# HISTORIC RECORDS

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

### **GEOLOGY**

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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.

SEVERAL SITE RECONNAISSANCE VISITS WERE MADE BETWEEN JUNE 2004 AND SEPTEMBER 2006. THE PROJECT AREA IS JUST NORTH OF THE OHIO RIVER AND IS WITHIN THE OHIO RIVER ROAD (CR 503) AND US 52 THE RIGHT OF WAY. THE ROCK CUT AT OHIO RIVER ROAD IS GENERALLY STABLE, WITH OCCASIONAL SMALL ROCK FALL EVENTS. THE GROUND COVER IN THE AREA IS MOWED GRASS WITH SMALL TREES AND BRUSH NEAR THE CULVERT INLETS AND ALONG THE SOUTH SIDE OF EASTBOUND US 52.

### SUBSURFACE EXPLORATION

THE FIELD EXPLORATION CONSISTED OF DRILLING A TOTAL OF ELEVEN STRUCTURE BORINGS FOR THE PROPOSED BRIDGE AND MSE WALLS. BORINGS B-48 THROUGH B-53 WERE DRILLED FOR THE CURRENTLY PROPOSED STRUCTURE, AS INDICATED ON THE STRUCTURE SITE PLAN. THESE BORINGS WERE DRILLED BETWEEN MAY 15 AND MAY 24, 2007. BORINGS TR-62, TR-64, TR-66, TR-71A AND TR-73A WERE DRILLED FOR A PREVIOUS DESIGN CONFIGURATION. BORINGS TR-62, TR-64 AND TR-66 WERE DRILLED BETWEEN MARCH 18 AND 30, 2005 AND BORINGS TR-71A AND TR-73A WERE DRILLED BETWEEN MARCH 18 AND 30, 2005 AND BORINGS IR-7/1A AND IR-7/3A WERE DRILLED BEIWEEN
JULY 27 AND 31, 2006 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**

AT THE GROUND SURFACE, BORINGS B-48, B-51, B-52, TR-64, TR-70A, TR-71A AND TR-73A ENCOUNTERED APPROXIMATELY 1 TO 10 INCHES OF TOPSOIL AND THE REMAINDER OF THE BORINGS, EXCEPT BORING B-53, ENCOUNTERED APPROXIMATELY 10 TO 12 INCHES OF ASPHALT PAVEMENT AND/OR 4 TO 6 INCHES OF AGGREGATE BASE. IN BORING B-53, FILL MATERIAL WAS ENCOUNTERED BETWEEN THE GROUND SURFACE AND A DEPTH OF

BELOW THE TOPSOIL, ASPHALT PAVEMENT, AGGREGATE BASE OR FILL MATERIAL, THE BORINGS GENERALLY ENCOUNTERED NATURAL COHESIVE SOILS INTERBEDDED WITH GRANULAR SOILS, EXCEPT BORINGS B-48 THROUGH B-50, WHERE 6.0 TO 7.2 FEET OF POSSIBLE FILL CONSISTING OF PRIMARILY OF SANDY SILT (A-4A) AND SILT (A-4B) WERE ENCOUNTERED. GENERALLY, THE NATURAL COHESIVE SOILS CONSISTED OF STIFF TO VERY STIFF SANDY SILT (A-4A), SOFT TO VERY STIFF SILT (A-4B), AND STIFF TO VERY STIFF SILT (ADD CLAY (A-6A) WHILE THE NATURAL GRANULAR SOILS CONSISTED OF MEDIUM DENSE GRAVEL WITH SAND AND SILT (A-2-4) AND MEDIUM DENSE TO VERY DENSE COARSE AND FINE SAND (A-3A) OCCASIONALLY MEDIUM DENSE GRAVEL WITH SAND (A-1-6) COARSE AND FINE SAND (A-3A). OCCASIONALLY, MEDIUM DENSE GRAVELWITH SAND (A-1-B) AND GRAVEL WITH SAND, SILT AND CLAY (A-2-6) WERE ALSO ENCOUNTERED. THE NATIVE SOIL EXTENDED TO DEPTHS RANGING BETWEEN APPROXIMATELY 3.5 AND 17.0 FEET BELOW THE GROUND SURFACE, WHERE BEDROCK WAS ENCOUNTERED. NOTE THAT BEDROCK WAS ENCOUNTERED BELOW FILLS AT A DEPTH OF 3.5 FEET IN BORING B-53.

