



**ENTECH**  
ENGINEERING, INC.

505 ELKTON DRIVE  
COLORADO SPRINGS, CO 80907  
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May 25, 2022

Waterview Commercial Investors, LLC  
2727 Glen Arbor Drive  
Colorado Springs, CO 80920

Attn: Heath Herber

Re: Preliminary Subsurface Soils Investigation  
Waterview Commercial Site  
Powers Boulevard and Bradley Road  
El Paso County, Colorado

Dear Mr. Herber:

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 on the southeast corner of Powers Boulevard and Bradley Road in south central El Paso County, 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 east/southeast, with the north and west edges of the property sloping moderately towards the streets. Portions of the site have been used as dump sites and vegetation is absent in the northeast corner of the site due to recent grading. The rest consists of field grasses and weeds, and yucca. Previous site uses consist of agricultural grazing.

**PROJECT DESCRIPTION:**

The project is to consist of developing a 22-acre parcel into a multi-use commercial development.

**FIELD INVESTIGATION AND LABORATORY TESTING PROGRAM:**

The subsurface conditions on this site were investigated by drilling seven (7) exploratory test borings across the site in the approximate building locations. 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 Swell/Consolidation Test (ASTM D-4546) in order to evaluate potential expansion/compression characteristics of the soil and bedrock. Sulfate testing was

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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:**

Two soil types and one bedrock type were encountered in the test borings drilled for the preliminary subsurface investigation: Type 1: native silty to very silty sand (SM), Type 2: sandy clay (CL), and Type 3: native sandy claystone bedrock (CL). 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 very silty sand (SM). The sand was encountered in six of the seven test borings at the ground surface or 3 feet bgs and extending to depths ranging from 9 to 17 feet bgs or to the termination of borings (20 feet). Standard Penetration Testing on the sand resulted in N-values ranging from 10 to 43 bpf, indicating medium dense to dense states. Water content and grain size testing resulted in water contents of 2 to 8 percent, with 20 to 47 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits testing on the sand resulted in no values. The sand is anticipated to exhibit low to negligible expansion potential. 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 2 classified as native sandy clay (CL). The native clay was encountered in five of the test borings at depths ranging from the ground surface to 17 feet bgs and extending to 3 feet or to the termination of the borings (20 feet). Standard Penetration Testing on the clay resulted in N-values of 12 to 36 blows per foot, indicating firm to very stiff consistencies. Water content and grain size testing resulted in water contents of 7 to 18 percent, with 81 to 85.5 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted a liquid limit of 33 percent and a plastic index of 14 percent. Swell/Consolidation Testing on two samples of the sandy clay resulted in volume changes of -0.4 to 1.4 percent indicating a low consolidation potential and a low to moderate expansion potential. 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 claystone bedrock (CL). The claystone was encountered in Test Boring Nos. 1, 2, and 3 at 14 to 18 feet bgs and extending to the termination of the boring (20 feet bgs). Standard Penetration Testing on the claystone resulted in N-values of 50 to greater than 50 blows per foot, indicating hard consistencies. Water content and grain size testing resulted in water contents of 10 to 14 percent moisture content, with 84 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in a liquid limit of 43 and a plastic index of 24 percent. Swell/Consolidation Testing resulted in a volume change of 2.1 percent indicating a moderate potential for expansion. 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. The claystone in this area typically has high sulfate levels.

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

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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 not encountered in any of the test borings which were drilled to 20 feet. 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 sand and sandy clay overlying claystone bedrock. Bedrock was encountered in three of the test borings at depths of 14 to 18 feet. The clay soils (Test Boring No. 2) will likely require overexcavation. The sandy site soils are suitable to support shallow foundations in their in-situ condition. The foundations should rest entirely on similar bearing soils, medium dense silty sand or on reworked and recompacted on-site granular sands, or structural fill.

Expansive clays encountered 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 reworked on-site granular soils, native medium dense sand soils, or structural fill 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 clay and sand soils will be moderate with rubber-tired equipment, the hard claystone 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 less than 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. We recommend additional sulfate testing as the site is developed as high sulfate levels are common in this area.

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. 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  $\pm 2$  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  $\pm 2$  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.

#### **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

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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 Waterview Commercial Investors, 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

