



**ENTECH**  
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**SUBSURFACE SOIL INVESTIGATION  
WATER STORAGE TANK AND  
TREATMENT FACILITY  
SADDLEHORN RANCH SUBDIVISION  
EL PASO COUNTY, COLORADO**

Prepared for:

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Colorado Springs, Colorado 80903

Attn: Mr. Bill Guman

February 26, 2021

Respectfully Submitted,

ENTECH ENGINEERING, INC.

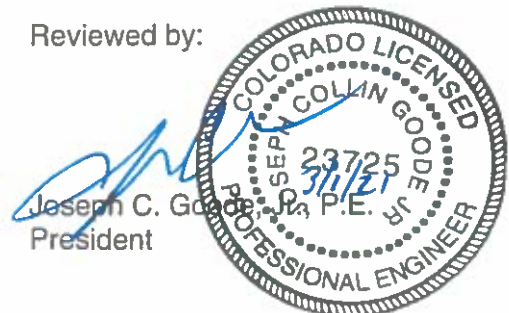
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Geologist

LLL

Encl.

Entech Job No. 210181  
AAprojects/2021/210181ssi

Reviewed by:



Joseph C. Goode, Jr.  
President

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**SUBSURFACE SOIL INVESTIGATION  
WATER STORAGE TANK AND  
TREATMENT FACILITY  
SADDLEHORN RANCH SUBDIVISION  
EL PASO COUNTY, COLORADO**

**1.0 INTRODUCTION**

William Guman and Associates, Ltd. are planning the construction of a water storage tank and water treatment facility for the proposed Saddlehorn Ranch Subdivision. A 42.5-foot round tank approximately 28-feet high, and a water treatment facility are proposed. The site is located east of Falcon, Colorado south and east of Judge Orr Road and Curtis Road in the eastern portion of El Paso County. The water wells are currently located on Tract A to the northeast of the proposed tank and treatment facility. The location of the project is shown on the Vicinity Map, Figure 1. The proposed site plan and the test boring locations are shown on the Test Boring Location Plan, Figure 2.

This report describes the subsurface soil conditions encountered in the test borings conducted on the site and provides recommendations for foundation design and construction. The Subsurface Soil Investigation included the drilling of two test borings within the proposed tank and treatment facility footprints, collecting samples of soil, and conducting a geotechnical evaluation of the investigation findings. All drilling and subsurface investigation activities were performed by Entech Engineering, Inc. (Entech). The contents of this report, including the geotechnical evaluation and recommendations, are subject to the limitations and assumptions presented in Section 6.0.

## **2.0 PROJECT AND SITE DESCRIPTION**

The project will consist the construction of a water storage tank and water treatment facility for the proposed Saddlehorn Ranch Subdivision. A 42.5-foot round tank approximately 28-feet high, a water treatment facility, and associated site improvements. The site is currently undeveloped with vegetation consisting of grasses and weeds. Past land use has consisted of agricultural grazing. The water wells are currently located on Tract A to the northeast of the proposed tank and treatment facility, and the area around the water wells has previously been regraded. Topography of the site is gradually sloping to the east. The site is bordered by agricultural grazing land to the east and south, and rural residential properties to the west.

## **3.0 SUBSURFACE EXPLORATIONS AND LABORATORY TESTING**

Subsurface conditions within the footprints of the proposed water tank and treatment facility were explored by drilling two test borings. Test Boring No. 1 was drilled at the water tank location, and Test Boring No. 2 was drilled at the treatment facility location. The test borings were drilled at the approximate locations shown on the Test Boring Location Plan, Figure 2. The borings were drilled to depths of 20 and 40 feet below the existing ground surface (bgs). The drilling was performed using a truck-mounted, continuous flight auger-drilling rig supplied and operated by Entech. Boring logs descriptive of the subsurface conditions encountered during drilling are presented in Appendix A. At the conclusion of drilling, observations for groundwater levels were made in the open boreholes.

Soil samples were obtained from the borings utilizing the Standard Penetration Test (ASTM D-1586) using 2-inch O.D. split-barrel and California samplers. Results of the Standard Penetration Test (SPT) are included on the boring logs in terms of N-values expressed in blows per foot (bpf). Soil samples recovered from the borings were visually classified and recorded on the boring logs. The soil classifications were later verified utilizing laboratory testing and grouped by soil type. The soil type numbers are included on the boring logs. It should be understood that the soil descriptions shown on the boring logs may vary between boring location and sample depth. It should also be noted that the lines of stratigraphic separation shown on the boring logs represent

approximate boundaries between soil types and the actual stratigraphic transitions may be more gradual and vary with location.

Moisture content testing (ASTM D-2216) was performed on the samples recovered from the borings, and the results are shown on the boring logs. Grain-Size Analysis Testing (ASTM D-422) was performed on selected samples to assist in classifying the materials encountered in the borings. Volume change testing was performed on selected samples using the Swell/Consolidation Test (ASTM D-4318) in order to evaluate potential expansion/compression characteristics of the soil. The Laboratory Testing Results are summarized on Table 1 and are presented in Appendix B.

#### **4.0 SUBSURFACE CONDITIONS**

Two soil types and one bedrock type were encountered in the test borings drilled for the subsurface investigation: Type 1: slightly silty to silty sand (SM-SW, SM), and Type 2: sandy siltstone (ML). Bedrock was encountered in Test Boring No. 1 at 30 feet bgs. 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.

