Report of:

SUBSURFACE EXPLORATION FOR SUBGRADE EVALUATION
MOUND STREET AND FULTON STREET
PROJECT FRA-70-14.48
I-70/I-71 EAST INTERCHANGE (PID 77370)
COLUMBUS, OHIO

DLZ Ohio, Inc.
6121 Huntley Road
Columbus, Ohio 43229

June 3, 2011

DLZ Job No. 1021-1005.01

DLZ

REPORT
OF
SUBSURFACE EXPLORATION
FOR
SUBGRADE EVALUATION

MOUND STREET AND FULTON STREET
PROJECT FRA-70-14.48 PID 77370

COLUMBUS, OHIO

For

OHIO DEPARTMENT OF TRANSPORTATION
DISTRICT 6
400 East William Street
Delaware, Ohio 43015

By

DLZ OHIO, INC.
6121 Huntley Road
Columbus, Ohio 43229

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1.0 INTRODUCTION

The project consists of the reconstruction of Mound Street and Fulton Street essentially between Front Street to the west and Washington Avenue to the east in Columbus, Ohio. This work is being performed as part of the I-70/I-71 East Interchange project.

The exploration presented in this report has been performed essentially in accordance with the DLZ Ohio, Inc. proposal for the project. The purpose of this exploration was to 1) determine the subsurface conditions to the depths penetrated by the borings, 2) evaluate the engineering characteristics of the subsurface materials, and 3) provide information to assist in designing the pavements. The contents of this report reflect the same information presented in a project memorandum on October 12, 2010.

The geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, has considered the findings, and has prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are made as to the professional advice included in this report.

2.0 FIELD EXPLORATION

The exploration consisted of drilling a total of 19 roadway borings. Borings B-038 and B-278-0 through B-285-0 were drilled on Fulton Street and Borings B-292-0 and B-294-0 through B-302-0 were drilled on Mound Street. The borings were drilled between May 25 and July 24, 2010 using a truck-mounted drill rig and were drilled to depths between 7.0 and 15.0 feet and were spaced approximately 400 feet apart. Three additional borings, B-289-0, B-290-0, B-291-0, and B-293-0, were planned along Mound Street in the vicinity of Front Street, but were not drilled due to utility conflicts. Information regarding the drilling procedures and logs of the borings are presented in Appendix I.

An additional eight borings that were drilled during other phases of the project for structure evaluations were also considered for the subgrade evaluation along Fulton Street. These borings, B-041-0, B-044-0, B-045-2, B-047-1, and B-164-0 through B-164-3, were drilled between June 16, 2008 and June 1, 2010 using either an ATV or truck-mounted drill rig and were drilled to depths between 22.5 and 135.0 feet. Boring logs of these structure borings are also included in Appendix I.

The boring locations were determined in the field by representatives of DLZ Ohio, Inc. The boring locations and ground surface elevations at the boring locations were established either by representatives of DLZ Ohio, Inc. or representatives of ms consultants, inc. and are presented on the Boring Logs in Appendix I.

3.0 FINDINGS

3.1 Geology of the Site

The natural ground in the area of this structure is characterized by relatively flat to gently sloping topography. The natural ground surface is interrupted by the 20 to 25 foot deep trench of the existing freeway. The project area is located in the Columbus Lowland of the glaciated Central Lowland Physiographic Region. The Columbus Lowland is characterized by the Wisconsin-age till over Devonian and Mississippian-age carbonate rock, shale and siltstone.

General geological references report the site was covered by the Wisconsin and Illinoian glaciers. The East Interchange area is approximately 1.5 miles east of the Scioto River.

The predominant glacial deposits in Franklin County consist of glacial till, which is a heterogeneous mixture of clay, silt, sand, gravel, cobbles and boulders. Most of the project alignment extends through glacial outwash deposits that fill the preglacial valley in which the Scioto River flows. Fine-grained fill and quaternary (recent) alluvial deposits cover the glacial outwash materials and are present along the length of the project are. The thickness of the glacial deposits in the East Interchange area generally varies between 80 and 120 feet.

Bedrock along the alignment lies on the eastern margin of the Cincinnati Arch and is inclined at approximately 10 feet per mile to the southeast towards the Appalachian Basin. Bedrock units as well as contacts between units display a pronounced north-south orientation or strike. Three different rock formations lie immediately below the soils along the alignment. These include from youngest to oldest: the Olentangy Shale, the Delaware Limestone and the Columbus Limestone, all of the Devonian Age.

Information regarding the thickness of the glacial deposits was obtained from general geologic references. A complete list of the geologic references used for the project is presented in the Red Flag Summary report, dated April 11, 2008.

3.2 Soil Conditions

At the ground surface, two to eight inches of asphalt concrete were encountered, which were underlain by two to eight inches of aggregate base. Five to fourteen inches of Portland cement concrete were encountered below the asphalt in 11 of the 27 borings evaluated for subgrade conditions. A layer of brick or granite pavers were also encountered in five of the borings.

Below the pavement layers, the soil in the top six feet consisted primarily of stiff to hard cohesive soils. The majority of the cohesive samples were classified as sandy silt (A-4a) and silt and clay (A-6a) with lesser amounts of silty clay (A-6b) and clay (A-7-6). Approximately 20 percent of the subgrade soils consisted of loose to medium dense granular soils. Concrete and brick fragments were occasionally encountered.

3.3 Groundwater Conditions

In general, no seepage or final water level readings were observed in the borings drilled for the pavement subgrade evaluation. One boring, B-282-0, encountered seepage at a depth of 6.5 feet, but no final water level was observed. In the borings drilled for the structure evaluations, seepage was generally first observed between depths of 13.0 and 38.5 feet.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 General

The existing roadway alignment traverses a relatively flat area. It is understood that the reconstructed roadways will be essentially the same as existing grade.

4.2 Subgrade Condition and Preparation

The existing subgrade soils were evaluated for suitability according to the ODOT Guidelines for Plan Subgrades (GB1), dated January 18, 2007, as this was the document in effect at the time the recommendations were originally developed. The optimum moisture content (MC) for each soil tested was estimated using the following criteria:

Optimum MC	=	plastic limit minus 3 (A-7-6 soils)
	=	plastic limit minus 5 (A-4 and A-6 soils)
	=	6 to 10 (granular soils)
	=	11 (non-plastic silts)

The results of this evaluation are presented in Appendix II. According to the referenced guidelines, any soils with moisture contents that exceed the optimum moisture content by more than three percentage points will likely require some form of subgrade treatment. In addition, any soils with Standard Penetration values (N) of 10 or less will also likely require some form of subgrade treatment.

Following the above guidelines, 45 percent of the samples tested required some kind of subgrade treatment. Because more than 30 percent of the tested samples required treatment, it is recommended that global treatment of both streets be performed. Results of the analysis as prepared in accordance with GB1 are presented in the table below.

Alignment	Design CBR	Recommended Treatment
Mound Street	8	12" cement or 14" undercut
Fulton Street	7	14" cement or 16" undercut

Note that the above recommendations refer to depths below the proposed subgrade level. Undercut areas should be lined with Item 204 Geotextile Fabric and replaced with Item 204 Granular Material Type B. Undercut areas should extend to 18 inches beyond the edge of the surface of the pavement, paved shoulders, or paved medians, including new curbs and gutters.

If the subgrade is stabilized with cement, the cement should be applied at a rate of 6 percent by dry unit weight of soil, assuming a dry weight of 110 pounds per cubic foot.

5.0 CLOSING REMARKS

You are encouraged to discuss with us any questions you may have concerning the findings, conclusions and recommendations presented. Please do not hesitate to call if we can be of further assistance.

Sincerely,

DLZ OHIO, INC.

Dorothy A. Adams

Dorothy A. Adams, P.E.
Senior Geotechnical Engineer

DAA

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APPENDIX I

General Information - Drilling Procedures and Logs of Borings
Legend - Boring Log Terminology
Boring Logs – Seventeen (17) Borings

GENERAL INFORMATION
DRILLING PROCEDURES AND LOGS OF BORINGS

Drilling and sampling were conducted in accordance with procedures generally recognized and accepted as standardized methods of investigation of subsurface conditions concerning geotechnical engineering considerations. Borings were drilled with either a truck-mounted or ATV-mounted drill rig.

Drive split-barrel sampling was performed in 1.5 foot increments at intervals not exceeding 5 feet. In the event the sampler encountered resistance to penetration of 6 inches or less after 50 blows of the drop hammer, the sampling increment was discontinued. Standard penetration data were recorded and one or more representative samples were preserved from each sampling increment.

In borings where rock was cored, NXM or NQ size diamond coring tools were used.

In the laboratory all samples were visually classified by a geotechnical engineer. Moisture contents of representative fine-grained soil samples were determined. A limited number of samples, considered representative of foundation materials present, were selected for performance of grain-size analyses and plasticity characteristics tests. The results of these tests are shown on the boring logs.

The boring logs included in the Appendix have been prepared on the basis of the field record of drilling and sampling, and the results of the laboratory examination and testing of samples. Stratification lines on the boring logs indicating changes in soil stratigraphy represent depths of changes approximated by the driller, by sampling effort and recovery, and by laboratory test results. Actual depths to changes may differ somewhat from the estimated depths, or transitions may occur gradually and not be sharply defined. The boring logs presented in this report therefore contain both factual and interpretative information and are not an exact copy of the field log.

Although it is considered that the borings have disclosed information generally representative of site conditions, it should be expected that between borings conditions may occur which are not precisely represented by any one of the borings. Soil deposition processes and natural geologic forces are such that soil and rock types and conditions may change in short vertical intervals and horizontal distances.

Soil/rock samples will be stored at our laboratory for a period of six months. After this period of time, they will be discarded, unless notified to the contrary by the client.

LEGEND – BORING LOG TERMINOLOGY

Explanation of each column, progressing from left to right

1. Depth (in feet) – refers to distance below the ground surface.

2. Elevation (in feet) – is referenced to mean sea level, unless otherwise noted.

3. Standard Penetration (N) – the number of blows required to drive a 2-inch O.D., 1-3/8 inch I.D., split-barrel sampler, using a 140-pound hammer with a 30-inch free fall. The blows are recorded in 6-inch drive increments. Standard penetration resistance is determined from the total number of blows required for one foot of penetration by summing the second and third 6-inch increments of an 18-inch drive.

   50/n – indicates number of blows (50) to drive a split-barrel sampler a certain number of inches (n) other than the normal 6-inch increment.

4. The length of the sampler drive is indicated graphically by horizontal lines across the "Standard Penetration" and "Recovery" columns.

5. Sample recovery from each drive is indicated numerically in the column headed "Recovery".

6. The drive sample location is designated by the heavy vertical bar in the "Sample No., Drive" column.

7. The length of hydraulically pressed "Undisturbed" samples is indicated graphically by horizontal lines across the "Press" column.

