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

SOILS AND GEOLOGY STUDY
VILLAS AT ASPEN TRAILS
PARCEL NO. 55092-00-002
SEC OF BRADLEY ROAD AND LEGACY HILL ROAD
EL PASO COUNTY, COLORADO

Prepared for:

RJ Development
17 South Wahsatch Avenue
Colorado Springs, Colorado 80903

Attn: James Buller

June 20, 2023

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Reviewed by:

COLORADO REGISTERED JOSEPH COLLIN GOODE JR. 23725 PROFESSIONAL ENGINEER
6-20-2023

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

LLL

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1 SUMMARY

Project Location

The project lies in portions of the NW ¼ and SW¼ of Section 9, Township 15 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located at the southeast corner of South Powers Boulevard and Bradley Road approximately 2½ miles east of Security-Widefield, Colorado, just south of the Colorado Springs city limits.

Project Description

Total acreage involved for the Villas at Aspen Trails is 4.32 acres, and seven three-plex and five four-plex townhomes with a water quality/detention pond are proposed for the site. The proposed development is to consist of multi-family residential, and the development will be serviced by municipal water and sewer.

Scope of Report

This report presents the results of our geologic evaluation and treatment of engineering geologic hazard study.

Land Use and Engineering Geology

This site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose constraints on development and land use. These include areas of artificial fill, expansive soils, and shallow bedrock. Based on the proposed site plan, it appears that these areas will have some impacts on the development. These conditions will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site can be properly mitigated with site grading and engineering design. All recommendations are subject to the limitations discussed in the report.

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The project lies in portions of the NW ¼ and SW¼ of Section 9, Township 15 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located at the southeast corner of South Powers Boulevard and Bradley Road approximately 2½ miles east of Security-Widefield, Colorado, just south of the Colorado Springs city limits. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is generally gradually sloping to the south. No drainages were observed on the site. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped grazing and pasture land prior to recent grading of the site and adjacent subdivision. The site is generally free of vegetation from recent grading. Site photographs, taken May 16, 2023, are included in Appendix A.

Villas at Aspen Trails is 4.32 acres, and seven three-plex and five four-plex townhomes with a water quality/detention pond are proposed for the site. The Site Plan/Test Boring Location Map is presented in Figure 3.

3 SCOPE OF THE REPORT

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

4 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements and 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 performed by personnel of Entech Engineering, Inc. on May 16, 2023.

Geologic Hazard Study was previously performed by Entech for the Trails at Aspen Ridge development (previously named Springs at Waterview East), revised date February 8, 2019 (Reference 4). Information from this report was used in evaluating the site.

A Subsurface Soil Investigation was performed for the site by Entech dated April 14, 2023 (Reference 5). Twenty-four (24) Test Borings were performed on the site to determine general soil and bedrock characteristics. The locations of the test borings are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Summary of Laboratory Testing Results and the Test Boring Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was performed on select samples of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422, and Atterberg Limits, ASTM D-4318. Swell/Consolidation and FHA Swell Testing to evaluate expansion potential. Sulfate testing was performed on selected samples to evaluate potential for below grade concrete degradation due to sulfate attack. A Summary of Laboratory Test Results is included in Appendix B.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 9 miles to the west is a major structural feature known as the Ute Pass Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southeastern 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 Upper Cretaceous in age. The bedrock underlying the site consists of the Pierre Shale Formation. Overlying this formation are artificial fill deposits associated with recent site grading of the site and adjacent properties. 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 (Figure 4). In general, the soils classify as fine sandy loam. The soils are described as follows:

Type	Description
56	Nelson-Tassel Fine Sandy Loams, 3 to 18% slopes
86	Stoneham Sandy Loam, 3 to 8% slopes

Complete descriptions of each soil type are presented in Appendix C. The soils have generally been described to have moderate permeabilities. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The majority of the soils have been described to have moderate erosion hazards.

5.3 Site Stratigraphy

The Elsmere Quadrangle Geology Map showing the site is presented in (Figure 5, Reference 4). The Geology/Engineering Geology Map prepared for the site is presented in Figure 6. Two mappable units were identified on this site which are described as follows:

Qaf **Artificial Fill of Holocene Age:** These recent man-made deposits associated with a previous grading completed on the site and adjacent properties. The placement of fill for the Trails at Aspen Ridge subdivision was observed and tested by personnel of Entech.

Kp **Pierre Shale of Cretaceous Age:** This formation consists of olive brown to gray claystone and shale. These materials were deposited in a marine environment associated with the Cretaceous Seaway. Typically, there is a layer of residually weathered soil present above the Pierre Shale. The soils and bedrock associated with this formation are typically expansive.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Elsmere Quadrangle* distributed by the Colorado Geological Survey in 2002 (Reference 6), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1979 (Reference 7), and the *Geologic Map of the Pueblo 1^0 x 2^0 Quadrangle*, distributed by the US

Geological Survey in 1978 (Reference 8). The Test Borings were also used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

5.4 Soil Conditions

The soils encountered in the Test Borings can be grouped into three general soil types. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 classified as sandy clay fill and clay fill (CL). The clay fill was encountered in ten of the twenty-four test borings at the existing ground surface and extending to depths ranging from 3 to 13 feet bgs. Standard Penetration testing conducted on the clay fill resulted in N-values ranging from 14 to 45 bpf, indicating firm to very stiff consistencies. Water content and grain size testing resulted in water contents ranging from 5 to 19 percent, with approximately 56 to 93 percent of the soil size particles passing the No. 200 Sieve. Atterberg Limits testing resulted in liquid limits ranging from 30 to 44, with plastic indexes ranging from 14 to 27. FHA Swell Testing resulted in a swell pressure of 1610 psf, indicating a low to moderate expansion potential. Swell/Consolidation Testing on samples of sandy clay fill resulted in volume changes ranging from -0.3 to 3.5 percent, indicating a low to high expansion potential. Sulfate testing resulted in 0.29 percent soluble sulfate by weight, indicating a severe potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 classified as native sandy clay (CL). The clay was encountered twenty of the twenty-four of the test borings at depths ranging from the existing surface grade to 13 feet and extending to depths ranging from 1 to 14 feet bgs or the termination of the test borings (20 feet). Standard Penetration Testing on the clay resulted in N-values of 10 to 41 bpf, indicating soft to very stiff consistencies. Water content and grain size testing resulted in water contents of 6 to 22 percent with approximately 55 percent of the soil size particles passing the No. 200 sieve.

Soil Type 3 classified as a sandy claystone and shale bedrock (CL). The bedrock was encountered in twenty-two of the test borings at depths ranging from 1 to 14 feet and extending to the termination of the test borings (3 to 20 feet). Standard penetration testing on the claystone and shale resulted in greater than 50 bpf indicating hard consistencies. Water content and grain size testing resulted in water contents of 9 to 17 percent and 67 to 98 percent of soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in liquid limits of 38 to 46 and plastic indexes of 22 to 29. FHA Swell Testing resulted in a swell pressure of 1610 psf, indicating a low to moderate expansion potential. Swell/Consolidation Testing resulted in a volume change of 1.6

to 5.2 percent, indicating a low to high expansion potential. Sulfate testing resulted in 0.02 to 0.36 percent soluble sulfate by weight which indicates a negligible to severe potential for below grade concrete degradation due to sulfate attack.

Additional descriptions and engineering properties of the soil encountered during drilling are included on the boring logs. It should be understood that the soil descriptions reported on the boring logs may vary between boring locations and sampling depths. Similarly, the lines of stratigraphic separation shown on the boring logs represent approximate boundaries between soil types and the actual transitions between types may be more gradual or variable.