##### **4.1 Soil and Bedrock**

Soil Type 1 classified as sand, slightly silty to silty sand (SM-SW, SM). The sand was encountered in both of the test borings at the existing surface extending to depths ranging from 20 to 30 feet bgs. Standard Penetration Testing resulted in SPT N-values of 14 to 50 bpf, indicating medium dense to dense states. Water content and grain size testing resulted in approximately 1 to 8 percent water content with approximately 8 to 19 percent of the soil size particles passing the No. 200 sieve.

Soil Type 2 classified as sandy siltstone (ML). The siltstone was encountered in Test Boring No. 1 at 30 feet and extended to the termination of the test boring (40 feet). Standard Penetration Testing resulted in SPT N-values of greater than 50 bpf, indicating hard consistencies. Water content and grain size testing resulted in approximately 15 to 16 percent water content with

approximately 85 percent of the soil size particles passing the No. 200 sieve. Swell/Consolidation Testing resulted in volume change of 0.0 percent, indicating low swell potentials.

#### **4.2 Groundwater**

Groundwater was not encountered in the test borings during or subsequent to drilling. It is anticipated groundwater will not affect construction of the water tank foundation depending on the final grading plans, however deeper excavations for utilities and potentially deep foundation members may encounter groundwater. Development of this and adjacent properties, as well as seasonal precipitation changes, and changes in runoff may affect groundwater elevations.

### **5.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS**

*The following discussion is based on the subsurface conditions encountered in two borings drilled for the planned water storage tank and treatment facility for the proposed Saddlehorn Ranch Subdivision. If subsurface conditions different from those described herein are encountered during construction of the structure or if the project elements change from those described, Entech Engineering, Inc. should be notified so that the evaluation and recommendations presented can be reviewed and revised if necessary.*

Subsurface soil conditions encountered in the test borings drilled within the proposed tank and treatment facility footprints consisted of slightly silty to silty sand with underlying sandy siltstone. The siltstone was encountered in Test Boring No. 1 at a depth of 30 feet bgs. SPT N-values measured in upper soil profiles indicated medium dense to dense states. The siltstone was encountered at hard states. The in-situ upper sands are considered moderate bearing soils and will provide adequate support for the proposed treatment facility. If higher bearing capabilities are required for the tank it is recommended the water tank foundation be overexcavated 3 feet and replaced with Class 6 Aggregate Basecourse to be compacted according to the "Structural Fill" paragraph. The overexcavation subgrade should be moisture-conditioned and recompacted prior to placement of the aggregate basecourse. A shallow foundation system in conjunction with overexcavation will provide a uniform bearing pad for the water tank. Foundation components for the treatment facility are suitable to bear on the medium dense native sands. Shallow foundations for the tank are anticipated to be concrete ring/footing configurations. Design considerations are discussed in the following sections.

### **5.1 Footing Subgrade Improvement and Bearing Capacity:**

The sand soils were encountered at medium dense to dense states. The upper soils exhibit a low potential for consolidation and expansion. The native soils are suitable to support the treatment building and water tank, if the lower bearing capacity is suitable. At the tank location, the subgrade soils should be removed and recompacted to provide a uniform pad. The recompaction should be 2 feet below footing depth and 3 feet beyond the foundation perimeter. Due to anticipated loads of the water tank, to achieve higher bearing capacities, the soils can be overexcavated to a depth of 3 feet below the foundation subgrade and replaced with 3 feet of compacted Class 6 Aggregate Basecourse (ABC) as defined by the Colorado Department of Transportation (CDOT). Alternative aggregate sources should be approved prior to hauling to this site. The overexcavation width should extend a minimum of 3 feet beyond the footing perimeter to assist in distributing footing stresses. The subgrade of the overexcavated area should be scarified, moisture conditioned and compacted, to at least 95 percent of the soils maximum dry density as determined by the Modified Proctor Test ASTM D-1557. The ABC placed in the overexcavation should be compacted to at least 95 percent of its maximum Modified Proctor Dry Density (ASTM D-1557).

Provided the soils encountered in the footing excavations are consistent with the in-place conditions observed in the borings and the above mitigation recommended is implemented, a maximum allowable bearing capacity of 3,500 pounds per square foot (psf) is recommended for the tank foundation design. Fill placed in the overexcavation should consist of ABC, free of organic materials, debris and stone sizes greater than 3 inches in diameter. If the overexcavation/base course is not used at the tank site, an allowable bearing capacity of 2600 psf can be used for recompacted site soils. Foundation components for the treatment facility are suitable to bear on the medium dense native sands; a maximum allowable bearing capacity of 2,400 psf is recommended. Fill placed below footings should be compacted to at least 95 percent of the soils' ASTM D-1557 maximum dry density and be placed in horizontal lifts not exceeding 6 inches in thickness after compaction. Frequent density tests should be performed at 12-inch intervals and at the final proposed footing subgrade elevation. Exterior footings should be embedded a minimum of 30 inches below the adjacent exterior site grade in order to provide frost protection.

Following the above foundation construction recommendations and adhering to the recommended maximum allowable soil bearing capacity is expected to result in a foundation

design which should limit total and differential settlements to 1 inch and ½ inch, or less, respectively. Given the site soil conditions as described herein, coupled with the use of ABC beneath the foundation footings, the bulk of the foundation settlement is expected to occur during the building construction period, upon initial filling of the tank, or shortly thereafter. Based on the use of ABC, a vertical modulus of subgrade reaction of 200 pounds per inch can be used.