8. Sample numbers are designated consecutively, increasing in depth.

9. Soil Description

   a. The following terms are used to describe the relative compactness and consistency of soils:

   Granular Soils – Compactness

Term	Blows/Foot Standard Penetration
Very Loose	0 – 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	over 50

   Cohesive Soils – Consistency

Term	Unconfined Compression tons/sq.ft.	Blows/Foot Standard Penetration	Hand Manipulation
Very Soft	less than 0.25	below 2	Easily penetrated by fist
Soft	0.25 – 0.50	2 – 4	Easily penetrated by thumb
Medium Stiff	0.50 – 1.0	4 – 8	Penetrated by thumb with moderate pressure
Stiff	1.0 – 2.0	8 – 15	Readily indented by thumb but not penetrated
Very Stiff	2.0 – 4.0	15 – 30	Readily indented by thumb nail
Hard	over 4.0	over 30	Indented with difficulty by thumb nail

   b. Color – If a soil is a uniform color throughout, the term is single, modified by such adjective as light and dark. If the predominant color is shaded by a secondary color, the secondary color precedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled".

   c. Texture is based on the Ohio Department of Transportation Classification System. Soil particle size definitions are as follows:

Description		Size	Description		Size
Boulders		Larger than 8"	Sand	– Coarse	2.0 mm to 0.42 mm
Cobbles		8" to 3"		– Fine	0.42 mm to 0.074 mm
Gravel	– Coarse	3" to ¾"	Silt		0.074 mm to 0.005 mm
	– Fine	¾" to 2.0 mm	Clay		smaller than 0.005 mm

d. The main soil component is listed first. The minor components are listed in order of decreasing percentage of particle size.

e. Modifiers to main soil descriptions are indicated as a percentage by weight of particle sizes.

trace	0 to 10%
little	10 to 20%
some	20 to 35%
"and"	35 to 50%

f. Moisture content of **cohesionless soils** (sands and gravels) is described as follows:

Term	Relative Moisture or Appearance
Dry	No moisture present
Damp	Internal moisture, but none to little surface moisture
Moist	Free water on surface
Wet	Voids filled with free water

g. The moisture content of **cohesive soils** (silts and clays) is expressed relative to plastic properties.

Term	Relative Moisture or Appearance
Dry	Powdery
Damp	Moisture content slightly below plastic limit
Moist	Moisture content above plastic limit but below liquid limit
Wet	Moisture content above liquid limit

10. Rock Hardness and Rock Quality Designation

a. The following terms are used to describe the relative strength of the **bedrock**.

Term	Description
Very Weak	Core can be carved with a knife and scratched by fingernail. Can be excavated readily with a point of a pick. Pieces 1-inch or more in thickness can be broken by finger pressure.
Weak	Core can be grooved or gouged readily by a knife or pick. Can be excavated in small fragments by moderate blows of a pick point. Small, thin pieces can be broken by finger pressure.
Slightly Strong	Core can be grooved or gouged 0.05 inch deep by firm pressure of a knife or pick point. Can be excavated in small chips to pieces about 1-inch maximum size by hard blows of the point of a geologist's pick.
Moderately Strong	Core can be scratched with a knife or pick. Grooves or gouges to ¼" deep can be excavated by hand blows of a geologist's pick. Requires moderate hammer blows to detach hand specimen.
Strong	Core can be scratched with a knife or pick only with difficulty. Requires hard hammer blows to detach hand specimen. Sharp and resistant edges are present on hand specimen.
Very Strong	Core cannot be scratched by a knife or sharp pick. Breaking of hand specimens requires hard repeated blows of the geologist hammer.
Extremely Strong	Core cannot be scratched by a knife or sharp pick. Chipping of hand specimens requires hard repeated blows of the geologist hammer.

b. Rock Quality Designation, RQD – This value is expressed in percent and is an indirect measure of rock soundness. It is obtained by summing the total length of all core pieces which are at least four inches long, and then dividing this sum by the total length of the core run.

11. Gradation – when tests are performed, the percentage of each particle size is listed in the appropriate column (defined in Item 9c).

12. When a test is performed to determine the natural moisture content, liquid limit moisture content, or plastic limit moisture content, the moisture content is indicated graphically.

13. The corrected standard penetration (N_{60}) value in blows per foot is indicated graphically.

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 755.4 (MSL) EOB: 7.0 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712152.270 N, 1830418.030 E

EXPLORATION ID B-038-0-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 6" Concrete - 6"	755.4 754.4																	
POSSIBLE FILL: Stiff brown SANDY SILTY (A-4a), little to some fine to coarse sand, trace gravel; moist.	752.9	1	3 3 3	8	67	SS-1	1.75	4	6	14	33	43	23	17	6	22	A-4a (8)	
Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.	751.4	2 3	7 6 6	16	61	SS-2	3.00	7	9	16	37	31	29	17	12	18	A-6a (7)	
Hard brown SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; damp.		4 5	8 10 9	25	100	SS-3	4.5+	-	-	-	-	-	23	15	8	12	A-4a (V)	
	748.4	6 EOB 7	8 8 10	24	100	SS-4	4.5+	17	12	18	30	23	23	15	8	11	A-4a (4)	

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BENTONITE CHIPS; SOIL CUTTINGS

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-041 | *Location:* Sta. 762+58.90, 115.94 ft Lt. of I-70 CL | *Date Drilled:* 6/23/2008 to 6/25/2008

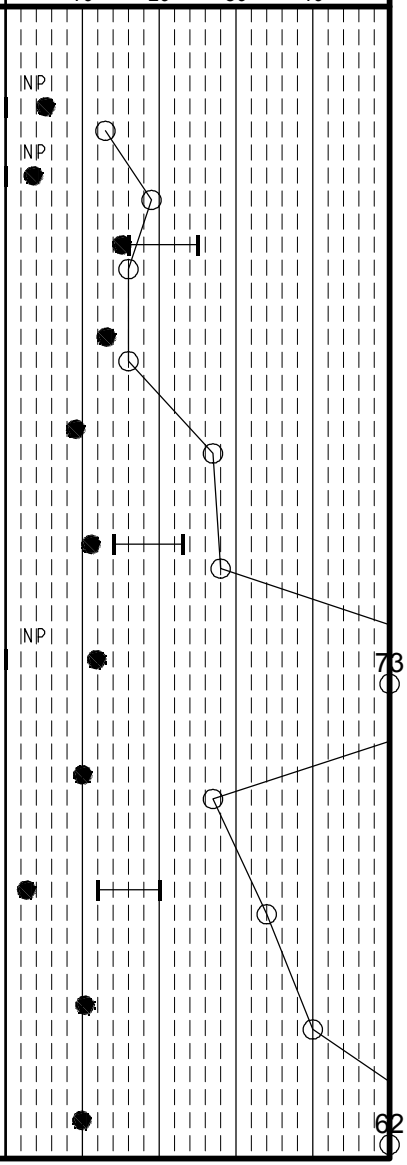
WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 52.0'-92.0'
Water level at completion: 37.1' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	759.7													
1.5	758.2						Asphalt Concrete Pavement - 8" Aggregate Base - 5"							
		10 8 4	6	1			Medium dense brown GRAVEL (A-1-a), trace to little fine to coarse sand, trace to little silty clay; damp to moist.		71	11	---	7	--11--	
		1 4 14	2	2			@ 3.2', encountered large rock fragments.		98	1	---	1	--0--	
4.5	755.2													
5		5 7 8	18	3		3.0	Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		13	14	---	16	31	26
		5 6 9	14	4		3.0								
		4 11 15	13	5		4.5+	@ 8.5', becomes gray.							
10		7 12 15	18	6		4.5+			12	11	---	20	37	20
13.0	746.7													
		17 38 31	18	7			Very dense brown and gray GRAVEL WITH SAND (A-1-b), some silt; wet.		21	32	---	24	--23--	
15														
15.5	744.2													
		7 10 16	18	8		4.5+	Hard gray SANDY SILT (A-4a), little gravel; damp to moist.							
		8 12 20	18	9		4.5+			12	13	---	22	33	20
20														
		9 15 23	18	10		4.5+								
		8 25 34	6	11		4.5+								
25	734.7													

GRADATION

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢—⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-041 | *Location:* Sta. 762+58.90, 115.94 ft Lt. of I-70 CL | *Date Drilled:* 6/23/2008 to 6/25/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 52.0'-92.0'
Water level at completion: 37.1' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL — LL; Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	734.7						Hard gray SANDY SILT (A-4a), little gravel; damp to moist.								
		7 23 34	18	12		4.5+									60
30		15 34 42	18	13		4.5+									80
35		10 22 30	18	14		4.5+			12	14	---	19	36	19	55
40		12 30 42	18	15		4.5+									76
45		15 45 31	10	16		4.5+									80
50	709.7	12 28 41	18	17		4.5+									73

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FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic - NP
	709.7														
52.0	707.7						Hard gray SANDY SILT (A-4a), little gravel; damp to moist.								
55		18 30 49	18	18			Very dense brown and gray GRAVEL WITH SAND (A-1-b), little gravel, trace to little silty clay; wet. @ 52.0'-58.5', cobbles and boulders.		38	30	---	21	--11--		NP; 83
60		50/5	5	19											50+
65		6 30 38	18	20											72
67.0	692.7														
70		11 18 40	8	21			Very dense black, brown, and gray GRAVEL (A-1-a), little fine to coarse sand, trace silty clay; wet.		78	13	---	5	--4--		NP; 61
75	684.7	48 50/4	7	22											50+

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Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL — LL; Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	684.7														
77.0	682.7						Very dense black, brown, and gray GRAVEL (A-1-a), little fine to coarse sand, trace silty clay; wet.								
		6 18 33	4	23			Very dense brown and gray GRAVEL WITH SAND AND SILT (A-2-4); wet.								54
80															
82.0	677.7														
		50/5	3	24			Very dense gray COARSE AND FINE SAND (A-3a), some silty clay, trace gravel; possible cobbles; wet.								50+
85															
		37 50/5	11	25					5	17	---	44	--34--		NP 50+
90															
92.0	667.7														
		50/5	5	26			Very dense brownish gray SANDY SILT (A-4a), trace gravel; damp.								50+
95															
		33 50/5	11	27					9	8	---	21	42	20	50+
100	659.7														

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FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) / Natural Moisture Content, % -
	659.7						Very dense brownish gray SANDY SILT (A-4a), some gravel; damp.								PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
		40 50/5	5	28											50+
105															
		50/5	5	29					21	17	---	21	27	14	50+
110															
112.0	647.7														
							Stiff to very stiff brown and gray SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; moist.								
		17 27 34	3	30					2	3	---	2	55	38	64
115.0 115	644.7														
		Core 60"	Rec 60"	RQD 80%	R1		Shale, blue-gray, weak, highly weathered, thinly laminated, slightly calcareous, jointed, moderately to highly fractured, tight, with typical narrow fractures, slightly rough; RQD 42%, Loss 0%. Contains dark gray, well cemented shale zones [thin, dark bands]. Dark shale zones are typically 1-2 inches thick, spaced at intervals of 12 to 18 inches.								
120															
		Core 60"	Rec 60"	RQD 25%	R2										
125	634.7														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-041 | *Location:* Sta. 762+58.90, 115.94 ft Lt. of I-70 CL | *Date Drilled:* 6/23/2008 to 6/25/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 52.0'-92.0'
Water level at completion: 37.1' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft) 634.7	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
127.5	632.2						Shale, blue-gray, weak, highly weathered, thinly laminated, slightly calcareous, jointed, moderately to highly fractured, tight, with typical narrow fractures, slightly rough; RQD 42%, Loss 0%. Contains dark gray, well cemented shale zones [thin, dark bands]. Dark shale zones are typically 1-2 inches thick, spaced at intervals of 12 to 18 inches.								
130		Core 120"	Rec 120"	RQD 58%	R3		Interbedded Shale [93%] and Limestone [7%], RQD 78%, Loss 0%; Shale, dark gray, weak, highly weathered, thinly laminated, calcareous, jointed, highly fractured with typical, tight, slightly rough shear fractures; Limestone, light gray, strong, slightly weathered, pyritic, unfractured. @ 133.5' - 134.0', qu = 1695 psi								
135.0 135	624.7						Bottom of Boring - 135.0'								
140															
145															
150															

