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SOILS AND GEOLOGY STUDY
MONUMENT ACADEMY 29 LOT SUBDIVISION
PINEHURST CIRCLE AND HIGHWAY 83
EL PASO COUNTY, COLORADO

Prepared for:

MA Infrastructure, LLC
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Monument, Colorado 80132

Attn: Matt Dunston

July 28, 2026

Entech Job No. 251792
LLL/JCG

PCD No.

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1 SUMMARY

Project Location

The project site is located within the NW¼ of Section 15, Township 12 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 4 miles east of the town of Monument, Colorado on the eastern side of Highway 83 on the southern side of Pinehurst Circle. The location of the site is as shown in the Vicinity Map (Figure 1).

Project Description

A twenty-nine lot residential subdivision is proposed for the approximate 24-acre parcel. The lots will be 0.5 to 0.86 acres and will be serviced by central water and sewer provided by the Walden Sanitation District. A detention pond is proposed in the southwestern portion of the site.

Scope of Report

This report presents the results of our geologic evaluation and treatment of engineering geologic hazard study with respect to the proposed subdivision.

Land Use and Engineering Geology

This site was found to be suitable for the proposed development; however, geologic conditions in certain areas will impose some minor constraints on development and land use. These include areas of potentially collapsible soils, potentially expansive soils, potential seasonally shallow groundwater areas, shallow bedrock, and the potential for elevated radon levels. These conditions are discussed in greater detail in this report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either properly mitigated or avoided. All recommendations are subject to the limitations discussed in the report.

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The topography of the site is generally gradually to moderately sloping to the west, with a minor drainage in the southern portion of the site, and minor drainage swales along the slopes in the north-central portion of the site. The drainage area and minor swales were dry at the time of our site observations. West Cherry Creek which flows north is located on the west side of Highway 83. The site boundaries are indicated in the USGS Map (Figure 2). Previous land uses have included rural undeveloped land. Vegetation observed on the site includes field grasses, weeds, and Ponderosa Pines. Site photographs are included in Appendix A.

The project consists twenty-nine lot residential subdivision is proposed for the approximate 24-acre parcel. The lots will be 0.5 to 0.86 acres and will be serviced by central water and sewer provided by the Walden Sanitation District. The proposed lot configuration is shown in the Site and Exploration Plan (Figure 3). Grading plans were not available at the time of this investigation, however, grading is anticipated limited to the roadways, proposed site drainage improvements, and the construction of the proposed detention and water quality pond.

3 SCOPE OF THE REPORT

The scope of this report includes 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 the Web Soil Survey from the Natural Resource Conservation Service (NRCS), formerly known as 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 Geology/Engineering Geology Map, which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech on September 29, 2029. Site photographs are included in Appendix A.

Eight (8) test borings were drilled on the site to evaluate the soil conditions and to determine the classification and engineering characteristics of the soils. The borings were drilled to depths of 20 feet using a truck-mounted, continuous flight auger drilling rig supplied and operated by Entech.

The locations of the test borings are indicated on the Site and Exploration Plan (Figure 3). The Test Boring Logs are included in Appendix B, and Laboratory Test Results are included in Appendix 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 D6913), and Atterberg Limits testing (ASTM D4318). Results of the laboratory testing are included in Appendix C.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

The site lies in the western portion of the Great Plains Physiographic Province just north of the Palmer Divide. A major structural feature known as the Rampart Range Fault lies approximately 8 miles to the west. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southwestern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be very gently dipping in a northeasterly direction (Reference 1). The rocks in the area of the site are sedimentary in nature and typically Tertiary to Cretaceous in age. The bedrock underlying the site consists of the Dawson Arkose Formation of Tertiary to Cretaceous Age. Overlying this formation are unconsolidated deposits of colluvium, sheetwash, and residual soils of Quaternary Age. The residual soils are produced by the in-situ action of weathering of the bedrock on site. Some colluvial soils deposited by gravity and sheetwash exist. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Survey

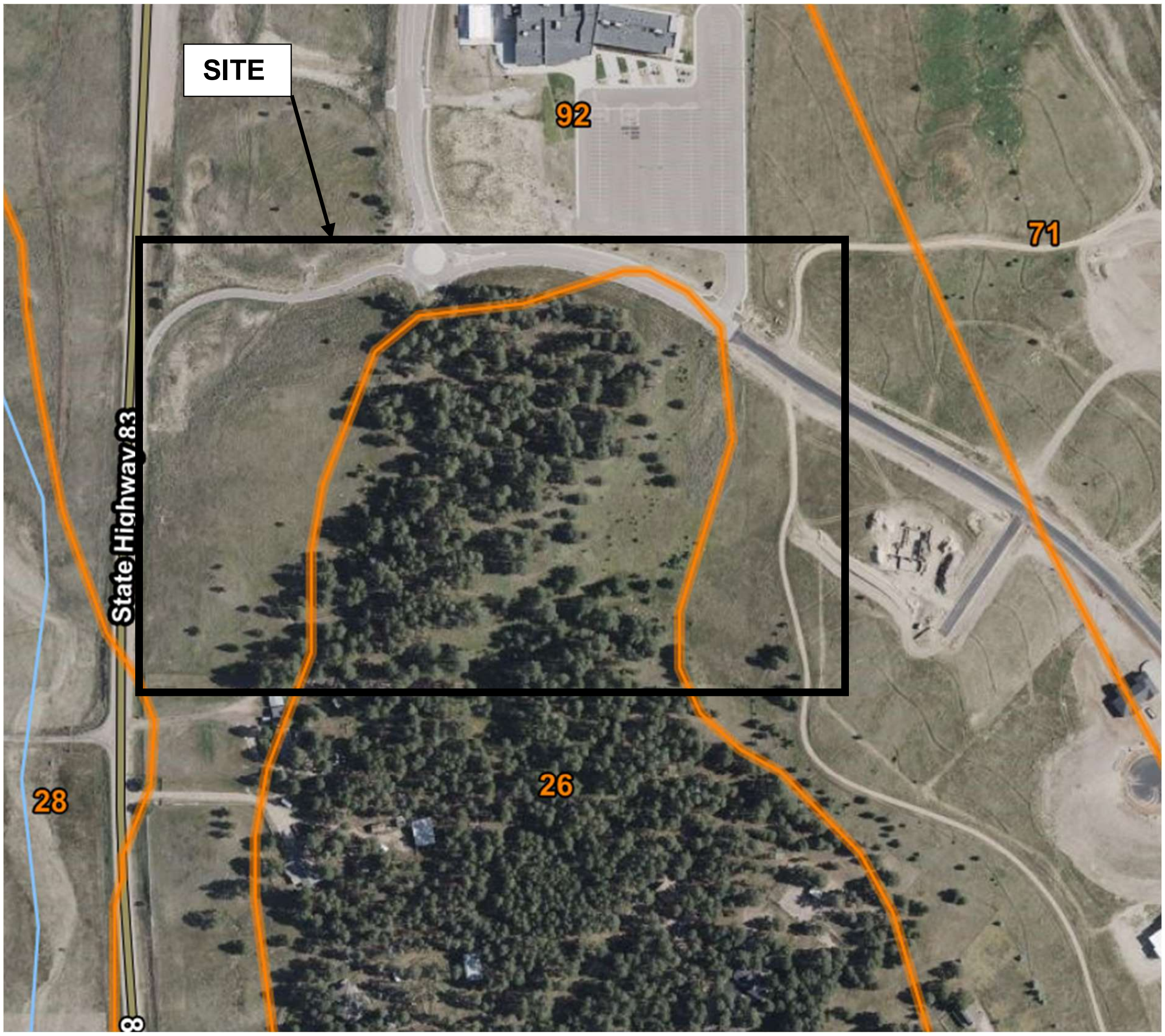
The Natural Resource Conservation Service (Reference 2), previously the Soil Conservation Service (Reference 3), has mapped two soil types on the site. In general, they are loamy sands. The soils are described in Exhibit 1, and shown in Exhibit 2.

Exhibit 1: Soil Survey Description

Type	Description
26	Elbeth sandy loam, 8 to 15% slopes
92	Tomah-Crowfoot loamy sands, 3 to 8% slopes

Exhibit 2: USDA – Web Soil Survey

Soil Map – El Paso County Area, Colorado



Complete descriptions of each soil type are presented in Appendix D. The soils have generally been described as having moderately high to high permeabilities. Limitations on development include limited ability to support a load, shrink-swell potential, slopes, and frost action potential. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards.

5.3 Site Stratigraphy

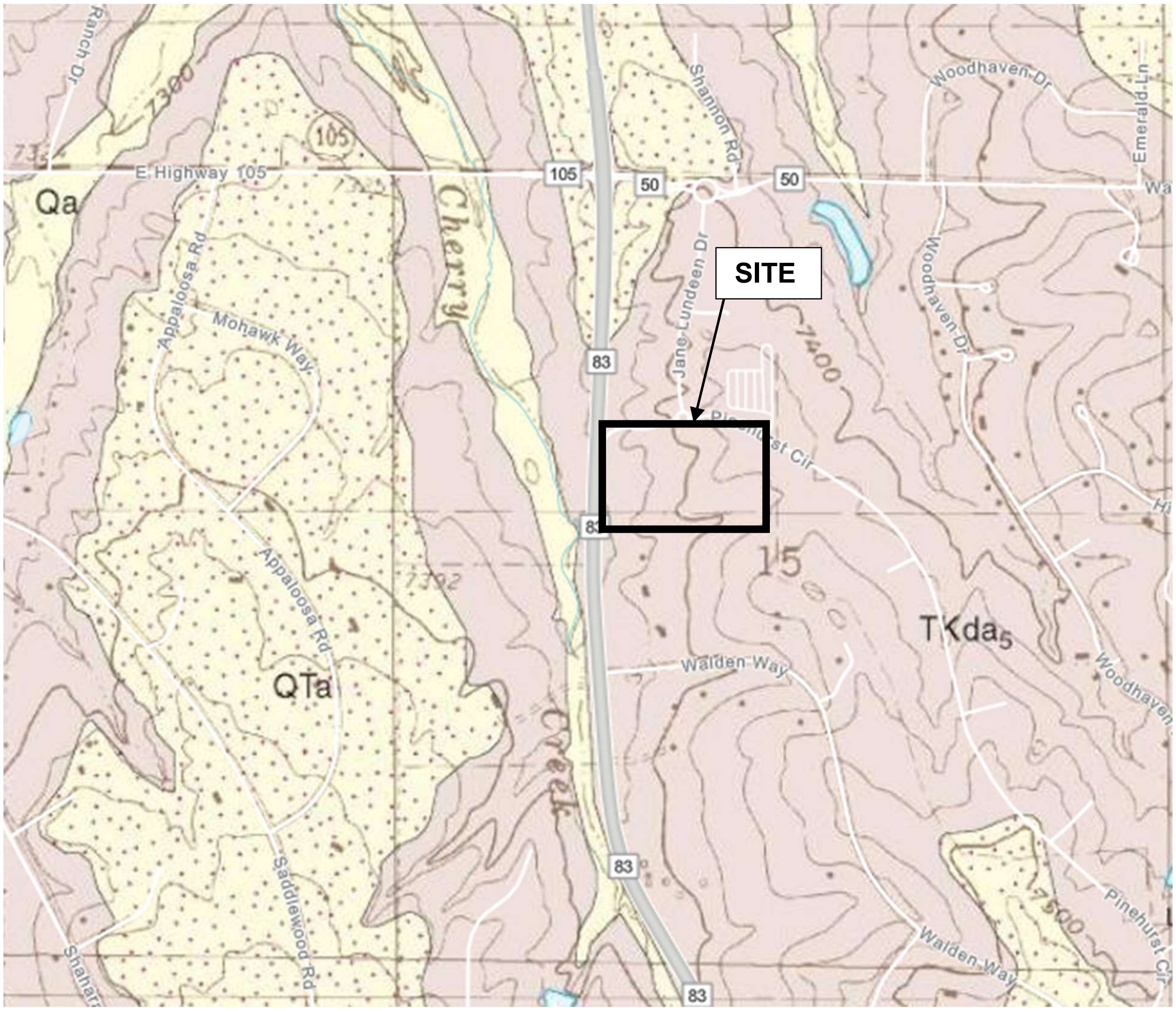
The Geologic Map of the Monument Quadrangle showing the site is presented in Exhibit 4 below (Reference 4). The Geology/Engineering Geology Map prepared for the site is presented in Figure 4. One mappable unit was identified on this site that are described as follows:

Qc/Tkd **Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The Dawson Formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone, and claystone. Overlying this formation is a variable layer of colluvium and residual soils. The residual soils were derived from the in-situ weathering of the bedrock materials on-site. These soils consist of clayey sands and sandy clays. The colluvial materials are derived from the bedrock materials and have been re-deposited by the action of sheetwash and gravity.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Monument Quadrangle* distributed by the Colorado Geological Survey in 2003 (Reference 4), 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 1^0 x 2^0 Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 6). The Test Borings and Test Pit Logs used in evaluating the site are included in Appendix B. The Geology/Engineering Geology Map prepared for the site is presented in Figure 4.