To further support the foundation design, it is recommended that an Entech Engineer observe the foundation excavation and evaluate if the exposed native and filled subgrade(s) are consistent with those described in this report. Overexcavation recommendations should be finalized when the excavation observations are performed. The Entech Engineer should also provide recommendations for foundation drainage should conditions warrant.

## **5.2 Tank Floor-On-Grade-Slab**

The floor of the water storage tank reportedly is expected to consist of a reinforced concrete slab-on-grade. To carry the expected heavy loads for a water storage tank, it is recommended that the sand soils be overexcavated to provide a uniform bearing pad as discussed above. The subgrade of the overexcavated zone should be scarified, moisture conditioned and compacted to at least 95 percent of the soils' maximum dry density as determined by the Modified Proctor Test ASTM D-1557 and within  $\pm 2\%$  of the optimum moisture content as determined by the proctor test. The overexcavation beneath the tank slab should be replaced with a minimum of 6 feet of ABC as defined by CDOT. The ABC should be compacted to 95% of its' ASTM D -1557 maximum dry density and within  $\pm 2\%$  of its' optimum moisture content as determined by the proctor test.

## **5.3 Seismic Site Classification**

Based on the subsurface conditions encountered at the site and in accordance with Section 1613 of the 2015 International Building Code (IBC), the site meets the conditions of a Site Class D.

## **5.4 Surface and Subsurface Drainage**

Positive surface drainage is recommended around the standpipe to minimize infiltration of surface water into the supporting foundation soils. A minimum ground surface slope of 5 percent in the first 10 feet adjacent to exterior foundation walls is recommended for unpaved areas. For paved areas and other impervious surfaces, a minimum slope of 2 percent is adequate. All tank overflow



pipng should be extended to discharge well beyond the tank's foundation backfill zone or be connected to a storm sewer system.

A perimeter foundation drain will not be required for the water tank.

### **5.5 Concrete Degradation Due to Sulfate Attack**

Type II cement is recommended for concrete at this site. To further avoid concrete degradation during construction it is recommended that concrete not be placed on frozen or wet ground. Care should be taken to prevent the accumulation or ponding of water in the foundation excavation prior to the placement of concrete. If standing water is present in the foundation excavation, it should be removed by ditching to sumps and pumping the water away from the foundation area prior to concrete placement. If concrete is placed during periods of cold temperatures, the concrete must be kept from freezing. This may require covering the concrete with insulated blankets and adding heat to prohibit freezing.

### **5.6 Foundation Excavation Observation**

Subgrade preparation for tank foundation should be observed by Entech prior to construction in order to verify that (1) no anomalies are present, (2) materials of the proper bearing capacity have been encountered or placed, and (3) no soft spots, expansive or organic soil, or debris are present in the foundation area prior to concrete placement or backfilling. Entech should make any additional recommendations for over-excavation during scheduled site visits.

### **5.7 Structural Fill**

The structural fill for the water tank shall consist of Class 6 Aggregate Basecourse (ABC) as defined by the Colorado Department of Transportation (CDOT). The basecourse should be approved by Entech, and compacted to a minimum of 95 percent of the soils maximum dry density as determined by the Modified Proctor Test (ASTM D-1557), usually within  $\pm 2$  percent of the optimum water content. Fill material should be placed in horizontal lifts such that each finished lift has a compacted thickness of six inches or less. Fill should be placed at water contents conducive to achieving adequate compaction. The overexcavation subgrade should be scarified a minimum of 12 inches, and be compacted to a minimum of 95 percent compaction, at  $\pm 2$  percent

optimum moisture content, utilizing a Modified Proctor Dry Density ASTM D-1557. No water flooding techniques of any type should be used for compaction or placement of foundation or floor slab fill material. Entech should approve any imported fill to be used within the foundation area prior to delivery to the site.

### **5.8 Utility Trench Backfill**

Fill placed in utility trenches should be compacted according to local specifications. Fill should be placed in horizontal lifts having a compacted thickness of six inches or less and at a water content conducive to adequate compaction, within  $\pm 2$  percent of optimum water content. Mechanical methods should be used for fill placement; however, heavy equipment should be kept at a distance from foundation walls. No water flooding techniques of any type should be used for compaction or placement of utility trench fill.

Trench backfill placement should be performed in accordance with the Town of Sheridan Lake and Kiowa County specifications. All excavation and excavation shoring/bracing should be performed in accordance with OSHA guidelines. Groundwater may be encountered in the excavations.

### **5.9 General Backfill**

Any areas to receive fill outside the foundation limits should have all topsoil, organic material, and debris removed. Fill must be properly benched into existing slopes in order to be adequately compacted. The fill receiving surface should be scarified to a depth of 12-inches and moisture conditioned to  $\pm 2$  percent of the optimum water content, and compacted to a minimum of 95 percent of Standard Proctor, ASTM D-698 (for cohesive soils) and Modified Proctor ASTM D-1557 (for cohesionless soils) maximum Dry Density before the addition of new fill. Fill should be placed in thin lifts not to exceed 6 inches in thickness after compaction while maintaining at least 95 percent of Standard Proctor, ASTM D-698 (for cohesive soils) and Modified Proctor, ASTM D-1557 (for cohesionless soils) maximum Dry Density. Fill material should be free of vegetation and other unsuitable material and shall not contain rocks or fragments greater than 3-inches. Topsoil and strippings should be segregated from all other fill sources on the site. Fill placement and compaction beneath and around foundations, in utility trenches, beneath roadways or other structural features of the project should be observed and tested by Entech during construction.

