June 12, 2012

EARTH ENGINEERING
CONSULTANTS, INC.

Campus Crest Construction, LLC
2100 Rexford Road – Suite 414
Charlotte, North Carolina 28211

Attn: Mr. Josh Schreppel (josh.schreppel@campuscrest.com)

Re: Street Subgrade Preparation – Phase I of Pavement Design Report
The Grove at Fort Collins – Pavement Evaluation
Tract C CSURF Property – Rolland Moore Drive and Centre Avenue
Fort Collins, Colorado
EEC Project No. 1102055

Mr. Schreppel:

Earth Engineering Consultants, Inc (EEC) personnel have completed the evaluation of in-place subgrades for the proposed interior roadways within the Grove at Fort Collins' student housing development project. The Grove at Fort Collins on Tract C of the CSURF Property is located west of Centre Avenue, south of Prospect Road, east of Shields Street and north the recently re-aligned Larimer Canal No. 2 in Fort Collins, Colorado. At the time of the field exploration, the subgrades for the referenced interior roadways were at or near approximate "rough" final subgrade elevations and the sanitary sewer and "wet" utilities had been installed. Results of the subgrade evaluation are provided with this report.

Soil borings were completed at seven (7) test locations (identified herein as B-1 thru B-7), to evaluate subgrades within the new interior roadway alignments. A diagram indicating the approximate roadway sections evaluated and the approximate boring locations are provided with this report. In general, those streets included the extension of Rolland Moore Drive from the east and west "dead-end/stubbed-in" sections off of Centre Avenue and Shields Street, Native Plant Way, and Perennial Lane.

At each of the test location, due to the presence of shallow utilities installed within these roadway alignments, as well as the amount of fill material placed and compacted above existing grades to elevate the site above flood plain elevations, only a single boring was completed. These borings were located and drilled within the sanitary sewer backfill area and were extended to depths of approximately 5-1/2-feet below present/current site grades. In general the native

subsoils, prior to placement of the overlot grading and roadway fill materials, were approximately 5 or more feet below existing site grades. Samples of the subsurface materials encountered were obtained within the top 4-feet of each borings.

Laboratory testing on the recovered samples included moisture content tests of all samples and evaluation of the unconfined strength of selected samples with a calibrated hand penetrometer. Atterberg limits and washed sieve analysis tests were completed on selected samples to evaluate the quantity and plasticity of the fines in the subgrade soils. In addition, swell/consolidation tests were completed on selected samples to evaluate the soils' tendency to swell with increased moisture content at current moisture and density conditions. Composite samples were collected at various boring locations and based on the soil classifications of each composite sample, a Hveem Stabilometer/R-Value test was performed to evaluate the subgrade strength characteristics. Results of the outlined tests are indicated on the attached boring logs and summary sheets.

As a part of the testing program, all samples were examined in the laboratory and classified in accordance with the attached General Notes and the Unified Soil Classification System, based on the soils' texture and plasticity. The estimated group symbol for the Unified Soil Classification System is indicated on the boring logs and a brief description of that classification system is included with this report.

Based on the results of the field borings and the laboratory testing, subsurface conditions can be generalized as follows. Soils observed within the pavement related test borings consisted of either sandy lean clay and/or clayey sand with varying amounts of sand and occasional scattered gravel. The cohesive to slightly cohesive subgrade soils were colored various shades of brown, tan or red, and were generally medium stiff to stiff in consistency. The moisture content in the clay subsoils were variable, and the swell potentials were generally low. The lean clay subsoils extended to depths explored, approximately 5-1/2-feet below existing site grades.

Observations were made while drilling and after completion of the borings to detect the presence and depth to hydrostatic ground water. Free water was not observed in the borings at the time of drilling to maximum depths of exploration. Groundwater has been measured at relatively shallow depths across the site prior to the current site development; thus the necessity for an

underdrain system. The majority of the underdrain has been installed and appears to effectively maintain groundwater levels below 5-feet from bottom of the pavement section. Fluctuations in groundwater levels can occur over time depending on variations in hydrologic conditions and other conditions not apparent at the time of this report. Longer term observations in cased holes sealed from the influence of surface water would be required to evaluate long term water level fluctuations.

ANALYSIS AND RECOMMENDATIONS

Swell – Consolidation Test Results

The swell-consolidation test is commonly performed to evaluate the swell or collapse potential of soils or bedrock for determining foundation, floor slab and pavement design criteria. In this test, relatively undisturbed samples obtained directly from the California ring barrel sampling device are placed in a laboratory apparatus and inundated with water under a predetermined load. The swell-index is the resulting amount of swell or collapse as a percent of the sample's thickness after the inundation period. Samples obtained at the ½ to 2-foot intervals are generally pre-loaded and inundated with water at an approximate 150 pounds per square foot (psf) increment to simulate the pavement loading conditions in general accordance with Larimer County Urban Area Street Standards (LCUASS) Pavement Design criteria. After the inundation period additional incremental loads are applied to evaluate the rate of consolidation.

For this assessment, we conducted five (5) swell-consolidation tests at various locations throughout the site at approximate depths of 1 to 2-feet below site grades. The following table summarizes the swell-consolidation laboratory test results conducted in the laboratory.