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

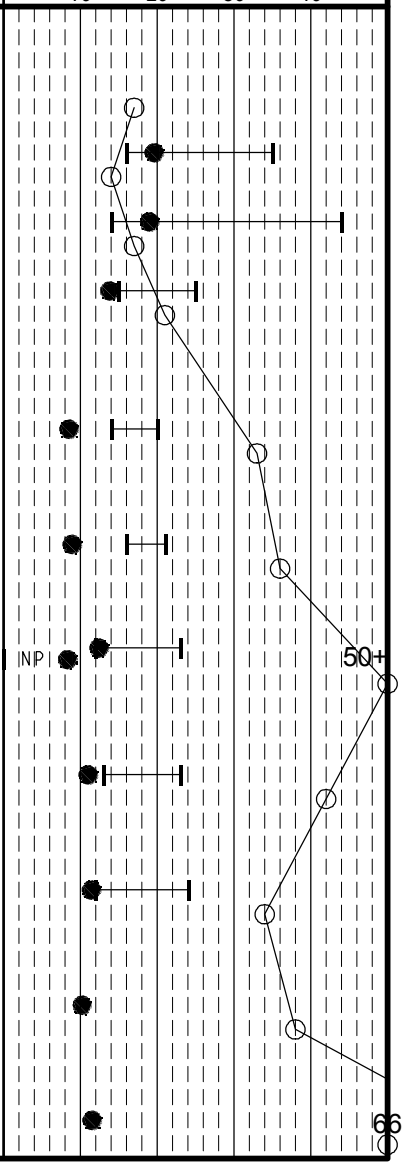
LOG OF: Boring B-044 | *Location:* Sta. 767+54.82, 120.59 ft Lt. of I-70 CL | *Date Drilled:* 6/16/2008 to 6/19/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'-14.2', 23.5'-25.0'
Water level at completion: 19.1' (beginning of shift, 9/17/08)
20.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.25" diameter hollowstem augers to 47.0'; 4.0" casing from 47.0' to 115.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	764.6													
1.3	763.3	10 9 7	8	1		--	Asphalt Concrete Pavement - 2" Portland Cement Concrete - 4" Aggregate Base - 10"							
3.5	761.1	9 8 5	8	2		--	POSSIBLE FILL: Stiff to very stiff brown SILTY CLAY (A-6b), little to some fine to coarse sand, trace gravel; moist.		2	7	---	16	33	42
5.5	759.1	4 5 11	18	3		2.5	POSSIBLE FILL: Very stiff mottled olive-brown and gray CLAY (A-7-6), little fine to coarse sand, trace gravel; moist.		2	5	---	10	43	40
		5 8 12	18	4		4.0	Very stiff brown SANDY SILT (A-4a), trace gravel, some clay; damp.		8	8	---	13	40	31
11.0	753.6	7 15 16	18	5		2.0	@ 11.0'-16.0', encountered very difficult drilling, dense till, possible cobbles. Recovered rock fragments in split spoon.		1	5	---	10	--84--	
13.0	751.6	12 13 21	17	6			Dense brown GRAVEL WITH SAND AND SILT (A-2-4); damp.		44	15	---	9	24	8
14.0	750.6	18 50/2	8	7A		--	Stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, little to some gravel; damp to moist.		21	14	---	18	28	19
15.0	749.6			7B			Very dense brown GRAVEL WITH SAND (A-1-b), little silty clay; moist to wet. @ 14.2', refusal of splitspoon.		46	25	---	14	--15--	
18.0	746.6	21 20 20	16	8		4.0	Very stiff to hard gray SANDY SILT (A-4a), little to some clay, trace to little gravel; damp.		10	11	---	20	38	21
20		9 14 18	16	9		3.5	Very stiff to hard gray SILT AND CLAY (A-6a), little to some clay, little gravel; damp to moist. @ 20.5', moist to wet.		13	11	---	20	36	20
		14 17 19	18	10		2.75								
25	739.6	17 28 35	18	11		--								

STANDARD PENETRATION (N60)
Natural Moisture Content, % - ●
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-044 | *Location:* Sta. 767+54.82, 120.59 ft Lt. of I-70 CL | *Date Drilled:* 6/16/2008 to 6/19/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'-14.2', 23.5'-25.0'
Water level at completion: 19.1' (beginning of shift, 9/17/08)
20.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.25" diameter hollowstem augers to 47.0'; 4.0" casing from 47.0' to 115.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) / Natural Moisture Content, % - / PL — LL / Blows per foot - ○ / Non-Plastic - NP
	739.6														10 20 30 40
		12 20 24	17	12		3.0	Very stiff to hard gray SILT AND CLAY (A-6a), little to some clay, little gravel; damp. @ 26.0', contains few thin (less than 1") fine to medium grained sand seams.								
28.0	736.6														
30		13 15 25	18	13		4.0	Very stiff to hard gray SANDY SILT (A-4a), little to some clay, little gravel; damp.		18	12	---	20	27	23	69
35		35 34 32	4	14		--	@ 33.9', encountered possible cobble or boulder. @36.0', pulled augers to change lead. Lead auger bit destroyed. Could not advance further with 500-600 psi down pressure. Changed tools to drill with casing.								
39.6	725.0	14 37 48	18	15A 15B		3.5 --	Very dense gray COARSE AND FINE SAND (A-3a), little silty clay, trace gravel; wet.								89
42.0	722.6														
45		21 42 50/5	17	16		4.5+	Hard gray SANDY SILT (A-4a), "and" fine to coarse sand, trace gravel; damp.		8	13	---	21	35	23	NP 50+
47.0	717.6														
50	714.6	10 20 42	6	17			Very dense gray GRAVEL WITH SAND (A-1-b), some silty clay; wet.		46	20	---	12	--22--		65

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-044 | *Location:* Sta. 767+54.82, 120.59 ft Lt. of I-70 CL | *Date Drilled:* 6/16/2008 to 6/19/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'-14.2', 23.5'-25.0'
Water level at completion: 19.1' (beginning of shift, 9/17/08) 20.8' (includes drilling water)

FIELD NOTES: Advanced boring using 4.25" diameter hollowstem augers to 47.0'; 4.0" casing from 47.0' to 115.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) / Natural Moisture Content, % -
	714.6														
52.0	712.6						Very dense gray GRAVEL WITH SAND (A-1-b), some silty clay; wet.								
							Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.								
55		14 42 43	6	18		4.5+									89
60		20 35 38	18	19		4.5+			10	12	---	22	32	24	77
							@ 62.0 to 67.0', very stiff.								
65		14 22 31	18	20		2.5									56
70		15 26 42	18	21		4.5+									72
75	689.6	22 26 34	18	22		4.5+									63

PL — LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

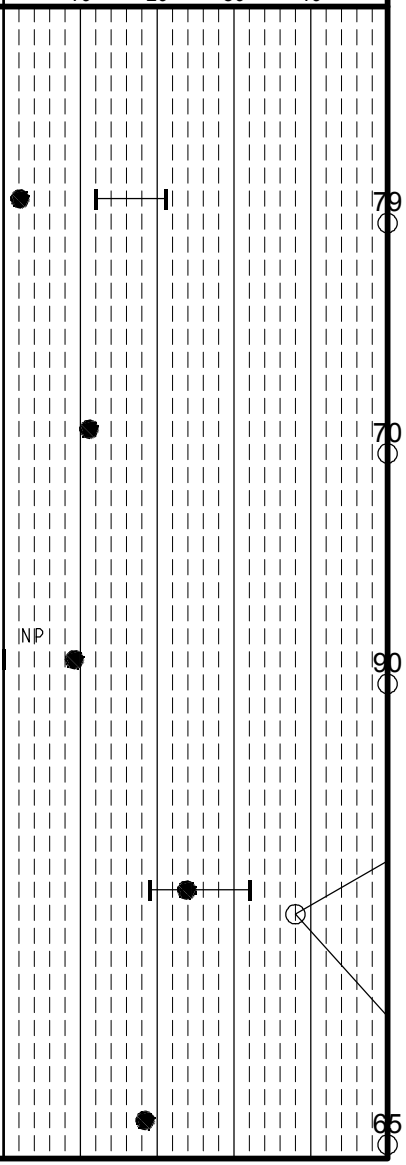
LOG OF: Boring B-044 | *Location:* Sta. 767+54.82, 120.59 ft Lt. of I-70 CL | *Date Drilled:* 6/16/2008 to 6/19/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'-14.2', 23.5'-25.0'
Water level at completion: 19.1' (beginning of shift, 9/17/08)
20.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.25" diameter hollowstem augers to 47.0'; 4.0" casing from 47.0' to 115.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	689.6						Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.							
80		19 33 42	18	23		4.5+			7	11	---	20	40	22
85		10 29 38	3	24		--	@ 84.0'-90.0', encountered possible cobbles.							
87.0	677.6													
							Very dense gray GRAVEL (A-1-a), some fine to coarse sand, little silty clay; wet.							
90		19 38 48	4	25					67	13	---	8	--12--	
92.0	672.6													
							Very stiff gray SILT AND CLAY (A-6a); moist.							
95		10 13 23	18	26		3.25			0	0	---	0	53	47
97.0	667.6													
							Hard gray SANDY SILT (A-4a), trace fine to coarse sand, trace gravel; moist.							
100	664.6	15 20 42	18	27		4.5+								

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-044 | *Location:* Sta. 767+54.82, 120.59 ft Lt. of I-70 CL | *Date Drilled:* 6/16/2008 to 6/19/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'-14.2', 23.5'-25.0'
Water level at completion: 19.1' (beginning of shift, 9/17/08)
20.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 4.25" diameter hollowstem augers to 47.0'; 4.0" casing from 47.0' to 115.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) / Natural Moisture Content, % -
	664.6						Hard gray SILT (A-4b), trace fine to coarse sand, trace gravel; moist.								PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
							@ 102', very stiff, grayish brown.								
105		13 14 14	18	28		2.5			2	1	---	6	59	32	
107.0	657.6						Hard brown and gray CLAY (A-7-6), varved; damp.								
110.0	654.6	42 50/3	9	29		4.5+									50+
111.5	653.1	20 37 50/3		30			Shale, grayish brown, very weak, severely weathered, thinly laminated.								50+
114.9	649.7	Core 60"	Rec 60"	RQD 73%	R1		Shale [90%] interbedded and Siltstone [10%], RQD 76%, Loss 0%; Shale, blue-gray, very weak to weak, severely weathered, laminated, slightly calcareous, jointed, moderately fractured, tight, slightly rough, typical clay-filled fractures; Siltstone, gray to dark gray, strong, slightly weathered, laminated, argillaceous. @ 112.0', high angle fracture, clay filled with fine and coarse grained sand.								
120		Core 60"	Rec 60"	RQD 77%	R2		Shale, blue-gray, weak, moderately to highly weathered, laminated, slightly calcareous, jointed, slightly fractured, tight, slightly rough, clay filled fractures; RQD 77%, Loss 0%. Contains dark gray, well cemented shale zones [thin, dark bands]. Dark shale zones are typically 1-2 inches thick, spaced at intervals of 12 to 18 inches. @ 114.4', 115.3', 116.7', 118.4', and 119.4', high angle fractures. @ 117.6' - 118.0', qu = 1202 psi								
125	639.6	Core 120"	Rec 120"	RQD 79%	R3										

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-044 | *Location:* Sta. 767+54.82, 120.59 ft Lt. of I-70 CL | *Date Drilled:* 6/16/2008 to 6/19/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'-14.2', 23.5'-25.0'
Water level at completion: 19.1' (beginning of shift, 9/17/08)
20.8' (includes drilling water)

FIELD NOTES: Advanced boring using 4.25" diameter hollowstem augers to 47.0'; 4.0" casing from 47.0' to 115.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) / Natural Moisture Content, % - ●
	639.6														PL ⊢ LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
130		Core 120"	Rec 120"	RQD 79%	R3		Shale, blue-gray, weak, moderately to highly weathered, laminated, slightly calcareous, jointed, slightly fractured, tight, slightly rough, clay filled fractures; RQD 77%, Loss 0%. Contains dark gray, well cemented shale zones [thin, dark bands]. Dark shale zones are typically 1-2 inches thick, spaced at intervals of 12 to 18 inches.								
131.5	633.1						Bottom of Boring - 131.5'								
135															
140															
145															
150															

