Revised July 16, 2020
March 10, 2020

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
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COLA, LLC
555 Middle Creek Parkway, Suite 200
Colorado Springs, Colorado 80921

Attn: Steven Schoonover

Approved
By: Elizabeth Nijkamp
Date:07/21/2020
El Paso County Planning & Community Development

Re: Pavement Recommendations – 2nd Revision
Trails at Aspen Ridge, Filing 1
El Paso County, Colorado

Dear Mr. Schoonover:

As requested, Entech Engineering, Inc. has obtained samples of the subgrade soils from sections of the roadways in the Trails at Aspen Ridge, Filing 1, in El Paso County, Colorado. Laboratory testing to determine the pavement support characteristics of the soils was performed. This letter presents the results of the laboratory testing and pavement recommendations for the roadways.

Project Description

The roadways in this project consist of the following roadways: Buffalo Horn Drive, Wagon Hammer Drive, Storm Castle Court, Windy Pass Court and Lookout Court, and portions of Sunday Gulch Drive, Falling Rock Drive, Big Johnson Drive and Legacy Hill Drive. The site layout and the locations of the test borings, drilled at approximate 500-foot intervals, are shown on the Test Boring Location Plan, Figure 1.

Subgrade Conditions

Thirty-three exploratory test borings were drilled in the roadways to depths of approximately 5 to 10 feet. The Boring Logs are presented in Appendix A. Based on the test results three soil types were encountered at the subgrade depth. Due to the similarity of the soils, the soils were all grouped into the Soil Type 1 category. Sieve Analysis and Atterberg Limit testing were performed on soil samples obtained from the test borings for the purpose of classification. Sieve analyses performed on the subgrade soils indicated the percent passing the No. 200 sieve ranged from 58 to 99 percent for the Type 1 soils. Atterberg Limit Tests performed on subgrade soil samples resulted in Liquid Limits between 30 to 53 percent and Plastic Indexes between 11 to 31 percent. Soil Type 1 consisted of sandy clay fill and sandy claystone which classified as A-6 and A-7-6 soils based on the AASHTO classification system. Type 1 subgrade soils encountered on in this filing typically have poor pavement support characteristics. Soils with severe sulfate levels are common in this area. Extra sulfate sampling was performed. Sulfate testing of the subgrade indicated that the sulfate levels were in the negligible to moderate potential range for sulfate attack. Groundwater was not encountered in the test borings.

Sulfate testing on site soils indicated the subgrade soils exhibit negligible to severe potential for concrete degradation due to sulfate attack. Type II cement is recommended for the cement treatment of the on-site clay soils which will exhibit a negligible to moderate exposure threat. This includes all negligible to moderate sulfate exposure cement treated soils and for any imported granular fill materials. Due to the variability of the severe sulfate soils, Type V cement is recommended for all cement treated clay soils on the site. Type V cement or equivalent

sulfate resistant materials should be used for all portions of the roadways on this site. If Type V cement is not readily available, the cement supplier shall provide a cement which is highly resistant to sulfate degradation.

Swell/Consolidation testing was conducted on the site subgrade soils which showed swells ranging between 0.8 and 9.9 percent. Many samples were above the level in which mitigation is required (2.0 percent) with a majority of the soils exceeding the swell threshold. These results indicate that soil mitigation due to expansive soils is required for the roadway sections investigated. Mitigation requirements are presented in the "Mitigation" section of the report. Laboratory test results are presented in Appendix B and are summarized on Table 1.

Type 1 soil was the only soil type encountered in the test borings at the subgrade depth. The roadways should be designed using the Soil Type 1 values. California Bearing Ratio (CBR) testing was performed on a sample of the Type 1 soils to determine the support characteristic of the subgrade soils for the roadway sections. The results of the CBR testing are presented in Appendix B and summarized as follows:

Soil Type 1 – Sandy Clay Fill

R @ 90% = 1.0
R @ 95% = 6.0
Use R = 6.0 for design

Classification Testing

Liquid Limit	41
Plasticity Index	22
Percent Passing 200	88.4
AASHTO Classification	A-7-6
Group Index	20
Unified Soils Classification	CL

Pavement Design

The CBR testing was used to determine pavement sections for this site. The pavement sections were determined utilizing the El Paso County "Pavement Design Criteria and Report" and the Traffic Impact and Access Analysis report by LSC Transportation Consultants, LSC Job No. 184362, dated October 15, 2019. Storm Castle Court, Windy Pass Court and Lookout Court (cul-de-sacs) classified as local low-volume roadways which used an 18K ESAL value of 36,500 for design. Buffalo Horn Drive, Wagon Hammer Drive, Sunday Gulch Drive, Falling Rock Court, and Big Johnson Drive classified as urban local roads, which used an 18K ESAL value of 292,000 for design. Legacy Hill Drive from Bradley Road to Frontside Drive classified as an urban non-residential collector which used a modified 18k ESAL value of 2,754,696 for design. Legacy Hill Drive from Frontside Drive to Big Johnson Drive classified as an urban non-residential collector which used an 18K ESAL value of 907,892 for design. Pavement alternatives for asphalt over aggregate basecourse and cement stabilized subgrade sections are provided. Design parameters used in the pavement analysis are as follows:

Reliability (Local Roads)	80%
Reliability (Collector)	85%
Serviceability Index (Local Road/Collector)	2.2/2.5
"R" Value Subgrade Soil Type 1	6.0
Resilient Modulus Soil Type 1	3,126 psi
Structural Coefficients:	
Hot Bituminous Pavement	0.44
Aggregate Basecourse	0.11
Cement Stabilized Subgrade	0.12

Pavement calculations are attached in Appendix C. Pavement sections recommended for the site are summarized as follows:

Pavement Sections – Soil Type 1

Urban Local (low-volume) – ESAL = 36,500 – Storm Castle Court, Windy Pass Court and Lookout Court (cul-de-sacs)

Alternative	Asphalt (in)	Basecourse (in)	Cement Stabilized Subgrade (in.)
1. Asphalt Over Basecourse	4.0	8.0	--
2. Cement Stabilized Subgrade	4.0	--	10.0

Urban Local – ESAL = 292,000 – Buffalo Horn Drive, Wagon Hammer Drive, Sunday Gulch Drive, Falling Rock Court, and Big Johnson Drive

Alternative	Asphalt (in)	Basecourse (in)	Cement Stabilized Subgrade (in.)
1. Asphalt Over Basecourse	5.5	11.0	--
2. Cement Stabilized Subgrade	5.0	--	12.0

Urban Non-Residential Collector – 907,892 – Legacy Hill Drive from Frontside Drive to Big Johnson Drive

Alternative	Asphalt (in)	Basecourse (in)	Cement Stabilized Subgrade (in.)
1. Asphalt Over Basecourse	6.0	15.0	--
2. Cement Stabilized Subgrade	7.0	--	10.0

Urban Non-Residential Collector – 2,754,696 – Legacy Hill Drive from Bradley Road to Frontside Drive

Alternative	Asphalt (in)	Basecourse (in)	Cement Stabilized Subgrade (in.)
1. Asphalt Over Basecourse	7.0	17.0	--
2. Cement Stabilized Subgrade	8.0	--	12.0

Mitigation

El Paso County criteria requires mitigation of expansive soils for roadway subgrade that have a swell of 2 percent or greater with a 150 pound per square foot surcharge. Subgrade samples tested resulted in swells of 0.8 to 9.9 percent under a 150 pound per square foot surcharge. Overexcavation and cement-stabilization is required due to expansive soils in the roadway sections included in this investigation. Moisture conditioning alone did not lower the swells to an acceptable level. Soil cement testing was performed to evaluate the swell potentials when mixed with 2 and 4 percent (by weight) of cement. Testing indicated that the swell potentials dropped to acceptable levels when treated with 4% cement. The soil cement depths will be 10 to 12-inches as shown in the tables above. These sections will provide an adequate layer of cement prepared subgrade to reduce the swells to acceptable levels. Testing during construction is recommended to verify the cement-treated subgrade meets the requirements. It should also be noted that the filing overlot fill soils were moisture-conditioned and compacted.

Roadway Construction – Cement Stabilized Subgrade Alternative

Due to the highly expansive nature of the subgrade soils, overexcavation and cement-treatment of the subgrade to a depth of 10 to 12 inches is required (See Tables above). The subgrade shall be stabilized by the addition of cement to a depth of 10 inches for the low volume roads and 12 inches for the local and urban non-residential collector roads. The amount of cement applied shall be 4.0 percent (by weight) of the subgrade's maximum dry density as determined by the Standard Proctor Test (ASTM D-698) based on laboratory cement stabilization testing. The cement should be spread evenly on the subgrade surface and be thoroughly mixed into the subgrade over the recommended 10 and 12-inch depths such that a uniform blend of soil and cement is achieved. Prior to application or mixing of the cement, the subgrade should be thoroughly moisture conditioned to the soil's optimum water content or as much as 3 to 4 percent more than the optimum water content as necessary to provide a compactable soil condition. Densification of the cement-stabilized subgrade should be completed to obtain a compaction of at least 95 percent of the subgrade maximum dry density as determined by the Standard Proctor Test (ASTM D-698). Satisfactory compaction of the subgrade shall occur within 90 minutes from the time of mixing the cement into the subgrade.

The following conditions shall be observed as part of the subgrade stabilization:

- Type V or equivalent sulfate resistant cement as supplied by a local supplier shall be used. All cement used for stabilization should come from the same source. If cement sources are changed a new laboratory mix design should be completed.

- Moisture conditioning of the subgrade and/or mixing of the cement into the subgrade shall not occur when soil temperatures are below 40° F. Cement treated subgrades should be maintained at a temperature of 40° F or greater until the subgrade has been compacted as required.

- Cement placement, cement mixing and compaction of the cement treated subgrade should be observed by a Soils Engineer. The Soils Engineer should complete in situ compaction tests and construct representative compacted specimens of the treated subgrade material for subsequent laboratory quality assurance testing.

If significant grading is performed, the soils at subgrade may change. Modification to the pavement sections should be evaluated after site grading is completed.

In addition to the above guidance, the asphalt, cement, subgrade conditions, compaction of materials and roadway construction methods shall meet the El Paso County specifications.

We trust that this has provided you with the information you required. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Daniel P. Stegman

DPS/bs

Encl.

Entech Job No. 191931
AAprojects/2019/191931/191931 pr-Rev2

Reviewed by:

COLORADO LICENSED MARK HOWARD HAUSCHILD 35140 7/11/2020 PROFESSIONAL ENGINEER

Mark H. Hauschild, P.E.
Senior Engineer

TABLE

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

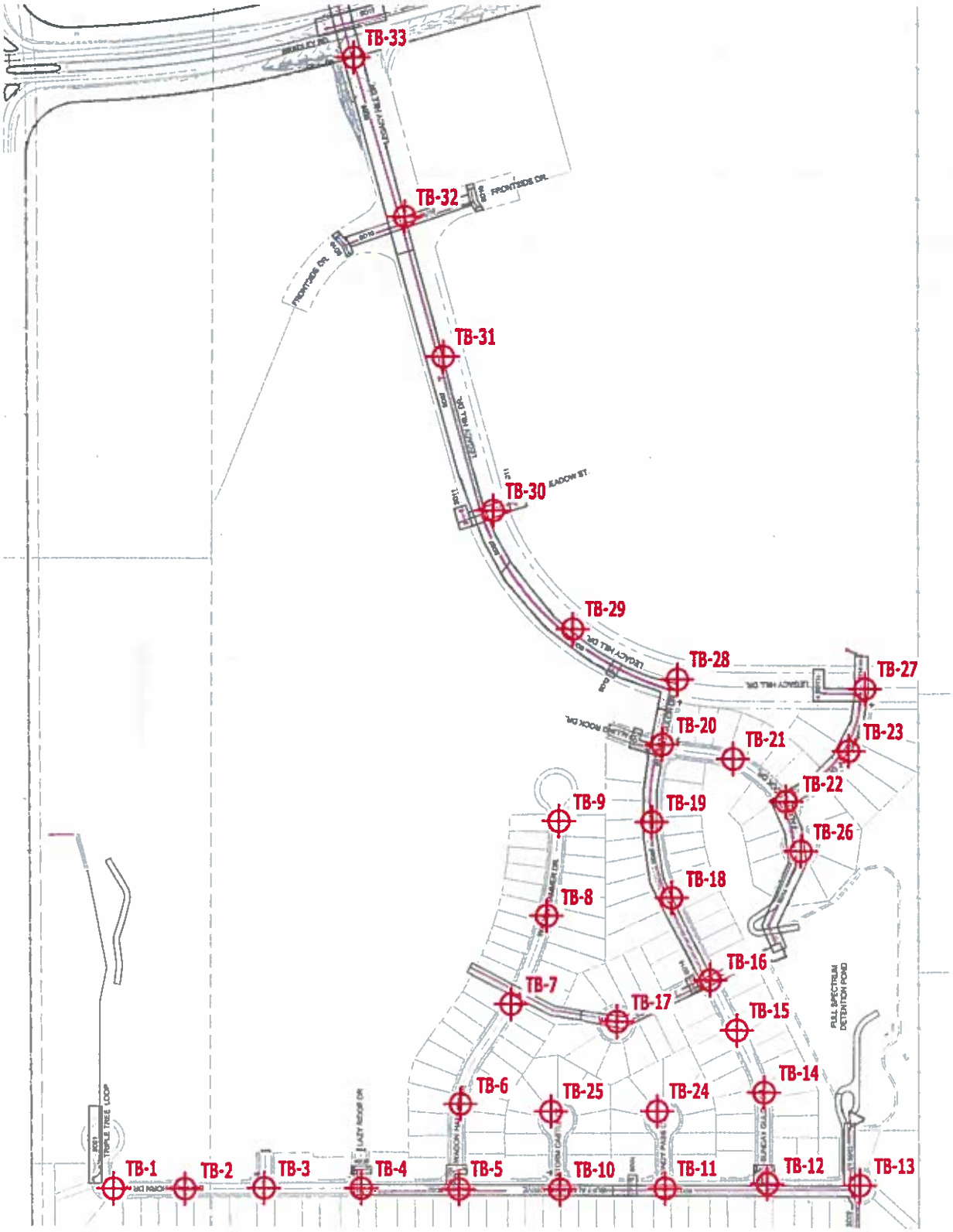
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE
JOB NO. 191931

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	AASHTO CLASS.	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1, CBR	1	0-3	12.6	108.5	88.4	41	22		A-7-6	2.4*	CL	FILL, CLAY, SANDY
1, CBR	1	0-3	14.2	109.5						1.7*	CL	FILL, CLAY, SANDY
1	1	1-2	17.3	107.3	96.0	45	22	0.07	A-7-6	6.7	CL	FILL, CLAY, SANDY
1	1	1-2	19.6	110.1						4.7*	CL	FILL, CLAY, SANDY
1	2	1-2	16.2	111.7	90.9	50	30	0.13	A-7-6	7.1	CH	FILL, CLAY, SANDY
1	2	1-2	17.5	110.3						5.5*	CH	FILL, CLAY, SANDY
1	3	1-2	14.1	111.3	87.5	48	28	0.14	A-7-6	3.7	CL	FILL, CLAY, SANDY
1	3	1-2	16.2	109.8						2.9*	CL	FILL, CLAY, SANDY
1	4	1-2	13.7	111.4	91.1	49	28	0.26	A-7-6	7.6	CL	FILL, CLAY, SANDY
1	4	1-2	15.1	113.2						5.4*	CL	FILL, CLAY, SANDY
1	5	1-2	15.3	111.1	89.0	47	28	0.14	A-7-6	5.0	CL	FILL, CLAY, SANDY
1	5	1-2	18.9	106.8						2.7*	CL	FILL, CLAY, SANDY
1	6	1-2	13.5	115.2	87.7	46	23	0.14	A-7-6	8.4	CL	FILL, CLAY, SANDY
1	6	1-2	20.1	109.8						2.9*	CL	FILL, CLAY, SANDY
1	7	1-2	16.8	110.8	76.2	43	24	0.08	A-7-6	2.3	CL	FILL, CLAY, SANDY
1	8	1-2	12.0	119.1	93.8	44	25	0.12	A-7-6	8.9	CL	FILL, CLAY, SANDY
1	9	1-2	15.6	113.0	88.4	48	29	0.13	A-7-6	3.3	CL	FILL, CLAY, SANDY
1	10	1-2	13.1	118.7	64.9	36	20	0.19	A-6	4.6	CL	FILL, CLAY, SANDY
1	10	1-2	16.7	107.2						2.2*	CL	FILL, CLAY, SANDY
1	11	1-2	14.5	112.5	83.0	48	21	0.18	A-7-6	8.2	CL	FILL, CLAY, SANDY
1	12	1-2	18.3	108.8	82.2	46	22	0.22	A-7-6	2.6	CL	FILL, CLAY, SANDY
1	13	1-2	16.9	106.0	88.2	48	26	0.14	A-7-6	2.8	CL	FILL, CLAY, SANDY
1	13	1-2	19.4	110.0						2.1*	CL	FILL, CLAY, SANDY
1	14	1-2	20.4	103.3	91.1	42	22	0.17	A-7-6	0.8	CL	FILL, CLAY, SANDY
1	15	1-2	16.4	111.4	93.4	39	17	0.16	A-6	2.0	CL	FILL, CLAY, SANDY
1	16	1-2	14.9	113.4	83.0	42	23	0.11	A-7-6	3.9	CL	FILL, CLAY, SANDY
1	17	1-2	16.0	108.1	89.5	39	17	0.11	A-6	2.7	CL	FILL, CLAY, SANDY
1	17	1-2	19.5	104.2						2.3*	CL	FILL, CLAY, SANDY
1	18	1-2	11.7	117.8	86.7	42	21	0.21	A-7-6	3.0	CL	FILL, CLAY, SANDY
1	19	1-2	13.5	111.8	79.5	41	18	0.21	A-7-6	2.5	CL	FILL, CLAY, SANDY
1	20	1-2	13.3	116.5	85.4	30	11	0.13	A-6	3.5	CL	FILL, CLAY, SANDY
1	21	1-2	17.2	113.4	94.4	42	20	0.26	A-7-6	4.4	CL	FILL, CLAY, SANDY
1	22	1-2	19.5	109.1	89.4	47	31	0.14	A-7-6	1.4	CL	FILL, CLAY, SANDY
1	23	1-2	13.0	113.2	90.4	40	22	0.22	A-7-6	1.4	CL	FILL, CLAY, SANDY
1	25	0-3			86.6	38	22		A-6		CL	FILL, CLAY, SANDY
1	24	1-2	11.4	113.2	87.0	36	19	0.03	A-6	4.6	CL	FILL, CLAY, SANDY
1	24	1-2	17.5	102.7						1.4*	CL	FILL, CLAY, SANDY
1	25	1-2	19.8	108.3	86.4	38	19	0.07	A-6	2.3	CL	FILL, CLAY, SANDY
1	25	1-2	27.6	90.7						0.8*	CL	FILL, CLAY, SANDY
1	26	1-2	14.0	115.6	95.0	41	22	0.26	A-7-6	2.3	CL	FILL, CLAY, SANDY
1	26	1-2	22.7	98.6						0.8*	CL	FILL, CLAY, SANDY
1	28	1-2	13.8	115.9	90.3	39	22	0.16	A-6	3.3	CL	FILL, CLAY, SANDY
1	28	1-2	20.3	100.4						1.6*	CL	FILL, CLAY, SANDY

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	AASHTO CLASS.	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	29	1-2	12.2	117.3	57.5	29	13	0.20	A-6	0.5	CL	FILL, CLAY, VERY SANDY
1	32	1-2	16.0	110.6	91.1	41	23	0.10	A-7-6	2.3	CL	FILL, CLAY, SANDY
1	32	1-2	23.2	98.3						0.8*	CL	FILL, CLAY, SANDY
1	33	1-2	13.6	110.7	68.7	35	18	0.29	A-6	1.1	CL	FILL, CLAY, SANDY
1A	28	10			34.2	NV	NP		A-2-4		SM	SAND, SILTY
2	27	1-2	12.7	119.6	97.7	44	26	0.26	A-7-6	10.6	CL	CLAYSTONE, SANDY
2	27	1-2	21.1	95.0						1.4*	CL	CLAYSTONE, SANDY
2	30	1-2	17.4	105.6	97.6	52	29	0.23	A-7-6	8.5	CH	CLAYSTONE, SANDY
2	30	1-2	26.8	93.0						3.7*	CL	CLAYSTONE, SANDY
2	31	1-2	15.3	104.8	97.9	53	29	0.09	A-7-6	6.0	CH	CLAYSTONE, SANDY
2	31	1-2	23.6	96.4						3.9*	CL	CLAYSTONE, SANDY
2	12	10	17.3	109.4	99.0	50	30		A-7-6	1.5	CL	CLAYSTONE, SANDY
2	17	10	15.8	115.2	76.8	39	22	0.33	A-6	5.3	CL	CLAYSTONE, SANDY
2	17	10	17.4	101.3						3.0*	CL	CLAYSTONE, SANDY
2	23	5	13.1	120.9	76.9	42	26		A-7-6	9.9	CL	CLAYSTONE, SANDY

* - REMOLDED SAMPLE

FIGURE



TB-2- APPROXIMATE TEST BORING LOCATION AND NUMBER

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

TEST BORING LOCATION PLAN
THE TRAILS OF ASPEN RIDGE
COLORADO SPRINGS, CO
FOR: COLA, LLC

DRAWN BY:	DATE DRAWN:	DESIGNED BY:	CHECKED:
EDK	03/13/20	DS	DPS

JOB NO.: 191931

FIG. NO.: 1

APPENDIX A: Test Boring Logs

TEST BORING NO. 1
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 10', 11/4/19						
FILL 0-10', CLAY, SANDY, BROWN, FIRM TO VERY STIFF, MOIST				20	14.5	1
	5			10	13.4	1
	10			36	8.3	1
	15					
	20					

TEST BORING NO. 2
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, FIRM TO STIFF, MOIST				14	15.2	1
	5			19	15.6	1
	10					
	15					
	20					

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO: 191931
FIG NO: A- 1

TEST BORING NO. 3
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, FIRM, MOIST				12	10.9	1
	5			14	9.4	1
	10					
	15					
	20					

TEST BORING NO. 4
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST				24	13.2	1
	5			29	12.0	1
	10					
	15					
	20					

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: A- 2

TEST BORING NO. 5
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 10', 11/4/19						
FILL 0-10', CLAY, SANDY, BROWN, STIFF TO HARD, MOIST				19	16.2	1
	5			22	10.1	1
	10			50	14.4	1
	15					
	20					

TEST BORING NO. 6
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST				20	13.4	1
	5			16	12.9	1
	10					
	15					
	20					

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: A- 3

TEST BORING NO. 7
DATE DRILLED 11/4/2019
Job # 191931

REMARKS

DRY TO 10', 11/4/19

FILL 0-4', CLAY, SANDY, BROWN, STIFF TO HARD, MOIST

CLAYSTONE, SANDY, BROWN, HARD, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	18.1	1
5			50/6"	10.6	2
10			50/5"	9.5	2
15					
20					

TEST BORING NO. 8
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 5', 11/4/19

FILL 0-5', CLAY, SANDY, BROWN, VERY STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			44	11.5	1
5			34	14.7	1
10					
15					
20					

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO: 191931
FIG NO: A- 4

TEST BORING NO. 9
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, STIFF TO FIRM MOIST				17	12.7	1
	5			12	12.4	1
	10					
	15					
	20					

TEST BORING NO. 10
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, VERY STIFF TO STIFF, MOIST				32	13.1	1
	5			24	6.1	1
	10					
	15					
	20					

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: A- 5

TEST BORING NO. 11
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST				26	12.9	1
	5			23	13.0	1
	10					
	15					
	20					

TEST BORING NO. 12
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 10', 11/4/19						
FILL 0-9', CLAY, SANDY, BROWN, STIFF TO FIRM, MOIST				15	15.7	1
	5			8	16.7	1
WEATHERED CLAYSTONE, SANDY, BROWN, VERY STIFF, MOIST	10			40	15.8	2
	15					
	20					

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO: 191931
FIG NO: A- 6

TEST BORING NO. 13
DATE DRILLED 11/4/2019
Job # 191931

REMARKS

DRY TO 5', 11/4/19

FILL 0-5', CLAY, SANDY, BROWN, STIFF TO FIRM, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			16	15.5	1
5			12	16.0	1
10					
15					
20					

TEST BORING NO. 14
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 5', 11/4/19

FILL 0-5', CLAY, SANDY, BROWN, FIRM, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			13	18.8	1
5			11	14.4	1
10					
15					
20					

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: A- 7

TEST BORING NO. 15
DATE DRILLED 11/4/2019
Job # 191931

TEST BORING NO. 16
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST				18	13.2	1
	5			20	14.0	1
	10					
	15					
	20					

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 10', 11/4/19						
FILL 0-10', CLAY, SANDY, BROWN, STIFF TO FIRM, MOIST				16	13.8	1
	5			14	15.2	1
	10			19	17.8	1
	15					
	20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/4/19

JOB NO.: 191931
FIG NO.: A- 8

TEST BORING NO. 17
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 10', 11/4/19						
FILL 0-9', CLAY, SANDY, BROWN, STIFF, MOIST				20	12.6	1
	5			11	11.8	1
CLAYSTONE, SANDY, BROWN, HARD, MOIST	10			50/6"	12.6	2
	15					
	20					

TEST BORING NO. 18
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST				28	15.2	1
	5			19	13.2	1
	10					
	15					
	20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: A-9

TEST BORING NO. 19
DATE DRILLED 11/4/2019
Job # 191931

REMARKS

DRY TO 5', 11/4/19

FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			24	11.8	1
5			22	16.4	1
10					
15					
20					

TEST BORING NO. 20
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 10', 11/4/19

FILL 0-10', CLAY, SANDY, BROWN, STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			23	11.2	1
5			24	12.2	1
10			21	13.6	1
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO: 191931
FIG NO: A-10

TEST BORING NO. 21
DATE DRILLED 11/4/2019
Job # 191931

REMARKS

DRY TO 5', 11/4/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST		25	17.2	1
5			26	14.3	1
10					
15					
20					

TEST BORING NO. 22
DATE DRILLED 11/4/2019
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 10', 11/4/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	FILL 0-10', CLAY, SANDY, BROWN, FIRM TO VERY STIFF, MOIST		25	16.3	1
5			23	16.1	1
10			19	12.8	1
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		M	12/9/19

JOB NO.: 191931
FIG NO.: A-11

TEST BORING NO. 23
DATE DRILLED 11/4/2019
Job # 191931

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 11/4/19						
FILL 0-4', CLAY, SANDY, BROWN, FIRM TO VERY STIFF, MOIST				16	12.6	1
CLAYSTONE, SANDY, BROWN, HARD, MOIST	5			50/10"	10.9	2
	10					
	15					
	20					

TEST BORING NO. 24
DATE DRILLED 2/12/2020
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 5', 2/12/20						
FILL 0-5', CLAY, SANDY, BROWN, STIFF TO FIRM, MOIST				17	11.0	1
	5			10	11.6	1
	10					
	15					
	20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:

JOB NO.: 191931
FIG NO.: A-12

TEST BORING NO. 25
DATE DRILLED 2/12/2020
Job # 191931

REMARKS

DRY TO 5', 2/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-5', CLAY, SANDY, BROWN, FIRM, MOIST					
			11	18.9	1
5			11	12.5	1
10					
15					
20					

TEST BORING NO. 26
DATE DRILLED 2/12/2020
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 10', 2/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST					
			28	13.7	1
5			19	12.6	1
10			28	13.5	1
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:

JOB NO: 191931
FIG NO: A-13

TEST BORING NO. 27
DATE DRILLED 2/12/2020
Job # 191931

REMARKS

DRY TO 5', 2/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			7	13.9	1
			50		2
5			50/10"	11.4	2
10					
15					
20					

FILL 0-1.5', CLAY, SANDY, TAN, FIRM, MOIST

CLAYSTONE, SANDY, TAN, HARD, MOIST

TEST BORING NO. 28
DATE DRILLED 2/12/2020
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 10', 2/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			34	13.7	1
5			23	14.5	1
10			25	5.7	1A
15					
20					

FILL 0-9', CLAY, SANDY, BROWN, STIFF, MOIST

TOPSOIL, SAND, SILTY, FINE GRAINED, DARK BROWN, MEDIUM DENSE, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:

JOB NO.: 191931

FIG NO.: A-14

TEST BORING NO. 29
DATE DRILLED 2/12/2020
Job # 191931

REMARKS

DRY TO 5', 2/12/20

FILL 0-5', CLAY, VERY SANDY, BROWN, STIFF, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			23	15.5	1
5			19	8.0	1
10					
15					
20					

TEST BORING NO. 30
DATE DRILLED 2/12/2020
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 10', 2/12/20

FILL 0-1', CLAY, SANDY, BROWN

CLAYSTONE, SANDY, BROWN, HARD, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/9"	16.5	2
5			50/8"	14.4	2
10			50/10"	14.2	2
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:

JOB NO.: 191931
FIG NO.: A-15

TEST BORING NO. 31
DATE DRILLED 2/12/2020
Job # 191931

REMARKS

DRY TO 5', 2/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50	14.5	2
5			50	16.6	2
10					
15					
20					

FILL 0-1', CLAY, SANDY, BROWN
CLAYSTONE, SANDY, BROWN, HARD, MOIST

TEST BORING NO. 32
DATE DRILLED 2/12/2020
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 10', 2/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			25	15.0	1
5			31	13.7	1
10			20	11.8	1
15					
20					

FILL 0-10', CLAY, SANDY, BROWN, STIFF TO VERY STIFF, MOIST

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TEST BORING LOG

DRAWN	DATE	CHECKED	DATE

JOB NO.
191931
FIG NO.
A-16

TEST BORING NO. 33
DATE DRILLED 2/12/2020
Job # 191931

TEST BORING NO.
DATE DRILLED
CLIENT COLA, LLC
LOCATION TRAILS AT ASPEN RIDGE

REMARKS

DRY TO 5', 2/12/20

REMARKS

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Description
			26	15.7	1	FILL 0-5', CLAY, SANDY, BROWN, STIFF, MOIST
5			28	18.3	1	
10						
15						
20						

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

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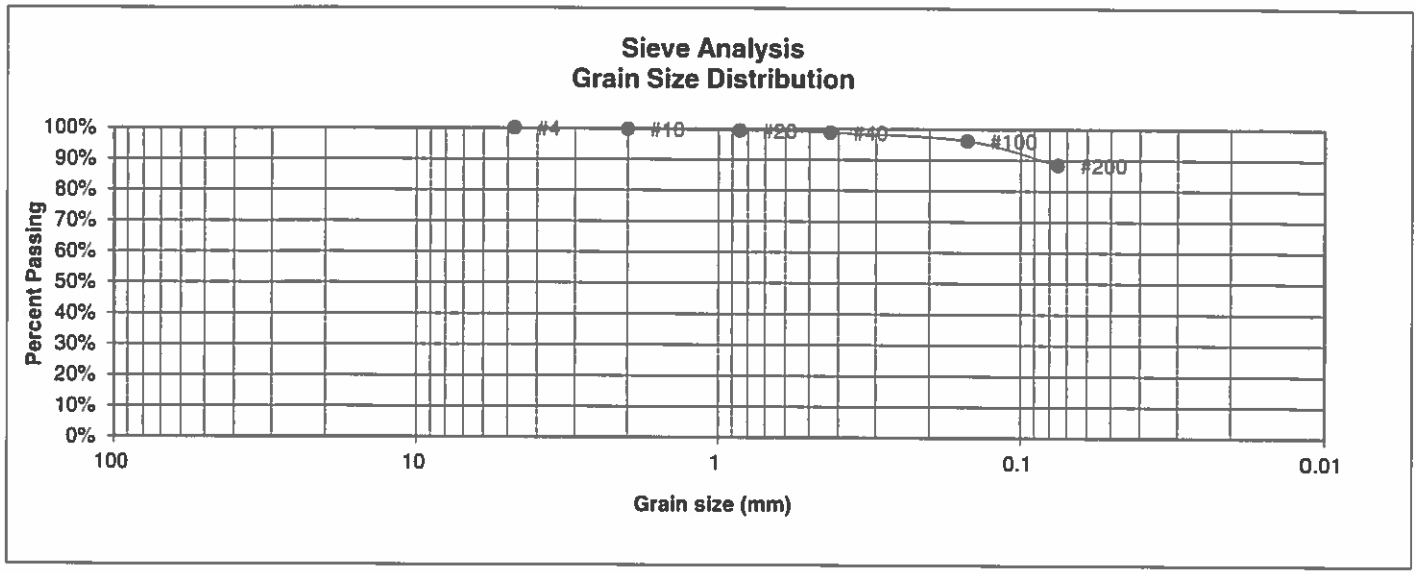
TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:

JOB NO.: 191931
FIG NO.: A-7

APPENDIX B: Laboratory Test Results

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1, CBR	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	1	JOB NO.	191931
DEPTH (FT)	0-3	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	20



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	99.3%
40	98.8%
100	96.2%
200	88.4%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	41
Plastic Index	22

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

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COLORADO SPRINGS, COLORADO 80907

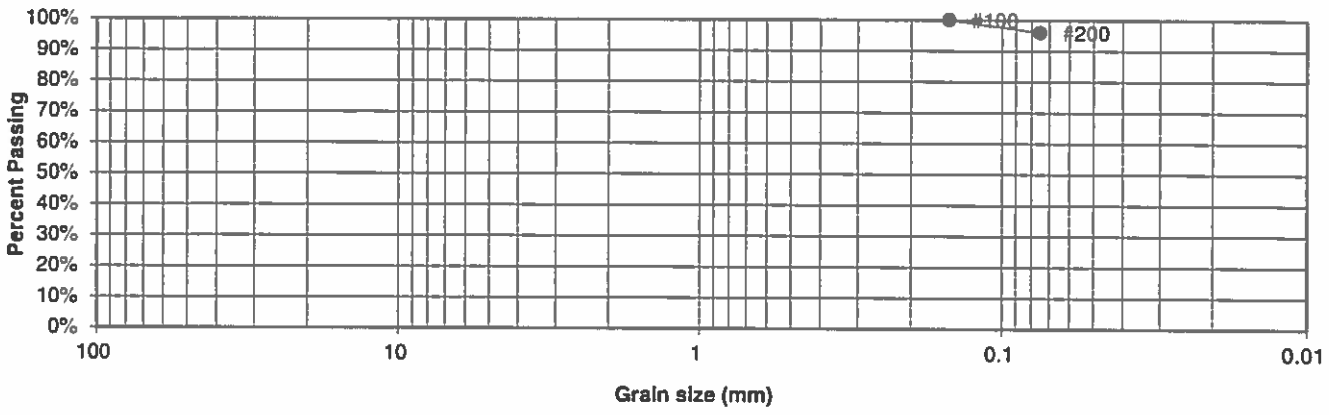
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-1

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	1	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	24

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	96.0%

Atterberg Limits

Plastic Limit	24
Liquid Limit	45
Plastic Index	22

Swell

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

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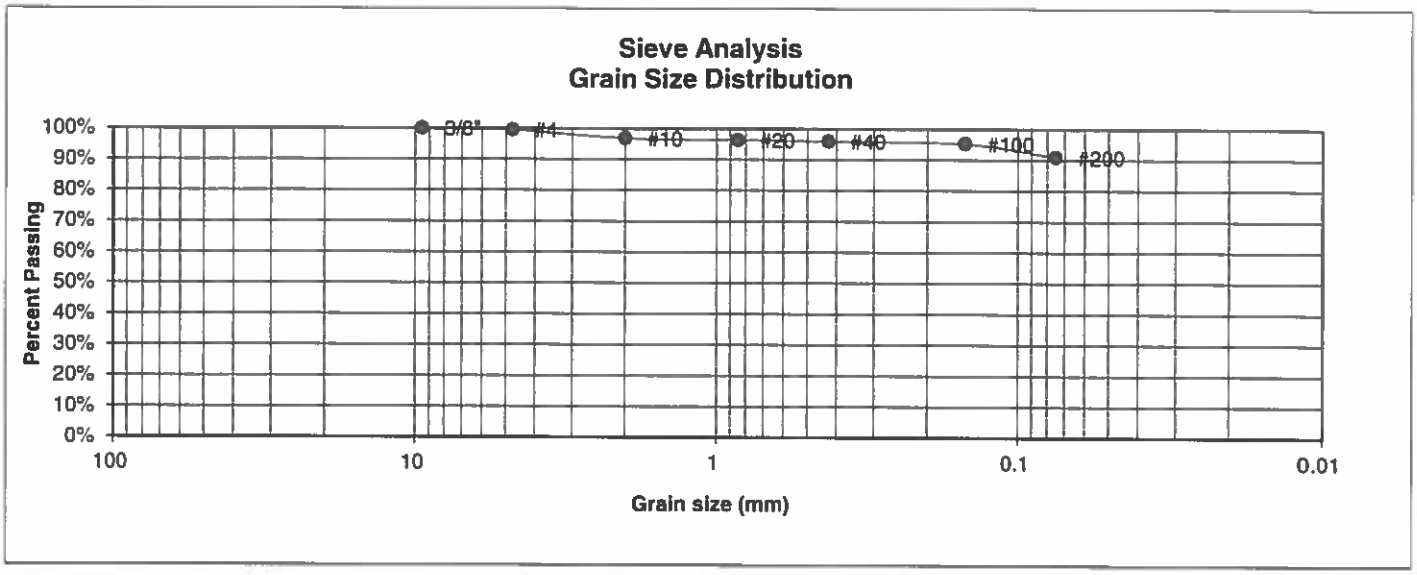
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/15

JOB NO.: 191931
FIG NO.: B-2

UNIFIED CLASSIFICATION	CH	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	2	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	29



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	96.8%
20	96.3%
40	95.9%
100	95.2%
200	90.9%

Atterberg Limits	
Plastic Limit	20
Liquid Limit	50
Plastic Index	30

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

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505 ELKTON DRIVE
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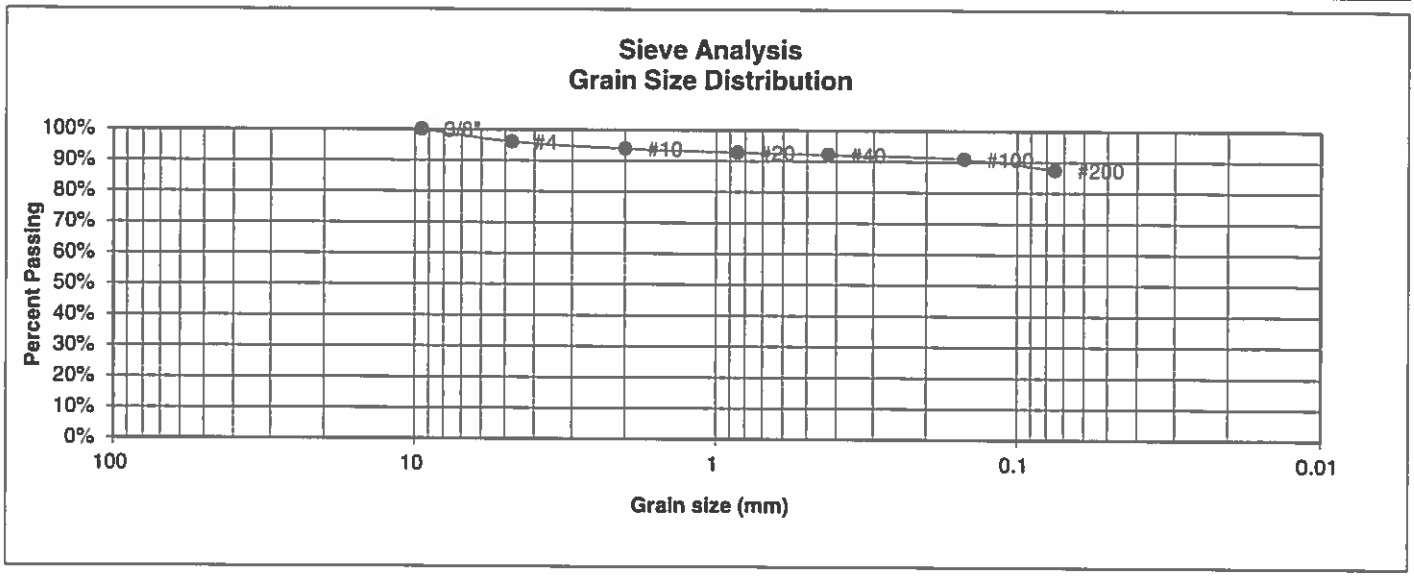
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/14

JOB NO.: 191931
FIG NO.: B-3

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	3	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	26



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.1%
10	93.9%
20	92.7%
40	92.1%
100	90.9%
200	87.5%

Atterberg Limits

Plastic Limit	20
Liquid Limit	48
Plastic Index	28

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
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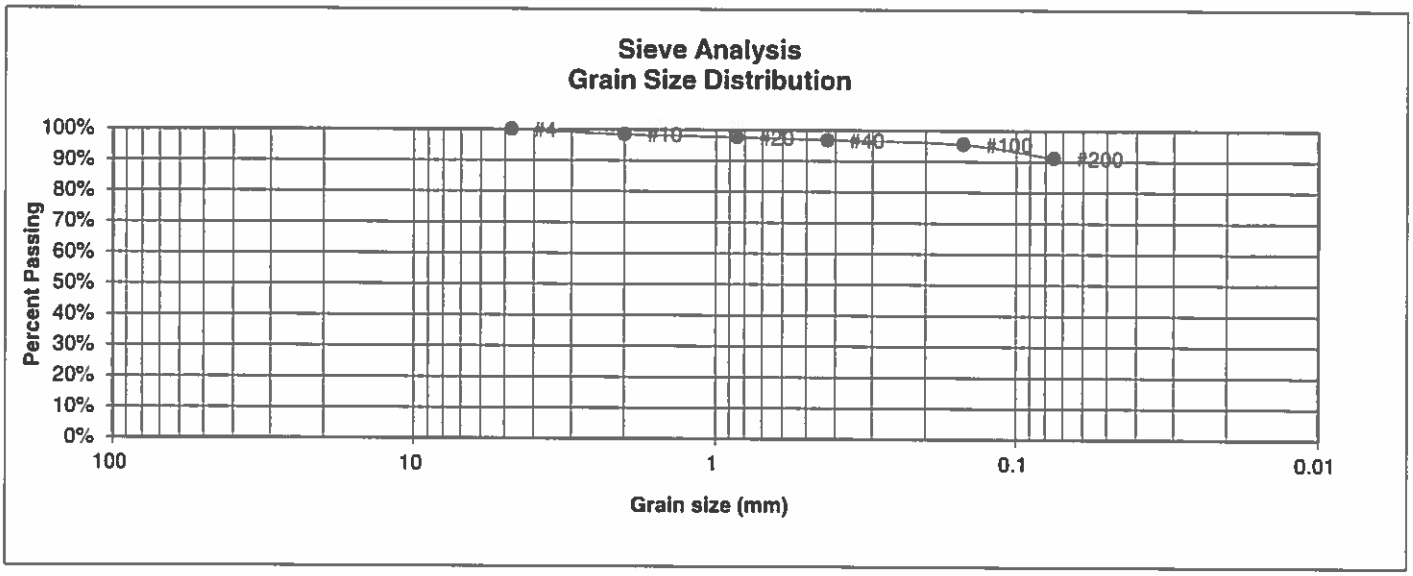
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
			12/9/19

JOB NO.: 191931
FIG NO.: B-4

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	4	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	27



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.4%
20	97.6%
40	96.8%
100	95.5%
200	91.1%

Atterberg Limits	
Plastic Limit	21
Liquid Limit	49
Plastic Index	28

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

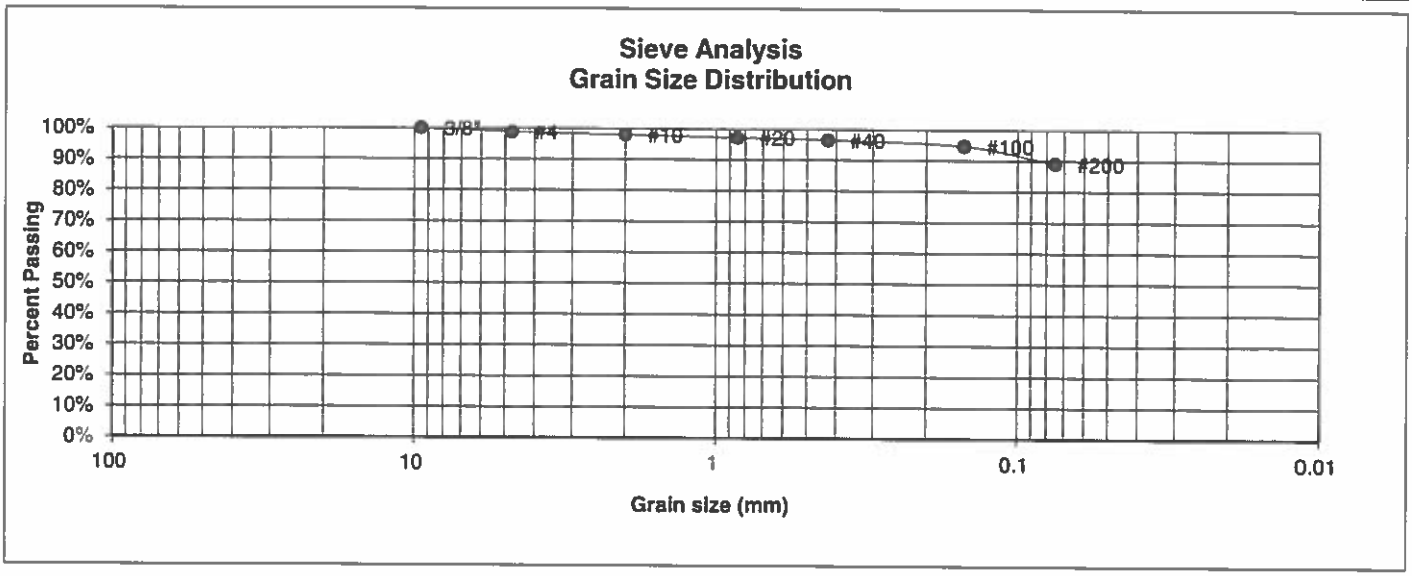
ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-5

