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

October 4, 2023

Baseline Engineering Corporation
1046 Elkton Drive
Colorado Springs, Colorado 80907

Attn: Steven Baggs

Re: Soils and Geology Study
Parcel No. 53320-02-015
2725 Akers Drive
Lot 7, Akers Acers Subdivision 1
El Paso County, Colorado
Entech Job No. 231480

Dear Mr. Baggs:

The project consists of the subdivision of a 9.37-acre commercial lot located northwest of Marksheffel Road and Constitution Avenue. Two lots are proposed with the existing building to remain on Lot 1 (2.76-acres), and a proposed building and RV storage on Lot 2 (6.58-acres). This report addresses potential geologic constraints and hazards affecting the proposed construction.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the SE¼ of Section 32, Township 13 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located northwest of Marksheffel Road and Constitution Avenue in El Paso County, Colorado. The location of the site is shown on the Vicinity Map, Figure 1.

The topography of the site is gradually sloping to the southeast. No drainages were observed on the site, however, a detention pond is located in the southeastern corner of the property that contains standing water. The site boundaries are indicated on the USGS Map, Figure 2. Current land use consists of an office/warehouse building and an asphalt shingle recycling facility, and vegetation consist of scattered areas of field grasses and weeds. Site photographs, taken September 18, 2023, are included in Appendix A.

The site consists of a 9.37-acre lot with two lots proposed with the existing building to remain on Lot 1 (2.76-acres), and a proposed building and RV storage on Lot 2 (6.58-acres). The buildings will be serviced by municipal water and sewer. The conceptual site plan is presented in the Site and Exploration Plan, Figure 3.

The scope of this report includes a geologic analysis of the site utilizing published geologic data, subsurface soils information and site-specific mapping of major geologic features, and identification of geologic hazards with respect to proposed development with recommended mitigation techniques. Three test borings were drilled as part of this investigation. The test boring locations are indicated on Figures 3 and 5. Test Borings Logs are included in Appendix B, and Laboratory Test Results are included in Appendix C.

LAND USE AND ENGINEERING GEOLOGY

This site was found to be suitable for the proposed development, which will consist a new RV storage facility with an office building in the southwestern portion of proposed lot 2. Areas were encountered where the geologic conditions will impose minor constraints on development and land use. These include artificial fill, hydrocompaction, and potentially expansive soils. Based on the proposed development plan, it appears that these areas will have minor impacts on the development. These conditions will be discussed in greater detail in the report.

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

SCOPE OF THE REPORT

A general geologic analysis utilizing published geologic data. 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.

FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject site are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on September 18, 2023.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 3, Figure 3), previously the Soil Conservation Service (Reference 4) has mapped one soil type on the site. Complete descriptions of the soils are presented in Appendix C. In general, the soils consist loamy sand and sandy loam. The soils are described as follows:

Type	Description
8	Blakeland loamy sand, 1-9% Slopes
10	Blendon sandy loam, 0-3% Slopes

The soils have been described to have rapid permeabilities. The soils are described as well suited for use as homesites. Possible hazards with soils erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 3).

Soils

Three soil types were encountered in the test borings drilled for the site investigation: Type 1A: silty sand fill (SM), Type 1: native silty to slightly silty sand (SM, SM-SW), Type 2: sandy clay (CL). Bedrock was not encountered in the test borings which were drilled to depths of 10 to 20 feet. Each soil type was classified in accordance with the Unified Soil Classification System (USCS) using the laboratory testing results and the observations made during drilling.

Soil Type 1A classified as silty to clayey sand fill (SM, SC). The sand fill was encountered in the test borings at the ground surface extending to depths ranging from 1 to 4 feet bgs. The sand was encountered at loose to dense states. The majority of the samples indicated medium dense states.

Soil Type 1 classified as silty to clayey sand (SM, SC). The sand was encountered in the test borings at depths ranging from 1 to 8 feet bgs and extended to depths ranging from 14 feet to the termination of the test borings (10 to 20 feet). The sand was encountered at loose to medium dense states. The majority of the samples indicated medium dense states.

Soil Type 2 classified as sandy clay (CL). The clay was encountered in the test borings at depths ranging from 4 to 14 feet bgs and extended to depths ranging from 7 to 8 feet bgs and to the termination of TB-1 (20 feet). The clay was encountered at stiff to hard consistencies. Swell/Consolidation Testing resulted in a volume change of -1.4 percent, indicating a moderate consolidation potential.

Groundwater

Groundwater was not encountered in the test borings which were drilled to depths of 10 to 20 feet. It should be noted that fluctuation in groundwater levels could change due to seasonal variations, changes in land runoff characteristics and future development of nearby areas. Isolated sand layers within the soil profile can carry water in the subsurface. Contractors should be cognizant of the potential for the occurrence of subsurface water during construction.

Geology

Approximately 11 miles west of the site is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within a large structural feature known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction. The bedrock underlying the site consists of the Dawson Formation of Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers of siltstone or claystone. Overlying the Dawson Formation are deposits of man-placed fill soils and soils associated with eolian sand deposits.

The geology of the site was evaluated using the *Geologic Map of the Elsmere Quadrangle,* by Madole and Thorson in 2003, (Reference 5, Figure 5). The Geology for the site is presented in Figure 6. One mappable unit was identified on this site which, are described as follows:

Qaf/Qes **Artificial Fill of Late Holocene Age overlying Eolian Sands of late Pleistocene Age:** These are man-made fill deposits associated with asphalt shingle recycling consisting of fill spread across the drive areas and stockpiles of the materials overlying windblown sediments. The sediments were deposited by prevailing winds from the west.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Elsemere Quadrangle* distributed by the Colorado Geologic Survey in 2012 (Reference 5, Figure 5), and the *Geologic Map of the Pueblo 1° x 2° Quadrangle,* distributed by the US Geological Survey in 1978 (Reference 6). The test borings used in evaluating the site are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

ENGINEERING GEOLOGIC HAZARDS

Mapping has been performed on this site to identify areas where various geologic conditions exist of which developers should be cognizant during the planning, design and construction stages should new construction be proposed. The engineering geologic constraints identified on this site include artificial fill, hydrocompaction, and potentially expansive soils. This hazard and recommended mitigation techniques are discussed as follows:

Artificial Fill – Constraint

Fill associated with the recycled asphalt shingle stockpiled on the site and spread around the site. The fill was encountered to depths ranging from 1 to 4 feet. Any uncontrolled fill encountered beneath the proposed building foundations will require removal and replacement with suitable granular soils.
Mitigation: It is anticipated that the fill piles will be removed during site grading for the proposed RV Storage. Areas of fill other than those encountered may be encountered. The fill piles are considered uncontrolled. Any uncontrolled fill encountered beneath foundations should be removed and recompacted at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

