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

August 15, 2025
Revised May 11, 2026

Lions Den Trust
1339 South Voyager Parkway, Suite 130
Colorado Springs, CO 80921

Attn: Lance Klug

Re: Soils and Geology Study
12120 Casey Lane – 7-Lot Subdivision
Parcel No. 62130-00-006
El Paso County, Colorado
Entech Job No. 213150

Dear Mr. Klug:

The project consists of subdividing 35.955-acres into seven rural residential lots. The site is located southwest of the intersection of Shoup Road and Casey Lane in the northern portion of El Paso County, Colorado.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the NW¼ of Section 13 Township 12 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located southwest of the intersection of Shoup Road and Casey Lane in the northern portion of El Paso County, Colorado. The location of the site is as shown in the Vicinity Map, Figure 1.

The topography of the site is generally gradually to moderately sloping to the south-southwest, with steeper slopes along the drainage located in the central and southwestern portions of the site. A tributary of Kettle Creek is located in the central and southwestern portions of the site. Several minor drainage swales were observed across the site. The drainages on the site flow in a southerly direction. Water was observed flowing in the tributary, and the minor drainage swales were dry at the time of our site investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included agricultural and rural residential. The site contains field grasses, weeds, kinnikinic, and Ponderosa Pines. Site photographs were taken and original site mapping was completed on December, 23, 2021. The site was revisited on July 25, 2025 to confirm previous mapping and updated site photographs are included in Appendix A. Test pit excavations were completed on January 18, 2022. Test Borings were drilled on January 19, 2022.

The project consists of 35.955-acres. Seven rural residential lots are proposed for the replat. The new lots will be serviced by an individual wells and on-site wastewater treatment systems. The existing residence, detached garage, an old ranch house, and a barn located on Lot 5 will remain. This house is currently on an existing onsite wastewater treatment system. The Site Plan with the proposed replat is presented in Figure 3.

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 potentially expansive soils, seasonally wet, and potentially seasonally wet areas, areas of erosion, areas of downslope creep, potentially unstable slopes, and the potential for

elevated radon levels. Based on the proposed development plan, it appears that these areas will have minor impacts 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.

SCOPE OF THE REPORT

A general geologic analysis utilizing published geologic data was completed. Detailed site-specific mapping was 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 August 19, 2024. The site was revisited on July 25, 2025 to confirm previous mapping.

Two test borings were drilled, and three test pits were excavated on the site to determine general suitability of the soil characteristics for residential construction. The test borings were drilled in the potential house locations. The locations of the test borings/pits are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Test Boring and 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 descriptions of the soil type are presented in Appendix D. In general, the soils consist of sandy loam to loam. The soils are described as follows:

Type	Description
40	Kettle gravelly loamy sand, 3 – 8% Slopes
41	Kettle gravelly loamy sand, 8 – 40% Slopes

The soils have been described to have rapid permeabilities. The soils are described as well suited for use as home sites. 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 three general soil and rock types. 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 2 feet, and to the termination of Test Pit No. 3 (8 feet). These soils were encountered at medium dense states and moist conditions. Samples tested had approximately 9 percent of the soil sized particles passing the No. 200 Sieve.

Soil Type 2 is a clayey to very clayey sandstone and silty to slightly silty sandstone (SC, SC-CL, SM-SW, SM). Soil type two was both of the test borings, and two of the test pits at depths ranging from 1 to 2 feet bgs and extended to depths ranging from 9 feet bgs to the termination of the test borings and test pits (3 to 15 feet). These soils were encountered at dense to very dense states and moist conditions. Samples tested had approximately 8 to 50 percent of the soil sized particles passing the No. 200 Sieve.

Soil Type 3 is a sandy claystone (CL). Soil Type three was encountered both of the test borings at depths ranging from 4 to 9 feet bgs and extended to depths ranging from 9 feet to the termination of the test boring (15 feet). These soils were encountered at hard consistencies and at moist conditions. Samples tested had approximately 68 to 84 of the soil sized particles passing the No. 200 Sieve. Swell/Consolidation Testing resulted in a volume change of 0.1 percent, indicated a low expansion potential. Highly expansive claystone is common in the area.

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

Signs of seasonally occurring groundwater was observed in Test Pit No. 2 at 4 feet. Groundwater is not anticipated to affect shallow foundations on the majority of the site. Water was observed flowing in the tributary, however, the minor drainage swales were dry. 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 9.5 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 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 Holocen Age:** These are recent stream deposits in the channels of the main drainage on site. Some areas have recent sand deposition, while others have highly organic soils.

Qp_1 **Younger Piedmont-Slope Alluvium of Holocene and late Pleistocene Age:** These are sheetwash and stream deposited sands and gravels associated with piedmont slope deposits.

Tkd **Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of a thin layer of residual soils overlying the bedrock materials on-site. 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 (Reference 4, Figure 5), The *Geologic Map of the Colorado Springs-Castle Rock Area,* distributed by the US Geological Survey in 1979 (Reference 5), and the *Geologic Map of the Denver 1° x 2° Quadrangle,* distributed by the US Geological Survey in 1981 (Reference 6). 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 that builders should be cognizant of 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, areas of potentially expansive soils, seasonally wet, and potentially seasonally wet areas, areas of erosion, areas of downslope creep, potentially unstable slopes, and the potential for elevated radon levels. These constraints/hazards and recommended mitigation techniques are discussed as follows:

Expansive Soils – Constraint

Potentially expansive clay soils were encountered in the test borings. It should also be noted that the bedrock underlying the site consist of the Dawson Formation of Cretaceous Age, which is commonly interbedded with layers of claystone or siltstone. Expansive clays or claystone, if encountered beneath foundations, can cause differential movement in the structure foundation.

Mitigation: Should expansive soils be encountered at or near the foundation grade; 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. Moisture conditioning and recompaction may also be a suitable mitigation pending further testing on each lot. Overexcavation depths of 3 to 4 feet are typical for the expansive soils encountered in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been

successful in minimizing slab movements. Drilled piers are another option that is used in areas where highly expansive soils are encountered. Typical minimum pier depths are on the order of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads.

Landslide Hazard, and Slope Stability – Hazard

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 across the site, and the steep slopes along the main drainage on the site have been identified as potentially unstable slopes. This area is identified on the Engineering Geology Map, Figure 6. The recommendations for these areas are as follows:

- Downslope Creep Areas

  The areas identified with this hazard includes the steeper slopes located in the western and southeaster portions of the site. In these areas we would anticipate lateral and vertical movement of the near surface soils in the downslope direction. These areas are acceptable for building sites with the following constraints on construction.

  Mitigation: This type of movement will increase lateral pressures against foundation walls on the uphill side of structures. The design of foundations in these areas should account for this additional pressure. A lateral pressure detail is shown in Figure 7. Where possible in areas of downslope creep, structures should be designed to be as compact and rigid as possible. This will help them better tolerate the vertical and lateral movements to which the foundation system may be subjected with minimal damage. Long, rambling, irregular structures should be avoided in these areas as they are associated with a much greater potential for damaging differential movement. Due to lot size, it is anticipated that the majority of the downslope creep areas can be avoided as building sites. Reinforcement or tie beams in the foundation may be necessary where the structures encroach on the downslope creep area. Any cuts steeper than 3:1 should be retained by walls designed for the sloping conditions.

- Potentially Unstable Slopes

  The areas identified with this hazard include the steep slopes along the main drainage in the central and southwestern portions of the site have been mapped as potentially unstable. These slopes are considered stable in their present condition, however, considerable care must be exercised in these areas not to create a condition which would tend to activate instability. Due to the lot size this area will be avoided by the proposed structures.

  Mitigation: A minimum 30-foot setback is recommended from the crest of the potentially unstable slopes. Building should be avoided in these areas. Proper control of drainage at both the surface and the subsurface is extremely important. Areas of ponded water at the surface should be avoided. Utility trenches, basement excavations and other subsurface features should not be permitted to become water traps which may promote saturation of the subsurface materials. Drainage should not be permitted over the potentially unstable slope but directed in a non-erosive manner away from the slope. Irrigation above these slopes should be kept to a minimum to prevent saturation of the subsurface soils.

Drainage and Floodplain Areas – Constraint

The site is not mapped within any floodplains according to the FEMA Map No. 08041CO315G, dated December 7, 2018 (Figure 8, Reference 7). However, a physiographic floodplain has been mapped along the main drainage located in the central and southwestern portions of the site. Additionally, areas of seasonal and potentially seasonal shallow groundwater were mapped on

the site in minor drainage swales (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 drainage swales in the southeastern and eastern portions of the site. Water was observed in the main drainage, and water was not observed in the minor drainage swales at 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. 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 low lying area located on portions of Lots 1 – 3, and along portions of the main drainage on the site. Construction is not recommended in this areas which can likely be avoided. Mitigation for seasonally wet areas is discussed in the following section.

Potentially Seasonally Wet Areas – Constraint

Several minor drainage swales are located across the site. Water was not observed in these drainage swales at the time of this investigation; however, these areas have the potential for seasonal shallow groundwater. These areas are indicated in the Geology/Engineering Geology Map (Figure 6). Due to the size of the proposed lots these areas can either be avoided or regraded and redirected around 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 9. If shallow groundwater is encountered, underslab drains or interceptor drains may be necessary Figures 10 and 11. Specific drainage details and recommendations should be made once building locations and plans are finalized, and additional investigation of the building sites have been completed. 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.

Areas of Erosion and Gullying – Constraint

These are areas that are undergoing erosion by water and sheetwash producing gullies and rill erosion. These areas are located within the main drainage, and portions of the minor drainage swales across the site.

> 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).

Faults – Hazard

The closest fault is the Rampart Range Fault, located approximately 9.5 miles west of the site (Reference 3). No faults are mapped in the site itself. Previously, Colorado was mapped entirely within Seismic Zone 1, a very low seismic risk. Additionally, the International Residential Code (IRC), 2003, currently places this area in Seismic Design Category B, also a low seismic risk. According to a report by the Colorado Geological Survey by Kirkman and Rogers, Bulletin 43 (1981) (Reference 7), this area should be designed for Zone 2 due to more recent data on the potential for movement in this area and any resultant earthquakes.

Radon – Hazard

Radon is a colorless, tasteless radioactive gas with a United States Environmental Protection Agency (EPA) specified action level of 4.0 picocuries per liter (pCi/L) of air. Radon gas has a very short half-life of 3.8 days. Radon levels for the area have been reported by the Colorado Geologic Survey in the open file, Report No. 91-4 (Reference 8). Average Radon levels for the 80908-zip code is 3.40 pCi/l. The following is a table of radon levels in this area:

Average Radon Levels for the 80908 Zip Code	
0 < 4 pCi/L	50.00%
4 < 10 pCi/L	50.00%
10 < 20 pCi/L	0.00%
> 20 pCi/L	0.00%

Mitigation:

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

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed development will consist of subdividing 35.955-acres into a 7-lot subdivision. The existing house on Lot 5 will remain. Existing septic records are included in Appendix E. 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 wet, and potentially seasonally wet areas, areas of erosion, areas of downslope creep, potentially unstable slopes, and the potential for elevated radon levels, which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The upper sandstone bedrock encountered in the test borings on the site was encountered at very dense states and hard consistencies. Shallow bedrock was encountered at one foot in both of 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 sandstone encountered in the test borings is considered to have low expansion potential, however, claystone is typically expansive. Highly expansive clays and claystone are known to

common in the area. Claystone lenses were encountered in both of the test borings. Mitigation of expansive soils if encountered at or near foundation grade will be required. 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. These soils will not prohibit development.

