SUBSURFACE EXPLORATION REPORT
FRENCH FIELD SCORE BOARD REPLACEMENT
ROCKY MOUNATIN HIGH SCHOOL CAMPUS – 1300 W SWALLOW ROAD
FORT COLLINS, COLORADO
EEC PROJECT NO. 1212011

Prepared for:

Poudre School District
2445 LaPorte Avenue
Fort Collins, Colorado 80521

Attn: Mr. Jason Lee (jlee@psdschools.org)
Construction Project Coordinator

Prepared by:

Earth Engineering Consultants, LLC
4396 Greenfield Drive
Windsor, Colorado 80550

February 19, 2021

Poudre School District
2445 LaPorte Avenue
Fort Collins, Colorado 80521

Attn: Mr. Jason Lee (jlee@psdschools.org)
Construction Project Coordinator

Re: Subsurface Exploration Report
French Field – Score Board Replacement
Rocky Mountain High School Campus – 1300 W Swallow Road
Fort Collins, Colorado
EEC Project No. 1212011

Mr. Lee:

Enclosed, herewith, are the results of the subsurface exploration completed by Earth Engineering Consultants, LLC (EEC) for the referenced project. For this exploration, one (1) soil boring was extended to a depth of approximately 25 feet below existing site grades at a pre-selected location. This subsurface exploration was carried out in general accordance with our proposal dated January 20, 2021.

In summary, the subsurface conditions encountered beneath the surficial vegetation layer in the test boring, generally consisted of lean clay with sand which extended to clayey sand materials at a depth of approximately 9 feet below the ground surface. The lean clay materials were generally dry, very stiff and exhibited very high swell potential at current moisture and density conditions. Clayey sand soils were encountered below the lean clay and extended to the underlying bedrock at a depth of approximately 24 feet. The clayey sand materials were generally well graded medium dense and exhibited low swell potential at current moisture and density conditions. Highly weathered siltstone/claystone bedrock was encountered below the clayey sand and extended to the depths explored, approximately 25 feet below the ground surface. Groundwater was not observed in the boring which extended to a maximum depth of approximately 25 feet below the ground surface.

Based on the encountered subsurface conditions, in our opinion, the proposed structure could be supported on drilled friction piers bearing into the undisturbed native sand soils. The friction piers should be designed to resist uplift forces due to the expansive overburden cohesive subsoils. Geotechnical recommendations concerning design and construction of the proposed score board are provided within the attached report.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the enclosed 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 Consultants, LLC

Reviewed by:

Erin Dunn, E.I.T.
Project Engineer

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

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INTRODUCTION

The geotechnical subsurface exploration for the new proposed scoreboard at French Field on the Rocky Mountain High School Campus in Fort Collins, Colorado has been completed. To develop subsurface information in the proposed development area, one (1) soil boring was drilled at a pre-selected location to a depth of approximately 25 feet below existing site grades. A diagram indicating the approximate boring location is included with this report.

We understand the proposed development consists of the replacement of the scoreboard located on the north endzone of French Field on the Rocky Mountain High School Campus. We anticipate maximum foundations loads will be relatively light with maximum column loads less than 50 kips along with lateral wind-loading and potential uplift forces. Small grade changes are expected to develop site grades for the proposed improvements.

The purpose of this report is to describe the subsurface conditions encountered in the test boring, analyze and evaluate the field and laboratory test data and provide geotechnical recommendations concerning design and construction of foundations.

EXPLORATION AND TESTING PROCEDURES

The test boring location was established in the field by EEC personnel with the assistance of PSD personnel by pacing and estimating angles from identifiable site features. The approximate location of the boring is shown on the attached boring location diagram. The boring location should be considered accurate only to the degree implied by the methods used to make the field measurements.

The test boring was advanced using a truck mounted, CME-55 drill rig equipped with a hydraulic head employed in drilling and sampling operations. The borehole was advanced using 4-inch nominal diameter continuous flight augers. Samples of the subsurface materials encountered were obtained using split-barrel and California barrel sampling procedures in general accordance with ASTM Specifications D1586 and D3550, respectively.

In the split-barrel and California barrel sampling procedures, standard sampling spoons are advanced into the ground by means of a 140-pound hammer falling a distance of 30 inches. The number of blows required to advance the split-barrel and California barrel samplers is recorded and is used to estimate the in-situ relative density of cohesionless soils and, to a lesser degree of accuracy, the consistency of cohesive soils. In the California barrel sampling procedure, relatively intact samples are obtained in removable brass liners. All samples obtained in the field were sealed and returned to our laboratory for further examination, classification and testing.

