



MEMORANDUM

Missouri Department of Transportation Construction - Materials Central Laboratory

TO: Gary Goessmann-sw/cm

FROM: Alan Miller
Geotechnical Engineer

DATE: December 4, 2014

SUBJECT: Materials
Geotechnical Section
Foundation Investigation for
Structure Design No. FI2222 Pole Building
Job No. R35G
Route 13, St. Clair County

Attached are logs of borings for the above noted structure, a proposed pole building at the Osceola Maintenance Shed as shown in Figure 1.

At the Osceola site, we encountered weathered shale at shallow depths. No water was encountered in the borings. An allowable bearing of 2500 psf may be used for the foundation soil below a depth of 4.0 feet.

cs
j:\sublec\alan\fi2222 pole barn ltr.doc
Attachments

**Missouri Department of Transportation
Construction and Materials**

BORING NO. V-14-33
Page 1 of 1

Job No.: <u>R35G</u>	County: <u>St. Clair</u>	Route: <u>13</u>
Design: <u>Fi2222</u>	Skew: _____	Location: <u>Osceola Main Bldg</u>
Bent: _____	Logged By: <u>Alan Miller</u>	Operator: <u>Kenny Mathews</u>
Station: _____	Northing: <u>683616.4</u>	Date of Work: <u>11/23/14-11/23/14</u>
Offset: _____	Easting: <u>3023826.1</u>	Depth to Water: _____
Elevation: <u>864.9</u>	Requested Northing: _____	Depth Hole Open: _____
Requested Station: _____	Requested Easting: _____	Time Change: <u>End of Drilling</u>
Requested Offset: _____	Equipment: <u>Acker Renegade ,Split-Spoon Sampler</u>	
Requested Elevation: _____	Location Note: <u>Pt 203</u>	
Drill No.: <u>G-9667</u>	Hammer Efficiency: <u>85%</u>	Drilling Method: <u>Hollow Stem Auger</u>

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Strength Data	Field Tests	Index Tests
0									
		0-1.7' CRUSHED STONE							
		1.7-4.2' Dark brown, LEAN CLAY with gravel, medium stiff, dry		X		3-2-4 (9)		PP = 1.50 tsf	
5		4.2-6.5' Red, FAT CLAY scattered fine gravel, stiff, moist	860	X		3-4-4 (11)		PP = 2.75 tsf	
		6.5-11' Tan and gray, FAT CLAY, very soft, moist, Shaley		X		2-3-4 (10)		PP = 3.00 tsf	
10		11-16.5' Shale, grayish brown, soft	855	X		4-5-9 (20)		PP = 6.00 tsf	
				X		6-10-15 (35)		PP = 9.00 tsf	
15			850	X		6-10-18 (40)		PP = 9.00 tsf	
		Bottom of borehole at 16.5 feet.							

LETTER BOREHOLE - R35G-S2109.GPJ - 12/5/14 14:38 - J:\SG\GINT\PROJECT FILES\R35G-FI2222.GPJ

N₆₀ = (Em/60)Nm N₆₀ - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 **Coordinate Zone:** Missouri West **Coordinate Proj. Factor:** 1.0000328
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

**Missouri Department of Transportation
Construction and Materials**

BORING NO. V-14-34
Page 1 of 1

Job No.: R35G
 Design: Fi2222
 Bent: _____
 Station: _____
 Offset: _____
 Elevation: 862.7
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: St. Clair
 Skew: _____
 Logged By: Alan Miller
 Northing: 683610.6
 Easting: 3023976
 Requested Northing: _____
 Requested Easting: _____
 Location Note: Pt 202
 Hammer Efficiency: 85%

Route: 13
 Location: Osceola Main Bldg
 Operator: Kenny Mathews
 Date of Work: 11/24/14-11/24/14
 Depth to Water: _____
 Depth Hole Open: _____
 Time Change: End of Drilling
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Strength Data	Field Tests	Index Tests
0									
0-3.1'		0-3.1' Brown, LEAN CLAY and gravel, very stiff	860						
3.1-5.5'		3.1-5.5' Red, FAT CLAY, hard		X		11-5-8 (18)		PP = 7.00 tsf	
5.5-15'		5.5-15' Grayish brown, LEAN CLAY with cobbles, hard	855	X		3-5-20 (35)		PP = 7.00 tsf	
						35/0.3', 10/0'			
10				X		35, 10/0'		PP = 7.50 tsf	
			850	X		32-35/0.2', 10/0'		PP = 8.00 tsf	
15		15-15.3' Dolomite, gray, moderately weathered		X		35/0.3', 10/0'		PP = 9.00 tsf	
		Bottom of borehole at 15.3 feet.							

