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

SOILS AND GEOLOGY STUDY
THE COMMONS AT FALCON FIELD, FILING NO. 1
DEVELOPMENT PLAN AND FINAL PLAT
EL PASO COUNTY, COLORADO

Prepared for:
PT Falcon Field, LLC
1864 Woodmoor Drive, Suite 100
Monument, Colorado 80132

Attn: Steve Rossoll

May 1, 2025

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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

Reviewed by:

COLORADO LICENSED
JOSEPH COLLIN GOODE
23725
PROFESSIONAL ENGINEER

Digitally signed by Joseph C Goode Jr.
Date: 05/01/25

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

LLL:JCG/ed

PCD No. SF2435

Entech Job No. 240260

F:\AA Projects\2024\240260-PT Falcon Field, LLC-The Commons at Falcon Field-Geotech\09-Reports\SGS\240260 SGS.docx

Table of Contents

1 SUMMARY........ 1

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION 2

3 SCOPE OF THE REPORT........ 3

4 FIELD INVESTIGATION 3

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY........ 4

5.1 General Geology........ 4
5.2 Soil Conservation Survey........ 4
5.3 Site Stratigraphy 5
5.4 Soil Conditions........ 6
5.5 Groundwater........ 6

6 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS 8

6.1 Relevance of Geologic Conditions to Land Use Planning 13

7 ECONOMIC MINERAL RESOURCES 16

8 EROSION CONTROL 17

9 ROADWAY, EMBANKMENT, and STORMWATER DETENTION FACILITY CONSTRUCTION RECOMMENDATIONS 18

10 CLOSURE........19

11 REFERENCES........20

FIGURES
Figure 1: Vicinity Map
Figure 2: USGS Map
Figure 3: Site and Exploration Plan
Figure 4: Proposed Cut/Fill Plan
Figure 5: Soil Survey Map
Figure 6: Falcon Quadrangles Geologic Map
Figure 7: Geology/Engineering Geology Map
Figure 8: Floodplain Map
Figure 9: Perimeter Drain Detail
Figure 10: Interceptor Drain Detail
Figure 11: Under Slab Drain Detail (Capillary Break)
Figure 12: Overexcavation Drain Detail
Figure 13: Sewer Underdrain Detail

APPENDIX A: Site Photographs
APPENDIX B: Test Boring Logs
APPENDIX C: Laboratory Test Results
APPENDIX D: Test Boring Logs and Laboratory Test Summary (2020 Borings)
APPENDIX E: Soil Survey Descriptions
APPENDIX F: Colorado Geological Survey Review Comments dated January 10, 2025

1 SUMMARY

Project Location

The project lies in a portion of the N½ of Section 7, Township 13 South, Range 64 West, in El Paso County, Colorado. The site is south of Woodmen Road and Highway 24, ½ mile east of Falcon, Colorado.

Project Description

The total acreage involved for The Commons at Falcon Field is approximately 57 acres. The first phase of the project, Filing No. 1, consists of eight commercial lots covering 19.4 acres. Residential development is proposed for Filing Nos. 2 and 3. Overlot grading is proposed for the entire development, along with the installation of the proposed storm culvert to modify the floodplain when Filing No. 1 is dewatered. Three full-spectrum detention ponds and other associated site drainage improvements are proposed. We also understand that the development will utilize a central water and sewer system.

Scope of Report

The report presents the results of our geologic investigation and treatment of engineering geologic hazard study. This report presents the results of our geologic reconnaissance, a review of available maps, aerial photographs, and our conclusions with respect to the impacts of the geologic conditions on development.

Land Use and Engineering Geology

This site was found to have constraints associated with shallow groundwater, surface waters, a spring, and a floodplain, which will impose constraints on development and land use. Shallow groundwater will result in constraints with respect to the depth of excavation. Other geologic conditions include hydrocompaction, expansive soils, unstable slopes, and artificial fill. These conditions will be discussed in greater detail in Section 6.0 of this report.

It is our opinion that the proposed development can be completed if the groundwater and surface drainage are properly mitigated. All recommendations are subject to the limitations discussed in the report. The report was revised to address El Paso County and Colorado Geological Survey (CGS) review comments.

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the N½ of Section 7, Township 13 South, Range 64 West, in El Paso County, Colorado. The site is located south of Woodmen Road and Highway 24, ½ mile east of Falcon, Colorado. The location of the site is as shown on the Vicinity Map (Figure 1).

The topography of the site varies from gently sloping over the majority of the site to steep slopes along the drainage in the central portion of the site. The drainages on-site trend in southerly to southeasterly directions. At the time of this investigation, water was observed flowing in the two drainages in the central and eastern portions of the site, and areas of persistent shallow groundwater existed across the site. The site boundaries are indicated on the USGS Map (Figure 2). Previous land uses have been agricultural, as the area has been primarily used as grazing and pasture land. The site contains primarily field grasses and weeds over the entire site, with trees around the previous house and outbuildings in the eastern portion of the site. Site photographs are included in Appendix A.

The total acreage involved for The Commons at Falcon Field is approximately 57 acres. The first phase of the project, Filing No. 1, consists of eight commercial lots covering 19.4 acres. Overlot grading is proposed for the entire development, along with the installation of the proposed storm culvert to modify the floodplain. Three full-spectrum detention ponds and other associated site drainage improvements are proposed. We also understand that the development will utilize a central water and sewer system.

The Site and Exploration Plan is presented in (Figure 3), and the proposed Cut/Fill Plan is presented in Figure 4. The grading plan prepared by Drexel Barrell & Company indicates cuts for the proposed detention ponds and large areas of the western portion of the site. Fill is proposed along Highway 24, in the drainage/floodplain in the central portion of the site, and across the majority of the eastern portion of the site.

The site was previously investigated by Entech Engineering, Inc. in the following reports:

- *Soil, Geology, Geologic Hazard Study, McLarty 57-Acre Parcel, Highway 24 and Woodmen Road,* dated February 23, 2004 (Reference 1)
- *Soils and Geology Study, The Commons at Falcon Field,* revised date July 21, 2023 (Reference 2)

3 SCOPE OF THE REPORT

The scope of the report will include a general geologic analysis utilizing published geologic data. Detailed site-specific mapping was conducted to obtain general information with respect to major geographic and geologic features, geologic descriptions, and their effects on the development of the property in accordance with the El Paso Land Development Code.

4 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The site was also evaluated using a survey by the Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS). The position of mappable units within the subject property is shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements and air photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Engineering Geology Map, which identified pertinent geologic conditions affecting development. The field mapping was initially performed by personnel of Entech on January 14, 2021 and June 30, 2023. Field mapping has continued during our previous site investigations and current investigations of The Commons at Falcon Field Filing No. 1. The most recent site observations were made on April 4, 2025. Site photographs are included in Appendix A.

Seventeen (17) additional test borings were completed across the site from January to April 2025. Temporary piezometers were installed in the open borings following the completion of drilling. The additional borings were placed in areas that are anticipated to need dewatering, areas of proposed cuts on the proposed lots along Highway 24, the proposed detention ponds, and in potential exfiltration basin areas to evaluate the overall groundwater levels across the project site. Continued seasonal monitoring of the piezometers across the site will be conducted by Entech.

The Test Boring Logs and Laboratory Test Results are included in Appendices B and C. The results of the testing will be discussed later in this report. Laboratory testing was performed to classify and determine the engineering characteristics of the soils. Laboratory tests included moisture content testing (ASTM D2216), grain-size analysis (ASTM D422), and Atterberg Limits testing (ASTM D4318). Swell testing included both FHA Swell Tests and Swell/Consolidation Tests.

Seven (7) test borings were previously drilled in December 2020 across the project site to determine the classification and engineering characteristics of the soils. Six (6) temporary piezometers were also placed across the site in 2023 to evaluate the extent of seasonal groundwater fluctuation across the site. The locations of the previously completed test borings and piezometers are indicated on the Site and Exploration Plan (Figure 3). The previous Test Boring Logs and Laboratory Testing Summary are included in Appendix D.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

The site lies in the western portion of the Great Plains Physiographic Province. Approximately 16 miles to the west is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be gently dipping in a northeasterly direction (Reference 3). The rocks in the area of the site are sedimentary in nature and typically Tertiary to Cretaceous in age. The bedrock underlying the site itself is the Dawson Formation. Overlying this formation are unconsolidated deposits of alluvium, eolian, and man-made soils. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Survey

The Natural Resource Conservation Service (Reference 4), previously the Soil Conservation Service (Reference 5), has mapped three soil types on the site (Figure 6). In general, they vary from sandy loam to loam and sandy loam with gravelly sandy loam. The soils are described as follows:

Exhibit 1: Soil Survey Descriptions

Type	Description
8	Blakeland loamy sand, 1 to 9% slopes
19	Columbine gravelly sandy loam, 0 to 3% slopes

Complete descriptions of each soil type are presented in Appendix E. The soils have generally been described as having moderate to rapid permeabilities. Soil Type 8 has been described by the Soil Conservation Service to provide good support for home sites. The potential for flooding is present in some areas on Soil Type 19. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. Most of the soils have been described as having moderate erosion hazards.

5.3 Site Stratigraphy

The Falcon Quadrangle Geologic Map showing the site is presented in Figure 5 (Reference 6). The Geology Map prepared for the site is presented in Figure 6. Four mappable units were identified on this site, which are described as follows:

Qaf **Artificial Fill of Holocene Age:** These are man-made fill deposits are associated with erosion berms and an earthen dam on-site.

Qal **Recent Alluvium of Holocene Age:** These are recent stream deposits associated with some of the drainages on site.

Qp **Piney Creek Alluvium of Holocene Age:** This material is a water deposit alluvium, typically classified as a silty to well-graded sand, brown to dark brown in color, and of moderate density. The Piney Creek Alluvium can sometimes be very highly stratified, containing thin layers of very silty and clayey soil.

Qes **Eolian Sand of Quaternary Age:** These are medium to fine-grained soils deposited on the site by the action of the prevailing winds from the west and northwest. They typically occur as large dune deposits or narrow ridges. These soil types are typically tan to brown in color and tend to have a very uniform or well-sorted gradation. These materials tend to have a relatively high permeability and low density.

The bedrock underlying the site is the Dawson Formation of Tertiary to Cretaceous Age. This formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone, and claystone. The bedrock encountered in the test borings consisted of silty sandstone and sandy claystone. The claystone is typically expansive. Bedrock was encountered at depths ranging from 16 to 19 feet in three of the test borings drilled on site.

The soils listed above were mapped from site-specific mapping of the site, the *Geologic Map of the Falcon Quadrangle* by Morgan and White, 2012 (Reference 6), and the *Geologic Map of the Pueblo 1x2 Quadrangle, South-Central Colorado*, distributed by the USGS in 1979 (Reference 7). The Test Borings and Test Pit Logs used in evaluating the site are included in Appendix B. The Geology Map prepared for the site is presented in Figures 8 and 9.

The site has a significant amount of fill, what are the soil conditions of the fill material brought to the site?

5.4 Soil Conditions

The soils encountered in the test borings drilled on the site can be grouped into four general soil and rock types. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 classified as a sand with silt to silty sand (SW-SM, SM). The sand was encountered at very loose to dense states in all the test borings at depths ranging from the existing ground surface to 4 feet below the ground surface (bgs) and extending to depths ranging from 8 feet bgs to the termination of the borings (20 feet).

Soil Type 2 classified as a sandy to very sandy clay (CL). The clay was encountered at firm to very stiff consistencies in four of the test borings at depths ranging from the existing ground surface to 16 feet bgs and extending to depths of 3 and 16 feet bgs or to the termination of the borings (20 feet). FHA Swell Testing resulted in an expansion pressure of 520 psf, indicating low expansion potential. Swell/Consolidation Testing resulted in a volume change of 0.5%, indicating low expansion potential.

Soil Type 3 classified as silty sandstone bedrock (SM) or as a silty sand when classified as a soil. The sandstone was encountered at very dense states in nine of the test borings at a depths ranging from 9 to 19 feet bgs and extending to the termination of the boring (20 feet).

Soil Type 4 classified as a sandy to very sandy claystone bedrock (CL) or sandy to very sandy clay when classified as a soil. The claystone was encountered at hard consistencies in five of the test borings at depths ranging from 14 to 19 feet and extended to the termination of the borings (20 feet). Swell/Consolidation Testing of the claystone resulted in a volume change of 0.7%, indicating low expansion potential. Moderately to highly expansive claystone is common in the area.

The test boring logs and laboratory test results pertaining to this investigation are included in Appendix B and summarized in Table B-1. The profile holes and laboratory test results from References 1, 2, and 3 are included in Appendix D and E.

5.5 Groundwater

Groundwater was encountered in all the test borings at 1.5 to 12.5 feet in the borings previously completed on the site in 2020. Six (6) temporary piezometers were installed across the site in 2023 to evaluate groundwater levels and seasonal fluctuation. Areas of shallow, seasonally shallow groundwater, and ponded water have been mapped in the drainages and some low-lying areas on the site. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors including development of the site and surrounding areas.

Seventeen (17) additional test borings were completed across the site from January to April 2025. Temporary piezometers were installed in the open borings following the completion of drilling. The additional borings were placed in areas that are anticipated to need dewatering, areas of proposed cuts on the proposed lots along Highway 24, the proposed detention ponds, and potential exfiltration basin areas to evaluate the overall groundwater levels across the project site.

Locations of previous test borings and piezometers and recently completed test borings are indicated on Figures 3, 4, and 7. The readings taken for the piezometers are presented in Exhibits 2 through 4 below, and will continue to be monitored during the development process.

Exhibit 2: Piezometers installed June 2023

Piezometer	Groundwater Level (ft.) 2/23/2024	Groundwater Level (ft.) 5/16/2024	Groundwater Level (ft.) 3/12/2025	Groundwater Level (ft.) 4/4/2025	Proposed Approx. Cut/Fill (ft.)
P1 (2023)	1.2	0.5	1	1	8
P1E (2023)	Surface	Surface	Surface	Surface	8
P1W (2023)	0.6	0.5	1	1	8
P2* (2023)	6.8	N/A*	N/A*	N/A*	5
P3 (2023)	2.7	2.7	2.7	2.6	1
P4 (2023)	9.8	3.5	4	4.2	8

* P2 has been removed/covered by fill stockpile

Exhibit 3: Piezometers installed January 2025 (Filing 2)

Piezometer	Groundwater Level (ft.) 1/21/2025	Groundwater Level (ft.) 2/24/2025	Groundwater Level (ft.) 3/12/2025	Groundwater Level (ft.) 4/4/2025	Proposed Approx. Cut/Fill (ft.)
P5 (1/15/2025)	2	Frozen	1.7	1.5	2
P6 (1/15/2025)	2.5	Frozen	2.6	2.5	3
P7 (1/17/2025)	1	Frozen	1	0.5	1
P8 (1/17/2025)	2	Frozen	1	1	1
P9 (1/17/2025)	2	Frozen	1	1	1

Exhibit 4: Piezometers installed February and April 2025 (Filing 1 and 3)

Piezometer	Groundwater Level (ft.) 2/24/2025	Groundwater Level (ft.) 3/12/2025	Groundwater Level (ft.) 4/4/2025	Proposed Approx. Cut/Fill (ft.)
P10 (2/1/2025)	4.4	3.8	3.8	2.5
P11(2/21/2025)	6.3	6.3	6.2	7
P12 (2/21/2025)	5.5	5.5	4.2	0.5
P13 (2/21/2025)	7	6.1	6.1	0.4
P14 (2/21/2025)	7	6.8	6.5	7
P15 (2/21/2025)	7.6	7.1	7	2
P16 (4/3/2025)	N/A	N/A	9.9	7
P17 (4/3/2025)	N/A	N/A	7.8	2
P18 (4/3/2025)	N/A	N/A	3.6	1
P19 (4/3/2025)	N/A	N/A	6	2
P20 (4/3/2025)	N/A	N/A	8.6	N/A
P21 (4/3/2025)	N/A	N/A	9.8	N/A

cut is deeper than GW

For the sandy materials on site, it should be noted that 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 occurrence of such subsurface water features during construction on site and mitigate as necessary at the time of construction.

6 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

Detailed mapping has been performed on this site to produce an Engineering Geology Map (Figure 7). This map shows the location of various geologic conditions that the developers should monitor during the planning, design, and construction stages of the project. The constraints/hazards identified on this site include artificial fill, hydrocompaction, potentially expansive soils, seasonal and potentially seasonal shallow groundwater areas, areas of ponded water, springs, unstable slopes, and floodplains. These constraints/hazards and the recommended mitigation techniques include:

Artificial Fill – Constraint

These are areas of man-made fill associated with an earthen dam, erosion berms, and temporary stockpile observed on the site to be used in the overlot grading of the property.

Mitigation: The existing fill across the site will be mitigated with the proposed site grading and construction of the proposed stormwater facilities. Any uncontrolled fill encountered beneath foundations will require removal and recompaction at a minimum of 95% of the Modified Procter (ASTM D1557) maximum dry density.

Hydrocompaction – Constraint

Areas in which hydrocompaction has been identified are acceptable as building sites. In areas identified for this hazard classification, however, we anticipate a potential for settlement movements upon saturation of these surficial soils. The low density, uniform grain-sized, windblown sand deposits are particularly susceptible to this type of phenomenon. Additionally, loose or collapsible soils may be encountered on this site.

Mitigation: The potential for settlement movement is directly related to the saturation of the soils below the foundation areas. Therefore, good surface and subsurface drainage is extremely critical in these areas in order to minimize the potential for saturation of these soils. The ground surface around all permanent structures should be positively sloped away from the structure to all points, and water must not be allowed to stand or pond anywhere on the site. We recommend that the ground surface within 10 feet of the structures be sloped away with a minimum gradient of 5%. If this is not possible on the upslope side of the structures, then a well-defined swale should be created to intercept the surface water and carry it quickly and safely around and away from the structures. Roof drains should be made to discharge well away from the structures and into areas of positive drainage. Where several structures are involved, the overall drainage design should be such that water directed away from one structure is not directed against an adjacent building. Planting and watering in the immediate vicinity of the structures, as well as general lawn irrigation, should be minimized.

Expansive Soils – Constraint

Expansive soils were encountered in some of the test borings drilled on site and as a part of the previous investigation (References 1 and 2). These areas are sporadic; therefore, none have been indicated on the map. Expansive clays and claystone, if encountered, can cause differential movement in the structure foundation.

Mitigation: Should expansive soils be encountered beneath foundations, 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 the Modified Proctor (ASTM D1557) maximum dry density is a suitable mitigation that is common in the area. Overexcavation depths of 3 to 5 feet may be necessary, depending on soil conditions. Another alternative in areas of highly expansive soils is the use of drilled pier foundation systems. 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. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement have been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be made after additional investigation of each building site.

Slope Stability and Landslide Hazard

The majority of the slopes on-site are gently sloping and do not exhibit any past or potential unstable slopes or landslides. Some of the steeper slopes along the drainage in the central portion of the site have been identified as unstable slopes. The mitigation recommendation for these areas is as follows:

Unstable Slopes – Hazard

The steep slopes along the drainage in the central portion of the site have been identified as unstable. These are areas where cut banks along the drainage have eroded, and slope angles are generally 45 degrees to near vertical along the drainage.

Mitigation: According to the grading plan prepared by Drexel Barrell & Company, the drainage area with the unstable slopes in the central portion of the site will be regraded and filled, mitigating the unstable slopes hazard. Fill should be placed on native soils or bedrock and properly benched into the slopes. Dewatering of the area may be required during site grading prior to placing fill. The drainage is to be routed through a pipe or box culvert.

Debris Fans – Hazard

Based on on-site observations, debris fans were not observed in this area.

