EARTHTEC ENGINEERING

1497 West 40 South
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3662 West 2100 South
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July 25, 2016

Foundation for Family Life
Attention: Mr. Joseph M. White
1733 West 12600 South #230
Riverton, Utah 84065

Re: Pavement Design
Riverton Office Building
11978 South Redwood Road
Riverton, Utah
Job No: 168689

Gentlemen:

This letter summarizes our pavement design for the Riverton Office Building located in Riverton, Utah. Our scope of work consisted of performing three Dynamic Cone Penetrometer (DCP) tests at the subject site, California Bearing Ratio (CBR) test in the laboratory, and the preparation of this letter.

Soil Exploration
A qualified member of our geotechnical staff performed 3 DCP tests and sampled the native soils at the site on July 15, 2016. The approximate locations of the DCP tests and sample location are shown on Figure No. 1, *Site Plan Showing Location of DCP Tests and Sample.*

Laboratory Testing
The representative soil sample collected during our field exploration was tested in the laboratory to assess pertinent engineering properties and to aid in refining field classifications, if needed. Tests performed included liquid and plastic limits determination, mechanical (partial) gradation analysis, and a CBR. The table below summarizes the laboratory test results.

Table 1: Laboratory Test Results

Sample Location	Depth (ft.)	CBR (%)	Natural Moisture (%)	Atterberg Limits		Grain Size Distribution (%)			Soil Type
				Liquid Limit	Plasticity Index	Gravel (+ #4)	Sand	Silt/Clay (- #200)	
DCP-2	2	6.3	2	31	13	5	32	63	CL

NP* = Non-Plastic

Subsurface Conditions
The soils encountered at the sample location consisted of approximately 4 to 6 inches of topsoil over Lean Clay with sand (CL) to the maximum depths explored of approximately 2 feet below existing site grades.

Pavement Recommendations
The native soils encountered beneath the topsoil during our field exploration was predominantly composed of clays. Laboratory test results and DCP data shows that the native soils have a California Bearing Ratio (CBR) value of 6.3 for the sampled soils, and between 2 and 62 in the

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DCP/CBR Correlations, we recommend using a CBR value of 6 for the pavement design. If the topsoil is left beneath pavement areas, increased maintenance costs over time should be anticipated.

We anticipate that the traffic volume will be about 360 vehicles a day or less for the parking areas, consisting of mostly cars and pickup trucks, with a daily delivery truck and a weekly garbage truck. Based on these traffic parameters, the estimated CBR given above, and the procedures and typical design inputs outlined in the UDOT Pavement Design Manual (1998), we recommend the minimum asphalt pavement section presented below.

Table 2: Pavement Section Recommendations

Asphalt Thickness (in)	Compacted Roadbase Thickness (in)	Compacted Subbase Thickness (in)
3	8*	0
3	6	6*

* Stabilization may be required

If the pavement will be required to support more traffic than listed above, our office should be notified so that we can re-evaluate the pavement section recommendations. The following also apply:

- The subgrade should be prepared by proof rolling to a firm, non-yielding surface, with any identified soft areas stabilized as discussed.
- Site grading fills below the pavements should meet structural fill composition and placement recommendations presented herein.
- Asphaltic concrete, aggregate base and sub-base material composition should meet local, APWA or UDOT requirements.
- Aggregate base and sub-base is compacted to local, APWA, or UDOT requirements, or to at least 95 percent of maximum dry density (ASTM D 1557).
- Asphaltic concrete is compacted to local or UDOT requirements, or to at least 96 percent of the laboratory Marshall density (ASTM D 6927).

Conclusions

Based on our observations the results of the laboratory testing, a minimum roadway section consisting of 3 inches of asphalt and 8 inches of road-base will be adequate to support the anticipated traffic loads for the parking lot area.