Exhibit 3: Geologic Map of the Monument Quadrangle

Colorado Geological Survey – OF-02-04



5.4 Soil Conditions

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

<u>Soil Type 1</u> classified as a clayey to silty sand (SC, SM). The sand was encountered in all test borings at the existing surface to 6 feet and extending to depths of 3 to 18 feet below the existing grade surface (bgs) and to the termination depths of TB-3 and TB-4 (20 feet). The sand was encountered at loose to dense states and moist conditions. One dimensional swell/collapse

testing resulted in a collapse of 3.2%, which indicates a moderate collapse potential for the silty sand

Soil Type 2 classified as a sandy clay (CL). The silt was encountered in TB-8 at a depth of 3 feet and extended to 6 feet bgs. The clay was encountered at very stiff states and moist conditions. One dimensional swell/collapse testing resulted in an expansion of 0.1%, which indicates a low expansion potential.

Soil Type 3 classified as highly weathered sandstone or silty sand when classified as a soil (SM). The sandstone was encountered in six test borings at depths of 3 to 18 feet bgs and extending to the termination depth of the borings (20 feet). The sandstone was encountered at very dense to dense states and moist conditions.

The test boring logs and laboratory test results pertaining to this investigation are included in Appendix B.

5.5 Groundwater

Groundwater was not encountered in the test borings during or subsequent to drilling. Minor areas of potentially seasonal shallow groundwater have been mapped in the drainage, minor swales 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.

It should be noted that some groundwater conditions may be encountered in the sandy lenses/layers. 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 monitor potential occurrences 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 a Geology/Engineering Geology Map (Figure 4). This map shows the location of various geologic conditions the developers should monitor during the planning, design, and construction stages of the project. No significant geologic hazards were identified on the site; however, the following constraints have been identified on the site: potentially collapsible soils, potentially expansive soils, potential seasonally shallow groundwater areas, shallow bedrock, and the potential for elevated radon levels. These constraints and the recommended mitigation techniques are discussed below.

Artificial Fill – Constraint

Areas of fill were not encountered in the test borings or observed during the field mapping, however, some areas of fill may exist on the site.

> Mitigation: 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.

Collapsible Soils – Constraint

The majority of the soils encountered on site do not exhibit collapsible characteristics, however, areas of silty and/or loose soils with the potential for collapse exists. Testing on a sample of silty sand from TB-6 at a depth of 2 to 3 feet bgs resulted in a collapse of 3.2 feet, indicated a moderate collapse potential.

> Mitigation: Should loose or collapsible soils be encountered beneath foundations, recompaction of the loose soil at a minimum of 95% of the Modified Procter (ASTM D1557) maximum dry density will be required. Exterior flatwork and driveway areas may also experience movement. Proofrolling and recompaction of soft areas should be performed during site work.

Potentially Expansive Soils – Constraint

The site is classified in an area of low swell potential according to the *Map of Potentially Swelling Soil and Rock in the Front Range Urban Corridor, Colorado* by Hart, 1974 (Reference 7). Expansive clays and claystone bedrock are commonly interbedded in the Dawson Formation. These occurrences are typically sporadic; therefore, none have been indicated on the maps. These clays, if encountered beneath foundations, can cause differential movement in the structure foundation. The sand and sandstone soils are anticipated to exhibit low expansion potentials. If potentially expansive materials are found during excavation, they will need to be mitigated. Expansive soils were not encountered in the test borings. Expansive soils should be identified and mitigated on an individual basis.

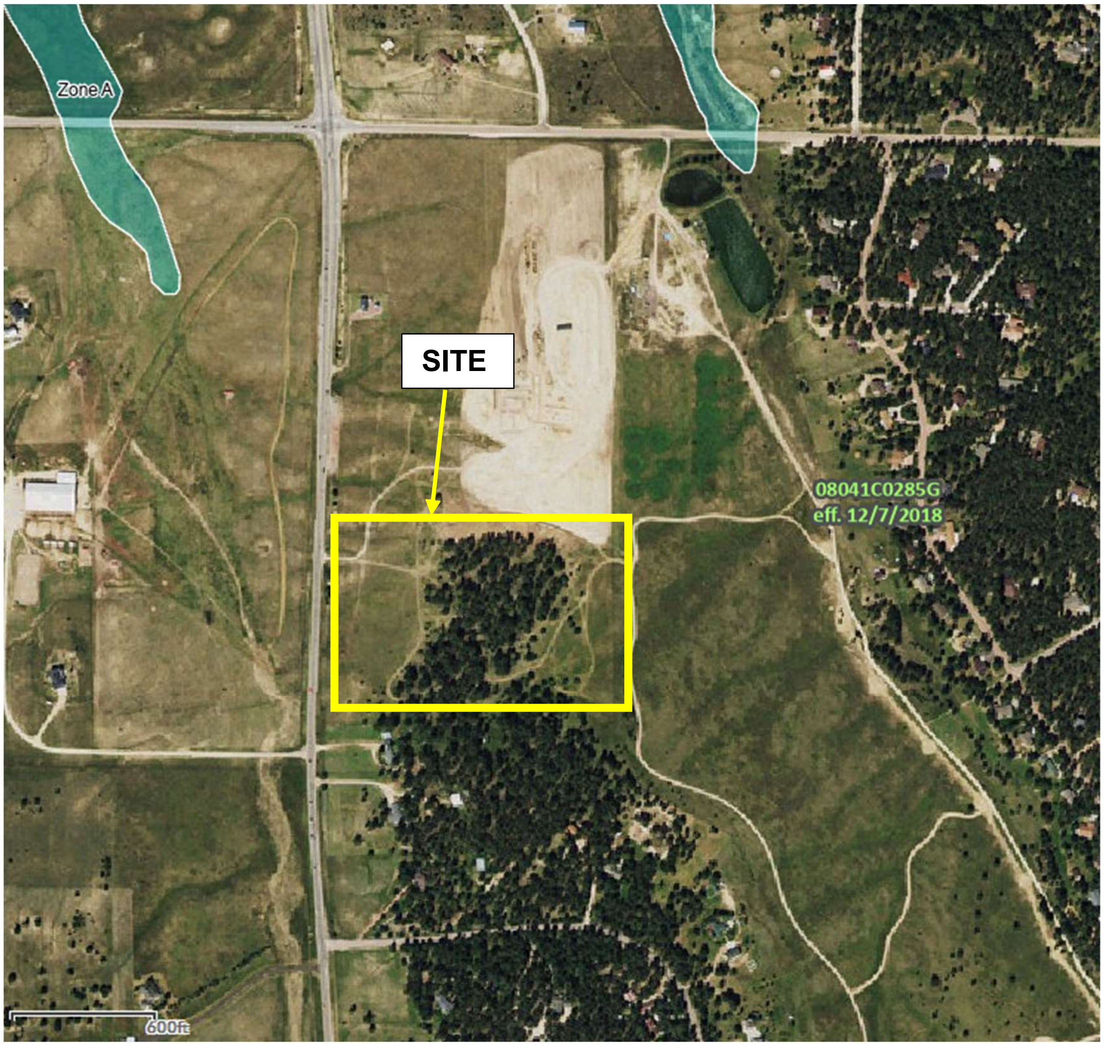
Mitigation: Should expansive soils be encountered beneath foundations; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95% of the Modified Proctor (ASTM D1557) maximum dry density is a suitable mitigation, which 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.

Drainage and Floodplain Areas – Constraint

The site is not located within any mapped floodplains according to FEMA Map No. 08041C0285G (Figure 6, Reference 8). a minor drainage in the southern portion of the site, and minor drainage swales along the slopes in the north-central portion of the site. West Cherry Creek which flows north is located on the west side of Highway 83. The drainage and minor swales onsite were dry at the time of our site observations, however, the potential for seasonal shallow groundwater exists in these areas. These areas are discussed further below. Specific drainage studies and floodplain locations are beyond the scope of this report.

Exhibit 4: FEMA Flood Map

FEMA Map No. 08041C0285G, eff. 12/7/2018



Potentially Seasonal Shallow Groundwater Areas – Constraint

In these areas, we would anticipate periodic high subsurface moisture conditions and frost heave potential on a seasonal basis. The areas identified with this constraint are the minor drainage along the southern side of the site, and minor drainage swales along portions of the slopes in the north-central portion of the site. Groundwater was not encountered in the test borings during or subsequent to drilling. Any structures in or adjacent to potentially shallow groundwater areas should follow the mitigation discussed below.

Mitigation: Minor swales identified in the north-central portion of the site can be regraded and directed around potential building areas. Foundations on this site must have a minimum 30-inch depth for frost protection. Buildings should typically be set a minimum of 3 feet above groundwater levels if possible. Subsurface perimeter drains are recommended for any usable below-grade. If groundwater is encountered within 3 feet of foundation grade, additional drains that may include but are not limited to interceptor drains, underslab drains (capillary break) may be required. Overexcavation drains may be needed in areas of expansive soils. Typical drain details are presented in Figures 5 through 7. Any grading in these areas should be done to direct surface flows around structures to avoid areas of ponded water. Structures should not block drainages. All organic material should be completely removed prior to any fill placement.

Slope Stability and Landslide Susceptibility – Hazard

The majority of the slopes on the site are gradually to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. Any future site grading should be no steeper than 3:1 unless specifically analyzed.

Downslope Creep – Constraint

Minor areas of downslope creep were observed along portions of the slopes in the northern and central portion 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 as building sites with the following constraints on construction.

Mitigation: Building is possible in these areas if the following engineering and construction mitigation steps are taken: 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 8. 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. Long, rambling, irregular structures should be avoided in these areas as they are associated with a much greater potential for damaging differential movement. Tie walls and buttresses are often used to stiffen the foundation system.

Debris Flow Susceptibility – Hazard

The site is not located within an area of debris flow susceptibility according to the *Debris Flow Susceptibility Map of El Paso County, Colorado* by McCoy et al. in 2018 (Reference 10).

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 11). The average radon level for the 80908 zip code is 3.40 pCi/l. The average radon levels are presented in Exhibit 2 below.

