ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
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March 24, 2020

D. Stefano – Building & Restoration, Inc.
520 West 21st Street, G-2 #710
Norfolk, Virginia 23517

Attn: David Stefano

Re: Soil, Geology and Geologic Hazard Evaluation
7765 Electronic Drive
El Paso County, Colorado

Dear Mr. Stefano:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the SW¼ of Section 32, Township 13 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located just east of the Colorado Springs city limits, southwest of Electronic Drive and Marksheffel Road 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. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped land. The site is currently vacant and vegetation consist of primarily field grasses and weeds with a row of evergreen trees along the western side of the site. Site photographs, taken March 9, 2020, are included in Appendix A.

The site is a 2.25-acre parcel. Proposed development consists of a four-story indoor storage facility and associated site improvements. The building will be serviced by municipal water and an individual on-site wastewater treatment system. A detention basin is proposed in the southeastern portion of the site. The Site Plan is presented in Figure 3.

LAND USE AND ENGINEERING GEOLOGY

This site was found to be suitable for the proposed commercial development. Areas were encountered where the geologic conditions will impose minor constraints on development and land use. These include areas of loose soils, and potentially expansive soils. 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

The scope of the report will include the following:

- 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.

SITE INVESTIGATIONS

The site has been investigated by Entech Engineering, Inc., (*Subsurface Soil Investigation,* dated March 16, 2020 Reference 1). Information from these reports was used in preparing this report. Seven test borings were drilled across the site in the proposed building footprint and driving/parking areas. The locations of the test borings are indicated on the Site Plan, Figure 3. Laboratory testing was also performed on 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. Test Boring Logs and Summary of Laboratory Testing Results are included in Appendix B.

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 March 9, 2020.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 2, Figure 3), previously the Soil Conservation Service (Reference 3) 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. The soils are described as follows:

Type	Description
8	Blakeland Loamy Sand, 1-9% Slopes

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as building site. Possible hazards with soils erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 2).

Soils

Two soil types and two bedrock types were encountered in the borings drilled for the subsurface investigation: Type 1: silty and clayey to vey clayey sand (SM, SC), Type 2: sandy clay (CL), Type 3: silty to clayey sandstone (SM, SC) and Type 4: sandy claystone (CL) and clayey siltstone (MH). The soil types were classified in accordance with the Unified Soil Classification System (USCS) using the laboratory testing results and the observations made during drilling.

Soil Type 1 is a silty and clayey to very clayey sand (SM, SC). The sand was encountered in all of the test borings at depths ranging from the existing surface to 10 feet and extending to depths ranging from 4 to 34 feet below the ground surface (bgs) in Test Boring Nos. 1 through 5 and to the termination of Test Boring Nos. 6 and 7 (10 feet). Standard Penetration Testing on the sand resulted in N-values ranging from 6 to 25 bpf, which indicates loose to medium dense states. Water content and grain size analysis conducted on samples resulted in water contents of 3 to 16 percent, with approximately 13 to 41 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in liquid limits of 28 and 36 and plastic indexes of 9 and 16 respectively. FHA Swell Testing resulted in an expansion pressure of 330 psf, indicating low expansion potential. Swell/Consolidation Testing resulted in a volume change of 2.7 percent, indicating moderate expansion potential. Sulfate testing resulted in 0.00 percent soluble sulfate by weight indicating a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 is a sandy clay (CL). The sandy clay was encountered in four of the test borings, at depths ranging from the existing ground surface to 34 feet and extending to depths ranging from 6 to 39 feet bgs. Standard Penetration Testing on the clay resulted in N-values of 12 to 36 bpf, which indicates firm to very stiff consistencies. Water content and grain size analysis conducted on samples resulted in water contents of 11 to 25 percent, with approximately 68 and 89 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing resulted in liquid limits of 40 and 49 and plastic indexes of 20 and 23, respectively. Swell/Consolidation Testing on a sample of sandy clay resulted in a volume change of 1.4%, which indicates a low to moderate expansion potential. Sulfate testing resulted in less than 0.01 and 0.22 percent soluble sulfate by weight, indicating negligible to severe potential for below grade concrete degradation due to sulfate attack.

Soil Type 3 is a silty to clayey sandstone (SM, SC). The sandstone was encountered in two of the test borings at depths of 34 and 38 feet below the ground surface (bgs) and extending to the termination of the borings (35 and 40 feet bgs). Standard Penetration Testing on the sandstone resulted in N-values greater than 50 bpf, which indicates very dense states. Water content and grain size analysis conducted on samples resulted in water contents of 14 to 18 percent, with approximately 20 percent of the soil size particles passing the No. 200 sieve. Atterberg limits

testing resulted in a liquid limit of 36 and plastic index of 8. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 4 classified as a sandy claystone (CL) and clayey siltstone (MH). The claystone/siltstone was encountered in three of the test borings at depths ranging from 31 to 39 feet and extending to the termination of the borings (35 to 40 feet). Standard Penetration Testing on the claystone/siltstone resulted in N-Values of 28 to greater than 50 bpf, indicating stiff to hard consistencies. Water content and grain size testing resulted in water contents of 18 to 25 percent with approximately 76 and 98 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing resulted in a liquid limit of 69 and a plastic index of 22. Swell/Consolidation Testing resulted in volume changes of 0.8 and 2.2 percent, indicating low to moderate expansion potential. Sulfate testing resulted in less than 0.01 percent solvable sulfate by weight, indicating a measurable potential of concrete degradation due to sulfate attack.

