



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
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June 29, 2022

Front Row Properties
1378 Promontory Bluff View
Colorado Springs, CO 80921

Attn: Ron Waldthausen

Re: Preliminary Subsurface Soil Investigation
Southmoor Properties
Fountain, Colorado

Dear Mr. Waldthausen:

As requested, personnel of Entech Engineering, Inc. have drilled twelve test borings to evaluate the site soil conditions for the anticipated development. This letter presents the results of our soils investigation, laboratory testing, and preliminary foundation recommendations.

SITE CONDITIONS:

The site development has not been determined and will likely consist of commercial and/or residential development with associated site improvements. Adjacent properties consist of commercial shopping center to the north and east, and a mix of rural residential and commercial properties to the west. The location of the site is shown in the vicinity map, Figure, 1. The site is gradually sloping to the southeast. At the time of our site investigation stables and out buildings were located in the southern portion of the site, and the remaining portion of the site was undeveloped. Vegetation consists of field grasses and weeds, with scattered trees in portions of the site, and fill piles were observed in the western portion of the site.

FIELD INVESTIGATION AND LABORATORY TESTING PROGRAM:

Subsurface conditions on the site were explored by drilling twelve test borings across the site. The test borings were drilled at the approximate locations shown on the Site Map/Test Boring Location Map, Figure 2. The borings were drilled to approximately 20 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 and in the provided chart. 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 Swell/Consolidation (ASTM D-4546) tests in order to evaluate potential expansion/compression characteristics of the soil. Sulfate testing was performed on selected samples to evaluate potential for below grade concrete degradation due to sulfate attack. The Laboratory Testing Results are summarized on Table 1 and are presented in Appendix B.

SUBSURFACE CONDITIONS:

Three soil and rock types were encountered during drilling. The soils consisted of Type 1: very clayey sand, clean sand, and silty to slightly silty sand (SC, SW, SM, SM-SW), Type 2: sandy silt and sandy clay (ML, CL). The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 classified as very clayey sand, clean sand, and silty to slightly silty sand (SC, SW, SM, SM-SW). The sand was encountered in all test borings from the existing ground surface to depths of 13 to 18 feet bgs, and to the termination of Test Boring Nos. 6, and 8 – 10 (20 feet). Standard Penetration Testing resulted in SPT N-values of 2 to 41 bpf, indicating very loose to dense states. The majority of the sands were encountered at medium dense states. Moisture contents of 1 to 9 percent were measured, indicating dry to moist conditions. Grain size testing resulted in 5 to 49 percent of the soil passing the No. 200 sieve. Atterberg Limits Testing on a sample of the very clayey sand resulted in a liquid limit of 26 and plastic index of 10. Sulfate testing on a sample of very clayey sand resulted in less than 0.1 percent sulfate by weight, indicating a low potential for below grade concrete degradation.

Soil Type 2 is classified as sandy silt and sandy clay (ML, CL). The silt and clay were encountered in five the test borings at depths of 13 to 19 feet bgs, extending to depths ranging from 17 to 19 feet, and the termination of Test Boring Nos. 4, 5, and 12 (20 feet bgs). Standard Penetration Testing resulted in an SPT N-value of 19 to 45 bpf, indicating stiff to very stiff consistencies. Moisture contents of 11 to 22 percent were measured, indicating moist conditions. Grain size testing resulted in 70 to 99 percent of the soil passing the No. 200 sieve. Atterberg Limits Testing resulted in a liquid limit of 49 and a plastic index of 21. Swell/Consolidation Testing resulted in volume changes of 0.7 to 1.7 percent, indicating a low to moderate expansion potential. Sulfate testing on the clay resulted in less than 0.1 percent sulfate by weight, indicating a low potential for below grade concrete degradation.

Soil Type 3 is classified as claystone and shale (CL, ML). The claystone and shale were encountered in four the test borings at depths of 13 to 19 feet bgs, extending to the termination of the test borings (20 feet bgs). Standard Penetration Testing resulted in an SPT N-value of 28 to greater than 50 bpf, indicating stiff to hard consistencies. Moisture contents of 13 to 17 percent were measured, indicating moist conditions. Grain size testing resulted in 88 to 97 percent of the soil passing the No. 200 sieve. Atterberg Limits Testing on the shale resulted in liquid limits of 40 and 44 and plastic indexes of 14 to 16. Swell/Consolidation Testing resulted in a volume change of 0.8 percent, indicating a low expansion potential. Sulfate testing on the shale resulted in 0.00 to 0.02 percent sulfate by weight, indicating a low potential for below grade concrete degradation.

Depth to groundwater was measured in each of the borings at the conclusion and subsequent to drilling. Groundwater was encountered in Test Boring No. 2 at 15.5 feet, groundwater was not

encountered in the remaining test borings were which drilled to depths of 20 feet bgs. It is anticipated groundwater will not affect construction on the site. Development of this site and adjacent properties, as well as seasonal precipitation changes, and changes in runoff may affect groundwater elevations.

GEOTECHNICAL EVALUATION AND RECOMMENDATIONS:

The following discussion is based on the subsurface conditions encountered in the borings drilled for the planned development. If subsurface conditions different from those described herein are encountered during construction 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.

The site is to be developed with commercial and/or residential structures and associated site improvements. Very loose to loose soils were encountered in several of the borings in the upper profile. Fill piles were observed on the site, however, fill was not encountered in the testing borings. If uncontrolled fill is encountered beneath foundations mitigation will be required. Loose soils or uncontrolled fill encountered within the building areas must be completely removed and recompacted. To provide a uniform bearing pad, at a minimum, it is recommended that the loose soils be penetrated or moisture-conditioned, and recompacted below the building(s). Prior to placing the structural fill, the subgrade should be scarified, moisture-conditioned, and compacted. Fill placed in building areas should be compacted according to the "Structural Fill" paragraph. Preliminary design considerations are discussed in the following sections. Additional subsurface soil investigation is recommended once development plans are prepared. The extent of overexcavation/recompaction will be determined at the time of the open excavation observations.

Expansive soils were encountered in the borings, however, are sporadic. Should expansive soils be encountered beneath the foundations, mitigation will be necessary. Mitigation of expansive soils will require overexcavation and replacement with non-expansive soils at 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. Final recommendations should be determined after additional investigation of each building site.

PRELIMINARY FOUNDATION RECOMMENDATIONS:

Shallow spread footing/stemwall foundation systems in conjunction with overexcavation/fill mitigation is anticipated for any structures to be built on this site. An allowable bearing pressure of 2000 pounds per square foot (psf) are anticipated for the site soils. Exterior footings should extend to a minimum of 30 inches for frost protection. Recommendations should be made after additional investigation and completion of the grading plans. Density testing of the reconditioned soil or structural fill placed on this site should be performed by a qualified individual.

Foundation walls retaining soils should be designed to resist lateral pressures generated by the soils. An equivalent hydrostatic fluid pressure (in the active state) of 45 pcf is recommended for the site soils. It should be noted that this value applies to level backfill conditions. Pressures may increase depending on the conditions adjacent to the walls. Surcharge loading if any, should be considered in wall designs. Equivalent fluid pressures for sloping conditions should be determined on an individual basis.

FOUNDATION EXCAVATION OBSERVATION:

The open foundation excavations should be observed by a representative of Entech Engineering, Inc. prior to construction of the foundation in order to verify that no anomalies are present, materials at the proper design bearing capacity have been encountered, and no soft or loose areas or debris are present in the excavation. Loose areas that require removal and or recompaction should be identified during site observations.

CONCRETE:

Type II cement is recommended for all concrete on this site. Concrete should not be placed on frozen or wet ground. Care should be taken to prevent the accumulation and ponding of water in the footing excavation prior to the placement of concrete. If standing water is present in the excavation, it should be removed from the excavation by pumping it away from the building area. Concrete placed during cold temperatures must be kept from freezing, which may require covering the concrete with insulated blankets and heating it.

FLOOR SLABS:

Floor slabs placed on loose soils should be expected to experience movement. The uncontrolled fill must be mitigated below slabs. Floor slabs on grade, if any should be separated from structural portions of the building, unless they are designed as part of the foundation system. Backfill placed below floor slabs should be compacted to a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

SITE SEISMIC 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 E.

SURFACE AND SUBSURFACE DRAINAGE:

Positive surface drainage must be maintained around the structure to minimize infiltration of surface water. A minimum gradient of 5 percent in the first 10 feet adjacent to foundations is recommended. A minimum gradient of 2 percent is recommended for paved areas. All grades should be directed away from the structure. All downspouts should be extended to discharge well beyond the backfill zone of the structure.

A subsurface drain is recommended around portions of the structure which will have useable space located below the finished ground surface. A perimeter drain will not be required for slab on grade construction if the slab is above exterior grade. Typical drain details are included with this letter.

STRUCTURAL FILL:

Areas to receive structural fill should have all topsoil, organic material or debris removed. Fill must be properly benched. Prior to placing new fill, the surface should be scarified and moisture conditioned to within ± 2 percent of its optimum moisture content and compacted to 95 percent of its maximum Modified Proctor Dry Density (ASTM D-1557) or to 95 percent of the soils maximum Standard Proctor Dry Density, ASTM D-698 at or above optimum moisture content. New fill should be placed in lifts not to exceed 6 inches after compaction while maintaining the above noted compaction requirements. Fill should be placed at a moisture

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content conducive to compaction. The placement and compaction of fill should be observed and tested by Entech. Any imported soils should be approved by Entech prior to being hauled to the site. The on-site soils may be used as structural fill pending approval by Entech.

UTILITIES:

Backfill placed in utility trenches should be compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density (ASTM D-1557). Utility backfill should be placed in lifts having a compacted thickness of six inches or less and a moisture content conducive to adequate compaction, usually ± 2 percent of its optimum Proctor moisture content. Mechanical methods should be used in placement of backfill; however, heavy equipment should be kept away from foundation walls. No water flooding techniques of any type should be used in compaction of backfill on the site.

Trench backfilling should be performed in accordance with City of Fountain specifications. Excavating should be performed in accordance with OSHA guidelines.

CLOSING:

The test borings were located to provide preliminary geotechnical information; variations in subsurface conditions may be encountered. In the event that the project scope changes, the conclusions and recommendations in this report should not be considered valid unless the changes are reviewed and the conclusions of this report are verified in writing or, if necessary, modified. Additional investigation will be required on the site as development/grading plans are prepared.