The majority of the slopes in the building areas on site are gently to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. However, the steeply sloping areas along the main drainage located in the central and southwestern portion of the site have been mapped as potentially unstable. Additionally, areas of downslope creep have been mapped in the western and southeaster portions of the site. These slopes are considered stable in their present condition, however, considerable care must be exercised in these areas not to create a condition which would tend to activate instability. Due to the lot sizes these areas will likely be avoided by the proposed structures.

A tributary of Kettle Creek is located in the central and southwestern portions of the site, and several minor drainage swales were observed across the site. The drainages on the site flow in a southerly direction, water was observed flowing in the tributary, and the minor drainage swales were dry at the time of our site investigation. A physiographic floodplain has been mapped along the main drainage, and the minor drainage swales/low lying areas have been mapped as seasonal shallow groundwater and potentially seasonal shallow groundwater. These areas are indicated in the Geology/Engineering Geology Map (Figure 6). 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.

Subsurface perimeter drains are recommended should structures with any useable below grade areas. Typical perimeter drain details are presented in Figure 9. If shallow groundwater is encountered, underslab drains or interceptor drains may be necessary Figures 10 and 11. Specific drainage details and recommendations should be made once building locations and plans are finalized, and additional investigation of the building sites have been completed.

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.

In summary, the granular soils and sandstone will provide good support for shallow foundations. The clay or claystone soils will likely require mitigation. 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 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.

ROADWAY, EMBANKMENT, and CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for the driveways. Groundwater is not anticipated to affect roadway construction. If driveway or embankment excavations encroach on the groundwater level unstable soil conditions may be encountered. Unstable soils are not anticipated in areas of shallow bedrock. Excavation of saturated soils will be difficult with rubber-tired equipment. Stabilization using shot rock or geogrids may be necessary.

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

New fill should be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95% of its maximum Modified Proctor Dry Density, ASTM D-1557. These materials should be placed at a moisture content conducive to compaction, usually 0 to ±2% of Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech during construction. Entech should approve any import materials prior to placing or hauling them to the site. Additional investigation will be required for pavement designs once roadway grading is completed and utilities are installed.

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 investigation for the 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 Lions Den Trust, for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

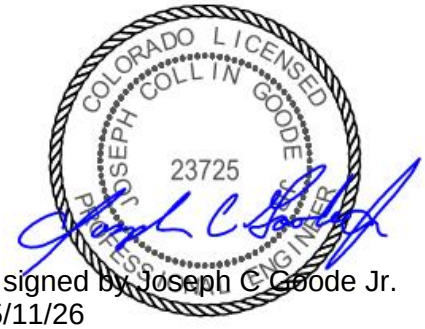
We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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

Reviewed by:



Digitally signed by Joseph C Goode Jr.
Date: 05/11/26

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

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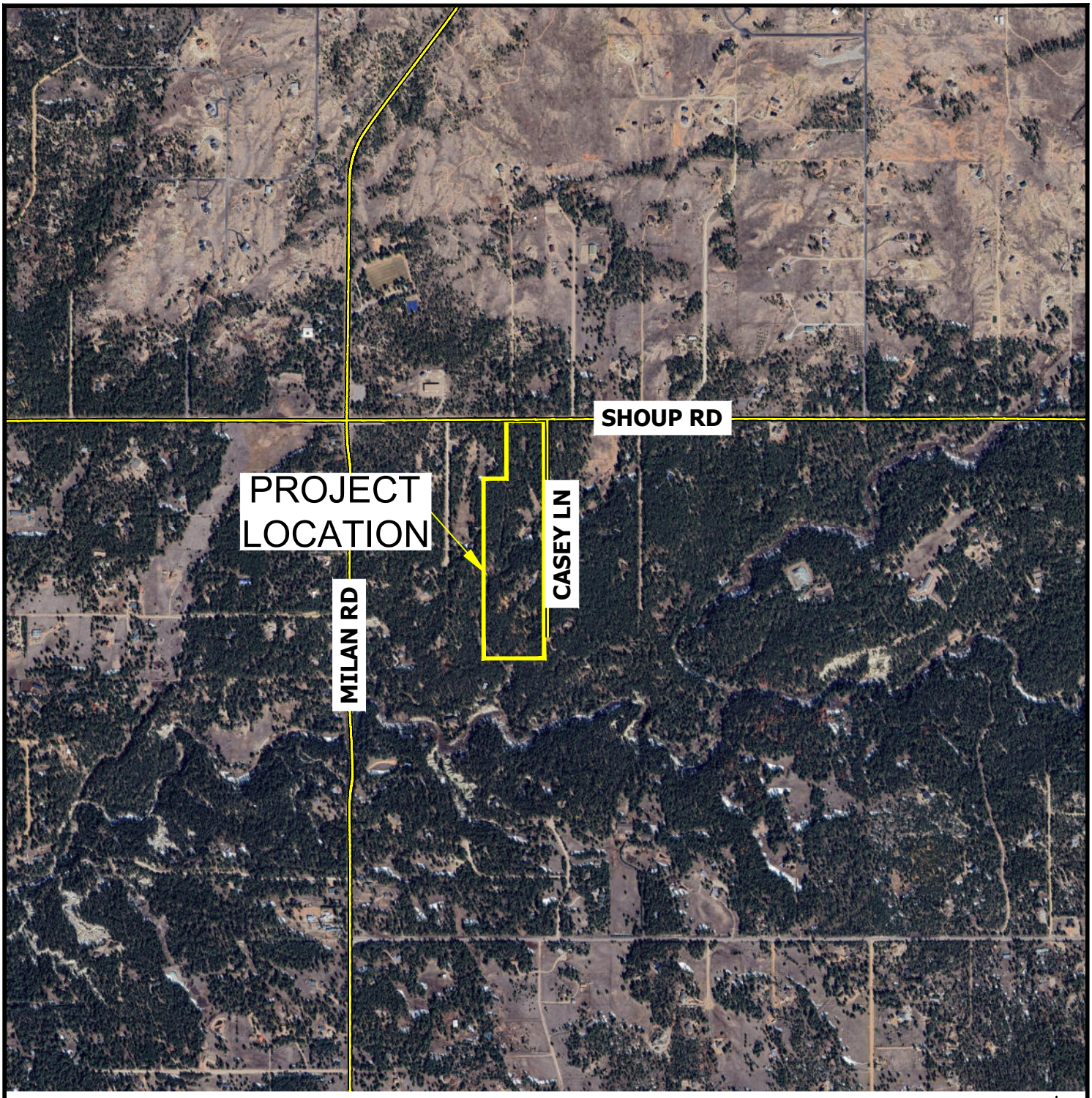
FIGURES



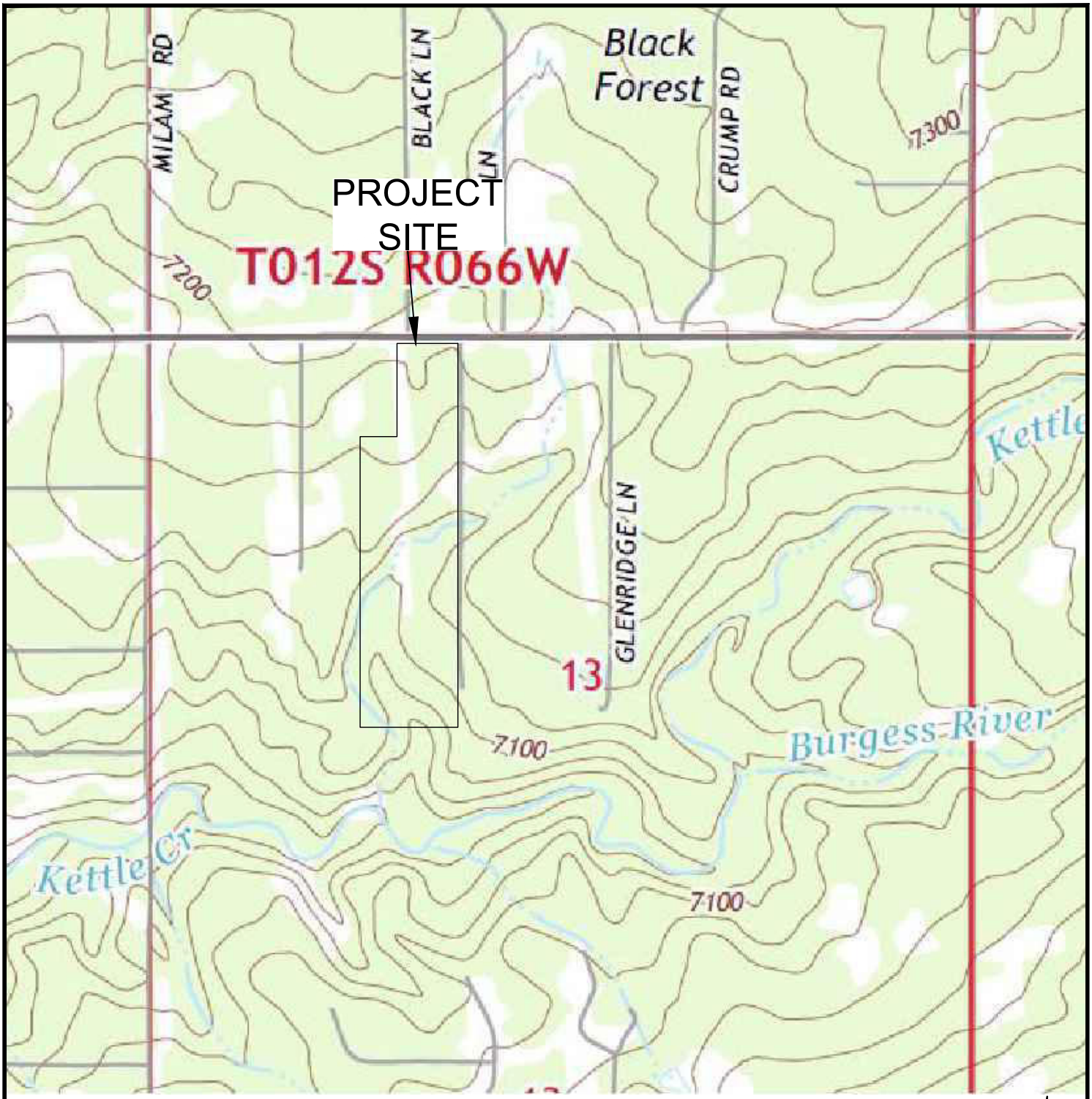
ENTECH ENGINEERING, INC.

