

PROJECT DESCRIPTION

THE PROJECT CONSISTS IN PART OF PLACING TWO STRUCTURES, NORTHBOUND AND SOUTHBOUND STRUCTURES, RESPECTIVELY FOR PROPOSED SR 823 OVER SR 140 (WEBSTER ST.). THE TWO STRUCTURES AS PLANNED, ARE SINGLE-SPAN STRUCTURES USING MSE WALLS TO HOLD BACK THE ROADWAY EMBANKMENTS AND CONTAIN THE ABUTMENTS.

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

BEDROCK IS OF THE MISSISSIPPIAN LOGAN FORMATION. GENERALLY, THIS FORMATION CONSISTS OF PRIMARILY SANDSTONE OR SANDY SILTSTONE WITH OCCASIONAL AREAS OF INTERBEDDED SHALE. HOWEVER, THE LITHOLOGY OF THE SANDSTONES VARIES BOTH Laterally and vertically. BEDROCK OF THE PENNSYLVANIAN BREATHITT FORMATION CAN BE FOUND AT THE TOP OF THE SLOPES ROUGHLY ABOVE ELEVATION 770 IN THIS AREA.

RECONNAISSANCE

SEVERAL SITE RECONNAISSANCE VISITS WERE MADE BETWEEN AUGUST 2004 AND SEPTEMBER 2006. THE AREA 150 FEET TO THE LEFT OF THE STRUCTURE HAS BEEN DEVELOPED FOR COMMERCIAL USE. THREE RESIDENTIAL STRUCTURES ARE NEAR OR WITHIN THE LIMITS OF CONSTRUCTION. THE STEEP SLOPES EAST AND WEST OF THE STRUCTURE ARE WOODED.

SUBSURFACE EXPLORATION

THE FIELD EXPLORATION CONSISTED IN PART OF THREE FINAL AND THREE PRELIMINARY STRUCTURAL BORINGS. BORINGS B-15 THROUGH B-17 WERE DRILLED FOR THE FINAL BRIDGE PLAN, ESSENTIALLY CONSISTING OF PROPOSED SR 823 PASSING OVER SR 140 (WEBSTER ST.). FINAL STRUCTURE BORINGS, B-15 THROUGH B-17 WERE DRILLED ON SEPTEMBER 19 AND 20, 2006. STRUCTURE BORINGS (TR-43 THROUGH TR-45) WERE DRILLED FOR A PREVIOUS DESIGN CONFIGURATION. THESE BORINGS WERE DRILLED BETWEEN FEBRUARY 2 AND 24, 2005 USING AN ATV MOUNTED ROTARY DRILL RIG, 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 TR-45 AND B-15 ENCOUNTERED SURFICIAL MATERIAL CONSISTING OF 2 INCHES OF TOPSOIL WHILE BORING TR-44 ENCOUNTERED 12 INCHES OF ASPHALT CONCRETE PAVEMENT. THE TOPSOIL IN BORING TR-45 WAS UNDERLAIN BY BEDROCK. BORINGS TR-43, TR-44, AND B-15 THROUGH B-17 ENCOUNTERED NATIVE COHESIVE AND GRANULAR SOIL DEPOSITS BELOW THE SURFICIAL MATERIAL OR THE GROUND SURFACE. THE COHESIVE DEPOSITS CONSISTED MAINLY OF STIFF TO HARD SILT (A-4B), VERY STIFF SILT AND CLAY (A-6A), STIFF TO VERY STIFF SILTY CLAY (A-6B), AND VERY STIFF CLAY (A-7-6), WHILE THE GRANULAR SOIL DEPOSITS CONSISTED MAINLY OF LOOSE TO MEDIUM DENSE SANDY SILT (A-4A). THE NATIVE SOIL DEPOSITS EXTENDED TO DEPTHS RANGING BETWEEN APPROXIMATELY 3.0 AND 11.6 FEET BELOW THE GROUND SURFACE, WHERE BEDROCK WAS ENCOUNTERED.