Exhibit 5: Average Radon Levels

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.**

6.1 Relevance of Geologic Conditions to Land Use Planning

We understand that the development will be single family residential with twenty-nine 0.5 to 0.86-acres lots. It is our opinion that the existing geologic and engineering geologic conditions will impose some minor constraints on the proposed development. The constraints will be those associated with the potentially collapsible soils, potentially expansive soils, potential seasonally shallow groundwater areas, downslope creep, shallow bedrock, and the potential for elevated radon levels. The constraints/hazards on the site may be satisfactorily mitigated through proper engineering design and construction practices.

The granular soils were generally encountered at medium dense to very dense states. The granular soils encountered in the upper soil profiles of the test boring should provide good support for foundations. Foundations anticipated for the site are standard spread footings on the medium dense granular soils or sandstone bedrock.

Loose or collapsible soils encountered beneath foundations will require recompaction to a minimum of 95% of the Modified Procter (ASTM D1557) maximum dry density. The depth of recompaction should be determined for each site as required. Exterior flatwork and driveway areas may also experience movement. Proofrolling and recompaction of soft areas should be performed during site work.

Expansive layers may also be encountered in the soil and bedrock on this site. Areas of expansive soils on site are expected to be sporadic; therefore, none have been indicated on the maps. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development. Overexcavation and replacement with non-expansive soils is a suitable mitigation. Site-specific subsurface investigations will need to be conducted.

In summary, development of the site can be achieved if the items mentioned above are mitigated. These items can be mitigated through proper design and construction or through avoidance. Investigation of the individual lots and building sites is required prior to construction.

7 ECONOMIC MINERAL RESOURCES

Some of the sandy materials on site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 12), the site is not mapped within any aggregate resources. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 13), areas of the site are not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 14), 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, shallow bedrock, 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 14), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "Poor" for coal resources. No active or inactive mines have been mapped near the site. No metallic mineral resources have been mapped on the site (Reference 14).

The site has been mapped as "Fair" for oil and gas resources (Reference 14). No oil or gas fields have been discovered 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 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 synthetic channel lining materials available 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 re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

9 PRIVATE DRIVEWAY AND ROADWAY CONSTRUCTION RECOMMENDATIONS

The site soils encountered in the test boring are suitable for the proposed embankments, driveways and roads. 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 unless specifically analyzed. 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.

TB-8 was placed in the area of the proposed detention and water quality pond in the southwest portion of the site. Soils encountered in the boring consisted of silty to clayey sand and sandy clay overlying sandstone which was encountered at 17 feet bgs. The soils are suitable for use for the proposed detention pond and associated embankments. Groundwater was not encountered in the boring and mitigation for shallow groundwater conditions are not anticipated.

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 roadway improvements.

10 CLOSURE

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

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

This report has been prepared for MA Infrastructure, 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.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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

Reviewed by:

COLORADO LICENSED PROFESSIONAL ENGINEER
JOSEPH COLLIN GOODE
23725

Digitally signed by Joseph C Goode Jr.
Date: 07/28/26

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

LLL/JCG

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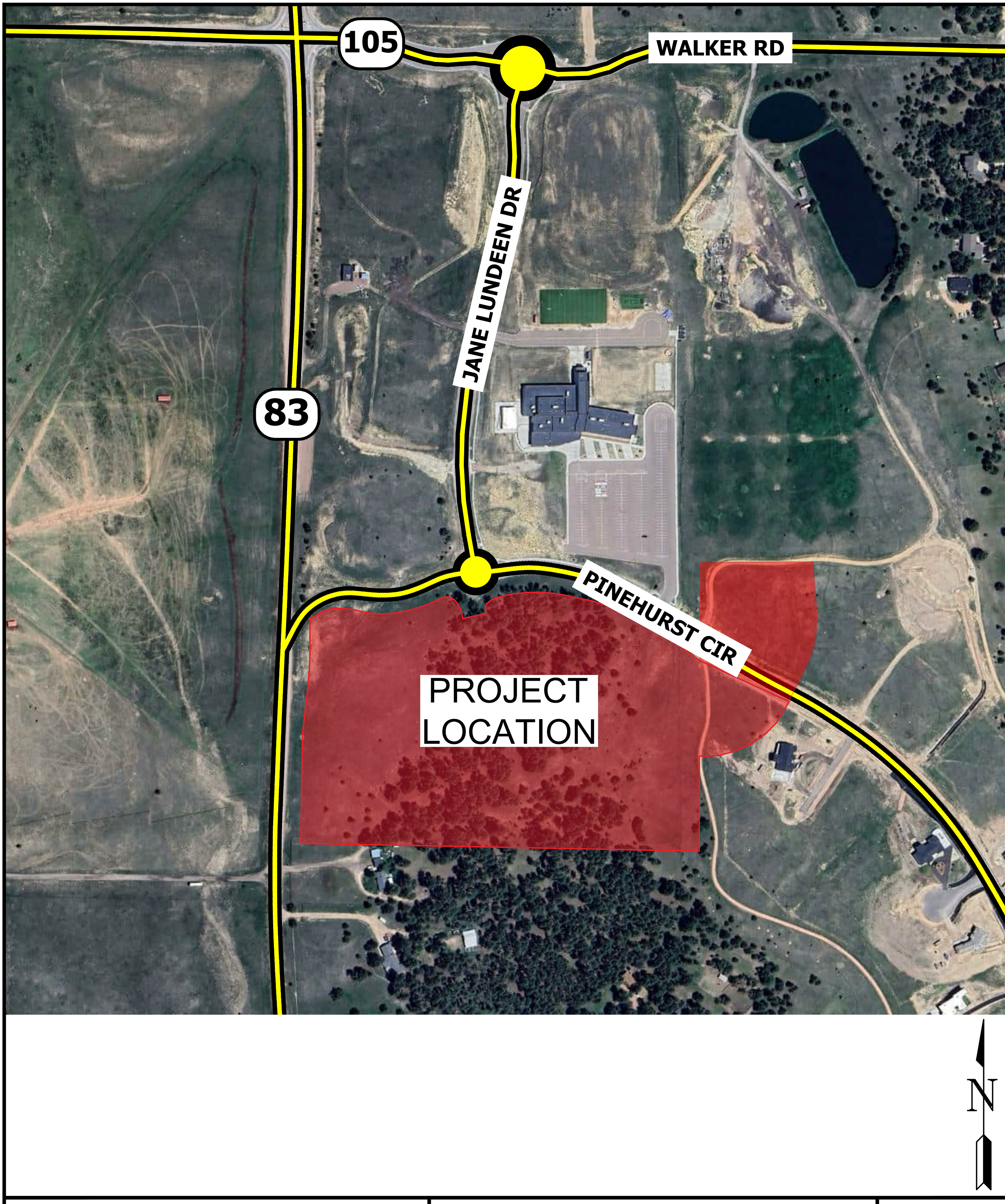
FIGURES



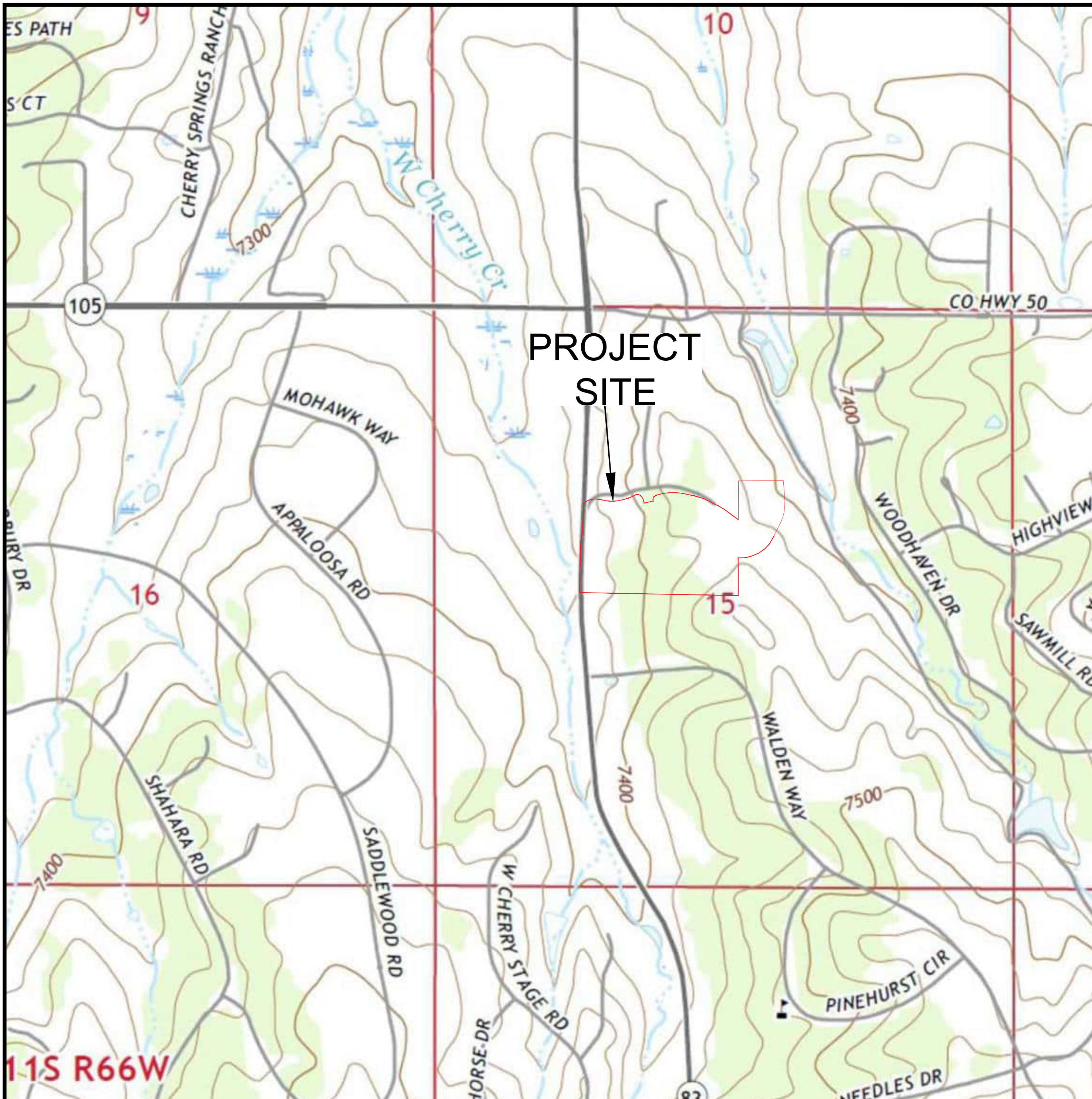
ENTECH ENGINEERING, INC.

