

October 30, 2020

Sonship Properties, LLC  
P.O. Box 511  
Rocky Ford, CO 81067



**ENTECH**  
ENGINEERING, INC.

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PHONE (719) 531-5599  
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Attn: Justin Ensor

Re: Soil, Geology, and Geologic Hazard Study  
Prairie Ridge Subdivision  
Brown Road  
Parcel No. 61000-00-483  
El Paso County, Colorado

Dear Mr. Ensor:

### **GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION**

The site is located in a portion of the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 12, Township 11 South, Range 66 West of the 6<sup>th</sup> Principal Meridian in El Paso County, Colorado. The site is located 8 miles east of Monument, Colorado, on Brown Road, north of Walker Road. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site varies from gently to moderately sloping generally to the south. The drainages on site flow in southerly and easterly directions through the property. No water was observed flowing in the minor drainage that bisects the property flowing south at the time of this investigation. Water was not observed flowing in the drainage that flows east in the southern portion of the site. Areas of ponded water were observed east of the property line in the embankment that exists east of the site. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included grazing and pasture land. Additionally, some fill placement has occurred in the past. The site contains primarily low grasses, and field weeds. Site photographs, taken August 26, and September 24, 2020, are included in Appendix A. The approximate locations and directions of the photographs are indicated on Figure 3.

Total acreage involved in the proposed development is approximately 40 acres. Seven (7) single-family residential lots are proposed with areas of open space. Lot sizes range from 5 acres to 6 acres. The area will be serviced by individual wells and sewage treatment systems.

### **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 constraints on development and land use. These include areas of seasonal and potentially seasonal shallow groundwater areas, drainage areas, areas of ponded water, erosion, artificial fill, collapsible soils, and expansive soils. 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.

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## **SCOPE OF THE REPORT**

The scope of the report will include the following:

- 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.

## **PREVIOUS INVESTIGATION**

The site was previously investigated by Entech Engineering, Inc. in a Soil, Geology, Geologic Hazard and Wastewater Study, dated May 31, 2007 (Reference 1). Information from this report was used in evaluating the site.

## **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 August 26, 2020.

Three test borings/percolation tests from the previous report (Reference 1) and two test pits were excavated on the site to determine general suitability for the use of on-site wastewater treatment systems and general soil characteristics for residential construction. The locations of the test pits are indicated on the Site Plan/Test Pit 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, and Atterberg Limits, ASTM D-4318. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

Test Boring Logs from the percolation tests and laboratory testing from the previous report (Reference 1) is included in Appendix D.

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## SOIL AND GEOLOGIC CONDITIONS

### Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 2, Figure 4), previously the Soil Conservation Service (Reference 3) has mapped two soil types on the site. Complete descriptions of the soil types are presented in Appendix E. In general, they vary from sandy loam and loamy sand to clay loam. The soils are described as follows:

<u>Type</u>	<u>Description</u>
15	Brussett loam, 3-5% slopes
69	Peyton-Pring complex, 8-15 % slopes

The soils have generally been described to have moderate to rapid permeabilities. Limitations on development include steep slopes, limited ability to support a load, shrink swell potential, and frost action potential. 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 to high erosion hazards (Reference 2).

### Soils

The soils encountered in the Test Borings of the percolation tests can be grouped into one general soil type. Bedrock was not encountered in any of the profile holes which were drilled to 10 feet. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 is a sandy clay (CL), and sandy clay – silt (CL- ML) encountered in all of the profile holes. These soils were encountered at stiff to very stiff consistencies and at moist conditions. Samples tested had approximately 69% to 79% of the soil sized particles passing the No. 200 Sieve. A swell of 1177 psf was measured in the FHA Swell Test. This swell pressure is in the moderate expansion range. The clays are also potentially collapsible. Consolidations of 0.4% and 0.6% were measured in the Swell/Consolidation Test. These values are in the low consolidation range.

The soils encountered in the test pits consisted of sandy clay. Samples tested had approximately 72% and 74% of the soil sized particles passing the No. 200 Sieve.

The 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, the Test Boring Logs from the Profile Holes, Laboratory test results, and percolation testing results from the previous investigation are presented in Appendix D.

### Groundwater

Groundwater was not encountered in any of the profile holes which were drilled to 10 feet. Groundwater was not encountered in the test pits which were excavated to 8 feet. Areas of

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seasonal and potentially seasonal shallow groundwater and ponded water have been mapped in the drainages on-site. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time.

It should be noted that in the sandy materials on site, some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock or clays. 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.

### Geology

Approximately 11 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 known as the Denver Basin. Bedrock in the area is typically gently dipping in a northeasterly direction (Reference 4). The bedrock underlying the site consists of the Dawson Formation of Cretaceous Age. The Dawson Formation typically very consists of coarse-grained arkosic sandstone with interbedded layers claystone or siltstone.

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

- Qaf Artificial Fill of Quaternary Age:** These are man-made fill deposits associated with the filled gullies in the central portion of the site.
- Qal Recent Alluvium of Quaternary Age:** These are recent stream deposits in the channels of the main drainages on site. Some areas have recent sand deposition, while others have highly organic soils.
- QTa Alluvium of Palmer Divide of Early Pleistocene or Pliocene Age:** These materials consist of water-deposited stream terrace deposits located along the Palmer Divide. They typically consist of silty to clayey sands with gravelly lenses and may contain areas of pebble and cobble lenses.
- 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 areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson

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Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone. The soil layer encountered on site was more than 10 feet thick and consisted of sandy, silty clays.

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 (Reference 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 Pueblo 1° x 2° Quadrangle*, distributed by the US Geological Survey in 1978 (Reference 7). The test borings and test pits were used in evaluating the site and is included in Appendices B and D. 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 hazards identified on this site include seasonal and potentially seasonal shallow groundwater areas. With areas of erosion, artificial fill and a ponded water area east of the site. Potentially expansive and/or collapsible soils were also encountered. These hazards and recommended mitigation techniques are discussed as follows:

### Expansive Soils

Expansive soils were not encountered on the site. Highly expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. Additionally, expansive residual clays were encountered in the test borings drilled on the site. Expansive clays, if encountered beneath foundations, can cause differential movement in the structure foundation.

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.

### Collapsible Soils

Collapsible soils were encountered in some of the test borings drilled on-site. These soils are typically highly sporadic in the area; therefore, none have been indicated on the map. Should collapsible soils be encountered beneath foundations, mitigation will be necessary.

Mitigation: Mitigation of collapsible soils typically involves overexcavation of the material 2 to 3 feet and recompaction with thorough moisture conditioning. The soils should be recompacted at a minimum of 95% of its maximum Proctor Dry Density ASTM D-1557 at 2% over the optimum moisture. Specific recommendations should be made on an individual bases at the time of construction.

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#### Artificial Fill

These are man-made fill associated with several gullies that were filled in the past. The fill is considered uncontrolled for construction purposes.

Mitigation: Due to the size of the lots, the filled area can likely be avoided by development. Should any uncontrolled fill be encountered beneath foundations, removal and recompaction at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557, will be required.

#### Floodplain

The site is not mapped within any floodplains according to the FEMA Map No. 08041CO305G, dated December 7, 2018 (Figure 7, Reference 8). Areas of seasonal and potentially seasonal shallow groundwater were observed on the site (Figure 6). In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These areas lie within low-lying areas and along the minor drainages in the central and southern portions of the site. Water was not observed in any of the drainages at the time of our site investigation. These areas can likely be avoided or properly mitigated by development. The potential exists for high groundwater levels during high moisture periods and should structures encroach on these areas the following precautions should be followed.

Mitigation: Because areas mapped as seasonally shallow groundwater lie within a defined drainage, we do not recommend structures be built within this area. Septic fields should be located a minimum of 25 feet away from the drainage or pond areas. Any construction in these areas should be done in a manner that does not create ponded water. Structures located immediately adjacent to the drainages any require drains to help prevent the intrusion of water with below-grade areas. Typical drain details are presented in Figure 8.

#### Potentially Seasonal Shallow Groundwater Area

In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils. The majority of these areas lie within a defined drainage which can be avoided by the proposed development. Construction in any portions of these areas, if required, should follow these precautions.

Mitigation: Foundations must have a minimum 30-inch depth for frost protection. In areas where high subsurface moisture conditions are anticipated periodically, subsurface perimeter drains are recommended to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 8. Any grading in these areas should be done to direct surface flow around construction to avoid areas of ponded water. All organic material would be completely removed prior to any fill placement. **Specific drainage studies are beyond the scope of this report.**

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#### Seasonal Shallow Groundwater Area

These are areas within the main drainage on the southern portion of the site. Water was not observed flowing in this area at the time of this investigation. These areas also contain frost heave potential and highly organic soils.

#### Areas of Erosion and Gullying

These are areas that are undergoing erosion by water and sheetwash producing gullies and rill erosion.

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

### **RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING**

The proposed development will be rural-residential utilizing individual on-site wastewater treatment systems and water wells. Total acreage involved in the proposed subdivision is 40-acres. Seven rural residential lots are proposed, and the proposed lot sizes range from 5 to 6 acres. The new lots will be serviced by individual wells and on-site wastewater treatment systems. The existing geologic and engineering geologic conditions will impose minor constraints on development and construction. The geologic conditions on the site include seasonal and potentially seasonal shallow groundwater areas, erosion, and potentially expansive/collapsible soils, which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The upper residual soils are typically at stiff to very stiff consistencies. Expansive and potentially collapsible soils were encountered on portions of the site that will require mitigation. Foundations anticipated for the site are standard spread footings possibly in conjunction with overexcavation in areas of expansive or collapsible soils. Areas of expansive and collapsible soils encountered on site are sporadic; therefore, none have been indicated on the maps. Expansive or collapsible soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas of seasonal and potentially seasonal shallow groundwater areas were encountered on site. An area of ponded water exists east of the site that could back up into the drainage at the southeast corner of the site. It is anticipated these areas can be avoided by construction. Structures should not block drainages. Should structures encroach on these areas, drains

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should be used to help prevent the intrusion of water into areas below grade. Additionally, foundations should penetrate a minimum of 3 feet for protection against frost heave.

An area exists in the central portion of the site where several gullies were filled in the past. Due to lot sizes this area can likely be avoided by building sites. Should any uncontrolled fill be encountered beneath foundations, overexcavation and recompaction or replacement with structural fill compacted at a minimum of 95% of its maximum modified Proctor Dry Density ASTM D-1557 will be necessary.

