

PROJECT DESCRIPTION

THE PROJECT CONSISTS IN PART OF PLACING A STRUCTURE FOR THE PROPOSED RAMP B OVER THE NORFOLK SOUTHERN RAILROAD. THE STRUCTURE AS PLANNED, IS A THREE-SPAN STRUCTURE, WHICH UTILIZES MSE RETAINING WALLS TO HOLD BACK THE ROADWAY EMBANKMENT AND CONTAIN THE REAR ABUTMENT. IT IS UNDERSTOOD THAT A SPILL THROUGH SLOPE IS CURRENTLY PROPOSED AT THE FORWARD ABUTMENT LOCATION.

HISTORIC RECORDS

HISTORIC BORING RECORDS FOR THE AREA WERE REQUESTED FROM THE ODOT OFFICE OF GEOTECHNICAL ENGINEERING AND THE DISTRICT, HOWEVER, NO SUCH RECORDS EXISTED.

GEOLOGY

GENERALIZED GEOLOGICAL REFERENCES REPORT THAT THE SITE LIES ON THE EAST SIDE OF THE FLOOD PLAIN OF THE TEAYS STAGE, PORTSMOUTH RIVER, WHICH IS CURRENTLY THE EAST SIDE OF THE SCIOTO RIVER VALLEY. THIS AREA IS UNGLACIATED, HOWEVER THE SCIOTO RIVER VALLEY IS FILLED WITH ILLINOIAN AND WISCONSIN GLACIAL OUTWASH TO DEPTHS OF UP TO 90 FEET.

THE AREA OF THESE STRUCTURES IS CHARACTERIZED BY GENTLY TO MODERATELY SLOPING TOPOGRAPHY RISING FROM OF THE FLOODPLAIN OF THE SCIOTO RIVER. THE PROJECT AREA IS LOCATED IN THE SHAWNEE-MISSISSIPPIAN PLATEAU OF THE UNGLACIATED PORTION OF THE APPALACHIAN PLATEAU PHYSIOGRAPHIC REGION. THE SHAWNEE-MISSISSIPPIAN PLATEAU IS CHARACTERIZED BY DEVONIAN AGED TO PENNSYLVANIAN AGED ROCKS AND CONTAINS RESIDUAL, COLLUVIAL, ALLUVIAL, AND LACUSTRINE SOILS.

RECONNAISSANCE

SEVERAL SITE RECONNAISSANCE VISITS WERE MADE BETWEEN JUNE 2004 AND SEPTEMBER 2007. THE SURROUNDING AREA IS UTILIZED FOR AGRICULTURAL PURPOSES AND COMMERCIAL STORAGE. GROUND COVER IN THE PROJECT AREA CONSISTS OF GRASS, BRUSH, AND OCCASIONAL SMALL TREES.

SUBSURFACE EXPLORATION

THE SUBSURFACE EXPLORATION CONSISTED OF DRILLING A TOTAL OF SIX BORINGS FOR THE RAMP B BRIDGE AND RETAINING WALLS. BORINGS TR-59A, TR-60, AND TR-61 WERE DRILLED FOR PREVIOUSLY PROPOSED STRUCTURE CONFIGURATION FROM MARCH 14 TO 16, 2005. BORINGS B-1109 THROUGH B-1112 WERE DRILLED FOR THE BRIDGE AND RETAINING WALLS FROM JULY 14 THROUGH OCTOBER 12, 2005. THE BORINGS WERE DRILLED WITH BOTH TRUCK AND ATV MOUNTED ROTARY DRILL RIGS, USING 3 1/4 -INCH I.D. HOLLOW STEM AUGERS TO ADVANCE THE HOLES THROUGH SOIL. DISTURBED SOIL SAMPLES WERE OBTAINED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT 1.5 TO 5.0-FOOT INTERVALS FOR THE FULL DEPTH OF THE SOIL PORTION OF THE BORINGS. UNDISTURBED SOIL SAMPLES WERE OBTAINED AT THE DEPTHS SHOWN ON THE LOGS AND IN THE PROFILE, IN ACCORDANCE WITH AASHTO T207. WHERE BEDROCK WAS ENCOUNTERED, THE BORINGS WERE ADVANCED AND THE ROCK WAS SAMPLED USING A TYPE NO SERIES CORE BARREL, WATER METHOD.