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

Respectfully Submitted,

ENTECH ENGINEERING, INC.



Logan L. Langford, P.G.
Geologist
LLL

Encl.

Entech Job No. 221305
AA projects\2022\221305-pssi



Reviewed by:



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

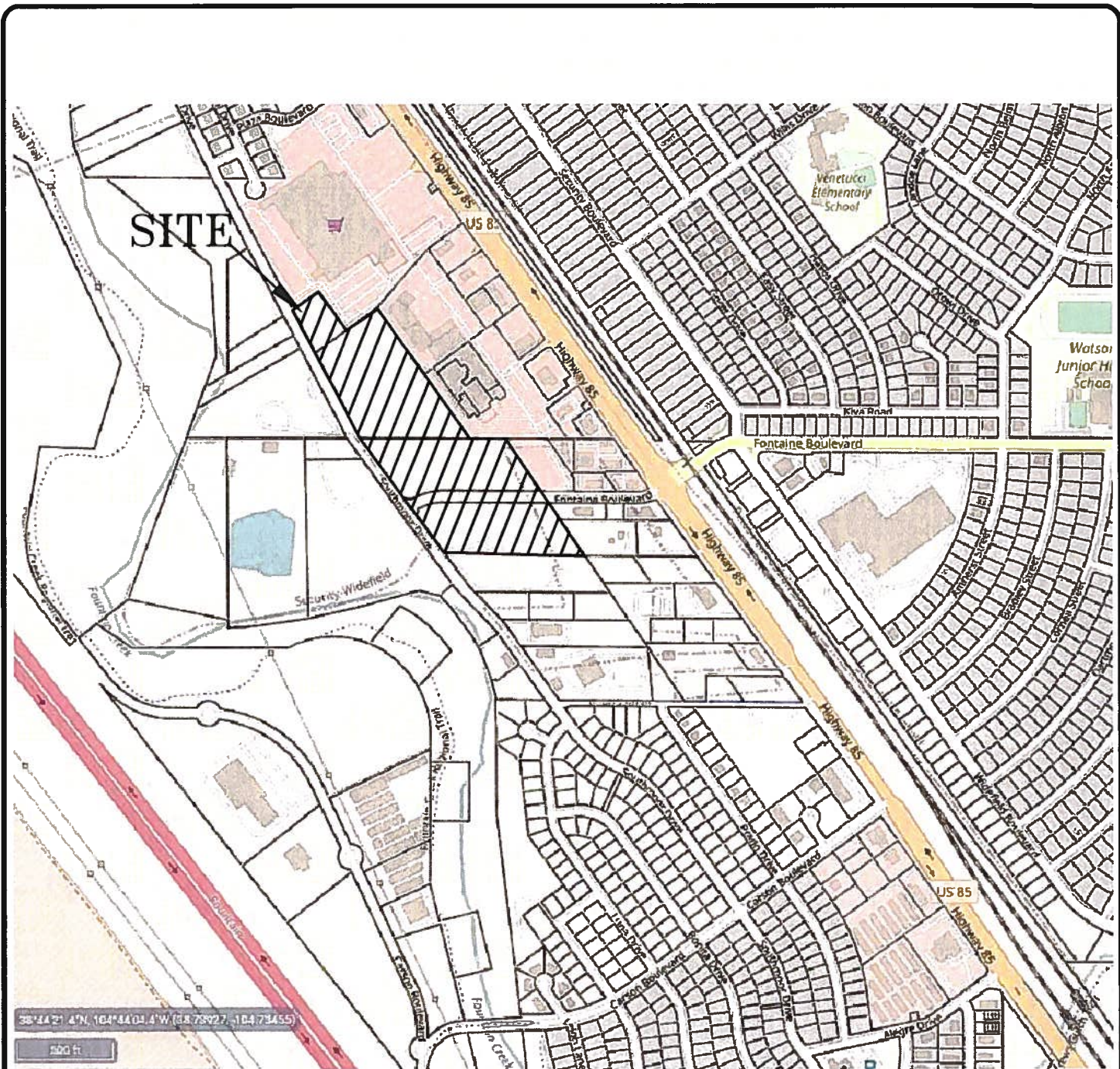
TABLE

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

CLIENT FRONT ROW PROPERTIES
PROJECT SOUTHMOOR DRIVE
JOB NO. 221305

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			43.9	26	10	<0.01			SC	SAND, VERY CLAYEY
1	4	5			4.7						SW	SAND
1	6	5			5.1						SM-SW	SAND, SLIGHTLY SILTY
1	8	2-3			10.2						SM-SW	SAND, SLIGHTLY SILTY
1	9	2-3			49.1						SC	SAND, VERY CLAYEY
1	10	5			24.2						SM	SAND, SILTY
1	11	10			22.4						SM	SAND, SILTY
2	5	15	14.9	100.0	97.4	49	21	<0.01		1.7	ML	SILT, SANDY
2	7	15	21.9	97.7	98.5					1.3	CL	CLAY, SANDY
2	12	20	23.4	89.5	70.2					0.7	CL	CLAY, SANDY
3	2	15	15.1	97.5	97.0	44	16	0.00		0.8	ML	SHALE
3	3	20			88.2	40	14	0.02			ML	SHALE

FIGURES



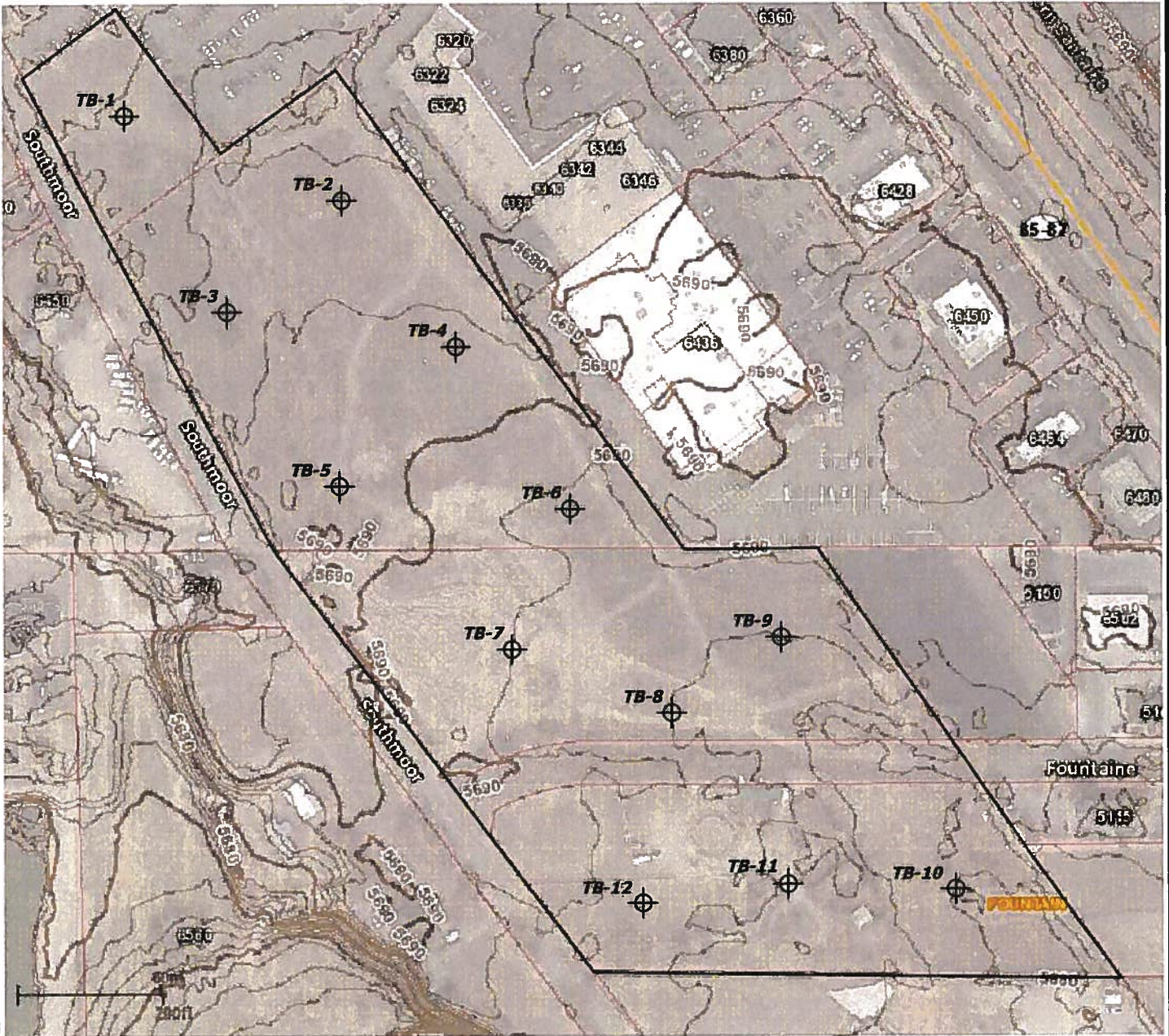
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VICINITY MAP
SOUTHMOOR DRIVE PROPERTIES
FOUNTAIN, COLORADO
FOR: FRONT ROW PROPERTIES

DRAWN: LLL	DATE: 6/28/22	CHECKED:	DATE:
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JOB NO.:
221305

FIG NO.:
1



TB- APPROXIMATE TEST BORING LOCATION AND NUMBER



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SITE MAP/TEST BORING LOCATION MAP
SOUTHMOOR DRIVE PROPERTIES
FOUNTAIN, COLORADO
FOR: FRONT ROW PROPERTIES