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), the area is mapped as stream terrace and floodplain deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 10), areas of the site are 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. A small quarried area exists on of the site. It is possible sand and gravel deposits associated with the Palmer Divide Alluvium could be an aggregate resource. However, considering the silty to clayey 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 11), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "Poor" for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site (Reference 11).

The site has been mapped as "Fair" for oil and gas resources (Reference 11). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area lacked the essential elements for oil or gas.

### **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.



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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.

## **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 new building sites and septic systems 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 Sonship Properties, 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.

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Brown Road  
Parcel No. 61000-00-483  
El Paso County, Colorado

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.

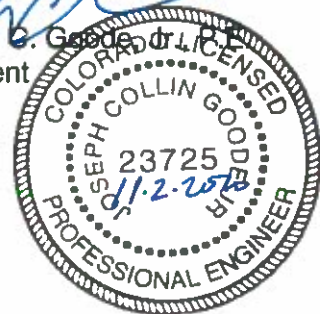
Reviewed by:



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Geologist



Joseph C. Gooden, P.E.  
President



Kristen A. Andrew-Hoeser, P.G.  
Senior Geologist

LLL

Encl.

Entech Job No. 201794  
AProjects/2020/201794 sg&ghs

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Parcel No. 61000-00-483  
El Paso County, Colorado

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## TABLES

**TABLE 1**  
**SUMMARY OF LABORATORY TEST RESULTS**

CLIENT SONSHIP PROPERTIES  
 PROJECT BROWN ROAD  
 JOB NO. 201794

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	TP-1	3			71.7						CL	CLAY, SANDY
1	TP-1	6			74.0						CL	CLAY, SANDY

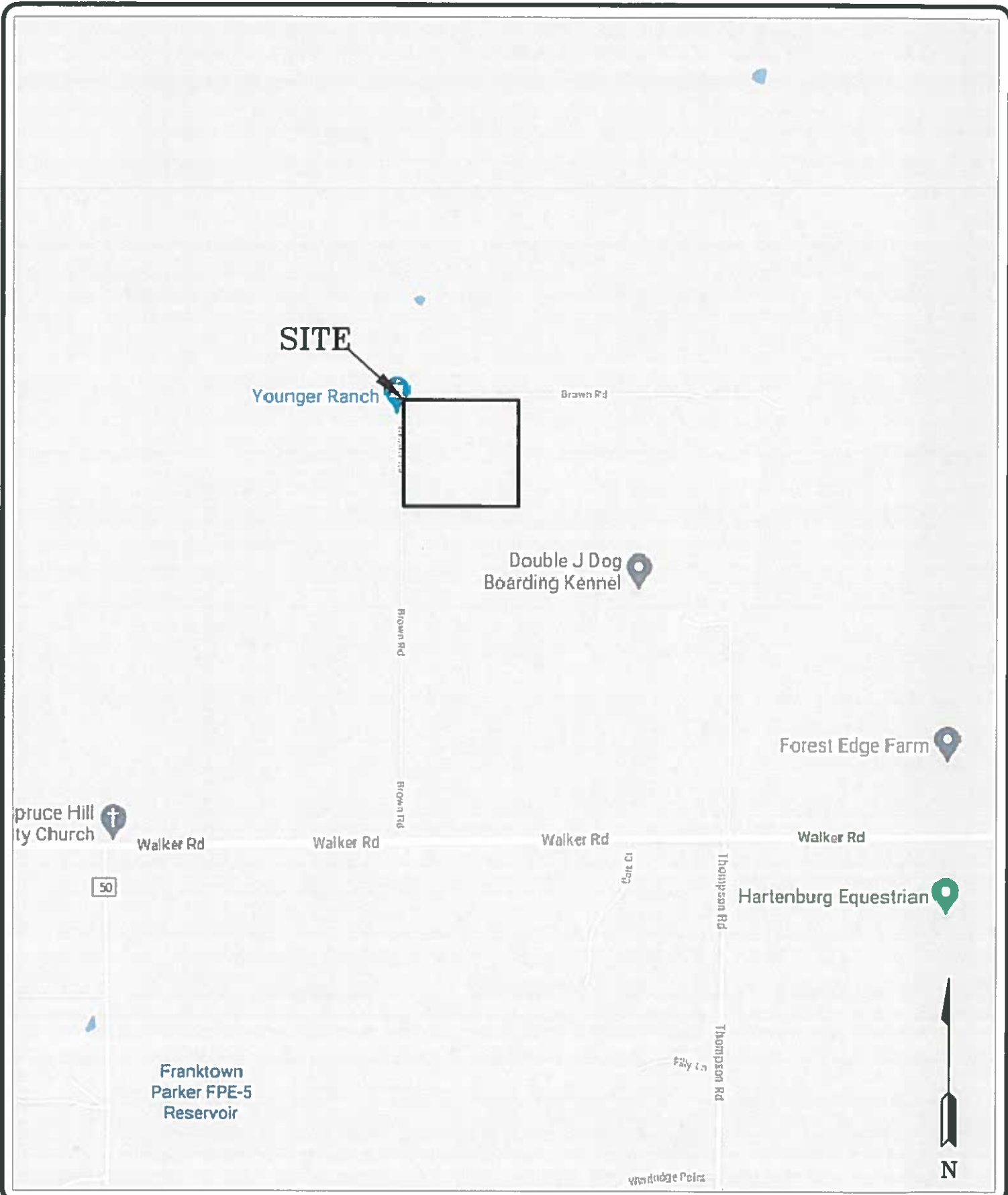
**Table 2: Summary Tactile Test Pit Results**

<b>Test Pit No.</b>	<b>USDA Soil Type</b>	<b>LTAR Value</b>	<b>Depth to Bedrock (ft.)</b>	<b>Depth to Seasonally Occurring Groundwater (ft.)</b>
1	4A*	0.20*	N/A	N/A
2	4A*	0.20*	N/A	N/A

\*- Conditions that will require an engineered OWTS

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## FIGURES



**ENTECH**  
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**VICINITY MAP**  
**PRAIRIE RIDGE SUBDIVISION**  
**BROWN ROAD**  
**EL PASO COUNTY, CO.**  
**FOR: SONSHIP PROPERTIES, LLC**

**DRAWN:**  
**LLL**

**DATE:**  
**10/9/20**

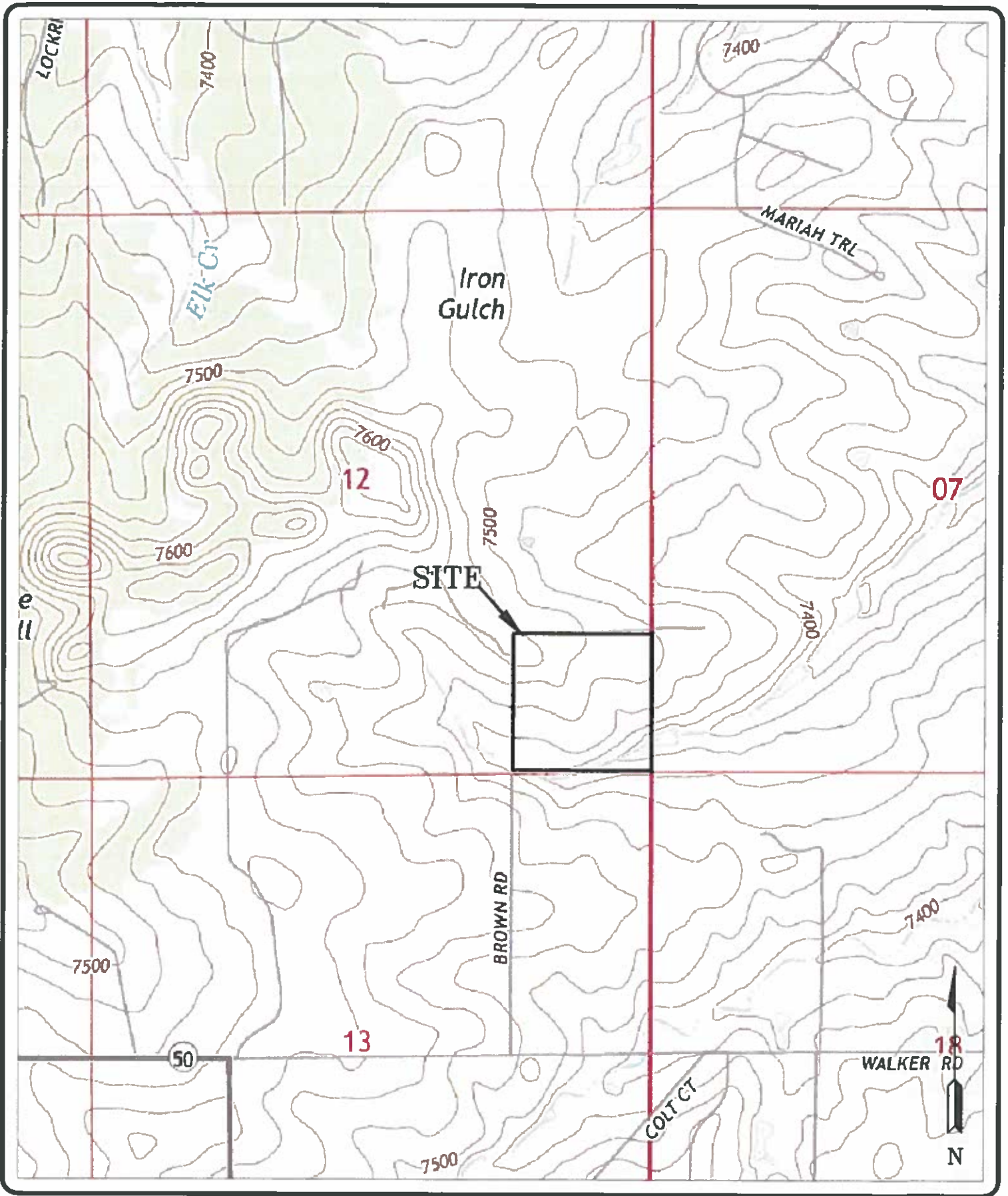
**CHECKED:**

**DATE:**

**JOB NO.:**  
**201794**

**FIG NO.:**  
**1**





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USGS MAP  
 PRAIRIE RIDGE SUBDIVISION  
 BROWN ROAD  
 EL PASO COUNTY, CO.  
 FOR: SONSHIP PROPERTIES, LLC