### **5.10 Excavation Stability**

Excavation sidewalls must be properly sloped, benched and/or otherwise supported in order to maintain stable conditions. All excavation openings and work completed therein shall conform to OSHA Standards as put forward in CFR 29, Part 1926.650-652, (Subpart P).

### **5.11 Winter Construction**

In the event construction of the planned facility occurs during winter, foundations and subgrades should be protected from freezing conditions. Concrete should not be placed on frozen soil and once concrete has been placed, it should not be allowed to freeze. Similarly, once exposed, the foundation subgrade should not be allowed to freeze. During site grading and subgrade preparation, care should be taken to avoid burial of snow, ice or frozen material within the planned construction area.

### **5.12 Construction Observations**

It is recommended that Entech observe and document the following activities during construction of the building foundations.

- Excavated subgrades and subgrade preparation.
- Placement of foundation perimeter drains (if installed).
- Placement/compaction of fill material for the foundation components and floor slab.
- Placement/compaction of utility bedding and trench backfill.

## **6.0 CLOSURE**

The subsurface Investigation, geotechnical evaluation and recommendations presented in this report are intended for use by William Guman and Associates, Ltd., with application to the planned water tank land treatment facility at the proposed Saddlehorn Ranch Subdivision in eastern El Paso County, Colorado, southeast of Judge Orr Road and Curtis Road. Based on the results of this investigation, the site is suitable for the proposed development, if the improvements are implemented as discussed in the report. In conducting the subsurface investigation, laboratory testing, engineering evaluation and reporting, Entech Engineering, Inc. endeavored to work in accordance with generally accepted professional geotechnical and geologic practices and principles consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession currently practicing in same locality and under similar conditions. No other warranty, expressed or implied is made. During final development design and prior to construction, additional investigation is recommended after site grading to provide final recommendations for the building site.

If there are any questions regarding the information provided herein or if Entech Engineering, Inc. can be of further assistance, please do not hesitate to contact us.