5.5 Groundwater

Groundwater was not encountered in the test borings which were drilled to depths of 20 feet. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time. It should be noted that in the sandy materials on-site, some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock. Builders and planners should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site and deal with each individual problem as necessary at the time of construction.

6 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

Detailed mapping has been performed on this site to produce an Engineering Geology Map Figure 6. This map shows the location of various geologic conditions of which the developers should be cognizant during the planning, design and construction stages of the project. These hazards and the recommended mitigation techniques are as follows:

Artificial Fill – Constraint

These recent man-made deposits associated with a previous grading completed on the site and adjacent properties. The placement of fill for the Trails at Aspen Ridge subdivision was observed and tested by personnel of Entech.

Mitigation: The fill on this site is considered controlled for construction purposes, however, may still require mitigation due to the expansive nature of the soils. Any uncontrolled fill encountered

beneath foundations will require removal and recompaction at a minimum of 95% of its maximum Standard Proctor Dry Density, ASTM D-698.

Expansive Soils – Constraint

Expansive soils were encountered in all of the test borings drilled on site. The clays, claystone, and shale if encountered at or near foundation grade, can cause differential movement in structures. Mitigation will be required for the proposed construction.

Mitigation Expansive soils mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation 3 to 5 feet and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. Overexcavation depths of 4 feet is recommended in areas of the fill, and overexcavation depths of 6 to 8 feet are anticipated for areas of shallow bedrock. Drilled piers are another option that is used in areas where highly expansive soils are encountered. Typical minimum pier depth of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads. The use of structural floors should be considered for basement construction on highly expansive clays. Spec

Shallow Bedrock – Constraint

Shallow claystone and shale bedrock were encountered in the test borings on the site at depths ranging from 1 to 14 feet. Shallow bedrock will be encountered in areas of this site. Where claystone or shale are encountered, excavation/grading may be difficult requiring track-mounted excavators with ripper attachments. Bedrock will likely be encountered cuts for utility excavations.

Groundwater and Floodplain Areas

No drainages were observed on the site, and the site is not mapped within floodplain zones according to the FEMA Map No. 08041CO768G, (Figure 8, Reference 7). Groundwater was not encountered in the test borings which were drilled to depths of 20 feet. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Exact floodplain locations and drainage studies are beyond the scope of this report.

6.1 Relevance of Geologic Conditions to Land Use Planning

As mentioned, we understand that the development will be multi-family residential. It is our opinion that the existing geologic and engineering geologic conditions will impose some

constraints on the proposed development and construction. The most significant problems affecting development will be those associated with the expansive soils and shallow bedrock. These constraints on site can be satisfactorily mitigated through proper engineering design and construction practices.

The upper materials are typically at firm to very stiff consistencies. Expansive soils were encountered in all of the test borings that will require mitigation. Foundations anticipated for the site are standard spread footings in conjunction with overexcavation in areas of expansive soils. Excavation of the sand and clay soils is anticipated to be moderate with rubber-tired equipment. Excavation of claystone and shale may be difficult and require track-mounted equipment with ripper attachments. Expansive soils will require special foundation design and/or overexcavation. These soils will not prohibit development. Drilled piers are another option that is used in areas where highly expansive soils are encountered. Typical minimum pier depth of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads. The use of structural floors should be considered for basement construction on highly expansive clays.

Areas of fill exist on the site. These are areas associated a large fill stockpile in the southern portion of the site. We would anticipate that the fill piles would be removed during site grading. Any uncontrolled fill encountered beneath foundations will require removal and recompaction at a minimum of 95% of its maximum Standard Proctor Dry Density, ASTM D-698. Fill placed at depths greater than 10 feet will require 100% of its maximum Standard Proctor Dry Density, ASTM D-698 (clay soils), and 98% of its maximum Modified Proctor Dry Density, ASTM D-1557 (granular soils). Any organic material or mulch should be removed prior to placing controlled fill.

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 on each lot is recommended prior to construction.

7 ECONOMIC MINERAL RESOURCES

According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 12), the area is not mapped with any aggregate deposits. 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 “Fair” for industrial minerals. However, considering the clayey silty nature of the soils, 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 in the area of the site. No metallic mineral resources have been mapped on-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 in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

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.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils become increasingly less susceptible to water erosion. For the typical soils observed on-site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to

control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

9 ROADWAY AND EMBANKMENT CONSTRUCTION RECOMMENDATIONS

In general, the site soils are suitable for the proposed roadways and embankments. Groundwater may be encountered in deeper cuts and along drainages and low areas. If excavations encroach on the groundwater level unstable soil conditions may be encountered. Excavation of saturated soils may be difficult with rubber-tired equipment. Stabilization using shot rock or geogrids may be necessary.

Swell/Consolidation testing was conducted on the site subgrade soils which showed swells ranging between -0.3 and 5.2 percent. Many samples were above the level in which mitigation is required (2.0 percent) with a majority of the soils exceeding the swell threshold. These results indicate that soil mitigation due to expansive soils may be required for the roadways. Overexcavation and cement-stabilization are suitable mitigation methods for the expansive soils in the roadways. Additional investigation for the proposed roadways will be required once site grading has been completed and utilities have been installed.

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

New fill should be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 for sandy soils, and clay soils should be compacted to a minimum of 95 percent of its maximum Standard Proctor Dry Density, ASTM D-698 at 0 to 4 percent of optimum moisture content. These materials should be placed at a moisture content conducive to compaction, usually 0 to ±2 percent of Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech

during construction. Entech should approve any import materials prior to placing or hauling them to the site. Additional investigation will be required for pavement designs once roadway grading is completed and utilities are installed.

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 that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Individual investigations for building sites will be required prior to construction. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

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

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

Include a section in the GEOTECH report addressing the following sections of the Drainage Criteria manual.
11.2.2 Detention Facility Construction