LLL/am

Entech Job No. 220689  
AAPProjects/2022/220689 pssi

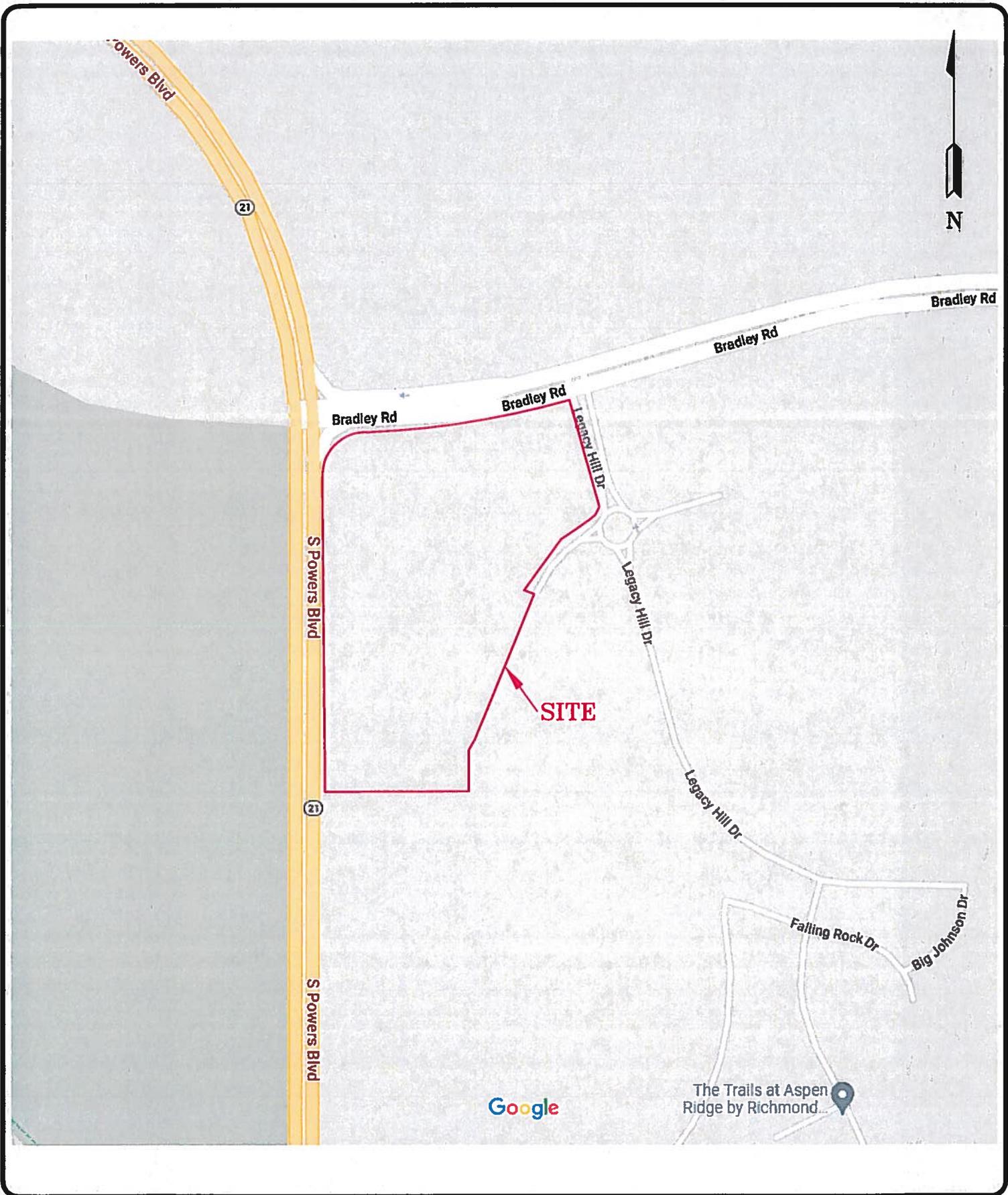
## TABLE

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

CLIENT WATERVIEW COMMERCIAL  
PROJECT WATERVIEW EAST DEV.  
JOB NO. 220689

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	3	2-3			21.7	NV	NP	<0.01			SM	SAND,S ILTY
1	4	5			47.1						SM	SAND, VERY SILTY
1	5	10			20.2						SM	SAND, SILTY
2	2	5	9.7	89.9	81.7	33	14	<0.01		-0.4	CL	CLAY, SANDY
2	6	20	21.9	100.5	81.4					1.4	CL	CLAY, SANDY
2	7	2-3			85.5						CL	CLAY, SANDY
3	1	15	13.9	109.6	84.4	43	24	<0.01		2.1	CL	CLAYSTONE, SANDY

## FIGURES



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VICINITY MAP  
 WATerview EAST DEVELOPMENT  
 COLORADO SPRINGS, CO.  
 FOR: WATerview COMMERCIAL INVESTORS, LLC

DRAWN:  
**JAC**

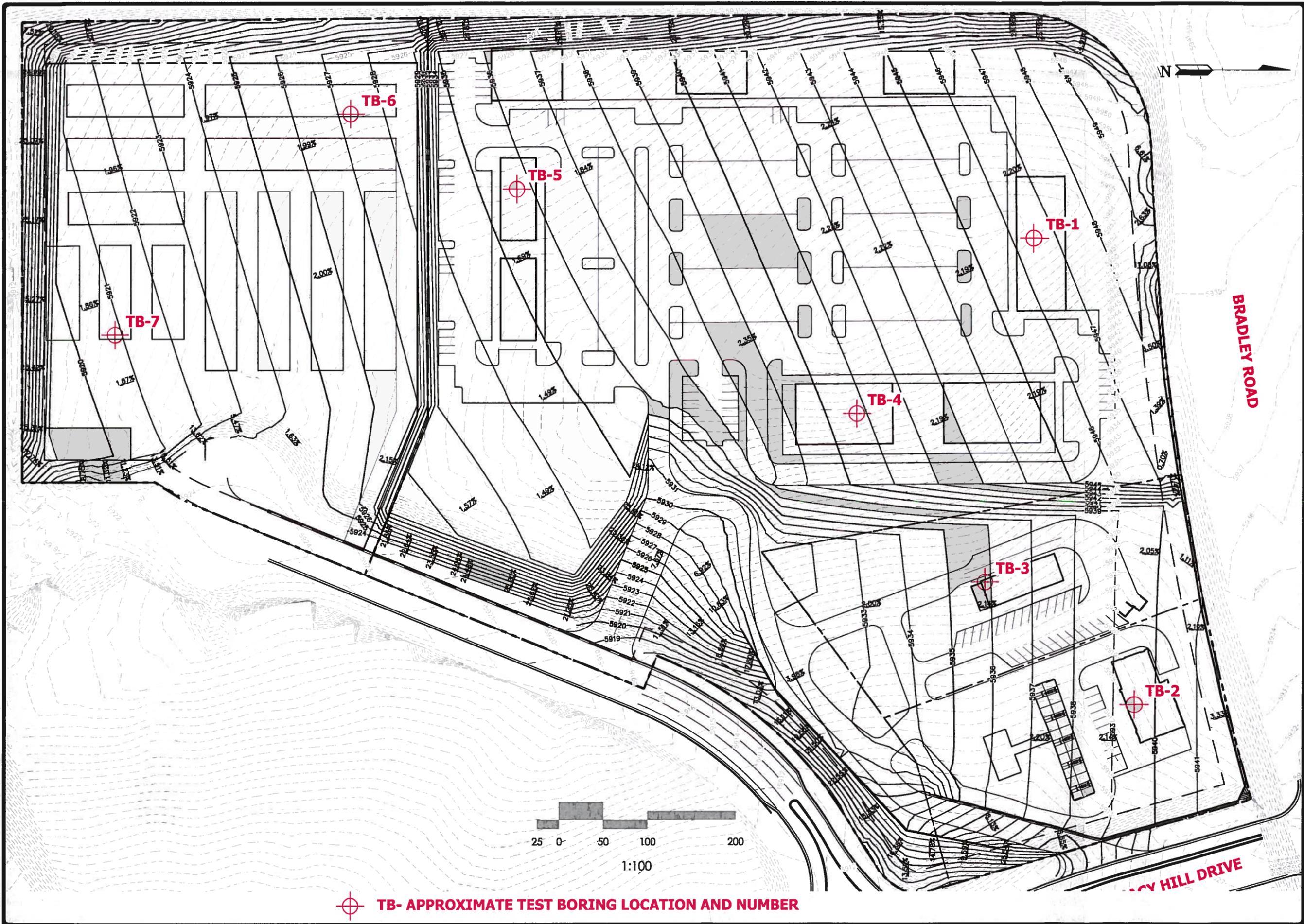
DATE:  
**4/29/22**

CHECKED:  
**DPS**

DATE:

JOB NO.:  
**220689**

FIG NO.:  
**1**



 TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

REVISION	BY

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TEST BORING LOCATION MAP  
WATERVIEW EAST DEVELOPMENT  
COLORADO SPRINGS, CO.  
FOR: WATERVIEW COMMERCIAL INVESTORS, LLC

DRWN	JAC
CHKD	DPS
DATE	4/29/22
SCALE	1:100
JOB NO.	220489
FIGURE NO.	2

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

TEST BORING NO. 1  
 DATE DRILLED 4/11/2022  
 Job # 220689

TEST BORING NO. 2  
 DATE DRILLED 4/11/2022  
 CLIENT WATERVIEW COMMERCIAL  
 LOCATION WATERVIEW EAST DEV.

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', 4/14/22							DRY TO 17', 4/14/22						
SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, DENSE, DRY TO MOIST	5			35	2.1	1	CLAY, SANDY, DARK BROWN, STIFF TO FIRM, MOIST	5			15	6.9	2
	5			31	4.9	1		5			22	7.1	2
CLAY, SANDY, BROWN, VERY STIFF, MOIST	10			34	8.4	2		10			13	11.5	2
CLAYSTONE, SANDY, BROWN, HARD, MOIST	15			50	11.1	3		15			17	13.8	2
				11"									
	20			50	12.3	3	CLAYSTONE, SANDY, BROWN, HARD, MOIST	20			50	10.3	3
											2"		



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**TEST BORING LOG**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *4-26-22*

JOB NO.:  
 220689

FIG NO.:  
 A-1

TEST BORING NO. 3  
 DATE DRILLED 4/11/2022  
 Job # 220689

TEST BORING NO. 4  
 DATE DRILLED 4/11/2022  
 CLIENT WATERVIEW COMMERCIAL  
 LOCATION WATERVIEW EAST DEV.

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', 4/14/22							DRY TO 18', 4/14/22						
SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE, DRY TO MOIST	5			10	2.8	1	SAND, VERY SILTY TO SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE, MOIST	5			21	5.3	1
	5			14	4.2	1		5			12	5.1	1
CLAY, SANDY, GRAY BROWN, VERY STIFF, MOIST	10			36	12.3	2		10			28	3.0	1
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST	15			50	13.4	3		15			16	3.4	1
	15			9"				15					
	20			50	13.7	3		20			19	3.5	1



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**TEST BORING LOG**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *4-26-22*

JOB NO.:  
 220689

FIG NO.:  
 A- 2

TEST BORING NO. 5  
 DATE DRILLED 4/11/2022  
 Job # 220689

TEST BORING NO. 6  
 DATE DRILLED 4/11/2022  
 CLIENT WATERVIEW COMMERCIAL  
 LOCATION WATERVIEW EAST DEV.

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', 4/14/22							DRY TO 19', 4/14/22						
SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE, DRY TO MOIST							SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE, MOIST						
	5			29	2.4	1		5			17	4.2	1
				25	2.0	1					17	3.7	1
	10			21	2.6	1		10			25	3.6	1
	15			16	3.5	1		15			43	4.3	1
	20			17	5.5	1	CLAY, SANDY, BROWN, STIFF, MOIST	20			26	17.3	2



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**TEST BORING LOG**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *4-26-22*

JOB NO:  
 220689

FIG NO:  
 A-3

TEST BORING NO. 7  
 DATE DRILLED 4/11/2022  
 Job # 220689

TEST BORING NO.  
 DATE DRILLED  
 CLIENT WATERVIEW COMMERCIAL  
 LOCATION WATERVIEW EAST DEV.

REMARKS

REMARKS

DRY TO 18.5', 4/14/22  
 CLAY, SANDY, TAN, FIRM,  
 MOIST

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

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
0 - 12			12	18.5	2
12 - 22			22	6.0	1
22 - 23			23	3.0	1
23 - 40			40	3.9	1
40 - 20			32	8.6	1

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
0 - 5					
5 - 10					
10 - 15					
15 - 20					



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 COLORADO SPRINGS, COLORADO 80907

**TEST BORING LOG**

DRAWN:

DATE:

CHECKED: *SW*

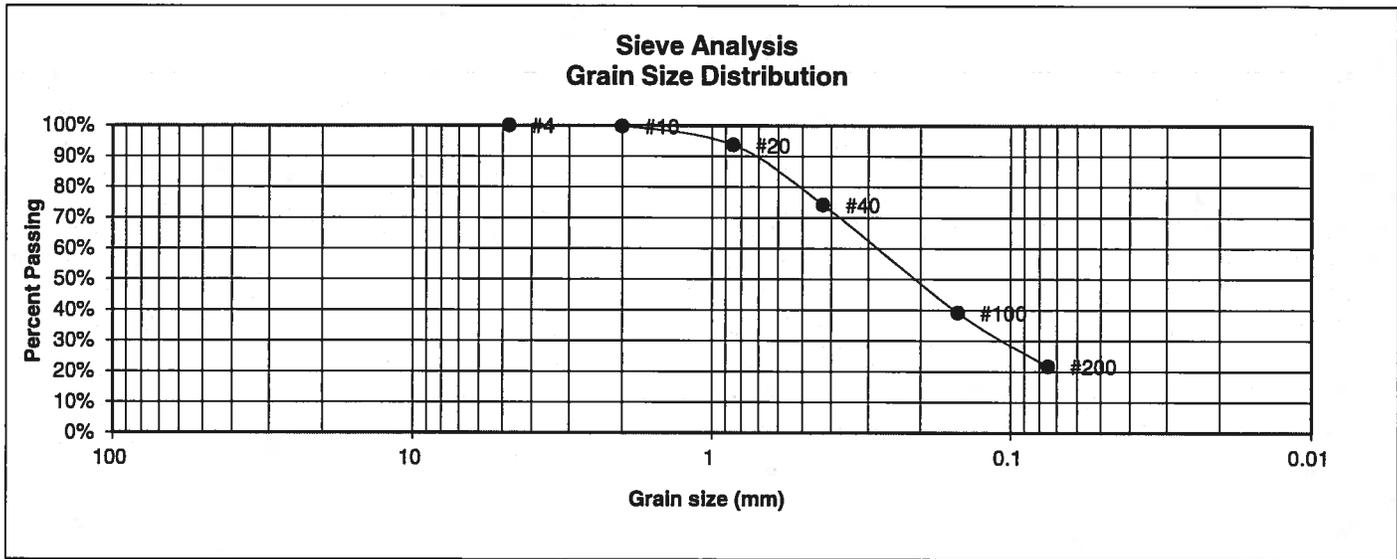
DATE: *4-26-22*

JOB NO.:  
 220689

FIG NO.:  
 A- 4

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

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	3	<u>JOB NO.</u>	220689
<u>DEPTH (FT)</u>	2-3	<u>TEST BY</u>	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	93.6%
40	74.1%
100	39.1%
200	21.7%