VICINITY MAP

PINEHURST CIRCLE 31 LOT SUB
MA INFASTRUCTURE, LLC

JOB NO. 251792

FIG. 1



USGS TOPOGRAPHY MAP

PINEHURST CIRCLE 31 LOT SUB
MA INFASTRUCTURE, LLC

JOB NO. 251792

FIG. 2

- APPROXIMATE TEST BORING LOCATION AND NUMBER
(P2) - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

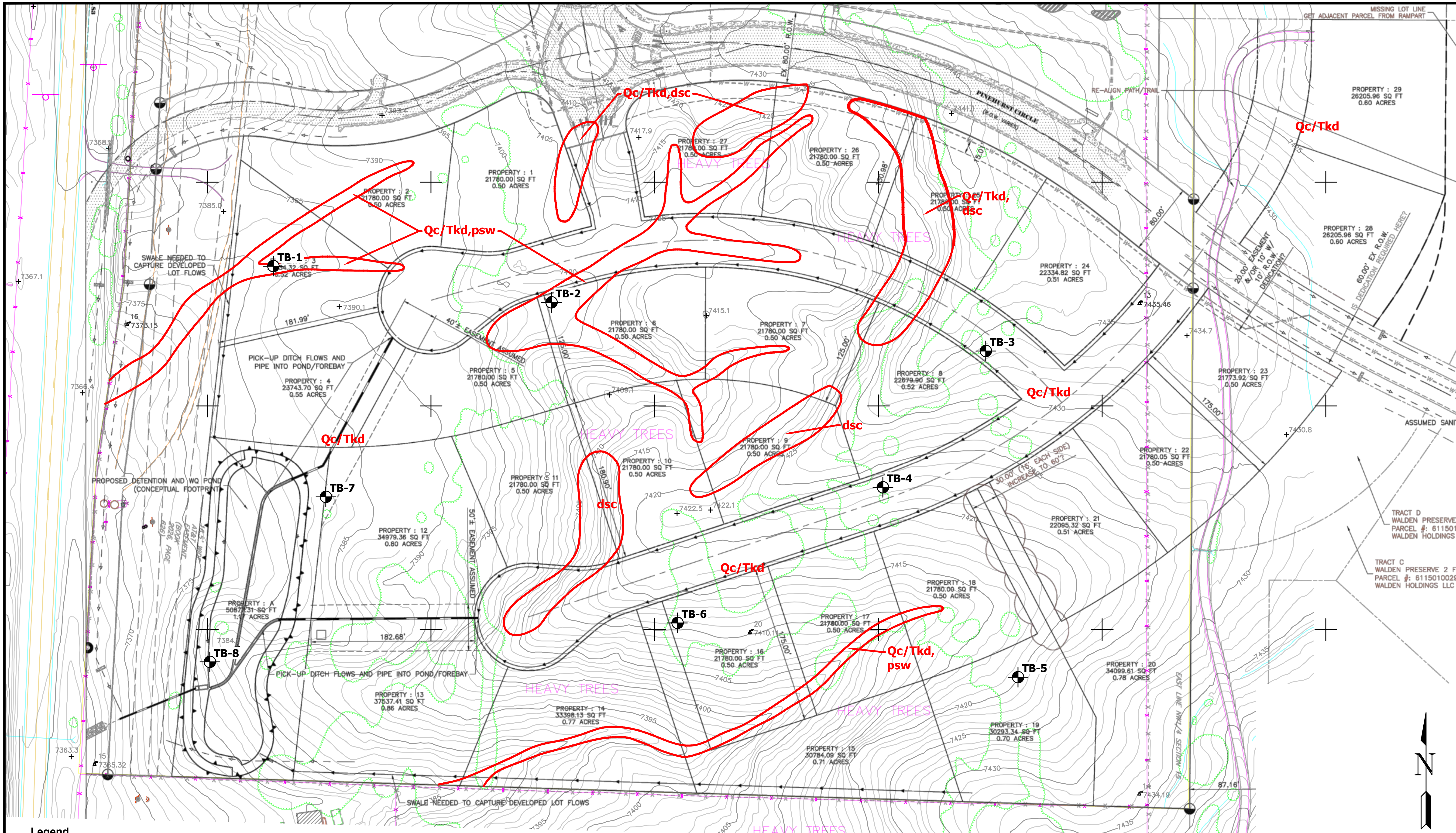
ENTECH
ENGINEERING, INC.

SITE AND EXPLORATION PLAN

PINEHURST CIRCLE 31 LOT SUB
MA INFRASTRUCTURE, LLC

JOB NO.
251792

FIG. 3



Legend

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

psw - potentially seasonally wet

dsc - downslope creep

- APPROXIMATE TEST BORING LOCATION AND NUMBER

ENTECH ENGINEERING, INC.

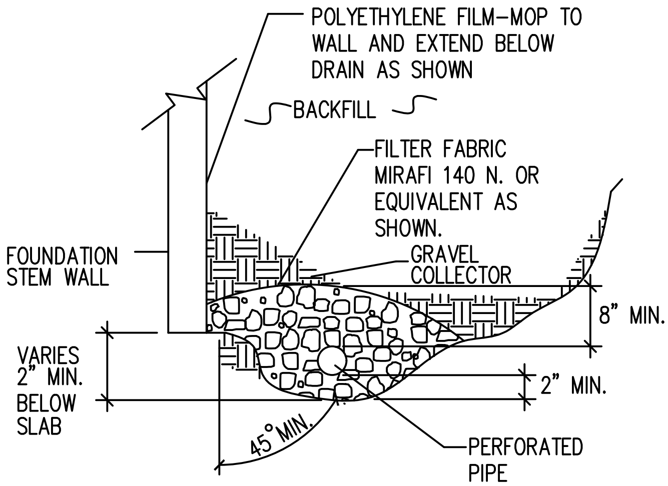
GEOLOGY/ENGINEERING GEOLOG MAP

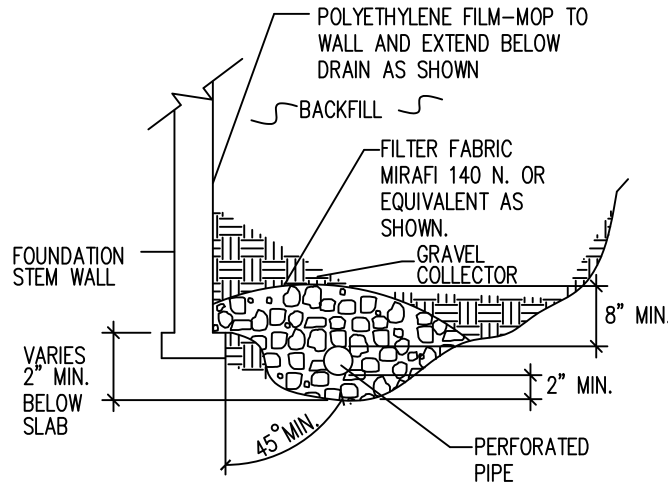
PINEHURST CIRCLE 31 LOT SUB

MA INFRASTRUCTURE, LLC

JOB NO. 251792

FIG. 4





NOTES:

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

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

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

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

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

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

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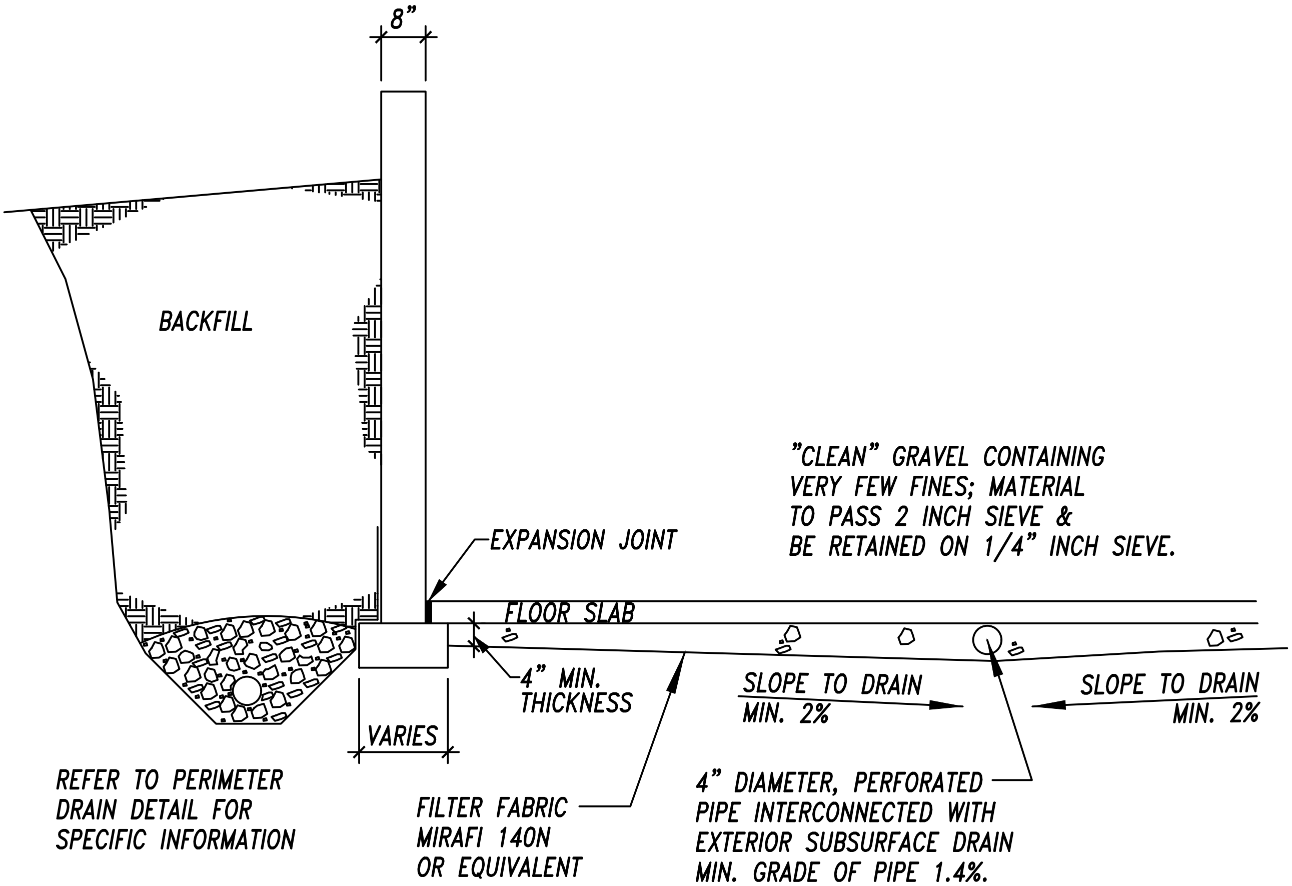
PERIMETER DRAIN DETAIL

PINEHURST CIRCLE 31 LOT SUB
MA INFASTRUCTURE, LLC

**JOB NO.
251792**

FIG. 5



ENTECH ENGINEERING, INC.

