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November 16, 2007

Michael D. Weeks, P.E., P.S.
TranSystems Corporation
5747 Perimeter Drive, Suite 240
Dublin, OH 43017

Re: **Pavement Design Information**
Phase 3 - Mainline and Side Road CBR Values
SCI-823-0.00 Portsmouth Bypass
Phase 3 – Stage I
DLZ Job No.: 0121-3070.03
PID No. 77366

Dear Mr. Weeks:

This document presents the findings of subsurface explorations performed for proposed side roads, ramps and the mainline alignment for Phase 3 of the SCI-823 Portsmouth Bypass project. The Phase 3 area is defined as being from station 54+11.25 to station 352+00.

The side roads in the Phase 3 area have been independently evaluated for subgrade improvements and pavement design information. Please refer to these documents for more information.

Appendix A: Pavement Design Information
-US 52

Appendix B: Pavement Design Information
SR 140

Appendix C: Pavement Design Information
Pershing Avenue

Appendix D: Pavement Design Information
Phase 3 Mainline

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We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our reports.

Respectfully submitted,

DLZ OHIO, INC.

Steven J. Riedy
Geotechnical Engineer

Eric W. Tse, P.E.
Senior Geotechnical Engineer

Andrew M Jalbrzikowski
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cc: File

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APPENDIX A

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November 16, 2007

Michael D. Weeks, P.E., P.S.
TranSystems Corporation
5747 Perimeter Drive, Suite 240
Dublin, OH 43017

Re: **Pavement Design Information**
US 52 Interchange
SCI-823-0.00 Portsmouth Bypass
DLZ Job No.: 0121-3070.03
PID #77366
Document #0091

Dear Mr. Weeks:

This letter presents the findings of a subsurface investigation performed for the US 52 pavement project. This pavement project is part of the reconstruction project of existing US 52 and the construction of the proposed US 52 Ramp A and Ramp B Bridges over Ohio River Road and US 52 of the Portsmouth bypass project. The findings included in this letter pertain to the reconstruction portion of the existing northbound US 52, approximately between Station 5+00 and Station 26+50, and the reconstruction portion of the existing southbound US 52, approximately between Station 5+00 and Station 18+23.0. This letter also presents the findings for the proposed Ramp A, approximately between Station 26+50 (approximately Station 25+00 referenced to Ramp A baseline) and Station 35+00 (approximately Station 34+00 referenced to Ramp A baseline), and for the proposed Ramp B, approximately between Station 18+23.00 (approximately Station 16+50 referenced to Ramp B baseline) and Station 31+50 (approximately Station 29+50 referenced to Ramp B baseline). Note that the stationing used in this report is referenced to the centerline of US 52 unless noted otherwise. Subsurface explorations were performed for the other features of the project but the results are presented in separate reports.

According to the information provided, embankment fills or sidehill fills, approximately between 1 and 10 feet thick, will be required for the construction of the proposed Ramp A up to Station 34+00 (referenced to Ramp A baseline) while the fills required for the construction of the proposed Ramp B up to Station 29+50 (referenced to Ramp B baseline) will be approximately between 2 and 20 feet. The finished grades for the reconstruction portion of existing US 52 are not known at this time and were assumed to approximate the existing grades.

The recommendations presented in this report have been made on the basis of the foregoing information. If the proposed alignment or concept is changed or differs from that assumed, DLZ Ohio, Inc. (DLZ) must be informed of the changes so that recommendations and conclusions presented in this letter may be revised as necessary.

The results of the subgrade evaluations are based in part upon the findings of seventeen subgrade borings. Borings B-1510 through B-1516, and B-1521 were drilled between January 4 and 16, 2006. Boring B-1519 was drilled between December 28 and 30, 2005. Borings B-1533 and B-1534 were drilled on August 16, 2006. Borings B-1535 through B-1540 were drilled on October 11, 2006. These borings were drilled to depths between 10.0 and 80.4 feet. In addition to subgrade information, the deeper borings also provided subsurface data for previous site development plans and other features of the Portmouth bypass project. For the purposes of subgrade evaluation, continuous sampling was performed in each of the borings, from approximately 1 foot to approximately 6.0 to 7.0 feet below the existing ground surface. Additional (non-subgrade) borings drilled within the proposed pavement area were also considered in developing the subgrade recommendations. These additional borings were B-1501 through B-1509, B-1517, B-1518, B-1520, and B-1522 through B-1532. The subgrade borings and the additional borings were drilled using a truck mounted rotary-type drill rig. Borings were planned and staked in the field by representatives of DLZ. The surveyed locations and ground surface elevations of the borings were determined by representatives from Lockwood, Lanier, Mathias & Noland, Inc. (2LMN). A boring plan showing the locations of borings and the logs of borings are attached.

At the ground surface, the subgrade borings encountered between 4 and 12 inches of asphalt concrete underlain by either 7 to 9 inches of Portland cement concrete or 1 to 8 inches of aggregate base except in Boring B-1514, where only 12 inches of asphalt concrete were encountered. Below the pavement materials, the subgrade borings encountered a variety of cohesive and granular soils in the upper 10 feet of the borings. Generally, the cohesive soils consisted of stiff to hard sandy silt (A-4a), silt (A-4b), silt and clay (A-6a), and silty clay (A-6b) while the granular soils consisted of loose to very dense gravel with sand (A-1-b), fine sand (A-3), coarse and fine sand (A-3a), and gravel with sand and silt (A-2-4). Note that the materials encountered in the upper 10 feet of Borings B-1533 and B-1534 appeared to be fills and possible fills.

Seepage was encountered in subgrade borings B-1510 through B-1519, B-1520, B-1521, B-1533 and B-1534. Seepage encountered in these borings was generally at depths greater than 10 feet below the ground surface except in Borings B-1510, B-1516, B-1533 and B-1534, where seepage was first encountered between depths of 1.0 and 6.3 feet. Prior to rock coring or adding water to wash out heaving sand, groundwater levels were observed at depths between 8.9 and 49.8 feet. Water levels at the completion of drilling, which included drilling water, were at depths between 15.0 and 68.0 feet.

Seepage was not encountered in subgrade borings B-1535 through B-1540. Groundwater was not observed in these borings during the field investigation.

Based upon the anticipated finished grades and the findings of the 17 subgrade borings, Table 1 presents the amount of cut or fill anticipated at each boring location and the uppermost layer of subgrade material encountered at the boring locations.

Table 1: Summary of Uppermost layer of Subgrade Material at Boring Locations

Boring No.	Station*	Existing Ground Surface Elev. (ft)	Proposed Grade (ft)	Fill / (Cut) (ft)	Uppermost Layer of Subgrade Material
B-1519	5+67.1	541.4	541.4	0	Sandy Silt (A-4a)
B-1535	9+66.6	542.5	542.5	0	Coarse and Fine Sand (A-3a)
B-1533	9+86.2	542.6	542.6	0	Silt and Clay (A-6a)
B-1516	10+14.5	542.5	542.5	0	Coarse and Fine Sand (A-3a)
B-1515	11+67.8	542.6	542.6	0	Coarse and Fine Sand (A-3a)
B-1514	13+03.6	543.1	543.1	0	Coarse and Fine Sand (A-3a)
B-1536	13+75.3	543.4	543.4	0	Sandy Silt (A-4a)
B-1534	13+90.5	543.4	543.4	0	Gravel with Sand (A-1b)
B-1513	14+62.9	543.2	543.2	0	Gravel with Sand (A-1b)
B-1512	16+15.9	543.2	543.2	0	Coarse and Fine Sand (A-3a)
B-1537	17+59.1	543.5	543.5	0	Silty Clay (A-6b)
B-1511	17+75.3	543.4	543.4	0	Coarse and Fine Sand (A-3a)
B-1510	19+13.0	543.7	543.7	0	Coarse and Fine Sand (A-3a)
B-1538	21+65.7	543.3	543.3	0	Gravel with Sand (A-1b)
B-1521	24+76.9	536.8	540.8	4.0	Silt and Clay (A-6a)
B-1539	25+57.1	544.2	544.2	0.0	Gravel with Sand (A-1b)
B-1540	29+54.5	546.0	548.7	2.7	Silt (A-4b)

* Stations are referenced to the centerline of US 52 except Station 24+76.9 (Boring B-1521), which is referenced to the baseline of the proposed US 52 Ramp B.

Pavement Design Information

Table 2 below lists the subgrade soils encountered by the borings and the group indices, CBR values, and number of samples tested for each soil type.

Table 2: Subgrade Soils

ODOT Classification	Group Index	CBR	No. Samples Tested
Gravel with Sand (A-1b)	0	13	5
Fine Sand (A-3)	0	13	1
Coarse and Fine Sand (A-3a)	0	13	3
Gravel w/ Sand and Silt (A-2-4)	0	13	1
Sandy Silt (A-4a)	3	9	5
Silt (A-4b)	8	7	2
Silt and Clay (A-6a)	9	6	5
Silty Clay (A-6b)	10	6	3

Based upon averaging the results of the laboratory testing, a CBR value of 9 is recommended for pavement design.

Subgrade Condition and Preparation

The existing subgrade soils at the boring locations were evaluated for suitability according to the ODOT Geotechnical Bulletin GB-1 "Plan Subgrades." The optimum moisture content (MC) for each soil type was estimated using the following criteria:

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

It should be noted that only samples within 6.0 to 7.0 feet of the estimated finished grade were evaluated. The GB-1 Soil Investigation Summary Sheet is attached.

According to the GB-1, any soil with moisture content exceeding the optimum moisture content of the soil by three or more percentage points, or has low N-values (generally N<10), is considered problematic soil and will likely require some form of subgrade treatment. The stabilization options available include undercutting, cement stabilization, and lime stabilization. However, the cement or lime stabilization may not be effective in very weak soils (N-values less than 5 blows per foot).

Results of this surface investigation indicate that approximately 36 percent of the tested samples, located within 6 to 7 feet of the estimated finished grade, had moisture contents exceeding their corresponding optimum moisture contents by more than 3 percent and that approximately 16 percent of the samples located within 6 to 7 feet of the estimated finished grade had low N-values. The natural moisture contents of the tested soil samples ranged from 3% to 23%, with an average of 12.9%, and the N-values varied from 5 to 71, with an average of 23.2. The low N-value of each boring varied from 5 to 30, with an average of 14.8.

To determine the appropriate treatment option, the average standard penetration value (N-value) and the plasticity index (PI) of the subgrade soils were considered. The average N-value, PI, moisture content, and CBR are summarized in Table 3.

Table 3

Percent of Tested Samples Over Optimum MC + 3 Percent	Average N_L*	Average PI	Average MC	CBR Average
36	14.8	10.9	12.9	9

* - N_L indicates lowest standard penetration value (N) in subgrade soil.

According to the GB-1 Soil Investigation Summary Sheet, cement stabilization of 12 to 14 inches of the subgrade or undercutting of 1 to 2 feet is recommended at Borings B-1537 (Station 17+59.1), B-1510 (Station 19+13.0), B-1538 (Station 21+65.7) and B-1539 (Station 25+57.1). However, cement stabilization of 14 inches of the subgrade or undercutting of 5 feet is recommended at Boring B-1540 (Station 29+54.5) and undercutting of 5 feet is recommended at Boring B-1520 (Station 27+68.3 referenced to Ramp B baseline). Generally, chemical stabilization is more economical when the area to be stabilized is greater than a mile. Given the fact that less than one-half mile of the subgrade would require treatment, undercutting of the

subgrade appears to be a more cost-effective soil stabilization method. The undercut area should be replaced with compacted Type B or Type C granular material (ODOT Item 703.16.C) and should extend 18 inches beyond the edge of the pavement, paved shoulders, or paved medians. Before placing the compacted granular material, proof-roll the entire undercut area. If any areas rut or deflect, overexcavate the soft or loose soils and replace with compacted Type B or Type C granular material. Please note that the ODOT Geotechnical Bulletin GB-1 requires that a geotextile fabric Type D (ODOT Item 712.09) be placed in the bottom of the undercut for separation purposes.

Based on the GB-1 Soil Investigation Summary Sheet, the subsurface conditions at the subgrade borings and the "non-subgrade" borings along the proposed Ramp A alignment, and the anticipated amounts of fill for the proposed Ramp A, the subgrade soils along the proposed Ramp A should be undercut in areas and to depths indicated in Table 4 below.

Table 4: Undercut and Replace Option for Existing Northbound US 52 and Proposed Ramp A

Begin Station*	End Station*	Depth of Undercut of Existing Subgrade Soil, ft.
17+00	17+70	2.0
18+60	19+60	2.0
21+15	22+00	1.0
25+10	26+00	1.0
29+25 (27+50)	29+90 (28+15)	2.5**

*Stations are referenced to the centerline of US 52. Stations in parentheses are approximate stations referenced to the baseline of US 52 Ramp A.

**The depth of undercut was recommended based on the anticipation that approximately 2.7 feet of sidehill fills will be required in the area.

Given the anticipated amounts of fill for the proposed Ramp B, and the subsurface conditions at the subgrade borings and the "non-subgrade" borings along the proposed Ramp B alignment, it appears that subgrade treatment would not be necessary for the reconstruction of existing southbound US 52 and the construction of the proposed Ramp B. However, since undercutting of unsuitable subgrade soils is required in a portion of the existing northbound US 52 and the proposed Ramp A, poor subgrade soil conditions may present in the existing southbound US 52 and the proposed Ramp B other than where the borings were drilled. It is recommended that the subgrade soil be proof-rolled with a heavy piece of construction equipment to determine if any soft yielding areas are present. If any yielding areas are revealed, they should be undercut to

firm non-yielding soils, and replaced with compacted Type B or Type C granular material (ODOT Item 703.16.C). The undercut should extend 18 inches beyond the edge of the pavement, paved shoulders, or paved medians.

Seepage was first encountered in subgrade borings B-1510, B-1516, B-1533 and B-1534 between depths of 1.0 and 6.3 feet. Seepage was also observed at shallow depths, between 1 and 4 feet, in "non-subgrade" borings B-1518, B-1517, B-1530. These borings and the subgrade borings are located in the existing US 52 alignment, approximately between Station 6+00 and Station 15+00.

Seepage is anticipated for the pavement excavations, particularly between Station 6+00 and 15+00. The Contractor should be prepared to perform dewatering, likely with sumping and pumping. In addition, the Contractor should be prepared to deal with unexpected seepage and precipitation entering any excavations.

We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our findings.

Respectfully submitted,

DLZ OHIO, INC.

Eric W. Tse, P.E.
Senior Geotechnical Engineer

Bryan Wilson, P.E.
Senior Geotechnical Engineer

Encl: As noted

cc: file

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Soil Investi[redacted]n Summary

Do NOT Rubblize & Roll
Global CS may be an option
Global LS is NOT an option

Design CBR is 9

Number of Borings = 17

Classification Counts by Sample															
R	1a	1b	3	3a	2-4	2-5	2-6	2-7	4a	4b	5	6a	6b	7-5	7-6
0	0	10	3	15	1	**0**	0	0	6	**3**	**0**	14	3	**0**	0
		18%	5%	27%	2%				11%	5%		25%	5%		
0.0%	52.7%								47.3%						

Class @ Surface		
2-5	0	
4b	1	6%
5	0	
7-5	0	
7-6	0	
R	0	

% Borings	
N_L [illegible]	6%
N_L [illegible]1(	35%
N_L [illegible]2(	24%
M+	41%

% @ Surface	
35%	
6%	29%

% Borings	
35%	

	N	N_L			PI			M	M_{OPT}		GI
Average	23.2	14.8			10.9		20.7		12.9	10.4	3.14
Maximum	71	30	36	22	16	63	45	93	23	17	10
Minimum	5	5	15	10	5	2	0	2	3	6	0

6%	35%	0%	29%	6%	35%

Portsmouth Bypass US 52, Scioto County, PID 77366

#	B #	Boring Location	Depth	To	Cut Fill	Standard Penetration n_2	n_3	N	N_L	Physical Characteristics LL	PL	PI	% Silt	% Clay	P 200	Moisture M	M_{OPT}	Classification Class	GI	Comments	Problem w/ Class	Problem w/ MN	Treatments LS	Treatments CS	Treatments UC Class	Treatments UC MN	Analysis
1	B-1519	Sta 5+67.1, 28.7' RT (Main Line)	1.2	2.0	0.0	6	13	19									10	4a	5								
			2.0	4.0	0.0	28	24	52		21	13	8	31	8	39	8	10	4a	1								
			4.0	6.0	0.0	21	30	51		NP	NP	NP	10	5	15	11	8	3a	0								
									19																		
2	B-1535	Sta 9+66.6, 29.2' RT (Main Line)	1.2	3.0	0.0	3	12	15		NP	NP	NP	10	8	18	6	8	3a	0								
			3.0	5.0	0.0	26	35	61								7	8	3a	0								
			5.0	7.0	0.0	10	13	23		19	11	8	23	16	39	10	10	4a	1								
									15																		
3	B-1533	Sta 9+86.2, 28.4' LT (Main Line)	1.3	3.0	0.0	16	27	43		27	16	11	28	28	56	13	14	6a	5								
			3.0	4.5	0.0	32	39	71		NP	NP	NP	6	3	9	6	6	1b	0								
			4.5	6.0	0.0	24	29	53		NP	NP	NP	11	6	17	8	10	2-4	0								
									30																		
4	B-1516	Sta 10+14.5, 36.8' RT (Main Line)	1.3	2.0	0.0												8	3a	0								
			2.0	3.0	0.0	6	12	18		29	18	11	35	34	69	18	14	6a	7								
			3.0	4.0	0.0	6	12	18									8	3	0								
			4.0	6.0	0.0	14	16	30	18								8	3	0								
5	B-1515	Sta 11+67.8, 39.3' RT (Main Line)	1.5	2.0	0.0												8	3a	0								
			2.0	4.0	0.0	8	15	23									8	3a	0								
			4.0	6.0	0.0	19	25	44									8	3a	0								
									23																		
6	B-1514	Sta 13+03.6, 38.2' RT (Main Line)	1.0	2.0	0.0												8	3a	0								
			2.0	4.0	0.0	6	14	20									14	6a	8								
			4.0	5.0	0.0	16	21	37									14	6a	8								
			5.0	6.0	0.0	16	21	37	20								8	3a	0								
7	B-1536	Sta 13+75.3, 29.3' RT (Main Line)	1.3	3.0	0.0	5	7	12		21	14	7	20	18	38	11	10	4a	1								
			3.0	5.0	0.0	5	7	12		34	20	14	43	39	82	20	15	6a	10			MN		12		1	
			5.0	7.0	0.0	8	17	25		NP	NP	NP	4	6	10	3	8	3	0								
									12																		
8	B-1534	Sta 13+90.5, 27.2' LT (Main Line)	1.1	1.3	0.0	6	6	12		NP	NP	NP						1b	0								
			1.3	2.5	0.0	6	6	12		25	15	10	28	24	52	11	10	4a	3								
			2.5	3.5	0.0	8	26	34		34	18	16	48	45	93	21	16	6b	10								
			3.5	5.5	0.0	15	28	43	12	NP	NP	NP	6		6	6	6	1b	0								
9	B-1513	Sta 14+62.9, 39.4' RT (Main Line)	1.0	2.0	0.0												6	1b	0								
			2.0	4.0	0.0	7	15	22									6	1b	0								
			4.0	6.0	0.0	6	20	26		NP	NP	NP	7	0	7	5	6	1b	0								
									22																		
10	B-1512	Sta 16+15.9, 39.1' RT (Main Line)	1.0	2.0	0.0												8	3a	0								
			2.0	4.0	0.0	8	9	17									8	3a	0								
			4.0	6.0	0.0	20	27	47									8	3a	0								
									17																		
11	B-1537	Sta 17+59.1, 29.5' RT (Main Line)	1.1	3.0	0.0	3	5	8		36	20	16	40	44	84	19	16	6b	10			N		14		2	
			3.0	5.0	0.0	9	8	17		15	10	5	14	10	24	9	8	3a	0								
			5.0	7.0	0.0	3	4	7		32	19	13	38	40	78	23	14	6a	9			MN		16		3	
									7																		
12	B-1511	Sta 17+75.3, 38.9' RT (Main Line)	1.0	2.0	0.0												8	3a	0								
			2.0	4.0	0.0	7	9	16									14	6a	8								
			4.0	6.0	0.0	6	10	16									14	6a	8								
									16																		

Portsmouth Bypass US 52, Scioto County, PID 77366						Standard Penetration				Physical Characteristics						Moisture		Classification		Comments	Problem		Treatments				Analysis
#	B #	Boring Location	Depth	To	Cut Fill	n_2	n_3	N	N_L	LL	PL	PI	% Silt	% Clay	P 200	M	M_{OPT}	Class	GI		w/ Class	w/ MN	LS	CS	UC Class	UC MN	
13	B-1510	Sta 19+13.0, 37.0' RT	1.0	2.0	0.0	4	4	8									8	3a	0			N				2	
		(Main Line)	2.0	4.0	0.0	10	16	26									14	6a	8								
			4.0	6.0	0.0	6	6	12									14	6a	8								
									8																		
14	B-1538	Sta 21+65.7, 29.8' RT	1.1	3.0	0.0	3	6	9		NP	NP	NP	2	0	2	6	6	1b	0			N		14		1	
		(Main Line)	3.0	5.0	0.0	4	11	15								8	6	1b	0								
			5.0	7.0	0.0	5	6	11		34	18	16	48	37	85	20	16	6b	10			MN		12		1	
									9																		
15	B-1521	Sta 24+76.9, 16.8' LT	4.0	6.0	0.0	7	9	16									14	6a	8								
		(Ramp B-Base Line)	6.0	7.5		7	7	14									14	6a									
			8.5	10.0		5	5	10									14	6a									
									10																		
16	B-1539	Sta 25+57.1, 29.2' RT	1.0	3.0	0.0	3	6	9		NP	NP	NP	4	0	4	6	6	1b	0			N		14		1	
		(Main Line)	3.0	5.0	0.0	8	7	15		31	21	10	49	39	88	21	16	4a	8								
			5.0	7.0	0.0	3	5	8		33	22	11	54	34	88	23	17	6a	8			MN		14		2	
									8																		
17	B-1540	Sta 29+54.5, 32.5' RT	2.7	3.0	0.0	2	3	5		27	18	9	53	27	80	20	13	4b	8		4b	MN		--	3	5	
		(Main Line)	3.0	5.0		4	5	9		29	20	9	63	26	89	21	15	4b	8		4b	MN		14	3	2	
			5.0	7.0		7	4	11								23	10	4b			4b	MN			3	1	
			8.0	10.0		9	11	20	5								6	1b									
18																											
19																											
20																											
21																											
22																											

III.C. Subgrade Checklist

C-R-S: SCI-823-0.00 (US 52)	PID: 77366	Reviewer: E. Tse/B. Wilson	Date: 11-15-07

If you do not have any subgrade work on the project, you do not have to fill out this checklist.

Y N X 1	Has the subsurface investigation adequately characterized the soil or rock according to Geotechnical Bulletin 1: Plan Subgrades (GB1)?	
Y N X 2	If soils classified as A-2-5, A-4b, A-5, or A-7-5 are present at the proposed subgrade (soil profile), do the plans specify that these materials need to be removed and replaced?	
Y N X	a If these materials are to be removed and replaced, have the station limits, depth, and lateral limits for the planned removal been provided?	
Y N X 3	If there is any rock, shale, or coal present at the proposed subgrade (CMS 204.05), do the plans specify the removal of the material?	No rock in the proposed subgrade.
Y N X	a If removal of any rock, shale, or coal is required, have the station limits, depth, and lateral limits for the planned removal of the material at proposed subgrade been provided?	
Y N X 4	In accordance with GB1, do the SPT values and existing moisture contents for the proposed subgrade soils indicate the need for subgrade stabilization?	
Y N X	a If removal and replacement is applicable, has the detail of subgrade removal been shown on the plans, including depth of removal, station limits, lateral extent, replacement material, and plan notes (Item 204 – Subgrade Compaction and Proof Rolling)?	Refer to roadway cross-sections.
Y N X	b If chemical stabilization is applicable, has the detail of this treatment been shown on the plans, including depth, percentage of chemical, station limits, lateral extent, and plan notes?	
	Indicate type of subgrade treatment specified: ☒ cement treatment ☐ lime treatment ☐ other List Other items:	GB-1 recommends cement treatment or undercutting. Undercutting was recommended for subgrade treatment.
Y N X 5	If drainage or groundwater is an issue with the proposed subgrade, has an appropriate drainage system (e.g., pipe, underdrains) been provided?	Refer to roadway cross-sections.
Y N X 6	Has an appropriate quantity of Proof Rolling been included in the plans (CMS 204.06)?	Refer to roadway cross-sections.
Y N X 7	Has a design CBR value been provided?	

III.C. Subgrade Checklist

Notes:

Stage 1:

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 to 2 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 hardness of the **bedrock**.

