DLZ
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May 22, 2009

Mr. Tom Hibbard, P.E.

Project Manager
ms consultants, inc.
2221 Schrock Road
Columbus, Ohio 43229-1547

Re: Roadway Boring Logs
I-70 Alignment, east of Whittier Street
Project FRA-70-8.93 PID 77369
DLZ Job No.: 0221-1004.01

Dear Mr. Hibbard:

Attached are the boring logs and associated grain-size analysis reports for the forty-nine roadway borings drilled to date along the I-70 alignment for the FRA-70-8.93 project. Boring logs for borings drilled along other alignments will be submitted in separate documents.

Please contact us if you have any questions or concerns about the information presented in this report.

Sincerely,

DLZ OHIO, INC.

Dorothy A. Adams

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

Attachments: As-Drilled Boring Locations
General Boring Information
General Information - Drilling Procedures and Logs of Borings
Legend – Boring Log Terminology
Borings Logs – Forty-nine (49)
Grain-size Analysis Reports

cc: file

FRA-70-8.93 SOUTH INNERBELT
I-70 AS-DRILLED BORING LOCATIONS
(EXCLUDING EAST INTERCHANGE RAMPS AND AREA WEST OF WHITTIER STREET)
PID 77369
MAY 2009

OHIO STATE PLANE COORDINATE SYSTEM, SOUTH ZONE						
NORTH AMERICAN DATUM OF 1983 (1986)						
NUMBER	NORTHING	EASTING	ELEVATION	ALIGNMENT	STATION	OFFSET
B-016-0	711620.1706	1825541.945	723.77	I-70	709+49.49	63.0289
B-017-0	711834.991	1825897.657	737.69	I-70	713+49.89	-51.1336
B-018	711806.1277	1826609.789	740.44	I-70	720+55.54	63.6828
B-020	711940.7345	1826960.759	734.76	I-70	724+03.63	-77.1343
B-022	711905.7014	1827420.656	738.01	I-70	728+59.94	-91.5667
B-023	711780.369	1827393.873	721.95	I-70	728+48.63	36.0955
B-024	711697.8423	1827594.694	743.43	I-70	730+58.01	93.5331
B-025	711853.4867	1827822.427	740.38	I-70	732+65.07	-88.7048
B-027	711671.0495	1828204.921	735.9	I-70	736+63.93	51.2213
B-028	711777.2546	1828551.788	731.73	I-70	740+11.22	-55.2967
B-029	711638.3081	1828591.548	742.29	I-70	740+41.62	85.9587
B-030	711817.3252	1828831.762	736.65	I-70	743+00.05	-64.2076
B-031	711716.0651	1829053.387	735.61	I-70	745+02.00	72.7689
B-033	711911.2666	1829507.244	730.51	I-70	749+82.21	-43.3954
B-035	711844.5938	1829807.277	732.29	I-70	752+66.77	72.7441
B-036	711865.1762	1830097.212	734.67	I-70	755+56.04	101.1724
B-037	712053.8287	1830191.801	749.14	I-70	756+80.53	-69.1783
B-039	711938.9304	1830589.284	739.53	I-70	760+57.45	102.6515
B-042	712130.6804	1830967.398	741.69	I-70	764+57.07	-41.063
B-043	712006.5169	1831083.282	743.12	I-70	765+56.96	96.2977
B-045	712051.0616	1831399.982	745.83	I-70	768+75.91	91.1827
B-046	711994.438	1831592.696	770.05	I-70	770+57.00	173.8817
B-047	712090.9321	1831779.605	753.32	I-70	772+54.77	107.0406
B-049	712315.0269	1832147.761	764.96	I-70	776+53.45	-56.7029
B-050	712275.381	1832579.836	766.31	I-70	780+74.00	50.0463
B-051-0	712389.8097	1833089.592	795.06	I-70	785+95.80	-2.05
B-051-1	712378.2169	1833450.683	794.84	I-70	789+57.40	14.11
B-052	712318.9522	1833746.719	786.36	I-70	792+59.57	51.851
B-053-0	712324.4604	1834149.651	773.81	I-70	796+59.37	-5.44
B-054	712250.1424	1834538.134	775.99	I-70	800+54.44	16.73
B-055	712137.5834	1834896.708	771.28	I-70	804+27.09	71.58
B-056	712201.6285	1835358.008	768.51	I-70	808+73.28	-62.57
B-059	712011.1473	1835723.849	769.69	I-70	812+61.34	78.004
B-062	712107.1534	1836128.264	770.83	I-70	816+49.66	-70.25
B-063	711935.5383	1836498.536	768.99	I-70	820+38.39	53.09
B-064	711998.4190	1836916.961	768.27	I-70	824+48.47	-51.1
B-065	711845.5952	1837318.504	769.76	I-70	828+59.20	73.86
B-068	711986.6660	1837718.930	770.32	I-70	832+53.33	-82.95
B-069	711827.9482	1838118.769	768.32	I-70	836+58.12	62.67
B-070	711767.4022	1838413.789	771.51	I-70	839+54.96	113.59
B-071	712006.5945	1838606.561	778.41	I-70	841+39.85	-131.74
B-073	711939.5377	1838524.845	765.53	I-70	840+60.36	-62.06
B-074	711726.9477	1838653.776	779.81	I-70	841+96.13	146.22
B-075	712023.0239	1838868.284	784.73	I-70	844+00.90	-156.68
B-076	711814.2329	1838906.172	763.52	I-70	844+45.56	50.77
B-077	711903.7894	1839331.991	760.84	I-70	848+68.24	-52.59
B-078	711778.3813	1839713.950	758.48	I-70	852+54.41	59.8
B-079	711893.6098	1840125.131	759.33	I-70	856+60.05	-73.39
B-082	711748.6270	1840495.816	761.39	I-70	860+38.00	50.89

FRA-70-8.93 SOUTH INNERBELT
I-70 SOIL BORINGS - GENERAL BORING INFORMATION
(EXCLUDING EAST INTERCHANGE RAMPS AND AREA WEST OF WHITTIER STREET)
PID 77369
MAY 2009

BORING NUMBER	BORING TYPE	FILL/(CUT) ASSUMED - BASED ON JUNE 2008 ALIGNMENT*	FILL/(CUT) ASSUMED - BASED ON FEBRUARY 2009 ALIGNMENT	DATE DRILLED	DEPTH
B-016-0	ROADWAY/EMBANKMENT	(14.0)	9.5	7/8/2008	25.0
B-017-0	ROADWAY/EMBANKMENT	(5.0)	10.5	7/25/2008	15.0
B-018	ROADWAY/EMBANKMENT	12.0	8.7	7/8/2008	17.5
B-020	ROADWAY/EMBANKMENT	18.0	11.5	7/25/2008	20.0
B-022	ROADWAY	(3.0)	(0.5)	7/24/2008	20.0
B-023	ROADWAY/EMBANKMENT	13.5	15.0	8/20/08 & 9/2/08	35.0
B-024	ROADWAY & RETAINING WALL	(2.0)	(1.0)	7/1 & 7/2/08	111.5
B-025	ROADWAY	(8.5)	(11.5)	7/24/2008	59.3
B-027	ROADWAY	(3.0)	(8.2)	7/8/2008	14.0
B-028	ROADWAY	2.5	(5.6)	7/24/2008	10.0
B-029	ROADWAY & RETAINING WALL	(4.0)	(11.3)	7/9 to 7/14/08	136.5
B-030	ROADWAY & RETAINING WALL	(2.0)	(8.2)	7/20 to 7/23/08	111.0
B-031	ROADWAY	(3.0)	(4.7)	7/7 & 7/8/08	60.0
B-033	ROADWAY	(4.5)	(2.0)	7/24/2008	15.0
B-035	ROADWAY	(3.5)	(5.7)	7/7/2008	15.0
B-036	ROADWAY & RETAINING WALL	(5.0)	(7.2)	7/14 to 7/16/08	115.6
B-037	ROADWAY & RETAINING WALL	(18.0)	(19.4)	7/21 to 7/24/08	130.0
B-039	ROADWAY	(6.0)	(7.7)	7/17/2008	17.5
B-042	ROADWAY	(5.0)	(3.5)	7/21/2008	15.0
B-043	ROADWAY & RETAINING WALL	(6.0)	(7.0)	7/16 to 7/20/08	115.0
B-045	ROADWAY	(5.0)	(5.0)	7/17/2008	15.0
B-046	ROADWAY & RETAINING WALL	(23.0)	not on current roadway alignment	6/26 to 6/27/08	125.0
B-047	ROADWAY	(1.0)	(1.0)	7/17/2008	10.0
B-049	ROADWAY	3.5	3.5	7/20/2008	10.0
B-050	ROADWAY/EMBANKMENT	15.0	15.0	7/17/2008	15.0
B-051-0	ROADWAY	7.0	2.0	3/16/2009	10.0
B-051-1	ROADWAY	--	3.0	3/18/2009	25.0
B-052	ROADWAY/EMBANKMENT	5.3	5.0/(30.0) cut to Ramp Q3	3/17/2009	40.0
B-053-0	ROADWAY/EMBANKMENT	6.0	10.7	7/29/2008	10.0
B-054	ROADWAY	(10.0)	0.0	7/29/2008	17.5
B-055	ROADWAY	--	(3.3)	3/9/2009	12.8
B-056	ROADWAY	--	(1.4)	3/11/2009	11.0
B-059	ROADWAY	--	0.0	3/10/2009	10.0
B-062	ROADWAY	--	(2.1)	3/11/2009	12.0
B-063	ROADWAY	--	(2.0)	3/10/2009	10.0
B-064	ROADWAY	--	(1.4)	3/11/2009	10.0
B-065	ROADWAY	--	0.0	3/10/2009	10.0
B-068	ROADWAY	--	(3.6)	3/11/2009	15.0
B-069	ROADWAY	--	(2.5)	3/9/2009	12.5
B-070	ROADWAY	--	(1.0)	3/10/2009	10.5
B-071	ROADWAY	--	(3.0)	3/10/2009	17.5
B-073	ROADWAY	--	0.0	3/10/2009	10.5
B-074	ROADWAY	--	0.0	3/10/2009	7.5
B-075	ROADWAY & RETAINING WALL	--	0.0	3/11/2009	50.0
B-076	ROADWAY	--	0.0	3/10/009	10.0
B-077	ROADWAY	--	(1.7)	3/10/2009	17.5
B-078	ROADWAY	--	(4.0)	3/10/2009	15.0
B-079	ROADWAY	--	(3.1)	3/10/2009	12.5
B-082	ROADWAY	--	0.0	3/10/2009	8.5

* - Profile on I-70 changed after locations and depths of borings drilled in July through September 2008 were approved.

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.

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

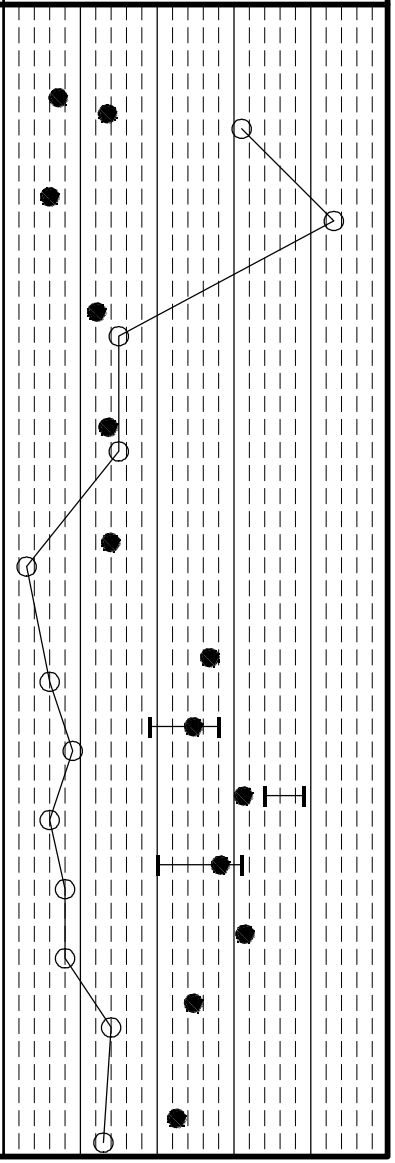
LOG OF: Boring B-016-0 | *Location:* Sta. 709+49.49, 63.03 ft Rt. of I-70 CL | *Date Drilled:* 7/8/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 723.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.0	722.8						Asphalt Concrete Pavement - 8" Aggregate Base - ??							
2.2	721.6	9 10 20	15	1A 1B		4.5+	FILL: Medium dense brown COARSE AND FINE SAND (A-3a), some silt, little gravel; moist.							
3.5	720.3						FILL: Hard brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; contains trace brick fragments; moist.							
5		14 21 21	13	2			FILL: Dense brown GRAVEL WITH SAND AND SILT (A-2-4), some silt; damp.							
6.0	717.8													
		5 6 9	12	3		3.0	FILL: Stiff to very stiff brown and gray SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; contains brick fragments; moist. @ 6.0'-7.5', contains coal fragments.							
10		12 11 4	0	4		1.5								
		1 1 2	9	5		1.5								
13.5	710.3													
15		5 4 2	8	6			FILL: Loose brown COARSE AND FINE SAND (A-3a), some silty clay, little gravel; contains brick fragments, cinders, and rock fragments; damp to moist.							
		4 3 6	8	7					18	33	---	21	5	23
		5 3 3	2	8										
18.0	705.8													
		2 3 5	13	9		1.25	Stiff to very stiff gray SILT AND CLAY (A-6a), little to some fine to coarse sand; moist.		0	5	---	20	46	29
20		3 3 5	14	10		2.5								
		3 6 8	11	11		3.5	@ 21.0'-25.0', brown and gray.							
		4 6 7	17	12		2.0								
25.0	698.8						Bottom of Boring - 25.0'							

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

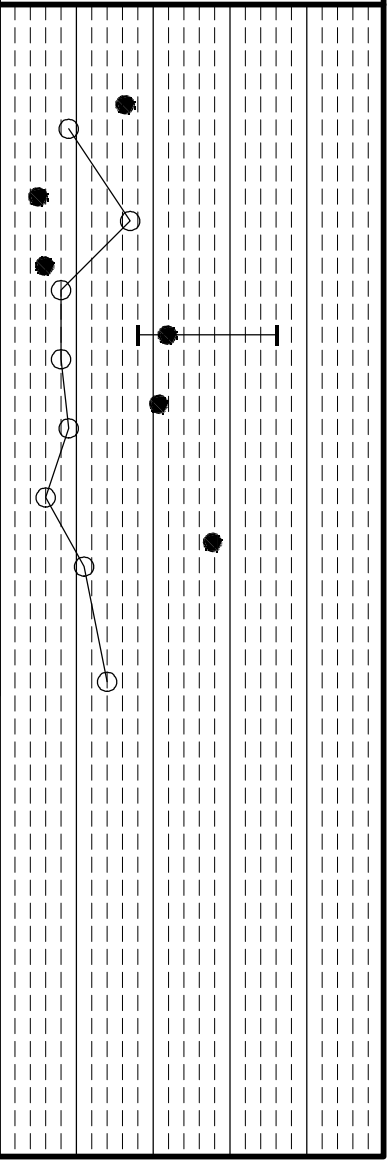
LOG OF: Boring B-017-0 | *Location:* Sta. 713+49.89, 51.13 ft Lt. of I-70 CL | *Date Drilled:* 7/25/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 737.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.8	735.9	6 5 4	9	1		2.5	Asphalt Concrete - 6" Portland Cement Concrete - 11" Aggregate Base - 4" Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; moist.							
3.5	734.2	2 8 8	14	2			Loose to medium dense brown GRAVEL WITH SAND (A-1-b), trace silt; damp.		40	47	---	6	--7--	
6.5	731.2	3 3 5	12	3					44	43	---	5	--8--	
9.5	728.2	5 3 5	15	4		1.5	Medium stiff to stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, trace gravel; damp to moist.		3	9	---	10	33	45
		4 5 4	14	5		0.5								
13.5	724.2	2 2 4	14	6		3.0	Stiff to very stiff gray CLAY (A-7-6), trace fine to coarse sand, trace gravel; moist.							
		5 5 6	16	7		1.5								
15.0	722.7	5 5 9	16	8		1.5	Stiff brown and gray SILTY CLAY (A-6b), little fine to coarse sand, little gravel; moist.							
							Bottom of Boring - 15.0'							

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

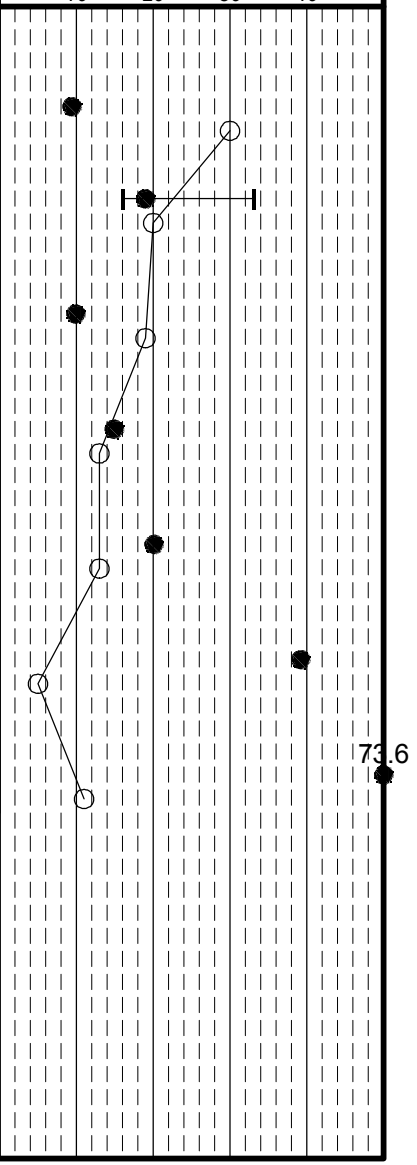
LOG OF: Boring B-018 | *Location:* Sta. 720+55.54, 63.68 ft Rt. of I-70 CL | *Date Drilled:* 7/8/2008

WATER OBSERVATIONS:
Water seepage at: None
Water level at completion: 15.0'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	740.4													
1.2	739.2						Asphalt Concrete Pavement - 10" Aggregate Base - 4"							
		9 17 12	9	1		2.5	FILL: Very stiff brown SILTY CLAY (A-6b), little to some fine to coarse sand, little gravel; contains rock fragments; moist.							
		8 6 13	11	2		2.75			14	16	---	11	30	29
7.0	733.4	7 8 10	16	3		4.0								
8.5	731.9						FILL: Medium dense brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
		5 8 5	1	4		--	FILL: Stiff gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; contains brick fragments; moist.							
11.0	729.4													
		4 7 6	8	5		3.0	Stiff to very stiff gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.							
		5 2 3	12	6		1.5								
17.5	722.9	2 4 7	12	7		2.75	@ 16.0'-17.5', contains wood fragments.							
							Bottom of Boring - 17.5'							

