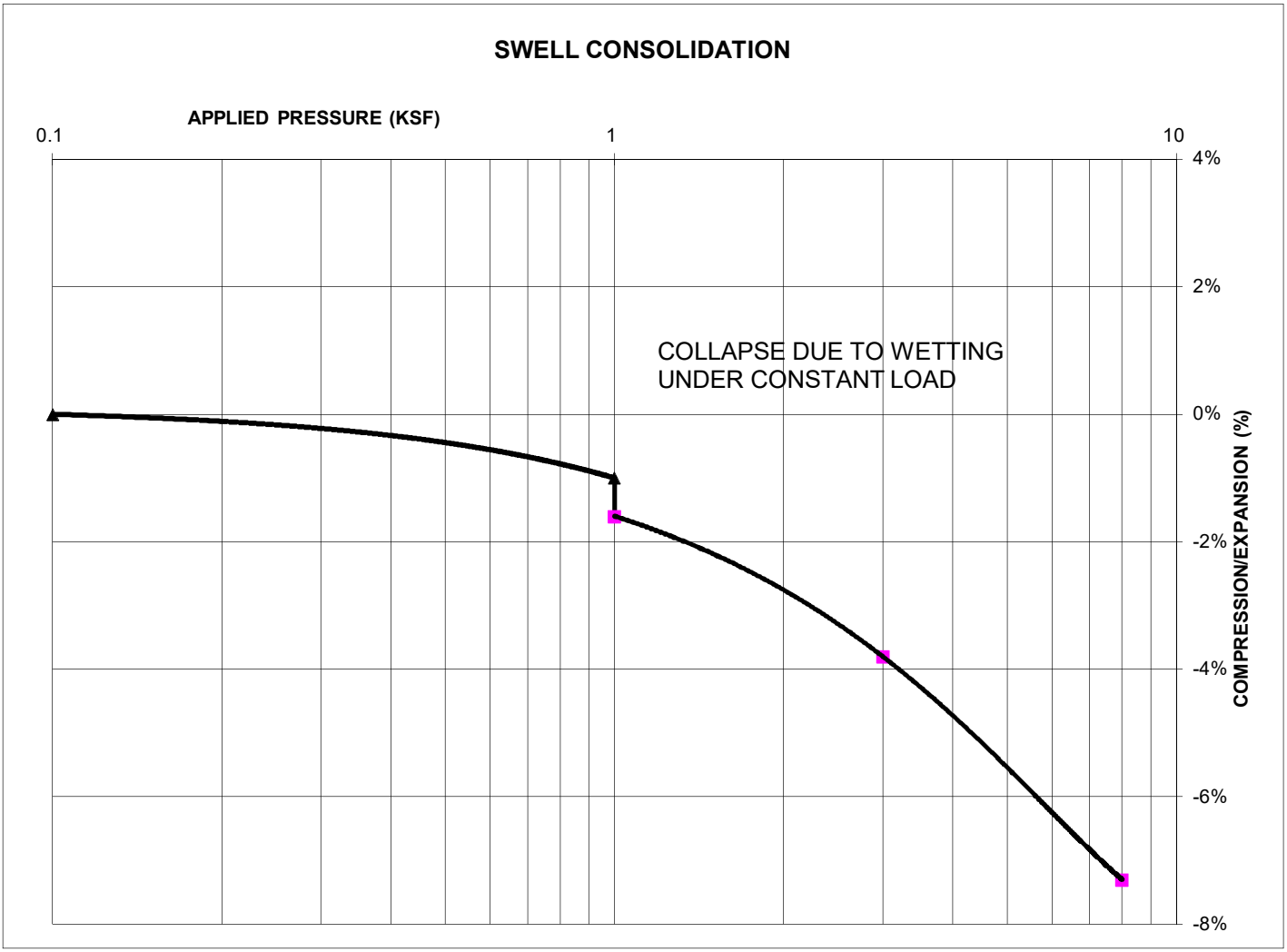
FIG. C-14

TEST BORING	5	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	5	SOIL TYPE	1



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 102
NATURAL MOISTURE CONTENT: 12.3%
SWELL/COLLAPSE (%): -0.6%