11 BIBLIOGRAPHY

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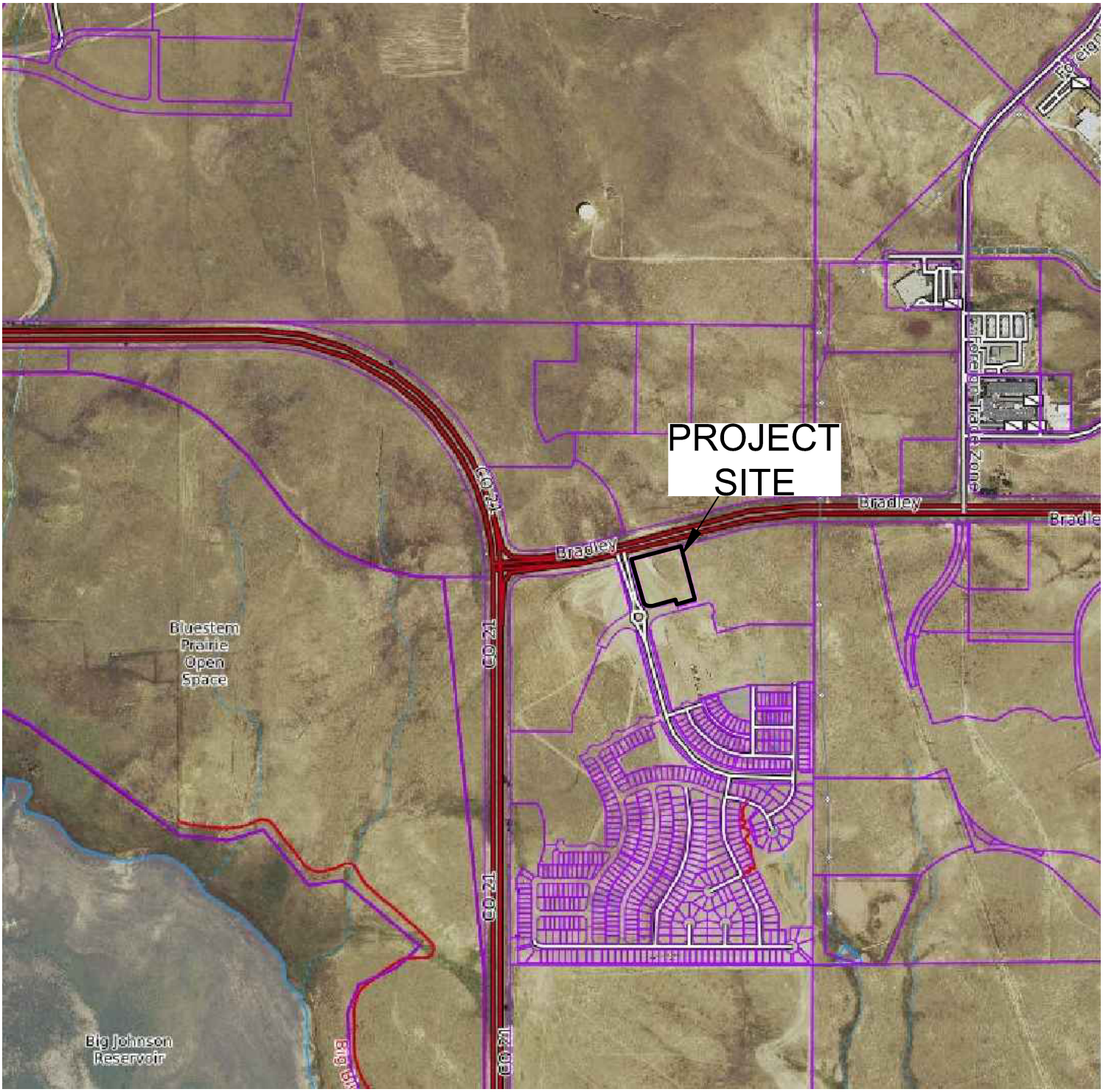
FIGURES



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VICINITY MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO.
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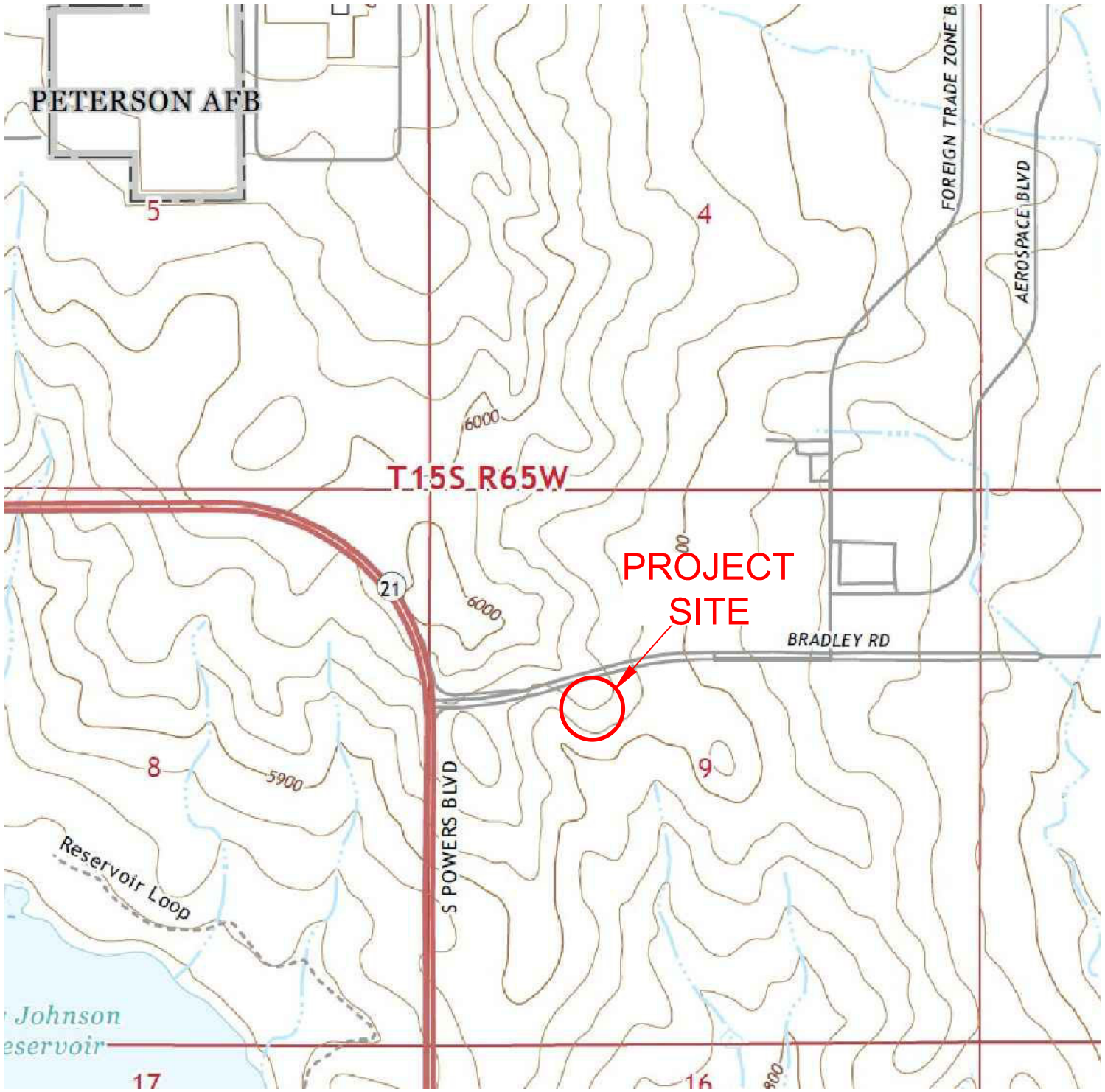
FIG. 1