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

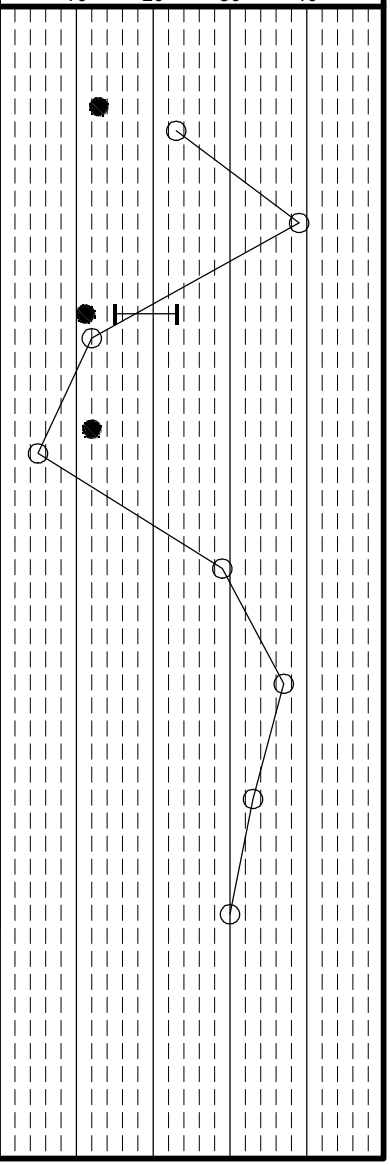
LOG OF: Boring B-020 | *Location:* Sta. 724+03.63, 77.13 ft Lt. of I-70 CL | *Date Drilled:* 7/25/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 734.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.7	733.1						Asphalt Concrete - 6" Portland Cement Concrete - 10" Aggregate Base - 4"							
		5 10 12	12	1		3.0	Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; moist.							
		6 17 21	9	2		2.25								
6.0	728.8													
		4 6 6	18	3		2.0	Very stiff gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		6	12	---	22	37	23
		4 2 3	13	4		2.25	@ 8.5'-10.0', contains trace brick fragments; probably carried by spoon from higher elevation.							
		5 14 14	9	5		2.0								
		15 18 18	1	6		--	@ 13.5'-15.0', little gravel.							
16.0	718.8													
		10 15 17	11	7		2.25	Very stiff grayish brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; very slightly organic, trace organic odor; damp.							
		14 15 14	18	8		3.75								
20.0	714.8						Bottom of Boring - 20.0'							

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

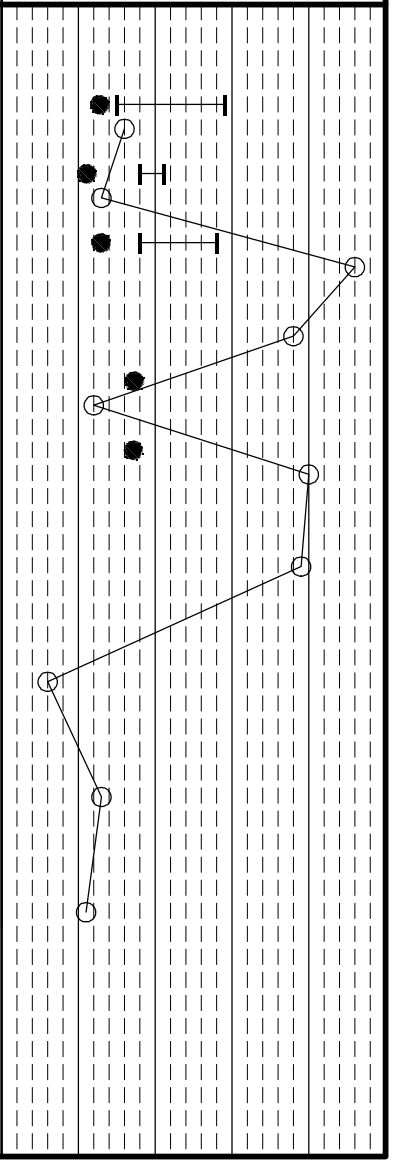
LOG OF: Boring B-022 | *Location:* Sta. 728+59.94, 91.57 ft Lt. of I-70 CL | *Date Drilled:* 7/24/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 738.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.7	736.3						Asphalt Concrete - 6" Portland Cement Concrete - 10" Aggregate Base - 4"							
3.0	735.0	6 9 7	12	1		1.5	FILL: Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp.		15	17	---	17	29	22
4.5	733.5	8 7 6	7	2		--	FILL: Stiff brown GRAVEL WITH SAND AND SILT (A-2-4), some silt, trace clay; moist.		34	23	---	16	18	9
6.0	732.0	5 18 27	15	3		2.0	FILL: Stiff brown SANDY SILT (A-4a), little gravel, trace clay; contains brick and asphalt fragments; damp.		11	23	---	18	30	18
7.5	730.5	9 21 16	16	4			FILL: Dense gray GRAVEL (A-1-a); damp.							
		5 5 7	11	5		3.0	FILL: Very stiff dark brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; moist.							
11.0	727.0	5 8 31	14	6		3.0	@ 9.0'-10.5', contains small brick fragments.							
		8 27 11	11	7			FILL: Dense dark gray SANDY SILT (A-4a), some gravel; damp.							
16.0	722.0	6 3 3	1	8			@ 13.5'-15.0', loose, brown.							
18.5	719.5	5 8 5	13	9			Medium dense brown COARSE AND FINE SAND (A-3a), little silt, trace gravel; damp.							
20.0	718.0	4 5 6	14	10		2.25	Very stiff gray SILTY CLAY (A-6b), trace fine to coarse sand; moist.							
							Bottom of Boring - 20.0'							

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

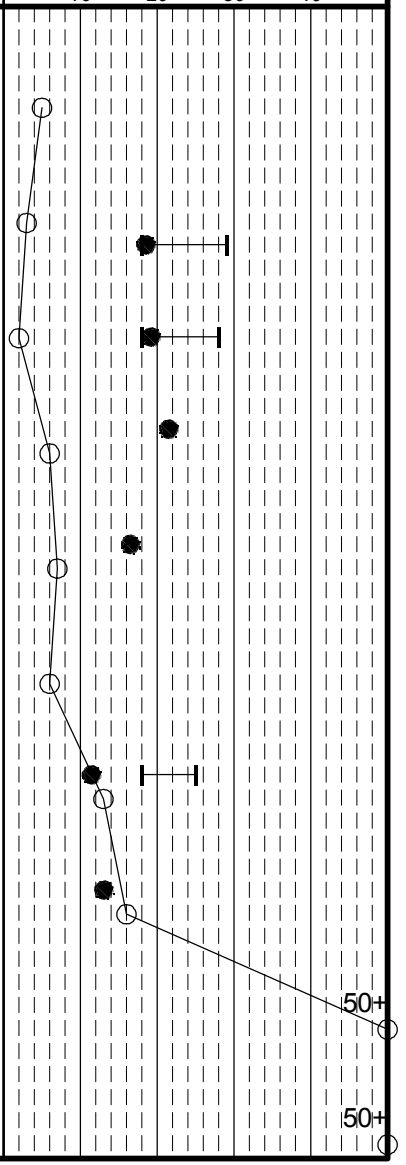
LOG OF: Boring B-023 | *Location:* Sta. 728+48.63, 36.10 ft Rt. of I-70 CL | *Date Drilled:* 8/20/2008 to 9/2/2008

WATER OBSERVATIONS:
Water seepage at: 25.0'
Water level at completion: 19.1'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	722.0													
1.5	720.5	7 2 3	4	1		3.0	Asphalt Concrete - 4" Portland Cement Concrete - 8" Aggregate Base - 6"							
5		1 1 2	12	2	P1	0.25	FILL: Very soft to soft brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; contains few brick fragments; moist. @ 1.5'-2.5', stiff.		14	14	---	21	33	18
6.0	716.0													
		WOH WOH 2	2	3	P2	1.5 0.25	FILL: Very soft to soft brown SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; contains few brick fragments; moist. @ 6.0'-7.5', slight organic odor.		9	16	---	20	32	23
10		1 2 4	18	4		<0.25								
		WOH 3 4	18	5		--								
13.5	708.5													
15		2 3 3	18	6			POSSIBLE FILL: Loose to medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp.							
		7 6 6	10	7					40	15	---	14	24	7
20		7 7 8	8	8			@ 21.0'-21.5', contains turpentine odor.							
21.5	700.5	18 50/6	10	9A 9B			Very dense medium orangish-brown SANDY SILT (A-4a), some fine to coarse sand, some gravel; contains turpentine odor; moist.							
25	697.0	11 43 50/5	14	10										

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
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-023 | *Location:* Sta. 728+48.63, 36.10 ft Rt. of I-70 CL | *Date Drilled:* 8/20/2008 to 9/2/2008

WATER OBSERVATIONS:
Water seepage at: 25.0'
Water level at completion: 19.1'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	697.0						Very dense brown COARSE AND FINE SAND (A-3a), some silt, some gravel; wet.								
		18 32 33	18	11			@ 26.0'-27.5', contains turpentine odor.								68
30		7 31 36	15	12											70
		18 23 29	17	13			@ 31.0'-35.0', gray, little silt, little gravel.								55
35.0 35	687.0	18 28 35	15	14											66
							Bottom of Boring - 35.0'								
40															
45															
50															

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

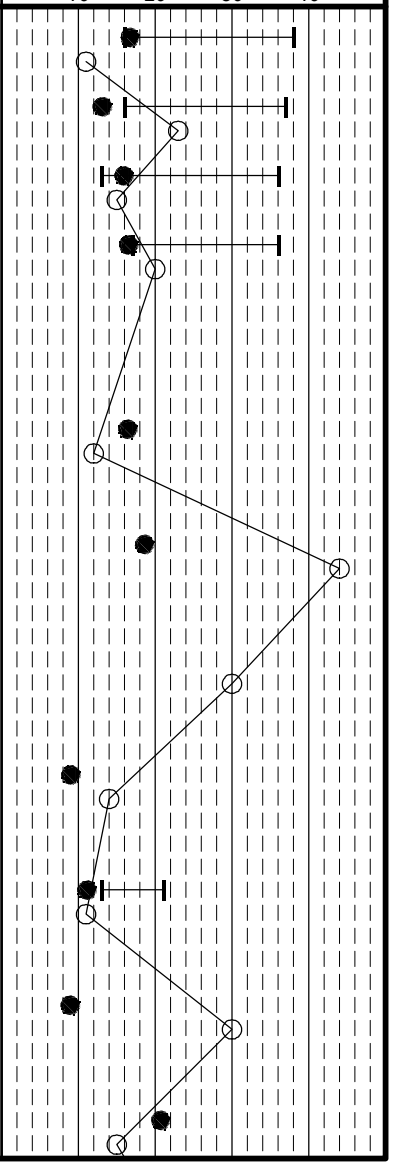
LOG OF: Boring B-024 | *Location:* Sta. 730+58.01, 93.53 ft Rt. of I-70 CL | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring)
10.7' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	743.4	3 4 7	11	1		--	Stiff to very stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, little gravel; damp to moist. @ 0.0 - 3.0', contains roots.		11	9	---	11	32	37
		7 12 11	12	2		4.5+	@ 1.5', hard.		15	8	---	10	32	35
		5 7 8	16	3		4.0	@ 3.0', very stiff to hard.		11	8	---	12	33	36
5		4 6 14	13	4		3.75			12	10	---	13	31	34
		4 4 8	15	5		4.5								
10		14 21 22	9	6		--	@ 11.0', encountered rock fragments.							
		17 14 15	1	7		--								
15.5	727.9						Very stiff brownish gray SANDY SILT (A-4a), little to some fine to coarse sand, trace gravel; damp to moist.							
		4 7 7	18	8		3.5								
20		2 4 7	18	9		3.0			9	15	---	19	35	22
		7 13 16	12	10		--	@ 21.5', encountered possible large rock fragments, cobbles.							
		3 7 8	18	11		3.25								
25	718.4													

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-024 | *Location:* Sta. 730+58.01, 93.53 ft Rt. of I-70 CL | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	718.4														
		8 10 14	18	12		--	Very stiff brownish gray SANDY SILT (A-4a), little to some fine to coarse sand, trace gravel; damp to moist.								
28.0	715.4														
30		3 12 15	16	13			Medium dense brownish gray SILT (A-4b), little fine sand; wet.		0	0	---	17	--83--		NP
32.0	711.4														
35		7 18 18	11	14			Dense brown GRAVEL (A-1-a), some fine to coarse sand, trace to little silty clay; wet.		60	22	---	8	--10--		NP
37.0	706.4														
40		13 26 45	15	15		--	Hard brownish gray SANDY SILT (A-4a), little gravel, trace clay; damp.		12	14	---	27	33	14	72
42.0	701.4														
45		17 26 45	18	16			Very dense brownish gray COARSE AND FINE SAND (A-3a), little silty clay, little gravel; wet. @ 43.5', 2.0 feet sand heave.		16	25	---	47	--12--		NP 72
47.0	696.4														
50	693.4	26 30 27	13	17			Very dense brownish gray SANDY SILT (A-4a), little gravel; wet.								58

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

LOG OF: Boring B-024 | *Location:* Sta. 730+58.01, 93.53 ft Rt. of I-70 CL | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	693.4						Very dense brownish gray GRAVEL WITH SAND (A-1-b), some silty clay; wet.								
55		15 40 50/4	13	18			@ 50.0'-60.0', difficulty advancing boring due to obstruction inside augers blocking rods; possible boulder zone.		30	31	---	16	15	8	50+
57.0	686.4														
							Very dense brownish gray SANDY SILT (A-4a), some gravel, some fine to coarse sand; damp.								
60		37 21 50	13	19					30	19	---	10	28	13	72
62.0	681.4														
							Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet.								
		11 50/4	10	20			@ 63.5', one foot sand heave; encountered black shale fragments.		73	17	---	5	--5--	NP	50+
65															
		50/3	0	21			@ 68.5', possible cobbles or boulders.								50+
70															
		50 50/3	6	22			@ 73.5', 6.0 feet sand heave; washed out with tricone.								50+
75	668.4														

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-024 | *Location:* Sta. 730+58.01, 93.53 ft Rt. of I-70 CL | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring)
10.7' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	668.4						Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet.								
		39 50/3	9	23			@ 78.5', 3.0 feet sand heave.		55	36	---	5	--4--	NP	50+
80							@ 80.0'-90.0', difficult drilling; possible cobbles.								
		50/0	0	24											50+
85															
		50/0	0	25			@ 88.5', 1.0 foot sand heave.								50+
90							@ 90.0' - 91.5', core loss.								
		Core 18"	Rec 0"	RQD 0%	R1		@ 91.5' - 91.8', encountered igneous-plutonic cobble/boulder; likely peridotite or gabbro.								
91.8	651.6						Interbedded Shale (90%) and Limestone (10%) RQD 60%, LOSS 26%; Shale, blue-gray, highly weathered, weak, laminated, slightly calcareous, contains abundant pyritic inclusions, moderately to highly fractured; Limestone, light gray, moderately weathered, moderately strong to strong, fractured.								
95		Core 120"	Rec 116"	RQD 81%	R2		@ 97.7' - 98.1', qu = 1650 psi								
100	643.4														

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-024 | *Location:* Sta. 730+58.01, 93.53 ft Rt. of I-70 CL | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring) 10.7' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	643.4						Interbedded Shale (90%) and Limestone (10%) RQD 60%, LOSS 26%; Shale, blue-gray, highly weathered, weak, laminated, slightly calcareous, contains abundant pyritic inclusions, moderately to highly fractured; Limestone, light gray, moderately weathered, moderately strong to strong, fractured.								
105		Core 120"	Rec 76"	RQD 48%	R3		@ 101.2', dark gray (shale).								
110							@ 107.8' - 111.5', core loss due to pyritic inclusion lodged in core barrel.								
	631.9						Bottom of Boring - 111.5'								
115															
120															
125															

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

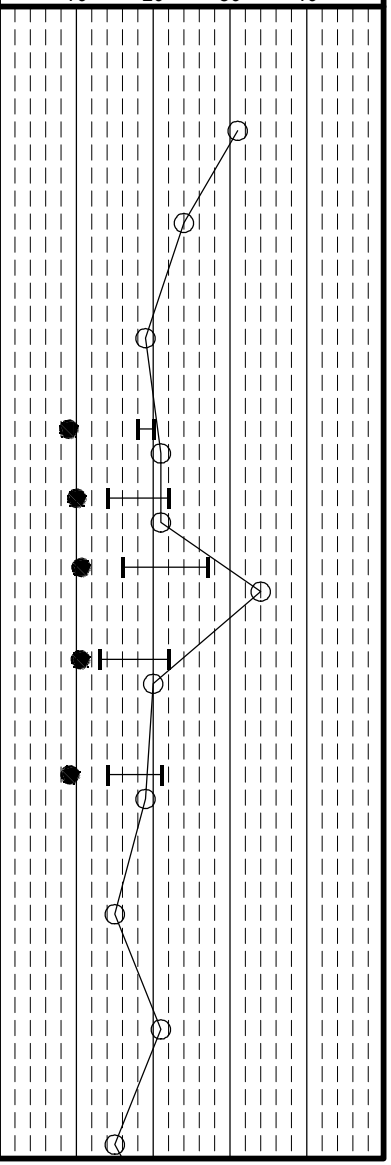
LOG OF: Boring B-025 | *Location:* Sta. 732+65.07, 88.70 ft Lt. of I-70 CL | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 26.0'
Water level at completion: 39.0'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	740.4													
1.2	739.2						Asphalt Concrete - 7" Aggregate Base - 7"							
		14 13 17	15	1		4.5+	FILL: Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; contains few brick fragments; damp.							
3.5	736.9													
5		11 10 14	14	2		4.5+	Hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.							
		6 8 11	14	3		4.5+								
10		7 10 11	18	4		4.5+			18	12	---	16	32	22
11.5	728.9	6 10 11	18	5		4.5+			8	15	---	20	36	21
		14 16 17	4	6		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.		12	16	---	18	34	20
13.5	726.9													
15		5 8 12	18	7		4.5+	Very stiff to hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.							
		5 7 12	18	8		4.5+			15	14	---	19	31	21
20		4 6 9	18	9		2.75								
		5 9 12	18	10		4.5								
25	715.4	5 6 9	18	11		2.5								

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-025 | *Location:* Sta. 732+65.07, 88.70 ft Lt. of I-70 CL | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 26.0'
Water level at completion: 39.0'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	715.4														
		3 6 17	13	12		3.5	Very stiff gray SILTY CLAY (A-6b), little fine sand; moist.								
28.5	711.9														
		17 29 37	10	13			Very dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silty clay; wet.								67
30							@ 30.0'-38.5', encountered cobbles while augering.								
		29 50/5	6	14					50	21	---	10	14	5	NP ● 50+
35															
38.5	701.9														
		23 50/6	10	15		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.								50+
40															
43.5	696.9														
		9 30 37	12	16			Very dense gray GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, little silt; wet.								68
45															
		22 39 30	15	17					39	26	---	22	--13--		NP ● 70
50	690.4														

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

LOG OF: Boring B-025 | *Location:* Sta. 732+65.07, 88.70 ft Lt. of I-70 CL | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 26.0'
Water level at completion: 39.0'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	690.4						Very stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.								
55		22 33 26	13	18		2.5									60 ○
57.0	683.4														
							Very dense brown COARSE AND FINE SAND (A-3a), some silt, little gravel; wet.								
59.3	681.1	48 50/3	9	19											50+ ○
60							Bottom of Boring - 59.3'								
65															
70															
75															

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

LOG OF: Boring B-027 | *Location:* Sta. 736+63.93, 51.22 ft Rt. of I-70 CL | *Date Drilled:* 7/8/2008

WATER OBSERVATIONS:
Water seepage at: 5.0'
Water level at completion: None

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	735.9														10 20 30 40
							Asphalt Concrete Pavement - 7" Portland Cement Concrete - 11" Aggregate Base - 11"								
2.4	733.5	16 23 17	18	1											
3.0	732.9						FILL: Brick fragments, little fine to coarse sand; damp.								
		3 8 12	18	2			Medium dense to dense brown GRAVEL WITH SAND (A-1-b), little to some silt; damp.		19	34	---	25	17	5	
5		13 12 9	18	3					39	32	---	10	--19--		NP
		8 6 16	14	4											
		9 14 28	15	5			@ 7.5'-9.0', contains rust stains.		28	34	---	15	--23--		NP
10.0	725.9														
		13 26 29	13	6			Dense to very dense brown SANDY SILT (A-4a), trace to little gravel; moist.		17	20	---	25	--38--		NP 57
		9 27 22	12	7											51
14.0	721.9														
15							Bottom of Boring - 14.0'								
20															
25															