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SWELL TEST RESULTS

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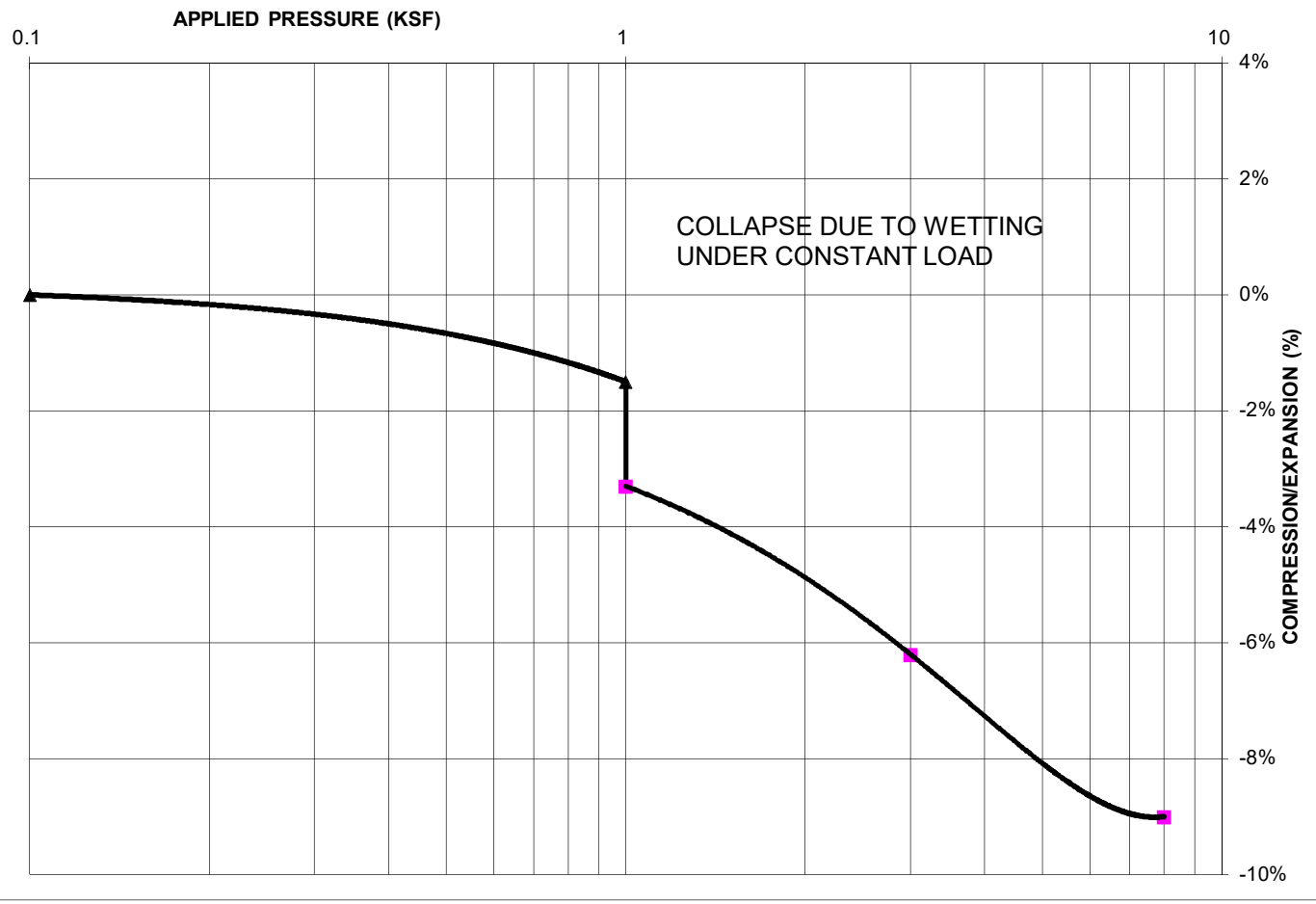
FIG. C-15

TEST BORING	1	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	15	SOIL TYPE	2

SWELL CONSOLIDATION



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 91
NATURAL MOISTURE CONTENT: 13.1%
SWELL/COLLAPSE (%): -1.8%

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SWELL TEST RESULTS

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FIG. C-16

TEST BORING	3	SOIL DESCRIPTION	CLAYSTONE (CLAY, WITH SAND)
DEPTH (FT)	10	SOIL TYPE	3

SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 96
NATURAL MOISTURE CONTENT: 14.2%
SWELL/COLLAPSE (%): 0.0%

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SWELL TEST RESULTS

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BRJM, LLC

JOB NO. 240519

FIG. C-17

APPENDIX D: Soil Survey Descriptions

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 21, Aug 24, 2023