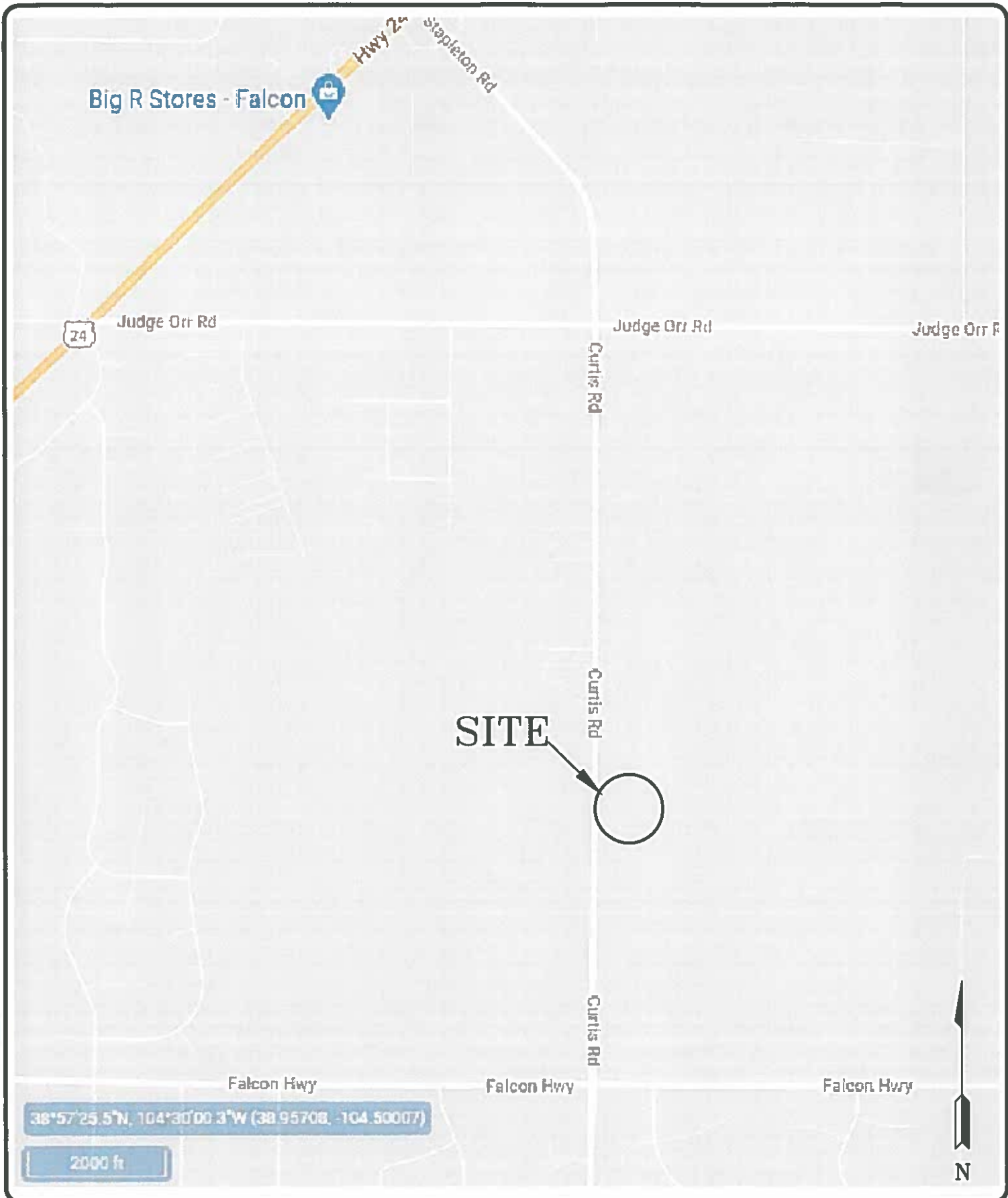
## TABLE

**TABLE 1**  
**SUMMARY OF LABORATORY TEST RESULTS**

CLIENT WILLIAM GUMAN  
 PROJECT CURTIS ROAD  
 JOB NO. 210181

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			7.9						SM-SW	SAND, SLIGHTLY SILTY
1	1	20			19.0						SM	SAND, SILTY
1	2	5			19.2						SM	SAND, SILTY
2	1	35	16.8	112.2	81.1					0.0	ML	SILTSTONE, SANDY

## FIGURES



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**VICINITY MAP**  
**SADDLEHORN RANCH SUBDIVISION**  
**WATER TANK AND TREATMENT FACILITY**  
**EL PASO COUNTY, COLORADO**  
**FOR: WILLIAM GUMAN AND ASSOCIATES, LTD.**

DRAWN:  
**LLL**

DATE:  
**2/12/21**

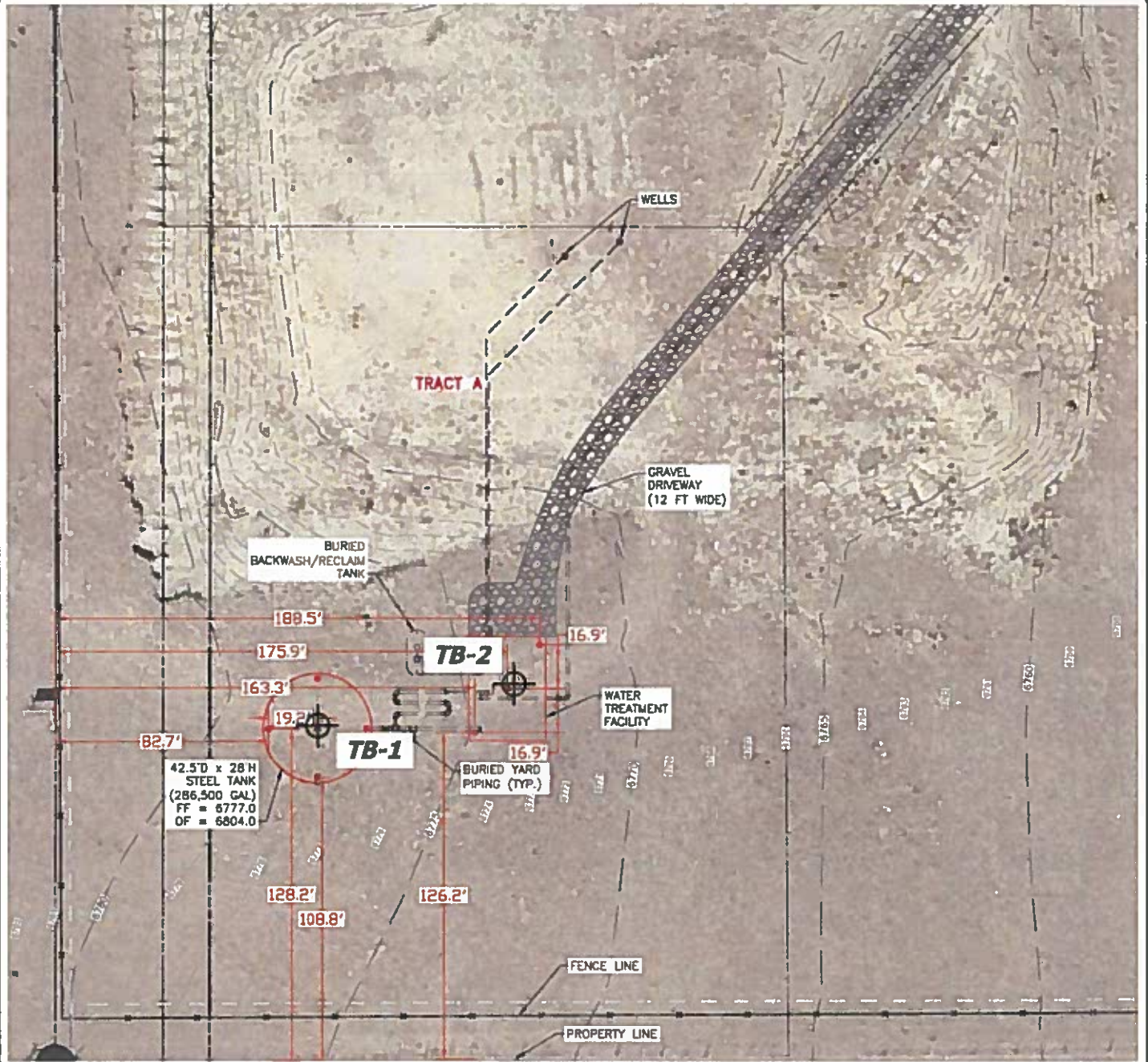
CHECKED:

DATE:

JOB NO.:  
**210181**

FIG NO.:  
**1**





TB- APPROXIMATE TEST BORING LOCATION AND NUMBER



N



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SITE PLAN/TEST BORING LOCATION MAP  
SADDLEHORN RANCH SUBDIVISION  
WATER TANK AND TREATMENT FACILITY  
EL PASO COUNTY, COLORADO  
FOR: WILLIAM GUMAN AND ASSOCIATES, LTD.

