



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
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May 3, 2022

Rhetoric, LLC
20 Boulder Crescent
Colorado Springs, CO 80903

Attn: Chaz Collins

Re: Preliminary Subsurface Soils Investigation
Rhetoric Site Marksheffel Road and Vollmer Road
Colorado Springs, Colorado

Dear Mr. Collins:

As requested, personnel of Entech Engineering, Inc. performed a Preliminary Subsurface Soil Investigation at the above referenced site. The site is a vacant parcel to be developed located southwest of the future extension of Marksheffel Road and southeast of Vollmer Road in northeastern Colorado Springs, Colorado. The site is indicated on the Vicinity Map, Figure 1. This letter presents the results of our soils investigation, laboratory tests, and preliminary recommendations for construction.

SITE CONDITIONS:

The site is currently undeveloped and the slope is gradual and generally trending to the south/southeast. Portions of the site have been used as dump sites and vegetation is sparse on areas, and consists of field grasses and weeds, with a few scattered trees and brush towards the southwestern portion of the site. Previous site uses consist of agricultural grazing and a sand quarry with a haul road used by Pioneer Sand bisecting the property.

PROJECT DESCRIPTION:

The project is to consist of developing a 31.2-acre parcel into multi-family residential development, to include 18 three-story buildings, with a clubhouse and pool, a commercial development to include a gas station, a 62,000 square foot retail building, and a restaurant. The project also involves a storage unit complex, parking lots, and associated site improvements.

FIELD INVESTIGATION AND LABORATORY TESTING PROGRAM:

The subsurface conditions on this site were investigated by drilling seven (7) exploratory test borings across the site. The approximate locations of the test borings are indicated on the Test Boring Location Map, Figure 2.

The test borings were advanced with a power-driven continuous flight auger drilling rig to depths of 20 feet below the existing ground surface. Samples were obtained during drilling using the Standard Penetration Test, ASTM D-1586, utilizing a California sampler. Results of the Standard Penetration Tests are shown on the Test Boring Logs. The Test Boring Logs are presented in Appendix A.

Water Content, ASTM D-2216, was obtained in the laboratory for the recovered samples. Grain-Size Analysis, ASTM D-422, and determination of Atterberg Limits, ASTM D-4318, were performed on samples for the purposes of classification. Volume change testing was performed on selected samples using the FHA Swell Test and Swell/Consolidation Test (ASTM D-4546) in

order to evaluate potential expansion/compression characteristics of the soil and bedrock. Sulfate testing was performed to determine the corrosive potential of the soils. Laboratory test results are summarized in Table 1 and presented in Appendix B.

SOIL AND GROUNDWATER CONDITIONS:

Three soil type and one bedrock type were encountered in the test borings drilled for the preliminary subsurface investigation: Type 1: silty to clayey to very clayey sands to clay-sand fill (SM, SC, SC-CL), Type 2: native slightly silty to silty sand (SM-SW, SM) Type 3: native sandy clay (CL), and Type 4: silty to very silty to clayey sandstone bedrock (SM, SC). The soils 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 classified as silty to clayey to very clayey sands to clay-sand fill (SM, SC, SC-CL). The fill was encountered in five of the seven test borings at the ground surface and extending to depths ranging from 4 to 11 feet bgs. Standard Penetration Testing on the fill resulted in N-values ranging from 5 to greater than 50 blows per foot, indicating loose to very dense states. Water content and grain size testing resulted in water contents of 5 to 13 percent, with 39 to 50 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits testing on the fill resulted in liquid limit of 37 percent, with a plastic index of 17 percent. Sulfate testing resulted in 0.00 percent soluble sulfate by weight, indicating negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 classified as native slightly silty to silty sand (SM-SW, SM). The native sand was encountered in four of the test borings at depths ranging from the ground surface to 9 feet bgs and extending to 1 foot or to the termination of the borings (20 feet). Standard Penetration Testing on the sand resulted in N-values of 6 to 43 blows per foot, indicating loose to dense states. Water content and grain size testing resulted in water contents of 3 to 22 percent, with 11 to 19 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in no values. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 3 classified as native sandy clay (CL, CH). The clay was encountered in two test borings; Test Boring No. 4 at a depth of 8 feet bgs extending to the termination of the boring (20 feet bgs) and in Test Boring No. 5 from 4 to 13 feet bgs. Standard Penetration Testing on the clay resulted in N-values of 3 to 15 blows per foot, indicating very soft to firm consistencies. Water content and grain size testing resulted in water contents of 16 to 55 percent moisture content, with 63.5 to 65 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in a liquid limit of 57 and a plastic index of 36 percent. Swell/Consolidation Testing resulted in a volume change of -0.1 percent indicating a low potential for expansion or consolidation. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, which indicates a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 4 classified as a silty to very silty to clayey sandstone bedrock (SM, SC). The sandstone was encountered in five of the test borings at depths of 1 to 17 feet below ground surface at extended to the termination of the borings (20 feet). Standard Penetration Testing on the sandstone resulted in blow counts of 29 to greater than 50 bpf, indicating dense to very

dense states. Water content and grain size testing resulted in water contents of 8 to 19 percent with 50 percent of soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in no values. The sandstone is anticipated to exhibit a low expansion potential. Sulfate testing resulted in negligible potential for concrete degradation due to sulfate attack.

Additional soil descriptions are presented on the enclosed drill logs. (Appendix A). A Summary of Laboratory Test Results is presented in Table 1. Laboratory test results are included in Appendix B. The soils were classified using the results of the laboratory testing, the Unified Soil Classification System (USCS), and visual classification. The soil types are expected to vary across the site. Also, stratification lines shown on the logs represent the approximate boundary between soil types and the actual transition are expected to be gradual and vary with location.

Groundwater was encountered in Test Boring Nos. 3, 4, 5, and 6 at depths of 12.5 to 19.5 feet bgs. This indicates that groundwater will have little effect on shallow foundations proposed for the site depending on final grades and depth of excavations. Groundwater conditions may vary due to variations in rainfall, drainage and other factors not readily apparent at this time. Development of the property, adjacent properties and associated changes in runoff can affect the groundwater surface elevations.

PRELIMINARY DEVELOPMENT CONSIDERATIONS AND RECOMMENDATIONS:

Grading plans were not available at the time of this investigation. The soils in the test borings generally consisted of silty to clayey sand fill overlying native sand and clay with underlying sandstone bedrock. Bedrock was encountered in four of the test borings at depths ranging from 1 to 17 feet. Sandstone was encountered in Test Boring No. 3 at 1 foot. In general, the majority of the site soils are unsuitable to support shallow foundations in their in-situ condition. The fill encountered is considered to be uncontrolled and should be fully penetrated and reworked and recompacted. The foundations should rest entirely on similar bearing soils, either entirely on undisturbed sandstone, reworked and recompacted on-site granular sands, or structural fill.