Laboratory moisture content tests were completed on each of the recovered samples with unconfined compressive strength of appropriate samples estimated using a calibrated hand penetrometer. Atterberg limits and washed sieve analysis tests were completed on select samples to evaluate the quantity and plasticity of fines in the subgrades. Swell/consolidation testing was completed on select samples to evaluate the potential for the subgrade materials to change volume with variation in moisture content and load. Soluble sulfate tests were completed on selected samples to estimate the potential for sulfate attack on site cast concrete. Results of the outlined tests are indicated on the attached boring logs and summary sheets.

As part of the testing program, all samples were examined in the laboratory and classified in general accordance with the attached General Notes and the Unified Soil Classification System, based on the soil's 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.

SITE AND SUBSURFACE CONDITIONS

The proposed scoreboard is planned for construction in the location of the existing scoreboard on the north end of the existing French Field in Fort Collins, Colorado. The area is currently developed as a football field with surrounding track, various pavement improvements, stands, and landscaping. Vegetation/sod was encountered at the surface of the boring. Ground surface in this area is relatively flat.

EEC field personnel were on site during drilling to evaluate the subsurface conditions encountered and direct the drilling activities. Field logs prepared by EEC site personnel were based on visual and tactual observation of disturbed samples and auger cuttings. The final boring logs included with this report may contain modifications to the field logs based on results of laboratory testing and evaluation. Based on results of the field borings and laboratory testing, subsurface conditions can be generalized as follows.

From the ground surface, the subgrades underlying the surficial vegetation/sod described previously consisted of lean clay with sand which extended to clayey sand materials at a depth of approximately 9 feet below the ground surface. The lean clay materials were generally dry, very stiff and exhibited very high swell potential at current moisture and density conditions. Clayey sand soils were encountered below the lean clay and extended to the underlying bedrock at a depth of approximately 24 feet. The clayey sand materials were generally well graded medium dense and exhibited low swell potential at current moisture and density conditions. Highly weathered siltstone/claystone bedrock was encountered below the clayey sand and extended to the depths explored, approximately 25 feet below the ground surface.

The stratification boundaries indicated on the boring logs represent the approximate location of changes in soil types; in-situ, the transition of materials may be gradual and indistinct.

GROUNDWATER CONDITIONS

Observations were made while drilling and after completion of the boring to detect the presence and depth to hydrostatic groundwater. At the time of drilling, groundwater was not observed in the boring which extended to a maximum depth of approximately 25 feet below the ground surface. The boring was backfilled upon completion of the drilling operations; therefore, subsequent groundwater measurements were not performed.

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 monitoring of water levels in cased wells, which are sealed from the influence of surface water, would be required to more accurately evaluate fluctuations in groundwater levels at the site. We have typically noted deepest groundwater levels in late winter and shallowest groundwater levels in mid to late summer.

ANALYSIS AND RECOMMENDATIONS

Swell – Consolidation Test Results

The swell-consolidation test is performed to evaluate the swell or collapse potential of soils to help determine foundation, floor slab and pavement design criteria. In this test, relatively undisturbed samples obtained directly from the California sampler 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 after the inundation period expressed as a percent of the sample's preload/initial thickness. After the inundation period, additional incremental loads are applied to evaluate the swell pressure and/or consolidation.

For this assessment, we conducted three (3) swell-consolidation tests on relatively undisturbed soil samples obtained at various intervals/depths on the site. The swell index values for the in-situ soil samples analyzed revealed low swell characteristics and compressible characteristics when inundated with water as indicated on the attached swell test summaries. The (+) test results indicate the soil materials swell potential characteristics while the (-) test results indicate the soils materials collapse/consolidation potential characteristics when inundated with water. The following table summarizes the swell-consolidation laboratory test results for samples obtained during our field explorations for the subject site.

Table I - Swell-Consolidation Test Results

Boring No.	Depth, ft.	Material Type	In-Situ Moisture Content, %	Dry Density, PCF	Inundation Pressure, psf	Swell Index, % (+/-)
1	4	Lean Clay with Sand (CL)	10.5	120.3	500	(+) 8.7
1	14	Clayey Sand (SC)	8.1	113.1	500	(+) 0.3
1	24	Siltstone / Claystone	13.3	122.6	2000	(+) 0.4

Colorado Association of Geotechnical Engineers (CAGE) uses the following information to provide uniformity in terminology between geotechnical engineers to provide a relative correlation of slab performance risk to measured swell. "The representative percent swell values are not necessarily measured values; rather, they are a judgment of the swell of the soil and/or bedrock profile likely to influence slab performance." Geotechnical engineers use this information to also evaluate the swell potential risks for foundation performance based on the risk categories.

Table II - Recommended Representative Swell Potential Descriptions and Corresponding Slab Performance Risk Categories		
Slab Performance Risk Category	**Representative Percent Swell (500 psf Surcharge)**	**Representative Percent Swell (1000 psf Surcharge)**
Low	0 to < 3	0 < 2
Moderate	3 to < 5	2 to < 4
High	5 to < 8	4 to < 6
Very High	> 8	> 6

Based on the laboratory test results, a majority of the in-situ samples analyzed for this project were within the low to very high range.