Drainage and Floodplain Areas – Constraint

Areas of the site have been identified as seasonal and potentially seasonal shallow groundwater areas. Additionally, shallow groundwater was encountered in some of the borings (less than 5 feet) and is identified as areas of shallow groundwater. A spring is located in the northeastern portion of the property along Rio Lane. Water was observed flowing in this area and along the drainage at the time of our recent site observations. The drainage in the central portion of the site west of the existing house has been mapped as a floodplain zone according to the FEMA Map Nos. 08041CO553G and 08041CO561G (Figure 8, Reference 8). The minor drainage to the east of the house is not mapped as a FEMA floodplain; however, it is a physiographic floodplain. These areas are indicated on the Geology/Engineering Geology Map (Figure 6). The existing drainages will be routed through a pipe or box culvert. These areas are further discussed as follows:

Seasonal Shallow Groundwater – Constraint: In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and possible frost-heave potential, depending on the soil conditions. These are areas where surface soils, topography, or vegetation indicate the yearly presence of shallow groundwater. The site map shows areas with high groundwater conditions during our investigation.

Mitigation: In these locations, foundations subject to severe frost-heave potential should penetrate sufficient depth to discourage the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth for frost protection of 30 inches is recommended. In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the intrusion of water into areas located below grade. A typical perimeter drain detail is presented in Figure 8. Unstable conditions should be expected where excavations approach the groundwater level. Stabilization using shot rock or geogrids may be necessary. Interceptor, underslab drains, capillary breaks, or overexcavation drains may be necessary to dewater the excavations. Drain details are presented in Figures 9 through 13. Underdrains along the utilities will be utilized to control groundwater. The underdrains will be connected to exfiltration areas.

Useable areas located below grade are not recommended for the commercial site. All soft or organic soils should be removed prior to any construction or filling. Further investigation will be necessary to determine the groundwater depth at each building site. Some areas of the site appear to be caused by springs and perched water.

It should be noted that shallow groundwater is anticipated across a large part of the site. Minimal excavation is recommended for the site. A minimum 30-inch depth is recommended for frost protection; however, deeper excavations are not recommended. Excavation depths can be reduced by building or filling the areas around the buildings to provide frost protection. Unstable soil conditions will likely be encountered where groundwater is encountered in excavations. Dewatering and soil stabilization of the excavation using shot rock or geofabric may be necessary. Builders should be cognizant of the potential for the occurrence of subsurface water during construction on site. Installation of utilities will likely require trench stabilization.

Based on the proposed cut depths, groundwater will likely be encountered in the excavations of the detention ponds. Temporary dewatering may be necessary for the construction of the detention ponds.

Provide mitigation recommendations for groundwater in the ponds. If temp dewatering is anticipated, what are the permanent mitigation measures going to need to be for the ponds which will exceed a 30 in excavation depth.

Note that UBSC GW District has requirements for any dewatering.

Potentially Seasonal Shallow Groundwater – Constraint: In these areas, we would anticipate the potential for periodic high subsurface moisture conditions and frost heave potential. Organic soils are also possible in areas mapped for potentially seasonal shallow groundwater, but are not expected to be as extensive as in areas mapped for seasonal shallow groundwater. These areas did not indicate the yearly presence of shallow groundwater in the surface soils and vegetation, as the seasonal high groundwater areas did. However, based on topography, site conditions, and groundwater measured in the test borings, these areas were mapped as having the potential for high groundwater during high moisture periods or years. The same mitigation recommendations for Seasonal Shallow Groundwater areas apply to these Potentially Seasonal High Groundwater areas. Further investigation of each building site may be necessary to delineate the depth to groundwater.

Floodplain – Constraint: The drainage in the central portion of the site has been mapped as a floodplain zone according to the FEMA Map Nos. 08041CO553G and 08041CO561G (Figure 8, Reference 8). There is also an unmapped physiographic floodplain in the eastern portion of the site. Any construction considered in a floodplain area will require approval of the drainage plan. Lots immediately adjacent to the floodplain may experience higher groundwater levels during peak flows. Subsurface perimeter drains are recommended for structures adjacent to the floodplain to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 8. Finished floor levels must be a minimum of one floor above the floodplain level. Exact floodplain locations by drainage studies are beyond the scope of this report.

Shallow Groundwater Areas: Areas identified with this hazard include those areas outside of drainage areas where shallow groundwater was encountered in the test borings. In these areas, the groundwater encountered may be associated with perched groundwater conditions. This is extremely common in the area, particularly where permeable sands associated with Eolian sand deposits exist over impermeable clayey sandstone or claystone. The potential for shallow groundwater also exists in areas identified for seasonal shallow groundwater and potentially seasonal shallow groundwater, as discussed previously. The same mitigation recommendations for seasonal shallow groundwater areas apply to these areas of known shallow groundwater. Overlot grading may influence the depth of groundwater and its effects on development. Specific recommendations should be made after grading plans are finalized.

Areas of Ponded Water: This is an area of ponded water associated with an earthen dam on site. The main portion of the dam has been breached on the east side; however, some water still ponds in a low area behind the dam. The pond and dam area exist in the area proposed as a detention pond and will be avoided by structures. Should construction or regrading of the pond site be considered, all organic matter and soft, wet soils should be completely removed before filling. Any drainage into these areas should be rerouted in a non-erosive manner off the site, where it does not create areas of ponded water around proposed structures.

Spring: This area lies within the floodplain area on the eastern portion of the site; therefore, recommendations for the floodplain should be followed for the spring area. Additionally, should development be considered in this area, interceptor drains will be necessary to capture water and transport it safely around structures. It is anticipated that dewatering and drainage systems will be necessary for this site, particularly in the drainage area below the spring in the northeastern portion of the site.

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 10). The average radon level for the 80831 zip code is 4.5 pCi/l. The following is a table of radon levels in this area:

Exhibit 5: Average Radon Levels

Average Radon Levels for the 80831 Zip Code	
0 < 4 pCi/L	0.00%
4 < 10 pCi/L	100.00%
10 < 20 pCi/L	0.00%
> 20 pCi/L	0.00%

Mitigation:

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

6.1 Relevance of Geologic Conditions to Land Use Planning

The first phase of The Commons at Falcon Field Filing No. 1 consists of eight (8) commercial lots over 19.4 acres. Overlot grading is proposed for the entire development along with the installation of a proposed storm culvert to direct channel flows across the site. Three full-spectrum detention ponds and other associated site drainage improvements are proposed. The existing geologic and engineering geologic conditions will impose constraints on some development and construction. The most significant problems affecting development will be those associated with shallow groundwater and surface drainage on the site. Useable areas below grade are not recommended for the site. Additional investigation on each building site is recommended after grading plans are finalized and grading is completed. Soil stabilization will likely be required where groundwater is encountered in excavations and utility trenches. Building elevations should be kept as high as possible, with the ground surface positively sloping away from the structure at all points. Dewatering of some of the building sites may be necessary.

The upper soils were encountered at medium dense states. Spread footing foundations are anticipated for the site. Areas of loose soils, if encountered, will require recompaction. Expansive layers may also be encountered in the soil and bedrock on this site. These areas are sporadic; therefore, no areas were indicated on the maps. Expansive soils, if encountered, will require special foundation design. These soils will not prohibit development.

Areas of seasonal shallow groundwater have been mapped in the drainage area in the central area of the site. This area will be regraded and the drainage will be routed through a pipe or box culvert. The potential exists for seasonally high subsurface moisture conditions across most of the site. Areas of perched groundwater on the site may require drainage systems in order to dewater the area. Cuts for the detention ponds and the western and northern portions of the site are proposed. Filling the eastern portion of the site, as indicated on preliminary plans, will further raise foundations above the groundwater level. A sanitary sewer underdrain will be utilized to control groundwater. The underdrain will be tied into exfiltration areas on the site. Test borings along the east side of the site indicated water levels of 6 to 8 feet. All soft or organic soils should be removed prior to fill placement. Proposed foundation grades should be a minimum of 3 feet above the highest anticipated groundwater levels.

Unstable soils will be encountered where excavations approach the groundwater level. Shallow groundwater areas may also affect utility installation. Geogrids or shot rock may be necessary to stabilize excavations. Foundations should be kept as high as possible. Foundations in or adjacent to seasonal shallow groundwater areas may require drains to control seepage within the foundation zone. Typical drain details are presented in Figures 9 through 12. Basements or useable areas below grade are not recommended for the site. Additional investigation is recommended after grading and the storm sewer and other drainage improvements are installed to re-evaluate groundwater conditions. Proposed foundation grades should be a minimum of 3 feet above the highest anticipated groundwater levels.

Six (6) temporary piezometers were installed across the site in 2023 to evaluate groundwater levels and seasonal fluctuation. Areas of shallow and seasonally shallow groundwater and ponded water have been mapped in the drainages and some low-lying areas on the site.

Seventeen (17) additional test borings (P5–P21) were completed across the site from January to April 2025. Temporary piezometers were installed in the open borings following the completion of drilling. The additional borings were placed in areas that are anticipated to need dewatering, areas of proposed cuts on the proposed lots along Highway 24, the proposed detention ponds, and potential exfiltration basin areas to evaluate the overall groundwater levels across the project site.

Locations of previous test borings, piezometers, and recently completed test borings are indicated on Figures 3, 4, and 7. The readings taken for the piezometers are presented in Exhibits 2 through 4 below and will continue to be monitored during the development process.

Floodplain areas have been mapped in the central and eastern portions of the site, as indicated on the Geology/Engineering Geology Map and Floodplain Map (Figures 7 and 8). Areas in the eastern portions of the site will require approval of the Drainage Report that excludes them from the FEMA floodplain prior to construction. Finished floor elevations must be a minimum of one foot above the floodplain level. Specific floodplain locations and drainage studies are beyond the scope of this report.

According to the preliminary overall grading plan, the unstable slopes along the central drainage will be filled and regraded when the box culvert is installed, mitigating the unstable slope hazard. The eastern portion of the site, where standing water was observed, will be filled. Fill should be placed on native soils or bedrock and properly benched into the slopes. Dewatering of the area may be required during site grading prior to placing fill. The drainage is to be routed through a pipe or box culvert. Based on the current grading plans, the proposed cuts in the ponds and western portion of the site will extend into the current groundwater levels, potentially limiting the capacity of the full-spectrum detention ponds. Additional utility drains should be considered along the northwestern side of the commercial lots. Any interceptor or underdrains should gravity discharge into exfiltration areas. Permanent drain systems will be required for this site. Maintenance of the drain system will be required. Test borings P18 and P19 were drilled along the eastern side of the south extension of the overall property. Groundwater was encountered at depths of 3.6 to 6 feet. Borings P16 and P17 on the southern end of the site encountered water at 9.9 and 7.8 feet. Borings P20 and P21 were drilled just east of the site. Groundwater was at 8.6 and 9.8 feet in these borings. The eastern side of the site P18 and P19 is to be filled. The eastern end and southern end of the site are potential exfiltration basin locations.

Soil susceptible to erosion will also require consideration during development. Erosion problems are extremely common throughout the region and may be satisfactorily mitigated through proper engineering design and construction of drainage systems.

Areas of hydrocompaction, where there is the potential for settlement movements upon saturation of the surficial soils, have been identified on this site. Good surface and subsurface drainage is critical in these areas, and the ground surface should be positively sloped away from structures at all points. Roof drains should be made to discharge well away from structures, and planting and watering in the immediate vicinity of structures should be minimized.

In summary, the granular soils will provide suitable support for shallow foundations on site. Groundwater and surface drainage will affect construction on the site. Drains adjacent to utility lines will be utilized to control groundwater. Stabilization of soils will likely be required where groundwater is encountered in the excavations. Additional investigation is recommended after grading plans are finalized.

7 ECONOMIC MINERAL RESOURCES

Some of the sandy materials on site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 11), portions of the area are mapped as stream terraces 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 12), areas of the site are not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 13), the area of the site has been mapped as “Little or No Potential” for industrial minerals. It is possible that sand materials on site could be an aggregate resource. However, considering the silty to clayey nature of many of these materials, the abundance of similar materials throughout the region, and the 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 13), 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 near the site. No metallic mineral resources have been mapped on the site (Reference 13).

The site has been mapped as "Fair" for oil and gas resources (Reference 13). No oil or gas fields have been discovered near the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, they may not be considered a significant resource. Hydraulic fracturing is a new method used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health, and safety.

8 EROSION CONTROL

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

Regarding 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 for 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 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 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 revegetation 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.

Provide permanent recommendations for the ponds if groundwater is encountered. The ponds can't have continuous groundwater flow into them.

9 ROADWAY, EMBANKMENT, and STORMWATER DETENTION FACILITY CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for the proposed roadways and embankments. Based on the proposed cut depths, groundwater will likely be encountered in the excavations of the detention ponds. Temporary dewatering may be necessary for the construction of the detention ponds. Groundwater may be encountered in deeper cuts in the areas mapped with the shallow groundwater (sg), seasonal shallow groundwater (sw), and low-lying areas across the site. Additional investigation of these areas is recommended as plans are completed. If excavations encroach on the groundwater level, unstable soil conditions may be encountered. Excavation of saturated soils will be difficult with rubber-tired equipment. Stabilization using shot rock or geogrids may be necessary.

What is the recommendation for pond linings to separate groundwater and surface water?

Any areas to receive fill should have all topsoil, organic material, or debris removed. Prior to fill placement, Entech should observe the subgrade. Fill must be properly benched and compacted to minimize potentially unstable conditions in slope areas. Fill slopes should be 3:1 or flatter. The subgrade should be scarified and moisture conditioned to within 2% of optimum moisture content and compacted to a minimum of 95% of the Modified Proctor (ASTM D1557) maximum dry density 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 the Modified Proctor (ASTM D1557) maximum dry density. These materials should be placed at a moisture content conducive to compaction, usually 0 to +/-2% of the Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech during construction. Entech should approve any imported materials prior to placing or hauling them to the site. Additional investigation will be required for pavement designs once roadway grading is completed and utilities are installed.

10 CLOSURE

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

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Construction and design personnel should be made familiar with the contents of this report. Additional investigation is recommended as plans (grading and development) are generated prior to construction on individual building sites.

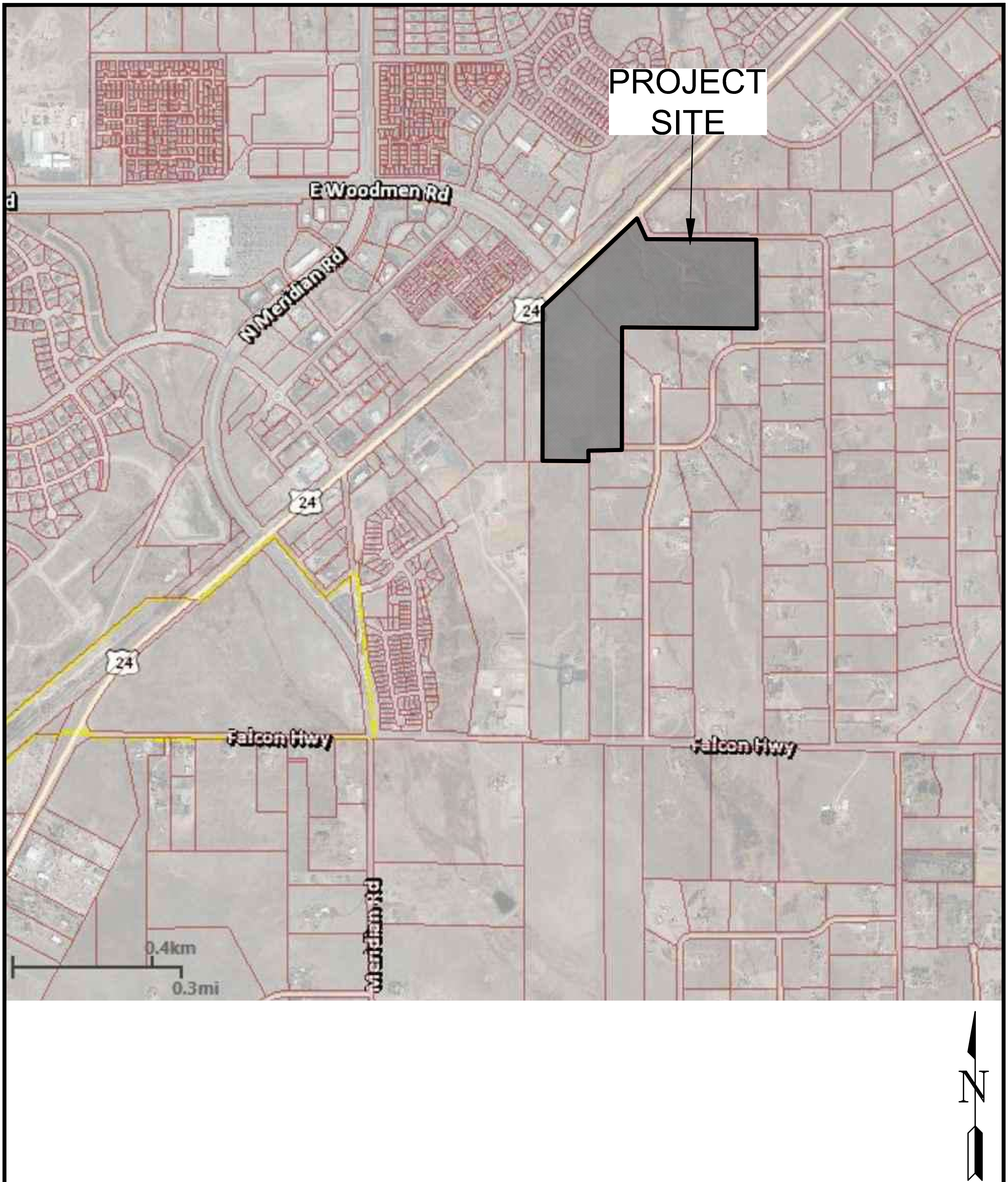
This report has been prepared for PT Falcon Field, LLC for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty, expressed or implied, is made.