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	5	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	26



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.8%
10	97.9%
20	97.1%
40	96.4%
100	94.6%
200	89.0%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	47
Plastic Index	28

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

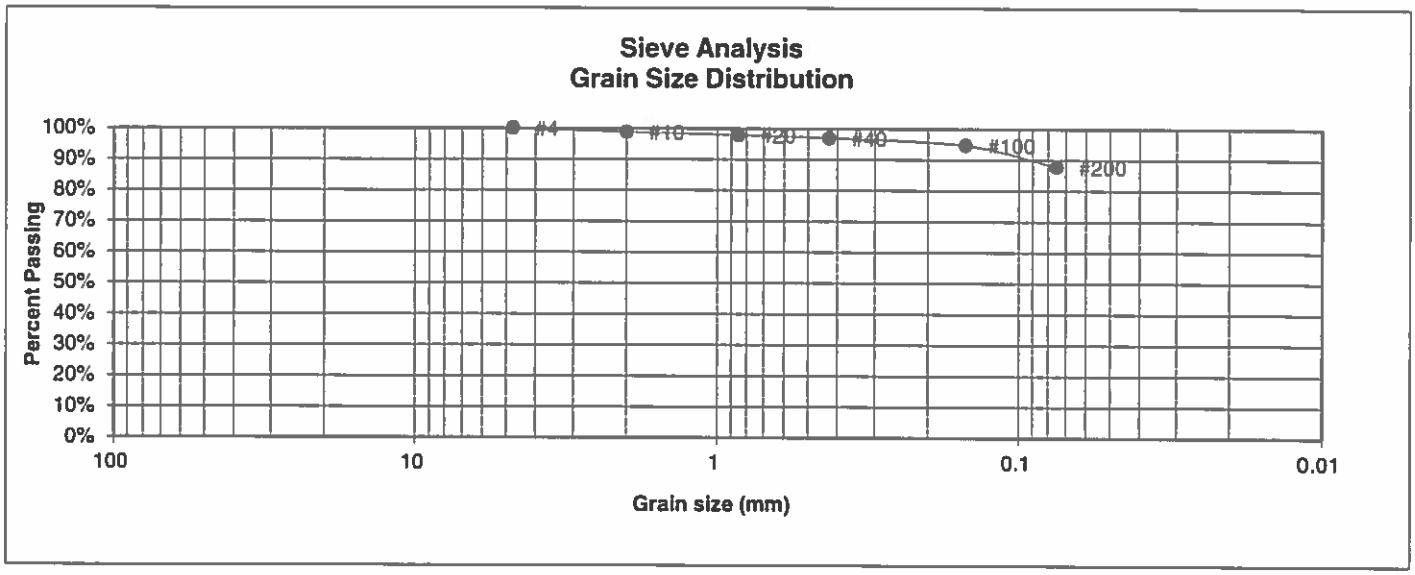
ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LH	12/9/19

JOB NO.: 191931
FIG NO.: B-6

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	6	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	21



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.8%
20	97.9%
40	96.9%
100	94.7%
200	87.7%

Atterberg Limits	
Plastic Limit	23
Liquid Limit	46
Plastic Index	23

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

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505 ELKTON DRIVE
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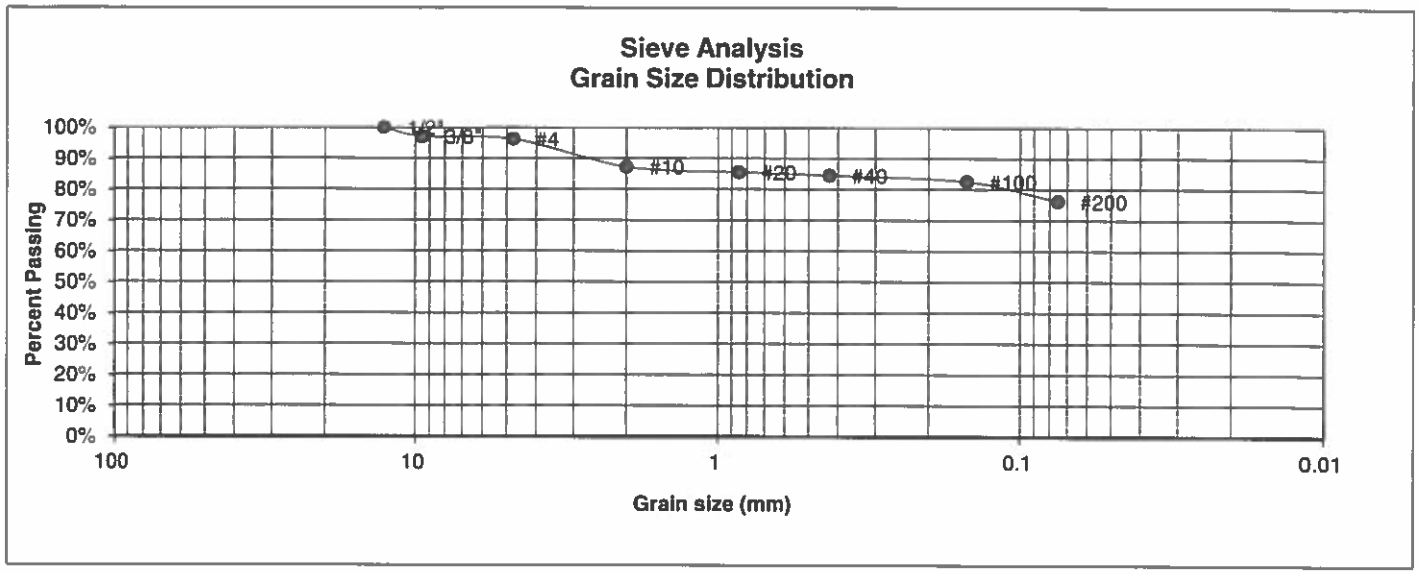
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/14

JOB NO.: 191931
FIG NO.: B-7

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	7	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	17



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.0%
4	96.2%
10	87.2%
20	85.5%
40	84.5%
100	82.5%
200	76.2%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	43
Plastic Index	24

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

ENTECH ENGINEERING, INC.
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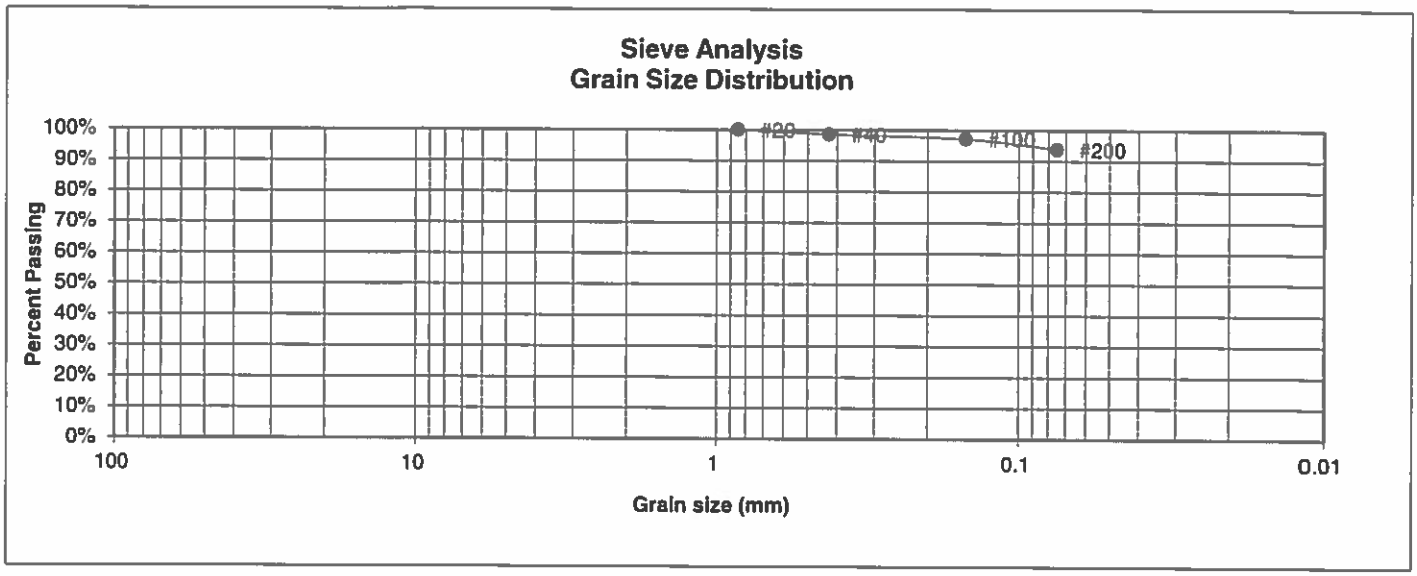
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		h	12/9/19

JOB NO.: 191931
FIG NO.: B-8

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	8	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	24



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	98.6%
100	97.2%
200	93.8%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	44
Plastic Index	25

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

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LABORATORY TEST RESULTS

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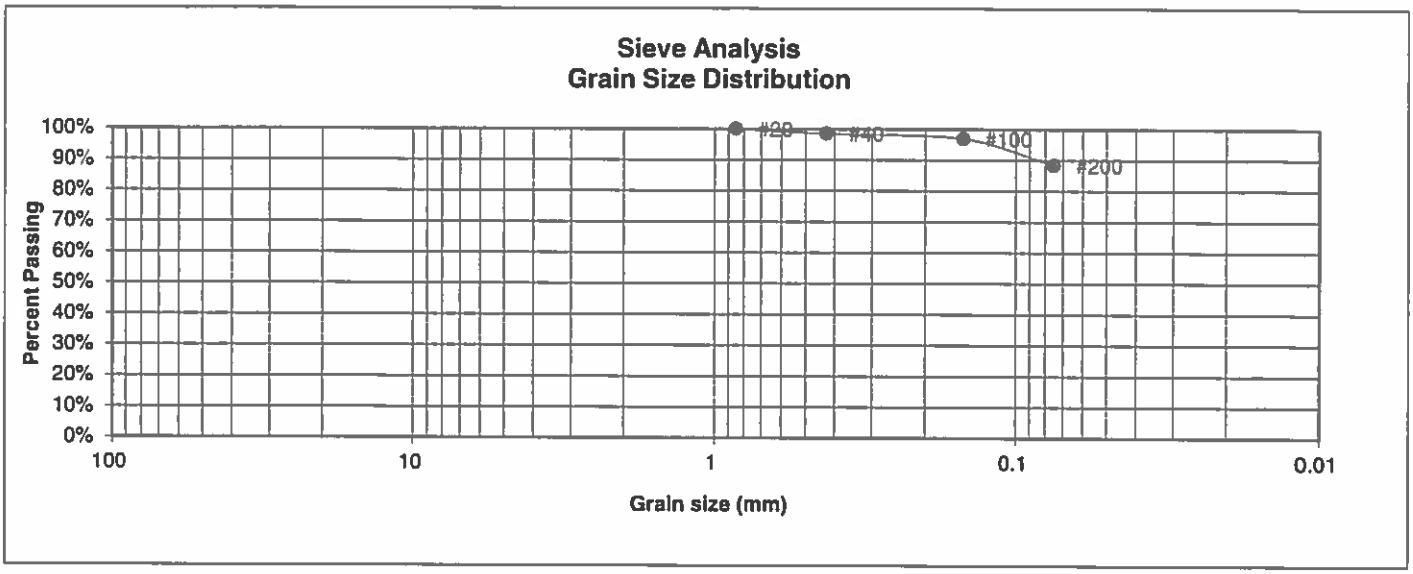
JOB NO.: 191931
FIG NO.: B-9

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	9	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	27



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	98.5%
100	96.9%
200	88.4%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	48
Plastic Index	29

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

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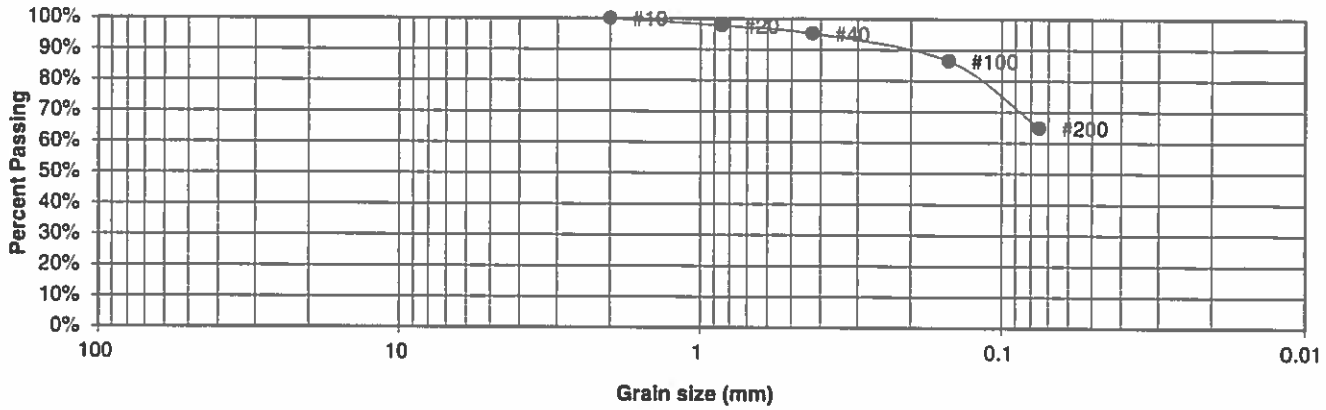
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-10

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	10	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	10

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	97.8%
40	95.2%
100	86.5%
200	64.9%

Atterberg Limits

Plastic Limit	16
Liquid Limit	36
Plastic Index	20

Swell

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

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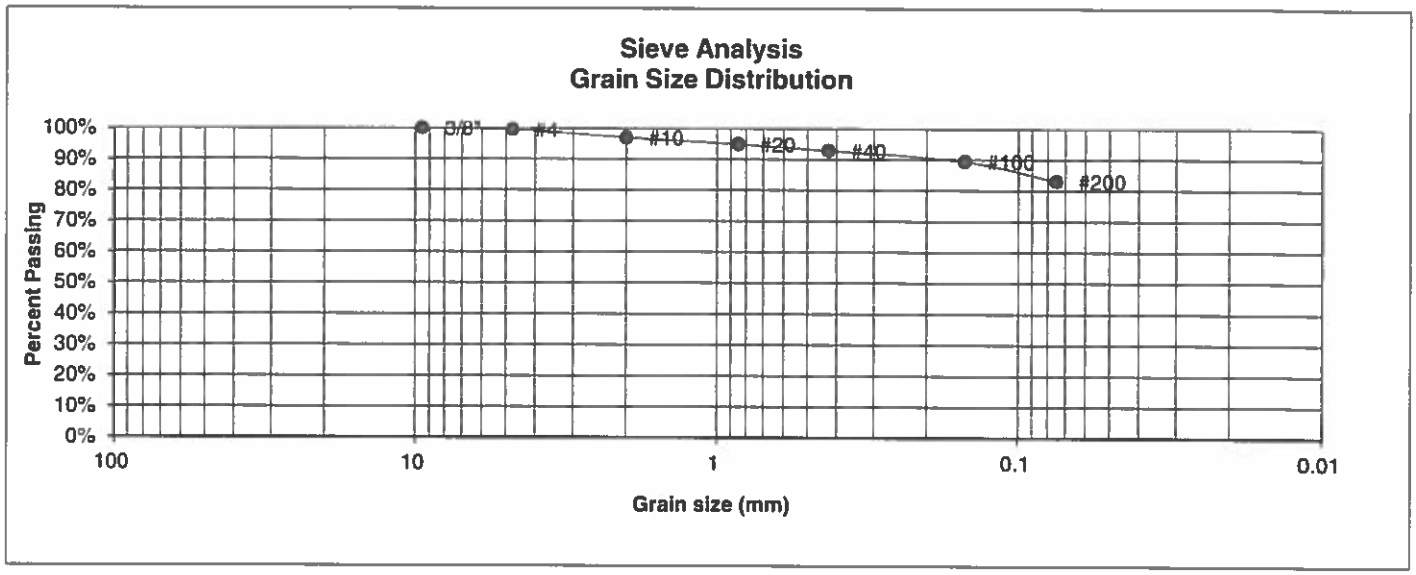
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		M	12/9/19

JOB NO.: 191931
FIG NO.: B-11

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	11	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	19



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.6%
10	96.9%
20	94.8%
40	92.7%
100	89.4%
200	83.0%

Atterberg Limits	
Plastic Limit	26
Liquid Limit	48
Plastic Index	21

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

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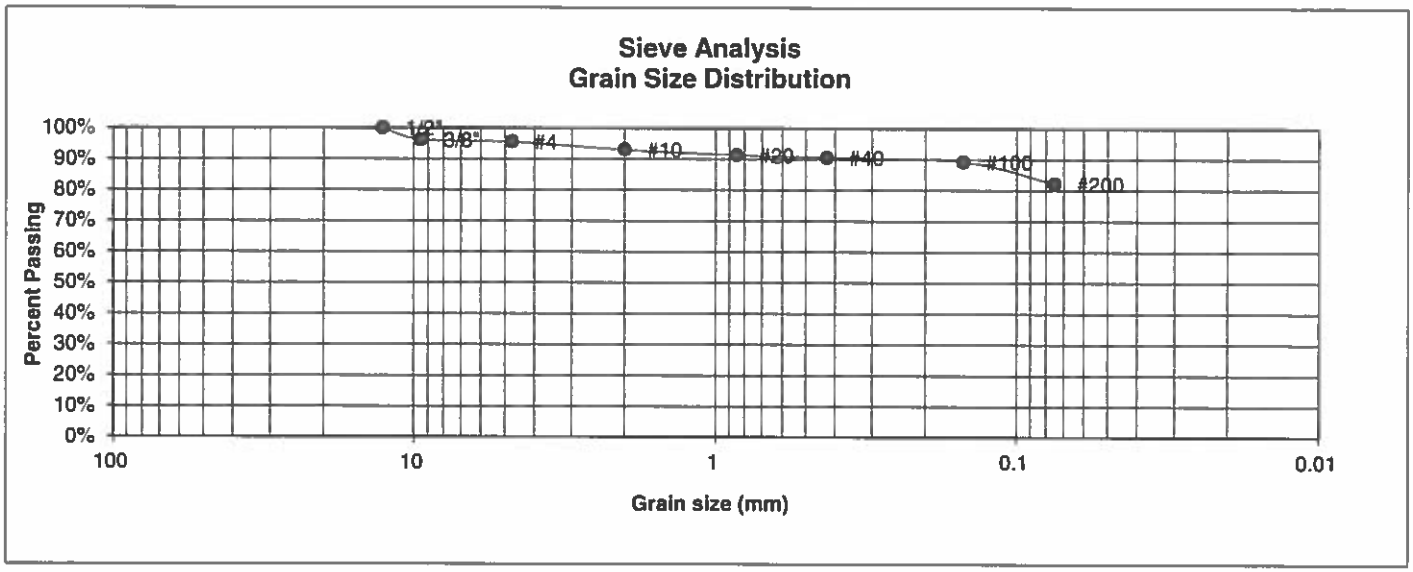
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-12

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	12	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	19



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	96.2%
4	95.5%
10	93.0%
20	91.3%
40	90.6%
100	89.3%
200	82.2%

Atterberg Limits

Plastic Limit	24
Liquid Limit	46
Plastic Index	22

Swell

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

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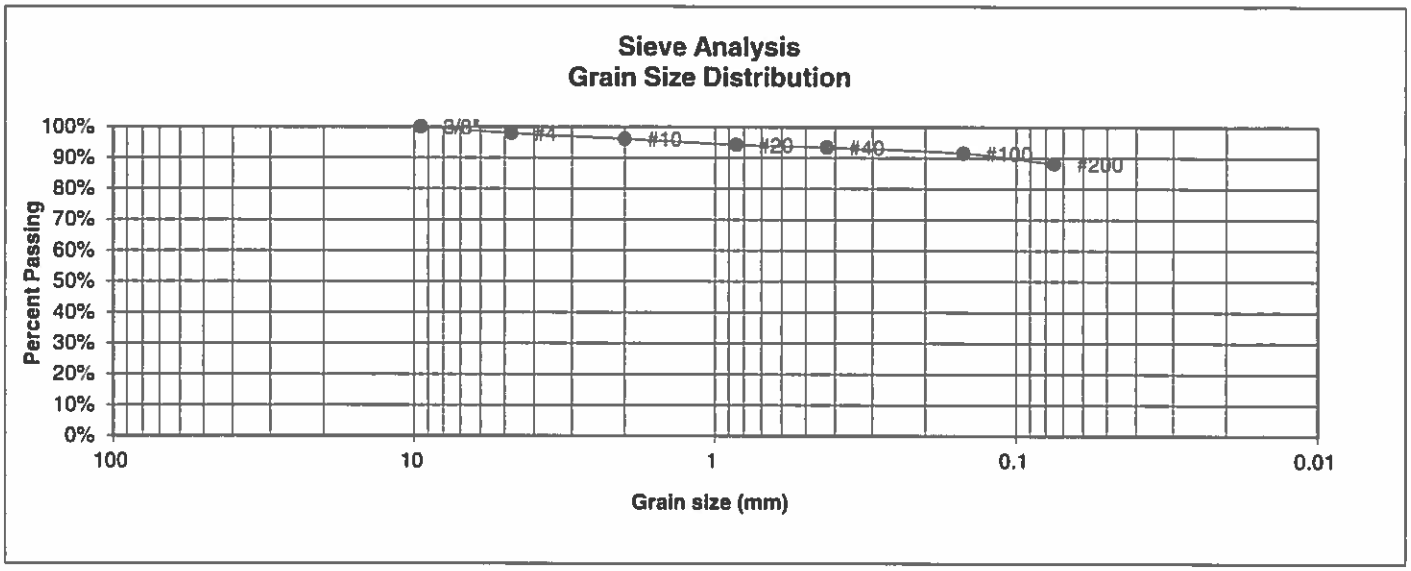
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/18

JOB NO.: 191931
FIG NO.: B-13

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	13	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	25



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.9%
10	96.1%
20	94.2%
40	93.4%
100	91.5%
200	88.2%

Atterberg Limits	
Plastic Limit	22
Liquid Limit	48
Plastic Index	26

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:
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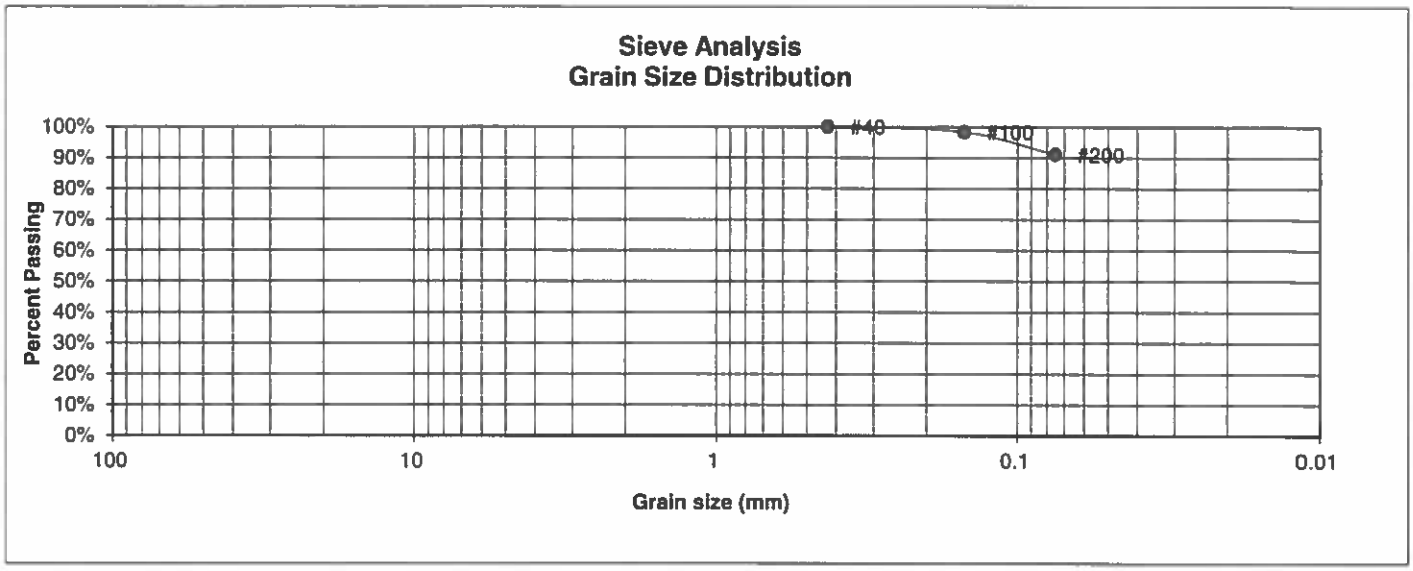
JOB NO.: 191931
FIG NO.: B-14

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	14	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	21



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	98.4%
200	91.1%

Atterberg Limits	
Plastic Limit	20
Liquid Limit	42
Plastic Index	22

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:
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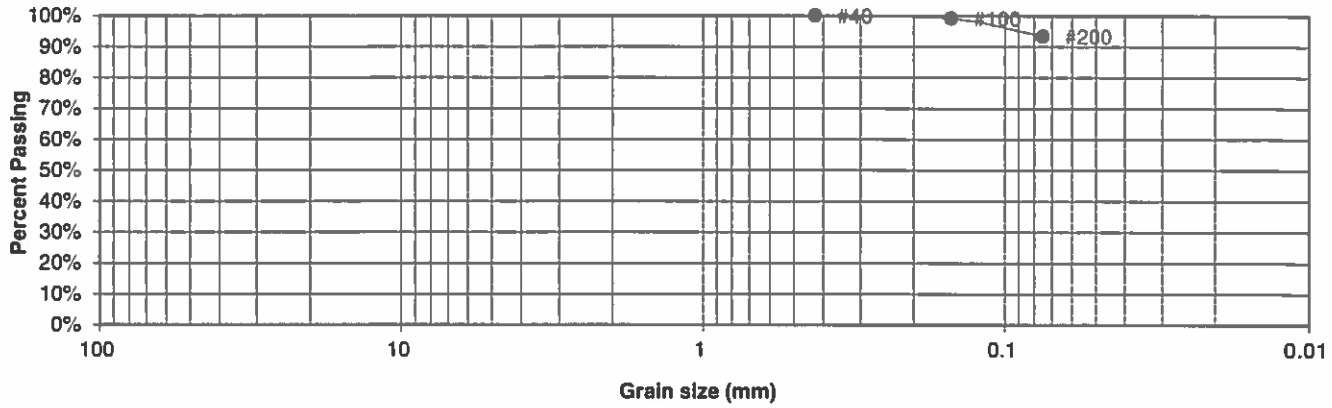
JOB NO.: 191931
FIG NO.: B-15

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	15	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	17

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	99.2%
200	93.4%

Atterberg Limits	
Plastic Limit	22
Liquid Limit	39
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:	DATE:
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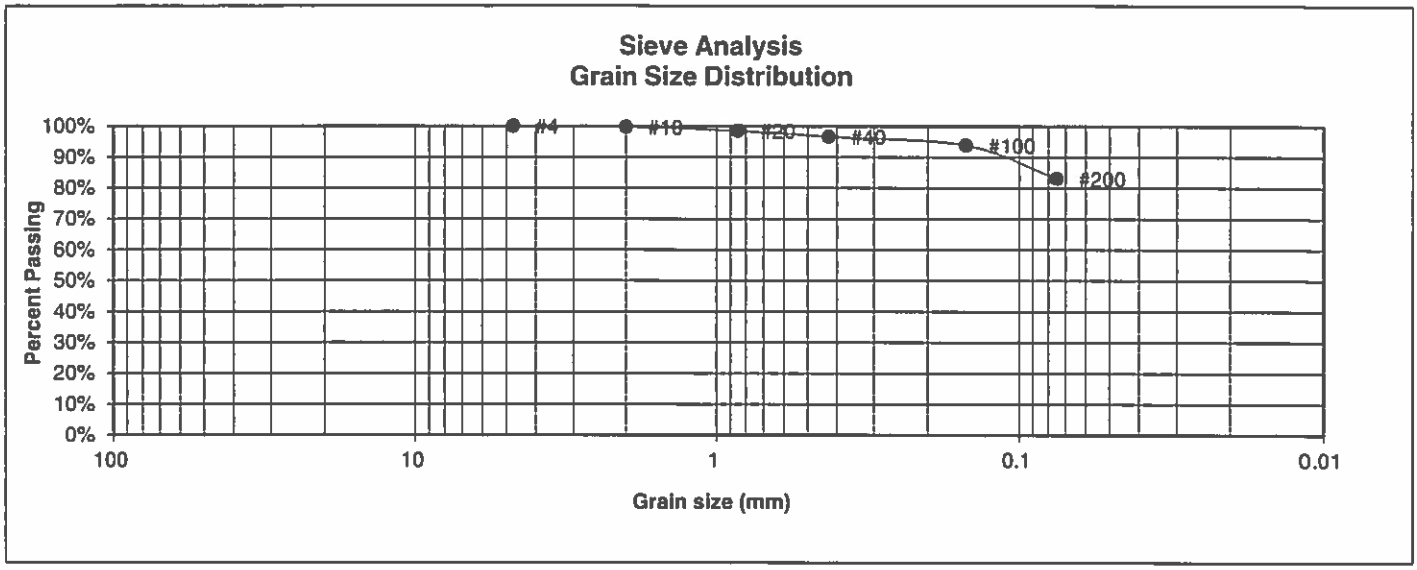
JOB NO.: 191931
FIG NO.: B-16

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	16	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	19



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	98.5%
40	96.6%
100	93.8%
200	83.0%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	42
Plastic Index	23

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

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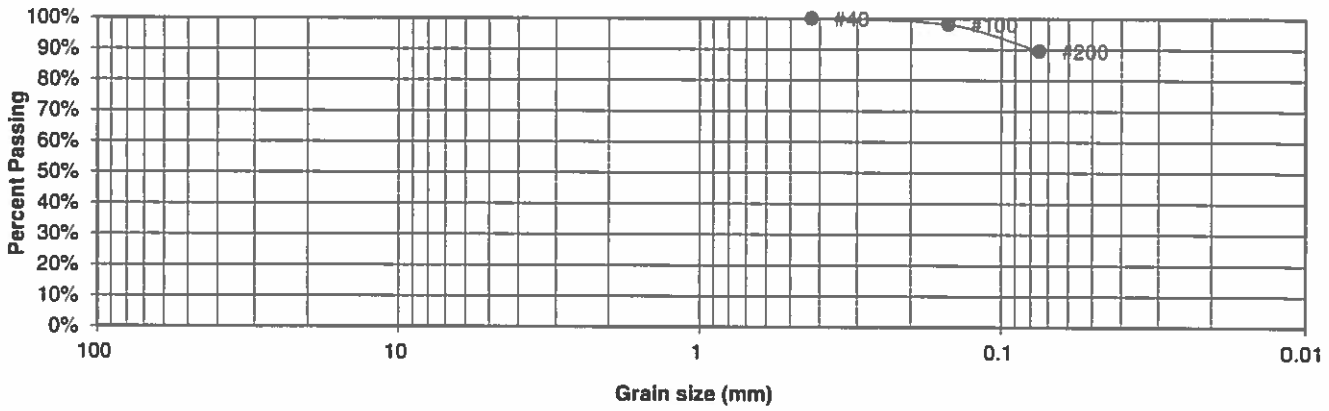
LABORATORY TEST RESULTS

DRAWN:	DATE	CHECKED:	DATE:
			12/4/19

JOB NO.: 191931
FIG NO.: B-17

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	17	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	15

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	98.1%
200	89.5%

Atterberg Limits

Plastic Limit	22
Liquid Limit	39
Plastic Index	17

Swell

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

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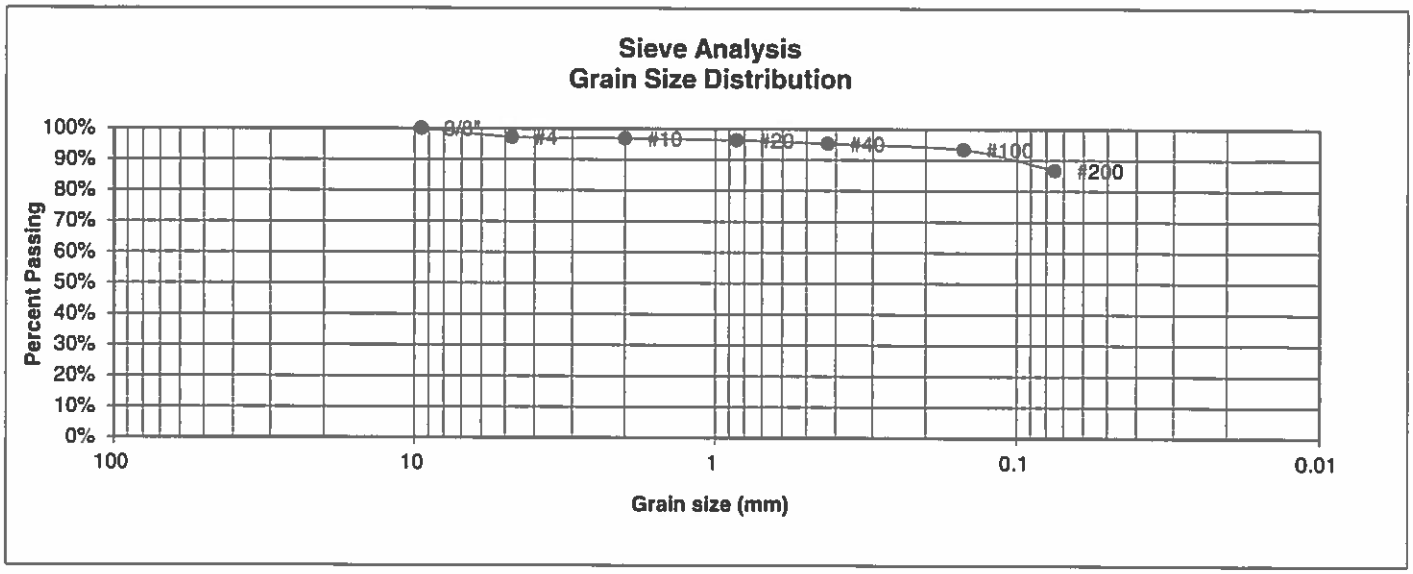
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/4/18

JOB NO.: 191931
FIG NO.: B-18

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	18	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	19



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.2%
10	96.8%
20	96.3%
40	95.2%
100	93.4%
200	86.7%

Atterberg Limits

Plastic Limit	21
Liquid Limit	42
Plastic Index	21

Swell

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

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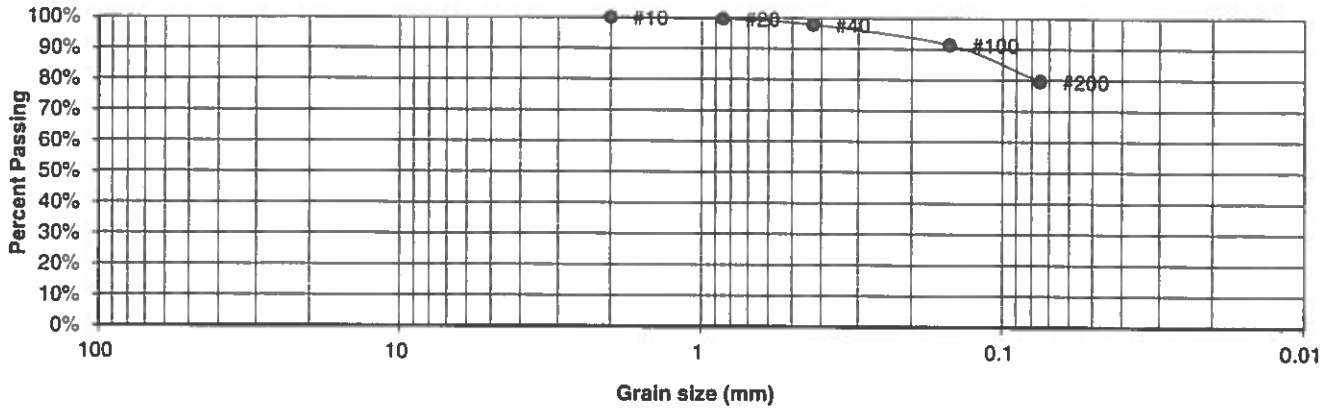
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-19

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	19	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	14

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	99.6%
40	97.7%
100	91.3%
200	79.5%

Atterberg Limits

Plastic Limit	23
Liquid Limit	41
Plastic Index	18

Swell

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

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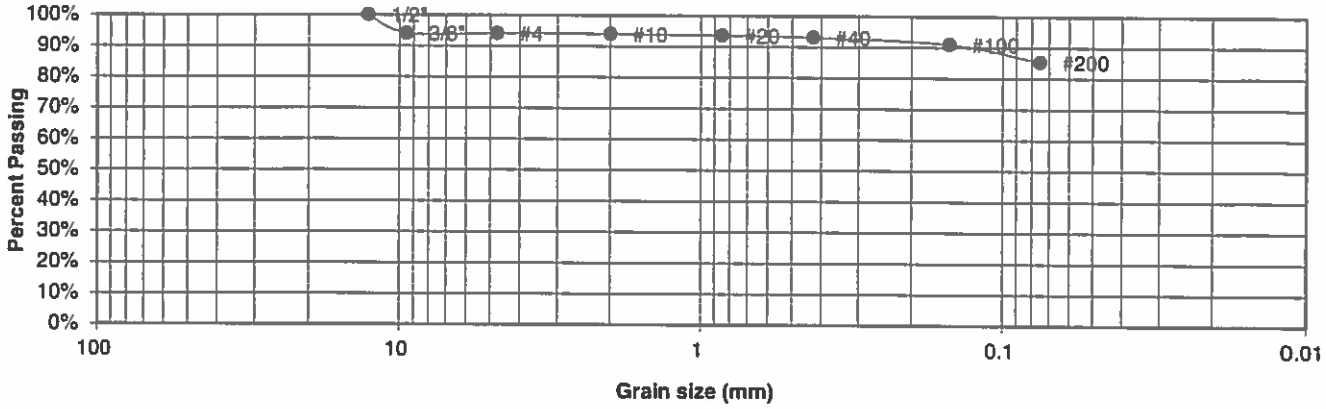
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-20

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	20	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	8

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	94.1%
4	94.1%
10	93.9%
20	93.6%
40	93.0%
100	91.0%
200	85.4%

Atterberg Limits

Plastic Limit	19
Liquid Limit	30
Plastic Index	11

Swell

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

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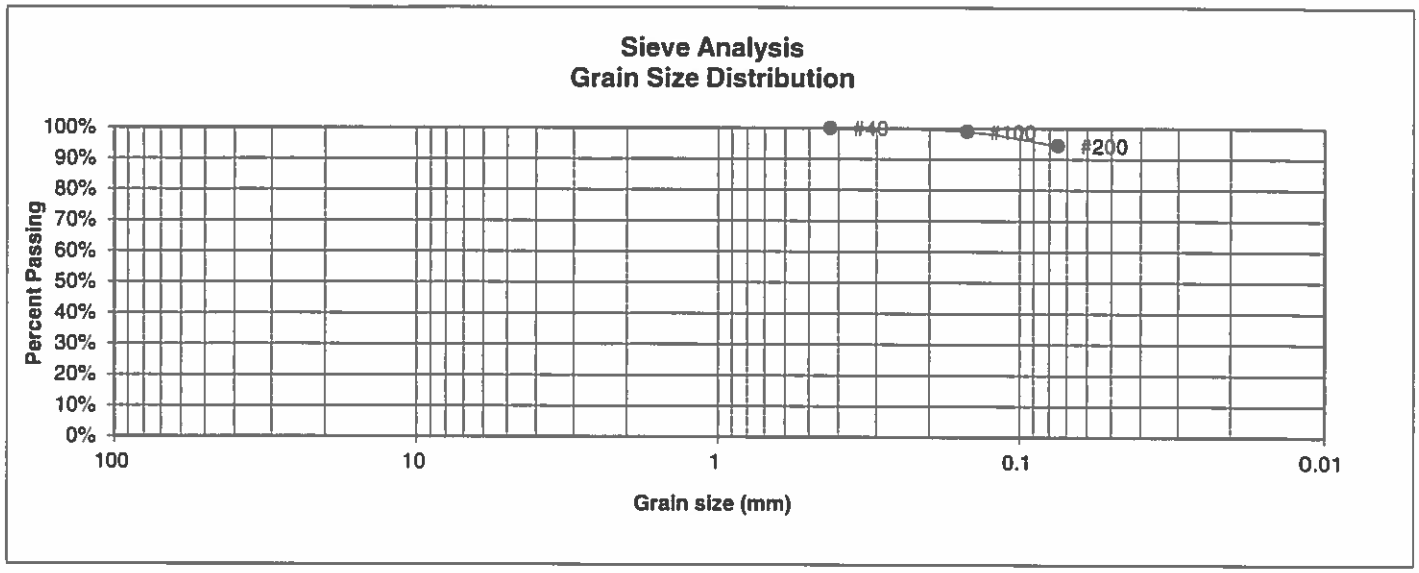
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-21

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	21	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	20



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	98.9%
200	94.4%

Atterberg Limits	
Plastic Limit	22
Liquid Limit	42
Plastic Index	20

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

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COLORADO SPRINGS, COLORADO 80907

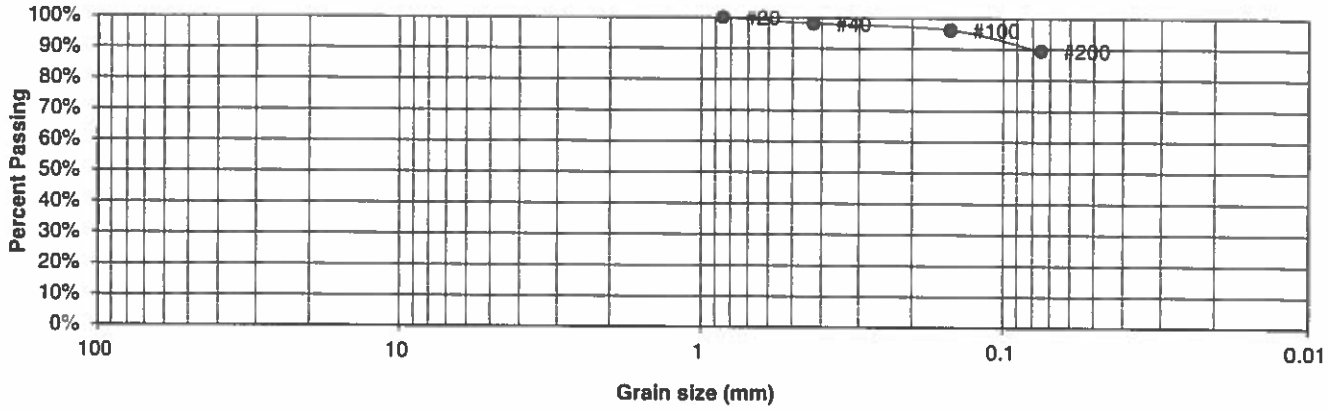
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-22

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	22	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	28

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	98.1%
100	96.1%
200	89.4%

Atterberg Limits

Plastic Limit	17
Liquid Limit	47
Plastic Index	31

Swell

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

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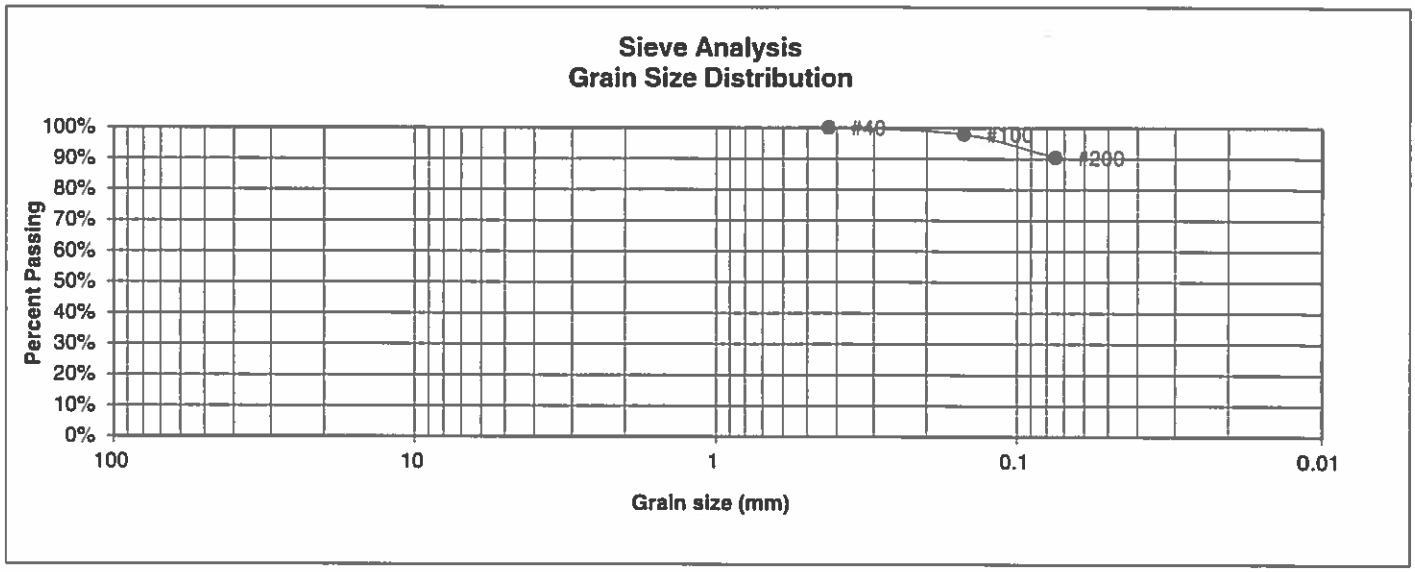
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO: 191931
FIG NO: B-23