Site Preparation

Prior to placement of any fill and/or improvements, we recommend any existing topsoil, vegetation, any potential tree roots, and any unsuitable materials be removed from the planned development area. Foundation concrete and any other materials derived from the demolition of the existing scoreboard should be completely removed from the site and not allowed for use in any fill materials.

Friction Pier Foundations

We anticipate the proposed scoreboard could potentially be supported on drilled piers/friction piers. Due to the uplift forces created by the very high swell potential encountered in the lean clay soils, we recommend piers be designed for a minimum depth of penetration to counteract uplift forces. Table III provides recommended design values for net allowable end bearing and allowable skin friction for design of drilled piers/friction piers. Table IV also includes allowable skin friction values to resist uplift forces. Allowable design values are based on a factor or safety of 3 for downward side shear, 3 for end bearing, and 3 for uplift skin friction. We recommend skin friction be neglected for the upper 3 feet of each pier below adjacent ground surface. Linear interpolation may be used between the values in Table IV. Total structure load should include full dead and live loads.

Table III: Recommendations for Drilled Piers / Friction Piers

Depth Below Surface (ft.)	Net Allowable End Bearing (psf)	Allowable Downward Skin Friction and Uplift Friction (psf)	Allowable Lateral Earth Pressure, Kp
0 - 3	--	--	--
6	950	75	495
9	1500	110	765
12	2100	155	1070
15	2700	200	1375
18	3350	250	1675
21	3950	295	1980
24	4600	340	2285

When the lateral capacity of drilled piers is evaluated by the LPILE program, we recommend that internally generated load-deformation (P-Y) curves be used. Please refer to Table IV for design parameters of drilled piers using LPILE. All piers should be reinforced full depth for the applied axial, lateral, and uplift stresses imposed.

Table IV – L-Pile Design Parameters

Parameters	On-Site Overburden Soils
Unit Weight of Soil (pcf)	120[(1)]
Cohesion (psf)	0
Angle of Internal Friction (□) (degrees)	35
Strain Corresponding to ½ Max. Principal Stress Difference ε_{50}	0.02

*Notes: 1) Reduce by 62.4 pcf below the water table

Drilling caissons to the design depth should be possible with conventional heavy-duty single flight power augers. However, with granular materials encountered in the completed test boring, maintaining open shafts may be difficult without stabilizing measures. We expect temporary casing and an adequate amount of stabilizing water in the open shaft will be required to properly drill and construct the piers. Pier concrete should be placed as soon as possible after completion of the drilled excavations using a tremie to displace water in the open shaft. Pier concrete with slump in the range of 6 to 8 inches is recommended. Casing used for pier construction should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in pier concrete.

Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ from those presented in this report, supplemental recommendations may be required.

Dead-man Anchors

For the proposed scoreboard, another alternative system for consideration would be reinforced concrete dead-man foundations, cast-in excavations against undisturbed subsoils for resistance to uplift. Footings or dead-man foundations may be designed using the cone method. The equation for determining the ultimate uplift capacity as a function of footing or dead-man foundation dimension, foundation depth, and soil weight is presented below:

$$T_u = 0.6\,\gamma \times D^2 \times (B + L) + W$$

Where:

T_u = Ultimate uplift capacity (lbs)
γ = Unit weight of soil (lbs/ft^3)*
D = Depth to base of footing/dead-man foundation below final grade (ft.)
B = Width of footing/dead-man foundation (ft.)
L = Length of footing/dead-man foundation (ft.)
W = Weight of footing/dead-man + weight of soil directly over the top of the footing/block (lbs)

*A unit weight (γ) of 120 pcf is recommended for soil (either undisturbed or compacted backfill) at this site.

The design uplift resistance should be calculated by dividing the ultimate resistance obtained from the equation above by an appropriate factor of safety. A factor of safety of at least 2 is recommended for live uplift loads in the analysis.

The soil mass providing uplift resistance for the foundation should be calculated as the zone contained within planes that extend up and out from the edges of the top of the foundation to the ground surface at an angle of approximately 30 degrees from vertical. The base of the inverted cone may be assumed to extend from the top of the foundation if the footing sides are vertical. The ultimate uplift capacity should then be taken as the sum of the weight of soil in this zone plus the weight of the concrete footings. Effective unit weights of 120 pcf for soil and 145 pcf for reinforced concrete can be used for these calculations. The ultimate combined uplift capacity should then be divided by a factor of safety of at least 2.0 to obtain the allowable uplift capacity.