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

11 REFERENCES

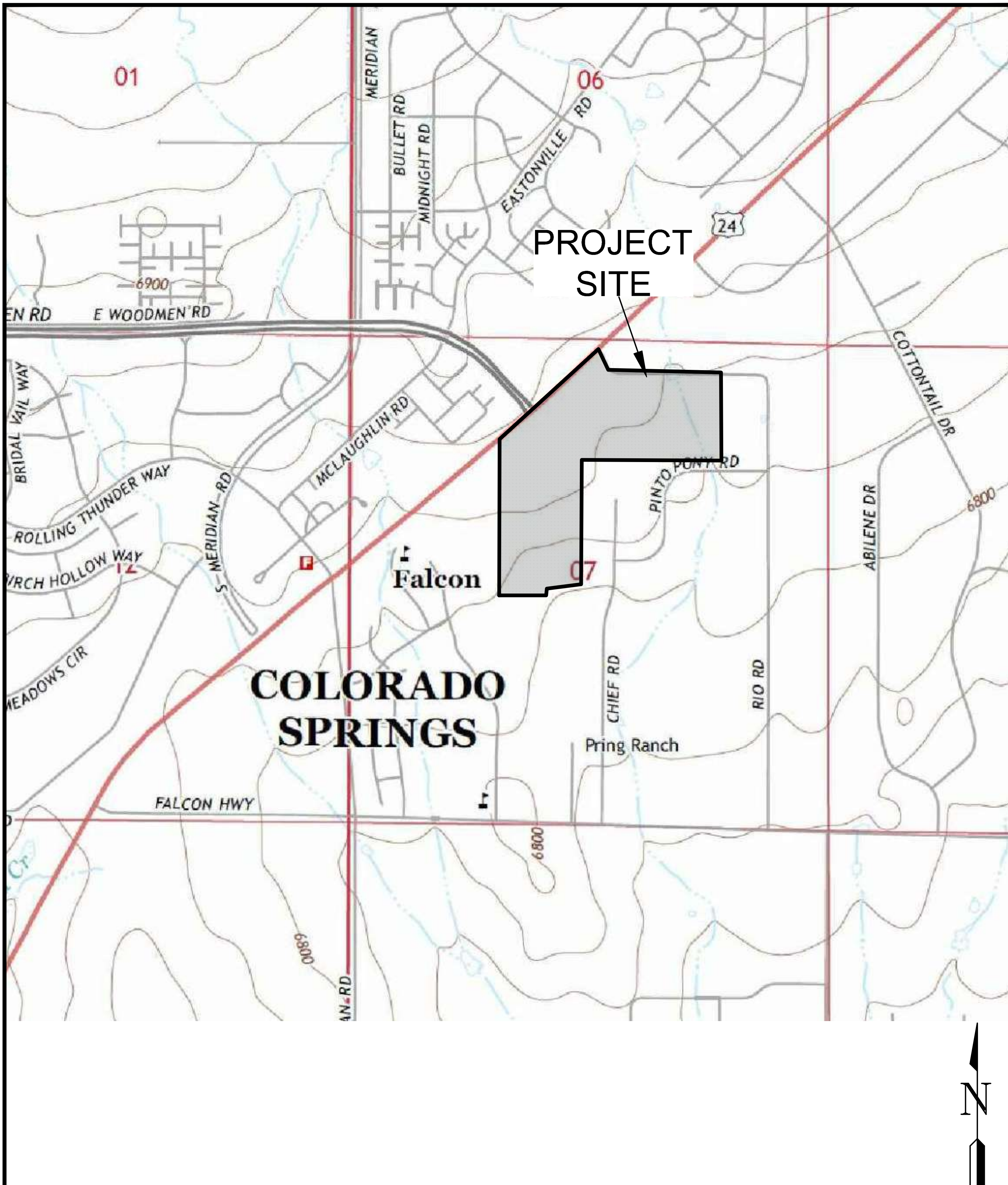
1. Entech Engineering, Inc., February 23, 2004. *Soil, Geology and Geologic Hazard Study, McLarty 57-Acre Parcel, Highway 24 and Woodmen Road, El Paso County, Colorado.* Entech Job No. 96643.
2. Entech Engineering, Inc., revised July 21, 2023. *Soils and Geology Study, The Commons at Falcon Field, Parcel Nos. 43070-00-001 and 430720-00-015, El Paso County, Colorado.* Entech Job No. 202649.
3. Natural Resource Conservation Service, June 20, 2007. *Web Soil Survey.* United States Department of Agriculture, hhtp://web soil survey.nrcs.usda.gov.
4. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado.*
5. Scott, Glen R.; Taylor, Richard B.; Epis, Rudy C. and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1˚x2˚, South-Central Colorado.* Sheet 2. U.S. Geologic Survey. Map I-1022.
6. Morgan, Matthew L. and White, Jonathan L. 2012. *Geologic Map of the Falcon Quadrangle, El Paso County, Colorado. Colorado Geological Survey.* Open-File Report 12-05.
7. Scott, Glen R.; Taylor, Richard B.; Epis, Rudy C. and Wobus, Reinhard A. 1978. *Geologic Map of the Pueblo 1˚x2˚, South-Central Colorado.* U.S. Geologic Survey. Map I-1022.
8. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Numbers 08041CO553G and 08041CO561G.
9. U.S. Fish & Wildlife Service, May 1, 2020. *National Wetlands Inventory*. Department of the Interior, fws.gov/wetlands/data/Mapper.html.
10. Colorado Geological Survey. 1991. *Results of the 1987-88 EPA Supported Radon Study in Colorado.* Open-file Report 91-4.
11. El Paso County Planning Development. December 1995. *El Paso County Aggregate Resource Evaluation Maps.*
12. Schwochow, S.D., Shroba, R.R., and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties*. Colorado Geological Survey. Special Publication 5-B.
13. Keller, John W., TerBest, Harry, and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.

FIGURES



ENTECH ENGINEERING, INC.

VICINITY MAP	JOB NO. 240260
THE COMMONS AT FALCON FIELD FILING NO. 1 PT FALCON FIELD, LLC	**FIG. 1**



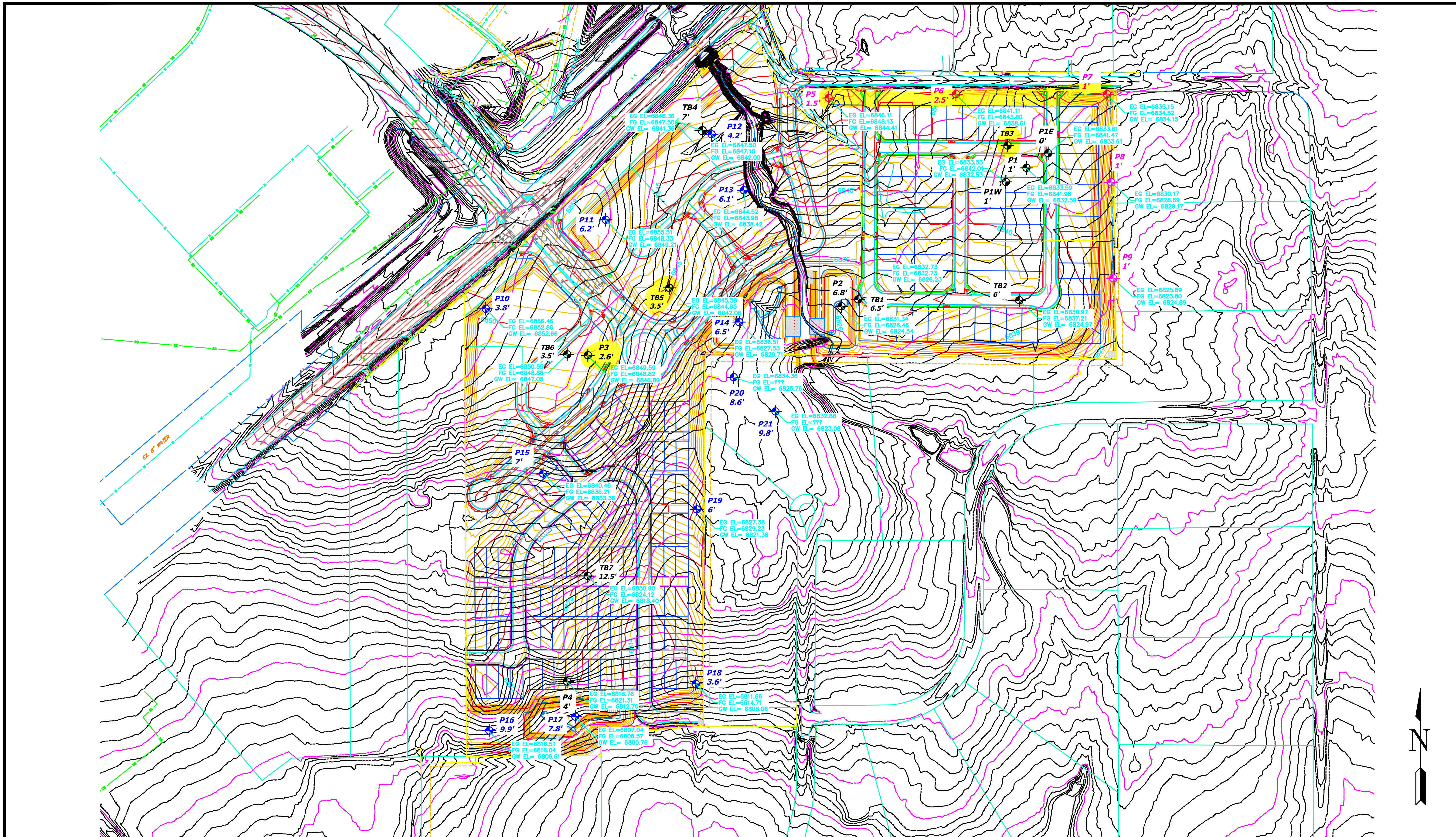
ENTECH ENGINEERING, INC.

USGS TOPOGRAPHY MAP

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO.
240260

FIG. 2



P- APPROXIMATE TEST BORING/PIEZOMETER LOCATION AND NUMBER (DRILLED 2/21/25 - 4/3/25)

P- APPROXIMATE TEST BORING/PIEZOMETER LOCATION AND NUMBER (DRILLED 1/15/25 & 1/17/25)

P- APPROXIMATE PIEZOMETER LOCATION AND NUMBER (DRILLED 6/2023)

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (DRILLED 12/2020)

P2 - APPROXIMATE PHOTOGRAPHIC LOCATION AND DIRECTION

(Identified areas requiring further specific study for public improvements are highlighted)

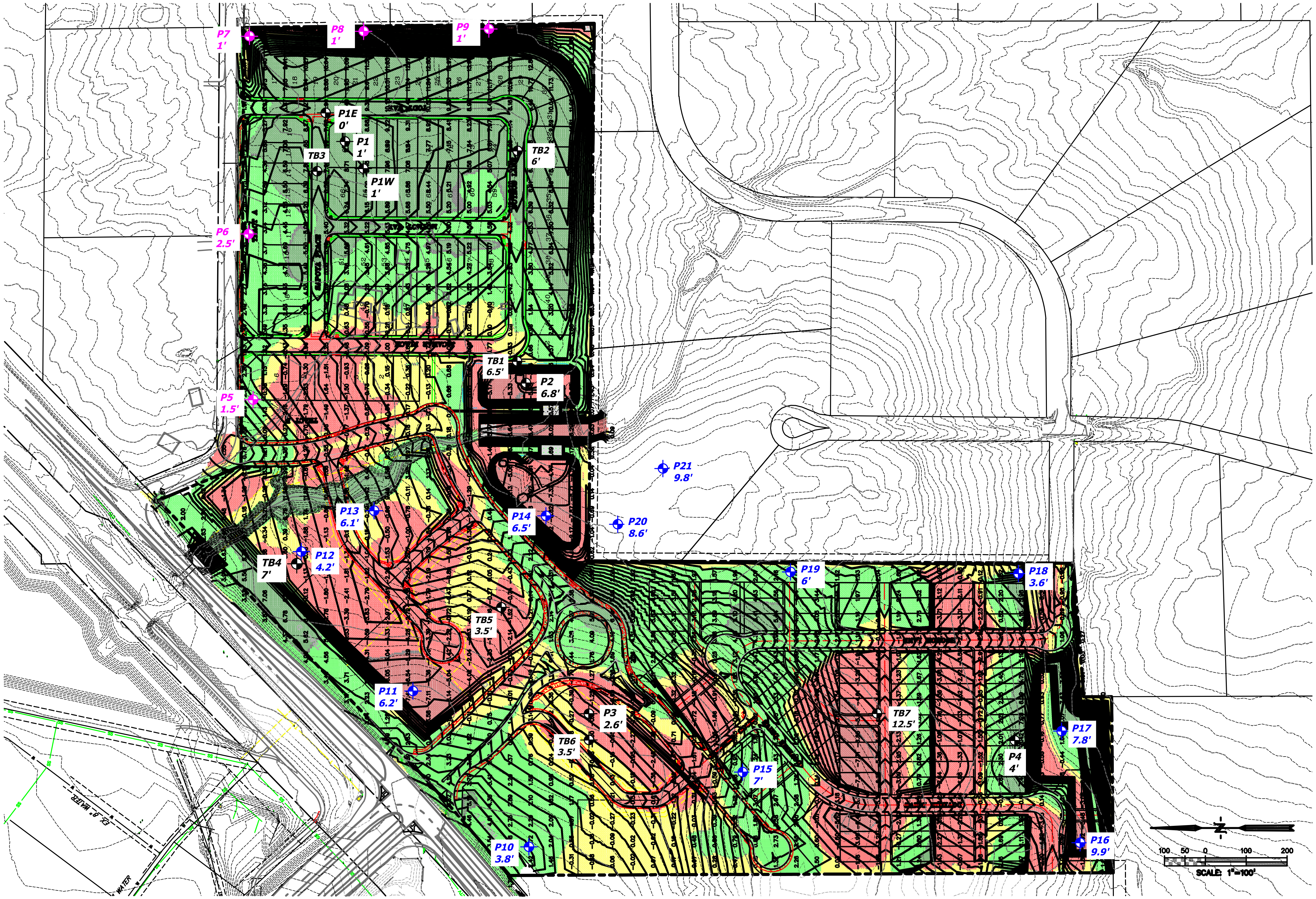
ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO. 240260

FIG. 3



P- APPROXIMATE TEST BORING/PIEZOMETER LOCATION AND NUMBER (DRILLED 2/21/25 - 4/3/25)

P- APPROXIMATE TEST BORING/PIEZOMETER LOCATION AND NUMBER (DRILLED 1/15/25 & 1/17/25)

P- APPROXIMATE PIEZOMETER LOCATION AND NUMBER (DRILLED 6/2023)

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (DRILLED 12/2020)

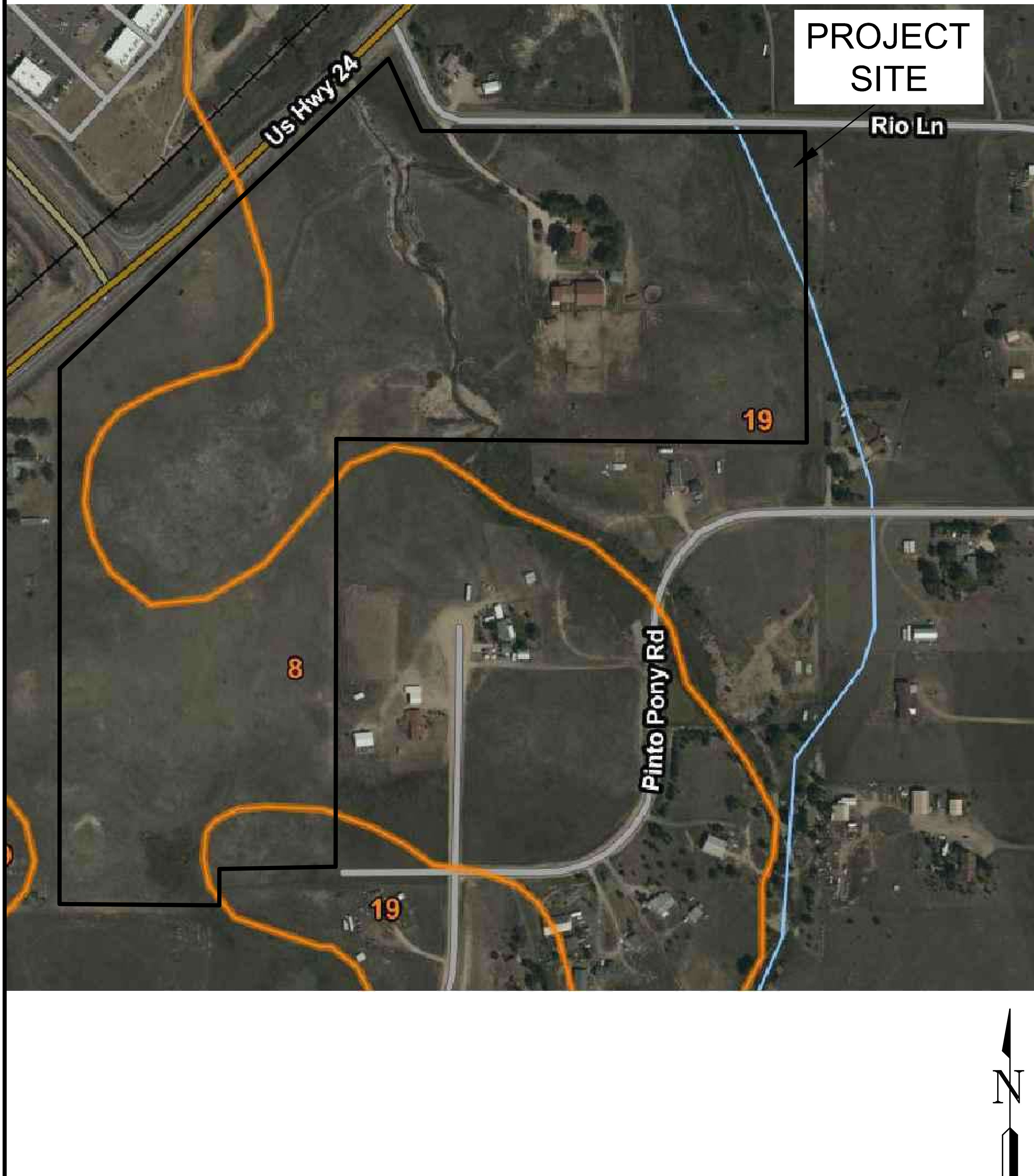
ENTECH ENGINEERING, INC.

PROPOSED CUT FILL PLAN

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO.
240260

FIG. 4



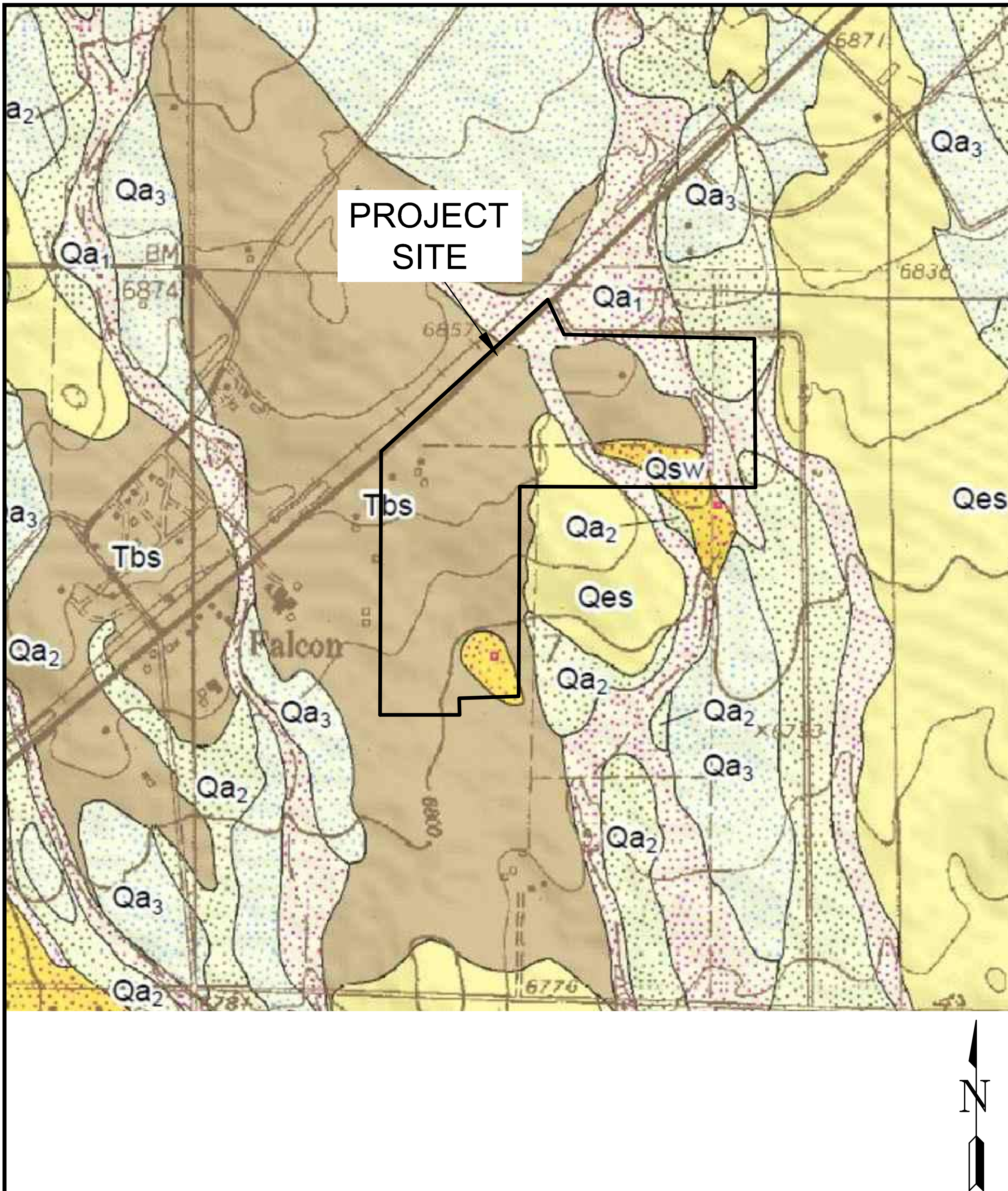
ENTECH ENGINEERING, INC.