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / M. EVENER	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP N3
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 766.0 (MSL) EOB: 90.0 ft.
START: 5/24/10 END: 5/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712271.190 N, 1831418.200 E

EXPLORATION ID B-045-2-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Asphalt - 5" Brick - 5" Base - 4"	766.0																	
	764.8	1																
POSSIBLE FILL: Very stiff mottled brown and gray CLAY (A-7-6), trace to little fine to coarse sand, trace gravel; moist.		2	11 4 7	14	56	SS-1	2.50	1	4	8	42	45	44	18	26	23	A-7-6 (15)	
		3																
@3.5'-4.1', contains rock fragments.		4	10 50/1"	-	57	SS-2	3.00	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
	760.0	5																
Stiff to very stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, trace gravel; damp to moist.		6	8 6 5	14	11	SS-3	1.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
		7																
@8.5'-11.2', grayish brown.		8	3 6 7	17	100	SS-4	3.00	-	-	-	-	-	-	-	-	16	A-6b (V)	
	754.8	9																
Very dense brown COARSE AND FINE SAND (A-3a), trace to little silt, trace to little gravel; damp.		10	19 19 28	62	100 -	SS-5A SS-5B	2.00 -	-	-	-	-	-	-	-	-	16 6	A-6b (V) A-3a (V)	
		11																
		12																
		13																
		14	28 50/5"	-	82	SS-6	-	-	-	-	-	-	-	-	-	4	A-3a (V)	
	750.0	15																
Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		16	13 14 15	38	33	SS-7	4.5+	8	12	20	44	16	22	14	8	9	A-4a (5)	
		17																
		18																
		19	6 7 8	20	89	SS-8	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
		20																
@ 21.0'-22.5', possible boulder.		21																
		22	9 34 27	80	17	SS-9	-	-	-	-	-	-	-	-	-	12	A-4a (V)	
		23																
@ 23.5'-25.0', stiff, contains shale fragments.		24	5 7 10	22	72	SS-10	1.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
	741.0																	

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/24/10	END: 5/24/10	PG 2 OF 4	B-045-2-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Very stiff gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; contains shale fragments; damp.	741.0	26	6 10 12	29	100	SS-11	3.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
		27																
		28																
		29	3 7 9	21	78	SS-12	4.00	11	14	19	37	19	22	14	8	11	A-4a (4)	
		30																
		31																
		32																
		33																
		34	18 20 24	58	100	SS-13	2.00	-	-	-	-	-	-	-	-	10	A-4a (V)	
		35																
		36																
	729.0	37																
Very dense gray GRAVEL (A-1-a), some fine to coarse sand, trace to little silt; wet.		38																
		W																
		39	12 21 24	59	78	SS-14	-	66	15	10	9	-	NP	NP	NP	6	A-1-a (0)	
		40																
		41																
		42																
		43																
@43.5'-45.0', contains petroleum odor.		44	32 26 27	70	6	SS-15	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
		45																
		46																
	719.0	47																
Very stiff to hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.		48																
		49	9 17 16	43	67	SS-16	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
		50																
		51																

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/24/10	END: 5/24/10	PG 3 OF 4	B-045-2-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 714.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Very stiff to hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp. *(continued)*		52																
		53																
		54	18 17 18	46	78	SS-17	2.50	13	11	24	33	19	21	13	8	10	A-4a (3)	
		55																
		56																
		57																
		58																
		59	12 17 21	50	100	SS-18	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
		60																
		61																
		62																
		63																
		64	13 11 13	32	100	SS-19	4.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
		65																
		66																
		67																
		68																
		69	11 17 22	51	100	SS-20	4.00	7	12	19	37	25	23	14	9	11	A-4a (5)	
		70																
		71																
		72																
		73																
		74	7 15 18	43	100	SS-21	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
		75																
		76																
		77																
		78																

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/24/10	END: 5/24/10	PG 4 OF 4	B-045-2-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	687.4																	
@78.5', moist to wet.	686.4	79	8 18 40	76	100	SS-22A	3.00	-	-	-	-	-	-	-	-	9	A-4a (V)	
Very dense gray COARSE AND FINE SAND (A-3a), little gravel, trace to little silt; wet.	684.0	80			-	SS-22B	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.		81 82 83 84	27 33 39	95	100	SS-23	4.5+	12	9	23	38	18	21	13	8	10	A-4a (4)	
		85 86 87 88 89	30 30 38	90	100	SS-24	4.5+	-	-	-	-	-	-	-	-	5	A-4a (V)	
	676.0	EOB 90																

NOTES: SEEPAGE AT 38.5 FEET AND 79.6 FEET; WATER LEVEL PRIOR TO ADDING WATER = 77.5 FEET; FINAL WATER LEVEL INCLUDING DRILLING WATER = 77.5 FEET.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAGS BENTONITE GROUT

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:	EXPLORATION ID B-047-1-10
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP Q2/FULTON	
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 769.6 (MSL) EOB: 69.9 ft.	PAGE 1 OF 3
START: 5/25/10 END: 5/26/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712321.020 N, 1831767.930 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 769.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Asphalt - 3" Base - 6"	768.8																	
POSSIBLE FILL: Stiff to very stiff brown to dark brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; contains trace brick fragments; damp to moist.		1	2 4 3	8	89	SS-1	2.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
		2																
		3																
		4	3 4 4	9	83	SS-2	1.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
		5																
@6.0' - 7.5', contains organic odor and rock fragments.		6																
		7	2 3 2	5	44	SS-3	1.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
		8																
		9	2 8 18	28	72	SS-4	3.50	-	-	-	-	-	-	-	-	13	A-4a (V)	
		10																
@11.0' - 12.5', hard, gray.		11																
		12	10 14 14	30	100	SS-5	4.5+	14	10	17	38	21	20	13	7	9	A-4a (5)	
	756.1	13																
Dense to very dense brown COARSE AND FINE SAND (A-3a), trace silt, trace gravel; damp.		14	9 21 25	50	78	SS-6	-	-	-	-	-	-	-	-	-	5	A-3a (V)	
		15																
		16																
	752.6	17	12 23 18	44	100 -	SS-7A SS-7B	- -	- -	- -	- -	- -	- -	- -	- -	- -	9 21	A-3a (V) A-4b (V)	
Dense brown and gray SILT (A-4b), some fine to coarse sand, trace gravel; damp.	751.1	18																
Dense gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		19	6 17 15	35	94	SS-8	-	12	8	25	40	15	18	14	4	9	A-4a (4)	
	748.6	20																
Dense to very dense gray COARSE AND FINE SAND (A-3a), little to some silt, little to some gravel; damp.		21																
		22	6 20 29	53	94	SS-9	-	-	-	-	-	-	-	-	-	8	A-3a (V)	
		23																
		24	18 21 24	49	78	SS-10	-	-	-	-	-	-	-	-	-	3	A-3a (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:28

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/25/10	END: 5/26/10	PG 2 OF 3	B-047-1-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 744.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Dense to very dense gray COARSE AND FINE SAND (A-3a), little to some silt, little to some gravel; damp. *(continued)*		26	20 25 30	59	100	SS-11	-	-	-	-	-	-	-	-	-	4	A-3a (V)	
		27																
		28																
		29	16 26 50	82	78	SS-12	-	26	3	48	- 23 -		NP	NP	NP	9	A-3a (0)	
		30																
		31																
		32																
		33																
		W																
@ 33.5', becomes wet.		34	17 29 36	70	89	SS-13	-	-	-	-	-	-	-	-	-	9	A-3a (V)	
		35																
		36																
		37																
@38.5', 43.5', 2.5' of sand heave; washed out with tricone.		38																
		39	25 21 50/2"	-	79	SS-14	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
		40																
		41																
		42																
		43																
		44	50/2"	-	100	SS-15	-	-	-	-	-	-	-	-	-	10	A-3a (V)	
		45																
		46																
		47																
		48																
		49	23 21 36	61	72	SS-16	-	16	26	37	- 21 -		NP	NP	NP	14	A-3a (0)	
		50																
		51																

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:28

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/25/10	END: 5/26/10	PG 3 OF 3	B-047-1-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 717.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Very dense gray GRAVEL WITH SAND (A-1-b), little to some fine to coarse sand, little silt; wet.	717.6	52																
		53																
		54	50/2"	-	100	SS-17	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		55																
@56.0', encountered possible cobbles or boulders.		56																
	712.6	57																
Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp to moist.		58																
		59	23 34 50/2"	-	100	SS-18	4.5+	4	9	18	47	22	23	15	8	11	A-4a (7)	
		60																
		61																
		62																
		63																
		64	24 46 50/2"	-	100	SS-19	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	
		65																
		66																
		67																
		68																
		69	30 46 50/5"	-	100	SS-20	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
	699.7	EOB																

NOTES: SEEPAGE AT 33.5 FEET; WATER LEVEL PRIOR TO ADDING WATER = 37.1 FEET; FINAL WATER LEVEL INCLUDING DRILLING WATER = 28.0 FEET.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

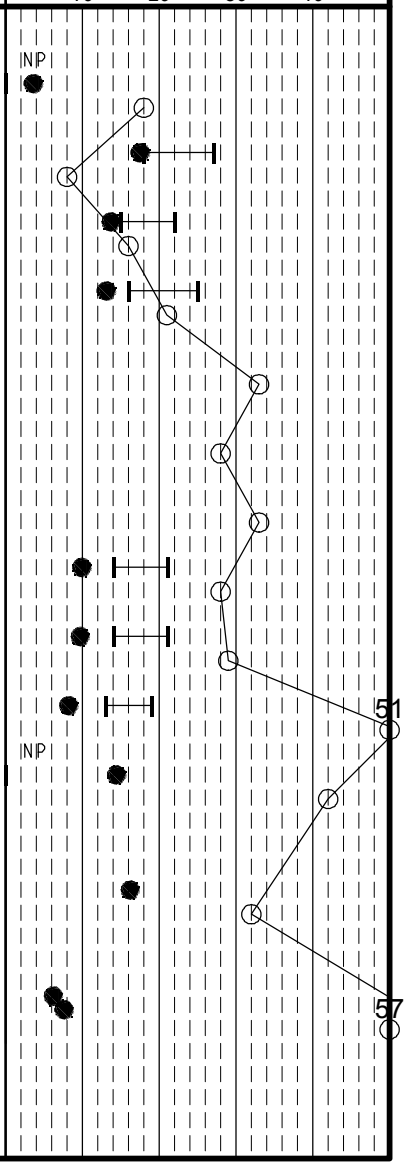
LOG OF: Boring B-164 | *Location:* Sta. 874+98.50, 10.05 ft. Lt. of Ramp Q4 BL | *Date Drilled:* 3/24/2009

WATER OBSERVATIONS:
Water seepage at: None
Water level at completion: None

FIELD NOTES:

Depth (ft)	Elev. (ft) 772.1	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	771.1						Asphalt Concrete - 4" Aggregate Base - 2"							
2.5	769.6	18 10 8	4	1			Brick - 4" Aggregate Base - 2"		56	21	---	10	--13--	
4.0	768.1	8 4 4	12	2		1.5	FILL: Medium dense gray GRAVEL (A-1-a), some fine to coarse sand, little silt; damp.		15	13	---	19	30	23
5		7 7 9	16	3		4.5	FILL: Stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; contains layers of brick fragments; damp.		5	15	---	20	37	23
		4 8 13	18	4		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.		8	15	---	20	34	23
		11 16 16	18	5		4.5+								
10		10 13 14	18	6		4.5+								
		5 13 19	18	7		4.5+								
		8 11 16	18	8		4.5+			12	13	---	20	34	21
		8 11 17	18	9		4.5+			13	15	---	19	33	20
15		18 25 25	18	10		4.5+			11	10	---	21	38	20
16.0	756.1	10 17 24	18	11			Dense gray SILT (A-4b), little clay, trace fine to coarse sand; damp.		1	2	---	7	76	14
		6 13 18	18	12										
20							@ 21.0'-21.6', fine sand seam.							
21.6	750.5	8 29		13A										
22.5	749.6	27	18	13B		4.5	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
							Bottom of Boring - 22.5'							
25														