Boring No.	Depth, ft.	Fill Material Type	Swell Consolidation Test Results				
			Moisture Content, %	Dry Density, PCF	Inundation Pressure, psf	Swell Index, %	Swell Pressure, psf
B-1	2	Sandy Lean Clay w/ Gravel	15.2	118.3	150	(+) 0.8	1000
B-2	2	Sandy Lean Clay w/ Gravel	17.1	117.0	150	(+) 0.4	600
B-4	2	Clayey Sand w/ Gravel	9.1	121.5	150	(+) 4.0	3200
B-5	2	Sandy Lean Clay w/ Gravel	12.3	118.2	150	(+) 1.5	1200
B-6	2	Sandy Lean Clay w/ Gravel	15.0	115.5	150	(+) 0.7	1000

The swell index values for the soil samples tested at the 150-psf inundation pressures revealed low to moderate swell characteristics on the order of (+) 0.4 to (+) 4.0%. The average swell-index for the overburden/subgrade fill material samples analyzed was approximately (+) 1.5%, which in comparison with the LCUASS guidelines is less than the 2 percent criteria established for requiring a swell mitigation plan throughout the development. One (1) subgrade sample obtained in boring B-4 revealed an approximate (+) 4.0% swell-index test result. This sample also indicated a relatively dry moisture content and stiff in-situ dry density at 9.1% moisture and a dry density of 121.5 pcf. Close evaluation during the final subgrade preparation should be conducted to determine the necessity for a swell mitigation plan, such as an over-excavation and replacement with either moisture conditioned on-site cohesive subsoils to near optimum moisture content or replacement with an approved granular material, and/or possibly a fly ash treatment to reduce the swell potential and provide a stable subgrade for placement of the approved pavement section. For consistency purposes throughout the development, consideration should be given to implementing a subgrade stabilization process, such as a fly ash treatment for all roadways.

Based on the variability and observed swells of the subgrade soils, we recommend the exposed subgrades be stabilized through the addition of Class C fly ash prior to the construction of the overlying pavement structure. Stabilization should consist of blending 13% by dry weight of Class C fly ash in the top 12 inches of the subgrades. The blended materials should be adjusted in moisture content to slightly dry of standard Proctor optimum moisture content and compacted to at least 95 % of the materials maximum dry density as determined in accordance to the standard Proctor procedure. Compaction of the subgrade should be completed within two hours after initial blending of the Class C fly ash.

Subgrade stabilization for the proposed interior roadways within The Grove at Fort Collins should be completed in general accordance with the recommendations presented in the LCUASS Pavement Design Manual – Chapter 22. Included in the appendix of this report are suggested specification guidelines for treatment of materials in place uses Class "C" fly ash.

The on-site cohesive subgrade soils generally have fair pavement subgrade strength characteristics. A Hveem Stabilometer/R-value of 15 was determined in the laboratory; however due to the variability of the on-site subgrade soils an R-Value of 10 will be used for the final pavement design to determine the appropriate structural numbers for each interior roadway.

Pavement section design is based on subgrade conditions and estimated traffic volumes. Estimated traffic volumes are provided by City of Fort Collins Engineering personnel after acceptance of the subgrade preparation report. We will prepare recommendations for the design pavement sections after we received the requisite traffic estimates from the City of Fort Collins.

GENERAL COMMENTS

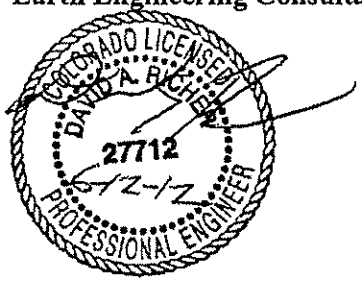
The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations which may occur between borings or across the site. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will be necessary to re-evaluate the recommendations of this report.

It is recommended that the geotechnical engineer be retained to review the plans and specifications so that comments can be made regarding the interpretation and implementation of our geotechnical recommendations in the design and specifications. It is further recommended that the geotechnical engineer be retained for testing and observations during earthwork and foundation construction phases to help determine that the design requirements are fulfilled.

This report has been prepared for the exclusive use of Campus Crest for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranty, express or implied, is made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we can be of further service to you in any other way, please do not hesitate to contact us.

Very truly yours,
Earth Engineering Consultant, Inc.