Term	Description
Very Soft	Permits denting by moderate pressure of the fingers. Resembles hard soil but has rock structure. (Crushes under pressure of fingers and/or thumb)
Soft	Resists denting by fingers, but can be abraded and pierced to shallow depth by a pencil point. (Crushes under pressure of pressed hammer)
Medium Hard	Resists pencil point, but can be scratched with a knife blade. (Breaks easily under single hammer blow, but with crumbly edges.)
Hard	Can be deformed or broken by light to moderate hammer blows. (Breaks under one or two strong hammer blow, but with resistant sharp edges.)
Very Hard	Can be broken only by heavy and in some rocks repeated hammer blows.

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 standard penetration (N) value in blows per foot is indicated graphically.

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1501 | Location: Sta. 32+00.5, 7.8 ft. LT of US 52 Ramp A BL | Date Drilled: 12/28/05 to 12/29/05

WATER OBSERVATIONS: Water seepage at: None
Water level at completion: None (prior to coring)
17.8' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	548.9												
0.5	548.4						Topsoil - 6"						
		3 3 4	14	1		1.25	Stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
3.5	545.4												
		7 13 16	17	2			Medium dense brown COARSE AND FINE SAND (A-3a), trace silty clay, trace gravel; damp.						
5.0	543.9						Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
		6 6 4	13	3		2.5							
8.5	540.4												
		2 2 2	18	4		1.0	Stiff to very stiff brown SILT (A-4b), little clay, trace fine sand; moist to wet.	0	0	--	4	78	18
10													
		2 9 8	16	5		2.5							
13.5	535.4												
		50/3	2	6			Severely weathered brown SANDSTONE.						
14.0	534.9						Medium hard to hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, thickly bedded to massive, highly fractured to broken. @ 16.1'-16.2',20.8'-21.2', broken zones. @ 16.2'-17.7', lost recovery, possible broken zone. @ 17.7', gray. @ 21.5', slightly fractured.						
15													
		Core 120"	Rec 102"	RQD 58%	R-1								
20													
24.0	524.9						Bottom of Boring - 24.0'						
25													
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1502 | Location: Sta. 29+49.3, 14.2 ft. LT of US 52 Ramp A BL | Date Drilled: 12/28/05

WATER OBSERVATIONS: Water seepage at: 8.0'-10.5'
Water level at completion: 7.8'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION
0	544.0						
0.6	543.4	5 6 6	14	1		3.75	Topsoil - 7" Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.
3.5	540.5	4 8 11	16	2			Medium dense brown COARSE AND FINE SAND (A-3a), trace to little silty clay, trace gravel; damp.
6.0	538.0	2 2 3	14	3		1.5	Stiff brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp to moist.
7.5	536.5	3 9 20	10	4			Medium dense brown COARSE AND FINE SAND (A-3a), trace to little silty clay, trace gravel; moist.
11.4	532.6	50/5	2	5			@ 11.0'-11.4', very dense. Bottom of Boring - 11.4'

GRADATION: % Aggregate | % C. Sand | % M. Sand | % F. Sand | % Silt | % Clay

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1503 | Location: Sta. 28+02.2, 10.3 ft. LT of US 52 Ramp A BL | Date Drilled: 12/28/05

WATER OBSERVATIONS: Water seepage at: 10.5'-14.1'
Water level at completion: 7.4' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	544.9												
0.5	544.4						Topsoil - 6"						
		5 6 9	16	1		3.25	Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
		5 6 6	15	2		2.25							
5													
		10 18 14	18	3A 3B		2.0							
7.0	537.9						Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp to wet.						
		4 10 10	16	4									
10													
		4 6 7	6	5			@ 13.5'-14.0', very dense, moist to wet.						
14.0	530.9	7 7 50/5	14	6A 6B			Very dense brown COARSE AND FINE SAND (A-3a); damp. (Decomposed Sandstone).						
15													
16.5	528.4	50/3	3	7			Hard brown and gray SANDSTONE; very fine to fine grained, highly weathered to decomposed, argillaceous, micaceous, thickly bedded, highly fractured to broken.						
20							@ 19.4', gray.						
		Core 120"	Rec 78"	RQD 42%	R-1		@ 21.7' to 21.9', broken zone.						
							@ 22.3'-23.0', broken, decomposed.						
							@ 23.0'-26.5', lost recovery, possible broken zone.						
25													
26.5	518.4						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured.						
		Core 60"	Rec 60"	RQD 100%	R-2		@ 29.2'-29.4', calcareous.						
30							@ 29.8', low angle fracture.						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

57

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1503 | Location: Sta. 28+02.2, 10.3 ft. LT of US 52 Ramp A BL | Date Drilled: 12/28/05

WATER OBSERVATIONS: Water seepage at: 10.5'-14.1'
Water level at completion: 7.4' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	514.9						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured.						
31.5	513.4						@ 31.4', low angle fracture.						
							Bottom of Boring - 31.5'						

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

35 40 45 50 55 60

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1504 | Location: Sta. 26+57.8, 10.4 ft. LT of US 52 Ramp A BL | Date Drilled: 1/3/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	545.4						Asphalt Concrete Pavement - 10"						
0.8	544.6	12 33 12	12	1		4.5+	FILL: Hard gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; contains slag; damp.						
3.5	541.9	4 5 7	8	2		2.25	Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; contains slag; damp.						
6.0	539.4	4 10 5	14	3			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
8.5	536.9	5 7 10	15	4			Medium dense brown SANDY SILT (A-4a); damp.						
11.0	534.4	6 10 20	13	5			Dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp.						
13.5	531.9	5 17 19	10	6			Dense to very dense brown COARSE AND FINE SAND (A-3a), little gravel; damp.						
16.3	529.1	50/3	0	7			Bottom of Boring - 16.3'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1505 | Location: Sta. 25+07.1, 6.4 ft. LT of US 52 Ramp A BL | Date Drilled: 1/3/06

WATER OBSERVATIONS: Water seepage at: None
Water level at completion: 7.5' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	544.9						Asphalt Concrete Pavement - 10"						
0.8	544.0	3 5 7	10	1		2.5	Very stiff to hard gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
5		4 9 9	11	2		4.5+							
		6 7 5	8	3		--	@ 6.0'-6.5', fine to coarse sand seam.						
8.5	536.4	2 3 2	13	4			Loose brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp.						
10		11 6 4	11	5									
13.5	531.4	2 6 16	15	6			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
15													
16.0	528.9	50/3	1	7			Severely weathered gray SILTSTONE.						
		50/2	0	8									
19.0	525.9	Core 120"	Rec 117"	RQD 53%	R-1		Hard gray SANDSTONE; fine grained, slightly weathered, argillaceous, massive, slightly fractured. @ 19.0'-19.6',19.8'-20.4', 21.0'-21.2', iron stained. @ 19.4',19.6',20.1',21.2', low angle fractures.						
20													
25							@ 27.3'-28.1', high angle fracture.						
29.0	515.9						Bottom of Boring - 29.0'						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1506 | Location: Sta. 25+05.3, 37.8 ft. RT of US 52 CL | Date Drilled: 1/3/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
0	544.1						Asphalt Concrete Pavement - 10"							
0.8	543.3	4 5 7	12	1		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.							
		10 10 13	8	2		4.5+								
5		3 5 8	14	3		--								
		3 5 6	15	4		2.25								
10														
11.0	533.1	3 6 16	14	5			Medium dense brown FINE SAND (A-3), trace coarse sand; damp.							
13.5	530.6	3 5 6	15	6			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.							
15														
16.0	528.1	35 50/4	7	7			Severely weathered gray SILTSTONE.							50+
18.3	525.8	50/3	1	8			Bottom of Boring - 18.3'							50+
20														
25														
30														

STANDARD PENETRATION (N): Natural Moisture Content, % - ●; PL ⊢—⊣ LL; Blows per foot - ○; 10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1507 | Location: Sta. 23+61.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/4/06

WATER OBSERVATIONS: Water seepage at: None
Water level at completion: 12.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.6						Asphalt Concrete Pavement - 11" Aggregate Base - 5"						
1.2	542.4	5 4 7	6	1		1.0	Stiff to very stiff brown SILT AND CLAY (A-6a), some to "and" fine to coarse sand, little gravel; damp.						
5		4 15 29	16	2		4.25	@ 3.5'-5.0', hard.						
5.5	538.1	30 22 20	9	3			Severely weathered gray SILTSTONE, arenaceous.						
8.5	535.1	4 3 3	7	4			Loose brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); contains coal fragments; damp.						
10.5	533.1	8 22 9	3	5			Severely weathered gray SILTSTONE, arenaceous.						
13.0	530.6	7 6 8	0	6			Medium dense brown FINE SAND (A-3), trace silty clay; damp.						
15		3 7 9	15	7									
		7 13 15	15	8									
20		50/2	1	9									
22.0	521.6						Hard gray SANDSTONE; very fine grained, moderately to highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken. @ 22.0'-22.1', high angle fracture. @ 22.0'-24.6', brown. @ 25.9'-27.0', lost recovery, possible broken zone.						
25		Core 120"	Rec 104"	RQD 31%	R-1		@ 29.1', slightly fractured.						
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1507 | Location: Sta. 23+61.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/4/06

WATER OBSERVATIONS: Water seepage at: None
Water level at completion: 12.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	513.6						Hard gray SANDSTONE; very fine grained, moderately to highly weathered, argillaceous, micaceous, thickly bedded, highly fractured to broken.						
32.0	511.6						Bottom of Boring - 32.0'						
35													
40													
45													
50													
55													
60													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

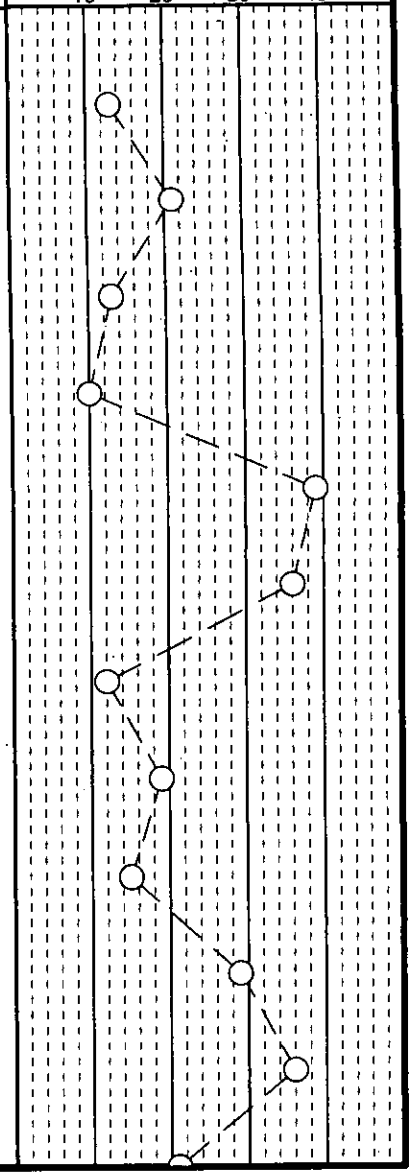
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1508 | Location: Sta. 22+13.3, 38.5 ft. RT of US 52 CL | Date Drilled: 1/4/06 to 1/5/06

WATER OBSERVATIONS: Water seepage at: 33.5'
Water level at completion: 27.5' (with augers removed)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.2						Asphalt Concrete Pavement - 12"						
1.0	542.2	14 6 7	7	1		3.75	Very stiff reddish brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
		5 7 14	10	2		3.0							
5		7 6 7	16	3		4.25							
8.0	535.2						Medium dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp.						
10		3 5 5	16	4									
10.5	532.7						Soft to medium hard gray SILTSTONE; moderately to highly weathered, argillaceous.						
		21 29 10	10	5									
		12 26 10	1	6									
15		8 7 5	1	7									
		12 10 9	12	8									
20													
20.5	522.7	3 6 9	17	9			Dense brown GRAVEL WITH SAND (A-1-b), trace silty clay; damp to moist.						
23.0	520.2	2 4 25	17	10			Medium dense brown FINE SAND (A-3), trace to little coarse sand, trace gravel; wet.						
25													
25.5	517.7	10 15 21	18	11			Dense brown GRAVEL WITH SAND (A-1-b); moist to wet.						
28.0	515.2	6 11 10	18	12			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; wet.						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

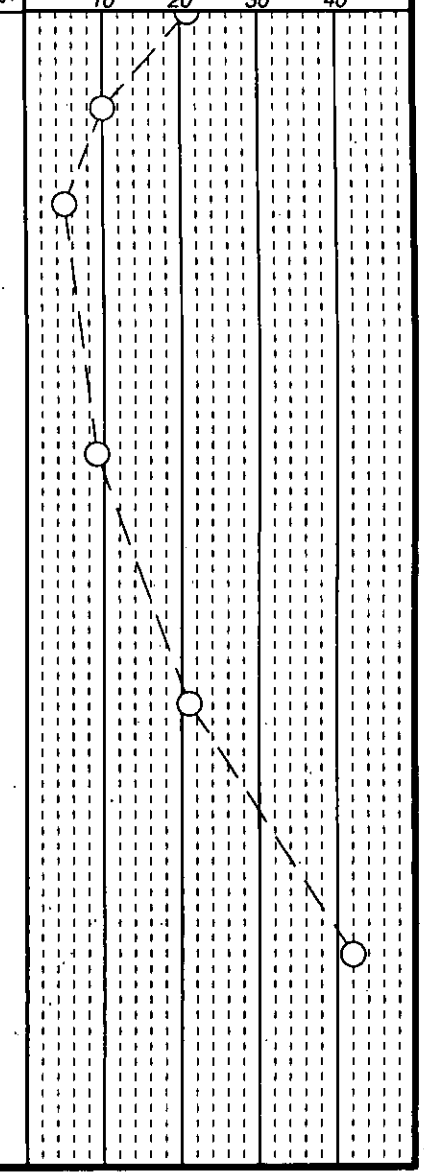
LOG OF: Boring B-1508 | Location: Sta. 22+13.3, 38.5 ft. RT of US 52 CL | Date Drilled: 1/4/06 to 1/5/06

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	513.2	5 5 5	13	13			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; wet.						
33.0	510.2												
		2 2 3	11	14		0.5	Very soft to soft gray SILT (A-4b), trace fine sand; wet.						
35													
40		WOH 4 5	19	15		0.25							
44.0	499.2												
45							Hard brown and gray SANDY SILT (A-4a), little gravel; contains siltstone fragments; damp.						
		9 9 12	15	16		4.5+							
50													
		8 15 27	14	17		4.5+							
54.5	488.7						Bottom of Boring - 54.5'						
55													
60													

WATER OBSERVATIONS: Water seepage at: 33.5'
Water level at completion: 27.5' (with augers removed)

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

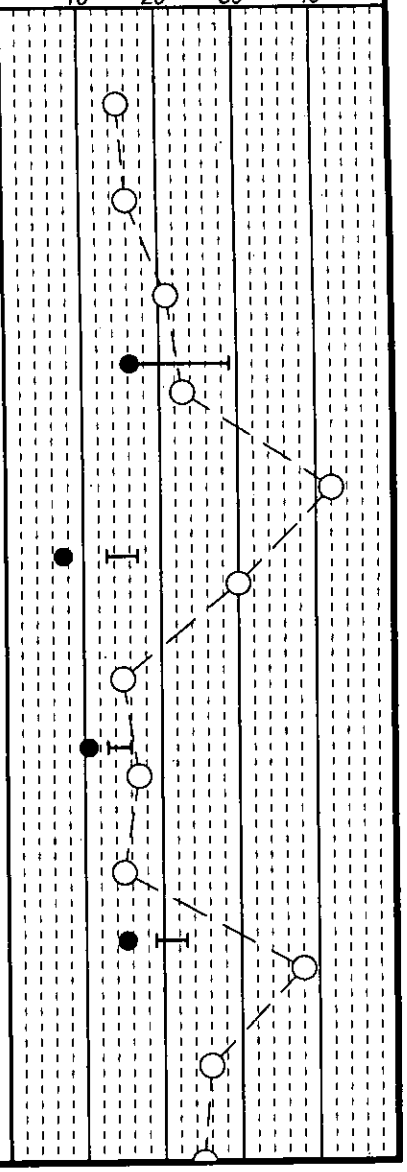
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1509 | Location: Sta. 20+59.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/5/06

WATER OBSERVATIONS: Water seepage at: 43.5', 48.5', 53.5', 58.5'
Water level at completion: 54.0' (prior to coring)
52.9' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.5						Asphalt Concrete Pavement - 11"						
0.9	542.6	4 6 9	5	1			Medium dense gray COARSE AND FINE SAND (A-3a), little gravel; contains rock fragments; dry.						
3.5	540.0	5 8 8	13	2		2.0	Stiff brown SILTY CLAY (A-6b), some fine to coarse sand; damp.						
5													
6.0	537.5	3 9 12	16	3			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel, trace clay; damp to moist.						
8.5	535.0	4 6 17	11	4		4.0	Very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.	8	8	--	15	41	28
10													
11.0	532.5	5 15 27	15	5			Medium dense to dense brown COARSE AND FINE SAND (A-3a), little clay, trace gravel; damp to moist.						
		4 15 15	13	6			@ 13.5'-15.0', some gravel.	22	24	--	28	18	8
15		4 9 6	14	7									
		4 6 11	18	8				3	21	--	50	15	11
20		5 5 10	14	9									
23.5	520.0	3 7 31	16	10		2.0	Very stiff brown SANDY SILT (A-4a), some gravel, trace clay; contains rock fragments; damp.	28	14	--	9	42	7
25		10 11 15	17	11		3.0							
28.5	515.0	8 12 13	15	12			Medium dense brown COARSE AND FINE SAND (A-3a); moist.						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1509 | Location: Sta. 20+59.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/5/06

WATER OBSERVATIONS: Water seepage at: 43.5', 48.5', 53.5', 58.5'
Water level at completion: 54.0' (prior to coring)
52.9' (includes drilling water).

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) / Natural Moisture Content, % / Blows per foot
30.0	513.5						Dense to very dense brown GRAVEL WITH SAND (A-1-b), little silt, trace clay; moist.							
		31 25 7	14	13										
35														
		16 32 47	15	14				33	17	--	30	17	3	Non-Plastic 79
40														
		18 19 16	14	15										
45														
47.0	496.5						Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp.							
		9 14 8	12	16				46	17	--	11	23	3	Non-Plastic
50														
		7 13 14	15	17										
55														
		50/3	1	18										50+
59.5	484.0													

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1509 | Location: Sta. 20+59.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/5/06

WATER OBSERVATIONS: Water seepage at: 43.5', 48.5', 53.5', 58.5'
Water level at completion: 54.0' (prior to coring)
52.9' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
60	483.5	Core 120"	Rec 120"	RQD 69%	R1		Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured. @ 60.0', 60.3', 60.6', 60.7', 60.9', 61.0', low angle fractures.						
69.5	474.0						Bottom of Boring - 69.5'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

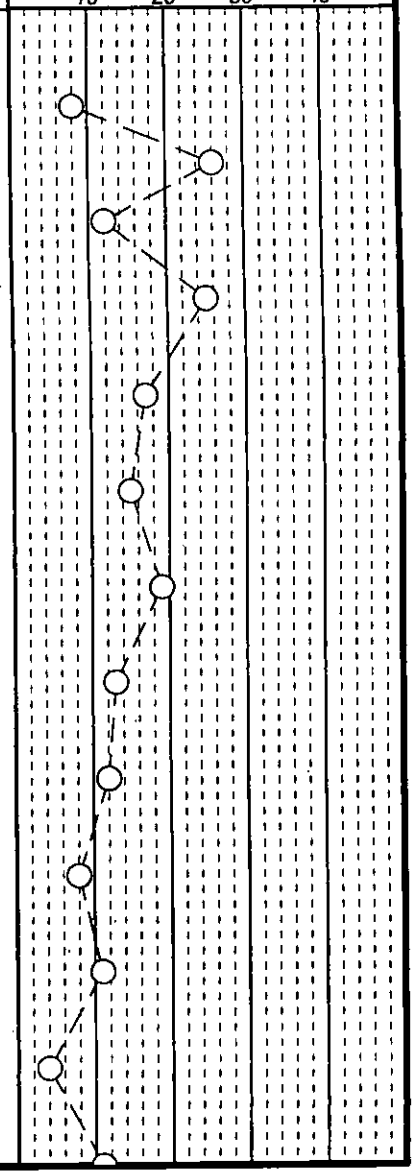
LOG OF: Boring B-1510 | Location: Sta. 19+13.0, 37.0 ft. RT of US 52 CL | Date Drilled: 1/10/06

WATER OBSERVATIONS: Water seepage at: 6.3', 29.6'
Water level at completion: 30.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.7												
1.0	542.7						Asphalt Concrete Pavement - 9" Aggregate Base - 3"						
2.0	541.7	3 4 4	12	1a 1b		3.75	Loose brown COARSE AND FINE SAND (A-3a), trace gravel; damp to moist.						
		6 10 16	14	2		4.5	Very stiff to hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; damp.						
5		3 6 6 8	13	3		4.5							
6.5	537.2	3 8 17	13	4a 4b		3.0	Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
		6 10 7	12	5									
10													
11.0	532.7	3 4 11	12	6		4.25	Very stiff to hard brown SILT AND CLAY (A-6a), trace gravel; damp to moist.						
		5 7 12	16	7		4.5+							
15		5 5 8	18	8		3.0							
		3 5 7	18	9		2.5							
20		3 4 4	18	10		1.25	@ 21.0'-22.5', stiff.						
		3 5 6	18	11		2.25							
25		1 2 2	18	12		0.75	@ 26.0'-30.0', medium stiff to stiff.						
		2 2 9	18	13a		1.25							
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1510 | Location: Sta. 19+13.0, 37.0 ft. RT of US 52 CL | Date Drilled: 1/10/06

WATER OBSERVATIONS: Water seepage at: 6.3', 29.6'
Water level at completion: 30.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ⊢—⊣ LL Blows per foot - ○ 10 20 30 40
30	513.7			13b		1.25	Stiff brown SILT AND CLAY (A- 6a), trace grave; damp to moist.							
33.5	510.2	50/3	3	14			Severely weathered gray SHALE.							50+
33.8	509.9						Bottom of Boring - 33.8'							
35														
40														
45														
50														
55														
60														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

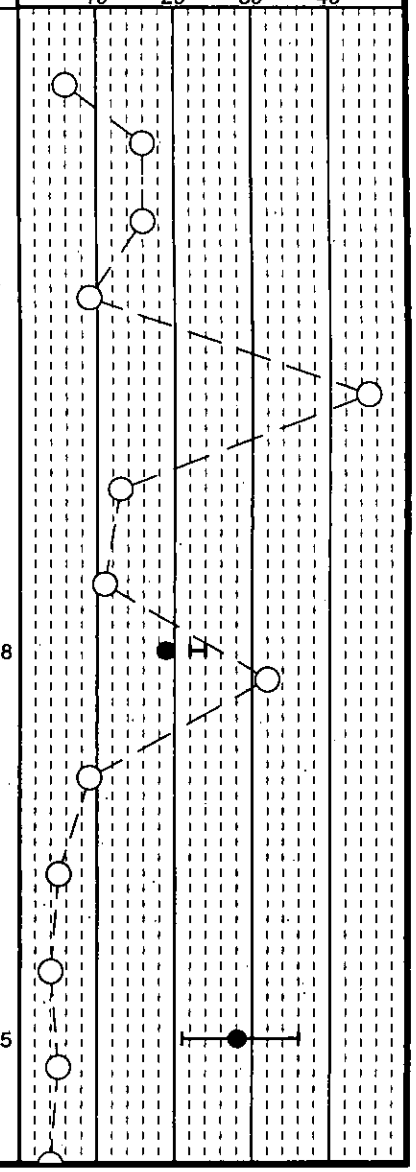
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1511 | Location: Sta. 17+75.3, 38.9 ft. RT of US 52 CL | Date Drilled: 1/10/06

WATER OBSERVATIONS: Water seepage at: 20.5', 32.0'
Water level at completion: 34.0' (prior to coring)
15.6' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.4						Asphalt Concrete Pavement - 11" Aggregate Base - 1"						
1.0	542.4	19 6	5	1			Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace to little gravel; damp.						
2.0	541.4	8 7 9 13	10	2		4.25	Very stiff to hard brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.						
5		6 6 10 13	13	3		4.5+							
		3 4 5	13	4		2.5							
9.5	533.9	3 9 36	18	5a		4.5							
10.0	533.4			5b			Loose to medium dense black and gray COARSE AND FINE SAND (A-3a), trace to little silty clay; damp.						
		4 5 8	18	6a		4.5	Very stiff to hard gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
				6b		4.5+	@ 12.0'-15.0', brown and gray.						
		3 5 6	18	7		2.0							
15													
15.5	527.9	12 16 16	18	8		4.5+	Hard brown and gray SILT (A-4b), little clay, trace fine to coarse sand; damp.	0	1	--	3	78	18
18.5	524.9	2 4 5	18	9		2.5	Very stiff to hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; damp.						
20													
21.0	522.4	3 2 3	18	10		0.5	Soft brown SILT (A-4b), little fine to coarse sand, trace gravel; moist to wet.						
23.5	519.9	2 1 3	18	11		0.5	@ 23.5'-24.0' contains decomposed rock fragments						
25							Soft to medium stiff brown and gray CLAY (A-7-6), trace silt; damp to moist.						
26.0	517.4	1 2 3	18	12		1.0	Soft to medium stiff brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; moist.	0	2	--	3	60	35
		1 3 1	13	13		0.75							
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢—⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1511 | Location: Sta. 17+75.3, 38.9 ft. RT of US 52 CL | Date Drilled: 1/10/06