DRAWN:
 LLL

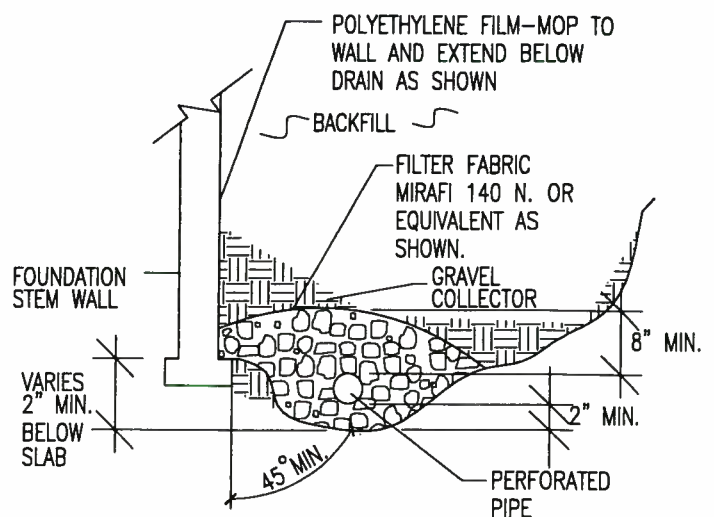
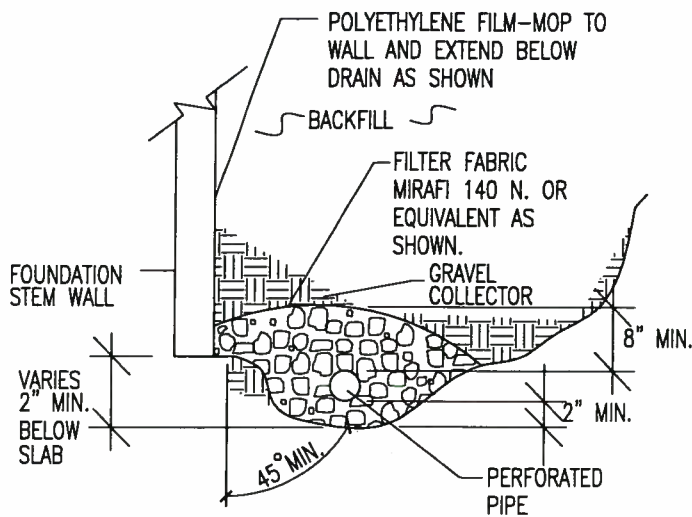
DATE:
 6/28/22

CHECKED:

DATE:

JOB NO:
 221305

FIG NO:
 2



NOTES:

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

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

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

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

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

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



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PERIMETER DRAIN DETAIL

DRAWN:

DATE:

DESIGNED:

CHECKED:

JOB NO.:

221305

FIG NO.:

3

APPENDIX A: Test Boring Logs

TEST BORING NO. 1
 DATE DRILLED 6/7/2022
 Job # 221305

TEST BORING NO. 2
 DATE DRILLED 6/7/2022
 CLIENT FRONT ROW PROPERTIES
 LOCATION SOUTHMOOR DRIVE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 18.5', 6/9/22							WATER @ 15.5', 6/9/22						
SAND, VERY CLAYEY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST	5		24	3.8	1		SAND, GRAVELLY, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE TO LOOSE, MOIST	5		25	5.0	1	
SAND, GRAVELLY, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE TO DENSE, MOIST TO DRY	5		15	3.1	1			5		8	2.3	1	
	10		33	1.3	1			10		11	1.6	1	
CLAYSTONE, SANDY, DARK GRAY, HARD, MOIST	15		50	12.9	3		SHALE, GRAY BROWN, VERY STIFF TO HARD, MOIST	15		44	14.0	3	
	20		50	13.4	3			20		50	13.8	3	
			5"							9"			



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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
 221305

FIG NO.:
 A- 1

TEST BORING NO. 3
 DATE DRILLED 6/7/2022
 Job # 221305

TEST BORING NO. 4
 DATE DRILLED 6/7/2022
 CLIENT FRONT ROW PROPERTIES
 LOCATION SOUTHMOOR DRIVE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 18.5', 6/9/22							DRY TO 19', 6/9/22						
SAND, GRAVELLY, SILTY, FINE TO COARSE GRAINED, BROWN TO TAN, MEDIUM DENSE TO DENSE, DRY	5		13	0.9	1		SAND, GRAVELLY, CLEAN TO SILTY, FINE TO COARSE GRAINED, TAN, DENSE TO MEDIUM DENSE, DRY TO MOIST	5		32	1.7	1	
	5		41	0.8	1			5		27	2.3	1	
	10		14	2.4	1			10		15	2.7	1	
CLAY, SANDY, GRAY BROWN, STIFF, MOIST	15		20	10.7	2			15		19	3.2	1	
WEATHERED SHALE, GRAY BROWN, STIFF, MOIST	20		28	17.3	3		CLAY, SANDY, GRAY BROWN, VERY STIFF, MOIST	20		33	10.9	2	



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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
 221305

FIG NO.:
 A- 2

TEST BORING NO. 5
 DATE DRILLED 6/7/2022
 Job # 221305

TEST BORING NO. 6
 DATE DRILLED 6/7/2022
 CLIENT FRONT ROW PROPERTIES
 LOCATION SOUTHMOOR DRIVE

REMARKS						REMARKS					
Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 19', 6/9/22						DRY TO 18', 6/9/22					
SAND, GRAVELLY, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO DENSE, DRY						SAND, GRAVELLY, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, DRY TO MOIST					
5			7	1.0	1	5			4	1.2	1
			8	1.5	1			14	1.2	1	
10			33	1.7	1	10			2	7.3	1
15			45	13.8	2	15			26	3.0	1
20			23	12.1	2	20			9	2.9	1
SILT, SANDY, DARK GRAY, VERY STIFF TO STIFF, MOIST											



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 COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
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FIG NO.:
 A- 3

TEST BORING NO. 7
 DATE DRILLED 6/7/2022
 Job # 221305

TEST BORING NO. 8
 DATE DRILLED 6/7/2022
 CLIENT FRONT ROW PROPERTIES
 LOCATION SOUTHMOOR DRIVE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 18.5', 6/9/22							DRY TO 15.5', 6/9/22						
SAND, GRAVELLY, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO DENSE, DRY							SAND, GRAVELLY, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST						
	5			23	0.9	1		5			15	6.0	1
				24	1.5	1					14	5.6	1
	10			22	1.9	1		10			20	3.1	1
CLAY, SANDY, TAN, STIFF, MOIST	15			28	22.1	2		15			28	4.3	1
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST	20			50	17.3	3		20			12	8.5	1
				8"									



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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
 221305

FIG NO.:
 A-4

TEST BORING NO. 9
 DATE DRILLED 6/8/2022
 Job # 221305

TEST BORING NO. 10
 DATE DRILLED 6/8/2022
 CLIENT FRONT ROW PROPERTIES
 LOCATION SOUTHMOOR DRIVE

REMARKS

DRY TO 20', 6/9/22

SAND, VERY CLAYEY, FINE
 GRAINED, BROWN, MEDIUM
 DENSE, MOIST

SAND, GRAVELLY, SILTY, FINE
 TO COARSE GRAINED, BROWN,
 MEDIUM DENSE, DRY TO MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			17	5.8	1
5			19	6.1	1
10			14	1.6	1
15			27	4.1	1
20			28	4.5	1

REMARKS

DRY TO 20', 6/8/22

SAND, GRAVELLY, SILTY, FINE
 TO COARSE GRAINED, BROWN,
 MEDIUM DENSE TO DENSE,
 MOIST TO DRY

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			24	8.7	1
5			17	2.8	1
10			32	2.1	1
15			35	7.3	1
20			36	6.3	1



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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/28/22

JOB NO.:
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FIG NO.:
 A- 5

TEST BORING NO. 11
 DATE DRILLED 6/8/2022
 Job # 221305

TEST BORING NO. 12
 DATE DRILLED 6/8/2022
 CLIENT FRONT ROW PROPERTIES
 LOCATION SOUTHMOOR DRIVE

REMARKS

DRY TO 20', 6/8/22

2" ASPHALT, SAND, GRAVELLY,
 SILTY, FINE TO COARSE GRAINED,
 TAN, DENSE TO MEDIUM DENSE,
 DRY

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			30	1.2	1
5			28	1.1	1
10			29	1.8	1
15			30	2.4	1
20			13	1.9	1

REMARKS

DRY TO 20', 6/8/22

SAND, GRAVELLY, SILTY, FINE
 TO COARSE GRAINED, BROWN,
 MEDIUM DENSE TO DENSE,
 MOIST TO DRY

CLAY, SANDY, BROWN, STIFF,
 MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			10	1.3	1
5			21	1.4	1
10			32	3.4	1
15			27	2.1	1
20			19	12.0	2



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TEST BORING LOG

DRAWN:

DATE:

CHECKED:
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DATE:
6/27/22

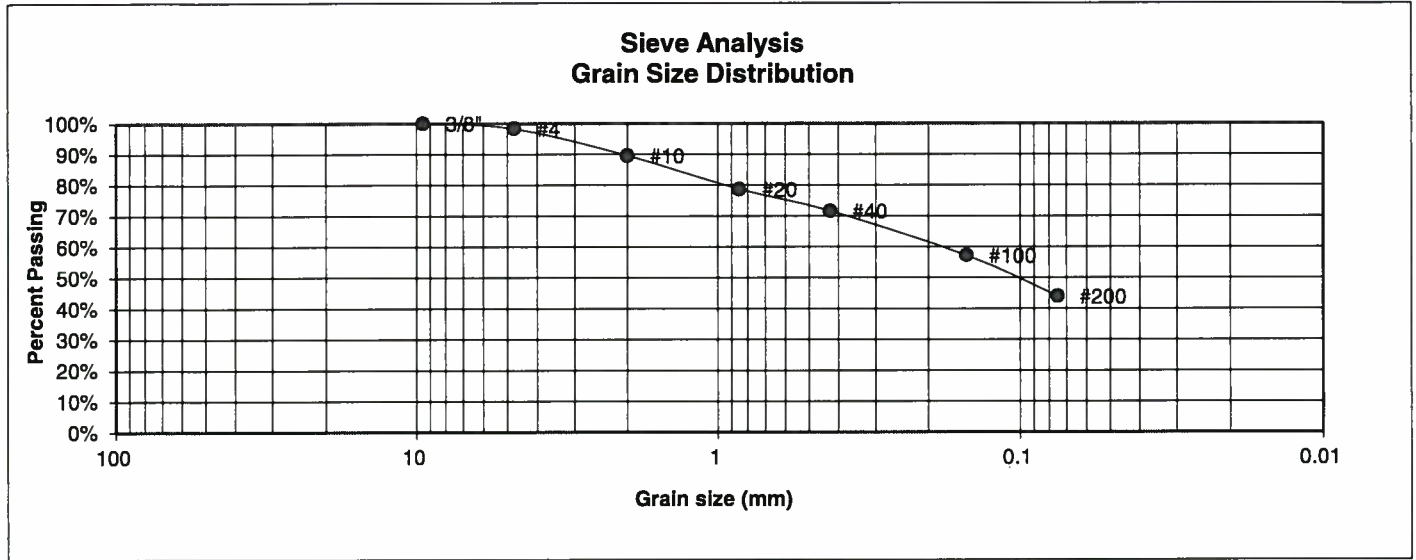
JOB NO.:
 221305

FIG NO.:
 A- 6

APPENDIX B: Laboratory Test Results

UNIFIED CLASSIFICATION SC
SOIL TYPE # 1
TEST BORING # 1
DEPTH (FT) 2-3

CLIENT FRONT ROW PROPERTIES
PROJECT SOUTHMOOR DRIVE
JOB NO. 221305
TEST BY BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.3%
10	89.6%
20	78.7%
40	71.6%
100	57.2%
200	43.9%