SOIL SURVEY MAP

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO.
240260

FIG. 5



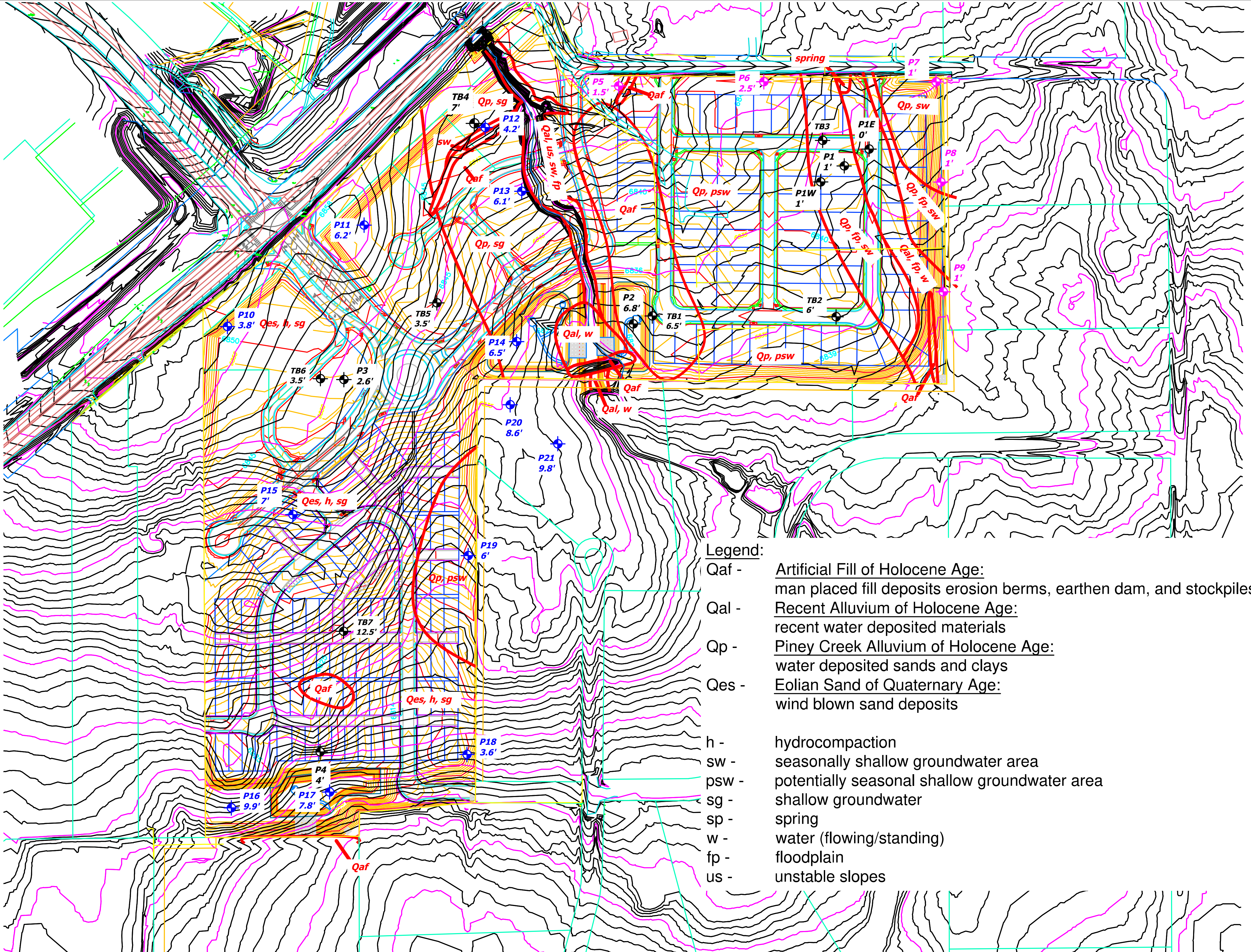
GEOLOGIC MAP OF THE FALCON QUADRANGLE

THE COMMONS AT FALCON FIELD FILING NO. 1

PT FALCON FIELD, LLC

JOB NO. 240260

FIG. 6



Legend:

Qaf - Artificial Fill of Holocene Age:
man placed fill deposits erosion berms, earthen dam, and stockpiles

Qal - Recent Alluvium of Holocene Age:
recent water deposited materials

Qp - Piney Creek Alluvium of Holocene Age:
water deposited sands and clays

Qes - Eolian Sand of Quaternary Age:
wind blown sand deposits

h - hydrocompaction
sw - seasonally shallow groundwater area
psw - potentially seasonal shallow groundwater area
sg - shallow groundwater
sp - spring
w - water (flowing/standing)
fp - floodplain
us - unstable slopes

P- APPROXIMATE TEST BORING/PIEZOMETER LOCATION AND NUMBER (DRILLED 2/21/25 - 4/3/25)
P- APPROXIMATE TEST BORING/PIEZOMETER LOCATION AND NUMBER (DRILLED 1/15/25 & 1/17/25)
P- APPROXIMATE PIEZOMETER LOCATION AND NUMBER (DRILLED 6/2023)
TB- APPROXIMATE TEST BORING LOCATION AND NUMBER (DRILLED 12/2020)

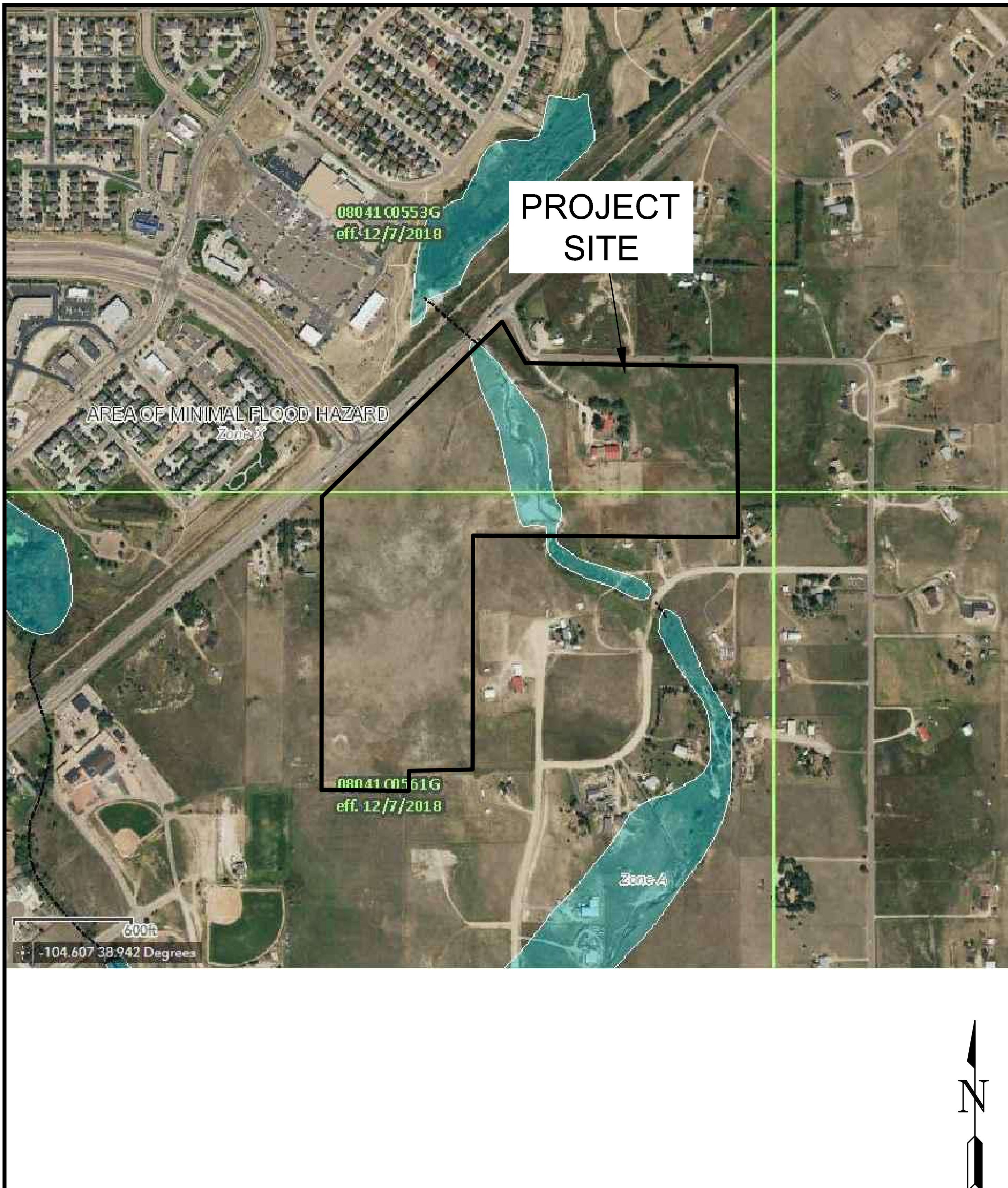
ENTECH ENGINEERING, INC.

GEOLOGY / ENGINEERING MAP

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO. 240260

FIG. 7



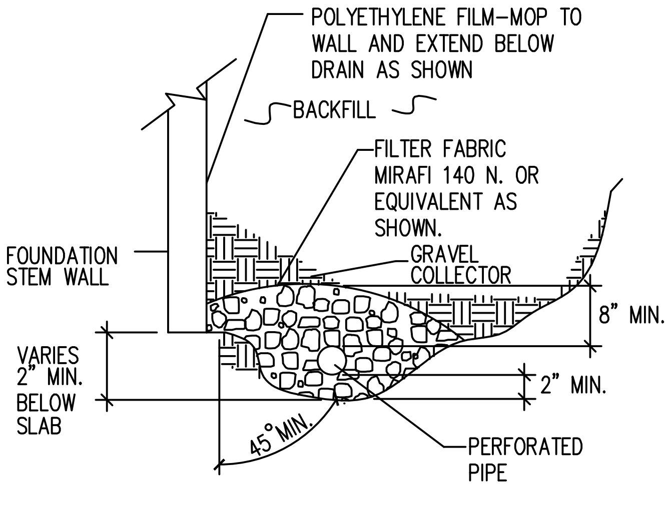
ENTECH ENGINEERING, INC.

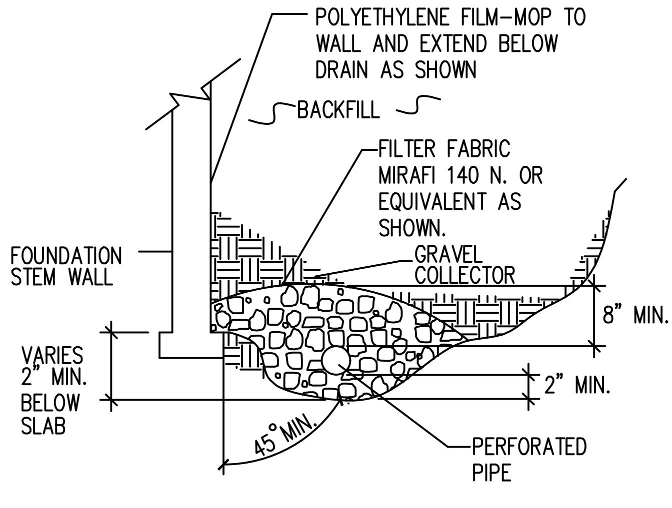
FEMA FLOODPLAIN MAP

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO. 240260

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.

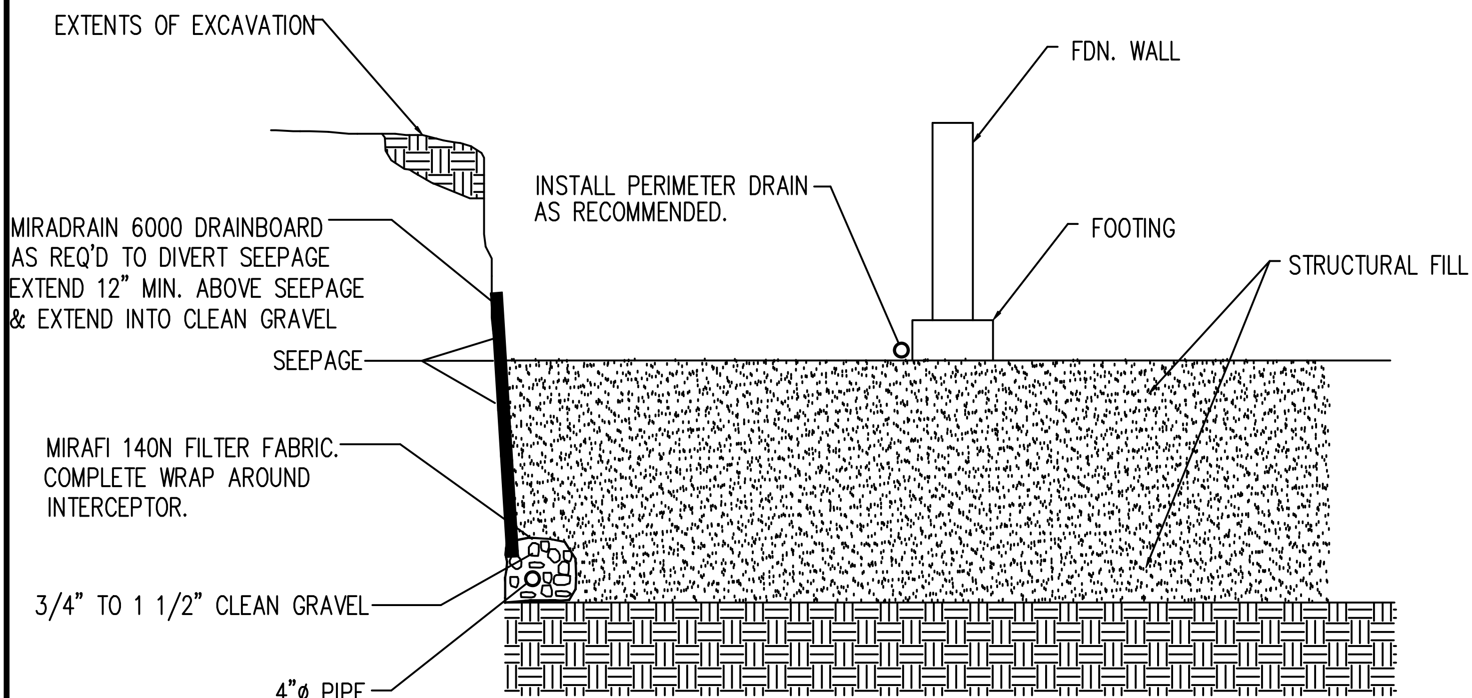
-ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON-PERFORATED PIPE.

-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** THE COMMONS AT FALCON FIELD FILING NO. 1 PT FALCON FIELD, LLC	JOB NO. 240260 **FIG. 9**

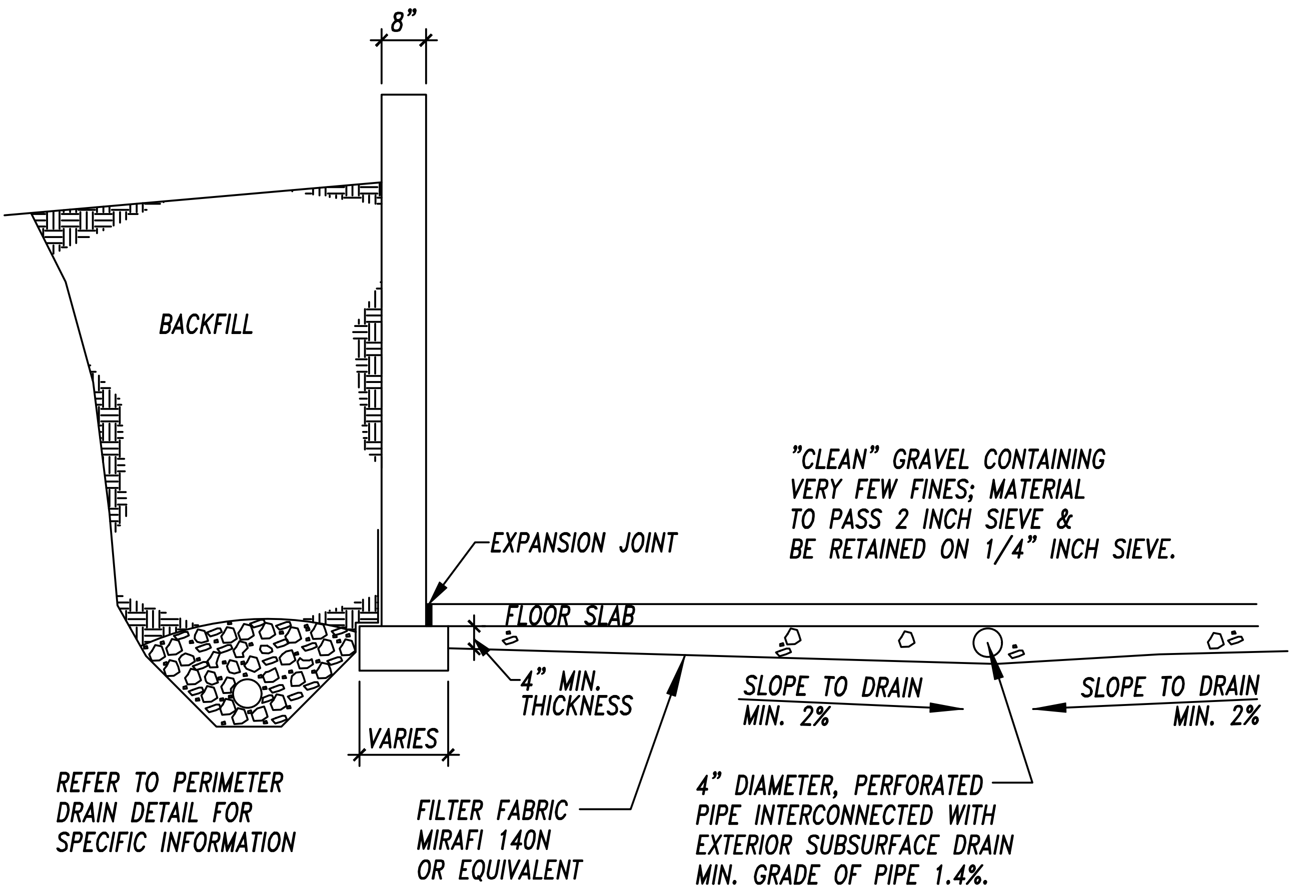


NOTE:
EXTEND INTERCEPTOR DRAIN TO UNDERDRAIN OR TO SUMP.
BENCH DRAIN INTO NATIVE SOILS 12 INCHES MINIMUM.