VICINITY MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. 1



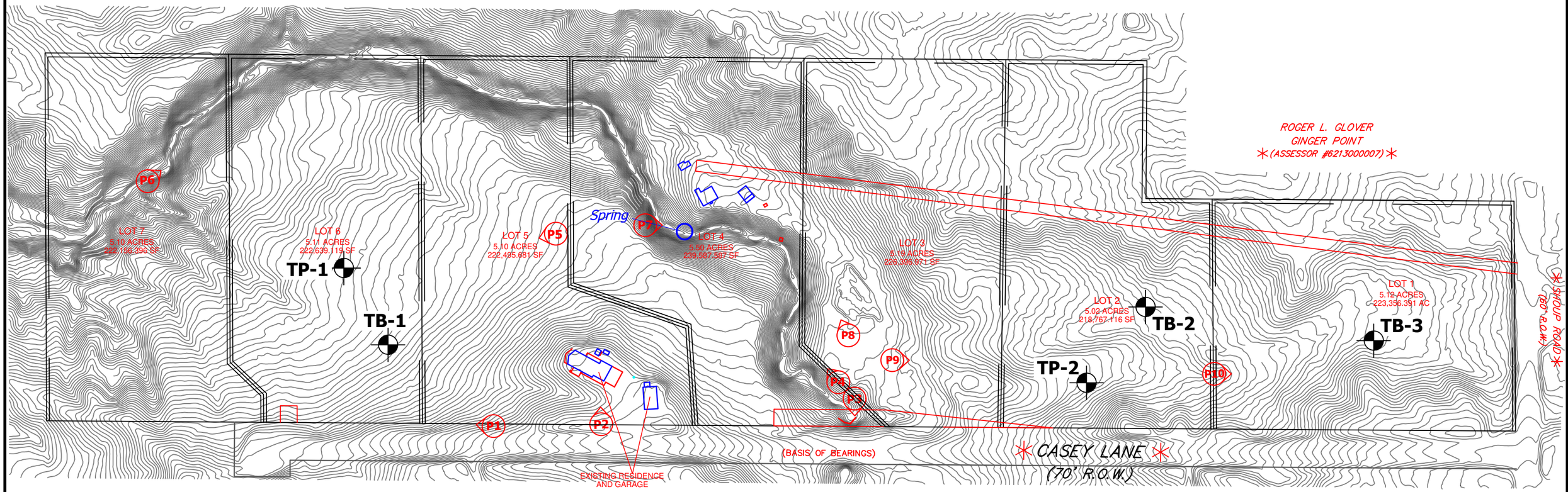
ENTECH ENGINEERING, INC.

USGS TOPOGRAPHY MAP

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 2



- APPROXIMATE TEST BORING LOCATION AND NUMBER

P2 - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. 3

N

ENTECH ENGINEERING, INC.

SOIL SURVEY MAP

12120 CASEY LANE
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JOB NO.
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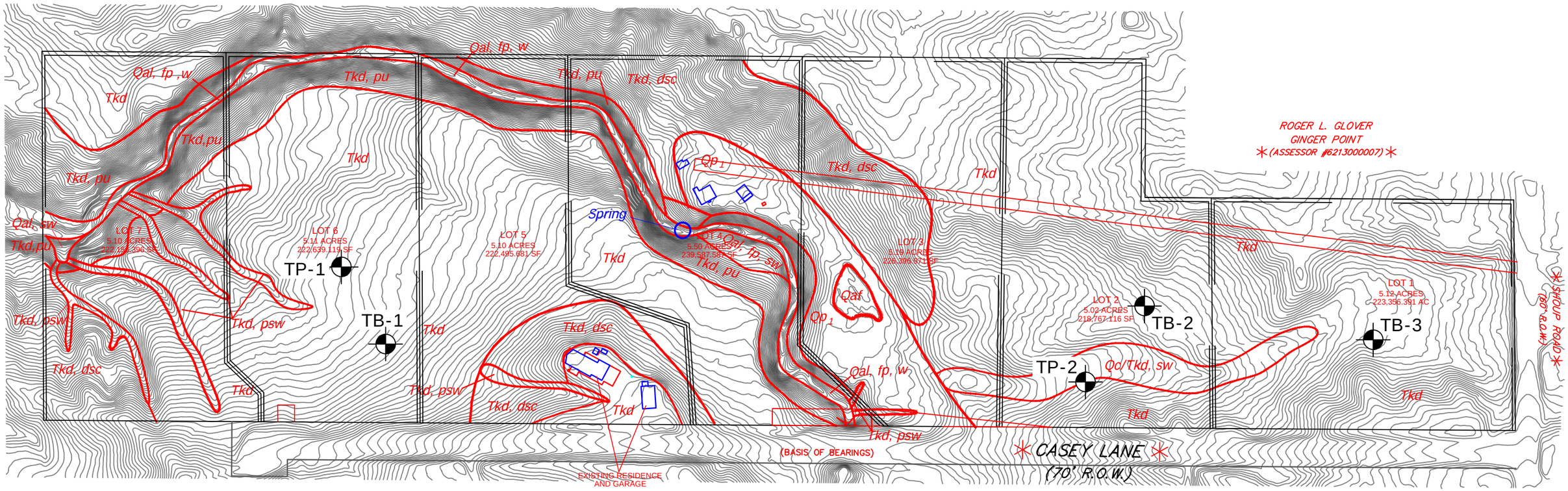
FIG. 4



◯ - Spring (lot 4)

Legend:

Qal - Alluvium of Quaternary Age:
recent stream deposited materials

Qp_1 - Younger Piedmont-Slope Alluvium of Holocene to late Pleistocene Age:
sheetwash and stream deposited alluvium

TKd - Dawson Formation of Tertiary to Cretaceous Age:
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone

dsc - downslope creep
pu - potentially unstable slopes
fp - floodplain
psw - potentially seasonal shallow groundwater area
sw - seasonally wet areas
w - flowing water

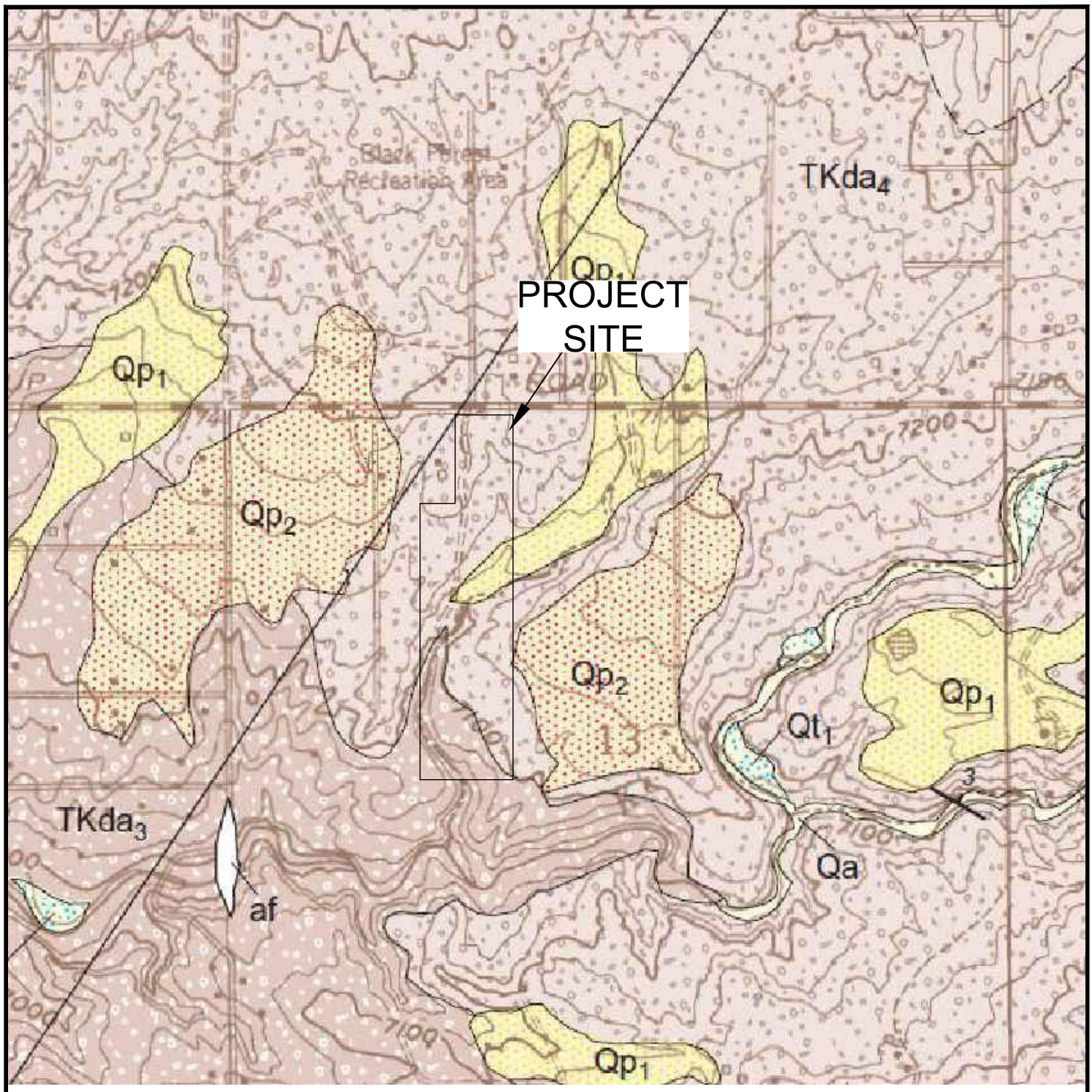
N

ENTECH ENGINEERING, INC.

GEOLOGY / ENGINEERING GEOLOGY MAP
12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 6