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	23	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	20



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	97.9%
200	90.4%

Atterberg Limits	
Plastic Limit	18
Liquid Limit	40
Plastic Index	22

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

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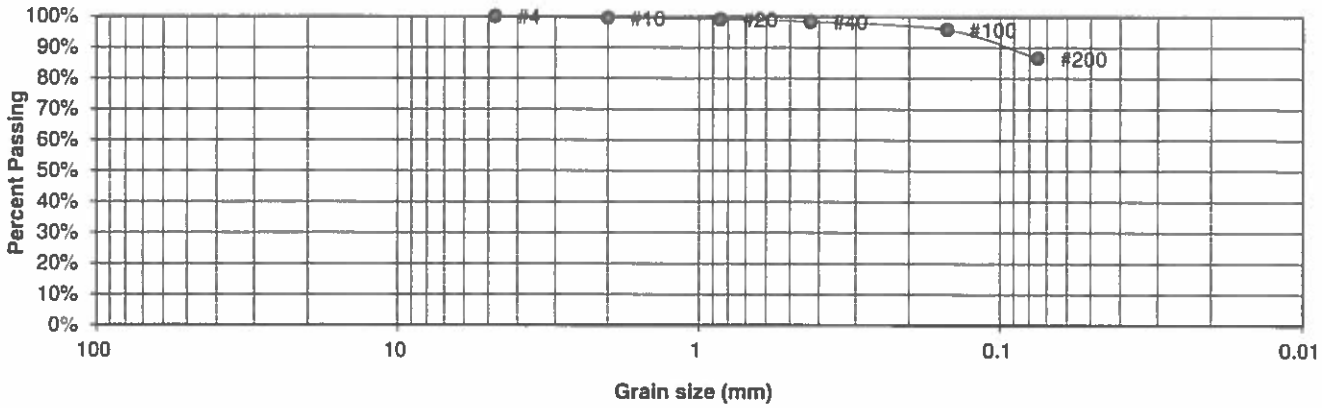
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-24

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	25	JOB NO.	191931
DEPTH (FT)	0-3	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	18

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.5%
20	99.1%
40	98.4%
100	95.9%
200	86.6%

Atterberg Limits	
Plastic Limit	16
Liquid Limit	38
Plastic Index	22

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

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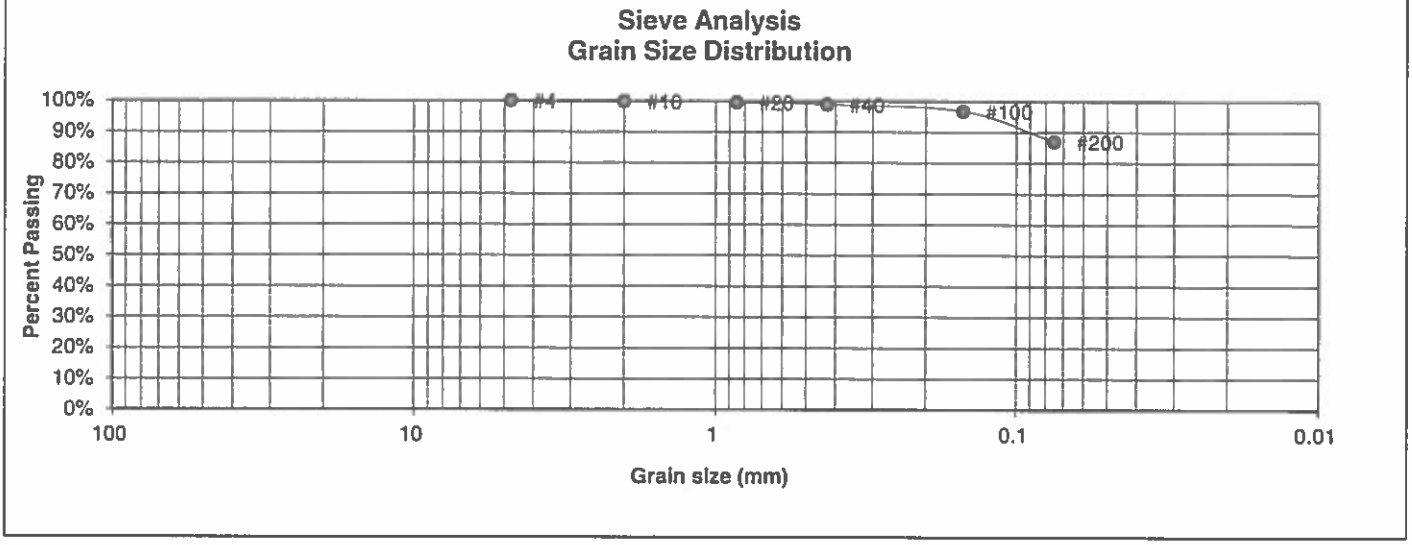
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DJ	3/9/20

JOB NO.: 191931
FIG NO.: B-25

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	24	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	16



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	99.5%
40	98.9%
100	96.8%
200	87.0%

Atterberg Limits	
Plastic Limit	17
Liquid Limit	36
Plastic Index	19

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

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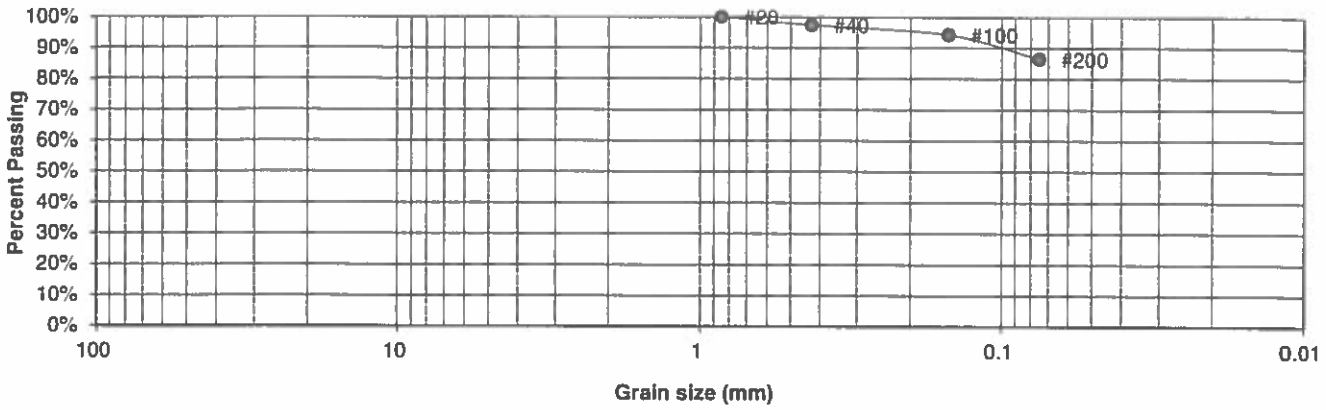
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-26

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	25	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	16

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	97.3%
100	94.2%
200	86.4%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	38
Plastic Index	19

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

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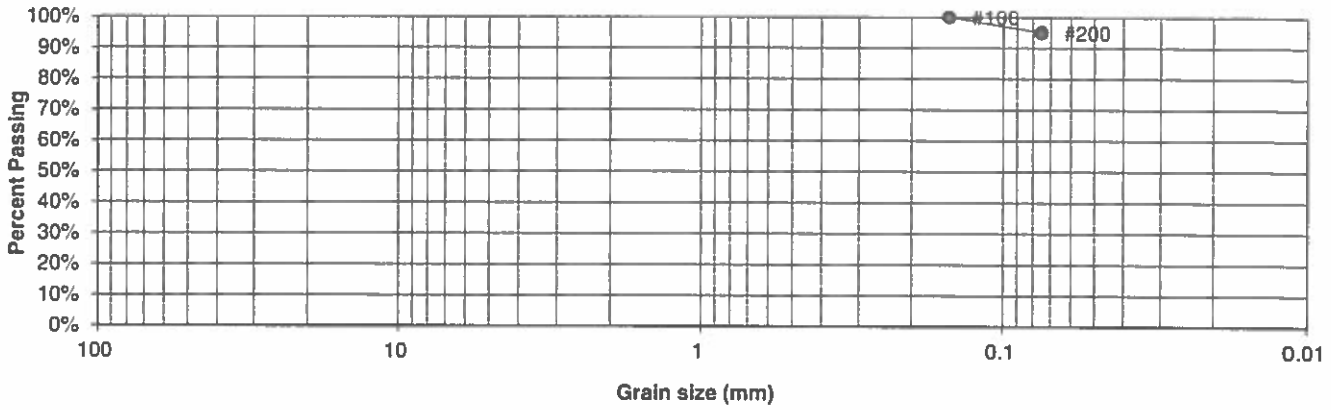
		DS	3/9/12a

JOB NO.: 191931
FIG NO.: B-27

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	26	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	22

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	95.0%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	41
Plastic Index	22

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

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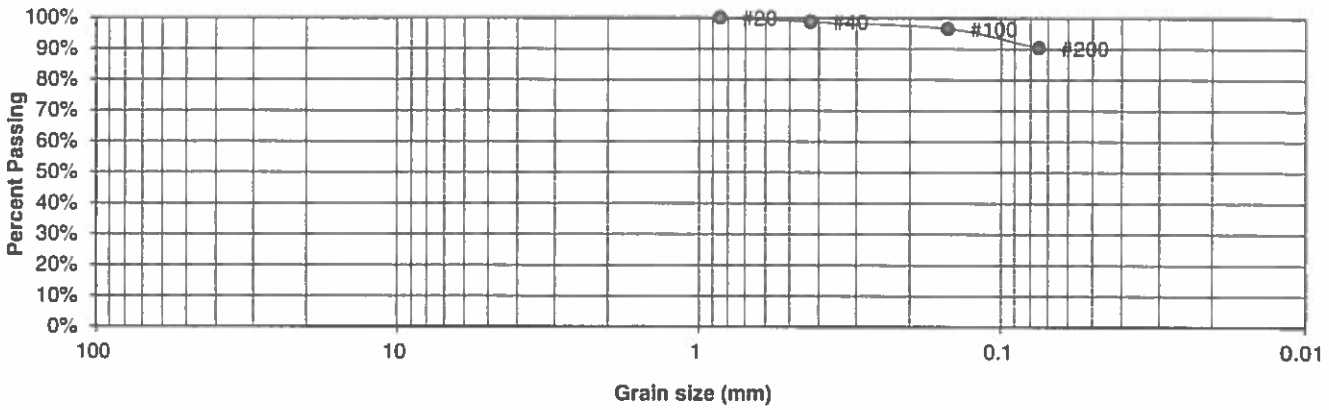
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-28

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	28	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	19

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	98.8%
100	96.6%
200	90.3%

Atterberg Limits	
Plastic Limit	17
Liquid Limit	39
Plastic Index	22

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

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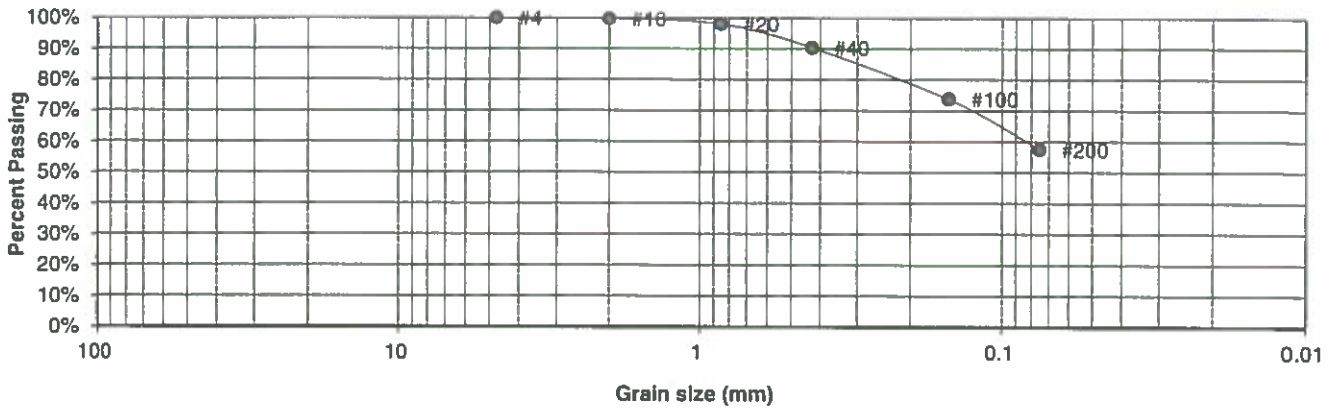
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/22

JOB NO.: 191931
FIG NO.: B-29

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	29	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	5

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	97.9%
40	90.3%
100	73.7%
200	57.5%

Atterberg Limits	
Plastic Limit	16
Liquid Limit	29
Plastic Index	13

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

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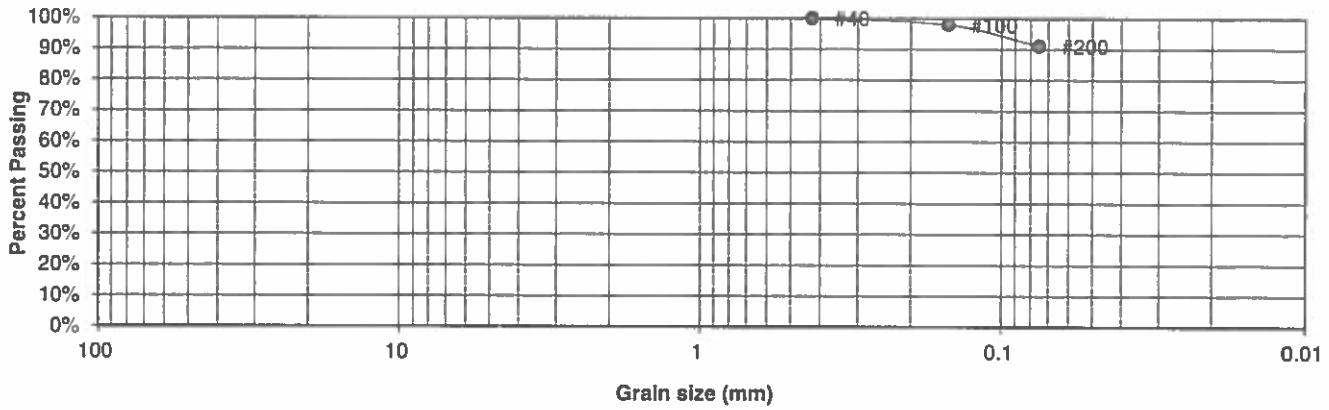
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-30

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	32	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	21

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	98.0%
200	91.1%

Atterberg Limits	
Plastic Limit	18
Liquid Limit	41
Plastic Index	23

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

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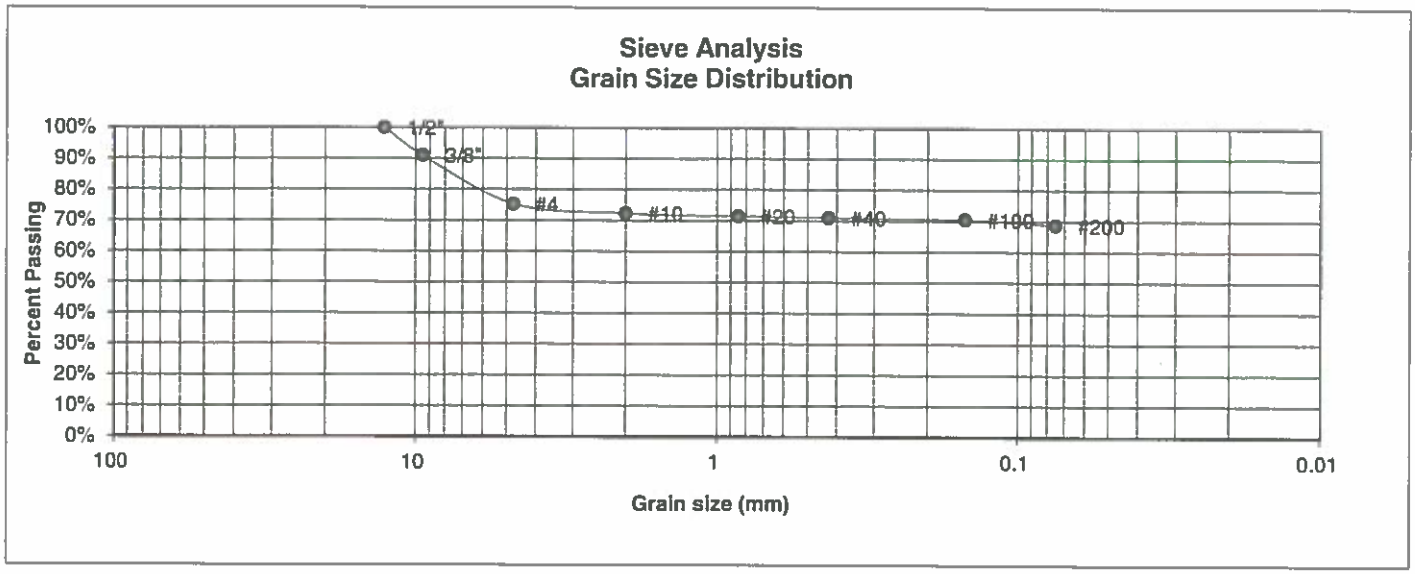
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-31

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	1	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	33	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	10



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	91.0%
4	75.2%
10	72.3%
20	71.4%
40	71.0%
100	70.4%
200	68.7%

Atterberg Limits	
Plastic Limit	17
Liquid Limit	35
Plastic Index	18

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

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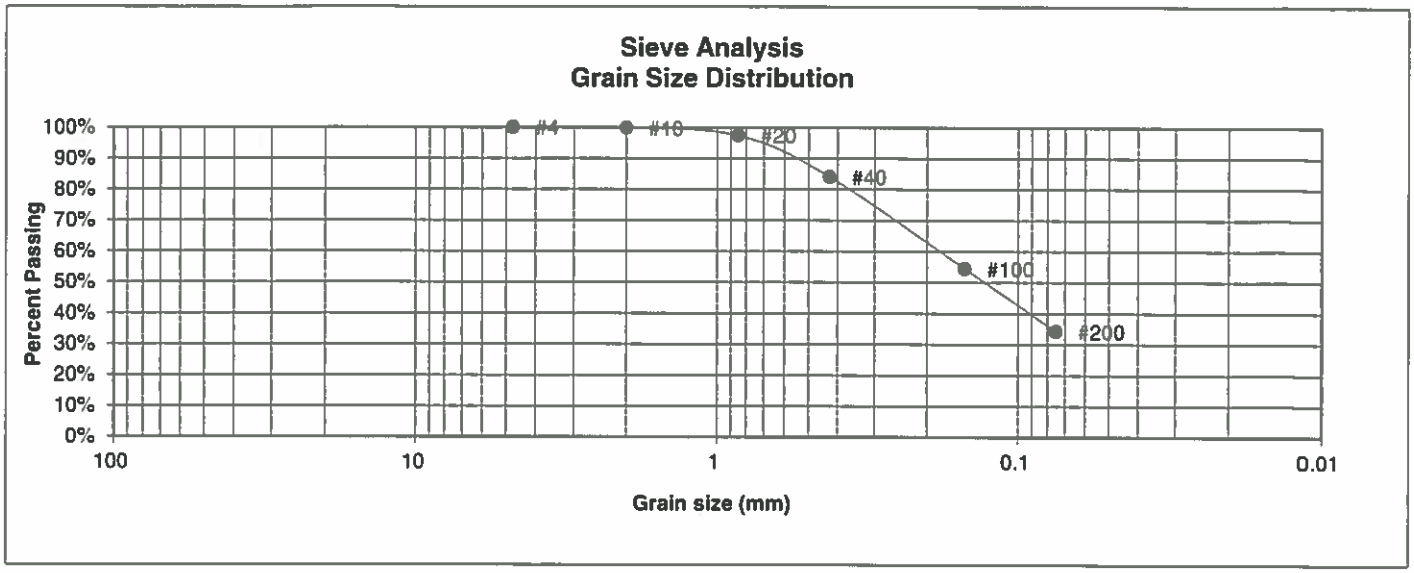
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-32

UNIFIED CLASSIFICATION	SM	CLIENT	COLA, LLC
SOIL TYPE #	1A	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	28	JOB NO.	191931
DEPTH (FT)	10	TEST BY	BL
AASHTO CLASSIFICATION	A-2-4	GROUP INDEX	0



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	97.4%
40	84.0%
100	54.5%
200	34.2%

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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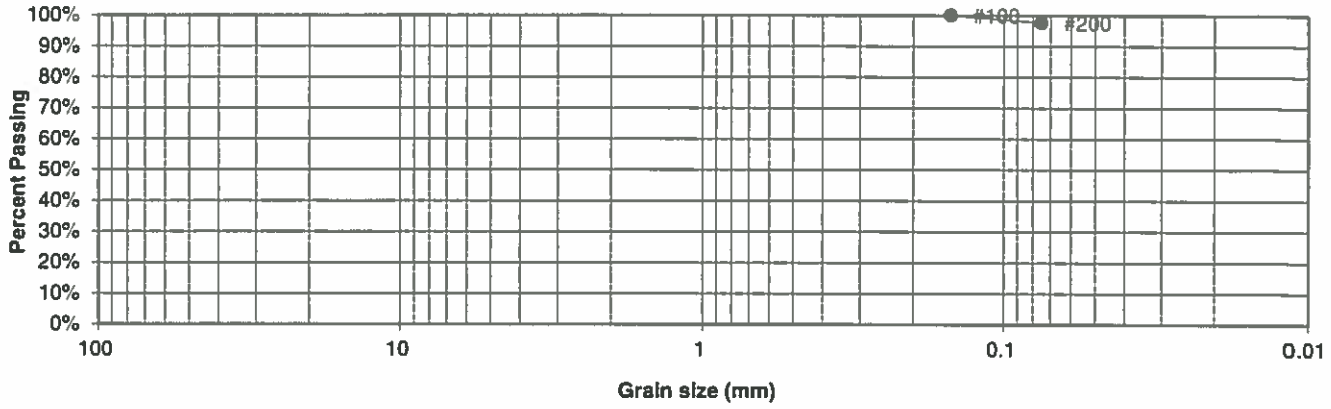
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-33

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	2	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	27	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	27

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	97.7%

Atterberg Limits	
Plastic Limit	18
Liquid Limit	44
Plastic Index	26

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

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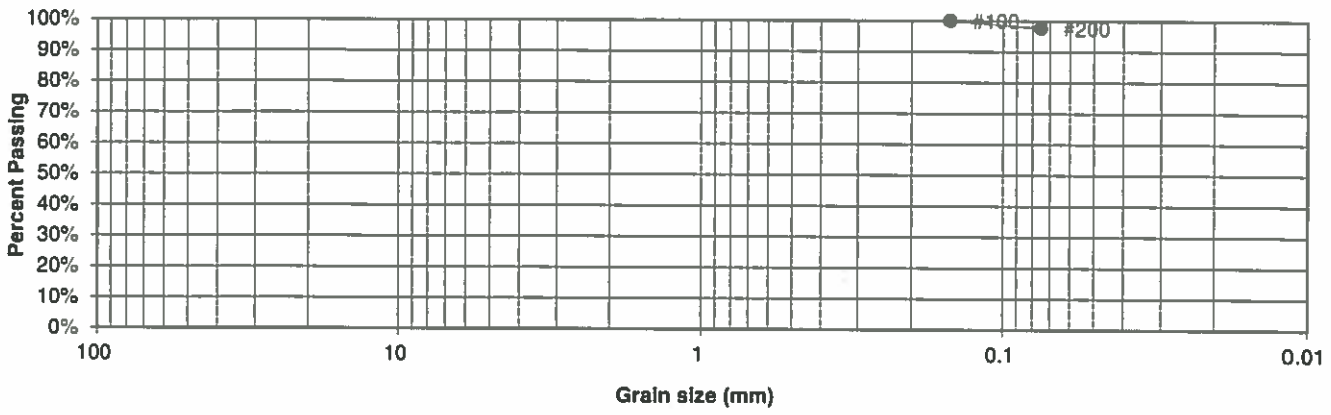
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-34

UNIFIED CLASSIFICATION	CH	CLIENT	COLA, LLC
SOIL TYPE #	2	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	30	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	32

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	97.6%

Atterberg Limits	
Plastic Limit	23
Liquid Limit	52
Plastic Index	29

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

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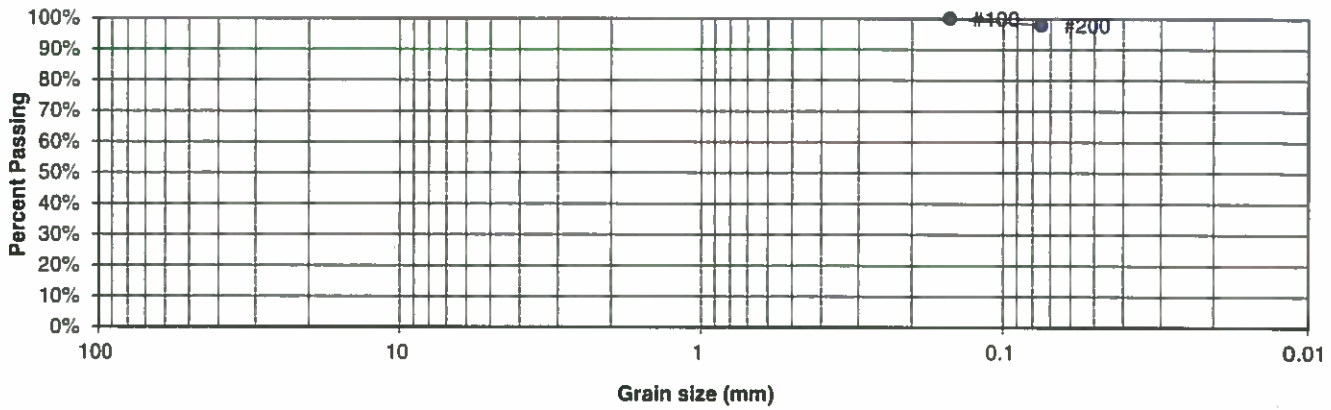
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-35

UNIFIED CLASSIFICATION	CH	CLIENT	COLA, LLC
SOIL TYPE #	2	PROJECT	TRAILS AT ASPEN RIDGE, F-1
TEST BORING #	31	JOB NO.	191931
DEPTH (FT)	1-2	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	32

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	97.9%

Atterberg Limits	
Plastic Limit	24
Liquid Limit	53
Plastic Index	29

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

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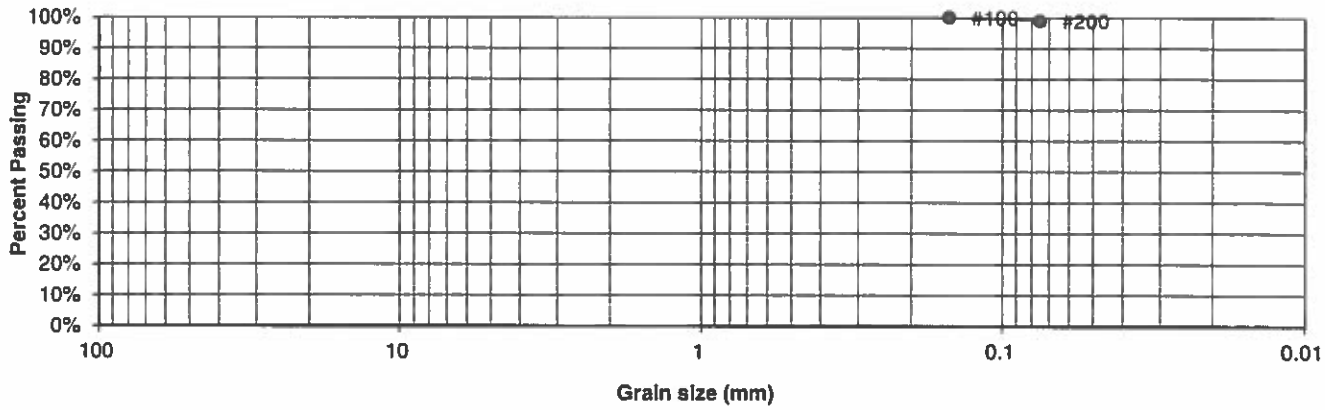
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-36

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	2	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	12	JOB NO.	191931
DEPTH (FT)	10	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	33

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	99.0%

Atterberg Limits	
Plastic Limit	20
Liquid Limit	50
Plastic Index	30

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

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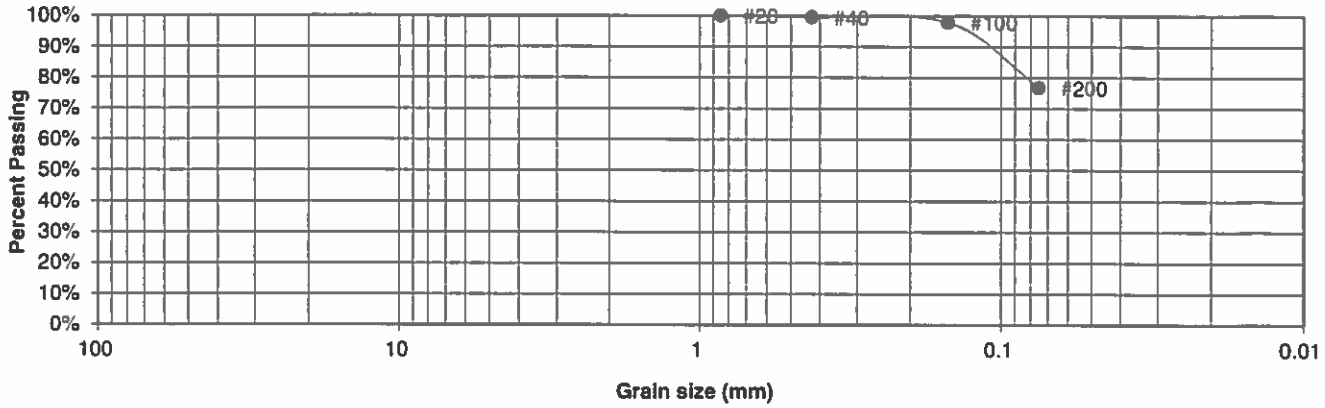
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-37

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	2	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	17	JOB NO.	191931
DEPTH (FT)	10	TEST BY	BL
AASHTO CLASSIFICATION	A-6	GROUP INDEX	16

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.5%
100	97.9%
200	76.8%

Atterberg Limits	
Plastic Limit	17
Liquid Limit	39
Plastic Index	22

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

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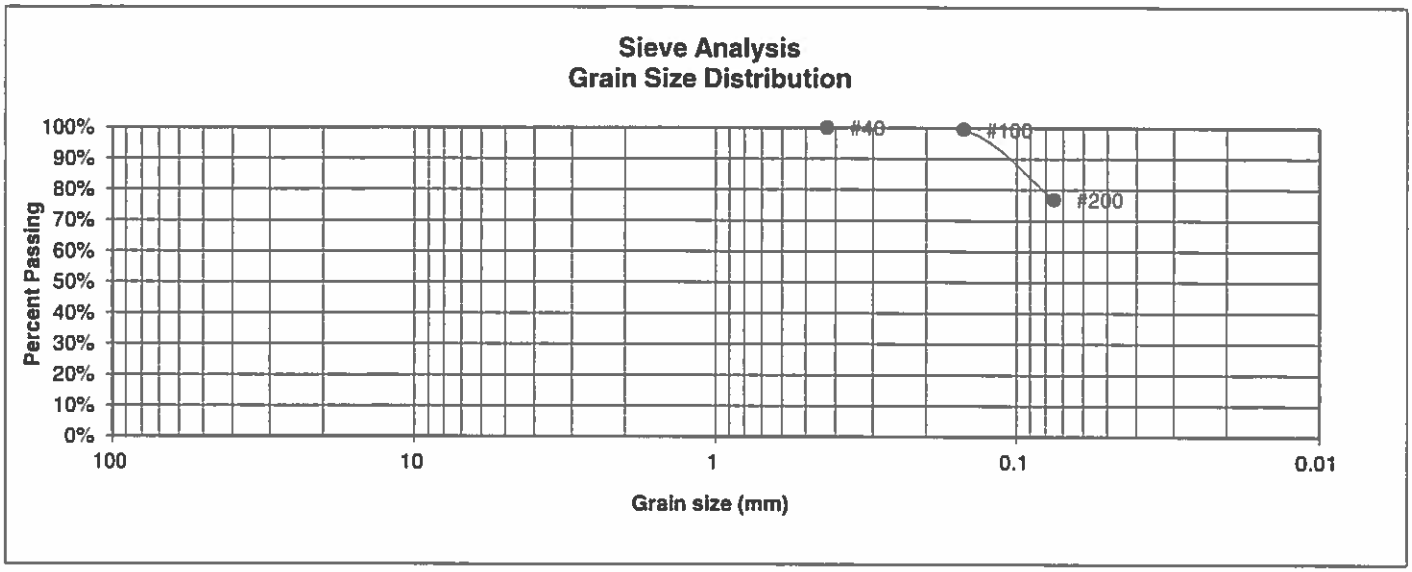
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-38

UNIFIED CLASSIFICATION	CL	CLIENT	COLA, LLC
SOIL TYPE #	2	PROJECT	TRAILS AT ASPEN RIDGE
TEST BORING #	23	JOB NO.	191931
DEPTH (FT)	5	TEST BY	BL
AASHTO CLASSIFICATION	A-7-6	GROUP INDEX	19



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	100.0%
100	99.4%
200	76.9%

Atterberg Limits	
Plastic Limit	17
Liquid Limit	42
Plastic Index	26

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

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LABORATORY TEST RESULTS

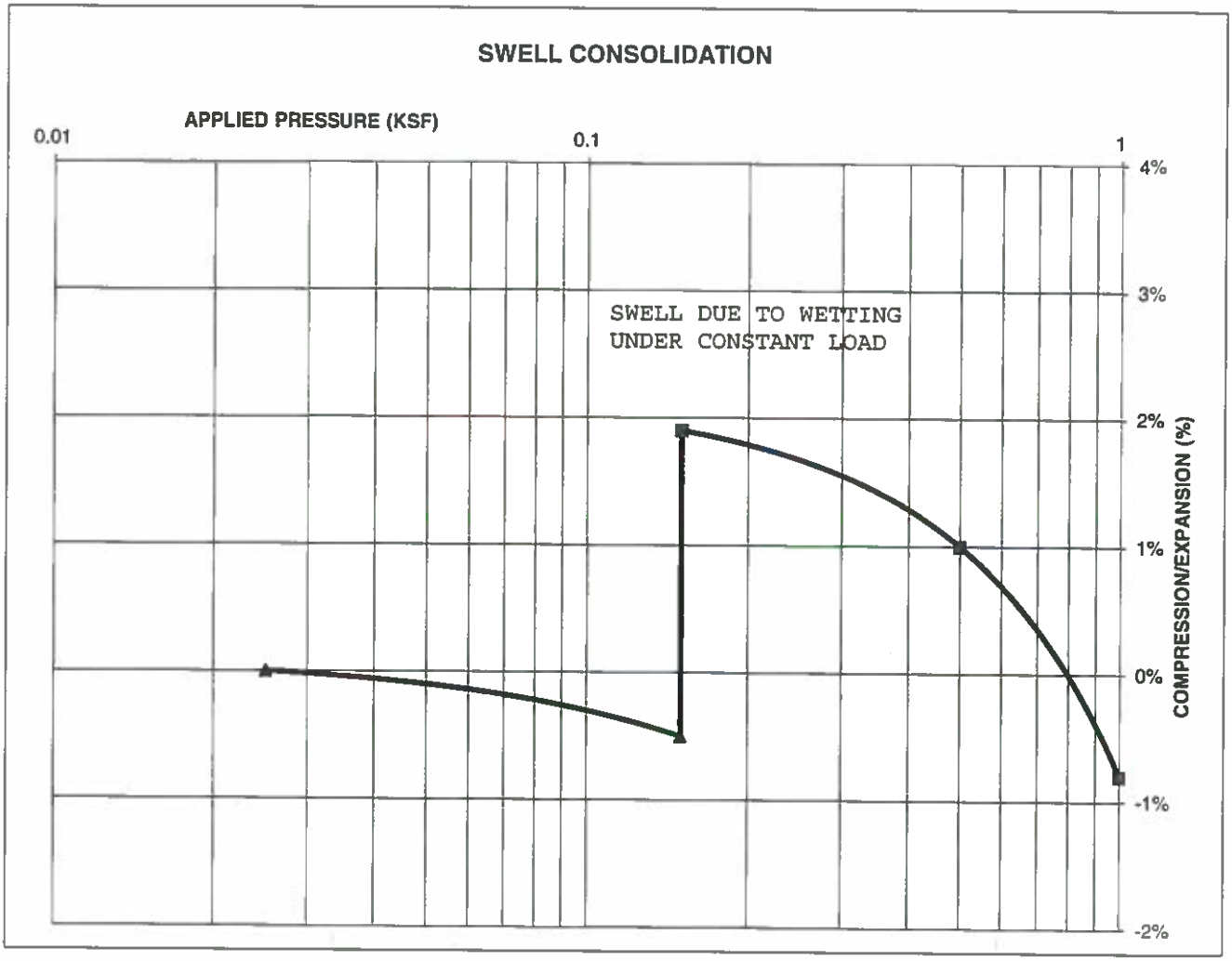
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: E-39

CONSOLIDATION TEST RESULTS

TEST BORING #	1	DEPTH(ft)	0-3
DESCRIPTION	CL	SOIL TYPE	1, CBR
NATURAL UNIT DRY WEIGHT (PCF)			108
NATURAL MOISTURE CONTENT			12.6%
SWELL/CONSOLIDATION (%)			2.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE
REMOLDED SAMPLE



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

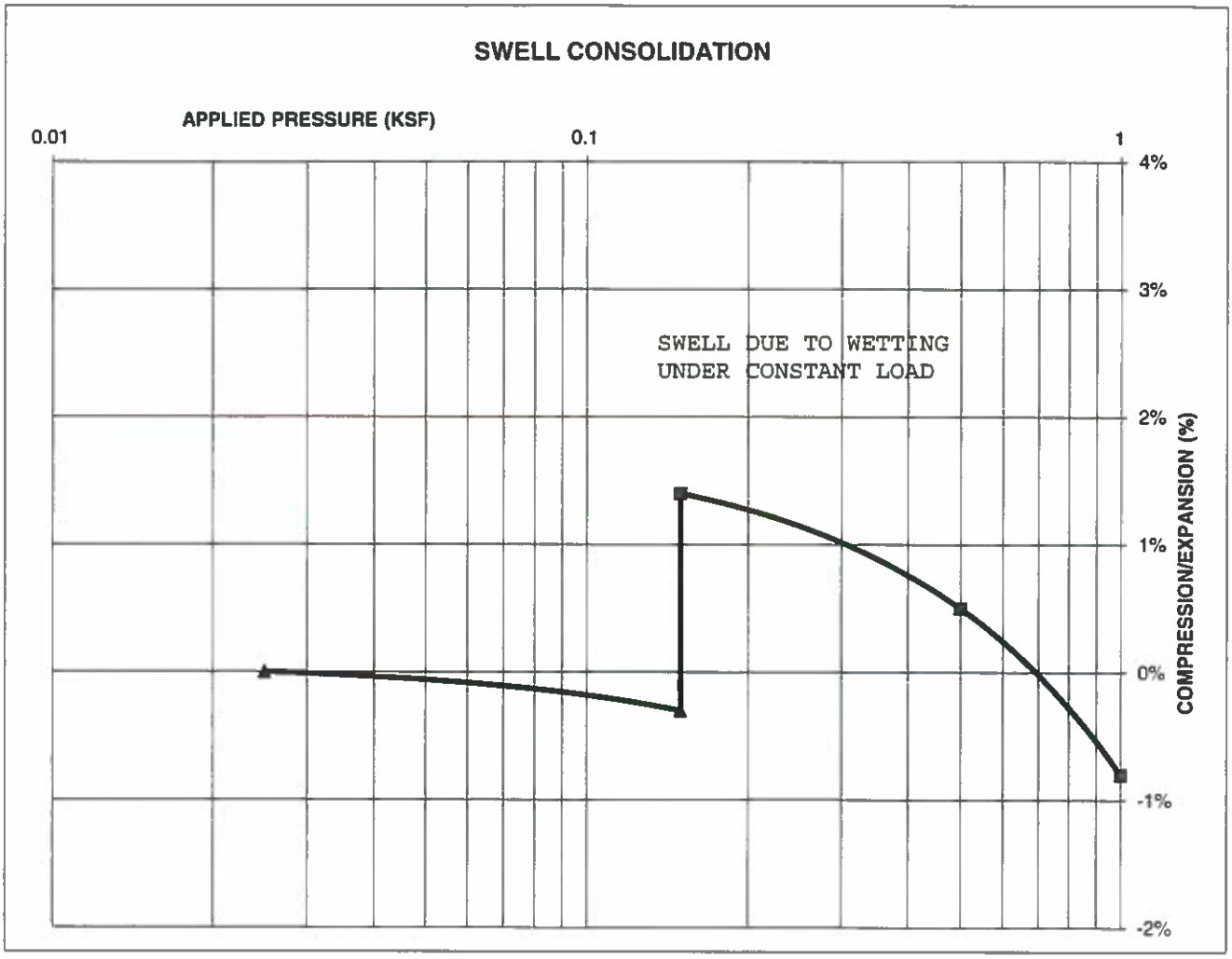
DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/9/19

JOB NO.: 191931
FIG NO.: B-40

CONSOLIDATION TEST RESULTS

TEST BORING #	1	DEPTH(ft)	0-3
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			109
NATURAL MOISTURE CONTENT			14.2%
SWELL/CONSOLIDATION (%)			1.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

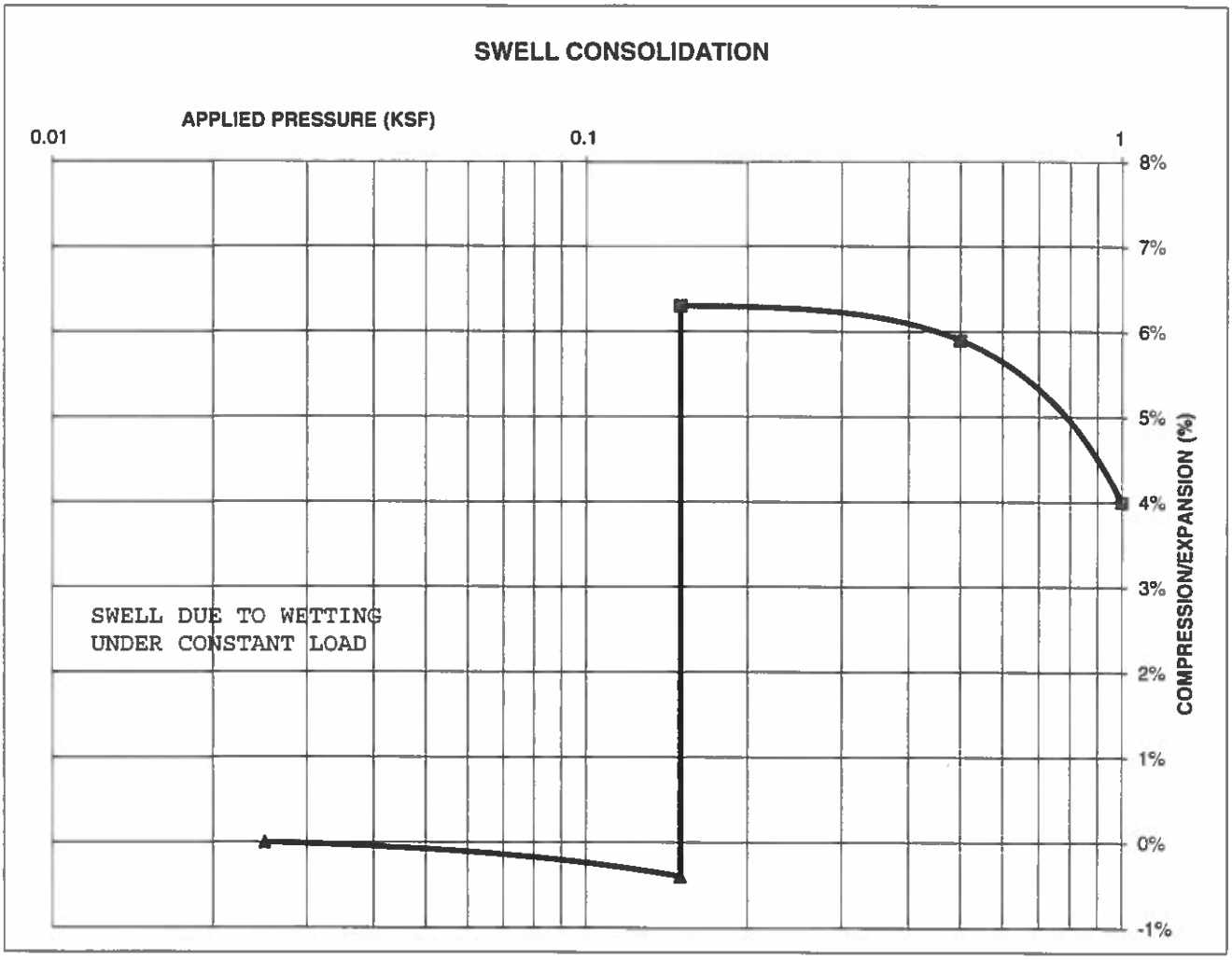
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-41

CONSOLIDATION TEST RESULTS

TEST BORING #	1	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			107
NATURAL MOISTURE CONTENT			17.3%
SWELL/CONSOLIDATION (%)			6.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