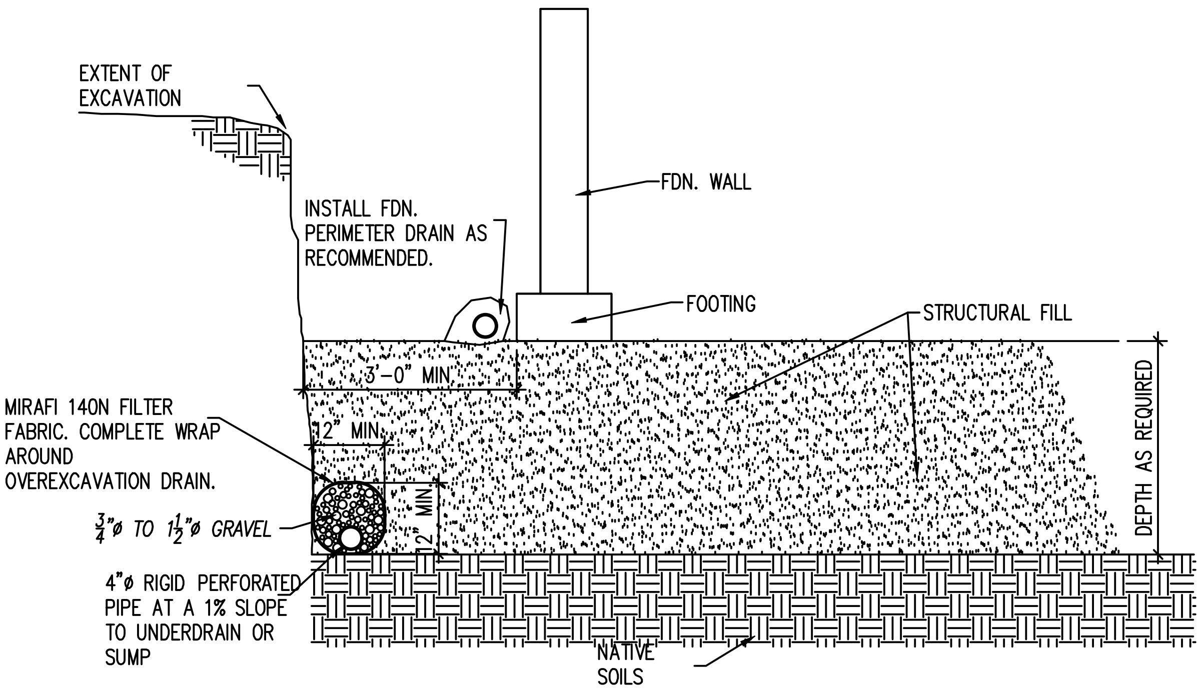
INTERCEPTOR DRAIN DETAIL

N.T.S.

ENTECH ENGINEERING, INC.	INTERCEPTOR DRAIN DETAIL THE COMMONS AT FALCON FIELD FILING NO. 1 PT FALCON FIELD, LLC	JOB NO. 240260 FIG. 10



ENTECH ENGINEERING, INC.	**TYP. UNDERSLAB DRAINAGE LAYER (CAPILLARY BREAK)** ADDRESS THE COMMONS AT FALCON FIELD FILING NO. 1 PT FALCON FIELD, LLC	JOB NO. 240260 **FIG. 11**

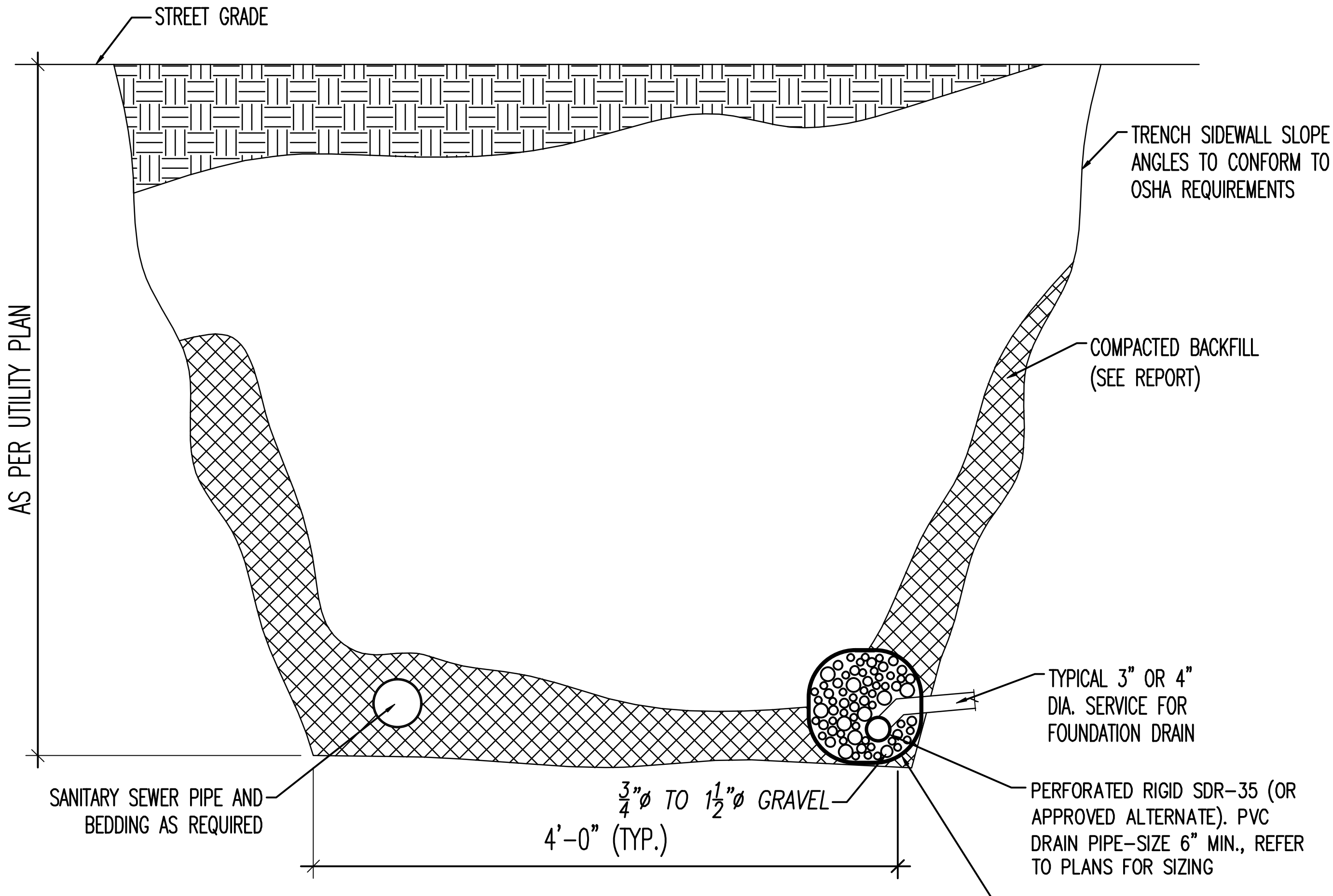


OVEREXCAVATION DRAIN DETAIL

N.T.S.

NOTE:
EXTEND DRAIN TO SUMP AS REQ'D.

ENTECH ENGINEERING, INC.	**OVEREXCAVATION DRAIN** THE COMMONS AT FALCON FIELD FILING NO. 1 PT FALCON FIELD, LLC	JOB NO. 240260 **FIG. 12**



ACTIVE DRAIN BESIDE SEWER

N.T.S.

ENTECH ENGINEERING, INC.

ACTIVE SEWER UNDERDRAIN

THE COMMONS AT FALCON FIELD FILING NO. 1
PT FALCON FIELD, LLC

JOB NO.
240260

FIG. 13

APPENDIX A: Site Photographs

1

Looking south along drainage from the northern portion of the site.

February 12, 2025

2

Looking northwest along drainage towards Highway 24 northern portion of the site.

February 12, 2025

3

Looking south from the central portion of the site.

February 12, 2025

4

Looking northwest from the central portion of the site.

February 12, 2025

5

Looking north from the southern side of the site.

February 12, 2025

6

Looking west from the southern side of the site.

February 12, 2025

APPENDIX B: Test Boring Logs

TEST BORING P5
DATE DRILLED 1/15/2025
REMARKS
WATER @ 2', 1/21/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, LIGHT BROWN, MEDIUM DENSE to LOOSE, WET						
				11	12.7	1
	5			11	20.2	1
	10			12	16.6	1
	15			4	16.0	1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, WET)	20			50/11"	15.4	3

TEST BORING P6
DATE DRILLED 1/15/2025
REMARKS
WATER @ 2.5', 1/21/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, WITH SILT, LIGHT BROWN to GRAY, LOOSE to DENSE, WET						
				19	10.7	1
	5			11	17.4	1
	10			19	18.5	1
	15			7	20.0	1
	20			41	18.5	1

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. B-1

TEST BORING P7
DATE DRILLED 1/17/2025
REMARKS
WATER @ 1', 1/21/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, WITH SILT, GRAY, MEDIUM DENSE to DENSE, WET					
		■	14	19.8	1
	5	■	12	19.0	1
	10	■	25	13.1	1
	15	■	43	12.4	1
	20	■	34	14.2	1

TEST BORING P8
DATE DRILLED 1/17/2025
REMARKS
WATER @ 2', 1/21/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, SANDY, DARK BROWN, STIFF, MOIST		■	9	19.5	2
SAND, SILTY, GRAY, MEDIUM DENSE, WET	5	■	17	11.5	1
	10	■	12	17.5	1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	15	■	50	12.9	3
	20				

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. B-2

TEST BORING P9
DATE DRILLED 1/17/2025
REMARKS
WATER @ 2', 1/21/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, WITH SILT, BROWN, LOOSE to MEDIUM DENSE, WET			9	21.2	1
	5		18	12.3	1
CLAY, SANDY, BROWN, STIFF, MOIST	10		11	14.1	2
SAND, SILTY, TAN					1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	15		50/11"	14.3	3
	20				

TEST BORING P10
DATE DRILLED 2/21/2025
REMARKS
WATER @ 4'.4', 2/24/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, WITH SILT, TAN, MEDIUM DENSE to LOOSE, MOIST			13	11.2	1
	5		6	16.6	1
	10		18	16.9	1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, WET)	15		50/8"	8.8	3
	20		50	12.7	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. B-3

TEST BORING P11
DATE DRILLED 2/21/2025
REMARKS
WATER @ 6.3', 2/24/25

SAND, WITH SILT, TAN to GRAY, MEDIUM DENSE to LOOSE, MOIST to WET

Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
2.5	X	10	3.1	1
5	X	8	10.1	1
10	X	8	23.3	1
15	X	4	21.3	1
20	X	13	17.1	1

TEST BORING P12
DATE DRILLED 2/21/2025
REMARKS
WATER @ 5.5', 2/24/25

CLAY, SLIGHTLY SANDY, BROWN to GRAY, STIFF to MEDIUM STIFF, MOIST

SANDSTONE, VERY WEAK, GRAY, MODERATELY WEATHERED (SAND, SILTY, VERY DENSE, WET)

Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
2.5	X	10	17.2	2
5	X	4	42.4	2
10	X	7	12.4	2
15	X	50/7"	11.0	3
20	X	50/10"	12.3	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. B-4

TEST BORING	P13
DATE DRILLED	2/21/2025

REMARKS

WATER @ 7', 2/24/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, BROWN to GRAY, MEDIUM DESNSE to VERY LOOSE, MOIST to WET				12	11.3	1
	5			3	17.0	1
	10			6	27.3	1
	15			4	14.7	1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	20			50/11"	12.2	3

TEST BORING	P14
DATE DRILLED	2/21/2025

REMARKS

WATER @ 7', 2/24/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, BROWN to GRAY, MEDIUM DESNSE to VERY LOOSE, MOIST to WET				7	4.0	1
	5			4	5.1	1
	10			7	22.8	1
	15			4	23.0	1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	20			50/9"	15.0	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. B-5

TEST BORING P15
DATE DRILLED 2/21/2025
REMARKS

WATER @ 7.6', 2/24/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, BROWN to GRAY, LOOSE to VERY LOOSE, MOIST to WET	3	■	9	5.2	1
	5	■	5	6.1	1
	10	■	<1	19.0	1
	15	■	5	22.8	1
SANDSTONE, VERY WEAK, GRAY, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	20	■	50/4"	9.6	3

TEST BORING P16
DATE DRILLED 4/3/2025
REMARKS

WATER @ 9.9', 4/4/24

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, TAN, LOOSE, MOIST	5	■	6	4.1	1
SAND, CLAYEY, TAN, LOOSE, MOIST	10	■	9	13.5	1
CLAYSTONE, WEAK, GRAY, WEATHERED (CLAY, WITH SAND, HARD, MOIST)	15	■	50/8"	14.3	4
	20	■	50/8"	11.0	4

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. B-6

TEST BORING P17
DATE DRILLED 4/3/2025

REMARKS

WATER @ 7.8', 4/4/24

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, WITH SAND, BROWN, SOFT to STIFF, MOIST	5	■	4	23.2	2
	10	■	9	25.8	2
CLAYSTONE, WEAK, GRAY, WEATHERED (CLAY, WITH SAND, HARD, MOIST)	15	■	50/7"	21.4	3
	20	■	50/5"	19.1	3

TEST BORING P18
DATE DRILLED 4/3/2025

REMARKS

WATER @ 3.6', 4/4/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, SANDY, GRAY, STIFF to MEDIUM STIFF, MOIST	5	■	10	19.7	2
	10	■	10	25.2	2
	15	■	5	16.1	2
CLAYSTONE, WEAK, GRAY, WEATHERED (CLAY, WITH SAND, HARD, MOIST)	20	■	50/11"	14.6	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. B-7

TEST BORING	P19
DATE DRILLED	4/3/2025

REMARKS

WATER @ 6', 4/4/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, TAN, LOOSE, MOIST						
	5			7	12.1	1
CLAY, SANDY, GRAY, STIFF to MEDIUM STIFF, MOIST	10			5	21.3	2
	15			11	17.9	2
	20			12	17.2	2

TEST BORING	P20
DATE DRILLED	4/3/2025

REMARKS

WATER @ 8.6', 4/4/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, CLAYEY, TAN, LOOSE to MEDIUM DENSE, MOIST to WET						
	5			5	3.6	1
	10			7	23.6	1
	15			11	19.0	1
	20			9	13.9	1

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. B-8

TEST BORING P21

DATE DRILLED 4/3/2025

REMARKS

WATER @ 9.8', 4/4/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, CLAYEY, TAN, LOOSE, MOIST to WET						
	5			5	7.1	1
	10			6	18.4	1
	15			9	18.6	1
CLAY, WITH SAND, GRAY, STIFF, MOIST	20			9	18.9	2

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. B-9

ENTECH ENGINEERING, INC.

TABLE B-1

DEPTH TO GROUNDWATER & BEDROCK

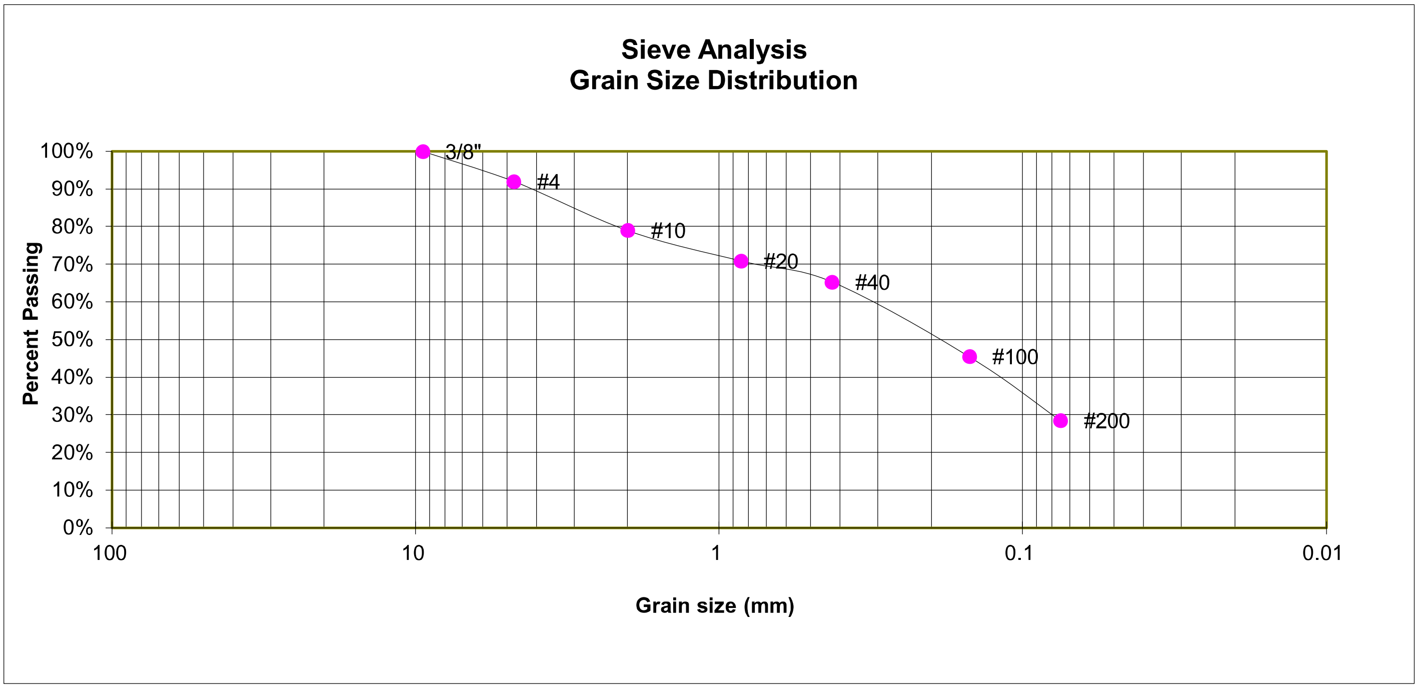
TEST BORING	DEPTH TO GROUNDWATER (ft.)	DEPTH TO BEDROCK (ft.)
P5	2' 3"	18
P6	2' 9"	>20
P7	1' 3"	>20
P8	1' 10"	14
P9	1' 10"	14
P10	4.25	12
P11	6.25	>20
P12	5.5	11
P13	7	19
P14	7	18
P15	7.5	17
P16	9.9	14
P17	7.8	14
P18	3.6	19
P19	6	>20
P20	8.6	>20
P21	9.8	>20

APPENDIX C: Laboratory Test Results

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	FHA SWELL (PSF)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	P5	2-3			28.5				160		SM	SAND, SILTY
1	P6	10			5.0						SM	SAND, WITH SILT
1	P7	2-3			12.9	NV	NP	NP			SM	SAND, SILTY
1	P9	5			5.2						SW-SM	SAND, WITH SILT
1	P11	2-3			5.5						SW-SM	SAND, WITH SILT
1	P13	2-3			21.5						SM	SAND, SILTY
1	P14	5			5.9						SW-SM	SAND, WITH SILT
1	P16	5			27.3	NV	NP	NP			SM	SAND, SILTY
1	P15	10			14.6						SM	SAND, SILTY
1	P19	5			20.5						SM	SAND, SILTY
1	P20	10			29.9						SC	SAND, CLAYEY
2	P8	2-3	18.2	104.4	67.5	47	26	21		0.5	CL	CLAY, SANDY
2	P10	10			88.1						CL	CLAY, SLIGHTLY SANDY
2	P12	5			94.7						CL	CLAY, SLIGHTLY SANDY
2	P17	10			73.3	39	23	16			CL	CLAY, WITH SAND
2	P21	20			68.1						CL	CLAY, WITH SAND
3	P5	20			20.2	NV	NP	NP			SM	SANDSTONE (SAND, SILTY)
4	P18	20			84.2	36	22	14			CL	CLAYSTONE (CLAY, WITH SAND)

TEST BORING	P5	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.0%
10	79.0%
20	70.9%
40	65.3%
100	45.5%
200	28.5%

FHA SWELL

Moisture at start	10.7%
Moisture at finish	19.2%
Moisture increase	8.6%
Initial dry density (pcf)	99
Swell (psf)	160