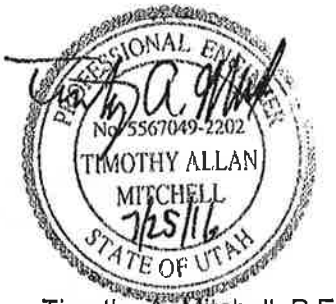
General Conditions

The information presented in this letter applies only to the soils encountered during our field investigation at the subject site. Site grading activities completed in other areas such as driveways, sidewalks, or detached structures, were not observed during this site visit, are outside of the scope of our work, and are not addressed in this letter. The observations and recommendations presented in this letter were conducted within the limits prescribed by our client, with the usual thoroughness and competence of the engineering profession in this area at this time. No warranty or representation is intended in our proposals, contracts, reports, or letters.

Closure

We appreciate the opportunity of providing our services on this project. If we can answer questions or be of further service, please call.

Respectfully;
EARTHTEC ENGINEERING



Caleb R. Allred, E.I.T.
Project Engineer

Timothy A. Mitchell, P.E.
Geotechnical Engineer

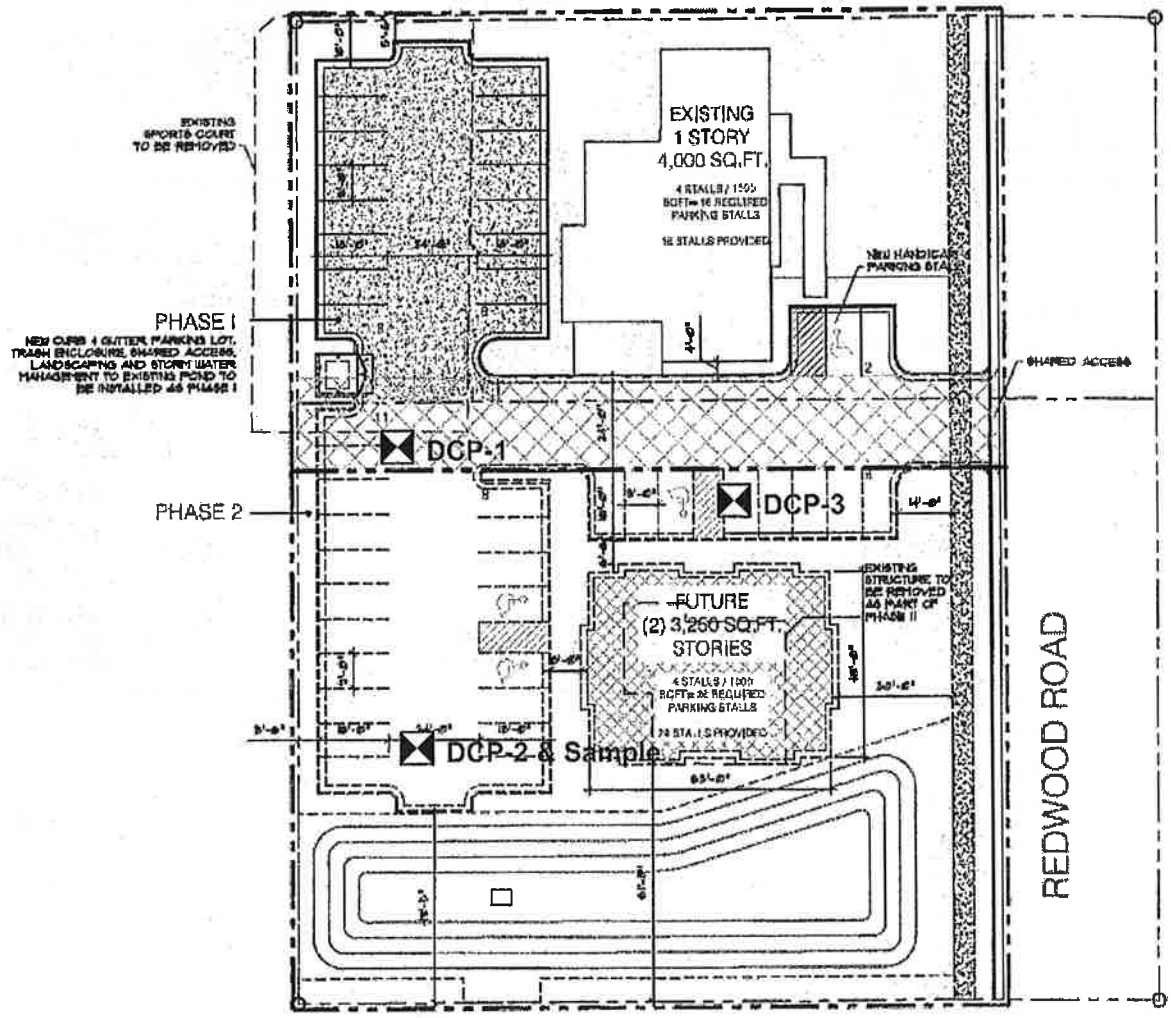
CA/tm

Attachments: Figure No. 1, *Site Plan Showing Location of Test Pits*
Figure No. 2-4, *DCP/CBR Correlation*

Appendix A: 168689_Lab 001_07-15-16 pages 1-2

SITE PLAN SHOWING LOCATION OF DCP TESTS AND SAMPLE

Riverton Office Building
11978 South Redwood Road
Riverton, Utah



Approximate DCP Location

N

Not to Scale

PROJECT NO.: 168689	EARTHTEC ENGINEERING	FIGURE NO.: 1

DCP/CBR CORRELATION

DCP-1

Soil Type: CL

Hammer Weight: 17.6 lbs

Test Results

#	Number of Blows	Cummulative Pentration (in)	CBR (%)
1	0	12	-
2	5	14	24
3	3	16	13
4	2	18	4
5	2	22	2
6	1	23	3
7	1	24	3
8	1	26	2
9	1	27	3
10	1	29	2
11	1	30	3
12	1	31	4
13	1	32	6
14	2	35	3
15	1	35	24
16	1	36	7
17	1	37	6
18	2	39	10
19	2	41	7
20	2	42	14
21	2	43	9
22	2	45	7
23	2	47	5
24	1	48	5
25	1	49	7
26			
27			
28			