WATER OBSERVATIONS: Water seepage at: 20.5', 32.0'
Water level at completion: 34.0' (prior to coring)
15.6' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	513.4						Soft to medium stiff brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; damp to moist.						
33.5	509.9	15 16 48	16	14			Very dense gray GRAVEL WITH SAND AND SILT (A-2-4), trace clay; contains rock fragments; moist to wet.	35	16	--	22	22	5
35													
35.5	507.9						Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thickly bedded, moderately fractured. @ 35.5'-38.0', highly fractured. @ 37.2'-37.5',38.3'-38.6', high angle fractures. @ 38.0'-45.5', slightly fractured.						
40		Core 120"	Rec 112"	RQD 93%	R1								
45							@ 43.3', decomposed, argillaceous seam. @ 44.0'-44.6', lost recovery, possible decomposed zone.						
45.5	497.9						Bottom of Boring - 45.5'						
50													
55													
60													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
Non-Plastic
64

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1512 | Location: Sta. 16+15.9, 39.1 ft. RT of US 52 CL | Date Drilled: 1/11/06

WATER OBSERVATIONS: Water seepage at: 42.0'
Water level at completion: 47.3' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.2						Asphalt Concrete Pavement - 11" Aggregate Base - 1"						
1.0	542.2	10 4	6	1			Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp to moist.						
		10 8 9 14	16	2a 2b									
5		6 20 27 36	22	3									
		5 13 7	13	4									
		5 14 18	9	5									
10													
11.0	532.2	4 5 6	16	6		4.5+	Very stiff to hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp to moist.						
		2 5 8	18	7		2.5							
15		5 6 9	18	8		1.75	@ 16.0'-17.5', stiff.						
		5 6 5	18	9		2.0							
20		3 4 6	18	10		3.0							
		3 4 5	18	11		3.25							
25		4 5 8	18	12		2.25							
		3 3 8	18	13		2.0							
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1512 | Location: Sta. 16+15.9, 39.1 ft. RT of US 52 CL | Date Drilled: 1/11/06

WATER OBSERVATIONS: Water seepage at: 42.0'
Water level at completion: 47.3' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
30	513.2						Stiff brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp to moist.							
34.0	509.2	2 10 21	18	14a 14b		1.25	Dense to very dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.							
40		26 19 30	18	15										
		50/5	2	16										50+
48.5	494.7	50/4	4	17			Severely weathered gray SHALE.							50+
49.0	494.2						Bottom of Boring - 49.0'							

STANDARD PENETRATION (N): Natural Moisture Content, % - ●; PL ⊢—⊣ LL; Blows per foot - ○; 10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1513 | Location: Sta. 14+62.9, 39.4 ft. RT of US 52 CL | Date Drilled: 1/11/06 to 1/12/06

WATER OBSERVATIONS: Water seepage at: 32.0'
Water level at completion: 43.5' (prior to coring)
39.8' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.2						Asphalt Concrete Pavement - 10" Aggregate Base - 2"						
1.0	542.2	9 7	3	1			Medium dense to very dense brown GRAVEL WITH SAND (A-1-b), trace clay; damp to moist.						
		4 7 15 12	8	2									
5		4 6 20 14	13	3				18	32	--	43	7	
		9 26 23	14	4				26	29	--	38	7	
		4 8 21	17	5									
10													
10.5	532.7	7 13 12	12	6		3.75	Very stiff brown and gray SILTY CLAY (A-6b), trace gravel, trace fine to coarse sand; damp to moist.						
		3 4 6	18	7		2.5		9	1	--	2	35	53
15													
		4 10 15	18	8		4.5+							
18.0	525.2												
		6 9 13	18	9		2.5	Very stiff brown and gray SILT (A-4b), some clay, trace fine to coarse sand, trace gravel; moist.	9	2	--	2	64	23
20													
20.5	522.7						Very stiff brown and gray SILTY CLAY (A-6b), little to some gravel, trace fine to coarse sand; damp to moist.						
		4 5 8	18	10		2.75		20	0	--	1	29	50
		4 6 9	18	11		4.5+							
25													
		4 5 8	18	12		2.0							
		2 7 10	18	13		2.0							
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic
Non-Plastic

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1513 | Location: Sta. 14+62.9, 39.4 ft. RT of US 52 CL | Date Drilled: 1/11/06 to 1/12/06

WATER OBSERVATIONS: Water seepage at: 32.0'
Water level at completion: 43.5' (prior to coring)
39.8' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30.0	513.2						Dense gray and brown SILT (A-4b), some clay, little fine to coarse sand, trace gravel; moist to wet.						
		3 8 34	18	14				2	2	--	11	64	21
35													
36.5	506.7						Medium dense to dense brown and gray GRAVEL WITH SAND (A-1-b), trace clay; damp.						
		10 23 26	18	15				46	25	--	25	4	
40													
		3 11 12	18	16									
45													
		6 12 14	17	17									
50													
52.0	491.2						Severely weathered gray SANDSTONE, argillaceous, micaceous.						
		50/5	2	18									
55													
56.0	487.2						Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded, slightly to moderately fractured. @ 56.6'-58.4', lost recovery, possible fracture zone.						
60													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1513 | Location: Sta. 14+62.9, 39.4 ft. RT of US 52 CL | Date Drilled: 1/11/06 to 1/12/06

WATER OBSERVATIONS: Water seepage at: 32.0'
Water level at completion: 43.5' (prior to coring)
39.8' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
60	483.2	Core 120"	Rec 99"	RQD 74%	R-1		Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, thickly bedded, slightly to moderately fractured.						
65							@ 65.7'-65.8', soft, argillaceous zone.						
66.0	477.2						Bottom of Boring - 66.0'						
70													
75													
80													
85													
90													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1514 | Location: Sta. 13+03.6, 38.2 ft. RT of US 52 CL | Date Drilled: 1/12/06

WATER OBSERVATIONS: Water seepage at: 52.0'
Water level at completion: 56.1' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.1						Asphalt Concrete Pavement - 12"						
1.0	542.1	8 5 6	7	1			FILL: Medium dense brown and gray COARSE AND FINE SAND (A-3a), trace gravel; contains slag; damp.						
2.0	541.1	6 14 16	14	2		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
5.0	538.1	8 16 21 34	24	3a 3b		2.75	Dense to very dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
		8 22 35	14	4									
10		7 11 24	18	5									
		12 12 16	2	6									
13.5	529.6	12 8 16	8	7		4.5+	Very stiff to hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
15		6 9 12	18	8		3.75							
20		4 6 10	18	9		3.5							
21.0	522.1	3 5 7	18	10			Medium dense to dense brown FINE SAND (A-3); damp.						
25		6 8 8	18	11									
		6 8 15	18	12									
30		10 15 16	18	13									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
57

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1514 | Location: Sta. 13+03.6, 38.2 ft. RT of US 52 CL | Date Drilled: 1/12/06

WATER OBSERVATIONS: Water seepage at: 52.0'
Water level at completion: 56.1' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	513.1						Medium dense to dense brown FINE SAND (A-3); damp.						
33.5	509.6	5 6 9	18	14			Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace silty clay; damp.						
35													
		11 16 16	18	15									
40													
		5 6 13	14	16									
45													
		9 12 14	16	17									
50													
53.5	489.6	13 15 19	6	18			Dense brown GRAVEL WITH SAND (A-1-b); wet.						
55													
58.5	484.6	50/2	2	19			Severely weathered gray SILTSTONE.						
59.0	484.1												
60													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40 50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1514 | Location: Sta. 13+03.6, 38.2 ft. RT of US 52 CL | Date Drilled: 1/12/06

WATER OBSERVATIONS: Water seepage at: 52.0'
Water level at completion: 56.1' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ 10 20 30 40
60	483.1						Bottom of Boring - 59.0'							
65														
70														
75														
80														
85														
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1515 | Location: Sta. 11+67.8, 39.3 ft. RT of US 52 CL | Date Drilled: 1/13/06

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 49.8' (prior to coring)
44.2' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.6						Asphalt Concrete Pavement - 12" Aggregate Base - 6"						
1.5	541.1	5	4	1			Dense to very dense brown COARSE AND FINE SAND (A-3a), trace to little silty clay, trace gravel; contains slag; damp to moist.						
		4 8 15 23	8	2									
5		10 19 25 32	19	3									
		9 14 18	18	4									
		9 16 23	18	5									
10													
11.0	531.6	5 7 6	17	6		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
		3 9 9	10	7		3.5							
15		4 5 8	18	8		4.5+							
		3 4 5	18	9		4.5							
20		4 9 15	18	10		2.75							
		4 5 7	18	11		3.0							
25		3 6 7	14	12		2.5							
		2 2 6	17	13		2.5							
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1515 | Location: Sta. 11+67.8, 39.3 ft. RT of US 52 CL | Date Drilled: 1/13/06

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 49.8' (prior to coring)
44.2' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION
30	512.6						Very stiff to hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.
33.5	509.1	5 11 16	18	14			Medium dense brown FINE SAND (A-3), trace coarse sand; contains coal fragments; damp.
40		2 11 13	18	15			
45		5 6 11	18	16			
50		6 7 8	18	17			
53.5	489.1	2 3 4	5	18			Loose brown COARSE AND FINE SAND (A-3a); wet.
55							
60		2 3 3	3	19			

GRADATION: % Aggregate | % C. Sand | % M. Sand | % F. Sand | % Silt | % Clay

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 | 11/13/2007 6:11 PM |

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1515 | Location: Sta. 11+67.8, 39.3 ft. RT of US 52 CL | Date Drilled: 1/13/06

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 49.8' (prior to coring)
44.2' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ⊢—⊣ LL Blows per foot - ○ 10 20 30 40
60	482.6						Loose brown COARSE AND FINE SAND (A-3a); wet.							
							@ 63.5', 9.0' sand heave; washed out.							
63.5	479.1	50/5	2	20			Severely weathered gray SHALE.							50+
64.0	478.6						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, massive, moderately fractured.							
65							@ 64.2', 64.6', 65.6', 65.8', 65.9', 67.8', 70.0', low angle fractures.							
		Core 120"	Rec 111"	RQD 83%	R-1		@ 65.8'-66.1', broken and decomposed.							
70							@ 66.5'-67.0', lost recovery. -							
74.0	468.6						Bottom of Boring - 74.0'							
75														
80														
85														
90														

FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1516 | Location: Sta. 10+14.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/4/06

WATER OBSERVATIONS: Water seepage at: 1.5'-2.0', 53.5'-70.0'
Water level at completion: None (prior to washing out)
68.0' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.5						Asphalt Concrete Pavement - 9" Aggregate Base - 6"						
1.3	541.2	9 6	3	1			Medium dense dark brown COARSE AND FINE SAND (A-3a), trace gravel; damp to moist.						
2.0	540.5	5 6											
3.0	539.5	12 15	18	2A 2B		3.0	Very stiff gray and brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.	6	10	--	15	35	34
5		10 14 16 18	14	3			Medium dense brown FINE SAND (A-3), trace gravel, some coarse sand, trace silty clay; damp to moist.						
		9 9 7	16	4				7	29	--	57	7	
9.5	533.0	5 8 8	18	5A 5B			Medium dense brown COARSE AND FINE SAND (A-3a), little clay, trace gravel; moist.	3	20	--	44	17	16
10													
10.5	532.0	4 7 9	13	6		4.5+	Hard brown CLAY (A-7-6), little fine to coarse sand; damp to moist.	0	7	--	10	33	50
		3 4 6	16	7		4.5+							
15													
16.0	526.5	5 5 6	18	8		4.25	Hard brown and gray SILTY CLAY (A-6b), trace to little fine to coarse sand; damp to moist. @ 16.0'-17.5', contains odor.						
		3 4 8	14	9		4.5							
20													
		4 7 10	18	10		4.5+		1	1	--	3	46	49
23.0	519.5												
		3 5 6	15	11		2.5	Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp to moist.	0	4	--	5	59	32
25													
		3 4 6	18	12		2.5							
28.0	514.5												
		3 8 12	18	13		--	Very stiff brown and gray SILT (A-4b), some clay, some fine sand, trace gravel; moist.	1	0	--	22	54	23
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1516 | Location: Sta. 10+14.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/4/06

WATER OBSERVATIONS: Water seepage at: 1.5'-2.0', 53.5'-70.0'
Water level at completion: None (prior to washing out)
68.0' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Drive	Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30.0	512.5							Stiff to very stiff brown and gray SANDY SILT (A-4a), little to some clay, trace gravel; moist.						
35		7 12 21	13		14		--	@ 33.5'-35.0', hard, possible cobbles.						
40		4 5 8	18		15		--							
45		6 7 9	15		16		--							
50		4 4 6	14		17		--							
55		4 7 12	18		18		--	@ 53.5', becomes wet. @ 53.5'-60.0', 1.0'-2.0' sand heave.						
60		4 16 36	18		19		--							

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]BUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1516 | Location: Sta. 10+14.5, 36.8 ft. RT of US 52 CL | Date Drilled: 1/4/06

WATER OBSERVATIONS: Water seepage at: 1.5'-2.0', 53.5'-70.0'
Water level at completion: None (prior to washing out)
68.0' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) / Natural Moisture Content, % / PL — LL / Blows per foot
60	482.5						Stiff to very stiff brown and gray SANDY SILT (A-4a), little to some clay, trace gravel; moist.							
65		3 6 10	18	20			@ 63.5', 5.0' sand heave.							
69.5	473.0	3 1 2	18	21A 21B			Very loose gray SILT (A-4b), some fine to coarse sand, trace clay; moist to wet.	0	1	--	30	61	8	Non-Plastic
72.0	470.5						Severely weathered gray SHALE, argillaceous.							
73.9	468.6	50/5	4	22			Bottom of Boring - 73.9'							
75														
80														
85														
90														

STANDARD PENETRATION (N) / Natural Moisture Content, % - ● / PL — LL / Blows per foot - ○
10 20 30 40 50+ 50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

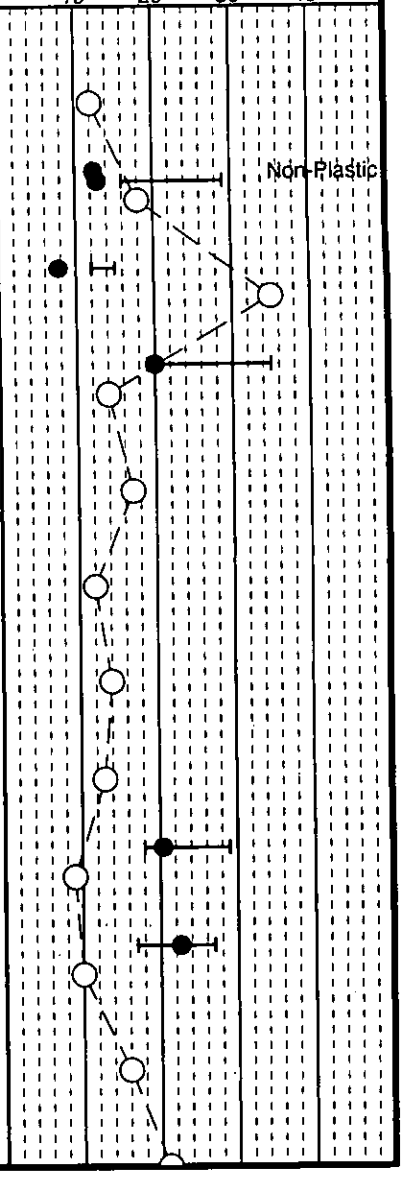
LOG OF: Boring B-1517 | Location: Sta. 8+62.5, 37.8 ft. RT of US 52 CL | Date Drilled: 12/28/05

WATER OBSERVATIONS: Water seepage at: 1.0'-4.0', 49.5-70.0'
Water level at completion: 46.5' (prior to coring)
44.1' (includes drilling water)
46.5' (after 93 hours)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.0						Asphalt Concrete Pavement - 12" Aggregate Base - 4"						
1.3	540.7	9 5 7	14	1			Medium dense brown COARSE AND FINE SAND (A-3a), trace clay, trace gravel; damp.						
4.0	538.0	6 6 12	18	2A		4.5+	Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, little gravel; damp.	9	27	--	51	8	5
5				2B				12	14	--	19	33	22
6.0	536.0	12 14 21	13	3			Medium dense brown COARSE AND FINE SAND (A-3a), little silt, little gravel, trace clay; damp.	12	23	--	40	17	8
8.5	533.5	3 6 8	15	4		4.25	Very stiff to hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.	1	2	--	14	41	42
10		5 7 10	18	5		4.5+							
		6 7 5	12	6		2.5							
15													
16.0	526.0	4 5 9	16	7		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.						
		4 6 7	18	8		2.5							
20							@ 21.0', stiff.						
		4 4 5	18	9		1.25		0	1	--	12	62	25
23.0	519.0												
		3 5 5	18	10		1.25	Stiff to very stiff brown SILT (A-4b), trace fine to coarse sand; moist.	0	1	--	5	71	23
25													
		6 7 9	18	11		2.5							
28.5	513.5												
		8 10 11	16	12			Medium dense brown FINE SAND (A-3), some coarse sand, trace gravel; damp to wet						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic



FILE: 0121-3070-03 | 11/13/2007 6:11 PM |

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1517 | Location: Sta. 8+62.5, 37.8 ft. RT of US 52 CL | Date Drilled: 12/28/05

WATER OBSERVATIONS: Water seepage at: 1.0'-4.0', 49.5-70.0'
Water level at completion: 46.5' (prior to coring)
44.1' (includes drilling water)
46.5' (after 93 hours)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	512.0						Loose to medium dense brown FINE SAND (A-3), some coarse sand, trace gravel; damp to wet.						
35		6 9 13	14	13									
40		3 3 6	18	14				3	22	--	72	3	
45		6 8 8	14	15									
50		6 9 9	17	16									
55		7 10 14	18	17			@ 53.5', 4.0' sand heave, becomes wet.						
60		6 6 9	15	18									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1517 | Location: Sta. 8+62.5, 37.8 ft. RT of US 52 CL | Date Drilled: 12/28/05

WATER OBSERVATIONS: Water seepage at: 1.0'-4.0', 49.5-70.0'
Water level at completion: 46.5' (prior to coring)
44.1' (includes drilling water)
46.5' (after 93 hours)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
60	482.0						Loose brown FINE SAND (A-3), some coarse sand, trace gravel; wet.						
		2 3 5	8	19				7	27	--	63	3	
65													
67.0	475.0						Medium dense brown GRAVEL WITH SAND (A-1-b), trace silt, trace clay; wet.						
		3 6 12	8	20				38	43	--	8	9	2
70													
73.5	468.5	50/4	4	21			Severely weathered gray SILTSTONE, arenaceous, micaceous.						
75													
76.0	466.0						Medium hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured.						
80		Core 120"	Rec 120"	RQD 89%	R-1		@ 77.8'-78.0', decomposed fracture.						
85							@ 84.8', low angle fracture.						
86.0	456.0						Bottom of Boring - 86.0'						
90													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic
Non-Plastic
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

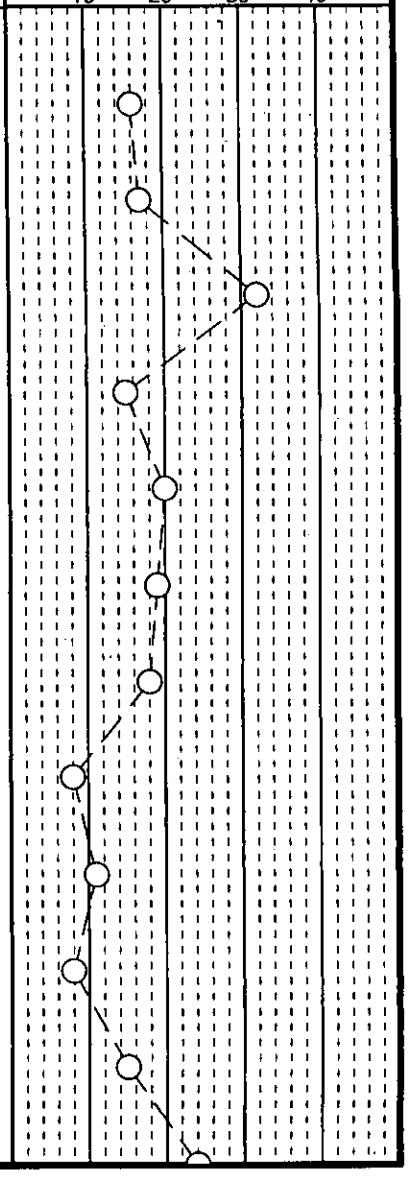
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1518 | Location: Sta. 7+14.9, 36.9 ft. RT of US 52 CL | Date Drilled: 12/22/05 to 12/28/05

WATER OBSERVATIONS: Water seepage at: 1.0'-2.5', 49.5'-74.2'
Water level at completion: 53.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	541.6						Asphalt Concrete Pavement - 10" Aggregate Base - 6"						
1.3	540.3	7 6 10	13	1			Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp to moist.						
5		8 9 8	16	2									
		22 16 16	18	3									
8.5	533.1	6 7 8	12	4		4.5+	Very stiff to hard brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
10		8 9 11	18	5A 5B		4.5+ 4.0							
		5 8 11	14	6		4.5+							
15		6 8 10	18	7		4.5+							
		3 3 5	18	8		2.5							
20													
21.0	520.6	3 5 6	18	9		--	Medium stiff to stiff brown SANDY SILT (A-4a), trace clay; damp.						
		3 4 4	18	10		--							
25													
26.0	515.6	5 6 9	18	11			Medium dense brown FINE SAND (A-3), trace to little silty clay; damp to moist.						
		9 11 13	13	12									
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 | 11/13/2007 6:11 PM |

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1518 | Location: Sta. 7+14.9, 36.9 ft. RT of US 52 CL | Date Drilled: 12/22/05 to 12/28/05

WATER OBSERVATIONS: Water seepage at: 1.0'-2.5', 49.5'-74.2'
Water level at completion: 53.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	511.6						Medium dense brown FINE SAND (A-3), trace to little silty clay; damp to moist.						
33.5	508.1	5 6 11	12	13			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp to moist.						
40		4 4 8	14	14									
45		6 7 7	13	15									
48.5	493.1	5 6 8	11	16			Loose to medium dense brown FINE SAND (A-3), trace coarse sand, trace gravel; moist to wet.						
55		1 3 6	14	17			@ 53.5', becomes wet. @ 53.5'-60.0', 1.0'-3.0' sand heave.						
60		12 8 7	18	18									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1518 | Location: Sta. 7+14.9, 36.9 ft. RT of US 52 CL | Date Drilled: 12/22/05 to 12/28/05

WATER OBSERVATIONS: Water seepage at: 1.0'-2.5', 49.5'-74.2'
Water level at completion: 53.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL — LL Blows per foot - ○
60	481.6						Loose to medium dense brown FINE SAND (A-3), trace coarse sand, trace gravel; wet.							
65		1 2 3	6	19			@ 63.5',68.5', 4.0' sand heave.							
70		4 12 10	18	20										
74.5	467.1	15 30 50/3	15	21A 21B			Severely weathered gray SHALE.							50+
75.0	466.6						Bottom of Boring - 75.0'							
80														
85														
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1519 | Location: Sta. 5+67.1, 28.7 ft. RT of US 52 CL | Date Drilled: 12/28/05 to 12/30/05

WATER OBSERVATIONS: Water seepage at: 50.0'
Water level at completion: 45.0' (prior to coring)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	541.4						Asphalt Concrete - 5" Portland Cement Concrete - 9"						
1.2	540.2	6 13	10	1		3.5	Very stiff to hard brown SANDY SILT (A-4a), little gravel, trace clay; damp.						
		20 28 24 20	22	2		4.5+		13	19	--	29	31	8
4.0	537.4	8 21 30 33	24	3			Very dense brown COARSE AND FINE SAND (A-3a), little gravel, trace clay; damp.	12	31	--	42	10	5
7.5	533.9												
		4 11 14	13	4		4.5+	Hard brown CLAY (A-7-6), "and" silt, trace fine to coarse sand; damp to moist.						
		5 11 15	16	5		4.5+		0	1	--	3	39	57
		7 14 20	18	6		4.5+							
16.0	525.4	2 5 7	18	7		1.5	Stiff brown SILT (A-4b), some fine to coarse sand, little clay; damp.						
		2 5 8	18	8		1.5		0	1	--	30	50	19
		5 5 9	18	9		1.5							
23.5	517.9	16 19 20	18	10			Dense brown GRAVEL WITH SAND (A-1-b), trace silty clay; dry to damp.						
		13 19 19	15	11				2	49	--	46	2	1
		6 18 28	16	12									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