IN THE AREA OF THE PROPOSED STRUCTURE, BEDROCK WAS ENCOUNTERED IN ALL BORINGS. THE BEDROCK CONSISTED OF SOFT TO HARD, SLIGHTLY WEATHERED TO DECOMPOSED, SLIGHTLY TO HIGHLY FRACTURED SANDSTONE. SEVERELY DECOMPOSED SILTSTONE WAS ENCOUNTERED IN BORING B-15 ABOVE THE SANDSTONE. THE AMOUNT OF ROCK RECOVERED IN EACH CORE RUN VARIED BETWEEN 97 AND 100 PERCENT. THE ROCK QUALITY DESIGNATION (RQD) OF THE BEDROCK RANGED BETWEEN 23 AND 100 PERCENT WITH AN AVERAGE OF 75 PERCENT INDICATING FAIR TO GOOD QUALITY ROCK.

SEEPAGE WAS NOT OBSERVED IN ANY OF THE BORINGS DRILLED FOR THIS STRUCTURE. THERE WERE NO MEASURABLE WATER LEVELS IN THE BORINGS PRIOR TO ROCK CORING. WATER WAS USED DURING ROCK CORING AND MASKED ANY SEEPAGE ZONES THAT MIGHT EXIST IN THE ROCK.

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.

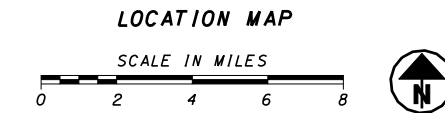
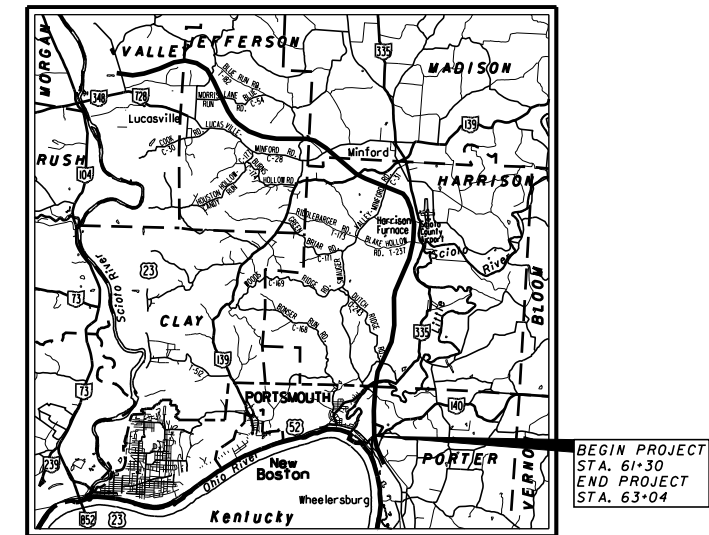
DESCRIPTION		ODOT CLASS	CLASSIFIED MECH./VISUAL	
	SANDY SILT	A-4a	2	0
	SILT	A-4b	5	0
	SILT AND CLAY	A-6a	3	5
	SILTY CLAY	A-6b	-	1
	Clay (A-7-6)	A-7-6	16	15
	TOTAL		26	21
	WEATHERED SILTSTONE	VISUAL		
	WEATHERED SANDSTONE	VISUAL		
	SANDSTONE	VISUAL		
	Topsoil	VISUAL		

	BORING LOCATION - PLAN VIEW
	DRIVE SAMPLE AND/OR CORE BORING LOCATION PLOTTED TO VERTICAL SCALE ONLY
W —	INDICATES FREE WATER ELEVATION
∇ —	INDICATES STATIC WATER ELEVATION
—TR	INDICATES THE TOP OF ROCK ELEVATION

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.