IN THE AREA OF THE PROPOSED STRUCTURE, BEDROCK WAS ENCOUNTERED IN ALL BORINGS. SEVERELY WEATHERED, ARGILLACEOUS SANDSTONE WAS ENCOUNTERED IN ALL BORINGS ABOVE THE COMPETENT SANDSTONE. THE BEDROCK GENERALLY CONSISTED OF SOFT TO HARD, SLIGHTLY TO HIGHLY WEATHERED, ARGILLACEOUS SANDSTONE. THE AMOUNT OF ROCK RECOVERED IN EACH CORE RUN VARIED BETWEEN 87 AND 100 PERCENT. THE ROCK QUALITY DESIGNATION (ROD) OF T BEDROCK RANGED BETWEEN O AND 100 PERCENT WITH AN AVERAGE OF 56 PERCENT INDICATING FAIR ROCK QUALITY. GENERALLY, THE ROD VALUES WERE LOWER IN THE UPPER PORTION OF THE BEDROCK AND INCREASED AT GREATER DEPTHS.

SEEPAGE WAS OBSERVED IN BORINGS B-48 THROUGH B-51, TR-66, TR-70A, TR-71A, AND TR-73A. THERE WERE NO MEASURABLE WATER LEVELS IN ANY OF THE BORINGS PRIOR TO ROCK CORING EXCEPT BORING TR-66, WHERE GROUNDWATER WAS ENCOUNTERED AT A DEPTH OF 14.0 FEET.

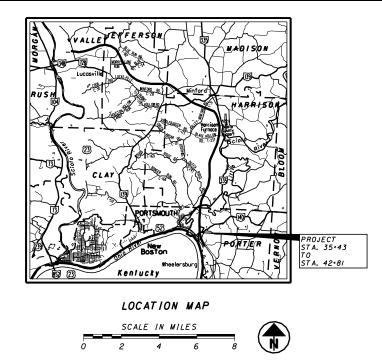
	LEGEND	ODOT	CLASSI	ILILD
-	CRIPTION	ODOT CLASS	MECH./\	
ြီးချို Grave	el with Sand (A-1-b)	A-1-b	2	2
Grave and S	el with Sand ilt (A-2-4)	A-2-4	3	6
Coars	se and Fine Sand (A-3a)	A-3a	1	4
Sandy	/ Silt (A-4a)	A-4a	5	9
*** Silt (	A-4b)	A-4b	8	8
Silt	and Clay (A-6a)	A-6a	5	2
		TOTAL	24	31
Sands	stone	VISUAL		
Weat	hered Sandstone	VISUAL		
Weat	hered Siltstone	VISUAL		
Tops	oil	VISUAL		
<b>-</b>	BORING LOCATION - PLAN VIEW			
	DRIVE SAMPLE AND/OR CORE BORING I PLOTTED TO VERTICAL SCALE ONLY	LOCATION		
w ——	INDICATES FREE WATER ELEVATION			
∇	INDICATES STATIC WATER ELEVATION			
——ТR	INDICATES THE TOP OF ROCK ELEVATI	ON		
X/Y/Z	FIGURES BESIDE THE BORING IN PROFIL INDICATE THE NUMBER OF BLOWS FOR SERVICE TO THE SERVICE THE SERVIC	STANDARD INCHES 6 INCHES		
50 (n)	INDICATES NUMBER OF BLOWS (50) TO BARREL SAMPLER A DEPTH OF (n) INCHE 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" Z.		m		mr 0.0		.005 mm
Boulders		Cobbles	Gravel	Coarse	Sand	Fine	Sand	Silt	Clay
			No. SIE	-	No. SIE		No. SIE	200 EVE	