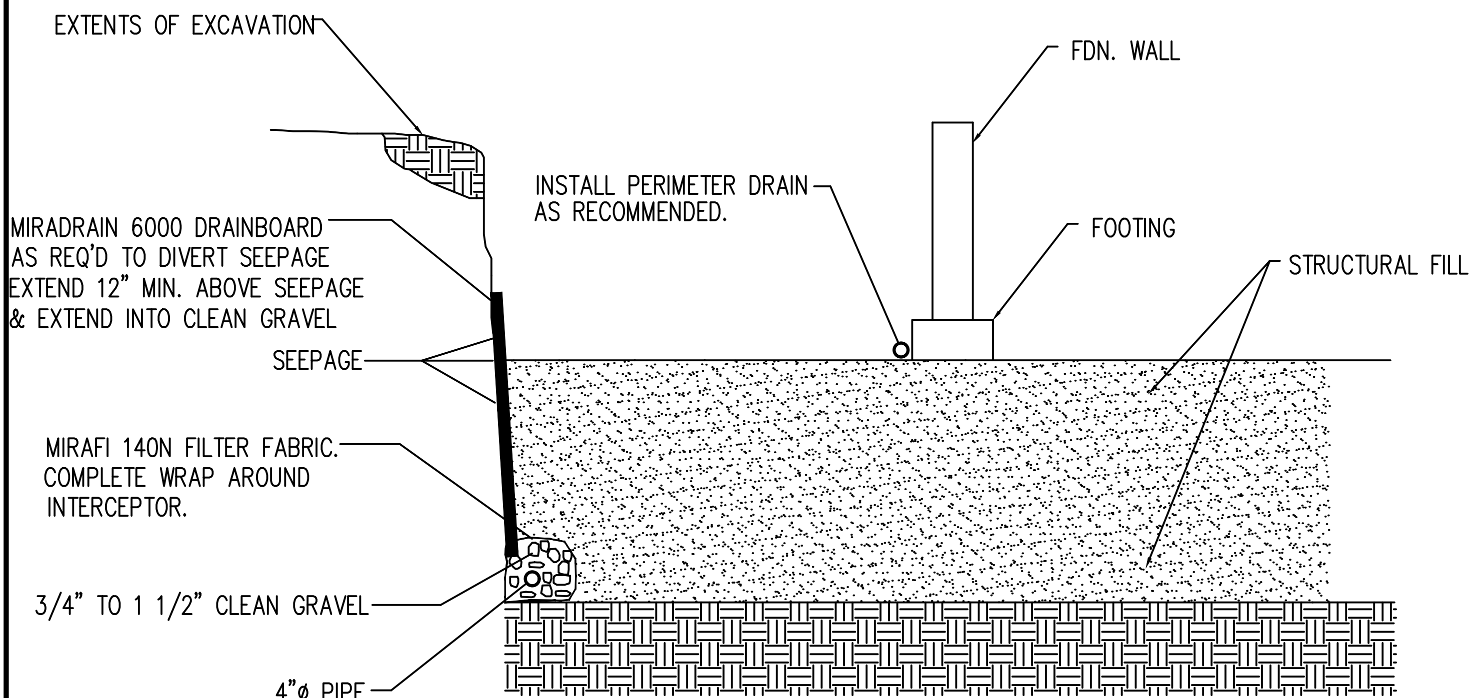
TYP. UNDERSLAB DRAINAGE LAYER (CAPILLARY BREAK)

PINEHURST CIRCLE 31 LOT SUB

MA INFASTRUCTURE, LLC

JOB NO. 251792

FIG. 6

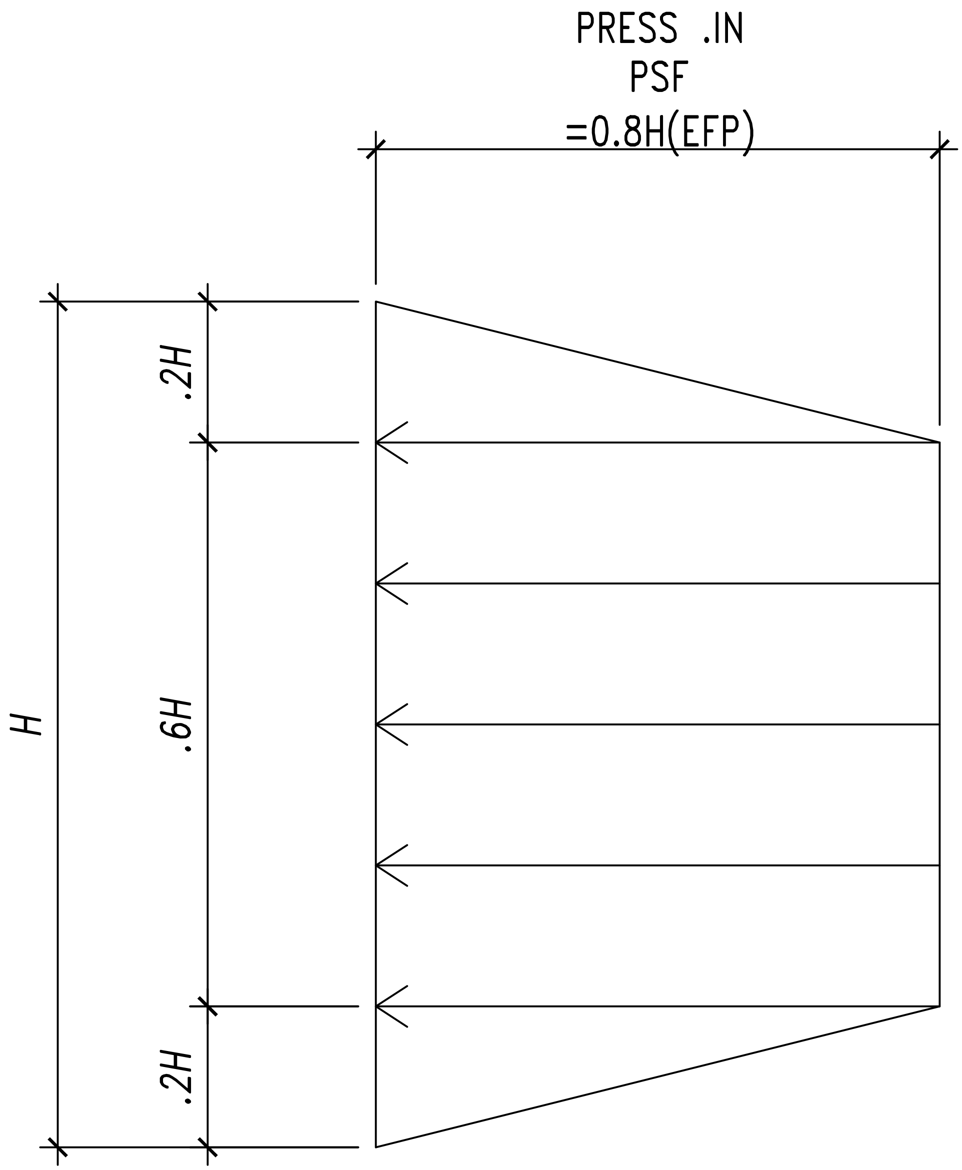


NOTE:
EXTEND INTERCEPTOR DRAIN TO UNDERDRAIN OR TO SUMP.
BENCH DRAIN INTO NATIVE SOILS 12 INCHES MINIMUM.

INTERCEPTOR DRAIN DETAIL

N.T.S.

ENTECH ENGINEERING, INC.	**INTERCEPTOR DRAIN DETAIL** PINEHURST CIRCLE 31 LOT SUB MA INFASTRUCTURE, LLC	**JOB NO. 251792** **FIG. 7**



PRESSURE DISTRIBUTION

ENTECH ENGINEERING, INC.	**LATERAL PRESSURE DIAGRAM** PINEHURST CIRCLE 31 LOT SUB MA INFASTRUCTURE, LLC	**JOB NO. 251792** **FIG. 8**

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APPENDIX A: Site Photographs

1

Looking northwest from the eastern portion of the site.

December 12, 2025

2

Looking southwest from the eastern portion of the site.

December 12, 2025

3

Looking northwest from the western portion of the site.

December 12, 2025

4

Looking south from the western portion of the site.

December 12, 2025

5

Looking east from the western portion of the site.

December 12, 2025

6

Looking northeast from the north-central portion of the site.

December 12, 2025

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APPENDIX B: Test Boring Logs

TEST BORING 1
DATE DRILLED 12/18/2025
REMARKS
DRY TO 20', 12/29/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL SAND, CLAYEY, BROWN to TAN, MEDIUM DENSE, MOIST		■	27	4.9	1
SAND, WITH SILT, TAN, MEDIUM DENSE, DRY to MOIST	5	■	21	2.4	1
	10	■	29	8.8	1
	15	■	20	7.7	1
SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	20	■	50/3"	7.3	3

TEST BORING 2
DATE DRILLED 12/18/2025
REMARKS
DRY TO 20', 12/29/25

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL SAND, SILTY, TAN, MEDIUM DENSE, DRY		■	17	2.9	1
SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	5	■	50/9"	6.9	3
	10	■	50/7"	5.5	3
	15	■	50/8"	6.9	3
	20	■	50/10"	7.4	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO. 251792

FIG. B-1

TEST BORING 3
DATE DRILLED 12/8/2025

REMARKS
DRY TO 20', 12/29/25

Description	Depth (ft)	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL				
SAND, SILTY, BROWN to TAN, MEDIUM DENSE to DENSE, DRY to MOIST		24	2.9	1
	5	38	3.2	1
	10	31	8.6	1
SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, WITH SILT, VERY DENSE, MOIST)	15	50/7"	5.0	3
	20	50/8"	5.8	3

TEST BORING 4
DATE DRILLED 12/8/2025

REMARKS
DRY TO 20', 12/29/25

Description	Depth (ft)	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL				
SAND, SILTY, BROWN to TAN, MEDIUM DENSE to DENSE, MOIST		29	3.6	1
	5	23	5.8	1
	10	25	6.0	1
	15	30	5.3	1
	20	47	6.4	1

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TEST BORING LOGS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. B-2

TEST BORING 5					
DATE DRILLED 12/8/2025					
REMARKS: DRY TO 20', 12/29/25	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL					
SAND, SILTY, BROWN to TAN, MEDIUM DENSE to DENSE, MOIST		X	10	2.1	1
	5	X	20	3.9	1
	10	X	23	6.6	1
SAND, CLAYEY, LIGHT BROWN, DENSE, MOIST	15	X	37	9.6	1
SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	20	X	50/7"	9.2	3

TEST BORING 6					
DATE DRILLED 12/18/2025					
REMARKS: DRY TO 20', 12/29/25	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL					
SAND, SILTY, BROWN to TAN, MEDIUM DENSE to DENSE, MOIST to DRY		X	26	5.8	1
	5	X	29	2.9	1
	10	X	33	6.2	1
	15	X	21	4.2	1
	20	X	31	7.5	1

ENTECH ENGINEERING, INC.

TEST BORING LOGS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. B-3

TEST BORING 7
DATE DRILLED 12/18/2025
REMARKS
DRY TO 20', 12/29/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
12" TOPSOIL						
SAND, SILTY, TAN, MEDIUM DENSE to DENSE, DRY to MOIST				15	3.7	1
	5			17	2.3	1
	10			39	11.0	1
SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	15			50/8"	8.3	3
	20			50/8"	6.9	3

TEST BORING 8
DATE DRILLED 12/18/2025
REMARKS
DRY TO 20', 12/29/25

Description	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
6" TOPSOIL						
SAND, SILTY, BROWN, DENSE, MOIST				41	3.6	1
CLAY, WITH SAND, BROWN, VERY STIFF, MOIST	5			18	15.5	2
SAND, CLAYEY, TAN, DENSE, MOIST						
	10			33	7.9	1
	15			42	10.4	1
SANDSTONE, VERY WEAK, TAN, HIGHLY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)	20			50/7"	5.0	3

ENTECH ENGINEERING, INC.