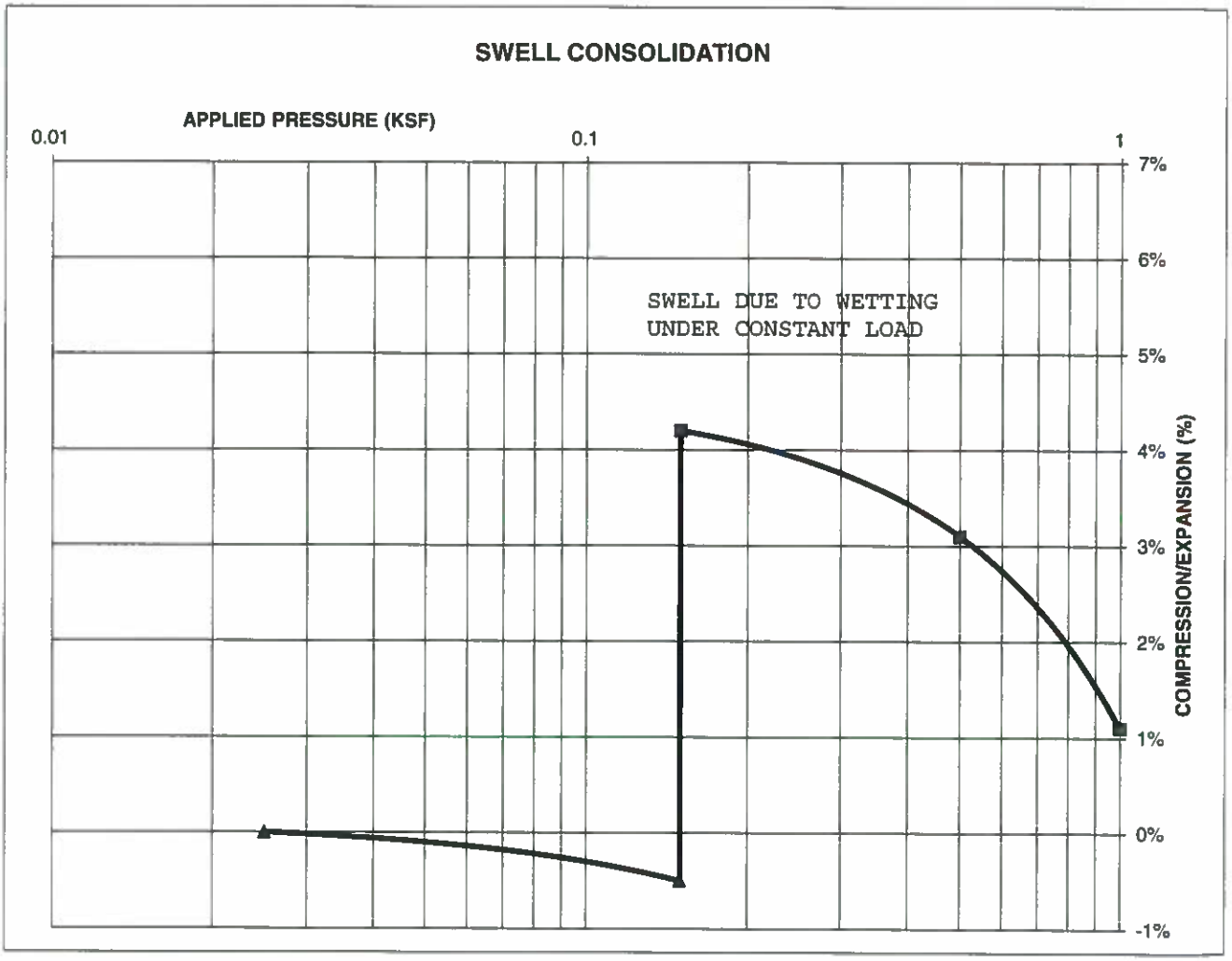
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-42

CONSOLIDATION TEST RESULTS

TEST BORING #	1	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			19.6%
SWELL/CONSOLIDATION (%)			4.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

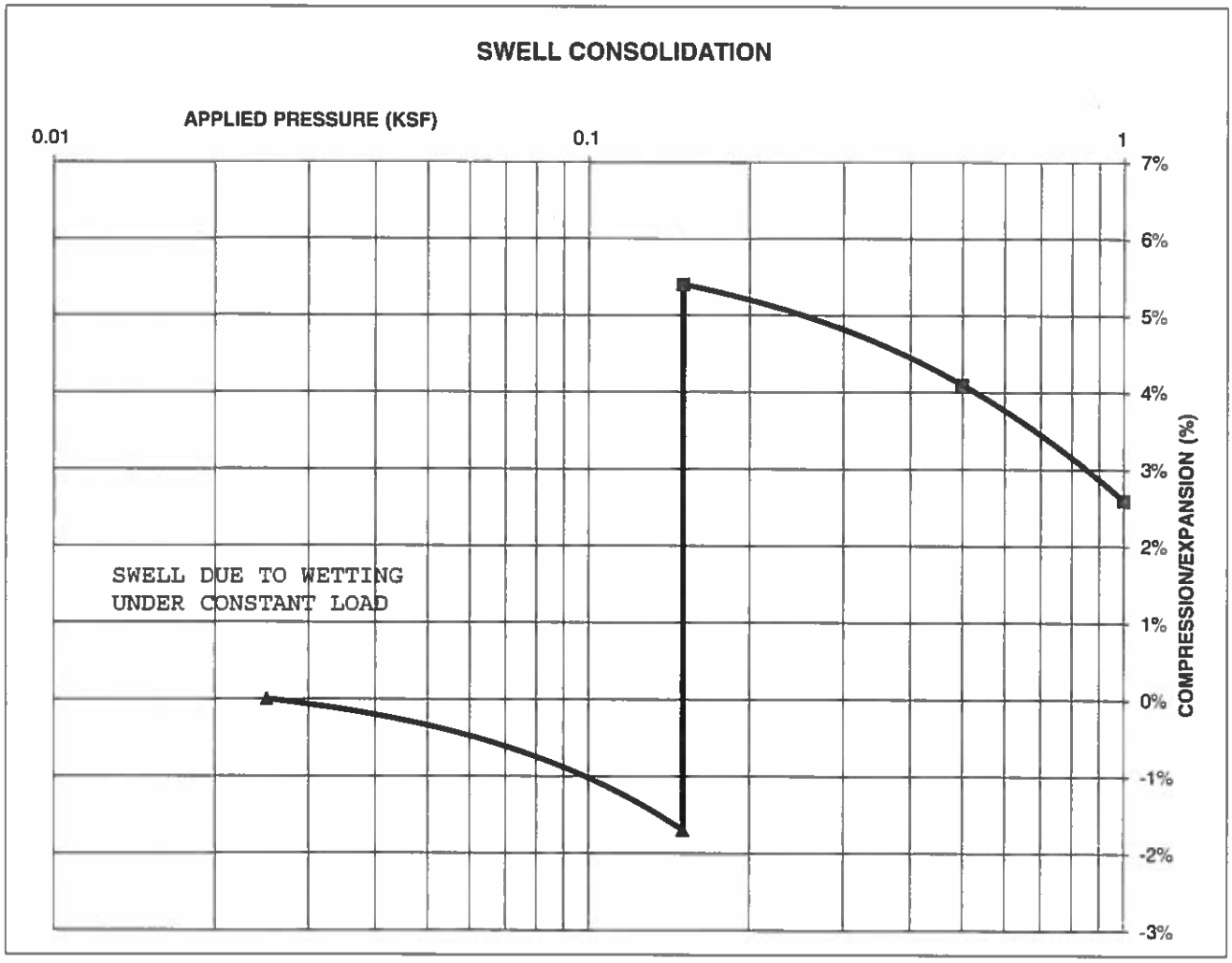
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-43

CONSOLIDATION TEST RESULTS

TEST BORING #	2	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			112
NATURAL MOISTURE CONTENT			16.2%
SWELL/CONSOLIDATION (%)			7.1%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

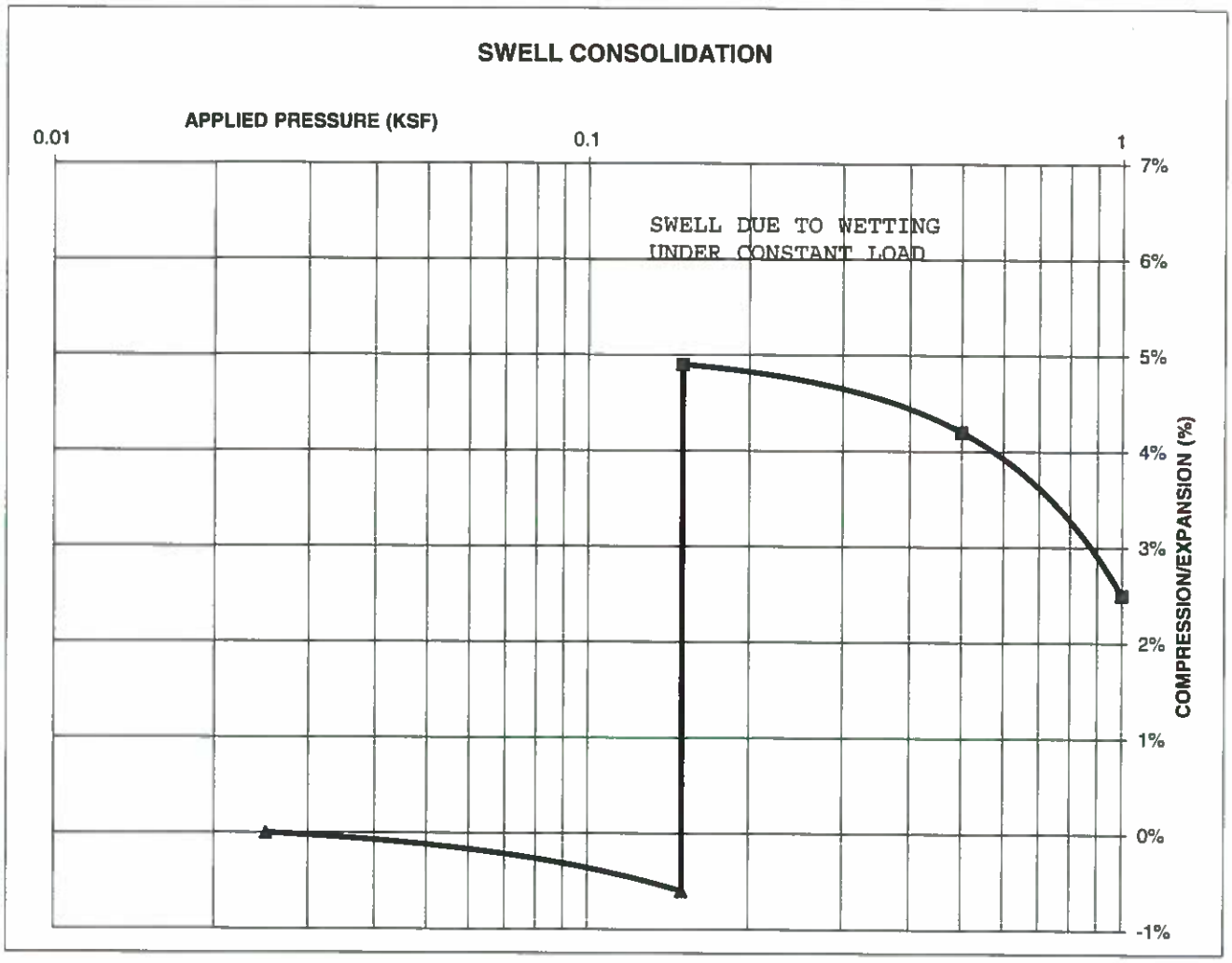
DRAWN:	DATE:	CHECKED:	DATE:
			12/4/19

JOB NO.: 191931
FIG NO.: B-44

CONSOLIDATION TEST RESULTS

TEST BORING #	2	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			17.5%
SWELL/CONSOLIDATION (%)			5.5%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

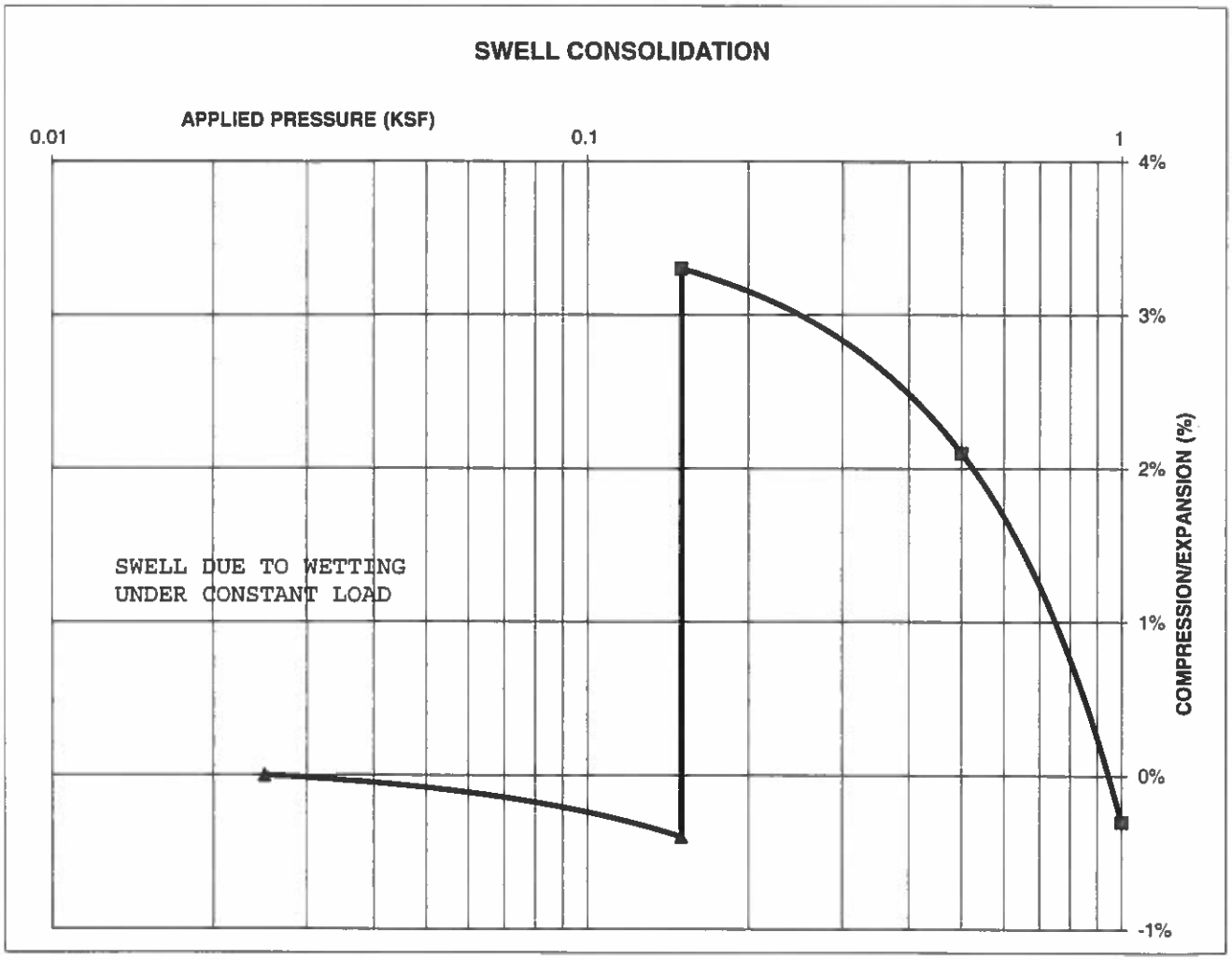
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/21

JOB NO.: 191931
FIG NO.: B-45

CONSOLIDATION TEST RESULTS

TEST BORING #	3	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			111
NATURAL MOISTURE CONTENT			14.1%
SWELL/CONSOLIDATION (%)			3.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

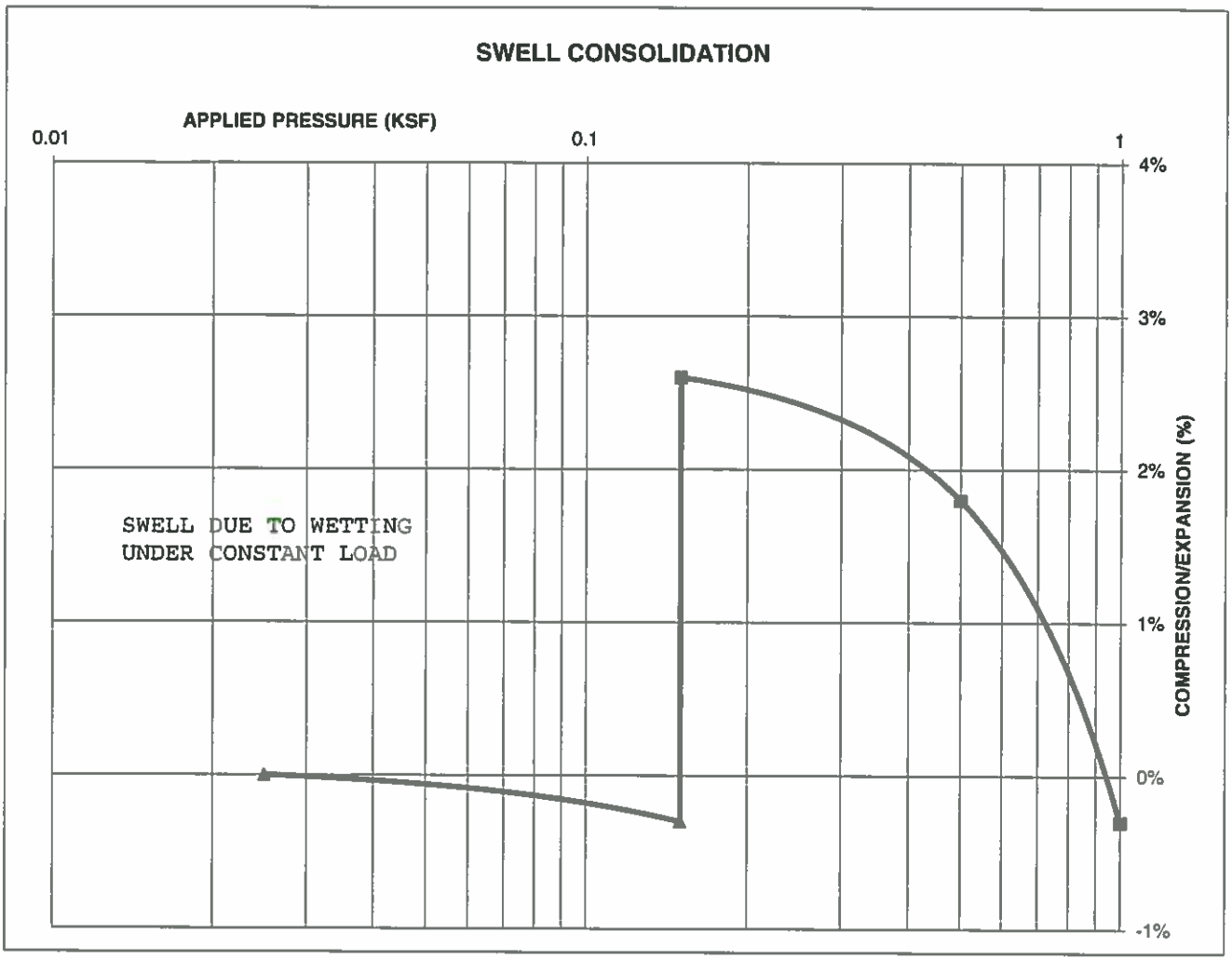
DRAWN:	DATE:	CHECKED: h	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-46

CONSOLIDATION TEST RESULTS

TEST BORING #	3	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			16.2%
SWELL/CONSOLIDATION (%)			2.9%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

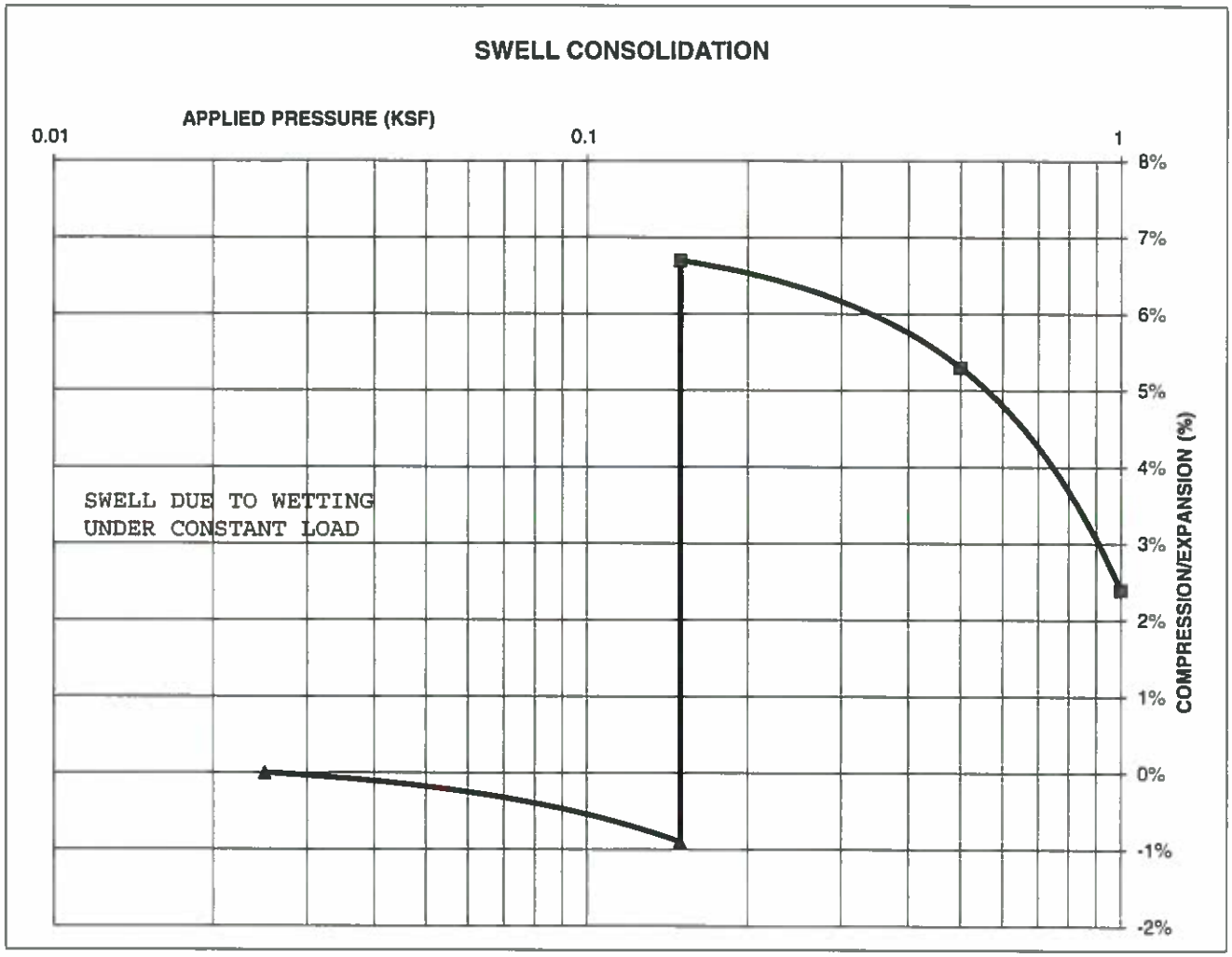
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/26

JOB NO.: 191931
FIG NO.: B-47

CONSOLIDATION TEST RESULTS

TEST BORING #	4	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			111
NATURAL MOISTURE CONTENT			13.7%
SWELL/CONSOLIDATION (%)			7.6%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

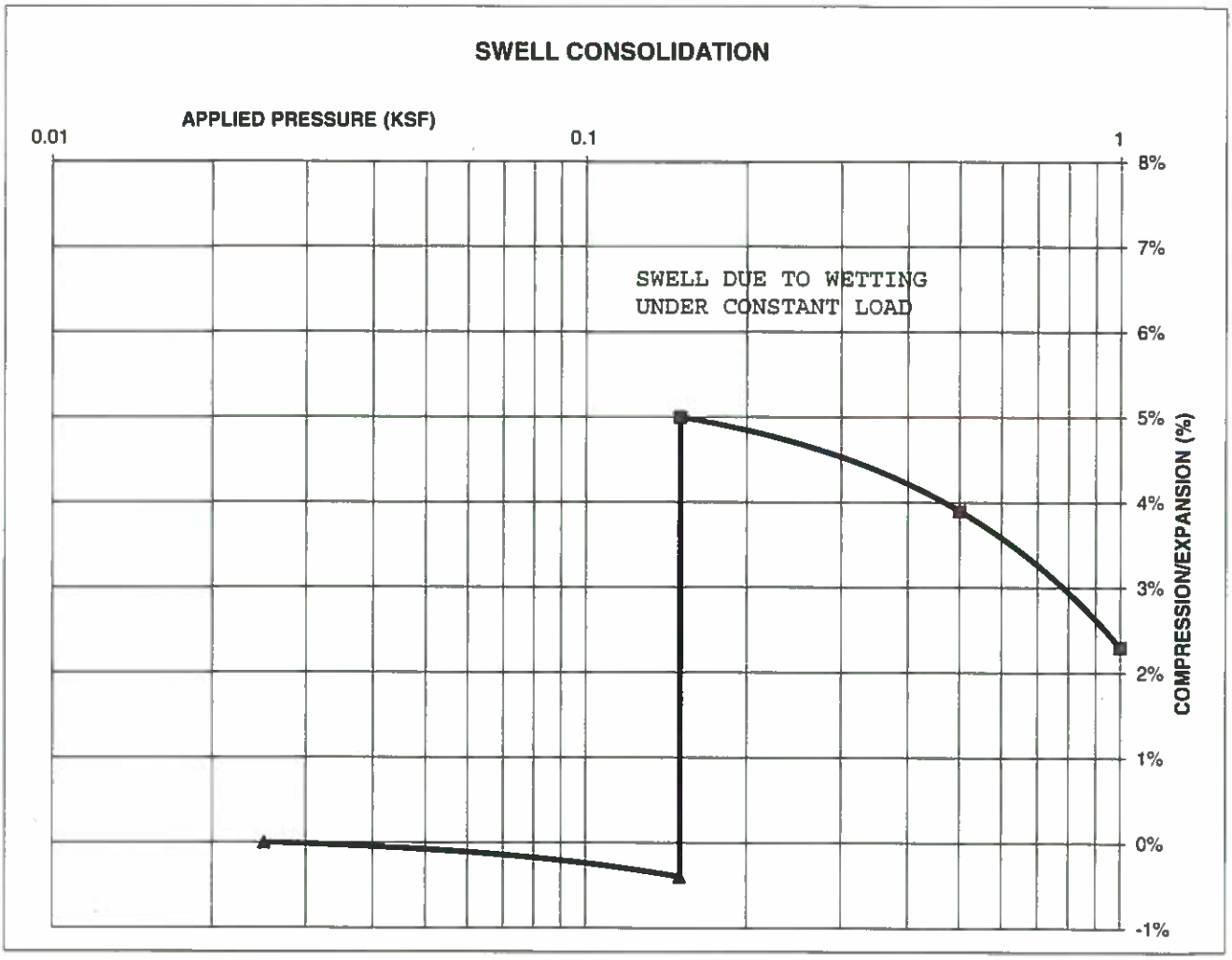
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-4B

CONSOLIDATION TEST RESULTS

TEST BORING #	4	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			15.1%
SWELL/CONSOLIDATION (%)			5.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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ENGINEERING, INC.
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SWELL CONSOLIDATION
TEST RESULTS

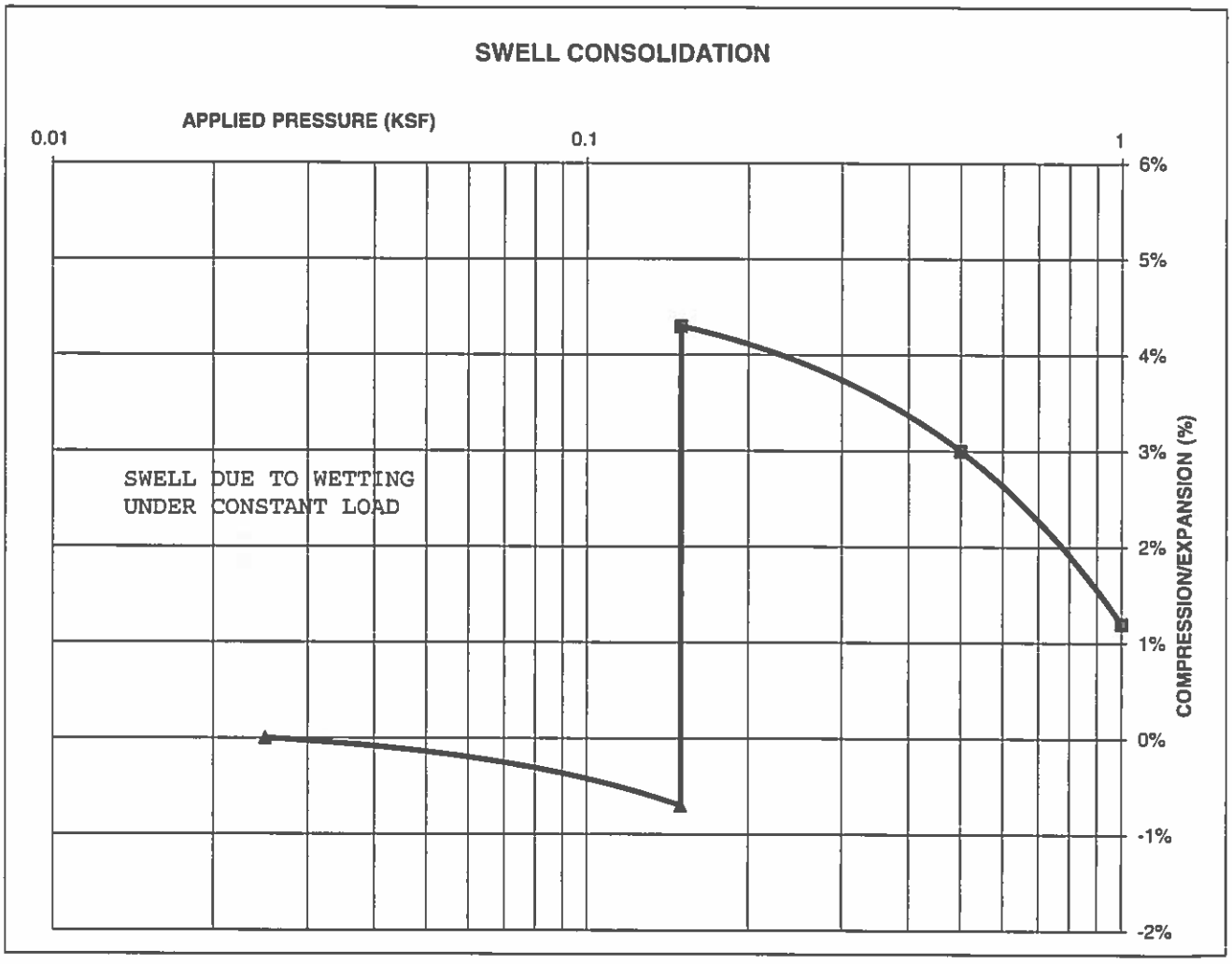
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-4

CONSOLIDATION TEST RESULTS

TEST BORING #	5	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			111
NATURAL MOISTURE CONTENT			15.3%
SWELL/CONSOLIDATION (%)			5.0%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

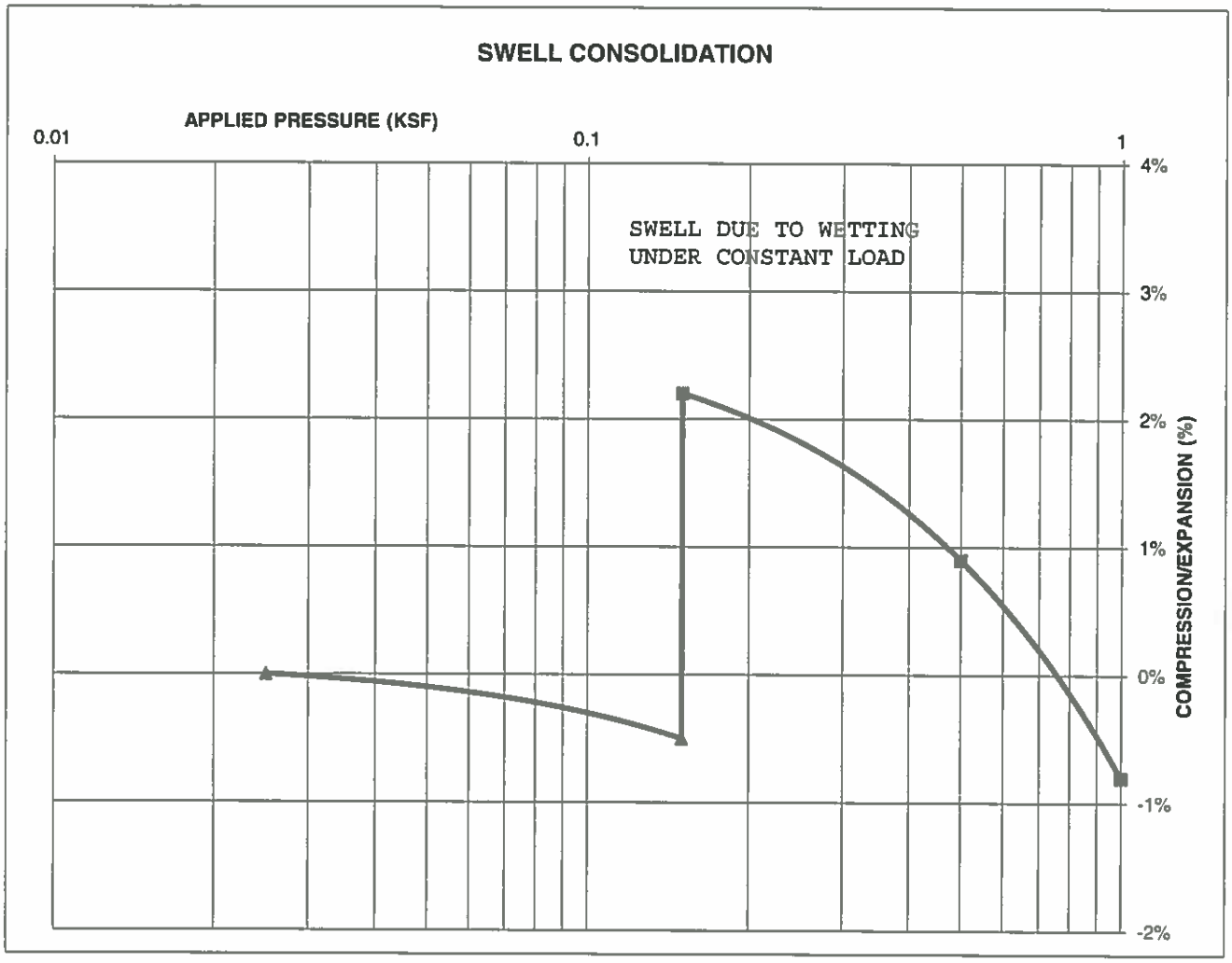
DRAWN:	DATE:	CHECKED:	DATE:
		h	12/9/19

JOB NO: 191931
FIG NO: B-5b

CONSOLIDATION TEST RESULTS

TEST BORING #	5	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			107
NATURAL MOISTURE CONTENT			18.9%
SWELL/CONSOLIDATION (%)			2.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

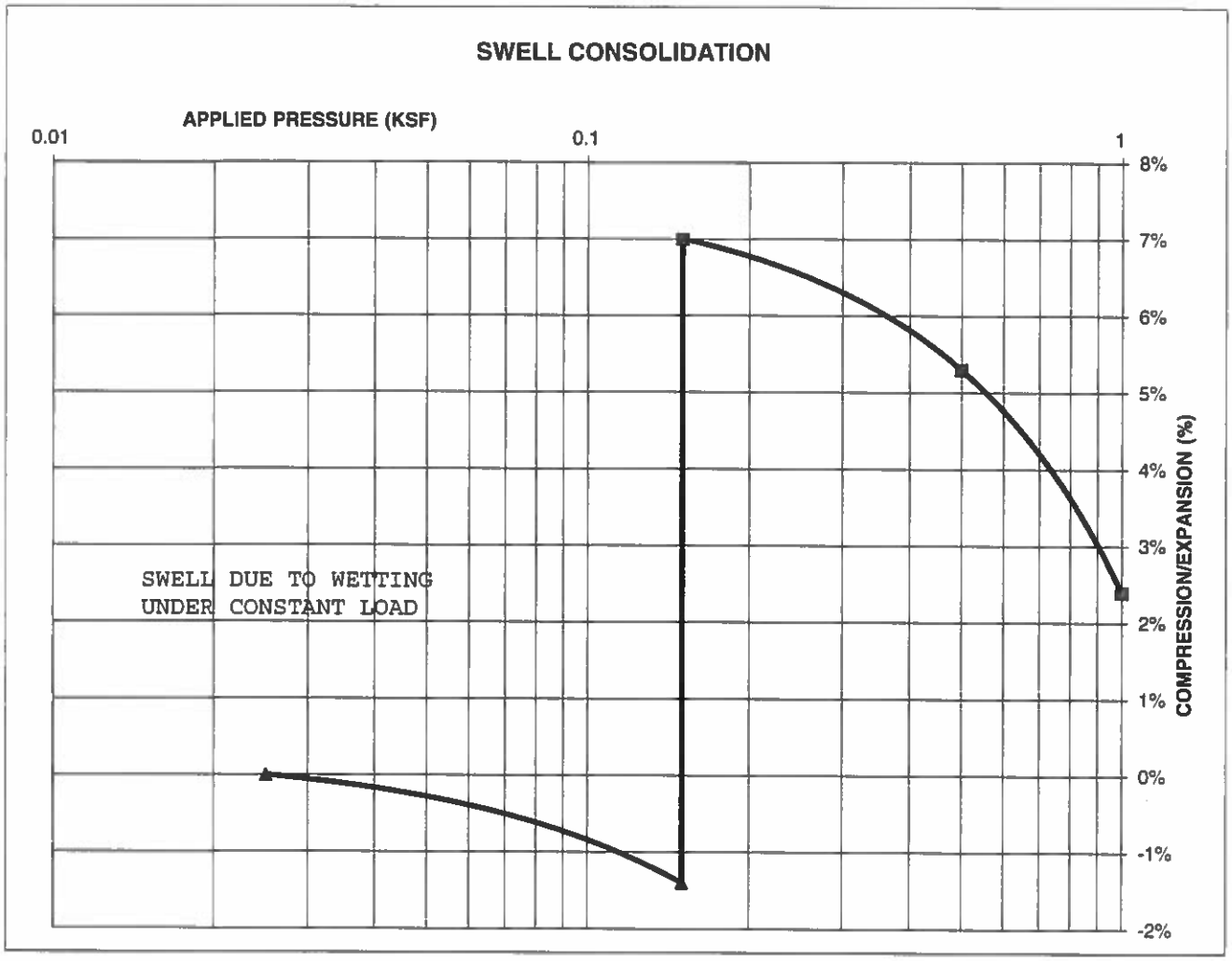
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/21/20

JOB NO.: 191931
FIG NO.: B-5

CONSOLIDATION TEST RESULTS

TEST BORING #	6	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			115
NATURAL MOISTURE CONTENT			13.5%
SWELL/CONSOLIDATION (%)			8.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

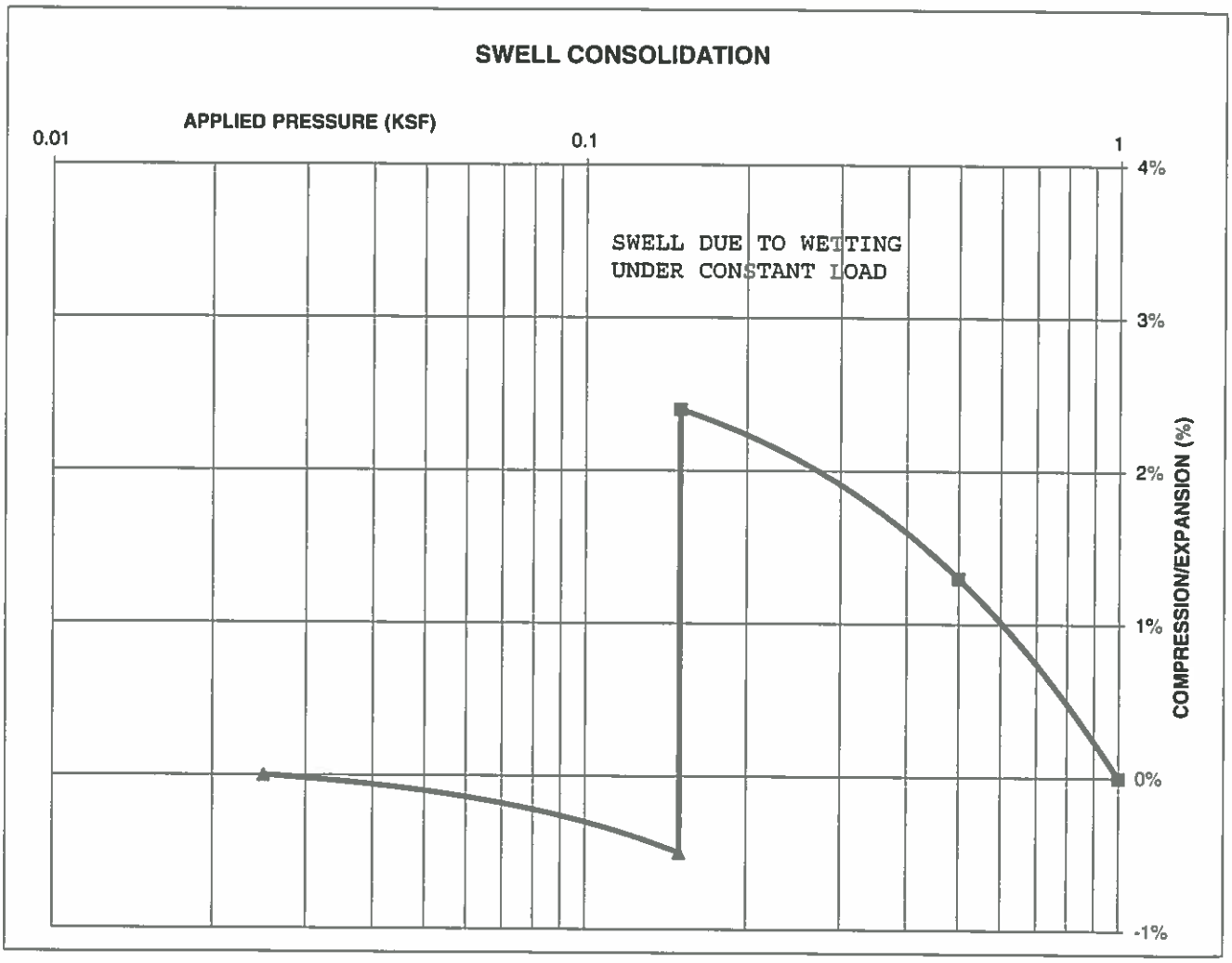
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-52

CONSOLIDATION TEST RESULTS

TEST BORING #	6	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			20.1%
SWELL/CONSOLIDATION (%)			2.9%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

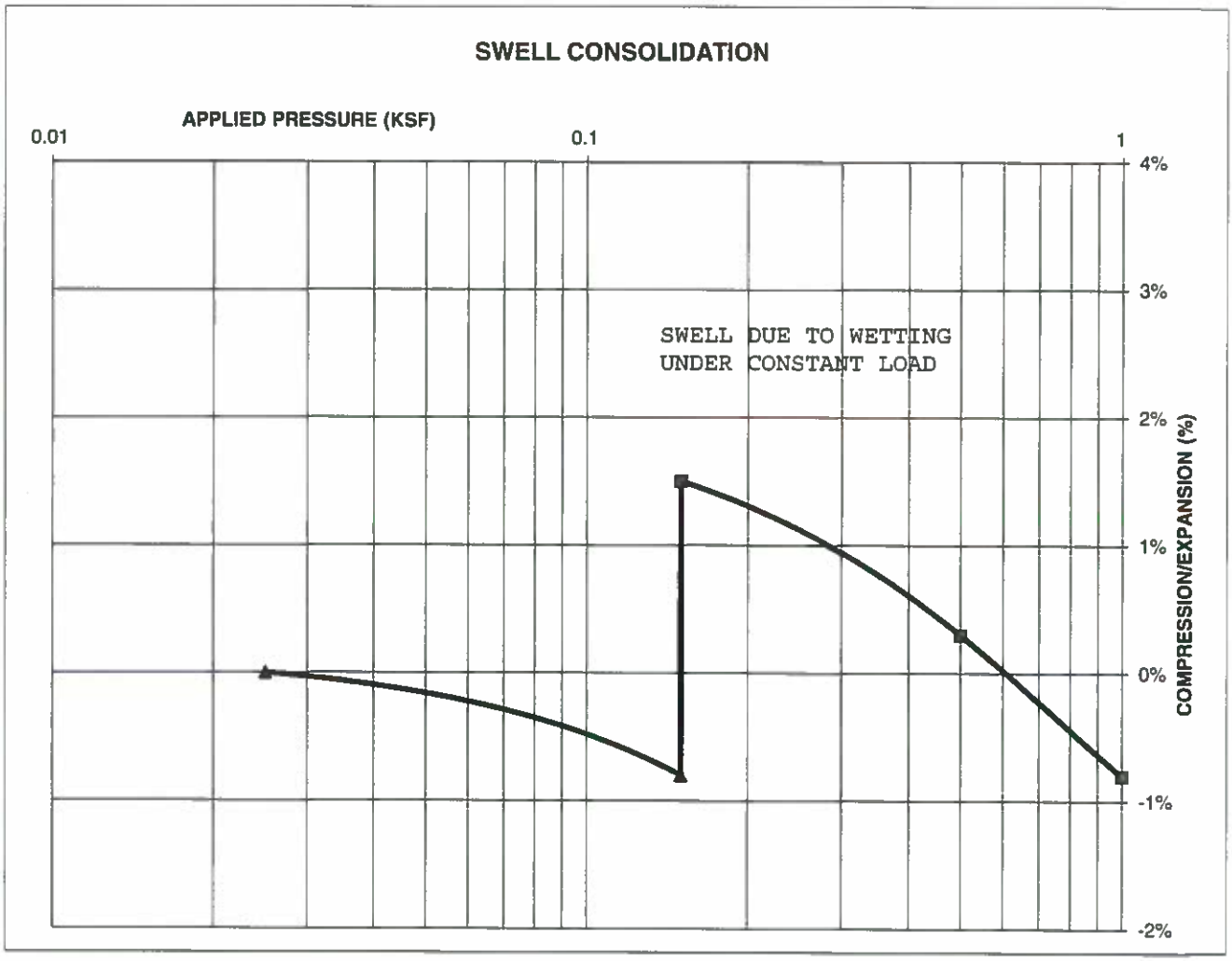
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-53