Groundwater

Groundwater was not encountered in the test borings during or subsequent to drilling which were drilled to depths of 10 to 40 feet. It is anticipated groundwater will not affect construction on the site. Development of this and adjacent properties, as well as seasonal precipitation changes, and changes in runoff may affect groundwater elevations. Contractors should be cognizant of the potential for the occurrence of subsurface water during construction.

Geology

Approximately 10 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 siltstone or claystone. Overlying the Dawson Formation are deposits of eolian sediments.

The geology of the site was evaluated using the *Geologic Map of the Elsmere Quadrangle,* by Madole and Thorson in 2003, (Reference 4, Figure 5). The Geology for the site is presented in Figure 5. Five mappable units were identified on this site which, are described as follows:

Qes_2 **Older Eolian Sands of Holocene to Late Pleistocene Age:** These are wind-blown sands deposited by the action of prevailing winds. The materials typically consist of silty sands and may contain sandy silt layers.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Elsmere Quadrangle* distributed by the Colorado Geologic Survey in 2012 (Reference 4, 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 hazards identified on this site include artificial fill, loose soils, potentially expansive soils and floodplain areas. These hazards and recommended mitigation techniques are discussed as follows:

Loose Soils

Some of the sandy soils encountered on site exhibit low density and may be subject to settlement under a load (Reference 2). The potential for loose or collapsible soils exists anywhere in areas mapped as Eolian Sand (Qes). Loose soils encountered beneath the foundation or floor slabs will require mitigation.

Mitigation: Loose soils encountered beneath the foundations or floor slabs; will require mitigation consisting of recompaction. Overexcavation and recompaction at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is typical. An overexcavation depth of 2 to 4 feet is anticipated.

Expansive Soils

Expansive soils were encountered in the test borings (Reference 1). Isolated clay lenses may be encountered in the alluvial deposits across the site. 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.

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils will be required. Overexcavation and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements.

Floodplain Areas

The site does not lie within a floodplain according to the FIRM Map, No. 08041CO756G (Reference 9, Figure 7). 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. Additionally, subsurface perimeter drains may be required. Specific drainage studies and exact floodplain locations are beyond the scope of this report.

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed site is 2.25-acres. Proposed development consists of a four-story indoor storage facility and associated site improvements. The building will be serviced by municipal water and an individual on-site wastewater treatment system. A private full spectrum extended detention basin is proposed in the southeastern portion of the site. The existing geologic and engineering geologic conditions will impose minor constraints on development and construction. The geologic conditions on the site include potentially seasonal shallow and shallow groundwater areas, which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The subsurface conditions primarily consisted of loose to medium dense silty sand with occasional clay lenses. Bedrock was encountered at depths of 31 to 39 feet in the test borings. The bedrock consisted of sandstone and claystone. Given the subsurface conditions encountered at the time of drilling and the site development as described, it is anticipated that a shallow foundation resting on recompacted site sands or structural fill will be utilized. Mitigation of expansive soils or loose soils if encountered will be required. Specific recommendations for the site have been made in the Subsurface Soil Investigation (Reference 1).

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

ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 8), of the area of the site is not mapped with any potential aggregate resources. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 9), the site is not mapped with any resources. 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.

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 "Moderate" for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site (Reference 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. 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

productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

EROSION CONTROL

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

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

CLOSURE

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

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Individual investigations for new building sites and septic systems will be required prior to construction. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

This report has been prepared for D. Stefano – Building & Restoration, Inc., for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

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

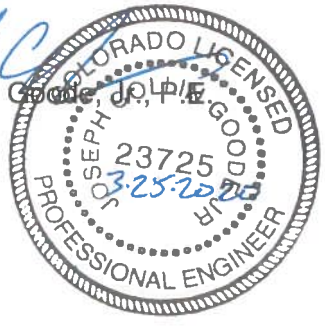
Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Reviewed by:

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



LLL/lll

Encl.