The soft clay, uncontrolled fill, and shallow bedrock may pose challenges and will require mitigation, which may include overexcavation and replacement with non-expansive soils or drilled pier foundations. Additionally, loose or soft soils, if encountered beneath foundations, will require overexcavation and recompaction or replacement and potential stabilization. The estimated extent of removal/recompaction or overexcavation should be evaluated after additional drilling is completed, when grading plans are available. The final extent of removal/recompaction or overexcavation should be determined at the time of excavation observations.

Shallow foundations bearing on structural fill, reworked on-site granular soils, native medium dense sand soils, or undisturbed sandstone are anticipated for this site. Exterior footings should extend a minimum of 30 inches below the adjacent exterior site grade for frost protection. Drilled piers are a suitable alternative to overexcavation.

Groundwater is not expected to be encountered in shallow foundation excavations depending on final grades and depths of excavations. However, groundwater conditions may vary. Excavation of the clay and sand soils will be moderate with rubber-tired equipment, the hard sandstone bedrock where encountered will likely require track-mounted equipment.

ON-GRADE FLOOR SLABS:

If standard spread footing foundations are used, any grade supported floor slabs should be separated from other structural components and utility penetrations to allow for possible future vertical movement unless designed as part of the foundation. Uncontrolled fills, and expansive clays at or near slabs grade will require overexcavation. Control joints in grade-supported slabs are recommended at 10 to 15-foot perpendicular spacings to control cracking. We anticipate perimeter drains are not necessary for slab-on-grade construction provided the slabs are positioned above finished exterior site grade, irrigation is minimized and foundation wall backfill is properly placed.

On-grade floor slabs should not be considered unless slab movement can be tolerated. If slab movement cannot be tolerated, then structural floors should be considered.

PRELIMINARY CONCRETE RECOMMENDATIONS:

Sulfate solubility testing was conducted on select samples recovered from the test borings to evaluate the potential for sulfate attack on concrete placed below surface grade. The test results indicated 0.00 to 0.01 percent soluble sulfate (by weight). These test results indicate that the sulfate component of the in-place soils present a negligible exposure threat to concrete placed below the site grade. Type II cement is recommended for the soils which pose a negligible to moderate threat, which will include imported structural fill materials.

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.

SITE GRADING:

Any areas to receive fill should have all topsoil, organic material or debris removed. Mitigation of the existing uncontrolled fill will be required prior to placing new fill. Fill must be properly benched and compacted to minimize potentially unstable conditions in slope areas. Completed slopes should be 3:1 or flatter if constructed without reinforcing. Flatter slopes may be required depending upon specific conditions. The ground surface should be scarified, and moisture conditioned to within ± 2 percent of optimum moisture content and compacted to a minimum of 95 percent of its maximum Standard Proctor Dry Density, ASTM D-698, prior to placing new fill.

New fill should be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 for granular soils and 95 percent of its maximum Standard Proctor Dry Density, ASTM D-698 for cohesive soils. These materials should be placed at a moisture content conducive to compaction, usually ± 2 percent of Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech during construction. Entech should approve any import materials prior to hauling them to the site.

Rhetoric, LLC
Preliminary Subsurface Soils Investigation
Rhetoric Site Marksheffel Road and Vollmer Road
Colorado Springs, Colorado

ADDITIONAL SUBSURFACE SOIL INVESTIGATIONS:

Additional subsurface soil investigations are recommended when building locations and grading plans are determined. The individual open foundation excavations should also be observed prior to construction of the foundation in order to verify that no anomalies are present, that materials at the proper design bearing capacity have been encountered, no unsuitable fill soils are present, and that no soft or loose spots or debris are present in the foundation area. Final drainage recommendations should also be determined at the time of the excavation observations.

CLOSURE:


The Preliminary Subsurface Investigation, geotechnical evaluation and recommendations presented in this report are intended for use by Rhetoric, LLC for the subject site. The borings were located to provide preliminary recommendations, variations in site subsurface conditions not indicated on the borings should be anticipated. Preliminary grading plans with respect to the soils encountered can be evaluated once plans become available. Additional subsurface investigation and testing is recommended to further evaluate the site after development plans are prepared.

In conducting the preliminary 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.

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.

Respectfully Submitted,

ENTECH ENGINEERING, INC.


Stuart Wood
Geologist

Reviewed by:


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



SW/el

Entech Job No. 220402
AAProjects/2022/220402 pssi

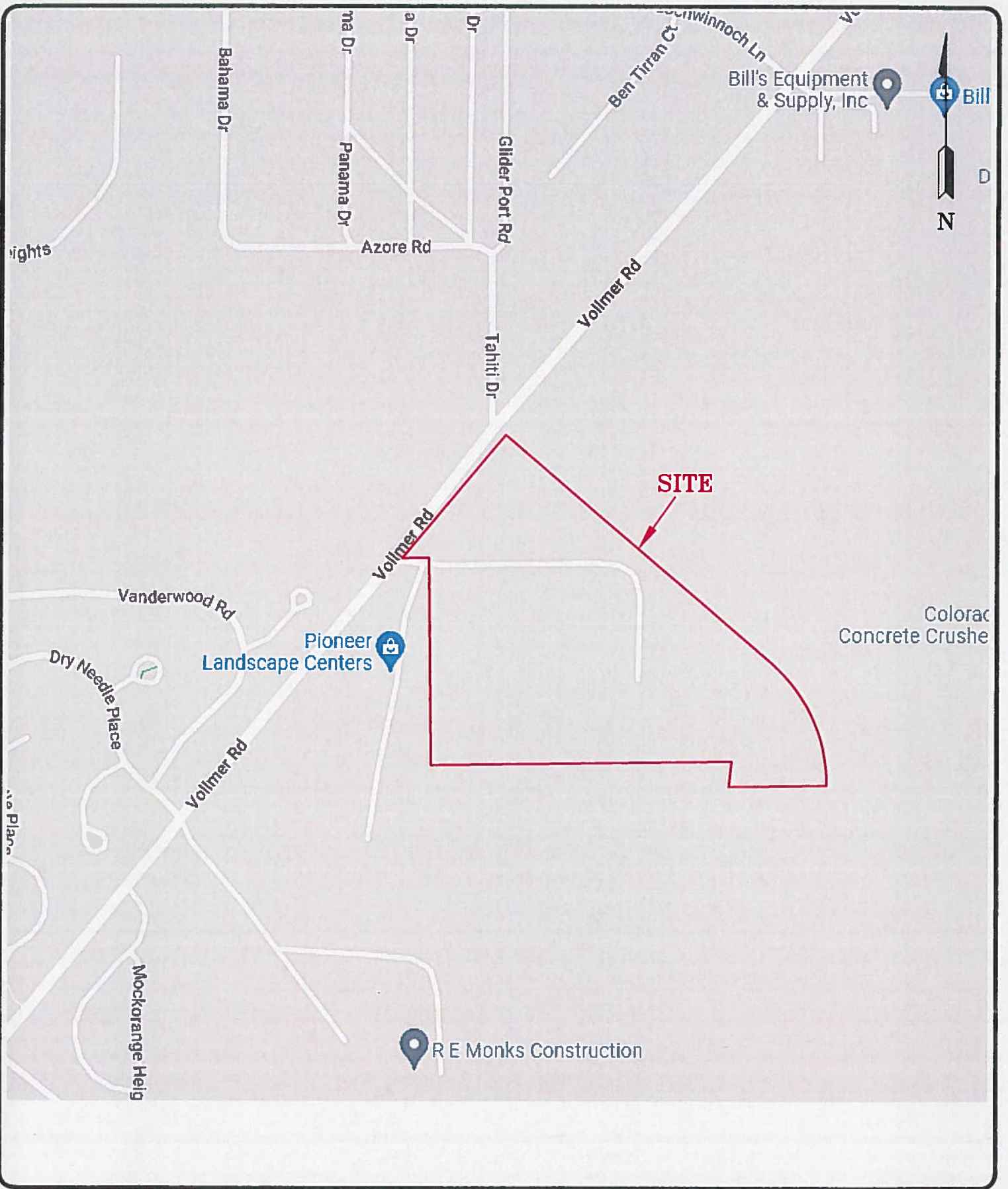
TABLE

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

CLIENT: RHETORIC
 PROJECT: MARKSHEFFEL & VOLLMER
 JOB NO.: 220402

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			39.4	37	17	0.00			SC	FILL, SAND, VERY CLAYEY
1	7	5			50.4						CL-SC	FILL, CLAY-SAND
2	2	10			19.1	NV	NP	<0.01			SM	SAND, SILTY
2	6	2-3			11.3						SM-SW	SAND, SLIGHTLY SILTY
3	4	10			63.5	57	36	<0.01			CH	CLAY, SANDY
3	5	5	42.4	77.6	65.1					-0.1	CL	CLAY, SANDY
4	3	15			49.7	NV	NP	0.01			SM	SANDSTONE, VERY SILTY
4	3	10							20		SM	SANDSTONE, SILTY

FIGURES




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VICINITY MAP
MARSHEFFEL RD. & VOLLMER RD.
COLORADO SPRINGS, CO
FOR: RHETORIC, LLC.

DRAWN: JAC	DATE: 3/23/22	CHECKED: DPS	DATE: 3-24-22
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JOB NO.:
220402

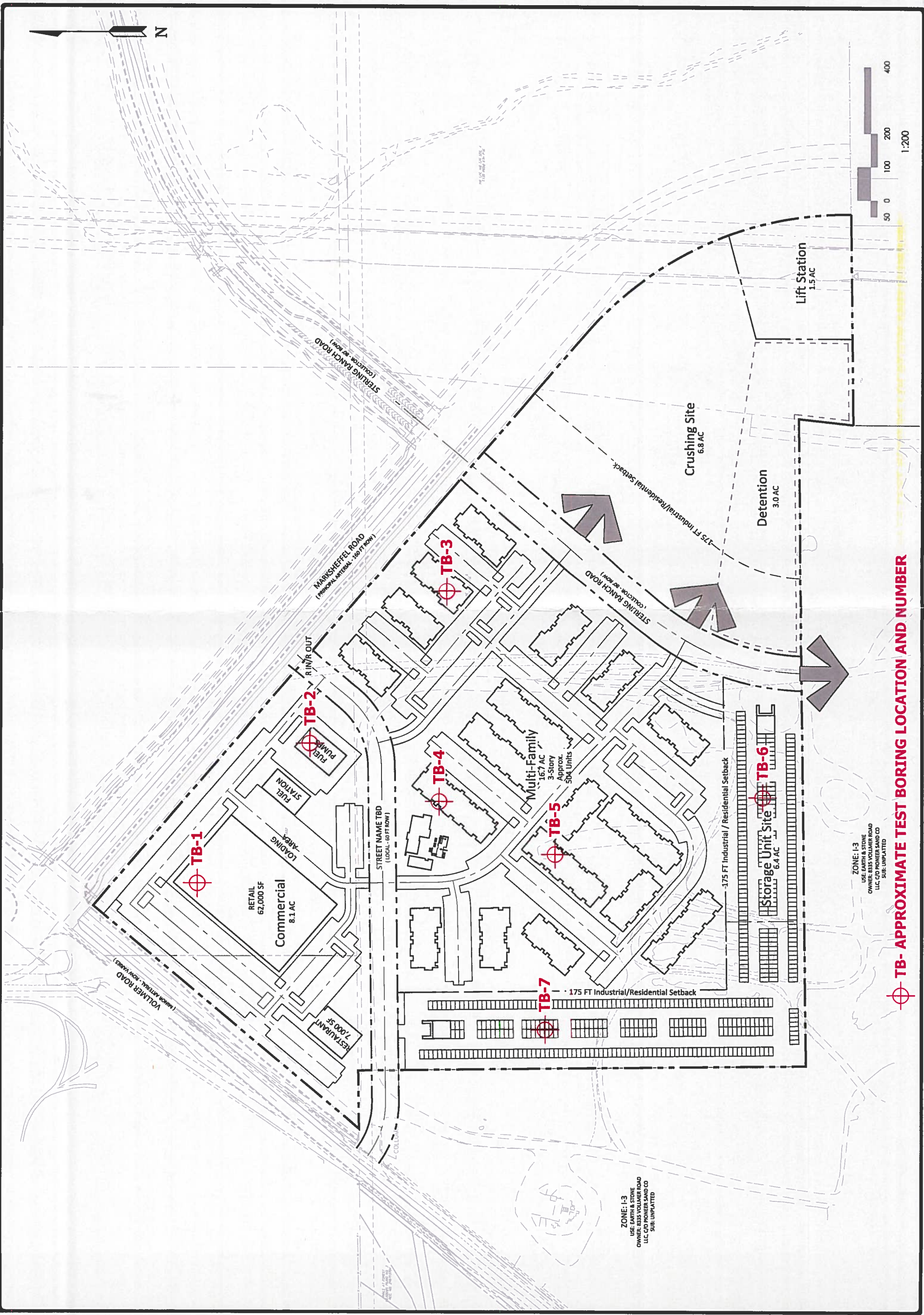
FIG NO.:
1

REVISION BY	

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 (719) 531-5599

TEST BORING LOCATION MAP
 MARSHOFFEL RD. & VOLLMER RD.
 FOR: RHEFORIC, LLC.