Atterberg Limits	
Plastic Limit	16
Liquid Limit	26
Plastic Index	10

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**

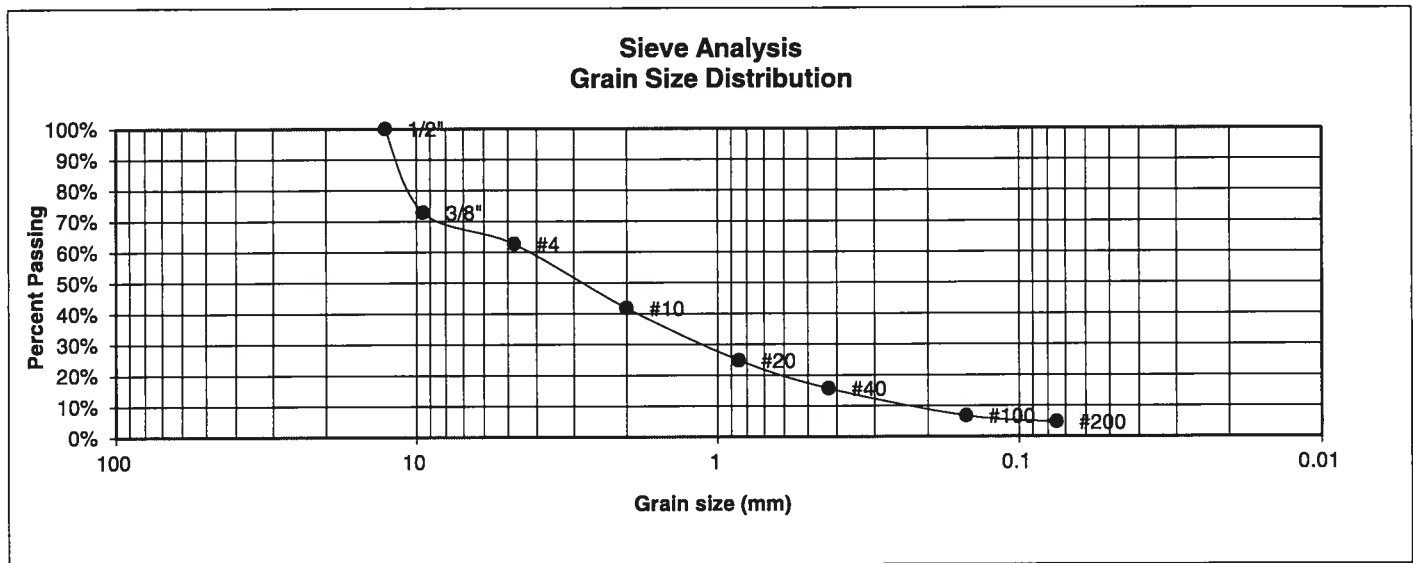
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
221305

FIG NO.:

B-1

<u>UNIFIED CLASSIFICATION</u>	SW	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	4	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	5	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	72.8%
4	62.6%
10	41.8%
20	24.8%
40	15.6%
100	6.7%
200	4.7%

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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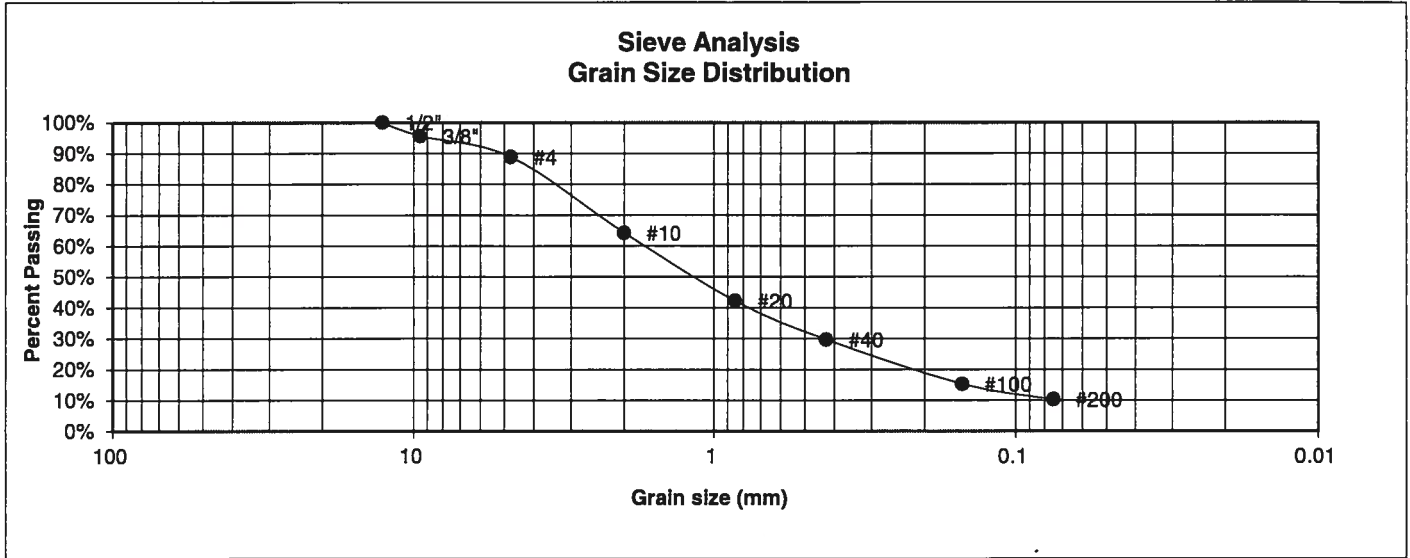
**LABORATORY TEST
RESULTS**

DRAWN:	DATE:	CHECKED: LLL	DATE: 6/27/22
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JOB NO.:
221305

FIG NO.:
B-Z

<u>UNIFIED CLASSIFICATION</u>	SM-SW	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	8	<u>JOB NO.</u>	221305
<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"	100.0%
3/8"	95.5%
4	88.8%
10	64.3%
20	42.2%
40	29.7%
100	15.3%
200	10.2%

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:
LLL

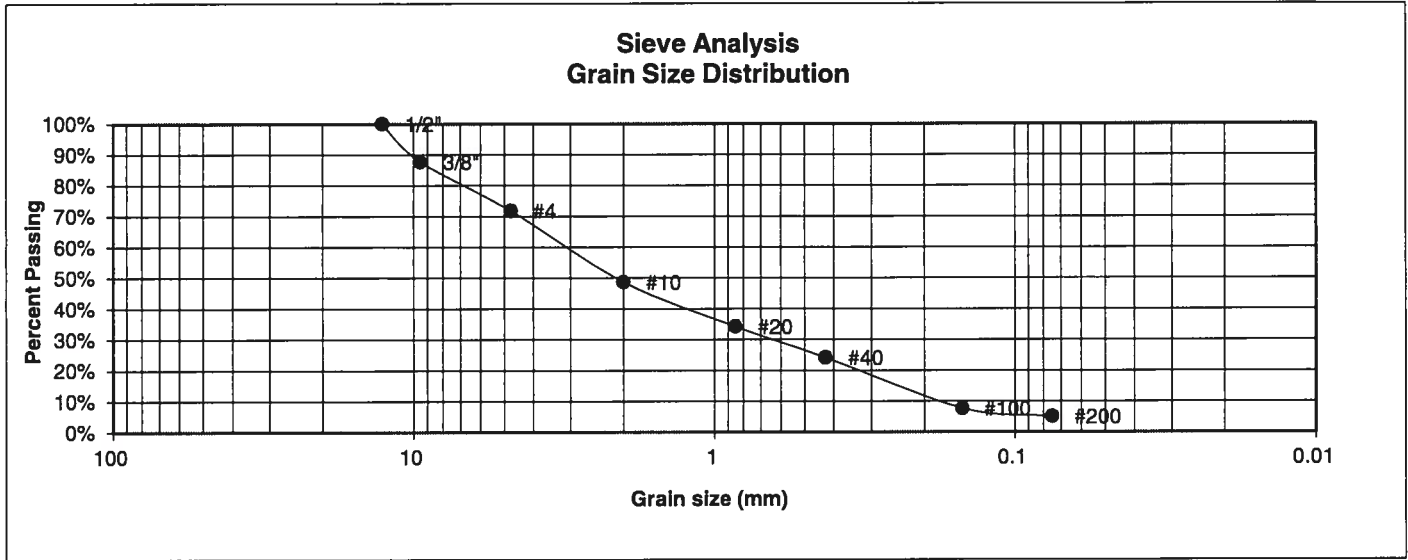
DATE:
6/27/22

JOB NO.:
221305

FIG NO.:

B-3

<u>UNIFIED CLASSIFICATION</u>	SM-SW	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	6	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	5	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	87.7%
4	71.8%
10	48.6%
20	34.2%
40	24.1%
100	7.7%
200	5.1%