<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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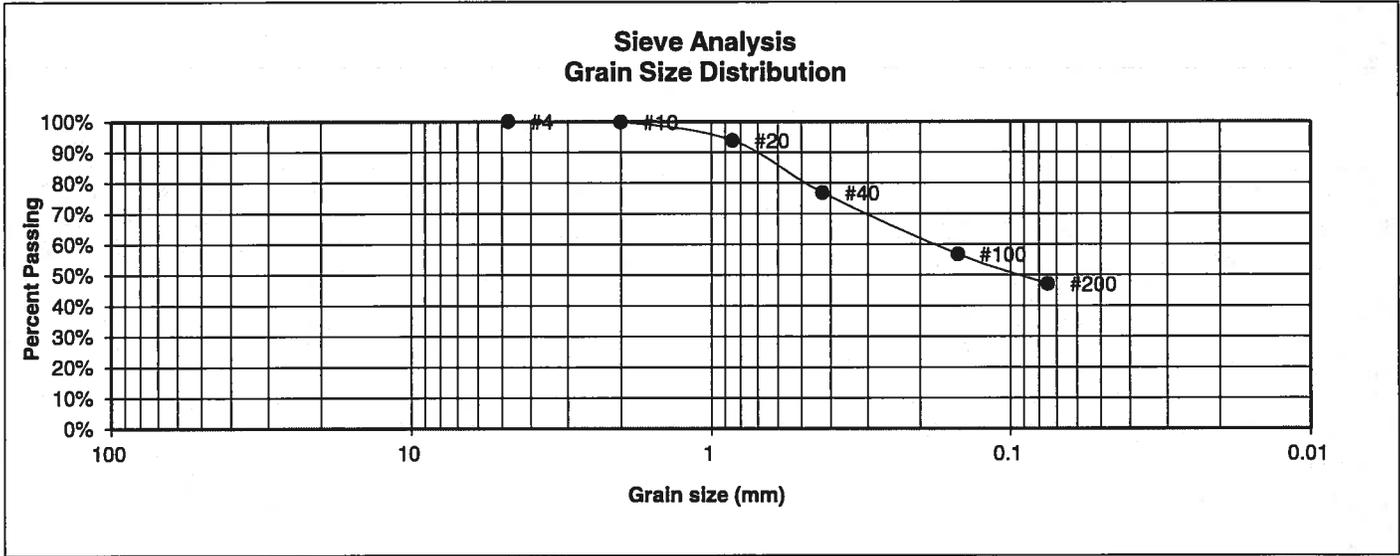
**LABORATORY TEST  
RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>4-26-22</i>
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JOB NO.:  
220689

FIG NO.:  
*B-1*

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	4	<u>JOB NO.</u>	220689
<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"	
4	100.0%
10	99.9%
20	93.8%
40	76.8%
100	56.8%
200	47.1%

- 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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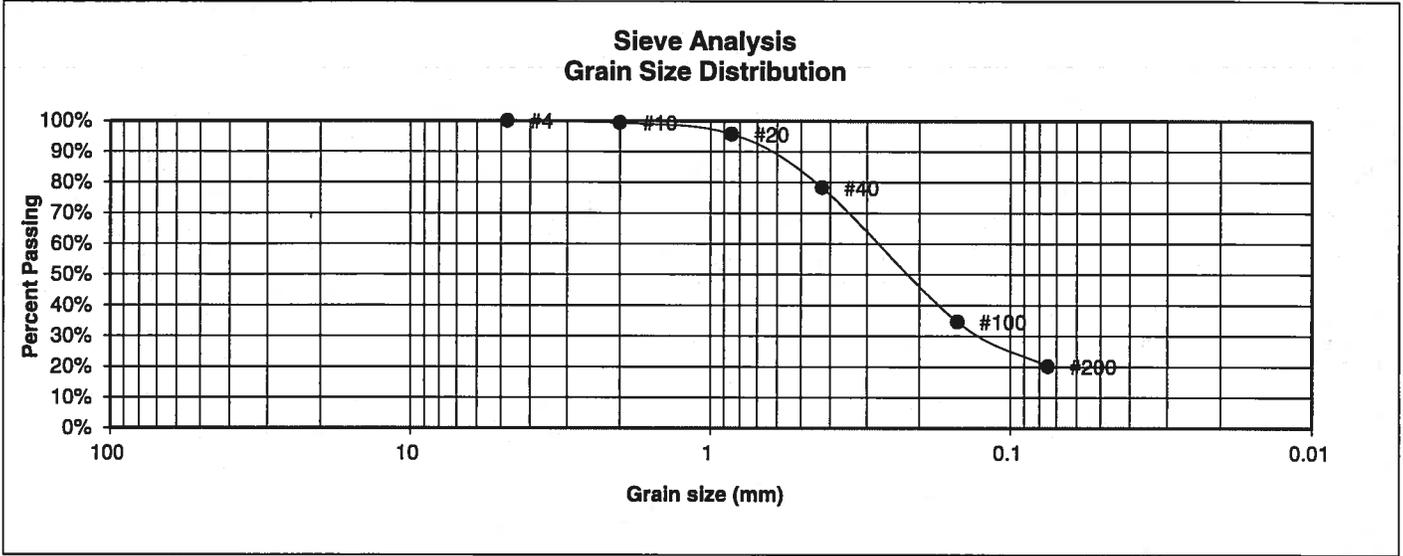
**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>4-26-22</i>
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JOB NO.:  
220689