52
Non-Plastic
51
Non-Plastic

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1519 | Location: Sta. 5+67.1, 28.7 ft. RT of US 52 CL | Date Drilled: 12/28/05 to 12/30/05

WATER OBSERVATIONS: Water seepage at: 50.0'
Water level at completion: 45.0' (prior to coring)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) / Natural Moisture Content, % / PL — LL / Blows per foot
30	511.4						Dense brown GRAVEL WITH SAND (A-1-b), little silty clay; dry to damp.							
		15 21 25	14	13				31	35	--	15	19		Non-Plastic
35														
37.0	504.4						Medium dense brown FINE SAND (A-3), trace coarse sand, trace silt; damp.							
		7 11 14	16	14										
40														
		6 7 8	17	15				0	4	--	93	3	0	Non-Plastic
45														
		11 11 14	14	16										
50														
52.0	489.4						Medium dense brown COARSE AND FINE SAND (A-3a), trace silty clay, trace gravel; wet.							
		13 16 12	18	17				3	30	--	55	8	4	Non-Plastic
55														
		3 6 9	18	18										
60														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1519 | Location: Sta. 5+67.1, 28.7 ft. RT of US 52 CL | Date Drilled: 12/28/05 to 12/30/05

WATER OBSERVATIONS: Water seepage at: 50.0'
Water level at completion: 45.0' (prior to coring)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
60	481.4						Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace silty clay, trace gravel; moist to wet.							Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ 10 20 30 40
65		1 3 4	18	19										
70		3 8 10	18	20										
		60 50/3	9	21			@ 73.5', very dense, little to some silty clay.							50+
75.0	466.4	Core 65"	Rec 65"	RQD 58%	R-1		Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, massive, slightly fractured, contains few to moderate argillaceous laminations. @ 79.4'-80.0', calcareous.							
80														
80.4	461.0						Bottom of Boring - 80.4'							
85														
90														

FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1520 | Location: Sta. 27+68.3, 25.8 ft. LT of US 52 Ramp B BL | Date Drilled: 1/16/06

WATER OBSERVATIONS: Water seepage at: 13.5'
Water level at completion: None (Prior to coring)
10.7' (Includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	534.7						Asphalt Concrete Pavement - 5" Aggregate Base - 7"						
1.0	533.7	1 2 3	14	1		2.25	Very stiff to hard gray SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp to moist.						
		3 4 7 9	20	2		4.5+							
5		4 8 8 7	24	3		4.5+							
		4 5 7	18	4		4.0							
		2 3 3	18	5		2.0							
10		4 4 5	18	6		1.5	@ 11.0'-12.5', stiff.						
13.5	521.2	6 39 50/3	12	7			Very dense brown GRAVEL WITH SAND AND SILT (A-2-4); moist.						
15.0	519.7						Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, highly fractured to broken. @ 18.0'-18.4', high angle fracture.						
19.6	515.1	Core 120"	Rec 120"	RQD 56%	R-1		Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured to unfractured. @ 16.4'-17.5', 18.7'-18.8', broken.						
25.0	509.7						Bottom of Boring - 25.0'						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1521 | Location: Sta. 24+76.9, 16.8 ft. LT of US 52 Ramp B BL | Date Drilled: 1/16/06

WATER OBSERVATIONS: Water seepage at: 13.5'-19.0'
Water level at completion: 15.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	536.8						Asphalt Concrete Pavement - 5" Aggregate Base - 5"						
0.8	536.0	1 4 8	12	1		4.5+	Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
		9 8 8 7	22	2		4.5+							
5		5 7 9 10	20	3		4.5+							
		5 7 7	18	4		4.5+							
6.5	528.3	4 5 5	14	5		2.0	Medium stiff to stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp to moist.						
10		3 3 3	18	6		1.0							
		2 3 4	12	7		0.5	@ 13.5'-17.5', moist to wet.						
15		2 2 2	13	8		0.5							
18.5	518.3	5 50/3	9	9			Severely weathered gray SILTSTONE.						
20.0	516.8						Medium hard light brown and gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, thinly bedded to massive, highly fractured to broken. @ 20.1'-20.2', 20.5'-20.7', broken. @ 21.2'-21.3', contains few to moderate argillaceous laminations with some fractures.						
25		Core 120"	Rec 120"	RQD 45%	R-1								
25.9	510.9						Medium hard to hard gray SANDSTONE; very fine to fine grained, moderately weathered, argillaceous, micaceous, slightly fractured, contains few argillaceous laminations. @ 26.3',26.9',27.2',28.2', low angle fractures.						
30.0	506.8						Bottom of Boring - 30.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1521 | Location: Sta. 24+76.9, 16.8 ft. LT of US 52 Ramp B BL | Date Drilled: 1/16/06

WATER OBSERVATIONS: Water seepage at: 13.5'-19.0'
Water level at completion: 15.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ 10 20 30 40
30	506.8													
35														
40														
45														
50														
55														
60														

FILE: 0121-3070-03 | 11/13/2007 6:11 PM |

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]IBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1522 | Location: Sta. 22+02.7, 8.2 ft. RT of US 52 Ramp B BL | Date Drilled: 1/12/06

WATER OBSERVATIONS: Water seepage at: 8.1', 11.0', 13.5'
Water level at completion: 8.1' (prior to coring)
4.4' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	529.2						Topsoil - 6"						
1.0	528.2	3 3 4	13	1		3.0	Very stiff brown SILT (A-4b), little clay; damp.						
3.5	525.7	4 5 11	16	2		3.5	Very stiff to hard brown SILT AND CLAY (A-6a), trace to little fine to coarse sand; damp to moist.						
5		4 9 9	16	3A 3B		4.5+ 4.5+		0	1	--	10	64	25
10		4 6 7	18	4A 4B		2.5 2.0		0	2	--	8	60	30
11.0	518.2	4 5 6	13	5			Dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.	41	29	--	25	5	
13.5	515.7	50/5	4	6			Severely weathered gray SANDSTONE, argillaceous.						
14.0	515.2						Medium hard to hard gray SANDSTONE; fine grained, moderately to highly weathered, argillaceous, thickly bedded, moderately to highly fractured. @ 14.0'-16.6',17.4'-17.9', iron stained. @ 14.6',17.0',17.4',17.6',18.1', low angle fractures with iron staining. @ 15.4', 15.6', 16.2', 17.0', 18.7', low angle fractures. @ 18.7', slightly to moderately fractured. @ 19.6'-19.9',23.1'-23.5', high angle fractures.						
15													
20		Core 120"	Rec 120"	RQD 67%	R-1								
24.0	505.2						Bottom of Boring - 24.0'						
25													
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

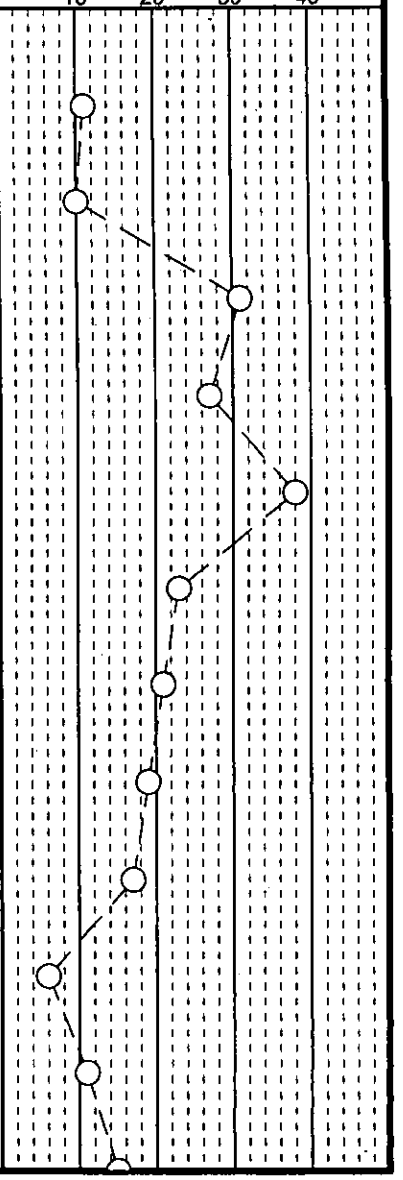
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1523 | Location: Sta. 18+98.8, 22.7 ft. RT of US 52 Ramp B BL | Date Drilled: 11/3/05 to 11/7/05

WATER OBSERVATIONS: Water seepage at: 33.5'
Water level at completion: 54.2' (prior to coring)
20.5' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	540.8						Asphalt Concrete Pavement - 8" Aggregate Base - 4"						
1.0	539.8												
1.5	539.3	7 4 7	12	1A 1B		4.0	Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist.						
		6 5 5	8	2		3.0	Very stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; moist.						
5		10 14 17	14	3									
8.5	532.3	6 10 17	12	4			Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp to moist.						
10		15 17 21	13	5									
		10 12 11	15	6									
15		6 8 13	18	7									
		5 11 8	16	8									
20		9 9 8	14	9									
23.5	517.3	4 3 3	9	10			Loose to medium dense gray SANDY SILT (A-4a), trace clay, trace fine to coarse sand, trace gravel; moist.						
25		5 5 6	10	11									
28.5	512.3	5 5 10	2	12			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist to wet						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1523 | Location: Sta. 18+98.8, 22.7 ft. RT of US 52 Ramp B BL | Date Drilled: 11/3/05 to 11/7/05

WATER OBSERVATIONS: Water seepage at: 33.5'
Water level at completion: 54.2' (prior to coring)
20.5' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
30	510.8						Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist to wet.							Natural Moisture Content, % - ● PL ⊢ LL; Blows per foot - ○ (10 20 30 40)
		3 1 1	18	13			@ 33.5'-35.0', very loose, wet.							
35														
		8 10 11	16	14										
40														
43.5	497.3	22 42 32	14	15			Very dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist to wet.							74
45														
48.5	492.3	10 15 9	12	16			Severely weathered gray SHALE.							
50														
		16 43 24	15	17										67
55														
		50/2	2	18										50+
60														

FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1523 | Location: Sta. 18+98.8, 22.7 ft. RT of US 52 Ramp B BL | Date Drilled: 11/3/05 to 11/7/05

WATER OBSERVATIONS: Water seepage at: 33.5'
Water level at completion: 54.2' (prior to coring)
20.5' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ 10 20 30 40
	480.8													
60.0	480.8						Hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured.							
							@ 61.0', 61.4', low angle fractures.							
65		Core 120"	Rec 120"	RQD 100%	R1		@ 66.2'-66.4', broken zone.							
70.0	470.8						Bottom of Boring - 70.0'							
75														
80														
85														
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

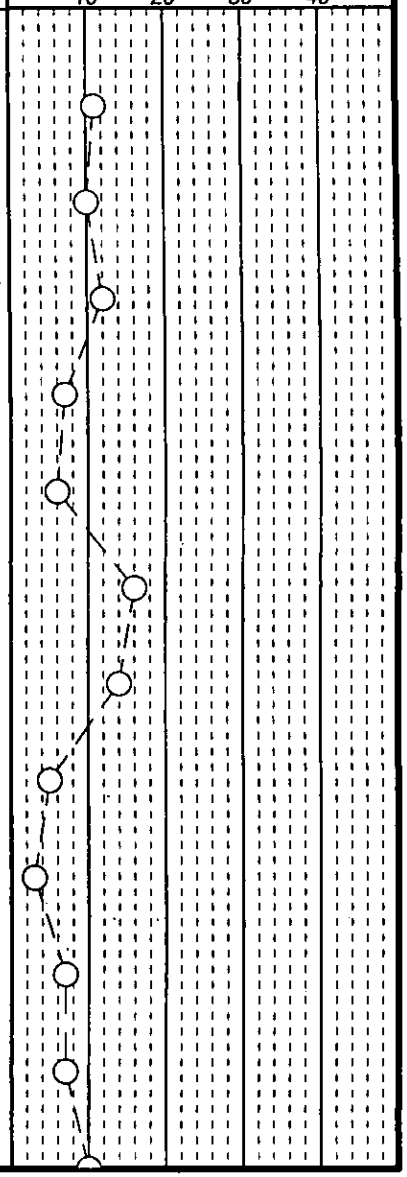
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1524 | Location: Sta. 17+90.5, 35.9 ft. LT of US 52 CL | Date Drilled: 11/7/05 to 11/9/05

WATER OBSERVATIONS: Water seepage at: 11.0', 28.5'
Water level at completion: 29.8' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.2						Asphalt Concrete Pavement - 9" Aggregate Base - 3"						
1.0	541.2												
1.5	540.7	5 4 7	12	1A 1B		4.0	POSSIBLE FILL: Medium dense brown FINE SAND (A-3), trace gravel, trace silt; moist.						
		3 5 5	8	2		4.5+	Very stiff to hard brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp to moist.						
5		4 4 8	14	3		3.0							
8.0	534.2												
9.0	533.2	3 4 3	12	4A 4B		4.5+	Loose brown FINE SAND (A-3), trace fine to coarse sand, trace gravel; moist.						
10							Hard brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp.						
11.3	530.9	3 3 3	18	5A 5B		1.0	@ 11.0'-11.3', wet sand seam.						
13.5	528.7	3 5 11	16	6			Stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; moist.						
15		10 6 8	18	7			Loose to medium dense gray SILT (A-4b), trace fine to coarse sand; damp.						
		2 2 3	18	8			@ 18.5'-22.5', occasional rust stains.						
20		1 1 2	18	9			@ 21.0'-22.5', very loose.						
23.5	518.7	2 3 4	15	10		1.75	Stiff gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; contains rust stains; moist.						
25		1 3 4	18	11		1.5							
28.0	514.2												
30		5 6 4	9	12			Loose to medium dense brown COARSE AND FINE SAND (A-3a), little gravel, little silty clay; wet.						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 | 11/13/2007 6:11 PM |

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1524 | Location: Sta. 17+90.5, 35.9 ft. LT of US 52 CL | Date Drilled: 11/7/05 to 11/9/05

WATER OBSERVATIONS: Water seepage at: 11.0', 28.5'
Water level at completion: 29.8' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
	512.2													Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ 10 20 30 40
30.0	512.2						Medium stiff gray SILT AND CLAY (A-6a), little fine to coarse sand; contains interbedded sand seams; moist.							
34.2	508.0	2 14 23	16	13A 13B		0.5	Medium dense to dense rusty brown COARSE AND FINE SAND (A-3a), little silt, trace to little gravel; damp.							
35														
		16 16 17	14	14										
40														
		5 6 9	16	15										
45														
48.5	493.7	50/5	5	16			Severely weathered gray SILTSTONE fragments, arenaceous.							50+
48.9	493.3						Bottom of Boring - 48.9'							
50														
55														
60														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

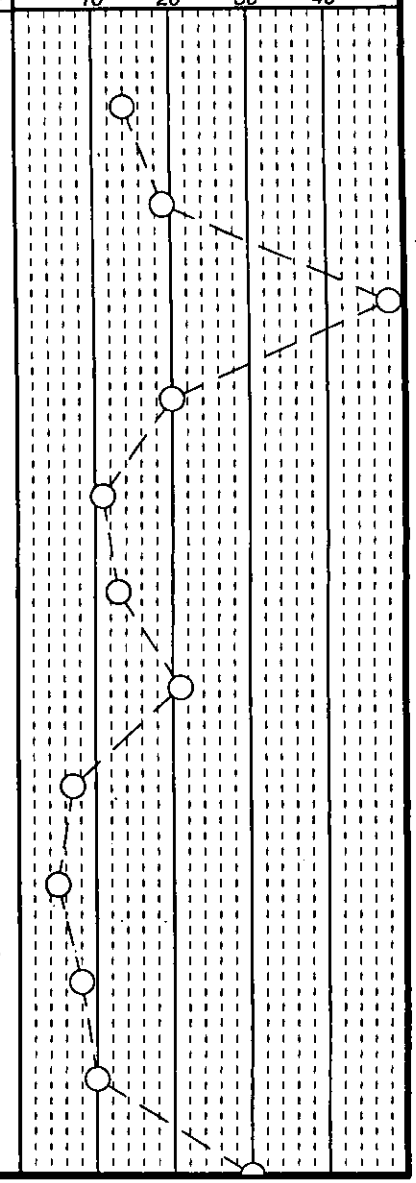
LOG OF: Boring B-1525 | Location: Sta. 16+39.4, 37.2 ft. LT of US 52 CL | Date Drilled: 11/9/05

WATER OBSERVATIONS: Water seepage at: 28.5'
Water level at completion: 47.2' (prior to coring)
18.8' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.1						Asphalt Concrete Pavement - 7" Aggregate Base - 5"						
1.0	542.1	5 7 7	0	1		--	Stiff brown SANDY SILT (A-4a), little clay, trace gravel; moist.						
3.5	539.6	7 6 13	15	2A 2B		4.5	Hard brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp.						
4.7	538.4	16 22 26	13	3			Medium dense to dense brown FINE SAND (A-3), little coarse sand, trace gravel; damp.						
10		12 10 10	16	4									
11.0	532.1	8 6 5	11	5		2.75	Very stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; contains occasonal rust stains; moist.						
15		3 5 8	15	6		3.25							
16.0	527.1	11 11 10	18	7			Medium dense brown SILT (A-4b), little fine to coarse sand; damp.						
18.5	524.6	2 3 4	15	8		2.25	Stiff to very stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand; moist.						
20		1 2 3	14	9		1.5							
23.5	519.6	2 4 4	18	10			Loose gray SANDY SILT (A-4a), trace clay; contains interbedded sand seams; moist.						
25		4 4 6	18	11									
28.5	514.6	7 10 20	16	12			Medium dense brown FINE SAND (A-3); wet.						
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1525 | Location: Sta. 16+39.4, 37.2 ft. LT of US 52 CL | Date Drilled: 11/9/05

WATER OBSERVATIONS: Water seepage at: 28.5'
Water level at completion: 47.2' (prior to coring)
18.8' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	513.1						Medium dense brown FINE SAND (A-3), little coarse sand, little gravel; wet.						
		15 14 14	13	13									
35													
		7 13 16	18	14									
40													
42.0	501.1						Medium dense brown COARSE AND FINE SAND (A-3a), trace silt, trace gravel; wet.						
		5 6 7	12	15									
45													
		8 7 9	16	16									
50													
53.5	489.6	50/5	4	17			Severely weathered gray SILTSTONE fragments, arenaceous.						
55.0	488.1						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly to moderately fractured. @ 55.7', 56.9', 58.9', 59.4', low angle fractures. @ 57.5'-57.8', high angle fracture.						
		Core 120"	Rec 120"	RQD 89%	R1								
60													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1525 | Location: Sta. 16+39.4, 37.2 ft. LT of US 52 CL | Date Drilled: 11/9/05

WATER OBSERVATIONS: Water seepage at: 28.5'
Water level at completion: 47.2' (prior to coring)
18.8' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ 10 20 30 40
60	483.1						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, slightly to moderately fractured. @ 60.3'-60.6', high angle fracture.							
65.0	478.1						Bottom of Boring - 65.0'							
70														
75														
80														
85														
90														

FILE: 0121-3070-03 | 11/13/2007 6:11 PM |

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

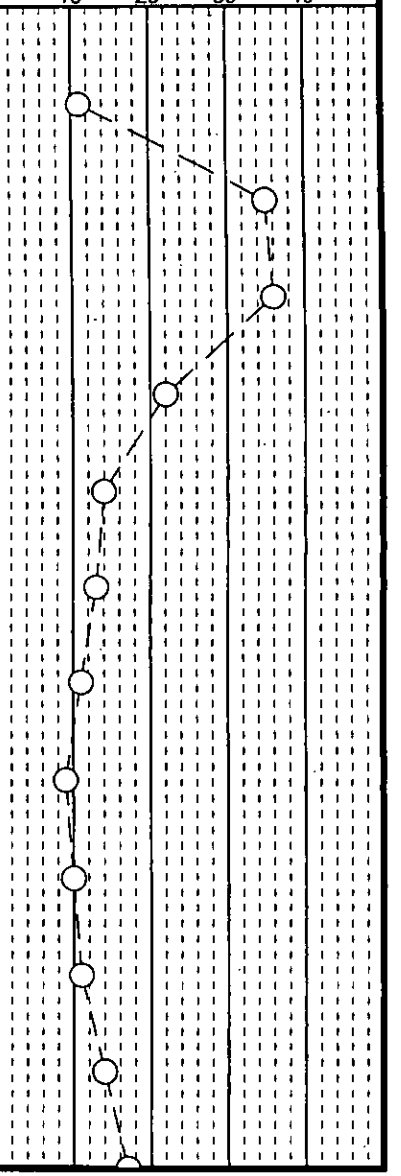
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1526 | Location: Sta. 14+86.7, 36.9 ft. LT of US 52 CL | Date Drilled: 11/10/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 53.9' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.3						Asphalt Concrete Pavement - 9" Aggregate Base - 15"						
2.0	541.3	6 6 5	17	1A 1B		4.5+	Hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; contains roots; damp.						
3.0	540.3	9 17 18	13	2			Medium dense to dense brown FINE SAND (A-3), trace coarse sand, trace gravel; moist.						
5		20 20 16	14	3									
		4 8 14	12	4									
10													
11.5	531.8	12 4 10	18	5A 5B		4.5+	Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.						
		4 5 8	16	6		4.5+							
15													
16.0	527.3	3 4 7	15	7		3.0	Very stiff gray SILTY CLAY (A-6b), trace fine sand; moist.						
18.5	524.8	3 4 5	18	8		--	Stiff brown SANDY SILT (A-4a), some clay; contains rust stains; damp.						
20		3 4 6	18	9		--							
		3 5 6	18	10		--							
25		5 6 8	18	11		--							
28.5	514.8	4 6 11	14	12			Medium dense brown FINE SAND (A-3), trace silt, trace gravel; damp						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1526 | Location: Sta. 14+86.7, 36.9 ft. LT of US 52 CL | Date Drilled: 11/10/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 53.9' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
30	513.3						Medium dense brown FINE SAND (A-3), trace silt, trace gravel; damp.							Natural Moisture Content, % - ● PL ⊢—⊣ LL; Blows per foot - ○ (10 20 30 40)
35		4 4 8	12	13										
40		14 13 12	16	14										
45		6 7 8	15	15										
50		7 7 7	18	16										
52.0	491.3						Medium dense brown GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, trace silt; wet.							
55		6 6 8	16	17										
58.5	484.8	50/2	2	18			Severely weathered gray SILTSTONE fragments, arenaceous.							50+
58.7	484.6													
60														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1526 | Location: Sta. 14+86.7, 36.9 ft. LT of US 52 CL | Date Drilled: 11/10/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 53.9' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ 10 20 30 40
60	483.3						Bottom of Boring - 58.7'							
65														
70														
75														
80														
85														
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

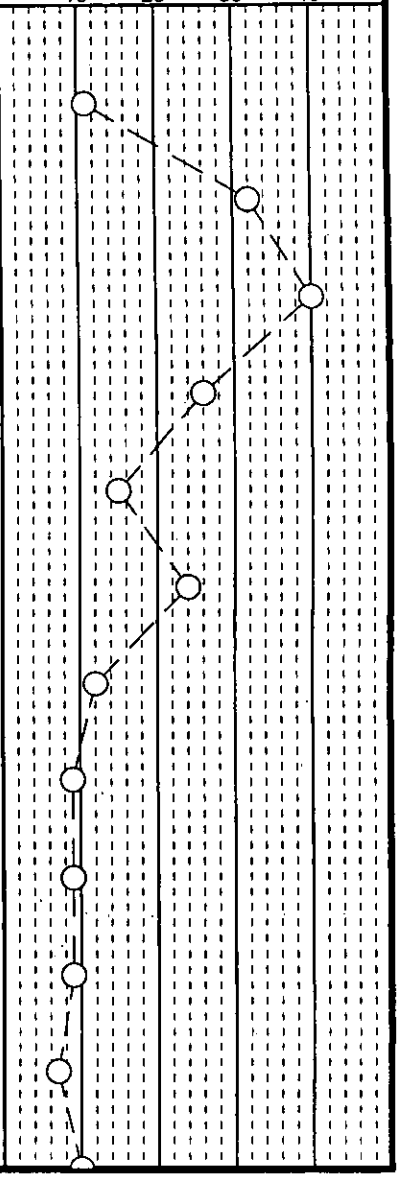
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1527 | Location: Sta. 13+26.9, 36.5 ft. LT of US 52 CL | Date Drilled: 11/10/05 to 11/15/05