Hydrocompaction – Constraint

Areas in which this hazard has been identified are acceptable as building sites. However, in areas identified for this hazard classification, we anticipate a potential for settlement movements upon saturation of these surficial soils. The low density, uniform grain sized, windblown sand deposits are particularly susceptible to this type of phenomenon.
Mitigation: The potential for settlement movement is directly related to saturation of the soils below the foundation areas. Therefore, good surface and subsurface drainage is extremely critical in these areas in order to minimize the potential for saturation of these soils. The ground surface around all permanent structures should be positively sloped away from the structure to all points, and water must not be allowed to stand or pond anywhere on the site. We recommend that the ground surface within 10 feet of the structures be sloped away with a minimum gradient of ten percent. If this is not possible on the upslope side of the structures, then a well-defined swale should be created to intercept the surface water and carry it quickly and safely around and away from the structures. Roof drains should be made to discharge well away from the structures and into areas of positive drainage. Where several structures are

involved, the overall drainage design should be such that water directed away from one structure is not directed against an adjacent building. Planting and watering in the immediate vicinity of the structures, as well as general lawn irrigation, should be minimized

Expansive Soils – Constraint

Expansive soils were encountered in the test borings drilled on site. These occurrences are typically sporadic; therefore, none have been indicated on the maps. The clay, if encountered at foundation grade, can cause differential movement in structures. These occurrences should be identified and dealt with on an individual building basis.
Mitigation Should expansive soils be encountered beneath foundations; 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. The use of structural floors should be considered for basement construction on highly expansive clays

Drainage Areas

The site does not lie within a floodplain according to the FIRM Map, No. 08041CO756G (Reference 7, Figure 7). An existing detention pond is located in the southeastern portion of the site, and water was observed in the pond at the time of our site observations. Any site grading considered should be modified to direct surface flows around the structures or roads, or carried off-site so as to not produce any areas of ponded water. Specific drainage studies and exact floodplain locations are beyond the scope of this report.

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed development will consist of consist of the subdivision of a 9.37-acre commercial lot located northwest of Marksheffel Road and Constitution Avenue. Two lots are proposed with the existing building to remain on Lot 1 (2.76-acres), and a proposed building and RV storage on Lot 2 (6.58-acres), parking and drive areas, and other associated site improvements. The existing geologic and engineering geologic conditions will impose minor constraints on development and construction. The geologic conditions on the site include artificial fill, hydrocompaction, and potentially expansive soils which can be satisfactorily mitigated through proper engineering design and construction practices.

The upper granular soils in the borings drilled on the site were encountered at loose medium dense states. Fill was encountered in all of the test borings on the site extending to depths of 1 to 4 feet. The fill at the site is considered uncontrolled for construction purposes. Any uncontrolled fill encountered beneath foundations will require complete penetration and removal and recompaction under controlled conditions. Areas of fill, other than those mapped, may be encountered. All fill piles and debris within building areas should be completely removed prior to construction. Any uncontrolled fill encountered beneath new foundations and floor slabs will require removal and recompaction at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

In summary, the recompacted granular soils will likely provide suitable support for shallow foundations. The geologic conditions encountered on site can be mitigated with proper engineering and construction practices.

ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 8), the area is mapped as upland deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 9), areas of the site are mapped as E4 – eolian sand and U3 – upland deposits fine aggregate. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 10), the area of the site has been mapped as "Little or no potential" for industrial minerals. Generally, the Dawson formation does not contain significant industrial mineral resources. The sands associated with the eolian and alluvial deposits may be considered a sand resource. Considering the silty to clayey nature of much of these materials and abundance of similar materials through the region, 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 10), 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. The *El Paso County Aggregate Resource Map* (Reference 9) has mapped coal resources in the Elsmere quadrangle area approximately 2½ miles south of the site (Reference 9). No metallic mineral resources have been mapped on the site (Reference 10).

The site has been mapped as "Fair" for oil and gas resources (Reference 10). No oil or gas fields have been discovered in the area of the site. A well was drilled nearly 3 miles southeast of the site to 8,263 feet deep in 1955. No oil or gas was reported and it was plugged. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it would not be considered a significant resource.

CLOSURE

It should be pointed out that because of the nature of data obtained by random sampling of such variable nonhomogeneous 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. Any new construction considered on this site will require additional investigation. Construction and design personnel should be made familiar with the contents of this report. Specific construction and foundation recommendations will be provided when investigations are completed at each building site prior to new construction.

This report has been prepared for Baseline Engineering Corporation. for application to the proposed development in accordance with generally accepted geologic, soil and engineering practices. No other warranty expresses or implied is made.

We trust that this report has provided you with all the information that you required. Should you have any questions or require additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

COLORADO REGISTERED JOSEPH COLLIN GOODE JR. 23725 10-4-2023 PROFESSIONAL ENGINEER

Reviewed by:

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

LLL

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2. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado.*

3. Madole, Richard F. and Thorson, Jon P., 2003. *Geologic Map of the Elsmere Quadrangle, El Paso County, Colorado*. Colorado Geological Survey. Open-File Report 02-2.

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5. Trimble, Donald E. and Machette, Michael N. 1979. *Geologic Map of the Colorado Springs-Castle Rock Area, Front Range Urban Corridor, Colorado*. USGS, Map I-857-F.

6. Scott, Glen R.; Taylor Richard B.; Epis, Rudy C; and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado*. Sheet 2. U.S. Geologic Survey. Map I-1022.