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

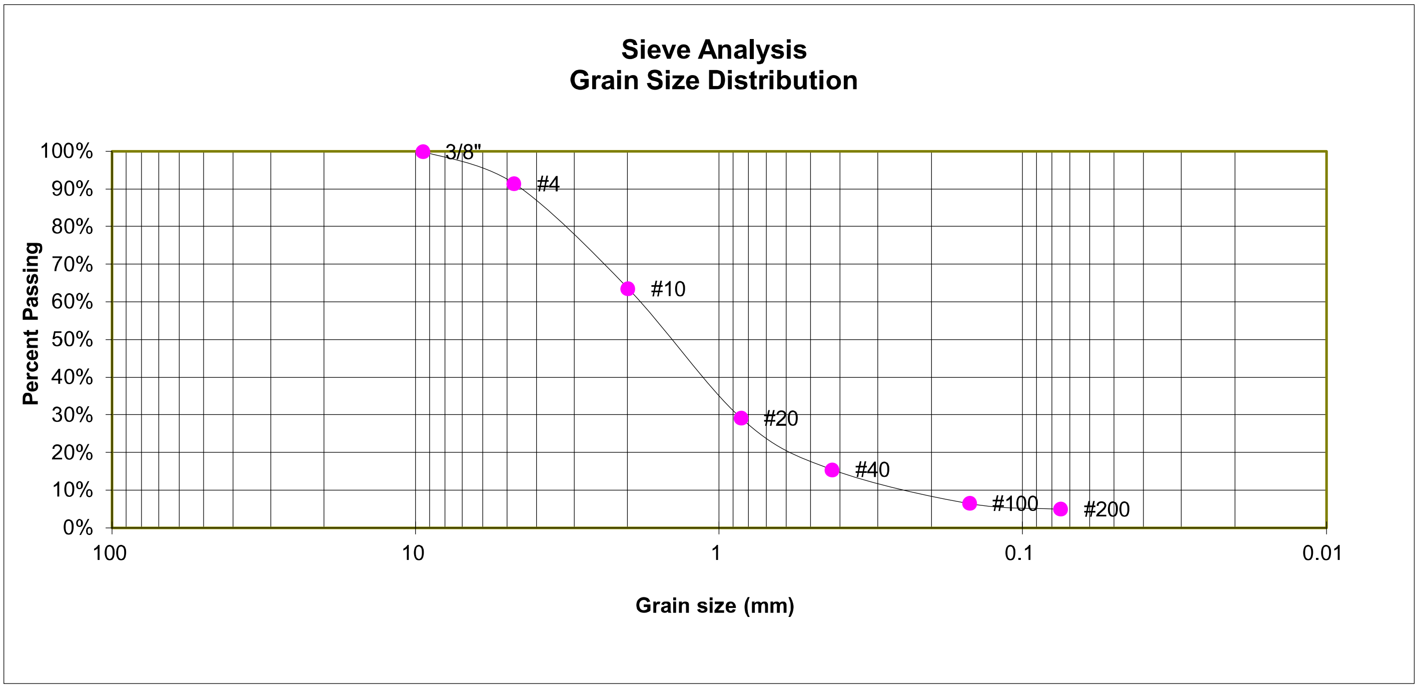
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-1

TEST BORING	P6	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	10	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.5%
10	63.6%
20	29.2%
40	15.5%
100	6.5%
200	5.0%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

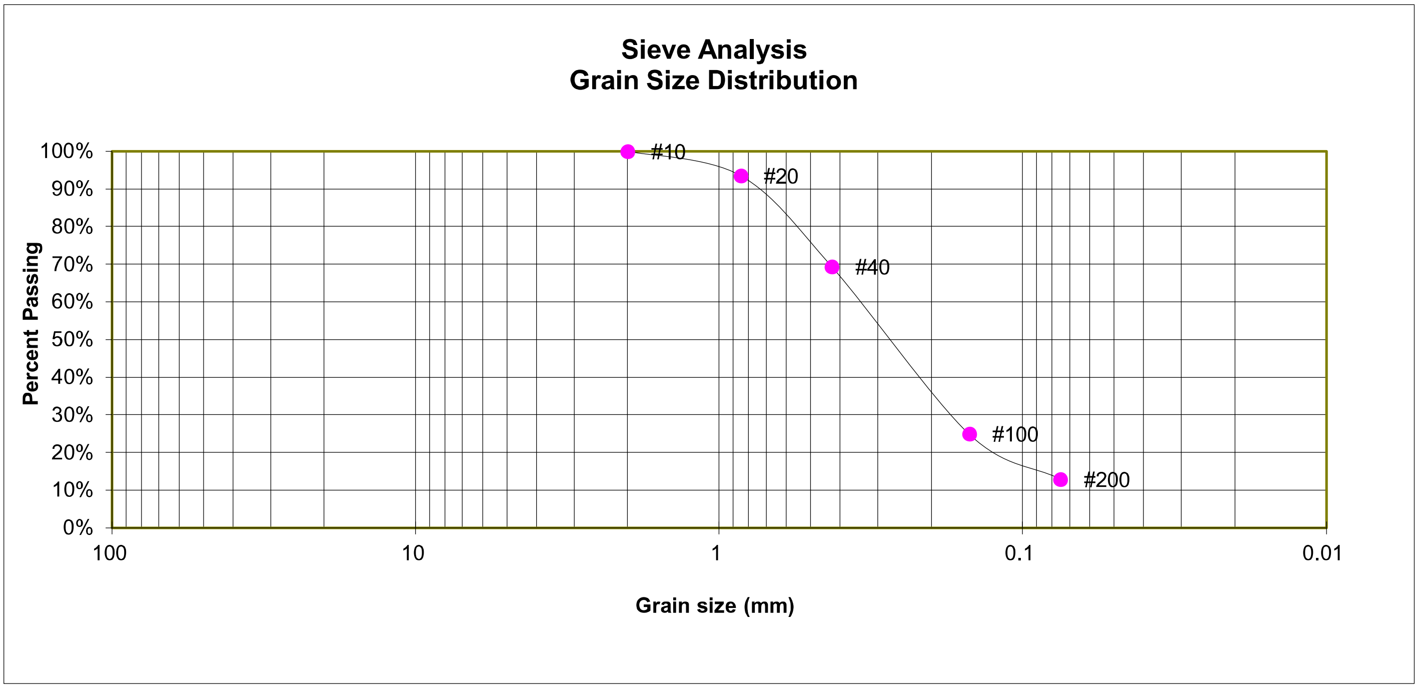
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-2

TEST BORING	P7	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	93.5%
40	69.3%
100	25.0%
200	12.9%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

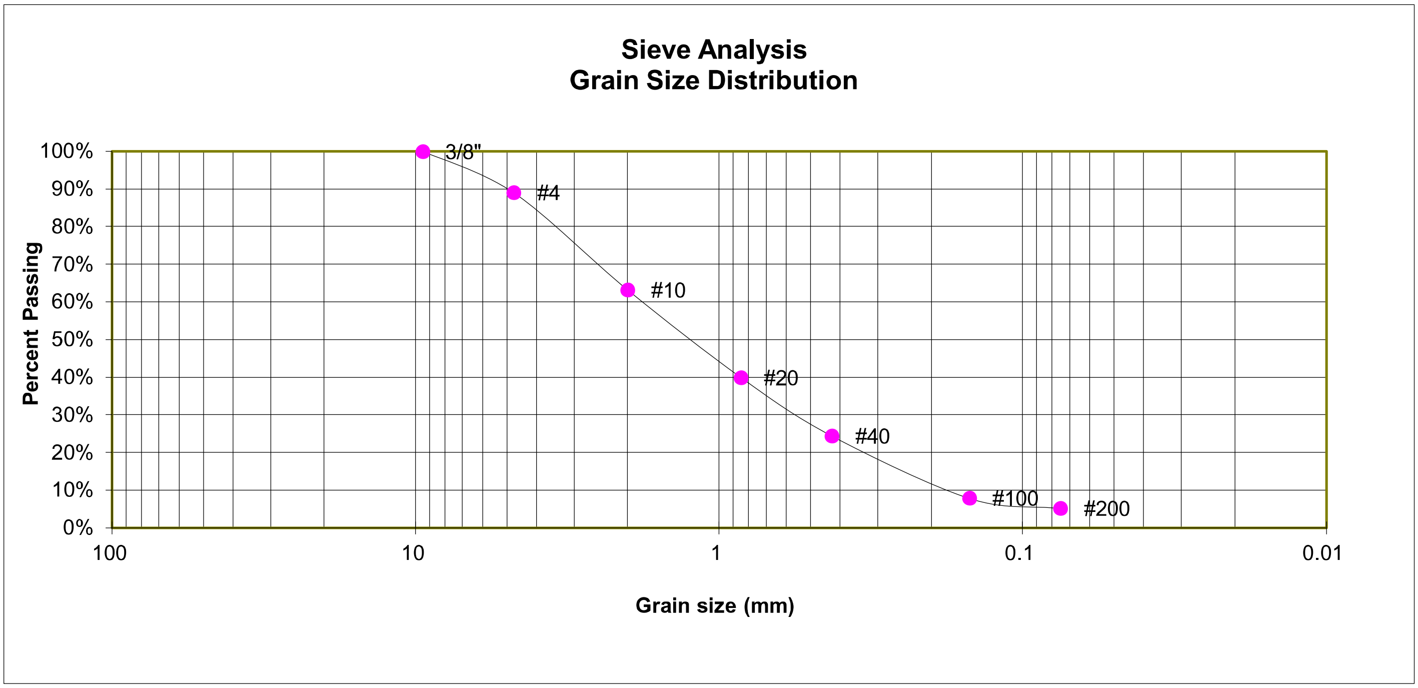
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. C-3

TEST BORING	P9	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	89.1%
10	63.2%
20	40.0%
40	24.4%
100	7.9%
200	5.2%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

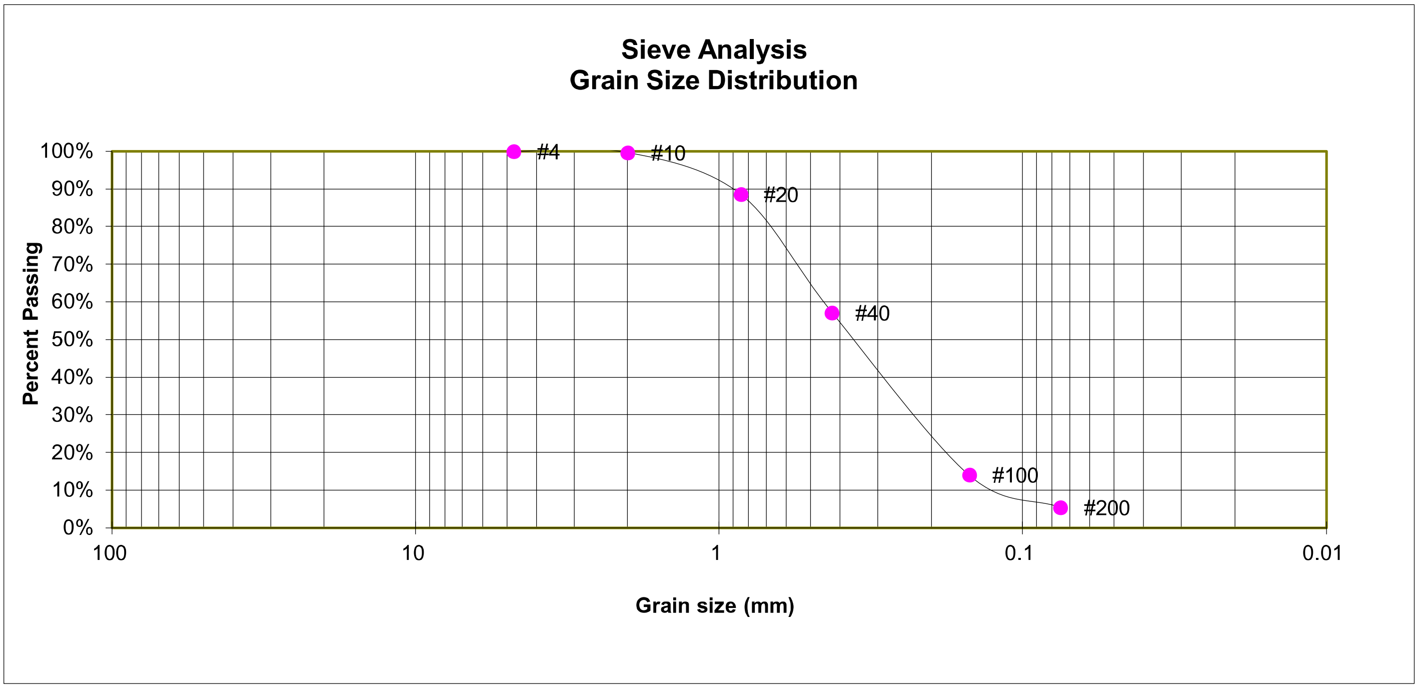
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-4

TEST BORING	P11	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	88.6%
40	57.2%
100	14.1%
200	5.5%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

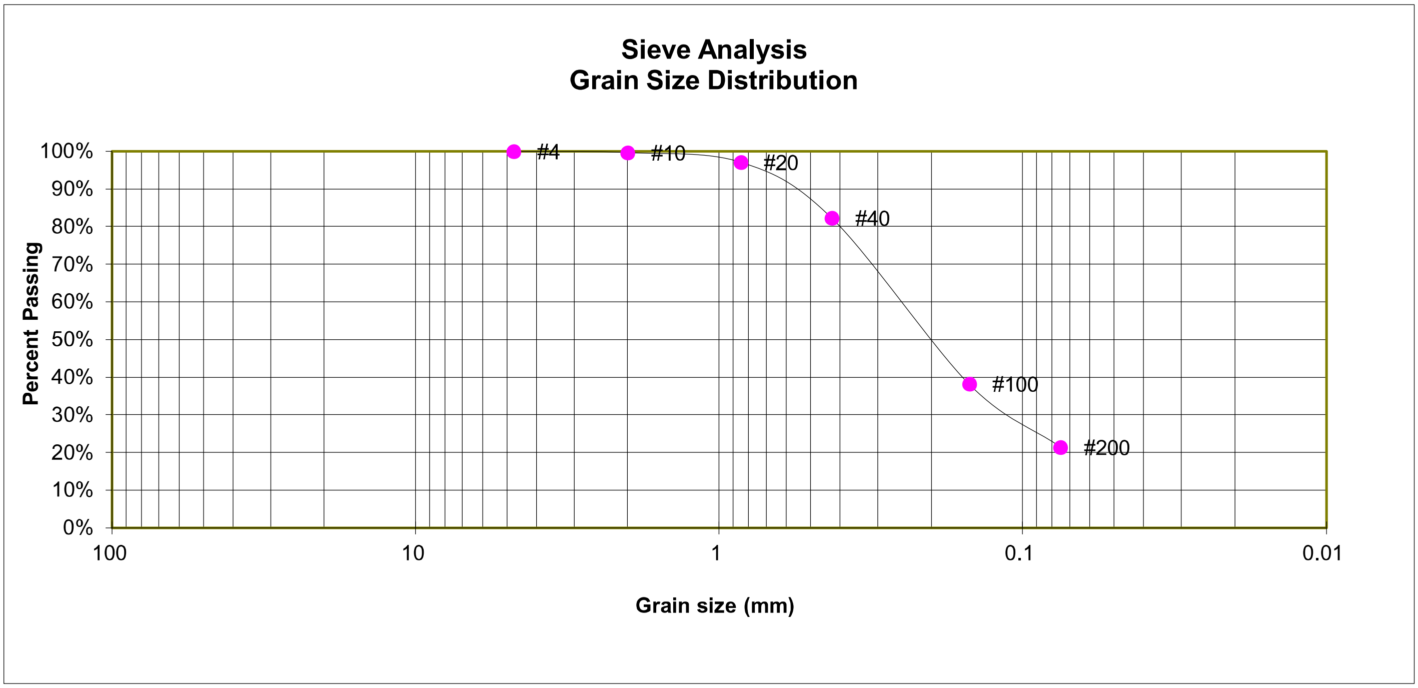
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-5

TEST BORING	P13	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	2-3	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	97.1%
40	82.3%
100	38.2%
200	21.5%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

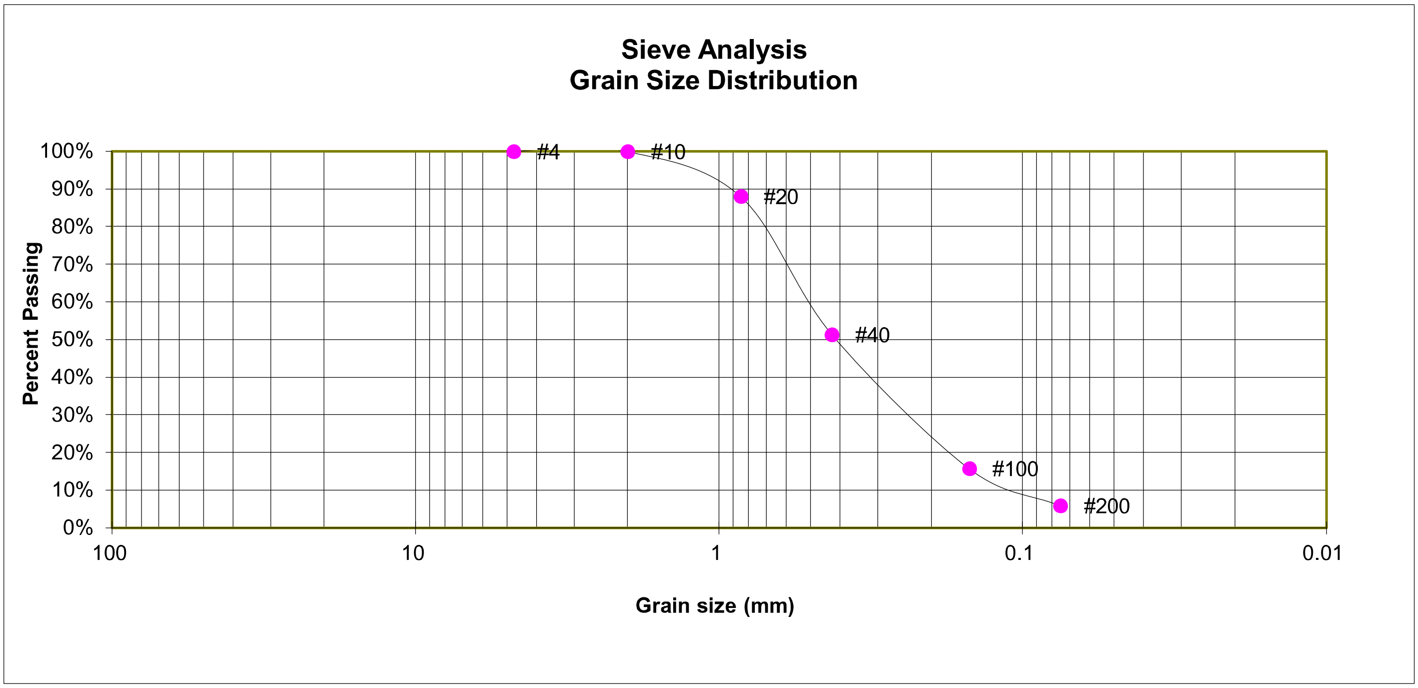
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-6

TEST BORING	P14	SOIL DESCRIPTION	SAND, WITH SILT
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.9%
20	88.0%
40	51.3%
100	15.8%
200	5.9%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

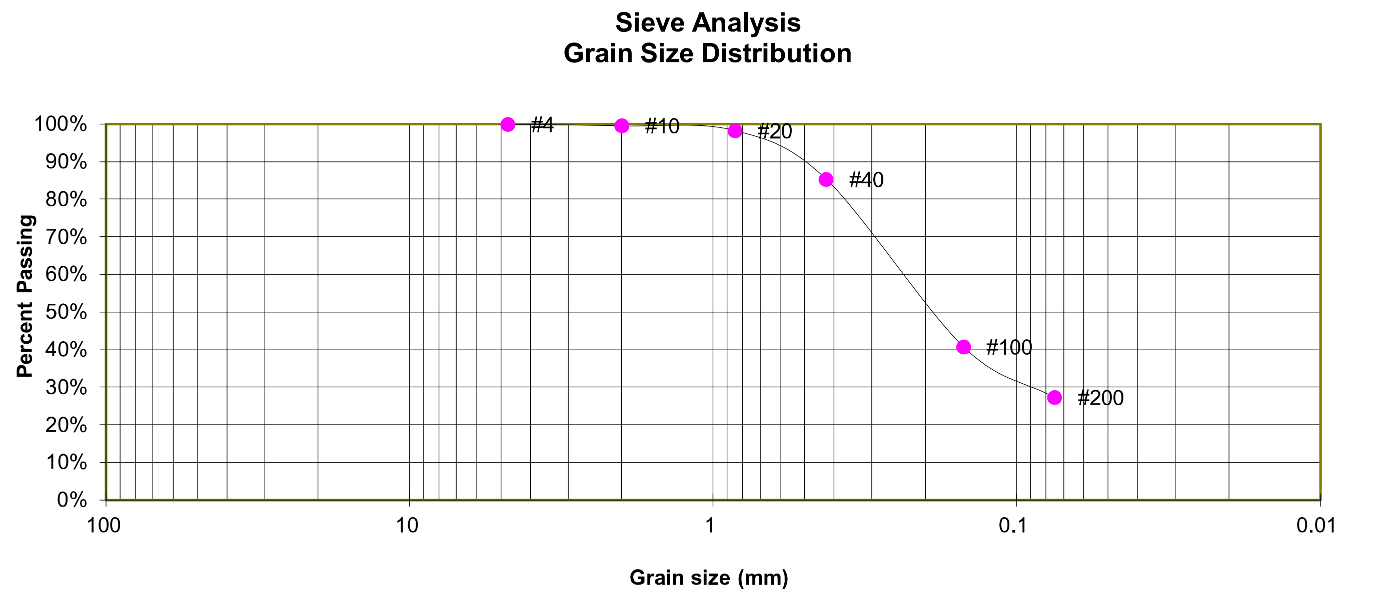
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-7