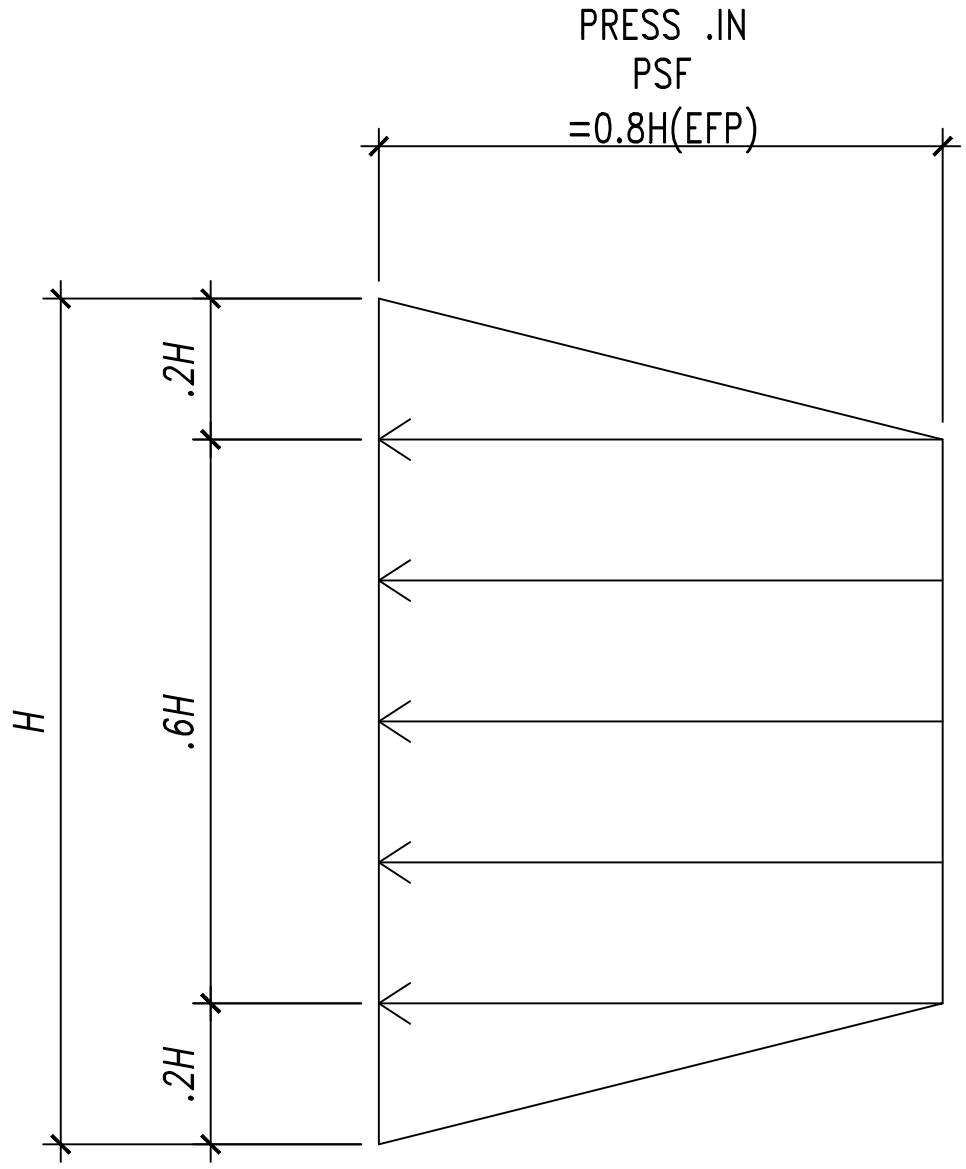
ENTECH ENGINEERING, INC.

GEOLOGIC MAP OF THE COLORADO SPRINGS QUADRANGLE

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. 5



PRESSURE DISTRIBUTION

ENTECH ENGINEERING, INC.

LATERAL PRESSURE DIAGRAM

12120 CASEY LANE
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FIG. 7

ENTECH ENGINEERING, INC.

FEMA FLOODPLAIN MAP

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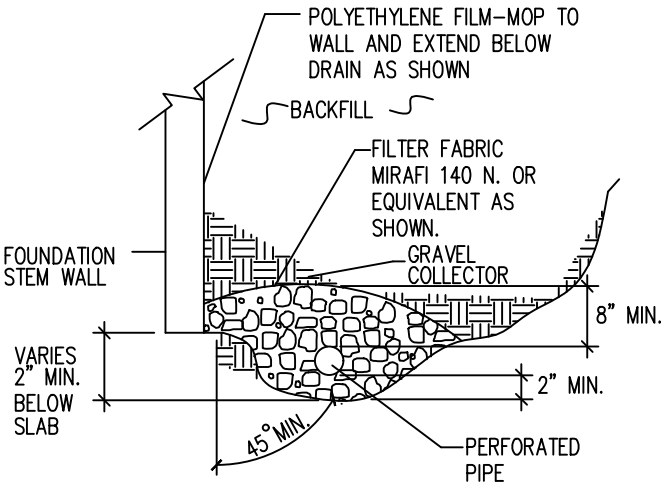
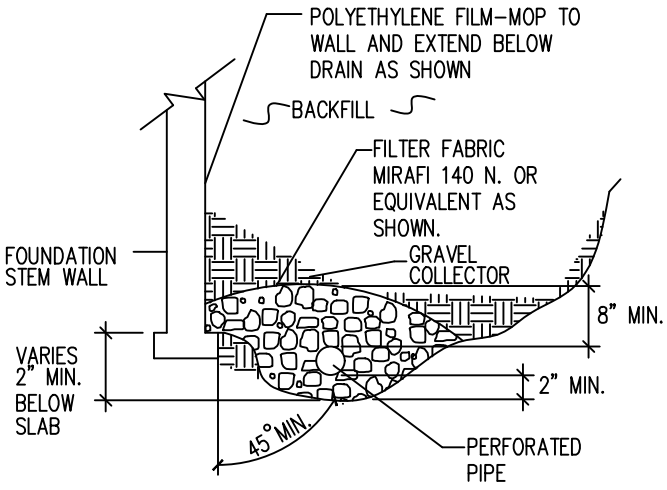
FIG. 8





NOTES:

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

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

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

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

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

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

ENTECH ENGINEERING, INC.

PERIMETER DRAIN DETAIL

12120 CASEY LANE
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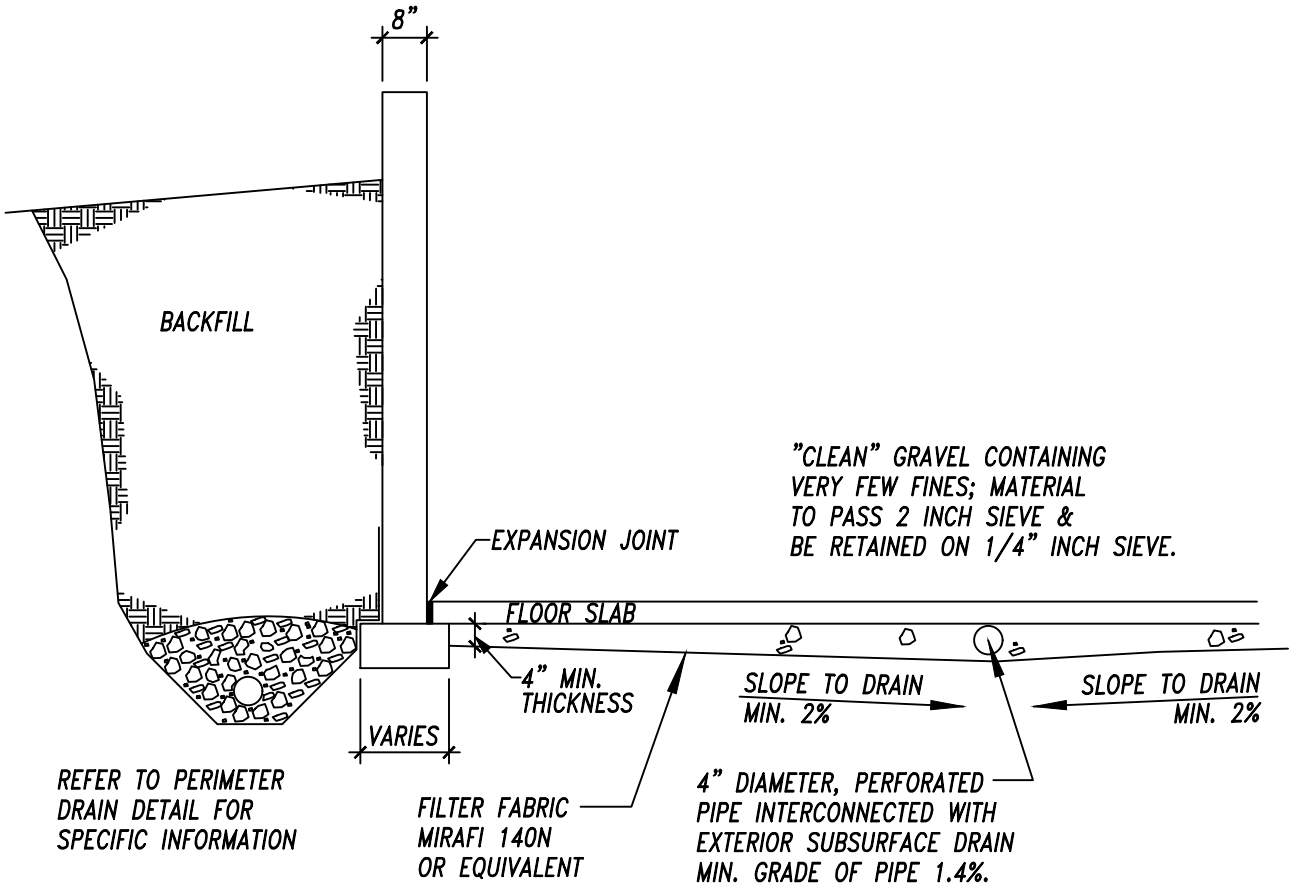
FIG. 9



ENTECH ENGINEERING, INC.

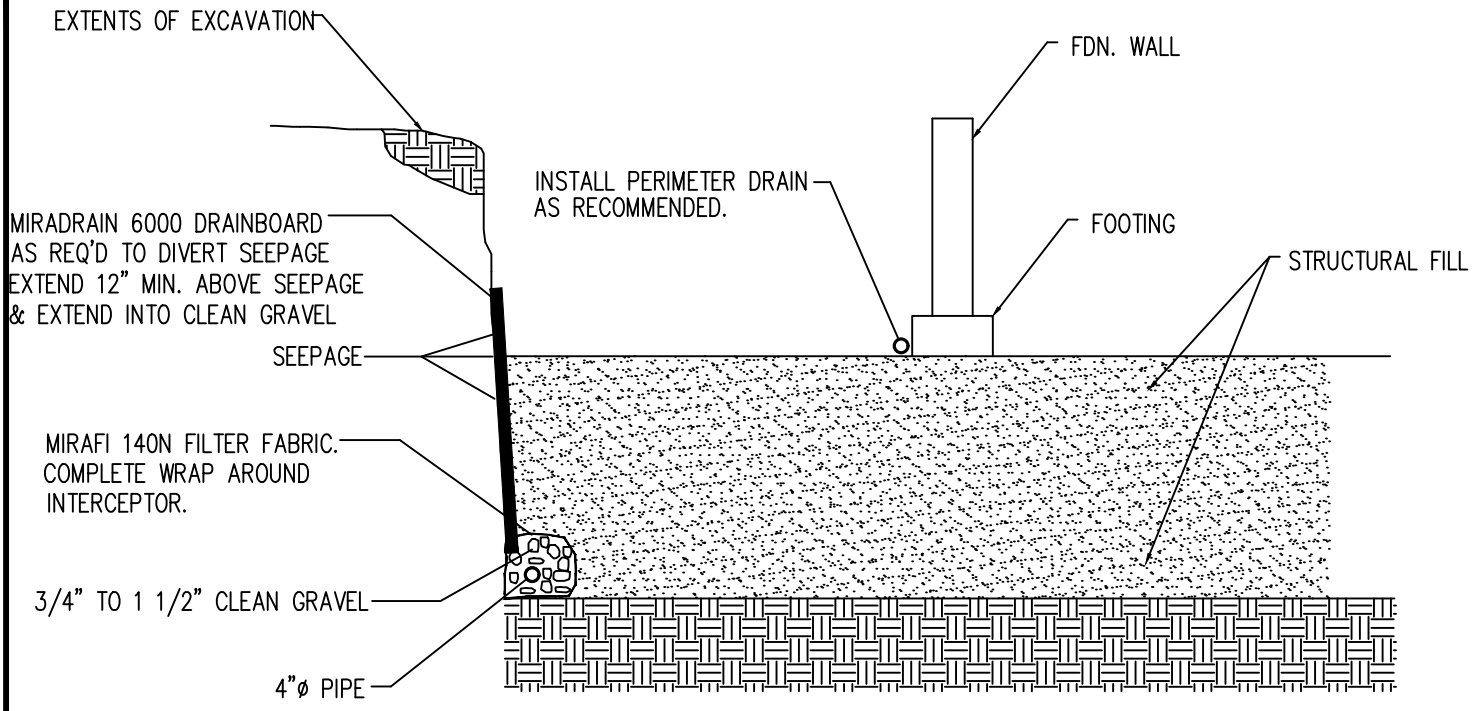
TYP. UNDERSLAB DRAINAGE LAYER (CAPILLARY BREAK)

12120 CASEY LANE

LIONS DEN TRUST

JOB NO. 213150

FIG. 10



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

INTERCEPTOR DRAIN DETAIL

N.T.S.

