

February 3, 2023



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

The Renehan's
604 Southpointe Drive, Suite 150
Colorado Springs, CO 80906

Re: Soil and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

Dear Renehan's:

The project consists of subdividing 34.28-acres; three rural residential lots are proposed for the subdivision. The site is located northwest of the intersection of Burgess Road and South Holmes Road in the northern portion of El Paso County, Colorado.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the SE¼ of Section 13 Township 12 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located to the northwest of the intersection of Burgess Road and South Holmes Road in the northern portion of El Paso County, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is generally gradually to moderately sloping to the northwest, with steeper slopes along the head of a drainage located in the northwestern portion of the site. Kettle Creek is located west of the site and Burgess Creek to the north. The head of a drainage was observed in the northwestern portion of the site. The drainage on the site flows in a westerly direction and was dry at the time of our site investigation. The site boundaries are indicated on the USGS Map, Figure 2. The site is currently undeveloped with La Foret located to the north, and rural residential development to the east, south, and west. The site contains field grasses, weeds, kinnikinic, and Ponderosa Pines. Site photographs were taken and site mapping was completed on November 8, 2022. Photographs are included in appendix A. Test Borings were drilled on November 9, 2022, and the Test Pits were excavated on November 10, 2022.

Total acreage of the site is 34.28-acres. Three rural residential lots are proposed as part of the replat which vary in size from 8.62 to 17.06 acres. The new lots will be serviced by an individual wells and on-site wastewater treatment systems. The Site Plan with the proposed replat is presented in Figure 3.

LAND USE AND ENGINEERING GEOLOGY

The site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose some minor constraints/hazards on development and land use. These include areas of potentially expansive soils, seasonally and potentially seasonally wet areas, shallow bedrock, and potentially unstable slopes. Based on the proposed development plan, it appears that these areas will have some impacts on the development. These conditions will be discussed in greater detail in the report.

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

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.

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.

FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of 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 aerial 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. The field mapping was performed by personnel of Entech Engineering, Inc. on November 8, 2022.

Five test borings were drilled and four test pits were excavated on the site to evaluate general suitability of the soil characteristics for residential construction. The test borings were placed in the proposed building footprints, and one located in the proposed private driveway. The locations of the test borings and test pits are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Test Pit Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on some of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422. Results of the laboratory testing are included in Appendix C.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 1, Figure 4), previously the Soil Conservation Service (Reference 2) has mapped two soil types on the site. Complete description of the soil types is presented in Appendix D. In general, the soils consist of gravelly loamy sand. The soils are described as follows:

<u>Type</u>	<u>Description</u>
40	Kettle gravelly loamy sand, 3 – 8% Slopes
41	Kettle gravelly loamy sand, 8 – 40% Slopes

The Renahan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as homesites. Possible hazards with soils erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 2).

Soils

The soils encountered in the Test Borings and Test Pits can be grouped into two general soil types: Type 1: silty to slightly silty sand, clean sand, clayey sand (SM-SW, SM, SW, SC), and Type 2: silty sandstone (SM). Bedrock was encountered at depths ranging from 2 to 12 feet in the Test Borings and Test Pits, bedrock was not encountered in Test Pit Nos. 1 – 3. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 is a silty to slightly silty sand (SM, SM-SW). Soil type one was encountered at the existing surface grade in all of the test borings and test pits extending to depths ranging from 1 to 12 feet. These soils were encountered at loose to medium dense states and dry to moist conditions. Samples tested had approximately 5 to 14 percent of the soil sized particles passing the No. 200 Sieve. Atterberg Limits Testing resulted in non-plastic results. Sulfate testing resulted in less than 0.01 percent sulfate by weight indicating the sand exhibits negligible potential for below grade concrete degradation.

Soil Type 2 is a silty sandstone (SM). Soil type two was encountered in all of the test borings, at depths ranging from 2 to 12 feet bgs and extended to the termination of the test borings (15 to 20 feet). These soils were encountered at dense to very dense states and moist conditions. Samples tested had approximately 16 to 31 percent of the soil sized particles passing the No. 200 Sieve. Atterberg Limits Testing resulted in non-plastic results. Sulfate testing resulted in less than 0.01 percent sulfate by weight indicating the sand exhibits negligible potential for below grade concrete degradation.

The Test Boring and Test Pit Logs are presented in Appendix B, and the Laboratory test results from the test pits are presented in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

Groundwater

Groundwater was not encountered in any of the test borings which were drilled to depths of 15 to 20 feet. Signs of seasonally occurring groundwater was observed in three of the test pits at 4.5 to 5 feet. Groundwater is not anticipated to affect shallow foundations on the majority of the site. Water was not observed in the head of the drainage in the northwestern portion of the site or in any of the minor drainage swales. Fluctuations in groundwater conditions may occur due to variations in rainfall or other factors not readily apparent at this time. Isolated sand layers within the soil profile can carry water in the subsurface. Contractors should be cognizant of the potential for the occurrence of subsurface water features during construction.

Geology

Approximately 10 miles west of the site 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 a large structural feature

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction (Reference 3). The bedrock underlying the site consists of the Dawson Formation of Tertiary to Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers of expansive claystone and siltstone.

The geology of the site was evaluated using the *Geologic Map of the Black Forest Quadrangle*, by Thorson and Madole in 2003, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. Three mappable units were identified on this site which are described as follows:

Qal Recent Alluvium of Holocene Age: These are recent stream deposits in the head of the drainage located in the northwest portion of site. Some areas have recent sand deposition, while others have highly organic soils.

Qc/Tkd Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age: The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of 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 Black Forest Quadrangle* distributed by the Colorado Geologic Survey in 2003, and the *Geologic Map of the Falcon NW Quadrangle*, by Madole in 2003, (References 4 and 5, Figure 5), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1979 (Reference 6), and the *Geologic Map of the Denver 1° x 2° Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 7). The test borings were used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

ENGINEERING GEOLOGIC HAZARDS

Mapping has been performed on this site to identify areas where various geologic conditions exist of which developers should be cognizant during the planning, design and construction stages where new construction is proposed. The engineering geologic constraints/hazards identified on this site include potentially expansive soils, seasonally and potentially seasonally wet areas, shallow bedrock, and areas of potentially unstable slopes. These constraints/hazards and recommended mitigation techniques are discussed as follows:

Expansive Soils – Constraint

Expansive soils were not encountered in the test borings, however, highly expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. Expansive clays, claystone, or siltstone, if encountered beneath foundations, can cause differential movement in the structure foundation.

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation 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.

Drainage and Floodplain Areas

The site is not mapped within any floodplains according to the FEMA Map Nos. 08041CO315G, and 08041CO526G dated December 7, 2018 (Figure 8, Reference 8). The head of a drainage is located in the northwestern portion of the site on Lot 3 that has been identified as a seasonally wet area, and a low lying area above the drainage has been identified as a potentially seasonally wet area. These areas indicated on Geology/Engineering Geology Map (Figure 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. Water was not observed these areas at time of our site investigation. The seasonally wet area is located within a no-build area, and the potentially seasonal shallow groundwater area will be avoided by the proposed structure on Lot 3. In these areas the potential exists for high groundwater levels during high moisture periods and should structures encroach on these areas the following precautions should be followed. Exact locations of floodplain and specific drainage studies are beyond the scope of this report.

Seasonally Wet Area – Constraint

The seasonally wet area has been mapped in the head of the drainage located in the northwestern portion of Lot 3. Construction is not recommended in this area and is located within a no-build area. Mitigation for seasonally wet areas is discussed in the following section.

Potentially Seasonally Wet Areas – Constraint

A low lying area above the head of the drainage located in the northwestern portion of Lot 3 was identified as a potentially seasonally wet area. Water was not observed in this area; however, this area has the potential for seasonal shallow groundwater, and is indicated on the Geology/Engineering Geology Map (Figure 6). Due to the size of the proposed lots these areas can either be avoided by the proposed structures or proposed soil treatment areas.

Mitigation: In these locations, foundations are subject to severe frost heave potential should penetrate sufficient depth so as to discourage the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth for frost protection of 2.5 feet is recommended. In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the intrusion of water into areas located below grade. A typical perimeter drain detail is presented in Figure 8. Additionally, swales should be created to intercept surface runoff and carry it safely around and away from structures. It is anticipated that the site grading may mitigate the drainages in some areas. The water table may be of sufficient depth to minimize the effects on buildings in some areas.

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

Shallow Bedrock – Constraint

Bedrock was encountered in both the test borings at depths of 2 to 12 feet, and was encountered at very dense states. A Summary of the Depth to Bedrock is included in Table 1. Where shallow bedrock is encountered, excavation/grading may be difficult requiring track-mounted excavators. Bedrock may be encountered cuts for the private driveway and utility excavations

Slope Stability and Landslide Hazards

The majority of the slopes in the building areas on site are generally gradually to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. However, areas of downslope creep have been mapped in the northwestern portion of the site along the head of a drainage. These slopes are located within a no-build area and will be avoided by the proposed development. This area is identified on the Geology/Engineering Geology Map, Figure 6. The recommendations for these areas are as follows:

- Potentially Unstable Slopes - Constraint

The areas identified with this hazard includes the steeper slopes along the drainage in the northwestern portion of Lot 3. In these areas we would anticipate lateral and vertical movement of the near surface soils in the downslope direction. These areas are located within a no-build area and will be avoided by the proposed development.