TEST BORING	P16	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.6%
20	98.3%
40	85.4%
100	40.8%
200	27.3%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

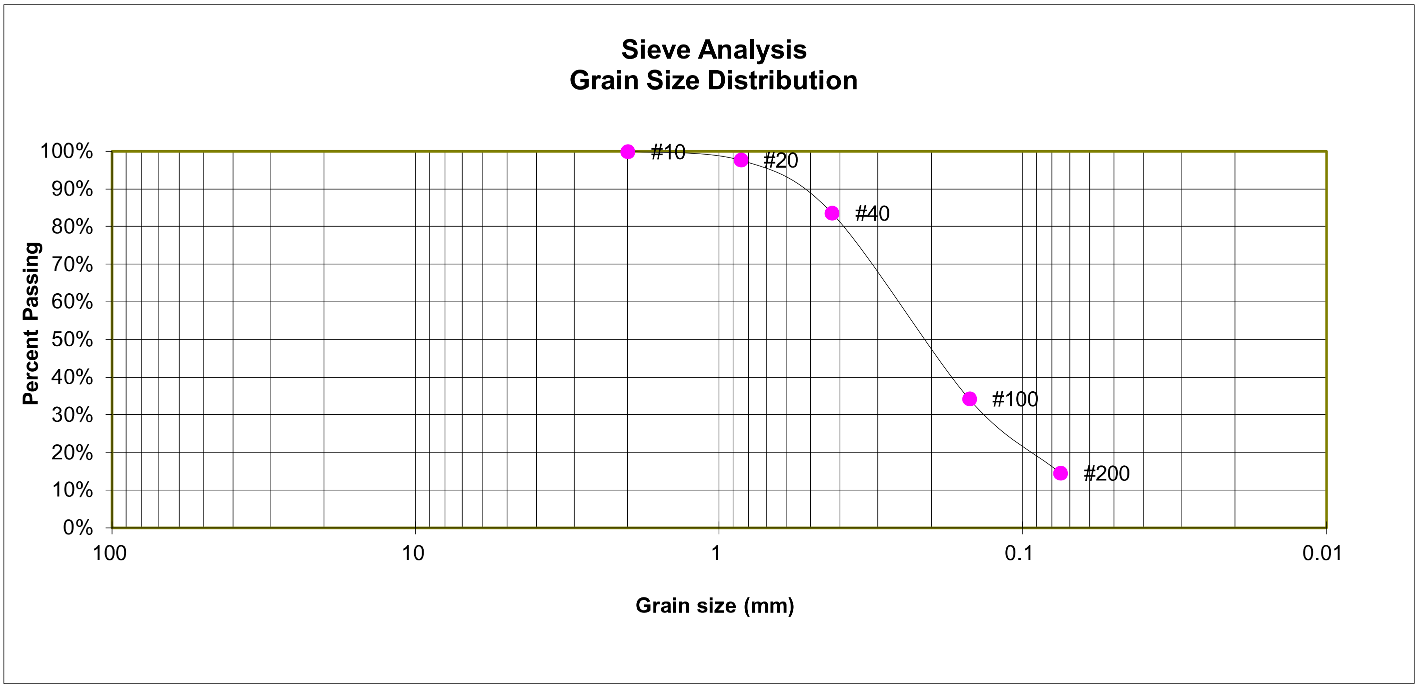
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-8

TEST BORING	P15	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	10	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	97.7%
40	83.6%
100	34.3%
200	14.6%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

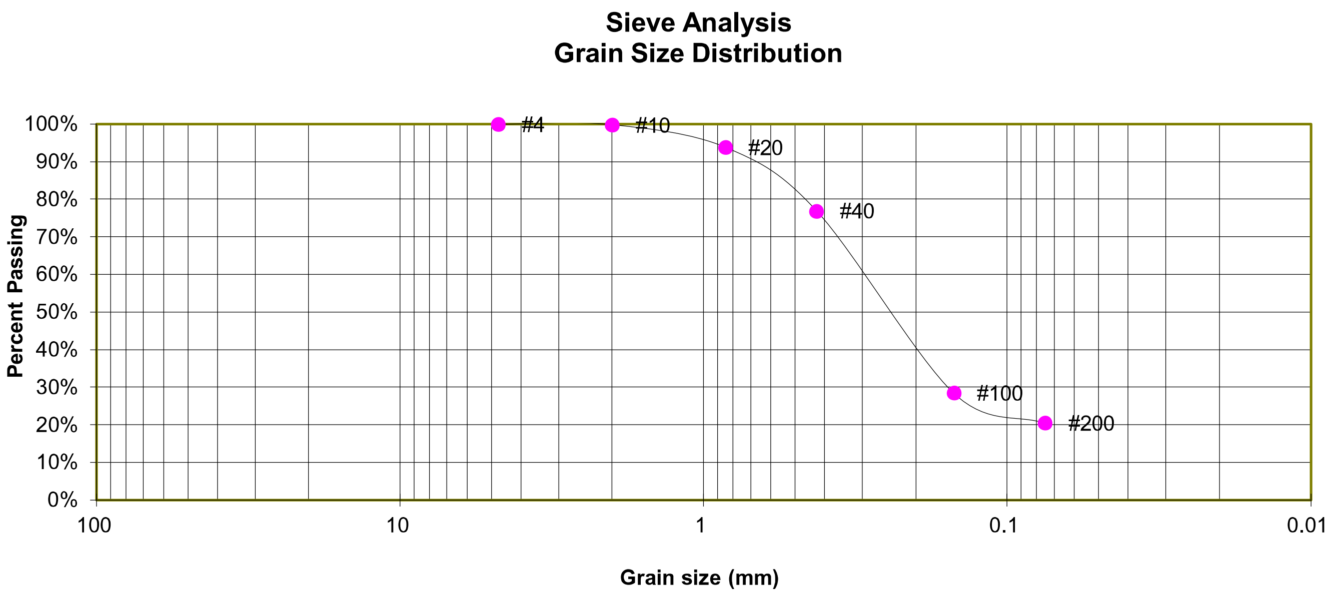
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. C-9

TEST BORING	P19	SOIL DESCRIPTION	SAND, SILTY
DEPTH (FT)	5	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	93.9%
40	76.9%
100	28.5%
200	20.5%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

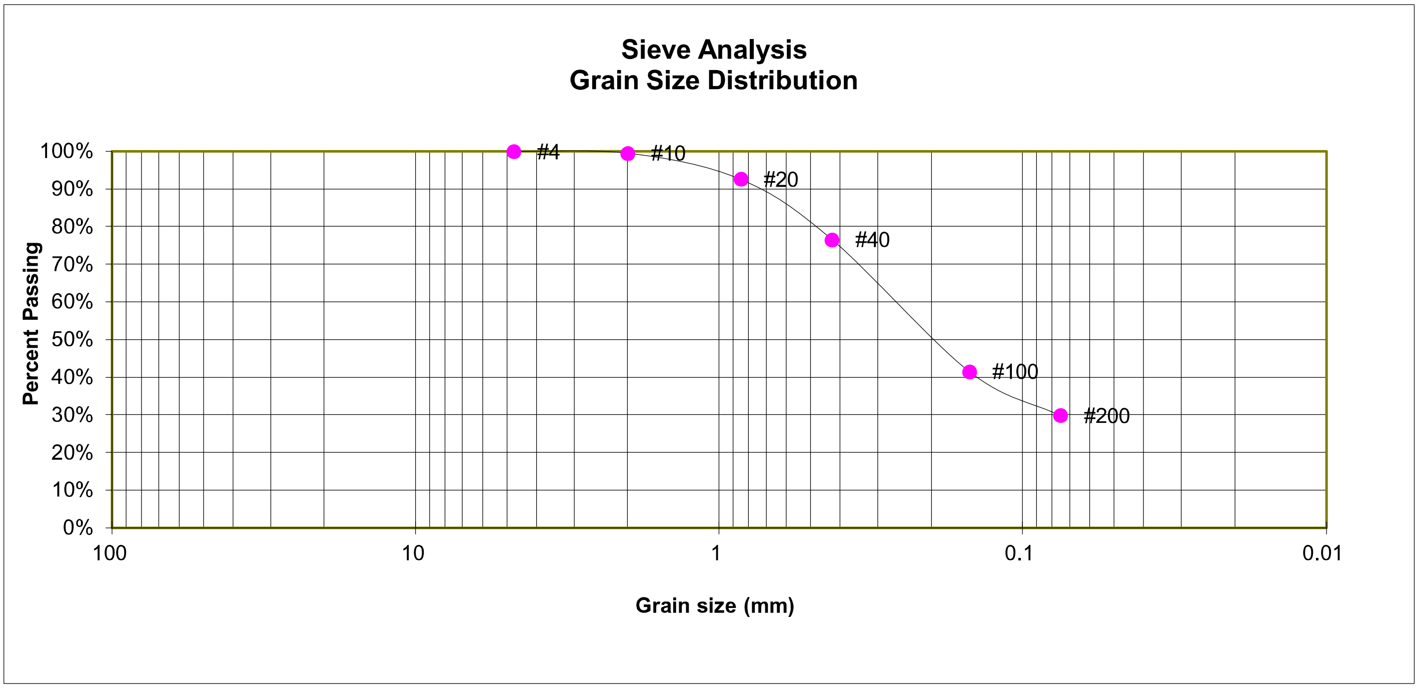
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-10

TEST BORING	P20	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	10	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.5%
20	92.6%
40	76.6%
100	41.5%
200	29.9%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

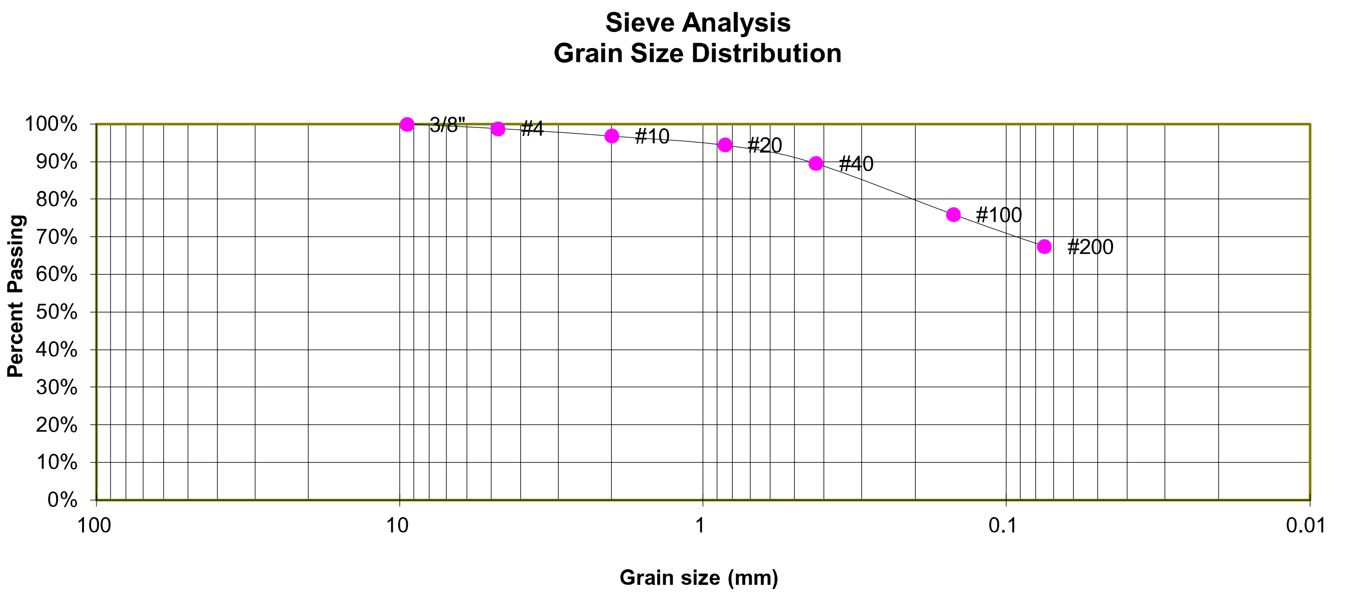
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. C-11

TEST BORING	P8	SOIL DESCRIPTION	CLAY, SANDY
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"	100.0%
4	98.9%
10	96.9%
20	94.5%
40	89.6%
100	76.0%
200	67.5%

ATTERBERG LIMITS

Plastic Limit	26
Liquid Limit	47
Plastic Index	21

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

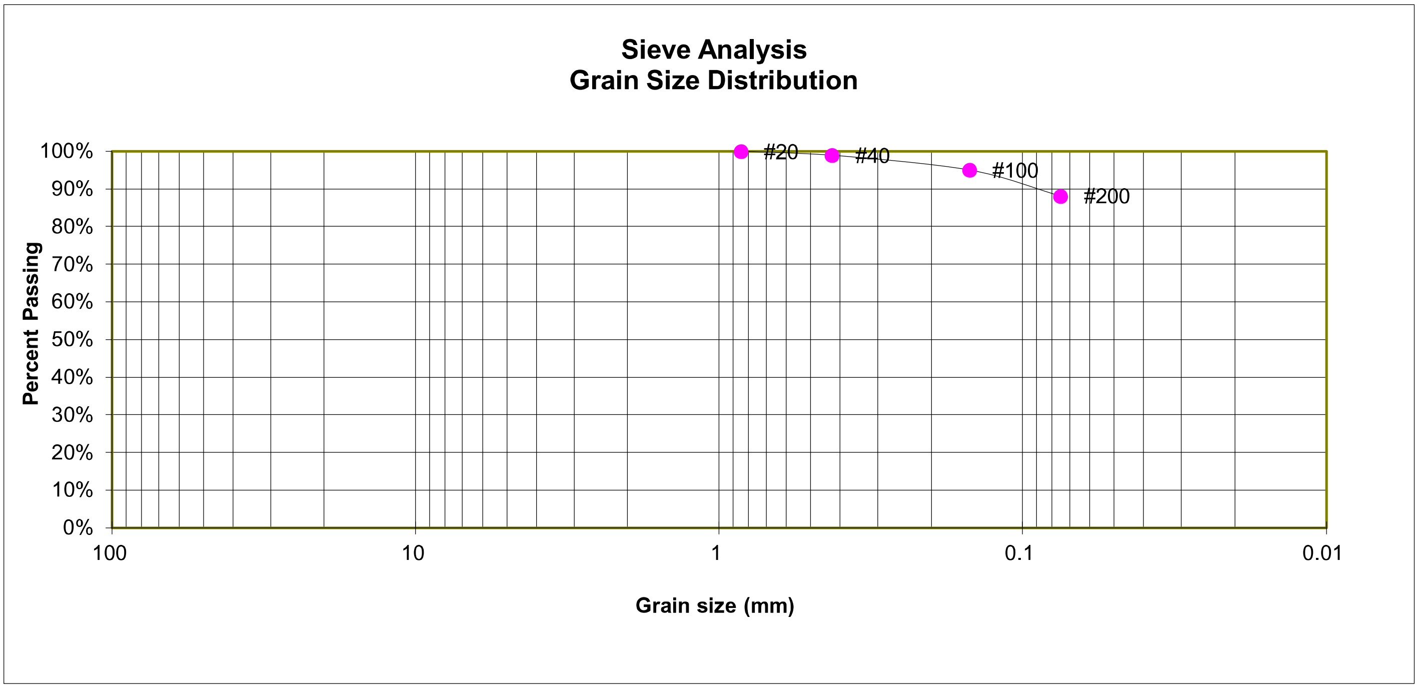
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-12

TEST BORING	P10	SOIL DESCRIPTION	CLAY, SLIGHTLY SANDY
DEPTH (FT)	10	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.0%
100	95.1%
200	88.1%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

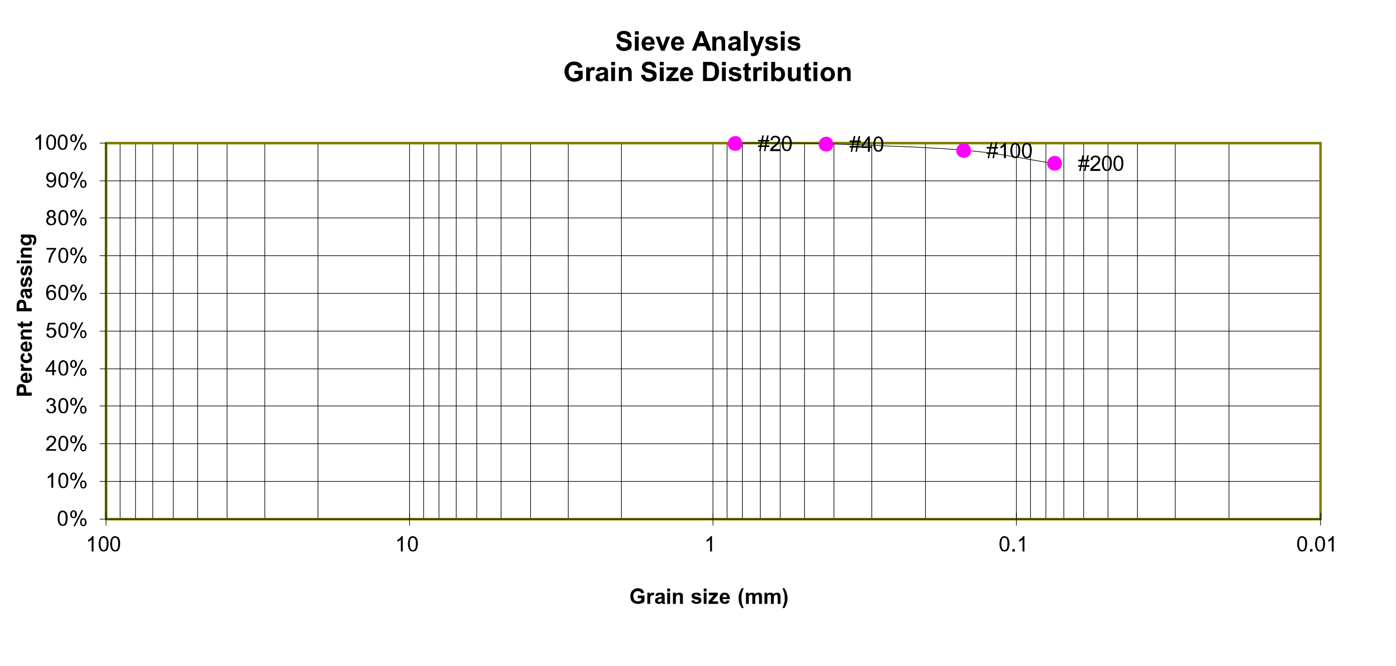
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-13

TEST BORING	P12	SOIL DESCRIPTION	CLAY, SLIGHTLY SANDY
DEPTH (FT)	5	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.9%
100	98.1%
200	94.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