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⊢——⊣ *LL*
Blows per foot - ○ / *Non-Plastic -* NP
10 20 30 40



PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP Q2/FULTON
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 771.8 (MSL) EOB: 37.5 ft.
START: 5/25/10 END: 5/26/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712346.690 N, 1831956.320 E

EXPLORATION ID B-164-1-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 2" Base - 5"	771.2																	
FILL: Stiff to very stiff mottled brown and gray SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; damp to moist.		1	4 6 13	20	78	SS-1	3.00	-	-	-	-	-	-	-	-	16	A-4a (V)	
@3.5' - 8.5', brown; contains rock fragments.		4	2 4 6	11	94	SS-2	3.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
		7	4 7 10	18	100	SS-3	4.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
@8.5' - 10.0', gray; contains rock fragments.		9	5 8 10	19	100	SS-4	4.00	-	-	-	-	-	-	-	-	9	A-4a (V)	
@11.0' - 12.5', gray.		12	3 5 16	23	78	SS-5	1.25	9	13	18	34	26	24	14	10	14	A-4a (5)	
@13.5', grayish brown.		14	6 33 45	84	0	SS-6	-	-	-	-	-	-	-	-	-	-	A-4a (V)	
	754.9	16	16 17	33	100	SS-7A	-	-	-	-	-	-	-	-	-	11	A-4a (V)	
Dense gray SILT (A-4b), little fine sand, trace clay; damp.	753.8	17	14		-	SS-7B	-	-	-	-	-	-	-	-	-	17	A-4b (V)	
Dense gray SANDY SILT (A-4a), little to some fine to coarse sand, little to some gravel; damp to moist.		19	10 20 23	46	94	SS-8	-	22	20	22	- 36 -		NP	NP	NP	7	A-4a (0)	
		22	10 15 16	33	100	SS-9	-	-	-	-	-	-	-	-	-	10	A-4a (V)	
	746.8	24	7 14 16	32	100	SS-10	-	-	-	-	-	-	-	-	-	9	A-4a (V)	

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/25/10	END: 5/26/10	PG 2 OF 2	B-164-1-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Dense gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.	746.8	26	13 20 20	43	89	SS-11	-	5	8	25	44	18	17	8	9	12	A-4a (5)	
Very dense gray FINE SAND (A-3), little fine sand, trace silt; damp to moist.	743.8	27 28 29	9 23 30	57	100	SS-12	-	-	-	-	-	-	-	-	-	6	A-3 (V)	
Very dense gray SANDY SILT (A-4a), some to "and" fine sand, trace gravel; contains rock fragments; damp.	740.2	W 30 31 32	14 39 38	83	78 -	SS-13A SS-13B	-	-	-	-	-	-	-	-	-	19 7	A-3 (V) A-4a (V)	
Very dense gray GRAVEL WITH SAND (A-1-b), little silt; moist to wet.	738.8	33 34 35	17 45 50/5"	-	82	SS-14	-	39	28	17	- 16 -		NP	NP	NP	8	A-1-b (0)	
Very dense gray GRAVEL WITH SAND AND SILT (A-2-4), trace clay; wet.	736.3	36 37	28 35 27	67	56	SS-15	-	-	-	-	-	-	-	-	-	6	A-2-4 (V)	
	734.3	EOB																

NOTES: SEEPAGE AT 31.0 FEET; FINAL WATER LEVEL = 35.1 FEET.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAGS BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP Q2/FULTON
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 774.2 (MSL) EOB: 35.0 ft.
START: 5/26/10 END: 5/27/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712383.510 N, 1832113.210 E

EXPLORATION ID B-164-2-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 774.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 3" Concrete - 5"	773.5																	
FILL: Stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; contains trace brick and rock fragments; moist.	771.2	1	3 3 2	5	56	SS-1	1.50	-	-	-	-	-	-	-	-	21	A-6a (V)	
POSSIBLE FILL: Medium dense brown COARSE AND FINE SAND (A-3a), little gravel, trace silt; damp.	768.7	4	4 7 8	16	61	SS-2	-	-	-	-	-	-	-	-	-	5	A-3a (V)	
Very stiff to hard brown and gray SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; damp to moist.		7	11 12 12	26	39	SS-3	4.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
		9	5 7 6	14	100	SS-4	4.5+	13	13	18	32	24	23	14	9	10	A-4a (4)	
		12	5 11 12	25	100	SS-5	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
@13.5', drove on possible cobbles or boulders, no recovery.	758.7	14	9 26 40	71	0	SS-6	-	-	-	-	-	-	-	-	-	-		
Dense to very dense gray GRAVEL WITH SAND (A-1-b), trace to little silt; damp.		17	16 32 50/5"	-	71	SS-7	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		19	13 28 37	70	83	SS-8	-	40	27	20	-	13 -	NP	NP	NP	4	A-1-b (0)	
		22	15 22 26	52	100	SS-9	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
	751.2																	
Very dense gray SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; contains rock fragments; damp.		24	13 24 36	65	100	SS-10	-	-	-	-	-	-	-	-	-	6	A-4a (V)	

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/26/10	END: 5/27/10	PG 2 OF 2	B-164-2-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Very dense gray SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; contains rock fragments; damp. *(continued)*	749.2	26																
		27	17 33 32	70	100	SS-11	-	16	16	23	32	13	16	14	2	9	A-4a (2)	
		28																
		29	23 31 35	71	100	SS-12	-	-	-	-	-	-	-	-	-	10	A-4a (V)	
		30																
		31																
		32																
		33																
		34	24 32 50	88	100	SS-13	-	-	-	-	-	-	-	-	-	8	A-4a (V)	
	739.2	EOB 35																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAGS BENTONITE CHIPS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP Q2/FULTON
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 776.5 (MSL) EOB: 40.0 ft.
START: 5/27/10 END: 6/1/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712442.390 N, 1832252.670 E

EXPLORATION ID B-164-3-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 776.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Asphalt - 4" Concrete - 8.5"	775.5	1																
FILL: Stiff mottled brown, gray and orange SANDY SILT (A-4a), some fine to coarse sand, some silt; trace gravel; damp.	773.5	2	2 5 5	11	100	SS-1	1.50	7	14	20	36	23	23	16	7	14	A-4a (5)	
POSSIBLE FILL: Stiff to very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, little silt; trace gravel; contains trace orange nodules; damp to moist.	768.5	3 4 5 6 7	3 3 4	8	100	SS-2	1.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
			5 12 18	32	11	SS-3	3.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
Very stiff to hard dark brown SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; damp to moist.	758.5	8 9 10 11 12 13 14 15 16 17 18	3 6 7	14	100	SS-4	2.00	-	-	-	-	-	-	-	-	10	A-4a (V)	
			3 9 9	19	100	SS-5	4.00	15	13	19	32	21	20	17	3	10	A-4a (4)	
			3 10 12	24	100	SS-6	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
			5 10 19	31	100	SS-7	4.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
Very dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; damp.		19 20 21 22 23 24	17 50/0"	-	100	SS-8	-	-	-	-	-	-	-	-	-	3	A-1-b (V)	
			17 22 22	47	100	SS-9	-	22	39	25	-	14 -	NP	NP	NP	6	A-1-b (0)	
			17 22 30	56	100	SS-10	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:29

PID: 77370	BR ID:	PROJECT: I-70/I-71 EAST INTERCHANGE	STATION / OFFSET:	START: 5/27/10	END: 6/1/10	PG 2 OF 2	B-164-3-10

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
Very dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; damp. *(continued)*	751.5	26																
		27	19 27 31	63	78	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	748.5	28																
Very stiff gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		29	15 13 20	36	100	SS-12	4.00	9	11	20	41	19	20	15	5	11	A-4a (5)	
		30																
		31																
		32																
		33																
@33.5' - 40.0', contains rock fragments		34	10 16 22	41	100	SS-13	4.00	-	-	-	-	-	-	-	-	9	A-4a (V)	
		35																
		36																
		37																
		38																
@38.5' - 40.0', "and" fine to coarse sand.		39	14 19 20	42	100	SS-14	4.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
	736.5	EOB 40																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAGS BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 757.7 (MSL) EOB: 15.0 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 711819.020 N, 1828187.930 E

EXPLORATION ID B-278-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 757.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 6" Concrete - 8" Base - 8"	755.9	1																
Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.	754.7	2	2 2 2	5	89	SS-1	-	9	11	14	26	40	27	16	11	23	A-6a (7)	
Medium stiff to stiff brown SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; damp to moist.		3 4	4 2 2	5	17	SS-2	-	19	21	14	26	20	22	16	6	15	A-4a (2)	
		5	4 5 7	16	100	SS-3	1.25	18	15	17	31	19	23	16	7	13	A-4a (3)	
		6 7	5 9 5	18	83	SS-4	1.50	13	18	19	31	19	23	16	7	16	A-4a (3)	
	748.7	8	3 3 3	8	22	SS-5	0.50	-	-	-	-	-	-	-	-	15	A-4a (V)	
Loose brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; moist.	746.7	9 10	WOH 1 6	9	39	SS-6	-	-	-	-	-	-	-	-	-	13	A-4a (V)	
Dense brown GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, trace silt; damp.		11	10 12 13	33	61	SS-7	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
		12 13																
	742.7	14	11 14 16	40	89	SS-8	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	EOB	15																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAGS BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:29

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 769.3 (MSL) EOB: 11.5 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 711867.570 N, 1828520.490 E

EXPLORATION ID B-279-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Granite Pavers - 6" Base - 5"	769.3 768.0	1	50/3"	-	100	SS-1	-	41	32	14	13		NP	NP	NP	14	A-1-b (0)	
POSSIBLE FILL: Medium stiff to stiff brown CLAY (A-7-6), some fine to coarse sand, trace to little gravel; moist.		2 3	2 3 2	7	100	SS-2	1.00	10	10	16	25	39	41	18	23	24	A-7-6 (11)	
	765.3	4																
POSSIBLE FILL: Medium stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.	763.8	5	2 4 6	13	78	SS-3	0.75	9	14	17	34	26	29	16	13	18	A-6a (6)	
Stiff brown SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; damp to moist.		6	2 4 4	11	100	SS-4	1.50	20	14	17	30	19	25	15	10	13	A-4a (3)	
		7	4 5 6	14	100	SS-5	1.25	-	-	-	-	-	-	-	-	19	A-4a (V)	
		8 9	4 5 9	18	89	SS-6	1.25	-	-	-	-	-	-	-	-	12	A-4a (V)	
	757.8	10 11 EOB	10 10 8	24	78	SS-7	1.00	-	-	-	-	-	-	-	-	15	A-4a (V)	

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:29

PROJECT: I-70/I-71 EAST INTERCHANGE
TYPE: ROADWAY
PID: 77370 BR ID:
START: 7/24/10 END: 7/24/10

DRILLING FIRM / OPERATOR: DLZ / K. CONRAD
SAMPLING FIRM / LOGGER: DLZ / S. LARIMER
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 75 TRUCK
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 1/7/10
ENERGY RATIO (%): 79