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

Total acreage of the site is 34.28-acres. Three rural residential lots which vary in size from 8.62 to 17.06 acres are proposed as part of the replat. The new lots will be serviced by an individual wells and on-site wastewater treatment systems. The existing geologic and engineering geologic conditions will impose constraints on development and construction. The geologic constraints/hazards identified on this site include potentially expansive soils, seasonally and potentially seasonally wet areas, shallow bedrock, and areas of potentially unstable slopes, which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The upper sand in the test borings were encountered at loose to medium dense states, and the sandstone bedrock was encountered in the test borings on the site was encountered at very dense states and hard consistencies. Bedrock was encountered 2 to 12 feet in the test borings. High allowable bearing capacities should be expected in areas of shallow bedrock. Difficult excavation of the very dense bedrock should be expected.

The sand and sandstone encountered in the test borings is considered to have low expansion potential. Highly expansive clays and claystone are commonly interbedded in the Dawson Formation in the area. Loose sands, if encountered, will require removal and recompaction typically to a depth of 2 to 3 feet. Expansive soils if encountered at or near foundation grade may require overexcavation 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

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

movement. Overexcavation and replacement has been successful in minimizing slab movements. These soils will not prohibit development.

The foundations should be supported by soils with a similar bearing capacity (i.e., entirely on structural fill, or entirely on sandstone bedrock). If the majority of the foundation is supported by sandstone and a relatively small portion supported by sand, the sand may be overexcavated down to sandstone and replaced with structural fill compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557. If the majority of the foundation is supported by sand, the sandstone should be overexcavated a minimum of 2 feet and replaced with sand compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557.

The head of a drainage is located in the northwestern portion of the site on Lot 3 that has been identified as a seasonally wet area, and a low lying area above the drainage has been identified as a potentially seasonally wet area. These areas indicated on Geology/Engineering Geology Map (Figure 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. Water was not observed these areas at time of our site investigation. The seasonally wet area is located within a no-build area, and the potentially seasonal shallow groundwater area will be avoided by the proposed structure on Lot 3. Due to the size of the lots these areas can either be avoided, or regraded and redirected around proposed structures or proposed soil treatment area.

The majority of the slopes in the building areas on site are generally gradually to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. However, areas of downslope creep have been mapped in the northwestern portion of the site on Lot 3 along the head of a drainage. These slopes are located within a no-build area and will be avoided by the proposed development. This area is identified on the Geology/Engineering Geology Map, Figure 6.

In summary, the granular soils will likely provide suitable support for shallow foundations. The geologic conditions encountered on site can be mitigated with avoidance or proper engineering and construction practices.

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), of the area of the site is not mapped with any potential aggregate resources. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 10), the site is not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 11), the area of the site has been mapped as "little or no potential" for industrial minerals.

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

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

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.

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.

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

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 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 and septic systems other than those tested for this report 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 The Renehan's, 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.

Respectfully Submitted,

ENTECH ENGINEERING, INC.



Logan L. Langford, P.G.
Geologist

LLL

Encl.

Entech Job No. 222084
A\projects\2022\222084 sg&ghs

Reviewed by:



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

The Renehan's
Soils and Geology Study
5740 Burgess Road
Tax Schedule No. 62130-00-050
El Paso County, Colorado

BIBLIOGRAPHY

1. Natural Resource Conservation Service, September 13, 2019. *Web Soil Survey*. United States Department Agriculture, <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
2. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado*.
3. Bryant, Bruce; McGraw, Laura W.; and Wobus, Reinhard A. 1981. *Geologic Structure Map of the Denver 1° x 2° Quadrangle, North-Central Colorado*. Sheet 2. U.S. Geologic Survey. Map I-1163, Sheet 2.
4. Thorson, Jon P. 2003. *Geologic Map of the Black Forest Quadrangle, El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 03-6.
5. Madole, Richard F., 2003. *Geologic Map of the Falcon NW Quadrangle, El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 03-08.
6. Trimble, Donald E. and Machette, Michael N. 1979. *Geologic Map of the Colorado Springs-Castle Rock Area, Front Range Urban Corridor, Colorado*. USGS, Map I-857-F.
7. Bryant, Bruce; McGraw, Laura W.; and Wobus, Reinhard A. 1981. *Geologic Map of the Denver 1° x 2° Quadrangle, South-Central Colorado*. U.S. Geologic Survey. Map I-1163.
8. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado*. Map Numbers 08041CO315G & 08041CO526G
9. El Paso County Planning Development. December 1995. *El Paso County Aggregate Resource Evaluation Maps*.
10. Schwochow, S.D.; Shroba, R.R. and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties*. Colorado Geological Survey. Special Publication 5-B.
11. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.

TABLES

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

CLIENT THE RENEHAN'S
PROJECT 5740 BURGESS ROAD
JOB NO. 222084

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			11.3	NV	NP	<0.01			SM-SW	SAND, SLIGHTLY SILTY
1	2	5			4.8						SW	SAND
1	4	2-3			13.5						SM	SAND, SILTY
2	3	5			31.3	NV	NP	<0.01			SM	SANDSTONE, SILTY
2	5	15			16.2						SM	SANDSTONE, SILTY

Table 2: Summary Test Boring Results

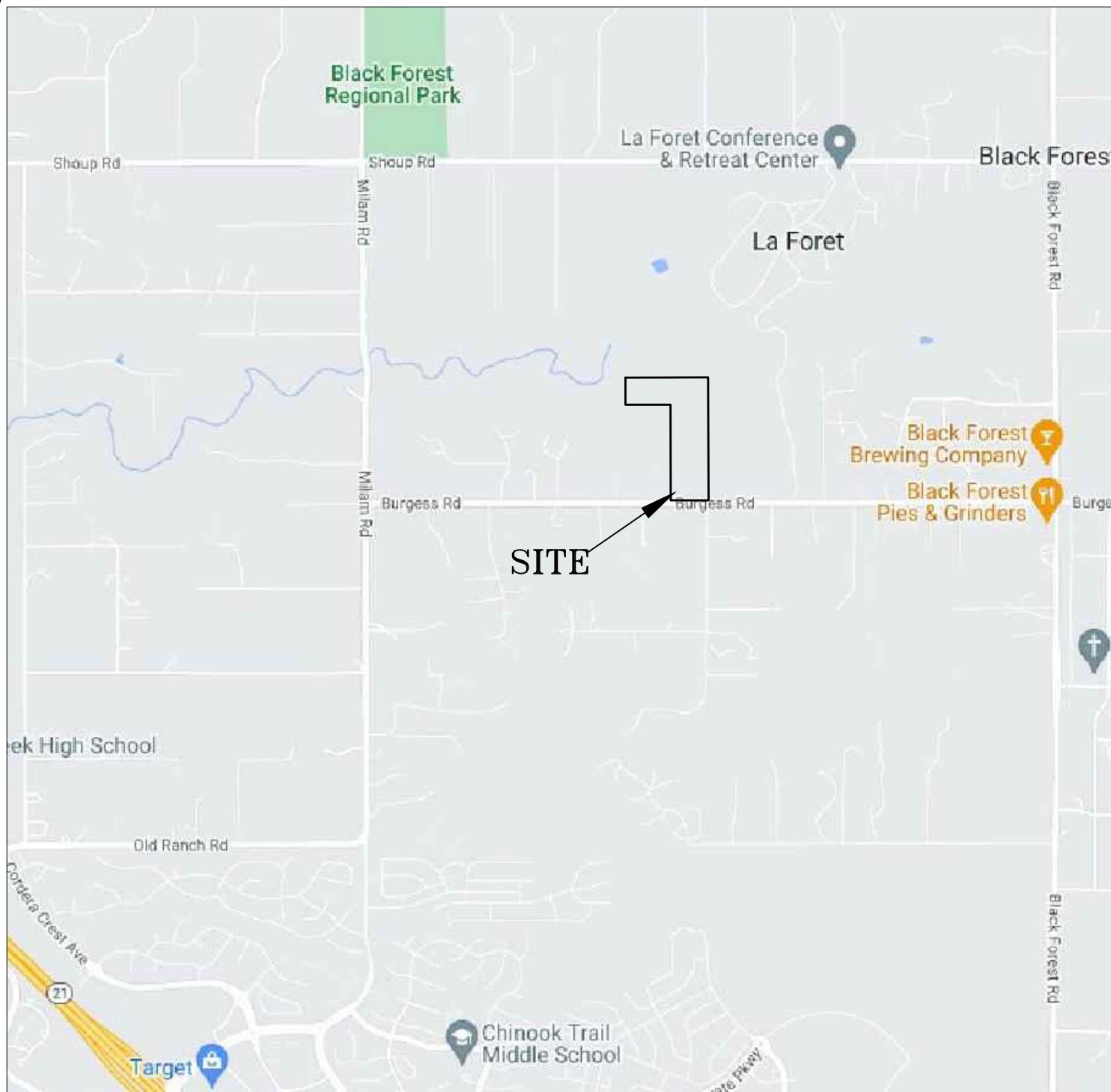
Test Boring No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.)
1	12	>20
2	7	>20
3	2	>15
4	3	>20
5	9	>20