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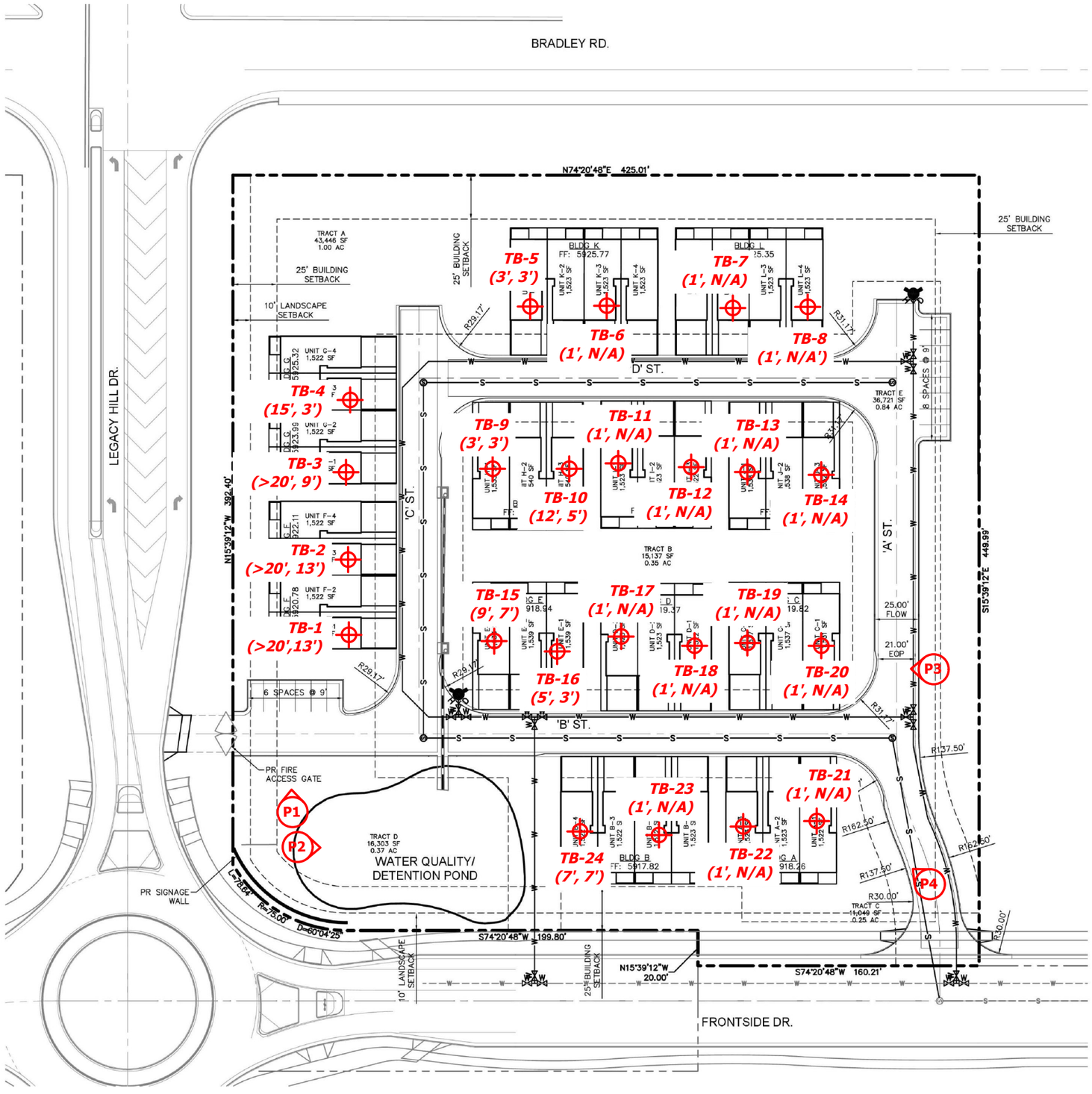
USGS TOPOGRAPHY MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO.
230745

FIG. 2



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0 30 60

1" = 30'

OPEN SPACE CALCULATIONS

PROVIDED OPEN SPACE		
TOTAL AREA =	185,242 SF	
UNIT AREA =	62,586 SF	(33.8%)
DRIVE AND PARKING	36,721 SF	(19.8%)
TOTAL OPEN SPACE	85,935 SF	(46.4%)

- APPROXIMATE TEST BORING LOCATION AND NUMBER

P1 - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

REVISION	BY

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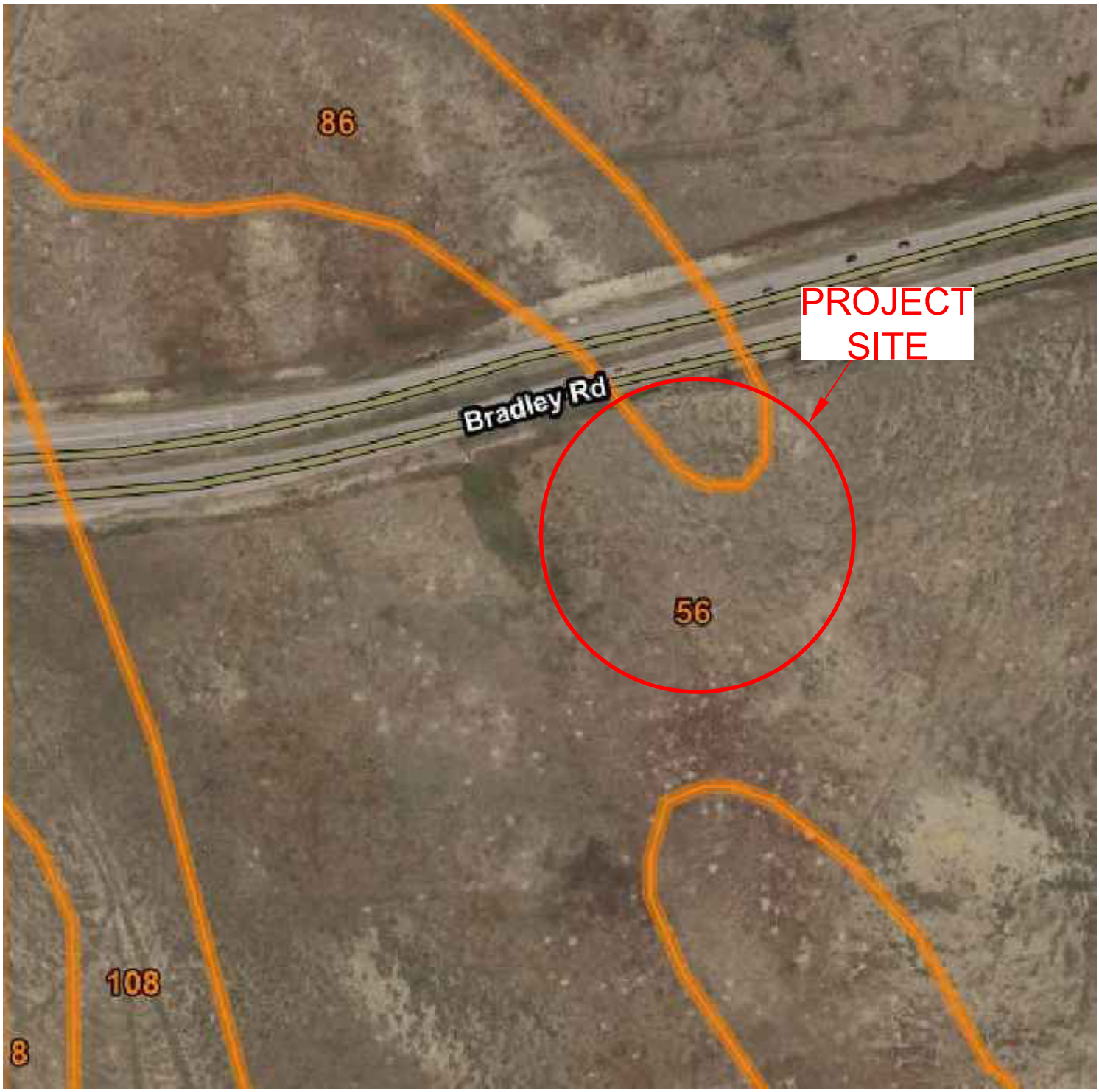
SITE PLAN/TESTING LOCATION MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO.
230745