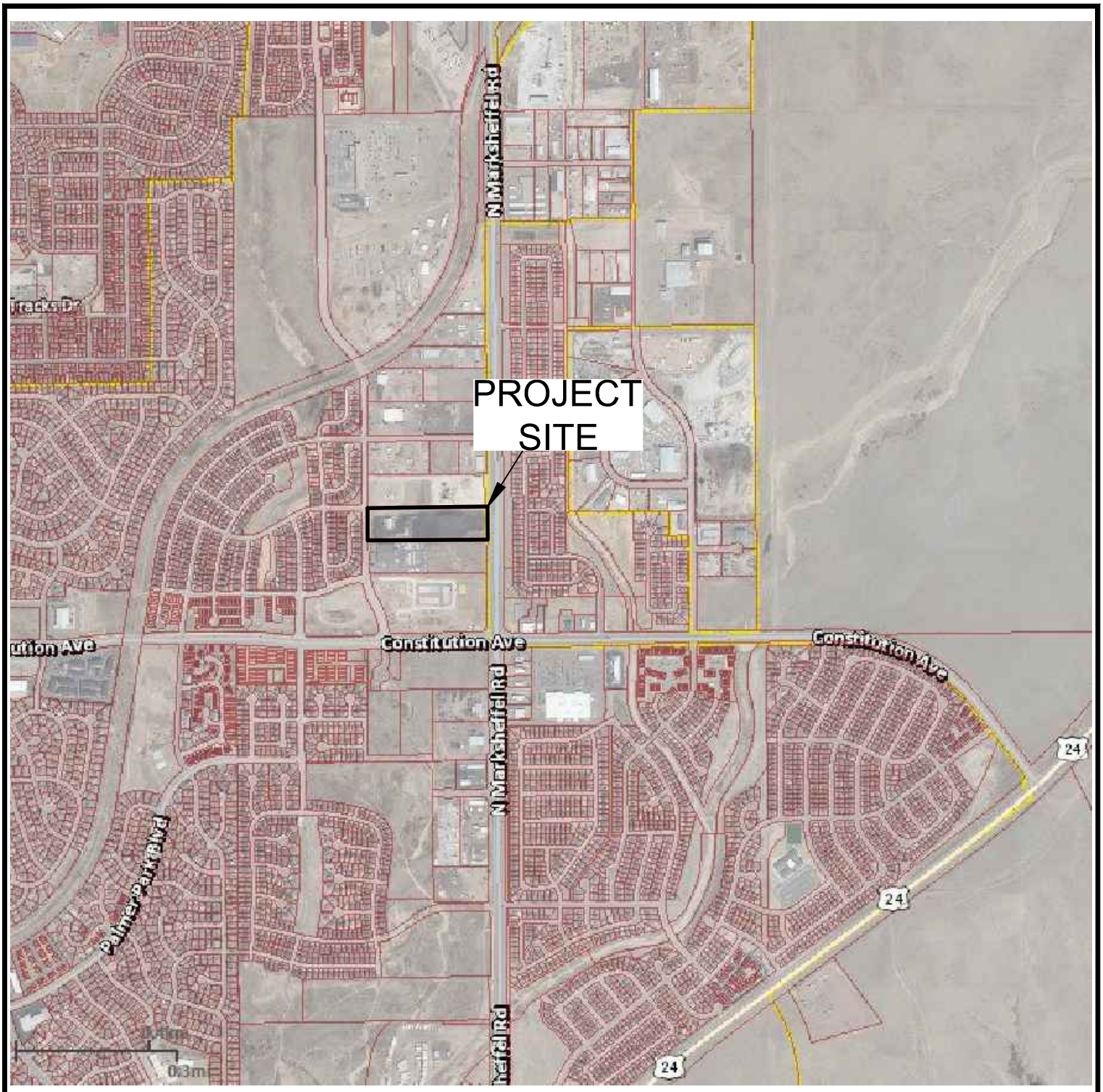
7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Number 08041CO756G.

8. El Paso County Planning Development. December 1995. *El Paso County Aggregate Resource Evaluation Maps.*

9. Schwochow, S.D.; Shroba, R.R. and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties*. Colorado Geological Survey. Special Publication 5-B.

10. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.

FIGURES



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ENTECH ENGINEERING, INC.

VICINITY MAP
2725 AKERS DRIVE
EL PASO COUNTY, COLORADO
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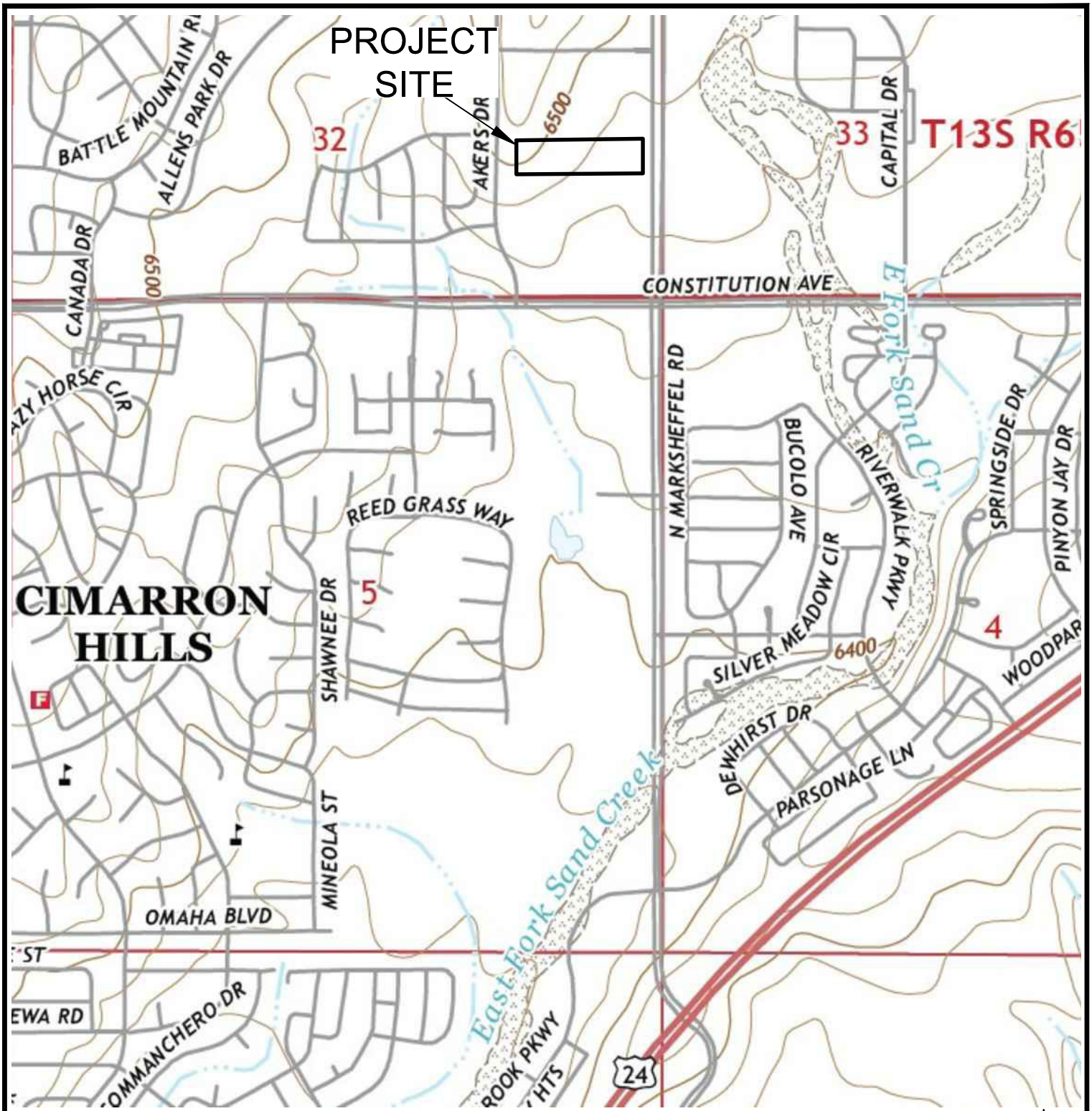
FIG. 1