STATION / OFFSET:
ALIGNMENT: FULTON STREET
ELEVATION: 761.2 (MSL) EOB: 7.5 ft.
COORD: 711920.350 N, 1828944.470 E

EXPLORATION ID B-280-0-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 761.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Concrete - 9" Base - 7"	759.5	1																
FILL: Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; contains brick fragments; moist.	758.2	2	9 6 6	16	78	SS-1	4.00	11	13	17	32	27	29	18	11	15	A-6a (5)	
POSSIBLE FILL: Stiff to very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; moist.	756.7	3 4	3 3 8	14	100	SS-2	2.00	0	2	6	55	37	29	18	11	22	A-6a (8)	
Very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; moist.	755.2	5	6 6 6	16	100	SS-3	3.00	3	9	14	32	42	37	17	20	21	A-6b (12)	
Stiff to very stiff brown SANDY SILT (A-4a), "and" fine to coarse sand, little to some gravel; damp.	753.7	6 7	4 5 6	14	100	SS-4	2.00	20	12	16	31	21	24	16	8	13	A-4a (3)	
		EOB																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:	EXPLORATION ID B-281-0-10
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET	
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 755.1 (MSL) EOB: 9.0 ft.	PAGE 1 OF 1
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 711974.550 N, 1829249.890 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 755.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Concrete - 10" Base - 4"	753.6	1																
FILL: Loose brown GRAVEL WITH SAND (A-1-b), trace silt; damp.		2	3 3 3	8	67	SS-1	-	46	36	12	6		NP	NP	NP	5	A-1-b (0)	
		3																
		4	7 4 3	9	67	SS-2	-	27	40	18	15		NP	NP	NP	6	A-1-b (0)	
@ 4.5'-4.9', concrete fragments.	749.1	5	50/5"	-	60	SS-3	-	-	-	-	-	-	-	-	-	-		
Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), little clay; damp.	747.6	6	11 10 12	29	72	SS-4	-	27	25	15	21	12	30	20	10	12	A-2-4 (0)	
Stiff to very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, some gravel; moist.	746.1	7																
EOB		8	14 10 10	26	100	SS-5	2.00	-	-	-	-	-	-	-	-	19	A-6a (V)	
		9																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 750.9 (MSL) EOB: 11.5 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712022.490 N, 1829685.240 E

EXPLORATION ID B-282-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 750.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 8" Brick - 4"	749.9																	
FILL: Stiff dark brown SILT AND CLAY (A-6a), some fine to coarse sand, some gravel; contains brick fragments; damp.	748.4	1	10 5 5	13	83	SS-1	1.50	21	13	14	31	21	28	16	12	15	A-6a (4)	
FILL: Soft to medium stiff dark brown SANDY SILT (A-4a), "and" fine to coarse sand, little gravel; damp.		2	6 2 1	4	100	SS-2	0.50	12	27	21	29	11	NP	NP	NP	21	A-4a (1)	
@ 2.5'-4.0', contains brick fragments.	745.4	3	0 2 1	4	56	SS-3	0.50	15	20	21	31	13	24	20	4	21	A-4a (2)	
FILL: Medium stiff to stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; slightly organic; moist.		4	1 3 5	11	100	SS-4	0.50	4	5	17	42	32	34	20	14	31	A-6a (9)	
@ 5.5'-7.0', contains brick fragments.	742.4	5	0 3 7	13	100	SS-5	1.25	-	-	-	-	-	-	-	-	19	A-6a (V)	
Hard gray SILTY CLAY (A-6b), "and" fine to coarse sand, some gravel; damp to moist.		6	17 22 19	54	100	SS-6	4.5+	-	-	-	-	-	-	-	-	9	A-6b (V)	
	739.4	7	16 17 24	54	67	SS-7	4.50	-	-	-	-	-	-	-	-	14	A-6b (V)	
		EOB																

W

NOTES: SEEPAGE AT 6.5 FEET; NO FINAL WATER LEVEL DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:30

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 752.5 (MSL) EOB: 8.5 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712102.150 N, 1830071.390 E

EXPLORATION ID B-283-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 752.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 5" Concrete - 7"	751.5	1																
FILL: Medium dense brown GRAVEL WITH SAND (A-1-b), little silt; damp.	750.0	2	7 11 10	28	44	SS-1	-	26	34	26	- 14 -		NP	NP	NP	6	A-1-b (0)	
POSSIBLE FILL: Loose brown GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, little silt; damp.	748.5	3	8 3 4	9	44	SS-2	-	50	22	12	- 16 -		NP	NP	NP	7	A-1-b (0)	
Very stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; damp to moist.	747.0	4	4 6 7	17	100	SS-3	3.00	5	3	12	32	48	39	20	19	20	A-6b (12)	
FILL: Very stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.		5																
		6	9 9 8	22	100	SS-4	4.00	10	11	20	34	25	25	15	10	13	A-4a (5)	
	744.0	7	9 8 11	25	100	SS-5	3.75	-	-	-	-	-	-	-	-	12	A-4a (V)	
	EOB	8																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:30

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:	EXPLORATION ID B-284-0-10
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: FULTON STREET	
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 762.6 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712227.300 N, 1831034.150 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 762.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 5" Base - 10"	761.3	1																
POSSIBLE FILL: Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, some gravel; contains concrete fragments; damp.	760.1	2	2 8 8	21	50	SS-1	1.50	25	13	9	32	21	30	18	12	15	A-6a (4)	
Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.	758.6	3 4	6 7	17	89	SS-2	2.50	9	9	18	36	28	28	17	11	17	A-6a (6)	
Hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.	755.6	5 7	8 8 8	21	100	SS-3	4.00	11	10	20	35	24	24	15	9	12	A-4a (5)	
		6 8	8 8 8	21	94	SS-4	4.5+	11	11	19	35	24	24	15	9	12	A-4a (5)	
		EOB 7																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE
TYPE: ROADWAY
PID: 77370 BR ID:
START: 5/25/10 END: 5/25/10

DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI
SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 75 TRUCK
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 1/7/10
ENERGY RATIO (%): 64.7

STATION / OFFSET:
ALIGNMENT: FULTON STREET
ELEVATION: 768.3 (MSL) EOB: 7.0 ft.
COORD: 712307.670 N, 1831623.290 E

EXPLORATION ID B-285-0-10

MATERIAL DESCRIPTION AND NOTES	ELEV. 768.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Base - 4"	767.6																	
FILL: Soft to medium stiff brown CLAY (A-7-6), little to some fine to coarse sand, little gravel; contains rock fragments and organic odor; moist.	765.8	1	6 5 14	20	22	SS-1	0.50	11	8	12	24	45	56	25	31	30	A-7-6 (18)	
FILL: Stiff mottled brown and dark gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp to moist.	764.3	2	2 6 9	16	94	SS-2	1.50	6	12	16	38	28	26	16	10	16	A-4a (6)	
FILL: Soft to medium stiff brown and dark brown SILT AND CLAY (A-6a), "and" fine to coarse sand, trace gravel; moist. @5.5' - 6.5', contains brick fragments.	761.8	3	3 6 4	11	100	SS-3	0.50	9	27	15	26	23	33	18	15	21	A-6a (5)	
		4																
		5																
		6	2 7 8	16	33	SS-4A	0.50	6	34	16	23	21	31	17	14	21	A-6a (3)	
Medium stiff to stiff brown SILTY CLAY (A-6b), little silt, little fine to coarse sand; little gravel; damp to moist.	761.3	EOB 7			-	SS-4B	1.00	-	-	-	-	-	-	-	-	11	A-6b (V)	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; AUGER CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 768.7 (MSL) EOB: 7.0 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712415.800 N, 1828679.080 E

EXPLORATION ID B-292-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 768.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 3" Brick - 5" Base - 4"	767.7																	
Medium dense brown GRAVEL WITH SAND (A-1-b), some to "and" fine to coarse sand, little silt; damp.		1	12 12 8	26	67	SS-1	-	45	23	15	- 17 -		NP	NP	NP	6	A-1-b (0)	
		2																
		3	15 9 11	26	89	SS-2	-	52	21	11	- 16 -		NP	NP	NP	8	A-1-b (0)	
		4																
		5	13 12 8	26	78	SS-3	-	44	25	14	- 17 -		NP	NP	NP	7	A-1-b (0)	
		6																
	761.7	EOB 7	7 9 9	24	89	SS-4	-	36	39	11	- 14 -		NP	NP	NP	6	A-1-b (0)	

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 754.2 (MSL) EOB: 7.0 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712508.040 N, 1829506.190 E

EXPLORATION ID B-294-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Concrete - 8"	754.2 753.2	1																
POSSIBLE FILL: Medium stiff brown SILTY CLAY (A-6b), some fine to coarse sand, little gravel; moist.	751.7	2	6 6 3	12	50	SS-1	1.75	11	10	18	33	28	33	17	16	21	A-6b (8)	
Hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp to moist.	748.7	3 4 5	6 7 17	32	72	SS-2	4.00	6	7	10	36	41	33	19	14	17	A-6a (10)	
			17 14 12	34	100	SS-3	4.25	0	1	2	54	43	31	19	12	19	A-6a (9)	
Hard brown SANDY SILT (A-4a), "and" fine to coarse sand, trace gravel; damp.	747.2	6	14 14 12	34	100	SS-4	4.50	8	20	21	33	18	22	16	6	11	A-4a (3)	
	EOB	7																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS OBSERVED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:33

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 752.2 (MSL) EOB: 12.5 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712560.810 N, 1829857.100 E

EXPLORATION ID B-295-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 752.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 7" Concrete - 14"	750.4	1																
FILL: Stiff to very stiff dark brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; damp to moist.		2	1 3 2	7	78	SS-1	2.25	6	9	18	35	32	32	17	15	19	A-6a (8)	
		3																
		4	4 2 3	7	67	SS-2	1.00	9	11	18	35	27	30	16	14	17	A-6a (7)	
		5																
		6	6 4 4	11	72	SS-3	1.00	18	12	20	29	21	27	13	14	15	A-6a (4)	
@ 6.5'-9.5', some gravel.		7	5 3 3	8	50	SS-4	1.25	25	13	17	24	21	29	16	13	16	A-6a (3)	
		8																
		9	5 4 7	14	89	SS-5	1.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
@ 9.5'-11.0', brick fragments.	741.2	10	15 25 23	63	67	SS-6	-	-	-	-	-	-	-	-	-	-		
Hard gray SILTY CLAY (A-6b), some to "and" fine to coarse sand, little gravel; damp.	739.7	11	16 16 17	43	83	SS-7	4.5+	-	-	-	-	-	-	-	-	10	A-6b (V)	
	EOB	12																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:33

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:	EXPLORATION ID B-296-0-10
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET	
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 755.1 (MSL) EOB: 6.6 ft.	PAGE 1 OF 1
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712620.760 N, 1830181.910 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 755.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 6" Concrete - 6"	754.1																	
Very stiff brown CLAY (A-7-6), some fine to coarse sand, trace gravel; moist.	752.6	1	5 4 3	9	17	SS-1	3.00	5	13	14	27	41	44	20	24	22	A-7-6 (13)	
Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; damp.	749.6	2 3 4 5	7 6 8	18	33	SS-2	4.50	12	12	13	33	30	33	18	15	12	A-6a (8)	
			4 5 7	16	100	SS-3	3.75	7	14	20	35	24	31	19	12	18	A-6a (6)	
Hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.	748.5	6	15 25 50/1"	-	85	SS-4	4.50	16	12	19	33	20	25	16	9	12	A-4a (4)	
		EOB																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 760.8 (MSL) EOB: 7.0 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712691.540 N, 1830583.100 E

EXPLORATION ID B-297-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 6" Base - 6"	760.8 759.8	1																
FILL: Stiff to very stiff brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.	758.3	2	5 5 6	14	72	SS-1	2.00	15	13	19	33	20	21	15	6	10	A-4a (4)	
FILL: Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; contains brick fragments; moist.	756.8	3	3 6 17	30	67	SS-2	1.50	16	16	17	26	25	29	18	11	15	A-6a (4)	
POSSIBLE FILL: Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp.	755.3	4 5	8 10 7	22	100	SS-3	4.5+	15	17	15	32	21	29	17	12	13	A-6a (4)	
POSSIBLE FILL: Very stiff brown SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; damp.	753.8	6	7 13 10	30	89	SS-4	2.50	16	17	18	30	19	24	16	8	12	A-4a (3)	
	EOB	7																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / S. LARIMER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 763.5 (MSL) EOB: 10.0 ft.
START: 7/24/10 END: 7/24/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712714.230 N, 1831003.220 E