Entech Job No. 200127
AAprojects/2020/200127sg&ghs

BIBLIOGRAPHY

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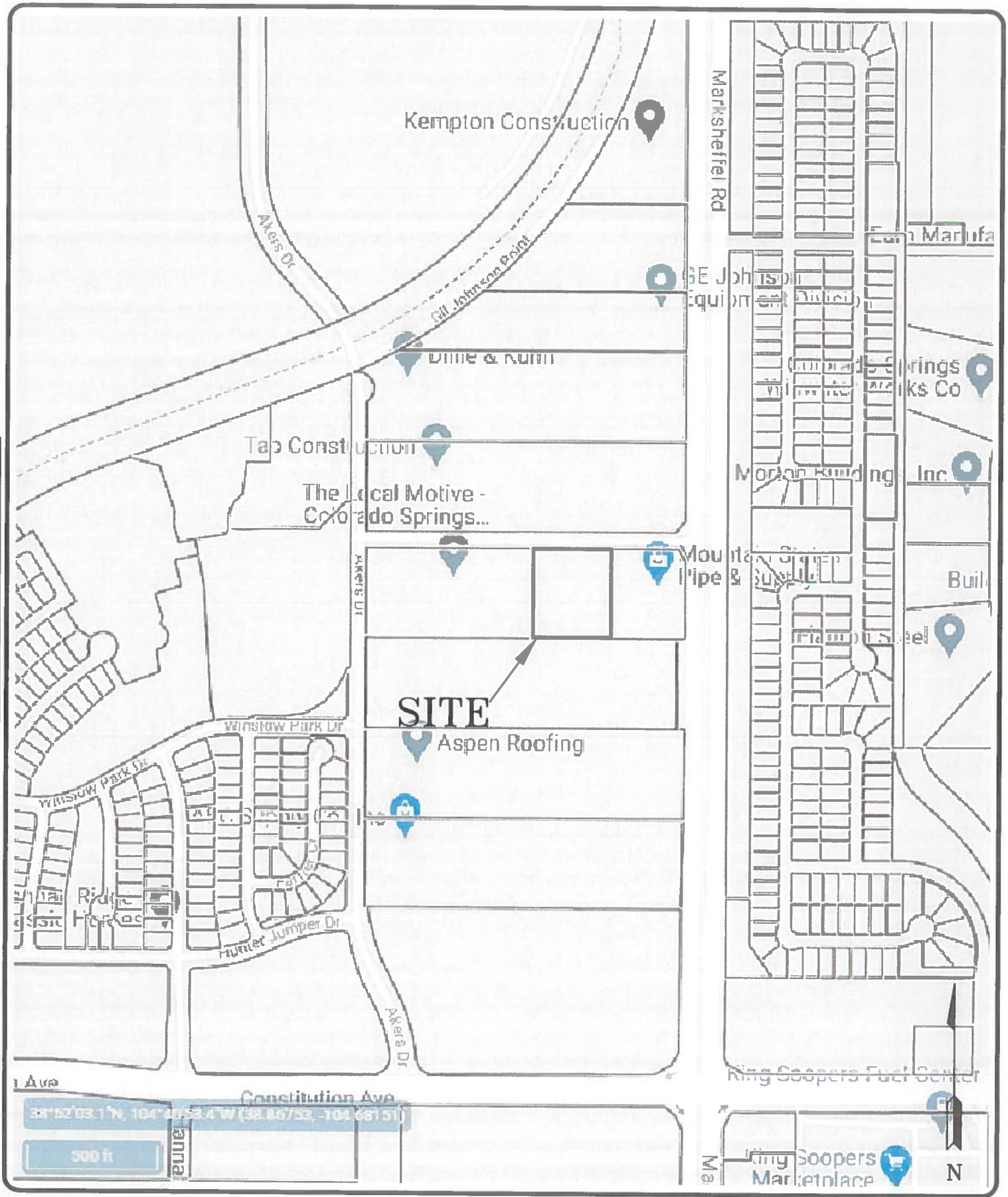
FIGURES



