



MEMORANDUM

Missouri Department of Transportation Construction - Materials Central Laboratory

TO: Paul Huskey-se/gs

CC/ATT: Kevin Plott-se/cm
Corbin Carlton-se/cm

FROM: Sheri J. Lamberson, R.G.
Senior Geotechnical Specialist

DATE: June 10, 2016

SUBJECT: Materials
Geotechnical Section
Foundation Investigation for
Structure No. FI2418
Bunker Maintenance Facility
Route A, Dent County

As requested in an electronic letter dated May 5, 2016, from SE District Assistant District Construction & Materials Engineer Kevin Plott, we have conducted a foundation investigation for a new pole barn building. Attached are logs of borings for the above noted structure, as well as an aerial photo of boring locations as Figure 1.

RECOMMENDATIONS

NE & NW Corners

Based on borings at these locations, the allowable bearing of the foundation soils below a depth of 4 feet is 1000 psf and may be used for the construction of these footings.

SE & SW Corners

Based on borings at these locations, the allowable bearing of the foundation soils below a depth of 4 feet is 4500 psf and may be used for the construction of these footings.

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Attachments

**Missouri Department of Transportation
Construction and Materials**

BORING NO. NE Corner
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Job No.: R35G-Fi2418
 Design: Fi2418
 Bent: _____
 Station: NE Corner
 Offset: _____
 Elevation: 1259.9
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: Dent
 Skew: _____
 Logged By: Sheri Lamberson
 Northing: 591538.8
 Easting: 612552.9
 Requested Northing: _____
 Requested Easting: _____
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Location Note: _____
 Hammer Efficiency: 82%

Route: A
 Location: Bunker Maintenance Facility
 Operator: Raymond Murray
 Date of Work: 05/26/16-05/26/16
 Depth to Water: _____
 Depth Hole Open: _____
 Time Change: _____
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Data	Field Tests	Index Tests
0									
5		0.0-8.2' Dark brown, SANDY LEAN CLAY with gravel, scattered asphalt, medium stiff, moist to dry	1255	X	27	3-7-7 (20)			
				X	100	42-19-20 (55)			
10		8.2-13.9' Brownish gray, LEAN CLAY with gravel, soft to stiff, moist to wet	1250	X	100	4-3-3 (9)		PP = 1.50 tsf	
				X	100	0-2-1 (4)		PP = 0.50 tsf	LL = 30 PL = 17
				X	100	2-3-2 (7)		PP = 0.75 tsf	LL = NP
15		13.9-16.5' Reddish tan, CLAYEY GRAVEL with sand, dense, moist to wet, fine to medium grained, scattered sand layers	1245	X	100	6-7-14 (30)		PP = 6.50 tsf	
		Bottom of borehole at 16.5 feet.							

LETTER BOREHOLE - MODOT 20150728.GDT - 6/10/16 08:46 - J:\SG\GINT\PROJECT FILES\R35G-Fi2418.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: U.S. State Plane 1983 Coordinate Zone: Missouri East Coordinate Proj. Factor: _____
 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.

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Construction and Materials**

BORING NO. NW Corner
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Job No.: R35G-Fi2418
 Design: Fi2418
 Bent: _____
 Station: NW Corner
 Offset: _____
 Elevation: 1261.3
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: Dent
 Skew: _____
 Logged By: Sheri Lamberson
 Northing: 591539.6
 Easting: 612502.2
 Requested Northing: _____
 Requested Easting: _____
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Location Note: _____
 Hammer Efficiency: 82%

Route: A
 Location: Bunker Maintenance Facility
 Operator: Raymond Murray
 Date of Work: 05/26/16-05/26/16
 Depth to Water: 4.5
 Depth Hole Open: _____
 Time Change: 0 hours
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Data	Field Tests	Index Tests
0									
0.0-7.0'		0.0-7.0' Dark brown, GRAVELLY LEAN CLAY with sand, scattered asphalt, medium stiff, moist to wet, (fill material)	1260						
5				X	100	2-2-5 (10)		PP = 0.75 tsf	
			1255	X	67	22-15-11 (37)			
7.0-10.7'		7.0-10.7' Brownish gray, LEAN CLAY with gravel, stiff, moist		X	53	4-6-5 (16)		PP = 1.50 tsf	
10				X	67	2-5-10 (21)		PP = 0.50 tsf	
10.7-14.0'		10.7-14.0' Reddish tan, CLAYEY GRAVEL with sand, dense, moist, fine to medium grained, scattered sand layers	1250	X	100	11-42-22 (91)		PP = 9.00 tsf	
		Bottom of borehole at 14.0 feet.							