DATE	8/23/22
SCALE	1"=200'
BY	JM
CHECKED	MS
DATE	22/04/02
PROJECT NO.	18000000
SHEET NO.	2



ZONE: I-3
 USE: EARTH & STONE
 OWNER: BESS VOLLMER ROAD
 LLC, C/O PIONEER SAND CO
 SUB: UNPLATTED

ZONE: I-3
 USE: EARTH & STONE
 OWNER: BESS VOLLMER ROAD
 LLC, C/O PIONEER SAND CO
 SUB: UNPLATTED

⊕ TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

APPENDIX A: Test Boring Logs

TEST BORING NO. 1
 DATE DRILLED 3/2/2022
 Job # 220402

TEST BORING NO. 2
 DATE DRILLED 3/2/2022
 CLIENT RHETORIC
 LOCATION MARKSHEFFEL & VOLLMER

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 19', 3/4/22							DRY TO 19.5', 3/4/22						
FILL 0-11', SAND, VERY CLAYEY WITH GRAVEL, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST	0-11'	(Symbol)		50 11"	5.9	1	FILL 0-9', SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST	0-9'	(Symbol)		17	5.0	1
FILL, SAND, CLAYEY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST	5-11'	(Symbol)		16	10.8	1	DARK BROWN, TRACE ORGANICS	5-9'	(Symbol)		22	10.2	1
	10-11'	(Symbol)		20	13.2	1	SAND, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, DENSE, MOIST	10-11'	(Symbol)		43	7.4	2
SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST	15-19'	(Symbol)		50 10"	8.1	4	SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST	15-19.5'	(Symbol)		50	8.6	4
	20-19'	(Symbol)		50 6"	10.1	4		20-19.5'	(Symbol)		50 6"	10.3	4



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TEST BORING LOG

DRAWN:

DATE:

CHECKED: *SW*

DATE: *3-14-22*

JOB NO.:
 220402

FIG NO.:
 A- 1

TEST BORING NO. 3
 DATE DRILLED 3/2/2022
 Job # 220402

TEST BORING NO. 4
 DATE DRILLED 3/2/2022
 CLIENT RHETORIC
 LOCATION MARKSHEFFEL & VOLLMER

REMARKS

WATER @ 13', 3/4/22

SAND, SILTY, TAN
 SANDSTONE, VERY SILTY, FINE
 TO COARSE GRAINED, TAN TO
 GRAY BROWN, DENSE TO VERY
 DENSE, MOIST

TO CLAYEY



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
2					2
4			46	9.1	4
5			45	10.0	4
10			50 10"	10.7	4
15			50 9"	19.4	4
20			50 8"	16.5	4

REMARKS

WATER @ 19.5', 3/4/22

FILL 0-8'. SAND, SILTY, FINE TO
 COARSE GRAINED, RED BROWN,
 LOOSE, MOIST

CLAY, SANDY WITH SEAMS OF
 FINE TO COARSE GRAINED SAND,
 GRAY BROWN, SOFT TO STIFF,
 WET



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
2					
6			6	5.9	1
5			5	5.7	1
10			5	26.4	3
15			7	29.1	3
20			15	15.5	3



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TEST BORING LOG

DRAWN:

DATE:

CHECKED: SW

DATE: 3-29-22

JOB NO.: 220402

FIG NO.: A-2

TEST BORING NO. 5
 DATE DRILLED 3/2/2022
 Job # 220402

TEST BORING NO. 6
 DATE DRILLED 3/2/2022
 CLIENT RHETORIC
 LOCATION MARKSHEFFEL & VOLLMER

REMARKS

REMARKS

WATER @ 12.5', 3/4/22

FILL 0-4', SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST

CLAY, SANDY, GRAY BROWN, VERY SOFT TO SOFT, WET

WEATHERED TO FORMATIONAL SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE TO VERY DENSE, MOIST



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
0-4	[Dotted]		20	10.2	1
4-5	[Diagonal lines]		3	43.5	3
5-10	[Dotted]		5	20.6	3
10-15	[Dotted]		29	11.0	4
15-20	[Dotted]		50 9"	8.7	4

WATER @ 14', 3/4/22

SAND, SLIGHTLY SILTY TO SILTY, FINE TO COARSE GRAINED, BROWN TO TAN, MEDIUM DENSE, MOIST

* - BULK SAMPLE TAKEN



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
0-5	[Dotted]		17	3.5	2
5-10	[Dotted]		13	2.9	2
10-15	[Dotted]		23	3.6	2
15-20	[Dotted]		15	11.4	2
20	[Dotted]	*		7.4	2



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TEST BORING LOG

DRAWN:

DATE:

CHECKED: SW

DATE: 3-11-22

JOB NO.:
 220402

FIG NO.:
 A- 3

TEST BORING NO. 7
 DATE DRILLED 3/2/2022
 Job # 220402

TEST BORING NO.
 DATE DRILLED
 CLIENT RHETORIC
 LOCATION MARKSHEFFEL & VOLLMER

REMARKS

REMARKS

DRY TO 20', 3/2/22

FILL 0-7, CLAY-SAND, BROWN,
 FIRM TO STIFF, MOIST

SAND, SILTY, FINE TO COARSE
 GRAINED, TAN, LOOSE TO
 MEDIUM DENSE, MOIST

SANDSTONE, SILTY, FINE TO
 COARSE GRAINED, GRAY
 BROWN, VERY DENSE, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			8	7.9	1	5					
5			22	12.6	1	5					
10			6	5.8	2	10					
15			25	21.9	2	15					
20			50 7"	8.7	4	20					



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TEST BORING LOG

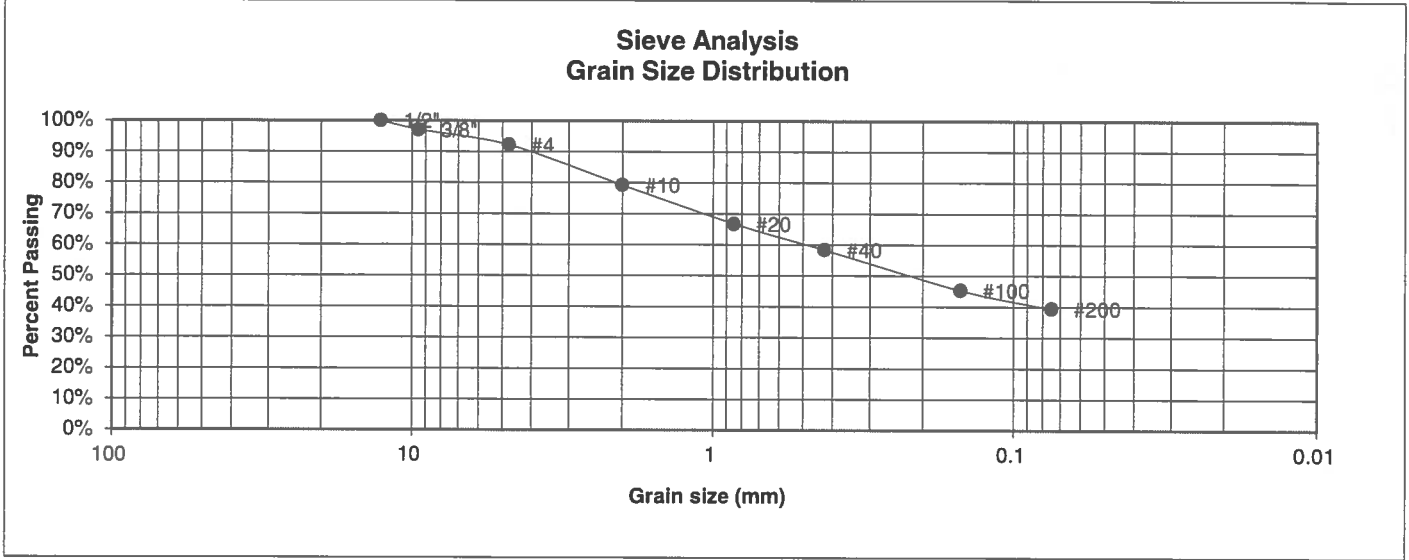
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JOB NO.:
 220402