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

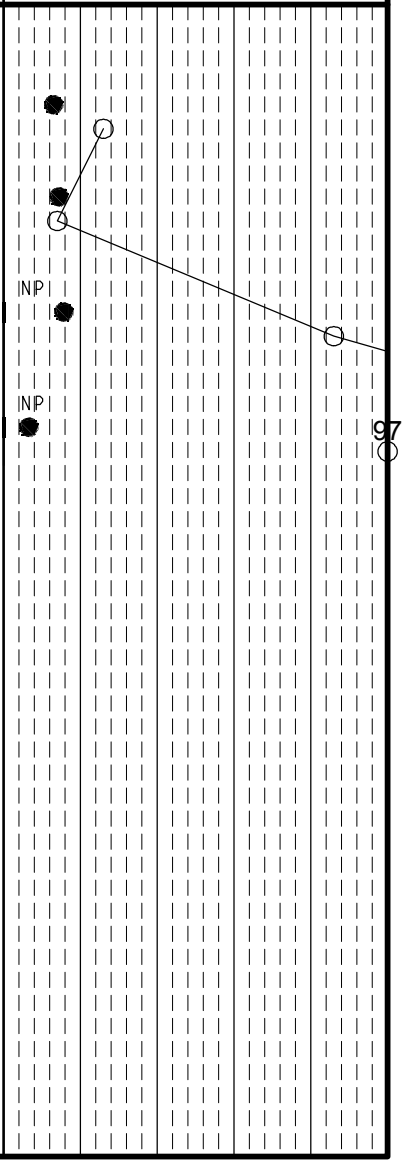
LOG OF: Boring B-028 | *Location:* Sta. 740+11.22, 55.30 ft Lt. of I-70 CL | *Date Drilled:* 7/24/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 731.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.5	730.2						Asphalt Concrete - 12" Aggregate Base - 6"							
		8 6 7	8	1			FILL: Loose to medium dense brown GRAVEL (A-1-a), little to some fine to coarse sand, little silty clay; moist.		65	16	---	6	--13--	
		4 5 2	7	2					70	14	---	5	--11--	
6.0	725.7													
		10 20 22	16	3			FILL: Dense brown GRAVEL WITH SAND (A-1-b), little silt; contains brick fragments and silty clay seams; damp.		34	35	---	14	--17--	
8.5	723.2													
10.0	721.7	47 49 46	12	4			FILL: Very dense gray GRAVEL (A-1-a), trace fine to coarse sand; contains few silty clay seams; damp.		84	5	---	3	--8--	
							Bottom of Boring - 10.0'							

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

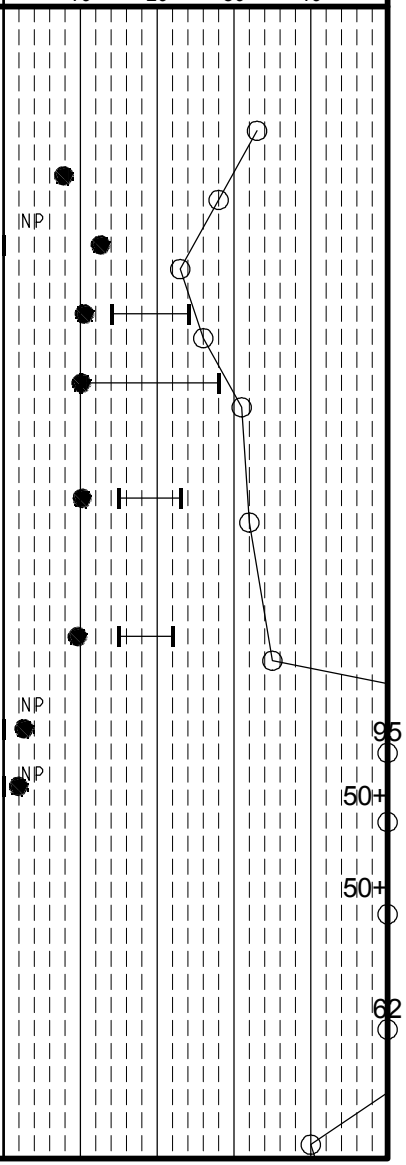
LOG OF: Boring B-029 | *Location:* Sta. 740+41.62, 85.96 ft Rt. of I-70 CL | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08)
20.5' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	742.3						Asphalt Concrete Pavement - 7" Portland Cement Concrete - 9" Aggregate Base - 11"							
2.3	740.0	5 15 17	7	1										
		13 15 12	10	2			POSSIBLE FILL: Medium dense to dense brown GRAVEL WITH SAND (A-1-b), little to some silt; damp.							
5		11 13 10	6	3					55	17	---	9	--19--	
6.0	736.3	4 10 15	14	4		4.5	Hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		12	11	---	16	35	26
7.5	734.8	12 15 15	12	5		4.5	Hard gray SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp to moist.		9	9	---	15	41	26
10.0	732.3	10 14 17	18	6		4.5	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp. @ 11.5'-21.0', difficult drilling.		8	8	---	15	40	29
15		8 15 19	18	7		4.5								
15.0	727.3	15 48 45	12	8			Very dense gray GRAVEL (A-1-a), some fine to coarse sand, trace to little silt; damp.		55	24	---	10	--11--	
		29 50/3	8	9					61	16	---	12	--11--	
		50/5	1	10			@ 18.5'-18.9', rock fragments; possible cobble blocking shoe.							
20														
21.0	721.3	21 28 33	6	11			Very dense gray GRAVEL WITH SAND AND SILT (A-2-4), some silt; wet.							
23.5	718.8	11 18 21	16	12			Dense gray SILT (A-4b), little fine sand; contains interbedded sand seams; wet.							
25	717.3													

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-029 | *Location:* Sta. 740+41.62, 85.96 ft Rt. of I-70 CL | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	717.3														PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
		10 19 25	15	13		4.5+	Hard gray SANDY SILT (A-4a), "and" fine to coarse sand, trace gravel; contains interbedded sand seams; damp.		9	8	---	33	34	16	
28.5	713.8															
30		13 23 31	13	14			Dense to very dense gray COARSE AND FINE SAND (A-3a), some silt; moist.								55
31.8	710.5	3 6		15A											
		29	14	15B		4.5+	Hard gray SANDY SILT (A-4a), some gravel, little to some fine to coarse sand; damp.								
							@ 31.0'-43.5', difficult drilling.								
35		13 26 31	9	16		--	@ 33.5', 5 inches sand heave.								58
40		14 23 33	14	17		4.5+			28	15	---	19	25	13	57
42.0	700.3														
44.2	698.1						Dense gray COARSE AND FINE SAND (A-3a), little silt; contains silty clay seams; wet.								
		10 20 29	18	18A 18B											
45							Dense gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.								
47.0	695.3														
							Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.								NP
		19 37 50/3	15	19											
50	692.3						@ 48.5', 6 inches sand heave.		21	48	---	27	--4--		50+

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

LOG OF: Boring B-029 | *Location:* Sta. 740+41.62, 85.96 ft Rt. of I-70 CL | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	692.3						Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.								
55		10 16 50/5	13	20			@ 53.5', 1.7 feet sand heave; washed out.								50+
57.0	685.3														
							Very dense gray COARSE AND FINE SAND (A-3a), little to some silt, trace to little gravel; wet.								
60		31 50/5	11	21			@ 58.5'-68.5', three to six inches sand heave.								50+
65		21 50/5	11	22					18	13	---	52	--17--		NP 50+
70		13 29 41	14	23											71
73.8	668.5	25		24A		3.75									
75	667.3	38 50/6	18	24B			Very stiff gray SILT (A-4b), little fine sand; moist.								50+

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

LOG OF: Boring B-029 | *Location:* Sta. 740+41.62, 85.96 ft Rt. of I-70 CL | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08)
20.5' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	667.3						Stiff gray SILT AND CLAY (A-6a), some to "and" fine to coarse sand, trace to little gravel; damp to moist.								PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
		50/4	4	25		1.5			25	20	---	18	26	11	50+
80															
84.0	658.3	31		26A											
		31				4.5+									50+
85		50/3	15	26B			Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.								
		15													
		50/4	10	27											50+
90															
		13													NP
		26													
		30	18	28					31	48	---	18	--3--		57
95															
		41													
		50/2	8	29			@ 98.5', 1.2 feet sand heave.								50+
100	642.3														

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

LOG OF: Boring B-029 | *Location:* Sta. 740+41.62, 85.96 ft Rt. of I-70 CL | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08)
20.5' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	642.3						Very dense gray FINE SAND (A-3), little coarse sand, trace gravel; wet.								
105		2 12 49	18	30			@ 103.5', 2.3 feet sand heave.		3	13	---	76	--8--		NP ● 62 ○
110		41 50/0	6	31			@ 113.5', 22 feet sand heave; washed out.								50+ ○
113.5	628.8														
115		50/2	2	32			Severely weathered gray SHALE.								50+ ○
116.5	625.8														
120		Core 42"	Rec 38"	RQD 0%	R-1		Shale, dark gray, moderately to highly weathered, weak, thinly laminated, calcareous, pyritic, fissile, friable, jointed, fractured, tight, slightly rough; RQD 0%, Loss 10%.								
120.6	621.7														
125	617.3	Core 60"	Rec 60"	RQD 88%	R-2		Limestone, brownish-gray, moderately weathered, moderately strong to strong, very thinly bedded, pyritic, cherty, moderately fractured, tight, slightly rough, RQD 86%, Loss 0%. [Delaware Limestone] @ 121.2' - 121.5', qu = 14,137 psi								

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

LOG OF: Boring B-029 | *Location:* Sta. 740+41.62, 85.96 ft Rt. of I-70 CL | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.25" diameter hollowstem augers.*

Depth (ft)	Elev. (ft) 617.3	Blows per 6"	Recovery	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)
130.2 130	612.1	Core 60"	Rec 60"	RQD 85%	R-3		Limestone, brownish-gray, moderately weathered, moderately strong to strong, very thinly bedded, pyritic, cherty, moderately fractured, tight, slightly rough, RQD 86%, Loss 0%. [Delaware Limestone]								
135		Core 60"	Rec 54"	RQD 76%	R-4		Limestone, light gray, slightly weathered, strong, thinly bedded, slightly fossiliferous, stylolitic, slightly fractured, tight to narrow, slightly rough, RQD 82%, Loss 8%. [Columbus Limestone]								
	605.8	Core 18"	Rec 18"	RQD 100%	R-5										
							Bottom of Boring - 136.5'								
140															
145															
150															

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

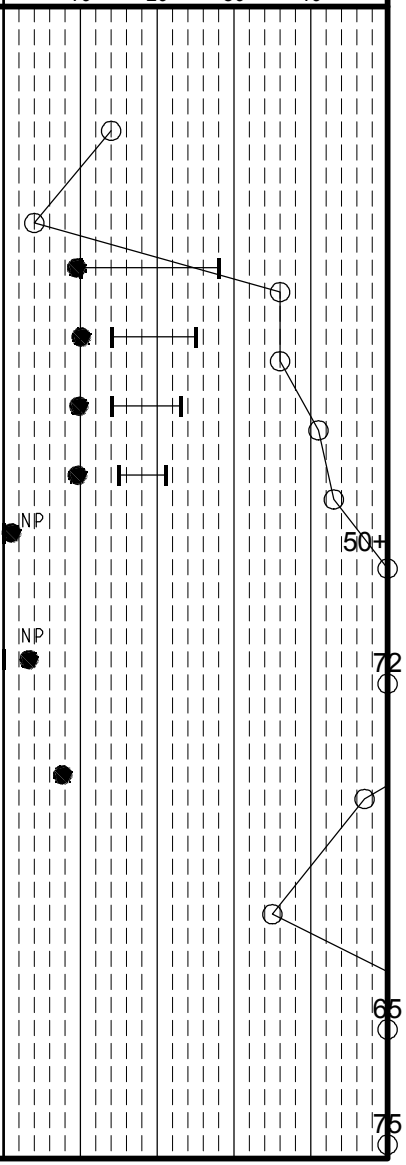
LOG OF: Boring B-030 | *Location:* Sta. 743+00.05, 64.21 ft Lt. of I-70 CL | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 13.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	736.7													
1.4	735.3						Asphalt Concrete - 11" Aggregate Base - 6"							
		4 6 8	11	1			Loose to medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; damp.							
		3 3 1												
5.0	731.7		8	2										
		4 14 21	18	3		4.5+	Hard gray SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; contains few rock fragments; damp to moist.		9	9	---	14	40	28
6.5	730.2													
		10 16 19	18	4		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		6	10	---	15	40	29
8.0	728.7													
		13 19 21	18	5		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		5	11	---	18	41	25
10		11 15 27		6		4.5+								
11.0	725.7		18											
		16 50/5	8	7			Dense to very dense gray GRAVEL (A-1-a), little to some fine to coarse sand, trace to little silty clay; damp.		71	12	---	5	--12--	
		11 33 38	13	8					59	21	---	8	--12--	
15														
		18 23 23	13	9			@ 16.0', becomes wet.		61	20	---	8	--11--	
		12 13 21	12	10										
20														
		13 28 36	12	11										
23.5	713.2													
		17 34 40	14	12			Very dense gray COARSE AND FINE SAND (A-3a), some silty clay; wet.							
25	711.7													

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-030 | *Location:* Sta. 743+00.05, 64.21 ft Lt. of I-70 CL | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 13.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	711.7						Very dense gray COARSE AND FINE SAND (A-3a), some silty clay; wet.								
		23 45 50/4	15	13			@ 26.0', 0.4 feet sand heave.								50+
30		9 21 31	16	14											53
		14 30 45	16	15					0	8	---	69	--23--		77
		50/4	4	16			@ 38.5'-38.8', contains sandy silt seams.								50+
40							@ 38.5'-43.5', difficult drilling.								
		11 32 50/5	17	17			@ 43.5', 1.9 feet sand heave.								50+
45															
47.0	689.7														
		12 50/5	10	18			Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.		15	54	---	23	--8--		50+
50	686.7														

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

LOG OF: Boring B-030 | *Location:* Sta. 743+00.05, 64.21 ft Lt. of I-70 CL | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 13.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	686.7						Very dense gray COARSE AND FINE SAND (A-3a), little gravel, little to some silty clay; wet.								
55		41 50/6	10	19			@ 53.5', 0.7 feet sand heave.								50+
60		24 39 45	13	20											86
62.0	674.7														
							Very dense gray FINE SAND (A-3), trace silt, trace gravel; wet.								
65		16 31 41	15	21											73
67.0	669.7														
							Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silty clay; wet.		49	29	---	13	--9--		
70		33 50/5	9	22											50+
		43 50/3	9	23											50+
75	661.7														

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

LOG OF: Boring B-030 | *Location:* Sta. 743+00.05, 64.21 ft Lt. of I-70 CL | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 13.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	661.7						Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silty clay; wet.								
80		35 50/5	10	24			@ 78.5', 1.0 foot sand heave.								50+
85		21 47 47	13	25			@ 83.5', 4.6 feet sand heave.		15	39	---	33	--13--		96
90		15 23 46	9	26											70
95		37 50/3	9	27											50+
100	636.7	38 50/5	7	28											50+

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-030 | *Location:* Sta. 743+00.05, 64.21 ft Lt. of I-70 CL | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 13.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	636.7														
							Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silty clay; wet.								
103.5	633.2						@ 100.0'-103.5', 25.0 to 27.3 feet sand heave; washed out twice.								
		50/3	3	29			Severely weathered gray SHALE.								50+ ○
105.0 105	631.7														
		Core 60"	Rec 57"	RQD 37%	R1		Shale, dark gray, highly weathered, weak, laminated, slightly calcareous, contains abundant pyritic inclusions, fissile, laminated, fractured to highly fractured, RQD 38%, Loss 4%.								
							@ 107.7'-107.8', encounterd large pyritic inclusion.								
110							@ 108.1'-109.1', moderately weathered, moderately strong.								
	625.7	Core 12"	Rec 12"	RQD 42%	R2		@ 111.0', core steel damaged. Abandoned boring at 111.0'.								
							Bottom of Boring - 111.0'								
115															
120															
125															

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

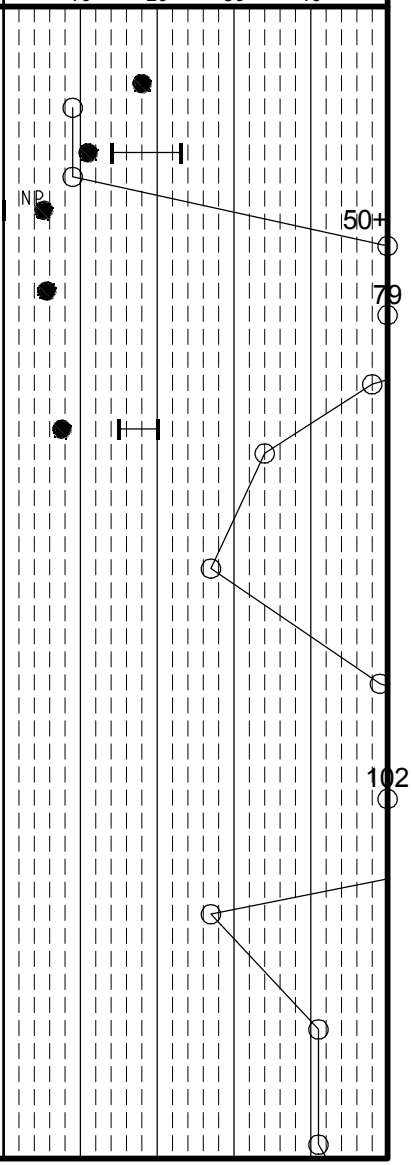
LOG OF: Boring B-031 | *Location:* Sta. 745+02.00, 72.77 ft Rt. of I-70 CL | *Date Drilled:* 7/7/2008 to 7/8/2008

WATER OBSERVATIONS:
Water seepage at: 9.5'
Water level at completion: 8.3' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	735.6													
0.7	734.9						Topsoil - 8"							
		2 4 5	18	1		3.75	FILL: Very stiff to hard brown SILT (A-4b), some clay, little fine to coarse sand, trace to little gravel; contains few brick and coal fragments; damp.							
		3 4 5	18	2		4.5+			12	5	---	6	52	25
4.0	731.6													
5		16 50/5	5	3			Dense to very dense brownish gray GRAVEL WITH SAND (A-1-b), little silt; damp.		50	20	---	13	--17--	
		42 44 31	1	4			@ 5.0', encountered refusal; offset boring approx. three feet west.							
		18 21 25	1	5			@ 5.5'-8.5', rock fragments; possible cobble blocking shoe.							
8.5	727.1													
9.5	726.1	9 15 17	18	6A 6B		4.5	Hard gray SANDY SILT (A-4a), little gravel; damp.		15	12	---	25	32	16
10							Medium dense to dense gray SILT (A-4b), some fine sand; wet.							
		4 12 14	18	7										
13.5	722.1													
		18 22 25	12	8		4.5+	Very stiff to hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.							
15														
		14 48 49	18	9		3.5								
18.5	717.1													
		11 13 13	18	10			Medium dense gray SILT (A-4b), trace fine sand; moist.							
20														
21.0	714.6													
		7 18 21	18	11			Dense gray COARSE AND FINE SAND (A-3a), some silt; wet.							
23.5	712.1													
		12 18 21	18	12		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
25	710.6													

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-031 | *Location:* Sta. 745+02.00, 72.77 ft Rt. of I-70 CL | *Date Drilled:* 7/7/2008 to 7/8/2008