EXPLORATION FINDINGS

BORINGS FOR THE PROPOSED BRIDGE GENERALLY ENCOUNTERED 1 TO 6 INCHES OF TOPSOIL AT THE GROUND SURFACE. BELOW THE TOPSOIL, BORINGS GENERALLY ENCOUNTERED COHESIVE SOILS RANGING FROM SILT (A-4B) TO SILTY CLAY (A-6B) TO DEPTHS RANGING FROM 10.5 TO 13.5 FEET BELOW THE GROUND SURFACE. BELOW THE COHESIVE SOILS, LAYERS OF COHESIONLESS SOILS RANGING FROM GRAVEL WITH SAND (A-1-B) TO SILT (A-4B) WERE GENERALLY ENCOUNTERED TO DEPTHS RANGING FROM 18.5 TO 33.0 FEET BELOW THE GROUND SURFACE, TO THE TOP OF BEDROCK.

BORINGS B-1108 THROUGH B-1112, TR-60, AND TR-61 ENCOUNTERED MEDIUM HARD, BLACK SHALE (SUNBURY SHALE) AT THE TOP OF ROCK. IN THESE BORINGS, BEDROCK WAS GENERALLY ENCOUNTERED AT DEPTHS RANGING FROM 16.0 TO 33.0 FEET BELOW THE GROUND SURFACE. BORING TR-59 ENCOUNTERED SOFT TO MEDIUM HARD GRAY SHALE INTERBEDDED WITH SANDSTONE OF THE CUYAHOGA FORMATION AT THE TOP OF ROCK. IN THIS BORING, BEDROCK WAS ENCOUNTERED AT A DEPTH OF 18.5 FEET BELOW THE GROUND SURFACE.

IN THE BORINGS, SEEPAGE WAS FIRST OBSERVED AT DEPTHS RANGING FROM 10.0 TO 26.0 FEET BELOW THE GROUND SURFACE. MEASURABLE WATER LEVELS WERE OBSERVED IN BORINGS B-1108 THROUGH B-1110, TR-60, AND TR-61 PRIOR TO ROCK CORING AT DEPTHS RANGING FROM 12.0 TO 26.0 FEET BELOW THE GROUND SURFACE. FINAL WATER LEVELS INCLUDE WATER THAT WAS USED DURING ROCK CORING OPERATIONS AND CONSEQUENTLY, MAY NOT BE REPRESENTATIVE OF ACTUAL GROUNDWATER CONDITIONS.

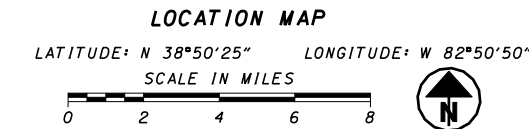
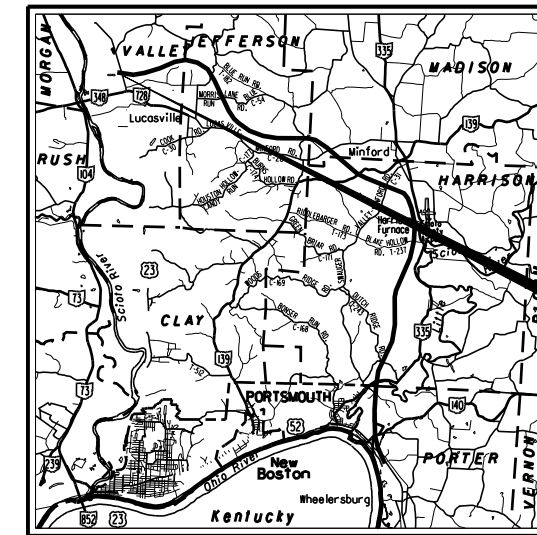
LEGEND		ODOT CLASS	CLASSIFIED MECH./VISUAL	
DESCRIPTION				
	Gravel with Sand	A-1-b	5	11
	Gravel with Sand and Silt	A-2-4	1	-
	Gravel with Sand, Silt and Clay	A-2-6	1	3
	Coarse and Fine Sand	A-3a	3	11
	Sandy Silt	A-4a	6	4
	Silt	A-4b	1	-
	Silt and Clay (A-6a)	A-6a	2	3
	Silty Clay (A-6b)	A-6b	3	-
	Clay (A-7-6)	A-7-6	2	2
	TOTAL		24	34
	Sandstone	VISUAL		
	Shale	VISUAL		
	Weathered Shale	VISUAL		
	Topsoil	VISUAL		
	BORING LOCATION - PLAN VIEW			
	DRIVE SAMPLE AND/OR CORE BORING LOCATION PLOTTED TO VERTICAL SCALE ONLY			
	INDICATES FREE WATER ELEVATION			
	INDICATES STATIC WATER ELEVATION			
	INDICATES STATIC WATER ELEVATION (DRILLING WATER USED)			
	FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST			
X/Y/Z	X = NUMBER OF BLOWS FOR FIRST 6 INCHES Y = NUMBER OF BLOWS FOR SECOND 6 INCHES Z = NUMBER OF BLOWS FOR THIRD 6 INCHES			
50 (n)	INDICATES NUMBER OF BLOWS (50) TO DRIVE A SPLIT-BARREL SAMPLER A DEPTH OF (n) INCHES OTHER THAN THE NORMAL 6 INCH INCREMENT.			