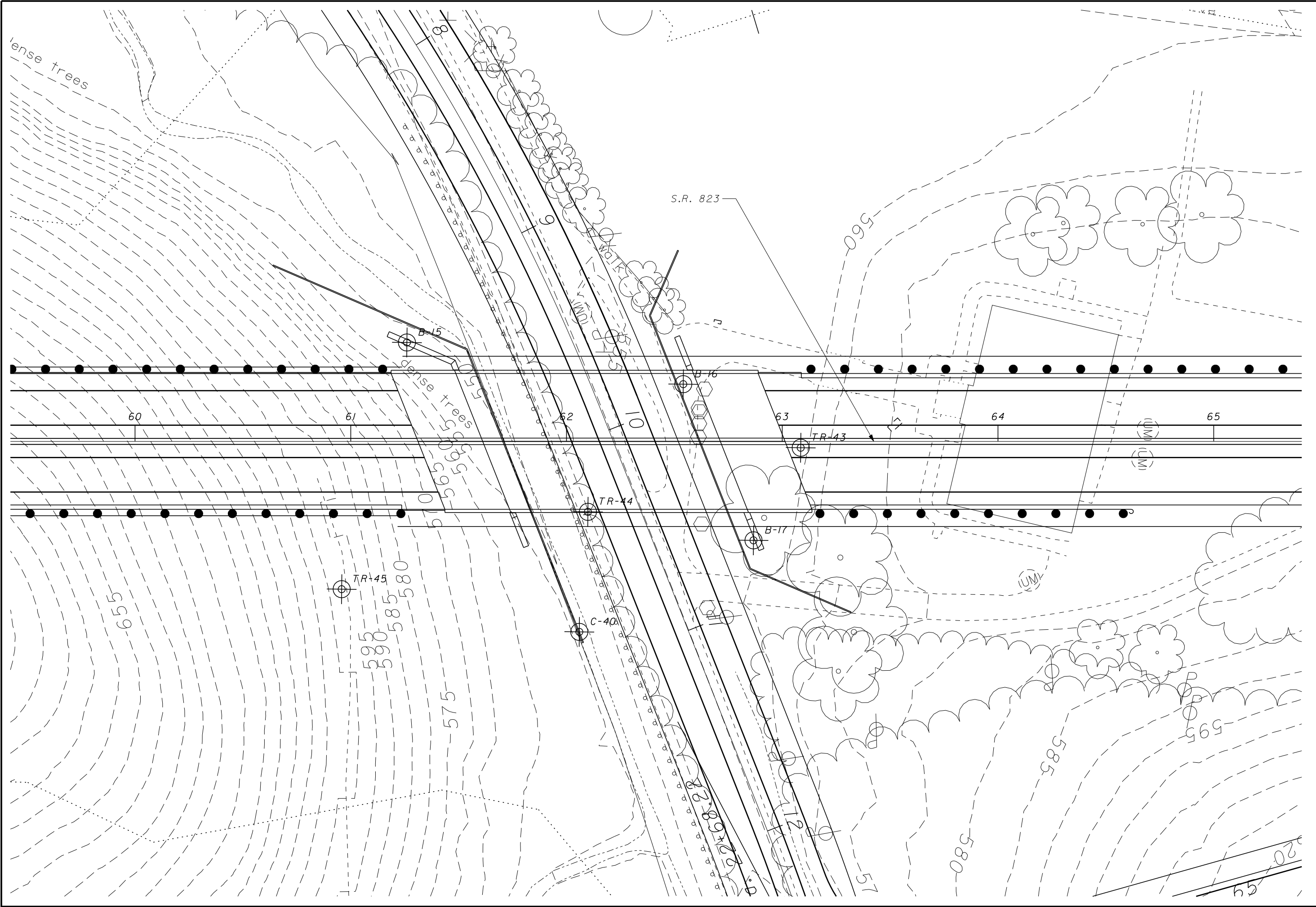
PARTICLE SIZE DEFINITIONS

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 AND SJR 06/04 to 06/06
- DRILLING - DW AND RB 02/02/05 TO 02/03/05, 02/24/05, AND 09/09/06 TO 09/20/06
- DRAWN - RLS & AMJ 8/09
- REVIEWED - AEN 8/19/09