FIG NO.:
 A- 4

APPENDIX B: Laboratory Testing Results

<u>UNIFIED CLASSIFICATION</u>	SC	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	1	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	2-3	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.0%
4	92.2%
10	79.2%
20	66.7%
40	58.4%
100	45.3%
200	39.4%

Atterberg Limits	
Plastic Limit	20
Liquid Limit	37
Plastic Index	17

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: *SW*

DATE:

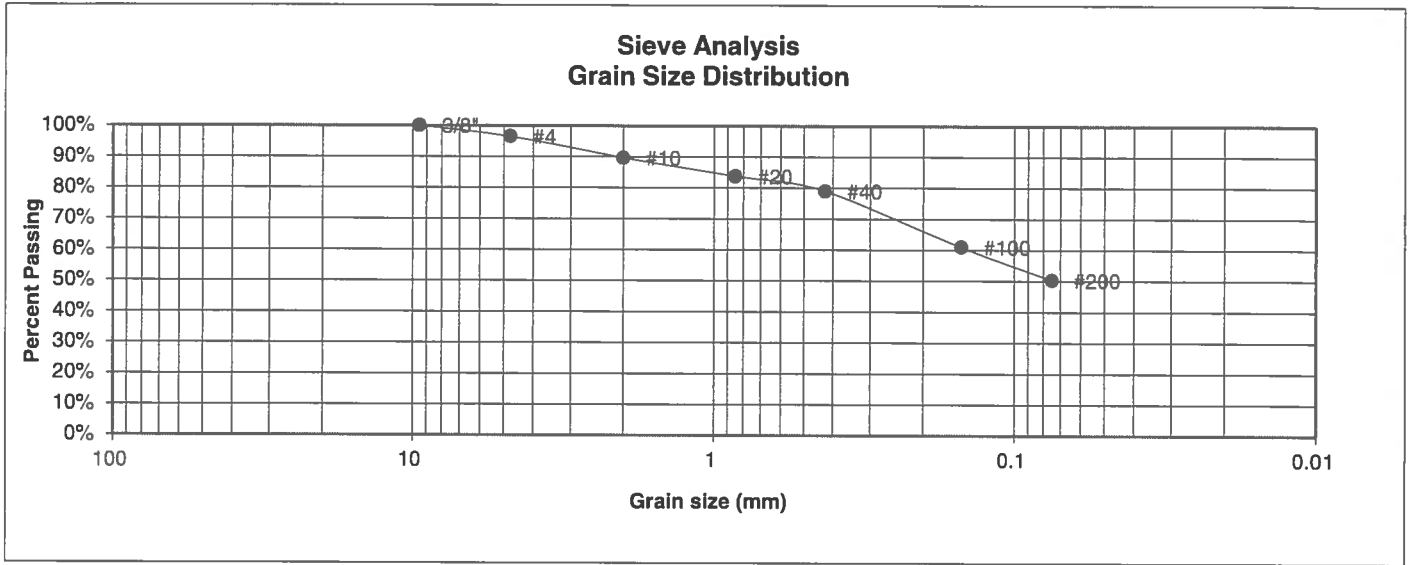
3-14-22

JOB NO.:
220402

FIG NO.:

B-1

<u>UNIFIED CLASSIFICATION</u>	CL-SC	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	7	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	5	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.5%
10	89.6%
20	83.7%
40	79.0%
100	61.0%
200	50.4%

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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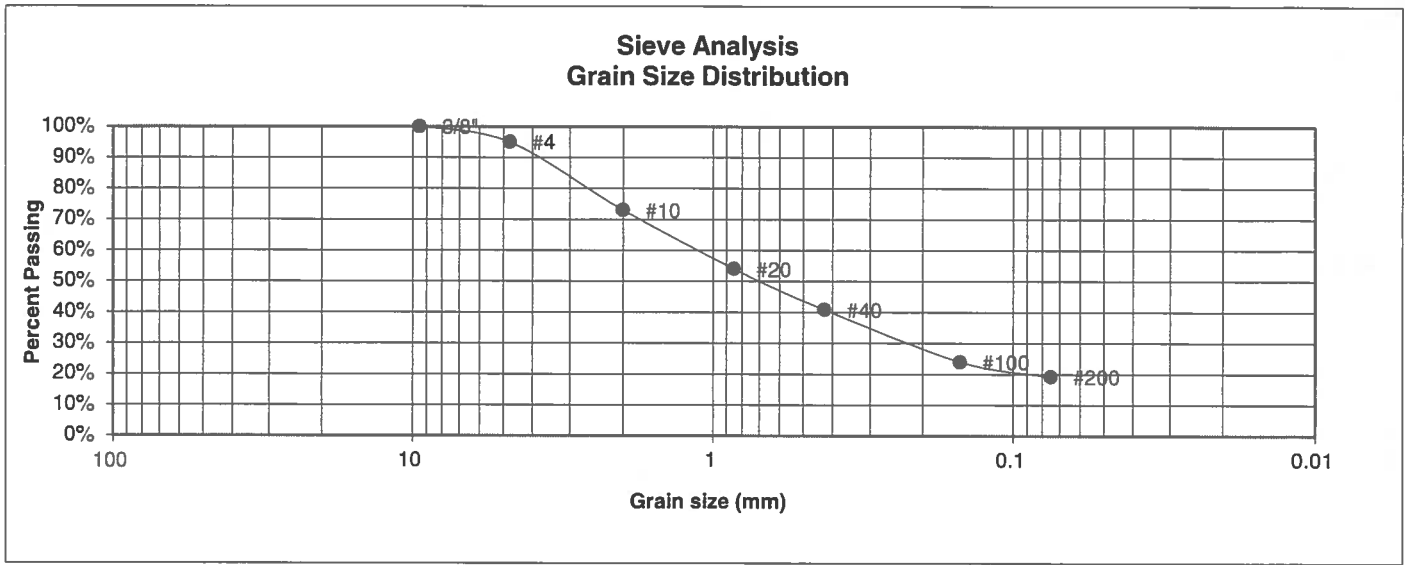
**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED: SW	DATE: 3-14-22
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JOB NO.:
220402