DRAWN:  
 LLL

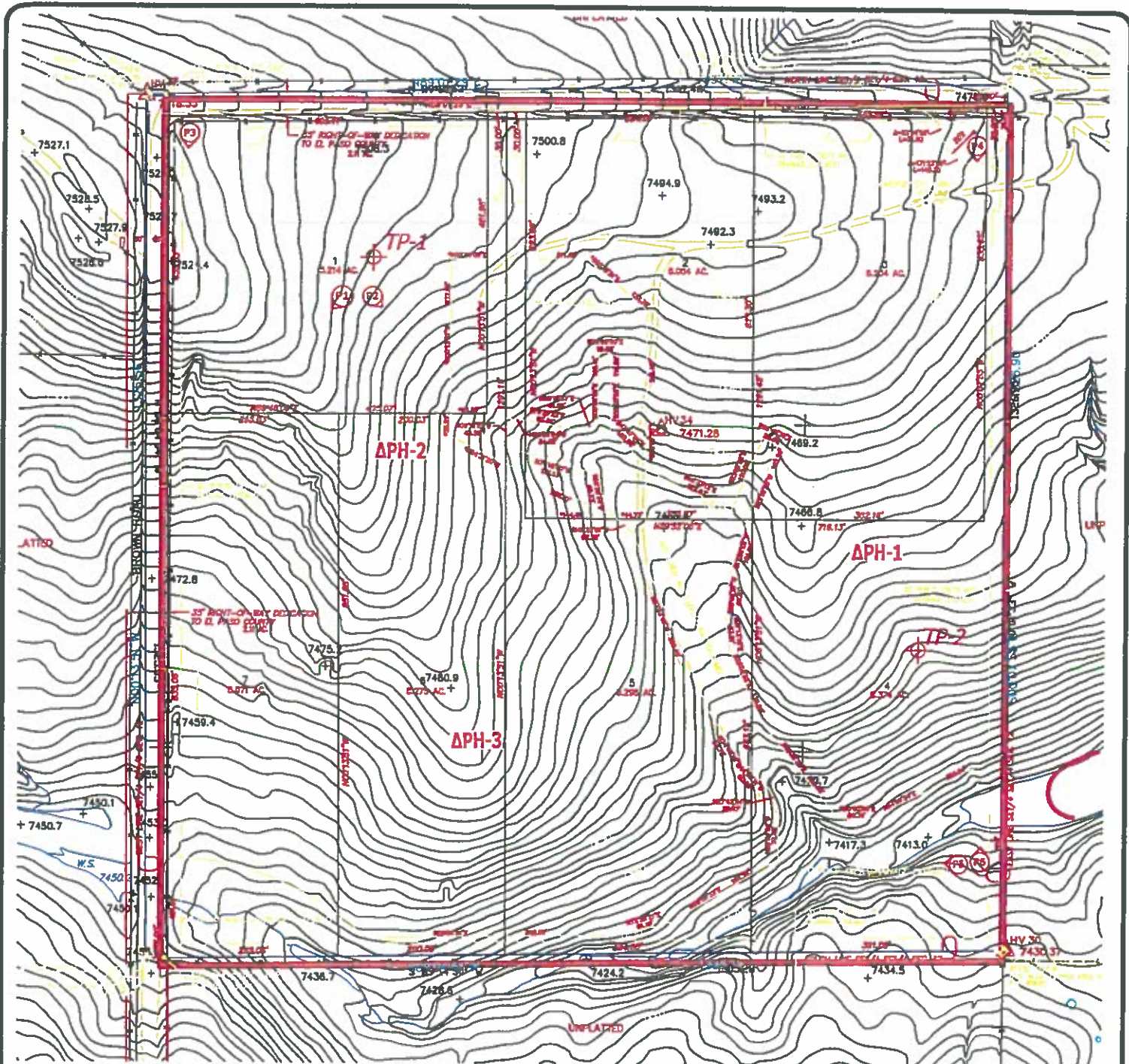
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DATE:

JOB NO.:  
 201794

FIG NO.:  
 2



⊕ TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

Ⓟ - APPROXIMATE TEST PIT LOCATION AND NUMBER



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**SITE PLAN/TESTING LOCATION MAP**  
**PRAIRIE RIDGE SUBDIVISION**  
**BROWN ROAD**  
**EL PASO COUNTY, CO.**  
**FOR: SONSHIP PROPERTIES, LLC**

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JOB NO.:  
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FIG NO.:  
 3

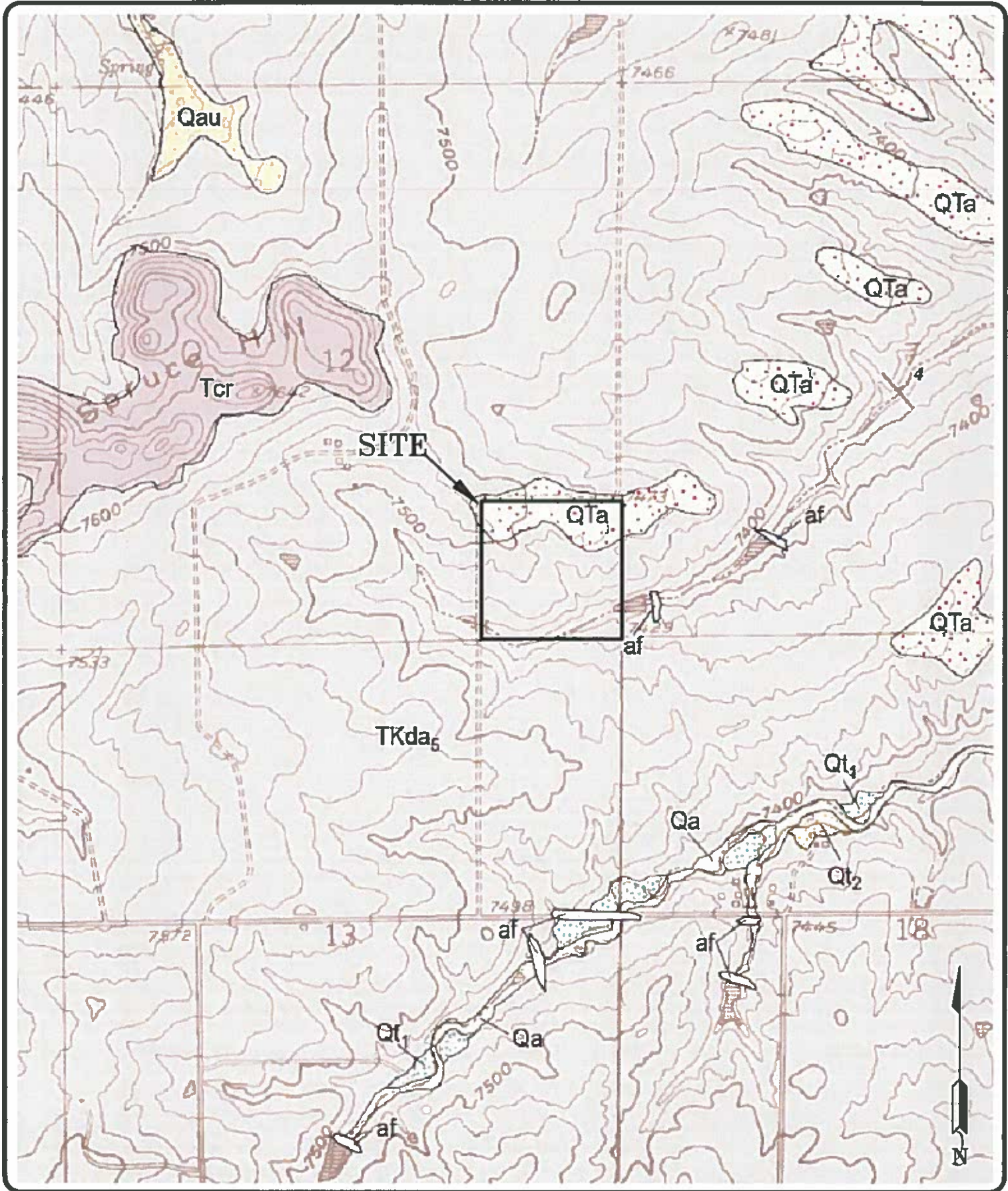

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**SOIL SURVEY MAP**  
**PRAIRIE RIDGE SUBDIVISION**  
**BROWN ROAD**  
**EL PASO COUNTY, CO.**  
**FOR: SONSHIP PROPERTIES, LLC**

DRAWN: <b>LLL</b>	DATE: <b>10/9/20</b>	CHECKED:	DATE:
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JOB NO.:  
**201794**