DRAWN:  
LLL

DATE:  
2/12/21

CHECKED:

DATE:

JOB NO.:  
210181

FIG NO.:  
2

## **APPENDIX A: Test Boring Logs**

TEST BORING NO. 1  
 DATE DRILLED 2/5/2021  
 Job # 210181

TEST BORING NO. 2  
 DATE DRILLED 2/5/2021  
 CLIENT WILLIAM GUMAN  
 LOCATION CURTIS ROAD

REMARKS

DRY TO 38', 2/17/21  
 SAND, SLIGHTLY SILTY TO SILTY,  
 FINE TO COARSE GRAINED,  
 TAN, MEDIUM DENSE TO VERY  
 DENSE, DRY TO MOIST

SILTSTONE, SANDY, BLUE GRAY,  
 HARD, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			20	1.2	1
			38	6.2	1
10			44	5.7	1
15			35	4.6	1
20			50	7.4	1
25			43	4.7	1
30			38	5.3	1
35			50	15.9	2
			10"		
40			50	15.2	2
			5"		

REMARKS

DRY TO 19.5', 2/17/21  
 SAND, SLIGHTLY SILTY TO SILTY,  
 FINE TO COARSE GRAINED,  
 TAN, MEDIUM DENSE TO DENSE,  
 MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			14	5.6	1
			23	6.2	1
10			36	3.3	1
15			34	7.7	1
20			35	5.7	1



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TEST BORING LOG

DRAWN:

DATE:

CHECKED:

DATE:

LLL

2/12/21

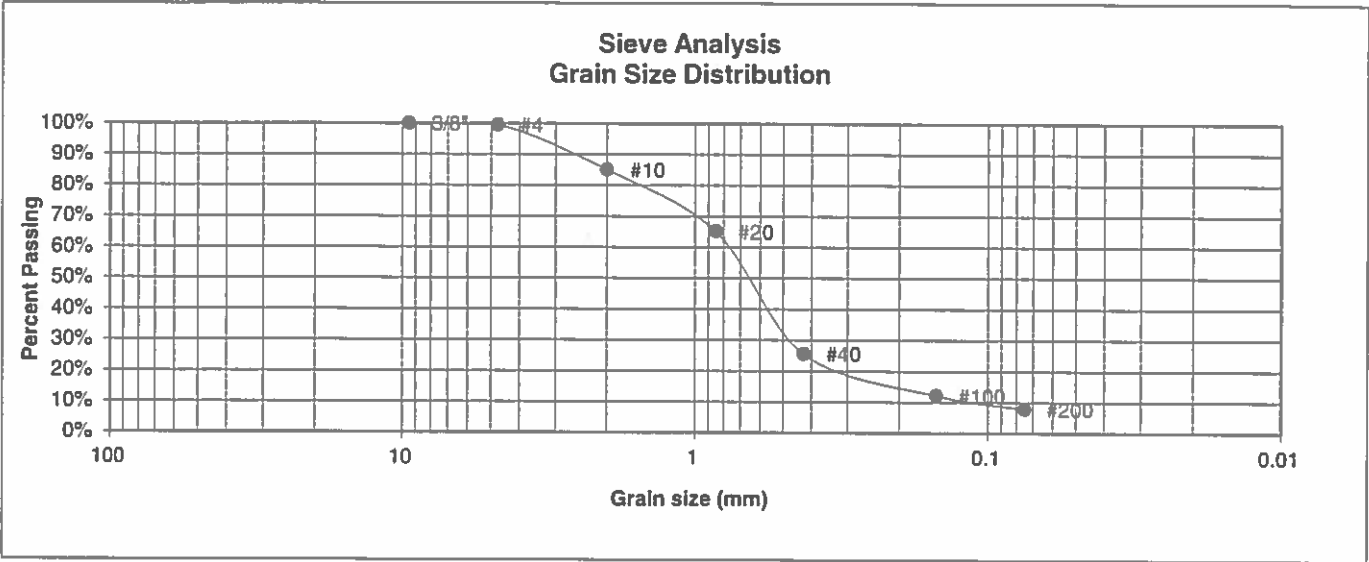
JOB NO:  
210181

FIG NO.:

A-1

## **APPENDIX B: Laboratory Test Results**

BORING NO.	1	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	210181
CLIENT	WILLIAM GUMAN				
PROJECT	CURTIS ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	85.1%
20	65.1%
40	25.6%
100	12.1%
200	7.9%

**Atterberg Limits**  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

**Swell**  
 Moisture at start  
 Moisture at finish  
 Moisture increase  
 Initial dry density (pcf)  
 Swell (psf)



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**LABORATORY TEST  
RESULTS**