FIG NO.:
B-2

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	2	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	10	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.0%
10	73.0%
20	54.0%
40	40.8%
100	24.0%
200	19.1%

<u>Atterberg Limits</u>	
Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

<u>Swell</u>	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	



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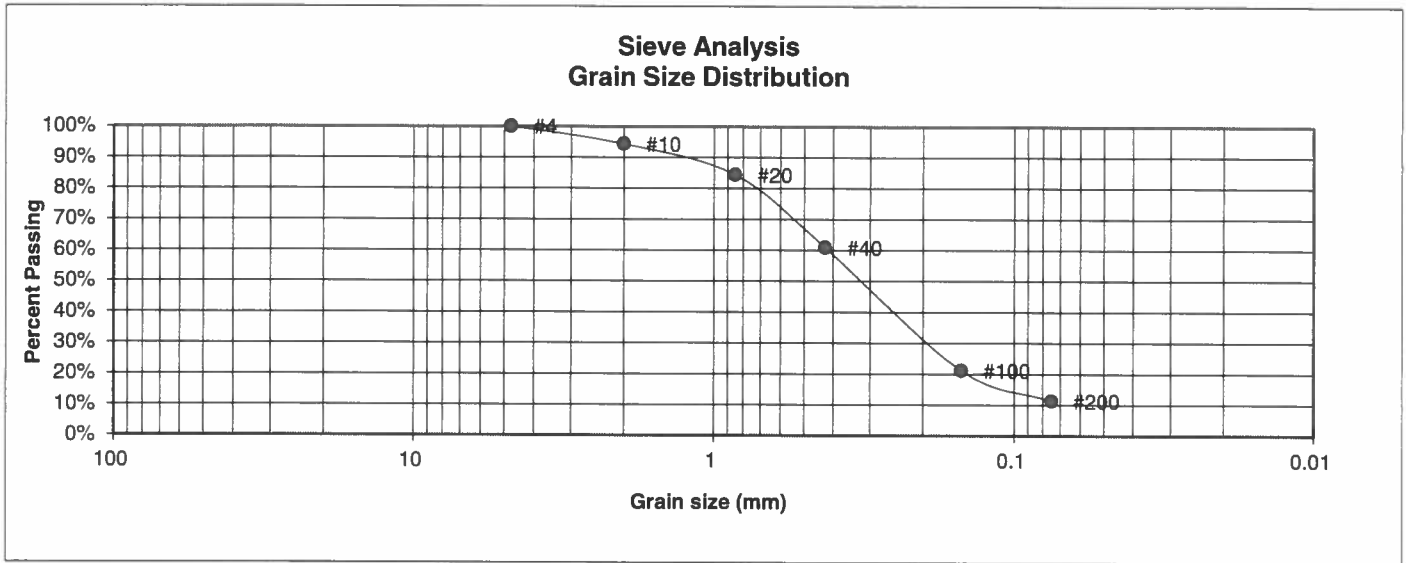
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>3-14-22</i>
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JOB NO.:
220402

FIG NO.:
B-3

<u>UNIFIED CLASSIFICATION</u>	SM-SW	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	6	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	2-3	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	94.4%
20	84.4%
40	60.9%
100	21.2%
200	11.3%

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

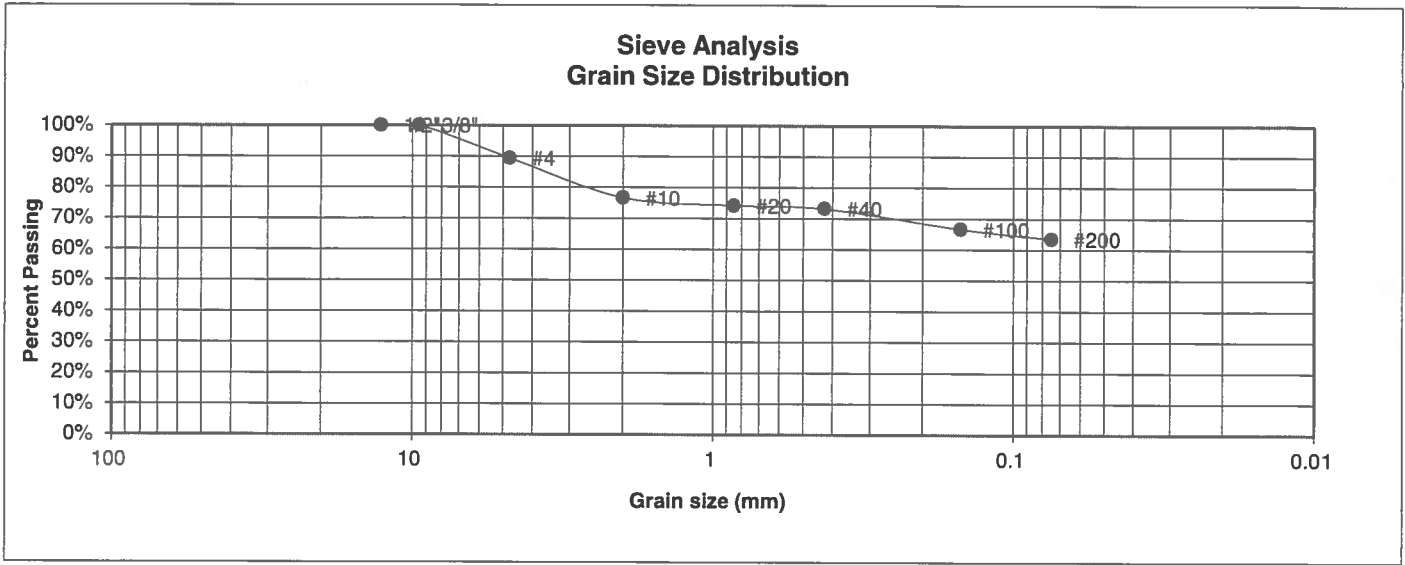
**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> SW	<u>DATE:</u> 3-14-22
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JOB NO.:
220402

FIG NO.:
B-4

<u>UNIFIED CLASSIFICATION</u>	CH	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	4	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	10	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	100.0%
4	89.4%
10	76.6%
20	74.2%
40	73.2%
100	66.7%
200	63.5%