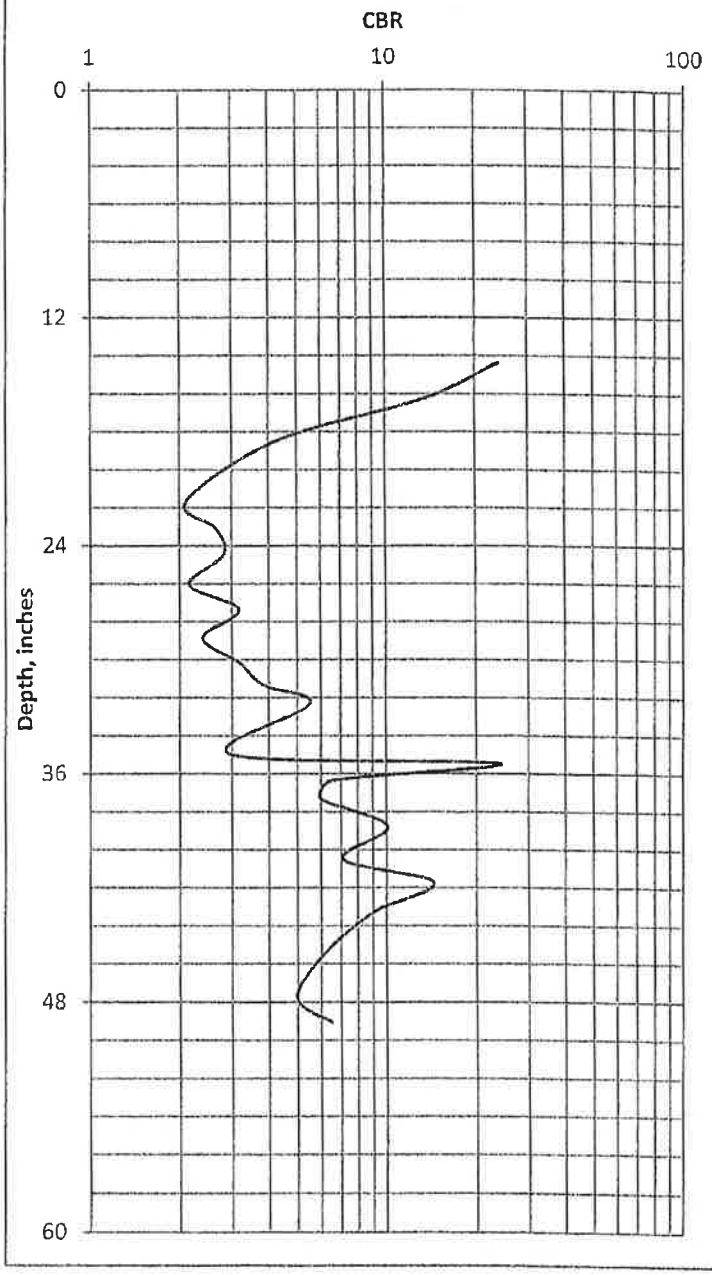


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FIGURE NO.: 2

DCP/CBR CORRELATION

DCP-2

Soil Type: CL

Hammer Weight: 17.6 lbs

Test Results

#	Number of Blows	Cummulative Pentration (In)	CBR (%)
1	0	12	-
2	10	14	62
3	10	15	64
4	10	17	59
5	5	18	35
6	3	19	37
7	4	20	37
8	4	21	28
9	4	22	25
10	4	24	23
11	3	25	23
12	3	26	21
13	3	28	21
14	3	29	26
15	3	30	27
16	4	31	23
17	3	32	22
18	3	33	23
19	4	35	22
20	4	36	29
21	4	37	31
22	5	39	33
23	4	40	27
24	5	41	39
25	5	43	33
26			
27			
28			