FIG. 3



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SOIL SURVEY MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO.
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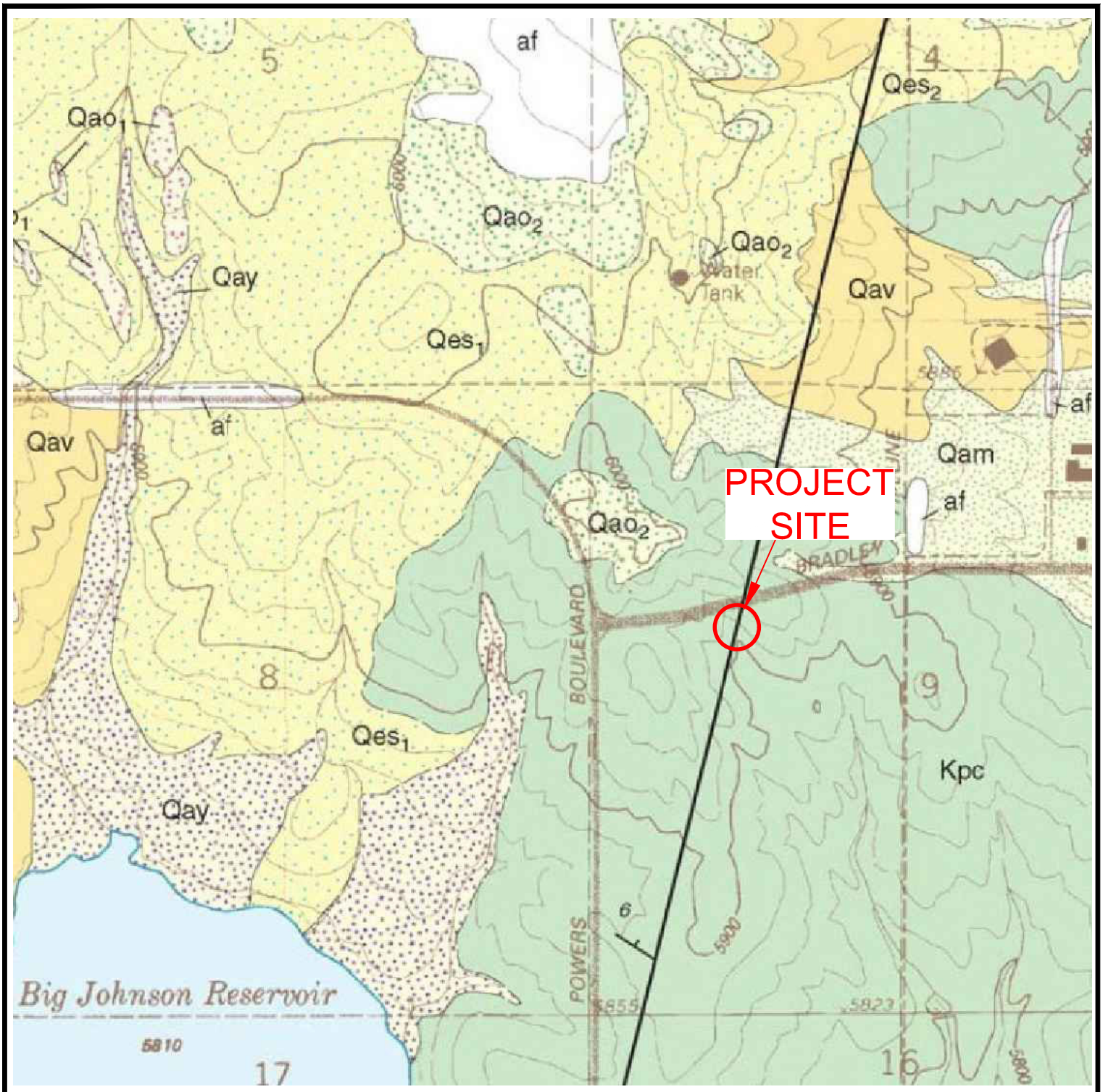
FIG. 4

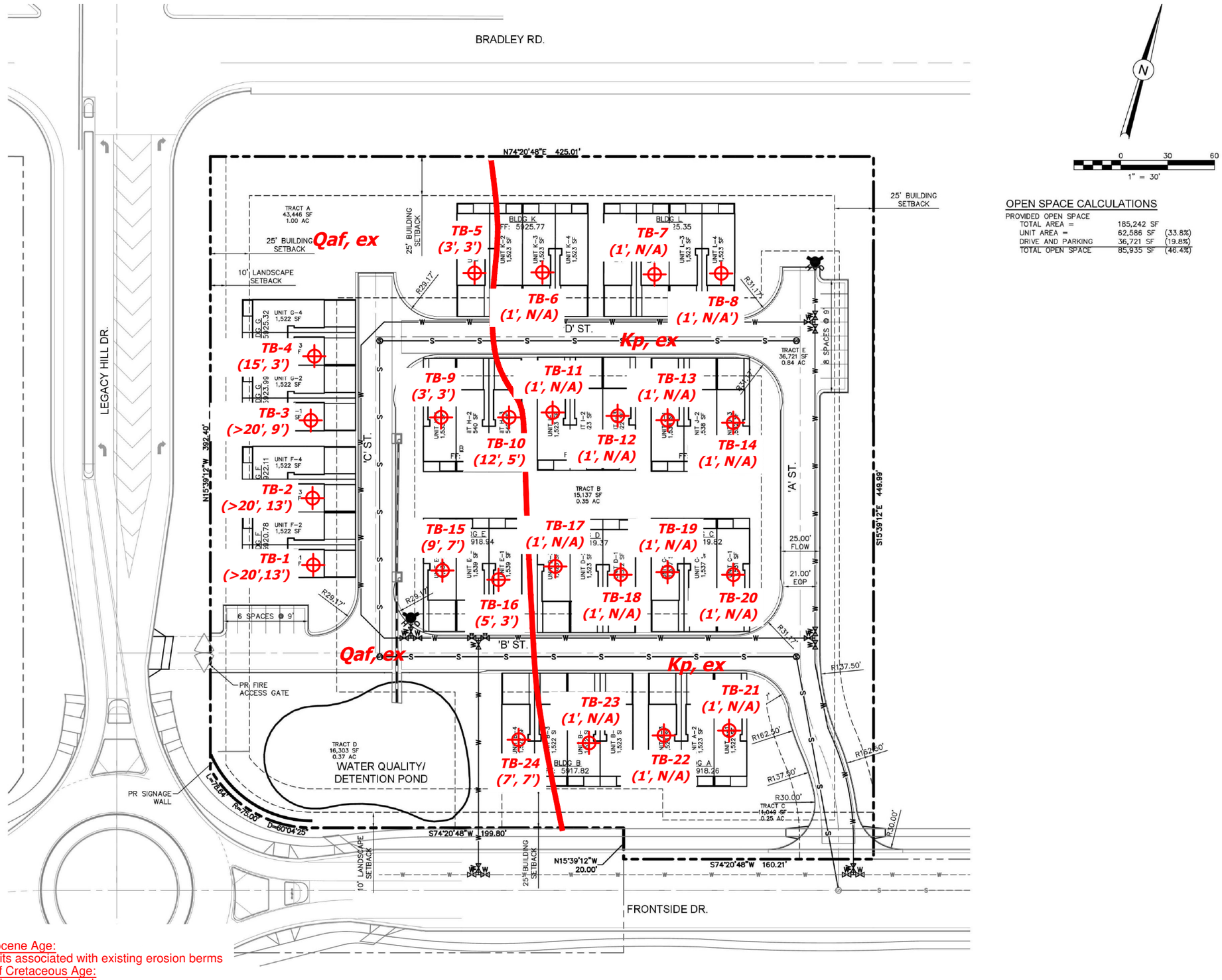


ENTECH ENGINEERING, INC.