DRAWN

DATE

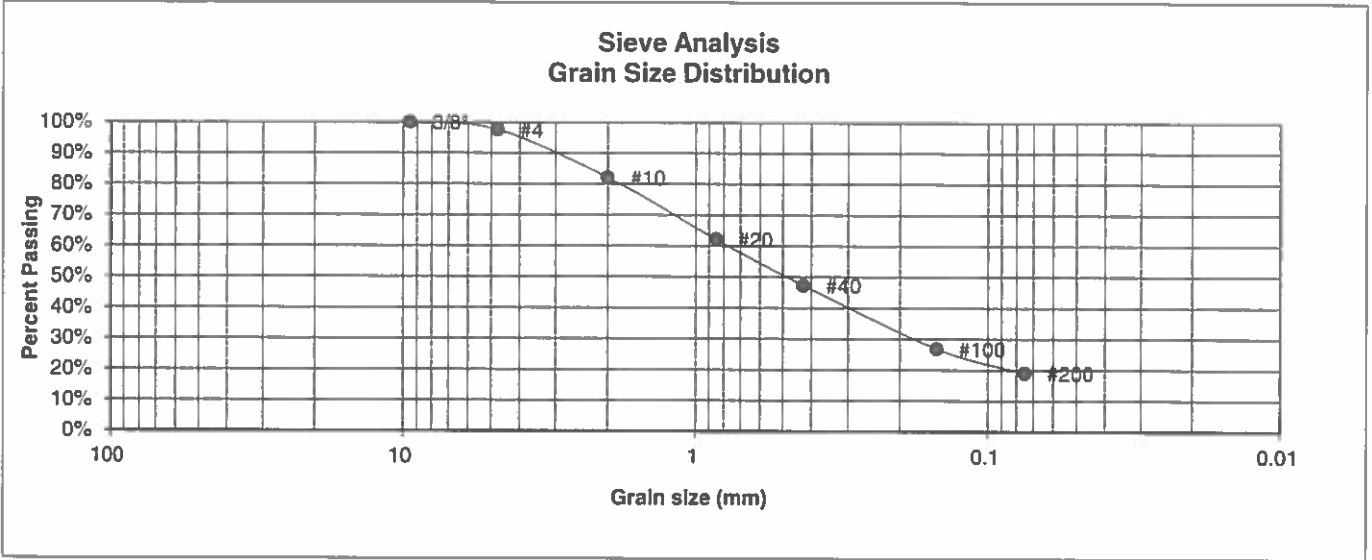
CHECKED:  
LLL

DATE:  
2/12/21

JOB NO.:  
210181

FIG NO.:  
B-1

BORING NO.	1	<u>UNIFIED CLASSIFICATION</u>	SM	<u>TEST BY</u>	BL
DEPTH(ft)	20	<u>AASHTO CLASSIFICATION</u>		<u>JOB NO.</u>	210181
CLIENT	WILLIAM GUMAN				
PROJECT	CURTIS ROAD				



<u>U.S. Sieve #</u>	<u>Percent Finer</u>	<u>Atterberg Limits</u>
3"		Plastic Limit
1 1/2"		Liquid Limit
3/4"		Plastic Index
1/2"		
3/8"	100.0%	
4	97.6%	<u>Swell</u>
10	82.1%	Moisture at start
20	62.1%	Moisture at finish
40	47.3%	Moisture increase
100	26.9%	Initial dry density (pcf)
200	19.0%	Swell (psf)



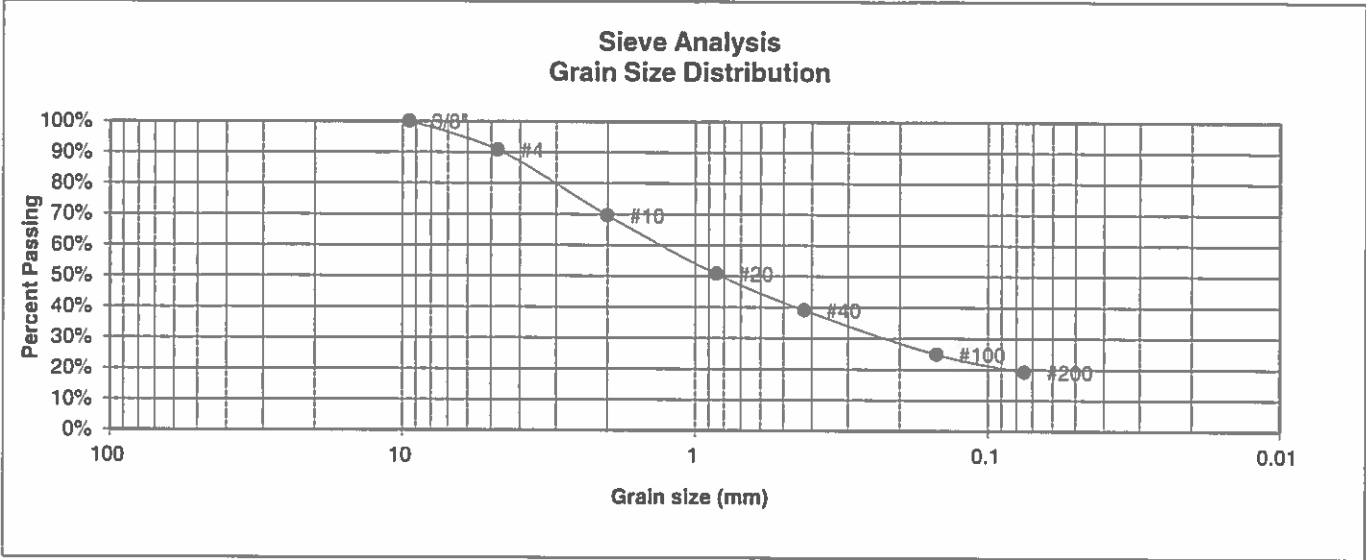
**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: LLL	DATE: 2/12/21
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JOB NO.:  
210181