ENTECH ENGINEERING, INC.

INTERCEPTOR DRAIN DETAIL

12120 CASEY LANE
LIONS DEN TRUS

JOB NO. 213150

FIG. 11

APPENDIX A: Site Photographs

1

Looking south along Casey Lane from the eastern portion of the site.

July 25, 2025

2

Looking west towards existing residence on proposed lot 5.

July 25, 2025

Job No. 213150

3

Looking east towards existing box culvert along tributary crossing Casey Lane.

July 25, 2025

4

Looking southwest along drainage from the eastern side of the site.

July 25, 2025

Job No. 213150

5

Looking south from central portion of the site.

July 25, 2025

6

Looking north along potentially unstable slopes along drainage in the southwestern portion of the site.

July 25, 2025

Job No. 213150

7

Looking north along drainage in the central portion of the site.

July 25, 2025

8

Looking west towards fill piles located on proposed Lot 3.

July 25, 2025

Job No. 213150

9

Looking north from the central portion of the site.

July 25, 2025

10

Looking north from the northern portion of the site from the approximate Lot 1/2 lot line.

July 25, 2025

Job No. 213150

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING 1
DATE DRILLED 1/19/2022

REMARKS

DRY TO 15', 1/19/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/9"	5.9	2
5			50/6"	6.5	2
10			50/7"	12.5	3
15			50/5"	10.7	3
20					

SAND, SILTY, TAN

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

CLAYSTONE, WEAK, BROWN, WEATHERED (CLAY, SANDY, HARD, MOIST)

TEST BORING 2
DATE DRILLED 1/19/2022

REMARKS

DRY TO 15', 1/19/22

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50	2.1	2
5			50/7"	14.4	2
					3
10			50/6"	8.6	2
15			50/4"	12.2	2
20					

SAND, SILTY, TAN

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

CLAYSTONE, WEAK, BROWN, WEATHERED (CLAY, WITH SAND, HARD, MOIST)

SANDSTONE, WEAK, TAN, WEATHERED (SAND, CLAYEY, VERY DENSE, MOIST)

ENTECH ENGINEERING, INC.

TEST BORING LOGS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. B-1

TEST PIT 1
DATE EXCAVATED 1/21/2022
REMARKS

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type	
1						topsoil, sandy clay loam, dark brown,
2						
3			ma		4A	sandy clay, fine to medium grained, light brown, moist (completely weathered clayey sandstone
4						
5						
6						
7						
8						
9						
10						

TEST PIT 2
DATE EXCAVATED 1/21/2022
REMARKS Redoximorphic Features @ 4'

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type	
1						topsoil, sandy clay, dark brown, moist
2						
3			ma	sl	4A	sandy clay, fine to medium grained, light brown, moist (completely weathered clayey sandstone
4						
5						
6			ma		R-1	gravelly sandy loam, fine to coarse grained, grayish brown, very moist (weathered sandstone)
7						
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
structureless - sl

ENTECH ENGINEERING, INC.

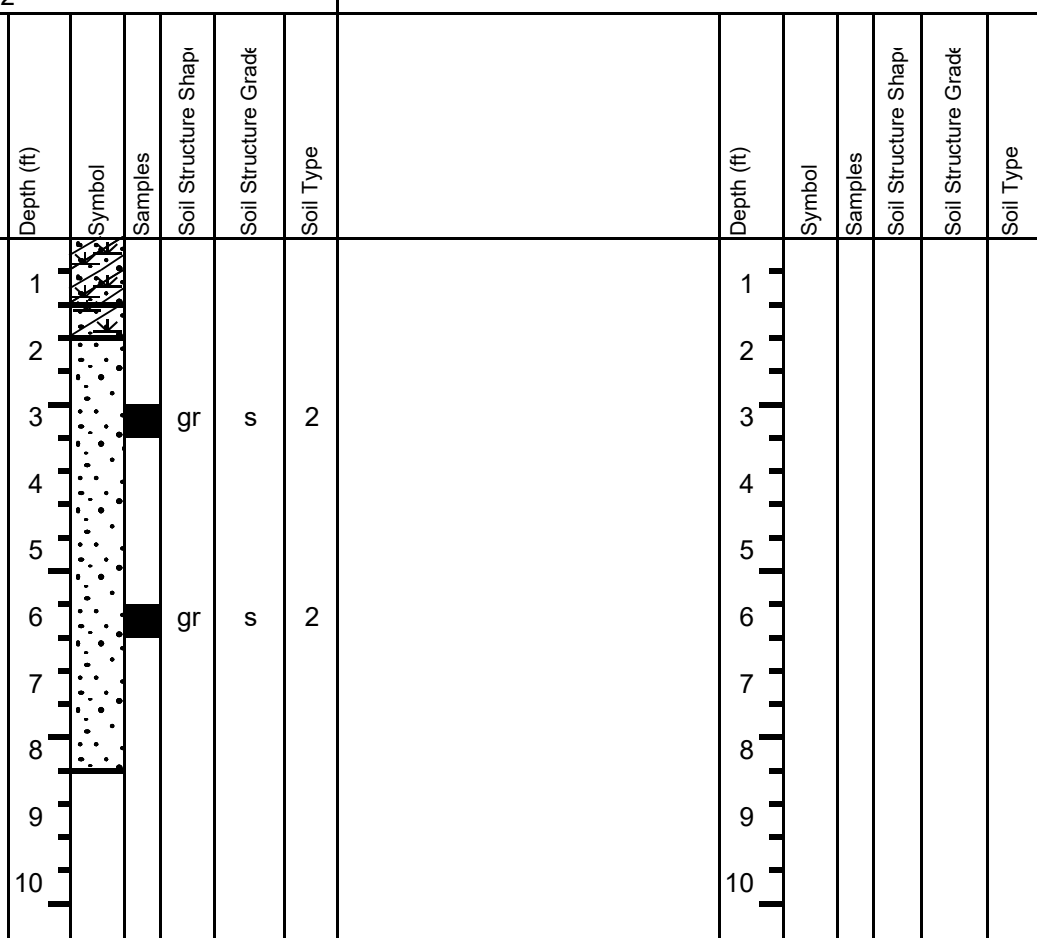
TEST PIT LOGS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 250183

FIG. B-2

TEST PIT 3
DATE EXCAVATED 1/21/2022
REMARKS



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.

TEST PIT LOGS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 250183

FIG. B-3

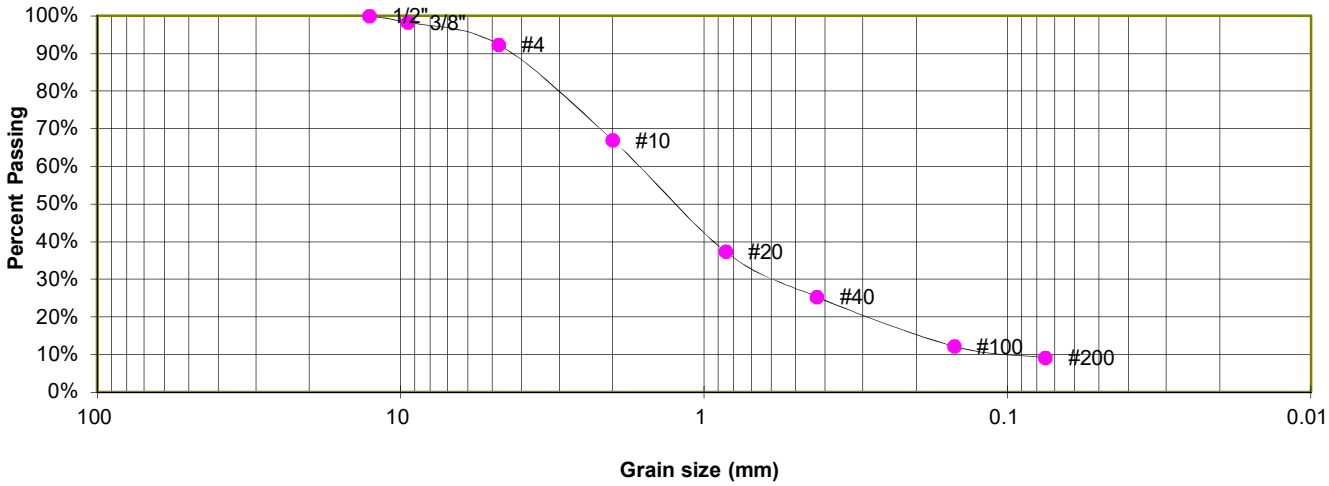
APPENDIX C: Laboratory Testing Results

ENTECH ENGINEERING, INC.

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	TP-3	3			9.2		SW-SM	SAND, WITH SILT
1	TP-1	2			49.8		SC	SANDSTONE (SAND, CLAYEY)
2	1	2-3			33.7		SM	SANDSTONE (SAND, SILTY)
2	TP-2	6			7.6		SW-SM	SANDSTONE (SAND, WITH SILT)
2	TP-2	3			30.8		SC	SANDSTONE (SAND, CLAYEY)
3	1	15	11.9	118.1	66.7	0.1	CL	CLAYSTONE (CLAY, SANDY)
3	2	5			84.2		CL	CLAYSTONE (CLAY, WITH SAND)

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.3%
4	92.4%
10	67.0%
20	37.4%
40	25.3%
100	12.2%
200	9.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

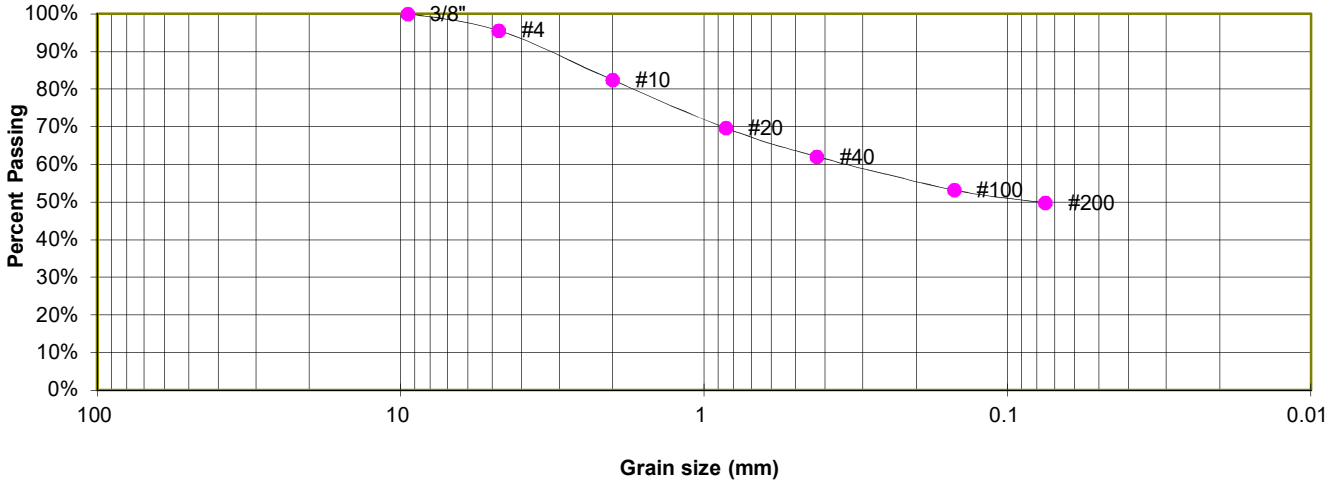
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO.
213150