FIG NO.:  
**4**

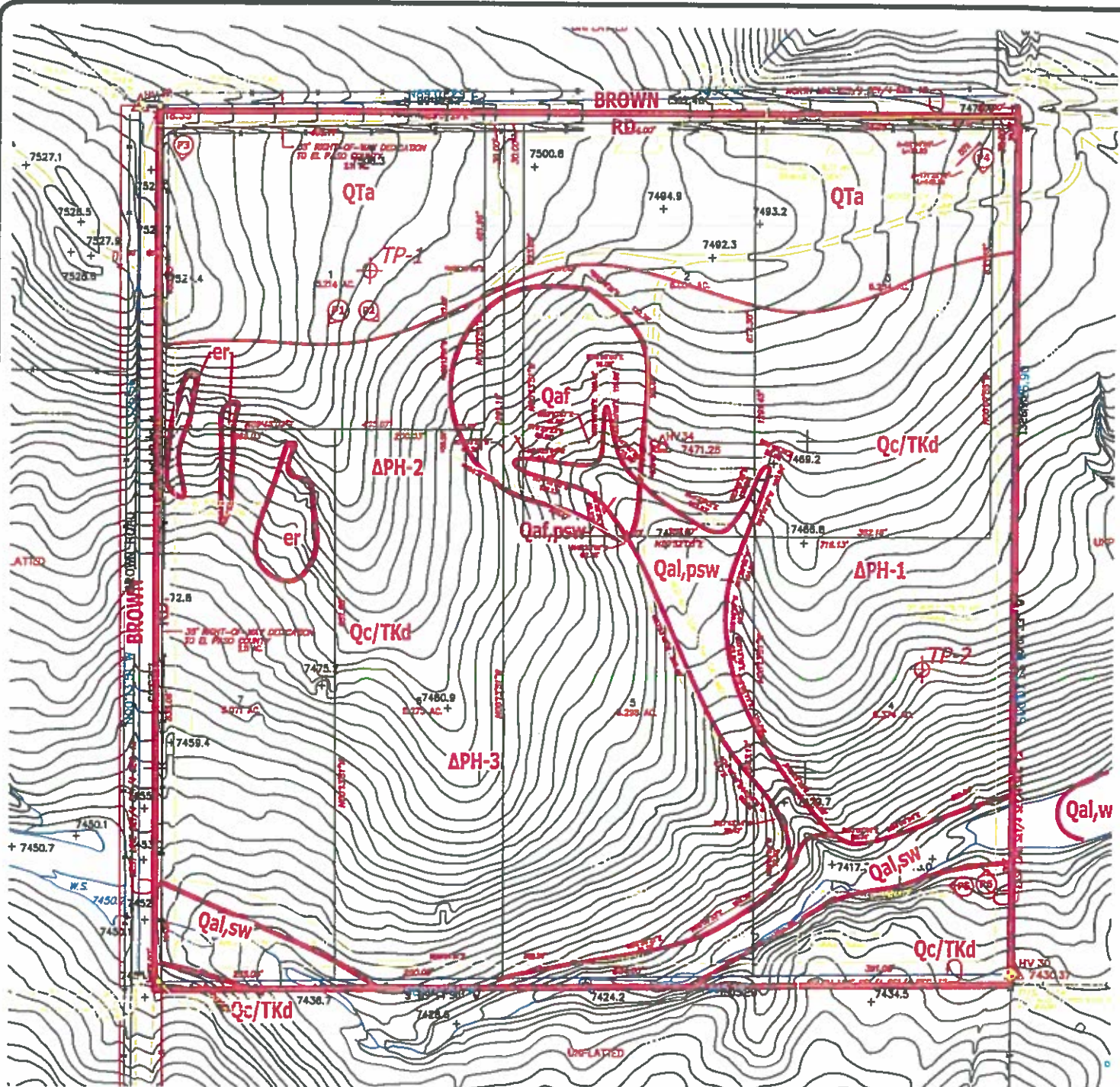
**ENTECH**  
ENGINEERING, INC.  
505 ELKTON DRIVE  
COLORADO SPRINGS, CO. 80907 (719) 531-3399

**BLACK FOREST QUADRANGLE GEOLOGIC MAP**  
**PRAIRIE RIDGE SUBDIVISION**  
**BROWN ROAD**  
**EL PASO COUNTY, CO.**  
**FOR: SONSHIP PROPERTIES, LLC**

DRAWN: LLL	DATE: 10/9/20	CHECKED:	DATE:
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JOB NO:  
201794

FIG NO:  
5



**Legend:**

- Qaf - Artificial Fill of Holocene Age:  
man-made fill deposits
- Qal - Alluvium of Holocene and Pleistocene Age:  
recent alluvium associated with the drainages on site
- QTa - Alluvium of Palmer Divide of Early Pleistocene or Pliocene Age:  
stream terrace deposits located along the Palmer Divide
- QcTKd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:  
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone
- psw - potentially shallow groundwater area
- sw - seasonal shallow groundwater area
- er - areas of erosion
- w - areas of ponded water



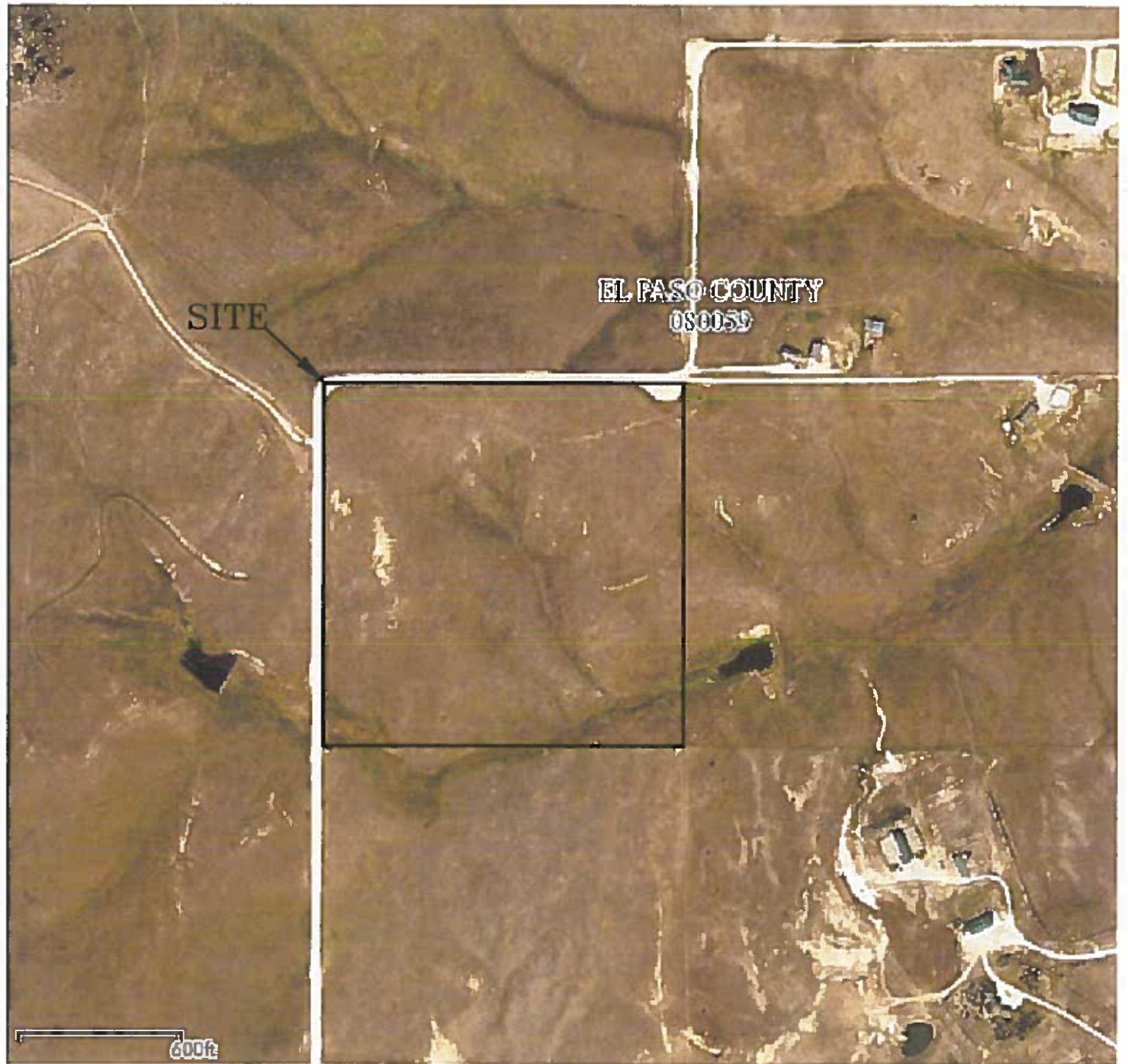
**ENTECH**  
ENGINEERING, INC.  
305 ELKTON DRIVE  
COLORADO SPRINGS, CO. 80907 (719) 531-3399

ENGINEERING GEOLOGY MAP  
PRAIRIE RIDGE SUBDIVISION  
BROWN ROAD  
EL PASO COUNTY, CO.  
FOR: SONSHIP PROPERTIES, LLC

DRAWN: LLL	DATE: 10/8/20	CHECKED:	DATE:
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JOB NO:  
201794

FIG NO.:  
6



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**ENGINEERING, INC.**  
305 ELKTON DRIVE  
 COLORADO SPRINGS, CO. 80907 (719) 531-3299

FEMA FLOODPLAIN MAP  
 PRAIRIE RIDGE SUBDIVISION  
 BROWN ROAD  
 EL PASO COUNTY, CO.  
 FOR: SONSHIP PROPERTIES, LLC

DRAWN:  
 LLL

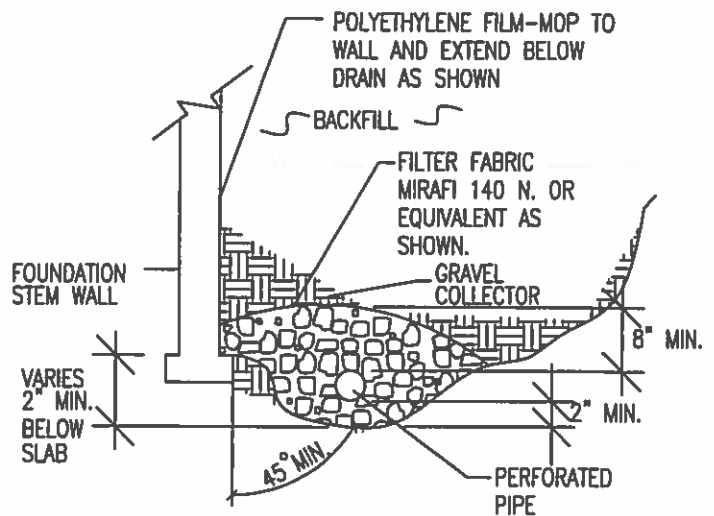
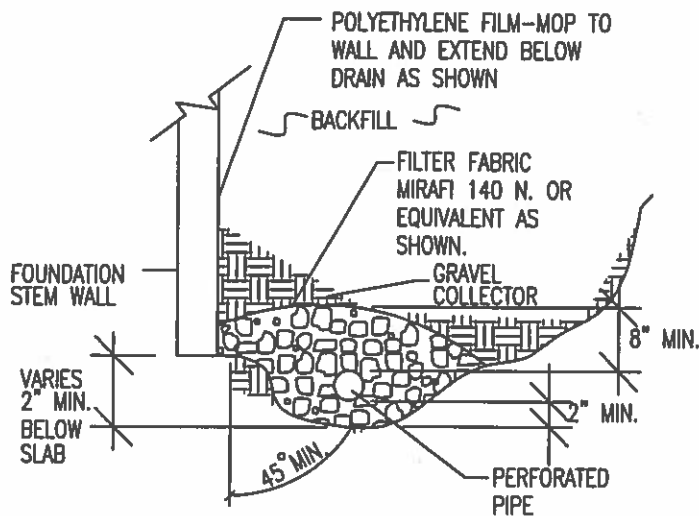
DATE:  
 10/8/20