WATER OBSERVATIONS: Water seepage at: 8.5', 53.5'
Water level at completion: 22.0' (11/14/06)
53.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.1						Asphalt Concrete Pavement - 8" Aggregate Base - 6"						
1.2	541.9												
1.5	541.6	9 5 6	14	1A 1B		4.5	Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist.						
3.5	539.6	3 13 19	14	2			Hard brown SILTY CLAY (A-6b), trace fine sand; moist.						
5		8 18 22	16	3			Medium dense to dense brown FINE SAND (A-3), trace to little gravel, trace coarse sand ; moist.						
10		9 13 13	15	4			@ 8.5'-15.0', wet spoons.						
		5 8 7	12	5									
15		3 10 14	18	6									
16.0	527.1	3 5 7	14	7		4.5+	Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand; moist.						
18.5	524.6	3 3 6	18	8		3.0	Very stiff to hard brown and gray SILTY CLAY (A-6b), trace fine to coarse sand; moist.						
20		3 4 5	18	9		4.25							
25		2 4 5	18	10		3.25							
		3 3 4	18	11		2.25	@ 26.0'-27.5', contains rust stains.						
28.5	514.6												
30		3 4 6	18	12		3.75	Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; contains rust stains; moist.						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢—⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]BUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1527 | Location: Sta. 13+26.9, 36.5 ft. LT of US 52 CL | Date Drilled: 11/10/05 to 11/15/05

WATER OBSERVATIONS: Water seepage at: 8.5', 53.5'
Water level at completion: 22.0' (11/14/06)
53.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0.0	513.1												
30.0	513.1						Medium dense brown COARSE AND FINE SAND (A-3a), little silt, trace gravel; moist.						
		6 11 16	9	13									
35													
38.5	504.6												
		5 9 10	12	14			Medium dense to dense brown FINE SAND (A-3), little silt, trace gravel; moist.						
40													
		4 5 7	18	15									
45													
		6 9 9	14	16									
50													
		16 34 15	18	17			@ 53.5',58.5', 2.0' sand heave.						
55													
		7 26 50/4	15	18			@ 58.5', very dense.						
60													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1527 | Location: Sta. 13+26.9, 36.5 ft. LT of US 52 CL | Date Drilled: 11/10/05 to 11/15/05

WATER OBSERVATIONS: Water seepage at: 8.5', 53.5'
Water level at completion: 22.0' (11/14/06)
53.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
60	483.1						Loose brown FINE SAND (A-3), little silt, trace gravel; moist.						
		4 2 1	12	19			@ 63.5', 15.0' sand heave.						
65							@ 68.5'-68.6', severely weathered gray SILTSTONE, arenaceous.						
68.5	474.6	50/1	1	20			Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, medium bedded, slightly fractured.						
70							@ 68.7'-69.2', 69.5'-70.3', 70.6'-70.7', 75.5'-75.7', few argillaceous laminations.						
		Core 120"	Rec 120"	RQD 93%	R1		@ 70.0', 76.3', low angle fractures.						
75													
78.5	464.6						Bottom of Boring - 78.5'						
80													
85													
90													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

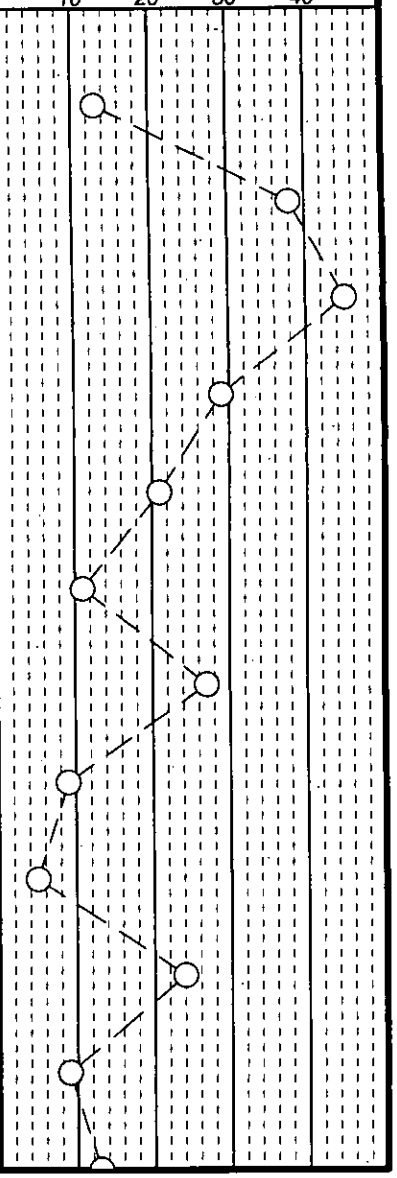
LOG OF: Boring B-1528 | Location: Sta. 11+77.5, 35.5 ft. LT of US 52 CL | Date Drilled: 11/16/05 to 11/17/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 58.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.6						Asphalt Concrete Pavement - 9" Aggregate Base - 9"						
1.5	541.1	8 6 7	12	1			Medium dense brown SANDY SILT (A-4a), "and" fine to coarse sand, little gravel, little clay; moist.						
3.5	539.1	7 16 22	13	2			Medium dense to dense brown FINE SAND (A-3), trace silt trace coarse sand, trace gravel; moist.						
5		14 22 23	16	3									
		4 11 18	14	4									
10		14 12 9	18	5									
13.5	529.1	4 5 6	15	6		2.75	Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; moist.						
15		7 9 18	16	7		2.5	@ 17.4'-17.5', sand seam.						
		3 4 5	14	8		4.0							
20		3 2 3	18	9		2.0	@ 21.0'-22.5', gray and brown.						
23.5	519.1	3 6 18	17	10		4.5+	Very stiff to hard brown and gray CLAY (A-7-6), little fine sand; contains rust stains; damp.						
25		3 4 5	18	11		3.5							
28.5	514.1	2 7 6	16	12		2.0	Stiff to very stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.						
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1528 | Location: Sta. 11+77.5, 35.5 ft. LT of US 52 CL | Date Drilled: 11/16/05 to 11/17/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 58.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
30.0	512.6						Loose to medium dense brown FINE SAND (A-3), trace gravel; damp to moist.							Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ (10 20 30 40)
35		5 7 7	13	13										
40		3 3 5	15	14										
45		5 9 10	11	15										
50		5 6 9	12	16										
55		2 3 4	0	17			@ 53.5', wet spoon, 8" sand heave.							
60		4 4 6	18	18			@ 58.5', becomes wet. @ 58.5'-70.0', 2.0'-3.0' sand heave.							

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1528 | Location: Sta. 11+77.5, 35.5 ft. LT of US 52 CL | Date Drilled: 11/16/05 to 11/17/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 58.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
60	482.6						Medium dense to dense brown FINE SAND (A-3), trace gravel; wet.							
		8 9 13	16	19										
65														
69.0	473.6	32 43 50/5	12	20A 20B			Very dense brown COARSE AND FINE SAND (A-3a), little silt, trace gravel; wet.							50+
70														
73.5	469.1	50/2	2	21			Severely weathered gray SILTSTONE, arenaceous.							50+
73.7	468.9						Bottom of Boring - 73.7'							
75														
80														
85														
90														

STANDARD PENETRATION (N): Natural Moisture Content, % - ● PL ⊢—⊣ LL; Blows per foot - ○ (10, 20, 30, 40)

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

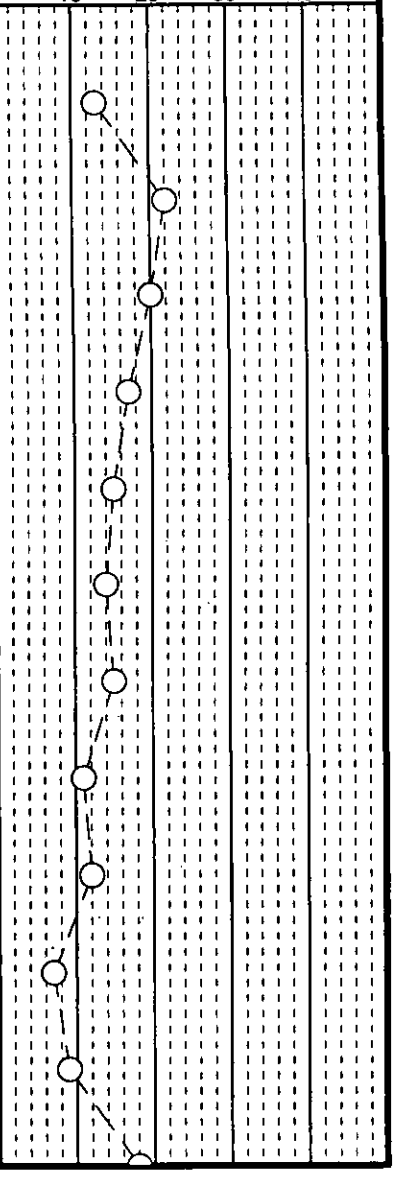
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1529 | Location: Sta. 10+35.5, 35.3 ft. LT of US 52 CL | Date Drilled: 11/17/05 to 11/22/05

WATER OBSERVATIONS: Water seepage at: 53.5'; Water level at completion: 53.4'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.5						Asphalt Concrete Pavement - 10" Aggregate Base - 2"						
1.0	541.5	7 5 8	12	1A 1B		4.5+	POSSIBLE FILL: Medium dense brown FINE SAND (A-3), trace coarse sand; contains occasional silty clay pieces; damp.						
2.0	540.5						Hard brown and gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.						
3.5	539.0	5 10 12	9	2			Medium dense brown COARSE AND FINE SAND (A-3a), little silt, trace gravel; moist.						
5													
7.0	535.5	8 10 10	18	3A 3B		4.5+	Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.						
8.5	534.0	6 7 10	16	4			Medium dense brown COARSE AND FINE SAND (A-3a), little silt, trace gravel; moist.						
10													
11.5	531.0	5 6 9	18	5A 5B		4.0	Hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; damp.						
		3 5 9	14	6		4.25							
15													
15.5	527.0						Stiff brown SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.						
16.5	526.0	4 6 9	18	7A 7B		-- 4.5	Hard brown CLAY (A-7-6), little fine to coarse sand; moist.						
		3 4 7	14	8		4.5+	@ 18.5'-20.0', gray, contains rust stains.						
20													
21.0	521.5	3 5 7	18	9		4.5	Hard brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; contains rust stains; moist.						
		2 3 4	18	10		0.75	@ 23.5'-27.5', medium stiff to stiff.						
25													
		3 4 5	18	11		1.25							
28.5	514.0												
		6 8 10	15	12			Medium dense brown FINE SAND (A-3); damp.						
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1529 | Location: Sta. 10+35.5, 35.3 ft. LT of US 52 CL | Date Drilled: 11/17/05 to 11/22/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 53.4'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	512.5						Medium dense brown FINE SAND (A-3); moist.						
35		7 6 4	16	13									
40		3 4 7	13	14									
45		4 6 8	15	15									
50		5 6 9	16	16									
55		14 50/5	10	17			@ 53.5', very dense, becomes wet.						
60		4 5 12	18	18									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1529 | Location: Sta. 10+35.5, 35.3 ft. LT of US 52 CL | Date Drilled: 11/17/05 to 11/22/05

WATER OBSERVATIONS: Water seepage at: 53.5'
Water level at completion: 53.4'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
60	482.5						Loose brown FINE SAND (A-3); wet.							Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ 10 20 30 40
65		WOH 2 5	18	19										
67.0	475.5						Loose brown COARSE AND FINE SAND (A-3a), trace silt, trace gravel; wet.							
70		WOH 3 4	18	20										
73.5	469.0	26 50/5	8	21			Hard gray SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; damp. (DECOMPOSED SILTSTONE)							50+
75.0	467.5						Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured. @ 75.3', 77.3', 77.8', low angle fractures.							
80		Core 120"	Rec 120"	RQD 76%	R1									
85.0	457.5						Bottom of Boring - 85.0'							
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1530 | Location: Sta. 8+95.4, 33.9 ft. LT of US 52 CL | Date Drilled: 12/07/05 to 12/08/05

WATER OBSERVATIONS: Water seepage at: 1.5'-4.0', 53.5'-75.0'
Water level at completion: 65.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.1												
1.2	540.9	7 8 16	14	1			Asphalt Concrete Pavement - 8" Aggregate Base - 6"						
							Medium dense brown COARSE AND FINE SAND (A-3a), little gravel, trace clay; moist.						
4.0	538.1	3 9 10	12	2A 2B		4.5+	Hard brown SILT AND CLAY (A-6a), little fine to coarse sand, little gravel; damp.						
6.0	536.1	16 15 13	15	3			Medium dense brown COARSE AND FINE SAND (A-3a), little gravel, trace silt; moist.	16	26	--	45	13	
8.5	533.6	5 5 8	16	4		4.5+	Hard brown SILTY CLAY (A-6b), trace fine to coarse sand; damp.						
11.0	531.1	5 6 10	18	5		3.25	Very stiff brown SANDY SILT (A-4a), little clay, trace gravel; damp.	6	7	--	32	32	23
13.5	528.6	4 6 10	16	6		4.5+	Hard brown SILTY CLAY (A-6b), trace fine sand, trace gravel; dry to damp.						
		4 6 8	18	7		4.5		8	0	--	3	45	44
18.5	523.6	3 3 4	16	8		3.5	Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand; damp.						
21.0	521.1	3 4 5	18	9		1.0	Stiff brown SANDY SILT (A-4a), trace to little clay; damp.						
23.5	518.6	4 4 4	15	10			Loose brown SANDY SILT (A-4a), little clay, trace gravel; damp.	5	5	--	46	29	15
27.0	515.1	4 6 9	18	11A 11B		1.5	Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace clay, trace silt; damp.						
30		4 4 8	13	12									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

Non-Plastic

FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1530 | Location: Sta. 8+95.4, 33.9 ft. LT of US 52 CL | Date Drilled: 12/07/05 to 12/08/05

WATER OBSERVATIONS: Water seepage at: 1.5'-4.0', 53.5'-75.0'
Water level at completion: 65.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) / Natural Moisture Content, % / Blows per foot
30.0	512.1-512.1						Medium dense brown GRAVEL WITH SAND (A-1-b), trace silt; damp.							
35		6 10 12	10	13			@ 33.5' some gravel.	25	55	--	16	4		Non-Plastic
40		4 6 6	13	14										
45		4 6 7	12	15										
47.0	495.1						Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace silty clay, trace gravel; damp.							
50		4 5 7	15	16				2	45	--	50	3		Non-Plastic
55		6 9 13	18	17			@ 53.5', wet, contains rock fragments.							
60		WOH 2 5	18	18										

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1530 | Location: Sta. 8+95.4, 33.9 ft. LT of US 52 CL | Date Drilled: 12/07/05 to 12/08/05

WATER OBSERVATIONS: Water seepage at: 1.5'-4.0', 53.5'-75.0'
Water level at completion: 65.5' (inside hollowstem augers)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) / Natural Moisture Content, % / Blows per foot
60	482.1						Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace silty clay, trace gravel; damp.							
65		12 8 11	16	19										
70		2 3 5	18	20										
75		5 15 50/5	13	21			@ 73.5', little gravel.	14	16	--	57	13		Non-Plastic 50+
77.0	465.1						Severely weathered gray SILTSTONE.							
78.7	463.4	50/2	2	22			Bottom of Boring - 78.7'							50+
80														
85														
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1531 | Location: Sta. 7+30.5, 32.2 ft. LT of US 52 CL | Date Drilled: 12/09/05 to 12/14/05

WATER OBSERVATIONS: Water seepage at: 23.5'-25.8', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 50.1' (prior to coring)
48.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	541.8						Asphalt Concrete Pavement - 10" Aggregate Base - 2"						
1.0	540.8	2 5 7	8	1			Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
		12 19 19	14	2									
5		10 20 18	15	3									
8.5	533.3	3 4 6	12	4		4.5+	Hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
10		12 9 9	10	5		4.5+							
		2 5 7	17	6		4.25							
15		5 6 8	18	7		4.5+							
18.5	523.3	4 4 5	15	8			Loose to medium dense brown FINE SAND (A-3), trace to little silt, trace coarse sand; damp.						
20		5 6 9	14	9									
		6 9 18	18	10									
25		14 13 11	16	11									
		5 7 8	16	12									
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1531 | Location: Sta. 7+30.5, 32.2 ft. LT of US 52 CL | Date Drilled: 12/09/05 to 12/14/05

WATER OBSERVATIONS: Water seepage at: 23.5'-25.8', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 50.1' (prior to coring)
48.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	511.8						Loose to medium dense brown FINE SAND (A-3), trace to little silt, trace coarse sand; damp.						
		8 10 13	11	13									
35													
38.5	503.3	2 4 7	15	14			Medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
40.0	501.8						Loose to medium dense brown FINE SAND (A-3), trace coarse sand, trace gravel; damp to wet.						
		4 4 5	14	15									
45													
		5 8 11	14	16									
50													
		3 10 15	15	17									
55													
		3 7 17	1813	18									
60													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1531 | Location: Sta. 7+30.5, 32.2 ft. LT of US 52 CL | Date Drilled: 12/09/05 to 12/14/05

WATER OBSERVATIONS: Water seepage at: 23.5'-25.8', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 50.1' (prior to coring)
48.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
60	481.8						Loose to medium dense brown FINE SAND (A-3), trace coarse sand, trace gravel; damp to wet.							Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ (10 20 30 40)
65		1 3 3	12	19										
70		3 6 9	8	20										
75		13 16 10	18	21										
78.5	463.3	50/2	2	22			Severely weathered gray SHALE.							50+
80														
81.0	460.8						Hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, massive, slightly fractured. @ 81.3'-81.4', 83.0'-83.2', ferric bands.							
85		Core 120"	Rec 120"	RQD 96%	R-1		@ 85.7'-86.1', calcareous. @ 87.2'-87.3', argillaceous zone. @ 87.3', low angle fracture.							
90														

GRADATION

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

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Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1531 | Location: Sta. 7+30.5, 32.2 ft. LT of US 52 CL | Date Drilled: 12/09/05 to 12/14/05

WATER OBSERVATIONS: Water seepage at: 23.5'-25.8', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 50.1' (prior to coring)
48.0' (includes drilling water)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
90	451.8												
91.0	450.8						Bottom of Boring - 91.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

90 95 100 105 110 115 120

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1532 | Location: Sta. 5+85.5, 26.3 ft. LT of US 52 CL | Date Drilled: 12/20/05 to 12/21/05

WATER OBSERVATIONS: Water seepage at: 6.0'-7.5', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 43.0' (prior to coring)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	541.5						Asphalt - 6", Portland Cement Concrete - 3", Asphalt - 5"						
1.2	540.3	3 6 25	6	1			Medium dense to dense brown COARSE AND FINE SAND (A-3a), trace silt and clay, trace gravel; damp.						
5		9 17 8	12	2									
		13 21 17	15	3									
8.5	533.0	6 4 7	14	4		4.25	Very stiff to hard brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
10		5 6 7	13	5		3.0							
		1 5 7	16	6		4.5+							
15		4 6 8	11	7		4.5+							
		3 3 5	14	8		4.5+							
20		5 5 8	10	9		4.5+							
		2 4 4	13	10		2.5							
25													
26.0	515.5	2 3 4	9	11		1.75	Stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
		1 2 4	13	12		2.0							
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]BUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1532 | Location: Sta. 5+85.5, 26.3 ft. LT of US 52 CL | Date Drilled: 12/20/05 to 12/21/05

WATER OBSERVATIONS: Water seepage at: 6.0'-7.5', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 43.0' (prior to coring)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
30	511.5						Stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp.						
33.5	508.0	2 5 12	16	13			Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist to wet.						
40		5 6 7	18	14									
45		3 3 5	13	15									
50		5 5 5	15	16									
55		3 3 16	18	17			@ 53.5', 4.0' sand heave, began adding water.						
60		2 3 5	16	18									

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1532 | Location: Sta. 5+85.5, 26.3 ft. LT of US 52 CL | Date Drilled: 12/20/05 to 12/21/05

WATER OBSERVATIONS: Water seepage at: 6.0'-7.5', 33.5'-35.0', 48.5'-75.0'
Water level at completion: 43.0' (prior to coring)

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ⊢—⊣ LL Blows per foot - ○ 10 20 30 40
60	481.5						Loose to medium dense brown COARSE AND FINE SAND (A-3a), trace gravel; moist to wet.							
65		4 1 5	12	19			@ 63.5'-70.0', 2.0'-3.0' sand heave.							
70		1 3 2	5	20										
74.5	467.0	8 13 50/5	16	21A 21B			@ 73.5'-74.5', very dense, wet.							50+
75							Severely weathered gray SHALE.							
76.0	465.5						Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered, argillaceous, micaceous, thickly bedded to massive, slightly to moderately fractured.							
80		Core 120"	Rec 120"	RQD 84%	R-1		@ 76.5'-76.8', high angle fracture. @ 80.0'-80.1', decomposed zone. @ 80.1', low angle fracture. @ 82.3'-82.4', ferric band.							
85														
86.0	455.5						Bottom of Boring - 86.0'							
90														

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]BUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1533 | Location: Sta. 9+86.2, 28.4 ft. LT of US 52 CL | Date Drilled: 8/16/06

WATER OBSERVATIONS: Water seepage at: 3.0'-9.5'
Water level at completion: 8.9'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.6						Asphalt Concrete - 7" Portland Cement Concrete - 9"						
1.3	541.3	8 16 27	18	1A 1B		--	FILL: Medium stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.	8	14	--	22	28	28
3.0	539.6	30 32 39	14	2			@ 2.8'-3.0', sand seam.	13	28	--	53	6	
4.5	538.1	20 24 29	18	3			FILL: Very dense brown GRAVEL WITH SAND (A-1-b), trace silty clay; damp.	27	30	--	34	6	3
6.0	536.6	21 28 14	18	4			FILL: Very dense brown GRAVEL WITH SAND AND SILT (A-2-4), little silty clay; damp.	25	23	--	35	11	6
8.5	534.1	12 4 6	18	5A 5B		2.0	FILL: Dense brown GRAVEL WITH SAND (A-1-b), trace silty clay; damp.	36	31	--	26	7	
9.5	533.1						POSSIBLE FILL: Medium dense brown COARSE AND FINE SAND (A-3a); damp.						
10.0	532.6						POSSIBLE FILL: Stiff to very stiff brown SILT AND CLAY (A-6a), trace fine sand; damp.						
							Bottom of Boring - 10.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic
Non-Plastic
7
Non-Plastic
53
Non-Plastic

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COL[illegible]US, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1534 | Location: Sta. 13+90.5, 27.2 ft. LT of US 52 CL | Date Drilled: 8/16/06

WATER OBSERVATIONS: Water seepage at: 1.0'-1.3', 4.0'-5.5', 9.0'-10.0'
Water level at completion: 9.3'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.4												
1.1	542.3	3					Asphalt Concrete - 6" Porland Cement Concrete - 7"						
1.3	542.1	6 6	7	1A 1B			FILL: Medium dense brown GRAVEL WITH SAND (A-1-b); damp.	34 11	38 14	-- --	25 23	3 28	24
2.5	540.9	5 8		2A		--							
3.5	539.9	26 5	18	2B			FILL: Medium dense brown SANDY SILT (A-4a), some clay; damp.	2 13	2 26	-- --	3 55	48 6	45
5		15 28	15	3			FILL: Very stiff brown SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; moist.	21	40	--	33	6	
		13 25 32	18	4			FILL: Dense to very dense brown GRAVEL WITH SAND (A-1-b), trace silty clay; damp.	20	36	--	37	7	
8.5	534.9	9				4.0							
9.5	533.9	18 26	18	5A 5B			POSSIBLE FILL: Very stiff to hard brown SILT AND CLAY (A-6a); damp.						
10.0	533.4						POSSIBLE FILL: Dense brown COARSE AND FINE SAND (A-3a), trace gravel; damp.						
							Bottom of Boring - 10.0'						
15													
20													
25													
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic
Non-Plastic
Non-Plastic
Non-Plastic
57

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1535 | Location: Sta. 9+66.6, 29.2 ft. RT of US 52 CL | Date Drilled: 10/11/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	542.5						Asphalt Concrete Pavement - 7" . Aggregate Base - 7"						
1.2	541.3	3 3 12 25	24	1			Medium dense to very dense brown COARSE AND FINE SAND (A-3a), little gravel, trace to little silt, trace clay; damp.	17	26	--	39	10	8
		23 26 35 34	24	2									
5.0	537.5	9 10 13 30	24	3		3.75	Very stiff brown SANDY SILT (A-4a), little clay, trace to little gravel; damp to moist.	10	19	--	32	23	16
7.5	535.0	10 5					Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp.						
9.0	533.5	6 9	24	4A 4B		4.25	Hard brown SILTY CLAY (A-6b), trace fine sand; damp to moist.						
10.0	532.5						Bottom of Boring - 10.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