Seismic

The site soil conditions generally consist of lean clay by clayey sand with bedrock encountered at a depth of approximately 24 feet. For those site conditions, the International Building Codes indicates a Seismic Site Classification of D. Drilling to a greater depth could reveal a different site classification.

Water Soluble Sulfates (SO_4)

The water-soluble sulfate (SO_4) content of the on-site overburden subsoils, taken during our subsurface exploration at random locations and intervals are provided below. Based on reported sulfate content test results, the Class/severity of sulfate exposure for concrete in contact with the on-site subsoils is provided in this report.

Table V - Water Soluble Sulfate Test Results

Sample Location	Description	Soluble Sulfate Content %
B-1, S-2, at 9’	Lean Clay with Sand (CL)	0.01

Based on the results as presented above, ACI 318, Section 4.2 indicates the site overburden soils have a low risk of sulfate attack on Portland cement concrete, therefore, ACI Class S0 requirements should be followed for concrete placed in the overburden soils. Foundation concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

Other Considerations

Excavations into the on-site sandy lean clay can be expected to stand on relatively steep, temporary slopes during construction, while excavations into the underlying granular soils may experience sloughing/caving. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

GENERAL COMMENTS

The analysis and recommendations presented in this report are based upon the data obtained from the soil boring 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 boring 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 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 phases to help determine that the design requirements are fulfilled.

This report has been prepared for the exclusive use of Poudre School District 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 are modified or verified in writing by the geotechnical engineer.

DRILLING AND EXPLORATION

DRILLING & SAMPLING SYMBOLS:

SS: Split Spoon - 13/8" I.D., 2" O.D., unless otherwise noted	PS: Piston Sample
ST: Thin-Walled Tube - 2" O.D., unless otherwise noted	WS: Wash Sample
R: Ring Barrel Sampler - 2.42" I.D., 3" O.D. unless otherwise noted	
PA: Power Auger	FT: Fish Tail Bit
HA: Hand Auger	RB: Rock Bit
DB: Diamond Bit = 4", N, B	BS: Bulk Sample
AS: Auger Sample	PM: Pressure Meter
HS: Hollow Stem Auger	WB: Wash Bore

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. split spoon, except where noted.

WATER LEVEL MEASUREMENT SYMBOLS:

WL : Water Level	WS : While Sampling
WCI: Wet Cave in	WD : While Drilling
DCI: Dry Cave in	BCR: Before Casing Removal
AB : After Boring	ACR: After Casting Removal

Water levels indicated on the boring logs are the levels measured in the borings at the time indicated. In pervious soils, the indicated levels may reflect the location of ground water. In low permeability soils, the accurate determination of ground water levels is not possible with only short term observations.

DESCRIPTIVE SOIL CLASSIFICATION

Soil Classification is based on the Unified Soil Classification system and the ASTM Designations D-2488. Coarse Grained Soils have move than 50% of their dry weight retained on a #200 sieve; they are described as: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are described as : clays, if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse grained soils are defined on the basis of their relative in-place density and fine grained soils on the basis of their consistency. Example: Lean clay with sand, trace gravel, stiff (CL); silty sand, trace gravel, medium dense (SM).

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Consistency
< 500	Very Soft
500 - 1,000	Soft
1,001 - 2,000	Medium
2,001 - 4,000	Stiff
4,001 - 8,000	Very Stiff
8,001 - 16,000	Very Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS:

N-Blows/ft	Relative Density
0-3	Very Loose
4-9	Loose
10-29	Medium Dense
30-49	Dense
50-80	Very Dense
80 +	Extremely Dense

PHYSICAL PROPERTIES OF BEDROCK

DEGREE OF WEATHERING:

Slight	Slight decomposition of parent material on joints. May be color change.
Moderate	Some decomposition and color change throughout.
High	Rock highly decomposed, may be extremely broken.

HARDNESS AND DEGREE OF CEMENTATION:

Limestone and Dolomite:

Hard	Difficult to scratch with knife.
Moderately Hard	Can be scratched easily with knife. Cannot be scratched with fingernail.
Soft	Can be scratched with fingernail.

Shale, Siltstone and Claystone:

Hard	Can be scratched easily with knife, cannot be scratched with fingernail.
Moderately Hard	Can be scratched with fingernail.
Soft	Can be easily dented but not molded with fingers.