EXPLORATION ID B-298-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Base - 6"	763.5 / 762.7																	
FILL: Medium stiff to stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; moist.	761.0	1	7 5 5	13	78	SS-1	1.00	13	18	12	36	21	31	20	11	23	A-6a (5)	
FILL: Very stiff brown CLAY (A-7-6), "and" fine to coarse sand, some gravel; contains brick fragments; damp.	759.5	2	3 50/5"	-	73	SS-2	3.75	21	27	10	21	21	41	19	22	16	A-7-6 (5)	
FILL: Loose brown GRAVEL WITH SAND (A-1-b), trace silt; contains concrete and brick fragments; damp.	758.0	3	3 2 2	5	56	SS-3	-	43	45	6	- 6 -		NP	NP	NP	5	A-1-b (0)	
FILL: Dense brown GRAVEL WITH SAND AND SILT (A-2-4); damp.	756.5	4	6 13 17	40	44	SS-4	-	25	34	13	- 28 -		NP	NP	NP	9	A-2-4 (0)	
Medium dense brown SANDY SILT (A-4a), "and" fine to coarse sand, little gravel; damp.	755.0	5	4 9 10	25	89	SS-5	-	-	-	-	-	-	-	-	-	13	A-4a (V)	
Medium dense to dense brown COARSE AND FINE SAND (A-3a), little silt; damp.	753.5	6	10 10 13	30	100	SS-6	-	-	-	-	-	-	-	-	-	14	A-3a (V)	
		EOB 7																
		8																
		9																
		10																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BAG ASPHALT PATCH; BAG BENTONITE CHIPS; SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - I-70/I-71 East Interchange - 10/11/10 17:34

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:	EXPLORATION ID B-299-0-10	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET		
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 766.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1	
START: 6/1/10 END: 6/1/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712796.330 N, 1831394.600 E		

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
	766.0																	
Asphalt - 2" Base - 4" Brick Fill - 6"	765.0	1																
POSSIBLE FILL: Stiff to very stiff mottled brown and gray SILTY CLAY (A-6b), little to some fine to coarse sand, trace gravel; moist. @2.5' - 4.0', contains trace rock fragments and brick nodules.	762.0	2 3 4	1 3 3	6	67	SS-1	2.00	1	5	10	41	43	37	17	20	24	A-6b (12)	
			7 3 6	10	67	SS-2	2.00	4	5	16	42	33	35	17	18	19	A-6b (11)	
POSSIBLE FILL: Stiff to very stiff mottled brown and gray SANDY SILT (A-4a), trace gravel; contains trace rock fragments and brick nodules; damp to moist.	759.0	5 6	3 3 5	9	44	SS-3	1.50	4	9	47	16	24	25	15	10	19	A-4a (1)	
		EOB 7	5 8 11	20	89	SS-4	2.50	9	12	26	38	15	19	16	3	12	A-4a (4)	

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 770.2 (MSL) EOB: 7.0 ft.
START: 6/1/10 END: 6/1/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712829.410 N, 1831782.080 E

EXPLORATION ID B-300-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 770.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
Asphalt - 4" Base - 6"	769.4																	
FILL: Very stiff dark brown to black GRAVEL WITH SAND AND SILT (A-2-4), trace to little clay; contains rock fragments; moist.	767.7	1	8 8 4	13	14	SS-1	--	26	19	24	21	10	NP	NP	NP	16	A-2-4 (0)	
POSSIBLE FILL: Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; contains rock fragments; damp to moist.	766.2	2	4 3 6	10	22	SS-2	1.25	8	13	20	29	30	31	16	15	19	A-6a (7)	
POSSIBLE FILL: Very stiff mottled brown and gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		3	2 6 8	15	100	SS-3	2.50	2	13	18	41	26	25	17	8	15	A-4a (6)	
@5.5', some gravel, contains nodules.	763.2	4	1 6 10	17	39	SS-4	3.00	29	11	14	27	19	24	16	8	11	A-4a (2)	
		EOB 5																
		6																
		7																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / J. POILLUCCI	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / D. WILLIARD	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 774.0 (MSL) EOB: 7.0 ft.
START: 6/1/10 END: 6/1/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 64.7	COORD: 712903.380 N, 1832183.200 E

EXPLORATION ID B-301-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
	774.0																	
Asphalt - 2" Base - 4"	773.5																	
POSSIBLE FILL: Stiff to very stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; contains trace brick nodules and rock fragments; damp.		1	2 9 6	16	50	SS-1	4.00	7	15	18	38	22	20	15	5	13	A-4a (5)	
		2	4 5 5	11	100	SS-2	1.50	13	15	18	34	20	22	15	7	14	A-4a (4)	
		3	2 4 6	11	100	SS-3	2.50	10	17	20	34	19	21	15	6	14	A-4a (4)	
		4	5 9 10	20	100	SS-4	3.00	16	14	17	32	21	23	15	8	12	A-4a (4)	
	767.0	EOB 5																
		6																
		7																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS

PROJECT: I-70/I-71 EAST INTERCHANGE	DRILLING FIRM / OPERATOR: DLZ / K. CONRAD	DRILL RIG: CME 75 TRUCK	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: DLZ / M. EVENER	HAMMER: CME AUTOMATIC	ALIGNMENT: MOUND STREET
PID: 77370 BR ID:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/7/10	ELEVATION: 777.9 (MSL) EOB: 7.0 ft.
START: 7/1/10 END: 7/1/10	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79	COORD: 712962.731 N, 1832605.412 E

EXPLORATION ID B-302-0-10

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 777.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	INST.
Asphalt - 3"	777.6																	
FILL: Medium dense brown GRAVEL (A-1-a), some fine to coarse sand, trace silt; damp.	775.4	1	10 11 6	22	17	SS-1	-	63	18	13	- 6 -		NP	NP	NP	11	A-1-a (0)	
POSSIBLE FILL: Very stiff brown CLAY (A-7-6), some fine to coarse sand, some gravel; moist. (QNS to perform gradation)	773.9	2	6 6 5	14	11	SS-2	2.50	-	-	-	-	-	42	19	23	22	A-7-6 (V)	
POSSIBLE FILL: Stiff to very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; moist.	772.4	3	5 5 6	14	28	SS-3	2.00	6	10	17	26	41	39	19	20	19	A-6b (10)	
POSSIBLE FILL: Very stiff brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.	770.9	4	4 5 13	24	33	SS-4	2.50	12	6	17	41	24	25	17	8	14	A-4a (6)	
		EOB 5 6 7																

NOTES: NO SEEPAGE OR FINAL WATER LEVELS DETECTED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 1 BAG ASPHALT PATCH; PLACED 1 BAG BENTONITE CHIPS

APPENDIX II

Subgrade Analysis Worksheets

Subgrade Analysis

V. 11.00 07/07/10

Design CBR 8

Global Options		
320	R&R	No
206	CS	Option
	LS	No
	LKD	Option
206	Depth	12

Classification Counts by Sample																	
R	1a	1b	3	3a	2-4	2-5	2-6	2-7	4a	4b	5	6a	6b	7-5	7-6	8a	8b
0	1	5	0	0	2	0	0	0	13	0	0	12	4	0	3	0	0
	3%	13%			5%				33%			30%	10%		8%		
0%	20%								80%								

Surface Class		
2-5	0	
4b	0	
5	0	
7-5	0	
7-6	1	10%
8a	0	
8b	0	
R	0	

% Borings	
N_{60L}<= 5	10%
<=10	50%
>=20	10%
M+	80%
R	0%

% Surface	
60%	
0%	60%

Rig	ER
A	79
B	65
C	
D	
E	
F	
G	
H	

Total Borings	10
PID	77370
Location	Mound Street

	N_{60}	N_{60L}			PI		Clay		M	M_{OPT}		GI
Average	21.0	11.2			12.3		21.7		14.6	12.1		5.47
Maximum	99	24	44	20	24	42	43	84	24	18		14
Minimum	5	5	19	13	3	3	3	6	5	6		0

UC @ Surface
16.2
24
12

	Boring					Subgrade		Standard Penetration						Physical Characteristics						Moisture		Class		Comments	Problem		Undercuts		Analysis
#	B #	Boring Location	Depth	To	Cut Fill	Depth	To	n_2	n_3	N	Rig	N_{60}	N_{60L}	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Ohio DOT	GI		w/ Class	w/ MN	UC Class	UC MN	
1	B-292-0	Sta. 18+33	1.0	2.5	0.0	1.0	2.5	12	8	20	A	26		NP	NP	NP	9	8	17	6	6	1b	0						
			2.5	4.0		2.5	4.0	9	11	20		26		NP	NP	NP	8	8	16	8	6	1b	0						
			4.0	5.5		4.0	5.5	12	8	20		26		NP	NP	NP	9	8	17	7	6	1b	0						
			5.5	7.0		5.5	7.0	9	9	18		24	24	NP	NP	NP	7	7	14	6	6	1b							
2	B-294-0	Sta. 26+65	1.0	2.5	0.0	1.0	2.5	6	3	9	A	12		33	17	16	33	28	61	21	16	6b	8			MN		12	
			2.5	4.0		2.5	4.0	7	17	24		32		33	19	14	36	41	77	17	14	6a	10						
			4.0	5.5		4.0	5.5	14	12	26		34		31	19	12	31	19	50	19	14	6a	4						
			5.5	7.0		5.5	7.0	14	12	26		34	12	22	16	6	22	16	38	11	11	4a							
3	B-295-0	Sta. 30+20	2.0	3.5	0.0	2.0	3.5	3	2	5	A	7		32	17	15	35	32	67	19	14	6a	8			N		21	
			3.5	5.0		3.5	5.0	2	3	5		7		30	16	14	35	27	62	17	14	6a	7			N		21	
			5.0	6.5		5.0	6.5	4	4	8		11		27	13	14	29	21	50	15	14	6a	4			N		14	
			6.5	8.0		6.5	8.0	3	3	6		8	7	29	16	13	24	21	45	16	14	6a				N		18	
4	B-296-0	Sta. 33+50	1.0	2.5	0.0	1.0	2.5	4	3	7	A	9		44	20	24	27	41	68	22	18	7-6	13			N		16	
			2.5	4.0		2.5	4.0	6	8	14		18		33	18	15	33	30	63	12	14	6a	8						
			4.0	5.5		4.0	5.5	5	7	12		16		31	19	12	35	24	59	18	14	6a	6						
			5.5	6.6		5.5	6.6	25	50	75		99	9	25	16	9	33	20	53	12	11	4a							
5	B-297-0	Sta. 37+58	1.0	2.5	0.0	1.0	2.5	5	6	11	A	14		21	15	6	33	20	53	10	10	4a	4						
			2.5	4.0		2.5	4.0	6	17	23		30		29	18	11	26	25	51	15	14	6a	4						
			4.0	5.5		4.0	5.5	10	7	17		22		29	17	12	32	21	53	13	14	6a	4						
			5.5	7.0		5.5	7.0	13	10	23		30	14	24	16	8	30	19	49	12	11	4a							
6	B-298-0	Sta. 41+77	1.0	2.5	0.0	1.0	2.5	5	5	10	A	13		31	20	11	36	21	57	23	15	6a	5			MN		12	
			2.5	3.4		2.5	3.4	50		50		66		41	19	22	21	21	42	16	18	7-6	5						
			4.0	5.5		4.0	5.5	2	2	4		5		NP	NP	NP	3	3	6	5	6	1b	0			N		---	
			5.5	7.0		5.5	7.0	13	17	30		40	5	NP	NP	NP	14	14	28	9	10	2-4							
7	B-299-0	Sta. 45+76	1.0	2.5	0.0	1.0	2.5	3	3	6	B	6		37	17	20	41	43	84	24	16	6b	12			N		24	
			2.5	4.0		2.5	4.0	3	6	9		10		35	17	18	42	33	75	19	16	6b	11			N		15	
			4.0	5.5		4.0	5.5	3	5	8		9		25	15	10	16	24	40	19	10	4a	1			N		16	
			5.5	7.0		5.5	7.0	8	11	19		20	6	19	16	3	38	15	53	12	11	4a							
8	B-300-0	Sta. 49+64	1.0	2.5	0.0	1.0	2.5	8	4	12	B	13		NP	NP	NP	21	10	31	16	10	2-4	0			MN		12	
			2.5	4.0		2.5	4.0	3	6	9		10		31	16	15	29	30	59	19	14	6a	7			N		15	
			4.0	5.5		4.0	5.5	6	8	14		15		25	17	8	41	26	67	15	12	4a	6						
			5.5	7.0		5.5	7.0	6	10	16		17	10	24	16	8	27	19	46	11	11	4a							
9	B-301-0	Sta. 53+72	1.0	2.5	0.0	1.0	2.5	9	6	15	B	16		20	15	5	38	22	60	13	10	4a	5						
			2.5	4.0		2.5	4.0	5	5	10		11		22	15	7	34	20	54	14	10	4a	4			N		14	
			4.0	5.5		4.0	5.5	4	6	10		11		21	15	6	34	19	53	14	10	4a	4			N		14	
			5.5	7.0		5.5	7.0	9	10	19		20	11	23	15	8	32	21	53	12	10	4a							
10	B-302-0	Sta. 880+00	1.0	2.5	0.0	1.0	2.5	11	6	17	A	22		NP	NP	NP	3	3	6	11	6	1a	0						
		(Ramp P2)	2.5	4.0		2.5	4.0	6	5	11		14		42	19	23				22	18	7-6	14			MN		12	
			4.0	5.5		4.0	5.5	5	6	11		14		39	19	20	26	41	67	19	16	6b	10						
			5.5	7.0		5.5	7.0	5	13	18		24	14	25	17	8	41	24	65	14	12	4a							