Atterberg Limits	
Plastic Limit	21
Liquid Limit	57
Plastic Index	36

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: *SW*

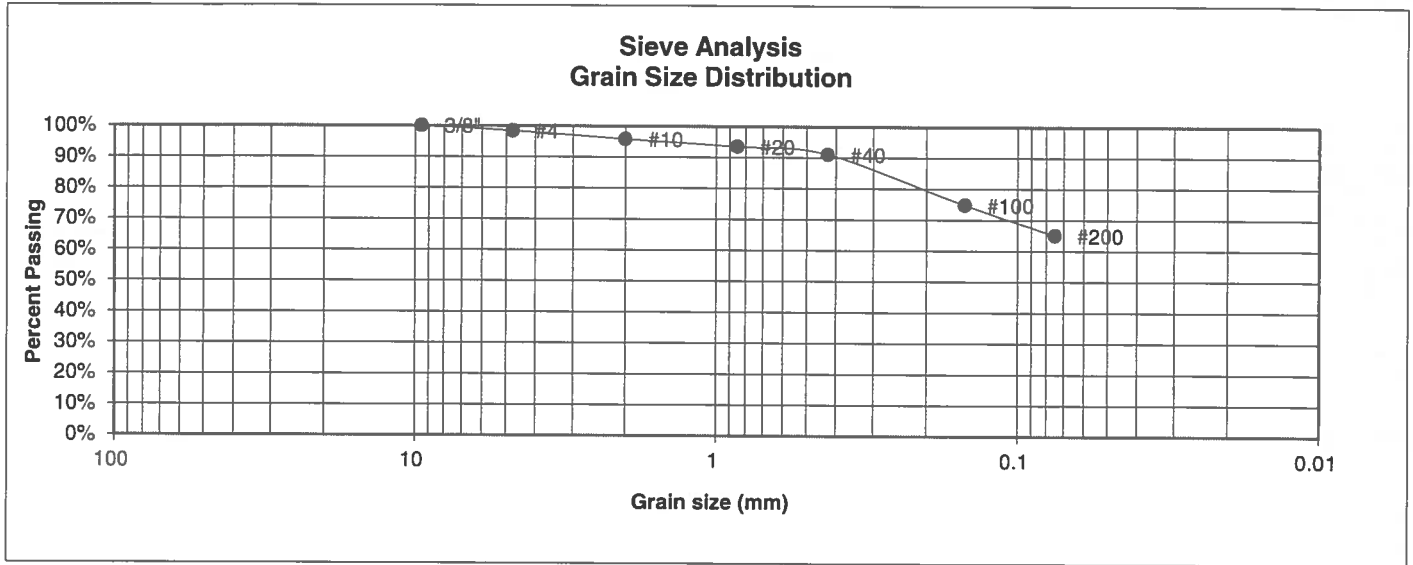
DATE: *3-14-22*

JOB NO.:
220402

FIG NO.:

B-5

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	3	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	5	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	5	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.4%
10	95.8%
20	93.5%
40	91.0%
100	74.8%
200	65.1%

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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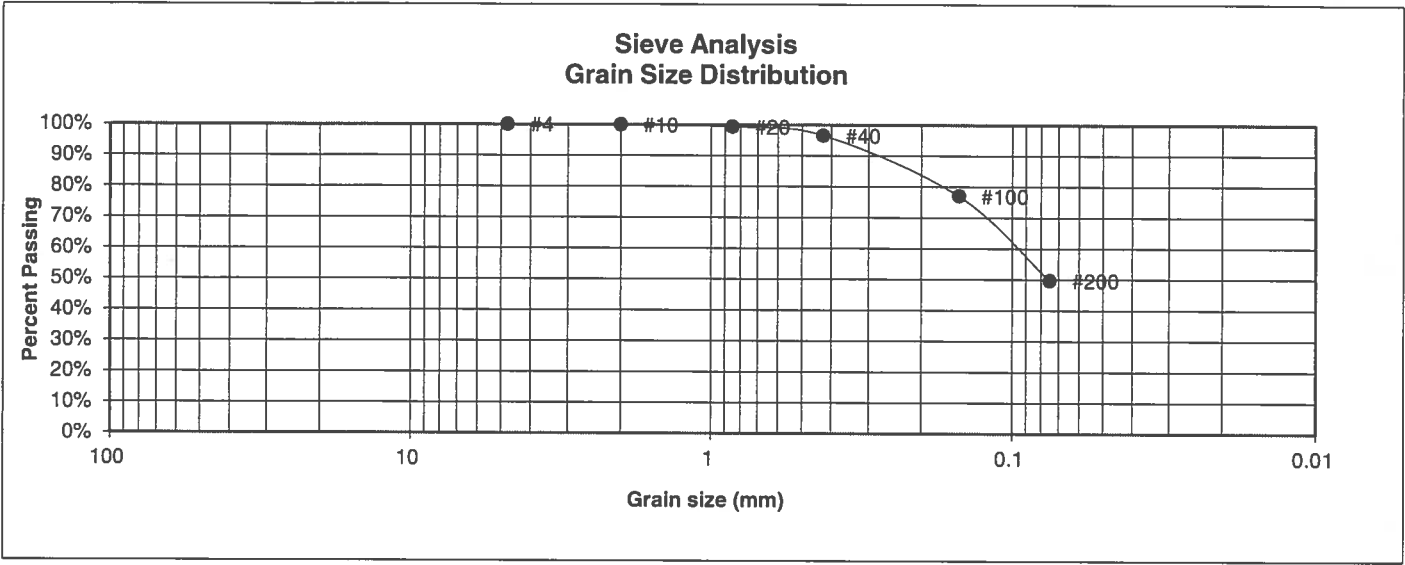
**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>3-14-22</i>
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JOB NO.:
220402

FIG NO.:
B-6

UNIFIED CLASSIFICATION	SM	CLIENT	RHETORIC
SOIL TYPE #	4	PROJECT	MARKSHEFFEL & VOLLMER
TEST BORING #	3	JOB NO.	220402
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.9%
20	99.3%
40	96.5%
100	77.0%
200	49.7%