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**

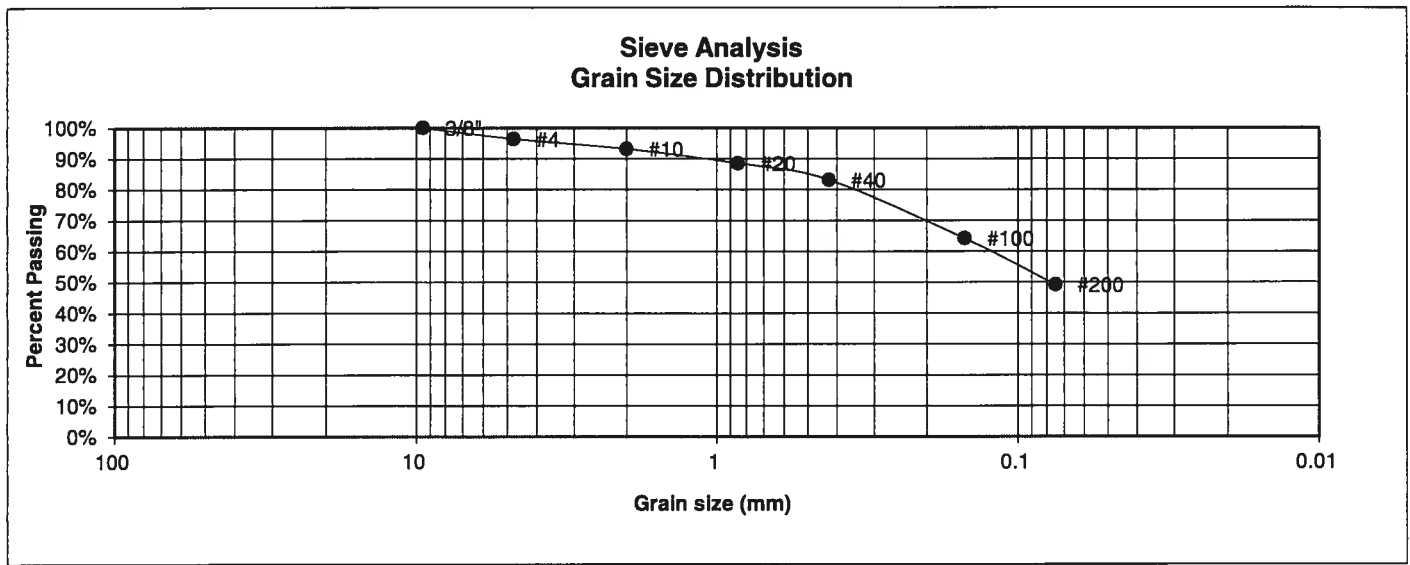
<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LLL	<u>DATE:</u> 6/27/22
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JOB NO.:
221305

FIG NO.:

B-4

<u>UNIFIED CLASSIFICATION</u>	SC	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	9	<u>JOB NO.</u>	221305
<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"	100.0%
4	96.4%
10	93.2%
20	88.5%
40	83.1%
100	64.2%
200	49.1%

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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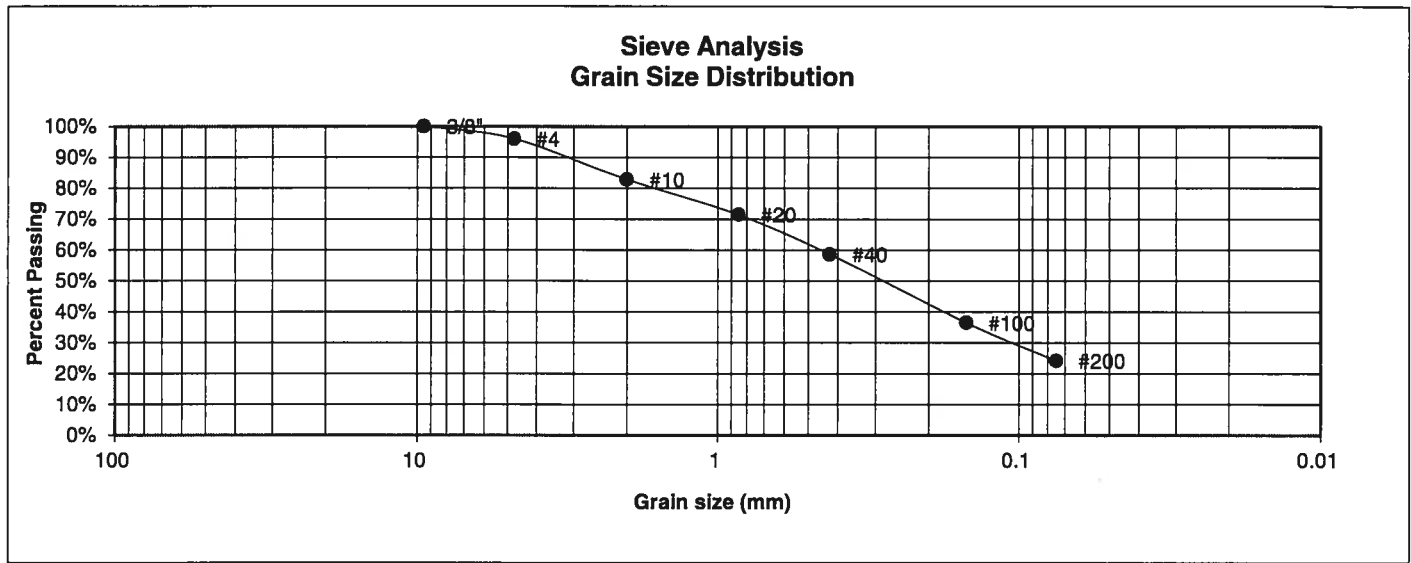
**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LLL	<u>DATE:</u> 6/27/22
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JOB NO.:
221305

FIG NO.:
B-5

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	10	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	5	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.0%
10	82.8%
20	71.4%
40	58.6%
100	36.5%
200	24.2%

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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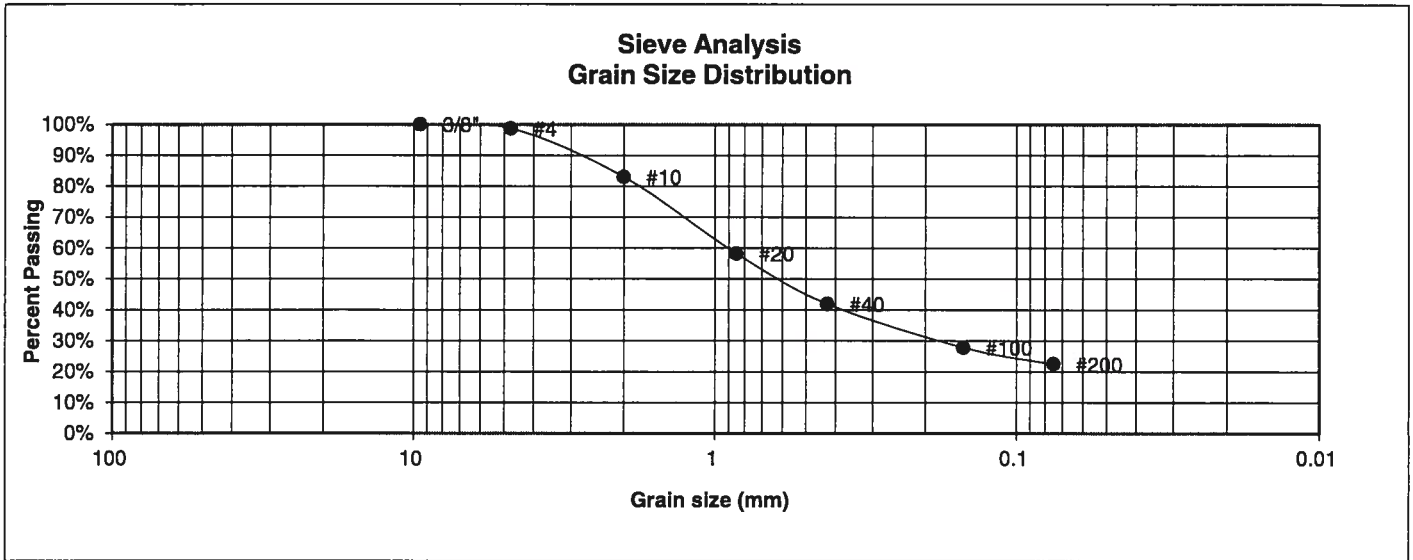
**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LLC	<u>DATE:</u> 6/27/22
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JOB NO.:
221305

FIG NO.:
B-4

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	11	<u>JOB NO.</u>	221305
<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"	100.0%
4	98.7%
10	83.0%
20	58.2%
40	41.9%
100	27.8%
200	22.4%

- 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**

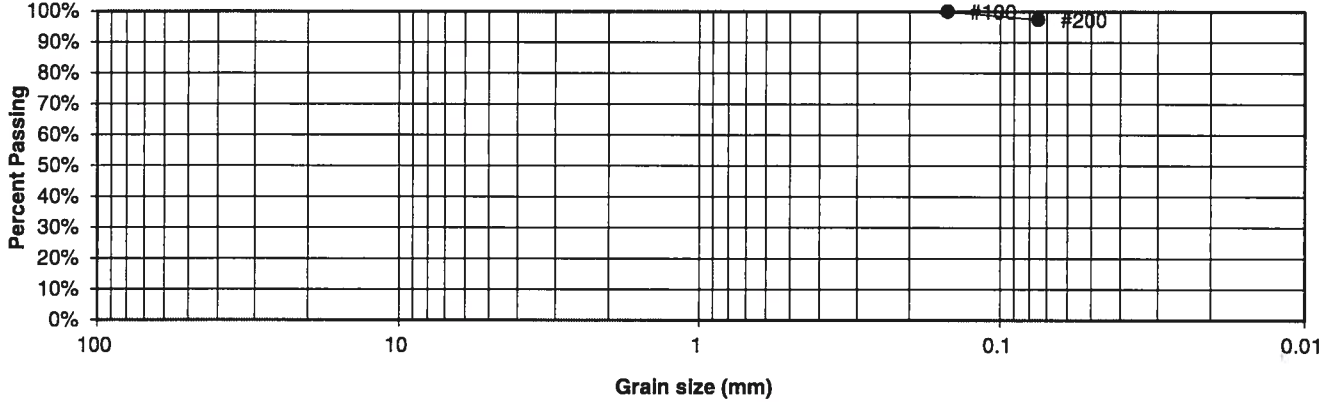
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
221305