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USGS TOPOGRAPHY MAP
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EL PASO COUNTY, COLORADO
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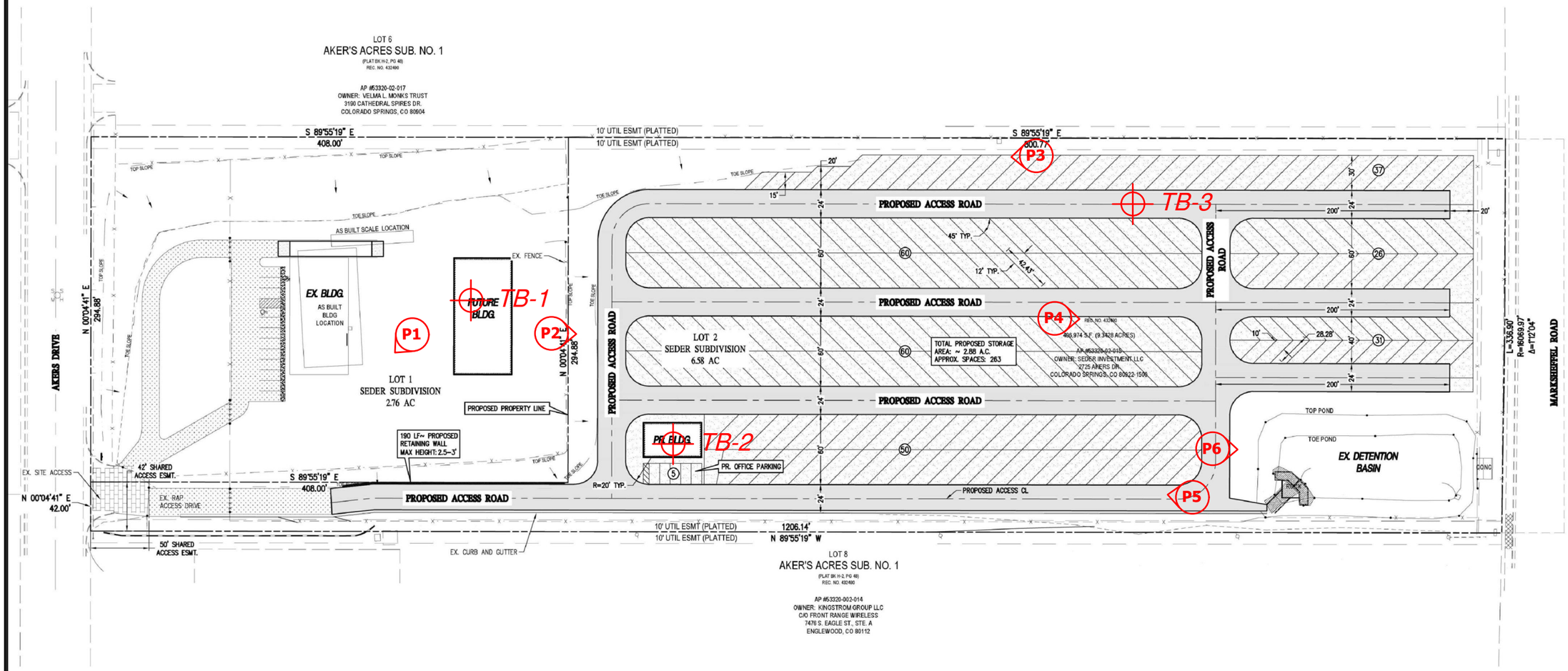
FIG. 2

CONCEPTUAL SITE PLAN EXHIBIT
SEDER SUBDIVISION

DATE PRINTED: August 8, 2023



LEGEND

EXISTING LINETYPES	PROPOSED LINETYPES	
		PROPERTY BOUNDARY
		LOT LINE
		EDGE OF GRAVEL
		EASEMENT
		CURB AND GUTTER (SPILL/CATCH)
		WIRE FENCE

EXISTING SYMBOLS	PROPOSED SYMBOLS		PROPOSED HATCHING	
⌀	⌀	POWER POLE		RAP ACCESS DRIVE
♿	♿	ADA PARKING STALL		GRAVEL STORAGE AREA
	(X)	PARKING SPACE COUNT		

NOTES:
1. THIS SITE PLAN IS FOR CONCEPTUAL PURPOSES AND SUBJECT TO CHANGE.
2. RV STORAGE SPACES SHOWN ARE AN APPROXIMATION OF POTENTIAL STORAGE SPACES.

STORAGE SPACE SUMMARY

TYPE	SPACE DEPTH X WIDTH	COUNT
A	30 FT X 12 FT	228
B	20 FT X 10 FT	33
C	15 FT X 10 FT	3
OFFICE PARKING	18 FT X 9 FT	5
TOTAL		269

N

GRAPHIC SCALE
40 0 40 80
(IN FEET)
1 INCH = 40 FT

⊕ - APPROXIMATE TEST BORING LOCATION AND NUMBER

(P1) - APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

REVISION	BY

ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN
2725 AKERS DRIVE
EL PASO COUNTY, COLORADO
BASELINE ENGINEERING CORPORATION

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Engineering · Planning · Surveying
1946 ELKTON DRIVE · COLORADO SPRINGS, COLORADO 80907
P: 7195316200 · F: 7195316266 · www.baselinecorp.com