FIG NO.:  
*B-2*

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	5	<u>JOB NO.</u>	220689
<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"	
4	100.0%
10	99.4%
20	95.7%
40	78.3%
100	34.7%
200	20.2%

- 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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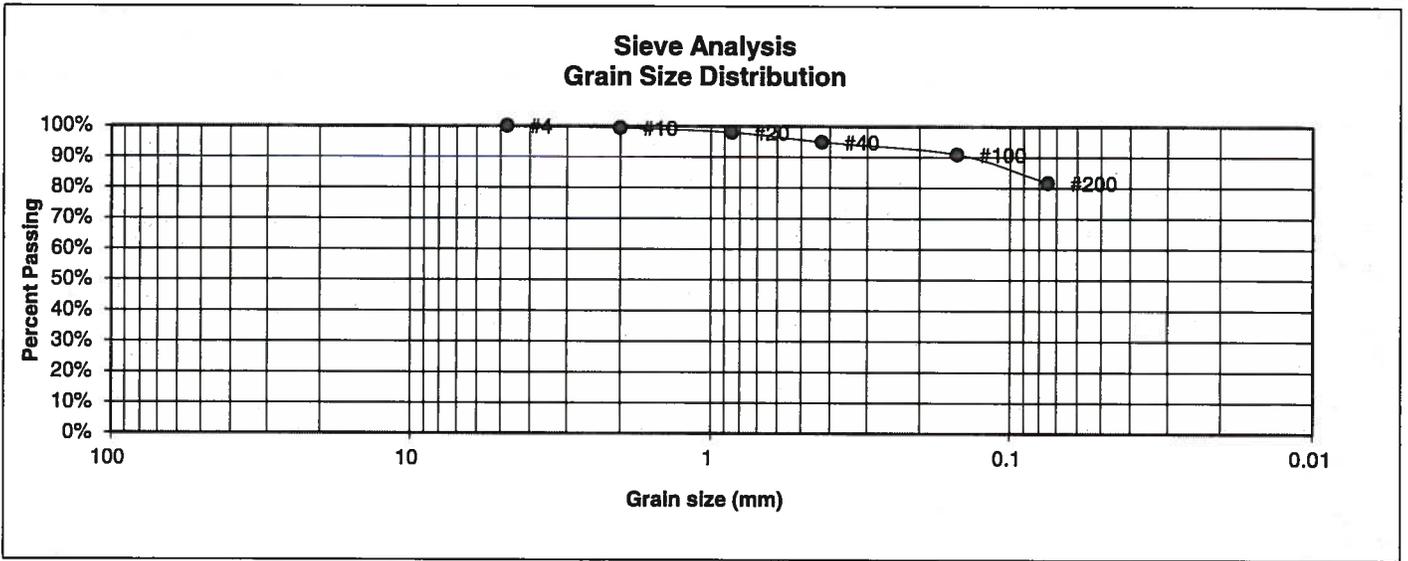
**LABORATORY TEST  
RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>4-26-22</i>
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JOB NO.:  
220689

FIG NO.:  
*B-3*

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	2	<u>JOB NO.</u>	220689
<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"	
4	100.0%
10	99.4%
20	98.0%
40	94.8%
100	90.9%
200	81.7%

<u>Atterberg Limits</u>	
Plastic Limit	19
Liquid Limit	33
Plastic Index	14

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



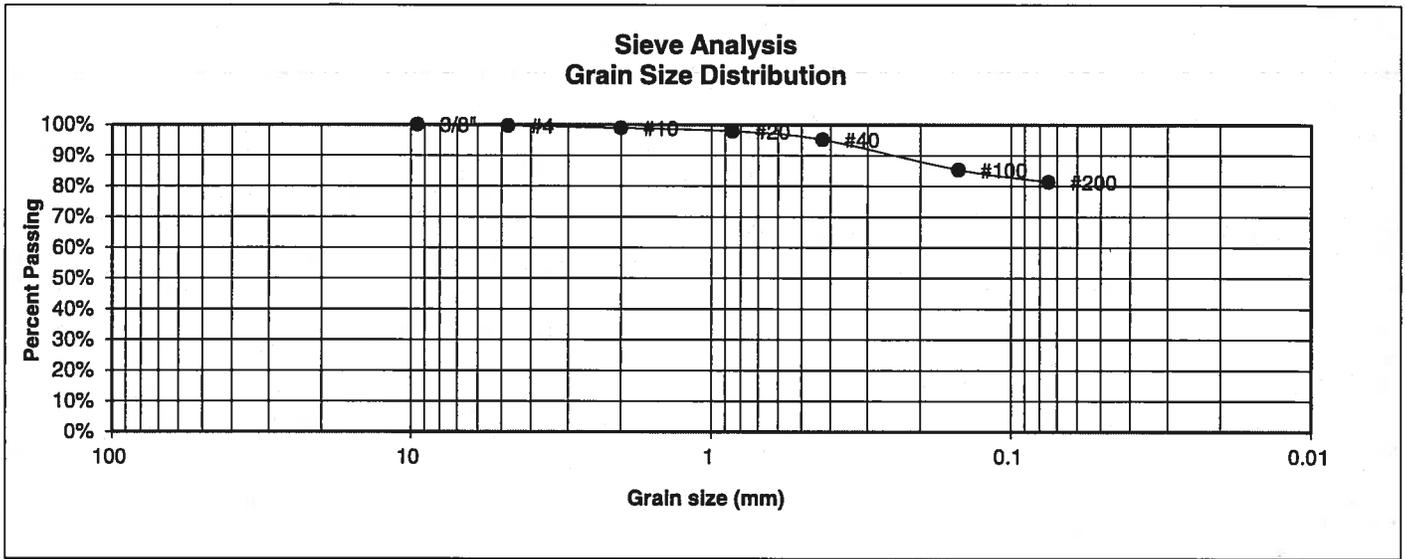
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**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: SW	DATE: 4-26-22
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JOB NO.: 220689  
FIG NO.: B-4

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	6	<u>JOB NO.</u>	220689
<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	99.6%
10	98.9%
20	97.9%
40	95.2%
100	85.3%
200	81.4%