David A. Richer, P.E.
Senior Geotechnical Engineer

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Ms. Erika Keeton, P.E.: ekeeton@fcgov.com
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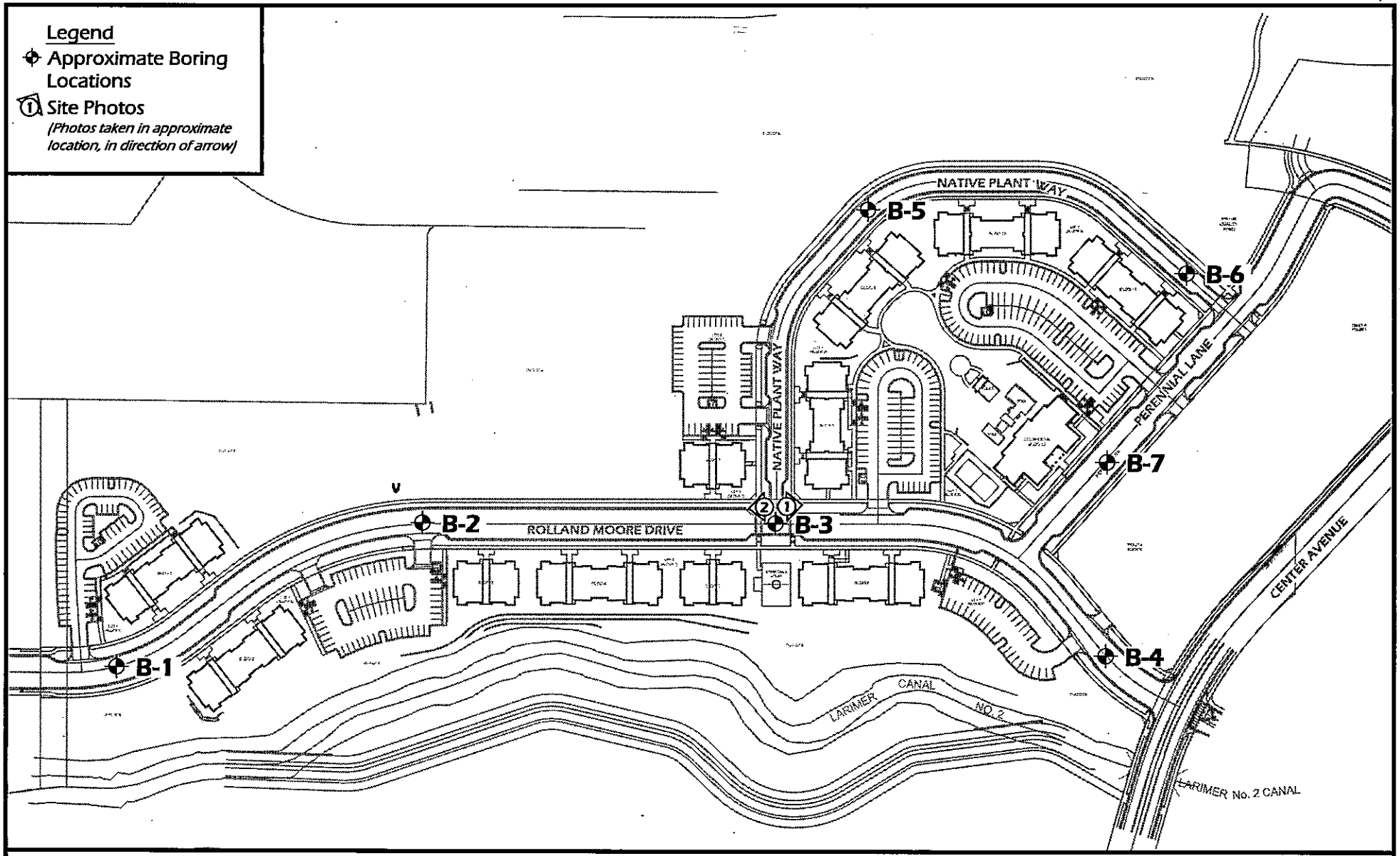

Boring Location Diagram
The Grove - Fort Collins, Colorado
EEC Project Number: 1102055
June 2012

Earth Engineering Consultants, Inc.