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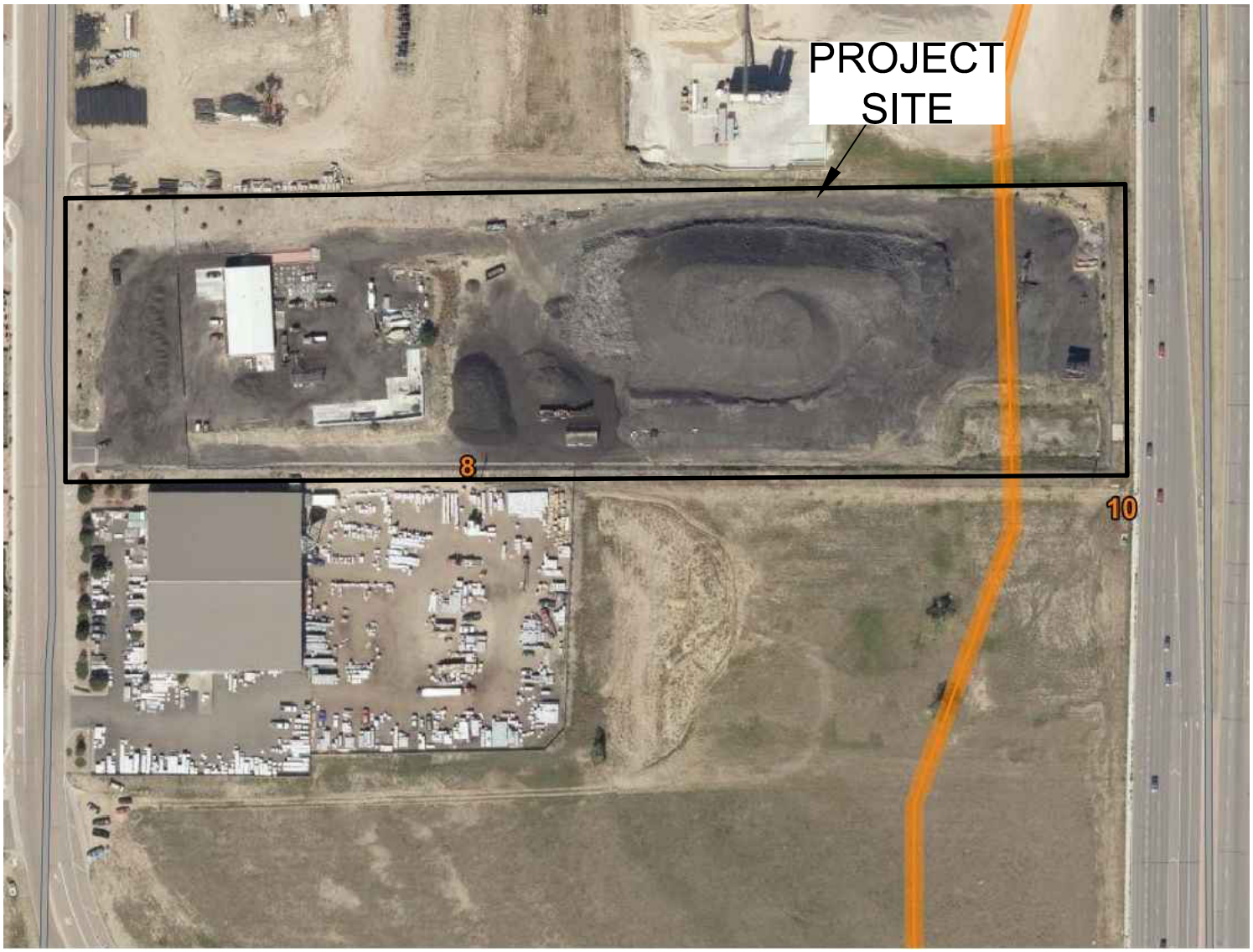
FIG. 3



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SOIL SURVEY MAP
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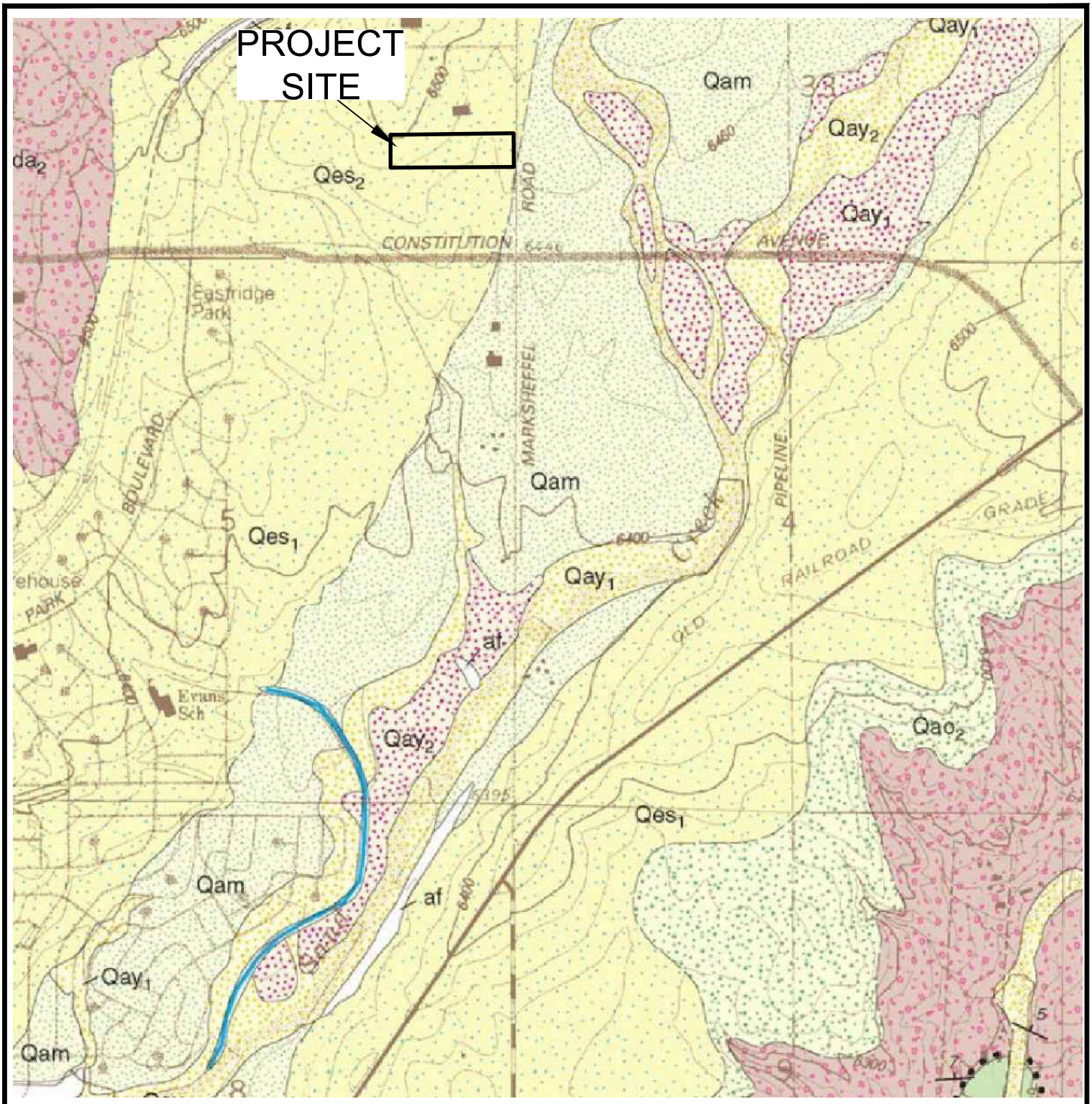
FIG. 4