FIG NO.:
B-7

<u>UNIFIED CLASSIFICATION</u>	ML	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	5	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	15	<u>TEST BY</u>	BL

**Sieve Analysis
Grain Size Distribution**



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	97.4%

<u>Atterberg Limits</u>	
Plastic Limit	28
Liquid Limit	49
Plastic Index	21

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



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**LABORATORY TEST
RESULTS**

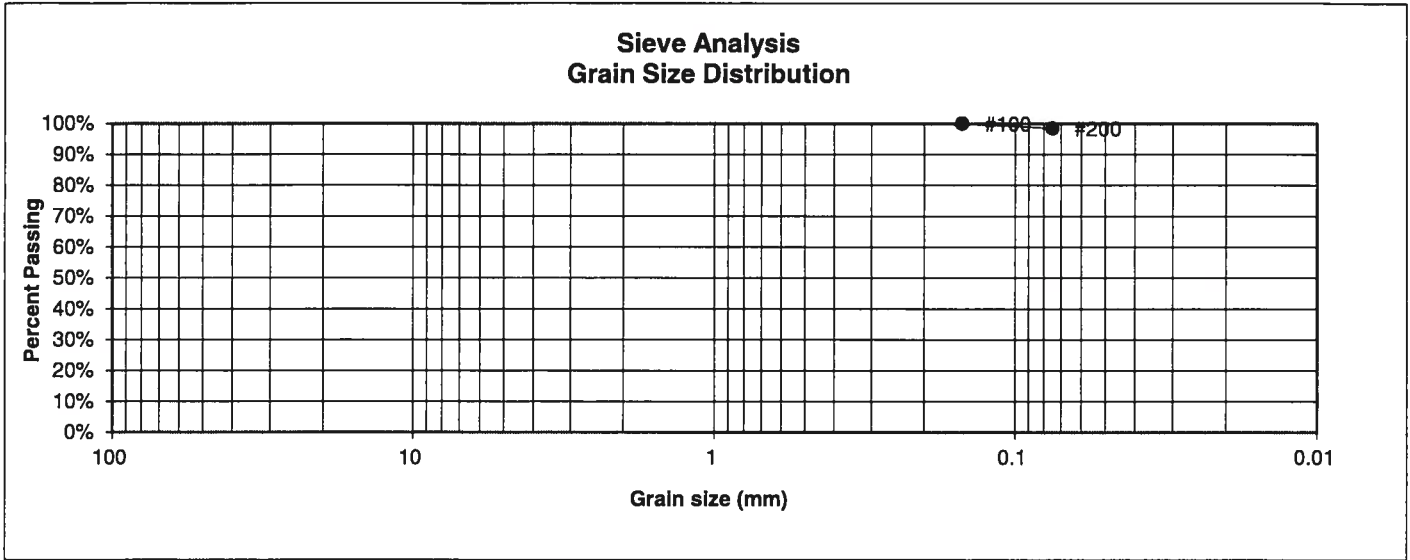
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
221305

FIG NO.:

B-8

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	7	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	15	<u>TEST BY</u>	BL



<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"		<u>Swell</u>
4		Moisture at start
10		Moisture at finish
20		Moisture increase
40		Initial dry density (pcf)
100	100.0%	Swell (psf)
200	98.5%	



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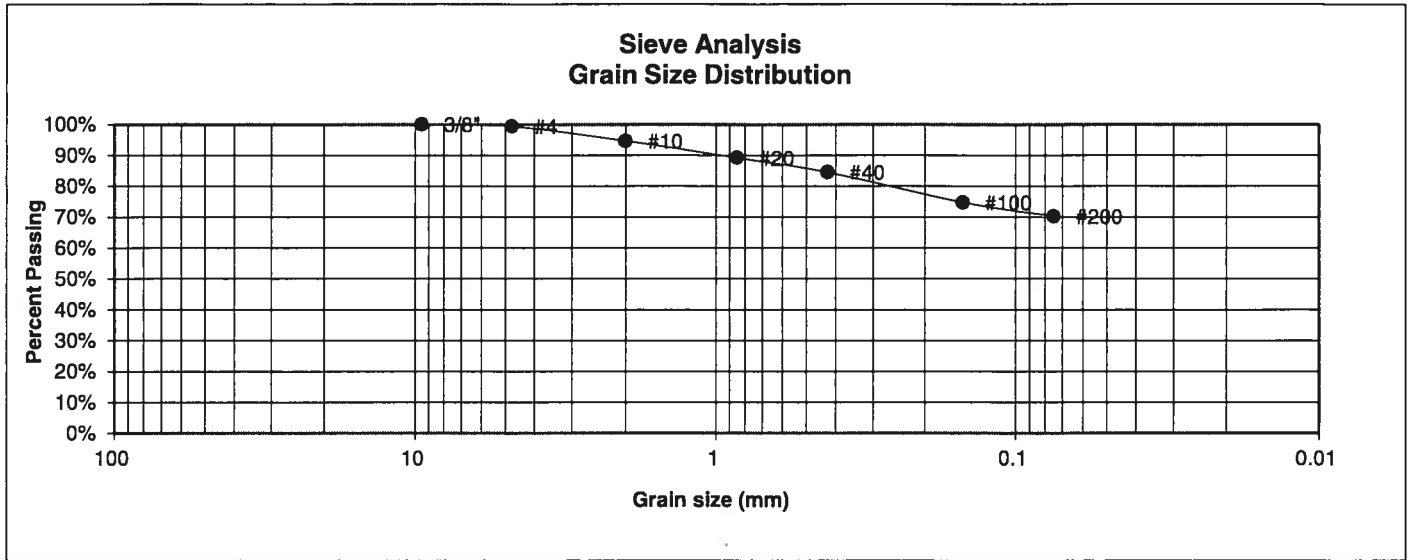
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED: <i>LLL</i>	DATE: <i>6/27/22</i>
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JOB NO.:
221305

FIG NO.:
B-9

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	12	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	20	<u>TEST BY</u>	BL



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.4%
10	94.7%
20	89.2%
40	84.5%
100	74.7%
200	70.2%

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:
LL

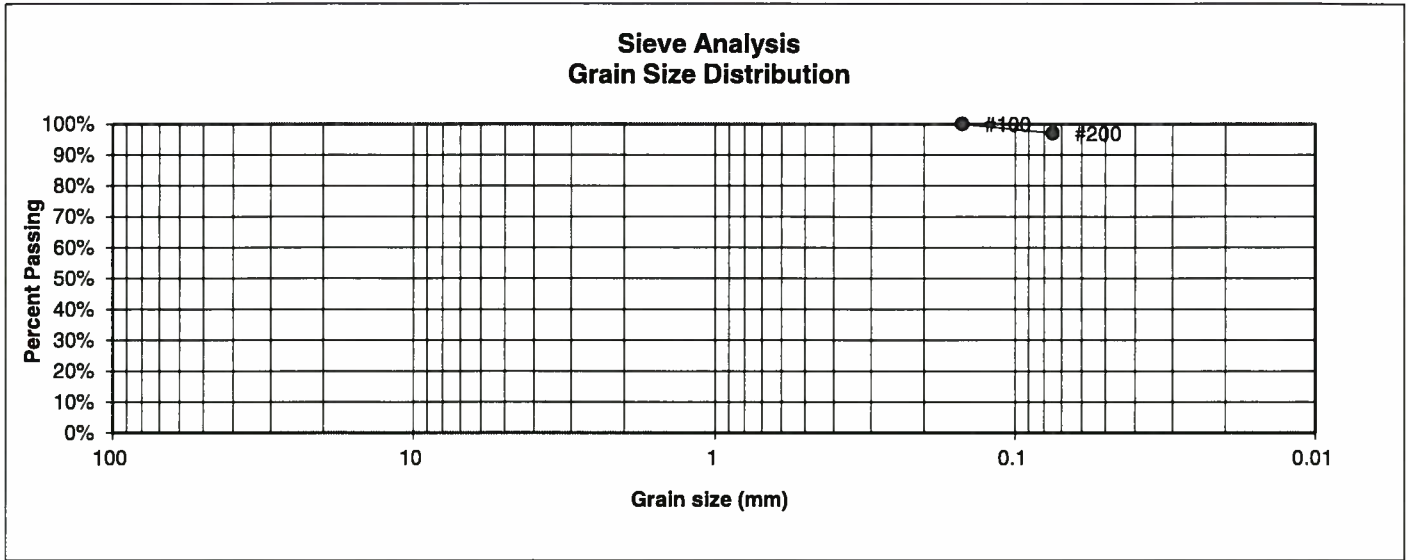
DATE:

6/27/22

JOB NO.:
221305

FIG NO.:
B-10

<u>UNIFIED CLASSIFICATION</u>	ML	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	3	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	2	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	15	<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	100.0%
200	97.0%