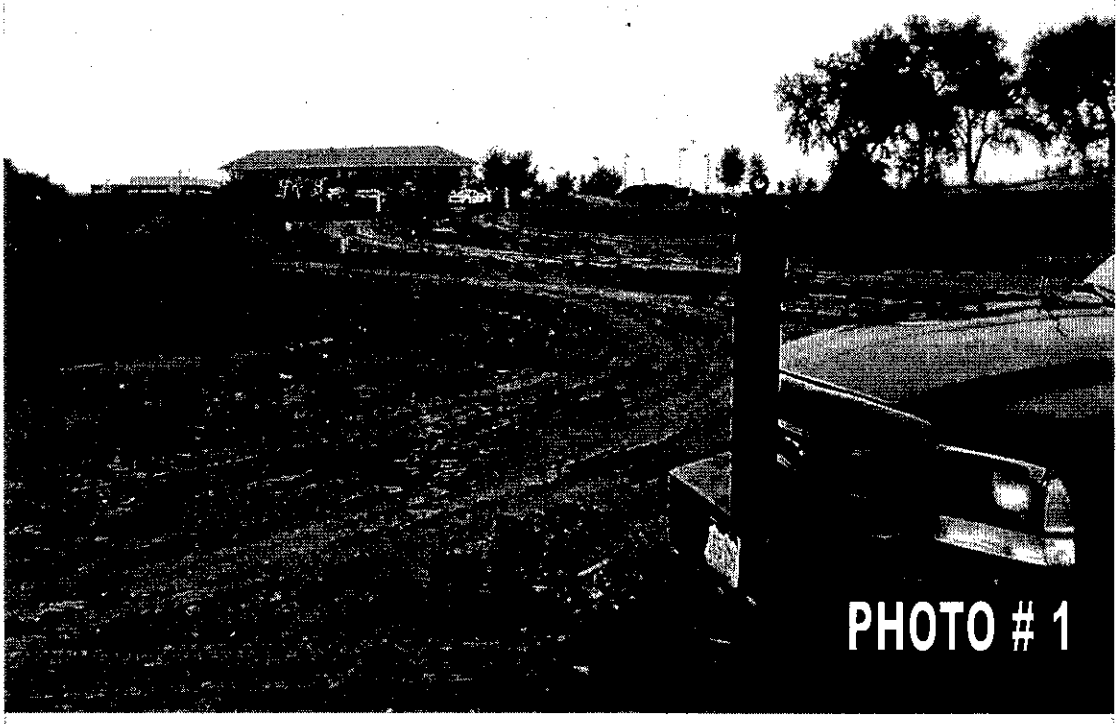

PHOTO # 1

PHOTO # 2

THE GROVE PAVEMENTS
FORT COLIINS, COLORADO
EEC PROJECT NO. 1102055
MAY 2012

THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055								DATE: MAY 2012			
				LOG OF BORING B-1							
RIG TYPE: CME45				SHEET 1 OF 1				WATER DEPTH			
FOREMAN: DG			START DATE		5/25/2012			WHILE DRILLING			None
AUGER TYPE: 4" CFA			FINISH DATE		5/25/2012			AFTER DRILLING			N/A
SPT HAMMER: MANUAL			SURFACE ELEV		N/A			24 HOUR			N/A

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
FILL: SANDY LEAN CLAY (CL) brown / red medium stiff to stiff		1									
		2									% @ 150 psf
	CS	3	9	9000+	15.2	118.5	36	21	57.7	1000 psf	0.8%
		4									
	SS	5	9	9000+	13.8						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
		10									
		11									
		12									
		13									
		14									
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		25									

THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055								DATE: MAY 2012			
				LOG OF BORING B-2							
RIG TYPE: CME45				SHEET 1 OF 1				WATER DEPTH			
FOREMAN: DG			START DATE		5/25/2012			WHILE DRILLING			None
AUGER TYPE: 4" CFA			FINISH DATE		5/25/2012			AFTER DRILLING			N/A
SPT HAMMER: MANUAL			SURFACE ELEV		N/A			24 HOUR			N/A
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL	
	TYPE	(FEET)	(BLOWS/FT)	(PSF)	(%)	(PCF)	LL	PI	(%)	PRESSURE	% @ 500 PSF
FILL: SANDY LEAN CLAY (CL)		1									
brown											
stiff to medium stiff		2									
											% @ 150 psf
	CS	3	13	7000	17.1	114.5				600 psf	0.4%
		4									
brown / tan and slightly elevated moisture contents											
	SS	5	5	3500	25.9						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
		10									
		11									
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		25									

THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055								DATE: MAY 2012			
				LOG OF BORING B-3							
RIG TYPE: CME45				SHEET 1 OF 1				WATER DEPTH			
FOREMAN: DG			START DATE		5/25/2012			WHILE DRILLING			None
AUGER TYPE: 4" CFA			FINISH DATE		5/25/2012			AFTER DRILLING			N/A
SPT HAMMER: MANUAL			SURFACE ELEV		N/A			24 HOUR			N/A
SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
FILL: SANDY LEAN CLAY (CL)		1									
brown		2									
medium stiff to soft with depth											
	CS	3	7	2500	20.0	106.6					
		4									
	SS	5	2	2500	20.8						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
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Earth Engineering Consultants

THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055								DATE: MAY 2012			
				LOG OF BORING B-4							
RIG TYPE: CME45				SHEET 1 OF 1				WATER DEPTH			
FOREMAN: DG			START DATE		5/25/2012			WHILE DRILLING			None
AUGER TYPE: 4" CFA			FINISH DATE		5/25/2012			AFTER DRILLING			N/A
SPT HAMMER: MANUAL			SURFACE ELEV		N/A			24 HOUR			N/A

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
FILL MATERIAL: CLAYEY SAND (SC) brown / red medium dense		1									
		2									% @ 150 psf
	CS	3	10	9000+	9.1	114.1	32	17	46.3	3200	4.0%
		4									
	SS	5	10	9000+	9.9						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
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		24									
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THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055							DATE: MAY 2012				
		LOG OF BORING B-5									
RIG TYPE: CME45		SHEET 1 OF 1					WATER DEPTH				
FOREMAN: DG		START DATE		5/25/2012			WHILE DRILLING			None	
AUGER TYPE: 4" CFA		FINISH DATE		5/25/2012			AFTER DRILLING			N/A	
SPT HAMMER: MANUAL		SURFACE ELEV		N/A			24 HOUR			N/A	
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL	
	TYPE	(FEET)	(BLOWS/FT)	(PSF)	(%)	(PCF)	LL	PI	(%)	PRESSURE	% @ 500 PSF
FILL: SANDY LEAN CLAY (CL)		1									
brown / red											
stiff to very stiff		2									
traces of gravel											% @ 150 psf
	CS	3	9	9000+	12.3	118.1				1200 psf	1.5%
		4									
	SS	5	11	4000	15.5						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
		10									
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THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055			DATE: MAY 2012
	LOG OF BORING B-6		
RIG TYPE: CME45	SHEET 1 OF 1		WATER DEPTH
FOREMAN: DG	START DATE	5/25/2012	WHILE DRILLING: None
AUGER TYPE: 4" CFA	FINISH DATE	5/25/2012	AFTER DRILLING: N/A
SPT HAMMER: MANUAL	SURFACE ELEV	N/A	24 HOUR: N/A