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PID NO. 77366
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 BRIDGE NO. SCI-823-0117
 SR823 OVER SR 140
 SCI-823-0.00
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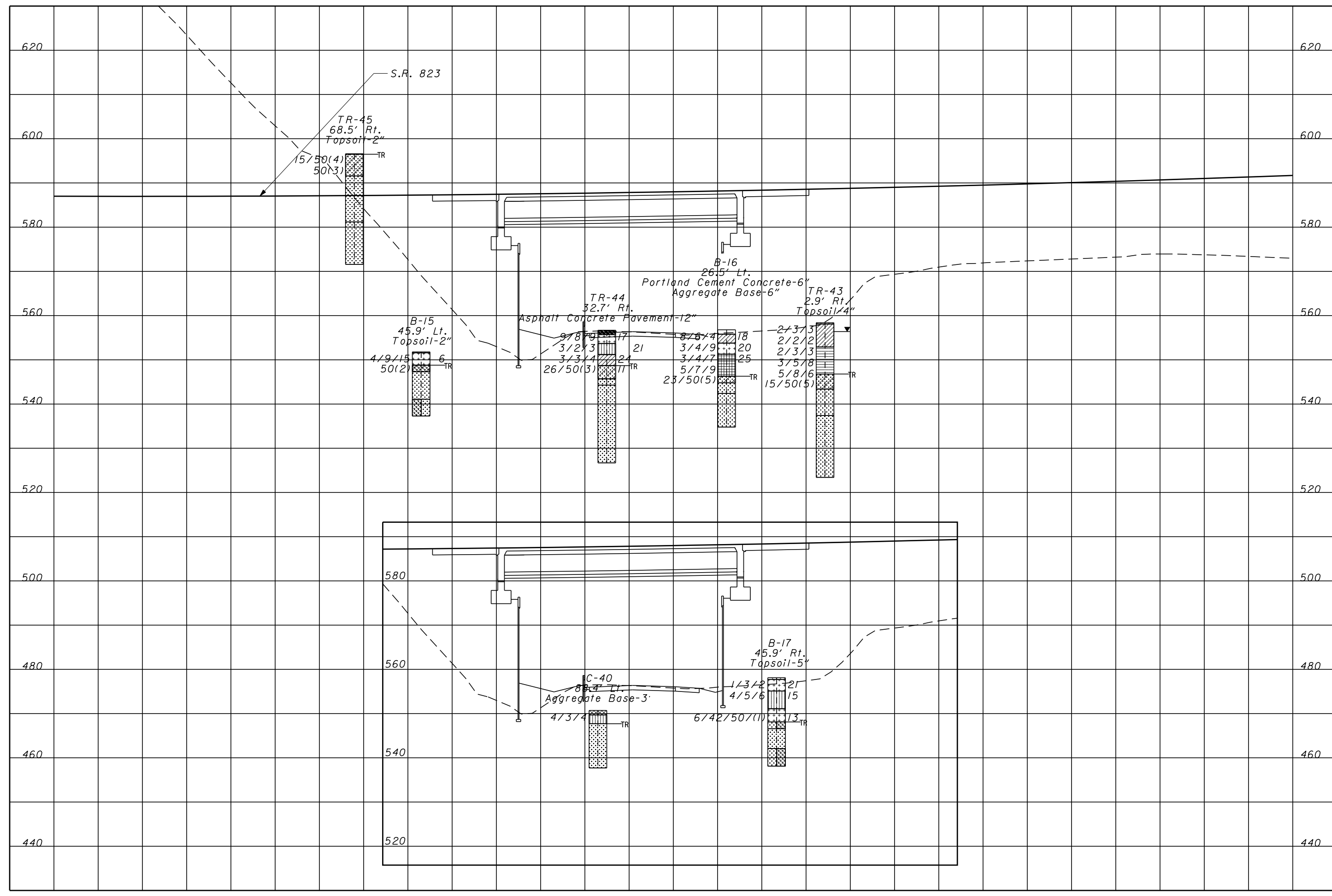


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60

61

62

63

64

65

620
600
580
560
540
520
500
480
460
440

620
600
580
560
540
520
500
480
460
440

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03															
LOG OF: Boring TR-45		Location: Sta. 60+95.8, 68.5 ft. RT of SR 823 CL		Date Drilled: 02/24/05															
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 6.7' (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																			
0.1	596.5						Topsoil - 2"												
		15 50/4	10	1			Severely weathered brown SANDSTONE, argillaceous.												
		50/3	3	2															
5.0	591.6						Soft to medium hard brownish gray SANDSTONE; very fine grained, highly weathered to decomposed, argillaceous, micaceous, massive, highly fractured, with typical low angle rust stained and clay filled fractures. @ 5.0'-5.1', 7.4'-7.6', broken zones. @ 9.3'-9.6', 14.2'-14.5', high angle rust stained fractures. @ 11.1'-11.4', broken zone.												
		Core 120"	Rec 120"	RQD 79%	R-1														
15	581.2						Medium hard to hard gray SANDSTONE; very fine grained, slightly weathered, argillaceous, micaceous, massive, slightly fractured. @ 16.1'-16.3', rust stained zone. @ 17.3'-20.2', low angle clay filled fractures.												
		Core 120"	Rec 120"	RQD 100%	R-2														
25.0	571.6						Bottom of Boring - 25.0'												