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505 ELKTON DRIVE
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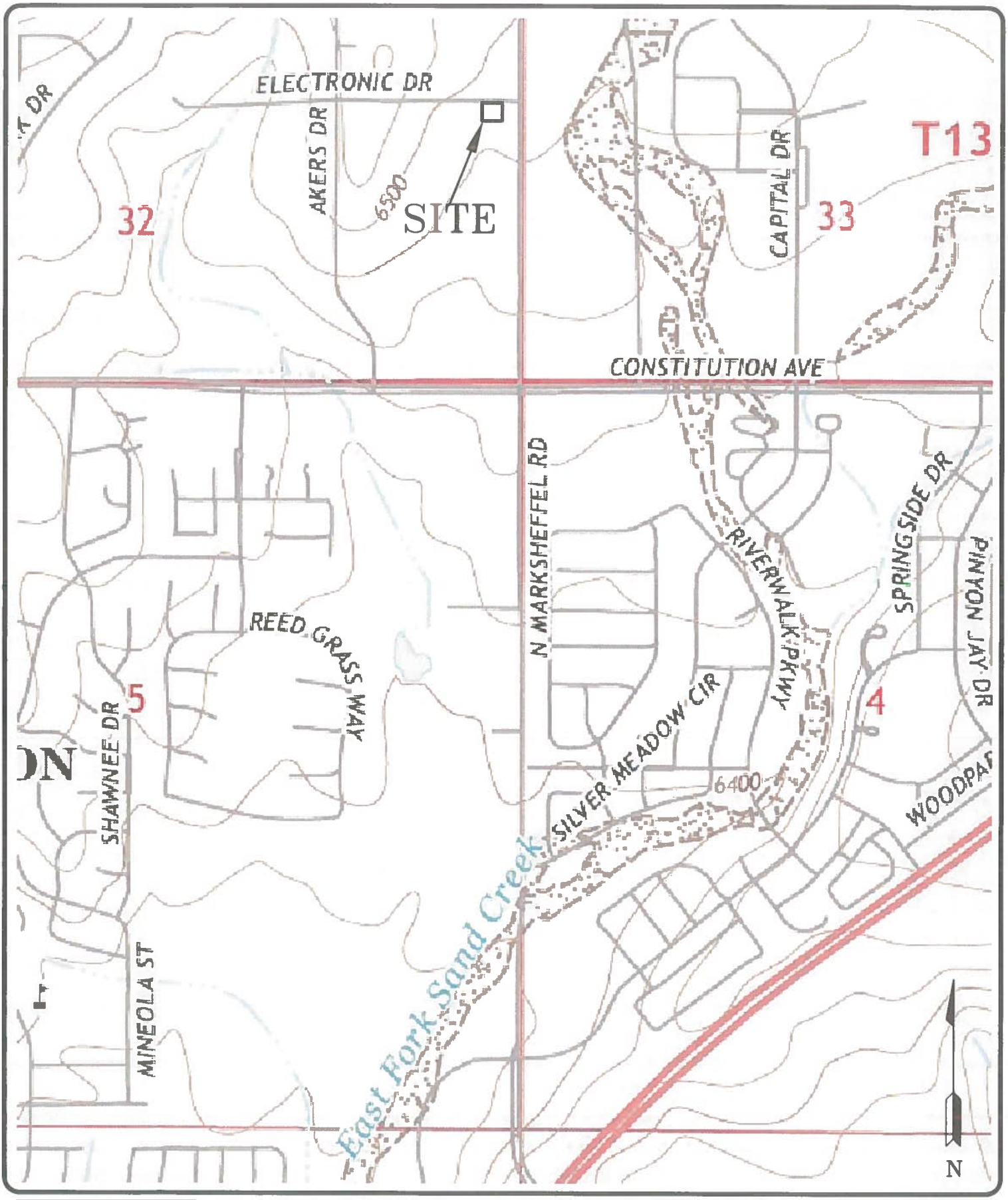
VICINITY MAP
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO–BUILDING & RESTORATION, INC.

DRAWN:	DATE:	CHECKED:	DATE:
LLL	3/19/20		

JOB NO.: 200127

FIG NO.: 1



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USGS TOPOGRAPHY MAP
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO–BUILDING & RESTORATION, INC.

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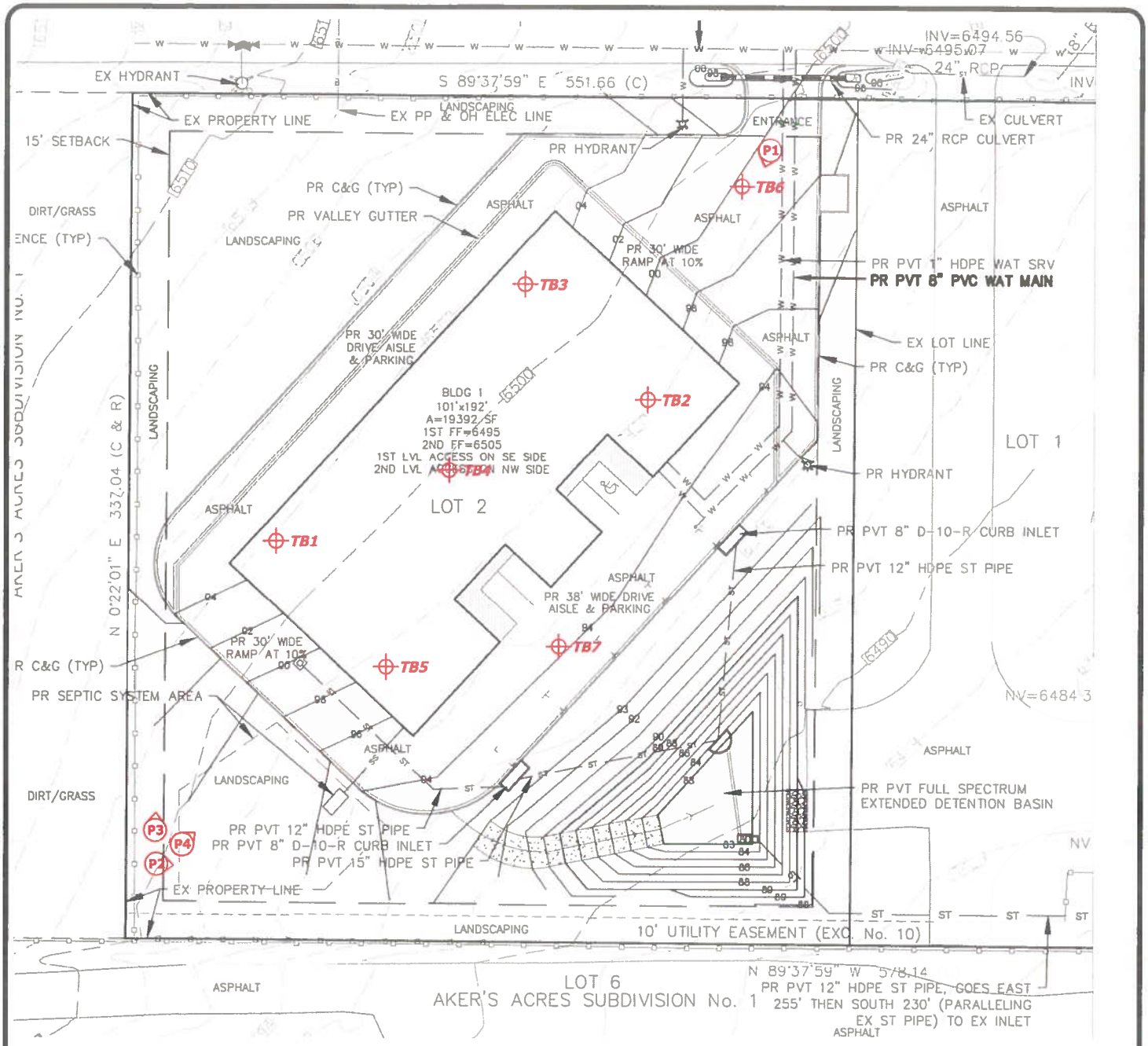
JOB NO.: 200127