TEST BORING LOGS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. B-4

TABLE B-1

DEPTH TO BEDROCK

TEST BORING	DEPTH TO BEDROCK (ft.)
1	18
2	3
3	13
4	>20
5	17
6	>20
7	11
8	17

Project: Pinehurst Circle
Client: MA Infrastructure
Job No: 251792

APPENDIX C: Laboratory Test Results

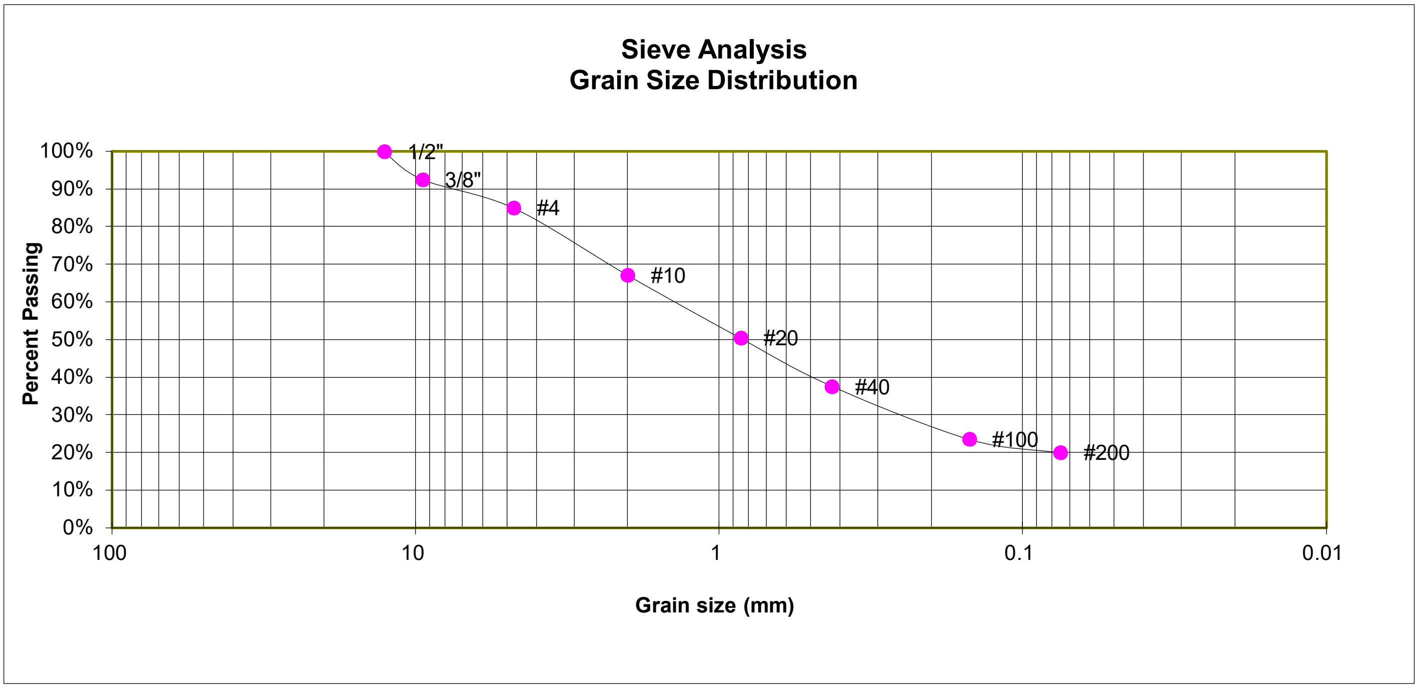
ENTECH ENGINEERING, INC.

TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	1	2-3			20.0	30	21	9	<0.01		SC	SAND, CLAYEY
1	4	5			24.1	NV	NP	NP			SM	SAND, SILTY
1	5	15			24.0	40	24	16	<0.01		SC	SAND, CLAYEY
1	6	2-3	6.1	98.4	38.2	26	24	2		-3.2	SM	SAND, SILTY
2	8	5	15.0	112.1	71.6				<0.01	0.1	CL	CLAY, WITH SAND
3	2	10			20.0	NV	NP	NP	0.00		SM	SANDSTONE (SAND, SILTY)
3	3	15			6.1	NV	NP	NP			SW-SM	SANDSTONE (SAND, WITH SILT)
3	7	15			24.4						SM	SANDSTONE (SAND, SILTY)

Project: Pinehurst Circle
Client: MA Infrastructure
Job No: 251792

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	92.5%
4	84.9%
10	67.1%
20	50.4%
40	37.6%
100	23.6%
200	20.0%

ATTERBERG LIMITS

Plastic Limit	21
Liquid Limit	30
Plastic Index	9

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

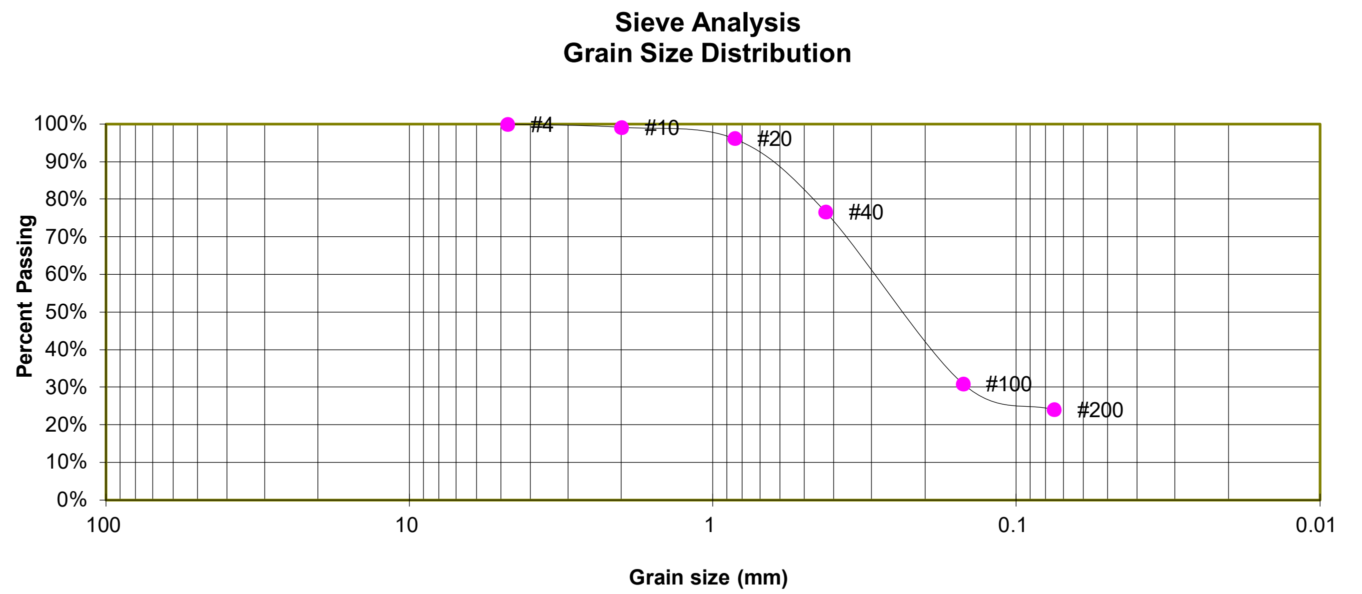
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-1

TEST BORING	4	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	99.2%
20	96.2%
40	76.6%
100	30.9%
200	24.1%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

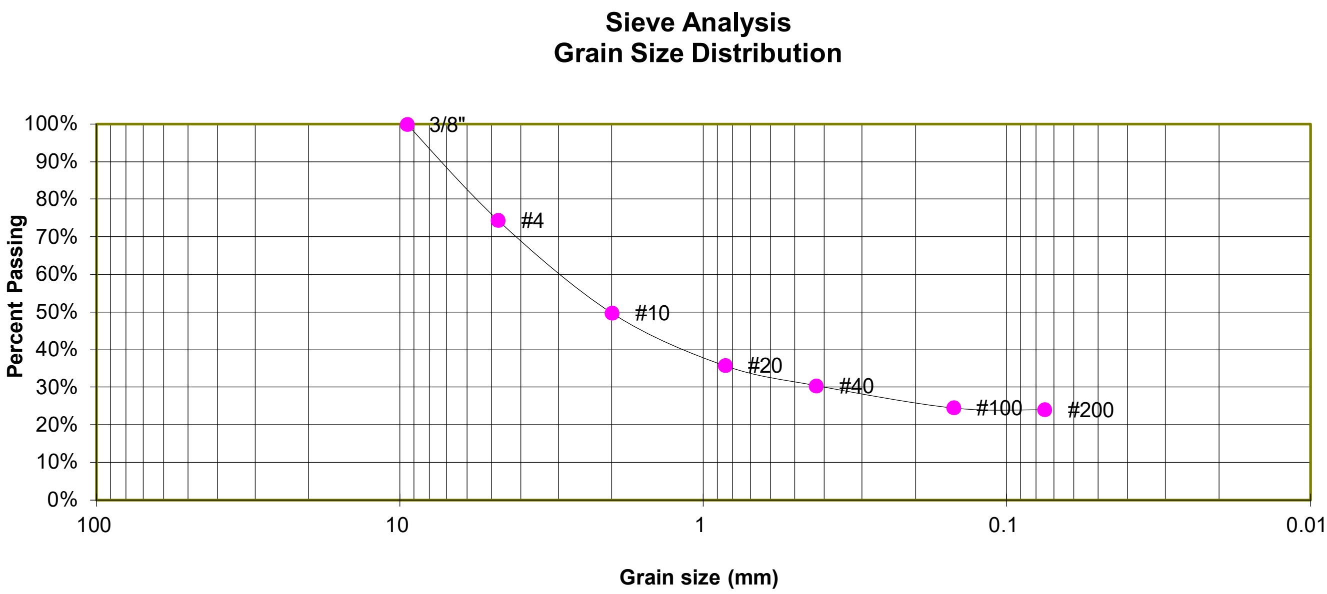
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-2

TEST BORING	5	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	15	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	74.4%
10	49.8%
20	35.8%
40	30.5%
100	24.6%
200	24.0%

ATTERBERG LIMITS

Plastic Limit	24
Liquid Limit	40
Plastic Index	16

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

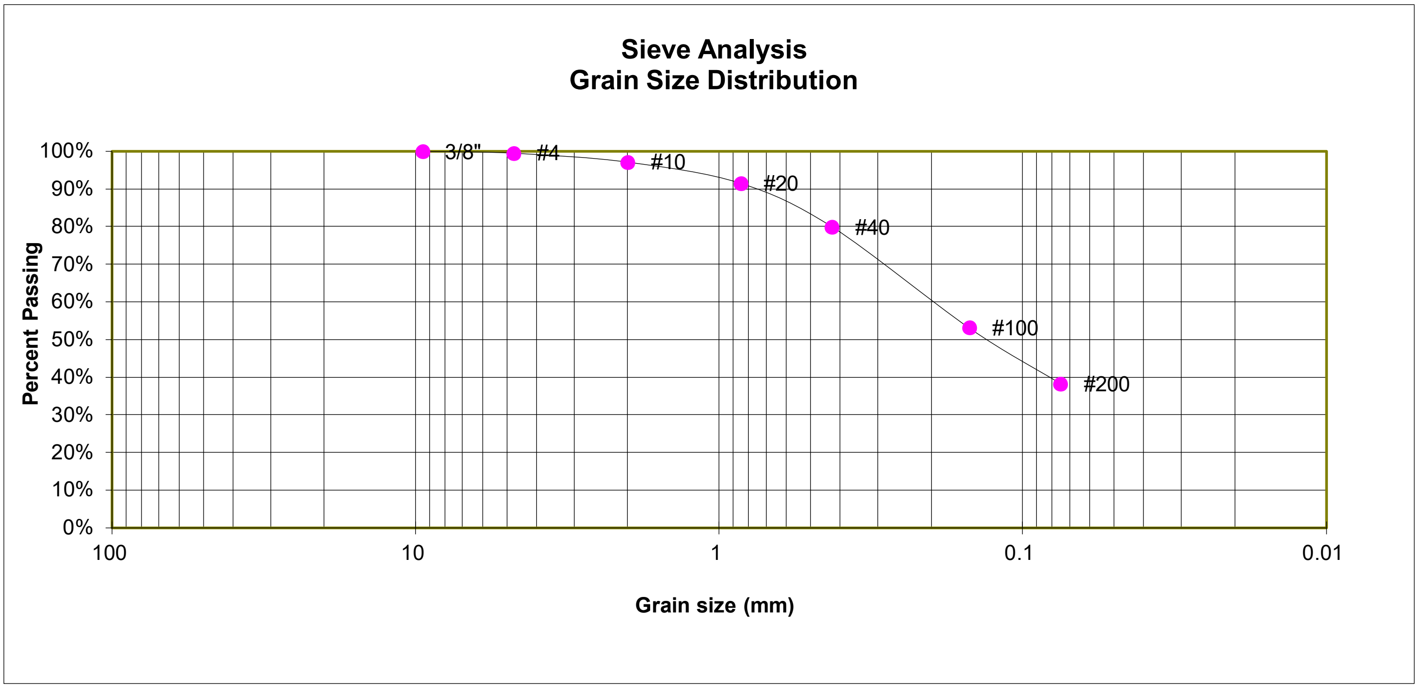
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-3