WATER OBSERVATIONS:
Water seepage at: 9.5'
Water level at completion: 8.3' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	710.6														PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
		20 50/5	10	13		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.								50+
28.0	707.6														
		50/5	5	14			Very dense gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; wet.								50+
30															
							@ 28.5'-38.9', possible cobbles.								
		24 49 48	18	15											102
35															
		50/5	5	16											50+
40															
42.0	693.6														
		11 13 18	18	17			Dense gray FINE SAND (A-3), trace silt; wet.								
45															
47.0	688.6														
		16 33 41	18	18			Very dense gray COARSE AND FINE SAND (A-3a), little silt, little gravel; wet. @ 48.5', ten feet sand heave; triconed and washed out.								78
50	685.6														

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

LOG OF: Boring B-031 | *Location:* Sta. 745+02.00, 72.77 ft Rt. of I-70 CL | *Date Drilled:* 7/7/2008 to 7/8/2008

WATER OBSERVATIONS:
Water seepage at: 9.5'
Water level at completion: 8.3' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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 ⊢ ○ / Non-Plastic - NP ⊣ LL Blows per foot - 10 20 30 40
	685.6						Very dense gray COARSE AND FINE SAND (A-3a), trace to little gravel, trace silt; wet.								
55		25 33 40	18	19											77 ○
60.0 60	675.6	38 42 49	18	20											96 ○
							Bottom of Boring - 60.0'								
65															
70															
75															

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

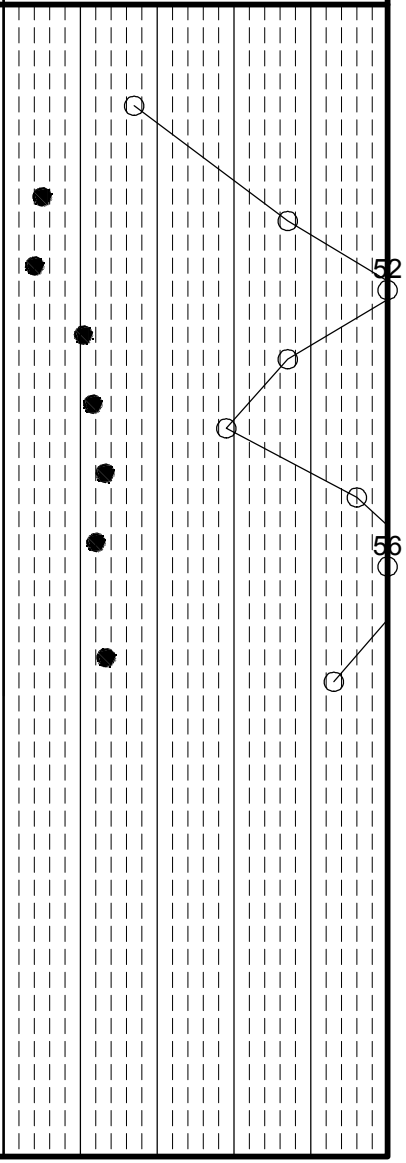
LOG OF: Boring B-033 | *Location:* Sta. 749+82.21, 43.40 ft Lt. of I-70 CL | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 6.5'
Water level at completion: 9.2'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.2	730.3						Gravel berm material - 2"							
		8 9 7	5	1			Medium dense brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.							
3.0	727.5						Dense to very dense brown GRAVEL WITH SAND (A-1-b), trace to little silty clay; damp.							
		7 16 19	12	2										
5		6 21 28	14	3					36	36	---	17	--11--	
		12 20 15	12	4			@ 6.5', becomes wet.		29	35	---	23	--13--	
		9 13 15	16	5			@ 8.0'-9.5', medium dense.		36	33	---	20	--11--	
10		15 20 24	18	6					29	37	---	22	--12--	
		18 25 28	18	7										
		7 14 27	18	8										
15.0 15	715.5						Bottom of Boring - 15.0'							
20														
25														

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-035 | *Location:* Sta. 752+66.77, 72.74 ft Rt. of I-70 CL | *Date Drilled:* 7/7/2008

WATER OBSERVATIONS:
Water seepage at: 9.2'-15.0'
Water level at completion: 9.2'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	732.3														
1.8	730.5	7 15 26	15	1			Asphalt Concrete Pavement - 8" Portland Cement Concrete - 10" Aggregate Base - 3"								
3.0	729.3	9 25 26	15	2			Dense brown FINE SAND (A-3), trace silt, trace gravel; contains silty clay seams; damp.								
6.0	726.3	10 25 27	15	3			Very dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; damp.		37	36	---	17	--10--		NP ● 53
7.5	724.8	5 14 18	13	4			Dense to very dense brown FINE SAND (A-3), trace to little gravel; damp.		12	20	---	60	--8--		● 52
		10 24 27	13	5			Dense to very dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; wet.		49	28	---	15	--8--		NP ● 52
		11 22 25	13	6					34	36	---	20	--10--		NP ● ○ 51
		12 23 27	15	7											● 57
15.0	717.3	10 22 34	13	8											
							Bottom of Boring - 15.0'								

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

LOG OF: Boring B-036 | *Location:* Sta. 755+56.04, 101.17 ft Rt. of I-70 CL | *Date Drilled:* 7/14/2008 to 7/16/2008

WATER OBSERVATIONS:
Water seepage at: 14.0'
Water level at completion: 11.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	734.7						Asphalt Concrete - 9.5" Portland Cement Concrete - 11" Aggregate Base - 4"								
2.0	732.7	16 22 27	13	1			Dense to very dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; damp to moist.								
		20 24 25	13	2											
5		12 15 23	14	3					17	43	---	23	--17--		NP
		14 24 38	14	4					22	44	---	21	--13--		NP 63
		16 23 25	14	5					32	36	---	20	--12--		NP
10		19 32 34	15	6					36	34	---	17	--13--		NP 67
11.0	723.7	10 25 26	15	7			Very dense brown COARSE AND FINE SAND (A-3a), little silt, trace gravel; moist.		1	41	---	44	--14--		NP 52
12.5	722.2	17 29 31	16	8			Dense to very dense brown GRAVEL WITH SAND (A-1-b), little silt; moist to wet.								61
15		4 22 27	14	9			@ 14.0', becomes wet.								
		6 18 21	15	10											
		9 20 21	13	11											
		28 32 50/5	14	12					37	31	---	16	--16--		NP 50+
20															
		17 30 35	12	13											66
		18 28 29	13	14											58
25	709.7														

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-036 | *Location:* Sta. 755+56.04, 101.17 ft Rt. of I-70 CL | *Date Drilled:* 7/14/2008 to 7/16/2008

WATER OBSERVATIONS:
Water seepage at: 14.0'
Water level at completion: 11.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	709.7														PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
		19 32 33	18	15			Very dense brown COARSE AND FINE SAND (A-3a), little silt, trace to little gravel; wet.								66
28.5	706.2														
		14 30 41	14	16		2.5	Stiff to very stiff gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; moist. @ 29.0'-29.5', sandy silt seam.		5	12	---	38	42	3	72
30															
		24 42 50/5	14	17		--	@ 33.5'-34.9', contains sand seams.		10	23	---	25	35	7	50+
35															
		29 50/4	10	18		1.0	@ 39.0'-39.3', silt seam.								50+
40															
42.0	692.7														
		17 49 39	14	19			Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silt; wet.		43	33	---	14	--10--		NP 90
45							@ 45.0'-55.0', difficult drilling.								
		23 42 50/5	12	20			@ 48.5', 2.3 feet sand heave.								50+
50	684.7														

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

LOG OF: Boring B-036 | *Location:* Sta. 755+56.04, 101.17 ft Rt. of I-70 CL | *Date Drilled:* 7/14/2008 to 7/16/2008

WATER OBSERVATIONS:
Water seepage at: 14.0'
Water level at completion: 11.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	684.7						Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silt; wet.								
		45 50/4	9	21			@ 53.5'-54.3', contains silty clay seams.								50+
55															
		19 35 45	12	22					30	38	---	21	--11--		NP 82
60															
		33 50/5	11	23			@ 63.5', 1.9 feet sand heave. @ 63.5'-64.4', brown.								50+
65															
		20 39 50/5	13	24											50+
70															
		35 46 50/6	13	25											50+
75	659.7														

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

LOG OF: Boring B-036 | *Location:* Sta. 755+56.04, 101.17 ft Rt. of I-70 CL | *Date Drilled:* 7/14/2008 to 7/16/2008

WATER OBSERVATIONS:
Water seepage at: 14.0'
Water level at completion: 11.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	659.7						Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silt; wet.								
80		49 50/3	8	26			@ 78.5', 0.9 feet sand heave.								50+
85		28 46 48	11	27					42	35	---	11	--12--		NP 96
90		50/1	0	28			@ 88.5'-93.5', encountered boulders.								50+
93.5	641.2														
94.9	639.8	27 50/3	8	29			Severely weathered gray SHALE.								50+
96.6	638.1	Core 68"	Rec 68"	RQD 93%	R1		Shale, blue-gray, highly weathered, very weak to weak, laminated, friable, fissile, pyritic, jointed, moderately fractured to fractured, tight, slightly rough, RQD 100%, 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.								
100	634.7						Interbedded Shale (90%) and Limestone (10%)								

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

LOG OF: Boring B-036 | *Location:* Sta. 755+56.04, 101.17 ft Rt. of I-70 CL | *Date Drilled:* 7/14/2008 to 7/16/2008

WATER OBSERVATIONS:
Water seepage at: 14.0'
Water level at completion: 11.8' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	634.7														
105		Core 60"	Rec 60"	RQD 83%	R2		Interbedded Shale (90%) and Limestone (10%) RQD 74% Loss 0%; Shale, dark gray, highly weathered, weak, laminated, friable, fissile, pyritic, jointed, moderately fractured to fractured, tight, slightly rough; Limestone, gray, moderately weathered, strong, thinly bedded, pyritic, slightly rough. @ 103.7' - 104.2', qu = 1442 psi								
110		Core 60"	Rec 60"	RQD 60%	R3										
115		Core 60"	Rec 60"	RQD 68%	R4										
	619.1						Bottom of Boring - 115.6'								
120															
125															

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

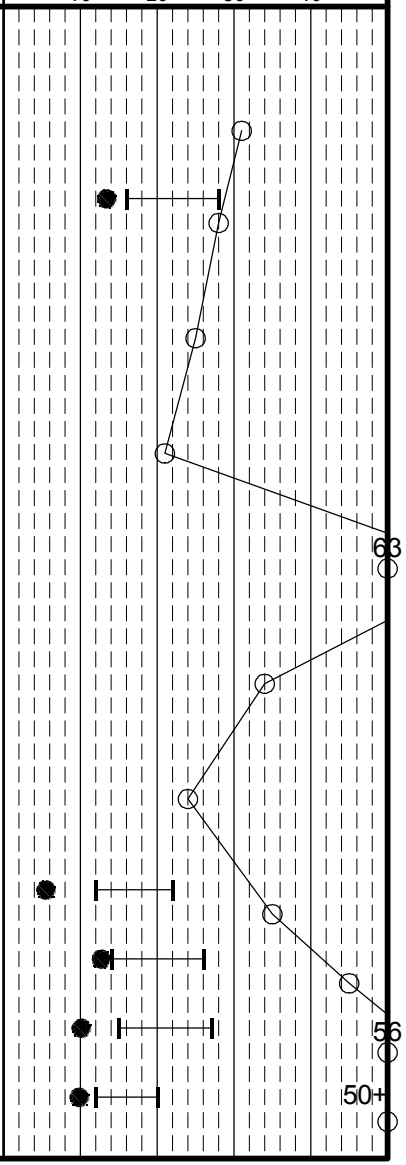
LOG OF: Boring B-037 | *Location:* Sta. 756+80.53, 69.18 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008 to 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 21.0', 25.4', 33.0', 40.5'
Water level at completion: 25.6' (prior to coring), 51.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	749.1													
1.8	747.3						Asphalt Concrete - 6.5" Portland Cement Concrete - 9.5" Aggregate Base - 5"							
		5 13 16	0	1		--	Stiff brown and gray SILT AND CLAY (A-6a), some fine to coarse sand, some gravel; increased moisture content due to pavement coring; damp to moist.							
5		9 13 14	5	2		1.75			29	15	---	17	24	15
		6 10 14	1	3		--								
8.5	740.6													
10		3 8 12	2	4		--	Very stiff gray SILT AND CLAY (A-6a), little to some fine to coarse sand, little gravel; damp to moist.							
		4 35 25	18	5		3.75								
13.5	735.6													
15		10 16 16	2	6		4.25	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
		10 11 12	1	7		--								
20.0	729.1	7 12 21	18	8		4.5+			8	11	---	22	40	19
		10 21 22	5	9		0.75	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp. @ 20.0'-21.5', stiff, wet; possible sand and gravel seam.		18	14	---	20	32	16
23.0	726.1	12 24 29	18	10		4.5+			13	12	---	21	36	18
		19 48 50/5	2	11		4.5+	Hard gray SANDY SILT (A-4a), trace to little gravel; contains sand seams; damp.		10	15	---	28	32	15
25	724.1	16												

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-037 | *Location:* Sta. 756+80.53, 69.18 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008 to 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 21.0', 25.4', 33.0', 40.5'
Water level at completion: 25.6' (prior to coring), 51.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
25.4	723.7	24 24	18	12A 12B		4.0	Hard gray SANDY SILT (A-4a), trace to little gravel; damp.								
		16 24 27	1	13			Very dense gray COARSE AND FINE SAND (A-3a), some silt, little gravel; wet.								54
28.5	720.6														
30		14 16 17	18	14		2.5	Very stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; damp.								
		5 12 17	18	15		4.0			6	10	---	18	41	25	
33.5	715.6														
35		19 45 50/5	12	16			Very dense gray GRAVEL WITH SAND (A-1-b), little silt; wet.		36	36	---	12	--16--		NP 50+
		16 50/5	5	17			@ 36.0'-36.9', contains cobble fragments.								50+
38.5	710.6														
40		42 50/3	5	18		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.								50+
41.0	708.1														
		31 50/4	10	19			Very dense gray COARSE AND FINE SAND (A-3a), trace to little silt; wet.								50+
45		42 50/5	10	20					0	8	---	75	--17--		NP 50+
		50/3	3	21			@ 48.5'-48.8', possible cobbles.								50+
50	699.1														

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

LOG OF: Boring B-037 | *Location:* Sta. 756+80.53, 69.18 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008 to 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 21.0', 25.4', 33.0', 40.5'
Water level at completion: 25.6' (prior to coring), 51.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	699.1														
		29 50/5	11	22		4.5+	Hard gray SILT (A-4b), little fine to coarse sand, trace gravel; damp.		3	3	---	10	63	21	50+
55															
57.0	692.1														
		25 50/3	3	23			Very dense gray GRAVEL WITH SAND (A-1-b), some fine to coarse sand, trace silt; wet. @ 59.0'-75.0', encountered cobbles and boulders.								50+
60															
62.0	687.1														
		45 50/5	4	24			Very dense gray COARSE AND FINE SAND (A-3a), little to some silt, little gravel; wet.		17	24	---	39	--20--		NP 50+
65															
		50/3	3	25											50+
70															
		50/4	1	26			@ 73.5'-73.8', drove sampler on gravel; poor recovery.								50+
75	674.1														

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

LOG OF: Boring B-037 | *Location:* Sta. 756+80.53, 69.18 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008 to 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 21.0', 25.4', 33.0', 40.5'
Water level at completion: 25.6' (prior to coring), 51.6' (includes drilling water)

FIELD NOTES: *Advanced boring using 3.0" diameter flush joint casing.*

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	674.1						Very dense gray COARSE AND FINE SAND (A-3a), little gravel, trace silt; wet.								
		47 50/4	5	27											50+
80							@ 75.0'-100.0', difficult advancement of casing due to gravel and boulders.								
		50/4	1	28											50+
85															
		27 50/5	5	29											50+
90															
92.0	657.1						Very dense gray GRAVEL (A-1-a); wet.								
		14 14 34	3	30											
95															
		50/4	1	31											50+
100	649.1														

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-037 | *Location:* Sta. 756+80.53, 69.18 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008 to 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 21.0', 25.4', 33.0', 40.5'
Water level at completion: 25.6' (prior to coring), 51.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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
	649.1						Very stiff to hard gray SILTY CLAY (A-6b), trace fine to coarse sand; moist.								
105		23 32 35	18	32		2.75			0	1	---	3	49	47	70 ○
108.5	640.6														
		50/5	5	33		4.5+	Severely weathered gray SHALE.								50+ ○
110.0 110	639.1														
		Core 60"	Rec 60"	RQD 60%	R1		Interbedded Shale (92%) and Limestone (8%) RQD 76% LOSS 0%; Shale, dark gray, highly weathered, weak, laminated, calcareous, moderately fractured to fractured; Limestone, light gray, moderately weathered, moderately strong to strong, thinly bedded.								
115															
		Core 60"	Rec 60"	RQD 83%	R2		@ 110.8'-111.2', 111.7'-111.8', 113.2'-113.5', 119.6'-120.0', 122.9'-123.0', high angle fractures.								
120															
		Core 60"	Rec 60"	RQD 77%	R3		@ 121.2' - 121.7', qu = 1546 psi @ 122.1'-125.4', highly to severely weathered.								
125	624.1														

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

LOG OF: Boring B-037 | *Location:* Sta. 756+80.53, 69.18 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008 to 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 21.0', 25.4', 33.0', 40.5'
Water level at completion: 25.6' (prior to coring)
51.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.0" diameter flush joint casing.