FIG NO.: 2



TB- approximate test boring location and number

P2 - approximate location and number of photograph

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505 ELKTON DRIVE
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SITE PLAN
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO–BUILDING & RESTORATION, INC.

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FIG NO.: 3

N

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SOIL SURVEY MAP
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO-BUILDING & RESTORATION, INC.

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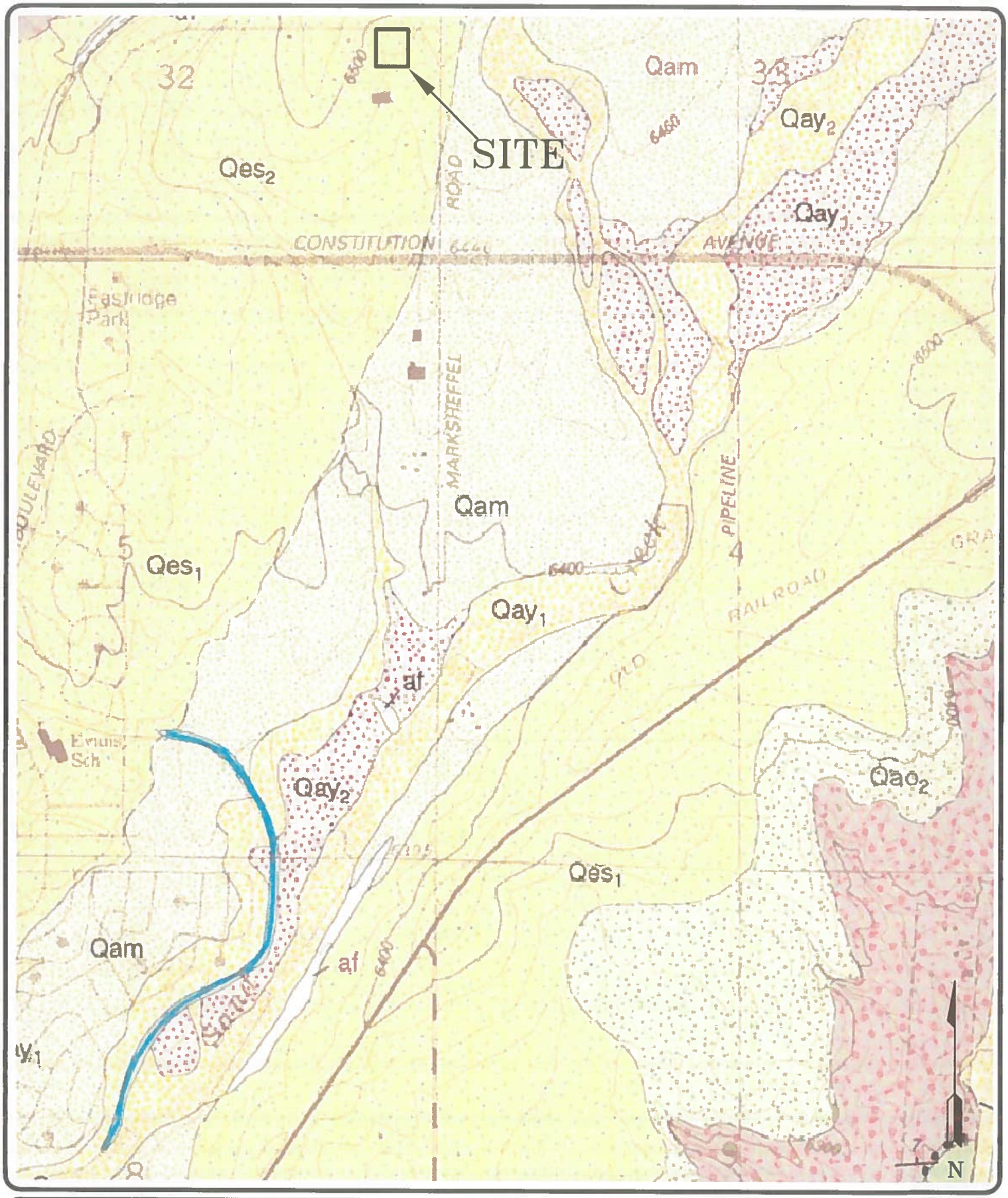
JOB NO.: 200127