FIG. C-1

TEST BORING	TP-1	SOIL DESCRIPTION	SANDSTONE (SAND, CLAYEY)
DEPTH (FT)	2	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.6%
10	82.4%
20	69.7%
40	62.1%
100	53.2%
200	49.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

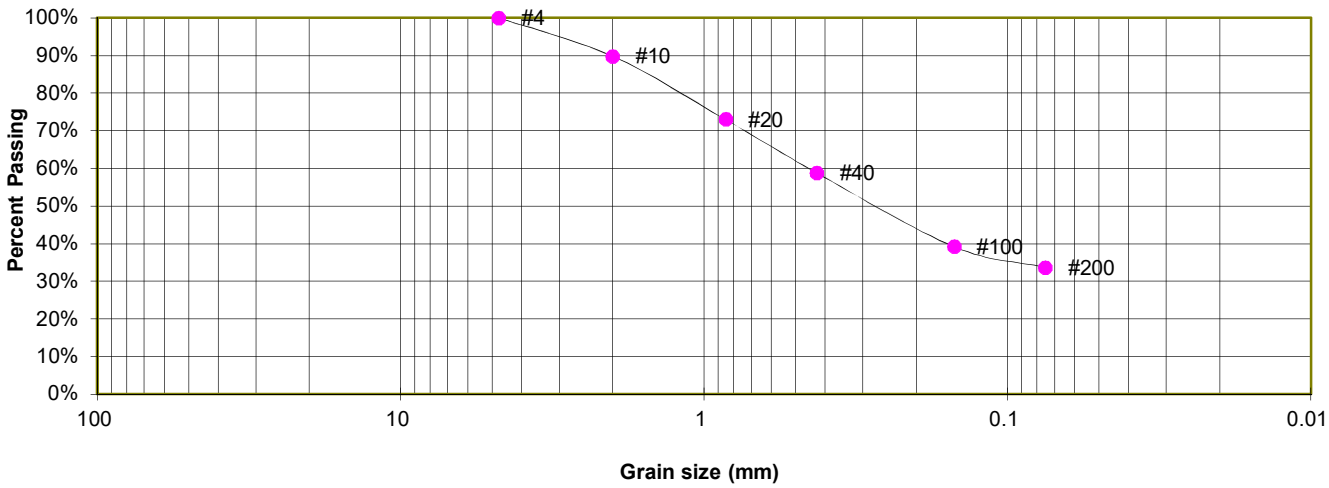
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-2

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	89.8%
20	73.0%
40	58.8%
100	39.2%
200	33.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

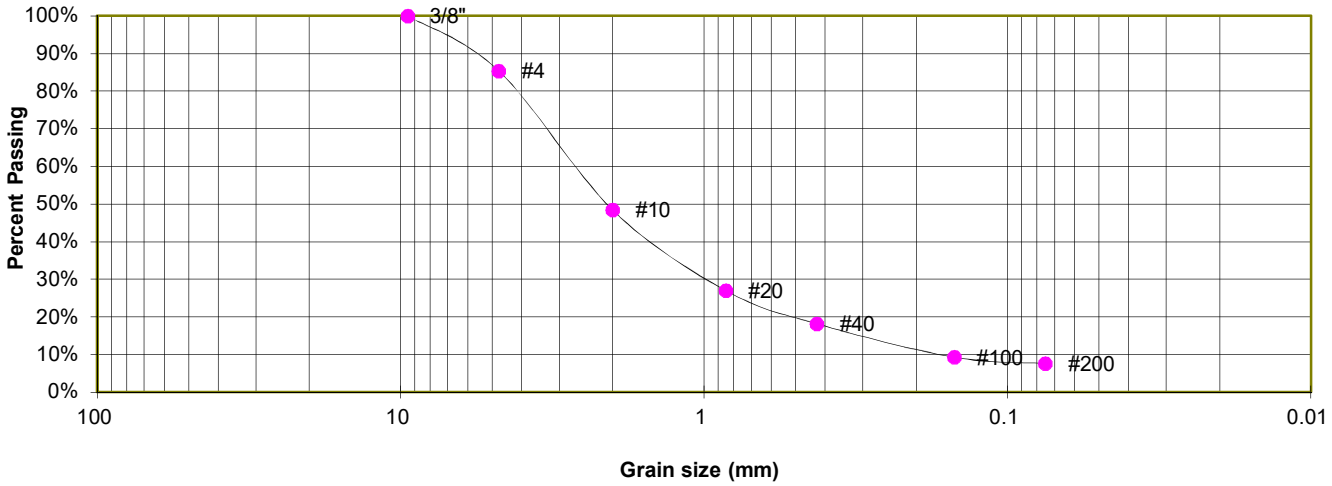
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-3

TEST BORING	TP-2	SOIL DESCRIPTION	SANDSTONE (SAND, WITH SILT)
DEPTH (FT)	6	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	85.4%
10	48.4%
20	27.0%
40	18.2%
100	9.3%
200	7.6%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

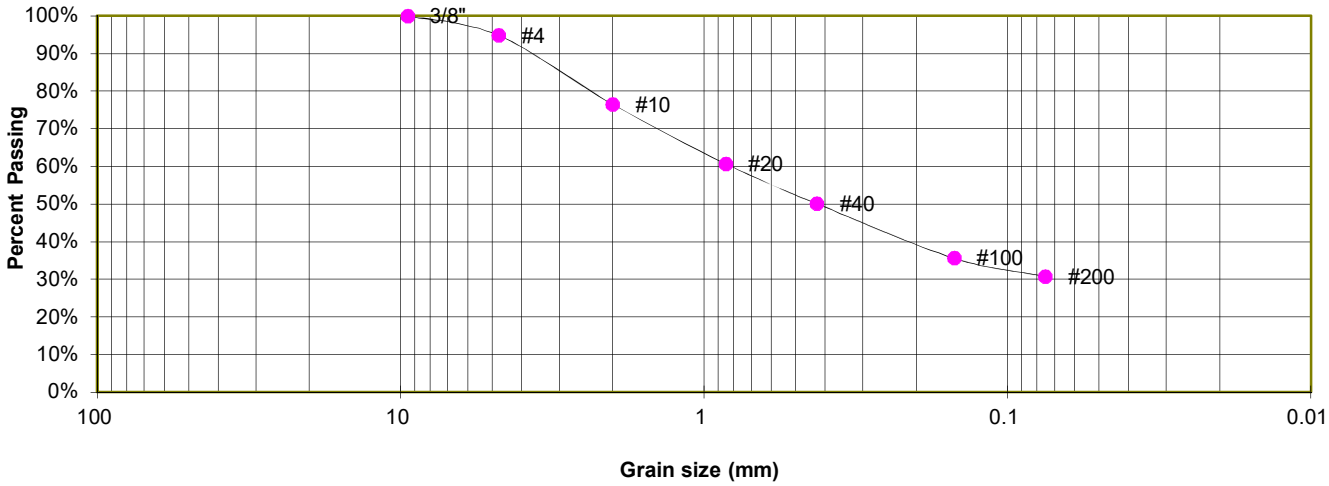
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-4

TEST BORING	TP-2	SOIL DESCRIPTION	SANDSTONE (SAND, CLAYEY)
DEPTH (FT)	3	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.8%
10	76.5%
20	60.7%
40	50.1%
100	35.6%
200	30.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

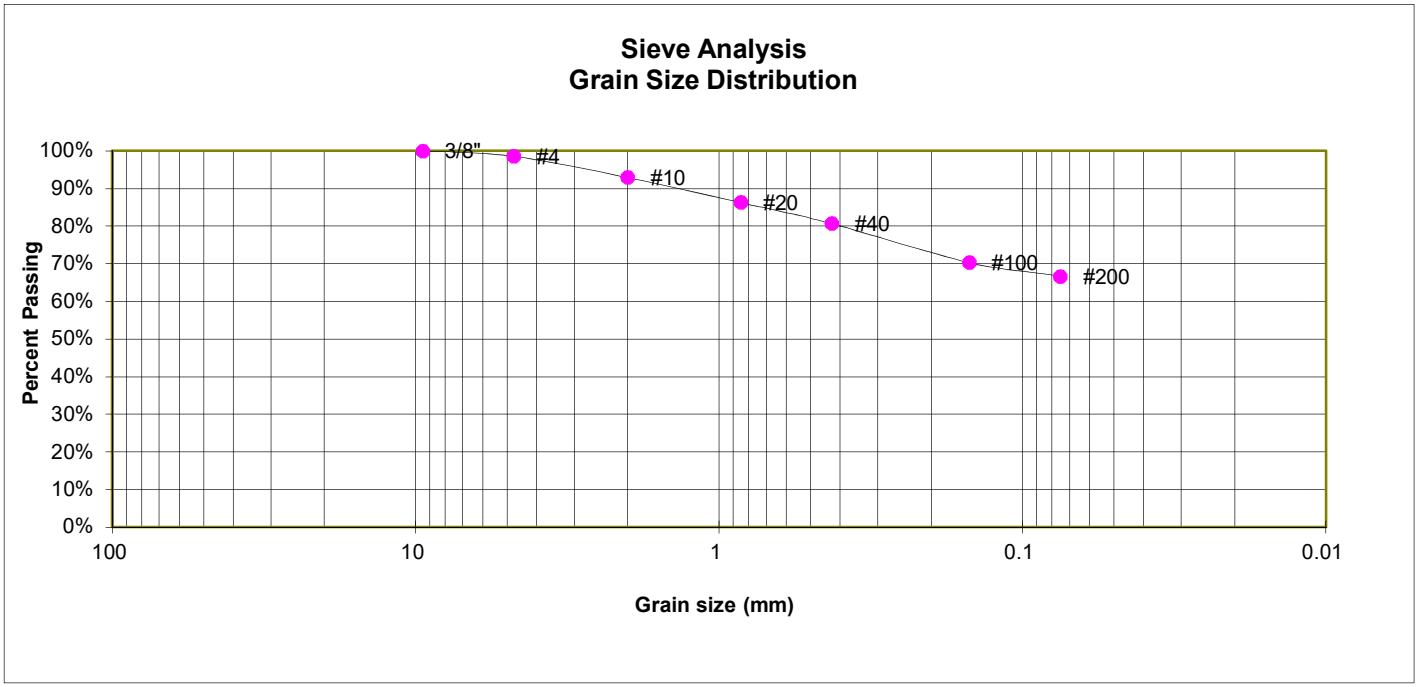
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-5