Atterberg Limits	
Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

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



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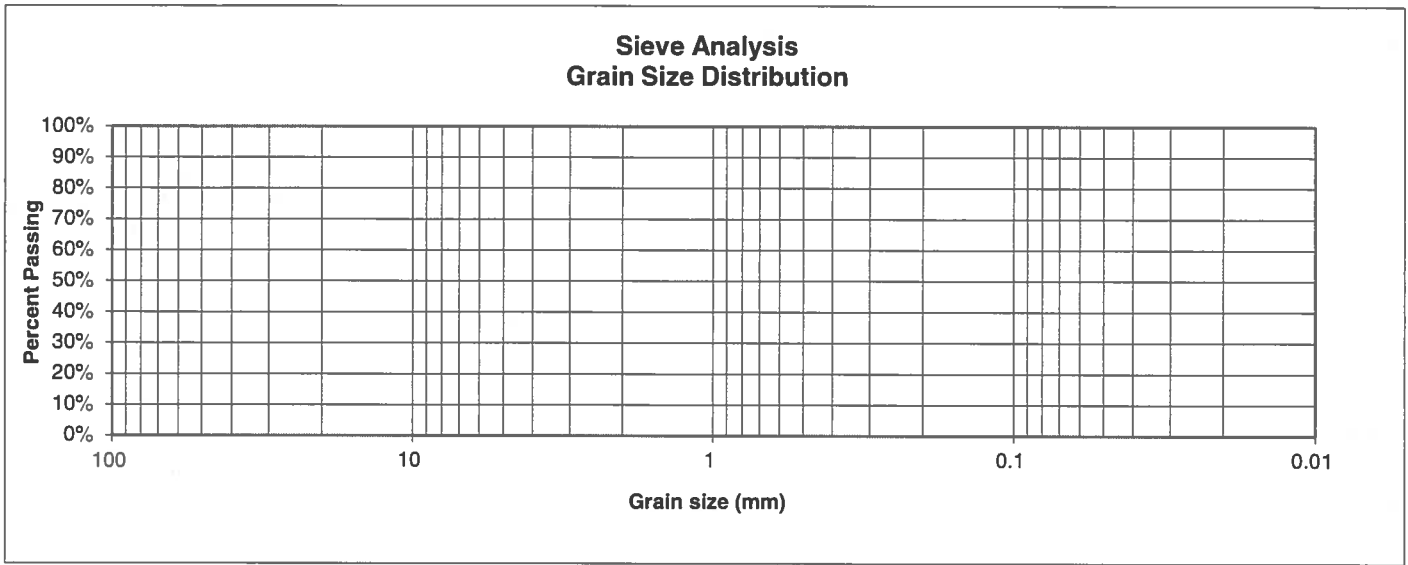
**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>3-14-22</i>
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JOB NO.:
220402

FIG NO.:
B-7

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	RHETORIC
<u>SOIL TYPE #</u>	4	<u>PROJECT</u>	MARKSHEFFEL & VOLLMER
<u>TEST BORING #</u>	3	<u>JOB NO.</u>	220402
<u>DEPTH (FT)</u>	10	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	
200	

Atterberg
Limits
 Plastic Limit
 Liquid Limit
 Plastic Index

<u>Swell</u>	
Moisture at start	13.9%
Moisture at finish	17.4%
Moisture increase	3.5%
Initial dry density (pcf)	103
Swell (psf)	20



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 COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>3-14-22</i>
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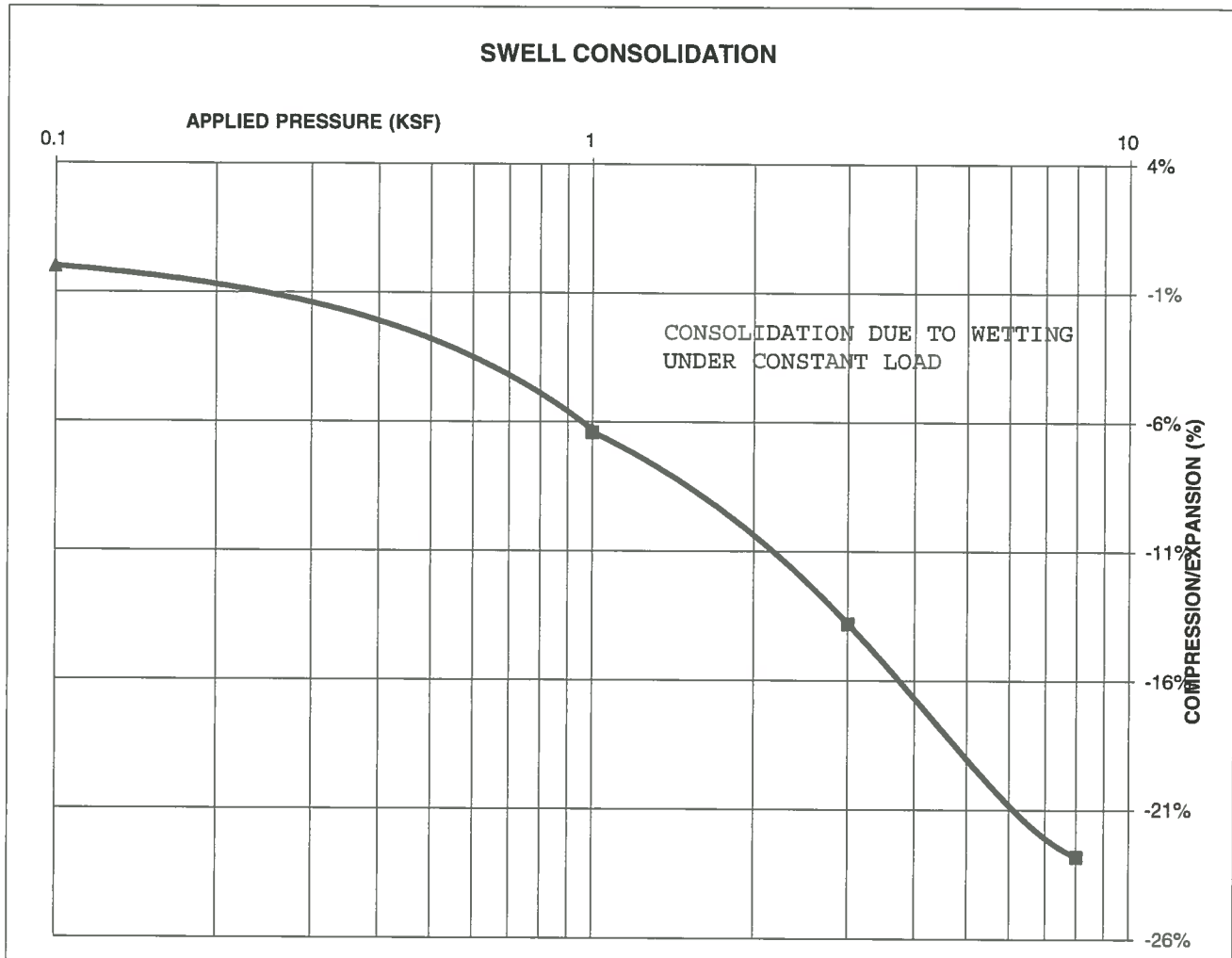
JOB NO.:
220402

FIG NO.:
8-8

CONSOLIDATION TEST RESULTS

TEST BORING #	5	DEPTH(ft)	5
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			78
NATURAL MOISTURE CONTENT			42.4%
SWELL/CONSOLIDATION (%)			-0.1%

JOB NO. 220402
 CLIENT RHETORIC
 PROJECT MARKSHEFFEL & VOLLMER



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**SWELL CONSOLIDATION
 TEST RESULTS**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *3-14-22*

JOB NO.:
220402

FIG NO.:
B-9