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ELSMERE QUADRANGLE GEOLOGIC MAP
2725 AKERS DRIVE
EL PASO COUNTY, COLORADO
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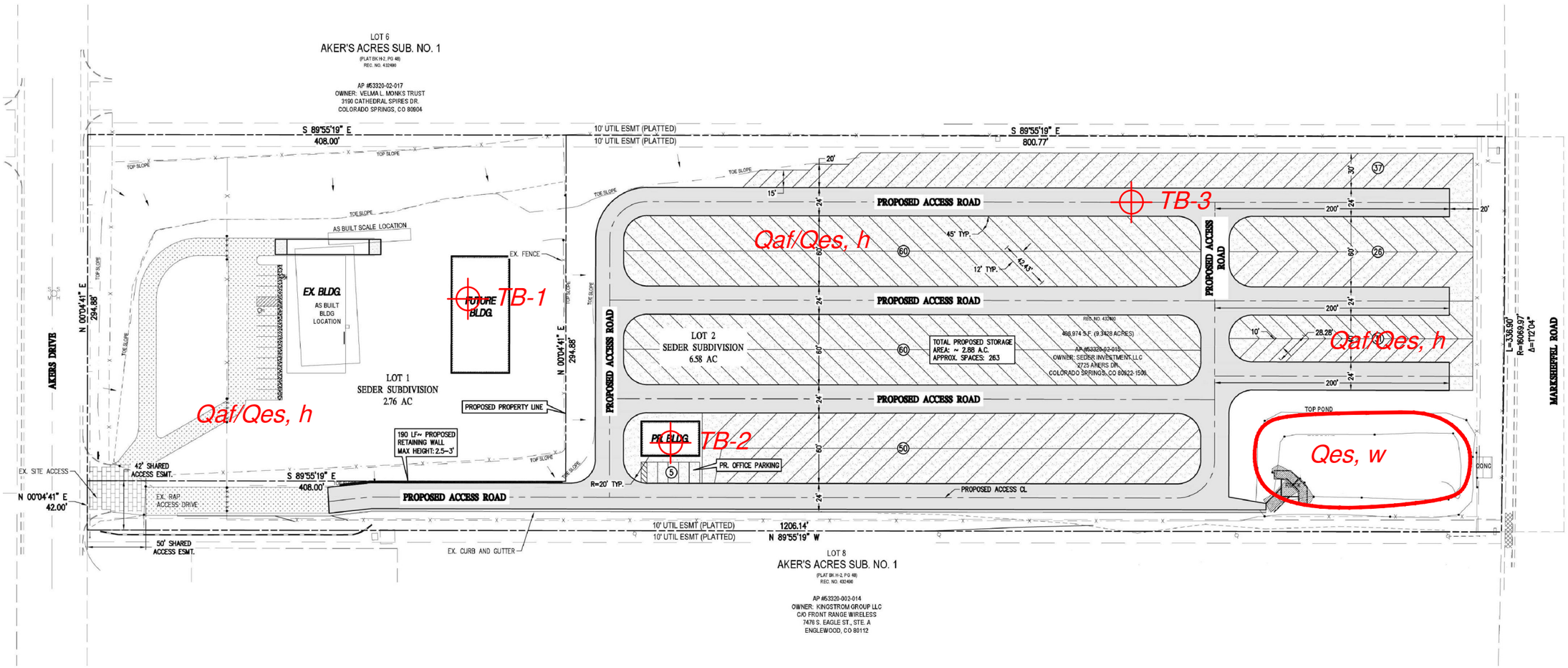
FIG. 5

CONCEPTUAL SITE PLAN EXHIBIT
SEDER SUBDIVISION

DATE PRINTED: August 8, 2023



LEGEND

EXISTING LINETYPES	PROPOSED LINETYPES	
		PROPERTY BOUNDARY
		LOT LINE
		EDGE OF GRAVEL
		EASEMENT
		CURB AND GUTTER (SPILL/CATCH)
		WIRE FENCE

EXISTING SYMBOLS	PROPOSED SYMBOLS		PROPOSED HATCHING	
∅	∅	POWER POLE		RAP ACCESS DRIVE
♿	♿	ADA PARKING STALL		GRAVEL STORAGE AREA
	(X)	PARKING SPACE COUNT		

NOTES:
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C	15 FT X 10 FT	3
OFFICE PARKING	18 FT X 9 FT	5
TOTAL		269

N

GRAPHIC SCALE
40 0 40 80
(IN FEET)
1 INCH = 40 FT

Legend:
Qaf/Qes - Artificial Fill of Holocene Age overlying Eolian Sands of late Pleistocene Age: man-placed fill deposits and stockpiles overlying windblown sediment deposits

h - hydrocompaction
w - ponded water

BASELINE
Engineering · Planning · Surveying
1046 ELKTON DRIVE · COLORADO SPRINGS, COLORADO 80907
P: 7195316200 · F: 7195316266 · www.baselinecorp.com

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GEOLOGY/ENGINEERING MAP
2725 AKERS DRIVE
EL PASO COUNTY, COLORADO
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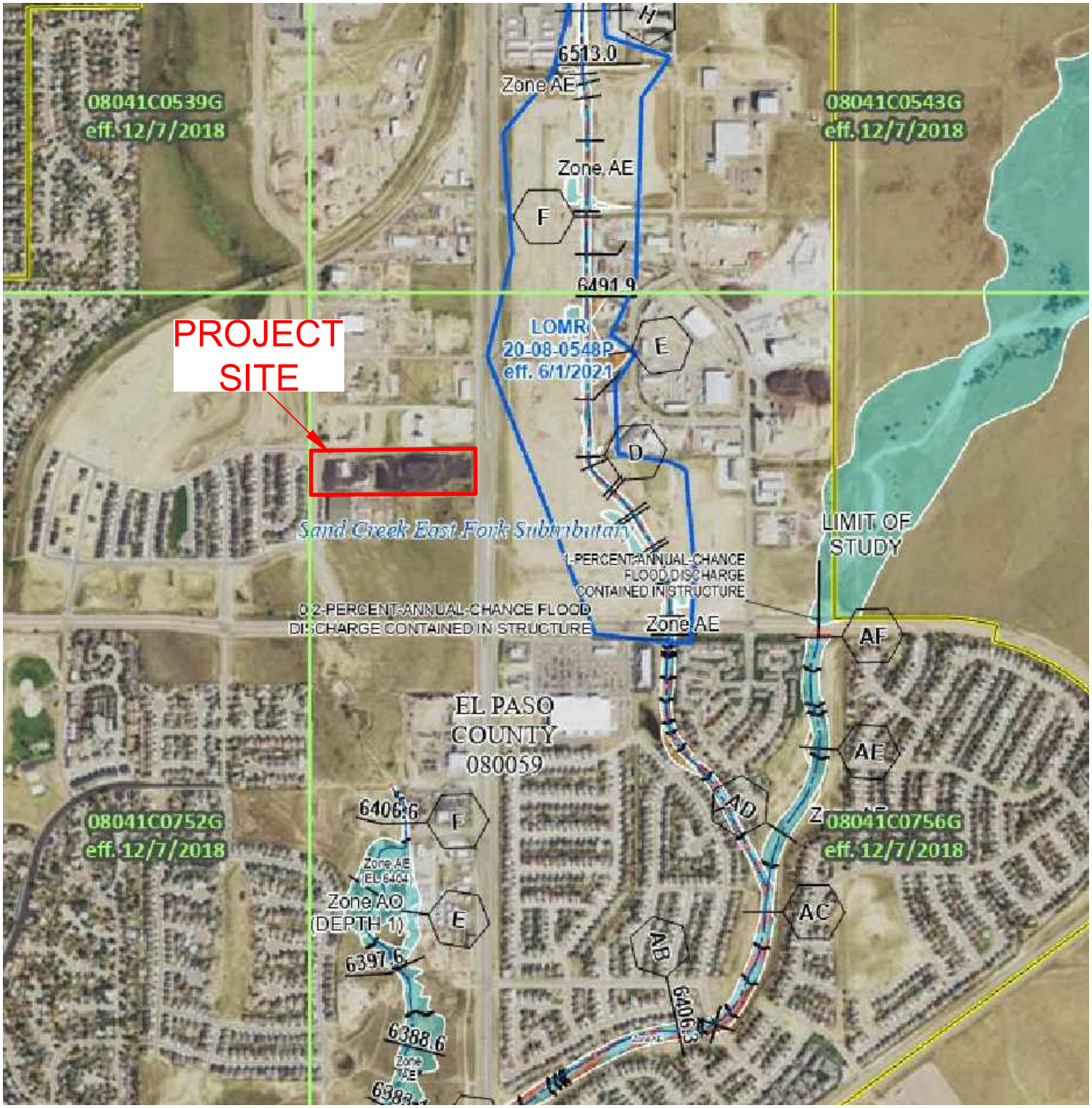
FIG. 6