Sandstone and Conglomerate:

Well Cemented	Capable of scratching a knife blade.
Cemented	Can be scratched with knife.
Poorly Cemented	Can be broken apart easily with fingers.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests					Soil Classification: Group Symbol	Soil Classification: Group Name
Coarse - Grained Soils more than 50% retained on No. 200 sieve	Gravels more than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines	Cu≥4 and 1<Cc≤3[E]		GW	Well-graded gravel [F]
			Cu<4 and/or 1>Cc>3[E]		GP	Poorly-graded gravel [F]
		Gravels with Fines more than 12% fines	Fines classify as ML or MH		GM	Silty gravel [G,H]
			Fines Classify as CL or CH		GC	Clayey Gravel [F,G,H]
	Sands 50% or more coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	Cu≥6 and 1<Cc≤3[E]		SW	Well-graded sand [I]
			Cu<6 and/or 1>Cc>3[E]		SP	Poorly-graded sand [I]
		Sands with Fines more than 12% fines	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid Limit less than 50	inorganic	PI>7 and plots on or above "A" Line		CL	Lean clay [K,L,M]
			PI<4 or plots below "A" Line		ML	Silt [K,L,M]
		organic	Liquid Limit - oven dried / Liquid Limit - not dried	<0.75	OL	Organic clay [K,L,M,N]; Organic silt [K,L,M,O]
	Silts and Clays Liquid Limit 50 or more	inorganic	PI plots on or above "A" Line		CH	Fat clay [K,L,M]
			PI plots below "A" Line		MH	Elastic Silt [K,L,M]
		organic	Liquid Limit - oven dried / Liquid Limit - not dried	<0.75	OH	Organic clay [K,L,M,P]; Organic silt [K,L,M,O]
Highly organic soils		Primarily organic matter, dark in color, and organic odor			PT	Peat

[A]Based on the material passing the 3-in. (75-mm) sieve

[B]If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C]Gravels with 5 to 12% fines required dual symbols:
GW-GM well graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly-graded gravel with silt
GP-GC poorly-graded gravel with clay

[D]Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F]If soil contains ≥15% sand, add "with sand" to

[G]If fines classify as CL-ML, use dual symbol GC-CM, or SC-SM.

[H]If fines are organic, add "with organic fines" to group name

[I]If soil contains >15% gravel, add "with gravel" to group name

[J]If Atterberg limits plots shaded area, soil is a CL-ML, Silty clay

[K]if soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

[L]If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

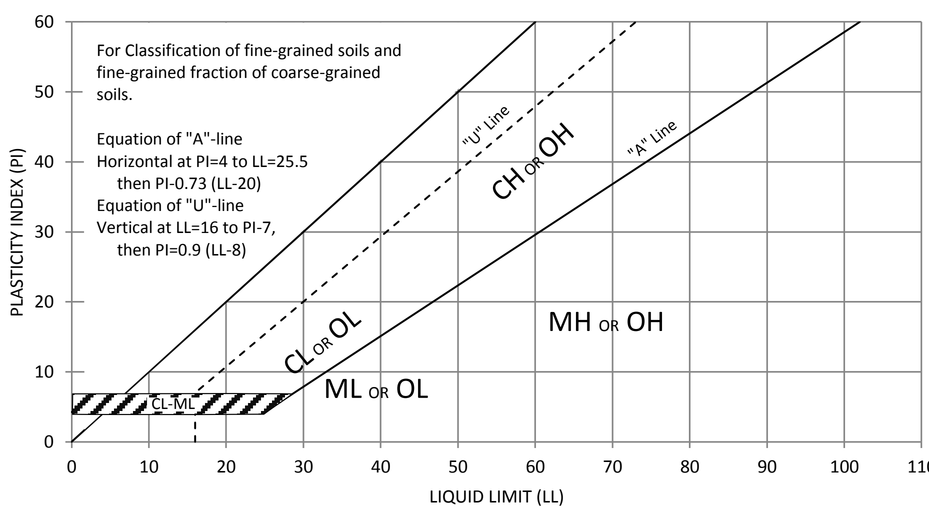
[M]If soil contains ≥30% plus No. 200 predominantly gravel, add "gravelly" to group name.

[N]PI≥4 and plots on or above "A" line.

[O]PI≤4 or plots below "A" line.

[P]PI plots on or above "A" line.

[Q]PI plots below "A" line.



French Field Scoreboard
Fort Collins, Colorado
EEC Project No. 1212011
February 2021

North
Not to Scale

Boring Location Diagram
French Field Scoreboard
Fort Collins, Colorado
EEC Project #: 1212011 Date: February 2021