Depth (ft)	Elev. (ft) 624.1	Blows per 6"	Recovery	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)
130	619.1	Core 60"	Rec 60"	RQD 82%	R4		Interbedded Shale (92%) and Limestone (8%) RQD 76% LOSS 0%; Shale, dark gray, highly weathered, weak, laminated, calcareous, moderately fractured to fractured; Limestone, light gray, moderately weathered, moderately strong to strong, thinly bedded. @ 125.9'-126.0', high angle fracture.								
							Bottom of Boring - 130.0'								
135															
140															
145															
150															

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

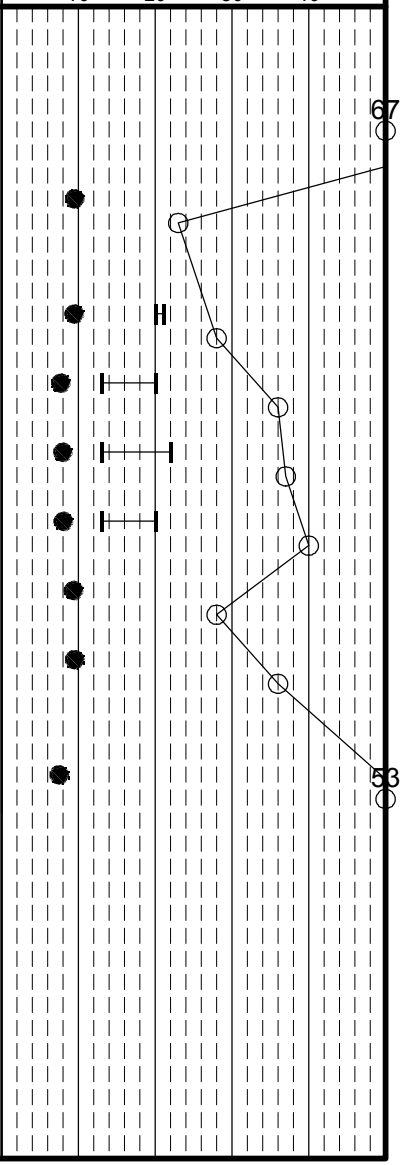
LOG OF: Boring B-039 | *Location:* Sta. 760+57.45, 102.65 ft Rt. of I-70 CL | *Date Drilled:* 7/17/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 739.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt Concrete - 8"							
							Portland Cement Concrete - 8"							
1.8	737.7						Aggregate Base - 5"							
		7 36 30	13	1A 1B		4.5+ 4.5+	Hard gray SANDY SILT (A-4a), little gravel, trace clay; damp. @ 1.8'-3.0', contains concrete fragments.							
		9 11 12	17	2		4.5+								
5														
		3 12 15	15	3		4.5	@ 7.1', encountered 1-inch thick sand seam.		20	15	---	19	30	16
		11 16 19	18	4		4.5+			17	15	---	25	28	15
		8 14 22	18	5		4.5+			14	15	---	25	31	15
10		12 18 21	18	6		4.5+			14	16	---	25	29	16
12.0	727.5													
		7 12 15	13	7A 7B			Medium dense gray COARSE AND FINE SAND (A-3a), some silt, trace gravel; moist.							
13.5	726.0													
		22 16 19	15	8		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.							
15														
		7 19 33	16	9		4.5+								
17.5	722.0													
							Bottom of Boring - 17.5'							
20														
25														

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

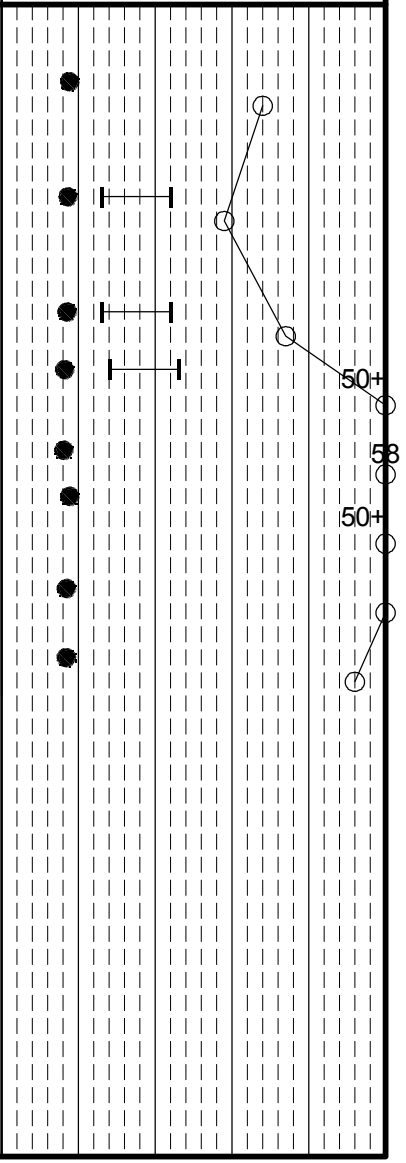
LOG OF: Boring B-042 | *Location:* Sta. 764+57.07, 41.06 ft Lt. of I-70 CL | *Date Drilled:* 7/21/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.2	741.5						Topsoil - 2"							
		6 14 18	18	1		4.5+	Hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, little clay, trace gravel; damp.							
		6 11 17	18	2		4.5+			8	14	---	24	35	19
5		6 14 21	18	3		4.5+			8	14	---	20	36	22
		19 50/5	11	4		4.5+			8	15	---	20	36	21
		14 28 27	18	5		4.5+								
10		50/5	3	6		4.5+								
		9 20 28	18	7		4.5+								
		12 20 24	18	8		4.5+								
15.0	726.7						Bottom of Boring - 15.0'							
20														
25														

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-043 | *Location:* Sta. 765+56.96, 96.30 ft Rt. of I-70 CL | *Date Drilled:* 7/16/2008 to 7/20/2008

WATER OBSERVATIONS:
Water seepage at: 37.0', 77.0'
Water level at completion: 14.4' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	743.1						Asphalt Concrete - 9" Portland Cement Concrete - 9" Aggregate Base - 5"								
1.9	741.2	3 8 13	13	1			Medium dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6), some silty clay; damp.								
3.5	739.6	7 7 15	10	2		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.								
5 6.0	737.1	7 25 30	18	3			Very dense grayish brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.		13	13	---	26	38	10	NP 58
9.0	734.1	7 12 45	1	4			@ 7.5'-9.0', rock blocking sampler.								60
10 10.5	732.6	10 31 46	18	5		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		9	13	---	19	37	22	81
		12 40 46	18	6		4.5+	Hard gray SILT AND CLAY (A-6a), some to "and" fine to coarse sand, trace to little gravel; damp.		7	21	---	19	33	20	90
		7 12 24	18	7		4.5+									
15		12 28 49	10	8		4.5+	@ 13.5'-15.0', contains sand seams.								81
		7 19 39	18	9		4.5+									61
20		39 49 42	18	10		4.5+									96
		12 24 42	18	11		4.5+									69
25	718.1	17 42 42	18	12		4.5+			17	12	---	18	33	20	88

STANDARD PENETRATION (N60) / Natural Moisture Content, % -
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-043 | *Location:* Sta. 765+56.96, 96.30 ft Rt. of I-70 CL | *Date Drilled:* 7/16/2008 to 7/20/2008

WATER OBSERVATIONS:
Water seepage at: 37.0', 77.0'
Water level at completion: 14.4' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	718.1														
		20 42 50/5	17	13		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.								50+ ○
		24 34 45	18	14		4.5+									83 ○
30															
		11 30 40	18	15		4.5+									74 ○
35															
		13 28 45	10	16		--	@ 38.5', becomes wet.								77 ○
40															
42.0	701.1														
		17 34 38	18	17			Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.		22	42	---	27	--9--		NP ● 76 ○
45															
		13 31 39	18	18											74 ○
50	693.1														

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

LOG OF: Boring B-043 | *Location:* Sta. 765+56.96, 96.30 ft Rt. of I-70 CL | *Date Drilled:* 7/16/2008 to 7/20/2008

WATER OBSERVATIONS:
Water seepage at: 37.0', 77.0'
Water level at completion: 14.4' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	693.1						Dense gray GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet. (GEOLOGIST'S DESCRIPTION - sample lost)								
		12 12 21	18	19			@ 50.0'-60.0', difficult drilling, possible boulders. @ 55.0'-60.0', encountered gas pockets.								
55															
57.0	686.1														
							Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.								
		35 43 50/5	8	20		4.5+									50+
60															
		50/1	1	21		--	@ 63.5', rock blocking sampler.								50+
65															
							@ 63.5'-70.0', possible cobbles.								
		14 33 36	4	22		4.5+			17	19	---	26	28	10	73
70															
		17 23 28	18	23		4.5									54
75	668.1														

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

LOG OF: Boring B-043 | *Location:* Sta. 765+56.96, 96.30 ft Rt. of I-70 CL | *Date Drilled:* 7/16/2008 to 7/20/2008

WATER OBSERVATIONS:
Water seepage at: 37.0', 77.0'
Water level at completion: 14.4' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	668.1						Very dense gray FINE SAND (A-3), trace gravel; wet.								
80		13 28 50/5	17	24			@ 78.5', 2.0 feet sand heave.								50+
82.0	661.1														
							Very dense gray GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; wet.								
85		40 42 42	18	25											88
		34 42 48	10	26											95
90															
93.5	649.6														
		50/5	3	27			Severely weathered gray SHALE.								
95.0	95 648.1														50+
		Core 60"	Rec 60"	RQD 85%	R1		Shale, blue-gray, weak, highly weathered, thinly laminated, slightly calcareous, pyritic, jointed, moderately to fractured, tight, slightly rough; RQD 88%, 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.								
100	643.1														

STANDARD PENETRATION (N60) Natural Moisture Content, % - ●
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-043 | *Location:* Sta. 765+56.96, 96.30 ft Rt. of I-70 CL | *Date Drilled:* 7/16/2008 to 7/20/2008

WATER OBSERVATIONS:
Water seepage at: 37.0', 77.0'
Water level at completion: 14.4' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	643.1														
105		Core 60"	Rec 60"	RQD 82%	R2		Shale, blue-gray, weak, highly weathered, thinly laminated, slightly calcareous, pyritic, jointed, moderately to fractured, tight, slightly rough; RQD 88%, 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.									
							@ 104.3' - 104.7', qu = 1612 psi								
		Core 60"	Rec 60"	RQD 97%	R3										
110.3 110	632.8														
		Core 60"	Rec 60"	RQD 87%	R4		Shale, dark gray, moderately to highly weathered, weak, thinly laminated, fissile, friable, pyritic, calcareous, jointed, fractured to moderately fractured, tight, slightly rough; RQD 87%, Loss 0%.								
115	628.1														
							Bottom of Boring - 115.0'								
120															
125															

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

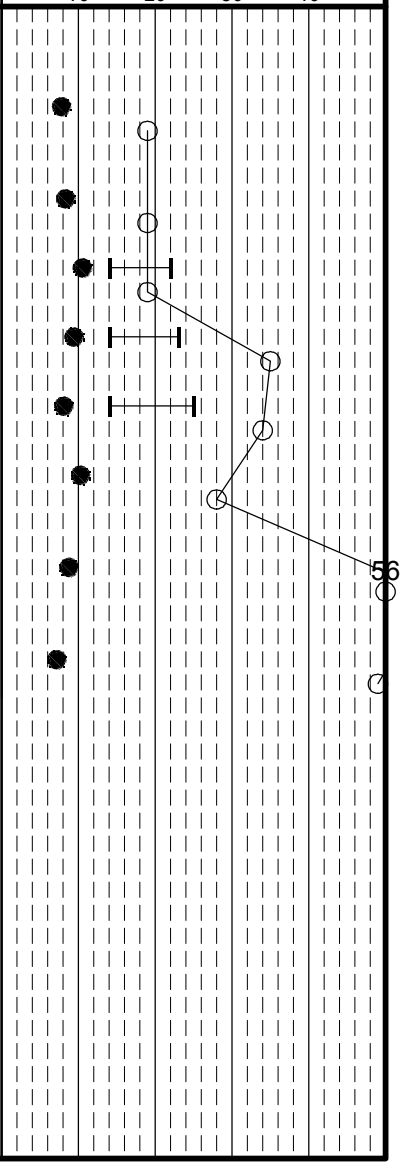
LOG OF: Boring B-045 | *Location:* Sta. 768+75.91, 91.18 ft Rt. of I-70 CL | *Date Drilled:* 7/17/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 745.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.1	744.7						Asphalt Concrete - 8" Aggregate Base - 5"							
		7 9 9	14	1		4.5+	Hard gray SANDY SILT (A-4a), little clay, trace to little gravel; damp.							
		7 9 9	10	2		4.5+								
5		3 7 11	12	3		4.0	@ 5.6', sand and gravel seam.		12	14	---	22	32	20
		12 15 19	18	4		4.5+			9	24	---	21	30	16
8.0	737.8													
		13 16 17	18	5		4.5+	Hard gray SILT AND CLAY (A-6a), some to "and" fine to coarse sand, trace gravel; damp. @ 8.0'-9.5', contains sand seams.		7	15	---	20	37	21
10		9 11 16	14	6		4.5+								
		16 27 27	6	7		--								
		10 24 23	12	8		4.5+								
15.0	730.8													
							Bottom of Boring - 15.0'							
20														
25														

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

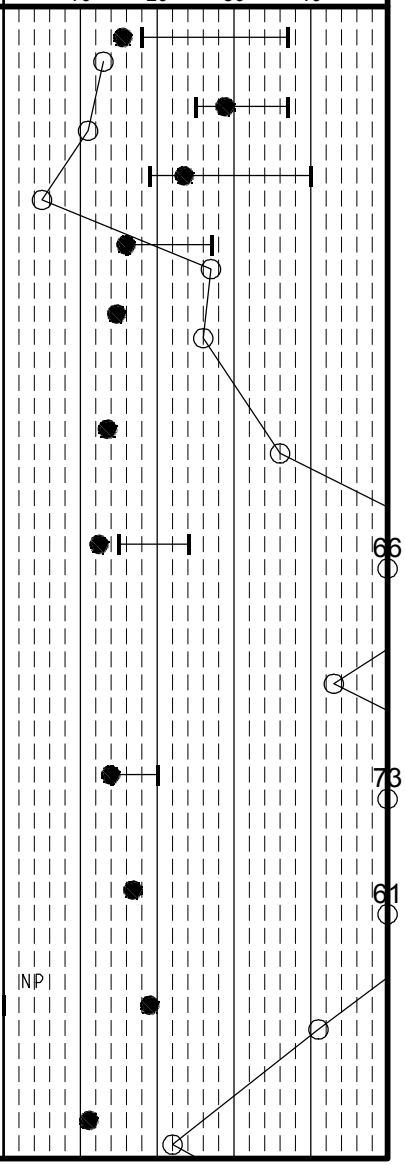
LOG OF: Boring B-046 | *Location:* Sta. 770+57.00, 173.88 ft Rt. of I-70 CL | *Date Drilled:* 6/26/2008 to 6/27/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 18.0'-28.0', 52.0', 62.0'
Water level at completion: 32.1' (beginning of shift, 6/21/08)
4.6' (includes drilling water)

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

Depth (ft)	Elev. (ft) 770.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	769.8	3 4 8	18	1		--	Topsoil - 4"		10	9	---	16	35	30
1.5	768.6						POSSIBLE FILL: Stiff to very stiff mottled brown and gray SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; trace organic debris (roots and wood chips); damp.							
3.0	767.1	4 5 5	18	2		--			7	13	---	16	42	22
4.5	765.6	3 2 3	18	3		--	Stiff dark brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; contains roots; moist.		4	9	---	16	32	39
5		7 13 13	12	4		3.0	Very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; moist.		8	13	---	17	36	26
		18 16 9	3	5		3.0	Very stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; damp to moist.							
10		10 15 19	18	6		3.5	@ 8.0', little gravel.							
11.0	759.1	15 23 40	18	7		4.0	Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		7	10	---	17	43	23
15		12 17 24	2	8		--	@ 13.5', encountered possible sandstone cobble / boulder, wet.							
15.5	754.6	9 29 40	8	9		--	Hard gray SILT (A-4b), little fine to coarse sand, little clay, trace gravel; damp to moist.		3	5	---	13	60	19
18.0	752.1	18 26 32	18	10			Dense to very dense brown and gray COARSE AND FINE SAND (A-3a), little to some silty clay; wet.							
20		9 19 20	16	11					3	6	---	64	--27--	
25	745.1	8 9 12	18	12										

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-046 | *Location:* Sta. 770+57.00, 173.88 ft Rt. of I-70 CL | *Date Drilled:* 6/26/2008 to 6/27/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 18.0'-28.0', 52.0', 62.0'
Water level at completion: 32.1' (beginning of shift, 6/21/08)
4.6' (includes drilling water)

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	745.1													
		14 21 27	12	13			Dense to very dense gray FINE SAND (A-3), trace to little silty clay; moist to wet.							
28.0	742.1													
		14 16 20	18	14		4.5+	Hard gray SILT AND CLAY (A-6a), some to "and" fine to coarse sand, little gravel; damp.							
30														
		10 21 27	18	15		4.5+			11	20	---	21	--48--	
35														
		10 33 38	18	16		4.5+								
40														
		14 20 29	18	17		4.5+								
45														
		19 26 41	18	18		4.5+								
50	720.1													

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

75
52
70

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

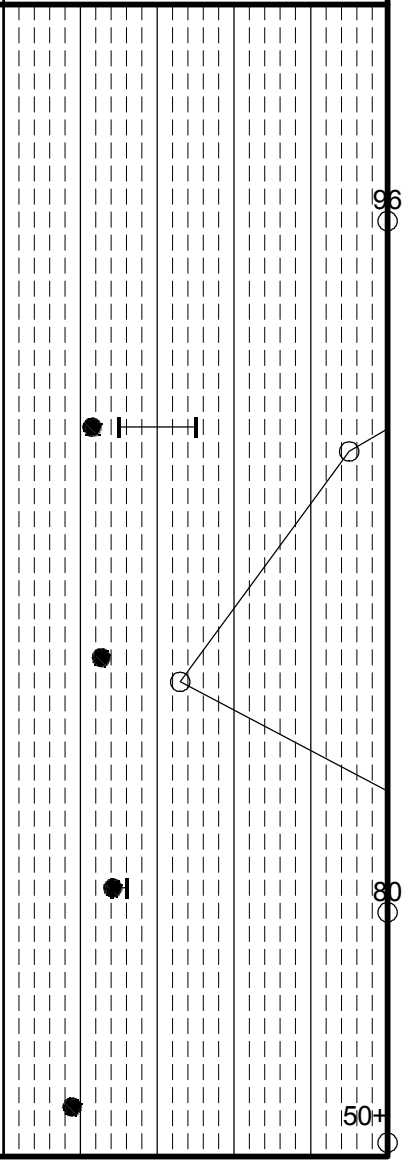
LOG OF: Boring B-046 | *Location:* Sta. 770+57.00, 173.88 ft Rt. of I-70 CL | *Date Drilled:* 6/26/2008 to 6/27/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 18.0'-28.0', 52.0', 62.0'
Water level at completion: 32.1' (beginning of shift, 6/21/08)
4.6' (includes drilling water)

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	720.1													
52.0	718.1						Hard gray SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; damp.							
55		27 42 49	1	19			Very dense brown and gray GRAVEL (A-1-a), trace fine to coarse sand, trace silty clay; possible cobbles; wet.							
57.0	713.1													
60		11 17 26	18	20		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		7	11	---	18	40	24
62.0	708.1													
65		15 13 9	18	21			Medium dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silty clay; wet.		76	16	---	5	--3--	
67.0	703.1													
70		21 35 41	16	22			Very dense gray COARSE AND FINE SAND (A-3a), some silty clay, little gravel; moist to wet.		15	17	---	35	26	7
72.0	698.1													
75	695.1	35 50/5	8	23			Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silty clay; wet.		70	13	---	10	--7--	

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
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-046 | *Location:* Sta. 770+57.00, 173.88 ft Rt. of I-70 CL | *Date Drilled:* 6/26/2008 to 6/27/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 18.0'-28.0', 52.0', 62.0'
Water level at completion: 32.1' (beginning of shift, 6/21/08)
4.6' (includes drilling water)

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	695.1						Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silty clay; wet.								
77.0	693.1														
							Hard brownish gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace gravel; damp.								
80		16 42 50/3	8	24		4.5+	@ 73.5'-94.3', possible boulders.								50+
85		42 50/3	9	25		4.5+			8	12	---	27	39	14	50+
90		16 42 50/3	15	26		4.5+									50+
95		16 50/4	8	27		4.5+									50+
97.0	673.1														
							Shale, gray and brownish gray, very weak, severely weathered to decomposed, thinly laminated.								
100	670.1	10 21 38	18	28											

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

LOG OF: Boring B-046 | *Location:* Sta. 770+57.00, 173.88 ft Rt. of I-70 CL | *Date Drilled:* 6/26/2008 to 6/27/2008

WATER OBSERVATIONS:
Water seepage at: 13.0'-15.5', 18.0'-28.0', 52.0', 62.0'
Water level at completion: 32.1' (beginning of shift, 6/21/08)
4.6' (includes drilling water)

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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)
	670.1						Shale, gray and brownish gray, very weak, severely weathered to decomposed, thinly laminated.								
		50/5	2	29											50+ ○
105.0 105	665.1														
		Core 60"	Rec 41"	RQD 10%	R1		Shale, brownish gray, weak to very weak, severely weathered, thinly laminated, jointed, highly fractured, tight, slighly rough shear fractures; RQD 0%, Loss 42%. @ 105.0' to 106.5', possible lost recovery [washed out].								
108.6	661.5														
110		Core 60"	Rec 60"	RQD 88%	R2		Shale, blue-gray, weak, moderately to highly weathered, thinly laminated, slightly calcareous, jointed, moderately fractured, tight, slighly rough fractures; RQD 79%, LOSS 0%. Contains dark gray, well cemented shale zones [thin, dark bands]. Dark shale zones are typically 1-4 inches thick, spaced at intervals of 4 to 12 inches. @ 108.6' - 109.1', qu = 1641 psi								
115															
120		Core 120"	Rec 120"	RQD 83%	R3		@ 121.8' to 123.0' calcareous.								
125	645.1						Bottom of Boring - 125.0'								