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FEMA FLOODPLAIN MAP
2725 AKERS DRIVE
EL PASO COUNTY, COLORADO
BASELINE ENGINEERING CORPORATION

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231480

FIG. 7

APPENDIX A: Site Photographs

1

Looking southwest from the west-central portion of the site.

September 18, 2023

2

Looking east from the west-central portion of the site.

September 18, 2023

Job No. 231480

3

Looking west from the northeastern portion of the site.

September 18, 2023

4

Looking east from the central portion of the site.

September 18, 2023

Job No. 231480

5

Looking west from the southeastern side of the site.

September 18, 2023

6

Looking east towards detention pond in the southeastern corner of the site.

September 18, 2023

Job No. 231480

APPENDIX B: Test Boring Logs

TEST BORING 1
DATE DRILLED 9/13/2023

REMARKS

DRY TO 14.5', 9/18/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1A
FILL TO 1', SAND, SILTY, BROWN, MEDIUM DENSE to LOOSE,			13	10.0	1
5			9	13.7	1
10			12	9.8	1
CLAY, SANDY, BROWN, VERY STIFF, MOIST 15			15	16.7	2
20			16	16.5	2

TEST BORING 2
DATE DRILLED 9/13/2023

REMARKS

DRY TO 17', 9/18/23

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1A
FILL TO 1.5', SAND, CLAYEY, BROWN, MEDIUM DENSE, MOIST			17	13.0	1
5 CLAY, SANDY, BROWN, STIFF, MOIST			8	18.4	2
SAND, CLAYEY, BROWN, MEDIUM DENSE, MOIST 10			12	11.2	1
15			10	12.7	1
20			13	10.0	1

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TEST BORING LOGS

2725 AKERS DRIVE
BASELINE ENGINEERING

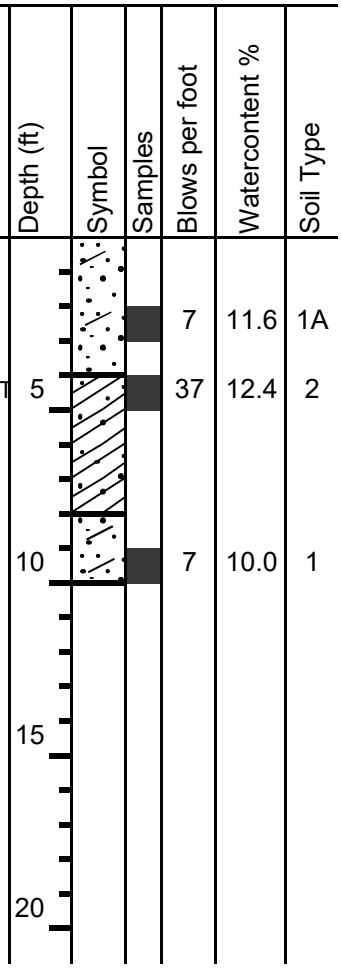
JOB NO. 231480

FIG. B-1

TEST BORING 3
DATE DRILLED 9/13/2023

REMARKS

DRY TO 9.5', 9/18/23



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TEST BORING LOGS

2725 AKERS DRIVE
BASELINE ENGINEERING

JOB NO. 231480

FIG. B-2

APPENDIX C: Laboratory Test Results

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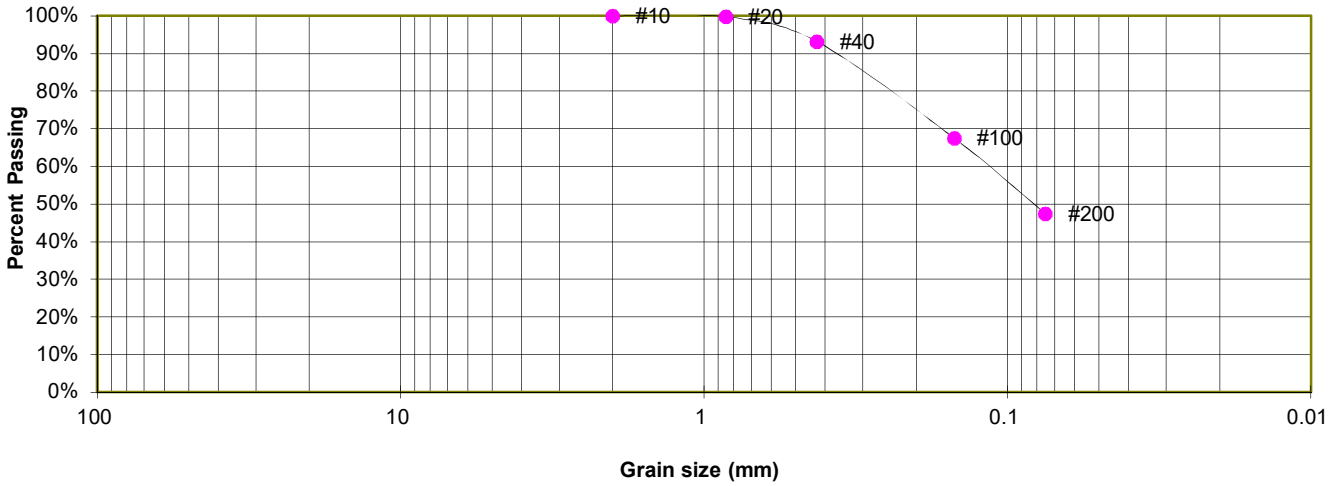
TABLE C-1
SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	USCS	SOIL DESCRIPTION
1	1	5			47.4							SM	SAND, SILTY
1	3	10			36.5	26	13	13				SC	SAND, CLAYEY
2	2	5	21.8	92.1	64.6	29	17	12			-1.4	CL	CLAY, SANDY