ELSMERE QUADRANGLE GEOLOGIC MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO. 230745

FIG. 5



OPEN SPACE CALCULATIONS

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DRIVE AND PARKING	36,721 SF	(19.8%)
TOTAL OPEN SPACE	85,935 SF	(46.4%)

Legend:

Qaf - Artificial Fill of Holocene Age:
man-mad fill deposits associated with existing erosion berms

Kp - The Pierre Shale of Cretaceous Age:
marine deposited claystone and shale

ex - expansive soils

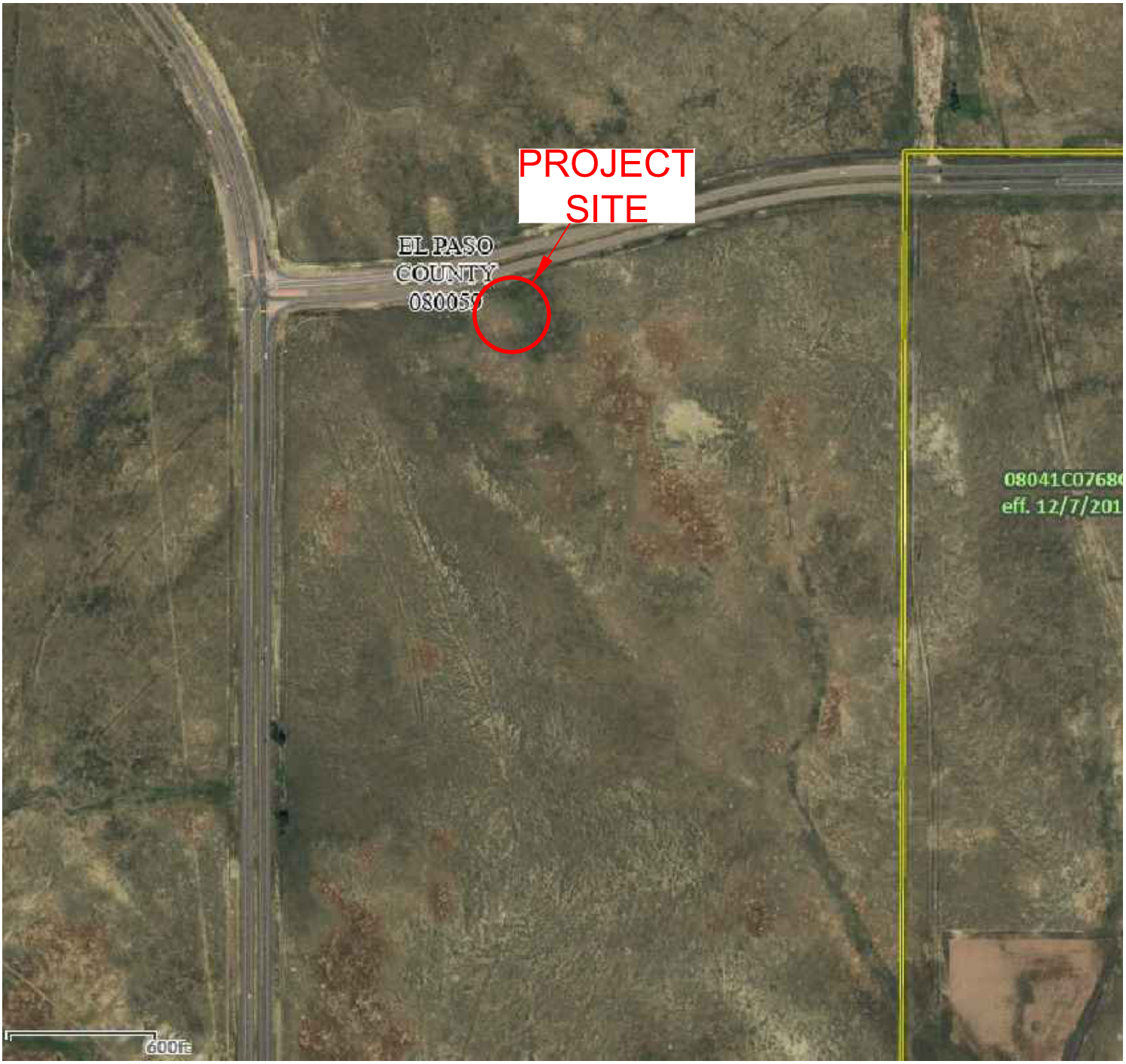
REVISION	BY

ENTECH
ENGINEERING, INC.

GEOLOGY/ENGINEERING MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO.
230745

FIG. 6



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FEMA FLOODPLAIN MAP
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO.
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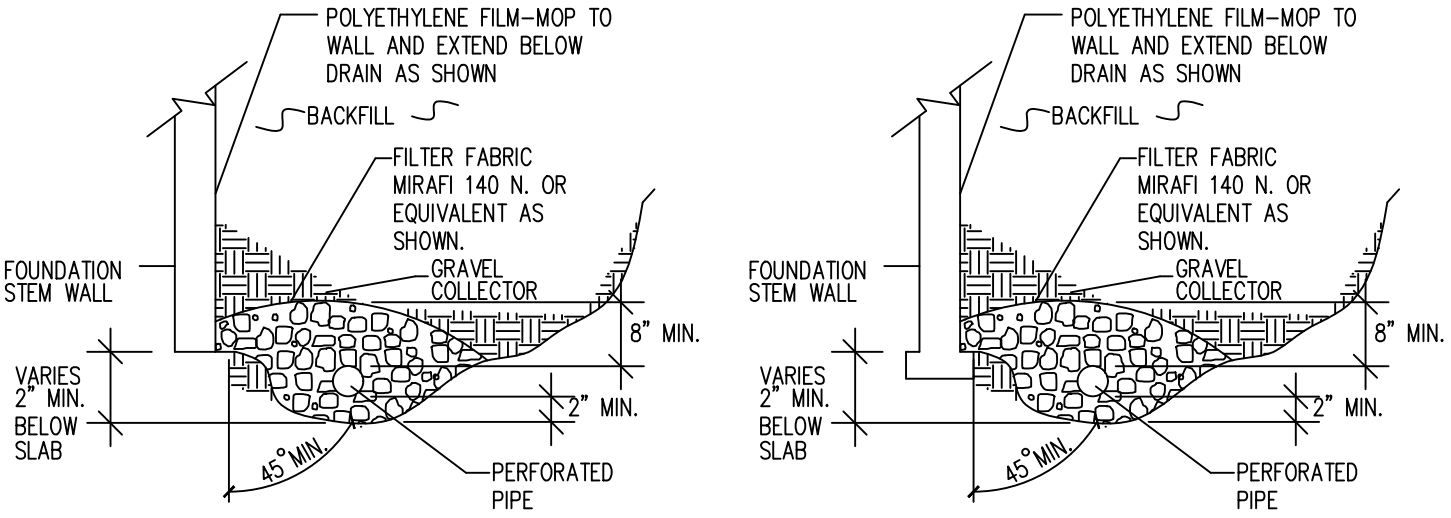
FIG. 7



NOTES:

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

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

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

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

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

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

ENTECH ENGINEERING, INC.

PERIMETER DRAIN DETAIL
VILLAS AT ASPEN TRAILS
RJ DEVELOPMENT

JOB NO. 230745

FIG. 8

APPENDIX A: Site Photographs

1

Looking north from the southwest side of the site.

May 16, 2023

2

Looking east from the southwest side of the site.

May 16, 2023

Job No. 230745

3

Looking west from the southeast side of the site.

May 16, 2023

4

Looking northwest from the southeast side of the site.