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	97.2%
20	91.5%
40	80.0%
100	53.1%
200	38.2%

ATTERBERG LIMITS

Plastic Limit	24
Liquid Limit	26
Plastic Index	2

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

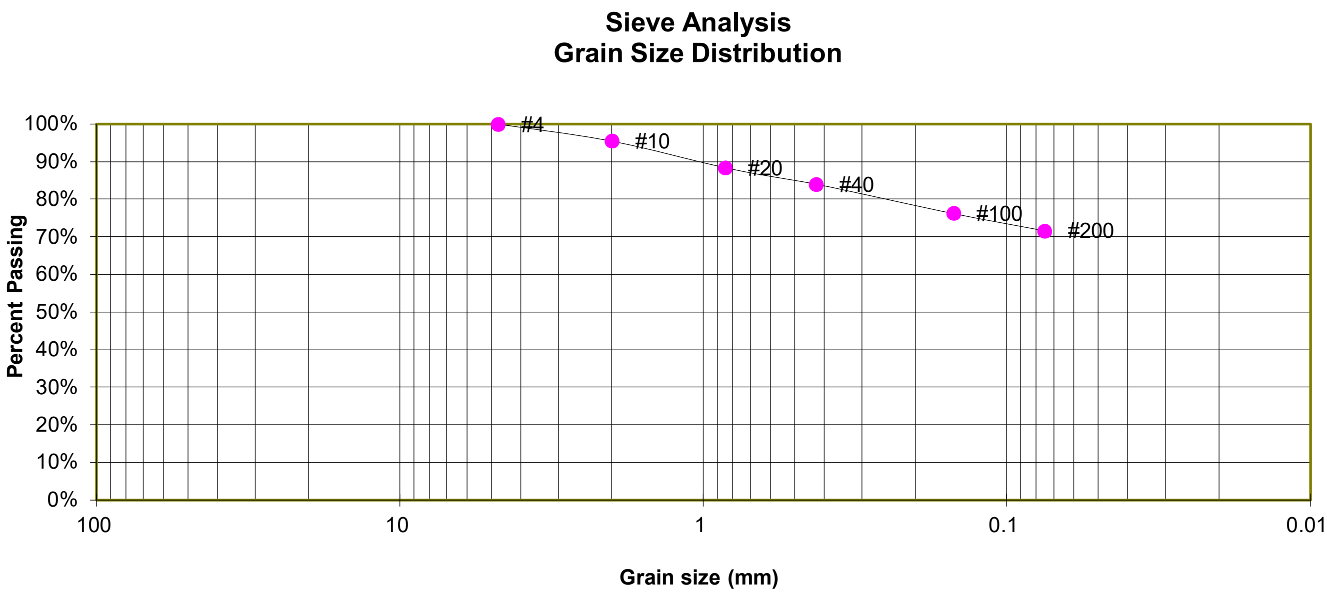
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-4

TEST BORING	8	SOIL DESCRIPTION	CLAY, WITH SAND
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	100.0%
10	95.5%
20	88.4%
40	84.0%
100	76.3%
200	71.6%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

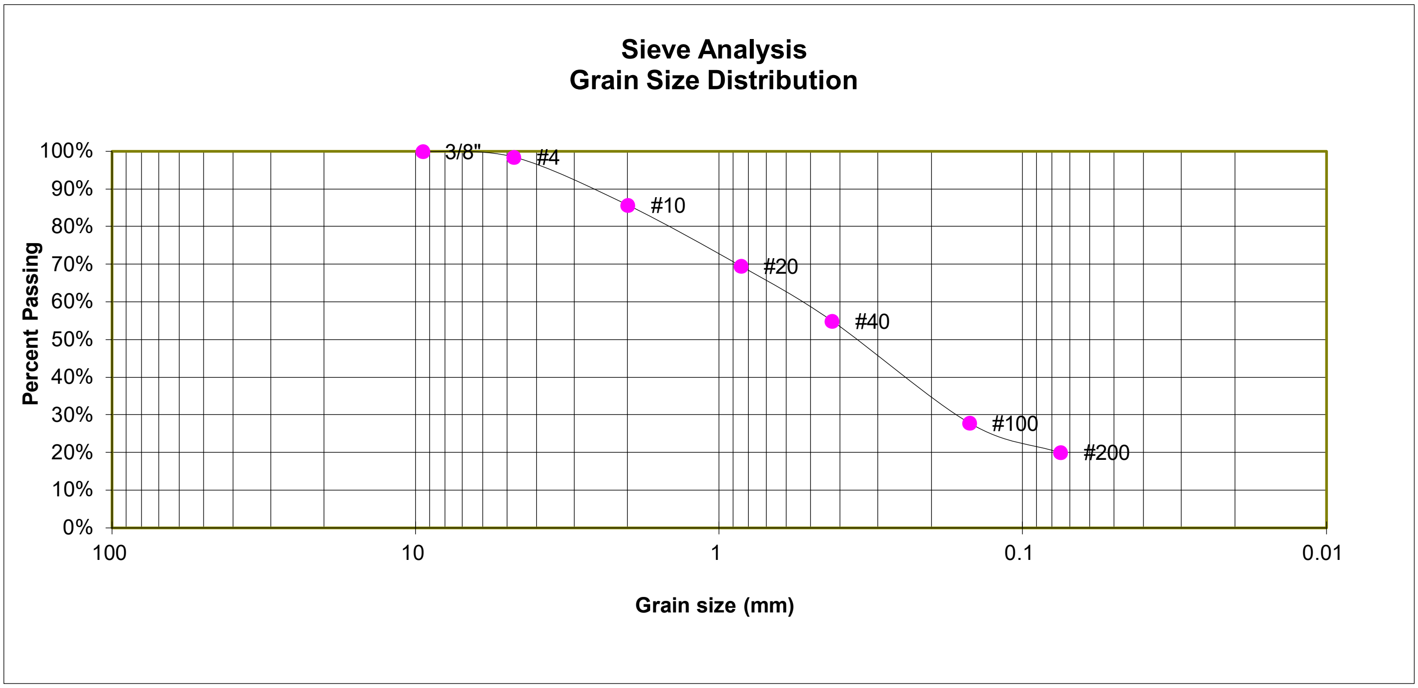
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-5

TEST BORING	2	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	10	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	85.7%
20	69.6%
40	54.9%
100	27.9%
200	20.0%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

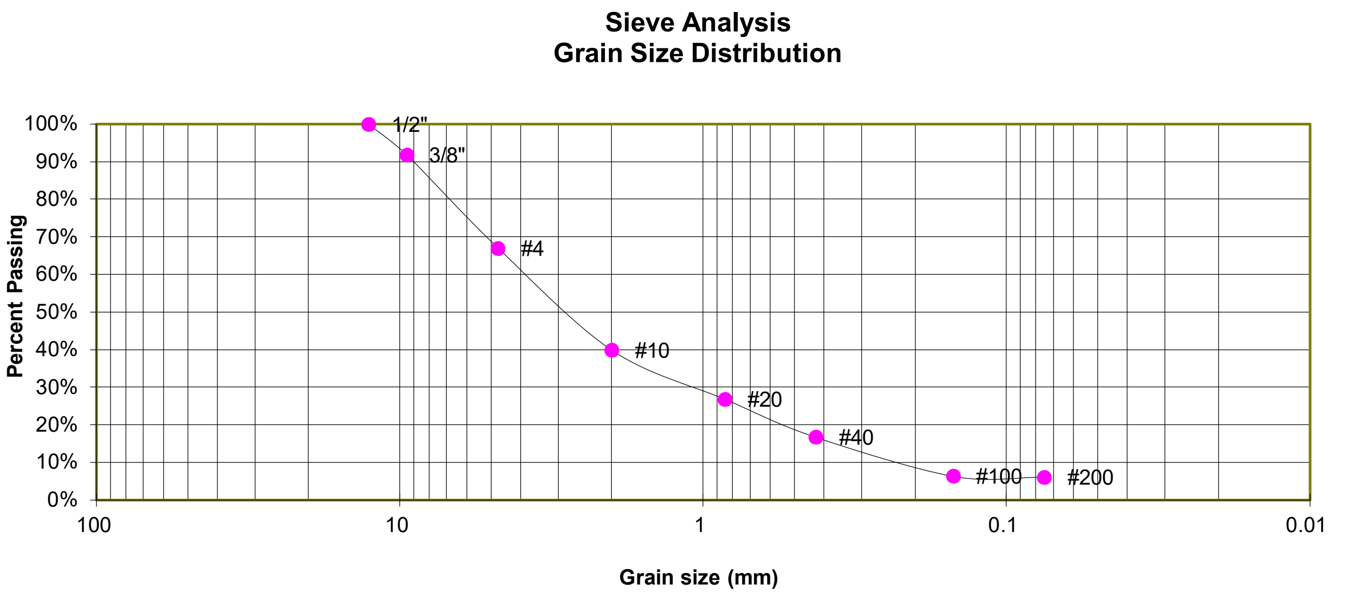
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-6

TEST BORING	3	SOIL DESCRIPTION	SANDSTONE (SAND, WITH SILT)
DEPTH (FT)	15	SOIL TYPE	3



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	91.8%
4	67.0%
10	39.9%
20	26.8%
40	16.8%
100	6.4%
200	6.1%

ATTERBERG LIMITS

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

SOIL CLASSIFICATION

USCS CLASSIFICATION: SW-SM

ENTECH ENGINEERING, INC.