CHECKED:

DATE:

JOB NO.:  
 201794

FIG NO.:  
 7



NOTES:

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

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

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

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

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

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



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

*PERIMETER DRAIN DETAIL*

DRAWN:

DATE:

DESIGNED:

CHECKED:  
*h*

JOB NO.:

201794

FIG NO.:

8

---

## **APPENDIX A: Photographs**





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

August 26, 2020



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

August 26, 2020



**Looking south from  
the northwestern  
corner of the site.**

August 26, 2020



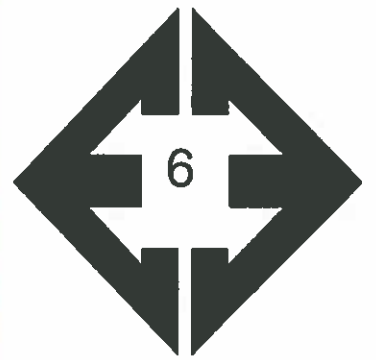
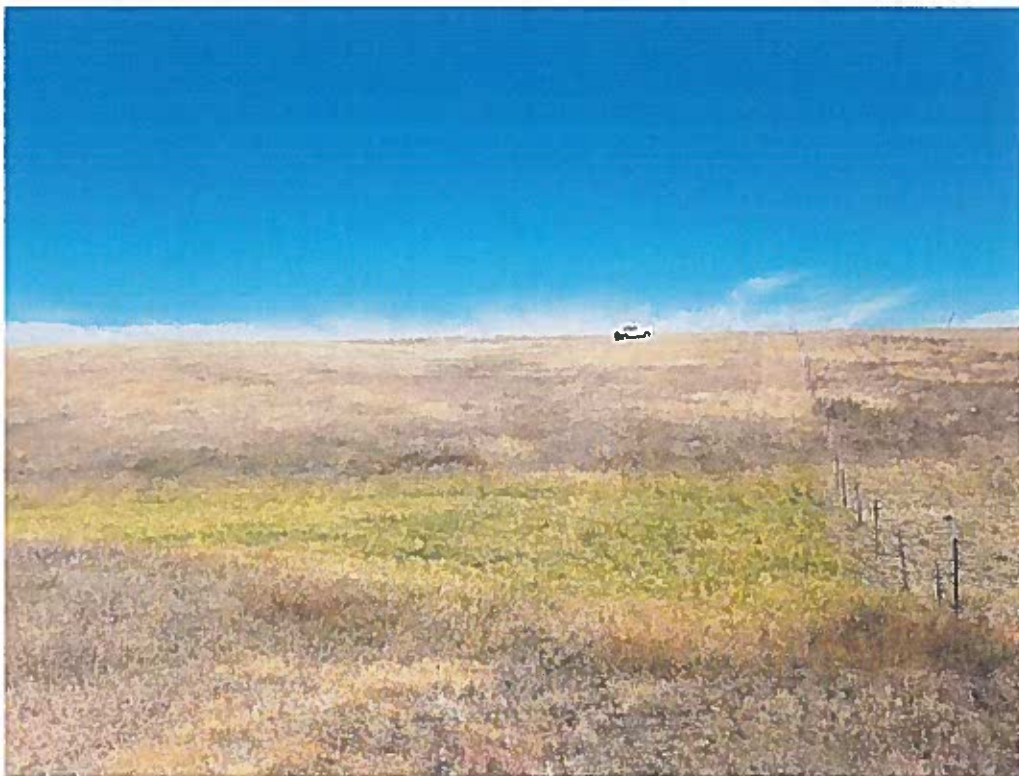
**Looking south from  
the northeastern  
portion of the site.**

August 26, 2020



**Looking west along the drainage in the southern portion of the site.**

September 24, 2020



**Looking north from the southeastern corner of site.**





















September 24, 2020

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## **APPENDIX B: Test Pit Logs**

TEST PIT NO. 1  
 DATE EXCAVATED 8/26/2020  
 Job # 201794

TEST PIT NO. 2  
 DATE EXCAVATED 8/26/2020  
 CLIENT SONSHIP PROPERTIES, LLC  
 LOCATION BROWN 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
Lot 1							Lot 4						
topsoil sandy clay, dark brown	1			ma	s	4A	topsoil sandy clay, dark brown	1			ma	s	4A
sandy clay, brown	2						sandy clay, brown	2					
	3							3					
	4							4					
	5							5					
	6							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

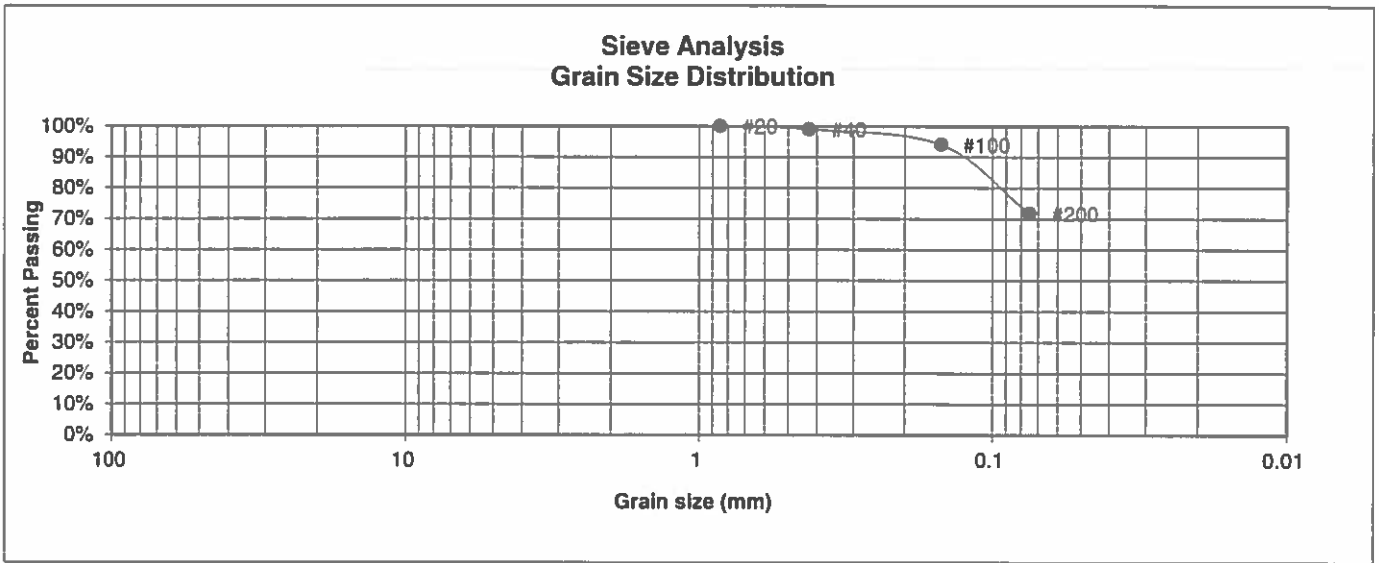


TEST PIT LOG			
DRAWN:	DATE	CHECKED: LLL	DATE: 10/9/20

JOB NO.:  
201794  
 FIG NO.:  
B-1

## **APPENDIX C: Laboratory Test Results**

BORING NO.	TP-1	<u>UNIFIED CLASSIFICATION</u>	CL	<u>TEST BY</u>	BL
DEPTH(ft)	3	<u>AASHTO CLASSIFICATION</u>		<u>JOB NO.</u>	201794
CLIENT	SONSHIP PROPERTIES				
PROJECT	BROWN ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.0%
100	94.1%
200	71.7%

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

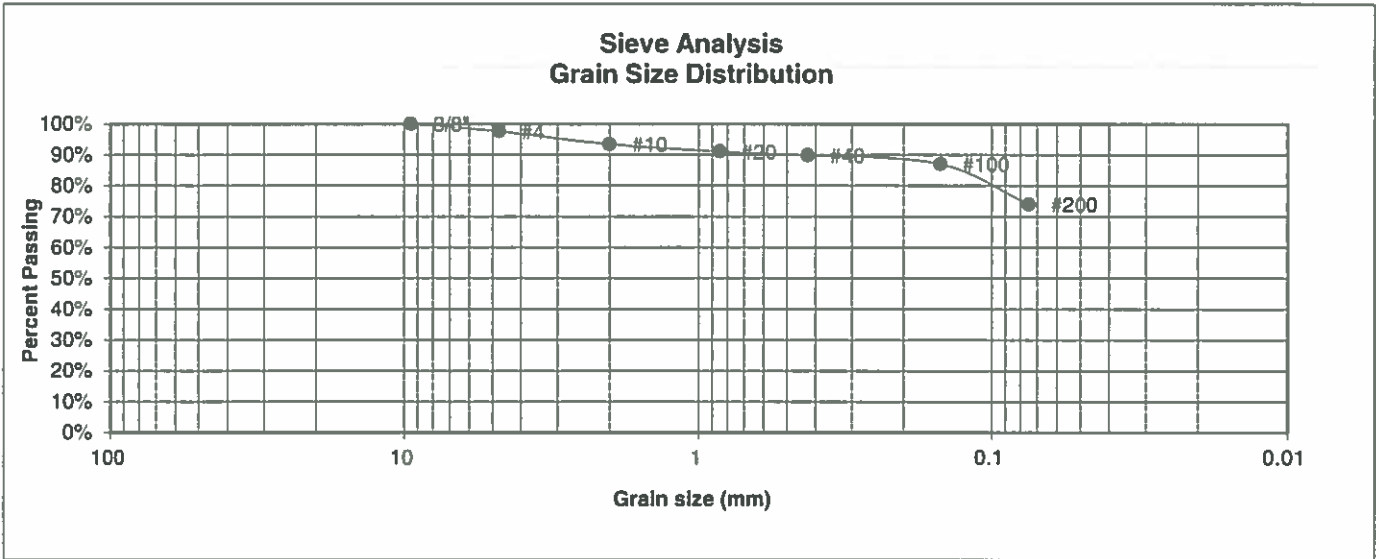
**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: L L L	DATE: 9/24/20
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JOB NO.:  
201794