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03															
LOG OF: Boring B-15		Location: Sta. 61+26.0, 45.9 ft. LT of SR 823 CL		Date Drilled: 9/20/06															
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION					STANDARD PENETRATION (N)							
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL Blows per foot -						
DESCRIPTION																			
0.2	551.8						Topsoil - 2"												
		4 9 15	10	1			Medium dense brown SILT (A-4b), little clay, trace to little fine sand, trace to little coarse sand, little gravel; dry to damp.												
3.0	548.8						Severely weathered brown SILTSTONE, arenaceous.												
		50/2	2	2															
4.5	547.3						Medium hard to hard gray SANDSTONE, fine to medium grained, moderately to slightly weathered, medium to thickly bedded, slightly fractured. @ 4.5'-4.7', brown. @ 4.9', 5.1', 5.2', 8.1', argillaceous, low angle fractures. @ 5.7'-8.1', qu=12,960 psi, Er=2,626,964 psi. @ 8.6'-8.8', high angle fracture, brown.												
		Core 30"	Rec 29"	RQD 87%	R-1														
10							Medium hard to hard gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, moderately weathered, medium bedded, highly to moderately fractured. @ 11.4', 11.9', 13.3', 13.6', argillaceous, low angle fractures. @ 12.1'-12.3', high angle fracture. @ 14.1'-14.5', qu=13,299 psi.												
		Core 60"	Rec 60"	RQD 97%	R-2														
10.7	541.1																		
		Core 30"	Rec 30"	RQD 80%	R-3														
14.5	537.3						Bottom of Boring - 14.5'												
15																			
20																			
25																			
30																			

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 STRUCTURE FOUNDATION INVESTIGATION
 BRIDGE NO. SCI-823-0117
 SR823 OVER SR 140

SCI-823-0.00

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Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03															
LOG OF: Boring C-40		Location: Sta. 62+05.9, 88.4 ft. LT of SR 823 CL		Date Drilled: 9/20/06															
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive Press / Core	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 0.0' (includes drilling water)	GRADATION					STANDARD PENETRATION (N)							
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL	Blows per foot - 10 20 30 40					
0	550.7																		
1.0	549.7	4	3	1															
3.0	547.7	4	9																
5		Core 60"	Rec 60"	RQD 95%	R-1														
10		Core 60"	Rec 60"	RQD 92%	R-2														
13.0	537.7																		
Bottom of Boring - 13.0'																			

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03															
LOG OF: Boring TR-44		Location: Sta. 62+09.9, 32.7 ft. RT of SR 823 CL		Date Drilled: 02/02/05															
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive Press / Core	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: 5.0' (includes drilling water)	GRADATION					STANDARD PENETRATION (N)							
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL	Blows per foot - 10 20 30 40					
0	556.7																		
1.0	555.7	8	8	1	4.0														
3.0	553.7	9	16																
5		3	2	2															
5.5	551.2	3	3	3	2.25														
8.0	548.7	3	4	4															
10		28	50/3	8															
11.0	545.7																		
12.4	544.3																		
15		Core 108"	Rec 108"	RQD 73%	R-1														
20																			
25		Core 120"	Rec 116"	RQD 92%	R-2														
30.0	526.7																		
Bottom of Boring - 30.0'																			

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Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03												
LOG OF: Boring B-16		Location: Sta. 62+54.1, 26.5 ft. LT of SR 823 CL		Date Drilled: 9/19/06												
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive Press / Core	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION					STANDARD PENETRATION (N)				
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL Blows per foot - ○ ●			
DESCRIPTION																
0	558.8															
1.0	555.8	8		1	3.0	Portland Cement Concrete - 6"										
		4	12			Aggregate Base - 6"	4	1	6	65	24					
						Very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp to moist.										
3.0	553.8	3		2	3.25	Very stiff brown SILT (A-4b), little clay, trace fine to coarse sand; damp to moist.	0	1	7	73	19					
		4	15													
5	551.3	3		3	3.5	Very stiff mottled brown and gray CLAY (A-7-6), trace fine sand, trace gravel; damp to moist.	1	0	1	34	64					
		4	18			@ 8.0', little coarse sand.										
		5		4	3.5											
		7	16													
10	546.3	23		5	-	Severely weathered brown SANDSTONE, argillaceous.										
		50/5	10													
14.4	542.4	Core 60"	Rec 60"	RQD 23%	R-1	Medium hard brown SANDSTONE; fine to medium grained, highly weathered, broken. @ 13.2', highly fractured, clay/silt filled low angle fractures.										
15						Medium hard to hard gray SANDSTONE; fine to medium grained, moderately weathered, thinly bedded, highly fractured. @ 14.6', 14.9', 15.1', 15.4', 15.7', low angle, iron stained fractures. @ 17.5', 17.7', 17.9', low angle, clay filled fractures. @ 18.8', moderately fractured. @ 19.1'-19.5', qu=11,775 psi, Er=2,364,082 psi.										
20		Core 60"	Rec 59"	RQD 73%	R-2											
22.0	534.8					@ 21.6'-22.0', qu=13,040 psi.										
						Bottom of Boring - 22.0'										

Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03												
LOG OF: Boring B-17		Location: Sta. 62+86.7, 45.9 ft. RT of SR 823 CL		Date Drilled: 9/19/06												
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No. Drive Press / Core	Hand Penetrometer (tsf)	WATER OBSERVATIONS: Water seepage at: None Water level at completion: Not reported	GRADATION					STANDARD PENETRATION (N)				
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - PL ——— LL Blows per foot - ○ ●			
DESCRIPTION																
0	558.1															
0.4	557.7					Topsoil - 5"										
		1		1	2.0	Stiff to very stiff SILT (A-4b), trace fine sand, trace coarse sand, trace gravel; moist.	4	1	4	63	28					
		2	12													
3.0	555.1	4		2	-	Stiff brown SANDY SILT (A-4a), some fine to coarse sand, little clay, little gravel; damp.	18	12	12	45	13					
		5	18													
5		6		3	2.75											
		42	12													
7.0	551.1					Very stiff brown SILT (A-4b), little fine to coarse sand, trace to little gravel; damp.										
		6														
10.0	548.1	Core 60"	Rec 59"	RQD 37%	R-1	Medium hard brown SANDSTONE interbedded with SILTSTONE; very fine to fine grained, highly weathered, argillaceous, highly fractured to broken.										
						Medium hard to hard gray SANDSTONE; fine to medium grained, moderately weathered, thickly bedded, moderately to highly fractured. @ 11.5'-13.1', iron stained, high angle fractures. @ 14.6'-15.0', qu=12,292 psi, Er=2,406,830 psi.										
15																
16.0	542.1	Core 60"	Rec 59"	RQD 67%	R-2	Medium hard to hard gray SANDSTONE interbedded with SILTSTONE; very fine to fine grained, moderately weathered, medium bedded, highly fractured. @ 18.7', 18.9', 19.3', clay/silt filled low angle fractures. @ 19.6'-20.0', qu=12,114 psi.										
20.0	538.1					Bottom of Boring - 20.0'										

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Client: TranSystems, Inc.		Project: SCI-823-0.00		Job No. 0121-3070.03														
LOG OF: Boring TR-43		Location: Sta. 63+08.6, 2.9 ft. RT of SR 823 CL		Date Drilled: 02/03/05														
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery (in)	Sample No.	Hand Penetrometer (tsf)	DESCRIPTION	GRADATION					STANDARD PENETRATION (N)						
							% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	Natural Moisture Content, % - ● PL ——— LL Blows per foot - ○					
0.3	558.1					Topsail - 4"												
		2		1	2.25	Stiff to very stiff brown SILT AND CLAY (A-6a), trace fine sand; damp to moist.												
		3	15															
		2		2	1.75	@ 3.5-5.5', brown and gray.												
		2	16															
5	552.9					Stiff to very stiff brown and gray SILTY CLAY (A-6b), little fine sand, trace fine gravel; moist.												
		2		3	2.0													
		3	17															
		3		4	1.75													
		5	18															
10																		
		5		5		Severely weathered brown SANDSTONE, argillaceous.												
		8	14															
11.6	546.8																	
		15	10															
15.0	543.4					Medium hard gray SANDSTONE; very fine to fine grained, highly weathered, argillaceous, micaceous, massive, highly fractured, with typical low and high angle clay filled and rust stained fractures.												
		Core 120"	Rec 120"	RQD 78% R-1		@ 20.1'-20.4', ferric band. @ 20.5', argillaceous lamination.												
20																		
21.0	537.4					Medium hard to hard gray SANDSTONE; very fine to fine grained, slightly weathered, argillaceous, micaceous, massive, unfractured to slightly fractured.												
		Core 120"	Rec 120"	RQD 100% R-2														
25																		
30																		
35.0	523.4					Bottom of Boring - 35.0'												
40																		
45																		
50																		
55																		
60																		

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