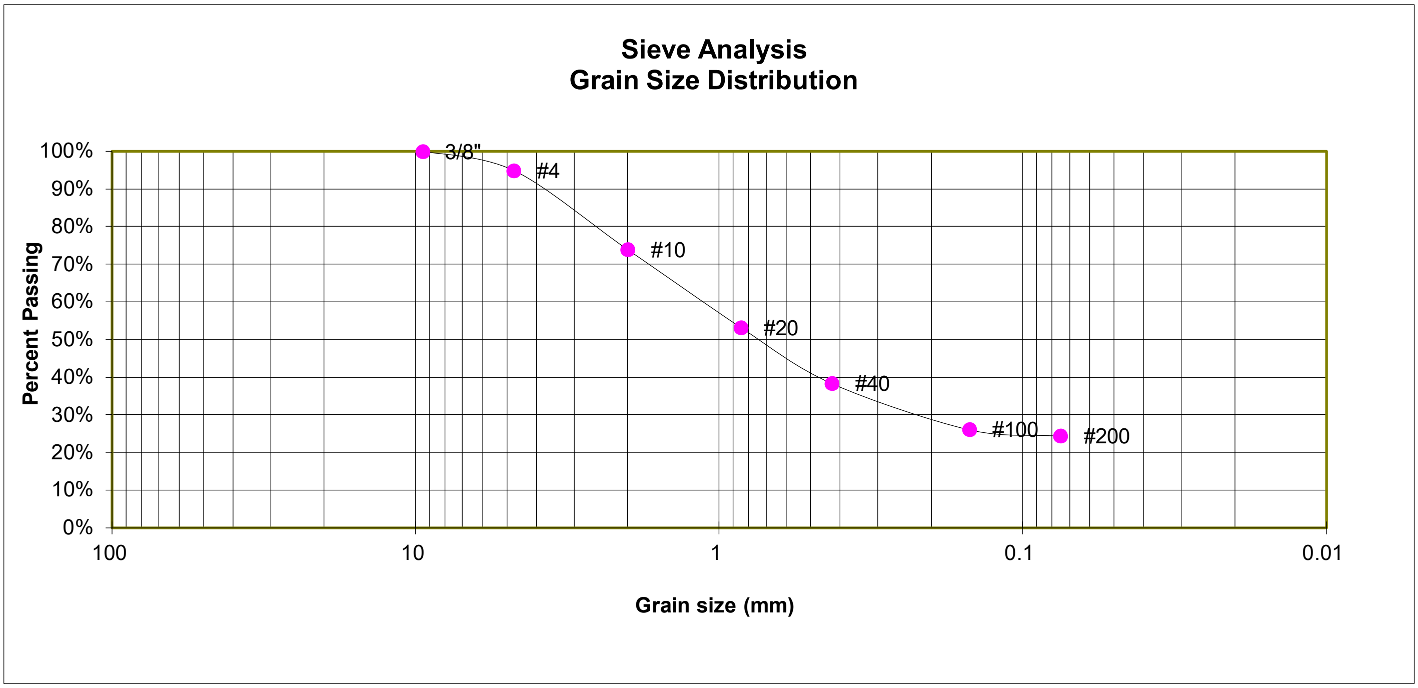
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-7

TEST BORING	7	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
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	94.9%
10	73.9%
20	53.3%
40	38.4%
100	26.2%
200	24.4%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

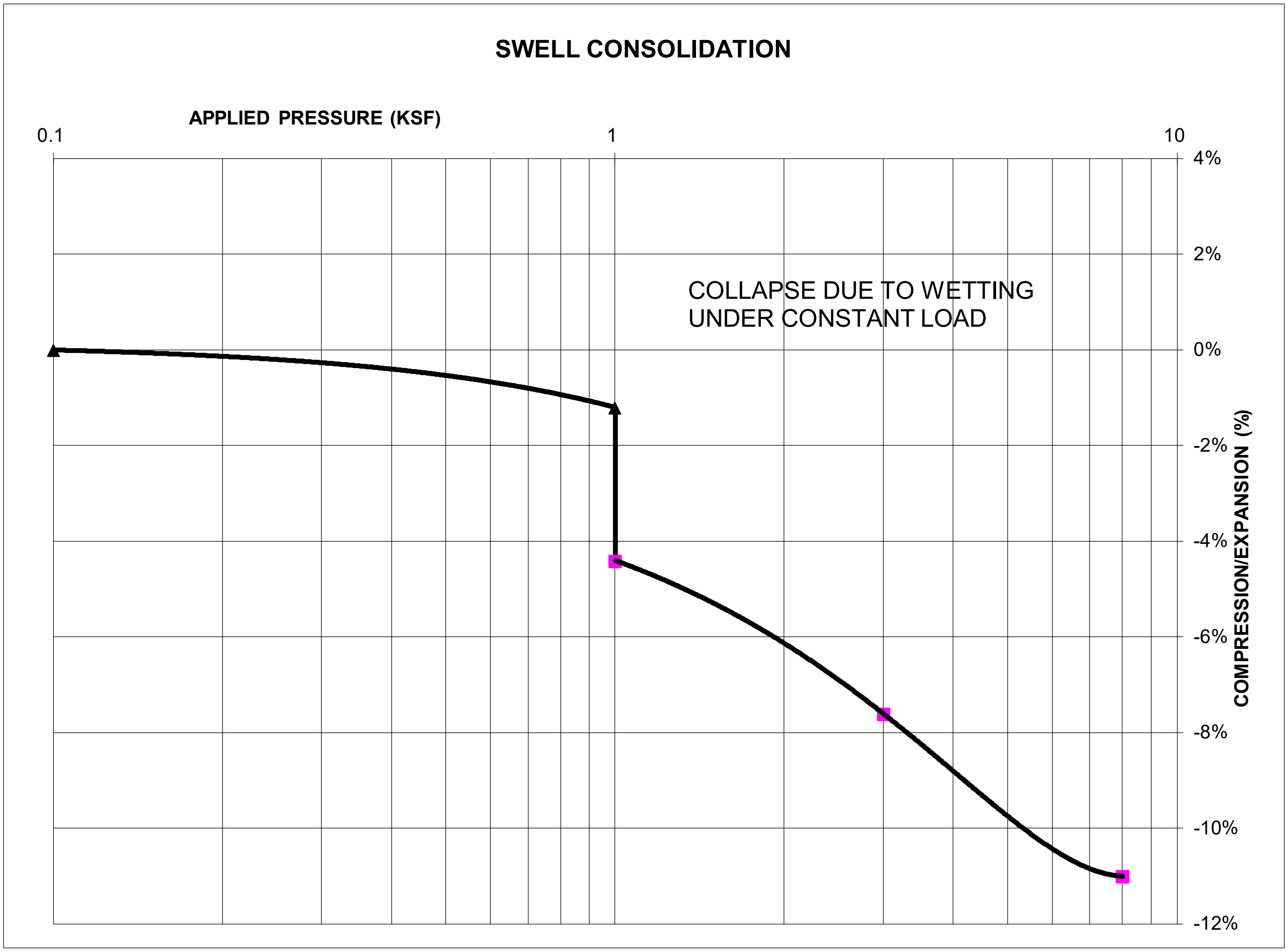
LABORATORY TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-8

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



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	98
NATURAL MOISTURE CONTENT:	6.1%
SWELL/COLLAPSE (%):	-3.2%

ENTECH ENGINEERING, INC.

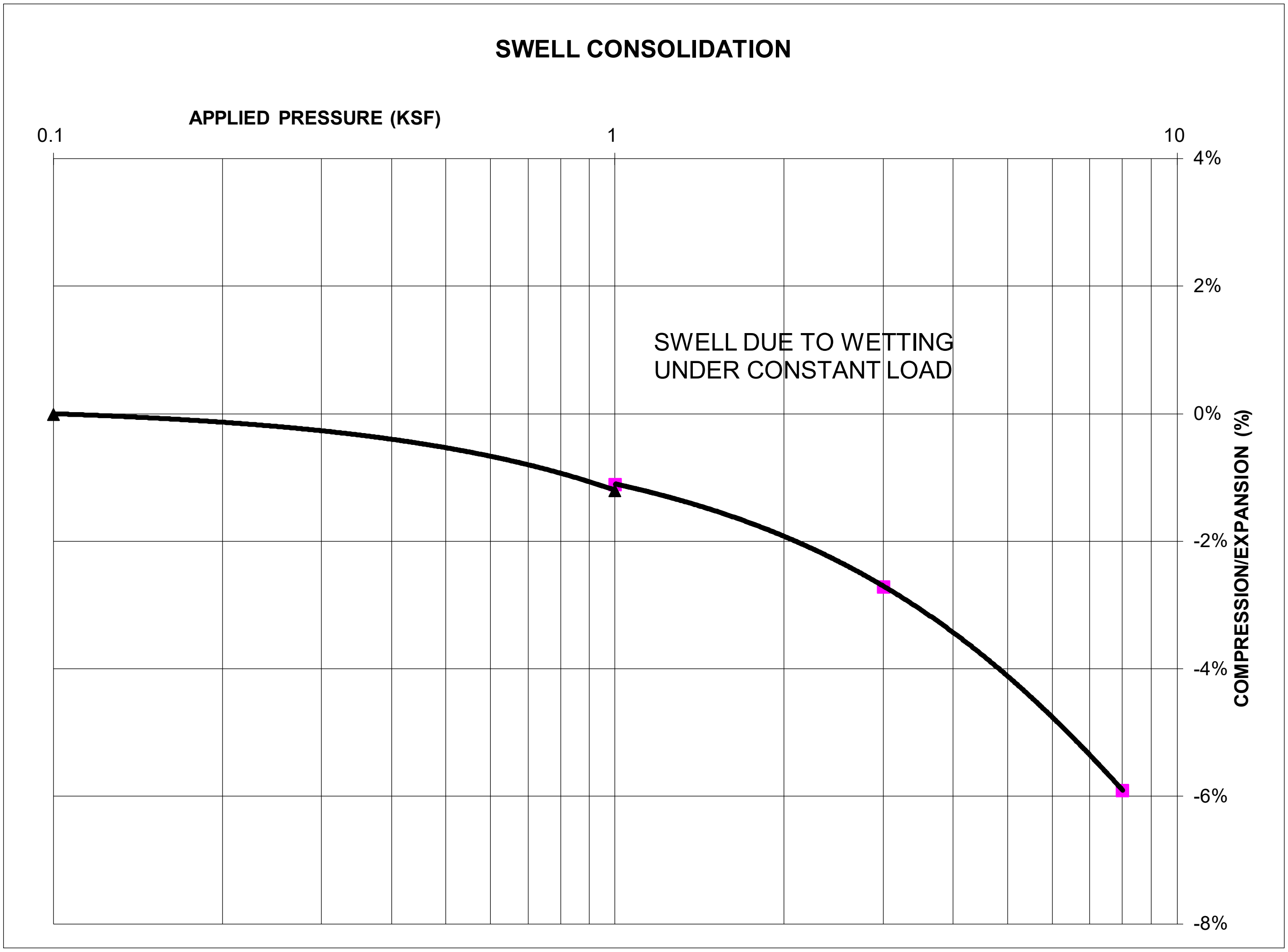
SWELL TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-9

TEST BORING	8	SOIL DESCRIPTION	CLAY, WITH SAND
DEPTH (FT)	5	SOIL TYPE	3



SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF):	112
NATURAL MOISTURE CONTENT:	15.0%
SWELL/COLLAPSE (%):	0.1%

ENTECH ENGINEERING, INC.

SWELL TEST RESULTS

PINEHURST CIRCLE
MA INFRASTRUCTURE

JOB NO.
251792

FIG. C-10

ENTECH
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APPENDIX D: USDA Soil Survey Descriptions

El Paso County Area, Colorado

26—Elbeth sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 367y
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Elbeth and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elbeth

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 3 inches: sandy loam
E - 3 to 23 inches: loamy sand
Bt - 23 to 68 inches: sandy clay loam
C - 68 to 74 inches: sandy clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.1 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

92—Tomah-Crowfoot loamy sands, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b9
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Tomah and similar soils: 50 percent
Crowfoot and similar soils: 30 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tomah

Setting

Landform: Alluvial fans, hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose and/or residuum weathered from arkose

Typical profile

A - 0 to 10 inches: loamy sand
E - 10 to 22 inches: coarse sand
Bt - 22 to 48 inches: stratified coarse sand to sandy clay loam
C - 48 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
Hydric soil rating: No

Description of Crowfoot

Setting

Landform: Hills, alluvial fans
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 12 inches: loamy sand
E - 12 to 23 inches: sand
Bt - 23 to 36 inches: sandy clay loam
C - 36 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
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