LETTER BOREHOLE - R35G-S2109.GPJ - 12/5/14 14:38 - J:\SG\GINT\PROJECT FILES\R35G-FI2222.GPJ

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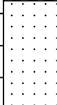
**Missouri Department of Transportation
Construction and Materials**

BORING NO. V-14-35
Page 1 of 1

Job No.: R35G
 Design: Fi2222
 Bent: _____
 Station: _____
 Offset: _____
 Elevation: 866.1
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: St. Clair
 Skew: _____
 Logged By: Alan Miller
 Northing: 68360.6
 Easting: 3023977
 Requested Northing: _____
 Requested Easting: _____
 Location Note: Pt 201
 Hammer Efficiency: 85%

Route: 13
 Location: Osceola Main Bldg
 Operator: Kenny Mathews
 Date of Work: 11/25/14-11/25/14
 Depth to Water: _____
 Depth Hole Open: _____
 Time Change: End of Drilling
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Strength Data	Field Tests	Index Tests
0									
0-4.6'		0-4.6' Reddish and reddish gray, FAT CLAY, hard	865	X				PP = 8.00 tsf	
4.6-8'		4.6-8' Sandstone, tan, soft, highly weathered	860	X		3-3-6 (13) 14-27-35 (88)		PP = 9.00 tsf	
8-15.5'		8-15.5' Sandy Shale, gray, soft	855	X		17-35/0.4', 10/0' 25-35/0.3', 10/0' 35/0.4', 10/0'		PP = 9.00 tsf	
Bottom of borehole at 15.5 feet.				X		35/0.4', 10/0'		PP = 9.00 tsf	

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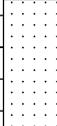
**Missouri Department of Transportation
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BORING NO. V-14-36
Page 1 of 1

Job No.: R35G
 Design: Fi2222
 Bent: _____
 Station: _____
 Offset: _____
 Elevation: 865.8
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: St. Clair
 Skew: _____
 Logged By: Alan Miller
 Northing: 683664
 Easting: 3023888.1
 Requested Northing: _____
 Requested Easting: _____
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Location Note: Pt 204
 Hammer Efficiency: 85%

Route: 13
 Location: Osceola Main Bldg
 Operator: Kenny Mathews
 Date of Work: 11/25/14-11/25/14
 Depth to Water: _____
 Depth Hole Open: _____
 Time Change: End of Drilling
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Strength Data	Field Tests	Index Tests
0									
0-1.6'		0-1.6' Dark brown, LEAN CLAY with gravel, soft, dry	865						
1.6-5'		1.6-5' Red and gray, FAT CLAY scattered, hard to very hard, Sand seams		X		3-4-5 (13)		PP = 5.00 tsf	
5-8.5'		5-8.5' Clay Shale, gray and brown, very soft, highly weathered	860	X		4-9-14 (33)		PP = 9.00 tsf	
8.5-12.7'		8.5-12.7' Clayey Sandstone, tan, soft, highly weathered		X		11-15-20 (50)		PP = 9.00 tsf	
12.7-16.5'		12.7-16.5' Clay Shale, brown and gray, soft, moderately weathered	855	X		13-21-26 (67)		PP = 9.00 tsf	
				X		5-8-12 (28)		PP = 8.00 tsf	
			850	X		5-7-18 (35)		PP = 7.00 tsf	
		Bottom of borehole at 16.5 feet.							

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**Missouri Department of Transportation
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BORING NO. V-14-37
Page 1 of 1

Job No.: <u>R35G</u>	County: <u>St. Clair</u>	Route: <u>13</u>
Design: <u>Fi2222</u>	Skew: _____	Location: <u>Osceola Main Bldg</u>
Bent: _____	Logged By: <u>Alan Miller</u>	Operator: <u>Kenny Mathews</u>
Station: _____	Northing: <u>683666.3</u>	Date of Work: <u>11/25/14-11/25/14</u>
Offset: _____	Easting: <u>3023828</u>	Depth to Water: _____
Elevation: <u>865.7</u>	Requested Northing: _____	Depth Hole Open: _____
Requested Station: _____	Requested Easting: _____	Time Change: <u>End of Drilling</u>
Requested Offset: _____	Equipment: <u>Acker Renegade ,Split-Spoon Sampler</u>	
Requested Elevation: _____	Location Note: <u>Pt 200</u>	
Drill No.: <u>G-9667</u>	Hammer Efficiency: <u>85%</u>	Drilling Method: <u>Hollow Stem Auger</u>

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Strength Data	Field Tests	Index Tests
0									
0-0.6'		Dark brown, LEAN CLAY and gravel, soft	865						
0.6-5'		Clay Shale, gray and brown, soft, highly weathered		X		3-4-5 (13)		PP = 3.50 tsf	
5-13.1'		Clay Shale, gray, soft, highly weathered	860	X		4-9-13 (31)		PP = 9.00 tsf	
				X		4-5-17 (31)		PP = 6.00 tsf	
10-13.1'			855	X		5-6-5 (16)		PP = 4.00 tsf	
13.1-16.5'		Clay Shale, brown and gray, soft, moderately weathered		X		10-9-13 (31)		PP = 9.00 tsf	
			850	X		6-11-17 (40)		PP = 9.00 tsf	
		Bottom of borehole at 16.5 feet.							

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Missouri Department of Transportation
1617 Mo. Blvd.
Jefferson City, Mo. 65109

KEY TO SYMBOLS

CLIENT _____ PROJECT NAME _____
PROJECT NUMBER R35G PROJECT LOCATION Osceola Main Bldg

LITHOLOGIC SYMBOLS (Unified Soil Classification System)

 CH: USCS High Plasticity Clay

 CL: USCS Low Plasticity Clay

 DOLOMITE: Dolomite

 GW: USCS Well-graded Gravel

 SANDSTONE: Sandstone

 SHALE: Shale

 SILTSTONE: Siltstone

SAMPLER SYMBOLS

 Split-Spoon Sampler

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION

 Water Level at Time of Drilling

 Water Level at End of Drilling

 Water Level after Drilling

Figure 1
Fi 2222 Osceola Main Bldg
Route 13 St Clair Co.
Boring Locations