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
FILL: SANDY LEAN CLAY (CL)		1									
brown		2									
stiff to very stiff											
with traces of gravel											% @ 150 psf
	CS	3	8	7000	15.0	114.9	34	18	63.1	1000 psf	0.7%
		4									
	SS	5	16	9000	14.5						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
		10									
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		25									

THE GROVE PAVEMENTS
FORT COLLINS, COLORADO

PROJECT NO: 1102055				DATE: MAY 2012	
	LOG OF BORING B-7				
RIG TYPE: CME45	SHEET 1 OF 1			WATER DEPTH	
FOREMAN: DG	START DATE	5/25/2012		WHILE DRILLING	None
AUGER TYPE: 4" CFA	FINISH DATE	5/25/2012		AFTER DRILLING	N/A
SPT HAMMER: MANUAL	SURFACE ELEV	N/A		24 HOUR	N/A

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
FILL: SANDY LEAN CLAY (CL)		1									
brown / red		2									
stiff											
with traces of gravel											
	CS	3	7	3500	17.7	111.5					
		4									
	SS	5	8	5000	18.4						
BOTTOM OF BORING DEPTH 5.5'		6									
		7									
		8									
		9									
		10									
		11									
		12									
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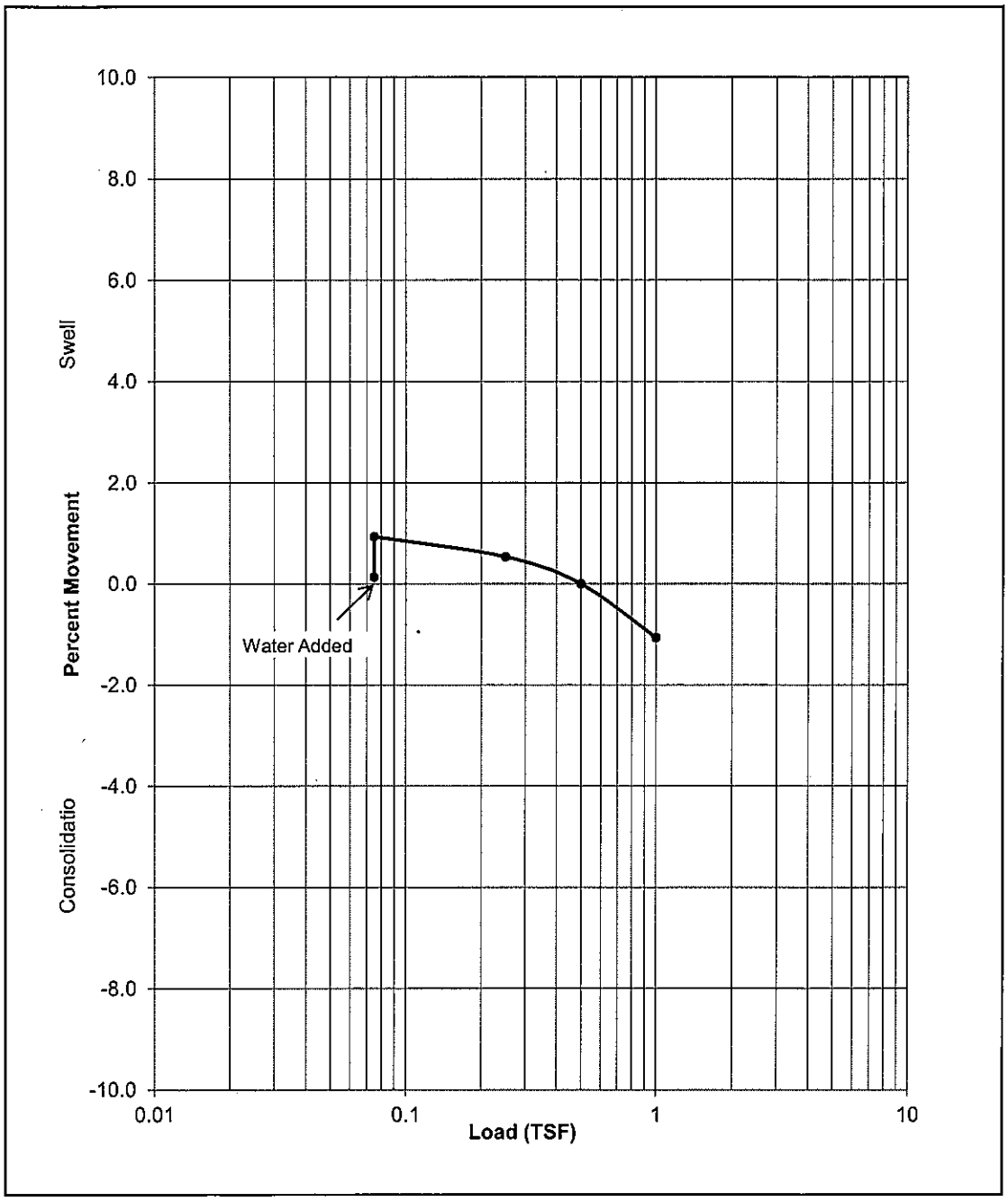
		19									
		20									
		21									
		22									
		23									
		24									
		25									

SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Fill: Brown / Red Sandy Lean Clay (CL)		
Sample Location:	Boring 1, Sample 1, Depth 2'		
Liquid Limit: 36	Plasticity Index: 21		% Passing #200: 57.7%
Beginning Moisture: 15.2%	Dry Density: 118.3 psf		Ending Moisture: 15.5%
Swell Pressure: 1000 psf		% Swell @ 150:	0.8%

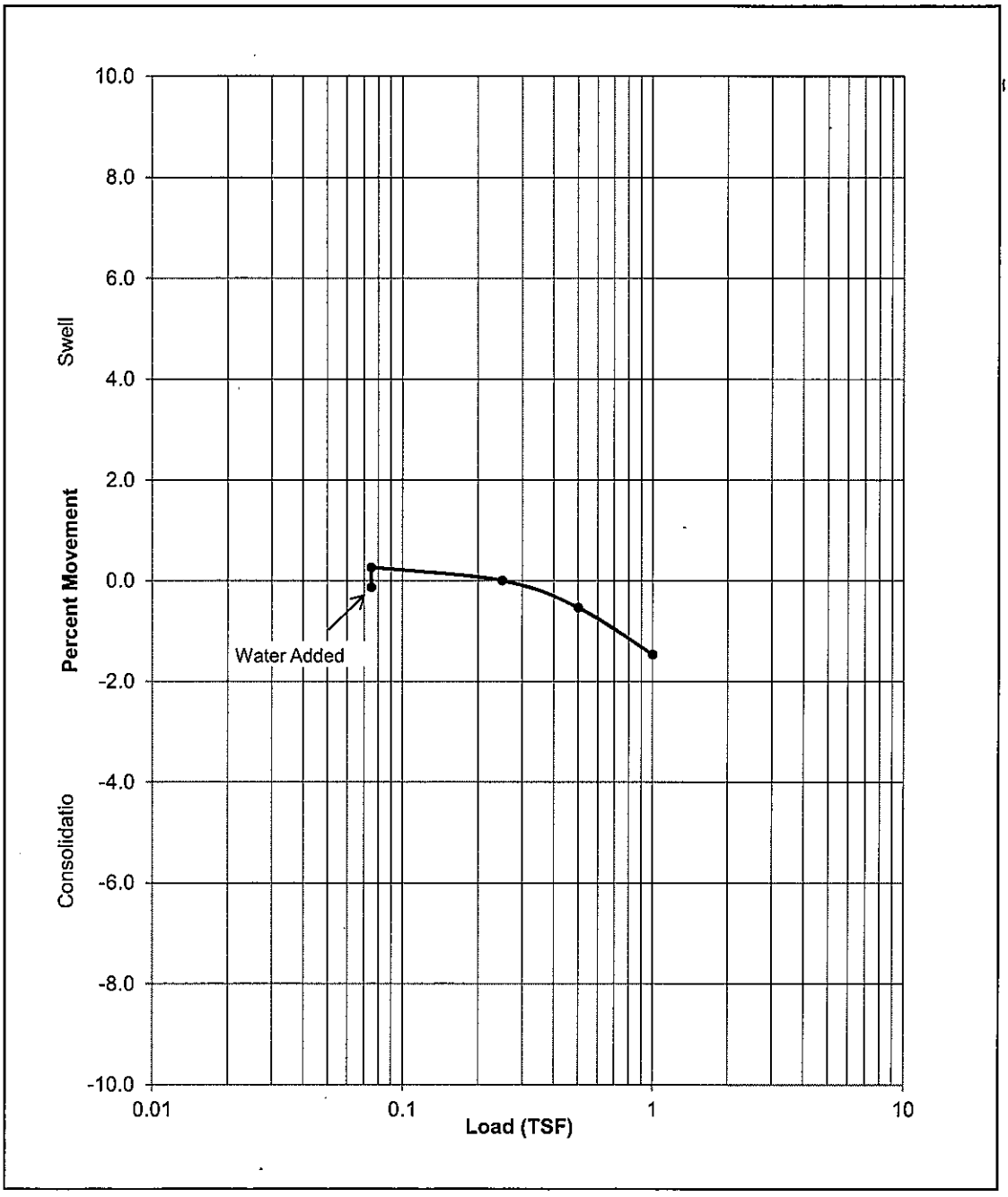


Project: The Grove Pavements
Location: Fort Collins, Colorado
Project #: 1102055
Date: May 2012

EEC

SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Fill: Brown Sandy Lean Clay (CL)		
Sample Location:	Boring 2, Sample 1, Depth 2'		
Liquid Limit: --	Plasticity Index: --	% Passing #200: --	
Beginning Moisture: 17.1%	Dry Density: 117 psf	Ending Moisture: 12.8%	
Swell Pressure: 600 psf	% Swell @ 150: 0.4%		