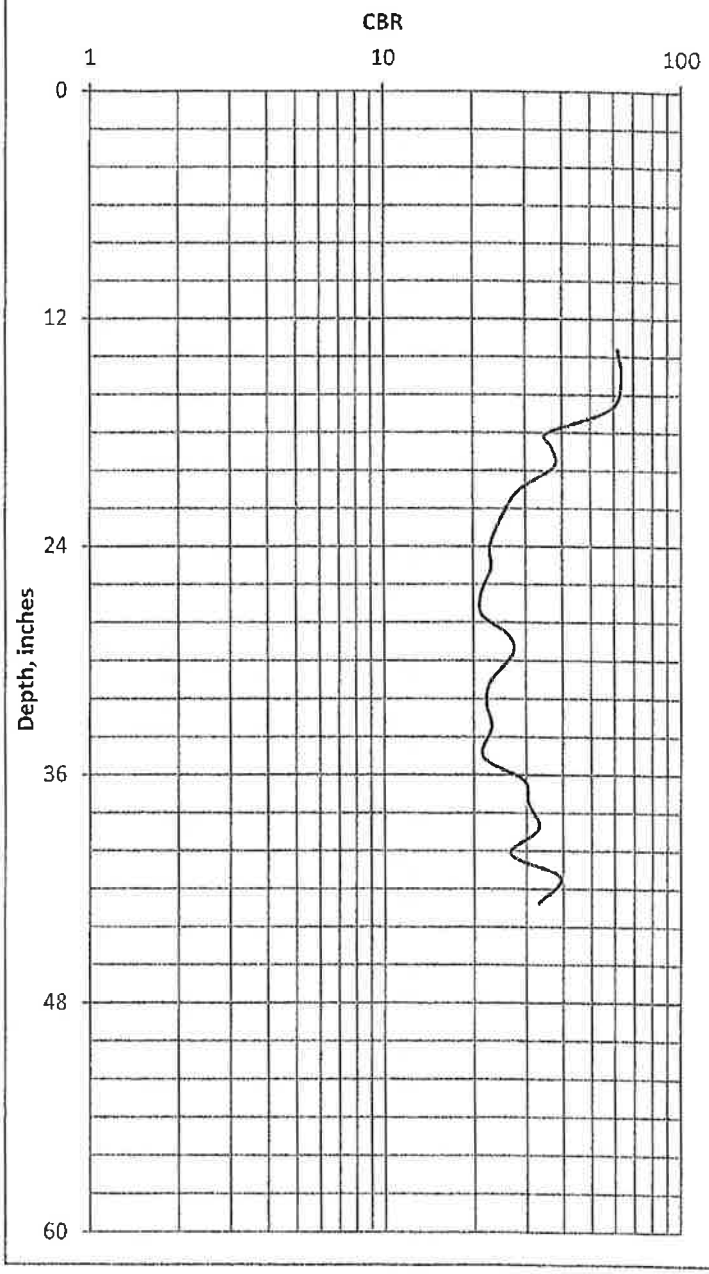

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FIGURE NO.: 3

DCP/CBR CORRELATION

DCP-3

Soil Type: CL

Hammer Weight: 17.6 lbs

Test Results

#	Number of Blows	Cummulative Pentration (in)	CBR (%)
1	0	13	-
2	8	16	23
3	4	18	17
4	3	20	13
5	3	23	9
6	2	25	7
7	2	27	7
8	2	28	10
9	2	30	12
10	2	31	14
11	3	33	13
12	3	35	13
13	3	37	14
14	3	38	14
15	3	40	15
16	4	42	16
17	4	43	34
18	3	45	18
19	3	46	18
20	3	48	16
21	3	49	21
22			
23			
24			
25			
26			
27			
28			