CONSOLIDATION TEST RESULTS

TEST BORING #	7	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			111
NATURAL MOISTURE CONTENT			16.8%
SWELL/CONSOLIDATION (%)			2.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

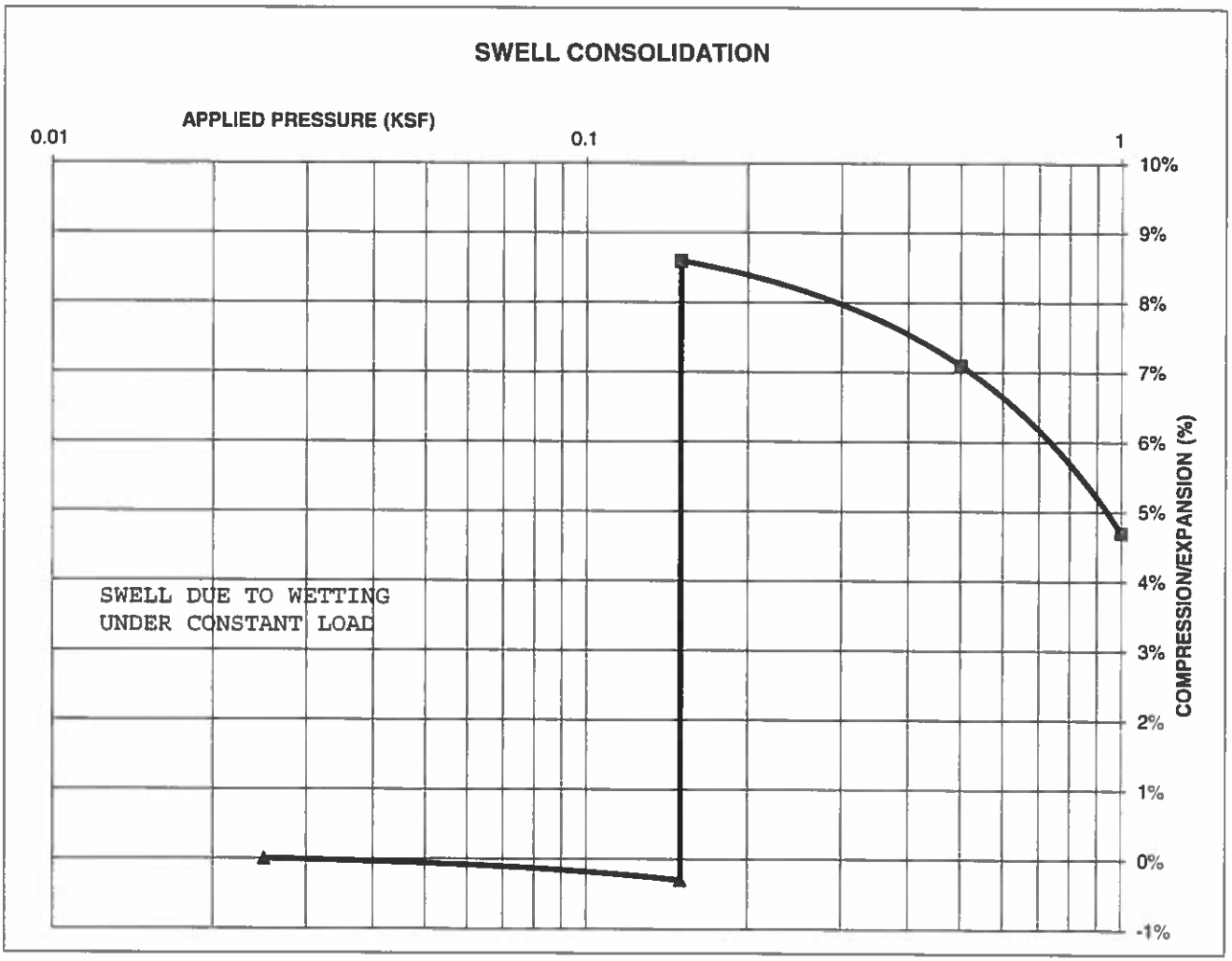
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-54

CONSOLIDATION TEST RESULTS

TEST BORING #	8	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			119
NATURAL MOISTURE CONTENT			12.0%
SWELL/CONSOLIDATION (%)			8.9%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

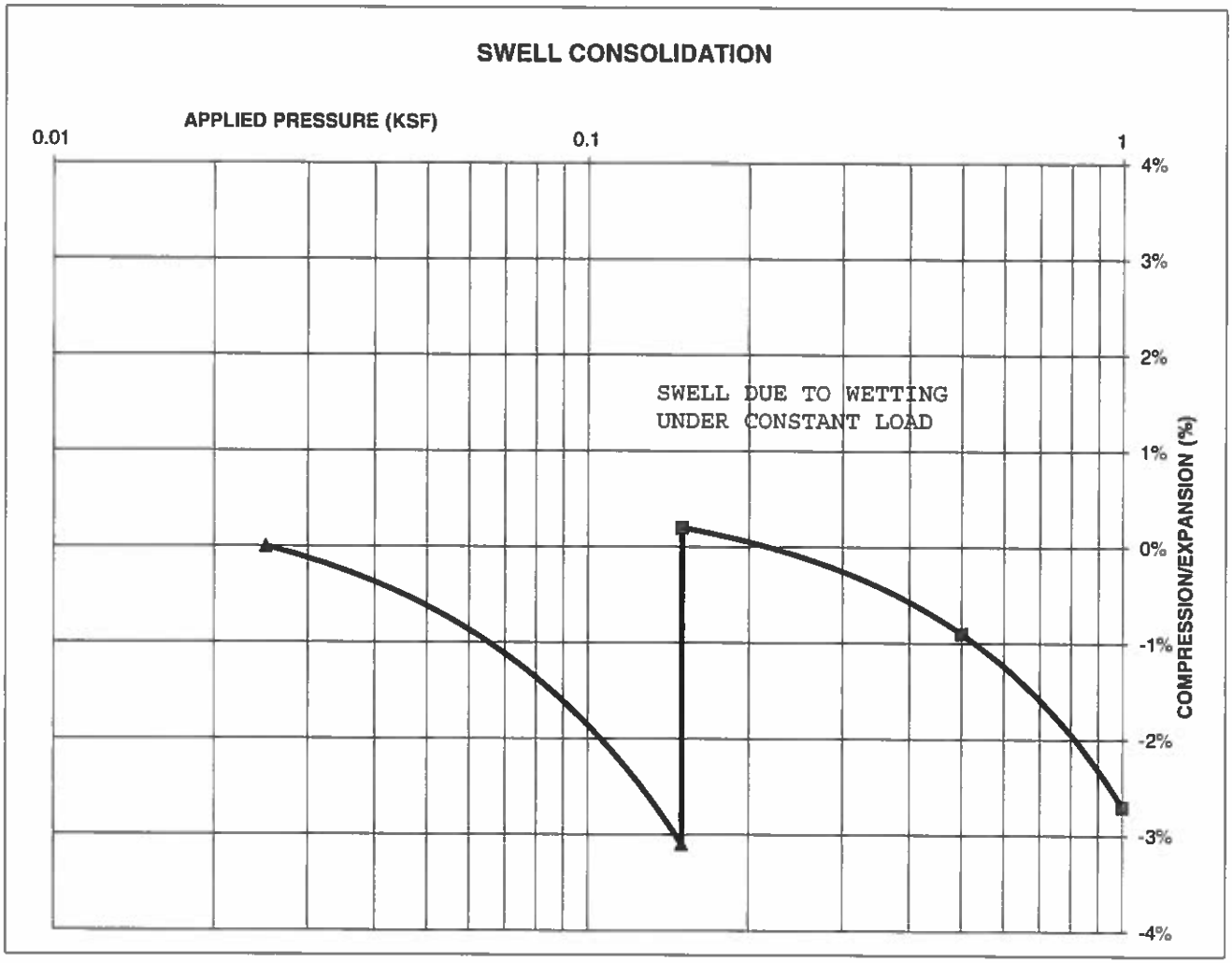
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-55

CONSOLIDATION TEST RESULTS

TEST BORING #	9	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			15.6%
SWELL/CONSOLIDATION (%)			3.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

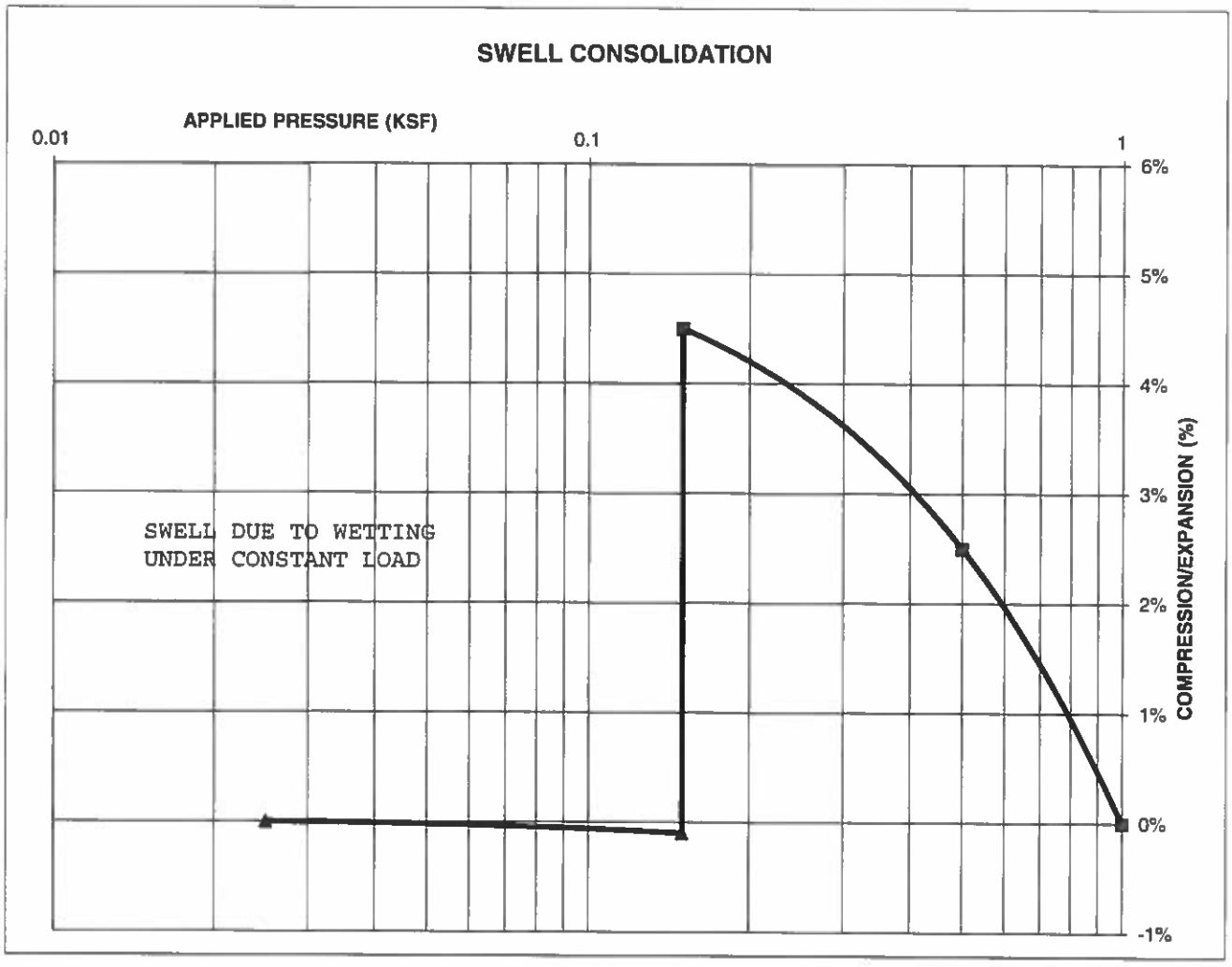
DRAWN:	DATE:	CHECKED:	DATE:
			12/4/19

JOB NO.: 191931
FIG NO.: B-5

CONSOLIDATION TEST RESULTS

TEST BORING #	10	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			119
NATURAL MOISTURE CONTENT			13.1%
SWELL/CONSOLIDATION (%)			4.6%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

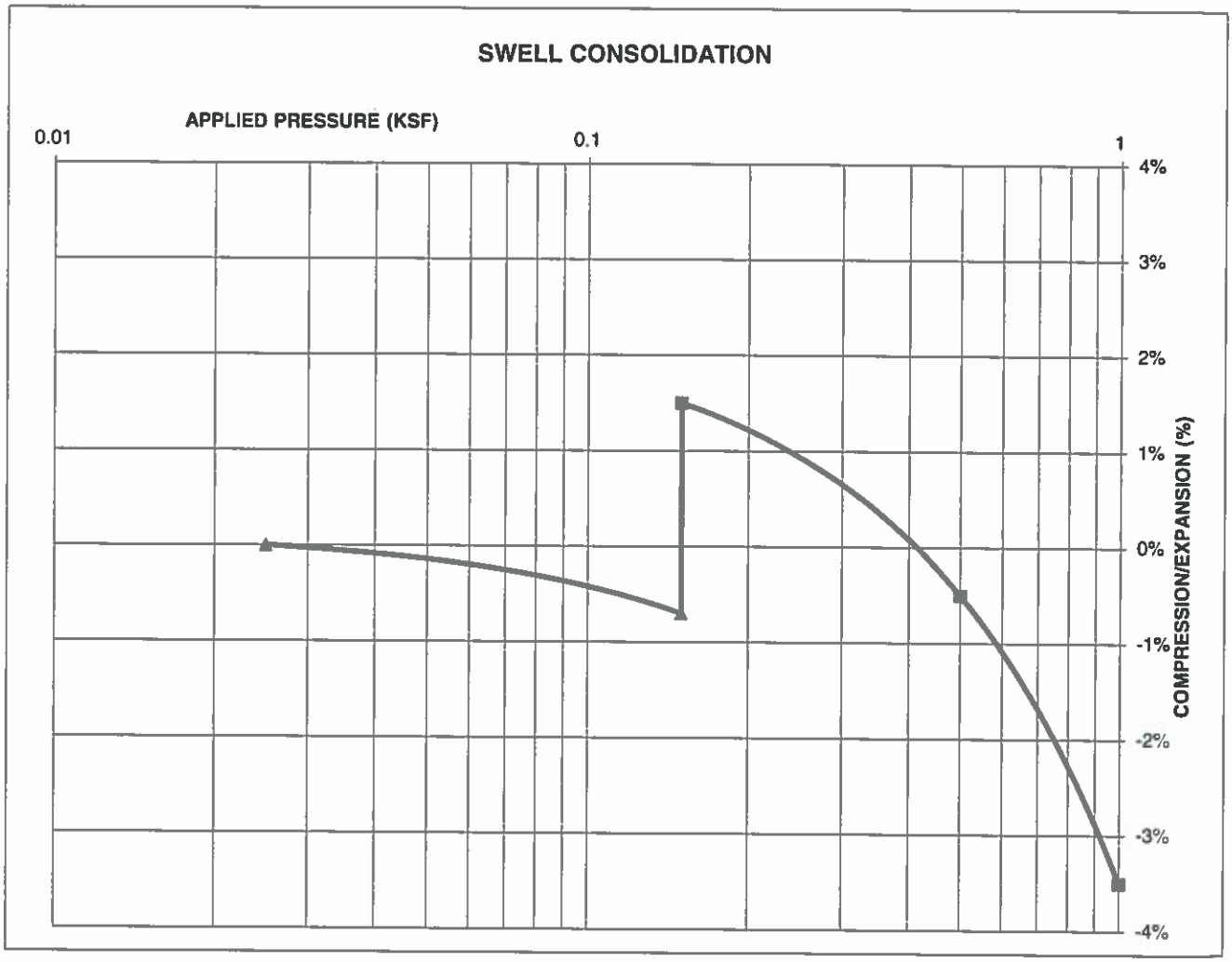
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-57

CONSOLIDATION TEST RESULTS

TEST BORING #	10	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			107
NATURAL MOISTURE CONTENT			16.7%
SWELL/CONSOLIDATION (%)			2.2%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

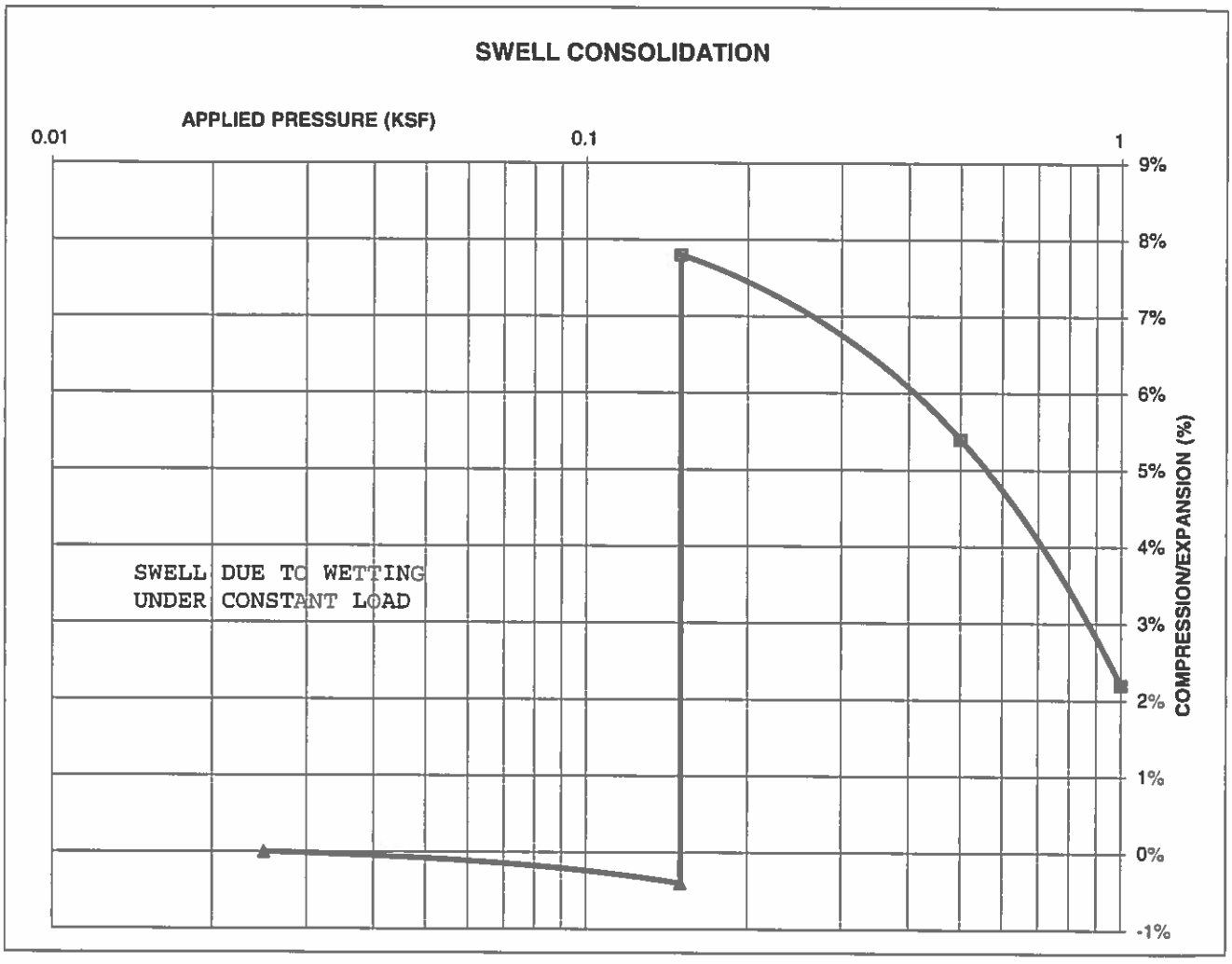
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-58

CONSOLIDATION TEST RESULTS

TEST BORING #	11	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			14.5%
SWELL/CONSOLIDATION (%)			8.2%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

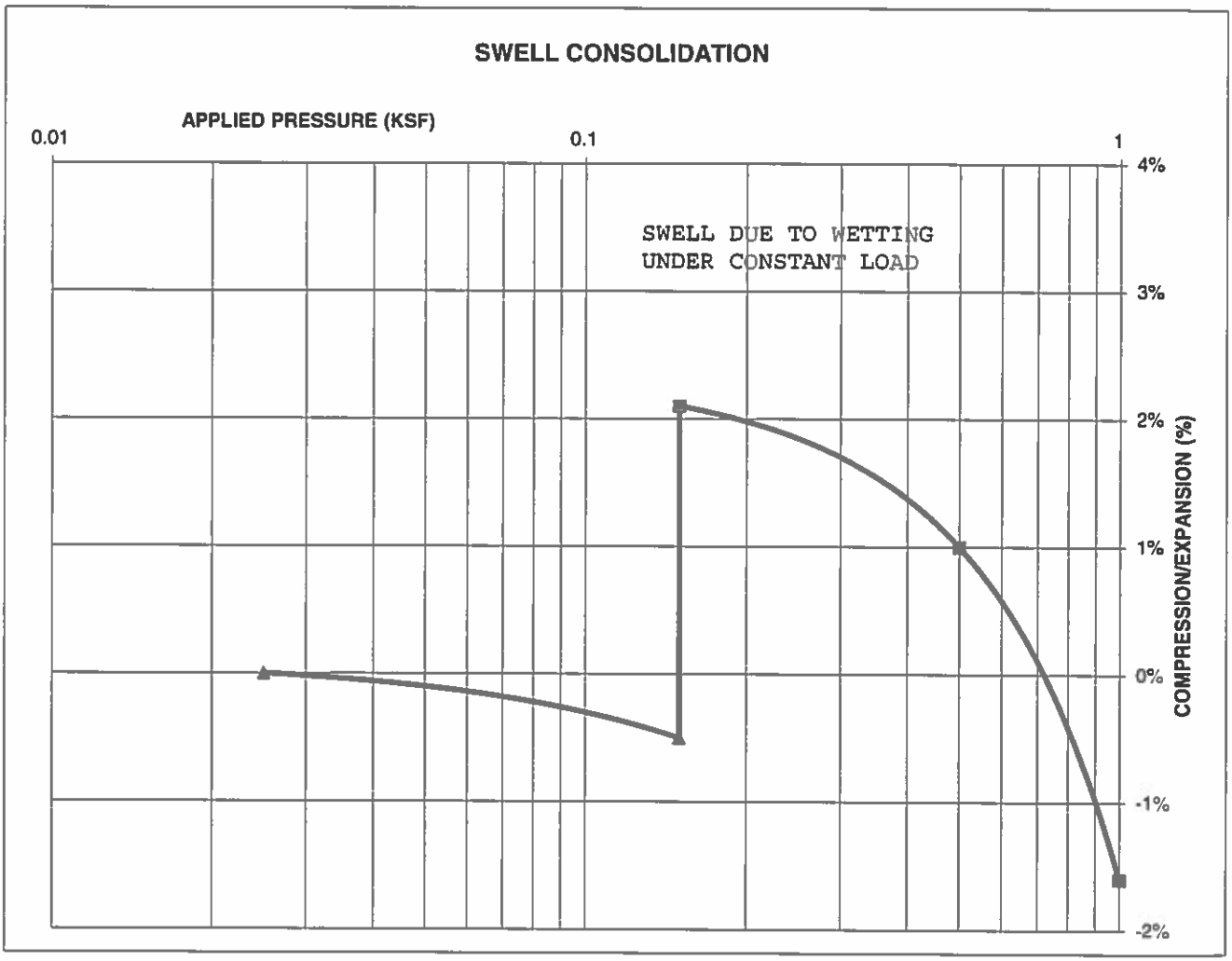
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-59

CONSOLIDATION TEST RESULTS

TEST BORING #	12	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			109
NATURAL MOISTURE CONTENT			18.3%
SWELL/CONSOLIDATION (%)			2.6%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

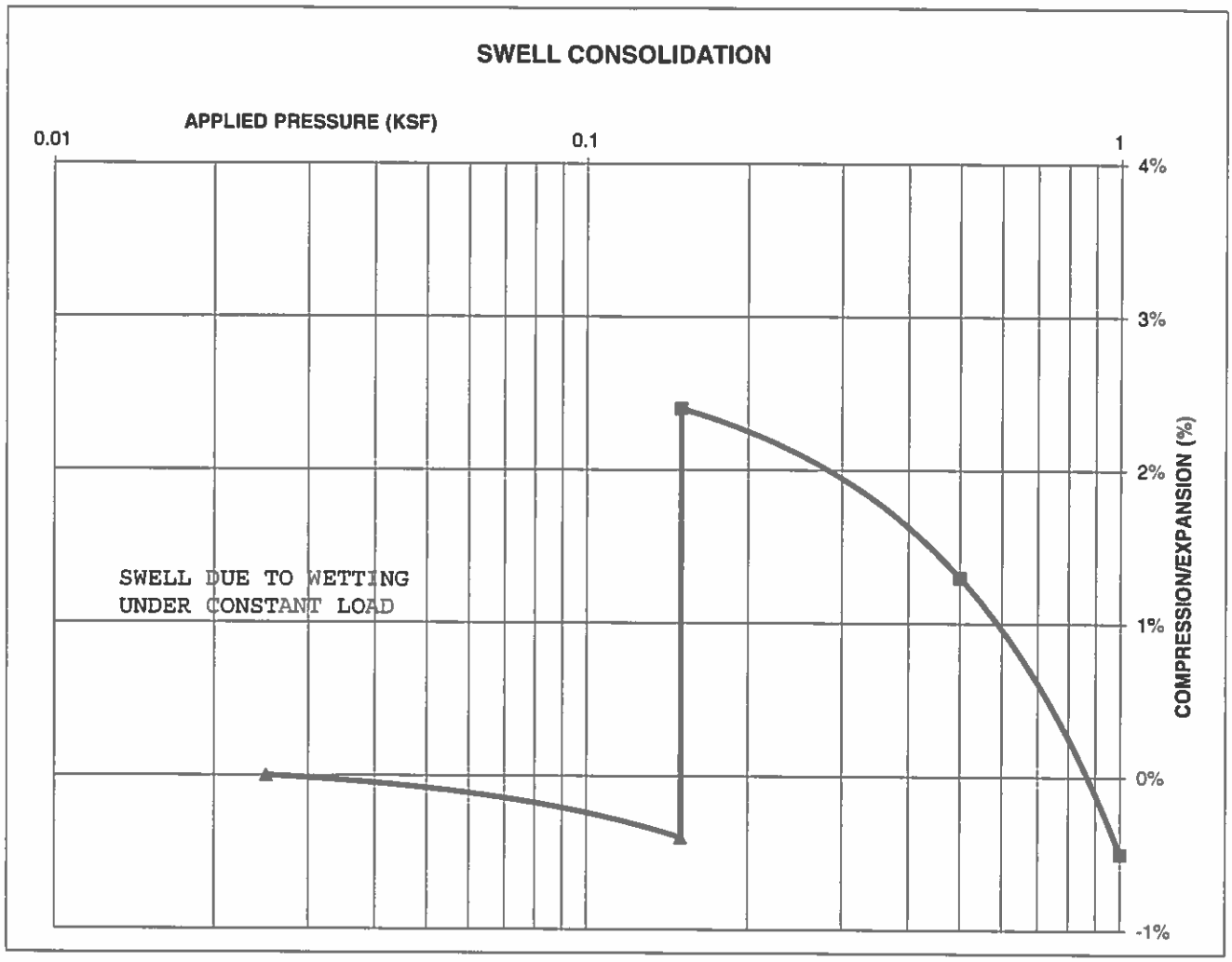
DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-6.0

CONSOLIDATION TEST RESULTS

TEST BORING #	13	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			106
NATURAL MOISTURE CONTENT			16.9%
SWELL/CONSOLIDATION (%)			2.8%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

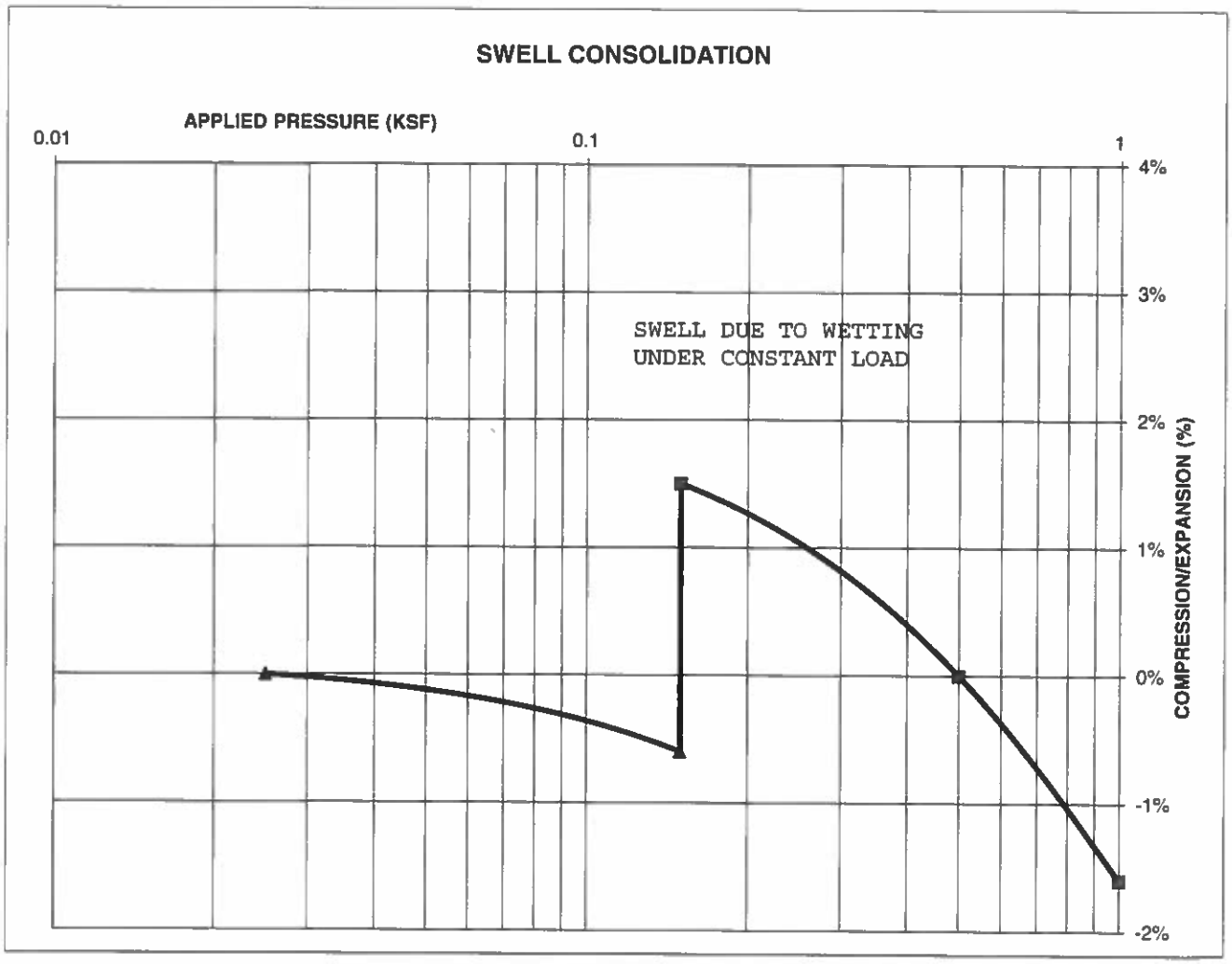
DRAWN:	DATE:	CHECKED:	DATE: 12/5/19

JOB NO.: 191931
FIG NO.: B-61

CONSOLIDATION TEST RESULTS

TEST BORING #	13	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			19.4%
SWELL/CONSOLIDATION (%)			2.1%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

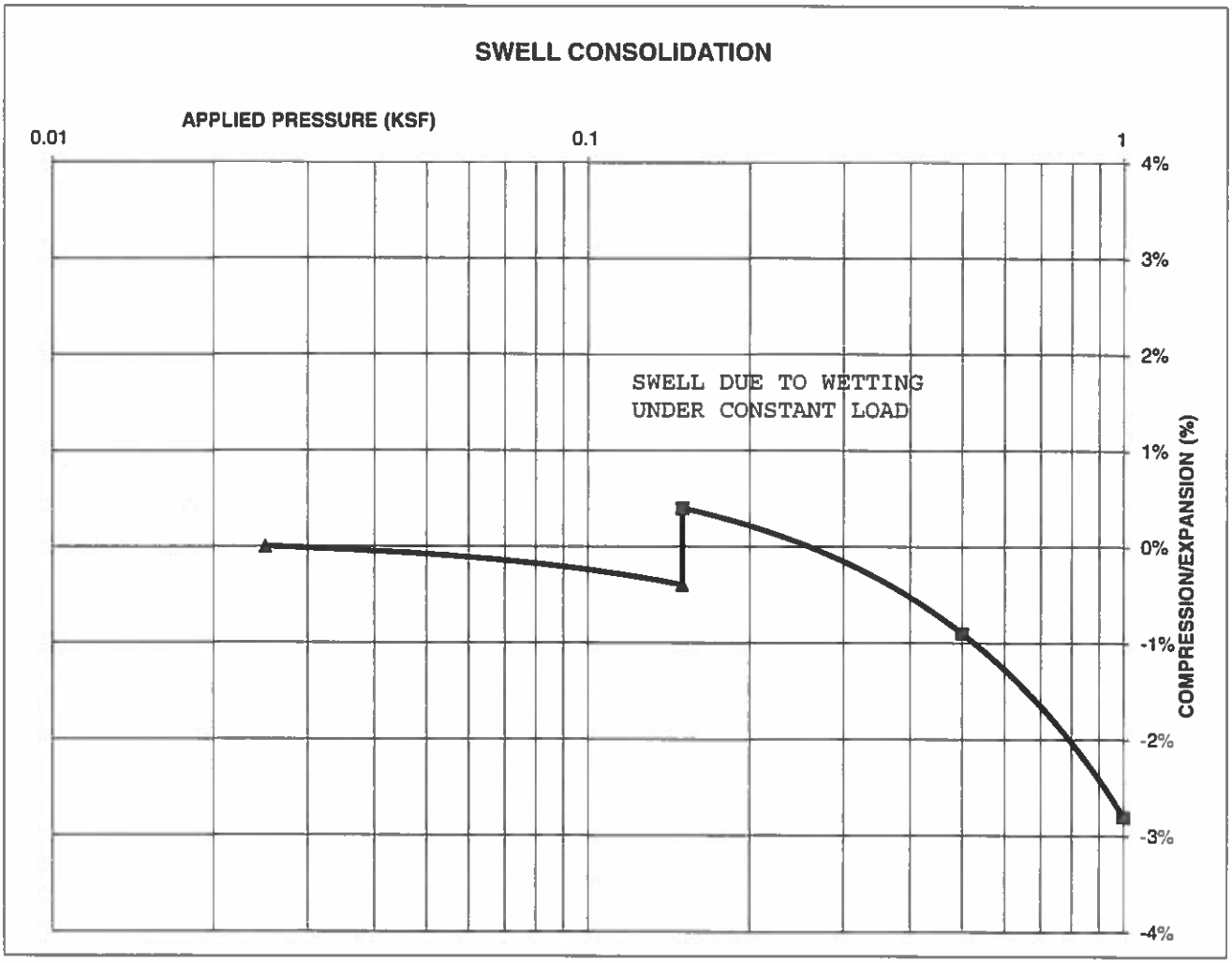
DRAWN	DATE	CHECKED	DATE
		DS	3/9/20

JOB NO. 191931
FIG NO. B-12

CONSOLIDATION TEST RESULTS

TEST BORING #	14	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			103
NATURAL MOISTURE CONTENT			20.4%
SWELL/CONSOLIDATION (%)			0.8%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

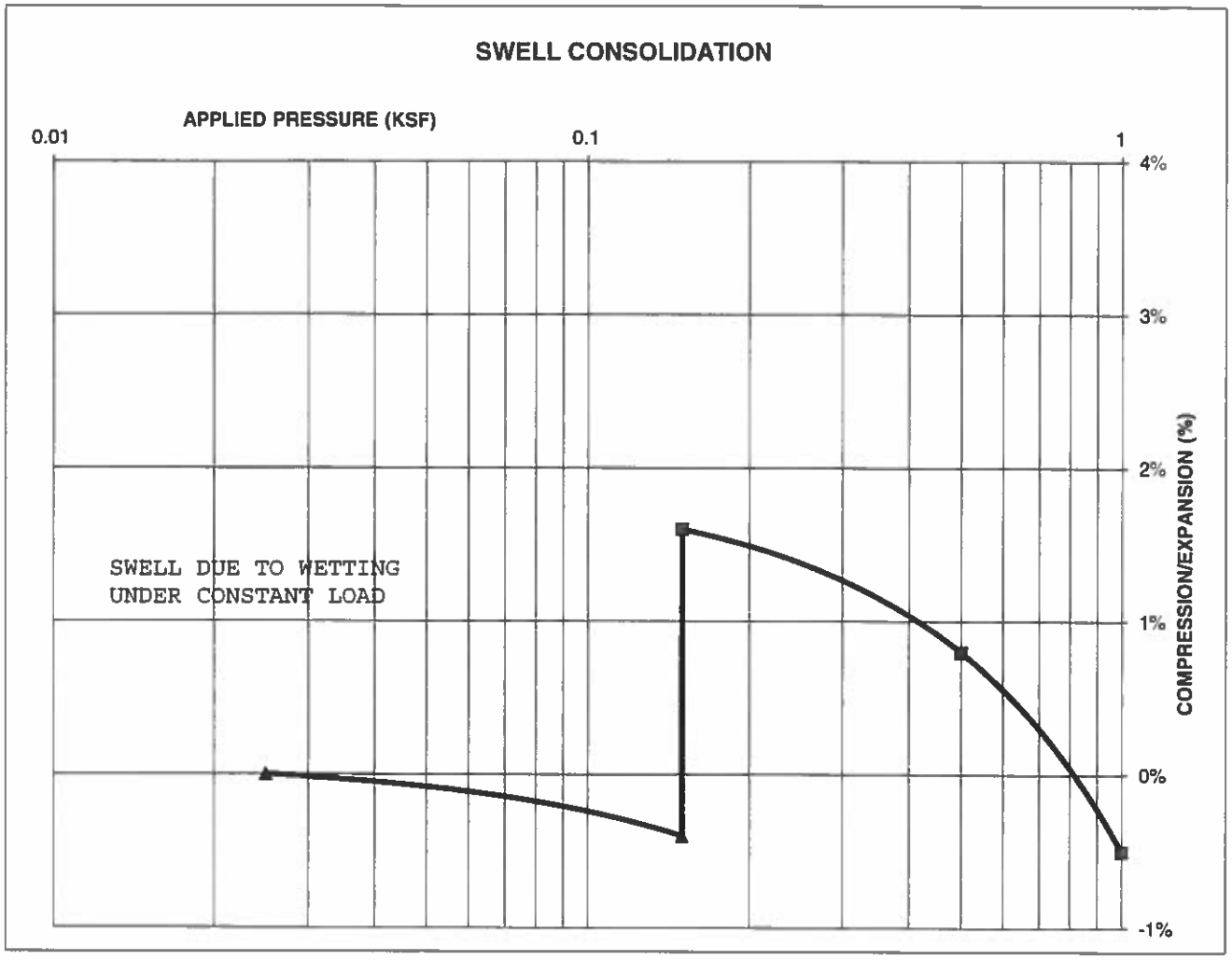
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-13

CONSOLIDATION TEST RESULTS

TEST BORING #	15	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			111
NATURAL MOISTURE CONTENT			16.4%
SWELL/CONSOLIDATION (%)			2.0%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

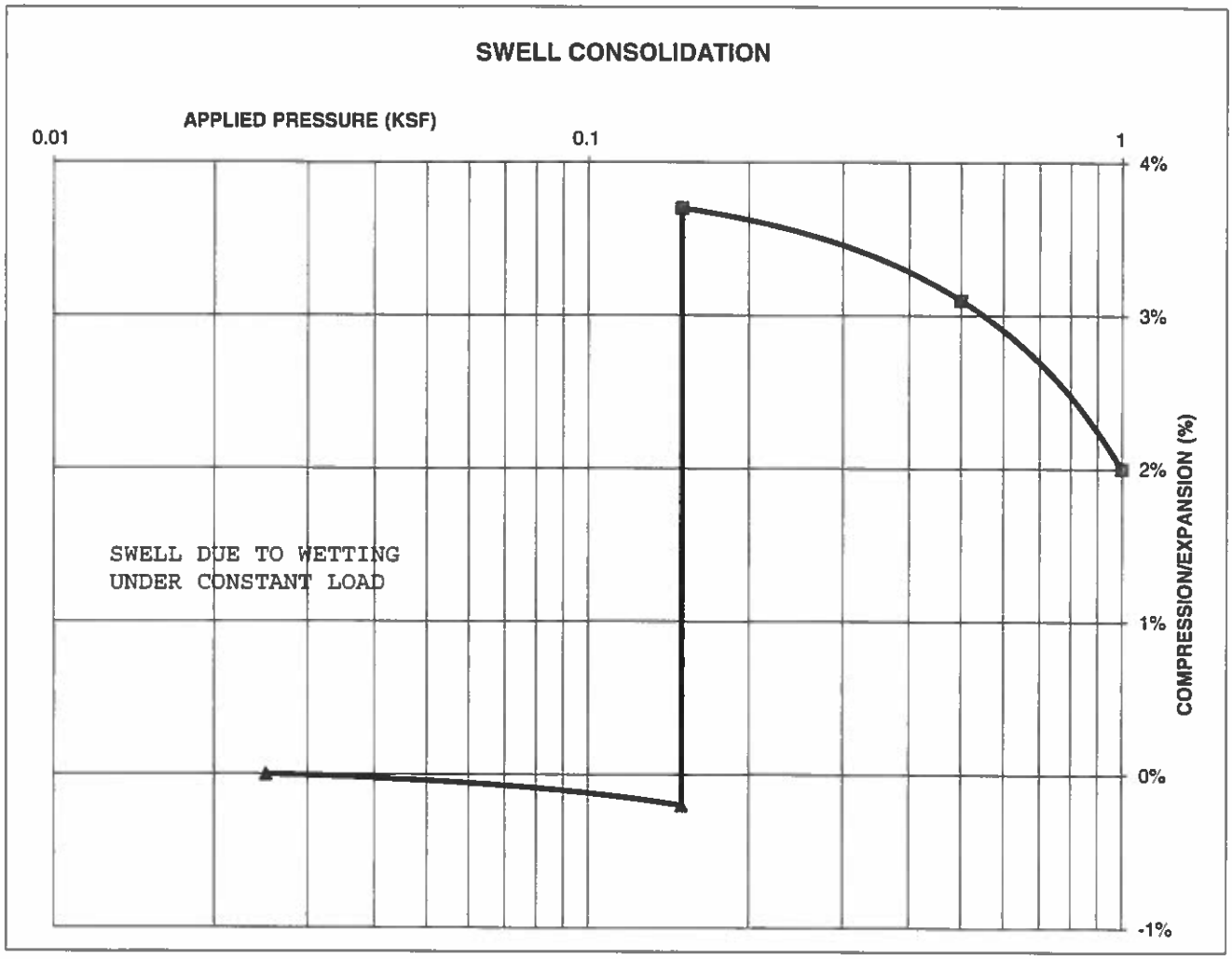
DRAWN	DATE	CHECKED	DATE
			12/9/14

JOB NO. 191931
FIG NO. B-64

CONSOLIDATION TEST RESULTS

TEST BORING #	16	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			14.9%
SWELL/CONSOLIDATION (%)			3.9%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