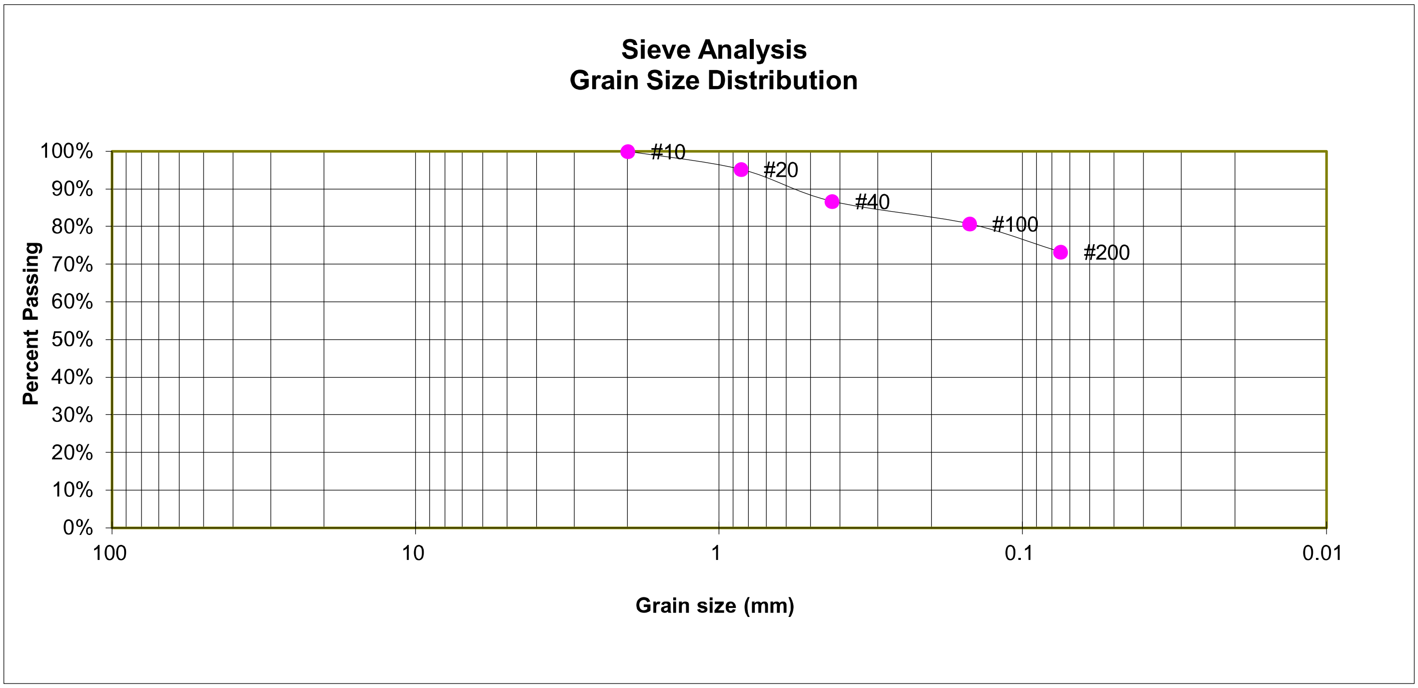
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-14

TEST BORING	P17	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	10	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	95.3%
40	86.8%
100	80.8%
200	73.3%

ATTERBERG LIMITS

Plastic Limit	23
Liquid Limit	39
Plastic Index	16

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

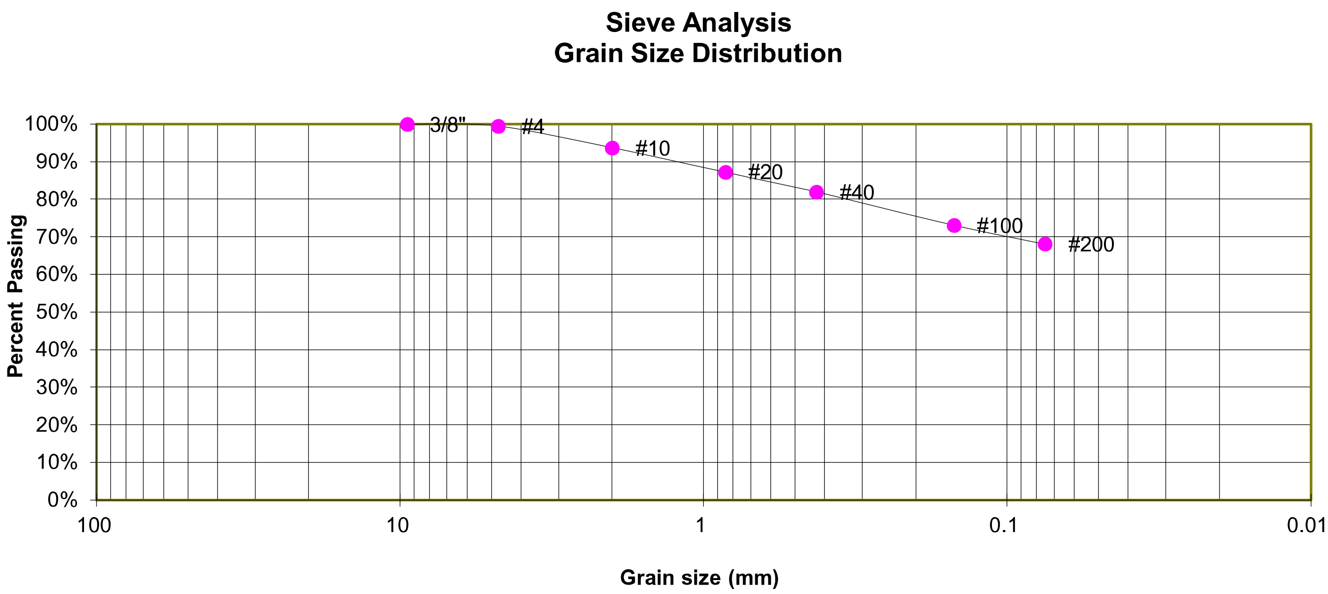
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-15

TEST BORING	P21	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	20	SOIL TYPE	2



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	93.7%
20	87.3%
40	81.9%
100	73.2%
200	68.1%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

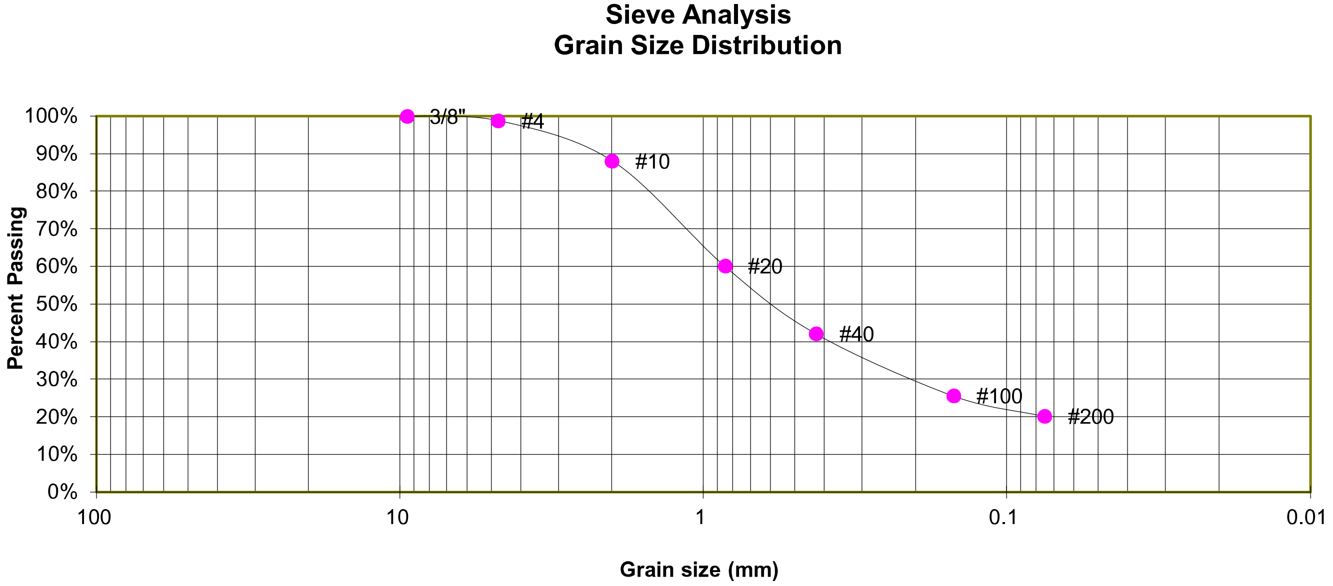
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-16

TEST BORING	P5	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	20	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.8%
10	88.1%
20	60.1%
40	42.1%
100	25.6%
200	20.2%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

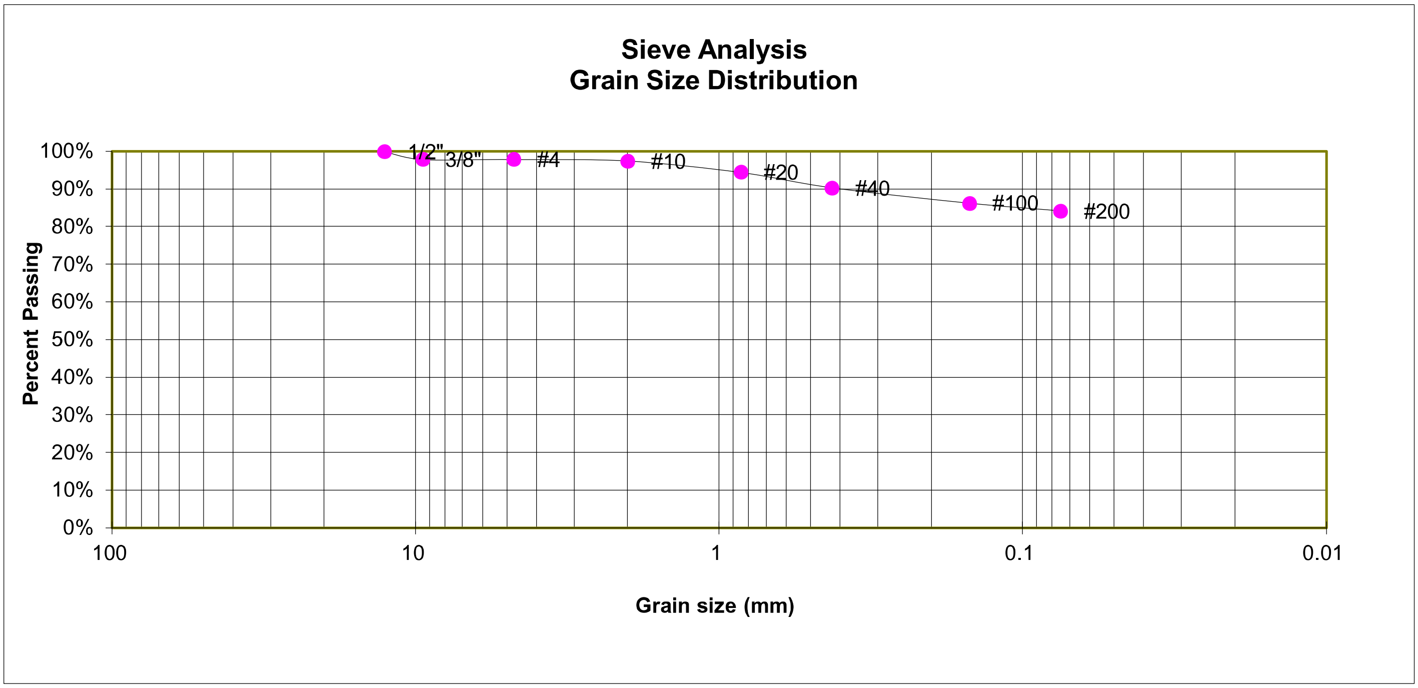
LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-17

TEST BORING	P18	SOIL DESCRIPTION	CLAYSTONE (CLAY, WITH SAND)
DEPTH (FT)	20	SOIL TYPE	4



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.9%
4	97.9%
10	97.5%
20	94.5%
40	90.3%
100	86.3%
200	84.2%

ATTERBERG LIMITS

Plastic Limit	22
Liquid Limit	36
Plastic Index	14

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO. 240260

FIG. C-18

TEST BORING	P8	SOIL DESCRIPTION	CLAY, SANDY
DEPTH (FT)	2-3	SOIL TYPE	2

SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	104
NATURAL MOISTURE CONTENT:	18.2%
SWELL/COLLAPSE (%):	0.5%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

THE COMMONS AT FALCON FIELD
PT FALCON FIELD

JOB NO.
240260

FIG. C-19

ENTECH
ENGINEERING, INC.

Appendix D: Previous Test Boring Logs and Laboratory Testing Summary (12/2020)

TEST BORING 1

DATE DRILLED 12/10/2020

REMARKS

WATER @ 6.5', 12/15/20

CLAY, SANDY, TAN, VERY STIFF, MOIST

SAND, SILTY, TAN to BROWN, MEDIUM DENSE to DENSE, MOIST

Depth (ft)	Blows per foot	Watercontent %	Soil Type
	16	10.8	2
5	11	7.6	1
10	31	11.4	1
15	12	16.7	2
20	50/9"	9.8	3

TEST BORING 2

DATE DRILLED 12/10/2020

REMARKS

WATER @ 6', 12/15/20

SAND, SILTY to WITH SILT, TAN to GRAY, MEDIUM DENSE, MOIST to DRY

CLAY, SANDY, GRAY BROWN, HARD, MOIST

Depth (ft)	Blows per foot	Watercontent %	Soil Type
	22	4.9	1
5	18	1.7	1
10	20	12.5	1
15	26	12.0	1
20	41	11.3	2

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
FALCON FIELD, LLC

JOB NO. 202649

FIG. A-1

TEST BORING 3
DATE DRILLED 12/10/2020
REMARKS
WATER @ 1.5', 12/15/20

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, SANDY, BROWN, STIFF, MOIST				15	25.6	2
SAND, SILTY, TAN to BROWN, MEDIUM DENSE, VERY MOIST	5			12	27.8	1
	10			17	20.1	1
CLAY, SANDY, BROWN, VERY STIFF, MOIST	15			22	14.1	2
SAND, SILTY, TAN, MOIST	20			*	24.7	1

TEST BORING 4
DATE DRILLED 12/10/2020
REMARKS
WATER @ 7', 12/15/20

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, BROWN, MEDIUM DENSE, MOIST				28	5.7	1
	5			12	19.3	1
CLAY, SANDY, BROWN, VERY STIFF, MOIST	10			17	28.6	2
	15			25	24.0	2
CLAYSTONE, WEAK, BROWN, WEATHERED (CLAY, SANDY, HARD, MOIST)	20			50/4"	13.4	4

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
FALCON FIELD, LLC

JOB NO.
202649

FIG. A-2

TEST BORING 5
DATE DRILLED 12/10/2020
REMARKS

WATER @ 3.5', 12/15/20

SAND, SILTY to WITH SILT, TAN to GRAY, MEDIUM DENSE, MOIST to WET

Depth (ft)	Blows per foot	Watercontent %	Soil Type
	19	3.4	1
5	15	25.6	1
10	18	30.2	1
15	23	22.7	1
20	27	27.5	1

TEST BORING 6
DATE DRILLED 12/10/2020
REMARKS

WATER @ 3.5', 12/15/20

SAND, SILTY, TAN to BROWN, MEDIUM DENSE to DENSE, MOIST to WET

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

Depth (ft)	Blows per foot	Watercontent %	Soil Type
	18	6.3	1
5	15	19.0	1
10	18	23.2	1
15	44	15.3	1
20	50/6"	12.5	4

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
FALCON FIELD, LLC

JOB NO.
202649

FIG. A-3

TEST BORING 7
DATE DRILLED 12/10/2020
REMARKS

WATER @ 12.5', 12/15/20

SAND, SILTY, BROWN to TAN, MEDIUM DENSE, DRY to WET

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			22	2.1	1
5			19	2.8	1
10			18	4.3	1
15			19	22.8	1
20			23	22.8	1

ENTECH ENGINEERING, INC.

TEST BORING LOGS

THE COMMONS AT FALCON FIELD
FALCON FIELD, LLC

JOB NO.
202649

FIG. A-4

ENTECH ENGINEERING, INC.

TABLE A-1

DEPTH TO GROUNDWATER & BEDROCK

TEST BORING	DEPTH TO GROUNDWATER (ft.)	DEPTH TO BEDROCK (ft.)
1	6.5	16
2	6	>20
3	1.5	>20
4	7	19
5	3.5	>20
6	3.5	15
7	12.5	>20

TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	2	5			6.1							SW-SM	SAND, WITH SILT
1	3	2-3			58.0					520		CL	CLAY, SANDY
1	4	5			33.1	NV	NP	NP	<0.01			SM	SAND, SILTY
1	5	10			5.7							SW-SM	SAND, WITH SILT
1	7	5			14.1							SM	SAND, SILTY
2	1	2-3			68.4							CL	CLAY, SANDY
2	2	20	11.9	125.3	62.0						0.5	CL	CLAY, SANDY
3	1	20			28.9							SM	SANDSTONE (SAND, SILTY)
4	4	20			61.7	40	22	18	<0.01			CL	CLAYSTONE (CLAY, SANDY)
4	6	20	14.9	117.4	63.0	33	22	11	0.00		0.7	CL	CLAYSTONE (CLAY, SANDY)

ENTECH ENGINEERING, INC.

APPENDIX E: Colorado Geological Survey Review Comments dated January 10, 2025

…Colorado Geological Survey 1/10/2025 8:13:13 AM	The referral documents include the Final Plat (Drexel, Barrell & CO., December 12, 2024), Commercial Construction Plans (Drexel, Barrell & CO., December 16, 2024), Letter of Intent (Drexel, Barrell & CO., December 16, 2024), Grading and Erosion Control Plans (Drexel, Barell & CO., December 13, 2024), revised Soil and Geology Study (Entech Engineering, Inc., 7/21/2023), and other documents. As stated in the preliminary plan application process, Entech's characterization of the geologic hazards and constraints associated with the project site is valid. We offer the following comments and recommendations. 1. The final plat should reference Entech's July 21, 2023 report and include all geologic hazards and constraints associated with the site (see the soil & geology conditions note on the preliminary plan for SP232 dated 4/10/2024). Additionally, the statement, "Due to the potential of shallow groundwater basements are prohibited" should be shown on the final plat/final plans. 2. Note 14 of the final plat states, "Due to high ground water in the area, all foundations shall incorporate an underground drainage system." Along with this note, a statement indicating "no basements allowed" should be included. 3. The construction plans should be updated to include Entech's 7/21/2023 report; currently, they reference a Ground Engineering report. 4. As indicated in the letter of intent, "Groundwater monitoring is underway and potential mitigation measures have been incorporated into the final design." Results of the groundwater monitoring program and mitigation measures should be requested by the county. 5. Per the construction plans, a concrete box culvert is proposed within the unnamed tributary traversing Tracts A and B to contain floodwaters that will discharge to a detention basin. Entech states (page 15), "the proposed cuts in the ponds will extend into the current groundwater levels potentially limiting the capacity of the full-spectrum detention ponds." The results of the groundwater monitoring program should be reviewed to determine if mitigation measures (i.e., geomembrane/liner, dewatering, etc.) are necessary. 6. CGS understands that a CLOMR for the unnamed tributary to Black Squirrel Creek is in process and Tracts A and B within this area will be utilized as temporary open space. It does not appear that the CLOMR has been approved. It is our understanding that no grading, buildings, or other improvements are to be performed/constructed within Tracts A and B until the CLOMR has been approved. Submitted 1/10/2025 by Amy Crandall, Engineering Geologist, Colorado Geological Survey	1/10/2025 8:13:13 AM

ENTECH
ENGINEERING, INC.

APPENDIX F: USDA Soil Survey Descriptions

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Flats, hills
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 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 to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Other soils

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

Pleasant

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

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Columbine

Setting

Landform: Fans, fan terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 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: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent

Landform: Swales
Hydric soil rating: Yes

Other soils

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

Pleasant

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

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024