EARTH ENGINEERING CONSULTANTS, LLC

POUDRE SCHOOL DISTRICT - FRENCH FIELD SCORE BOARD REPLACEMENT
FORT COLLINS, COLORADO

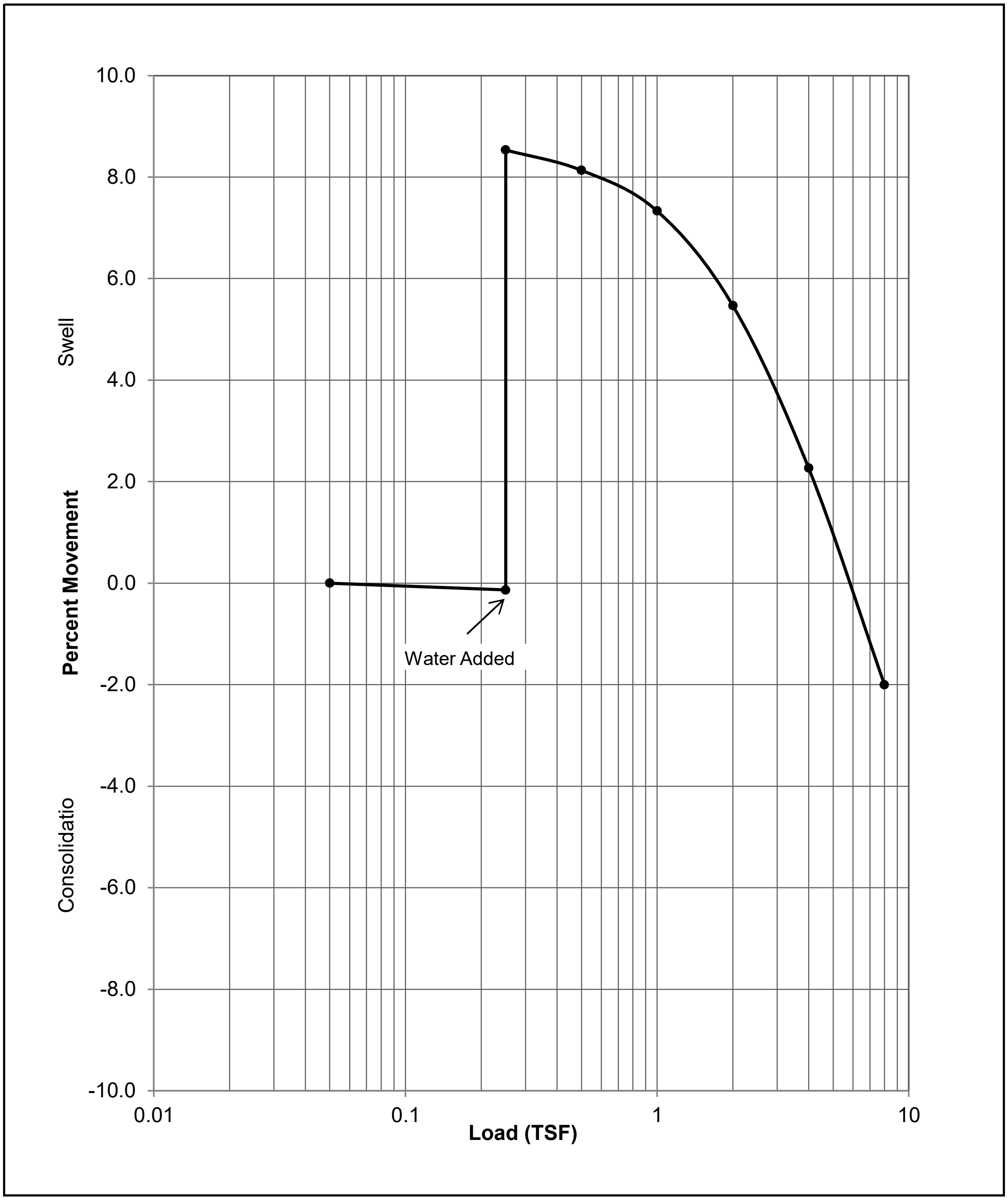
PROJECT NO: 1212011	**LOG OF BORING B-1**		**DATE: FEBRUARY 2021**	
RIG TYPE: CME55	*SHEET 1 OF 1*		**WATER DEPTH**	
FOREMAN: DG	**START DATE**	**2/10/2021**	**WHILE DRILLING**	**None**
AUGER TYPE: 4" CFA	**FINISH DATE**	**2/10/2021**		
SPT HAMMER: AUTOMATIC				

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
VEGETATION / SOD											
		1									
LEAN CLAY with SAND (CL)											
brown		2									
very stiff											
with calcareous deposits		3									
		4									
	CS	**5**	**25**	**9000+**	**10.5**	**110.3**	**44**	**27**	**66.2**	**10000 psf**	**8.7%**
		6									
		7									
		8									
		9									
CLAYEY SAND (SC)	SS	**10**	**24**	**500**	**4.5**						
brown / red											
medium dense		11									
		12									
		13									
		14									
with trace gravel											
	CS	**15**	**10**	**6000**	**8.1**	**114.5**	**24**	**12**	**35.9**	**700 psf**	**0.3%**
		16									
		17									
		18									
		19									
	SS	**20**	**10**	**4500**	**21.0**						
		21									
		22									
		23									
		24									
SILTSTONE / CLAYSTONE											**% @ 2000 psf**
gray / olive, with calcareous deposits	CS	**25**	**46**	**9000+**	**13.3**	**122.1**				**2500 psf**	**0.4%**
BOTTOM OF BORING DEPTH 25'											