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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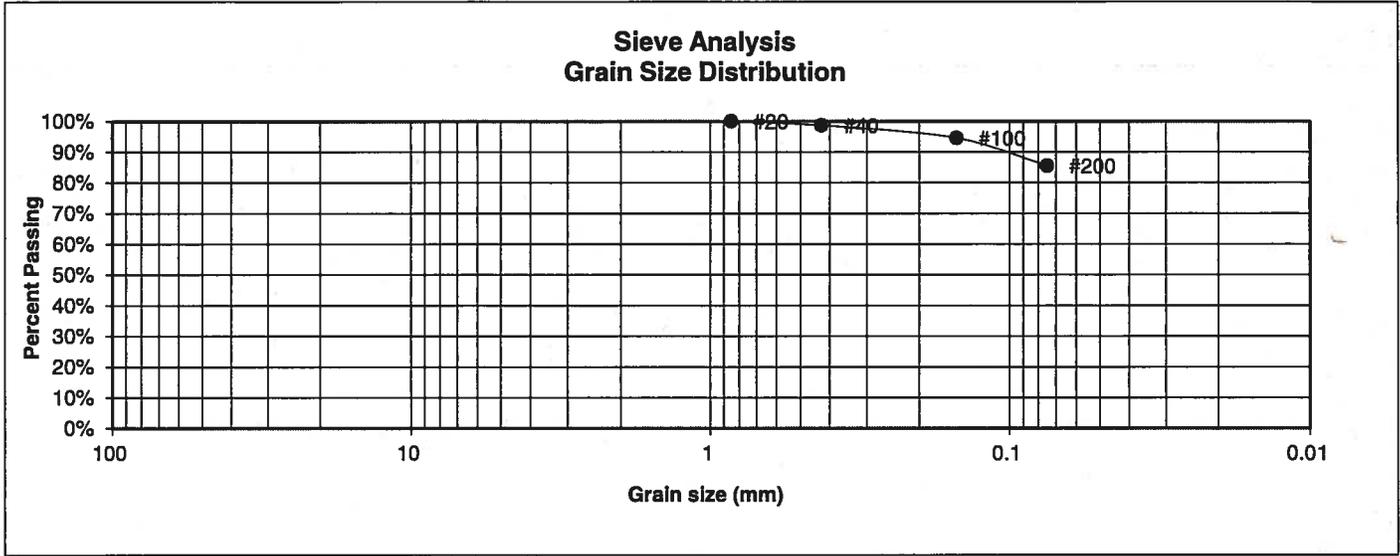
**LABORATORY TEST  
RESULTS**

<u>DRAWN:</u>	<u>DATE:</u>	<u>CHECKED:</u> SW	<u>DATE:</u> 4-26-22
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JOB NO.:  
220689

FIG NO.:  
B-5

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	2	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	7	<u>JOB NO.</u>	220689
<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	
10	
20	100.0%
40	98.7%
100	94.5%
200	85.5%

- Atterberg Limits  
 Plastic Limit  
 Liquid Limit  
 Plastic Index
- Swell  
 Moisture at start  
 Moisture at finish  
 Moisture increase  
 Initial dry density (pcf)  
 Swell (psf)



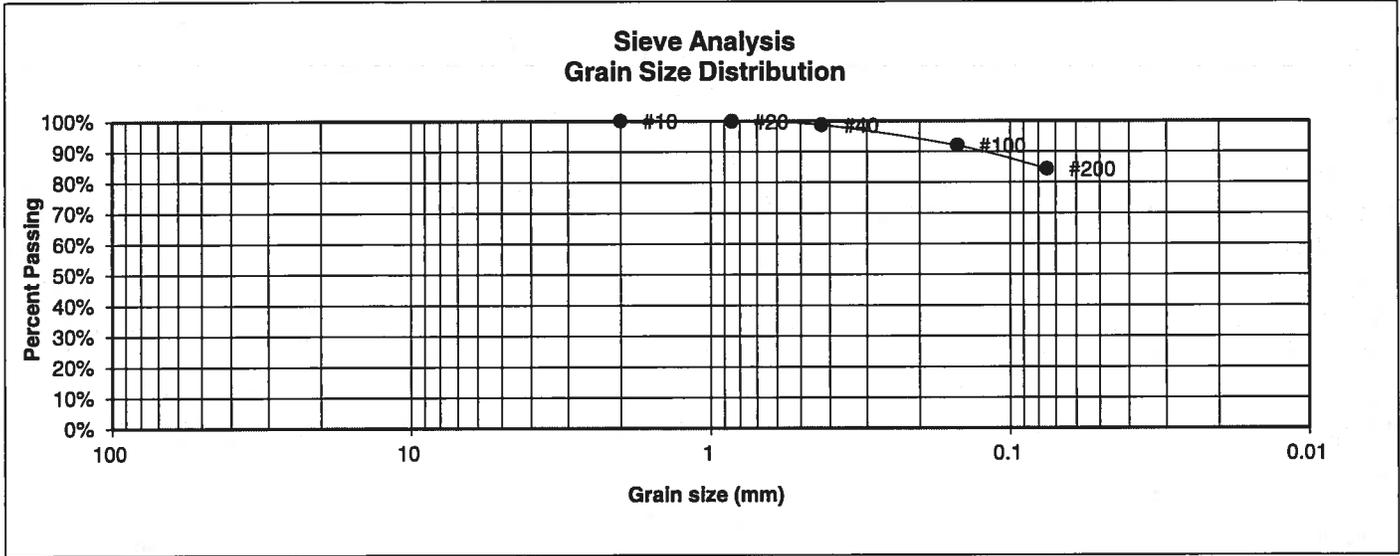
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**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: <i>SW</i>	DATE: <i>4-26-22</i>
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JOB NO.: 220689  
 FIG NO.: *B-6*

<u>UNIFIED CLASSIFICATION</u>	CL	<u>CLIENT</u>	WATERVIEW COMMERCIAL
<u>SOIL TYPE #</u>	3	<u>PROJECT</u>	WATERVIEW EAST DEV.
<u>TEST BORING #</u>	1	<u>JOB NO.</u>	220689
<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	100.0%
20	99.9%
40	98.7%
100	92.0%
200	84.4%