61

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]BUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1536 | Location: Sta. 13+75.3, 29.3 ft. RT of US 52 CL | Date Drilled: 10/11/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.4						Asphalt Concrete Pavement - 8" Aggregate Base - 8"						
1.3	542.1	5 7 11	18	1		2.5	Very stiff dark brown SANDY SILT (A-4a), some gravel, little clay; damp.	21	20	--	21	20	18
3.0	540.4	3 5 7 9	24	2		3.75	Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; damp to moist.	3	6	--	9	43	39
5.0	538.4	3 8 17 28	24	3			Medium dense brown FINE SAND (A-3), some coarse sand, little gravel, trace silt, trace clay; dry to damp.	12	27	--	51	4	6
7.5	535.9	5 19 18 2	24	4		1.25	Stiff brown SILTY CLAY (A-6b), "and" fine to coarse sand; moist.						
10.0	533.4						Bottom of Boring - 10.0'						

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C[illegible]BUS, OHIO 43229 * (614)888-0040

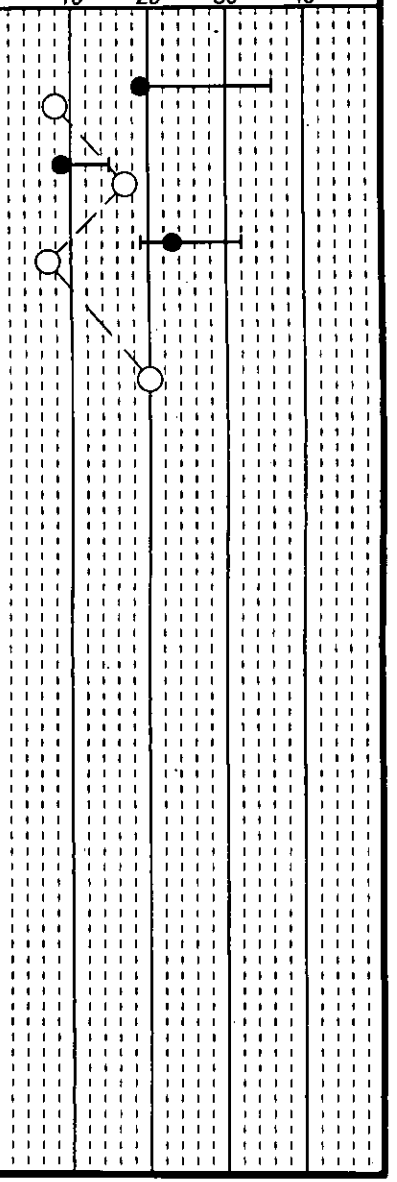
Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1537 | Location: Sta. 17+59.1, 29.5 ft. RT of US 52 CL | Date Drilled: 10/11/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.5						Asphalt Concrete Pavement - 6" Aggregate Base - 7"						
1.1	542.4	2 3 5 10	24	1		4.5+	Hard brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; damp.	1	8	--	7	40	44
3.0	540.5	9 9 8 8	24	2			Medium dense brown COARSE AND FINE SAND (A-3a), little gravel, little silt, trace to little clay; damp.	18	26	--	32	14	10
5.0	538.5	9 3 4 4	24	3		1.75	Stiff brown and gray SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.	3	9	--	10	38	40
7.5	536.0	4 6 14 22	24	4			Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp to moist.						
10.0	533.5						Bottom of Boring - 10.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



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FILE: 0121-3070-03 (11/13/2007 6:11 PM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1538 | Location: Sta. 21+65.7, 29.8 ft. RT of US 52 CL | Date Drilled: 10/11/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	543.3						Asphalt Concrete Pavement - 8" Aggregate Base - 5"						
1.1	542.2	3 3 6 9	24	1			Loose to mediium dense brown GRAVEL WITH SAND (A-1-b), trace silt; dry to damp.	40	27	--	31	2	
		4 4 11 11	24	2									
5.0	538.3	3 5 6 11	24	3		4.5+	Hard brown SILTY CLAY (A-6b), little fine to coarse sand; damp.	0	2	--	13	48	37
7.5	535.8												
		6 14 13 9	24	4			Medium dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp to moist.						
10.0	533.3						Bottom of Boring - 10.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

15 20 25 30

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, C MBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1539 | Location: Sta. 25+57.1, 29.2 ft. RT of US 52 CL | Date Drilled: 10/11/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	544.2						Asphalt Concrete Pavement - 6" Aggregate Base - 6"						
1.0	543.2	4 3 6 15	24	1			Loose brown GRAVEL WITH SAND (A-1-b), trace silt; damp.	29	34	--	33	4	
3.0	541.2	8 8 7 9	24	2		4.5+	Hard brown SANDY SILT (A-4a); damp to moist.	0	3	--	9	49	39
5.0	539.2	2 3 5 7	24	3		2.0	Stiff to very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand; damp to moist.	0	3	--	9	54	34
8.0	536.2	3 4 5 6	24	4		2.5	Very stiff brown SANDY SILT (A-4a); damp.						
10.0	534.2						Bottom of Boring - 10.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

15 20 25 30

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1540 | Location: Sta. 28+02.3, 22.6 ft. LT of US 52 Ramp A BL | Date Drilled: 10/11/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	546.0												
1.0	545.0	2 2 3 6	24	1		2.0	Asphalt Concrete Pavement - 4" Aggregate Base - 8"						
							Stiff to very stiff gray SILT (A-4b), little fine to coarse sand, trace gravel; possible organic with odor; moist.	6	6	--	9	53	27
		3 4 5 7	24	2		2.5		1	2	--	8	63	26
5		3 7 4 4	24	3		2.0							
8.0	538.0	6 9 11 16	24	4			Medium dense brown GRAVEL WITH SAND (A-1-b); dry to damp.						
10.0	536.0						Bottom of Boring - 10.0'						
15													
20													
25													
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/13/2007 6:11 PM]

BEGIN U.S. 52
STA. XX+XX

BEGIN U.S. 52
RAMP B STA. XX+XX

℄ U.S. 52

℄ U.S. 52 RAMP B

B-1533
B-1533A
B-1534
B-1532
B-1531
B-1530
B-1529
B-1528
B-1527
B-1526
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B-1508
B-1507
B-1506
B-1539
B-1540
B-1503
B-1504
B-1505
B-1538

SHEET XX
STA. 30+00
MATCHLINE & U.S. 52

℄ U.S. 52 RAMP A

BEGIN U.S. 52
RAMP A STA. XX+XX

HORIZONTAL SCALE IN FEET
0 50 100 200

CALCULATED BLS
CHECKED AEN

SOIL PROFILE

U.S. 52 INTERCHANGE

SCI-823-0.00

XXX

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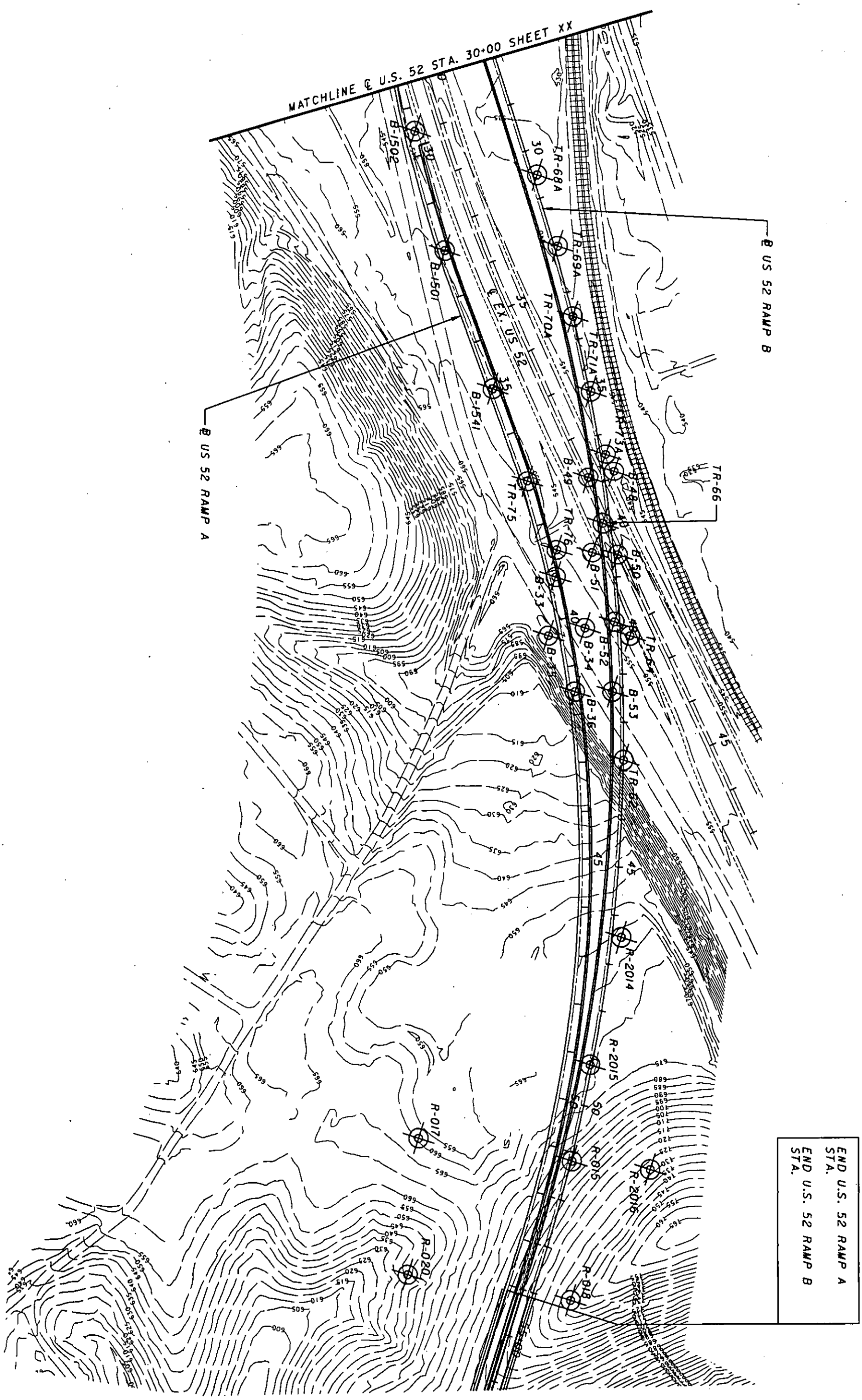

SCI-823-0.00

SOIL PROFILE
U.S. 52 INTERCHANGE

CALCULATED BLS
CHECKED AEN

0 100
50 200
HORIZONTAL SCALE IN FEET

8/8/2007
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	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650	660	670
24																			
25	544.34																		545.27
26	544.66																		545.50
27	544.77																		545.74
28	544.60																		546.00
29	544.34																		546.24
30	543.92																		546.53
31	544.28																		546.94
32	544.29																		547.36
33	544.50																		547.78
34	544.55																		548.28
35	545.52																		548.96
36	546.53																		549.82
37	547.65																		550.85
38	548.65																		552.05
39	549.55																		553.42
40	550.01																		554.97
41	550.31																		556.69
	550.53																		558.59
	550.58																		560.65
	550.70																		562.90
	551.09																		565.31
	551.62																		567.82
	552.45																		570.32
	553.19																		572.82
	553.75																		575.32
	553.82																		577.80
	552.19																		580.12
	556.07																		582.28
	558.32																		584.27
	560.02																		586.11
	560.36																		587.77
	560.15																		589.28
	558.92																		590.62
	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650	660	670

B-1505
6.4' Lt.
3/5/7
4/9/9
5/7/5
2/3/2
1/1/6/4
2/6/16
50(3)
50(2)
TR

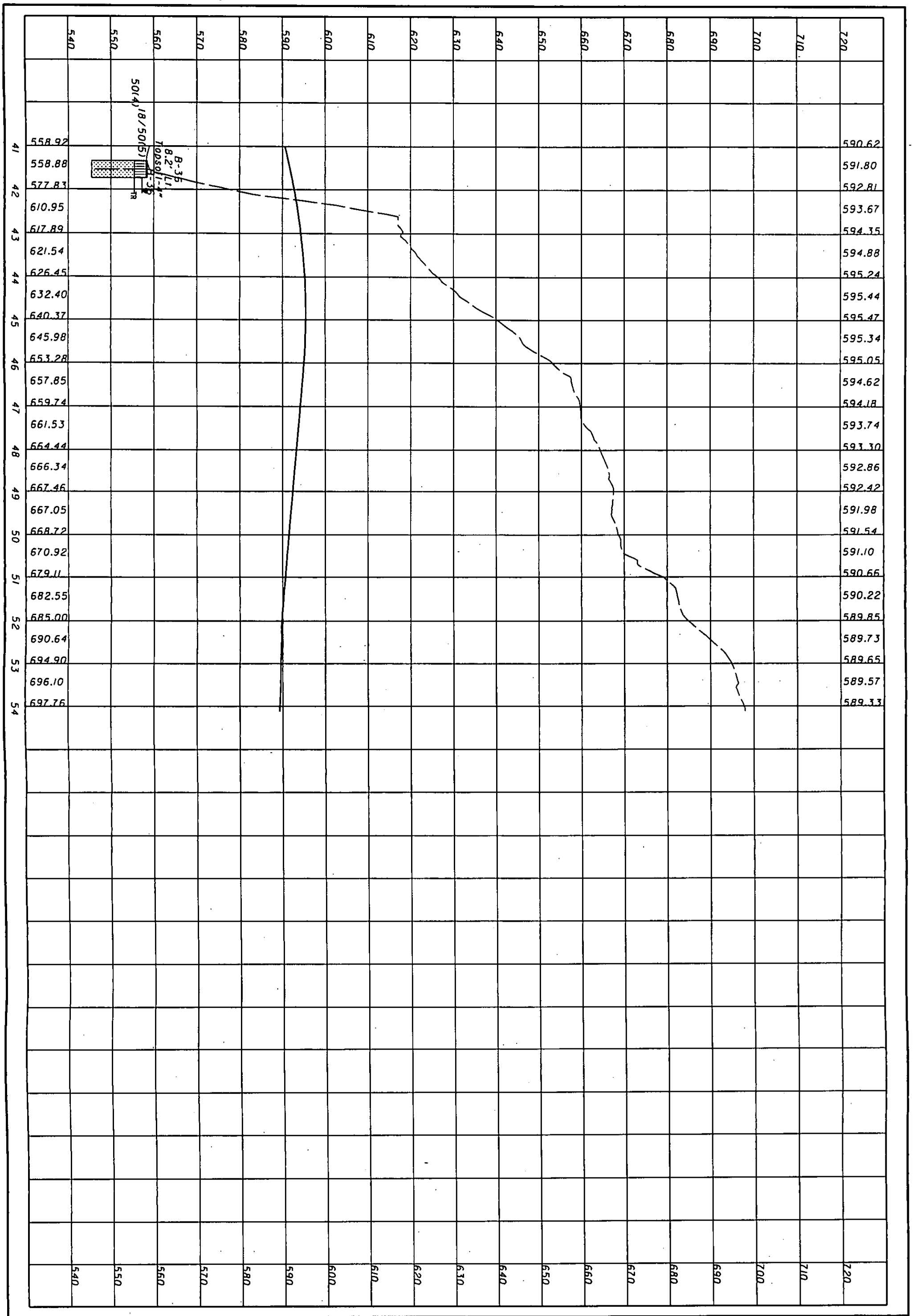
B-1503
10.3' Lt.
Topsoil-6"
5/7/9
5/6/6
10/18/14
4/10/10
4/6/7
7/7/50(5)
50(3)
TR
W

B-1502
14.2' Lt.
Topsoil-7"
5/6/6
4/8/11
2/2/3
3/9/2
50(5)
W

B-1501
7.8' Lt.
Topsoil-6"
7/13/16
3/3/4
6/6/4
2/2/2
2/9/8
50(3)
27
TR

XXX	SCI-823-0.00	SOIL PROFILE - US 52 RAMP A STA. 24+95.53 TO STA. 41+00.00

DRAWN RLS
CHECKED AEN



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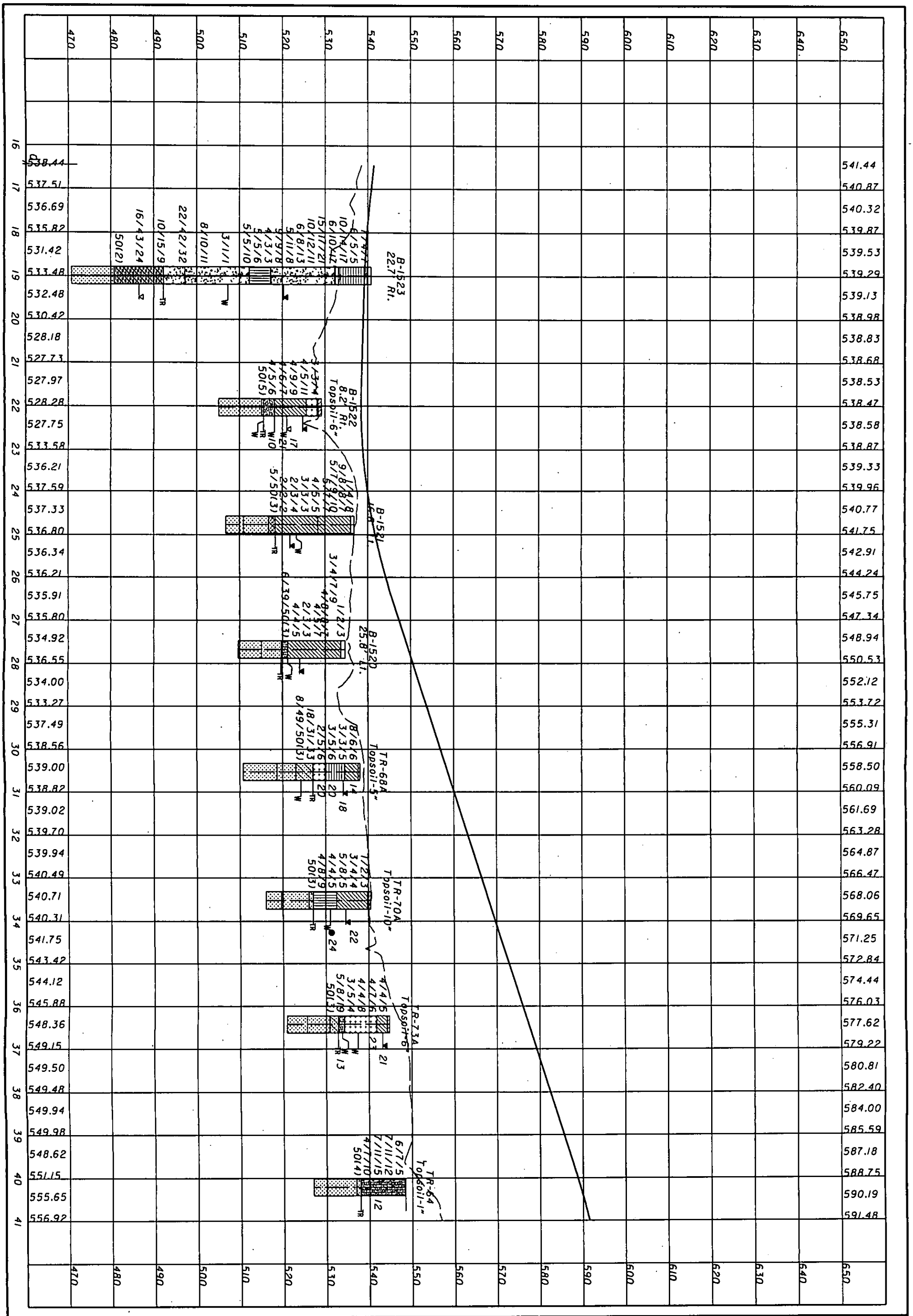

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CADDRAWN: RLS
CHECKED: AEN

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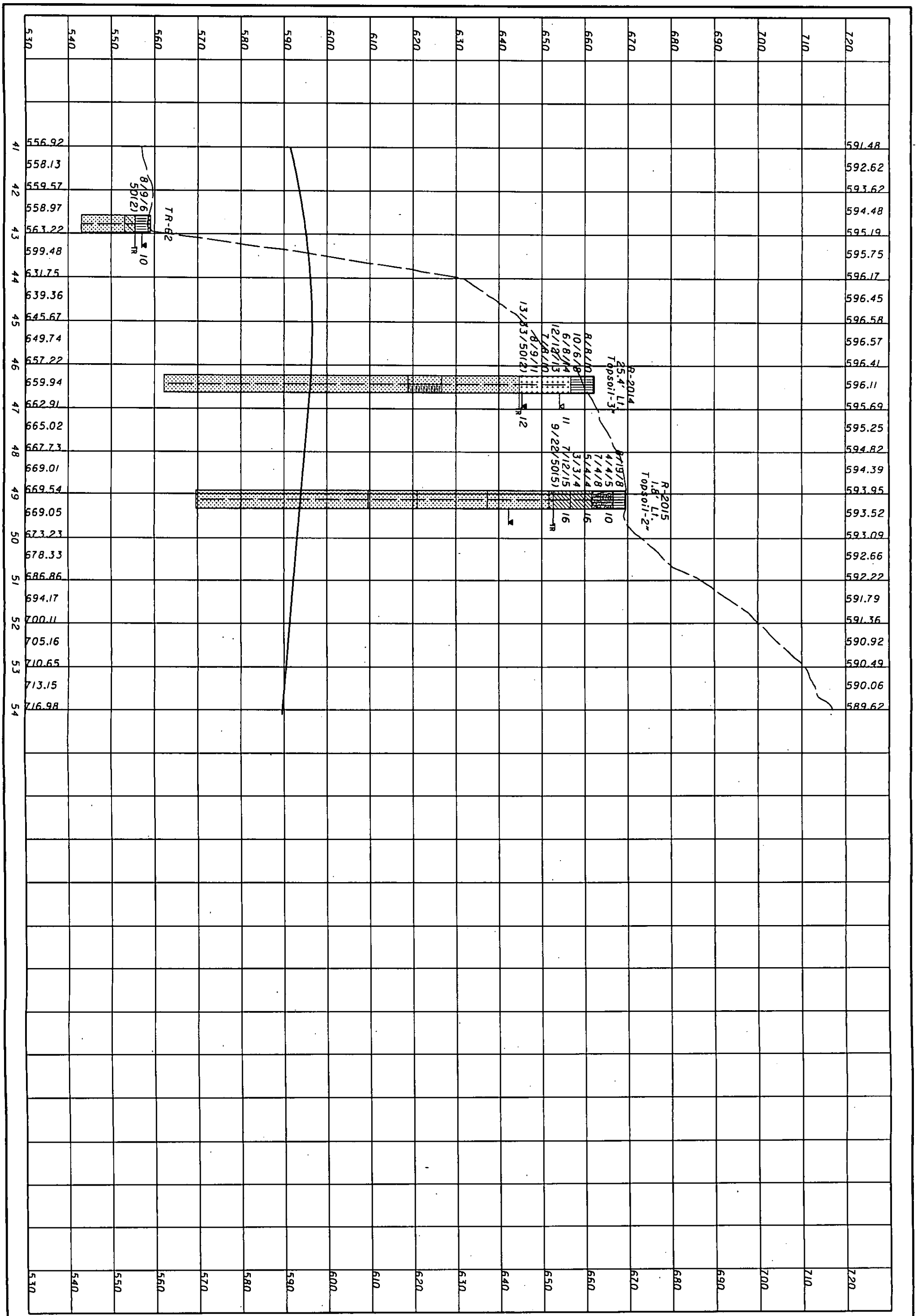

XXX	SCI-823-0.00	SOIL PROFILE U.S. 52 RAMP B STA. 41+00.00 TO STA. 54+11.247

DRAWN RLS
CHECKED AEN

APPENDIX B

DLZ

DLZ
ENGINEERS • ARCHITECTS • SCIENTISTS
PLANNERS • SURVEYORS

August 22, 2006

Michael D. Weeks, P.E., P.S.
TranSystems Corporation
5747 Perimeter Drive, Suite 240
Dublin, OH 43017

Re: **Pavement Design Information**
SR 140 Improvements and Widening
SCI-823-0.00 Portsmouth Bypass
DLZ Job No.: 0121-3070.03
Document # 0028

Dear Mr. Weeks:

This letter includes the findings of a subsurface exploration performed for the SR 140 improvement and widening near the intersection of proposed SR 823. The findings included in this letter pertain to SR 140 only. The findings of other subsurface explorations for pavement design will be submitted in separate documents.

The improvements will essentially consist of regrading and widening approximately 1125 feet of existing SR 140 from station 4+45 to 15+70. Plan and profile drawings indicate that the proposed grade will be essentially at existing grade. Additionally, a turn lane will be added to the north side of SR 140. See attached plan drawing for more information.

The recommendations presented in this report have been made on the basis of the foregoing information. If the proposed improvements or concept is changed or differs from that assumed, DLZ Ohio, Inc. (DLZ) should be informed of the changes so that recommendations and conclusions presented in this letter may be revised as necessary.