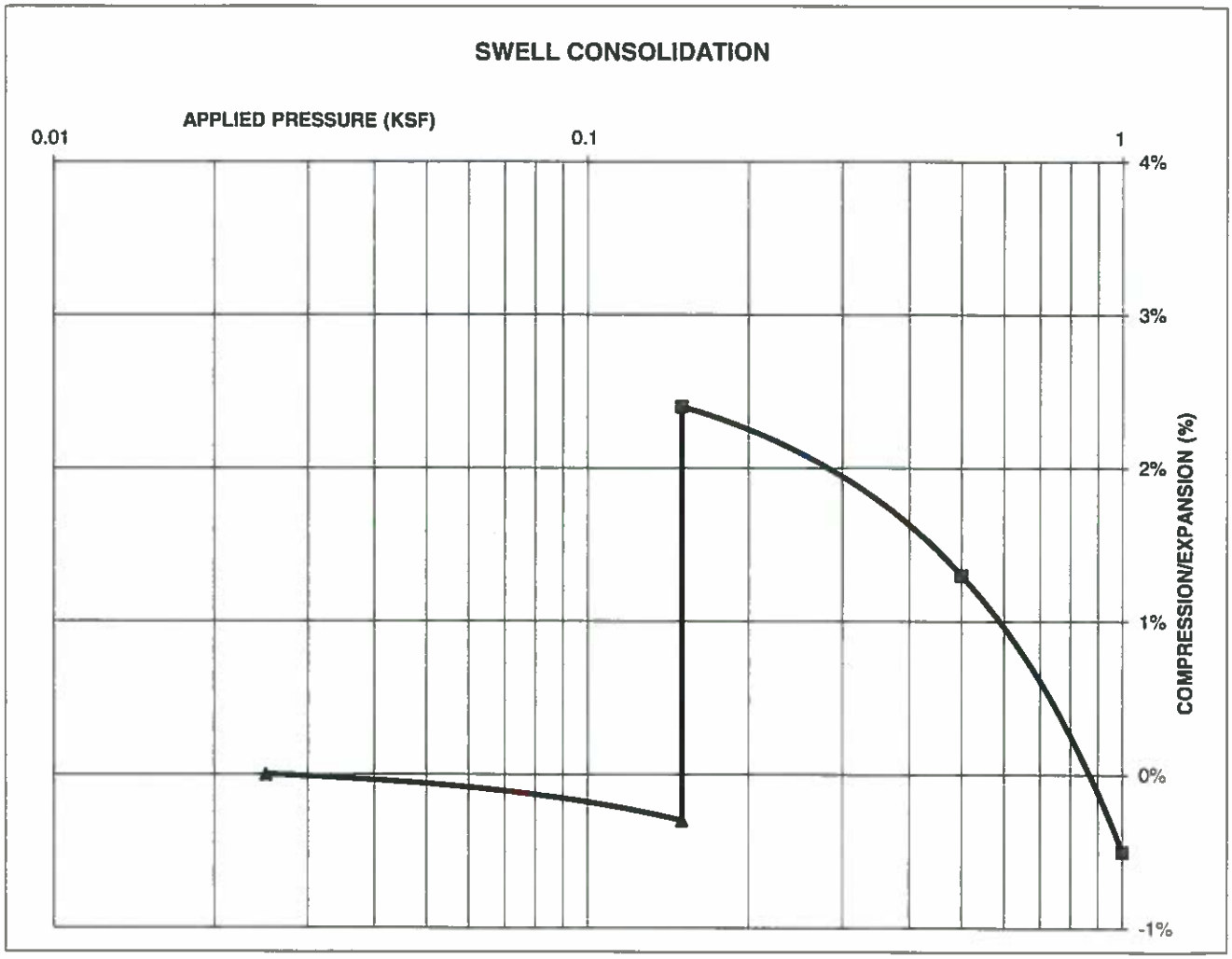
DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-65

CONSOLIDATION TEST RESULTS

TEST BORING #	17	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			108
NATURAL MOISTURE CONTENT			16.0%
SWELL/CONSOLIDATION (%)			2.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

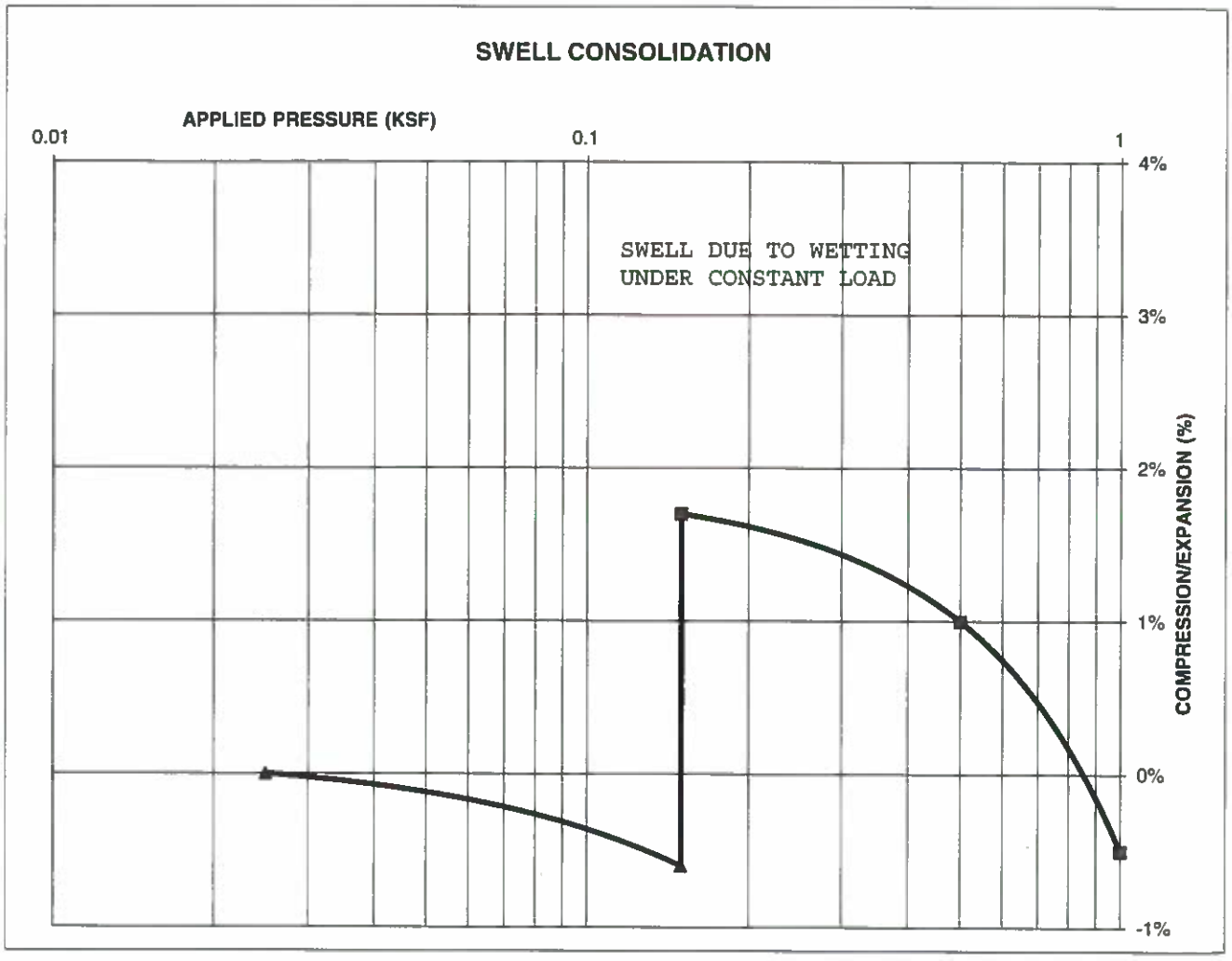
DRAWN:	DATE:	CHECKED:	DATE: 12/9/19

JOB NO.: 191931
FIG NO.: B-66

CONSOLIDATION TEST RESULTS

TEST BORING #	17	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			104
NATURAL MOISTURE CONTENT			19.5%
SWELL/CONSOLIDATION (%)			2.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

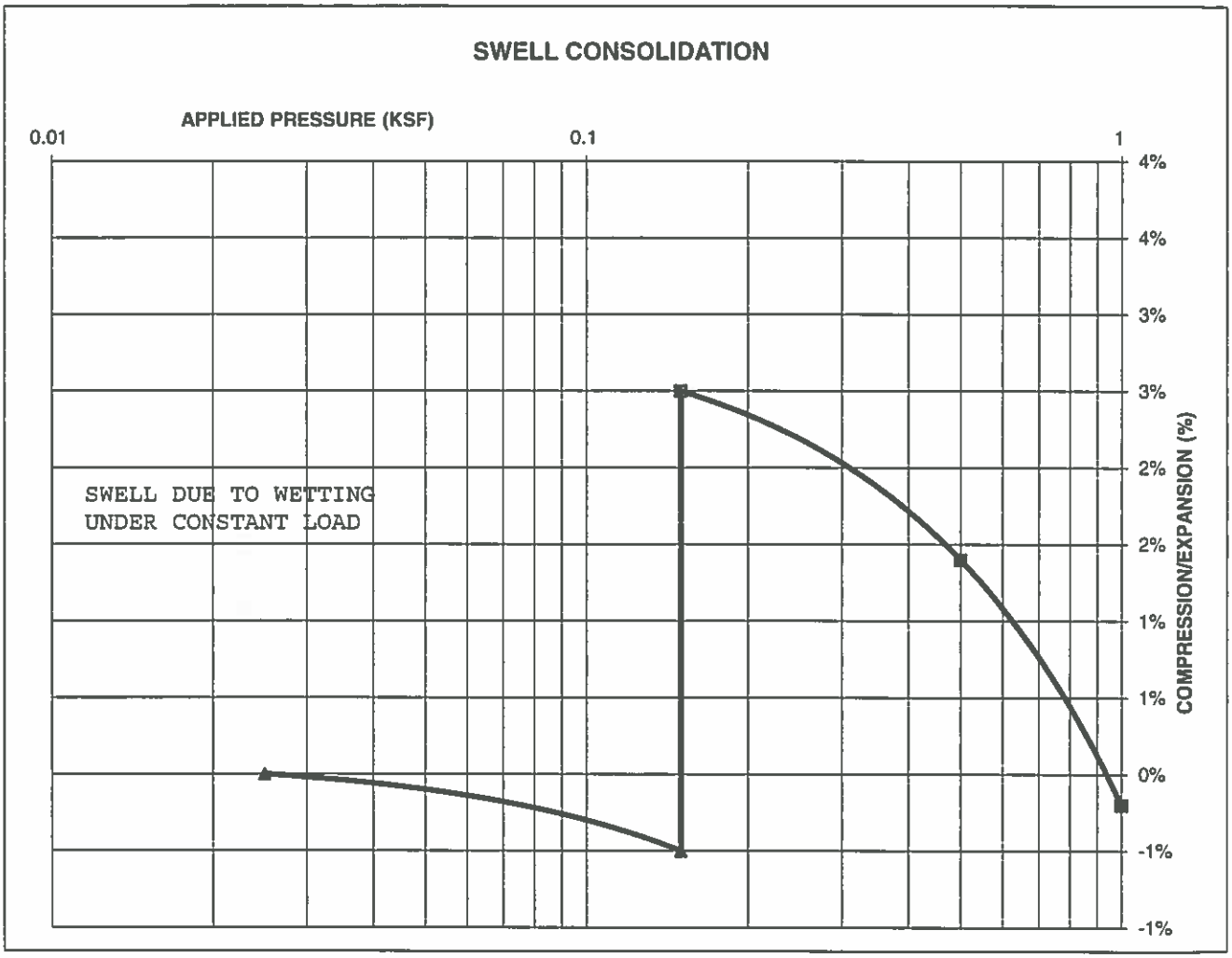
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-67

CONSOLIDATION TEST RESULTS

TEST BORING #	18	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			118
NATURAL MOISTURE CONTENT			11.7%
SWELL/CONSOLIDATION (%)			3.0%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

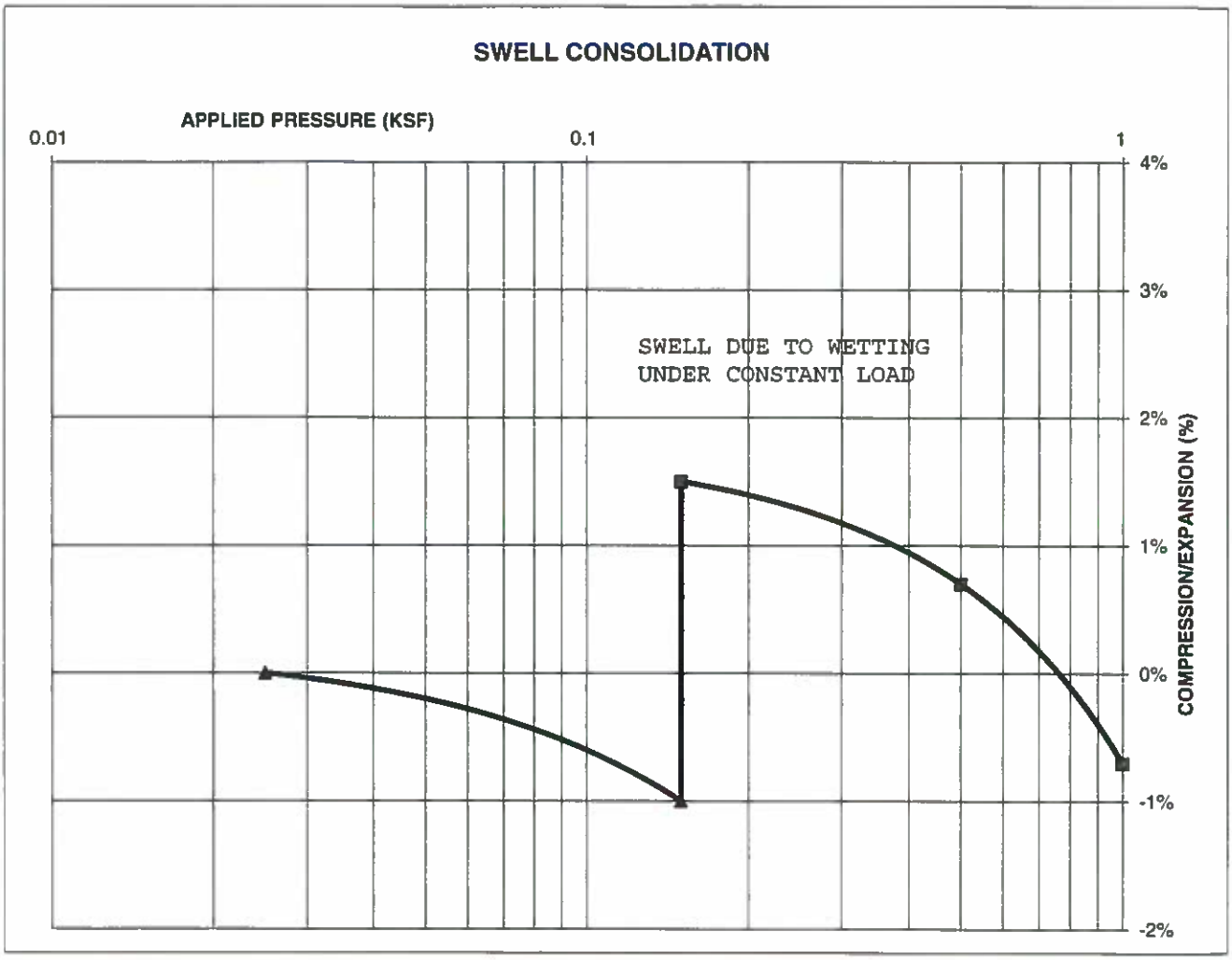
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-C8

CONSOLIDATION TEST RESULTS

TEST BORING #	19	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			112
NATURAL MOISTURE CONTENT			13.5%
SWELL/CONSOLIDATION (%)			2.5%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

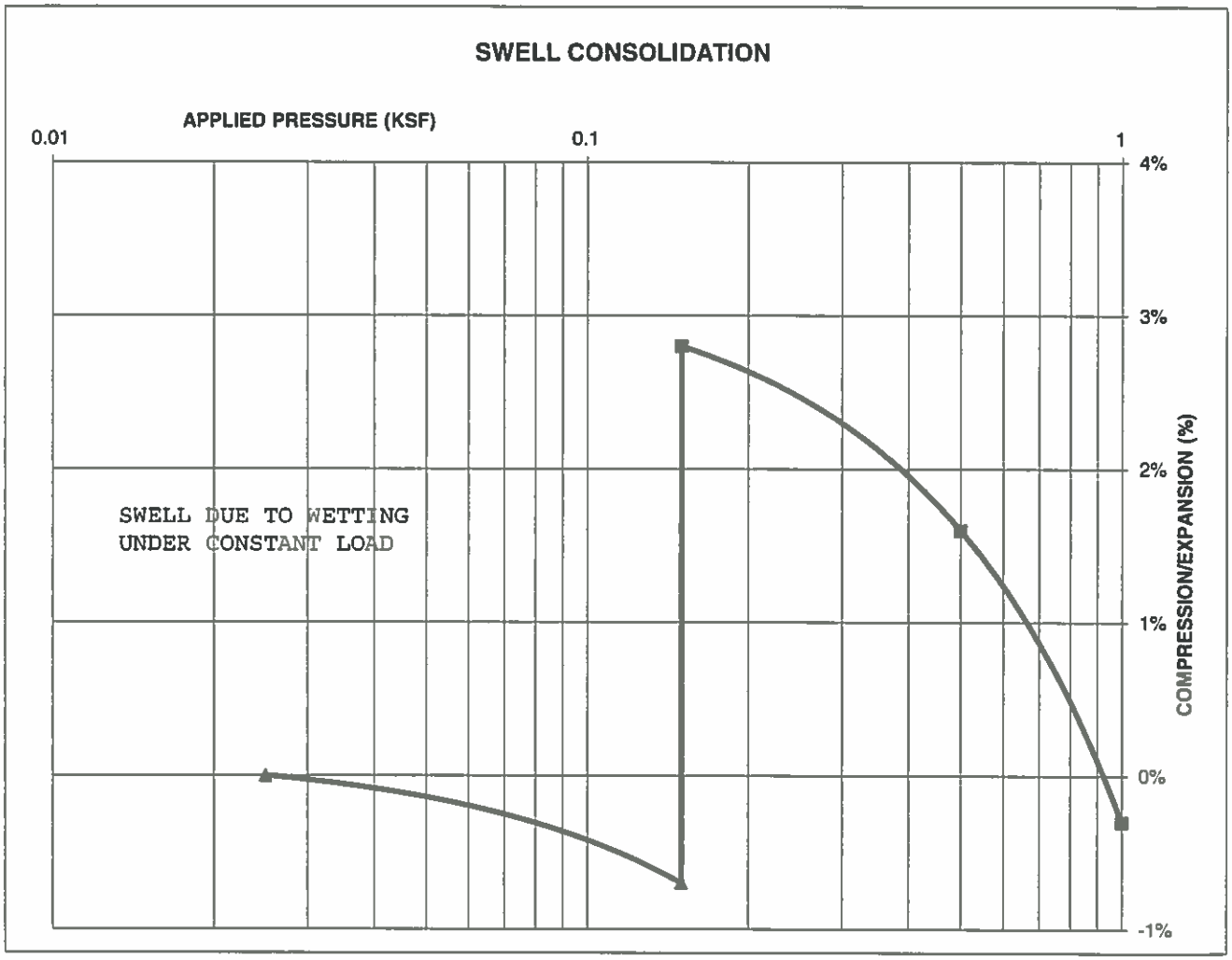
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-69

CONSOLIDATION TEST RESULTS

TEST BORING #	20	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			117
NATURAL MOISTURE CONTENT			13.3%
SWELL/CONSOLIDATION (%)			3.5%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

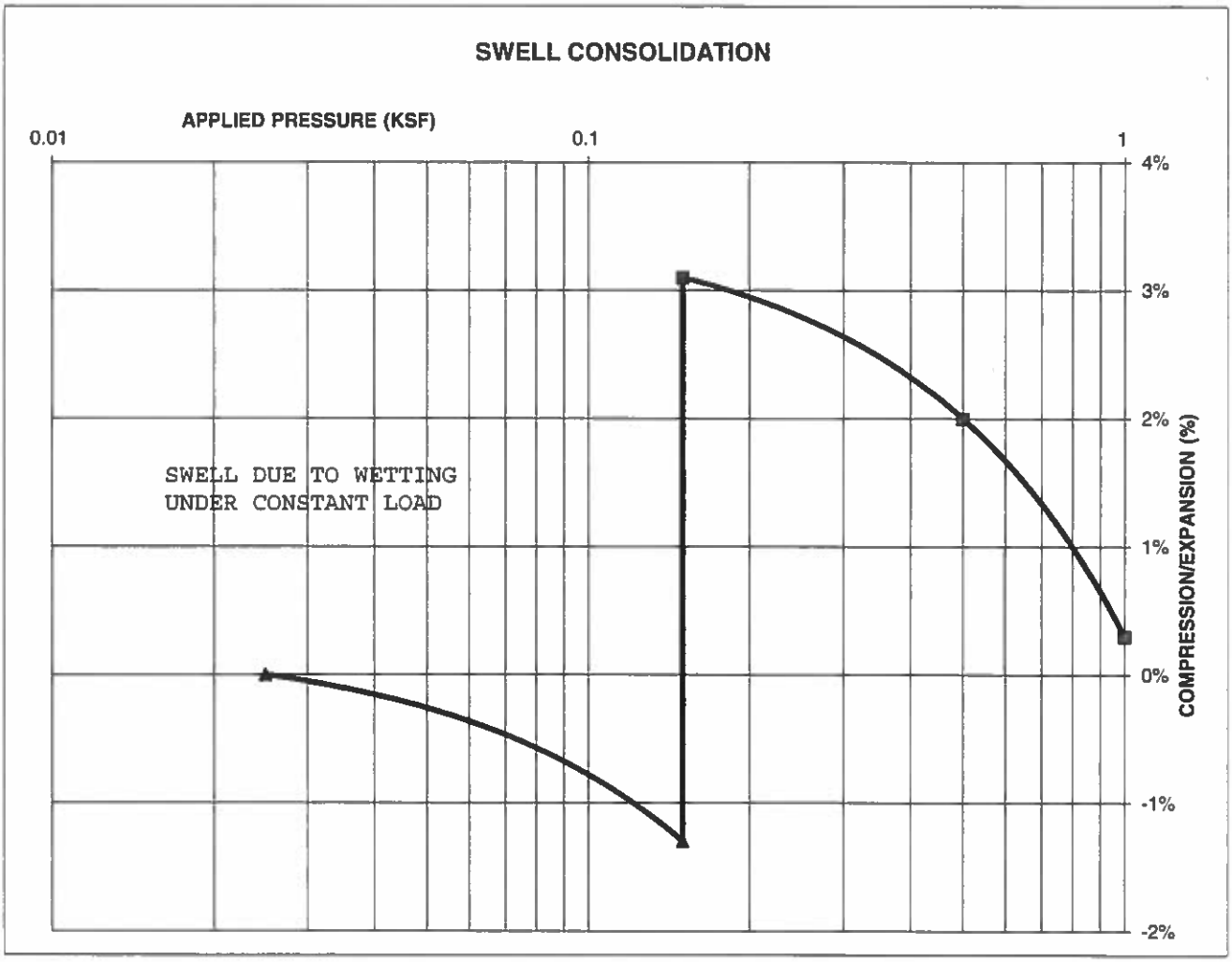
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-10

CONSOLIDATION TEST RESULTS

TEST BORING #	21	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			17.2%
SWELL/CONSOLIDATION (%)			4.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

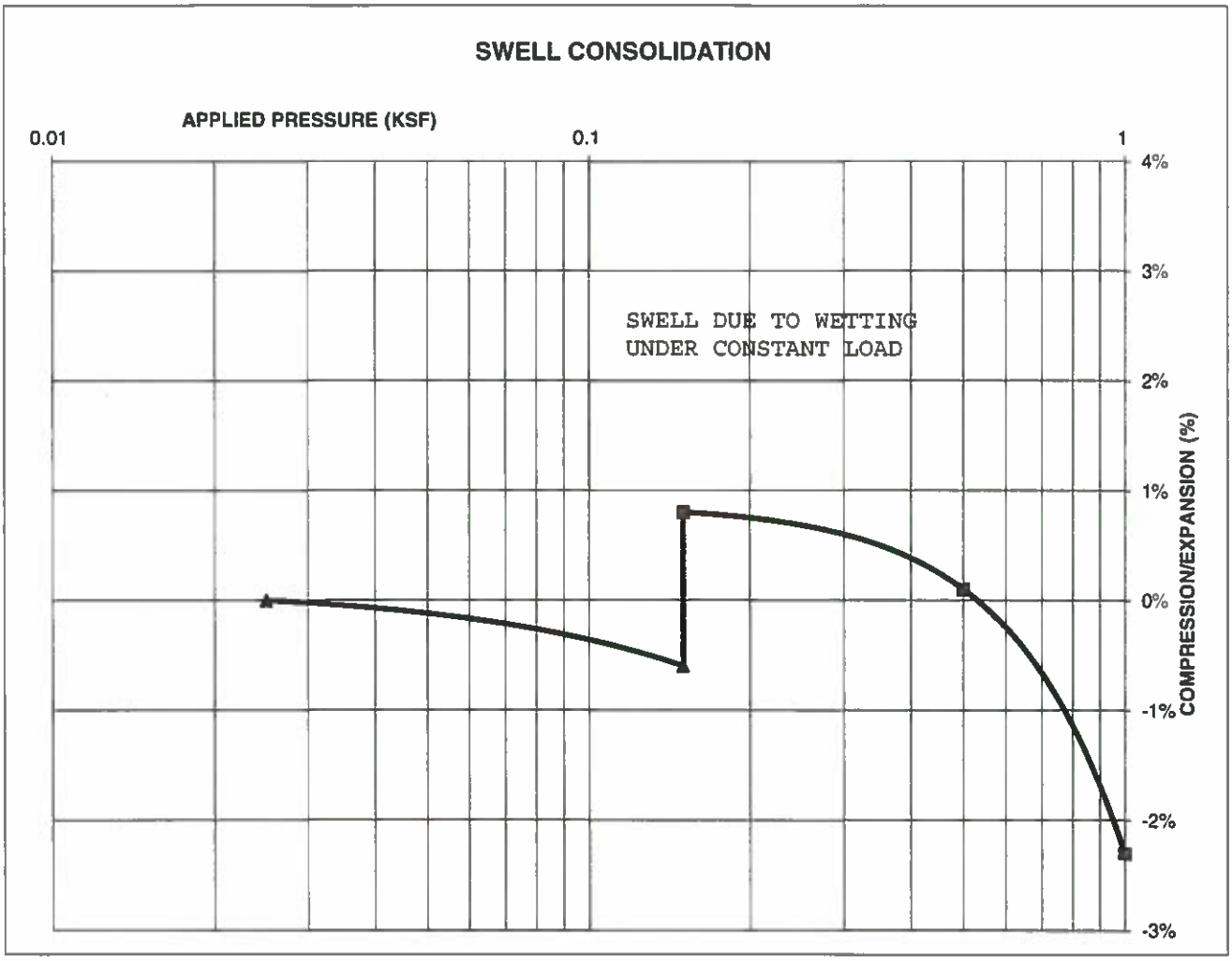
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-7.1

CONSOLIDATION TEST RESULTS

TEST BORING #	22	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			109
NATURAL MOISTURE CONTENT			19.5%
SWELL/CONSOLIDATION (%)			1.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

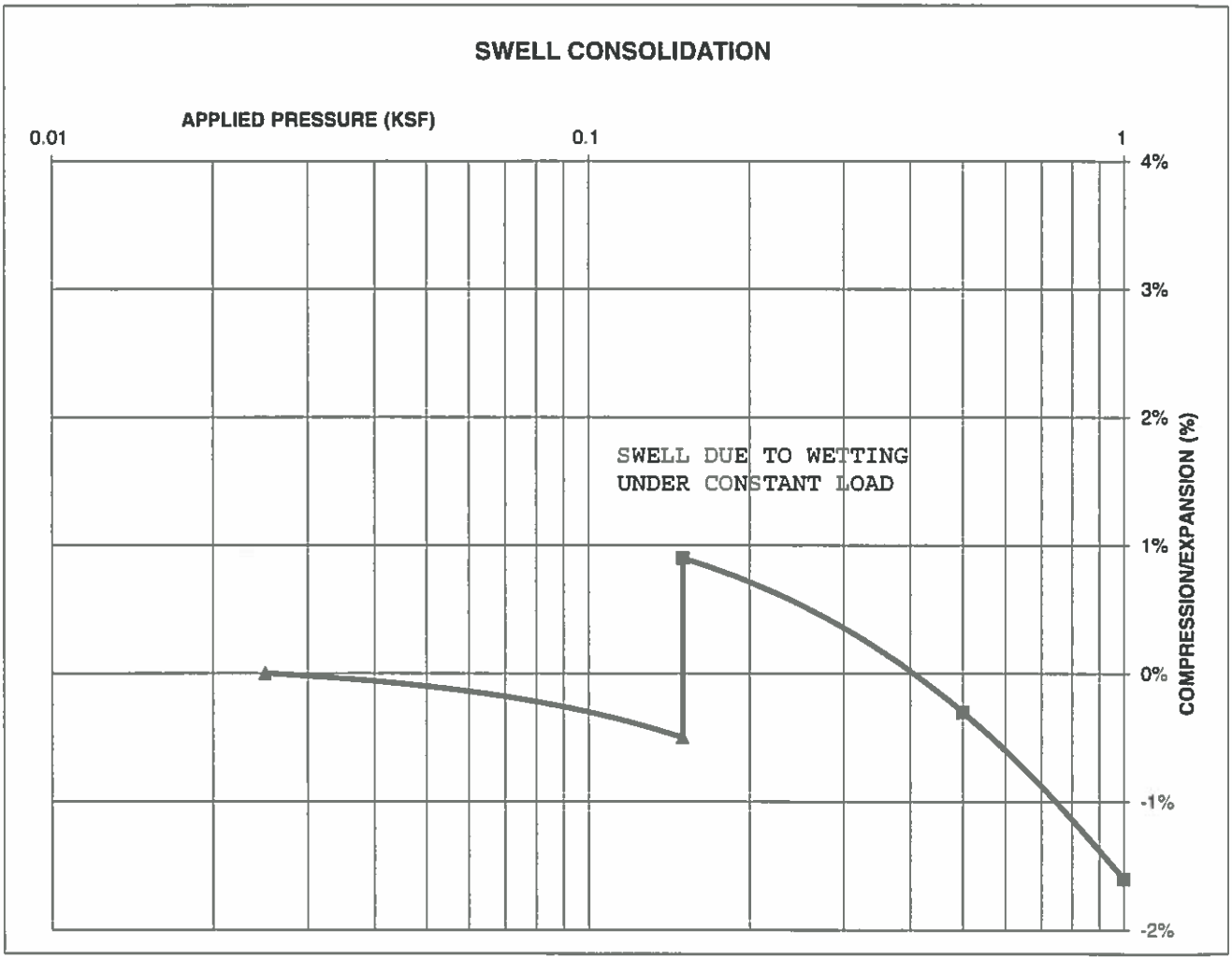
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-72

CONSOLIDATION TEST RESULTS

TEST BORING #	23	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			13.0%
SWELL/CONSOLIDATION (%)			1.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

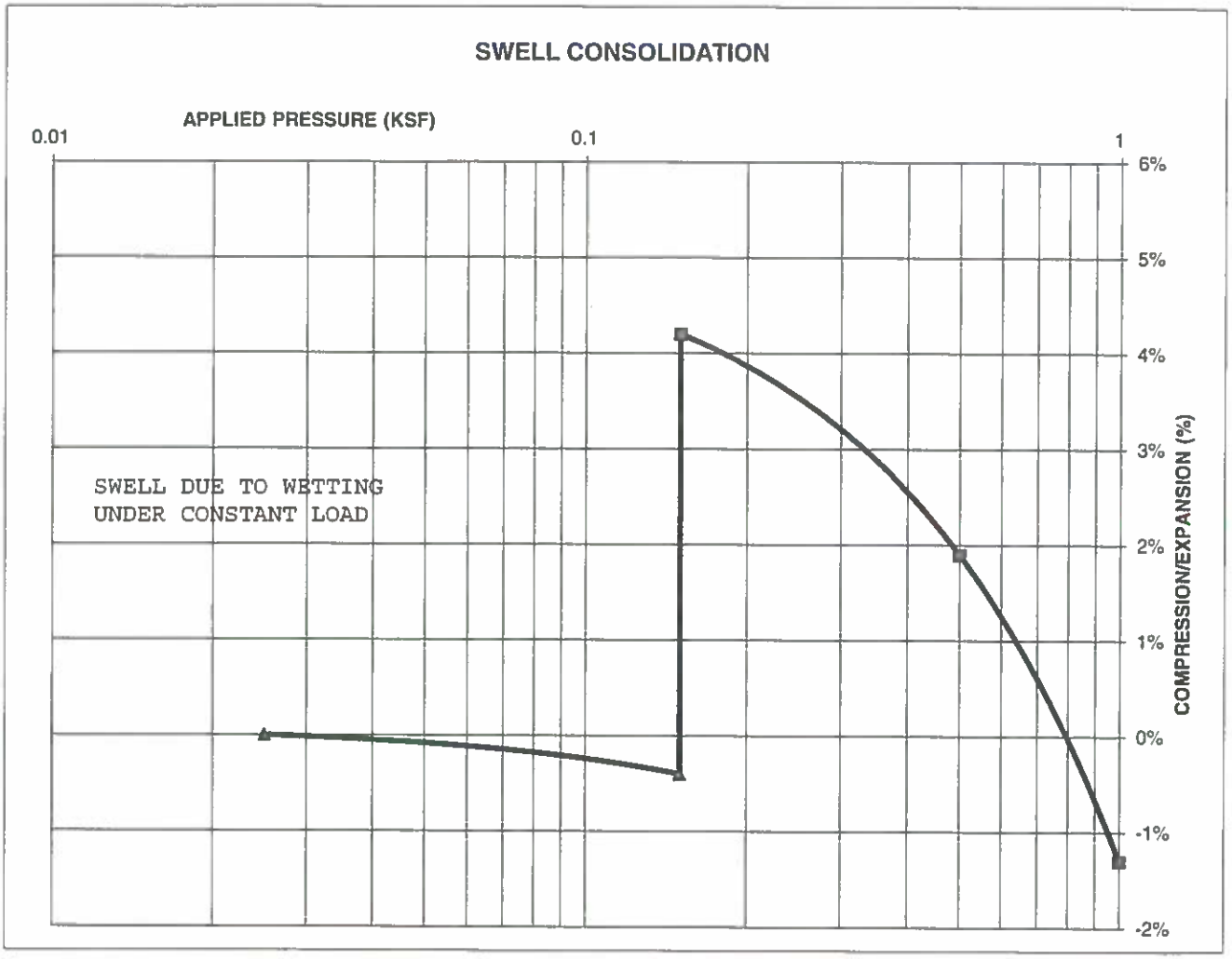
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/14

JOB NO.: 191931
FIG NO.: B-73

CONSOLIDATION TEST RESULTS

TEST BORING #	24	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			11.4%
SWELL/CONSOLIDATION (%)			4.6%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

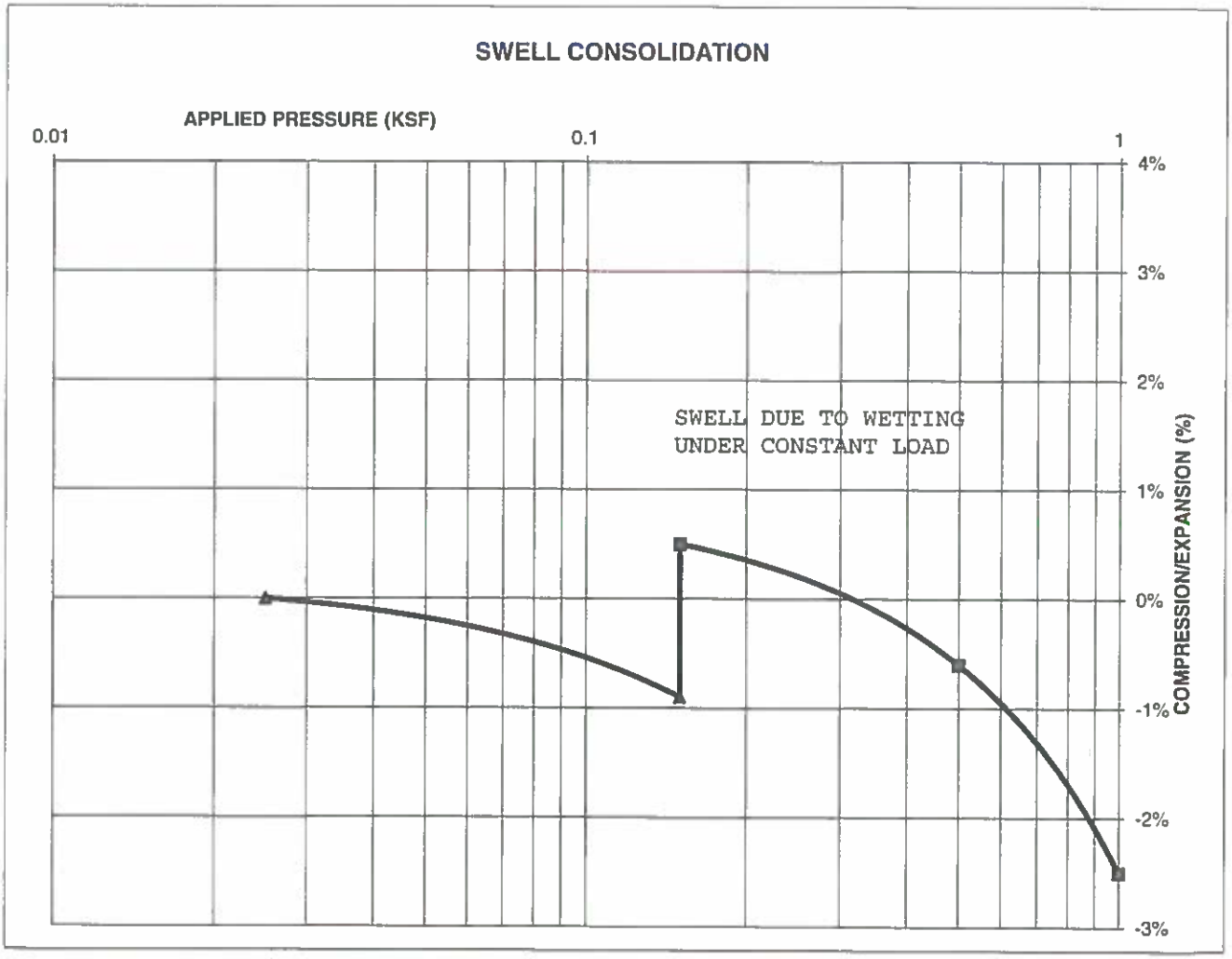
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-14

CONSOLIDATION TEST RESULTS

TEST BORING #	24	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			103
NATURAL MOISTURE CONTENT			17.5%
SWELL/CONSOLIDATION (%)			1.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

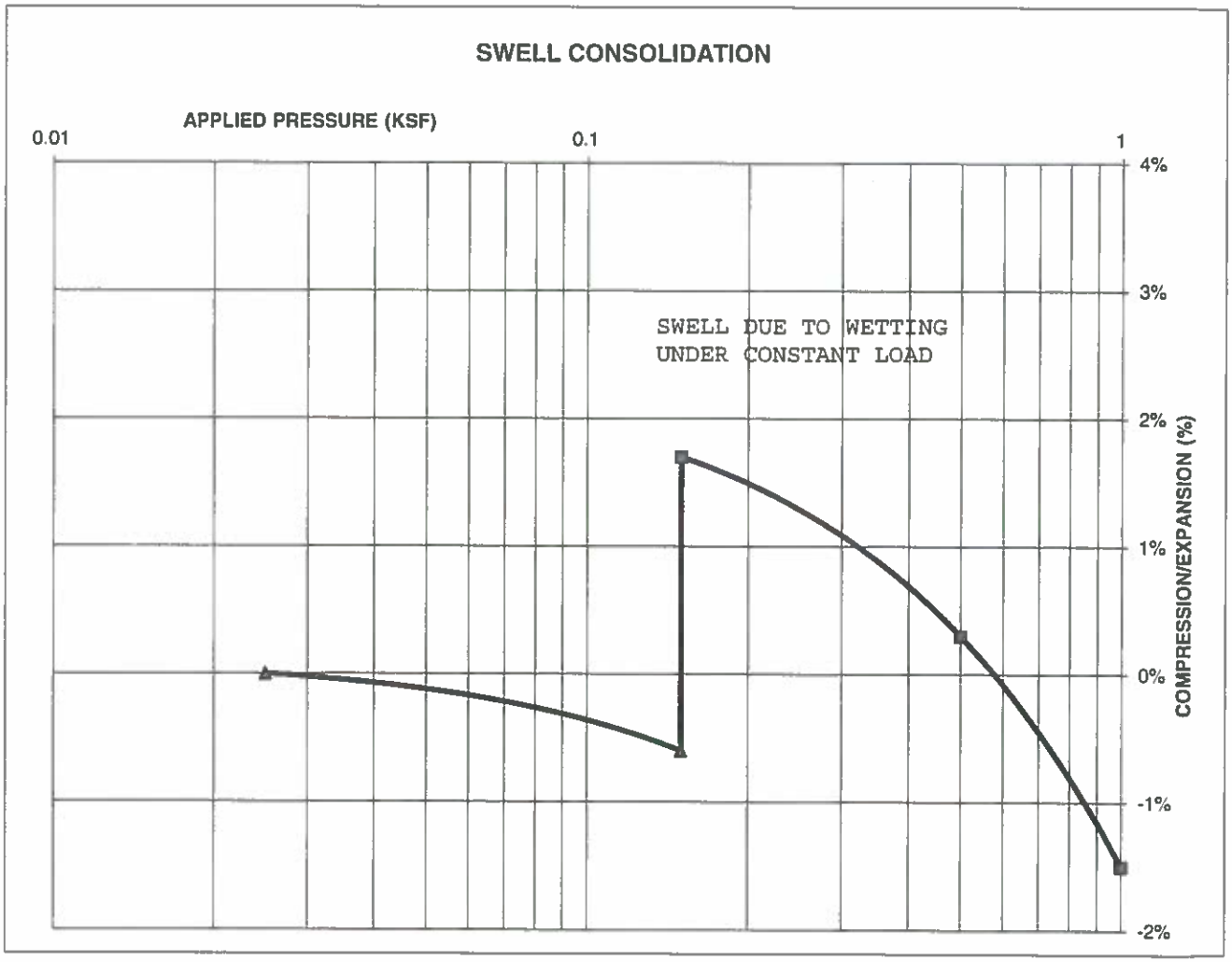
DRAWN:	DATE:	CHECKED:	DATE:
		[illegible]	3/9/20

JOB NO.: 191931
FIG NO.: B-75

CONSOLIDATION TEST RESULTS

TEST BORING #	25	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			108
NATURAL MOISTURE CONTENT			19.8%
SWELL/CONSOLIDATION (%)			2.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

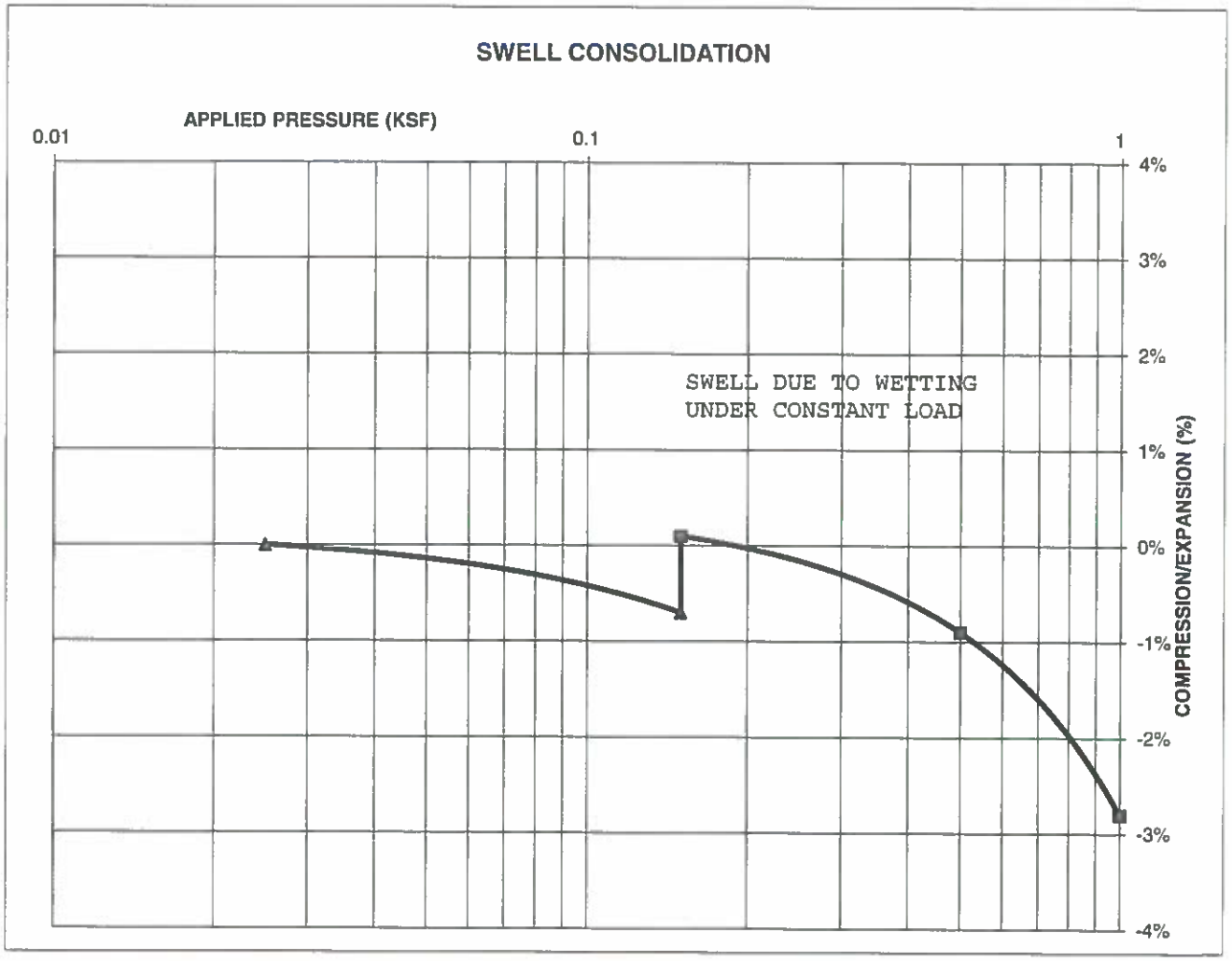
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-76

CONSOLIDATION TEST RESULTS

TEST BORING #	25	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			91
NATURAL MOISTURE CONTENT			27.6%
SWELL/CONSOLIDATION (%)			0.8%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