May 16, 2023

Job No. 230745

APPENDIX B: Entech Engineering, Inc. Subsurface Soil Investigation, Entech Job No. 230196

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT SYNERGY HOMES
PROJECT VILLAS AT ASPEN TRAILS
JOB NO. 230196

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	2-3	17.3	100.8	81.6	44	27			0.8	CL	FILL, CLAY, SANDY
1	2	10	17.6	110.5	90.8					1.0	CL	FILL, CLAY, SANDY
1	3	5			92.6				1610		CL	FILL, CLAY, SANDY
1	5	2-3	15.0	113.2	88.4	41	24	0.29		2.4	CL	FILL, CLAY, SANDY
1	15	5	10.5	118.0	56.4	30	14			-0.3	CL	FILL, CLAY, VERY SANDY
1	16	2-3			61.2	32	16				CL	FILL, CLAY, VERY SANDY
1	24	5			88.3						CL	FILL, CLAY, SANDY
1	4	5	12.8	117.1						1.2	CL	FILL, CLAY, SANDY
1	24	2-3	17.7	111.7						3.5	CL	FILL, CLAY, SANDY
2	10	10			55.3						CL	CLAY, VERY SANDY
3	4	15			90.3	38	22	0.06			CL	CLAYSTONE, SANDY
3	6	5			91.9	40	24	0.32			CL	CLAYSTONE, SANDY
3	7	10			73.3	42	25	0.32			CL	CLAYSTONE, SANDY
3	8	5	11.6	111.0	97.6					1.6	CL	CLAYSTONE, SANDY
3	9	5	12.9	121.3	86.4					4.2	CL	CLAYSTONE, SANDY
3	11	15	12.6	123.9	96.1					2.0	CL	SHALE
3	12	5			96.8				1640		CL	CLAYSTONE, SANDY
3	13	5			95.8	46	29				CL	SHALE
3	14	10	11.8	118.9	93.6					5.2	CL	SHALE
3	17	15			95.2						CL	SHALE
3	18	5			85.5						CL	SHALE
3	19	5	11.6	122.0	86.2					3.1	CL	SHALE
3	20	2-3			66.6						CL	SHALE
3	21	10			92.9						CL	CLAYSTONE, SANDY
3	22	15	15.2	108.8	95.0					2.5	CL	SHALE
3	23	2-3			95.0						CL	SHALE

TABLE 2

DEPTH TO BEDROCK & DEPTH OF FILL

CLIENT SYNERGY HOMES
PROJECT VILLAS AT ASPEN TRAILS
JOB NO. 230196

TEST BORING NO.	DEPTH TO BEDROCK (ft.)	DEPTH OF FILL (ft.)
1	>20	13
2	>20	10
3	>20	9
4	14	6
5	3	3
6	1	-
7	1	-
8	1	-
9	3	3
10	12	5
11	1	-
12	1	-
13	1	-
14	1	-
15	9	7
16	5	3
17	1	-
18	1	-
19	1	-
20	1	-
21	1	-
22	1	-
23	1	-
24	7	7

TB- Approximate Test Boring Location and Number
(depth of bedrock, depth of fill)

N

0 30 60
1" = 30'

OPEN SPACE CALCULATIONS

PROVIDED OPEN SPACE		
TOTAL AREA =	185,242 SF	
UNIT AREA =	62,586 SF	(33.8%)
DRIVE AND PARKING	36,721 SF	(19.8%)
TOTAL OPEN SPACE	85,935 SF	(46.4%)

REVISION	BY

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

SITE PLAN/TEST BORING LOCATION MAP
VILLAS AT ASPEN TRAILS
SEC OF BRADLEY RD & LEGACY HILL DR
EL PASO COUNTY, CO
FOR: SYNERGY HOMES

DRAWN	LLL
CHECKED	
DATE	3/20/23
SCALE	AS SHOWN
JOB NO.	230196
FIGURE No.	2

TEST BORING NO. 1
DATE DRILLED 3/2/2023
Job # 230196

REMARKS

DRY TO 20', 3/3/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	FILL 0-13', CLAY, SANDY, TAN TO GRAY BROWN, STIFF, MOIST		29	7.1	1
5			17	12.8	1
10			22	15.4	1
	CLAY, SANDY, STIFF TO FIRM, TAN TO GRAY BROWN, MOIST				
15			21	6.1	2
20			13	11.8	2

TEST BORING NO. 2
DATE DRILLED 3/2/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 19', 3/3/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	FILL 0-10', CLAY, SANDY, TAN TO GRAY BROWN, STIFF TO FIRM, MOIST		22	17.1	1
5			14	16.5	1
10			22	18.8	1
	CLAY, SANDY, TAN TO GRAY BROWN, STIFF TO FIRM, MOSIT				
15			26	10.6	2
20			10	12.9	2

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/20/23

JOB NO.: 230196
FIG NO.: A- 1

TEST BORING NO. 3
DATE DRILLED 3/2/2023
Job # 230196

REMARKS

DRY TO 20', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			31	12.3	1	FILL 0-9', CLAY, SANDY, TAN TO GRAY BROWN, VERY STIFF TO STIFF, MOIST
5			22	14.9	1	
10			25	9.6	2	CLAY, SANDY, STIFF TO FIRM, TAN TO GRAY BROWN, MOIST
15			10	7.8	2	
20			11	22.1	2	

TEST BORING NO. 4
DATE DRILLED 3/2/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 19.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			29	11.0	1	FILL 0-6', CLAY, SANDY, TAN TO GRAY BROWN, STIFF, MOIST
5			17	17.8	1	
10			21	6.4	2	CLAY, SANDY, GRAY BROWN, STIFF, MOIST
15			50/11"	12.6	3	CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST
20			50/11"	13.8	3	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/20/23

JOB NO.: 230196
FIG NO.: A- 2

TEST BORING NO. 5
DATE DRILLED 3/6/2023
Job # 230196

REMARKS

DRY TO 19', 3/15/23

FILL 0-3', CLAY, SANDY, TAN, VERY STIFF, MOIST

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
		45	14.4	1
5		50/7"	12.0	3
10		50/8"	11.6	3
15		50/6"	12.0	3
20		50/8"	12.2	3

TEST BORING NO. 6
DATE DRILLED 3/6/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 19.5', 3/15/23

CLAY, SANDY, TAN
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
		50/8"	11.1	3
5		50/7"	11.8	3
10		50/10"	11.6	3
15		50/6"	9.8	3
20		50/6"	12.7	3

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/10/23

JOB NO.: 230196
FIG NO.: A-3

TEST BORING NO. 7
DATE DRILLED 3/6/2023
Job # 230196

REMARKS

DRY TO 19', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/6"	9.1	3
5			50/7"	10.4	3
10			50/8"	8.1	3
15			50/7"	10.9	3
20			50/6"	10.8	3

CLAY, SANDY, TAN
CLAYSTONE, SANDY, GRAY
BROWN, HARD, MOIST

SHALE, GRAY BROWN, HARD, MOIST

TEST BORING NO. 8
DATE DRILLED 3/6/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 8.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/5"	10.8	3
5			50/8"	10.5	3
10			50/8"	8.5	3
15					
20					

CLAY, SANDY, TAN
CLAYSTONE, SANDY, GRAY
BROWN, HARD, MOIST

AUGER REFUSAL AT 10'

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/10/23

JOB NO.: 230196
FIG NO.: A- 4

TEST BORING NO. 9
DATE DRILLED 3/7/2023
Job # 230196

REMARKS

DRY TO 19', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			19	6.3	1
5			50/11"	10.7	3
10			50/8"	13.9	3
15			50/7"	14.6	3
20			50/7"	13.8	3

FILL 0-3', CLAY, SANDY, TAN, STIFF, MOIST

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

TEST BORING NO. 10
DATE DRILLED 3/7/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 17', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			25	4.6	1
5			25	5.1	1
10			34	6.5	2
15			50/8"	14.7	3
20			50/7"	16.5	3

FILL 0-5', CLAY, SANDY, TAN TO GRAY BROWN, STIFF, MOIST

CLAY, SANDY, GRAY BROWN, VERY STIFF, MOIST

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/20/23

JOB NO.: 230196
FIG NO.: A- 5

TEST BORING NO. 11
DATE DRILLED 3/7/2023
Job # 230196

REMARKS

DRY TO 18', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
CLAY, SANDY, TAN CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST			50/9"	11.5	3
5			50/8"	10.3	3
10			50/5"	11.2	3
SHALE, GRAY BROWN, HARD, MOIST 15			50/6"	11.9	3
20			50/6"	12.3	3