The results of these evaluations are based upon the findings of five subgrade borings. Borings B-1401, B-1402, and B-1404 were drilled on January 25 and January 26, 2006. Borings B-1403A and B-1405A were drilled on July 26, 2006. All borings were drilled using a truck mounted rotary-type drill rig. Borings were planned and staked in the field by representatives of DLZ. The surveyed locations and ground surface elevations of the borings were determined by representatives from Lockwood, Lanier, Mathias & Noland, Inc. (2LMN). Borings were advanced to depths between 6.0 and 11.0 feet. Continuous sampling was performed from below the pavement layers to approximately 6.0 feet below the ground surface to evaluate the subgrade soil properties. See attached Boring Plan and Boring Logs.

All borings were drilled within the travel lanes of SR 140. Borings B-1401 and B-1402 encountered 3.5 to 4 inches of asphalt concrete pavement over 9 inches of portland cement concrete. Below the pavement layers, boring B-1401 first encountered sandy silt (A-4a) over

gravel with sand and silt (A-2-4). Also below the pavement layers, boring B-1402 first encountered sandy silt (A-4a) over silt (A-4b). Additionally, borings B-1403A and B-1405A encountered 12 to 14 inches of asphalt concrete pavement, over 6 inches of red brick pavers, over 4 inches of aggregate base. Below the pavement layers, boring B-1403A first encountered gravel with sand and silt (A-2-4) over silt (A-4b). Also, below the pavement layers, boring B-1405A first encountered silt (A-4b) over sandy silt (A-4a). Boring B-1404 encountered 11 inches of asphalt concrete pavement. No well-defined aggregate base layer was observed in borings B-1401, B-1402, and B-1404. Below the pavement layer, boring B-1404 first encountered sandy silt (A-4a) to a depth of 10.0 feet.

Seepage was encountered in borings B-1401, B-1403A, and B-1405A. Observed seepage was first encountered in borings from 4.0 to 7.0 feet below ground surface. No groundwater was observed in the borings upon completion of drilling.

Pavement Design Information

It is anticipated that the majority of the project will be at grade with the widening portion requiring small fill sections within five feet of existing grade. Table 1 below lists the subgrade soils encountered by the borings and the group indices, CBR values, and number of samples tested for each soil type.

Table 1: Subgrade Soils

ODOT Classification	Group Index	CBR	No. Samples Tested
Gravel with Sand and Silt (A-2-4)	0	13	2
Sandy Silt (A-4a)	3	9	9
Silt (A-4b)	7	7	4

Based upon averaging the results of the laboratory testing, a CBR value of 9 is recommended for pavement design.

Silt (A-4b) was encountered in four out of five borings drilled for this project. Of the four borings, two of them encountered silt (A-4b) within the upper three feet of existing grade. As per GB-1 "Plan Subgrades", when silt (A-4b) soil is encountered in natural ground or an existing embankment within 3 feet of top of subgrade, regardless of its consistency or moisture content, it shall be removed or chemically stabilized because of its susceptibility to frost heaving.

Subgrade Condition and Preparation

The existing subgrade soils along the project were evaluated for suitability according to the ODOT Geotechnical Bulletin GB-1 "Plan Subgrade." The optimum moisture content (MC) for each soil tested was estimated using the following criteria:

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

The results of this evaluation are presented in the attached spreadsheet. Note only samples within six feet of the proposed grade were evaluated. According to the referenced guidelines, any soils with moisture contents that exceed the optimum moisture content by three or more percentage points will likely require some form of subgrade treatment. In addition, any soils with standard penetration values (N-Values) of 10 or less will also likely require some form of subgrade treatment.

To determine the appropriate option, the average standard penetration value (N-value) and the plasticity index (PI) of the subgrade soils were considered. The average N-value, PI, moisture content, and CBR are presented in Table 2 below.

Table 2

Percent of Samples Over Optimum MC + 3 Percent	Average N_L*	Average PI	Average MC	CBR Average
33	7.6	6.8	14.9	9

* - N_L indicates lowest standard penetration value (N) in subgrade soil.

Based on GB-1 guidelines, cement treatment is the preferred stabilization option for soils with average N-values less than 10 and an average PI less than 20, as encountered on SR 140. In lieu of complete removal using undercutting and replacement with granular material, all silt (A-4b) encountered within 3.0 feet of top of subgrade will require cement stabilization. In addition, cement stabilization is also an option for stabilizing weak or soft soils encountered across the project. Consequently, it is recommended that the entire project area be treated with cement to a depth of 16 inches.

Another subgrade stabilization option that could be considered is to undercut the weak, soft or unsuitable soils and replace the subgrade with compacted Type B or C granular material (ODOT

Item 703.16.C). If cement stabilization is not selected as an option on this project, the silt (A-4b) will have to be completely removed from the top 3 feet of proposed subgrade. As an alternative to cement stabilization, it is recommended that subgrade soils be undercut in areas and to depths indicated in Table 3 below.

Table 3: Undercut and Replace Option

Begin Station	End Station	Depth of Undercut
4+45	9+00	2.0'
9+00	15+70	3.0'

For both options recommended for this site, the subgrade treatment should be extended to 18 inches beyond the edge of pavement, paved shoulders, or paved medians.

Seepage was first encountered in the borings from 4.0 to 7.0 feet. No groundwater was noted in any of the borings. Although no groundwater was encountered in the borings, the contractor should be prepared to maintain reasonable dry excavations if water from seepage or precipitation enters any excavations.

We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our findings.

Respectfully submitted,

DLZ OHIO, INC.

Steven J. Riedy
Geotechnical Engineer

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

Encl: As noted

cc: file

℄ S.R. 140

℄ S.R. 104 RAMP B

END RAMP B
STA. 82+92.08

℄ S.R. 823

℄ S.R. 140 RAMP A

END RAMP A
STA. 78+21.61

B-1401 B-1402 B-1403 B-1404 B-1405 B-1406 B-1407 B-1408 B-1409

B-15 B-16 B-17

TR-43

R-021 R-022 R-023 R-024 R-025 R-026 R-027 R-028 R-029 R-030 R-031 R-032 R-034

65+00 70+00

S.R. 140 - STA. 3+00 TO STA. 17+1+74

N

0 50 100 200
HORIZONTAL SCALE IN FEET

CALCULATED RLS
CHECKED AEN

BORING PLAN
S.R. 140 INTERCHANGE

SCI-823-0.00

1 / 2

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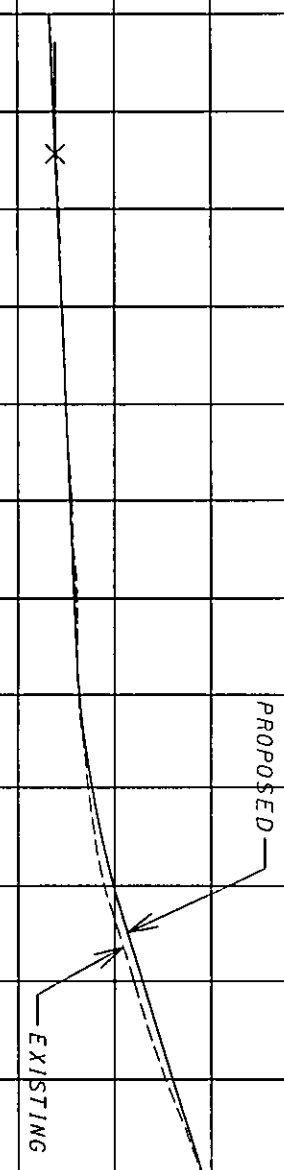
	530	520	510	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	
3	553.32																		553.32
4	553.61																		553.53
	553.80																		553.74
5	554.08																		553.95
	554.30																		554.16
6	554.39																		554.37
	554.64																		554.58
7	554.84																		554.79
	554.94																		555.00
8	555.23																		555.21
	555.62																		555.42
9	555.74																		555.63
	556.10																		555.84
10	556.16																		556.05
	556.27																		556.37
11	556.76																		556.92
	557.27																		557.69
12	557.97																		558.69
	558.97																		559.91
13	560.46																		561.36
	562.01																		562.92
14	563.55																		564.48
	565.31																		566.04
15	567.27																		567.59
	569.03																		569.15
16	570.72																		570.68
	572.31																		572.14
17	573.86																		573.54
	574.67																		574.87
	576.06																		576.17
	530	520	510	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	



2/2

SCI-823-0.00

PROFILE

S.R. 140 STA. 3+00 TO STA. 17+91.74

CALCULATED RLS

CHECKED AEN

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1401 | Location: Sta. 4+42.9, 6.0 ft. LT of SR 140 CL | Date Drilled: 01/25/06

WATER OBSERVATIONS: Water seepage at: 6.2'
Water level at completion: None

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	553.9												
1.1	552.8	4 8 8 4	16	1		--	Asphalt Concrete - 4" Portland Cement Concrete - 9" POSSIBLE FILL: Very stiff gray SANDY SILT (A-4a), "and" gravel; dry to damp.	40	12	--	6	32	10
3.0	550.9	5 4 3 4	16	2			POSSIBLE FILL: Medium dense gray GRAVEL WITH SAND AND SILT (A-2-4), trace clay; damp. @ 4.5', encountered asphalt fragments.	48	11	--	6	26	9
5.0	548.9	33 5 10 11	20	3		2.0	Stiff to very stiff brown SILT (A-4b), some fine to coarse sand, little clay, trace gravel; damp. @ 6.2'-6.5', moist to wet.	9	9	--	17	53	12
7.0	546.9	5 6 7 7	21	4			Loose to medium dense brown SILT (A-4b), some fine to coarse sand, trace gravel; moist to wet.	4	10	--	12	60	14
10		2 4 3 4	20	5									
11.0	542.9						Bottom of Boring - 11.0'						
15													
20													
25													
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

Non-Plastic

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 012-3070.03

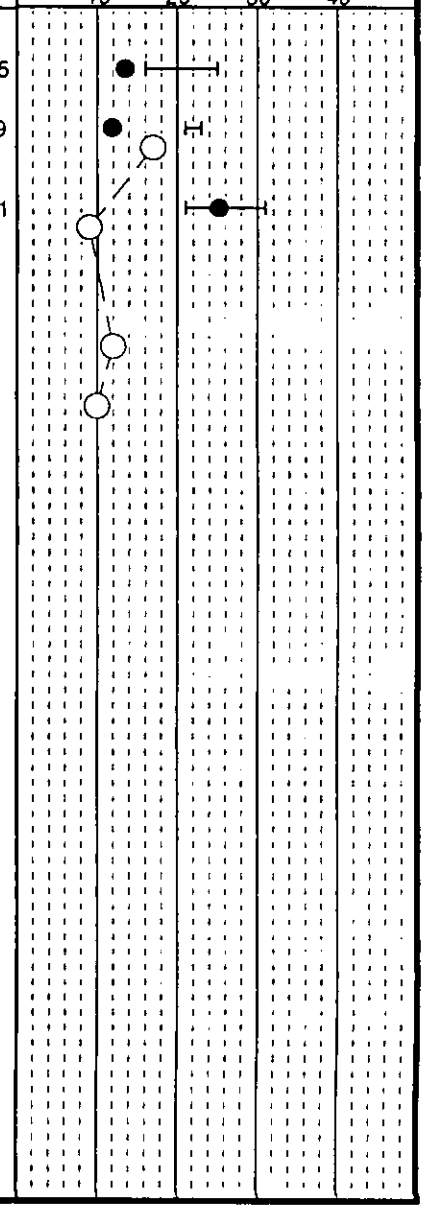
LOG OF: Boring B-1402 | Location: Sta. 6+87.0, 7.3 ft. RT of SR 140 CL | Date Drilled: 01/25/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	554.1												
1.1	553.0	3 4	9	1		2.5	Asphalt Concrete - 4" Portland Cement Concrete - 9" POSSIBLE FILL: Very stiff grayish brown SANDY SILT (A-4a), trace to little clay, some gravel; damp.	25	13	--	10	37	15
		3 5 12 12	19	2		3.5	@ 3.5', brown, trace clay.	20	22	--	16	33	9
5.0	549.1	7 4 5 6	22	3		3.0	Very stiff mottled brown and gray SILT (A-4b), some clay, trace fine to coarse sand; moist.	0	2	--	4	63	31
		4 4 8	18	4		3.0							
9.0	545.1	5 5 5	2	5			Loose to medium dense brown SANDY SILT (A-4a), trace clay; contains decomposed sandstone fragments; damp.						
10.0	544.1						Bottom of Boring - 10.0'						
15													
20													
25													
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 012[illegible]3070.03

LOG OF: Boring B-1403A | Location: Sta. 10+14.1, 17.4 ft. RT of SR 140 CL | Date Drilled: 07/26/06

WATER OBSERVATIONS: Water seepage at: 7.0'-7.5'
Water level at completion: 9.0'

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
0	556.4						Asphalt Concrete Pavement - 12", Red Brick Pavers - 6", Aggregate Base - 4"							
1.8	554.6	4 14 10	9	1			POSSIBLE FILL: Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), trace clay; contains organic debris; damp.	32	21	--	19	22	6	Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ (10 20 30 40); Non-Plastic
3.0	553.4	5 3 2	12	2			POSSIBLE FILL: Loose brown SILT (A-4b), little fine sand, little clay; moist.	0	0	--	17	72	11	Non-Plastic
4.5	551.9	3 5 7	13	3		--	Stiff brown SANDY SILT (A-4a), little gravel, trace to little clay; damp.	13	20	--	16	41	10	
6.0	550.4	3 1 2	15	4		0.5	Soft to medium stiff mottled brown and gray SILT (A-4b), some clay, trace fine sand; moist.	0	0	--	3	76	21	
8.5	547.9	12 23 50/5	10	5			Dense to very dense brown GRAVEL WITH SAND (A-1-b), contains sandstone fragments; dry to damp.							50+
10.0	546.4						Bottom of Boring - 10.0'							

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 012[illegible]3070.03

LOG OF: Boring B-1404 | Location: Sta. 13+01.1, 27.2 ft. RT of SR 140 CL | Date Drilled: 01/26/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)
0	561.1						Asphalt Concrete Pavement - 11"							Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ (10 20 30 40)
0.9	560.2	3 4	6	1		0.5	POSSIBLE FILL: Soft to medium stiff brown SANDY SILT (A-4a), little to some gravel, trace to little clay; damp to moist.	20	18	--	19	35	9	Non-Plastic
		2 3 2 1	7	2		0.5		18	12	--	12	40	18	
		3 3	2	3		0.5	@ 4.0'-5.0', "and" gravel.	44	10	--	10	26	11	
5		4 3 4 7	16	4		2.5		11	16	--	17	39	17	
6.0	555.1	5 3 3 1	12	5		2.5	Very stiff mottled brown and gray SANDY SILT (A-4a), little gravel; damp to moist.							
9.0	552.1	8 9	7	6			Loose to medium dense brown SANDY SILT (A-4a), trace clay; damp to moist.							
10.0	551.1						Bottom of Boring - 10.0'							
15														
20														
25														
30														

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 012-3070.03

LOG OF: Boring B-1405A | Location: Sta. 13+91.7, 0.5 ft. RT of SR 140 CL | Date Drilled: 07/26/06

WATER OBSERVATIONS: Water seepage at: 4.0'-4.5'
Water level at completion: None

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	564.8						Asphalt Concrete Pavement - 14", Red Brick Pavers - 6", Aggregate Base - 4"						
2.0	562.8	7 9 5 5	14	1			POSSIBLE FILL: Stiff light brown SILT (A-4b), some fine to coarse sand, little clay, little gravel; damp.	11	12	--	13	52	12
4.0	560.8	4 39	12	2A 2B			Hard light brown SANDY SILT (A-4a), some fine to coarse sand, little gravel, little clay; damp.	19	17	--	13	40	11
5.0	559.8	50/3					Severely weathered brown SANDSTONE.						
5.3	559.5						Bottom of Boring - 5.3'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40
50+

Soil Investigation Summary

Do NOT Rubblize & Roll
Global CS may be an option
Global LS is NOT an option

Design CBR is 9

Number of Borings = 5

Classification Counts by Sample															
R	1a	1b	3	3a	2-4	2-5	2-6	2-7	4a	4b	5	6a	6b	7-5	7-6
0	0	0	0	0	2	0	0	0	9	4	0	0	0	0	0
	13%								60%	27%					
0.0%	13.3%								86.7%						

Class @ Surface		
2-5	0	
4b	1	20%
5	0	
7-5	0	
7-6	0	
R	0	

% Borings	
N_L 2-	40%
N_L 2-1(	80%
N_L @2(	0%
M+	60%

	N	N_L			PI			M	M_{OPT}		GI
Average	14.1	7.6			6.8		12.7		14.9	12.5	3.53
Maximum	60	14	31	21	10	71	31	95	28	16	8
Minimum	5	5	22	15	2	22	6	28	6	10	0

% @ Surface			
60%			
20%	40%		
% Borings			
100%			
80%	80%	0%	60%

SCI-823-0.00 SR 140 (Webster Street)

#	B #	Boring Location	Depth	To	Cut Fill	Standard Penetration n_2	n_3	N	N_L	Physical Characteristics LL	PL	PI	% Silt	% Clay	P 200	Moisture M	M_{OPT}	Classification Class	GI	Comments	Problem w/ Class	w/ MN	Treatments LS	CS	UC Class	UC MN
1	1401	4+43, 7'Lt.	1.0	3.0		8	8	16		28	18	10	32	10	42	8	13	4a	1							
			3.0	5.0		4	3	7		28	18	10	26	9	35	11	10	2-4	0			N		16		2
			5.0	7.0		5	10	15		23	17	6	53	12	65	12	12	4b	6		4b				3	
									7																	
2	1402	6+87, 7'Rt.	1.0	2.0		3	4	7		25	16	9	37	15	52	10	11	4a	3			N		16		2
			2.0	4.0		5	12	17		23	21	2	33	8	41	12	16	4a	1							
			4.0	6.0		4	5	9		31	21	10	64	31	95	25	16	4b	8		4b	MN		14	3	2
									7																	
3	1403A	10+76, 6'Rt.	1.5	3.0		14	10	24		NP	NP	NP	22	6	28	6	10	2-4	0							
			3.0	4.5		3	2	5		NP	NP	NP	71	11	82	28	11	4b	8		4b	MN		--	3	5
			4.5	6.0		5	7	12		24	20	4	41	10	51	15	15	4a	3							
									5																	
4	1404	12+99, 15'Rt.	1.0	2.0		3	4	7		NP	NP	NP	35	9	44	15	11	4a	5			MN		16		3
			2.0	4.0		3	2	5		24	15	9	40	18	58	19	10	4a	5			MN		--		5
			4.0	5.0		3	3	6		24	17	7	26	11	37	15	12	4a	0			N		16		3
			5.0	7.0		3	4	7	5	26	18	8	39	17	56	18	13	4a	4			MN		16		3
5	1405A	13+88, 7'Lt.	2.0	4.0		9	5	14		22	19	3	52	12	64	16	14	4b	6		4b				3	
			4.0	5.0		30	30	60		22	19	3	40	11	51	14	14	4a	3							
									14																	

III.C. Subgrade Checklist

C-R-S: SC-823-0.00 SR 140	PID: 77366	Reviewer: AMJ	Date: 11-16-2007

If you do not have any subgrade work on the project, you do not have to fill out this checklist.

Y N X 1	Has the subsurface investigation adequately characterized the soil or rock according to Geotechnical Bulletin 1: Plan Subgrades (GB1)?	
Y N X 2	If soils classified as A-2-5, A-4b, A-5, or A-7-5 are present at the proposed subgrade (soil profile), do the plans specify that these materials need to be removed and replaced?	
Y N X	a If these materials are to be removed and replaced, have the station limits, depth, and lateral limits for the planned removal been provided?	
Y **N** X 3	If there is any rock, shale, or coal present at the proposed subgrade (CMS 204.05), do the plans specify the removal of the material?	
Y N **X**	a If removal of any rock, shale, or coal is required, have the station limits, depth, and lateral limits for the planned removal of the material at proposed subgrade been provided?	
Y N X 4	In accordance with GB1, do the SPT values and existing moisture contents for the proposed subgrade soils indicate the need for subgrade stabilization?	
Y **N** X	a If removal and replacement is applicable, has the detail of subgrade removal been shown on the plans, including depth of removal, station limits, lateral extent, replacement material, and plan notes (Item 204 – Subgrade Compaction and Proof Rolling)?	Refer to roadway cross-sections.
Y N **X**	b If chemical stabilization is applicable, has the detail of this treatment been shown on the plans, including depth, percentage of chemical, station limits, lateral extent, and plan notes?	
	Indicate type of subgrade treatment specified: 9 **cement treatment** 9 lime treatment 9 other List Other items:	GB-1 recommends cement treatment or undercutting. Undercutting was recommended for subgrade treatment.
Y N X 5	If drainage or groundwater is an issue with the proposed subgrade, has an appropriate drainage system (e.g., pipe, underdrains) been provided?	Refer to roadway cross-sections.
Y N **X** 6	Has an appropriate quantity of Proof Rolling been included in the plans (CMS 204.06)?	Refer to roadway cross-sections.
Y N X 7	Has a design CBR value been provided?	

APPENDIX C

DLZ

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November 16, 2007

Michael D. Weeks, P.E., P.S.
TranSystems Corporation
5747 Perimeter Drive, Suite 240
Dublin, OH 43017

Re: **Pavement Design Information**
Pershing Avenue
SCI-823-0.00 Portsmouth Bypass
DLZ Job No.: 0121-3070.03
Document # 0099

Dear Mr. Weeks:

This letter includes the findings of a subsurface exploration performed for the subgrade of Pershing Avenue. The findings in this letter pertain to the realignment and resurfacing of Pershing Avenue to accommodate the proposed embankment and bridge structure associated with the construction of SCI-823. Note that the stationing used in the report is referenced to the centerline of Pershing Avenue unless noted otherwise. Subsurface explorations were performed for the other features of the project but the results are presented in separate reports.

According to the information provided, approximately 1260 feet of Pershing Avenue will be realigned. The intersection of North Pershing Avenue will be realigned to intersect with Slocum Avenue approximate 90 feet southeast of the current intersection, while the intersection of South Pershing Avenue will be relocated 280 feet northwest. See the attached boring plan for more information. The recommendations presented in this report have been made on the basis of the foregoing information. If the proposed improvements or concept is changed or differs from that assumed, DLZ Ohio, Inc. (DLZ) should be informed of the changes so that recommendations and conclusions presented in this letter may be revised as necessary.

The results of these evaluations are based upon the findings of five borings. Borings B-1601, B-1604, B-1605 and B-1606 were drilled on January 10, 2006, while boring B-1602 was drilled on January 17, 2007. All borings were drilled using an ATV mounted, rotary-type drill rig. Borings were planned and staked in the field by representatives of DLZ. The surveyed locations and ground surface elevations of the borings were determined by representatives from Lockwood, Lanier, Mathias & Noland, Inc. (2LMN). Borings were advanced to depths between 6.0 and 10.0 feet. The borings were continuously sampled below the pavement layers to approximately 6.0 feet below the ground surface to evaluate the subgrade soil properties. See the attached boring logs for more information

The station and offsets for all the borings are listed on the attached GB-1 spreadsheet and boring logs. Four of the borings were drilled on the asphalt pavement of Pershing Avenue or Slocum

Avenue, while B-1602 was drilled off the road at station 17+7.5. Borings drilled in the road surface encountered 5 to 10 inches of asphalt concrete pavement over 3 to 9 inches of aggregate base. Boring B-1602 encountered 4 inches of topsoil.

Below the pavement layers, boring B-1601 encountered very stiff brown silt (A-4b), clay (A-7-6), and silt and clay (A-6a). Below the topsoil, boring B-1602 encountered stiff to very stiff brown silt (A-4b), sandy silt (A-4a), and clay (A-7-6). B-1604 encountered stiff brown clay (A-7-6) and elastic clay (A-7-5) beneath the asphalt layer. Below the asphalt layers, B-1605 encountered stiff silt and clay (A-6a), while boring B-1606 encountered sandy silt (A-4a) over stiff silty clay (A-6b).

Pavement Design Information

It is anticipated that the majority of the project will be at grade with a portion of South Pershing Avenue requiring a small fill section along the proposed realignment. See the attached profile sheets for more information. The table below lists the subgrade soils encountered by the borings and the group indices, CBR values, and number of samples tested for each soil type.

ODOT Classification	Group Index	CBR	No. Samples Tested
Sandy Silt (A-4a)	8	7	1
Silt (A-4b)	8	7	1
Silt and Clay (A-6a)	10	6	3
Silty Clay (A-6b)	11	6	2
Elastic Clay (A-7-5)	12	5	1
Clay (A-7-6)	12	5	5

Based upon the average results of the laboratory testing, a CBR value of 6 is recommended for pavement design.