RECON. -AMJ AND SJR 06/04 to 06/06

DW 03/18-30/05, 07/27-31/06, 05/15-24/07

DRAWN -RJH & AMJ 8/09 REVIEWED - AEN 8/21/09

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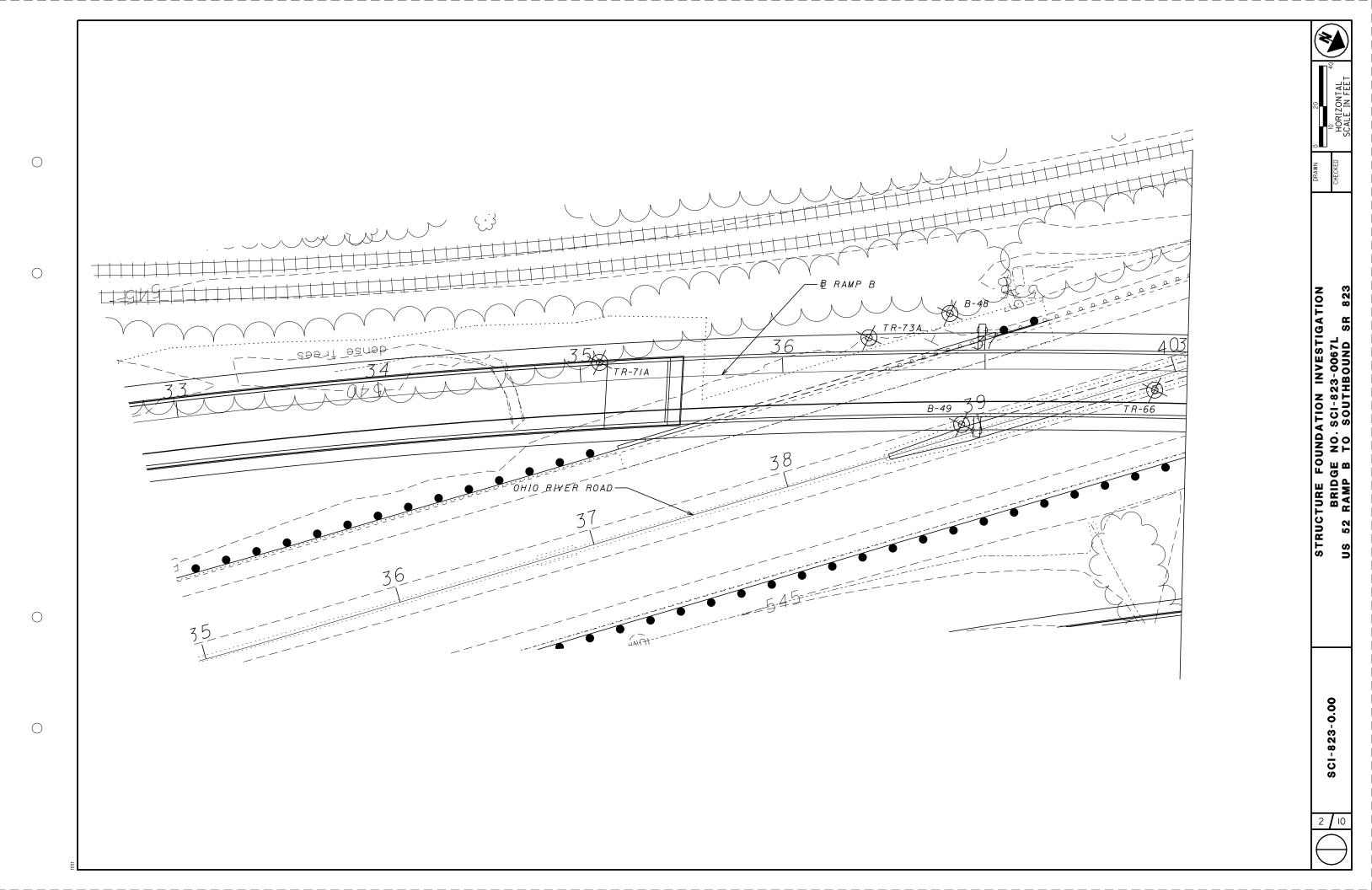
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FOUNDATION INVESTIGATIOGE NO. SCI-823-0067
ER OHIO RIVER ROAD AND