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

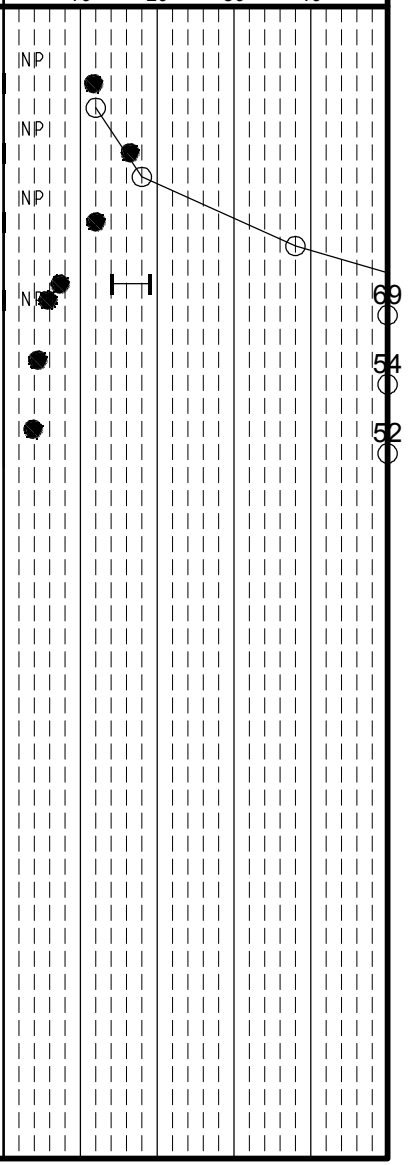
LOG OF: Boring B-047 | *Location:* Sta. 772+54.77, 107.04 ft Rt. of I-70 CL | *Date Drilled:* 7/17/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 753.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.6	752.7						Topsoil - 7"							
2.5	750.8	5 5 7	18	1			Medium dense brown SANDY SILT (A-4a), little gravel, trace clay; damp.		14	5	---	32	38	11
5.0	748.3	19 9 9	15	2			Medium dense to dense brown SILT (A-4b), "and" fine to coarse sand, trace clay, trace gravel; damp.		1	3	---	34	52	10
		16 17 20	18	3					5	8	---	32	44	11
6.2	747.1	15 33 35	18	4A 4B		4.0	Hard gray SANDY SILT (A-4a), trace to little gravel; damp.							
8.5	744.8	21 28 25	15	5			Very dense gray GRAVEL (A-1-a), some fine to coarse sand, trace to little silt; damp.		68	13	---	9	--10--	
10.0	743.3	13 18 33	12	6			Very dense brown COARSE AND FINE SAND (A-3a), trace silt; damp.							
							Bottom of Boring - 10.0'							

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

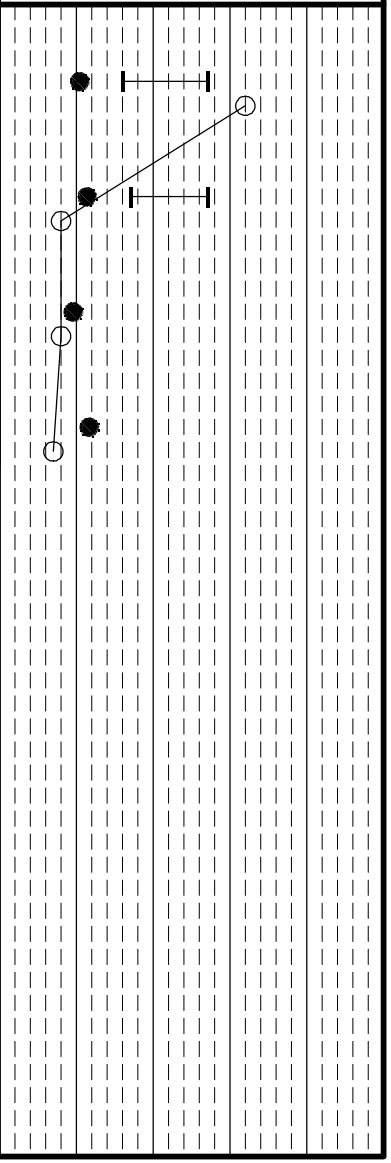
LOG OF: Boring B-049 | *Location:* Sta. 776+53.45, 56.70 ft Lt. of I-70 CL | *Date Drilled:* 7/20/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 765.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.7	764.3						Topsoil - 8"							
3.0	762.0	18 18 13	12	1		4.5+	FILL: Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		4	11	---	17	35	33
5		5 4 4	14	2		3.0	FILL: Very stiff brown SANDY SILT (A-4a), trace gravel, trace clay; damp.		8	19	---	19	32	22
8.0	757.0	3 4 4	14	3		2.75	@ 6.0'-7.5', contains few 1/2-inch brick fragments.							
10.0	755.0	4 4 3	10	4		2.0	Very stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.							
							Bottom of Boring - 10.0'							

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

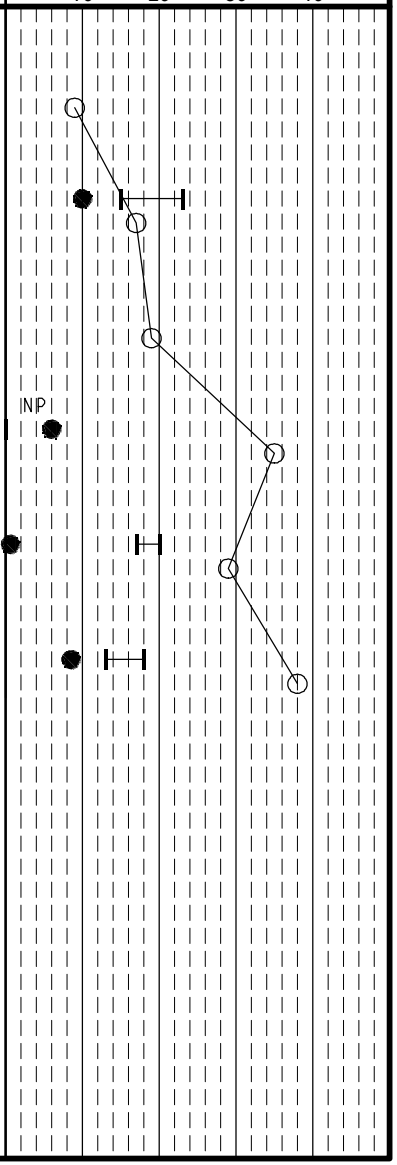
LOG OF: Boring B-050 | *Location:* Sta. 780+74.00, 50.05 ft Rt. of I-70 CL | *Date Drilled:* 7/17/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 766.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	765.9						Topsoil - 5"							
		5 4 5	18	1		4.5+	Hard gray SANDY SILT (A-4a), little gravel, trace clay; damp..							
		6 8 9	15	2		4.5+			15	12	---	21	33	19
5														
		5 9 10	18	3		4.5+								
8.5	757.8													
		14 17 17	13	4			FILL: Dense brown GRAVEL WITH SAND AND SILT (A-2-4), some silty clay; damp.		32	18	---	19	--31--	
10														
11.0	755.3													
		16 13 15	4	5		--	Hard gray SANDY SILT (A-4a), little clay, little gravel; contains rock fragments; damp.		19	17	---	19	26	19
		11 18 19	14	6		4.5+			12	9	---	20	39	20
15.0	751.3						Bottom of Boring - 15.0'							
15														
20														
25														

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

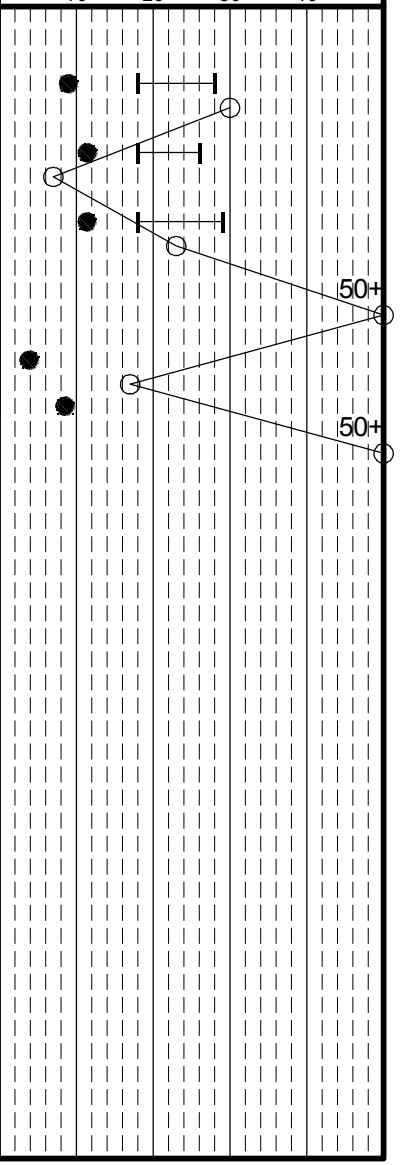
LOG OF: Boring B-051-0 | *Location:* Sta. 785+95.80, 2.05 ft Lt. of I-70 CL | *Date Drilled:* 3/16/2009

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

Depth (ft)	Elev. (ft) 795.1	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.2	794.9						Topsoil - 2"							
		13 8 13	18	1			FILL: Loose to medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), little clay; contains brick and slag fragments; damp.		39	19	---	13	17	12
		3 2 3	18	2					36	23	---	14	17	10
4.0	791.1													
5		7 3 13	10	3		--	FILL: Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, some gravel; damp.		24	17	---	17	31	11
		50/3	1	4		--	@ 5.5'-5.8', drove on boulder.							
7.0	788.1													
		5 4 8	10	5			Black cinders, little gravel; damp.							
8.5	786.6													
8.9	786.2	50/5	3	6			FILL: Very dense gray COARSE AND FINE SAND (A-3a), some gravel, little silt; contains brick and slag fragments; damp.							
10							Bottom of Boring - 8.9'							
15														
20														
25														

GRADATION

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



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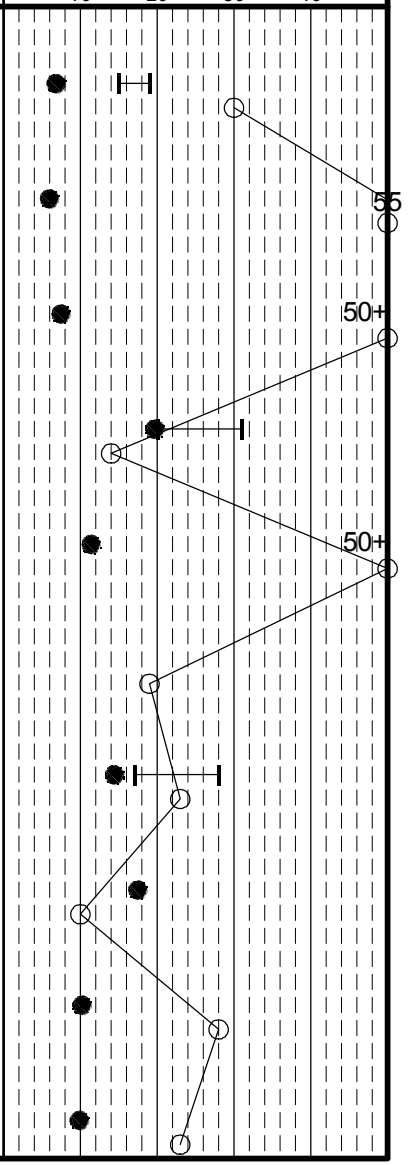
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-051-1 | *Location:* Sta. 789+57.40, 14.11 ft Rt. of I-70 CL | *Date Drilled:* 3/16/2009

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

Depth (ft)	Elev. (ft) 794.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	794.5						Topsoil - 3"							
		10 11 13	16	1			Dense to very dense brown GRAVEL WITH SAND (A-1-b), some silty clay; damp.		31	26	---	20	14	9
		6 15 29	15	2			@ 3.5'-5.0', little silt.							
6.0	788.8													
		13 40 50/3	13	3			Very dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp.							
8.5	786.3													
		6 6 5	10	4		1.5	Very stiff to hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.		27	17	---	17	24	15
							@ 8.5'-10.0', stiff, some gravel.							
		4 8 50/1	10	5		4.25								
		6 9 6	0	6		--								
		4 9 9	18	7		4.0			5	11	---	16	41	27
		2 2 6	8	8		3.5								
		5 9 13	18	9		4.5+	@ 21.0', becomes gray.							
		3 9 9	18	10		4.5+								
25.0	769.8						Bottom of Boring - 25.0'							

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



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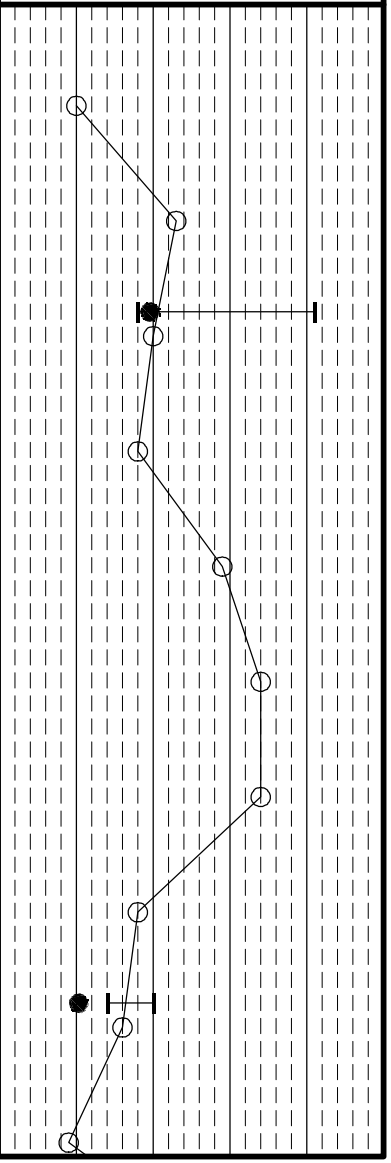
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-052 | *Location:* Sta. 792+59.57, 51.85 ft Rt. of I-70 CL | *Date Drilled:* 3/17/2009

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	786.4													
0.3	786.1						Topsoil - 4"							
		4 4 4	16	1		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
		4 9 9	18	2		4.5+								
6.0	780.4													
		4 5 11	13	3		4.5	Very stiff to hard brown CLAY (A-7-6), some fine to coarse sand, trace gravel; moist.		2	7	---	14	30	47
		3 5 9	14	4		2.75								
10.0	776.4						Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.							
		6 10 13	12	5		4.5+								
		6 11 16	17	6		4.25	@ 14.5', becomes gray.							
		8 14 13	9	7		4.5+								
		3 6 8	16	8		4.5+								
		3 5 8	18	9		4.5			16	14	---	18	35	17
		2 3 4	14	10		2.5								
	761.4													

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-052 | *Location:* Sta. 792+59.57, 51.85 ft Rt. of I-70 CL | *Date Drilled:* 3/17/2009

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

FIELD NOTES:

Depth (ft)	Elev. (ft) 761.4	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
		9 10 14	13	11			Medium dense gray COARSE AND FINE SAND (A-3a), some gravel, little silt; damp. @ 26.0'-27.5', contains cobble fragments.							
29.0	757.4	7 8 14	18	12A 12B 12C		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		4	11	---	68	--17--	
29.5	756.9						Medium dense to dense gray COARSE AND FINE SAND (A-3a), little silt, trace gravel; damp.		4	10	---	67	--19--	
31.5	754.9	8 15 17	12	13A 13B		4.0	Very stiff to hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, little to some gravel; damp.		15	15	---	22	32	16
34.0	752.4	3 5 8	18	14		3.25	Very dense brown GRAVEL (A-1-a), "and" fine to coarse sand, trace silt; damp.		25	13	---	17	28	17
40.0	746.4	12 31 35 / 8 30 25 / 15 27 27 / 16 27 26	18 / 18 / 16 / 18	15 16A 16B 17 18					50	26	---	16	--8--	
							Bottom of Boring - 40.0'							

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

NP NP NP 83 69 68 66

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

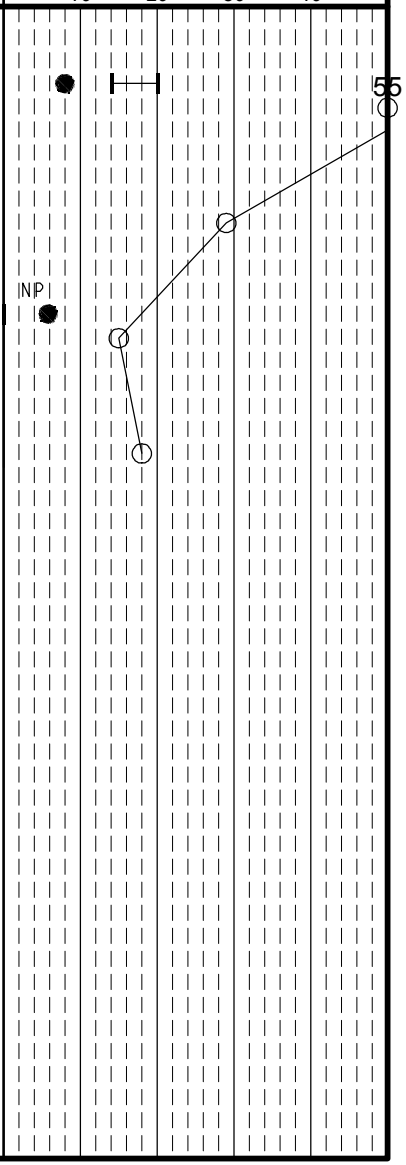
LOG OF: Boring B-053-0 | *Location:* Sta. 796+59.37, 5.44 ft Lt. of I-70 CL | *Date Drilled:* 7/29/2008

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

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 773.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.2	773.6						Topsoil - 2"							
		10 25 27	18	1		4.5+	Hard brown SANDY SILT (A-4a), trace to little gravel, trace clay; damp.		10	19	---	28	28	15
3.0	770.8						Medium dense brown GRAVEL WITH SAND (A-1-b), little silty clay; damp.							
		7 14 14	18	2										
5														
		9 6 8	18	3					44	27	---	15	--14--	
8.0	765.8													
		7 8 9	18	4		4.5+	Hard gray SANDY SILT (A-4a), trace gravel; damp.							
10.0 10	763.8						Bottom of Boring - 10.0'							
15														
20														
25														

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

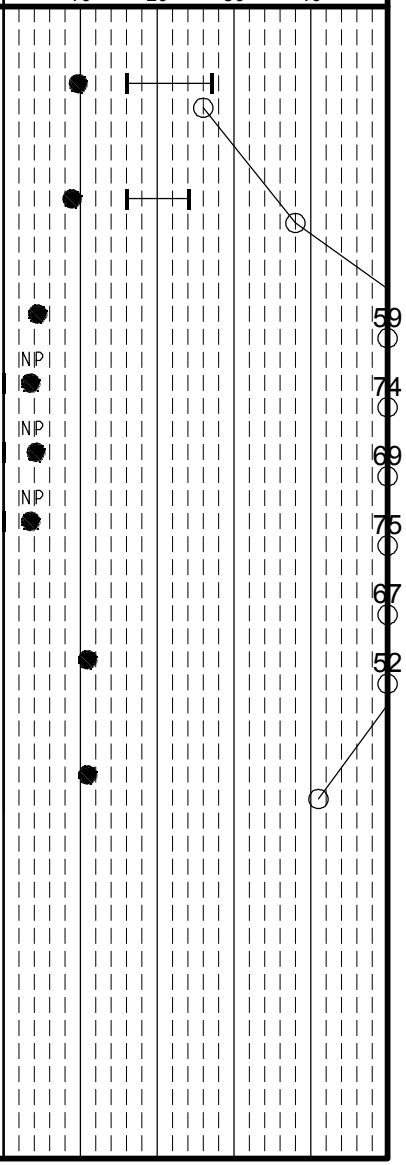
LOG OF: Boring B-054 | *Location:* Sta. 800+54.44, 16.73 ft Rt. of I-70 CL | *Date Drilled:* 7/29/2008