<u>Atterberg Limits</u>	
Plastic Limit	19
Liquid Limit	43
Plastic Index	24

<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>4-26-22</i>
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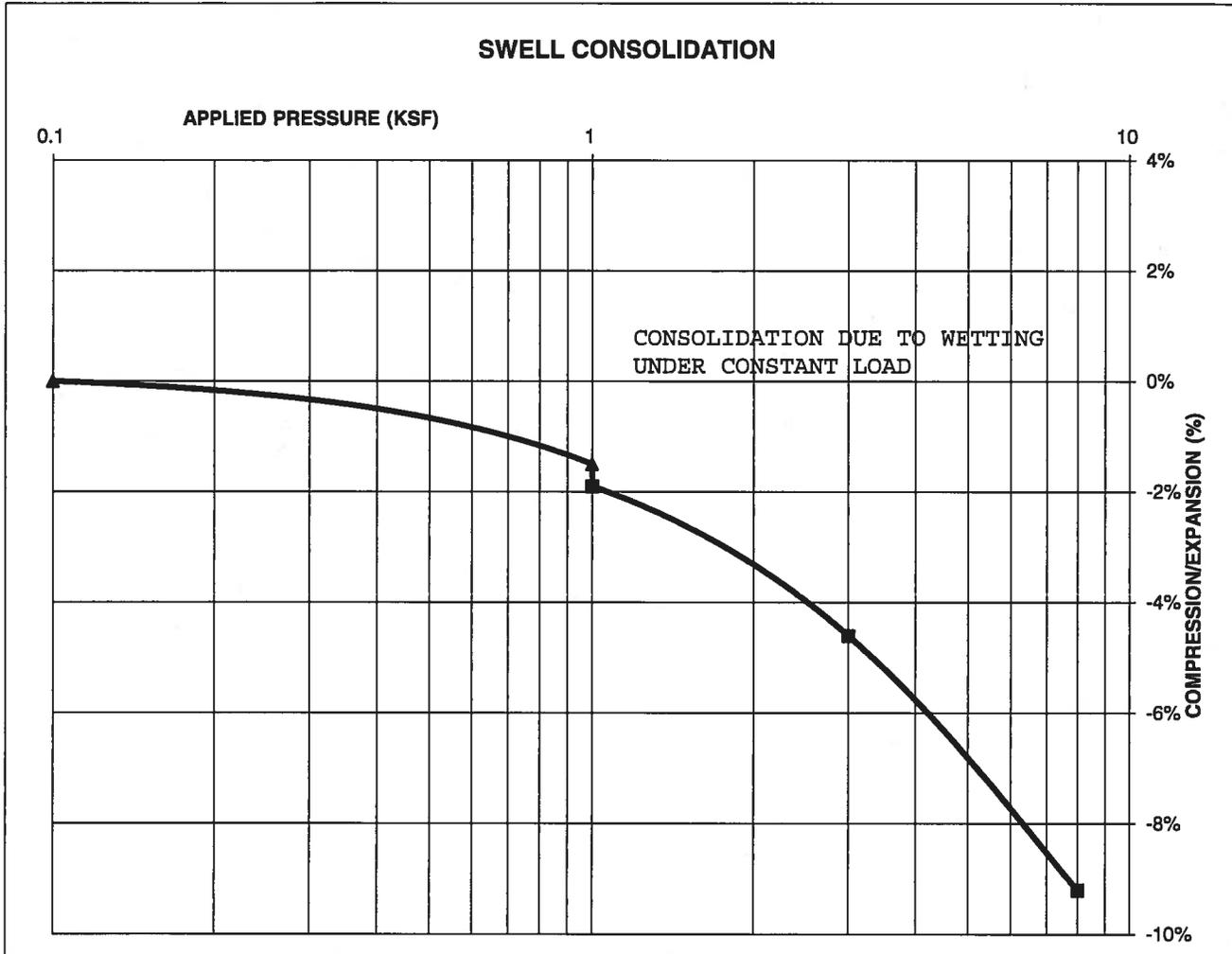
JOB NO.:  
220689

FIG NO.:  
*B-7*

**CONSOLIDATION TEST RESULTS**

TEST BORING #	2	DEPTH(ft)	5
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			90
NATURAL MOISTURE CONTENT			9.7%
SWELL/CONSOLIDATION (%)			-0.4%

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 PROJECT WATERVIEW EAST DEV.



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**SWELL CONSOLIDATION  
 TEST RESULTS**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *4-26-22*