<u>Atterberg Limits</u>	
Plastic Limit	28
Liquid Limit	44
Plastic Index	16

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



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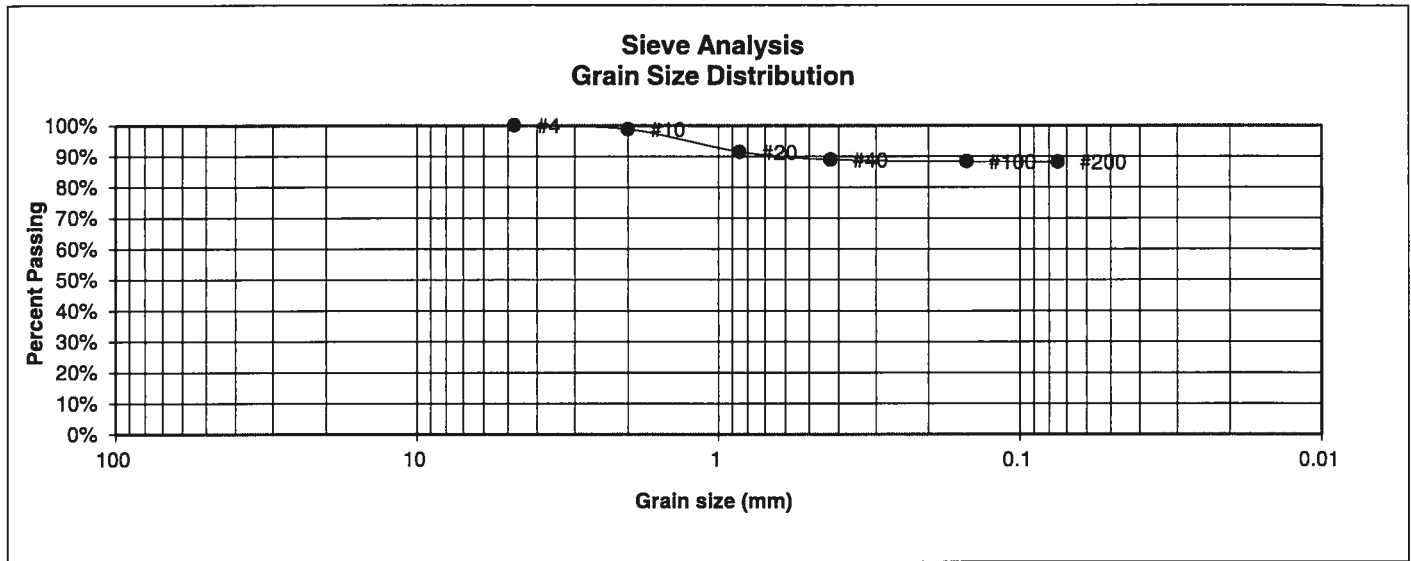
**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LLL	<u>DATE:</u> 6/27/22
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JOB NO.:
221305

FIG NO.:
B-11

<u>UNIFIED CLASSIFICATION</u>	ML	<u>CLIENT</u>	FRONT ROW PROPERTIES
<u>SOIL TYPE #</u>	3	<u>PROJECT</u>	SOUTHMOOR DRIVE
<u>TEST BORING #</u>	3	<u>JOB NO.</u>	221305
<u>DEPTH (FT)</u>	20	<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	98.8%
20	91.4%
40	88.9%
100	88.3%
200	88.2%

<u>Atterberg Limits</u>	
Plastic Limit	26
Liquid Limit	40
Plastic Index	14

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



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**LABORATORY TEST
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> LLL	<u>DATE:</u> 6/27/22
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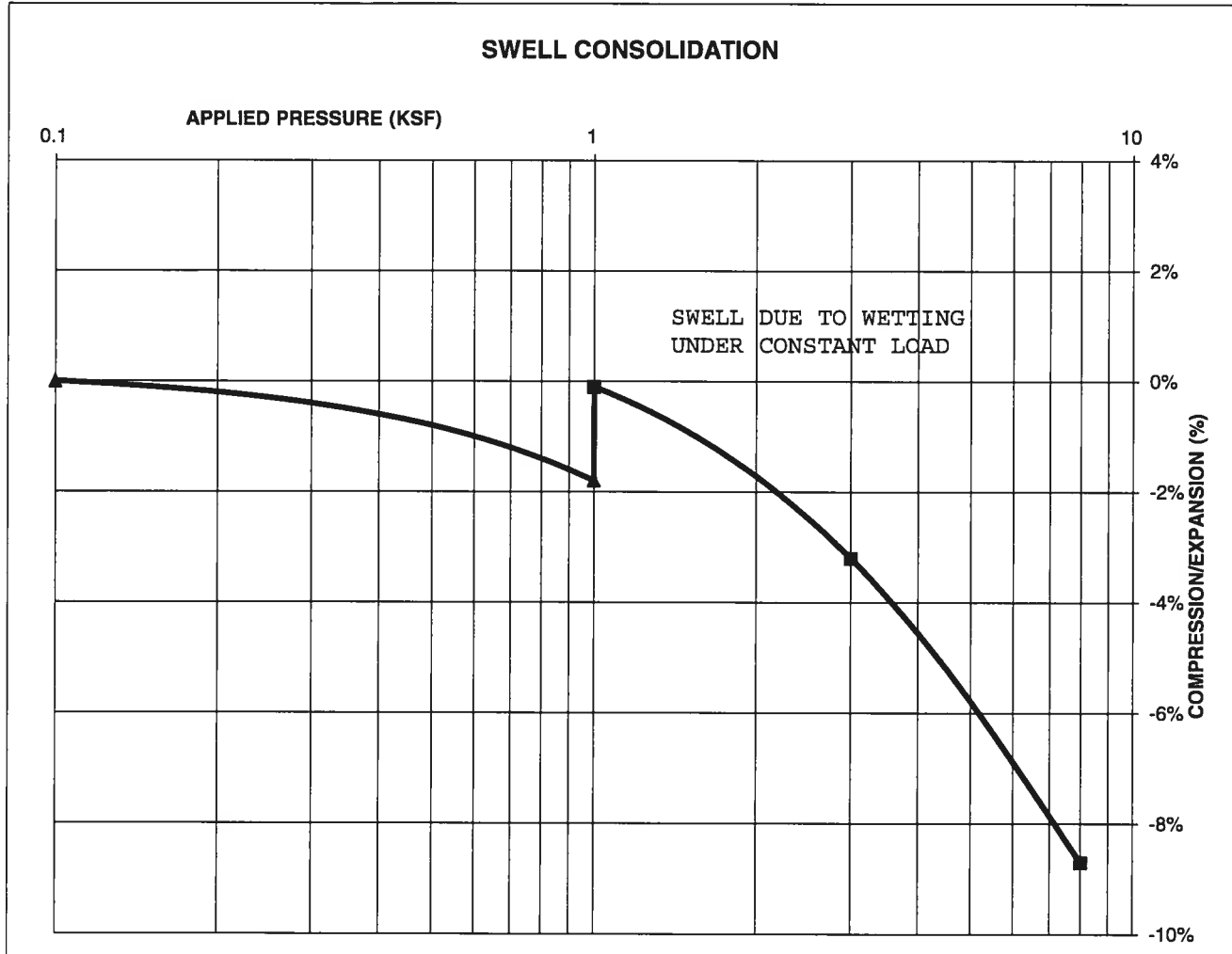
JOB NO.:
221305

FIG NO.:
B-12

CONSOLIDATION TEST RESULTS

TEST BORING #	5	DEPTH(ft)	15
DESCRIPTION	ML	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			100
NATURAL MOISTURE CONTENT			14.9%
SWELL/CONSOLIDATION (%)			1.7%

JOB NO. 221305
 CLIENT FRONT ROW PROPERTIES
 PROJECT SOUTHMOOR DRIVE



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SWELL CONSOLIDATION
 TEST RESULTS

DRAWN:

DATE:

CHECKED:

DATE:

LLL

6/27/22

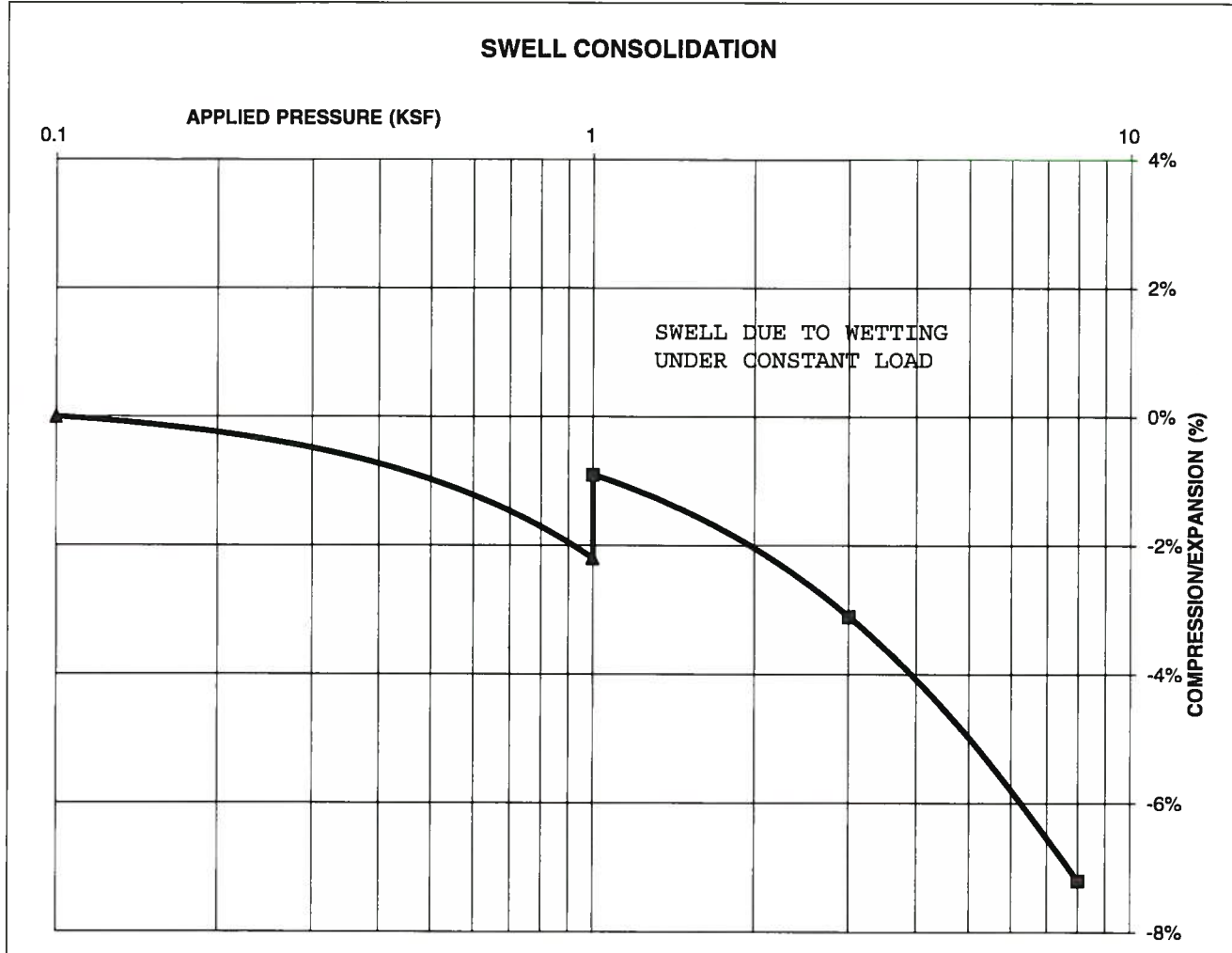
JOB NO:
 221305

FIG NO:
 B-13

CONSOLIDATION TEST RESULTS

TEST BORING #	7	DEPTH(ft)	15
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)	98		
NATURAL MOISTURE CONTENT	21.9%		
SWELL/CONSOLIDATION (%)	1.3%		