WATER OBSERVATIONS:
Water seepage at: 13.5'
Water level at completion: 14.2'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft) 776.0	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	775.7						Topsoil - 3"							
		7 13 12	18	1		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp.							
3.5	772.5													
		5 18 18	12	2		--	Hard gray SANDY SILT (A-4a), "and" fine to coarse sand, little gravel; contains few rust stains; damp.		12	16	---	20	33	19
5.5	770.5													
		6 22 34	18	3			Very dense brown GRAVEL (A-1-a), some to "and" fine to coarse sand, trace to little silt; damp.							
		40 31 39	18	4					56	21	---	12	--11--	
		17 28 38	18	5					52	25	---	16	--7--	
		16 39 32	18	6					57	22	---	11	--10--	
12.0	764.0													
		18 32 32	0	7		--	Hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp. (AUGER SAMPLE)							
13.5	762.5													
		7 18 31	18	8			Dense to very dense brown COARSE AND FINE SAND (A-3a), little silt, little gravel; wet.							
		18 20 19	18	9										
17.5	758.5													
							Bottom of Boring - 17.5'							

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-055 | *Location:* Sta. 804+27.09, 71.58 ft Rt. of I-70 CL | *Date Drilled:* 3/9/2009

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

Depth (ft)	Elev. (ft) 771.3	Blows per 6"	Recovery	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)
							Asphalt Concrete - 18"								
1.5	769.8														
		10 11 14	15	1		4.5	Hard brown and gray SANDY SILT (A-4a), some to "and" fine to coarse sand, little to some gravel; damp.								
		22 30 50/5	16	2		4.5+			22	17	---	20	27	14	50+
5		50/2	0	3		--			29	16	---	15	25	15	50+
		50/4	0	4		--	@ 4.5'-10.5', no recovery, collected auger cutting samples.		19	14	---	18	30	19	50+
		49 50/3	1	5		--			10	12	---	20	34	24	50+
		50/6	3	6		--									50+
10															
		32 24 36	18	7		4.5+									61
12.8	758.5	49 50/3	0	8		--									50+
							Bottom of Boring - 12.8'								
15															
20															
25															

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

LOG OF: Boring B-056 | *Location:* Sta. 808+73.28, 62.57 ft Lt. of I-70 CL | *Date Drilled:* 3/11/2009

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % -
	768.5						Asphalt Concrete - 19" Aggregate Base - 8"								PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
2.3	766.2	20 30 28	8	1		3.25	Very stiff to hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp to moist.		24	20	---	19	25	12	59
		8 17 22	18	2		4.5+	@ 2.3'-3.5', some gravel.		9	11	---	23	37	20	
5		11 14 20	18	3		4.5+			7	14	---	28	35	16	
		5 18 33	18	4		4.5+			19	14	---	25	30	12	52
		16 22 24	18	5		4.5+									
10		17 27 29	18	6		4.5+									57
11.0	757.5						Bottom of Boring - 11.0'								
15															
20															
25															

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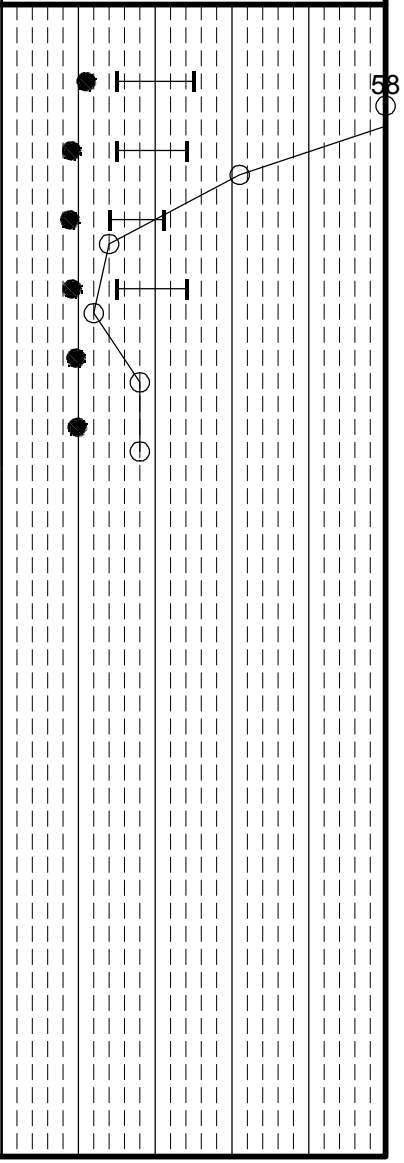
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-059 | *Location:* Sta. 812+61.34, 78.00 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

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

Depth (ft)	Elev. (ft) 769.7	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	769.3						Topsoil							
		9 18 38	18	1		4.5+	Hard brownish gray SANDY SILT (A-4a), some fine to coarse sand, little to some gravel; damp.		18	13	---	19	30	20
		18 10 20	3	2		--			26	15	---	14	29	16
5		5 6 8	18	3		4.5+	@ 4.0', becomes gray.		12	15	---	20	36	17
		4 6 6	18	4		4.5+			16	11	---	18	36	20
		4 8 9	18	5		4.5								
10.0 10	759.7	11 8 9	18	6		4.5+								
							Bottom of Boring - 10.0'							

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



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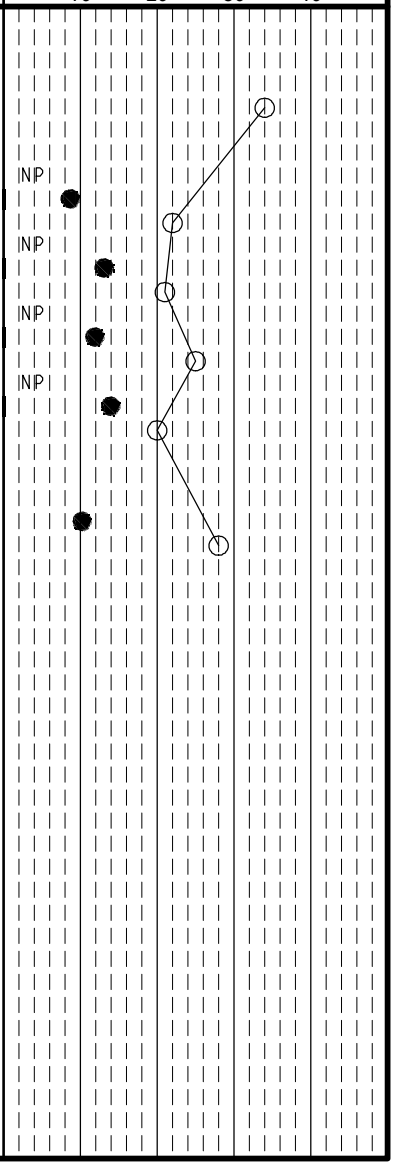
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-062 | *Location:* Sta. 816+49.66, 70.25 ft Lt. of I-70 CL | *Date Drilled:* 3/11/2009

WATER OBSERVATIONS:
Water seepage at: 6.1'
Water level at completion: 6.1'
FIELD NOTES:

Depth (ft)	Elev. (ft) 770.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	770.4						Topsoil - 5"							
		9 16 17	18	1		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
3.5	767.3													
		12 12 9	18	2			Medium dense brown and gray GRAVEL WITH SAND (A-1-b), little silt; moist.		35	31	---	24	--10--	
5		7 10 10	18	3			@ 6.1', becomes wet.		27	29	---	33	--11--	
		11 13 11	12	4					30	27	---	31	--12--	
8.0	762.8													
		11 10 9	18	5			Medium dense gray COARSE AND FINE SAND (A-3a), little gravel, little silt; wet.		17	25	---	43	--15--	
10														
10.5	760.3													
		9 16 11	12	6		4.5	Hard gray SANDY SILT (A-4a), "and" fine to coarse sand, little gravel; moist.							
12.0	758.8						Bottom of Boring - 12.0'							
15														
20														
25														

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

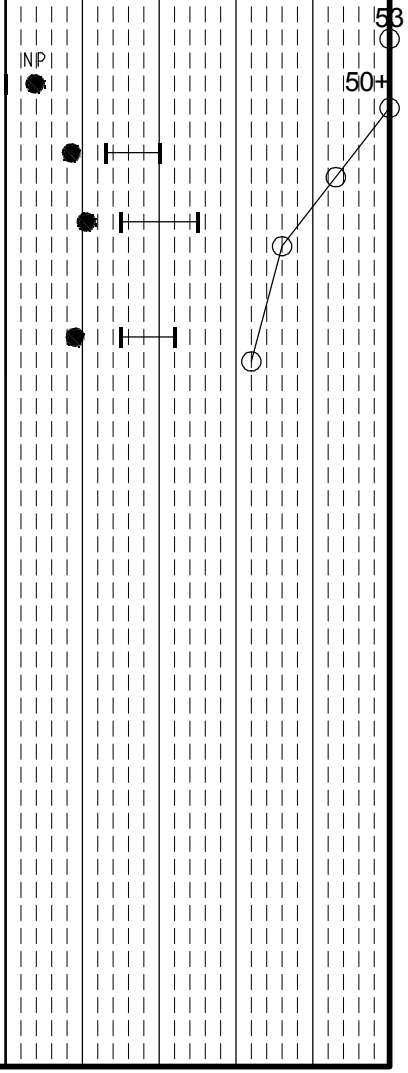
LOG OF: Boring B-063 | *Location:* Sta. 820+38.39, 53.09 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	769.0						Asphalt Concrete - 19" Aggregate Base - 10"							
2.4	766.6	37 27 24	12	1			FILL: Very dense brown and gray GRAVEL WITH SAND (A-1-b), some silt; damp.							
4.0	765.0	7 10 50/3	3	2			Hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace gravel; damp.		62	8	---	7	--23--	
5		17 19 23	18	3		4.5+			10	9	---	27	36	18
		14 19 16	18	4		4.5+			4	10	---	16	44	26
10.0	759.0	6 12 19	18	5		4.5+			9	12	---	22	39	18
							Bottom of Boring - 10.0'							
15														
20														
25														

GRADATION

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



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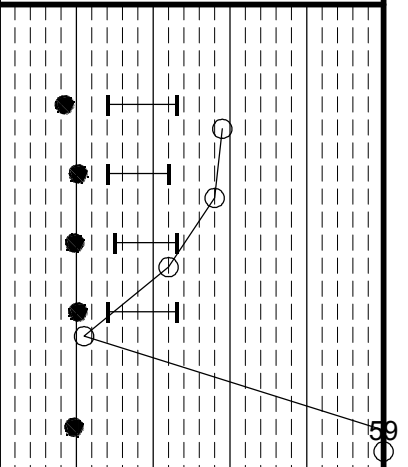
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-064 | *Location:* Sta. 824+48.47, 51.10 ft Lt. of I-70 CL | *Date Drilled:* 3/11/2009

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	768.3						Asphalt Concrete - 14" Aggregate Base - 4"							
1.5	766.8													
		11 15 13	18	1		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		13	14	---	18	32	23
		11 16 11	18	2		4.5+			11	14	---	18	36	21
5		11 13 8	18	3		4.5+			12	12	---	17	35	24
		1 3 8	18	4		4.5+			14	11	---	17	33	25
		28 39 18	18	5		4.5+								
10.0 10	758.3						Bottom of Boring - 10.0'							
15														
20														
25														

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



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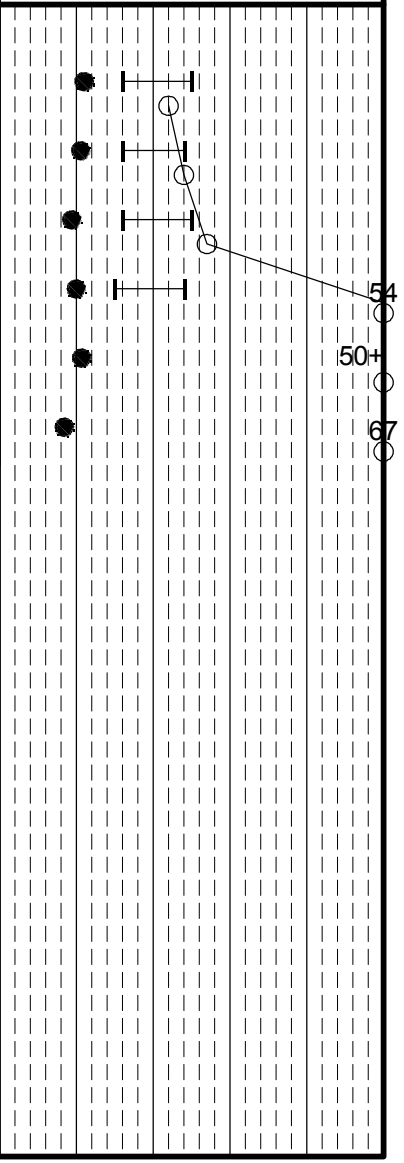
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-065 | *Location:* Sta. 828+59.20, 73.86 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

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

Depth (ft)	Elev. (ft) 769.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.3	769.5						Topsoil - 4"							
		6 11 10	18	1		4.5+	Hard brown SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.		9	14	---	19	36	21
		11 11 12	18	2		4.5+			7	16	---	21	37	19
5		9 13 13	18	3		4.5+			12	9	---	16	37	26
		15 28 24	5	4		4.5+			5	14	---	20	38	23
		28 49 50/5	17	5		4.5+								
10.0	759.8	37 38 27	18	6		4.5+								
							Bottom of Boring - 10.0'							

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



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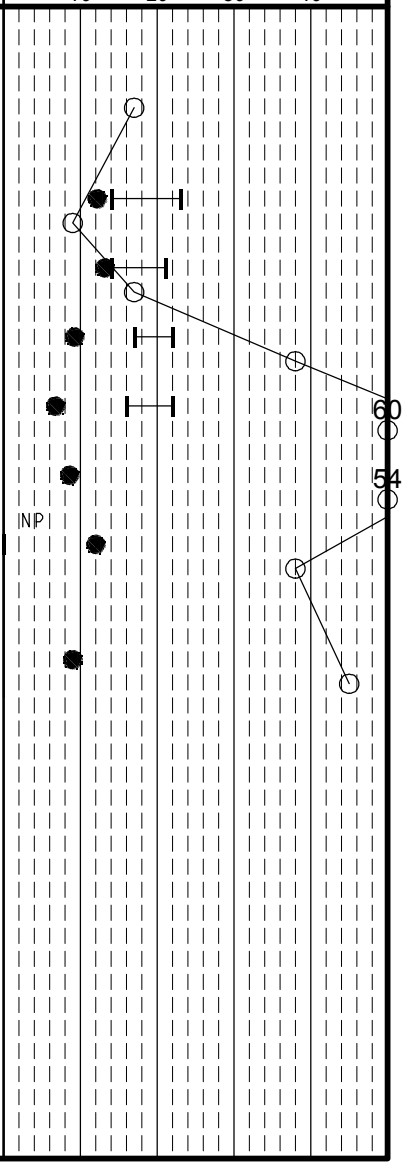
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-068 | *Location:* Sta. 832+53.33, 82.95 ft Lt. of I-70 CL | *Date Drilled:* 3/11/2009

WATER OBSERVATIONS:
Water seepage at: 12.0'
Water level at completion: 14.0'
FIELD NOTES:

Depth (ft)	Elev. (ft) 770.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	769.9						Topsoil - 5"							
		8 8 9	18	1		4.5+	Hard brown SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.							
		4 5 4	16	2		4.5+			6	12	---	19	39	24
5		2 3 14	18	3		1.0	@ 5.0'-6.5', stiff.		10	13	---	25	33	19
		5 19 18	18	4		4.5+			11	16	---	22	36	15
8.0	762.3													
9.5	760.8	15 29 30	18	5		--	Very dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace to little clay; damp.		26	27	---	20	17	10
10		21 24 29	18	6			Dense to very dense brown GRAVEL WITH SAND (A-1-b), little silt; damp.							
		11 19 18	18	7					27	41	---	16	--16--	
13.5	756.8													
15.0	755.3	14 21 23	18	8		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.							
15							Bottom of Boring - 15.0'							
20														
25														

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-069 | *Location:* Sta. 836+58.12, 62.67 ft Rt. of I-70 CL | *Date Drilled:* 3/9/2009

WATER OBSERVATIONS:
Water seepage at: 8.5'
Water level at completion: 10.8'
FIELD NOTES:

Depth (ft)	Elev. (ft) 768.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt Concrete - 20" Aggregate Base - 10"							
2.5	765.8	10 15 21	18	1		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.		12	11	---	19	35	23
		17 12 26	16	2		4.5+			10	14	---	20	34	22
5		12 19 23	18	3		4.5+			5	13	---	22	37	23
		15 18 22	18	4		4.5+	@ 8.5'-8.7', silty sand seam.		11	11	---	19	37	22
8.7	759.6	18 18 27	18	5A		4.5+								
9.5	758.8			5B		2.0	Stiff to very stiff gray SILT (A-4b), some fine sand; moist.	+ +						
10		21 23 24	18	5C 6		2.5	Very stiff brown SANDY SILT (A-4a), "and" fine to coarse sand, trace gravel; moist.							
11.0	757.3													
12.5	755.8	12 17 23	16	7			Dense brown COARSE AND FINE SAND (A-3a), some silty clay, trace gravel; moist.							
							Bottom of Boring - 12.5'							
15														
20														
25														

GRADATION

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

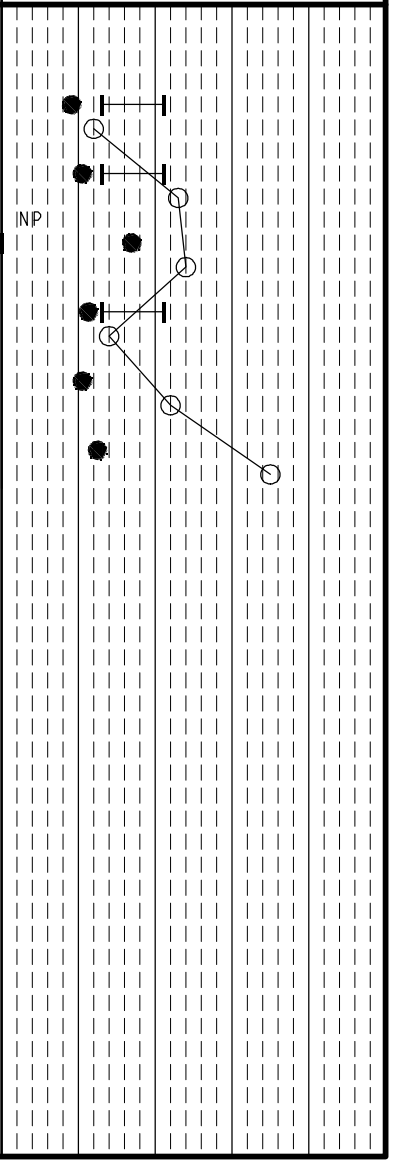
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-070 | *Location:* Sta. 839+54.96, 113.59 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

WATER OBSERVATIONS:
Water seepage at: 4.5'
Water level at completion: 8.1'
FIELD NOTES:

Depth (ft)	Elev. (ft) 771.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt Concrete - 13" Aggregate Base - 5"							
1.8	769.7	4 6 6	18	1		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		8	10	---	20	40	22
		15 12 10	18	2		4.5+			7	8	---	19	41	25
4.5	767.0													
5 6.0	765.5	15 12 11	18	3			Medium dense brown COARSE AND FINE SAND (A-3a), some silt; wet.		2	2	---	73	--23--	
		8 7 7	10	4		4.5+	Hard brown SILT (A-4b), trace fine to coarse sand, trace gravel; damp.		7	2	---	5	63	23
		8 10 11	18	5		4.5+								
9.0	762.5													
10 10.5	761.0	15 17 17	15	6			Dense brown FINE SAND (A-3), trace gravel; moist.							
							Bottom of Boring - 10.5'							
15														
20														
25														