SPECIFICATIONS

THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED NOVEMBER 1995.

AVAILABLE INFORMATION

ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE SOIL PROFILE SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE EXPLORATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1600 WEST BROAD STREET OR THE OFFICE OF STRUCTURAL ENGINEERING AT 1980 WEST BROAD STREET.



PARTICLE SIZE DEFINITIONS

12"	3"	2.0 mm	0.42 mm	0.074 mm	0.005 mm	
Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

RECON. - AMJ & SJR 09/05 to 09/06
 DRILLING - DW 08/19 TO 08/19/04 & 06/13 TO 06/14/06
 DRAWN - RLS & AMJ 3/09 TO 4/09
 REVIEWED - AEN 4/20/09

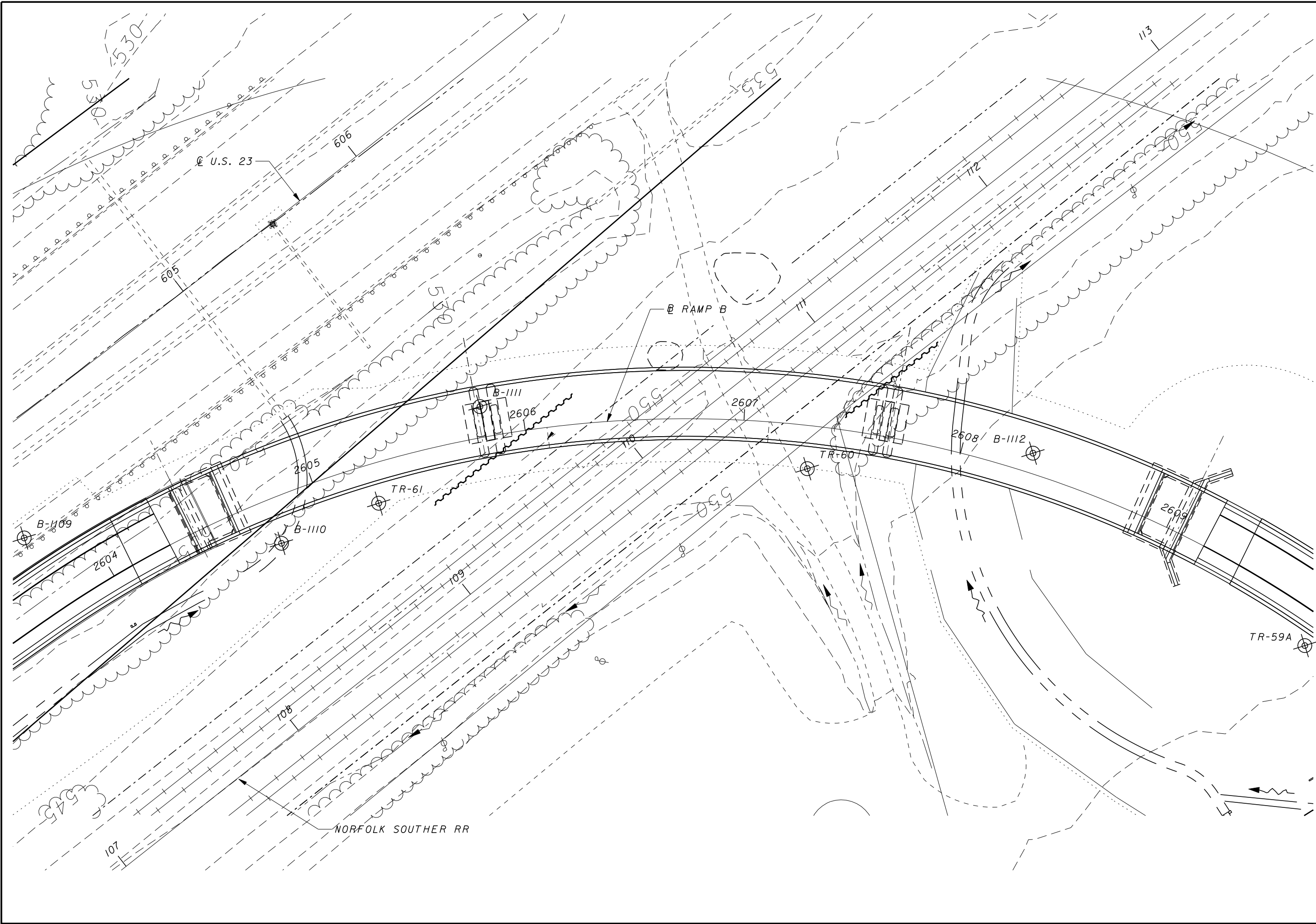
DLZ
 650 HARTLEY ROAD - COLUMBUS, OHIO 43229