Earth Engineering Consultants, LLC

SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Brown Lean Clay with Sand (CL)		
Sample Location:	Boring 1, Sample 1, Depth 4'		
Liquid Limit: 44	Plasticity Index: 27		% Passing #200: 66.2%
Beginning Moisture: 10.5%	Dry Density: 120.3 pcf		Ending Moisture: 17.4%
Swell Pressure: 10000 psf		% Swell @ 500: 8.7%	

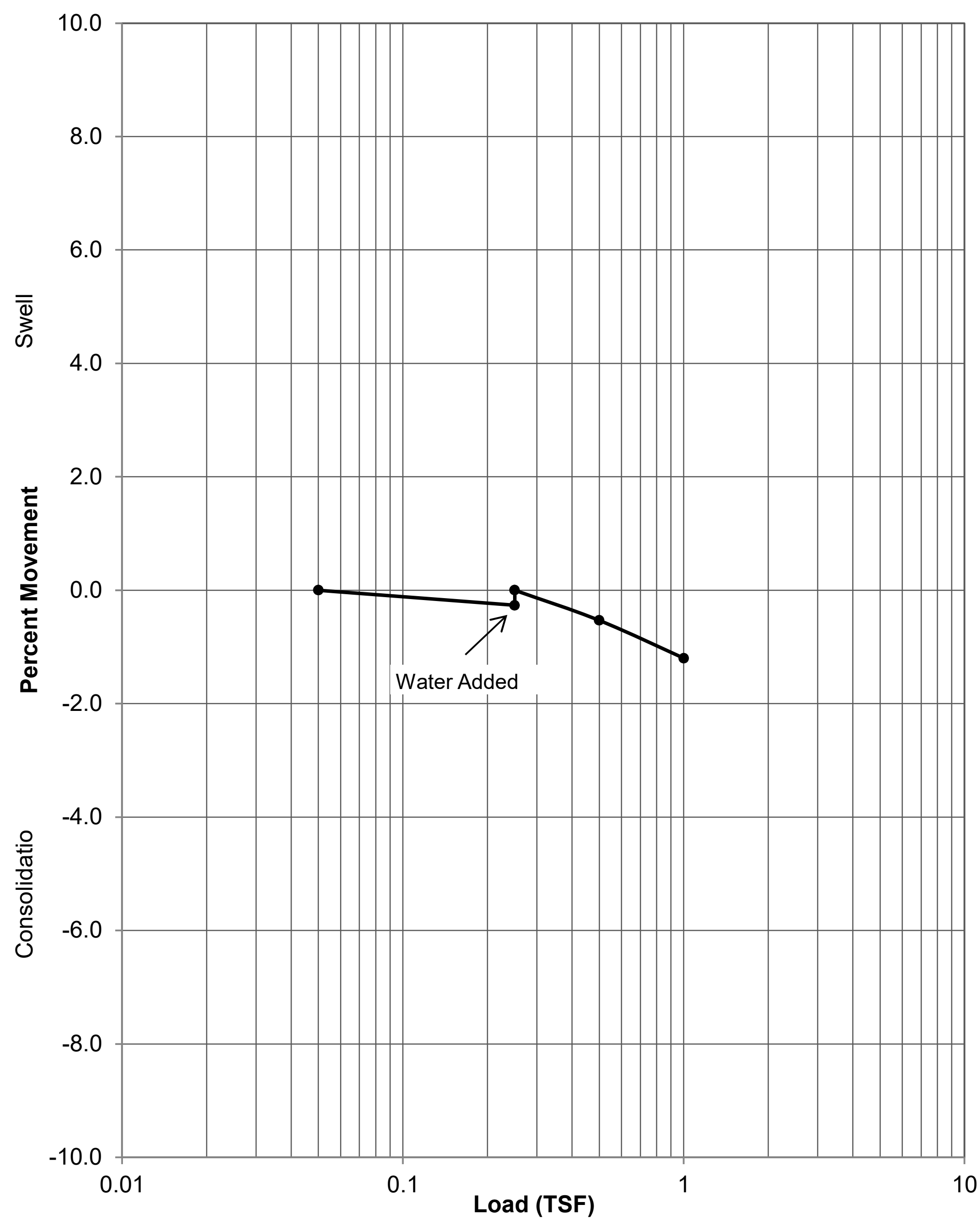


Project: PSD - French Field Score Board Replacement
Location: Fort Collins, Colorado
Project #: 1212011
Date: February 2021