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

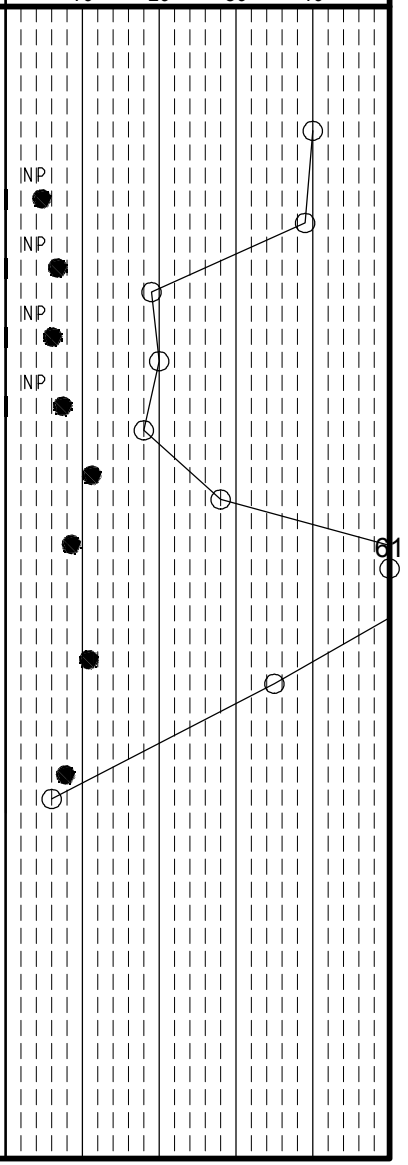
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-071 | *Location:* Sta. 841+39.85, 131.74 ft Lt. of I-70 CL | *Date Drilled:* 3/10/2009

WATER OBSERVATIONS:
Water seepage at: 11.0'
Water level at completion: 16.5'
FIELD NOTES:

Depth (ft)	Elev. (ft) 778.4	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt Concrete - 18" Aggregate Base - 11"							
2.4	776.0	32 22 17	18	1										
							Dense brown GRAVEL WITH SAND (A-1-b), little silt; damp.							
		19 20 18	16	2					19	41	---	24	--16--	
5.0 5	773.4													
		7 8 11	18	3			Medium dense brown COARSE AND FINE SAND (A-3a), little silt, trace to little gravel; damp.		10	29	---	48	--13--	
6.5	771.9													
		10 9 11	18	4			Medium dense brown FINE SAND (A-3), trace silt; damp to moist.		0	13	---	78	--9--	
8.0	770.4													
		6 9 9	16	5			Medium dense to dense brown and gray COARSE AND FINE SAND (A-3a), trace to little silt; wet.		0	2	---	86	--12--	
10		8 12 15	14	6										
		11 24 36	18	7			@ 11.0'-12.5', very dense. @ 12.5'-17.5', installed piezometer screen.							
							Water level readings: 3/10/09 10.60' 3/27/09 10.50' 4/16/09 10.38'							
15		12 16 18	12	8										
		7 4 2	8	9			@ 16.0'-17.5', loose.							
17.5	760.9													
							Bottom of Boring - 17.5'							
20														
25														

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

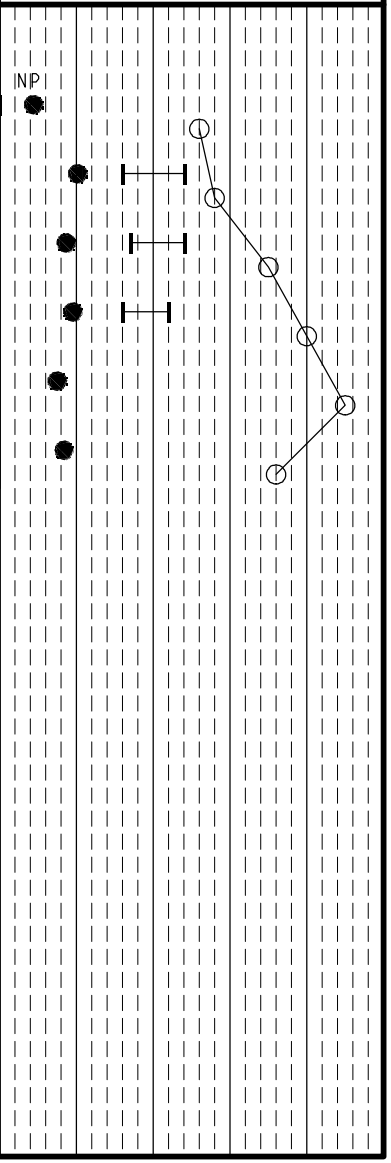
LOG OF: Boring B-073 | *Location:* Sta. 840+60.36, 62.06 ft Lt. of I-70 CL | *Date Drilled:* 3/10/2009

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

Depth (ft)	Elev. (ft) 765.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt Concrete - 12" Aggregate Base - 6"							
1.5	764.0													
		21 13 12	12	1			Medium dense light gray GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; probable lime stabilized subgrade; damp.		53	19	---	10	--18--	
3.0	762.5													
		12 16 11	18	2		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		11	15	---	19	41	14
5		23 18 16	18	3		4.5+			16	15	---	17	33	19
		15 17 22	18	4		4.5+			10	11	---	18	45	16
		23 24 20	18	5		4.5+	@ 7.5'-10.5', gray.							
10		18 17 18	18	6		4.5+								
10.5	755.0													
							Bottom of Boring - 10.5'							
15														
20														
25														

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-074 | *Location:* Sta. 841+96.13, 146.22 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

WATER OBSERVATIONS:
Water seepage at: 6.0'
Water level at completion: None
FIELD NOTES:

Depth (ft)	Elev. (ft) 779.8	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.5	778.3						Asphalt Concrete - 11" Aggregate Base - 7"							
3.0	776.8	40 43 23	18	1			Very dense light gray GRAVEL WITH SAND (A-1-b), some silt; probable lime stabilized subgrade; damp.		43	22	---	12	--23--	
4.5	775.3	17 21 17	18	2			Dense brown COARSE AND FINE SAND (A-3a), some silty clay, little gravel; damp.		19	29	---	24	21	7
5		18 20 23	18	3			Medium dense to dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; damp to moist.		33	38	---	17	--12--	
7.5	772.3	7 7 5	5	4					19	34	---	37	--10--	
							Bottom of Boring - 7.5'							

10
15
20
25

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

NP
NP
NP

68

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

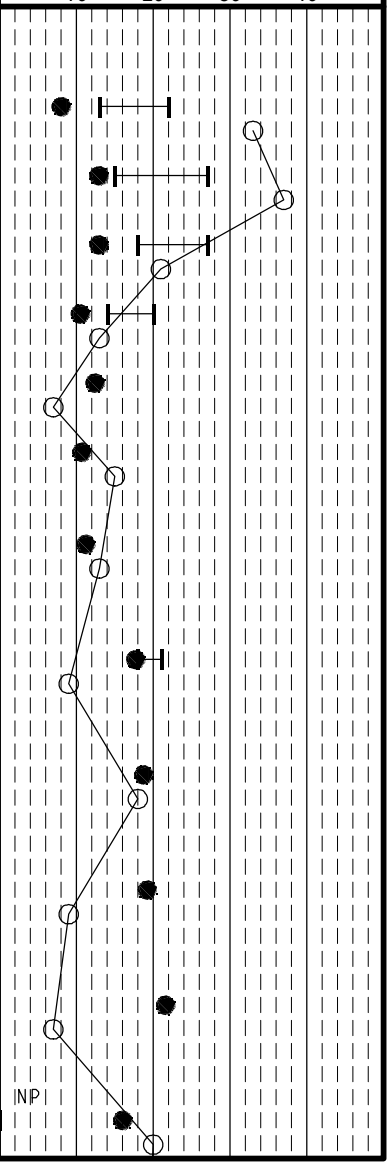
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-075 | *Location:* Sta. 844+00.90, 156.68 ft Lt. of I-70 CL | *Date Drilled:* 3/11/2009

WATER OBSERVATIONS:
Water seepage at: 13.0'
Water level at completion: 32.4'
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	784.7						Asphalt Concrete - 18"							
1.5	783.2													
		15 18 14	12	1		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		13	13	---	21	32	21
3.0	781.7													
		19 10 26	10	2		4.5+	Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		10	13	---	17	33	27
4.5	780.2													
5		10 8 12	18	3		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		12	12	---	18	32	26
		10 7 6	18	4		4.5+	@ 6.0', becomes gray.		12	13	---	21	36	18
		2 3 4	12	5		4.25								
10		4 8 7	3	6		4.5								
		3 6 7	18	7		4.25								
13.5	771.2													
		3 3 6	18	8		3.75	Very stiff gray SILT (A-4b), trace fine to coarse sand; damp to moist.		0	1	---	4	77	18
15														
16.0	768.7													
		5 6 11	18	9			Loose to medium dense gray COARSE AND FINE SAND (A-3a); moist.							
		5 4 5	18	10			@ 18.5', becomes wet.							
20														
		3 3 4	18	11										
		WOH 1 18	18	12					11	27	---	41	--21--	
25	759.7													

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-075 | *Location:* Sta. 844+00.90, 156.68 ft Lt. of I-70 CL | *Date Drilled:* 3/11/2009

WATER OBSERVATIONS:
Water seepage at: 13.0'
Water level at completion: 32.4'
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	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, % -
	759.7														PL — LL; Blows per foot - ○ / Non-Plastic - NP; 10 20 30 40
		4 6 12	18	13		3.5	Stiff to very stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.								
28.5	756.2														
		10 15 18	18	14		4.5+	Hard gray SANDY SILT (A-4a), little to some fine to coarse sand, trace gravel; damp.								
30															
		11 21 25	18	15		4.5+									
		10 13 18	18	16		4.5									
35															
		12 22 27	18	17		4.5+			8	6	---	13	44	29	51
		22 29 32	18	18		4.5+									63
40															
		22 33 36	18	19		4.5+									71
		33 39 44	18	20		4.5+									86
45															
		32 50/5	11	21		4.5+									50+
50.0	734.7						Bottom of Boring - 50.0'								
50															

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

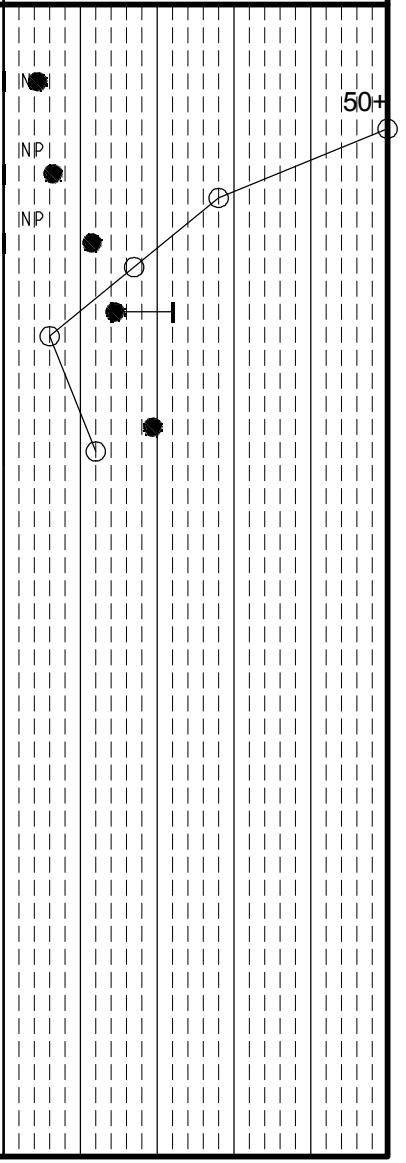
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-076 | *Location:* Sta. 844+45.56, 50.77 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

WATER OBSERVATIONS:
Water seepage at: 4.5'. 8.0'
Water level at completion: 4.6'
FIELD NOTES:

Depth (ft)	Elev. (ft) 763.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetro-meter (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
1.2	762.3						Asphalt Concrete - 14"							
3.0	760.5	50/5	2	1			Very dense light gray GRAVEL WITH SAND (A-1-b), little silt; probable lime-treated subgrade; damp.		50	21	---	11	--18--	
6.0	757.5	14 16 11	18	2			Medium dense light brown to brown GRAVEL (A-1-a), some fine to coarse sand, little silt; wet.		61	17	---	9	--13--	
		4 7 9	3	3			@ 3.0'-4.5', probable lime-treated subgrade.		66	14	---	8	--12--	
8.5	755.0	1 2 4	10	4		1.5	Stiff gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.		9	10	---	20	38	23
10.0	753.5	14 6 6	3	5			Medium dense gray COARSE AND FINE SAND (A-3a), some silt, little gravel; wet.							
							Bottom of Boring - 10.0'							

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



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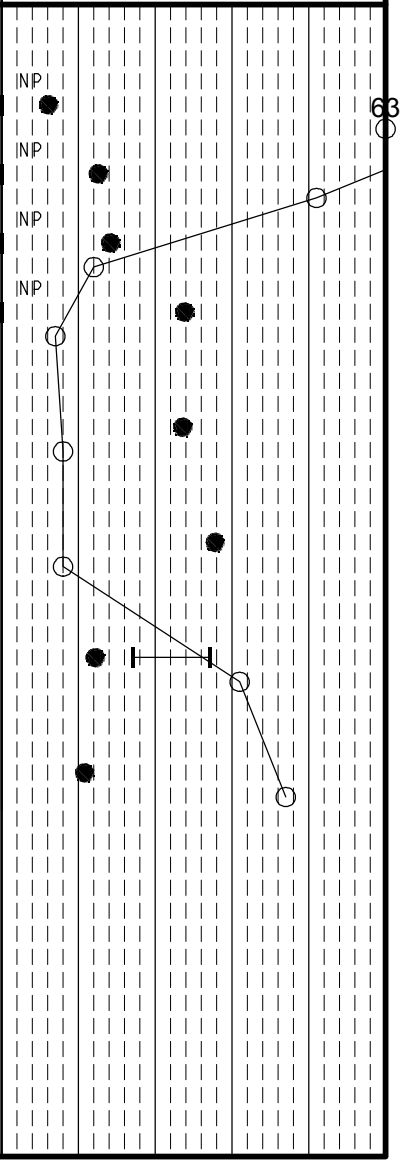
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-077 | *Location:* Sta. 848+68.24, 52.59 ft Lt. of I-70 CL | *Date Drilled:* 3/10/2009

WATER OBSERVATIONS:
Water seepage at: 6.6'
Water level at completion: 6.7'
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	760.8						Asphalt Concrete - 18" Aggregate Base - 10"							
2.3	758.5	35 36 26	16	1					27	13	---	24	--36--	
3.0	757.8						Very dense brown SANDY SILT (A-4a), "and' fine to coarse sand, some gravel; possible road base; damp.							
		8 14 26	18	2					0	2	---	64	--34--	
5		5 6 6	17	3			Loose to medium dense brown COARSE AND FINE SAND (A-3a), little to some silt; moist to wet.		0	4	---	77	--19--	
		3 3 4	18	4			@ 6.6', becomes wet.		0	4	---	79	--17--	
		4 3 5	16	5										
10		3 4 4	15	6										
13.5	747.3													
		10 12 18	15	7		4.5+	Hard brownish gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		2	8	---	14	42	34
15														
		8 16 20	12	8		4.5+								
17.5	743.3													
							Bottom of Boring - 17.5'							
20														
25														

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-078 | *Location:* Sta. 852+54.41, 59.80 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

WATER OBSERVATIONS:
Water seepage at: 8.8'
Water level at completion: 8.5'
FIELD NOTES:

Depth (ft)	Elev. (ft) 758.5	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
							Asphalt Concrete - 19" Aggregate Base - 8"							
2.3	756.2	29 23 16	12	1		4.5+								
							Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, little to some gravel; damp.							
5.0	753.5	4 13 13	18	2		4.5+			20	12	---	17	26	25
		8 15 16	18	3		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		7	14	---	19	40	20
		9 13 19	18	4		4.5+			7	10	---	16	43	24
		16 12 16	18	5A 5B		4.5+ 4.25	@ 8.8'-8.9', wet sand seam.		5	11	---	17	50	17
10		7 13 15	18	6		4.5+								
		6 12 15	16	7		4.5+								
15.0	743.5	9 15 23	16	8		4.5+								
							Bottom of Boring - 15.0'							

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

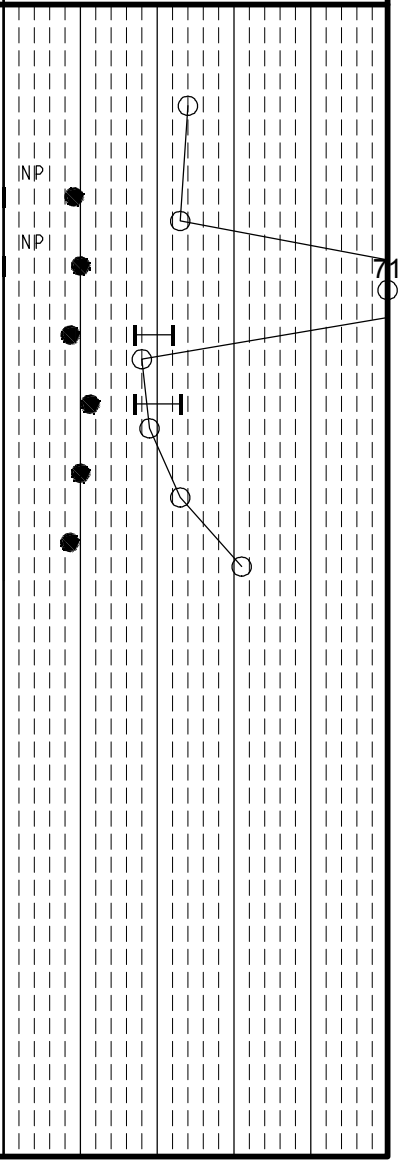
Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-079 | *Location:* Sta. 856+60.05, 73.39 ft Lt. of I-70 CL | *Date Drilled:* 3/10/2009

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

Depth (ft)	Elev. (ft) 759.3	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.4	758.9						Topsoil - 5"							
		5 12 11	18	1			Dense brown COARSE AND FINE SAND (A-3a), little gravel, trace silt; damp.							
3.5	755.8													
5.0	754.3	2 10 12	18	2			Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; moist.		25	21	---	27	22	5
6.5	752.8	11 22 47	10	3			Very dense brown SANDY SILT (A-4a), some gravel; moist.		25	14	---	22	--39--	
8.0	751.3	5 11 6	18	4			Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp.		20	30	---	18	24	8
		4 11 7	18	5		4.5+	Hard brown SANDY SILT (A-4a), some fine to coarse sand, little to some gravel; ; damp.		20	9	---	14	42	15
10		10 11 11	18	6		4.0	@ 9.5'-12.5', gray.							
12.5	746.8	8 15 15	18	7		4.5+								
							Bottom of Boring - 12.5'							
15														
20														
25														

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-082 | *Location:* Sta. 860+38.00, 50.89 ft Rt. of I-70 CL | *Date Drilled:* 3/10/2009

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

Depth (ft)	Elev. (ft) 761.4	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
		56 52 32	17	1			Asphalt Concrete - 20" Aggregate Base - 9"		51	24	---	11	--14--	
2.4	759.0													
		8 18 26	15	2		4.5+	Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		8	13	---	17	34	28
4.0	757.4													
5		7 8 9	18	3		4.25	Hard brown SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.		12	13	---	16	32	27
		6 8 15	16	4		4.5	@ 4.0'-7.0', contains occasional rust stains.		7	12	---	24	34	23
		5 5 8	18	5		4.5+	@ 7.0'-8.5', gray.							
8.5	752.9						Bottom of Boring - 8.5'							
10														
15														
20														
25														

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