FIG NO.: 4



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ELSMERE QUADRANGLE GEOLOGY MAP
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO–BUILDING & RESTORATION, INC.

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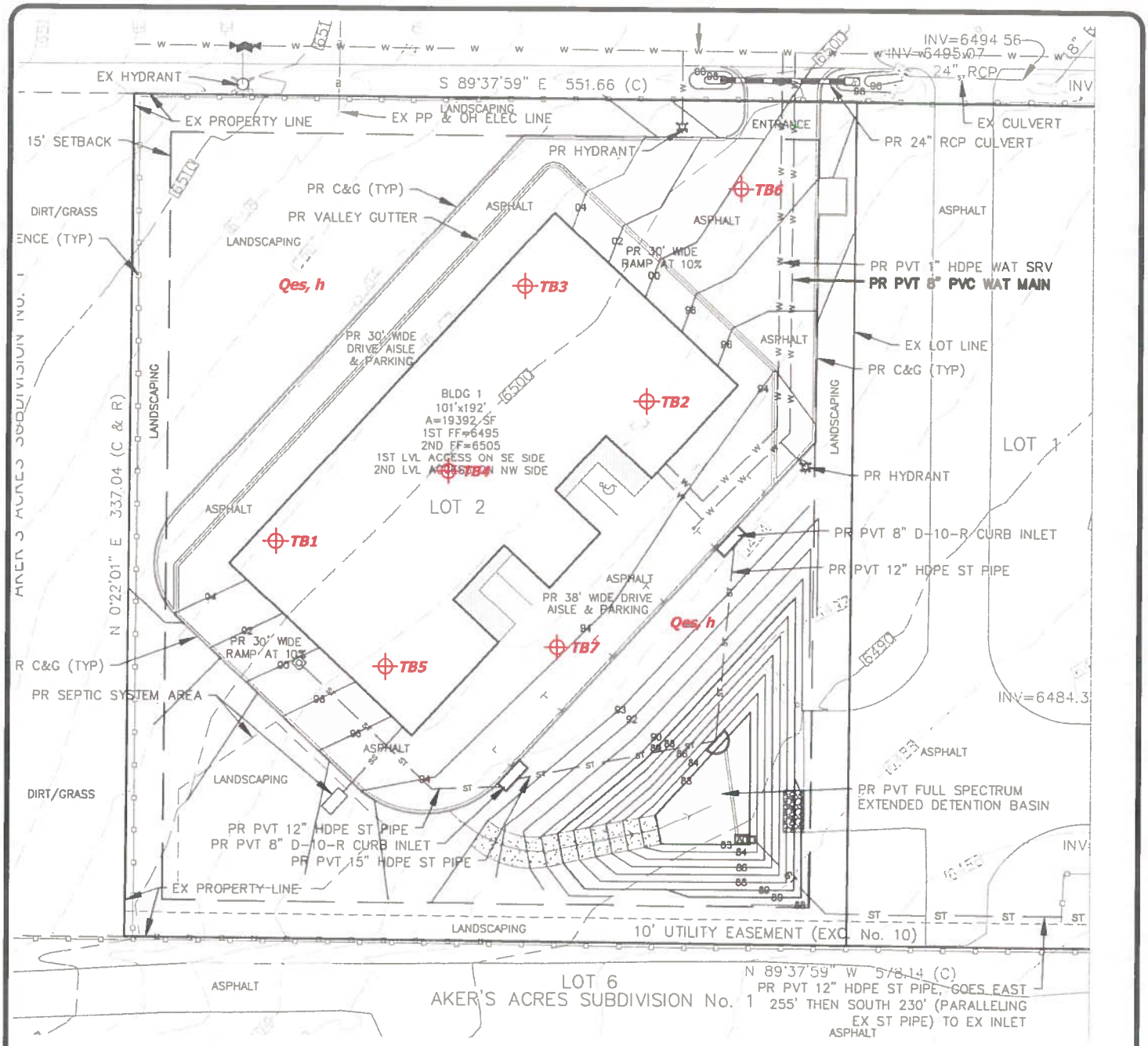
JOB NO.: 200127

FIG NO.: 5



Legend:

Qes_2 - Older Eolian Sand of Late Pleistocene Age:
wind-deposited sediment

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ENGINEERING GEOLOGY/ GEOLOGY MAP
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO-BUILDING & RESTORATION, INC.