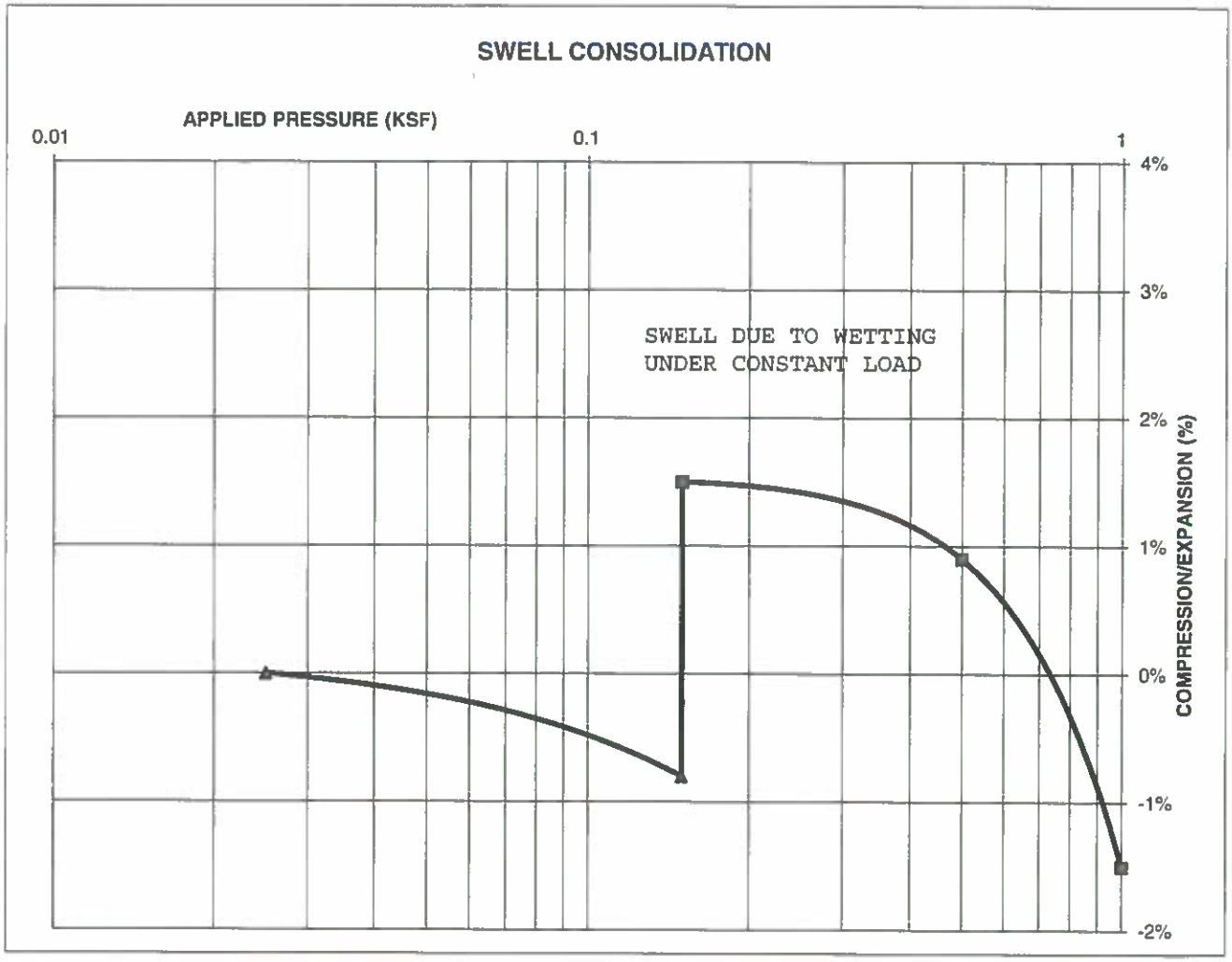
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-7

CONSOLIDATION TEST RESULTS

TEST BORING #	26	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			116
NATURAL MOISTURE CONTENT			14.0%
SWELL/CONSOLIDATION (%)			2.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

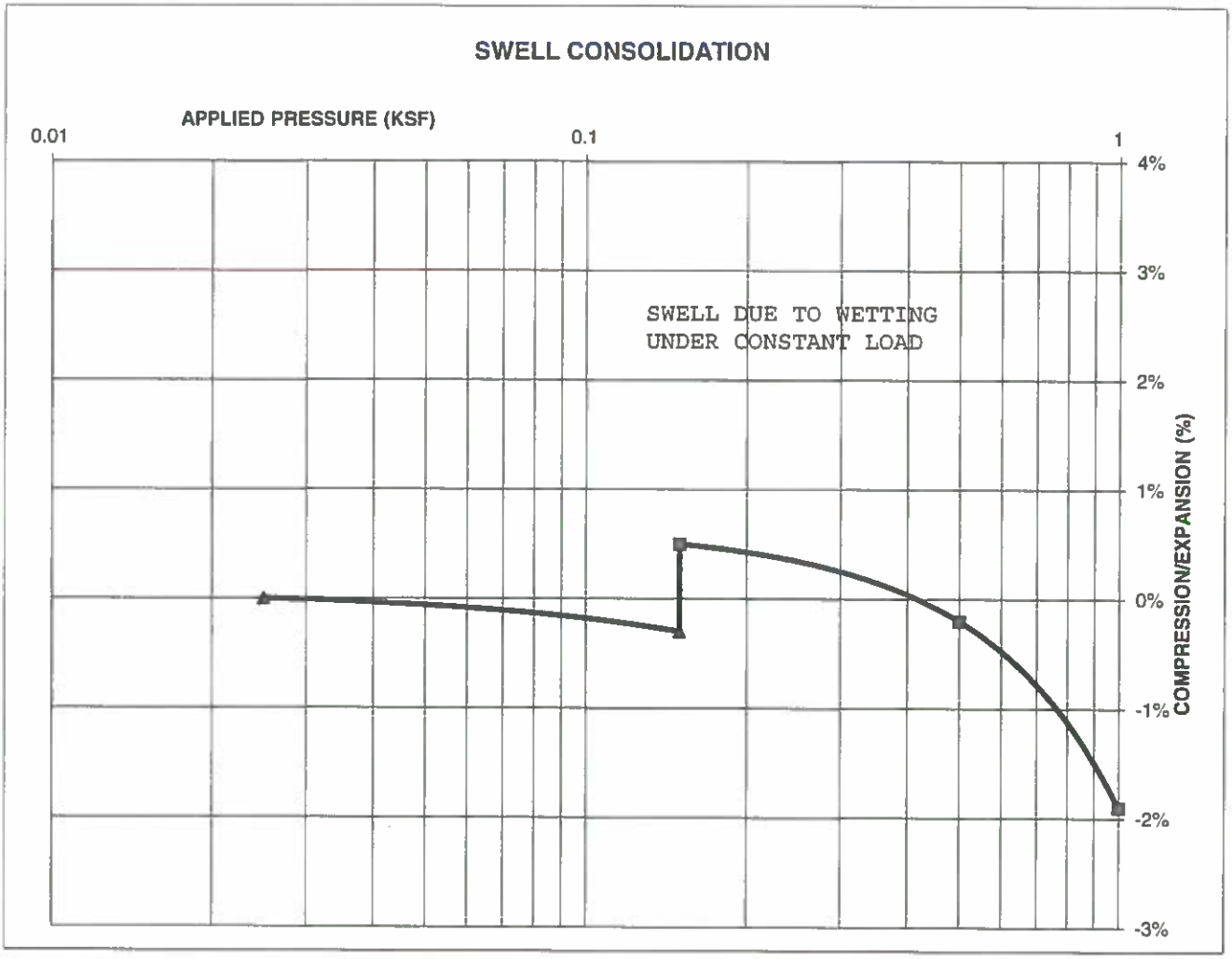
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-78

CONSOLIDATION TEST RESULTS

TEST BORING #	26	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			99
NATURAL MOISTURE CONTENT			22.7%
SWELL/CONSOLIDATION (%)			0.8%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

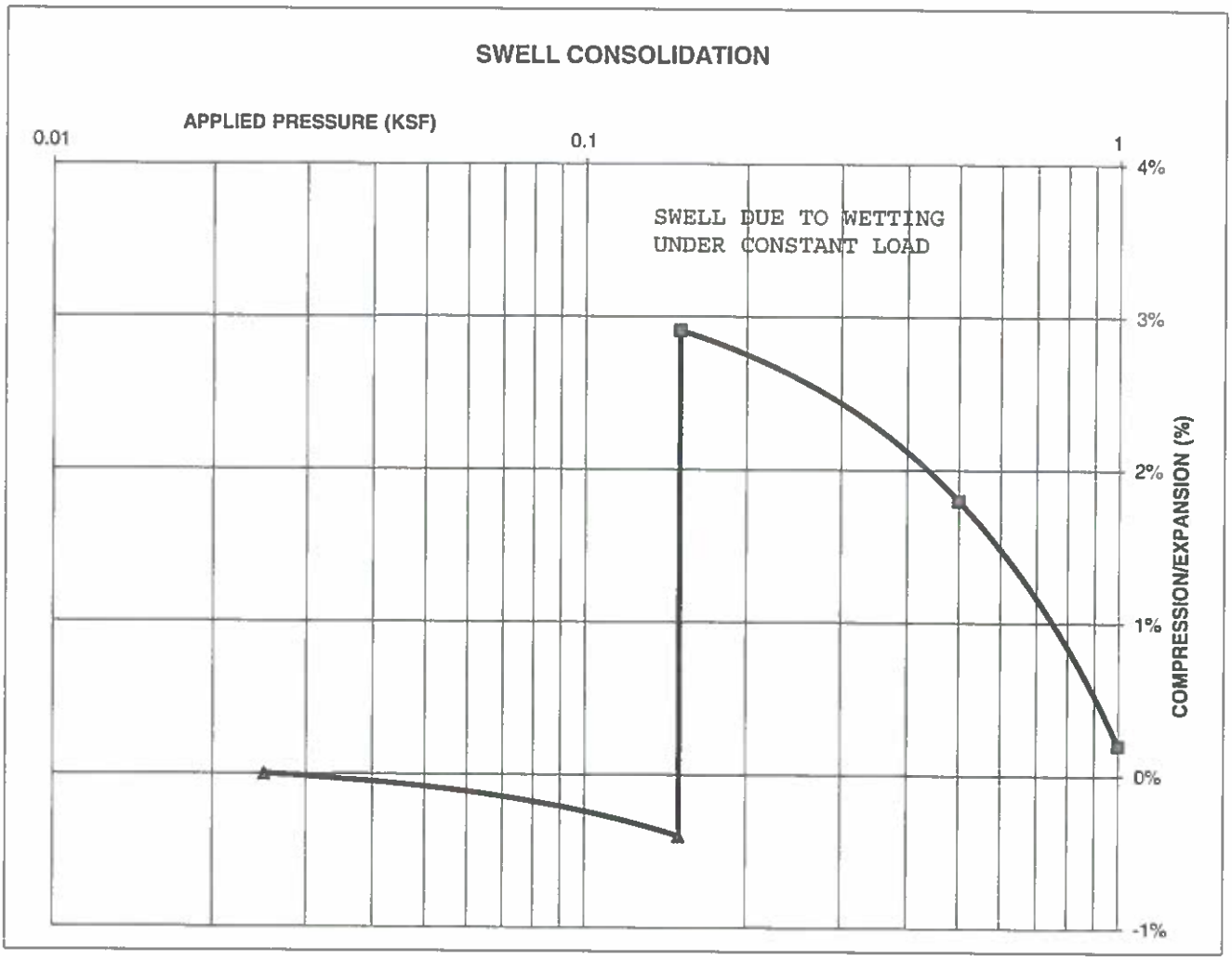
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-79

CONSOLIDATION TEST RESULTS

TEST BORING #	28	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			116
NATURAL MOISTURE CONTENT			13.8%
SWELL/CONSOLIDATION (%)			3.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

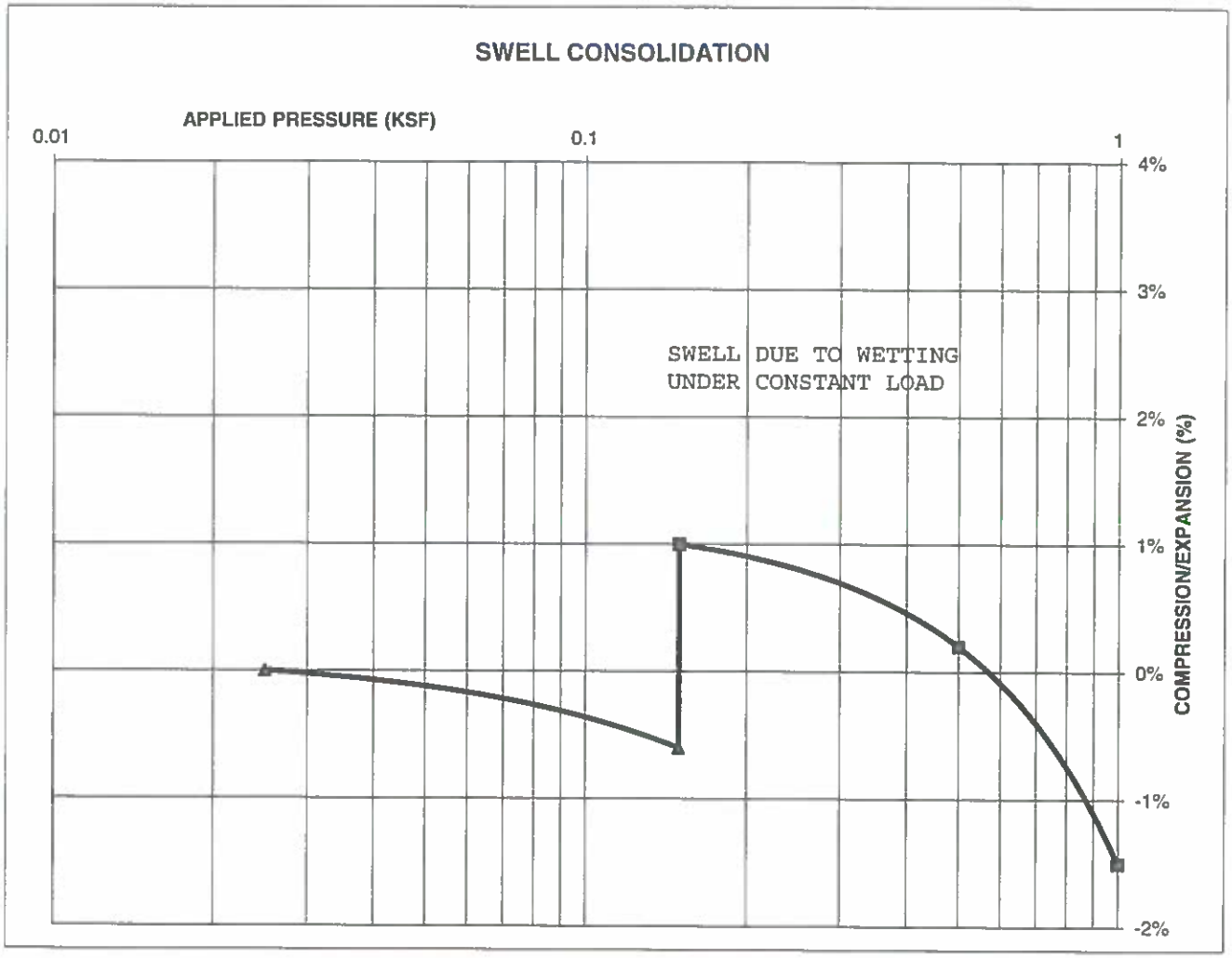
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-80

CONSOLIDATION TEST RESULTS

TEST BORING #	28	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			100
NATURAL MOISTURE CONTENT			20.3%
SWELL/CONSOLIDATION (%)			1.6%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

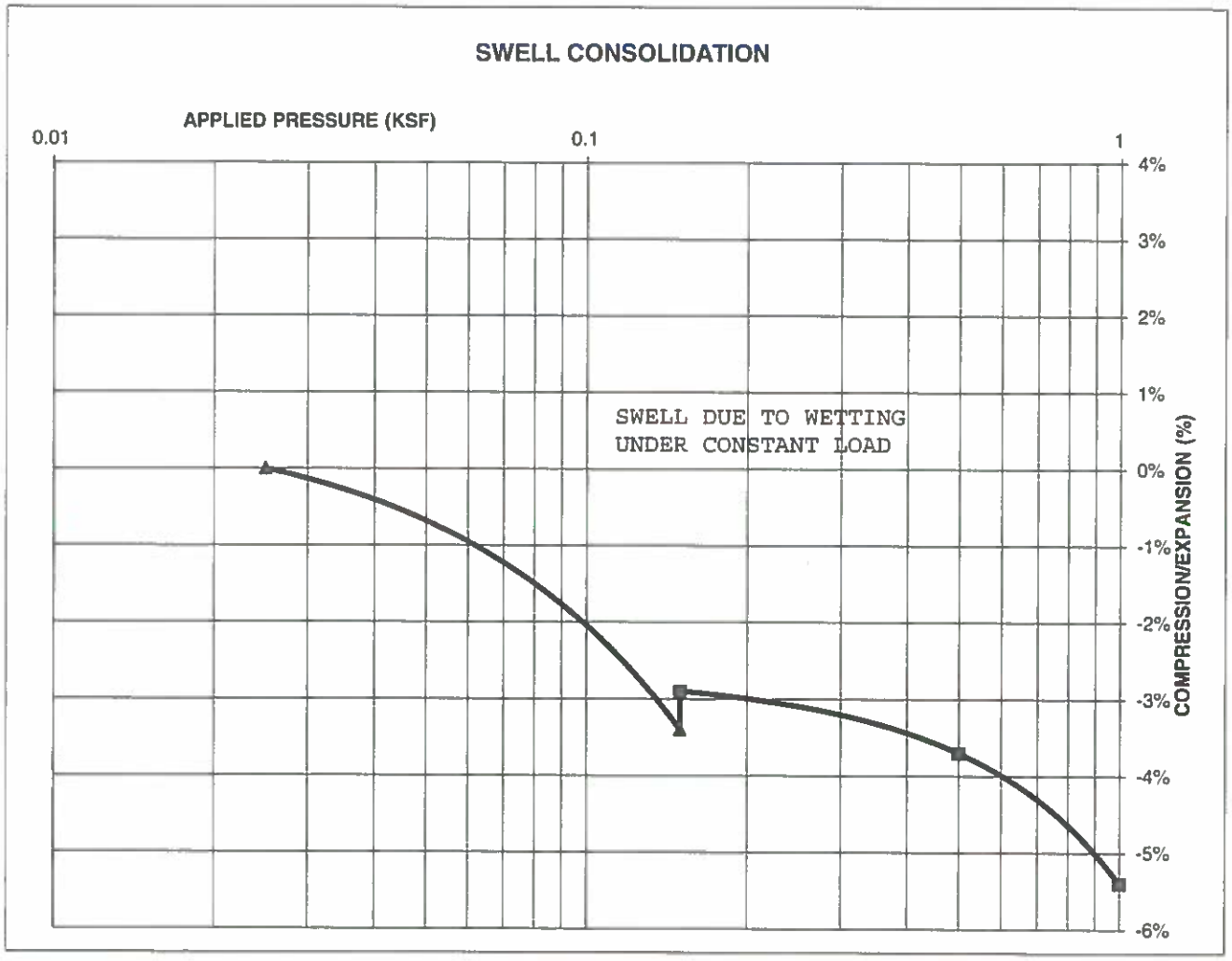
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-81

CONSOLIDATION TEST RESULTS

TEST BORING #	29	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			117
NATURAL MOISTURE CONTENT			12.2%
SWELL/CONSOLIDATION (%)			0.5%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

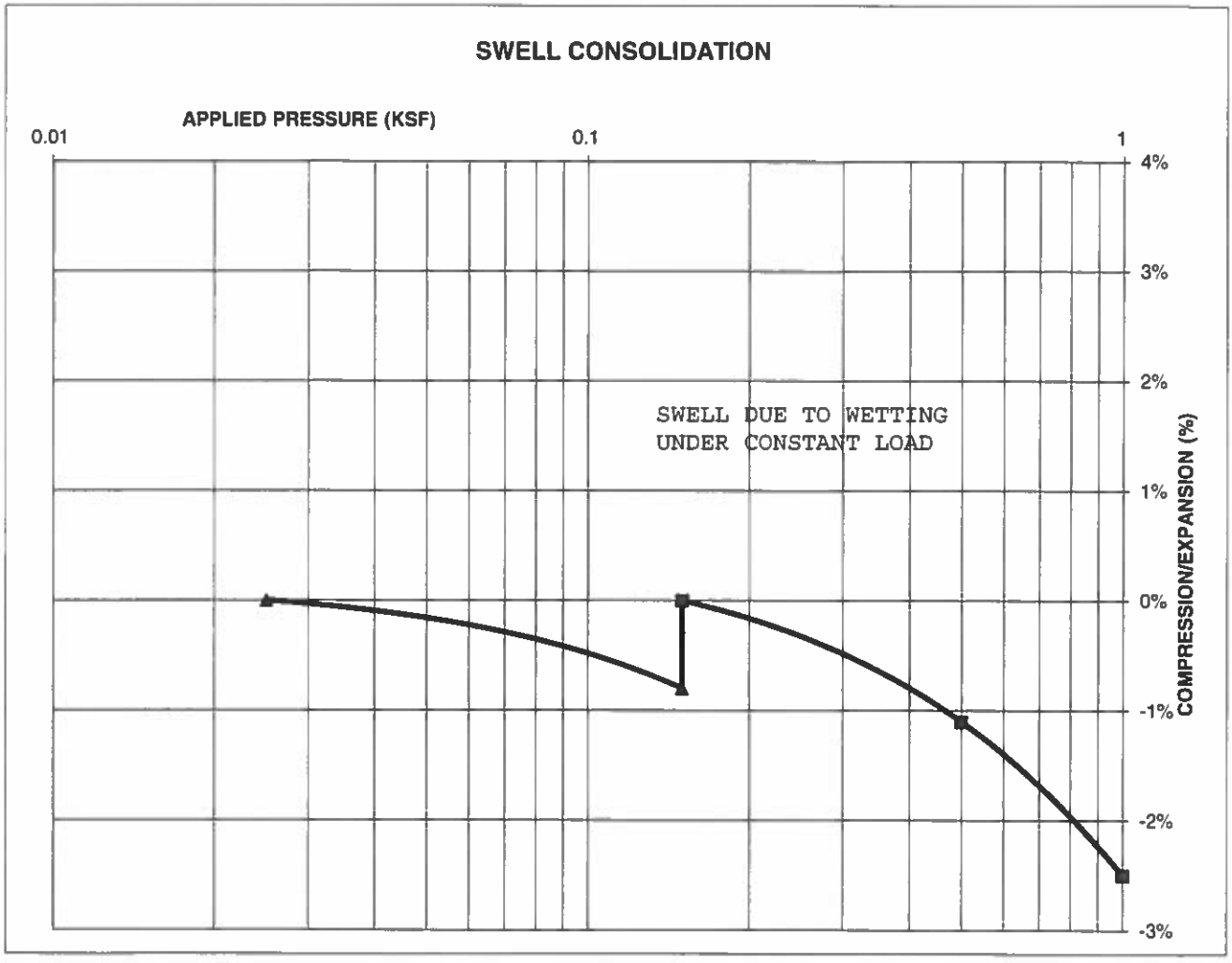
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-8

CONSOLIDATION TEST RESULTS

TEST BORING #	32	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			98
NATURAL MOISTURE CONTENT			23.2%
SWELL/CONSOLIDATION (%)			0.8%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

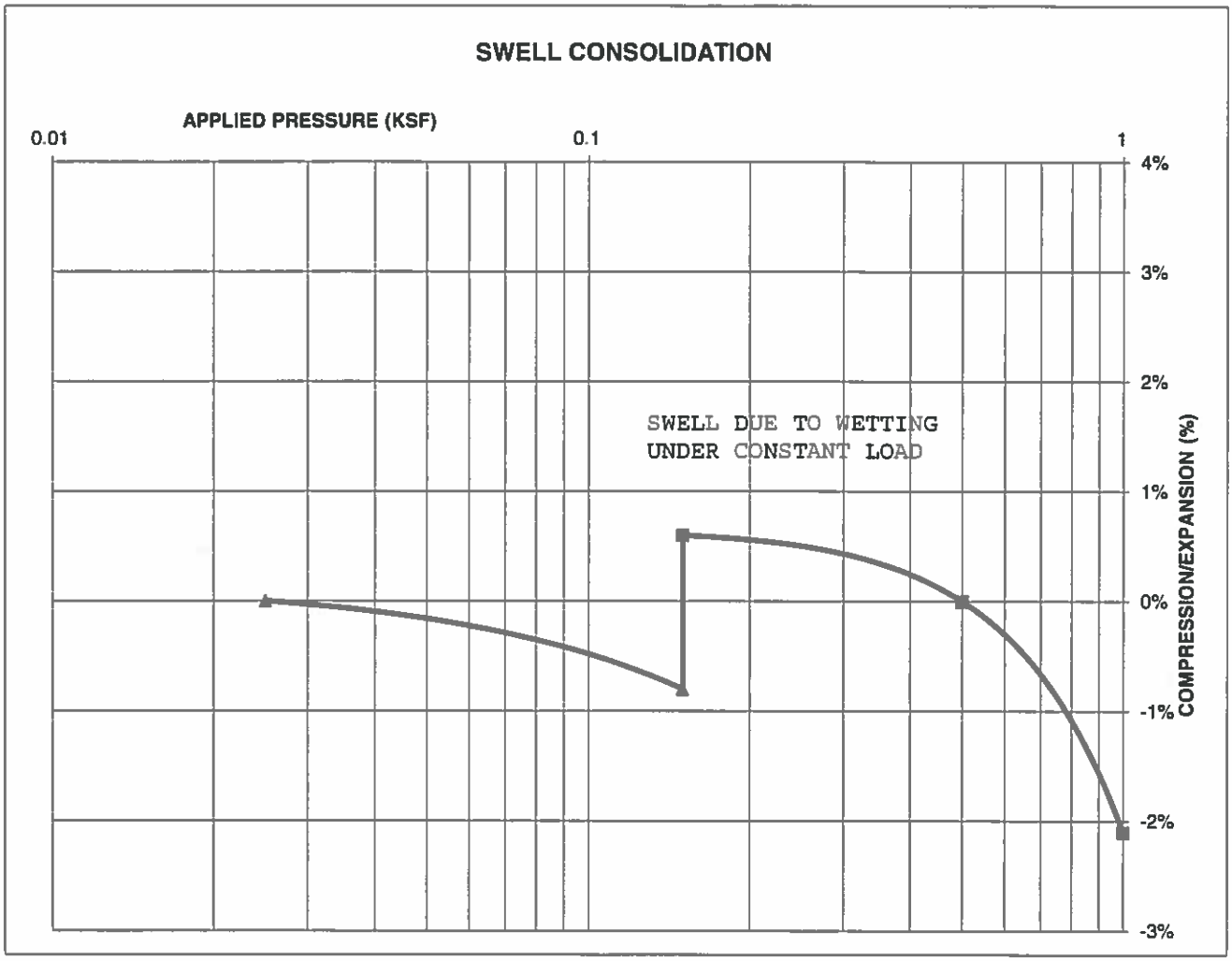
DRAWN:	DATE:	CHECKED:	DATE:
		DJ	3/19/20

JOB NO. 191931
FIG NO. D-83

CONSOLIDATION TEST RESULTS

TEST BORING #	27	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			95
NATURAL MOISTURE CONTENT			21.1%
SWELL/CONSOLIDATION (%)			1.4%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

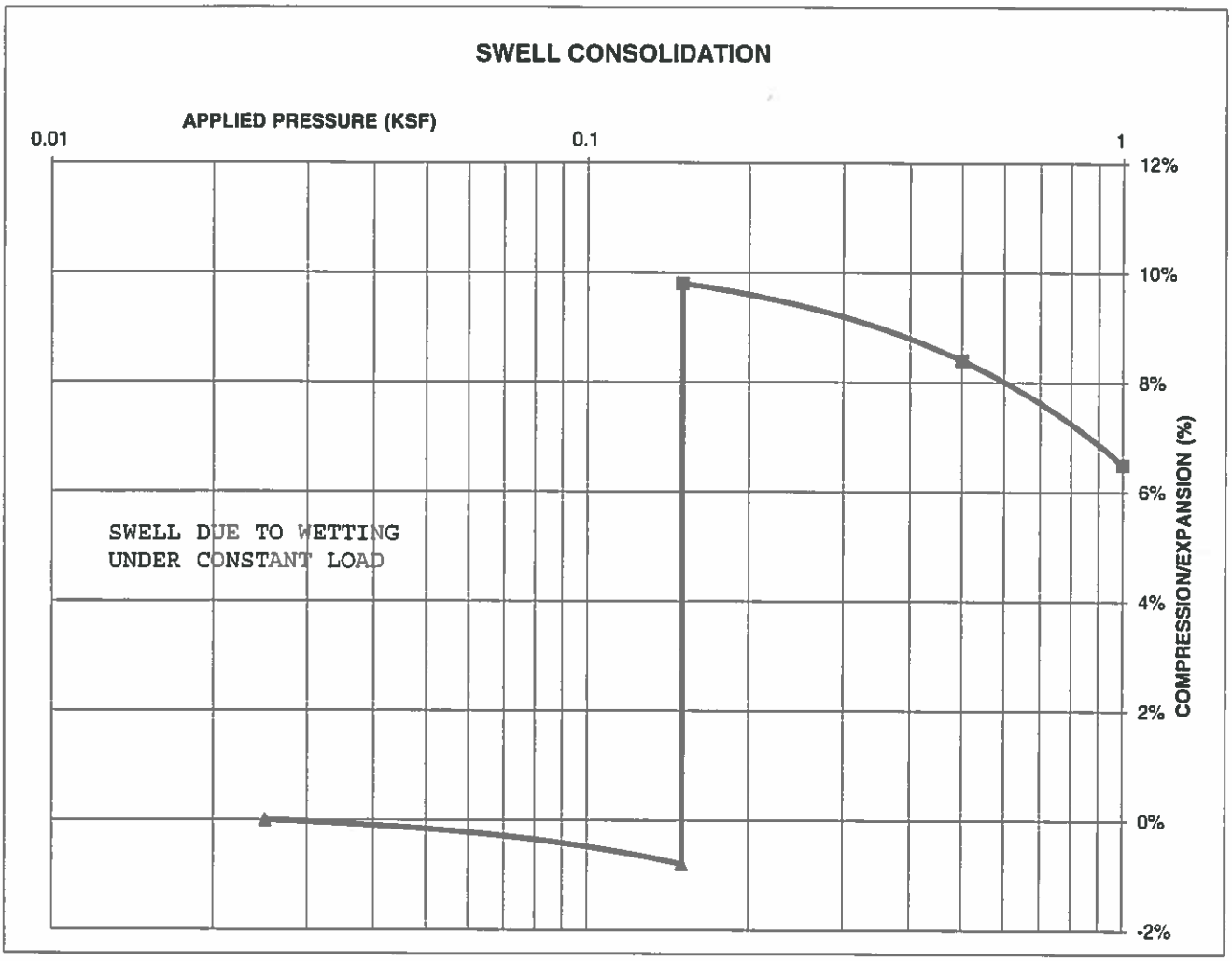
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-84

CONSOLIDATION TEST RESULTS

TEST BORING #	27	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			120
NATURAL MOISTURE CONTENT			12.7%
SWELL/CONSOLIDATION (%)			10.6%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

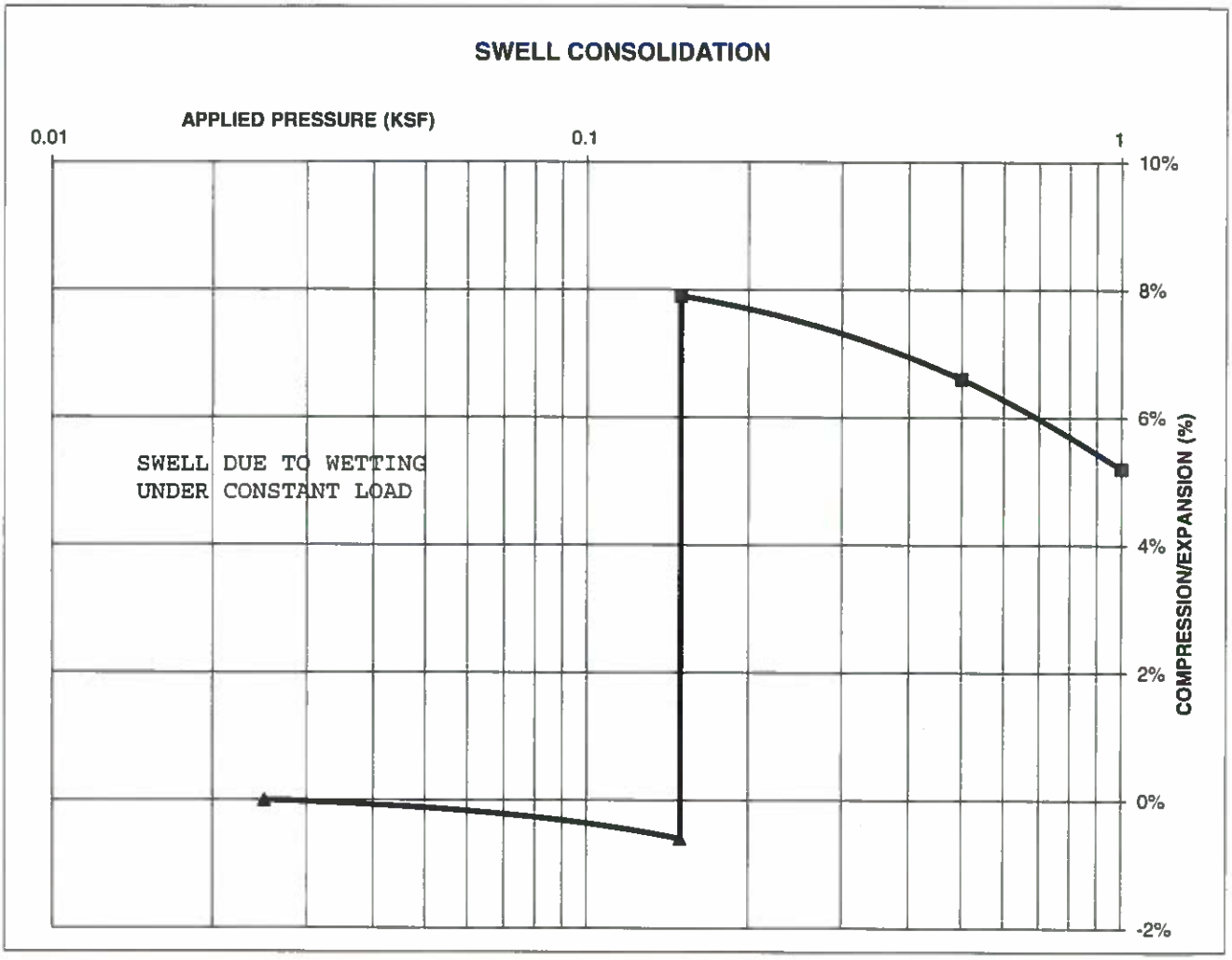
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-05

CONSOLIDATION TEST RESULTS

TEST BORING #	30	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			106
NATURAL MOISTURE CONTENT			17.4%
SWELL/CONSOLIDATION (%)			8.5%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

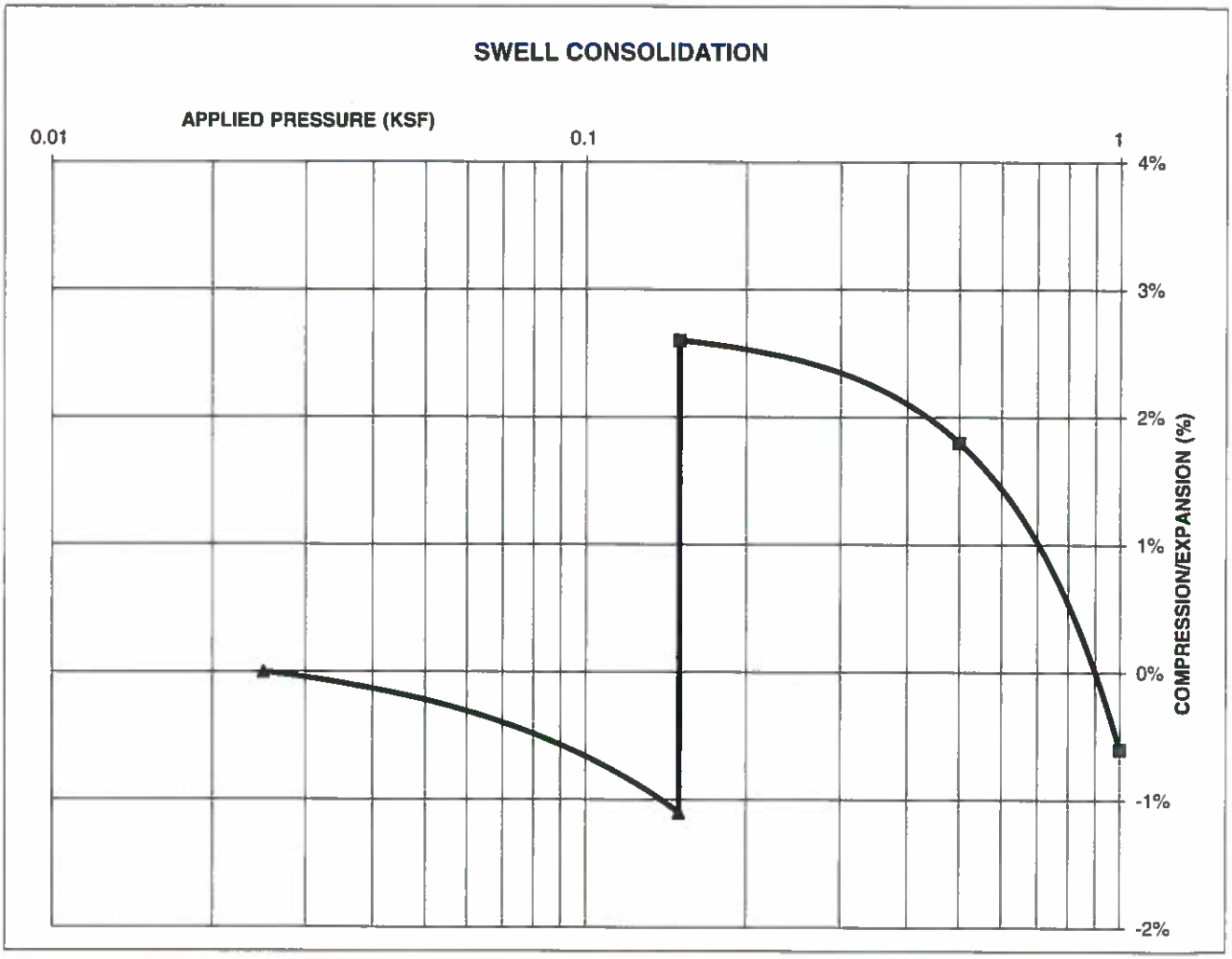
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/12/20

JOB NO.: 191931
FIG NO.: B-8C

CONSOLIDATION TEST RESULTS

TEST BORING #	30	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			93
NATURAL MOISTURE CONTENT			26.8%
SWELL/CONSOLIDATION (%)			3.7%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



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SWELL CONSOLIDATION
TEST RESULTS

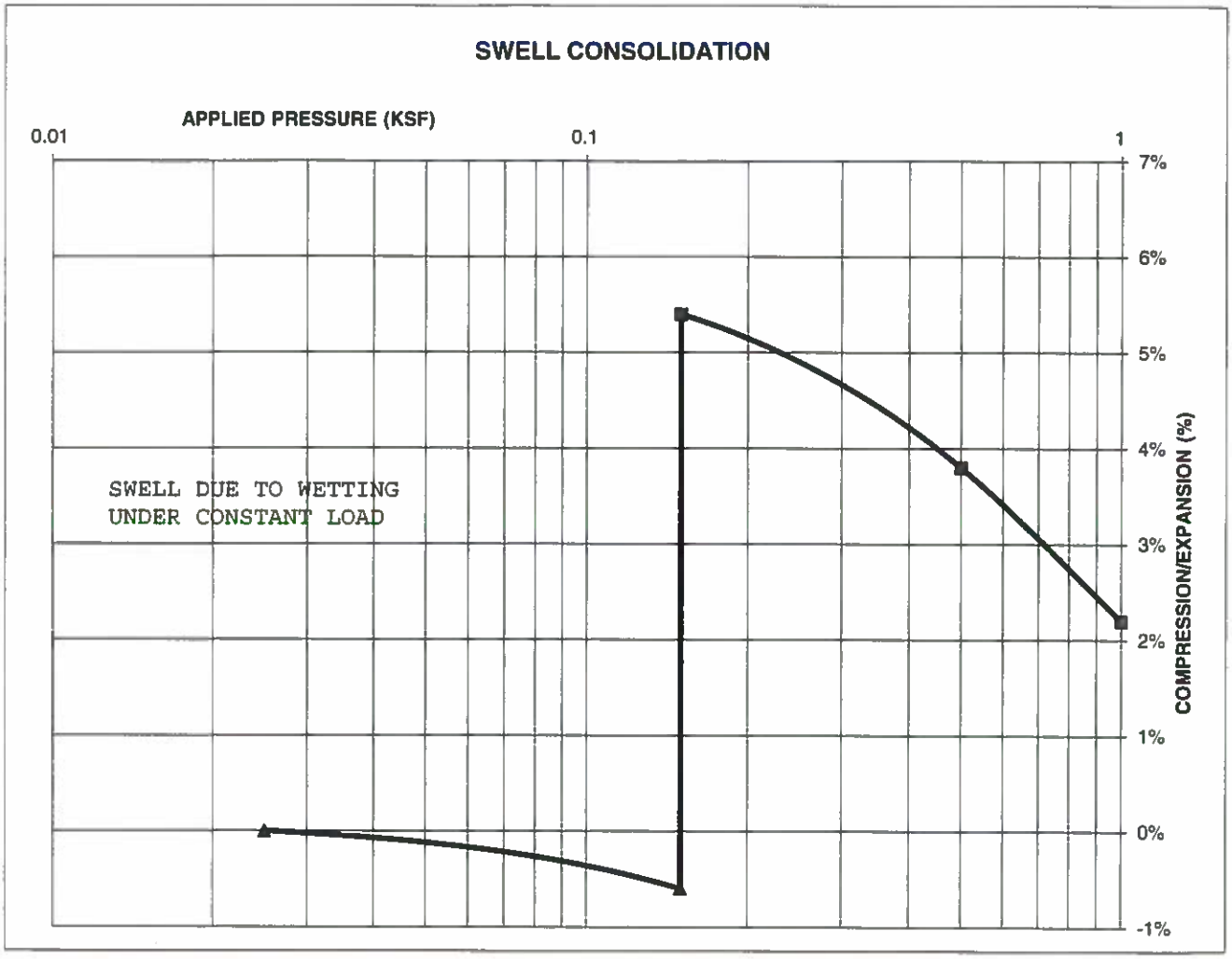
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-87

CONSOLIDATION TEST RESULTS

TEST BORING #	31	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			105
NATURAL MOISTURE CONTENT			15.3%
SWELL/CONSOLIDATION (%)			6.0%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1



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SWELL CONSOLIDATION
TEST RESULTS

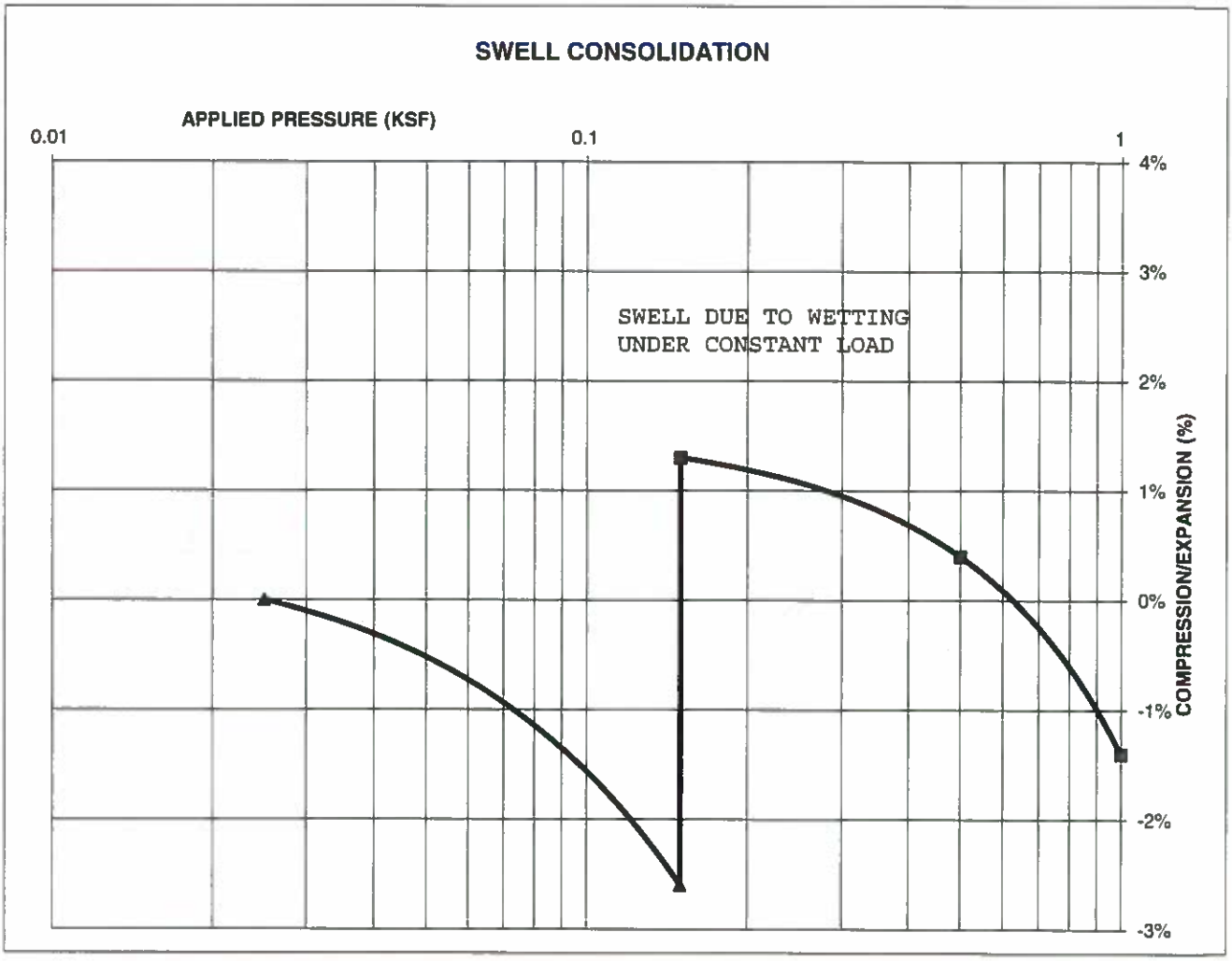
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: B-86