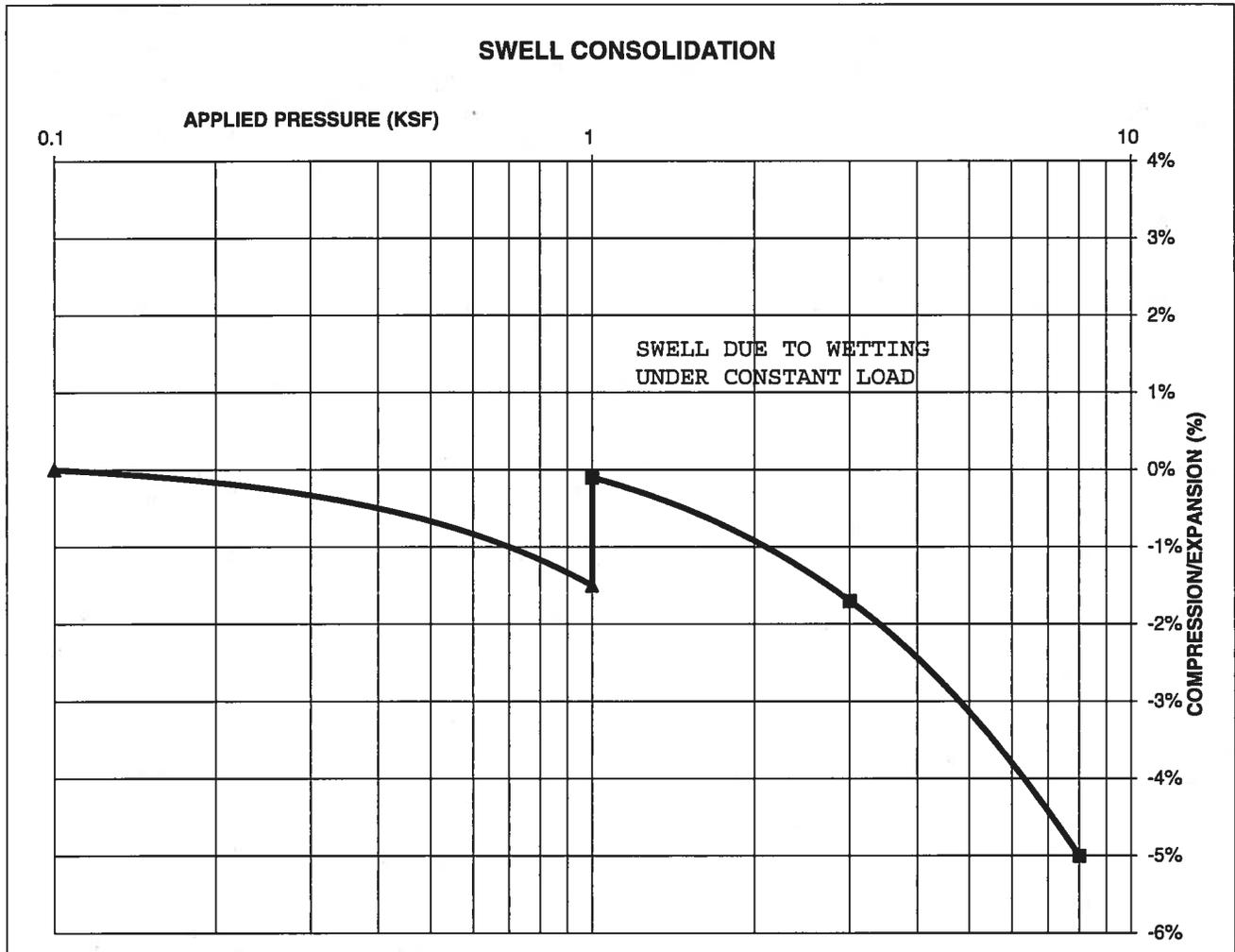
JOB NO:  
 220689

FIG NO:  
*B-8*

**CONSOLIDATION TEST RESULTS**

TEST BORING #	6	DEPTH(ft)	20
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			100
NATURAL MOISTURE CONTENT			21.9%
SWELL/CONSOLIDATION (%)			1.4%

JOB NO. 220689  
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**SWELL CONSOLIDATION  
 TEST RESULTS**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *4-26-22*

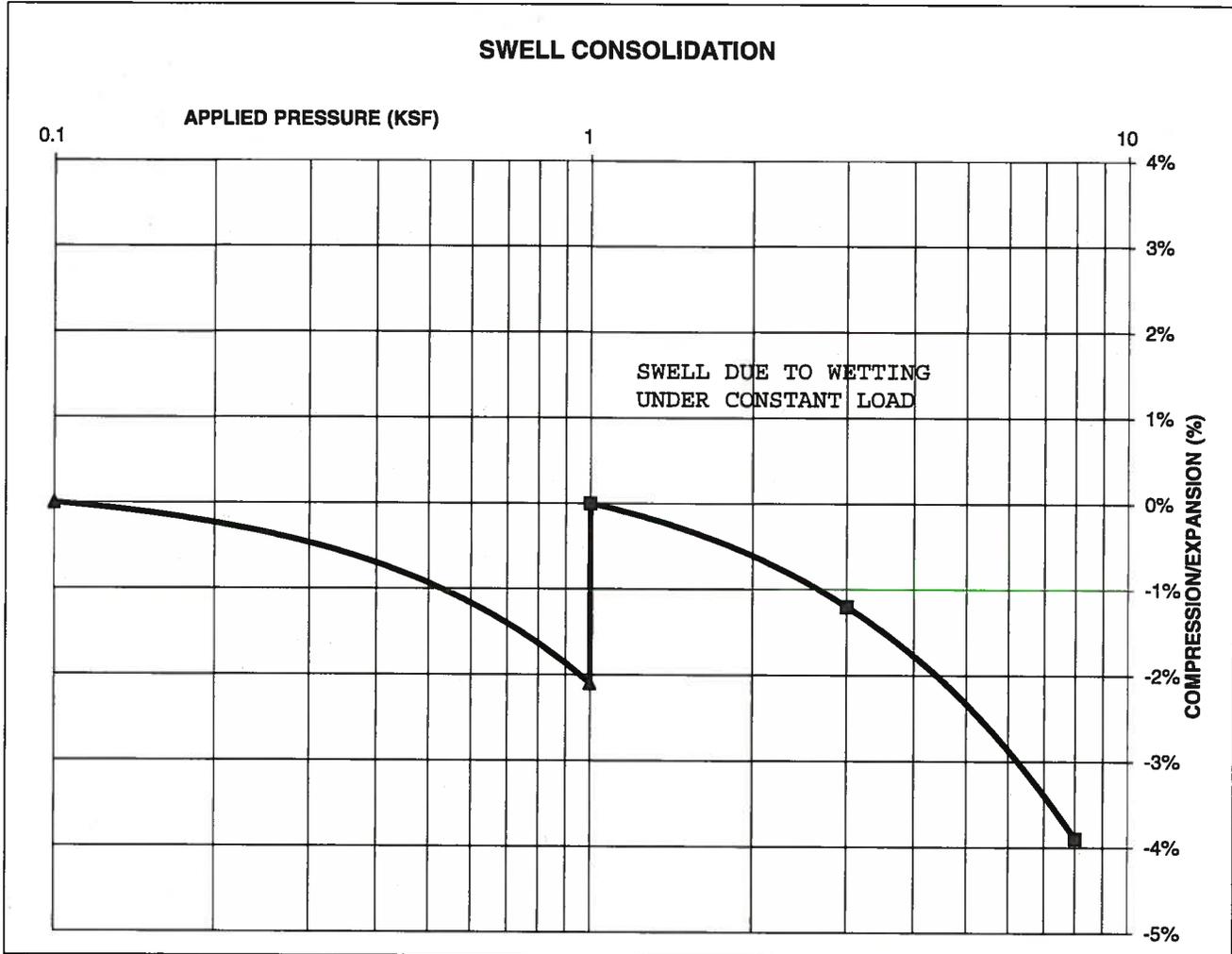
JOB NO.:  
 220689

FIG NO.:  
*B-9*

**CONSOLIDATION TEST RESULTS**

TEST BORING #	1	DEPTH(ft)	15
DESCRIPTION	CL	SOIL TYPE	3
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			13.9%
SWELL/CONSOLIDATION (%)			2.1%

JOB NO. 220689  
 CLIENT WATERVIEW COMMERCIAL  
 PROJECT WATERVIEW EAST DEV.



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**SWELL CONSOLIDATION  
 TEST RESULTS**

DRAWN:

DATE:

CHECKED: *SW*

DATE: *4-26-22*

JOB NO.:  
 220689

FIG NO.:  
*B-10*