Subgrade Analysis	
V. 11.00	07/07/10
Design CBR	**7**

Global Options		
320	R&R	No
206	CS	Option
	LS	No
	LKD	Option
206	Depth	14

Classification Counts by Sample

R	1a	1b	3	3a	2-4	2-5	2-6	2-7	4a	4b	5	6a	6b	7-5	7-6	8a	8b
0	3	5	0	1	1	0	0	0	24	0	0	13	4	0	5	0	0
	5%	9%		2%	2%				43%			23%	7%		9%		
0%	18%								82%								

Surface Class		
2-5	0	
4b	0	
5	0	
7-5	0	
7-6	2	12%
8a	0	
8b	0	
R	0	

% Borings	
N_{60L}<= 5	18%
<=10	59%
>=20	0%
M+	82%
R	0%

% Surface	
82%	
0%	35%

UC @ Surface
5.3
27
0

Rig	ER
A	79
B	60
C	65
D	
E	
F	
G	
H	

Total Borings	17
PID	77370
Location	Fulton Street

	N_{60}	N_{60L}	LL	PL	PI	Silt	Clay	P 200	M	M_{OPT}	GI
Average	17.2	9.5			12.3		23.9		15.3	11.9	5.76
Maximum	66	17	56	25	31	55	48	92	31	22	18
Minimum	4	4	22	14	4	0	0	6	4	6	0

Boring						Subgrade		Standard Penetration						Physical Characteristics						Moisture		Class		Comments	Problem		Undercuts		Analysis
#	B #	Boring Location	Depth	To	Cut Fill	Depth	To	n_2	n_3	N	Rig	N_{60}	N_{60L}	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Ohio DOT	GI		w/ Class	w/ MN	UC Class	UC MN	
1	B-278-0	Sta. 19+60	1.5	3.0	0.0	1.5	3.0	2	2	4	A	5		27	16	11	26	40	66	23	14	6a	7			N		27	
			3.0	4.5		3.0	4.5	2	2	4		5		22	16	6	26	20	46	15	11	4a	2			N		27	
			4.5	6.0		4.5	6.0	5	7	12		16		23	16	7	31	19	50	13	11	4a	3						
			6.0	7.5		6.0	7.5	9	5	14		18	5	23	16	7	31	19	50	16	11	4a							
2	B-279-0	Sta. 22-95	1.0	1.3	0.0	1.0	1.3	50		50	A	66		NP	NP	NP	7	6	13	14	6	1b	0			M			
			2.5	4.0		2.5	4.0	3	2	5		7		41	18	23	25	39	64	24	18	7-6	11			N		21	
			4.0	5.5		4.0	5.5	4	6	10		13		29	16	13	34	26	60	18	14	6a	6			MN		12	
			5.5	7.0		5.5	7.0	4	4	8		11	7	25	15	10	30	19	49	13	10	4a				N		14	
3	B-280-0	Sta. 27+22	1.5	3.0	0.0	1.5	3.0	6	6	12	A	16		29	18	11	32	27	59	15	14	6a	5						
			3.0	4.5		3.0	4.5	3	8	11		14		29	18	11	55	37	92	22	14	6a	8			MN		12	
			4.5	6.0		4.5	6.0	6	6	12		16		37	17	20	32	42	74	21	16	6b	12						
			6.0	7.5		6.0	7.5	5	6	11		14	14	24	16	8	31	21	52	13	11	4a							
4	B-281-0	Sta. 30+32	1.5	3.0	0.0	1.5	3.0	3	3	6	A	8		NP	NP	NP	3	3	6	5	6	1b	0			N		---	
			3.0	4.5		3.0	4.5	4	3	7		9		NP	NP	NP	8	7	15	6	6	1b	0			N		---	
			4.5	4.9		4.5	4.9	50	0	50		66		NP	NP	NP													
			6.0	7.5		6.0	7.5	10	12	22		29	8	30	20	10	21	12	33	12	10	2-4							
5	B-282-0	Sta. 34+69	1.0	2.5	0.0	1.0	2.5	5	5	10	A	13		28	16	12	31	21	52	15	14	6a	4						
			2.5	4.0		2.5	4.0	2	1	3		4		NP	NP	NP	29	11	40	21	11	4a	1			N		30	
			4.0	5.5		4.0	5.5	2	1	3		4		24	20	4	31	13	44		15	4a	2			N		30	
			5.5	7.0		5.5	7.0	3	5	8		11	4	34	20	14	42	32	74	31	15	6a				N		14	
6	B-283-0	Sta. 38+63	1.0	2.5	0.0	1.0	2.5	11	10	21	A	28		NP	NP	NP	7	7	14	6	6	1b	0						
			2.5	4.0		2.5	4.0	3	4	7		9		NP	NP	NP	8	8	16	7	6	1b	0			N		---	
			4.0	5.5		4.0	5.5	6	7	13		17		39	20	19	32	48	80	20	16	6b	12						
			5.5	7.0		5.5	7.0	9	8	17		22	9	25	15	10	34	25	59	13	10	4a							
7	B-038-0	Sta. 42+14	1.0	2.5	0.0	1.0	2.5	3	3	6	A	8		23	17	6	33	43	76	22	12	4a	8			N		18	
			2.5	4.0		2.5	4.0	6	6	12		16		29	17	12	37	31	68	18	14	6a	7						
			4.0	5.5		4.0	5.5	10	9	19		25		23	15	8				12	10	4a	5						
			5.5	7.0		5.5	7.0	8	10	18		24	8	23	15	8	30	23	53	11	10	4a							
8	B-041-0	Sta 45+57	1.5	3.0	0.0	1.5	3.0	8	4	12	B	12		NP	NP	NP	6	5	11	5	6	1a	0						
			3.0	4.5		3.0	4.5	4	14	18		18		NP	NP	NP	0	0		4	6	1a	0						
			4.5	6.0		4.5	6.0	7	8	15		15		25	16	9	31	26	57	15	11	4a	4						
													12																
9	B-284-0	Sta. 48+34	1.0	2.5	0.0	1.0	2.5	8	8	16	A	21		30	18	12	32	21	53	15	14	6a	4						
			2.5	4.0		2.5	4.0	6	7	13		17		28	17	11	36	28	64	17	14	6a	6						
			4.0	5.5		4.0	5.5	8	8	16		21		24	15	9	35	24	59	12	10	4a	5						
			5.5	7.0		5.5	7.0	8	8	16		21	17	24	15	9	35	24	59	12	10	4a							
10	B-044-0	Sta. 50+53	1.0	2.5	0.0	1.0	2.5	9	7	16	B	16									16	6b	10						
			2.5	4.0		2.5	4.0	8	5	13		13		35	16	19	33	42	75	20	16	6b	12			MN		12	
			4.0	5.5		4.0	5.5	5	11	16		16		44	14	30	43	40	83	19	18	7-6	17						
			5.5	7.0		5.5	7.0	8	12	20		20	13	25	15	10	40	31	71	14	10	4a							
11	B-045-2	Sta. 61+12	1.5	3.0	0.0	1.5	3.0	4	7	11	A	14		44	18	26	42	45	87	23	18	7-6	15			MN		12	
			3.5	5.0		3.5	5.0	50		50		66								19	18	7-6	14						
													14																

	Boring					Subgrade		Standard Penetration						Physical Characteristics						Moisture		Class		Comments	Problem		Undercuts		Analysis
#	B #	Boring Location	Depth	To	Cut Fill	Depth	To	n_2	n_3	N	Rig	N_{60}	N_{60L}	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Ohio DOT	GI		w/ Class	w/ MN	UC Class	UC MN	
12	B-285-0	Sta. 63+20	1.0	2.5	0.0	1.0	2.5	5	14	19	C	20		56	25	31	24	45	69	30	22	7-6	18			M			
			2.5	4.0		2.5	4.0	6	9	15		16		26	16	10	38	28	66	16	11	4a	6						
			4.0	5.5		4.0	5.5	6	4	10		11		33	18	15	26	23	49	21	14	6a	5			N		14	
			5.5	7.0		5.5	7.0	7	8	15		16	11	31	17	14	23	21	44	21	14	6a				M			
13	B-047-1	Sta. 64+66	1.0	2.5	0.0	1.0	2.5	4	3	7	C	8								13	10	4a	5			N		18	
			3.5	5.0		3.5	5.0	4	4	8		9								14	10	4a	5			N		16	
													8																
14	B-164-1	Sta. 66+56	1.0	2.5	0.0	1.0	2.5	6	13	19	C	20								16	10	4a	5			M			
			3.5	5.0		3.5	5.0	4	6	10		11								14	10	4a	5			N		14	
													11																
15	B-164-0	Sta. 66+87	1.0	2.5	0.0	1.0	2.5	10	8	18	B	18		NP	NP	NP	7	6	13	4	6	1a	0						
			2.5	4.0		2.5	4.0	4	4	8		8		27	18	9	30	23	53	17	13	4a	4			N		18	
			4.0	5.5		4.0	5.5	7	9	16		16		22	15	7	37	23	60	13	10	4a	5						
			5.5	7.0		5.5	7.0	8	13	21		21	8	25	16	9	34	23	57	13	11	4a							
16	B-164-2	Sta. 68+15	1.0	2.5	0.0	1.0	2.5	3	2	5	C	5								21	14	6a	8			N		27	
			3.5	5.0		3.5	5.0	7	8	15		16								5	8	3a	0						
													5																
17	B-164-3	Sta. 69+63	1.5	3.0	0.0	1.5	3.0	5	5	10	C	11		23	16	7	36	23	59	14	11	4a	5			N		14	
			3.5	5.0		3.5	5.0	3	4	7		8								13	14	6a	8			N		18	
													8																