CONSOLIDATION TEST RESULTS

TEST BORING #	31	DEPTH(ft)	1-2
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			96
NATURAL MOISTURE CONTENT			23.6%
SWELL/CONSOLIDATION (%)			3.9%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE, F-1
REMOLDED SAMPLE



ENTECH
ENGINEERING, INC.
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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

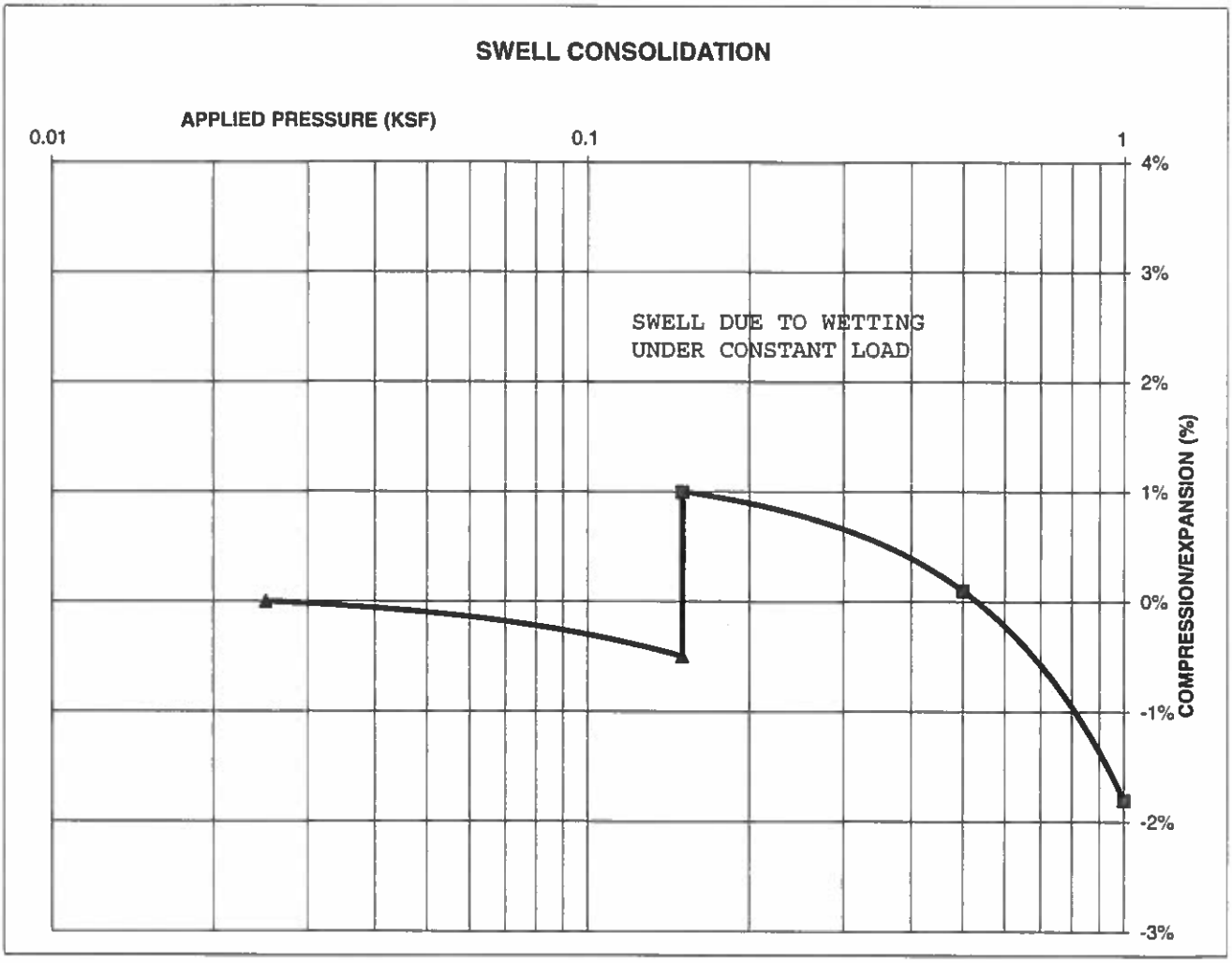
DRAWN:	DATE:	CHECKED:	DATE:
		DS	3/9/20

JOB NO.: 191931
FIG NO.: 6-89

CONSOLIDATION TEST RESULTS

TEST BORING #	12	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			109
NATURAL MOISTURE CONTENT			17.3%
SWELL/CONSOLIDATION (%)			1.5%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



ENTECH
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505 ELKTON DRIVE
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SWELL CONSOLIDATION
TEST RESULTS

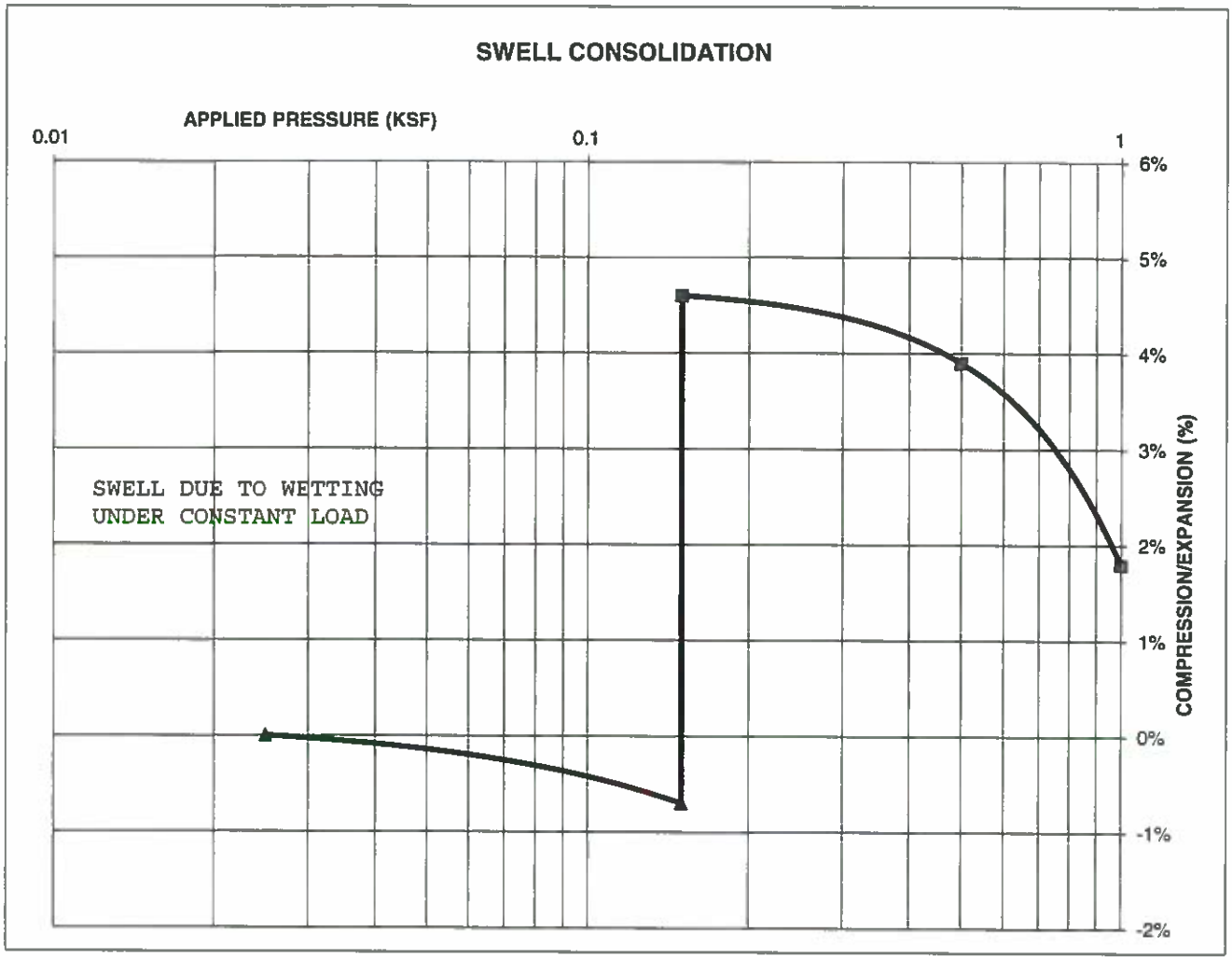
DRAWN:	DATE:	CHECKED:	DATE:
			12/9/15

JOB NO.: 191931
FIG NO.: B-10

CONSOLIDATION TEST RESULTS

TEST BORING #	17	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			115
NATURAL MOISTURE CONTENT			15.8%
SWELL/CONSOLIDATION (%)			5.3%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

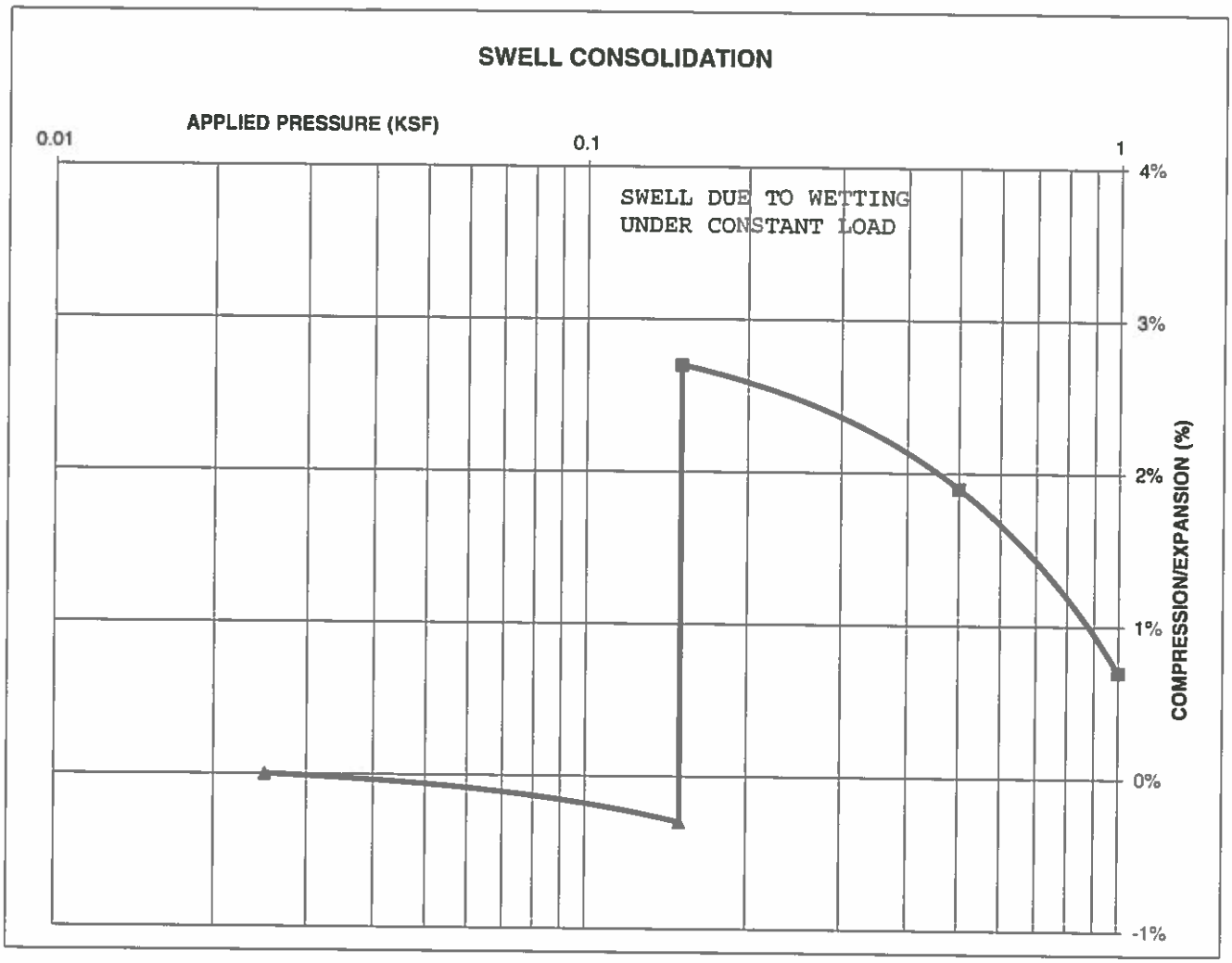
DRAWN:	DATE:	CHECKED:	DATE: 1/27/19

JOB NO.: 191931
FIG NO.: B-9

CONSOLIDATION TEST RESULTS

TEST BORING #	17	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	1
NATURAL UNIT DRY WEIGHT (PCF)			101
NATURAL MOISTURE CONTENT			17.4%
SWELL/CONSOLIDATION (%)			3.0%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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SWELL CONSOLIDATION
TEST RESULTS

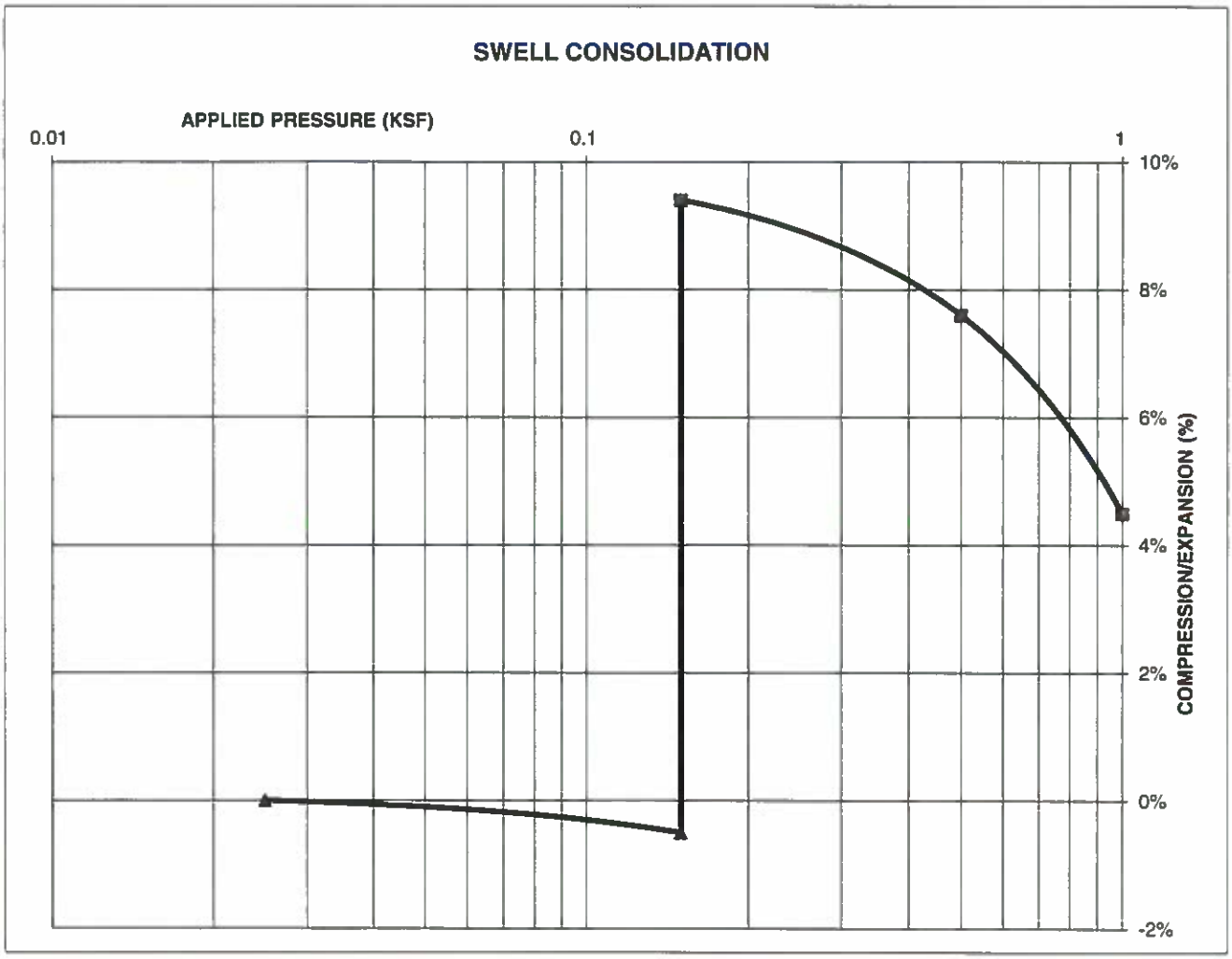
DRAWN:	DATE:	CHECKED:	DATE:
		JS	3/9/20

JOB NO.: 191931
FIG NO.: B-12

CONSOLIDATION TEST RESULTS

TEST BORING #	23	DEPTH(ft)	5
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			121
NATURAL MOISTURE CONTENT			13.1%
SWELL/CONSOLIDATION (%)			9.9%

JOB NO. 191931
CLIENT COLA, LLC
PROJECT TRAILS AT ASPEN RIDGE



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COLORADO SPRINGS, COLORADO 80907

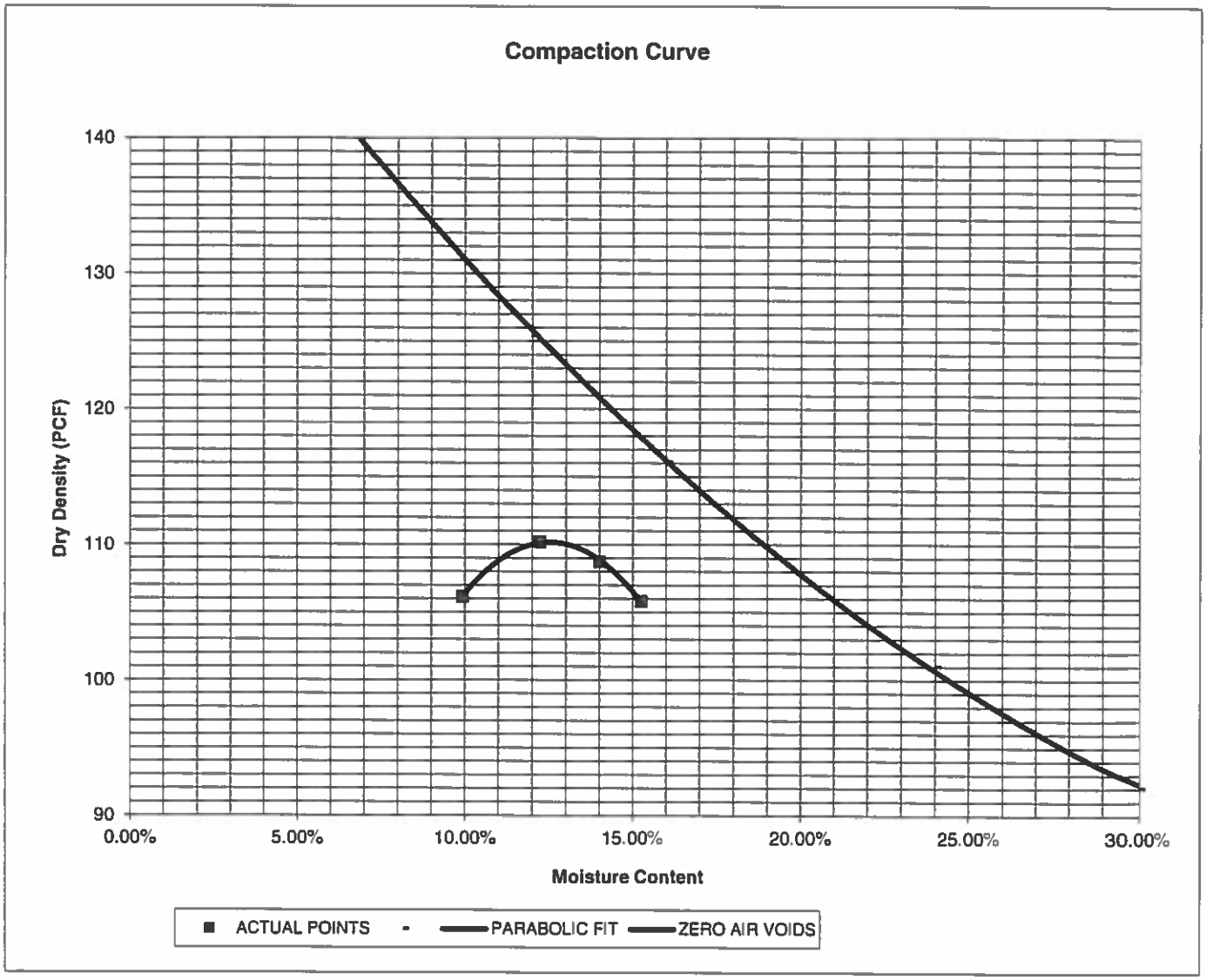
SWELL CONSOLIDATION
TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931
FIG NO.: B-93

PROJECT	TRAILS AT ASPEN RIDGE	CLIENT	COLA, LLC
SAMPLE LOCATION	TB-1 @ 0-3'	JOB NO.	191931
SOIL DESCRIPTION	CLAY, SANDY, BROWN	DATE	11/07/19

IDENTIFICATION	CL	COMPACTION TEST #	1
TEST DESIGNATION / METHOD	ASTM D-698-A	TEST BY	BL
MAXIMUM DRY DENSITY (PCF)	110.2	OPTIMUM MOISTURE	12.6%



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COLORADO SPRINGS, COLORADO 80907

MOISTURE DENSITY RELATION

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO.: 191931

FIG NO.: B-9

CBR TEST LOAD DATA

JOB NO: 191931
CLIENT: COLA, LLC
PROJECT: TRAILS AT ASPEN RIDGE
SOIL TYPE: 1

PISTON DIAMETER (cm)	PISTON AREA (in^2)
4.958	2.99250919

PENETRATION DEPTH (INCHES)	*10 BLOWS* MOLD # 1 LOAD(LBS) (LBS)	STRESS (PSI)	*25 BLOWS* MOLD # 2 LOAD(LBS) (LBS)	STRESS (PSI)	*56 BLOWS* MOLD # 3 LOAD(LBS) (LBS)	STRESS (PSI)
0.000	0	0.00	0	0.00	0	0.00
0.025	13	4.34	23	7.69	34	11.36
0.050	20	6.68	35	11.70	47	15.71
0.075	25	8.35	43	14.37	61	20.38
0.100	30	10.03	48	16.04	72	24.06
0.125	33	11.03	55	18.38	85	28.40
0.150	37	12.36	61	20.38	91	30.41
0.175	40	13.37	65	21.72	95	31.75
0.200	42	14.04	65	21.72	95	31.75
0.300	43	14.37	76	25.40	101	33.75
0.400	47	15.71	85	28.40	109	36.42
0.500	52	17.38	93	31.08	123	41.10

FINAL MOISTURE CONTENT

	MOLD # 1	MOLD # 2	MOLD # 3
CAN #	305	313	312
WT. CAN	6.73	6.78	6.66
WT. CAN+WET	219.18	356.51	208.01
WT. CAN+DRY	171.6	292.59	171.23
WT. H20	47.58	63.92	36.78
WT. DRY SOIL	164.87	285.81	164.57
MOISTURE CONTENT	28.86%	22.36%	22.35%

WET DENSITY (PCF)	99.9	111.9	117.2
DRY DENSITY (PCF)	88.8	99.4	104.1

BEARING RATIO	1.00	1.60	2.41

90% OF DRY DENSITY	99.2
95% OF DRY DENSITY	104.7

BEARING RATIO AT 90% OF MAX	1.59	~ R VALUE	1
BEARING RATIO AT 95% OF MAX	2.51	~ R VALUE	6

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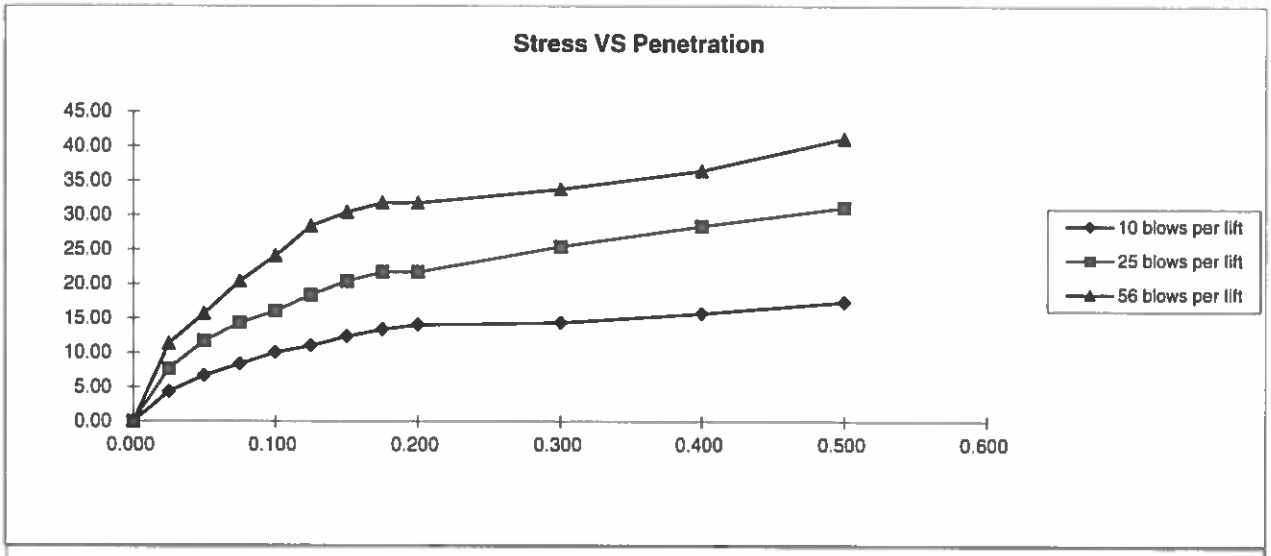
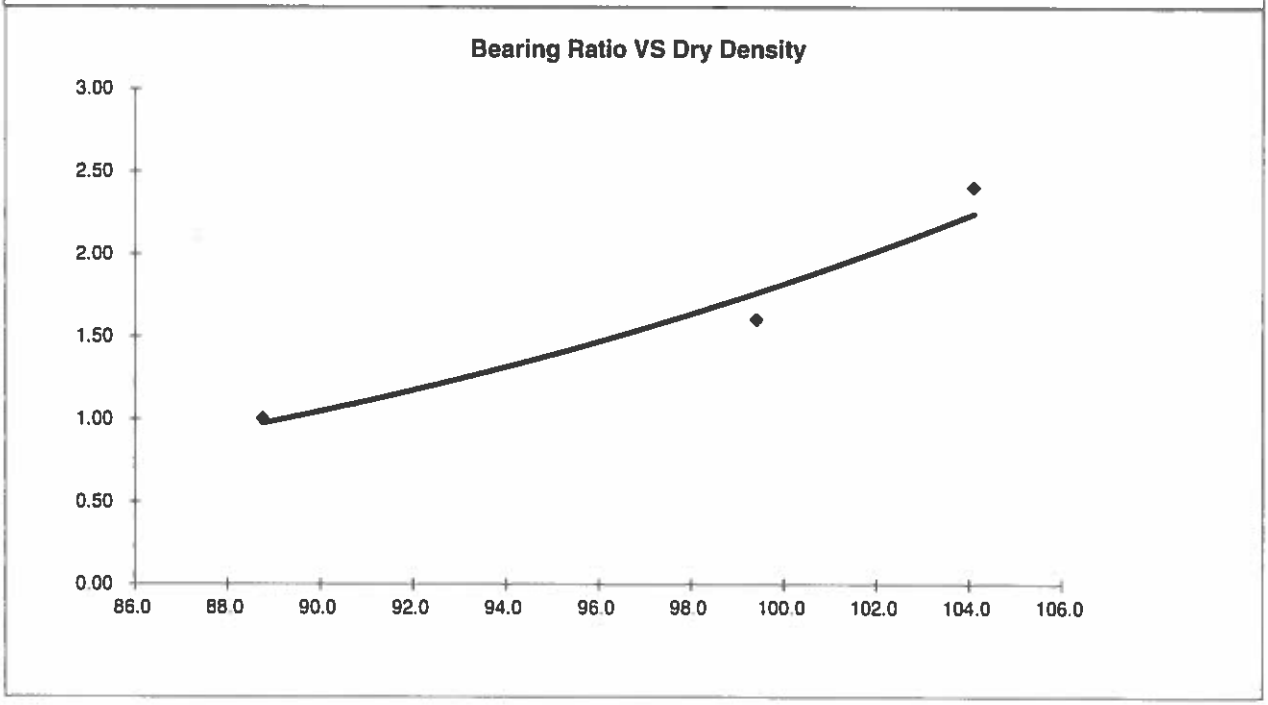
CBR TEST DATA

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO: 191931
FIG NO: B-95





BEARING RATIO AT 90% OF MAX	1.59	~ R VALUE	1.00
BEARING RATIO AT 95% OF MAX	2.51	~ R VALUE	6.00

JOB NO: 191931
SOIL TYPE: 1

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COLORADO SPRINGS, COLORADO 80907

CALIFORNIA BEARING RATIO

DRAWN:	DATE:	CHECKED:	DATE:
			12/9/19

JOB NO: 191931
FIG NO: B-96

CLIENT	COLA, LLC	JOB NO.	191931
PROJECT	TRAILS AT ASPEN RIDGE	DATE	11/20/2019
LOCATION	TRAILS AT ASPEN RIDGE	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-1	0-1	1	CL	0.07
TB-2	0-1	1	CL	0.13
TB-3	0-1	1	CL	0.14
TB-4	0-1	1	CL	0.26
TB-5	0-1	1	CL	0.14
TB-6	0-1	1	CL	0.14
TB-7	0-1	1	CL	0.08
TB-8	0-1	1	CL	0.12
TB-9	0-1	1	CL	0.13
TB-10	0-1	1	CL	0.19
TB-11	0-1	1	CL	0.18
TB-12	0-1	1	CL	0.22
TB-13	0-1	1	CL	0.14
TB-14	0-1	1	CL	0.17
TB-15	0-1	1	CL	0.16
TB-16	0-1	1	CL	0.11
TB-17	0-1	1	CL	0.11
TB-24	0-1	1	CL	0.03
TB-25	0-1	1	CL	0.07

QC BLANK PASS

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST
SULFATE RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		DJ	11/10/20

JOB NO.: 191931
FIG NO.: B-97

CLIENT	COLA, LLC	JOB NO.	191931
PROJECT	TRAILS AT ASPEN RIDGE	DATE	11/20/2019
LOCATION	TRAILS AT ASPEN RIDGE	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-18	0-1	1	CL	0.21
TB-19	0-1	1	CL	0.21
TB-20	0-1	1	CL	0.21
TB-21	0-1	1	CL	0.26
TB-22	0-1	1	CL	0.14
TB-23	0-1	1	CL	0.22
TB-26	0-1	1	CL	0.26
TB-27	0-1	1	CL	0.26
TB-28	0-1	1	CL	0.16
TB-29	0-1	1	CL	0.20
TB-30	0-1	1	CL	0.23
TB-31	0-1	1	CL	0.09
TB-32	0-1	1	CL	0.10
TB-33	0-1	1	CL	0.29

QC BLANK PASS

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST
SULFATE RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		TJS	12/16/20

JOB NO.: 191931
FIG NO.: B-98

APPENDIX C: Pavement Design Calculations

FLEXIBLE PAVEMENT DESIGN

DESIGN DATA

COLA, LLC
TRAILS AT ASPEN RIDGE, FILING 1 - LOCAL LOW-VOLUME
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL (W_{18}) =	36,500
Hveem Stabilometer (R Value) Results:	R =	6
Standard Deviation	S_o =	0.45
Loss in Serviceability	Δpsi =	2.2
Reliability	Reliability =	85
Reliability (z-statistic)	Z_R =	-1.04
Soil Resilient Modulus	M_R =	3126

Weighted Structural Number (WSN): → WSN = 2.63

DESIGN TABLES AND EQUATIONS

$S_1 = [(R - 5) / 11.29] + 3$

$M_R = 10^{[(S_1 + 18.72) / 6.24]}$

$k = M_R / 19.4$

Where:

M_R = resilient modulus (psi)

S_1 = the soil support value

R = R-value obtained from the Hveem stabilometer

CBR = California Bearing Ratio

Reliability (%)	Z_R (z-statistic)
80	-0.84
85	-1.04
90	-1.28
93	-1.48
94	-1.56
95	-1.65
96	-1.75
97	-1.88
98	-2.05
99	-2.33
99.9	-3.09
99.99	-3.75

$$\log_{10}W_{18} = Z_R * S_O + 9.36*\log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32*\log_{10}M_R - 8.07$$

Left	Right	Difference
4.56	4.56	0.0

Job No. 191931
Fig. No. C-1

DESIGN CALCULATIONS

DESIGN DATA COLA, LLC
TRAILS AT ASPEN RIDGE, FILING 1 - LOCAL LOW-VOLUME
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL =	36,500
Hveem Stabilometer (R Value) Results:	R =	6
Weighted Structural Number (WSN):	WSN =	2.63

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.11 Strength Coefficient - Aggregate Base Course

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Base Course (inches)

FOR FULL DEPTH ASPHALT SECTION (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 6.0 inches of Full Depth Asphalt
Use 6.0 inches Full Depth

FOR ASPHALT + AGGREGATE BASE COURSE SECTION

Asphalt Thickness (t) = [4] inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 7.9 inches of Aggregate
Base Course, use 8.0 inches

RECOMMENDED ALTERNATIVES

1. 4.0 inches of Asphalt + 8.0 inches of Aggregate Base Course, or
2. 6.0 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-2

DESIGN CALCULATIONS

CEMENT TREATED SECTIONS

DESIGN DATA: COLA, LLC
TRAILS AT ASPEN RIDGE, FILING 1 - LOCAL LOW VOLUME
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL =	36,500
Hveem Stabilometer (R Value) Results:	R =	6
Weighted Structural Number (WSN):	WSN =	2.63

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.12 Strength Coefficient - Cement Treated Subgrade.

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Cement Treated Subgrade (inches)

FOR FULL DEPTH ASPHALT SECTION - (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 6.0 inches of Full Depth Asphalt
Use 6.0 inches Full Depth

FOR ASPHALT + CEMENT TREATED SUBGRADE SECTION

Asphalt Thickness (t) = 4 inches USE 4 INCH MINIMUM.
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 7.3 inches
Use 10.0 inches of Cement Treated Subgrade.

RECOMMENDED ALTERNATIVES

1. 4.0 inches of Asphalt + 10 inches of Cement Treated Subgrade.
2. 6.0 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-3

FLEXIBLE PAVEMENT DESIGN

DESIGN DATA

COLA, LLC
TRAILS AT ASPEN RIDGE, FILING 1 - LOCAL ROADS
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL (W_{18}) =	292,000
Hveem Stabilometer (R Value) Results:	R =	6
Standard Deviation	S_o =	0.45
Loss in Serviceability	Δpsi =	2.2
Reliability	Reliability =	85
Reliability (z-statistic)	Z_R =	-1.04
Soil Resilient Modulus	M_R =	3126

Weighted Structural Number (WSN): → WSN = 3.60

DESIGN TABLES AND EQUATIONS

$S_1 = [(R - 5) / 11.29] + 3$

$M_R = 10^{[(S_1 + 18.72) / 6.24]}$

$k = M_R / 19.4$

Where:

M_R = resilient modulus (psi)

S_1 = the soil support value

R = R-value obtained from the Hveem stabilometer

CBR = California Bearing Ratio

Reliability (%)	Z_R (z-statistic)
80	-0.84
85	-1.04
90	-1.28
93	-1.48
94	-1.56
95	-1.65
96	-1.75
97	-1.88
98	-2.05
99	-2.33
99.9	-3.09
99.99	-3.75

$$\log_{10}W_{18} = Z_R * S_O + 9.36*\log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32*\log_{10}M_R - 8.07$$

Left	Right	Difference
5.47	5.47	0.0

Job No. 191931
Fig. No. C-4

DESIGN CALCULATIONS

DESIGN DATA COLA, LLC
TRAILS AT ASPEN RIDGE, FILING 1 - LOCAL ROADS
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL =	292,000
Hveem Stabilometer (R Value) Results:	R =	6
Weighted Structural Number (WSN):	WSN =	3.60

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.11 Strength Coefficient - Aggregate Base Course

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Base Course (inches)

FOR FULL DEPTH ASPHALT SECTION (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 8.2 inches of Full Depth Asphalt
Use 8.5 inches Full Depth

FOR ASPHALT + AGGREGATE BASE COURSE SECTION

Asphalt Thickness (t) = [5.5] inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 10.8 inches of Aggregate Base Course, use 11.0 inches

RECOMMENDED ALTERNATIVES

1. 5.5 inches of Asphalt + 11.0 inches of Aggregate Base Course, or
2. 8.5 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-5

DESIGN CALCULATIONS

CEMENT TREATED SECTIONS

DESIGN DATA: COLA, LLC
TRAILS AT ASPEN RIDGE, FILING 1 - LOCAL ROADS
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL =	292,000
Hveem Stabilometer (R Value) Results:	R =	6
Weighted Structural Number (WSN):	WSN =	3.60

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.12 Strength Coefficient - Cement Treated Subgrade.

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Cement Treated Subgrade (inches)

FOR FULL DEPTH ASPHALT SECTION - (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 8.2 inches of Full Depth Asphalt
Use 8.5 inches Full Depth

FOR ASPHALT + CEMENT TREATED SUBGRADE SECTION

Asphalt Thickness (t) = 5 inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 11.7 inches
Use 12.0 inches of Cement Treated Subgrade.

RECOMMENDED ALTERNATIVES

1. 5.0 inches of Asphalt + 12.0 inches of Cement Treated Subgrade.
2. 8.5 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-6

FLEXIBLE PAVEMENT DESIGN

DESIGN DATA

COLA, LLC - LEGACY HILL - FRONTSIDE DR TO BIG JOHNSON DR
TRAILS AT ASPEN RIDGE, FILING 1 - URBAN NON-RES. COLLECTOR
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL (W_{18}) =	907,892
Hveem Stabilometer (R Value) Results:	R =	6
Standard Deviation	S_o =	0.45
Loss in Serviceability	Δpsi =	2.2
Reliability	Reliability =	85
Reliability (z-statistic)	Z_R =	-1.04
Soil Resilient Modulus	M_R =	3126

Weighted Structural Number (WSN): → WSN = 4.24

DESIGN TABLES AND EQUATIONS

$S_1 = [(R - 5) / 11.29] + 3$

$M_R = 10^{[(S_1 + 18.72) / 6.24]}$

$k = M_R / 19.4$

Where:

M_R = resilient modulus (psi)

S_1 = the soil support value

R = R-value obtained from the Hveem stabilometer

CBR = California Bearing Ratio

Reliability (%)	Z_R (z-statistic)
80	-0.84
85	-1.04
90	-1.28
93	-1.48
94	-1.56
95	-1.65
96	-1.75
97	-1.88
98	-2.05
99	-2.33
99.9	-3.09
99.99	-3.75

$$\log_{10}W_{18} = Z_R * S_O + 9.36*\log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32*\log_{10}M_R - 8.07$$

Left	Right	Difference
5.96	5.96	0.0

Job No. 191931
Fig. No. C-7

DESIGN CALCULATIONS

DESIGN DATA COLA, LLC - LEGACY HILL - FRONTSIDE DR TO BIG JOHNSON DR
TRAILS AT ASPEN RIDGE, FILING 1 - URBAN NON-RES. COLLECTOR
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL = 907,892
Hveem Stabilometer (R Value) Results:	R = 6
Weighted Structural Number (WSN):	WSN = 4.24

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.11 Strength Coefficient - Aggregate Base Course

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Base Course (inches)

FOR FULL DEPTH ASPHALT SECTION (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 9.6 inches of Full Depth Asphalt
Use 10.0 inches Full Depth

FOR ASPHALT + AGGREGATE BASE COURSE SECTION

Asphalt Thickness (t) = [6] inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 14.6 inches of Aggregate
Base Course, use 15.0 inches

RECOMMENDED ALTERNATIVES

1. 6.0 inches of Asphalt + 15.0 inches of Aggregate Base Course, or
2. 10.0 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-8

DESIGN CALCULATIONS

CEMENT TREATED SECTIONS

DESIGN DATA: COLA, LLC - LEGACY HILL - FRONTSIDE DR TO BIG JOHNSON DR
TRAILS AT ASPEN RIDGE, FILING 1 - URBA NON-RES COLLECTOR
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL =	907,892
Hveem Stabilometer (R Value) Results:	R =	6
Weighted Structural Number (WSN):	WSN =	4.24

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.12 Strength Coefficient - Cement Treated Subgrade.

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Cement Treated Subgrade (inches)

FOR FULL DEPTH ASPHALT SECTION - (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 9.6 inches of Full Depth Asphalt
Use 10.0 inches Full Depth

FOR ASPHALT + CEMENT TREATED SUBGRADE SECTION

Asphalt Thickness (t) = 7 inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 9.7 inches
Use 10.0 inches of Cement Treated Subgrade.

RECOMMENDED ALTERNATIVES

1. 7.0 inches of Asphalt + 10.0 inches of Cement Treated Subgrade.
2. 10.0 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-9

FLEXIBLE PAVEMENT DESIGN

DESIGN DATA — COLA, LLC - LEGACY HILL - BRADLEY RD TO FRONTSIDE DR
TRAILS AT ASPEN RIDGE, FILING 1 - URBAN NON-RES. COLLECTOR
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL (W_{18}) =	2,754,696
Hveem Stabilometer (R Value) Results:	R =	6
Standard Deviation	S_o =	0.45
Loss in Serviceability	Δpsi =	2.2
Reliability	Reliability =	85
Reliability (z-statistic)	Z_R =	-1.04
Soil Resilient Modulus	M_R =	3126

Weighted Structural Number (WSN): → WSN = 4.94

DESIGN TABLES AND EQUATIONS

$S_1 = [(R - 5) / 11.29] + 3$

$M_R = 10^{[(S_1 + 18.72) / 6.24]}$

$k = M_R / 19.4$

Where:

M_R = resilient modulus (psi)

S_1 = the soil support value

R = R-value obtained from the Hveem stabilometer

CBR = California Bearing Ratio

Reliability (%)	Z_R (z-statistic)
80	-0.84
85	-1.04
90	-1.28
93	-1.48
94	-1.56
95	-1.65
96	-1.75
97	-1.88
98	-2.05
99	-2.33
99.9	-3.09
99.99	-3.75

$$\log_{10}W_{18} = Z_R * S_O + 9.36 * \log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \log_{10}M_R - 8.07$$

Left	Right	Difference
6.44	6.44	0.0

Job No. 191931
Fig. No. C-10

DESIGN CALCULATIONS

DESIGN DATA COLA, LLC - LEGACY HILL - BRADLEY RD TO FRONTSIDE DR
TRAILS AT ASPEN RIDGE, FILING 1 - URBAN NON-RES. COLLECTOR
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL = 2,754,696
Hveem Stabilometer (R Value) Results:	R = 6
Weighted Structural Number (WSN):	WSN = 4.94

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.11 Strength Coefficient - Aggregate Base Course

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Base Course (inches)

FOR FULL DEPTH ASPHALT SECTION (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 11.2 inches of Full Depth Asphalt
Use 11.5 inches Full Depth

FOR ASPHALT + AGGREGATE BASE COURSE SECTION

Asphalt Thickness (t) = [7] inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 16.9 inches of Aggregate
Base Course, use 17.0 inches

RECOMMENDED ALTERNATIVES

1. 7.0 inches of Asphalt + 17.0 inches of Aggregate Base Course, or
2. 11.5 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-11

DESIGN CALCULATIONS

CEMENT TREATED SECTIONS

DESIGN DATA: COLA, LLC - BRADLEY RD TO FRONTSIDE DR
TRAILS AT ASPEN RIDGE, FILING 1 - URBA NON-RES COLLECTOR
SOIL TYPE 1

Equivalent (18 kip) Single Axle Load Applications (ESAL):	ESAL =	2,754,696
Hveem Stabilometer (R Value) Results:	R =	6
Weighted Structural Number (WSN):	WSN =	4.94

DESIGN EQUATION

$$WSN = C_1D_1 + C_2D_2$$

C_1 = 0.44 Strength Coefficient - Hot Bituminous Asphalt
C_2 = 0.12 Strength Coefficient - Cement Treated Subgrade.

D_1 = Depth of Asphalt (inches)
D_2 = Depth of Cement Treated Subgrade (inches)

FOR FULL DEPTH ASPHALT SECTION - (CURRENTLY NOT ALLOWED)

$D_1 = (WSN)/C_1$ = 11.2 inches of Full Depth Asphalt
Use 11.5 inches Full Depth

FOR ASPHALT + CEMENT TREATED SUBGRADE SECTION

Asphalt Thickness (t) = 8 inches
$D_2 = ((WSN) - (t)(C_1))/C_2$ = 11.8 inches
Use 12.0 inches of Cement Treated Subgrade.

RECOMMENDED ALTERNATIVES

1. 8.0 inches of Asphalt + 12.0 inches of Cement Treated Subgrade.
2. 11.5 inches of Full Depth Asphalt

Job No. 191931
Fig. No. C-12