Project: The Grove Pavements
Location: Fort Collins, Colorado
Project #: 1102055
Date: May 2012

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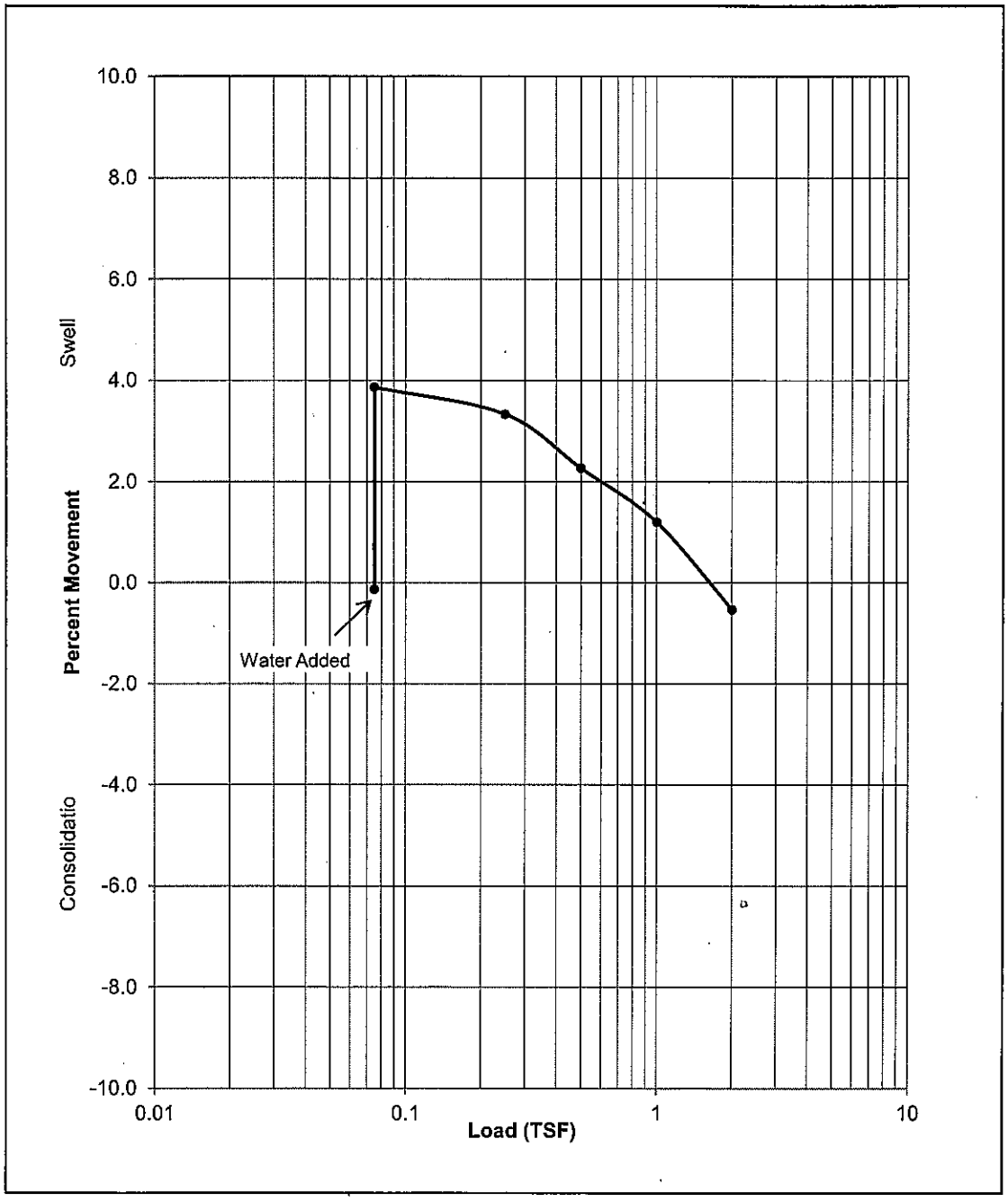
SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Brown / Red Clayey Sand (SC)		
Sample Location:	Boring 4, Sample 1, Depth 2'		
Liquid Limit: 32	Plasticity Index: 17	% Passing #200: 46.3%	
Beginning Moisture: 9.1%	Dry Density: 121.5 psf	Ending Moisture: 14.5%	
Swell Pressure: 3200 psf	% Swell @ 150: 4.0%		