FIG NO.:  
B-2

BORING NO.	2	<u>UNIFIED CLASSIFICATION</u>	SM	<u>TEST BY</u>	BL
DEPTH(ft)	5	<u>AASHTO CLASSIFICATION</u>		<u>JOB NO.</u>	210181
CLIENT	WILLIAM GUMAN				
PROJECT	CURTIS ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	90.8%
10	69.6%
20	50.8%
40	39.1%
100	24.9%
200	19.2%

Atterberg Limits  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

Swell  
 Moisture at start  
 Moisture at finish  
 Moisture increase  
 Initial dry density (pcf)  
 Swell (psf)



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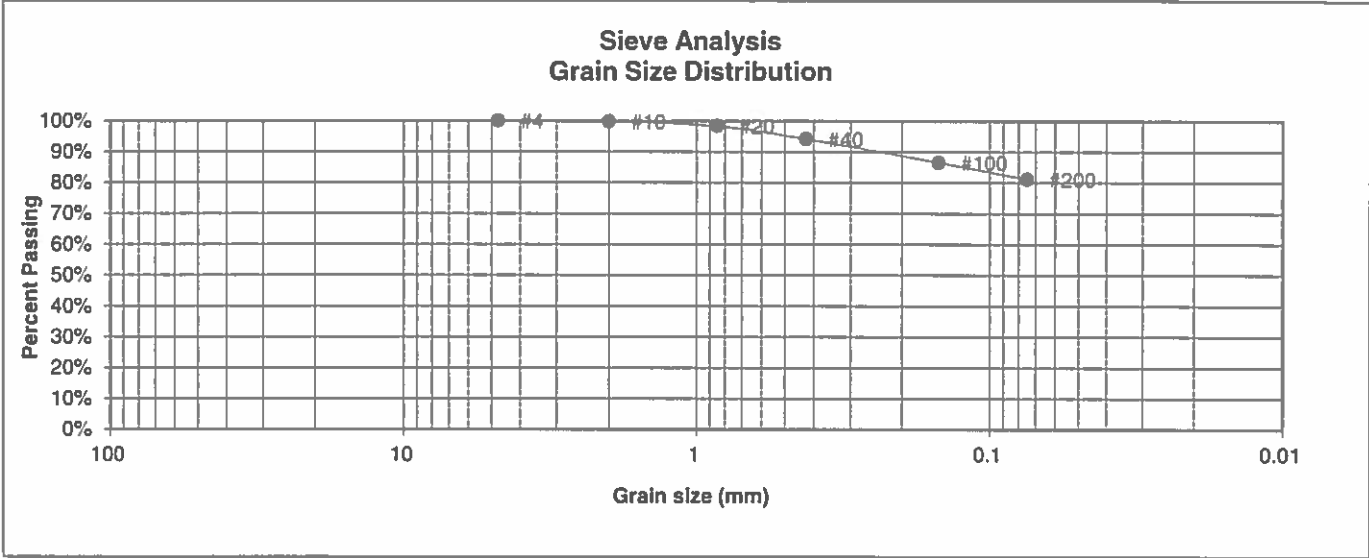
**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: <i>LLL</i>	DATE: <i>2/12/14</i>
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JOB NO.:  
210181

FIG NO.:  
**B-3**

BORING NO.	1	UNIFIED CLASSIFICATION	ML	TEST BY	BL
DEPTH(ft)	35	AASHTO CLASSIFICATION		JOB NO.	210181
CLIENT	WILLIAM GUMAN				
PROJECT	CURTIS ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	98.3%
40	94.1%
100	86.5%
200	81.1%

Atterberg Limits  
 Plastic Limit  
 Liquid Limit  
 Plastic Index

Swell  
 Moisture at start  
 Moisture at finish  
 Moisture increase  
 Initial dry density (pcf)  
 Swell (psf)



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505 ELKTON DRIVE  
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST  
RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	2/12/21

JOB NO.  
210181

FIG NO.  
B-4



**CONSOLIDATION TEST RESULTS**

SAMPLE FROM:	1	DEPTH(ft)	35
DESCRIPTION	SILTSTONE, SANDY		
NATURAL UNIT DRY WEIGHT (PCF)	112		
NATURAL MOISTURE CONTENT	16.8%		
SWELL/CONSOLIDATION (%)	0.0%		

JOB NO. 210181  
 CLIENT WILLIAM GUMAN  
 PROJECT CURTIS ROAD



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**SWELL CONSOLIDATION  
 TEST RESULTS**

DRAWN:	DATE:	CHECKED:	DATE
		LLL	2/12/21

JOB NO:  
210181

FIG NO:  
B-5