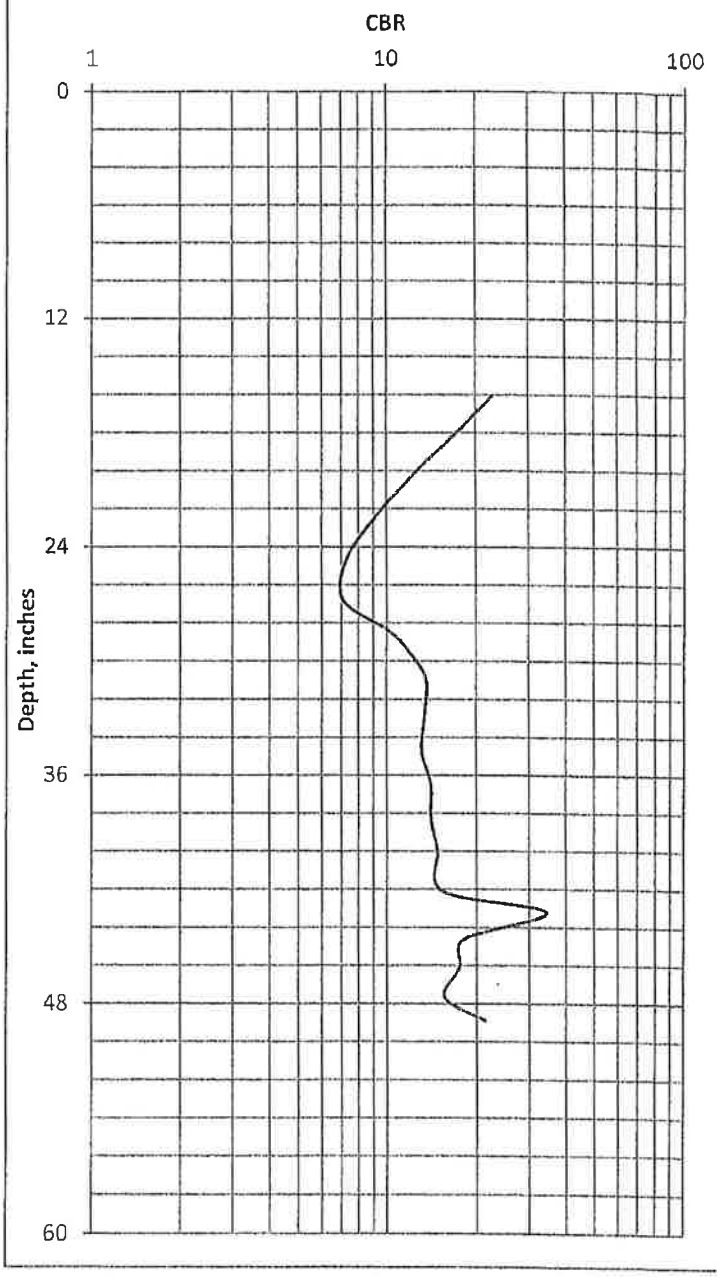

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FIGURE NO.: 4

APPENDIX A

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July 25, 2016

Foundation for Family Life
Attn: Joseph White
1733 West 12600 South #230
Riverton, UT 84065

Subject: Results of Laboratory Tests of the sample received at our lab on: 07-15-16
Job No.: 168689 Job Name: Riverton Office Building, 1197 South Redwood Road, Riverton
Earthtec Engineering Reference: 168689_Lab 001_07-15-16

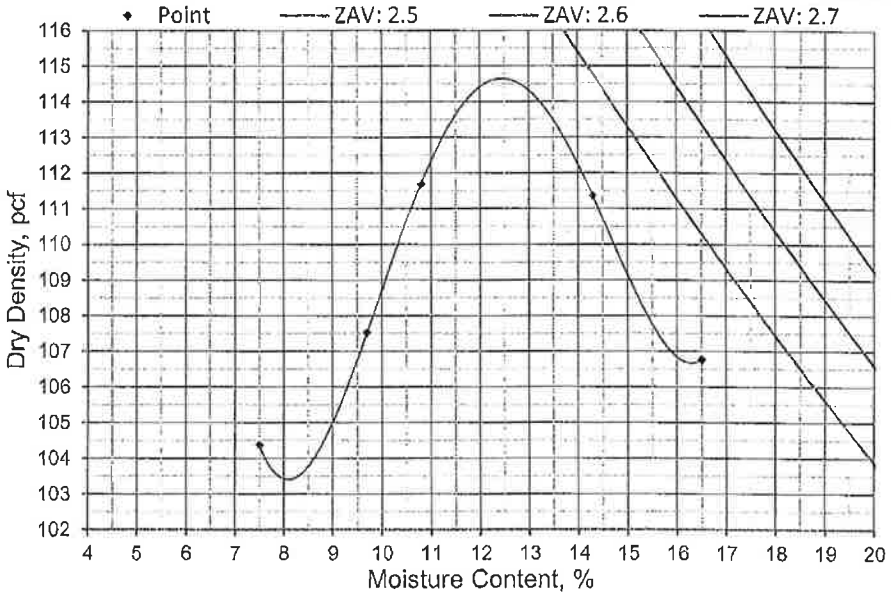
Sample of:	Sandy Lean CLAY (CL), light brown	Material Source:	Native
Used for:	Existing Native	Sampled From:	Onsite

The results of our laboratory testing are as follows:

TEST PROCEDURE ASTM D422		
Sieve Size	Result	Spec.
5"	--	--
4"	100	--
3"		--
2"		--
1 1/2"		--
1"		--
3/4"	100	--
1/2"		--
3/8"		--
No. 4	95	--
No. 8	--	--
No. 10		--
No. 16		--
No. 30		--
No. 40		--
No. 50	--	--
No. 100		--
No. 200	63	--
Oversize (3/4"+)	0%	--
COBBLES	0%	--
GRAVEL	5%	--
SAND	32%	--
FINES	63%	--

TEST PROCEDURE ASTM D4318		
	Result	Spec.
Liquid Limit	31	--
Plastic Limit	18	--
Plasticity Index	13	--

TEST PROCEDURE ASTM C127/C128		
(Estimated Vaules)	Result	Spec.
Specific Gravity	2.51	--
Bulk Specific Gravity (SSD)	--	--
Apparent Specific Gravity	--	--
Absorption %	1.3	--



Comments:

TEST METHOD ASTM D1557	
Maximum Dry Density	114.6 PCF
Optimum Moisture	12.4%
Procedure (Mechanical)	C

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Caleb R. Allred, E.I.T.

NOTE: This report indicates the results of the tests performed by EE. This report is not an engineering approval for the application of the material. This must be determined by the engineer of record or onsite specifications for the project.

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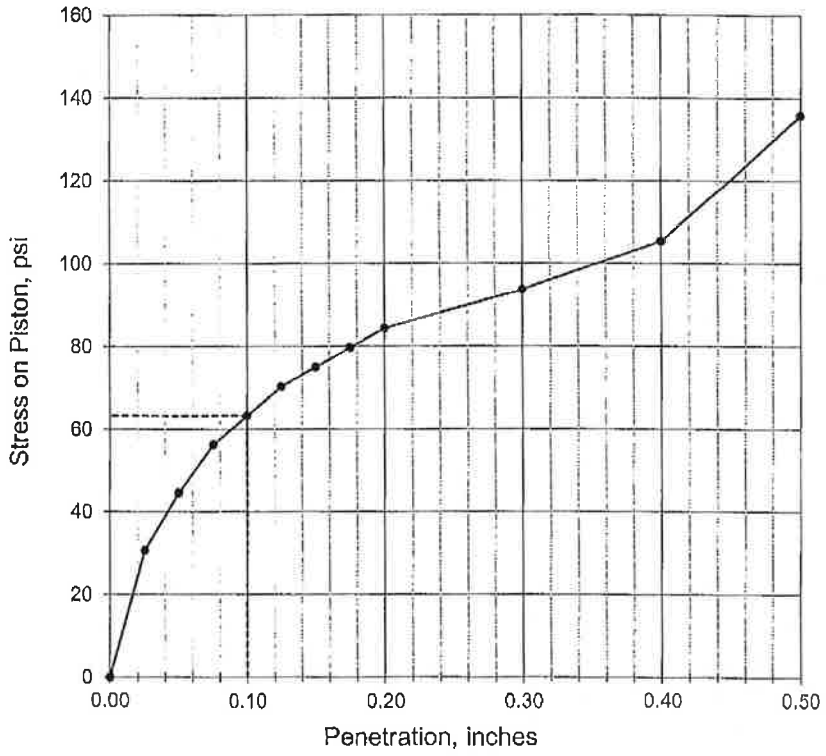
Sample of:	Sandy Lean CLAY (CL), light brown	Material Source:	Native
Used for:	Existing Native	Sampled From:	Onsite

The CBR results of our laboratory testing are as follows:

Moisture Content	
Before Compaction, %:	7.32
At Compaction, %:	12.0
Top 1in. After Soaking,%:	21.3

Dry Density	
At Compaction, %:	94.5
Before Compaction, %:	--
Top 1 in. After Soaking,%:	6.4

		Spec.
Surcharge Weight, lb:	10.00	--
Soaking Period, hr:	96	--



Comments:

TEST METHOD ASTM D1883 / AASHTO T193		
	Result	Spec.
Swell, %:	0.4	--
CBR Value, %:	6.3	--

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