Subgrade Condition and Preparation

The existing subgrade soils along the project were evaluated for suitability according to the ODOT Geotechnical Bulletin GB-1 "Plan Subgrade." The optimum moisture content (MC) for each soil tested was estimated using the following criteria:

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

= 11 (non-plastic silts)

The results of this evaluation are presented in the attached spreadsheet. Note only samples within six feet of the proposed grade were evaluated. According to the referenced guidelines, any soils with moisture contents that exceed the optimum moisture content by three or more percentage points will likely require some form of subgrade treatment. In addition, any soils with standard penetration values (N-Values) of 10 or less will also likely require some form of subgrade treatment.

To determine the appropriate option, the average standard penetration value (N-value) and the plasticity index (PI) of the subgrade soils were considered. The average N-value, PI, moisture content, and CBR are presented in the table below.

Percent of Samples Over Optimum MC + 3 Percent	Average N_L*	Average PI	Average MC	CBR Average
100	12.2	15	23.7	6

* - N_L indicates lowest standard penetration value (N) in subgrade soil.

According to the GB-1, any soil with moisture content exceeding the optimum moisture content of the soil by three or more percentage points, or has low N-values (generally N<10), is considered problematic soil and will likely require some form of subgrade treatment. The stabilization options available include undercutting, cement stabilization, and lime stabilization. However, the cement or lime stabilization may not be effective in very weak soils (N-values less than 5 blows per foot).

Based on GB-1 guidelines, cement treatment is the preferred stabilization option for soils with average N-values less than 10 and an average PI less than 20. However, cement stabilization is generally not effective in stabilizing subgrade soils with N-values less than 5 because the soils do not gain sufficient strength. Two of the five borings were determined to be suitable for cement treatment. Generally, chemical stabilization is more economical when the area to be stabilized is greater than a mile. Given the fact that less than one-half mile of the subgrade would require treatment, undercutting of the subgrade appears to be a more cost-effective soil stabilization method.

It should be noted that the existing pavement is failing. Excessive cracking, settlements, and rutting were observed in the project area. In addition, boring B-1601 encountered silt (A-4b) to a depth of two feet. Silt is listed as an unsuitable material in GB-1 and must be completely removed. Based on the GB-1 guidelines, and given the poor condition of the current asphalt

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pavement, all of the subgrade soils along the proposed South Pershing Avenue realignment should be undercut to a depth of three feet.

Boring B-1604 encountered elastic clay (A-7-5) to a depth of four feet. GB-1 guidelines list elastic clay as an unsuitable subgrade material that should be completely removed. Accordingly, it is recommended the subgrade soil for the proposed North Pershing Avenue realignment be undercut to a depth of four feet.

The undercut areas should be replaced with compacted Type B or Type C granular material (ODOT Item 703.16.C) and should extend 18 inches beyond the edge of the pavement, paved shoulders, or paved medians. In addition to undercutting, it is recommended that the entire subgrade be proof-rolled to identify any soft or weak areas that require subgrade stabilization. If any soft or weak areas are encountered, it is recommended that the area be overexcavated and replaced with compacted Type B or C granular material (ODOT Item 703.16.C).

Seepage and groundwater were not encountered in any of the borings. Although no groundwater was encountered within the proposed subgrade elevations, the contractor should be prepared to maintain reasonably dry excavations if water from seepage or precipitation enters any excavations.

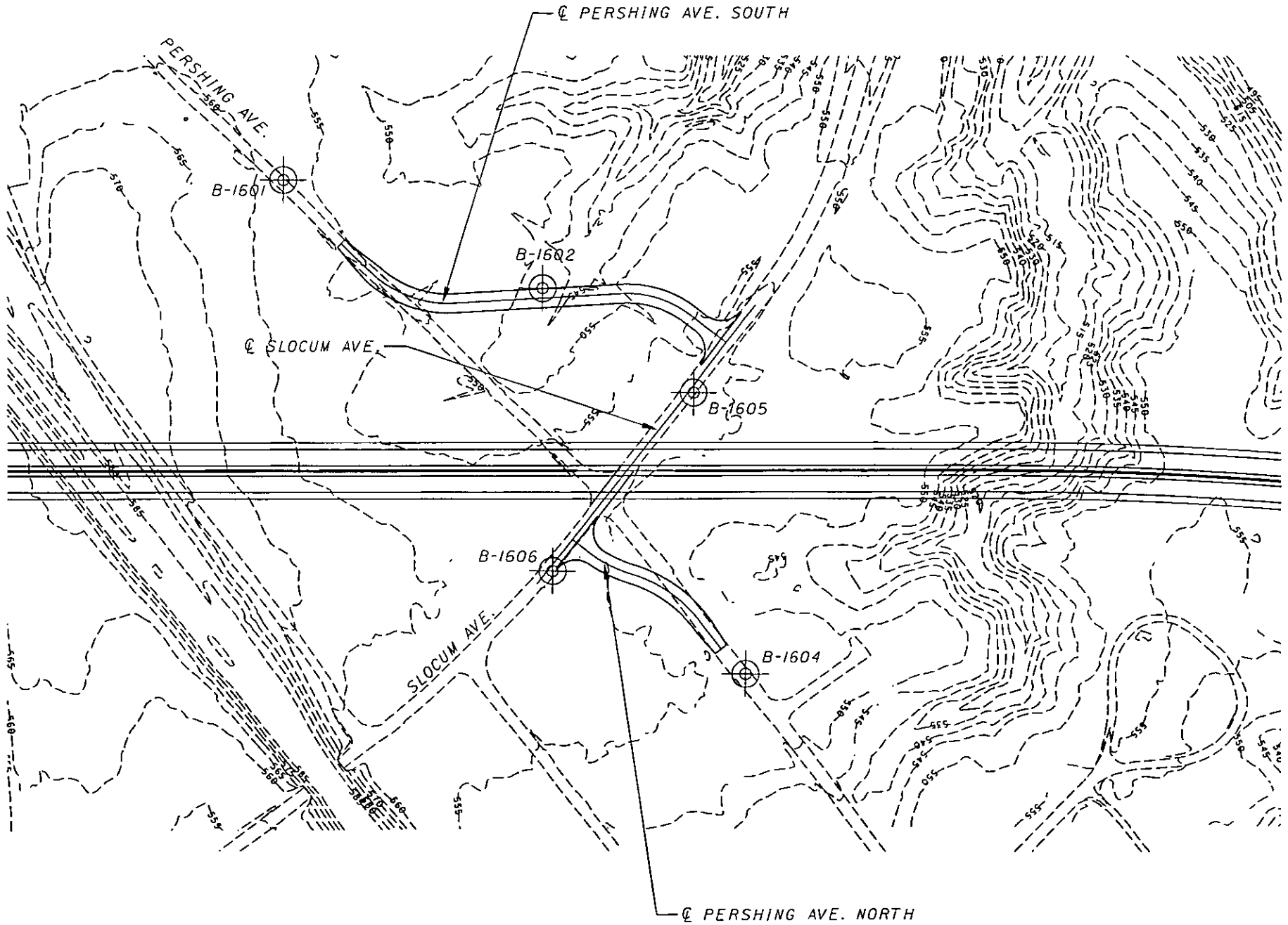
We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our findings.

Respectfully submitted,

DLZ OHIO, INC.

Andrew Jalbrzikowski
Engineering Geologist

Pete Nix, P.E.
Geotechnical Division Manager



PERSHING AVE. NORTH-STA. 30+00 TO STA. 32+79.57
PERSHING AVE. SOUTH-STA. 13+82.19 TO STA. 20+00

N

0 50 100 200
HORIZONTAL SCALE IN FEET

DRAWN RLS
CHECKED AEN

BORING PLAN
PERSHING AVE. NORTH & SOUTH

SCI-823-0.00

1 / 3

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11/15/2007
10:53:21 PM
M:\proj\012\3010.03\Pavement Design\Exhibits\Phase III\pershingsprofl.dgn

	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	
12																			
13																			
14	555.47																		555.49
15	555.13																		554.91
16	555.04																		554.33
17	554.68																		553.75
18	554.24																		553.17
19	551.20																		552.59
20	546.17																		552.01
	545.03																		551.77
	546.53																		552.23
	552.92																		553.03
	554.36																		553.83
	555.17																		554.63
	555.43																		555.43
	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	

EXISTING

PROPOSED

2/3	SCI-823-0.00	PROFILE PERSHING AVE. SOUTH STA. 13+82.19 TO STA. 20+00	CALCULATED RLS CHECKED AEN

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	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	
30	556.55																		556.55
31	555.42																		555.75
	553.92																		554.95
	552.74																		554.39
32	553.53																		554.34
	554.22																		554.53
33																			

PROPOSED

EXISTING

	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	

3/3	SCI-823-0.00	PROFILE PERSHING AVE. NORTH STA. 30+00 TO STA. 32+79.57	CALCULATED RLS CHECKED AEN

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

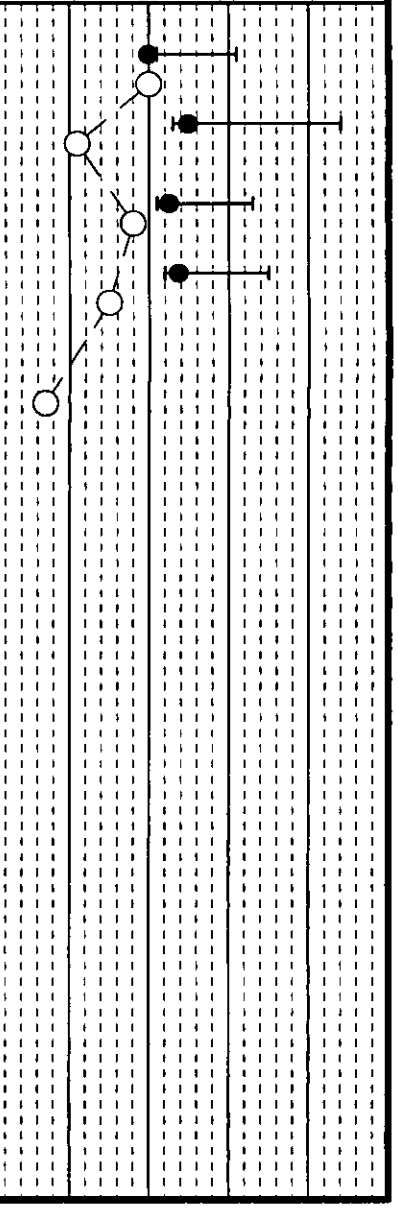
LOG OF: Boring B-1601 | Location: Sta. 12+53.2, 4.9 ft. LT of Pershing Ave. South CL | Date Drilled: 1/10/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	554.6												
0.9	553.7	12 13 7	14	1		3.75	Asphalt Concrete Pavement - 5" Aggregate Base - 6"						
1.5	553.1						Very stiff brown SILT (A-4b), "and" clay, trace fine to coarse sand; damp to moist.	0	2	--	5	51	42
		3 5 6 8	22	2		3.0	Very stiff brown CLAY (A-7-6), "and" silt, trace fine sand; moist. @ 3.0', mottled brown and gray.	0	0	--	2	37	61
5.0	549.6	7 7 11 14	24	3		3.0		0	0	--	3	55	42
		5 7 8	18	4		3.0	Stiff to very stiff brown SILT AND CLAY (A-6a), trace fine sand; moist.	0	0	--	1	47	52
		2 3 4	16	5		1.5							
10.0	544.6						Bottom of Boring - 10.0'						
15													
20													
25													
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢—⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 [11/15/2007 11:06 AM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1602 | Location: Sta. 17+07.5, 14.8 ft. LT of Pershing Ave. South CL | Date Drilled: 1/17/07

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	546.2												
0.3	545.9	1 3 3	9	1		2.0	Topsoil - 4"	1	2	--	9	52	36
1.5	544.7	2 4 4	10	2		1.5	Stiff to very stiff brown SILT (A-4b), little fine to coarse sand, trace gravel; moist.	0	1	--	7	49	43
3.0	543.2	1 4 5	18	3		3.5	Stiff brown SANDY SILT (A-4a), "and" clay; moist.	0	0	--	2	54	44
5		3 4 6	18	4		3.5	Very stiff brown CLAY (A-7 6), trace fine sand; moist.						
6.0	540.2						Bottom of Boring - 6.0'						

GRADATION

STANDARD PENETRATION (N)

Natural Moisture Content, % - ●

PL ⊢——⊣ LL

Blows per foot - ○

10 20 30 40

FILE: 0121-3070-03 [11/15/2007 11:06 AM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1604 | Location: Sta. 33+30.3, 5.2 ft. LT of Pershing Ave. North CL | Date Drilled: 1/10/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	554.6						Asphalt Concrete Pavement - 5" Aggregate Base - 7"						
1.0	553.6	2 12 4	12	1		3.5	Very stiff brown CLAY (A-7-6), "and" silt, trace fine to coarse sand; damp to moist.	0	1	--	4	38	57
3.0	551.6	3 4 6 7	19	2		2.75	Very stiff brown ELASTIC CLAY (A-7-5), "and" silt, trace fine to coarse sand; damp to moist.	0	1	--	3	38	58
5.0	549.6	5 7 9 9	24	3		2.5	Stiff to very stiff brown SILTY CLAY (A-6b), trace fine sand; damp to moist.	0	0	--	2	44	54
		3 4 6	20	4		2.25	@ 7.0', moist.						
		3 3 6	18	5		1.75							
10.0	544.6						Bottom of Boring - 10.0'						

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

58

15 20 25 30

FILE: 0121-3070-03 (11/15/2007 11:06 AM)

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

LOG OF: Boring B-1605 | Location: Sta. 20+05.8, 88.5 ft. RT of Pershing Ave. South BL | Date Drilled: 1/10/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	555.4												
							Asphalt Concrete Pavement - 9" Aggregate Base - 3"						
1.0	554.4	3 4 6	14	1		3.25	Very stiff mottled brown and gray SILT AND CLAY (A-6a), trace fine to coarse sand; damp to moist.	0	1	--	5	48	46
		4 6 7 10	22	2		3.0	@ 3.0', trace organic clay, moist.	0	0	--	3	40	57
5.0	550.4	6 6 9 11	20	3		2.5	Very stiff mottled brown and gray CLAY (A-7-6), "and" silt, trace fine to coarse sand; damp to moist.	0	0	--	7	46	47
		3 4 6	18	4		2.5							
		2 4 8	16	5		2.75							
10.0	545.4						Bottom of Boring - 10.0'						
15													
20													
25													
30													

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40

FILE: 0121-3070-03 [11/15/2007 11:06 AM]

DLZ OHIO INC. * 6121 HUNTLEY ROAD, COLUMBUS, OHIO 43229 * (614)888-0040

Client: TranSystems, Inc. | Project: SCI-823-0.00 | Job No. 0121-3070.03

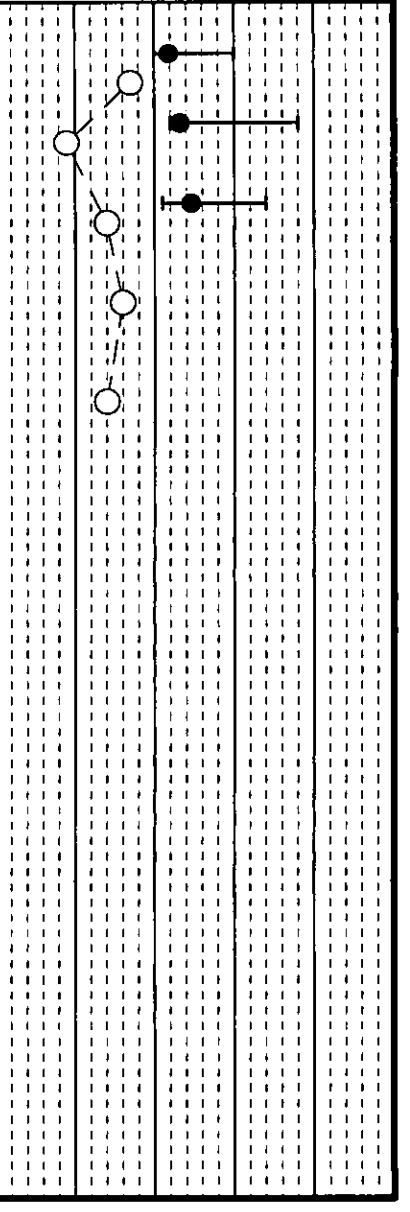
LOG OF: Boring B-1606 | Location: Sta. 30+06.0, 55.1 ft. RT of Pershing Ave. North BL | Date Drilled: 1/10/06

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

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf) / * Point-Load Strength (psi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
0	556.8												
		4 12 5	10	1		2.0	Asphalt Concrete Pavement - 10" Aggregate Base - 9"	0	3	--	7	46	44
1.6	555.2	3 3 6 8	18	2		3.5	Stiff to very stiff mottled brown and gray SANDY SILT (A-4a), "and" clay; moist.	0	0	--	4	44	52
3.0	553.8	4 6 8 10	24	3		1.5	Stiff to very stiff mottled brown and gray SILTY CLAY (A-6b), trace fine sand; damp to moist.	0	0	--	6	43	51
5.0	551.8	4 6 10	18	4		2.5	Stiff to very stiff mottled brown and gray SILT AND CLAY (A-6a), trace fine sand; moist.						
		4 5 9	18	5		2.25							
10.0	546.8						Bottom of Boring - 10.0'						
15													
20													
25													
30													

GRADATION

STANDARD PENETRATION (N)
Natural Moisture Content, % - ●
PL ⊢——⊣ LL
Blows per foot - ○
10 20 30 40



FILE: 0121-3070-03 (11/15/2007 11:06 AM)

Subgrade Analysis

V. 9.09 08/10/07

Design CBR	6
Item 320	No
Global CS	Option
Global LS	No

5 Total Borings

Classification Counts by Sample

R	1a	1b	3	3a	2-4	2-5	2-6	2-7	4a	4b	5	6a	6b	7-5	7-6	8a	8b
0	0	0	0	0	0	0	0	0	1	1	0	3	2	1	5	0	0
									8%	8%		23%	15%	8%	38%		
0.0%	0.0%								100.0%								

Class @ Surface

2-5	0	
4b	1	20%
5	0	
7-5	0	
7-6	2	40%
8a	0	
8b	0	
R	0	

	N_{60}	N_L			PI		Clay		M	M_{OPT}		GI
Average	16.3	12.2			15.0		50.9		23.7	17.8		10.69
Maximum	25	14	58	47	21	55	61	98	25	21		14
Minimum	10	10	30	20	10	37	42	90	22	15		8

% Borings	
N_L <= 5	0%
N_L <=10	40%
N_L >=20	0%
M+	100%
R	0%

% Surface			
80%			
20%	80%		
% Borings			
100%			
0%	- 40%	40%	.100%

SCI-823-0.00 Pershing Ave.

#	B #	Boring Location	Depth	To	Cut Fill	Standard Penetration n_2	n_3	N_m	Rig	N_{60}	N_L	Physical Characteristics LL	PL	PI	% Silt	% Clay	P 200	Moisture M	M_{OPT}	Classification Class	GI	Comments	Problem w/ Class	w/ MN	Treatments LS	CS	UC Class	UC MN
1	1601	STA. 12+53.2	0.5	2.0		13	7	20	A	20		31	21	10	51	42	93	25	16	4b	8		4b	M			3	1
		4.9 ft. LT	2.0	4.0		6	8	14		14		44	23	21	37	61	98	23	20	7-6	13							
			4.0	6.0		11	14	25		25		33	21	12	55	42	97	24	18	7-6	9			M				1
											14																	
2	1602	STA. 17+07.5	4.5	6.0	5.0	4	6	10	A	10								25	18	7-6	14			MN				1
		14.8 ft. LT									10																	
3	1604	STA 33+30.3	0.5	2.0		12	4	16	A	16		45	24	21	38	57	95	24	21	7-6	13							
		5.2' LT	2.0	4.0		6	7	13		13		58	47	11	38	58	96	24		7-5	12		Un				All	
			4.0	6.0		9	9	18		18		40	23	17	44	54	98	24	18	6b	11			M				1
											13																	
4	1605	STA 20+5.8	0.5	2.0		4	6	10	A	10		39	23	16	48	46	94	23	18	6a	10			MN		12		1
		88.5' RT	2.0	4.0		7	10	17		17		34	20	14	40	57	97	25	15	6a	10			M				1
			4.0	6.0		9	11	20		20		43	24	19	46	47	93	23	21	7-6	12							
											10																	
5	1606	STA 30+6	0.5	2.0		12	5	17	A	17		30	20	10	46	44	90	22	15	4a	8			M				1
		55.1' RT	2.0	4.0		6	8	14		14		38	22	16	44	52	96	23	17	6b	10			MN		12		1
			4.0	6.0		8	10	18		18		34	21	13	43	51	94	25	16	6a	9			M				1
											14																	

III.C. Subgrade Checklist

C-R-S: SC-823-0.00 Pershing Ave.	PID: 77366	Reviewer: AMJ	Date: 11-16-2007

If you do not have any subgrade work on the project, you do not have to fill out this checklist.

Y N X 1	Has the subsurface investigation adequately characterized the soil or rock according to Geotechnical Bulletin 1: Plan Subgrades (GB1)?	
Y N X 2	If soils classified as A-2-5, A-4b, A-5, or A-7-5 are present at the proposed subgrade (soil profile), do the plans specify that these materials need to be removed and replaced?	
Y N X	a If these materials are to be removed and replaced, have the station limits, depth, and lateral limits for the planned removal been provided?	
Y **N** X 3	If there is any rock, shale, or coal present at the proposed subgrade (CMS 204.05), do the plans specify the removal of the material?	
Y N **X**	a If removal of any rock, shale, or coal is required, have the station limits, depth, and lateral limits for the planned removal of the material at proposed subgrade been provided?	
Y N X 4	In accordance with GB1, do the SPT values and existing moisture contents for the proposed subgrade soils indicate the need for subgrade stabilization?	
Y **N** X	a If removal and replacement is applicable, has the detail of subgrade removal been shown on the plans, including depth of removal, station limits, lateral extent, replacement material, and plan notes (Item 204 – Subgrade Compaction and Proof Rolling)?	Refer to roadway cross-sections.
Y N **X**	b If chemical stabilization is applicable, has the detail of this treatment been shown on the plans, including depth, percentage of chemical, station limits, lateral extent, and plan notes?	
	Indicate type of subgrade treatment specified: 9 **cement treatment** 9 lime treatment 9 other List Other items:	GB-1 recommends cement treatment or undercutting. Undercutting was recommended for subgrade treatment.
Y N X 5	If drainage or groundwater is an issue with the proposed subgrade, has an appropriate drainage system (e.g., pipe, underdrains) been provided?	Refer to roadway cross-sections.
Y N **X** 6	Has an appropriate quantity of Proof Rolling been included in the plans (CMS 204.06)?	Refer to roadway cross-sections.
Y N X 7	Has a design CBR value been provided?	

APPENDIX D

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PLANNERS • SURVEYORS

November 16, 2007

Michael D. Weeks, P.E., P.S.
TranSystems Corporation
5747 Perimeter Drive, Suite 240
Dublin, OH 43017

Re: **Pavement Design Information**
Phase 3 Mainline
SCI-823-0.00 Portsmouth Bypass
DLZ Job No.: 0121-3070.03
Document No. 0100

Dear Mr. Weeks:

We have evaluated the existing laboratory test results performed as of June 6, 2006, to estimate a recommended CBR value for the above-mentioned project. A minor amount of testing was performed subsequent to this date, but including the subsequent data should not substantially change the overall conclusions and recommendations. Because the vast majority of the project's alignment will be in rock cuts or on embankments, all of the laboratory test results for the Phase 3 area were considered. Accordingly, the results of Phase 3 only are presented in this letter.

The method used was essentially the same as the one used by the Office of Geotechnical Engineering to determine the design CBR for the Nelsonville Bypass project. The alignment for that project was similar to the Portsmouth Bypass alignment in that most of it will also be in rock cuts or on embankments.

It is understood that the Phase 3 area is inclusive of station 54+11 to 353+00. The results of the other phases will be presented in separate documents.

A total of 252 samples have been tested for particle size and plasticity where necessary. A summary of the soil samples tested is presented on the following page.

Based upon the results of the laboratory testing, an average CBR value of 6.4 was calculated for Phase 3. Consequently, a CBR value of 7 is recommended for the pavement design on the mainline alignment and ramps of the new alignment in Phase 3.

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Michael D. Weeks, P.E., P.S.
November 16, 2007

Summary of Soil Samples Tested

ODOT Classification	Number of Samples Tested
Gravel with sand (A-1-b)	4
Fine sand (A-3)	1
Gravel, sand and silt (A-2-4)	10
Sandy silt (A-4a)	38
Silt (A-4b)	81
Silt and clay (A-6a)	50
Silty clay (A-6b)	24
Elastic clay (A-7-5)	1
Clay (A-7-6)	43

We appreciate having the opportunity to be of service to you on this project. Please do not hesitate to call if you have any questions concerning our report.

Respectfully submitted,

DLZ OHIO, INC.

Steven J. Riedy
Geotechnical Engineer

Andrew M. Jalbrzikowski
Engineering Geologist

Pete Nix, P.E.
Geotechnical Division Manager

cc: File

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