TEST BORING	1	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	15	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.5%
10	92.9%
20	86.3%
40	80.7%
100	70.3%
200	66.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

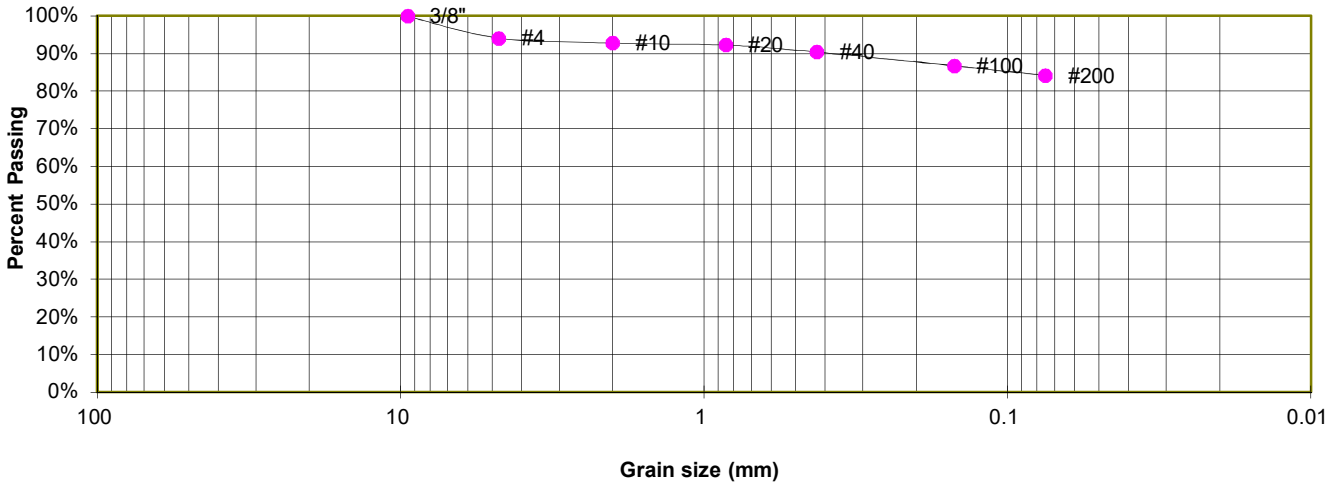
LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-6

TEST BORING	2	SOIL DESCRIPTION	CLAYSTONE (CLAY, WITH SAND)
DEPTH (FT)	5	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.1%
10	92.8%
20	92.3%
40	90.4%
100	86.8%
200	84.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-7

TEST BORING	1	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	15	SOIL TYPE	3

SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 118
NATURAL MOISTURE CONTENT: 11.9%
SWELL/COLLAPSE (%): 0.1%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

12120 CASEY LANE
LIONS DEN TRUST

JOB NO. 213150

FIG. C-8

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
Minor components: 5 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

Pleasant

Percent of map unit: 5 percent
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 22, Sep 3, 2024

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
Minor components: 5 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

Pleasant

Percent of map unit: 5 percent
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 22, Sep 3, 2024

APPENDIX E: El Paso County Health Department Existing Septic Records

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
INDIVIDUAL SEWAGE DISPOSAL SYSTEM INSPECTION FORM

Permit # 010462
Date 10/4/96

#62130-00-006

APPROVED: YES ✓ **NO** ____ ENVIRONMENTALIST KRUEGER

Address 12120 CASEY LN. Owner DELLACROCE

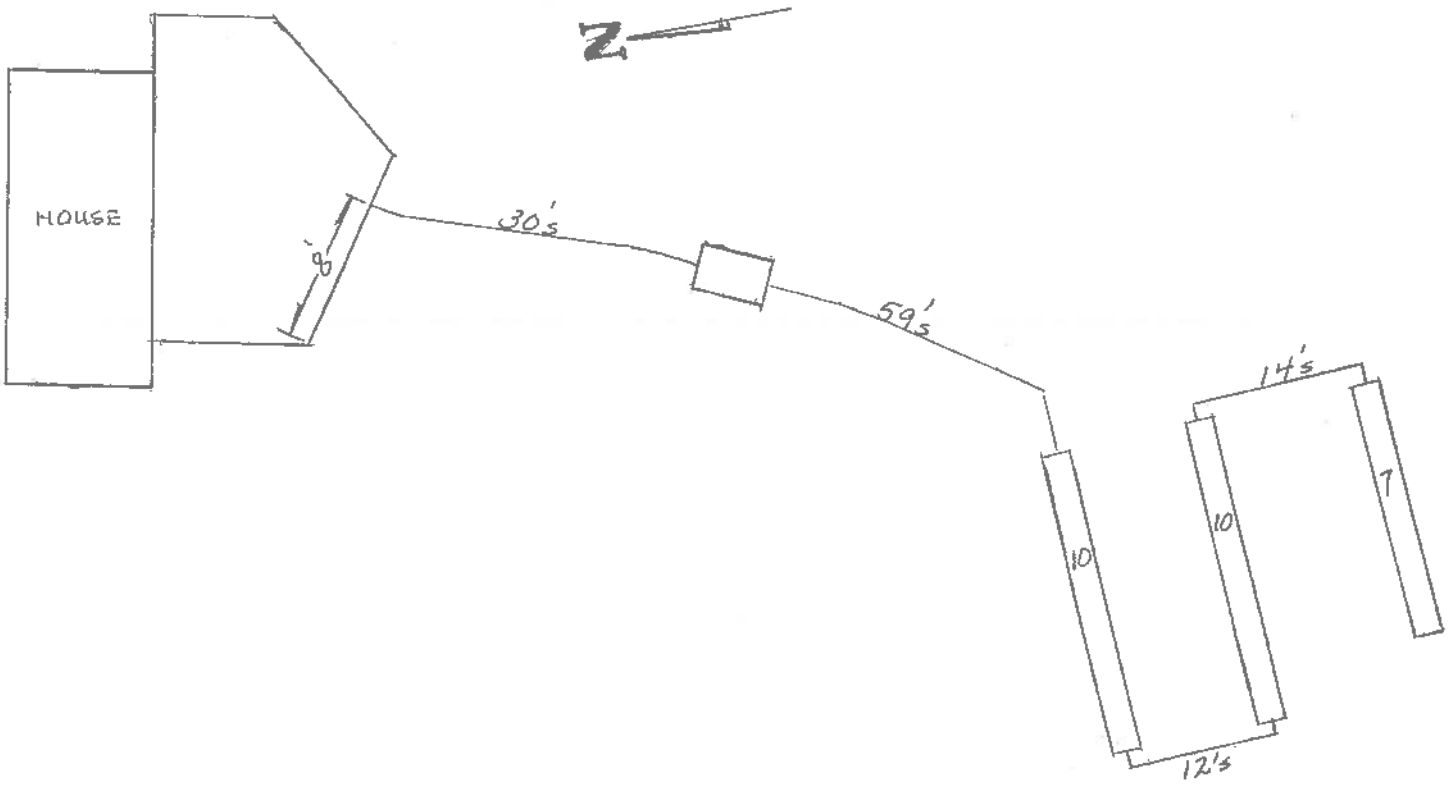
Legal Description ATTACHED
Residence ✓, # of bedrooms 3; Commercial ____; System Installer KUNAU

SEPTIC TANK:
Commercial ✓; Noncommercial ____, L ____, W ____, WD ____
Construction Material CONCRETE, capacity 1250 gallons.

DISPOSAL FIELD:
Rock Systems:
Trench: depth ____, width ____, total length ____, sq. feet ____
Bed: depth ____, length ____, width ____, sq. feet ____
Rock type ____, depth ____, under PVC ____, over PVC ____
Seepage Pits: # of pits ____, total # of rings ____, working depth(s) ____
size of pit(s) L X W ____, lining material ____, total sq. feet ____
Rockless Systems:
Chamber: Type INFILTRATOR, number of chambers 27, bed ____, trench ✓
sq. ft./section 18, reduction allowed 50 %, sq. ft required 604
total sq. ft. installed 972, depth of installation 12"-30"
Engineer Design Y or (N), Designing Engineer ____,
Approval letter provided? Y or N
Well 50 feet from tank Y or N 100 feet from leach field Y or N
Well installed at time of septic system inspection Y or (N) Public Water ____
*Approval will be revoked if in the future the well is found to be within 50 feet of the septic tank and/or 100 feet of the disposal field.

NOTES:

CASEY LN.



Acres 36.7 EL PASO COUNTY • DEPARTMENT OF HEALTH AND ENVIRONMENT

Water Supply WELL 301 South Union Blvd. • Colorado Springs, Colorado • 578-3125

Permit 010462

PERMIT

TO CONSTRUCT, ALTER, REPAIR OR MODIFY ANY INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Issued to RON & MARJORIE DELLACROCE Receipt No. 10C

Address of Property 12120 CASEY LANE, W2, E2, NW2, SEC: 13-T12S-R66W Date 8-5-96

(Permit valid at this address only) Phone 495-2843

Sewage-Disposal System work to be performed by Kernau Drilling Phone

This Permit is issued in accordance with 25-10-106 Colorado Revised Statutes 1973, as amended. PERMIT EXPIRES upon completion of installation of sewage-disposal system or at the end of twelve (12) months from date of issue--whichever occurs first-(unless work is in progress). This permit is revokable if all stated requirements are not met.

-THIS PERMIT DOES NOT DENOTE APPROVAL OF ZONING AND ACREAGE REQUIREMENTS-

$150.00
PERMIT FEE (NOT REFUNDABLE)

8-5-97
DATE OF EXPIRATION

DIRECTOR, DEPARTMENT OF HEALTH AND ENVIRONMENT

ENVIRONMENTALIST

NOTE: LEAVE ENTIRE SEWAGE-DISPOSAL SYSTEM UNCOVERED FOR FINAL INSPECTION. 48 HOUR ADVANCE NOTICE REQUIRED.

SEPTIC TANK:	TRENCH SYSTEM:	BED SYSTEM:	SEEPAGE PIT SYSTEM:
1250 gallons	total square feet *604 ____ ft. of trench ____ inches wide ____ ft. of trench ____ inches wide	total square feet	total square feet ____ rings or ____ diam. x ____ w/d

NOTES: MEET ALL APPLICABLE ISDS REGULATIONS. *RECOMMEND ADDITIONAL 60 PER CENT FOR WASHER AND DISPOSAL. MAINTAIN 4 FOOT SEPARATION BETWEEN BOTTOM OF TRENCHES AND BEDROCK.

The Health Office shall assume no responsibility in case of failure or inadequacy of a sewage-disposal system, beyond consulting in good faith with the property owner or representative. Free access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with requirements of this law.