PID NO. **79977**

STRUCTURE FOUNDATION INVESTIGATION
 BRIDGE NO. SCI-823-1598
 RAMP B OVER NORFOLK SOUTHERN RR

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HORIZONTAL
SCALE IN FEET

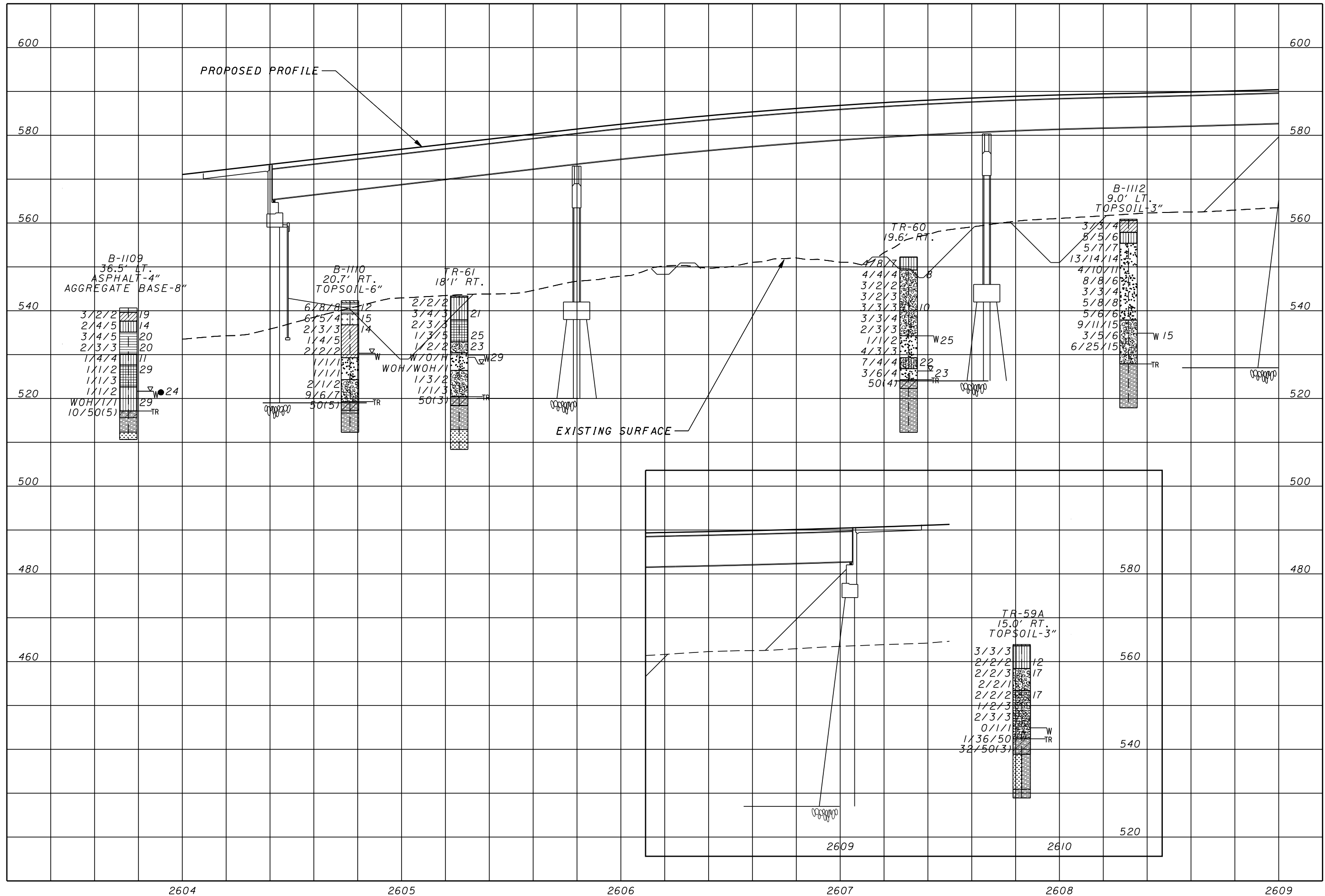
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Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03													
LOG OF: Boring B-1109		Location: Sta. 2603+75.4, 36.5 ft. LT of US 23 Ramp B BL		Date Drilled: 07/22/05													
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: 19.0'-22.0' Water level at completion: 19.0' (prior to coring) 8.0' (inside hollowstem augers)	GRADATION					STANDARD PENETRATION (N)					
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL Blows per foot - ○ ●				
DESCRIPTION																	
0	540.6																
1.0	539.6	3		1	1.5												
3.0	537.6	2	12	2	2.0												
5.5	535.1	4	14	3	3.5												
10.5	530.1	2	13	4	4.25												
13.0	527.6	1	10	5	1.5												
18.0	522.6	1	12	7	2.0												
20.0		1	18	8	-												
23.5	517.1	10	16	9	-												
25.0	515.6	50/5	9	10	-												
28.3	512.3	Core 60"	Rec 60"	RQD 77%	R1												
30.0	510.6																