FIG NO.:  
C-1

BORING NO.	TP-1	<u>UNIFIED CLASSIFICATION</u>	CL	<u>TEST BY</u>	BL
DEPTH(ft)	6	<u>AASHTO CLASSIFICATION</u>		<u>JOB NO.</u>	201794
CLIENT	SONSHIP PROPERTIES				
PROJECT	BROWN ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.6%
10	93.4%
20	91.0%
40	89.9%
100	87.1%
200	74.0%

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: 9/24/20
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JOB NO.:  
201794  
FIG NO.:  
C-2



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**APPENDIX D: Test Boring Logs, Laboratory Test Results, &  
Percolation Testing Results Entech Job No. 94477**

**TABLE 1**

**SUMMARY OF LABORATORY TEST RESULTS**

CLIENT PRAIRIE RIDGE PROP.  
 PROJECT PRAIRIE RIDGE  
 JOB NO. 94477

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	5-10			71.6				1177		CL-MI	CLAY-SILT, SANDY
1	2	10	9.0	93.1	78.9	28	11			-0.6	CL	CLAY, SANDY
1	3	5	6.6	94.1	69.2	24	6			-0.4	CL-MI	CLAY-SILT, SANDY

**Table 2: Summary of Percolation Test Results**



<b>Percolation Test No.</b>	<b>Percolation Rate (min/in)</b>	<b>Depth to Bedrock (ft.)</b>	<b>Depth to Groundwater (ft.)</b>
1	320	>10	>10
2	267	>10	>10
3	160	>10	>10

PROFILE HOLE NO 1  
 DATE DRILLED 5/14/2007  
 Job # 94477

PROFILE HOLE NO 2  
 DATE DRILLED 5/14/2007  
 CLIENT PRAIRIE RIDGE PROP.  
 LOCATION PRAIRIE RIDGE



REMARKS

DRY TO 10', 5/15/07  
 CLAY-SILT, SANDY, BROWN TO  
 TAN, STIFF TO VERY STIFF,  
 MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			18	8.7	1
10			30	8.4	1
15					
20					

REMARKS

DRY TO 10', 5/15/07  
 CLAY, SANDY, BROWN TO TAN,  
 STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			19	6.8	1
10			16	8.9	1
15					
20					



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505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

PROFILE HOLE LOG

DRAWN:	DATE:	CHECKED: <i>RLA</i>	DATE: 5/21/07
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JOB NO.:



FIG NO.:

PROFILE HOLE NO 3  
 DATE DRILLED 5/14/2007  
 Job # 94477

PROFILE HOLE NO.  
 DATE DRILLED  
 CLIENT PRAIRIE RIDGE PROP.  
 LOCATION PRAIRIE RIDGE

REMARKS

DRY TO 10', 5/15/07  
 CLAY-SILT, SANDY, BROWN  
 TO TAN, STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			18	6.5	1
10			18	7.3	1
15					
20					

REMARKS

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5					
10					
15					
20					



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

PROFILE HOLE LOG

DRAWN:	DATE:	CHECKED: <i>KA</i>	DATE: 5/21/07
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JOB NO.:

FIG NO.:

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## **APPENDIX C: Laboratory Test Results**

UNIFIED CLASSIFICATION CL-ML

CLIENT

PRAIRIE RIDGE PROP.

SOIL TYPE # 1

PROJECT

PRAIRIE RIDGE

TEST BORING # 1

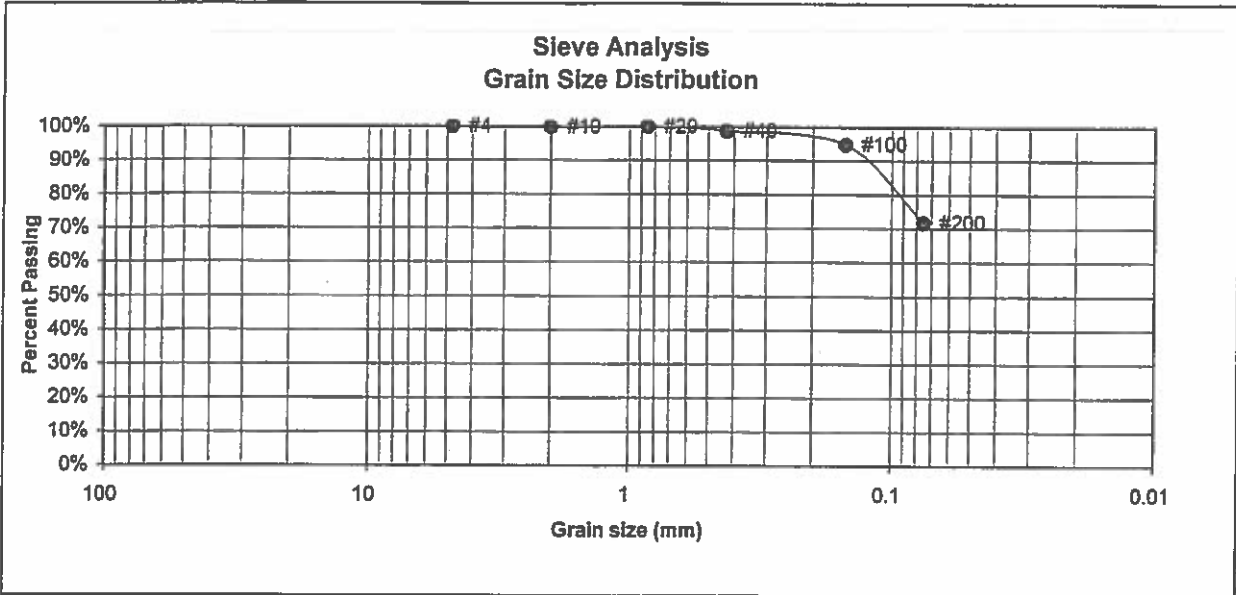
JOB NO.

94477

DEPTH (FT) 5-10

TEST BY

DG



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	99.9%
40	98.7%
100	94.7%
200	71.6%

Atterberg Limits  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

Swell  
 Moisture at start 10.0%  
 Moisture at finish 22.1%  
 Moisture increase 12.1%  
 Initial dry density (pcf) 100  
 Swell (psf) 1177



**ENTECH**  
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505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

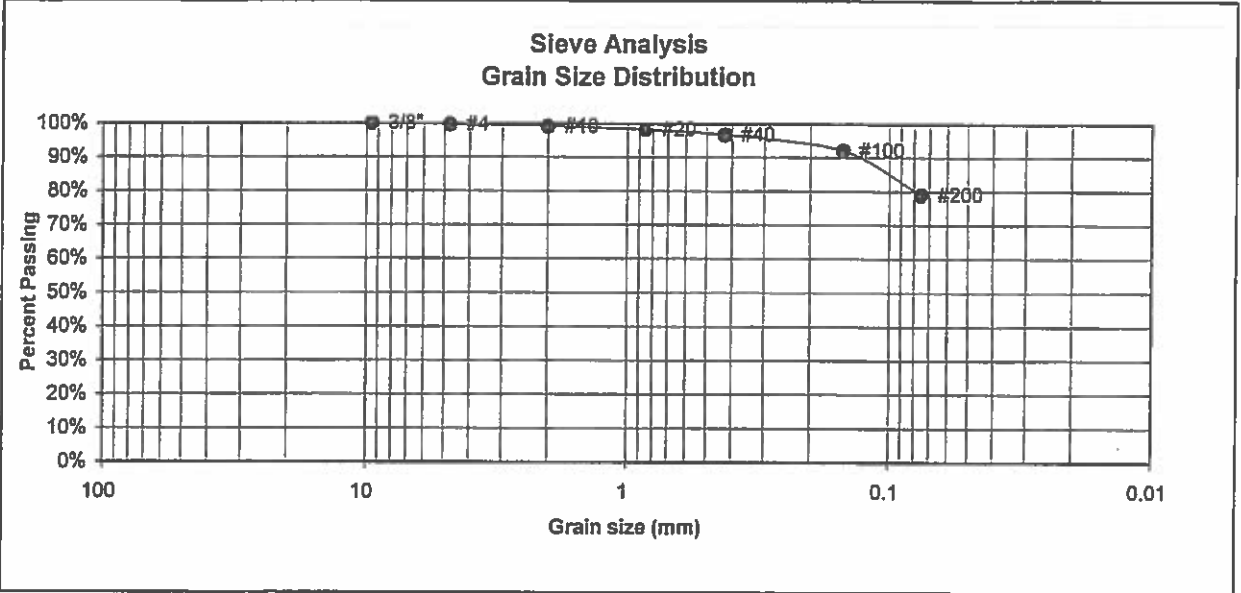
**LABORATORY TEST  
 RESULTS**

DRAWN:	DATE:	CHECKED: <i>KAT</i>	DATE: 5/21/07
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JOB NO.:

FIG NO.:

<u>UNIFIED CLASSIFICATION</u> CL		<u>CLIENT</u>	PRAIRIE RIDGE PROP.
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	PRAIRIE RIDGE
<u>TEST BORING #</u>	2	<u>JOB NO.</u>	94477
<u>DEPTH (FT)</u>	10	<u>TEST BY</u>	DG



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.7%
10	99.0%
20	98.1%
40	96.6%
100	91.9%
200	78.9%

<u>Atterberg Limits</u>	
Plastic Limit	17
Liquid Limit	28
Plastic Index	11

<u>Swell</u>	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	



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505 ELKTON DRIVE  
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST  
RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		<i>DG</i>	5/21/07