ON FAX # 6213000006 P

10/04/96

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
301 South Union Boulevard
Colorado Springs, CO 80910-3123

APPLICATION TO CONSTRUCT, REMODEL OR INSTALL AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Ron & Marjorie Dellacroce — (719) 495-2843
Name of Owner — Phone

12120 Casey Ln., Black Forest — W½, E½, NW ¼ of section 13, T12S, R66W
Address of Property — Legal Description

P.O. Box 88174, Black Forest, CO 80908 — T.B.D — GENERAL CONTRACTOR:
Owner's Mailing Address — Septic Contractor and Phone # WESTERRA HOMES (719) 488-1772,

6213O-00-006 — Single Family — WELL
Tax Schedule Number — Type of Building by Use — Source of Water Supply

36.7 ac. — 3
Lot Size — MAXIMUM POTENTIAL NUMBER OF BEDROOMS

Basement Y (N) — Percolation Test Attached (Y) N — Garbage Disposal (Y) N — Clothes Washer (Y) N

I have supplied a plot plan as described on the back of this form. I acknowledge the completeness of the application is conditional upon such further mandatory and additional tests and reports as may be required by the Department to be made and furnished by a applicant for purposes of evaluating the application, and issuance of the permit is subject to such terms and conditions as deemed necessary to ensure compliance with rules and regulations adopted pursuant to C.R.S. 10-25-101 et. seq. I hereby certify all represented to be true and correct to the best of my knowledge and belief, and are designed to be relied on by the El Paso County Department of Health and Environment in evaluating the same for purposes of issuing the permit, applied for herein. I further understand any falsification or misrepresentation may result in the denial of the application or revocation of any permit granted based upon said application and in legal action for perjury as provided by law.

OWNER'S SIGNATURE Ronald J Della Croce Marjorie A Della Croce — Date 7-13-96

DEPARTMENT OF HEALTH USE ONLY

* 604 — 1250 — 7/9/96
Absorption Area — Tank Capacity — Date of Site Inspection

REMARKS: MEET ALL APPLICABLE ISDS REGS * RECOMMEND ADDITIONAL 60% FOR WASHER + DISPOSAL MAINTAIN 4' SEPARATION BETWEEN BOTTOM OF TRENCHES + BEDROCK

ok

Kmc — 7/9/96 — Application is APPROVED DENIED Pending Planning approval
ENVIRONMENTALIST — Date

PERMIT # 10462 — DATE TO EPC PLANNING DEPT 7/9/96

JPC 8-6-96

PROPERTY AND PERC HOLES MUST BE CLEARLY MARKED OR POSTED

The ORIGINAL of your percolation (perc) test is required.

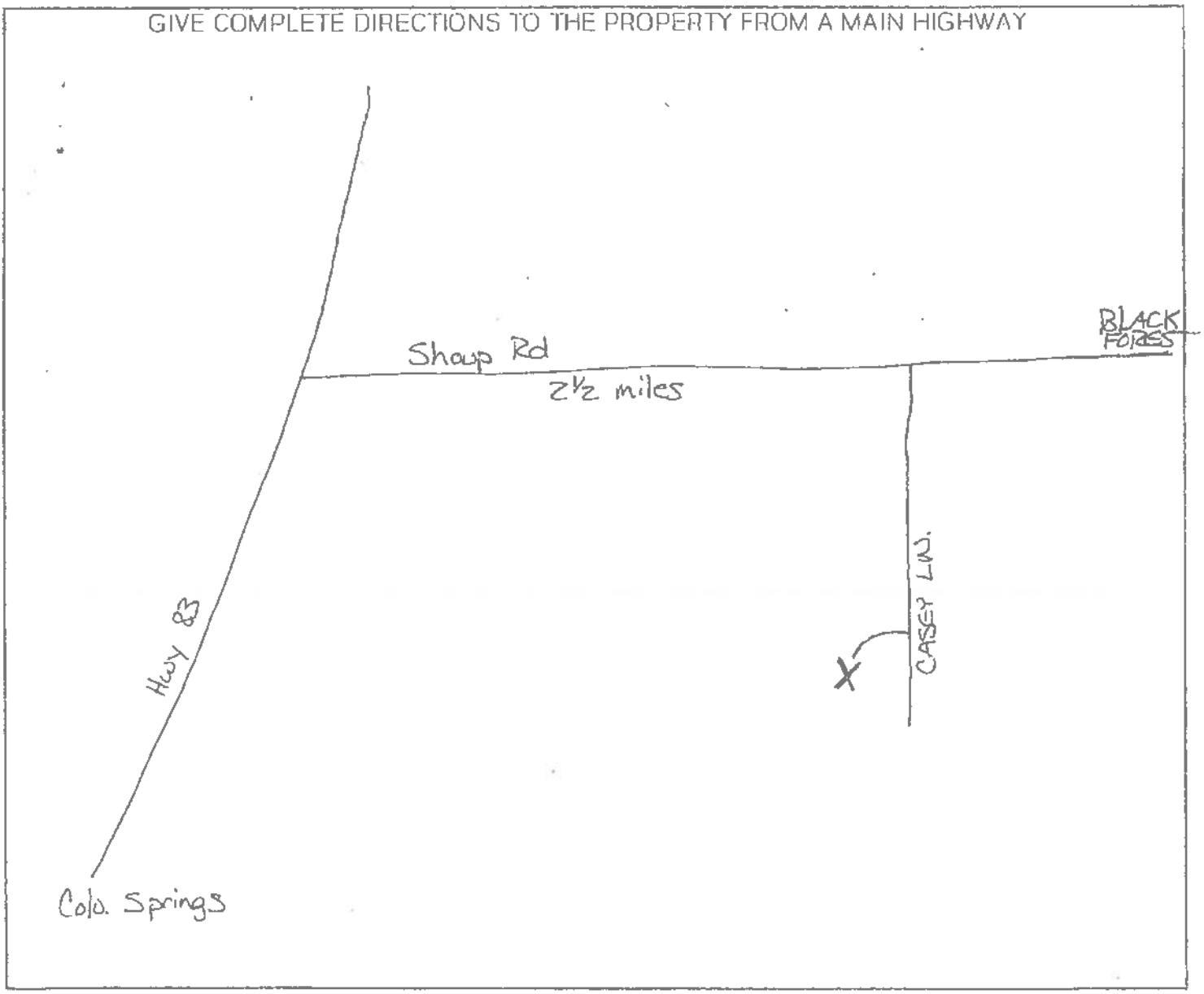
The following information must be on your PLOT PLAN.

- ✓ Property lines
- ✓ Proposed septic system site
- ✓ Well(s)
- ✓ Building(s)
- ~~Water line~~
- ✓ Subsoil drain(s)
- Property dimensions
- Designated alternate septic system site
- Adjacent property well(s)
- Proposed building(s)
- Cistern

If any of these are within 100 feet of your proposed septic system include on your plot plan

- Spring(s)
- Pond(s)
- Dry Gulch(s)
- Lake(s)
- Stream(s)
- Natural drainage course(s)

GIVE COMPLETE DIRECTIONS TO THE PROPERTY FROM A MAIN HIGHWAY



FRONT RANGE GEOTECHNICAL INC.

P.O. Box 1351
Monument, CO 80132
719 481-4560
Fax 481-9204

PERCOLATION TEST

FOR

RON & MARJORIE DELLACROCE

JOB #4318

**W 1/2 OF E 1/2, NW 1/2, Section 13,
TS 12 S, Range 66 West of the 6th PM,
12120 Casey Lane,
El Paso County,
Colorado**

Respectfully submitted,

Jeff Houchin
Geologist

Reviewed by,

9 JUL 96

Paul R. Bryant, P.E.
Civil Engineer

PERCOLATION TEST FINDINGS

Enclosed are the results of the percolation test for the septic system to be installed at **W 1/2 of E 1/2, NW 1/2, Section 13, TS 12 S, Range 66 West of the 6th PM, 12120 Casey Lane, El Paso County, Colorado.** The residence will not be on a public sewer system or on a public water system. The number of bedrooms in the design for the residence is three. Due to the natural slope of the property, the entire system will gravity feed to the southwest approximately 111 feet down slope. All applicable regulations of the El Paso County Health Department will be complied with for the installation of the disposal system.

The percolation test was performed on June 27, 1996, with three test holes being dug. The location of these test holes was determined by Troy Coats of Westerra Homes. These test holes had one foot of water placed in them and were allowed to pre-soak for 24 hours. For the test, the holes were filled to the bottom 25% of the hole and allowed to drain while measurements were taken every 10 minutes of the test. The field data and results of the percolation test are on the following page.

The average of the three test holes is one inch in 19.6 minutes which I feel is representative of the soils conditions in the area. A rate of one inch in 19.6 minutes will be adequate for the design and sizing of the disposal system. While there are some variations in the rate of percolation for each hole there is no significant variation in the composition of materials encountered while drilling these holes. The test and procedures conform to **El Paso County Health Department** regulations. The soil profile for the disposal system is as follows.

0 to 2"	-	Topsoil- sandy loam, organic composition.
2" to 9'	-	Sand- fine to medium grained, moderate density, moderate moisture and moderate clay content, moderate plasticity,
9' to 12'	-	Sandstone- very dense, same properties as above, buff-tan in color throughout.

No water was encountered during the drilling of all holes. Bedrock (sandstone) was encountered at 9 feet below the native ground level. No known wells were observed within 100 feet of the proposed system. The following setbacks shall be followed during the construction of the field: **All setbacks must be in compliance with the county regulations.**

If during construction of the field itself, subsurface conditions change considerably or if the location of the proposed field changes, this office shall be notified to determine whether the conditions are adequate for the system as designed or whether a new system needs to be designed.

Weather conditions at the time of the test consisted of sunny skies, with warm temperatures.

FRONT RANGE GEOTECHNICAL, INC

PERCOLATION TEST DATA FORM

NAME Ron & Marjorie Dellacroce ADDRESS 12120 Casey Lane SW 1/2 of E 1/2, NW 1/2, Sec. 13, T 12S, R 66W, 6th

CITY Black Forest STATE Colorado ZIP _____ PHONE _____

LOCATION OF TEST See Site Map COUNTY El Paso

WATER SUPPLY Private BEDROOMS 3 SLOPE S.W. 8%

DATE OF TEST 6-27-96 DIAMETER 5" DEPTH 32"

DROP IN INCHES

TIME	P-1	P-2	P-3
9:30			
9:40	3-	3 3/4	2 1/8
9:50	1 7/8	2 11/16	1-
10:00	1 1/2	1 7/8	7/8
10:10	1-	1 1/8	1/2
10:20	9/16	13/16	7/16
10:30	1/2	11/16	
10:40		5/8	
AVERAGE FOR EACH HOLE	20	16	22.9
TOTAL AVERAGE	1 INCH IN 19.6 MINUTES		

PROFILE 0-2" Topsoil;
2"-9' Sand-Fine to Medium Grained, Moderate Density, Moisture and Clay Content, Moderate Plasticity;
9'-12' Sandstone-Very Dense-Same Properties As Above, Buff-Tan Color Throughout.

GROUNDWATER None BEDROCK 9' Sandstone

Site Map

W 1/2 of E 1/2, NW 1/2, Section 13,
TS 12 S, Range 66 West ot the 6th PM,
12120 Casey Lane,
El Paso County, Colorado

Location from Found Survey Pin to PROFILE: S. 61° W. - 303'

Locations from PROFILE to:

P-1:	N. 30° W.	- 14'
P-2:	N. 62° E.	- 8'
P-3:	S. 21° E.	- 19'