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03													
LOG OF: Boring B-1110		Location: Sta. 2604+76.5, 20.7 ft. RT of US 23 Ramp B BL		Date Drilled: 07/14/05													
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: 12.0'-25.0' Water level at completion: 12.0' (prior to coring) 5.0' (inside hollowstem augers)	GRADATION					STANDARD PENETRATION (N)					
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL Blows per foot - ○ ●				
DESCRIPTION																	
0	542.3																
0.5	541.8	6		1	4.5+												
3.0	539.3	6	18	2	3.5												
5.5	536.8	5	18	3	4.0												
10.0		1	15	4	2.5												
13.0	529.3	2	16	5	2.0												
15.0		1	18	6													
18.0	524.3	1	10	7													
20.0		2	16	8													
23.0	519.3	1	9	9													
25.0	517.3	6	7	10													
25.6	516.7	50/5	7														
30.0	512.3	Core 60"	Rec 52"	RQD 32%	R1												

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Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03										
LOG OF: Boring TR-60		Location: Sta. 2607+31.2, 19.6 ft. RT of US 23 Ramp B BL		Date Drilled: 3/14/05										
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive Press / Core	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: 18.0'-28.0' Water level at completion: 26.0' (prior to coring) 19.0' (includes drilling water)	GRADATION					STANDARD PENETRATION (N)		
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○	
DESCRIPTION							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)	
0.1	552.2	4	8	1										
Topsoil - 1" FILL: Medium dense brown SANDY SILT (A-4s), little gravel, little clay; damp.														
3.0	549.3	4	4	2			33	43	11	13				Non-Plastic
5		3	2	3										
10		3	2	4										
15		3	3	5			50	20	9	17	4			Non-Plastic
18.0	534.3	1	1	8			10	53	20	17				Non-Plastic
20		4	3	9										
23.0	529.3	7	4	10			31	27	12	18	12			
25		3	6	11			7	14	58	21				Non-Plastic
25.5	526.8	50/4	4	12										
28.0	524.3													
30.0	522.3													
35		Core 120"	Rec 119"	RQD 79%	R-1									
40.0	512.3													
Soft to medium hard black SHALE; carbonaceous, moderately weathered to decomposed, laminated, slightly fractured. @ 30.0'-32.3', clay seam. @ 32.3', hard. @ 33.2', 38.0'-38.2', clay seams. @ 39.4'-39.8', high angle fracture. @ 39.9'-40.0', hard gray SANDSTONE. Bottom of Boring - 40.0'														