2725 AKERS DR
BASELINE ENGINEERING
Job No: 231480

TEST BORING	1	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	
10	100.0%
20	99.8%
40	93.2%
100	67.6%
200	47.4%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

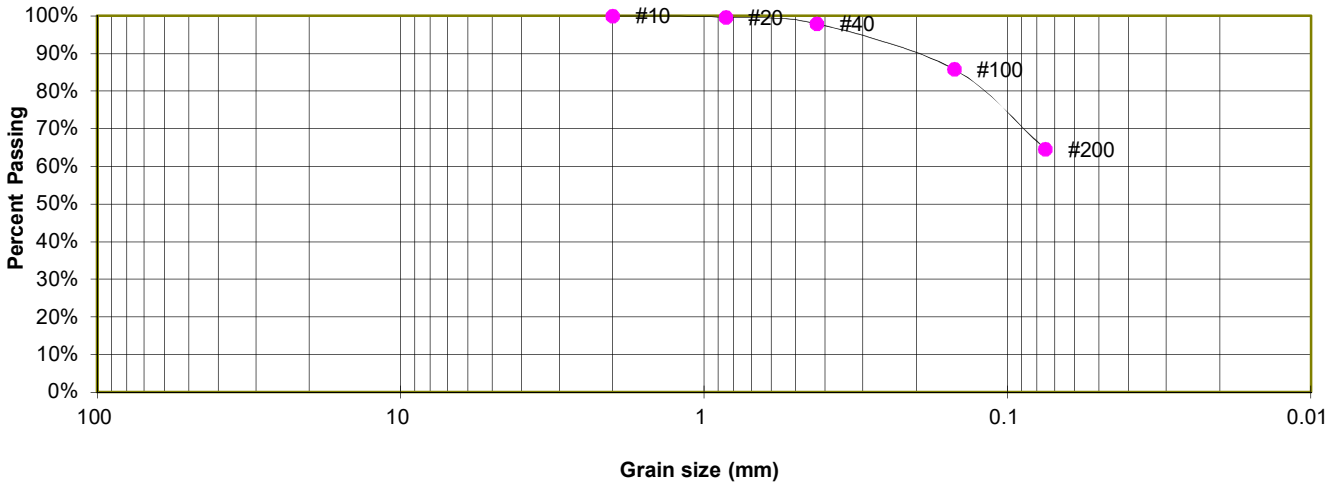
LABORATORY TEST RESULTS

2725 AKERS DRIVE
BASELINE ENGINEERING

JOB NO.
231480

FIG. C-1

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



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	99.6%
40	97.9%
100	85.8%
200	64.6%

ATTERBERG LIMITS

Plastic Limit	17
Liquid Limit	29
Plastic Index	12

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

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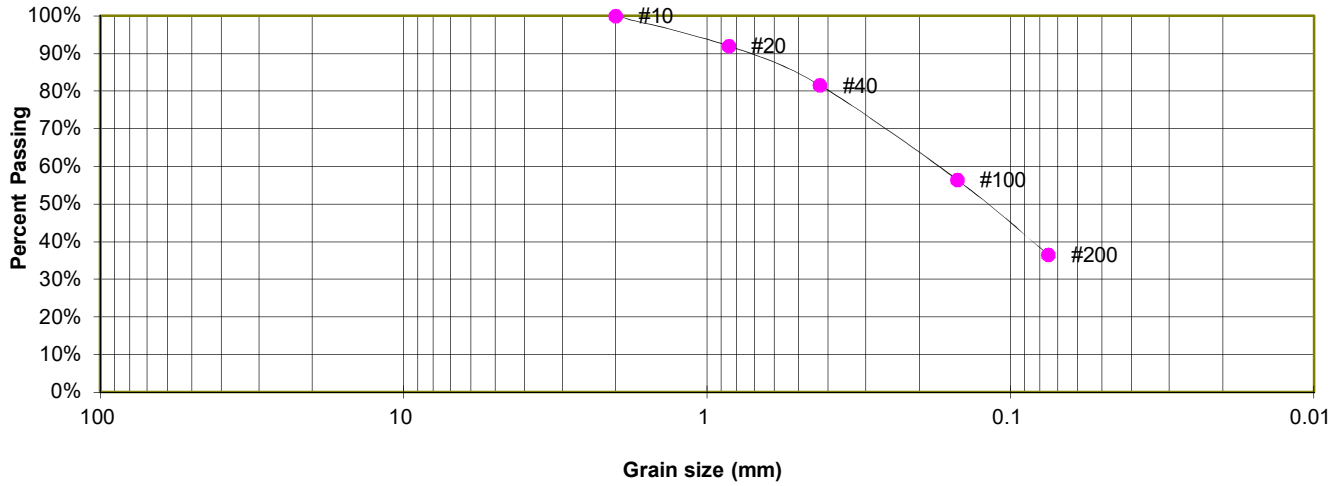
FIG. C-2

TEST BORING	3	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	10	SOIL TYPE	1



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	92.0%
40	81.6%
100	56.5%
200	36.5%

ATTERBERG LIMITS

Plastic Limit	13
Liquid Limit	26
Plastic Index	13

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

2725 AKERS DRIVE
BASELINE ENGINEERING

JOB NO. 231480

FIG. B-3

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

SWELL/CONSOLIDATION TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 92
NATURAL MOISTURE CONTENT: 21.8%
SWELL/CONSOLIDATION (%): -1.4%

ENTECH ENGINEERING, INC.

SWELL/CONSOLIDATION TEST RESULTS

2725 AKERS DRIVE
BASELINE ENGINEERING

JOB NO. 231480

FIG. C-4

APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

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

Map Unit Composition

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

Description of Blakeland

Setting

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

Typical profile

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

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

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

Minor Components

Other soils

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

Pleasant

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

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 21, Aug 24, 2023

El Paso County Area, Colorado

10—Blendon sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 3671
Elevation: 6,000 to 6,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Blendon

Setting

Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

A - 0 to 10 inches: sandy loam
Bw - 10 to 36 inches: sandy loam
C - 36 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high 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: 2 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Other soils

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

Pleasant

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

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 21, Aug 24, 2023