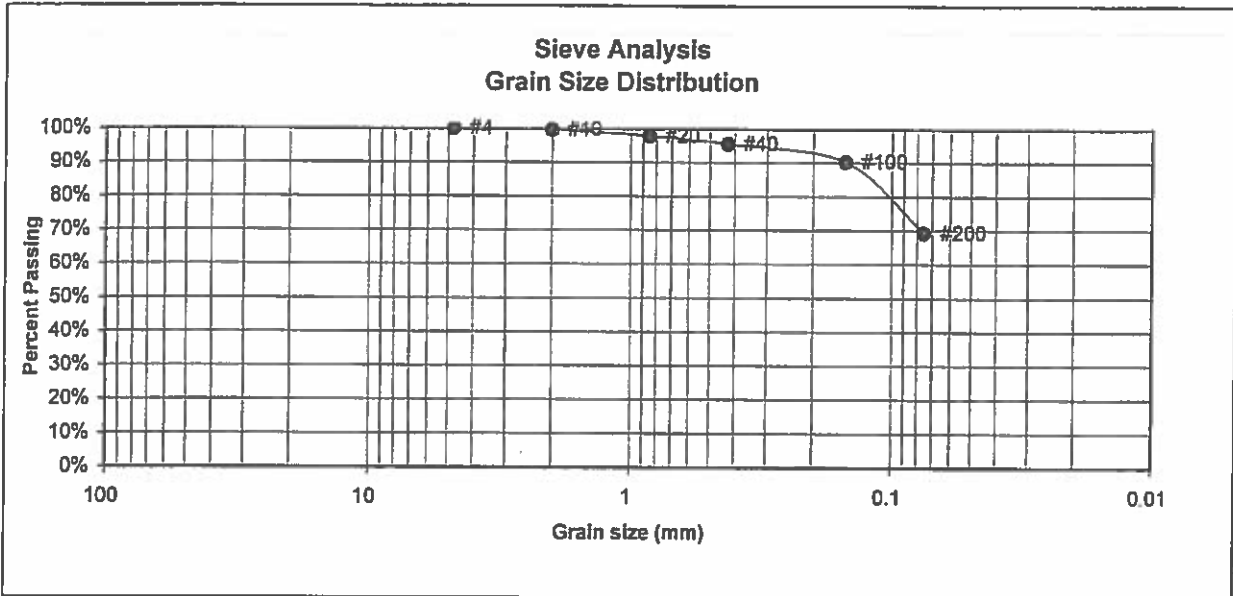
JOB NO.:

FIG NO.:



UNIFIED CLASSIFICATION CL-ML  
 SOIL TYPE # 1  
 TEST BORING # 3  
 DEPTH (FT) 5

CLIENT PRAIRIE RIDGE PROP.  
 PROJECT PRAIRIE RIDGE  
 JOB NO. 94477  
 TEST BY DG



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.6%
20	97.8%
40	95.4%
100	90.2%
200	69.2%

Atterberg Limits

Plastic Limit	18
Liquid Limit	24
Plastic Index	6

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: <i>DG</i>	DATE: 5/21/07
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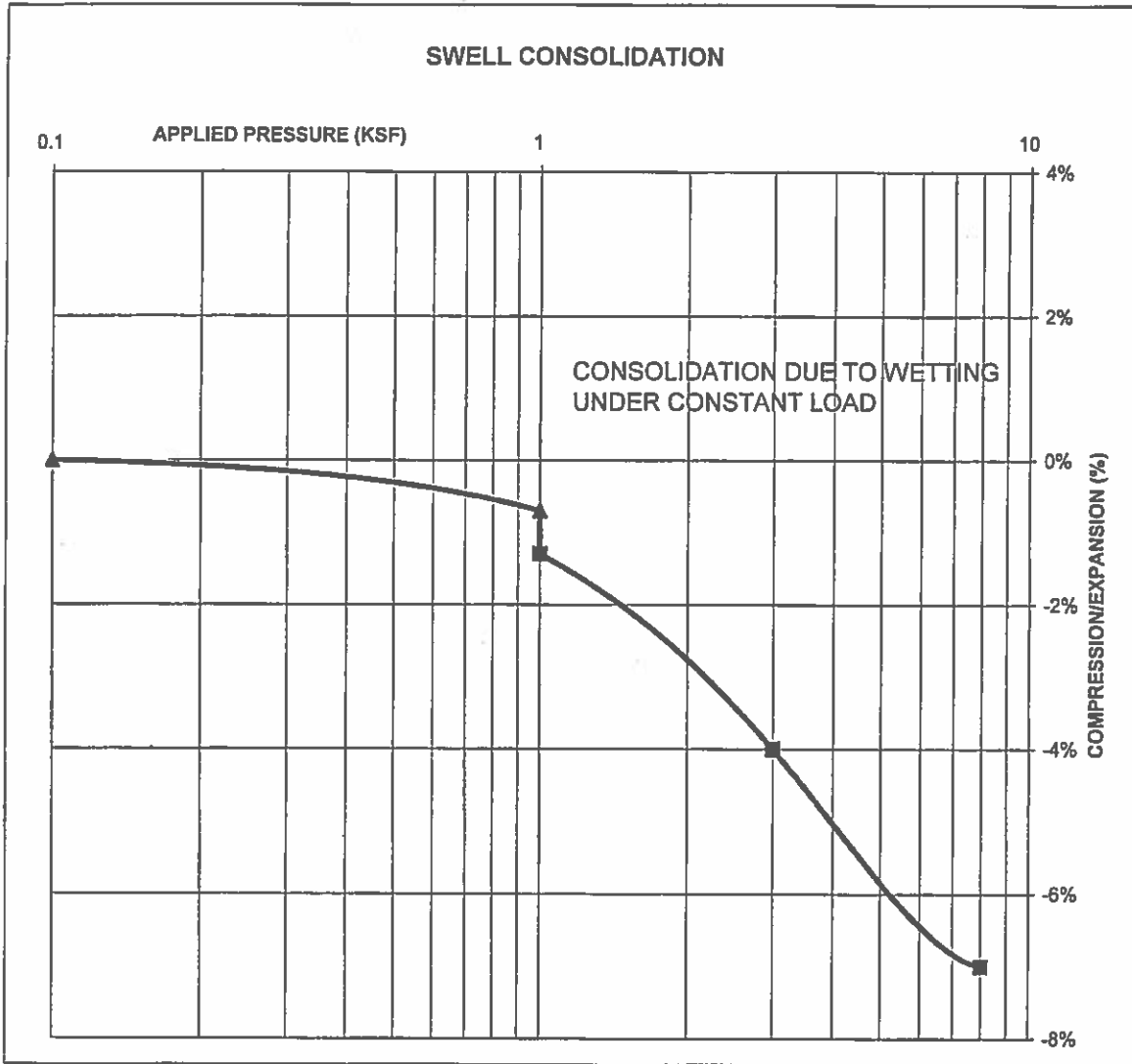
JOB NO.:

FIG NO.:

**CONSOLIDATION TEST RESULTS**

TEST BORING #	2	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)	93		
NATURAL MOISTURE CONTENT	9.0%		
SWELL/CONSOLIDATION (%)	-0.6%		

JOB NO. 94477  
CLIENT PRAIRIE RIDGE PROP.  
PROJECT PRAIRIE RIDGE



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505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**SWELL CONSOLIDATION  
 TEST RESULTS**

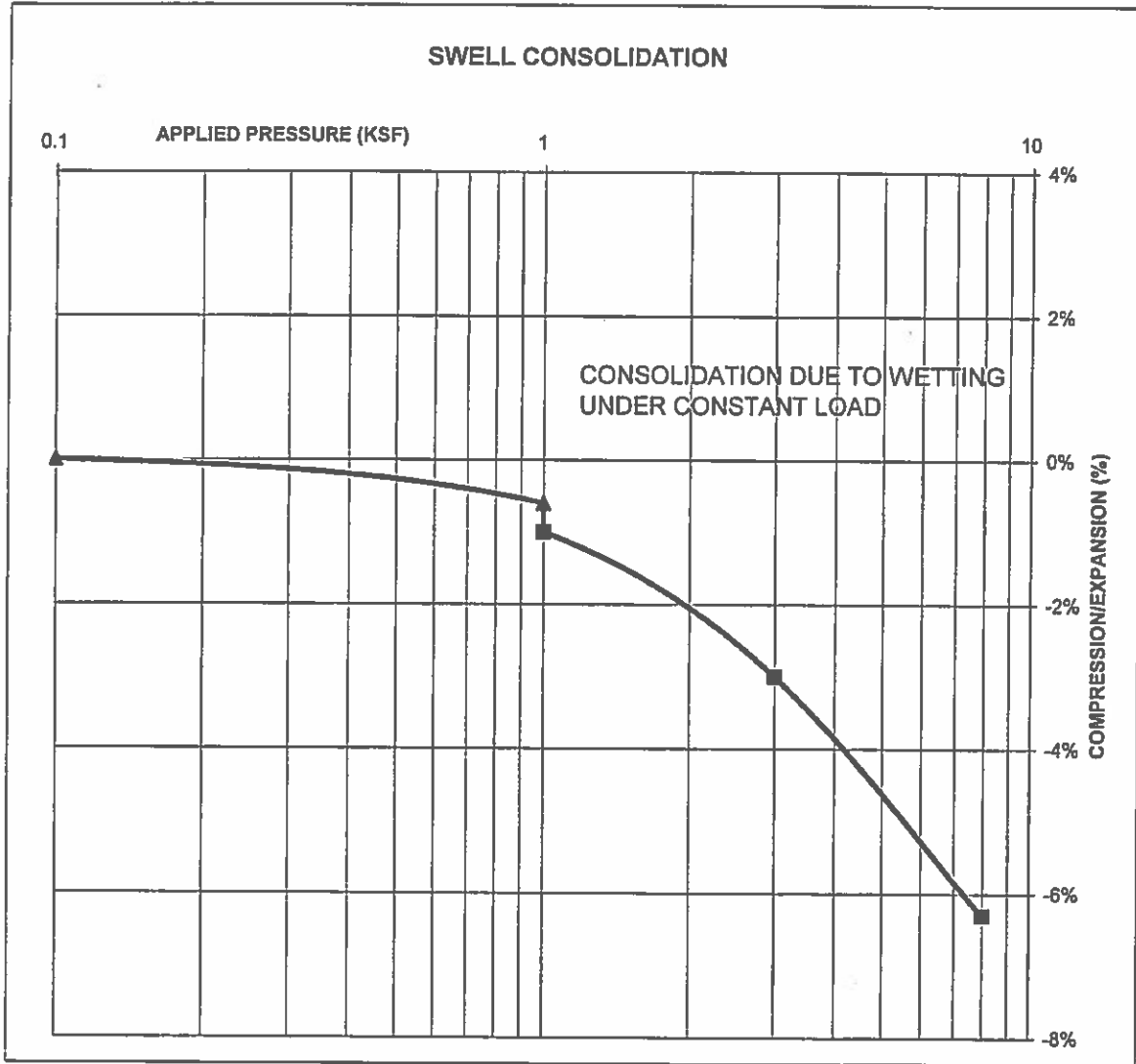
DRAWN:	DATE:	CHECKED:	DATE:
		<i>LAG</i>	<i>5/21/07</i>