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BORING NO. SE Corner
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Job No.: R35G-Fi2418
 Design: Fi2418
 Bent: _____
 Station: SE Corner
 Offset: _____
 Elevation: 1265.4
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: Dent
 Skew: _____
 Logged By: Sheri Lamberson
 Northing: 591421.7
 Easting: 612552.2
 Requested Northing: _____
 Requested Easting: _____
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Location Note: _____
 Hammer Efficiency: 82%

Route: A
 Location: Bunker Maintenance Facility
 Operator: Raymond Murray
 Date of Work: 05/25/16-05/25/16
 Depth to Water: _____
 Depth Hole Open: _____
 Time Change: _____
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Data	Field Tests	Index Tests
0			1265						
0.0-3.2'		0.0-3.2' CRUSHED AGGREGATE BASE							
3.2-11.0'		3.2-11.0' Reddish tan, CLAYEY GRAVEL with sand, dense to very dense, moist to wet, fine to medium grained	1260	X	100	16-18-14 (45)			
				X	100	8-35-19 (77)			
				X	100	5-7-25 (45)			
11.0-16.5'		11.0-16.5' Sandy Clay Shale, reddish tan, highly weathered, scattered sand layers	1255	X	93	5-20-43/0.2'			
				X	100	6-8-19 (38)		PP = 4.00 tsf	
			1250	X	100	13-26-17 (61)			
		Bottom of borehole at 16.5 feet.							

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BORING NO. SW Corner
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Job No.: R35G-Fi2418
 Design: Fi2418
 Bent: _____
 Station: SW Corner
 Offset: _____
 Elevation: 1262.9
 Requested Station: _____
 Requested Offset: _____
 Requested Elevation: _____
 Drill No.: G-9667

County: Dent
 Skew: _____
 Logged By: Sheri Lamberson
 Northing: 591422.4
 Easting: 612501.8
 Requested Northing: _____
 Requested Easting: _____
 Equipment: Acker Renegade ,Split-Spoon Sampler
 Location Note: _____
 Hammer Efficiency: 82%

Route: A
 Location: Bunker Maintenance Facility
 Operator: Raymond Murray
 Date of Work: 05/25/16-05/25/16
 Depth to Water: 3.0
 Depth Hole Open: _____
 Time Change: At Time of Drilling
 Drilling Method: Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N ₆₀)	Shear Data	Field Tests	Index Tests
0		0.0-3.0' CRUSHED AGGREGATE BASE							
5		3.0-14.5' Reddish tan, CLAYEY GRAVEL with sand, medium dense to very dense, moist to wet, fine to medium grained	1260	X	47	2-3-10 (18)		PP = 2.25 tsf	
				X	100	3-8-8 (23)			
			1255	X	100	2-3-16 (27)			
				X	100	4-6-34 (57)			
15		14.5-16.3' Sandy Clay Shale, reddish tan, highly weathered, scattered sand layers	1250	X	100	6-21-28 (69)			
		Bottom of borehole at 16.3 feet.		X	98	2-5-43/0.3'		PP = 2.75 tsf	

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

KEY TO SYMBOLS

CLIENT _____ PROJECT NAME Pole Barn
PROJECT NUMBER R35G-FI2418 PROJECT LOCATION Bunker Maintenance Facility

LITHOLOGIC SYMBOLS (Unified Soil Classification System)

-  CLG: USCS Low Plasticity Gravelly Clay
-  CLS: USCS Low Plasticity Sandy Clay
-  GC: USCS Clayey Gravel
-  GW: USCS Well-graded Gravel
-  SHALE: Shale

SAMPLER SYMBOLS

-  Split-Spoon Sampler

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

- | | |
|--|-----------------------------------|
| LL - LIQUID LIMIT (%) | TV - TORVANE |
| PI - PLASTIC INDEX (%) | PID - PHOTOIONIZATION DETECTOR |
| W - MOISTURE CONTENT (%) | UC - UNCONFINED COMPRESSION |
| DD - DRY DENSITY (PCF) | ppm - PARTS PER MILLION |
| NP - NON PLASTIC | ▽ Water Level at Time of Drilling |
| -200 - PERCENT PASSING NO. 200 SIEVE | ▼ Water Level at End of Drilling |
| PP - POCKET PENETROMETER (TSF) | ▽ Water Level after Drilling |
| Qu - UNCONFINED COMPRESSIVE STRENGTH (PSF) | |



FIGURE 1
R35G Fi2418
ROUTE A, DENT COUNTY
BUNKER MAINTENANCE FACILITY