EEC

SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Brown / Red Clayey Sand (SC)		
Sample Location:	Boring 1, Sample 3, Depth 14'		
Liquid Limit: 24	Plasticity Index: 12		% Passing #200: 35.9%
Beginning Moisture: 8.1%	Dry Density: 113.1 pcf		Ending Moisture: 13.3%
Swell Pressure: 700 psf		% Swell @ 500: 0.3%	



Project: PSD - French Field Score Board Replacement
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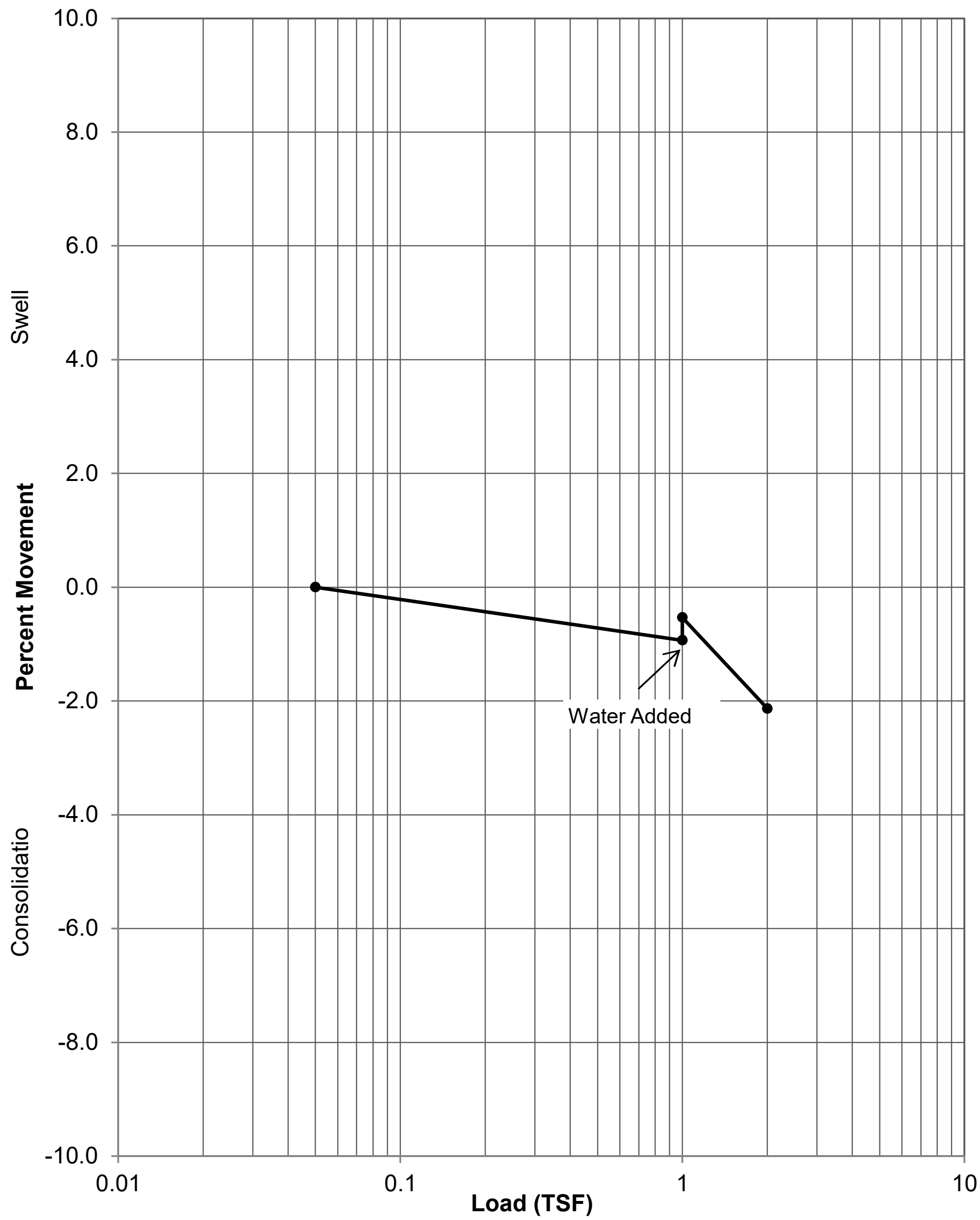
Date: February 2021

SWELL / CONSOLIDATION TEST RESULTS

Material Description:	Gray / Olive Siltstone / Sandstone		
Sample Location:	Boring 1, Sample 5, Depth 24'		
Liquid Limit: - -	Plasticity Index: - -		% Passing #200: - -
Beginning Moisture: 13.3%	Dry Density: 122.6 pcf		Ending Moisture: 14.5%
Swell Pressure: 2500 psf		% Swell @ 2000: 0.4%	



Project: PSD - French Field Score Board Replacement
Location: Fort Collins, Colorado
Project #: 1212011
Date: February 2021