Table 3: Summary Tactile Test Pit Results

Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Groundwater or Seasonally Occurring Groundwater (ft.)
1	4A*	0.15	>8	4.5*
2	4A*	0.15	>8	5*
3	R-1*	0.5	>8	>8
4	4A*	0.15	3.5*	>4.5

*- Conditions that will require an engineered OWTS

FIGURES



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

VICINITY MAP
5740 BURGESS ROAD
EL PASO COUNTY, CO.
FOR: THE RENEHAN'S

DRAWN:
LLL

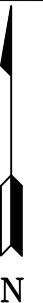
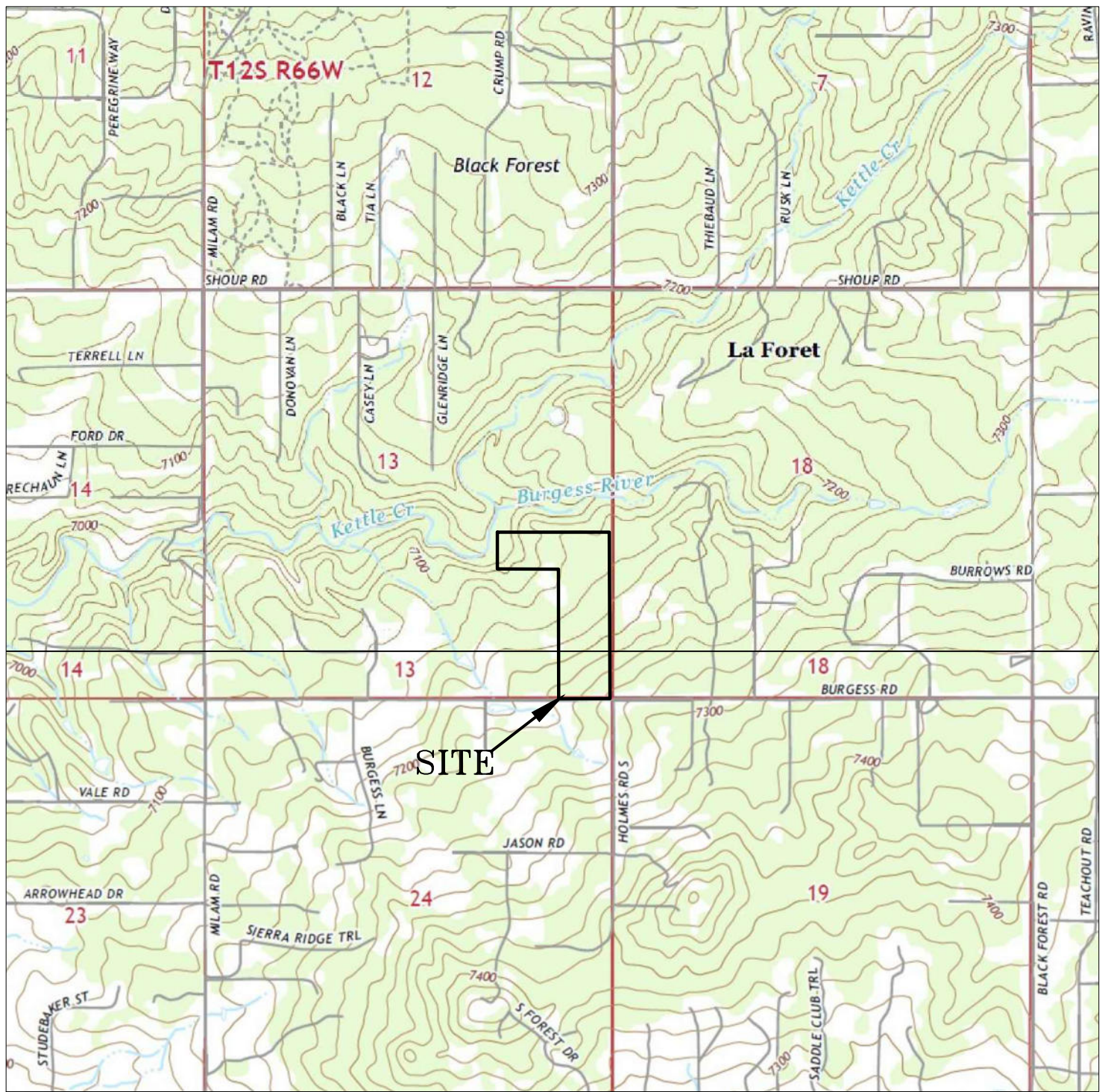
DATE:
11/23/22

CHECKED:

DATE:

JOB NO.:
222084

FIG NO.:
1



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

USGS MAP
5740 BURGESS ROAD
EL PASO COUNTY, CO.
FOR: THE RENEHAN'S

DRAWN:
LLL

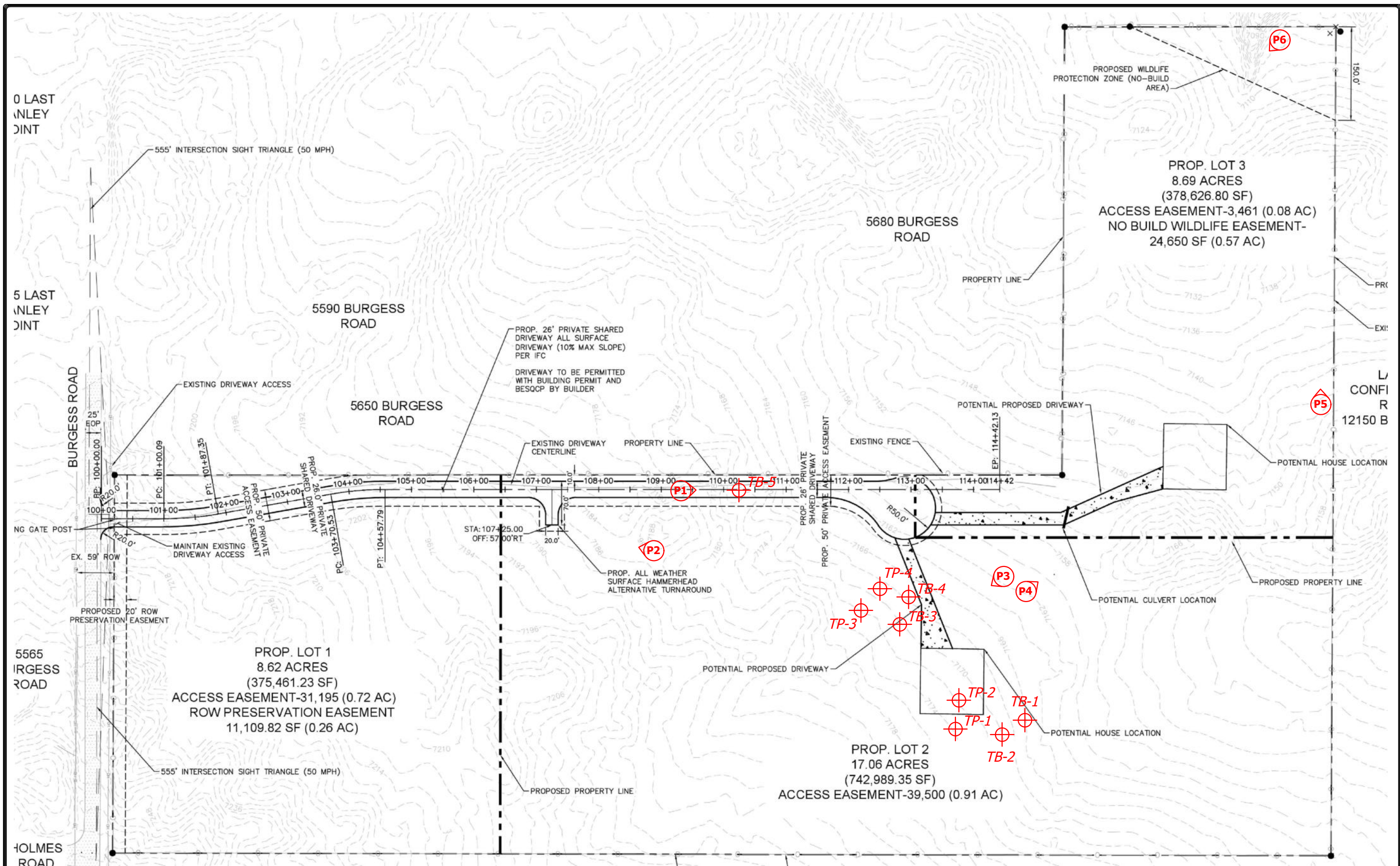
DATE:
11/23/22

CHECKED:

DATE:

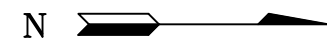
JOB NO.:
222084

FIG NO.:
2



Legend:

- TB - Approximate Test Boring Location and Number
- TP - Approximate Test Pit Location and Number
- Approximate Photograph Direction and Location



REVISION	BY

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



SITE MAP/TESTING LOCATION MAP
5740 BURGESS ROAD
EL PASO COUNTY, CO.
FOR: THE RENEHAN'S

DRAWN L.L.L. CHECKED
DATE 2/1/23
SCALE AS SHOWN
JOB NO. 222084
FIGURE No. 3



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

SOIL SURVEY MAP
5740 BURGESS ROAD
EL PASO COUNTY, CO.
FOR: THE RENEHAN'S

DRAWN:
LLL

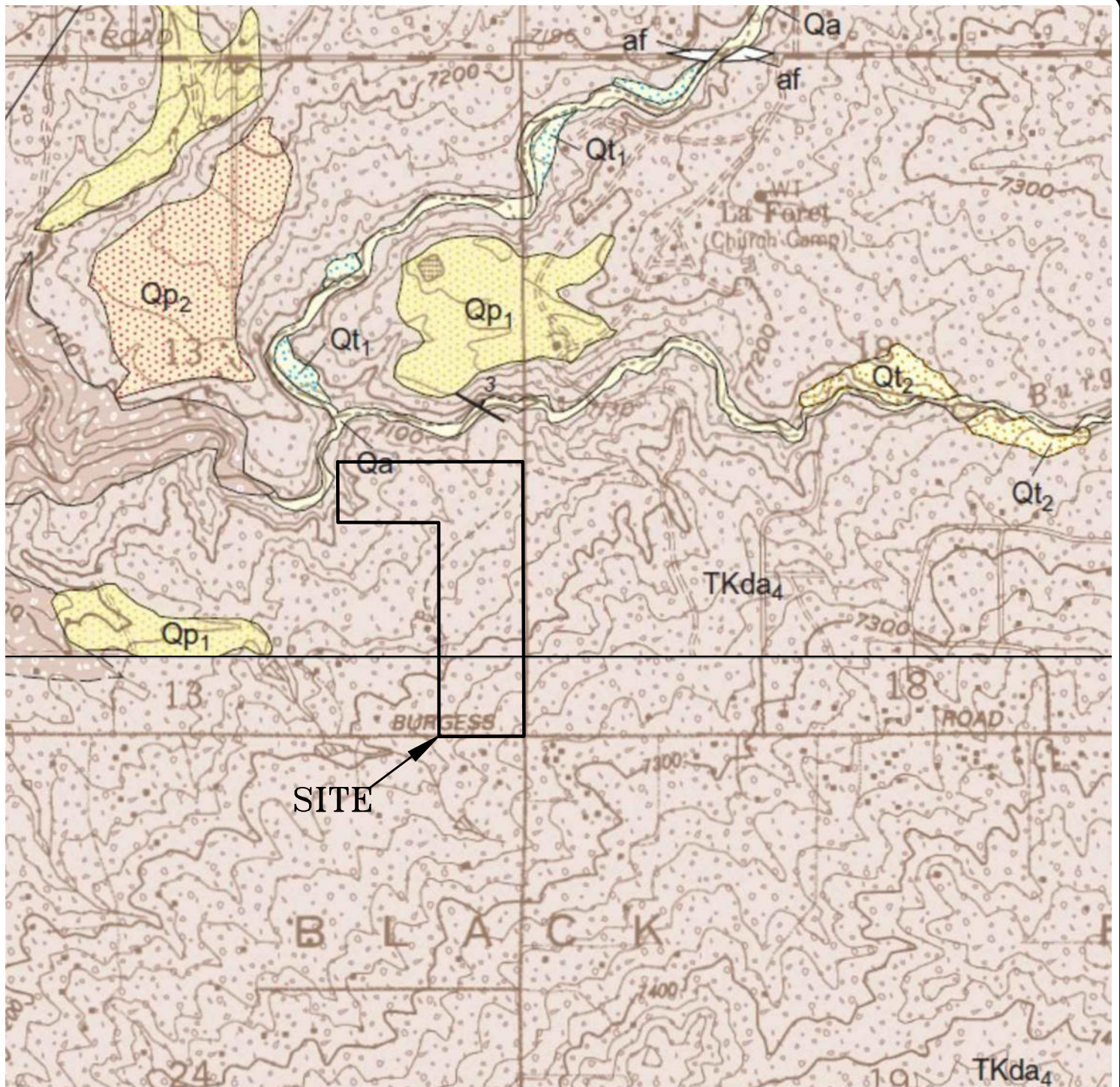
DATE:
11/23/22

CHECKED:

DATE:

JOB NO.:
222084

FIG NO.:
4



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

BLACK FOREST/FALCON NW QUADRANGLES
GEOLOGIC MAP
5740 BURGESS ROAD
EL PASO COUNTY, CO.
FOR: THE RENEHAN'S

DRAWN:
LLL

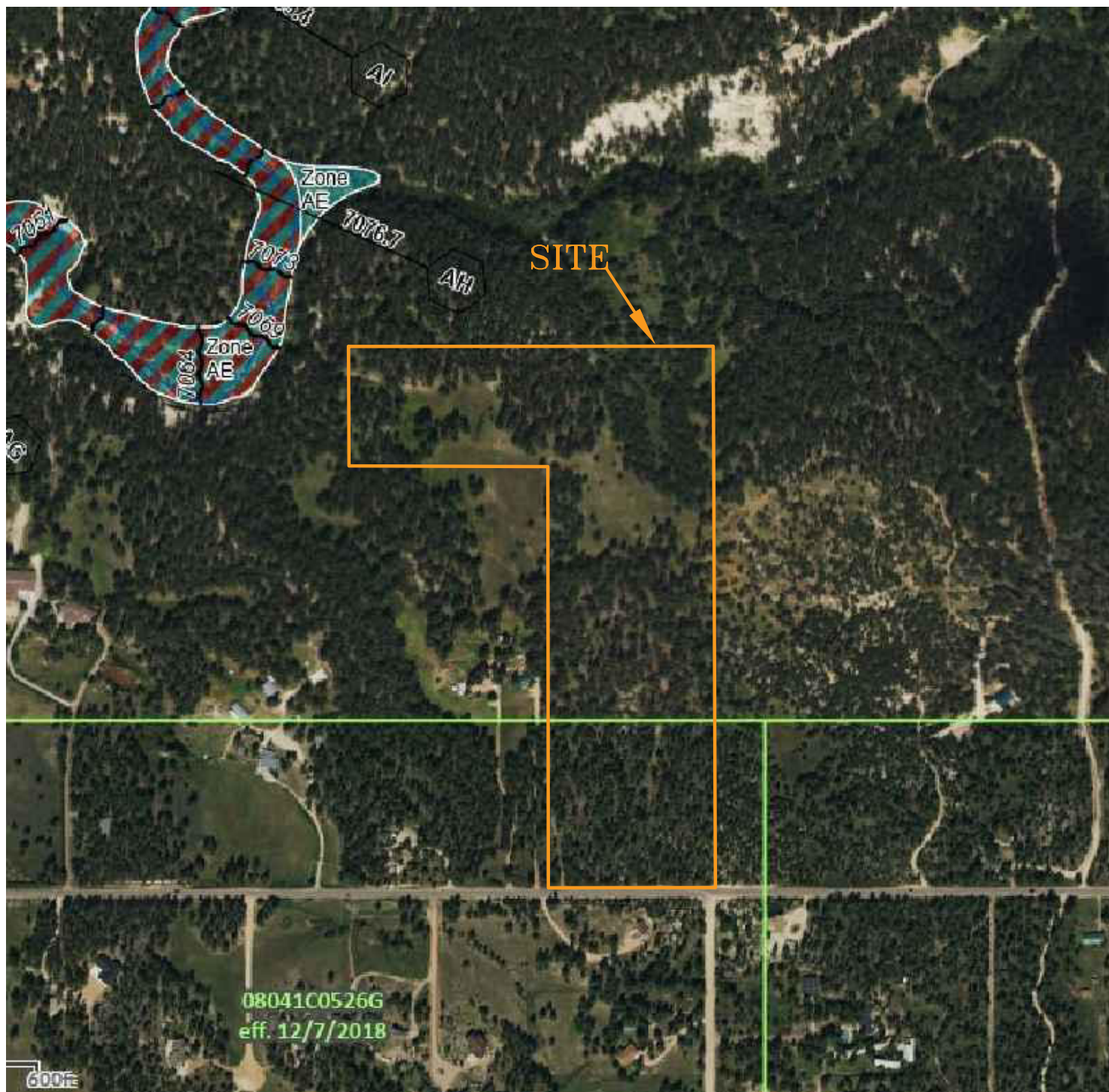
DATE:
11/23/22

CHECKED:

DATE:

JOB NO.:
222084

FIG NO.:
5



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

FEMA FLOODPLAIN MAP
5740 BURGESS ROAD
EL PASO COUNTY, CO.
FOR: THE RENEHAN'S

DRAWN:
LLL

DATE:
11/23/22

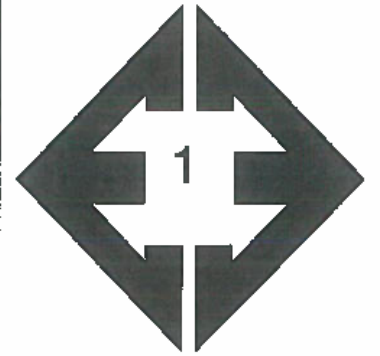
CHECKED:

DATE:

JOB NO.:
222084

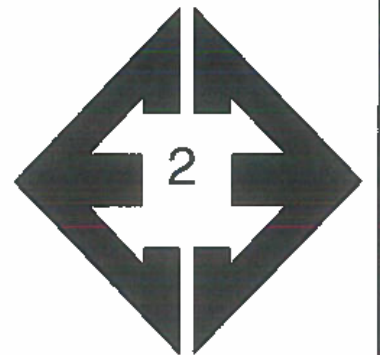
FIG NO.:
7

APPENDIX A: Site Photographs



**Looking north along
the proposed driveway
in the western side of
the site.**

November 8, 2022



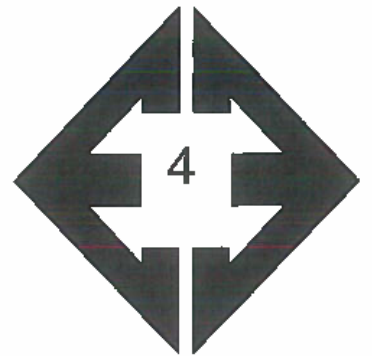
**Looking south from
the southern portion of
the site.**

November 8, 2022



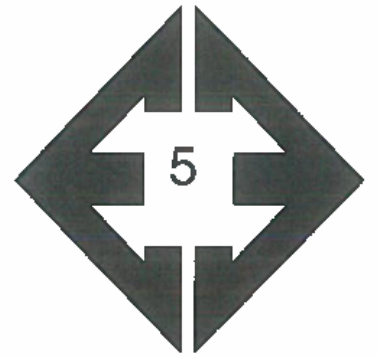
**Looking southeast
from the northeastern
portion of the site.**

November 8, 2022



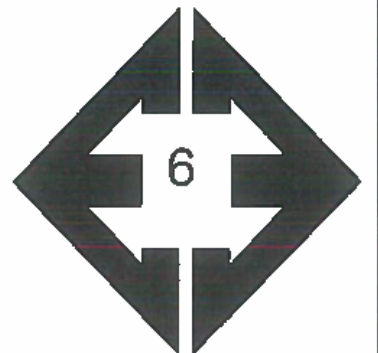
**Looking northwest
from the northeastern
portion of the site.**

November 8, 2022



**Looking west along
the northern side of
the site.**

November 8, 2022



**Looking east along the
head of the drainage in
the northwestern
portion of Lot 3.**

November 8, 2022

APPENDIX B: Test Boring & Test Pit Logs

TEST BORING NO. 1
 DATE DRILLED 11/9/2022
 Job # 222084

TEST BORING NO. 2
 DATE DRILLED 11/9/2022
 CLIENT THE RENEHAN'S
 LOCATION 5740 BURGESS ROAD

REMARKS

DRY TO 20', 11/10/22

SAND, SLIGHTLY SILTY TO
 SILTY, FINE TO COARSE GRAINED,
 TAN, LOOSE TO DENSE, DRY TO
 MOIST

SANDSTONE, SILTY, FINE TO
 COARSE GRAINED, GRAY
 BROWN, VERY DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			8	1.8	1
5			7	3.9	1
10			32	6.7	1
15			50 8"	10.3	2
20			50 8"	8.4	2

REMARKS

DRY TO 20', 11/10/22

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

SANDSTONE, SILTY, FINE TO
 COARSE GRAINED, GRAY
 BROWN, VERY DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			17	4.2	1
5			13	4.4	1
10			50 8"	11.8	2
15			50 7"	10.4	2
20			50 8"	11.4	2



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

LLL

11/18/22

JOB NO.:
 222084

FIG NO.:
 B- 1

TEST BORING NO. 3
 DATE DRILLED 11/9/2022
 Job # 222084

TEST BORING NO. 4
 DATE DRILLED 11/9/2022
 CLIENT THE RENEHAN'S
 LOCATION 5740 BURGESS ROAD

REMARKS

DRY TO 15', 11/10/22

SAND, SILTY, BROWN

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

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
					2
5			50 11"	11.0	2
			50 7"	13.9	2
10			50	12.9	2
15			50 5"	6.0	2
20					

REMARKS

DRY TO 20', 11/10/22

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

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

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			30	2.2	1
5			50 7"	7.1	2
10			50 7"	13.4	2
15			50 7"	10.5	2
20			50 7"	15.9	2



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

LLL

11/18/22

JOB NO.:
 222084

FIG NO.:
 B- 2

TEST BORING NO. 5
 DATE DRILLED 11/9/2022
 Job # 222084

TEST BORING NO.
 DATE DRILLED
 CLIENT THE RENEHAN'S
 LOCATION 5740 BURGESS ROAD

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 11/10/22													
SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE TO DENSE, DRY TO MOIST	5			23	2.3	1		5					
				27	3.0	1							
SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST	10			50 8"	12.7	2		10					
	15			50 6"	9.8	2		15					
	20			50 9"	16.8	2		20					



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

LLL






11/18/22





JOB NO.:
 222084

FIG NO.:
 B- 3

TEST PIT NO. 1
DATE EXCAVATED 11/10/2022
Job # 222084

TEST PIT NO. 2
DATE EXCAVATED 11/10/2022
CLIENT The Renehans
LOCATION 5740 Burgess Road

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Redoximorphic Features @ 4-feet 6-inches						
topsoil, sandy clay loam, brown, moist	1					
sandy clay, fine to medium grained, grayish brown, moist	2			ma		4A
sandy loam, fine to coarse grained, brown, moist	3			gr	m	2
	4					
sandy loam, fine to coarse grained, brown, moist	5			gr	m	2
	6					
sandy clay, fine to medium grained, grayish brown, moist	7			ma		4A
	8					
	9					
	10					

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Redoximorphic Features @ 5-feet 0-inches						
topsoil, sandy clay loam, brown, moist	1					
	2					
sandy clay, fine to medium grained, grayish brown, moist	3			ma		4A
	4					
sandy loam, fine to coarse grained, brown, moist	5			gr	m	2
	6					
sandy clay, fine to medium grained, grayish brown, moist	7			ma		4A
	8					
	9					
	10					

Soil Structure Shape

granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade

weak - w
moderate - m
strong - s
loose - l



**ENTECH
ENGINEERING, INC.**

505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

DRAWN:
jhr

DATE:
11/14/22

CHECKED:
LL

DATE:
11/22

JOB NO.:
222084

FIG NO.:
P-41

TEST PIT NO. 3
 DATE EXCAVATED 11/10/2022
 Job # 222084

TEST PIT NO. 4
 DATE EXCAVATED 11/10/2022
 CLIENT The Renchans
 LOCATION 5740 Burgess Road

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
							Bedrock @ 3-feet 6-inches, Refusal @ 4-feet 6-inches						
topsoil, sandy clay loam, brown, moist	1						topsoil, sandy clay loam, brown, moist	1					
gravelly sandy clay loam, fine to very coarse grained, brown to grayish brown, moist	2			gr	s	R-1	sandy loam, fine to coarse grained, pale brown, moist	2			bl	s	2
	3							3					
	4			gr	s	R-1	clayey sandstone, fine to medium grained, brown, moist	4			ma		4A
	5							5					
gravelly sandy loam, fine to very coarse grained, brown, moist	6			gr	m	R-1		6					
	7							7					
	8							8					
	9							9					
	10							10					

Soil Structure Shape

granular - gr
 platy - pl
 blocky - bl
 prismatic - pr
 single grain - sg
 massive - ma

Soil Structure Grade

weak - w
 moderate - m
 strong - s
 loose - l



**ENTECH
 ENGINEERING, INC.**

505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

DRAWN:
jhr

DATE:
11/14/22

CHECKED:
LLC

DATE:
11/18/22

JOB NO.:
222084

FIG NO.:

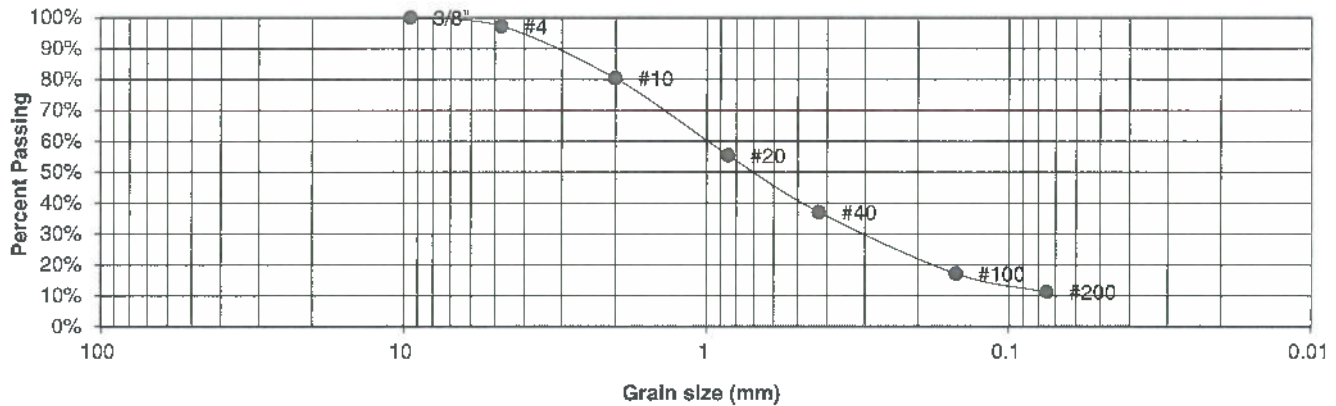
B-5

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION SM-SW
 SOIL TYPE # 1
 TEST BORING # 1
 DEPTH (FT) 2-3

CLIENT THE RENEHAN'S
 PROJECT 5740 BURGESS ROAD
 JOB NO. 222084
 TEST BY BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.2%
10	80.4%
20	55.4%
40	37.0%
100	17.1%
200	11.3%

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:
LLL

DATE:

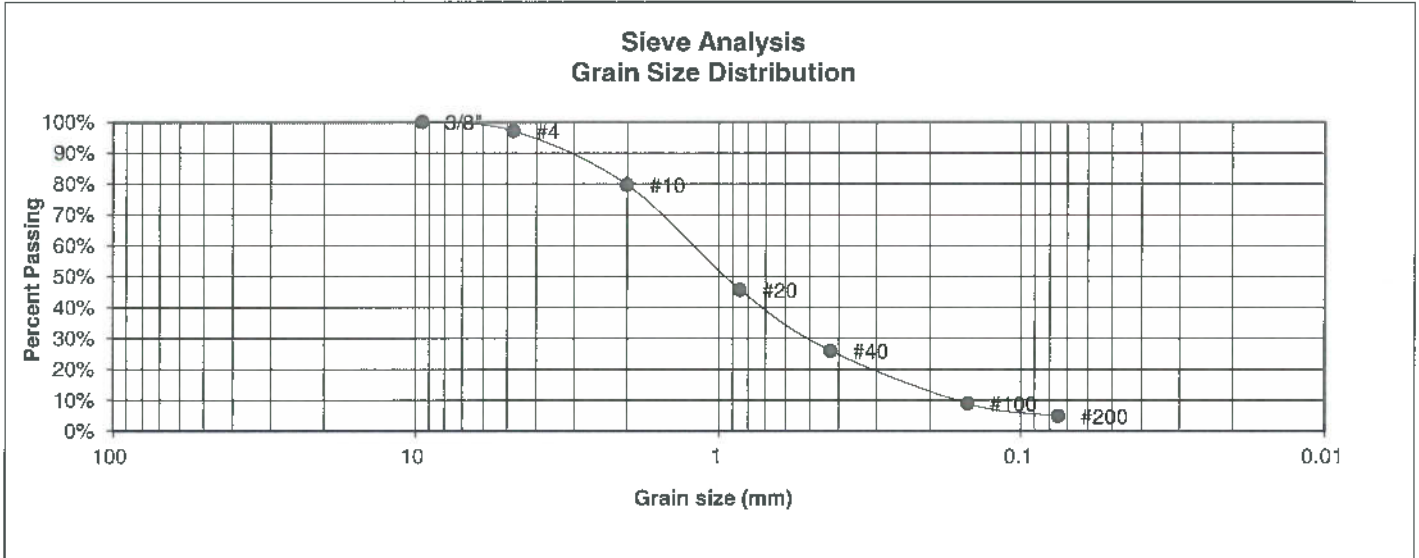
11/18/22

JOB NO.:
222084

FIG NO.:

C-1

UNIFIED CLASSIFICATION	SW	CLIENT	THE RENEHAN'S
SOIL TYPE #	1	PROJECT	5740 BURGESS ROAD
TEST BORING #	2	JOB NO.	222084
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer	Atterberg Limits
3"		Plastic Limit
1 1/2"		Liquid Limit
3/4"		Plastic Index
1/2"		
3/8"	100.0%	
4	97.2%	
10	79.7%	
20	45.7%	
40	26.0%	
100	8.9%	
200	4.8%	

<u>Swell</u>
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: LL	DATE: 11/18/22
--------	-------	----------------	-------------------

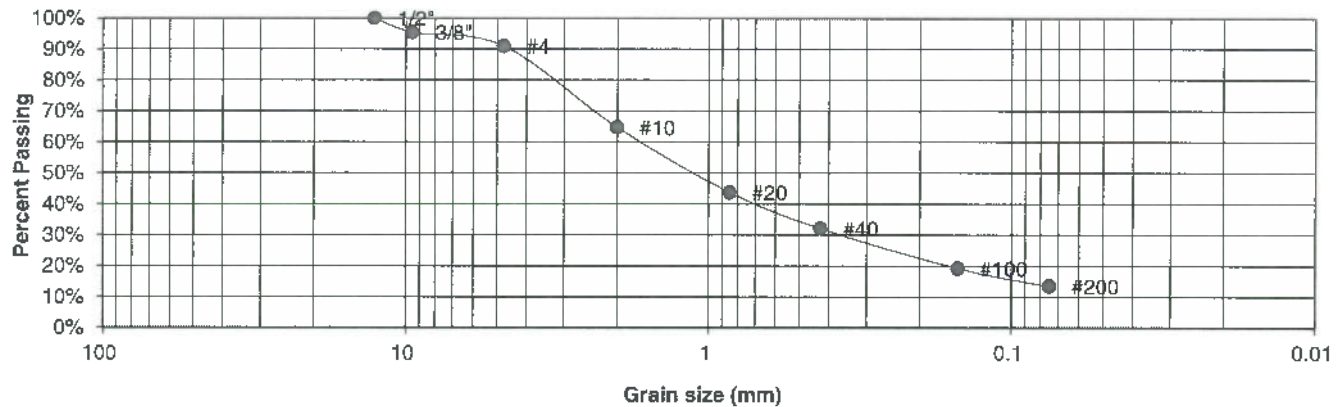
JOB NO.:
222084

FIG NO.:
C-2

UNIFIED CLASSIFICATION	SM
SOIL TYPE #	1
TEST BORING #	4
DEPTH (FT)	2-3

CLIENT	THE RENEHAN'S
PROJECT	5740 BURGESS ROAD
JOB NO.	222084
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"	95.3%
4	90.9%
10	64.7%
20	43.7%
40	32.0%
100	19.2%
200	13.5%

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:

LL

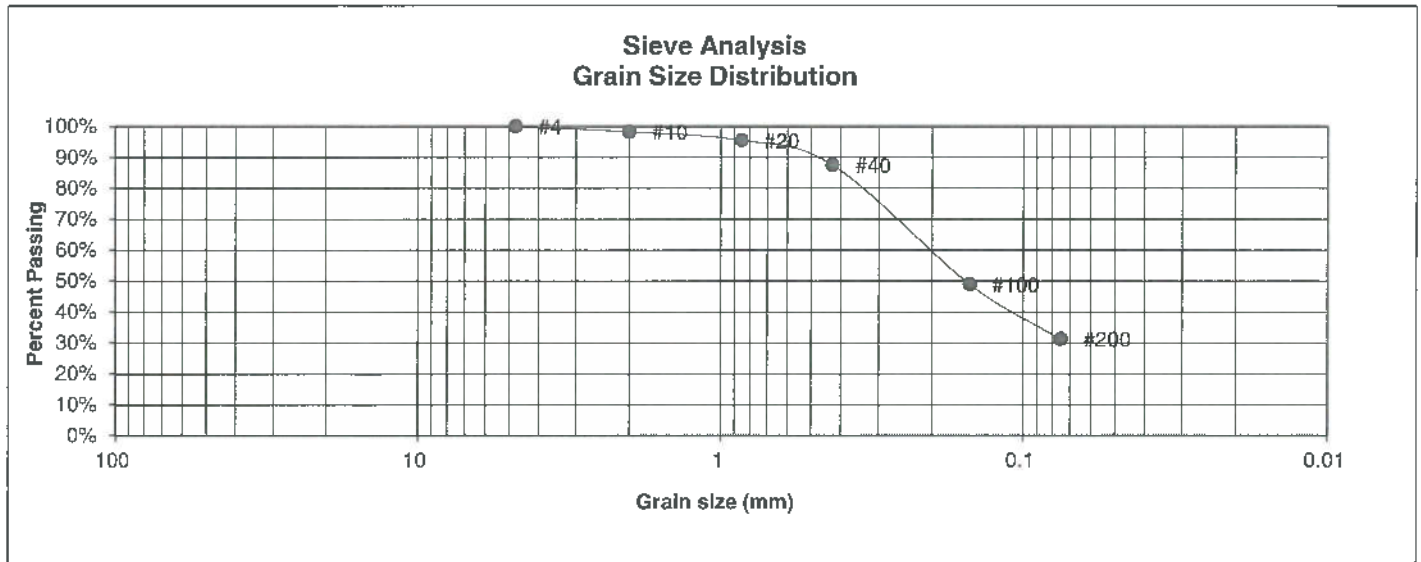
11/18/22

JOB NO.:
222084

FIG NO.:

C-3

UNIFIED CLASSIFICATION	SM	CLIENT	THE RENEHAN'S
SOIL TYPE #	2	PROJECT	5740 BURGESS ROAD
TEST BORING #	3	JOB NO.	222084
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.3%
20	95.5%
40	87.5%
100	48.9%
200	31.3%

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:
		ELL	11/18/22

JOB NO.:
222084

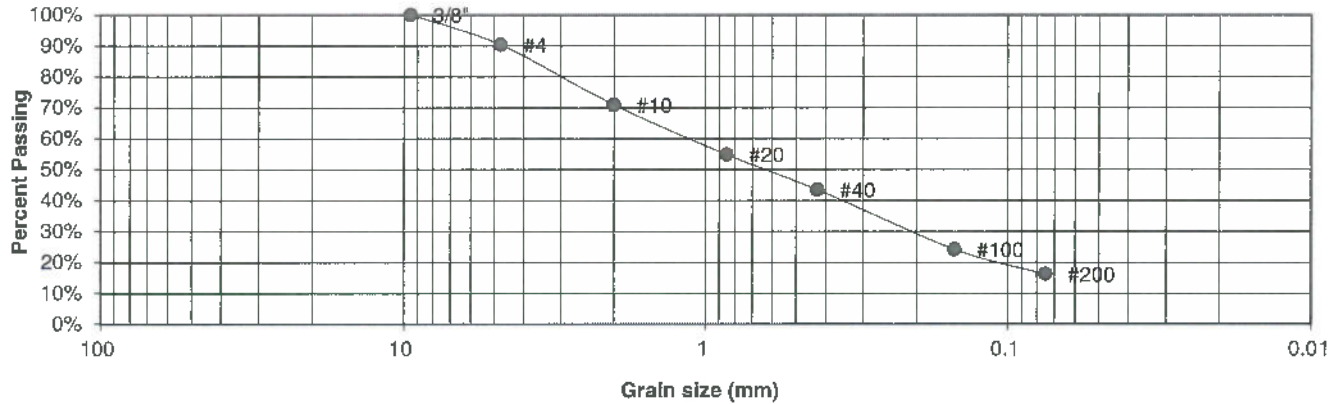
FIG NO.:

C-41

UNIFIED CLASSIFICATION SM
 SOIL TYPE # 2
 TEST BORING # 5
 DEPTH (FT) 15

CLIENT THE RENEHAN'S
 PROJECT 5740 BURGESS ROAD
 JOB NO. 222084
 TEST BY BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	90.3%
10	70.9%
20	54.9%
40	43.5%
100	24.2%
200	16.2%

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:

LLC

11/18/22

JOB NO.:
222084

FIG NO.:

C-5

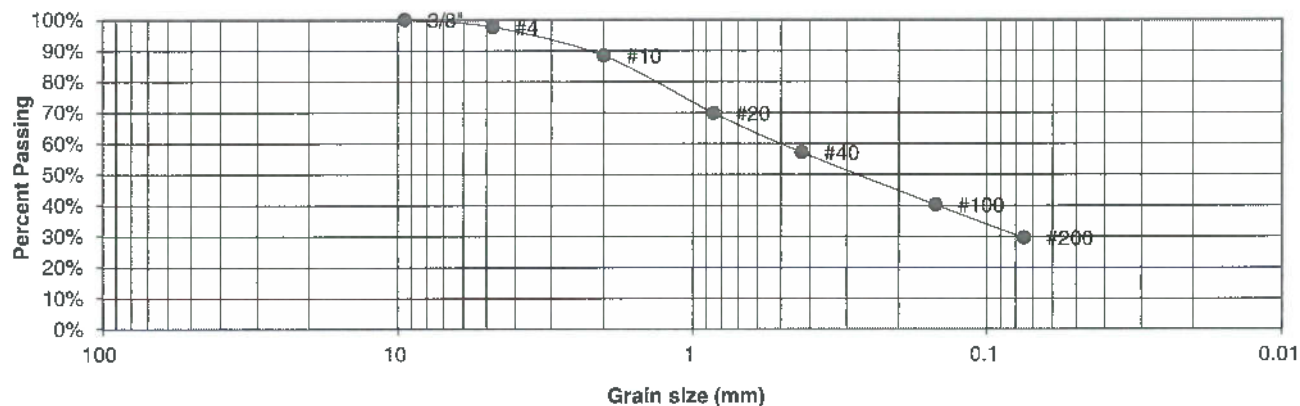
BORING NO. TP-1
 DEPTH(ft) 2
 CLIENT THE RENEHANS
 PROJECT 5740 BURGESS ROAD

UNIFIED CLASSIFICATION
 AASHTO CLASSIFICATION

SC

TEST BY BL
 JOB NO. 222084

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.7%
10	88.4%
20	69.8%
40	57.2%
100	40.2%
200	29.5%

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:
LL

DATE:

11/18/22

JOB NO.:
222084

FIG NO.:

6-7

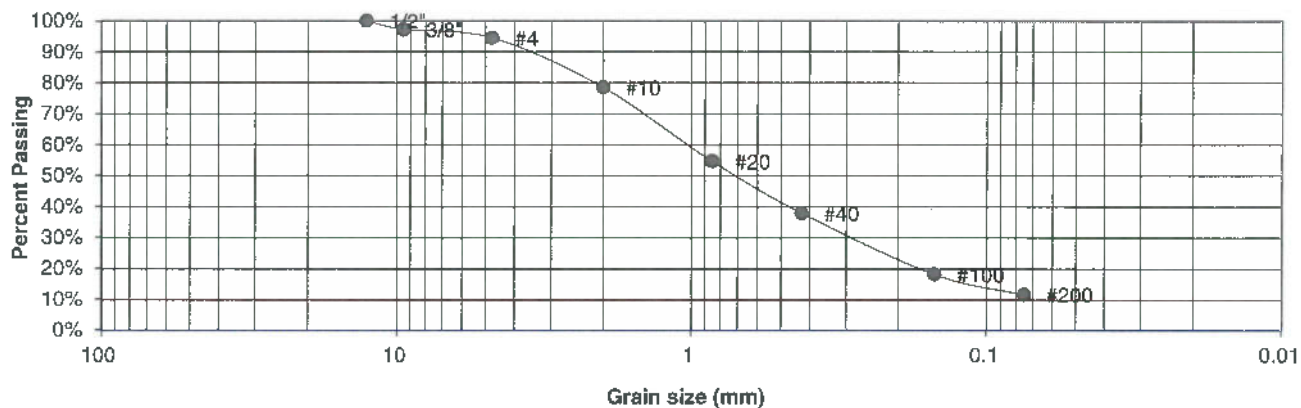
BORING NO. TP-1
 DEPTH(ft) 5
 CLIENT THE RENEHANS
 PROJECT 5740 BURGESS ROAD

UNIFIED CLASSIFICATION
 AASHTO CLASSIFICATION

SM-SW

TEST BY BL
 JOB NO. 222084

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.1%
4	94.4%
10	78.4%
20	54.6%
40	37.9%
100	18.2%
200	11.7%

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:

LL

11/18/22

JOB NO.:
222084

FIG NO.:
C-8

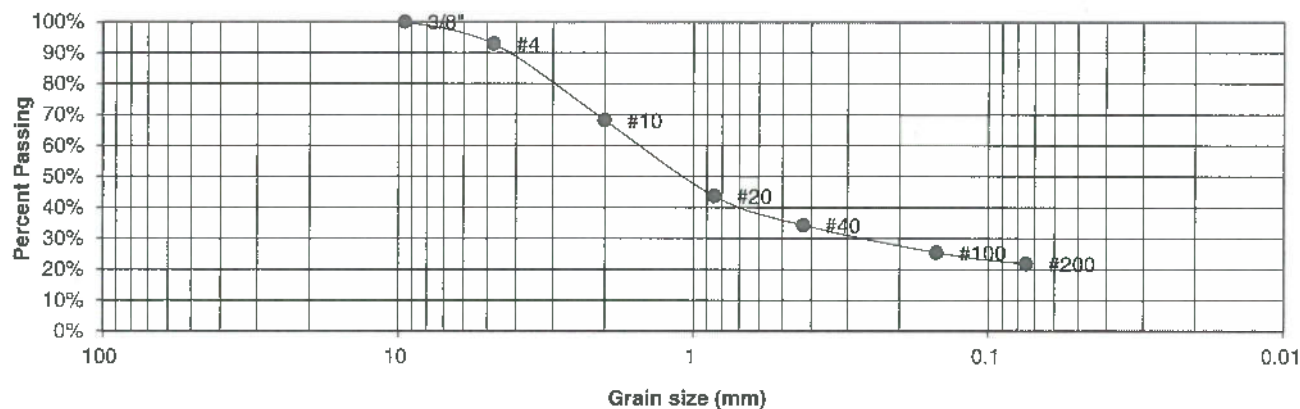
BORING NO. TP-2
 DEPTH(ft) 3
 CLIENT THE RENEHANS
 PROJECT 5740 BURGESS ROAD

UNIFIED CLASSIFICATION
 AASHTO CLASSIFICATION

SM

TEST BY BL
 JOB NO. 222084

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.8%
10	68.1%
20	43.7%
40	34.3%
100	25.4%
200	21.8%

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:
 LLL

DATE:
 11/15/22

JOB NO.:
 222084

FIG NO.:
 C-9

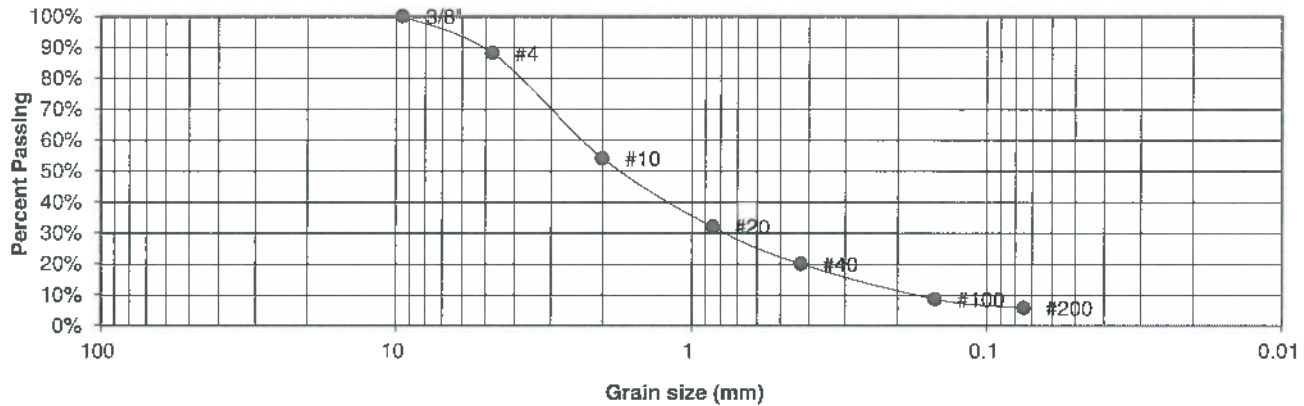
BORING NO. TP-3
 DEPTH(ft) 2
 CLIENT THE RENEHANS
 PROJECT 5740 BURGESS ROAD

UNIFIED CLASSIFICATION
 AASHTO CLASSIFICATION

SM-SW

TEST BY BL
 JOB NO. 222084

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	88.1%
10	54.2%
20	32.0%
40	20.1%
100	8.7%
200	5.9%

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:

665

11/18/22

JOB NO.:
222084

FIG NO.:

C-18

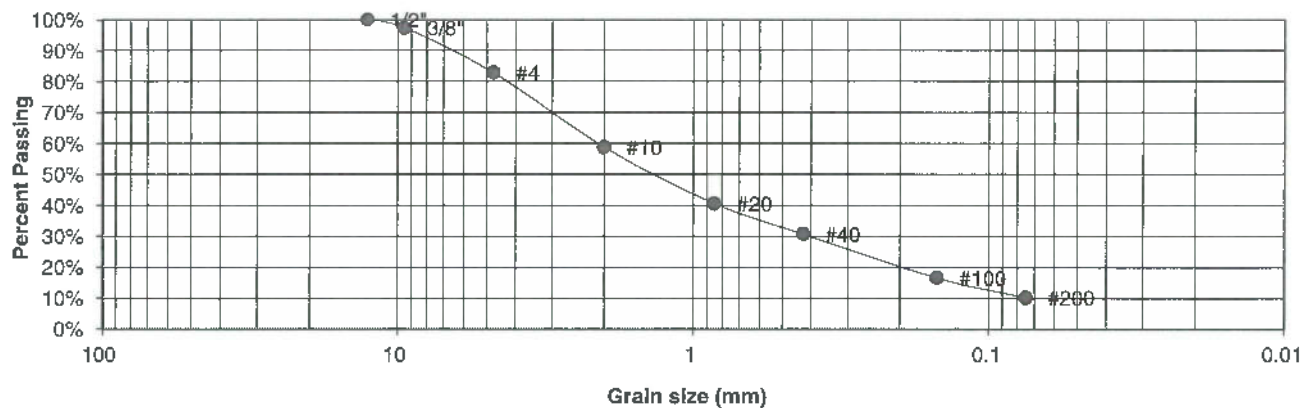
BORING NO. TP-3
 DEPTH(ft) 4
 CLIENT THE RENEHANS
 PROJECT 5740 BURGESS ROAD

UNIFIED CLASSIFICATION
 AASHTO CLASSIFICATION

SM-SW

TEST BY BL
 JOB NO. 222084

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.2%
4	82.8%
10	58.8%
20	40.6%
40	30.7%
100	16.6%
200	10.3%

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:

LL

11/18/22

JOB NO.:
 222084

FIG NO.:
 C-11

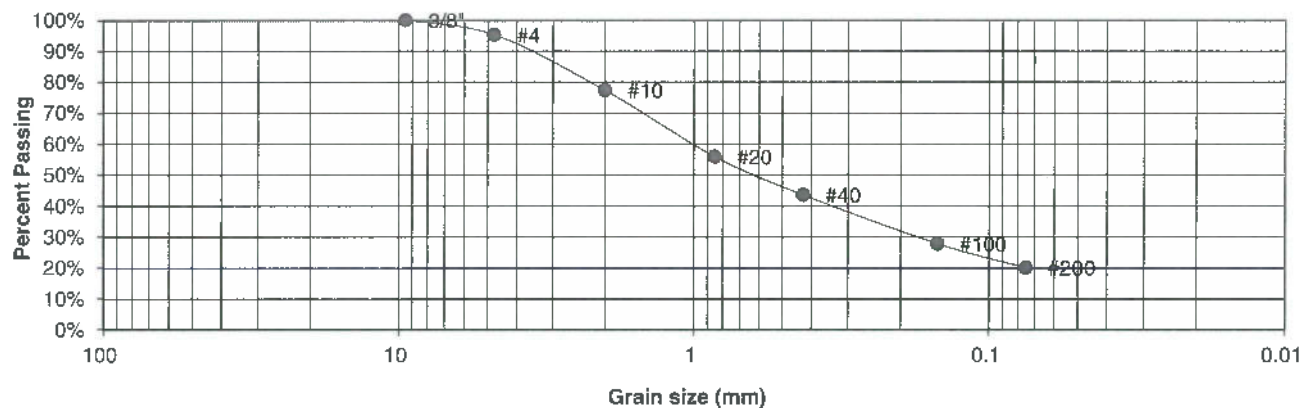
BORING NO. TP-4
 DEPTH(ft) 2
 CLIENT THE RENEHANS
 PROJECT 5740 BURGESS ROAD

UNIFIED CLASSIFICATION
 AASHTO CLASSIFICATION

SM

TEST BY BL
 JOB NO. 222084

Sieve Analysis Grain Size Distribution



U.S.
Sieve #

Percent
Finer

3"
1 1/2"
3/4"
1/2"
3/8"
4
10
20
40
100
200

100.0%
95.3%
77.4%
55.9%
43.6%
27.8%
20.1%

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:

LL

11/18/22

JOB NO.:
222084

FIG NO.:
C-12

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g

Elevation: 7,000 to 7,700 feet

Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

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

E - 0 to 16 inches: gravelly loamy sand

Bt - 16 to 40 inches: gravelly sandy loam

C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively 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 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: F048AY908CO - Mixed Conifer

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:

Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 20, Sep 2, 2022

El Paso County Area, Colorado

41—Kettle gravelly loamy sand, 8 to 40 percent slopes

Map Unit Setting

National map unit symbol: 368h

Elevation: 7,000 to 7,700 feet

Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

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

E - 0 to 16 inches: gravelly loamy sand

Bt - 16 to 40 inches: gravelly sandy loam

C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 8 to 40 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Medium

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 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Ecological site: F048AY908CO - Mixed Conifer

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:

Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 20, Sep 2, 2022