JOB NO. 221305
 CLIENT FRONT ROW PROPERTIES
 PROJECT SOUTHMOOR DRIVE



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**SWELL CONSOLIDATION
 TEST RESULTS**

DRAWN:

DATE:

CHECKED:
LLL

DATE:
6/27/22

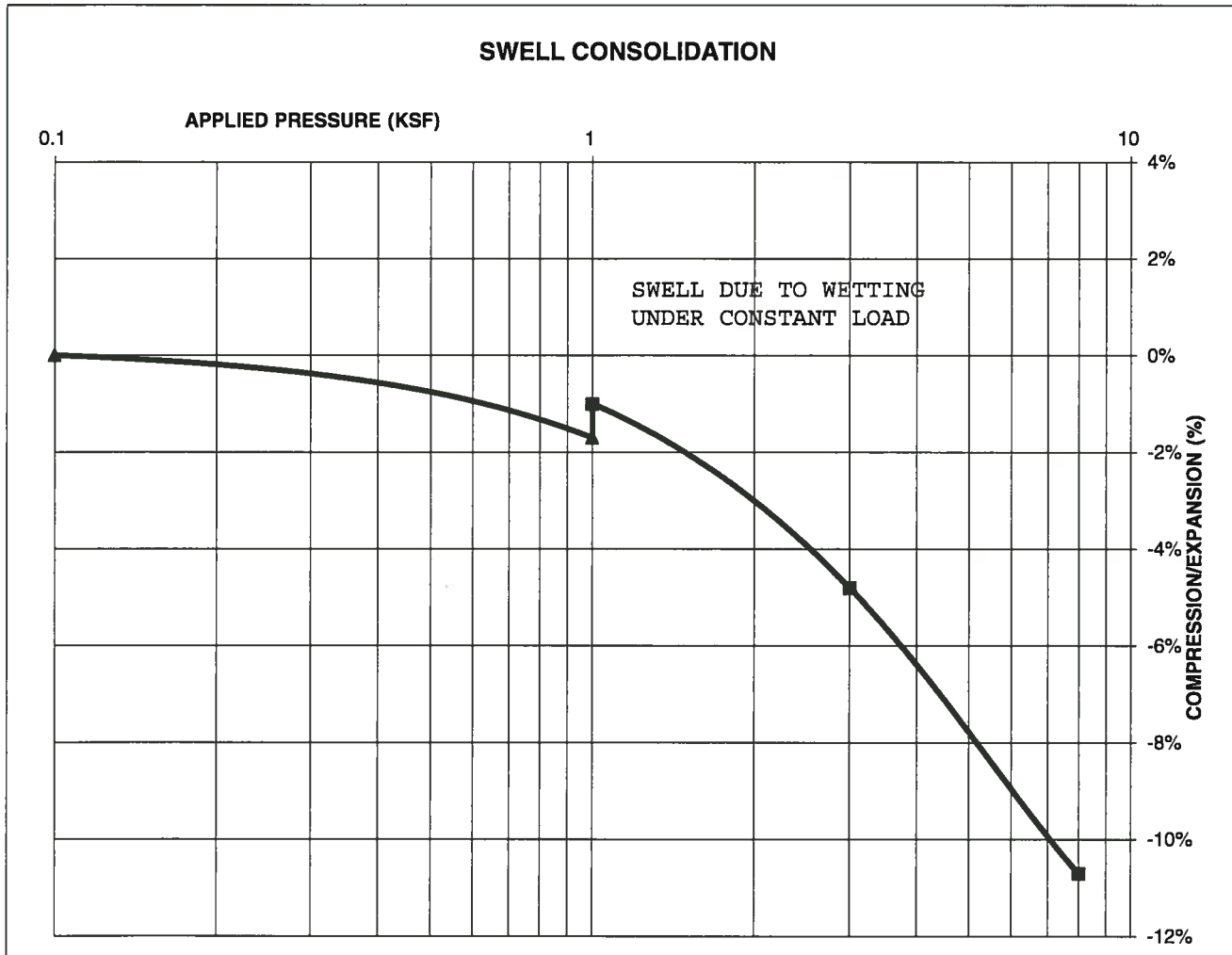
JOB NO.:
 221305

FIG NO.:
 B-14

CONSOLIDATION TEST RESULTS

TEST BORING #	12	DEPTH(ft)	20
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)	89		
NATURAL MOISTURE CONTENT	23.4%		
SWELL/CONSOLIDATION (%)	0.7%		

JOB NO. 221305
 CLIENT FRONT ROW PROPERTIES
 PROJECT SOUTHMOOR DRIVE



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**SWELL CONSOLIDATION
 TEST RESULTS**

DRAWN:

DATE:

CHECKED:
LLL

DATE:
6/27/22

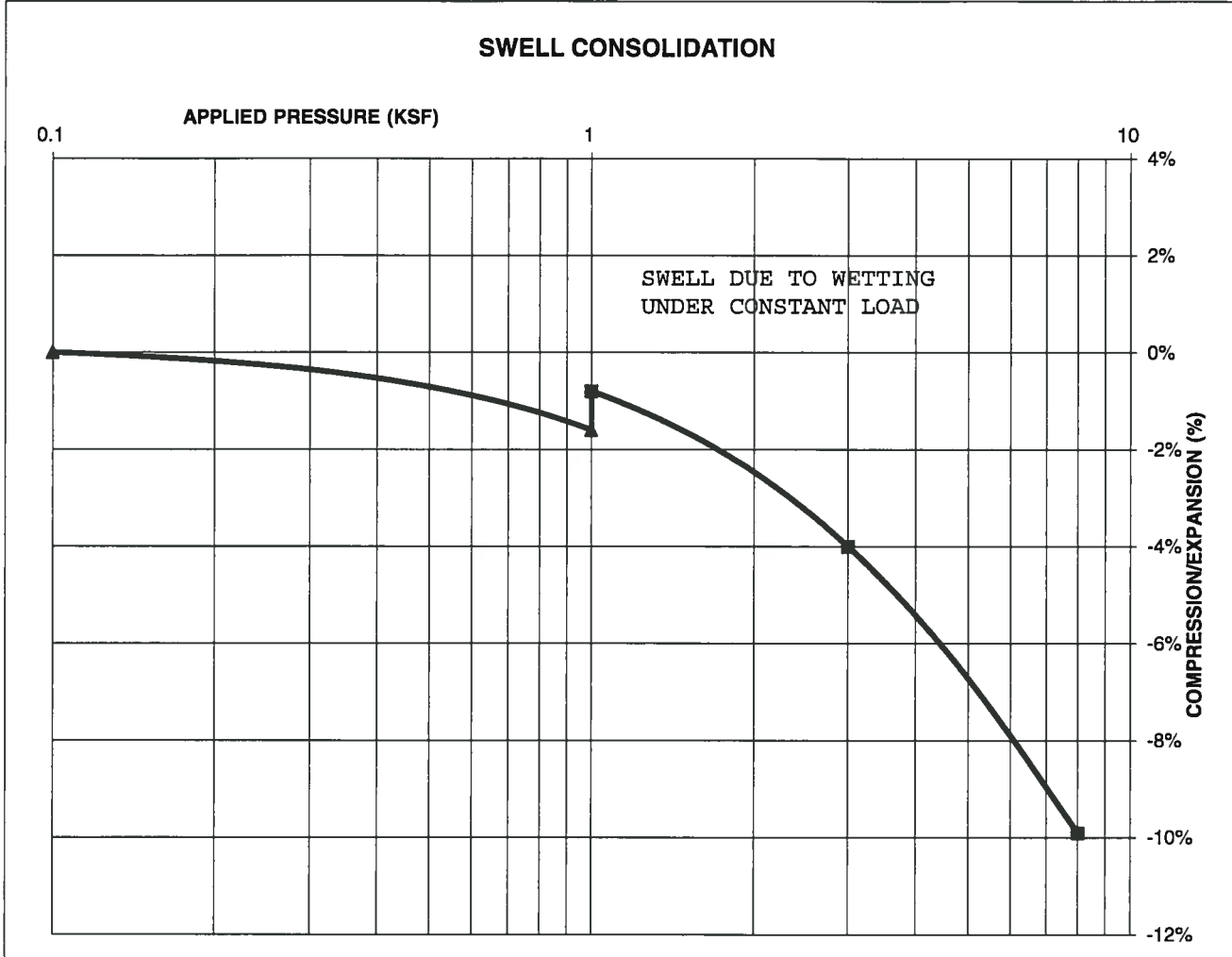
JOB NO.:
 221305

FIG NO.:
B-15

CONSOLIDATION TEST RESULTS

TEST BORING #	2	DEPTH(ft)	15
DESCRIPTION	ML	SOIL TYPE	3
NATURAL UNIT DRY WEIGHT (PCF)			98
NATURAL MOISTURE CONTENT			15.1%
SWELL/CONSOLIDATION (%)			0.8%

JOB NO. 221305
 CLIENT FRONT ROW PROPERTIES
 PROJECT SOUTHMOOR DRIVE



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SWELL CONSOLIDATION
 TEST RESULTS

DRAWN:

DATE:

CHECKED:
LLL

DATE:

6/27/22

JOB NO.:
 221305

FIG NO.:
B-16

CLIENT	<u>FRONT ROW PROPERTIES</u>	JOB NO.	<u>221305</u>
PROJECT	<u>SOUTHMOOR DRIVE</u>	DATE	<u>6/22/2022</u>
LOCATION	<u>SOUTHMOOR DRIVE</u>	TEST BY	<u>BL</u>

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-1	2-3	1	SC	<0.01
TB-2	15	3	ML	0.00
TB-3	20	3	ML	0.02
TB-5	15	2	ML	<0.01

QC BLANK PASS



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**LABORATORY TEST
 SULFATE RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/27/22

JOB NO.:
 221305

FIG NO.:
 B-17