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03										
LOG OF: Boring TR-61		Location: Sta. 2605+26.3, 18.1 ft. RT of US 23 Ramp B BL		Date Drilled: 3/16/05										
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive Press / Core	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: 13.5'-23.0' Water level at completion: 14.0' (prior to coring) 9.0' (includes drilling water)	GRADATION					STANDARD PENETRATION (N)		
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○	
DESCRIPTION							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N)	
0.3	543.1	2	2	1										
Topsoil - 4" FILL: Loose black SANDY SILT (A-4s), little clay, little gravel; organic; dry to damp.														
5		3	4	2			14	20	26	28	12			
5.5	537.9	2	3	3										
10		1	3	4			8	12	12	29	39			
10.5	532.9	1	2	5			9	46	32	13				Non-Plastic
13.0	530.4	W	1	6			1	22	62	15				Non-Plastic
15		W	1	7										
17.0	526.4	W	1	8										
20		1	3	9										
23.0	520.4	50/3	3	10										
25.0	518.4													
30		Core 120"	Rec 114"	RQD 92%	R-1									
30.5	512.9													
35.0	508.4													
Hard black SHALE; carbonaceous, moderately weathered, thinly bedded, moderately fractured. @ 25.0'-25.2', 27.5'-27.6', 28.1'-28.2', 29.3'-30.0', high angle fractures Hard gray SANDSTONE; very fine to fine grained, slightly weathered, thinly to medium bedded, slightly fractured. @ 31.2'-31.6', high angle fracture. @ 33.7'-33.9', clay seam. Bottom of Boring - 35.0'														

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Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03								
LOG OF: Boring B-1112		Location: Sta. 2808+31.5, 9.0 ft. LT of US 23 Ramp B BL		Date Drilled: 10-12-05								
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: 26.0'-30.0' Water level at completion: None (prior to coring) 6.6' (inside hollowstem augers)	GRADATION					STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	
DESCRIPTION												
0.3	560.8	3	9	1	4.0	Topsoil - 3"						
3.0	557.9	5	18	2		FILL: Very stiff to hard brown SILT AND CLAY (A-6a), little gravel, trace fine to coarse sand; moist.						
5.5	555.4	5	15	3		FILL: Medium dense brown and dark gray SANDY SILT (A-4a), trace clay, trace gravel; damp.						
10.0		13	10	4		POSSIBLE FILL: Medium dense brown COARSE AND FINE SAND (A-3a), trace to little gravel; dry.						
15.0		8	9	6								
20.0		3	17	7		@ 16.0', little silt, little clay; damp to moist.						
23.0	537.9	9	1	10		POSSIBLE FILL: Medium dense to dense brown GRAVEL WITH SAND (A-1-b), little silt, trace clay; wet.						
25.0		3	14	11								
30.0		5	11	12								
33.0	527.9					Medium hard black SHALE; moderately to highly weathered, carbonaceous, thinly bedded, moderately fractured. @ 33.9'-34.0', broken zone.						
43.0	517.9					Bottom of Boring - 43.0'						

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03								
LOG OF: Boring TR-59A		Location: Sta. 2609+82.8, 15.0 ft. RT of US 23 Ramp B BL		Date Drilled: 3/14/05								
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: 19.0'-21.5' Water level at completion: None (prior to coring) 17.0' (includes drilling water)	GRADATION					STANDARD PENETRATION (N) Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	
DESCRIPTION												
0.3	563.8	3	14	1	-	Topsoil - 3"						
5.0		2	12	2	-	@ 3.5', brown.						
5.5	558.4	2	15	3		Very loose to loose brown GRAVEL WITH SAND (A-1-b), little clay; moist.						
10.0		2	13	4								
10.5	553.4	2	16	5		Loose brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); damp to moist.						
15.0		1	15	6								
20.0		0	14	8		@ 19.0'-21.5', very loose; wet.						
21.5	542.4	36	12	9		Severely weathered gray SHALE.						
25.0	538.9	32	9	10								
30.0						Medium hard to hard gray SANDSTONE interbedded with SHALE; very fine to fine grained, highly weathered to decomposed, laminated to thinly bedded, slightly fractured. @ 25.4'-25.7', 28.5', 29.6', clay seams. @ 25.9', 26.5-26.7', 27.8', high angle fractures. @ 28.6'-29.6', moderately weathered SHALE. @ 31.4'-31.7', clay seams with high angle fractures.						
33.0	530.9					Hard black SHALE; carbonaceous, moderately weathered, laminated, slightly fractured. @ 33.8'-34.0', broken, high angle fracture.						
35.0	528.9					Bottom of Boring - 35.0'						

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