JOB NO.:
FIG NO.:

**CONSOLIDATION TEST RESULTS**

TEST BORING #	3	DEPTH(ft)	5
DESCRIPTION	CL-M	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)	94		
NATURAL MOISTURE CONTENT	6.6%		
SWELL/CONSOLIDATION (%)	-0.4%		

JOB NO. 94477  
CLIENT PRAIRIE RIDGE PROP.  
PROJECT PRAIRIE RIDGE



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**ENGINEERING, INC.**

505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**SWELL CONSOLIDATION  
 TEST RESULTS**

DRAWN:

DATE:

CHECKED:

DATE:

*[Signature]* 5/21/07

JOB NO.:

FIG NO.:

Client: PRAIRIE RIDGE PROP.  
 Test Location: PRAIRIE RIDGE

Job Number: 94477

**PERCOLATION HOLES-TEST NO. 1**

Date Holes Prepared: 5/14/2007

Date Hole Completed: 5/15/2007

Hole No. 1  
 Depth: 32"

Hole No. 2  
 Depth: 33"

Hole No. 3  
 Depth: 34"

Hole No. 1			Hole No. 2			Hole No. 3		
Trial	Time (min.)	Water Level Change (in.)	Trial	Time (min.)	Water Level Change (in.)	Trial	Time (min.)	Water Level Change (in.)
1	10	1/16	1	10	1/16	1	10	1/8
2	10	0	2	10	0	2	10	0
3	10	1/16	3	10	0	3	10	0

Perc Rate (min./in.): 240

Perc Rate (min./in.): 480

Perc Rate (min./in.): 240

Average Perc Rate (min./in.) 320

**PROFILE HOLE**

Date Profile Hole Completed: 5/14/2007

Depth: 0-10'  
 Visual Classification: Clay-silt, sandy, dark brown to tan

Remarks:  
 No Bedrock  
 No Groundwater

18 Blows / ft. @ 4'  
 30 Blows / ft. @ 9'

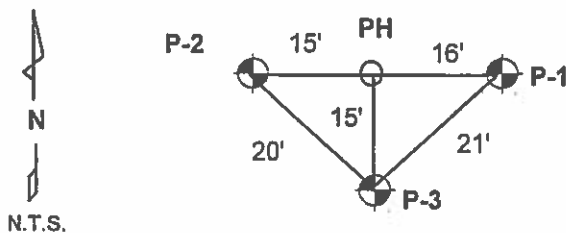
Required Area of Absorption Field: N/A\* Sq. Ft./gpd sewage volume  
 Required Area of Absorption Field: N/A\* Sq. Ft./bedroom  
 Required Area of Absorption Field: N/A\* Sq. Ft./bedroom with garbage disposal and washing machine

Remarks:

\* - Due to slow percolation rate, a designed system or additional drilling is recommended

Observer: Blake Leonard

By:



**ENTECH**  
**ENGINEERING, INC.**

505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**PERCOLATION TEST RESULTS**

DRAWN:	DATE:	CHECKED: <i>[Signature]</i>	DATE: 5/21/07
--------	-------	-----------------------------	---------------

JOB NO.:

FIG NO.:

Client: PRAIRIE RIDGE PROP.  
 Test Location: PRAIRIE RIDGE

Job Number: 94477

**PERCOLATION HOLES-TEST NO. 2**

Date Holes Prepared: 5/14/2007

Date Hole Completed: 5/15/2007

Hole No. 1  
 Depth: 41"

Hole No. 2  
 Depth: 38"

Hole No. 3  
 Depth: 37"

Hole No. 1			Hole No. 2			Hole No. 3		
Trial	Time (min.)	Water Level Change (in.)	Trial	Time (min.)	Water Level Change (in.)	Trial	Time (min.)	Water Level Change (in.)
1	10	1/16	1	10	1/8	1	10	0
2	10	0	2	10	1/4	2	10	1/8
3	10	0	3	10	0	3	10	0

Perc Rate (min./in.): 480

Perc Rate (min./in.): 80

Perc Rate (min./in.): 240

Average Perc Rate (min./in.) 267

**PROFILE HOLE**

Date Profile Hole Completed: 5/14/2007

Depth: 0-10'  
 Visual Classification: Clay, sandy, brown to light brown

Remarks:  
 No Bedrock  
 No Groundwater

19 Blows / ft. @ 4'  
 16 Blows / ft. @ 9'

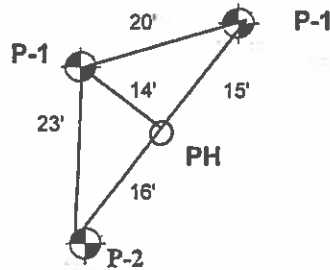
Required Area of Absorption Field: N/A\* Sq. Ft./gpd sewage volume  
 Required Area of Absorption Field: N/A\* Sq. Ft./bedroom  
 Required Area of Absorption Field: N/A\* Sq. Ft./bedroom with garbage disposal and washing machine

Remarks:

\* - Due to slow percolation rate, a designed system or additional drilling is recommended

Observer: Blake Leonard

By:



**ENTECH**  
**ENGINEERING, INC.**

505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**PERCOLATION TEST RESULTS**

DRAWN: \_\_\_\_\_ DATE: \_\_\_\_\_ CHECKED: *BLN* DATE: *5/15/07*

JOB NO.:

FIG NO.:

Client: PRAIRIE RIDGE PROP.  
 Test Location: PRAIRIE RIDGE

Job Number: 94477

**PERCOLATION HOLES-TEST NO. 3**

Date Holes Prepared: 5/14/2007

Date Hole Completed: 5/15/2007

Hole No. 1  
 Depth: 32"

Hole No. 2  
 Depth: 34"

Hole No. 3  
 Depth: 38"

Hole No. 1			Hole No. 2			Hole No. 3		
Trial	Time (min.)	Water Level Change (in.)	Trial	Time (min.)	Water Level Change (in.)	Trial	Time (min.)	Water Level Change (in.)
1	10	1/8	1	10	1/16	1	10	0
2	10	0	2	10	1/16	2	10	1/8
3	10	1/8	3	10	0	3	10	1/8

Perc Rate (min./in.): 120

Perc Rate (min./in.): 240

Perc Rate (min./in.): 120

Average Perc Rate (min./in.) 160

**PROFILE HOLE**

Date Profile Hole Completed: 5/14/2007

Depth	Visual Classification	Remarks
0-2'	Sand, clayey, dark brown	
2-10'	Clay-Silt, sandy, brown to light brown	No Bedrock No Groundwater

18 Blows / ft. @ 4'  
 18 Blows / ft. @ 9'

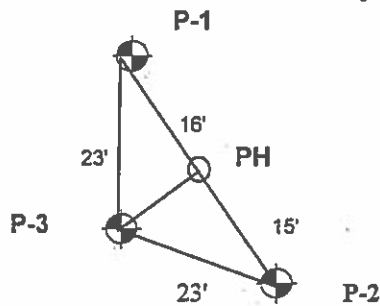
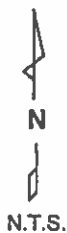
Required Area of Absorption Field: N/A\* Sq. Ft./gpd sewage volume  
 Required Area of Absorption Field: N/A\* Sq. Ft./bedroom  
 Required Area of Absorption Field: N/A\* Sq. Ft./bedroom with garbage disposal and washing machine

Remarks:

\* - Due to slow percolation rate, a designed system or additional drilling is recommended

Observer: Blake Leonard

By:



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

**PERCOLATION TEST RESULTS**

DRAWN:

DATE:

CHECKED:

DATE:

*1/2/07* 5/21/07

JOB NO.:

FIG NO.:

## **APPENDIX E: Soil Survey Descriptions**

## El Paso County Area, Colorado

### 15—Brussett loam, 3 to 5 percent slopes

#### Map Unit Setting

*National map unit symbol:* 367k  
*Elevation:* 7,200 to 7,500 feet  
*Frost-free period:* 115 to 125 days  
*Farmland classification:* Prime farmland if irrigated

#### Map Unit Composition

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

#### Description of Brussett

##### Setting

*Landform:* Hills  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Eolian deposits

##### Typical profile

*A - 0 to 8 inches:* loam  
*BA - 8 to 12 inches:* loam  
*Bt - 12 to 26 inches:* clay loam  
*Bk - 26 to 60 inches:* silt loam

##### Properties and qualities

*Slope:* 3 to 5 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):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water capacity:* High (about 9.1 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4e  
*Hydrologic Soil Group:* B  
*Ecological site:* R048AY222CO  
*Hydric soil rating:* No



### Minor Components

#### Other soils

*Percent of map unit:*

*Hydric soil rating:* No

### Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 18, Jun 5, 2020

## El Paso County Area, Colorado

### 69—Peyton-Pring complex, 8 to 15 percent slopes

#### Map Unit Setting

*National map unit symbol:* 369g

*Elevation:* 6,800 to 7,600 feet

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Peyton and similar soils:* 40 percent

*Pring and similar soils:* 30 percent

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

#### Description of Peyton

##### Setting

*Landform:* Hills

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

##### Typical profile

*A - 0 to 12 inches:* sandy loam

*Bt - 12 to 25 inches:* sandy clay loam

*BC - 25 to 35 inches:* sandy clay loam

*C - 35 to 60 inches:* sandy loam

##### Properties and qualities

*Slope:* 8 to 9 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water*

*(Ksat):* Moderately high (0.20 to 0.60 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Moderate (about 7.3 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4e

*Hydrologic Soil Group:* B

*Ecological site:* R049XB216CO - Sandy Divide

*Hydric soil rating:* No

## Description of Pring

### Setting

*Landform:* Hills

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Arkosic alluvium derived from sedimentary rock

### Typical profile

*A - 0 to 14 inches:* coarse sandy loam

*C - 14 to 60 inches:* gravelly sandy loam

### Properties and qualities

*Slope:* 8 to 15 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 capacity:* Low (about 6.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6e

*Hydrologic Soil Group:* B

*Ecological site:* R049XB222CO - Loamy Park

*Hydric soil rating:* No

## Minor Components

### Pleasant

*Percent of map unit:*

*Landform:* Depressions

*Hydric soil rating:* Yes

### Other soils

*Percent of map unit:*

*Hydric soil rating:* No

## Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 18, Jun 5, 2020