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JOB NO.: 200127

FIG NO.: 6

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FEMA FLOODPLAIN MAP
7765 ELECTRONIC DRIVE
EL PASO COUNTY, COLORADO
FOR: D. STEFANO-BUILDING & RESTORATION, INC.

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JOB NO.: 200127

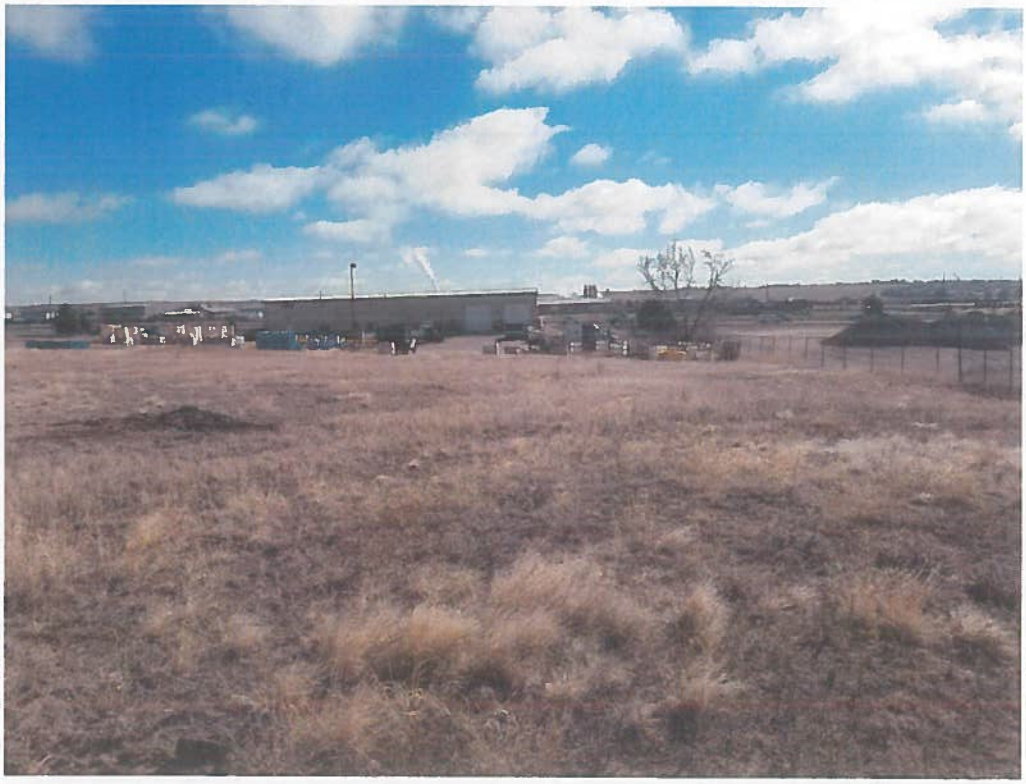
FIG NO.: 7

APPENDIX A: Site Photographs

1

Looking south from the northeast portion of the site.

March 9, 2020



2

Looking east from the southwest portion of the site.

March 9, 2020

Job No. 200127

3

Looking northeast from the southwest portion of the site.

March 9, 2020

4

Looking north from the southwest portion of the site.

March 9, 2020

Job No. 200127

APPENDIX B: Test Boring Logs and Summary of Laboratory Testing Results, Entech Job No. 200127

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT D. STEFANO
PROJECT 7765 ELECTRONIC DRIVE
JOB NO. 200127

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	25			35.5	28	9	0.00			SC	SAND, CLAYEY
1	2	15			29.3						SC	SAND, CLAYEY
1	4	2-3			40.5						SC	SAND, VERY CLAYEY
1	4	20			25.1						SC	SAND, CLAYEY
1	5	15			12.7						SM	SAND, SILTY
1	7	1-2			38.8	36	16				SC	SAND, VERY CLAYEY
1	4	2-3			40.5				330		SC	SAND, VERY CLAYEY
1	5	5	16.8	99.1						2.7	SC	SAND, CLAYEY
2	1	5	21.1	91.7	88.9	49	23	0.22		1.4	CL	CLAY, SANDY
2	6	1-2			68.1	40	20	<0.01			CL	CLAY, SANDY
3	2	35			19.6	36	8	<0.01			SM	SANDSTONE, SILTY
4	5	35	32.7	88.3	75.8					2.2	CL	CLAYSTONE, SANDY
4	3	40	17.4	92.7	98.2	69	22	<0.01		0.8	MH	SILTSTONE