TEST BORING NO. 12
DATE DRILLED 3/7/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 18.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
CLAY, SANDY, TAN CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST			50/6"	12.2	3
5			50/6"	12.9	3
10			50/5"	11.0	3
15 SHALE, GRAY BROWN, HARD, MOIST			50/6"	10.9	3
20			50/4"	12.7	3

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/20/23

JOB NO.: 230196
FIG NO.: A- 6

TEST BORING NO. 13
DATE DRILLED 3/8/2023
Job # 230196

REMARKS

DRY TO 18', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/9"	11.4	3
5			50/8"	9.4	3
10			50/5"	10.2	3
15			50/6"	12.5	3
20			50/6"	14.3	3

CLAY, SANDY, TAN

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

SHALE, GRAY BROWN, HARD, MOIST

TEST BORING NO. 14
DATE DRILLED 3/8/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 17.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/9"	11.7	3
5			50/6"	9.9	3
10			50/5"	9.7	3
15			50/4"	9.1	3
20			50/6"	12.7	3

CLAY, SANDY, TAN

SHALE, GRAY BROWN, HARD, MOIST

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

SHALE, GRAY BROWN, HARD, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/20/23

JOB NO.: 230196

FIG NO.: A-7

TEST BORING NO. 15
DATE DRILLED 3/8/2023
Job # 230196

REMARKS

DRY TO 18.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-7', CLAY, SANDY, TAN TO GRAY BROWN, STIFF, MOIST			26	9.6	1
5			23	15.7	1
CLAY, SANDY, GRAY BROWN					2
SHALE, GRAY BROWN, HARD, MOIST			50/9"	11.7	3
10					
15			50/7"	12.5	3
20			50/5"	12.3	3

TEST BORING NO. 16
DATE DRILLED 3/8/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 18.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-3', CLAY, SANDY, TAN TO GRAY BROWN, STIFF, MOIST			26	12.7	1
CLAY, SANDY, GRAY BROWN, VERY STIFF, MOIST			41	11.2	2
5					
SHALE, GRAY BROWN, HARD, MOIST			50/8"	14.5	3
10					
15			50/6"	12.1	3
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST			50/7"	11.5	3
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/20/23

JOB NO.: 230196
FIG NO.: A- 8

TEST BORING NO. 17
DATE DRILLED 3/8/2023
Job # 230196

REMARKS

DRY TO 18', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/7"	11.0	3
5			50/7"	12.9	3
10			50/9"	14.6	3
15			50/5"	12.9	3
20			50/6"	13.5	3

CLAY, SANDY, TAN
CLAYSTONE, SANDY, GRAY
BROWN, HARD, MOIST

SHALE, GRAY BROWN, HARD, MOIST

TEST BORING NO. 18
DATE DRILLED 3/8/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 18.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/6"	11.4	3
5			50/7"	11.4	3
10			50/5"	13.1	3
15			50/6"	12.7	3
20			50/6"	11.9	3

CLAY, SANDY, TAN
CLAYSTONE, SANDY, GRAY
BROWN, HARD, MOIST

SHALE, GRAY BROWN, HARD, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LL	3/20/23

JOB NO.: 230196
FIG NO.: A- 9

TEST BORING NO. 19
DATE DRILLED 3/9/2023
Job # 230196

REMARKS

DRY TO 18.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			50/7"	10.4	3
5			50/5"	9.9	3
10			50/6"	10.5	3
15			50/6"	10.4	3
20			50/7"	10.6	3

CLAY, SANDY, TAN
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

SHALE, GRAY BROWN, HARD, MOIST

TEST BORING NO. 20
DATE DRILLED 3/9/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 3', 3/9/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
			*	7.5	3
5					
10					
15					
20					

CLAY, SANDY, TAN
SHALE, GRAY BROWN, HARD, MOIST

* - BULK SAMPLE TAKEN

AUGER REFUSAL AT 3'

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/10/23

JOB NO.: 230196
FIG NO.: A- 10

TEST BORING NO. 21
DATE DRILLED 3/9/2023
Job # 230196

REMARKS

DRY TO 12.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
CLAY, SANDY, TAN CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST			50 7"	10.7	3
5 SHALE, GRAY BROWN, HARD, MOIST			50 5"	10.7	3
10 CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST			50 6"	11.0	3
15 AUGER REFUSAL AT 15'					
20					

TEST BORING NO. 22
DATE DRILLED 3/9/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 17.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
CLAY, SANDY, TAN SHALE, GRAY BROWN, HARD, MOIST			50 6"	13.0	3
5			50 7"	13.9	3
10			50 7"	12.7	3
15			50 7"	11.1	3
20			50 5"	11.3	3

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/20/23

JOB NO.: 230196
FIG NO.: A- 11

TEST BORING NO. 23
DATE DRILLED 3/9/2023
Job # 230196

REMARKS

DRY TO 17.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			50/11"	9.6	3
5			50/8"	11.8	3
10			50/7"	9.4	3
15			50/8"	11.1	3
20			50/8"	12.1	3

CLAY, SANDY, TAN
SHALE, GRAY BROWN, HARD, MOIST

CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST
SHALE, GRAY BROWN, HARD, MOIST

TEST BORING NO. 24
DATE DRILLED 3/9/2023
CLIENT SYNERGY HOMES
LOCATION VILLAS AT ASPEN TRAILS

REMARKS

DRY TO 18.5', 3/15/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			36	13.3	1
5			36	8.1	1
10			50/7"	9.6	3
15			50/7"	10.6	3
20			50/5"	11.4	3

FILL 0-7', CLAY, SANDY, TAN TO GRAY BROWN, VERY STIFF, MOIST

SHALE, GRAY BROWN, HARD, MOIST

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED: LL	DATE: 3/20/23

JOB NO.: 230196
FIG NO.: A- 12

APPENDIX C: Soil Survey Descriptions

El Paso County Area, Colorado

56—Nelson-Tassel fine sandy loams, 3 to 18 percent slopes

Map Unit Setting

National map unit symbol: 3690
Elevation: 5,600 to 6,400 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Nelson and similar soils: 55 percent
Tassel and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nelson

Setting

Landform: Hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous residuum weathered from interbedded sedimentary rock

Typical profile

A - 0 to 5 inches: fine sandy loam
Ck - 5 to 23 inches: fine sandy loam
Cr - 23 to 27 inches: weathered bedrock

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B
Ecological site: R067BY045CO - Shaly Plains
Other vegetative classification: SHALY PLAINS (069AY046CO)
Hydric soil rating: No

Description of Tassel

Setting

Landform: Hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous slope alluvium over residuum weathered from sandstone

Typical profile

A - 0 to 4 inches: fine sandy loam
C - 4 to 10 inches: fine sandy loam
Cr - 10 to 14 inches: weathered bedrock

Properties and qualities

Slope: 3 to 18 percent
Depth to restrictive feature: 6 to 20 inches to paralithic bedrock
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
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R067BY045CO - Shaly Plains
Other vegetative classification: SHALY PLAINS (069AY046CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 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 20, Sep 2, 2022

El Paso County Area, Colorado

86—Stoneham sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b2
Elevation: 5,100 to 6,500 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Stoneham and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stoneham

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

A - 0 to 4 inches: sandy loam
Bt - 4 to 8 inches: sandy clay loam
Btk - 8 to 11 inches: sandy clay loam
Ck - 11 to 60 inches: loam

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
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: R067BY024CO - Sandy Plains
Other vegetative classification: SANDY PLAINS (069AY026CO)
Hydric soil rating: No

Minor Components

Other soils
Percent of map unit: 4 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 20, Sep 2, 2022