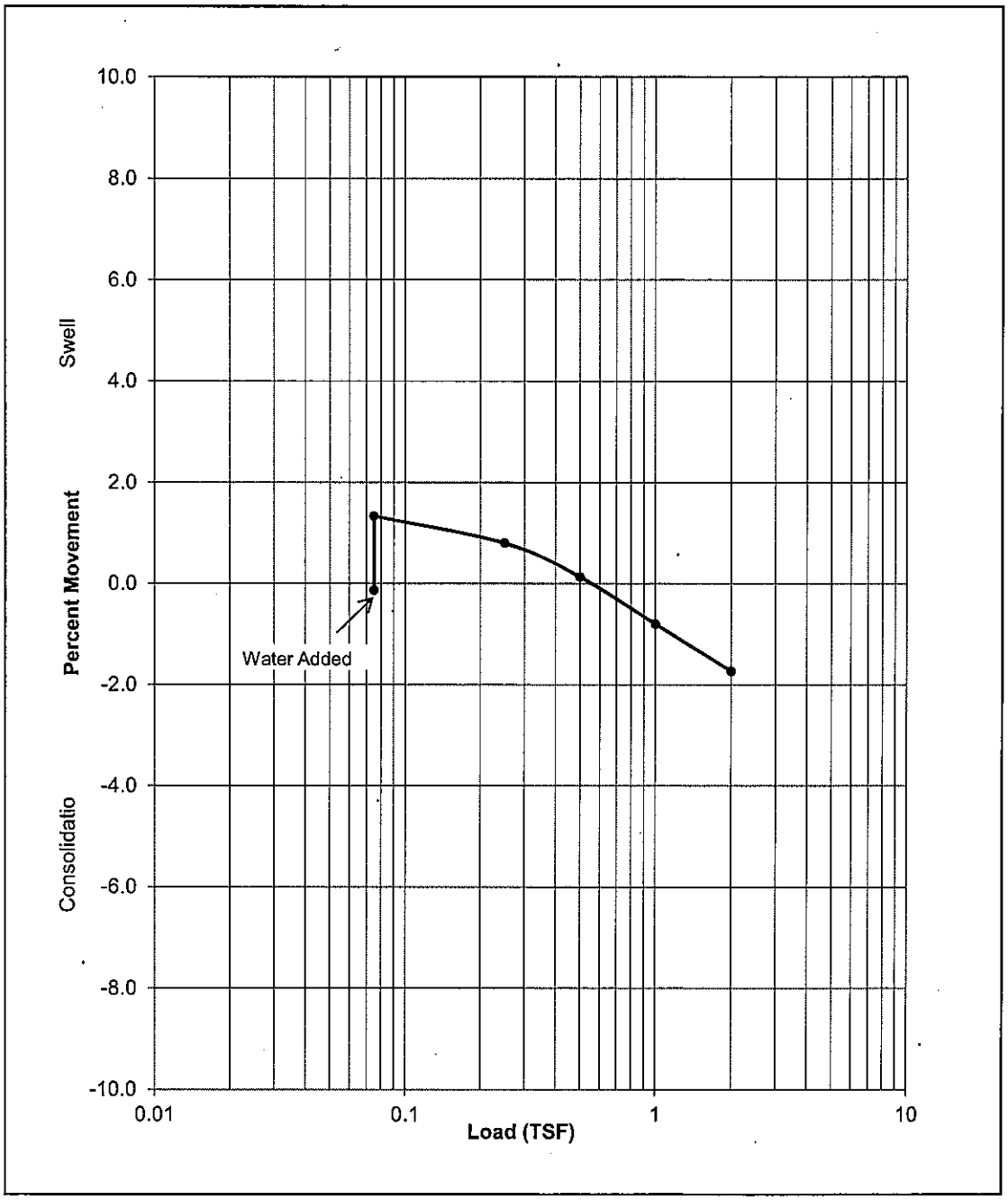


Project: The Grove Pavements
Location: Fort Collins, Colorado
Project #: 1102055
Date: May 2012

EEC

SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Brown / Red Sandy Lean Clay (CL)	
Sample Location:	Boring 5, Sample 1, Depth 2'	
Liquid Limit: - -	Plasticity Index: - -	% Passing #200: - -
Beginning Moisture: 12.3%	Dry Density: 118.2 psf	Ending Moisture: 13.3%
Swell Pressure: 1200 psf	% Swell @ 150: 1.5%	



Project: The Grove Pavements
Location: Fort Collins, Colorado
Project #: 1102055
Date: May 2012

EEC

RESISTANCE R-VALUE & EXPANSION PRESSURE OF COMPACTED SOIL - ASTM D2844

PROJECT:	The Grove at Fort Collins, Extension of Rolland Moore	**PROJECT NO.**	1102055
LOCATION:	Fort Collins, Colorado	**DATE**	June 2012
MATERIAL DESCRIPTION:	Sandy Lean Clay (CL) - AASHTO A-6		
SAMPLE LOCATION:	Comp. Subgrade Sample - TB No. 3 @ 1 -4-feet		
LIQUID LIMIT:	36	**PLASTICITY INDEX:** 17	**%PASSING #200:** 69

R-VALUE LABORATORY TEST RESULTS

TEST SPECIMEN NO.	1	2	3
COMPACTION PRESSURE (PSI)	50	75	100
DENSITY (PCF)	107.8	110.3	111.3
MOISTURE CONTENT (%)	15.2	14.1	13.2
EXPANSION PRESSURE (PSI)	0.00	0.00	0.00
HORIZONTAL PRESSURE @ 160 PSI	134	128	120
SAMPLE HEIGHT (INCHES)	2.51	2.48	2.49
EXUDATION PRESSURE (PSI)	187.5	287.4	400.5
UNCORRECTED R-VALUE	11.2	14.3	18.5
CORRECTED R-VALUE	11.2	14.3	18.5

R-VALUE @ 300 PSI EXUDATION PRESSURE = 15	**RESILIENT MODULUS, PSI =** 4,195