TEST BORING NO. 1
DATE DRILLED 2/10/2020
Job # 200127

REMARKS

DRY TO 40', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			16	9.3	1	6" TOPSOIL, SAND, CLAYEY, FINE GRAINED, DARK BROWN, MEDIUM DENSE, MOIST
5			15	17.1	2	CLAY, SANDY, GRAY BROWN, STIFF, MOIST
10			15	11.3	2	SAND, CLAYEY, FINE GRAINED, BROWN, MEDIUM DENSE, MOIST TO DRY
15			23	4.7	1	
20			20	11.1	1	
25			23	2.8	1	
30			20	5.4	1	
35			12	17.2	2	CLAY, SANDY, DARK BROWN, FIRM, MOIST
40			50/7"	17.8	3	SANDSTONE, CLAYEY, FINE GRAINED, TAN, VERY DENSE, MOIST

TEST BORING NO. 2
DATE DRILLED 2/10/2020
CLIENT D. STEFANO
LOCATION 7765 ELECTRONIC DRIVE

REMARKS

DRY TO 35', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			19	6.4	1	6" TOPSOIL, SAND, CLAYEY, FINE GRAINED, BROWN, MEDIUM DENSE TO LOOSE, MOIST
5			9	4.7	1	
10			17	7.4	1	
15			15	10.7	1	
20			16	8.1	1	
25			17	6.5	1	
30			16	15.8	1	VERY CLAYEY LENSES
35			50/6"	13.9	3	SANDSTONE, SILTY, FINE GRAINED, TAN, VERY DENSE, MOIST
40						

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			2/27/20

JOB NO.: 200127
FIG NO.: A- 1

TEST BORING NO. 3
DATE DRILLED 2/10/2020
Job # 200127

REMARKS

DRY TO 40', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			7	5.7	1	6" TOPSOIL, SAND, CLAYEY, FINE GRAINED, BROWN, LOOSE TO MEDIUM DENSE, MOIST
5			13	6.2	1	
10			10	8.2	1	
15			14	6.7	1	
20			18	4.9	1	SILTY LENSES
25			13	6.4	1	
30			13	7.0	1	
35			15	17.3	2	CLAY, SANDY, BROWN, STIFF, MOIST
40			28	18.1	4	HIGHLY WEATHERED SILTSTONE, CLAYEY, GRAY BROWN, STIFF, MOIST

TEST BORING NO. 4
DATE DRILLED 2/10/2020
CLIENT D. STEFANO
LOCATION 7765 ELECTRONIC DRIVE

REMARKS

DRY TO 35', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			22	7.0	1	6" TOPSOIL, SAND, VERY CLAYEY TO CLAYEY, FINE GRAINED, BROWN TO TAN, LOOSE TO MEDIUM DENSE, MOIST
5			9	6.6	1	
10			18	7.3	1	
15			19	7.1	1	
20			20	6.4	1	
25			13	10.3	1	
30			36	25.4	2	CLAY, SANDY, VERY STIFF, DARK BROWN, MOIST
35			50/10"	22.3	4	CLAYSTONE, SANDY, DARK GRAY, HARD, MOIST
40						

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE: 2/27/20

JOB NO.: 200127
FIG NO.: A- 2

TEST BORING NO. 5
DATE DRILLED 2/10/2020
Job # 200127

REMARKS

DRY TO 35', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			6	8.2	1	6" TOPSOIL, SAND, CLAYEY WITH ORGANICS, FINE GRAINED, DARK BROWN TO TAN, LOOSE TO MEDIUM DENSE, MOIST
5			20	12.1	1	
10			16	6.3	1	
15			11	5.6	1	SILTY LENSES
20			11	9.9	1	
25			8	9.4	1	
30			14	6.2	1	
35			50	24.5	4	CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

TEST BORING NO. 6
DATE DRILLED 2/10/2020
CLIENT D. STEFANO
LOCATION 7765 ELECTRONIC DRIVE

REMARKS

DRY TO 10', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			12	11.0	2	6" TOPSOIL, CLAY, SANDY WITH ORGANICS, DARK BROWN, FIRM TO STIFF, MOIST
5			18	12.8	2	
10			18	7.6	1	SAND, CLAYEY, FINE GRAINED, TAN, MEDIUM DENSE, MOIST
15						
20						

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE: 2/27/20

JOB NO.: 200127
FIG NO.: A- 3

TEST BORING NO. 7
DATE DRILLED 2/10/2020
Job # 200127

REMARKS

DRY TO 10', 2/11/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			14	6.6	1	SAND, VERY CLAYEY TO CLAYEY, FINE GRAINED, BROWN, MEDIUM DENSE, MOIST
5			25	7.4	1	
10			15	8.3	1	
15						
20						

TEST BORING NO.
DATE DRILLED
CLIENT D. STEFANO
LOCATION 7765 ELECTRONIC DRIVE

REMARKS

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

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			2/27/20

JOB NO.: 200127
FIG NO.: A- 4

APPENDIX C: 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
Natural 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 in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
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 17, Sep 13, 2019