STRUCTURE

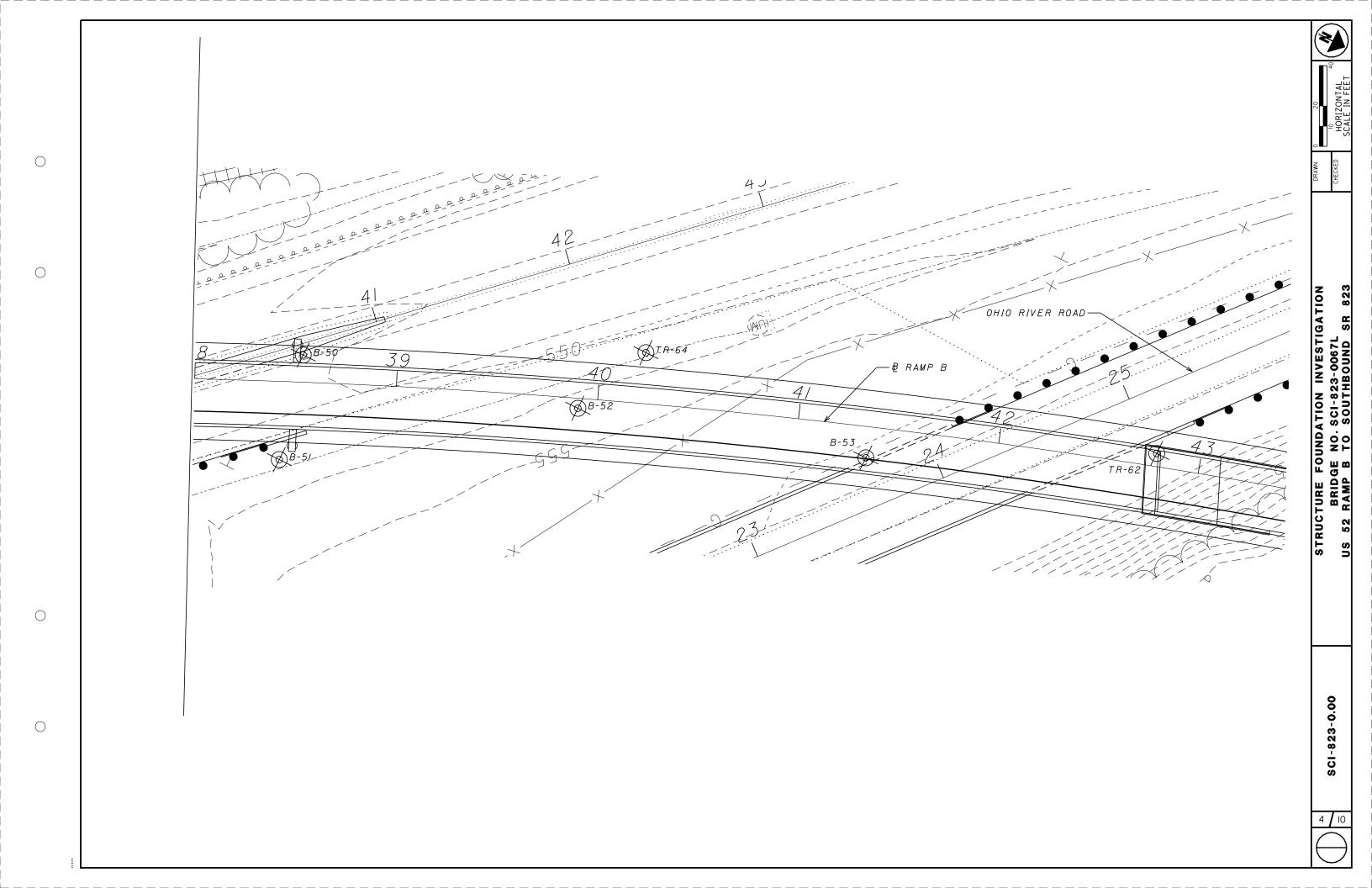
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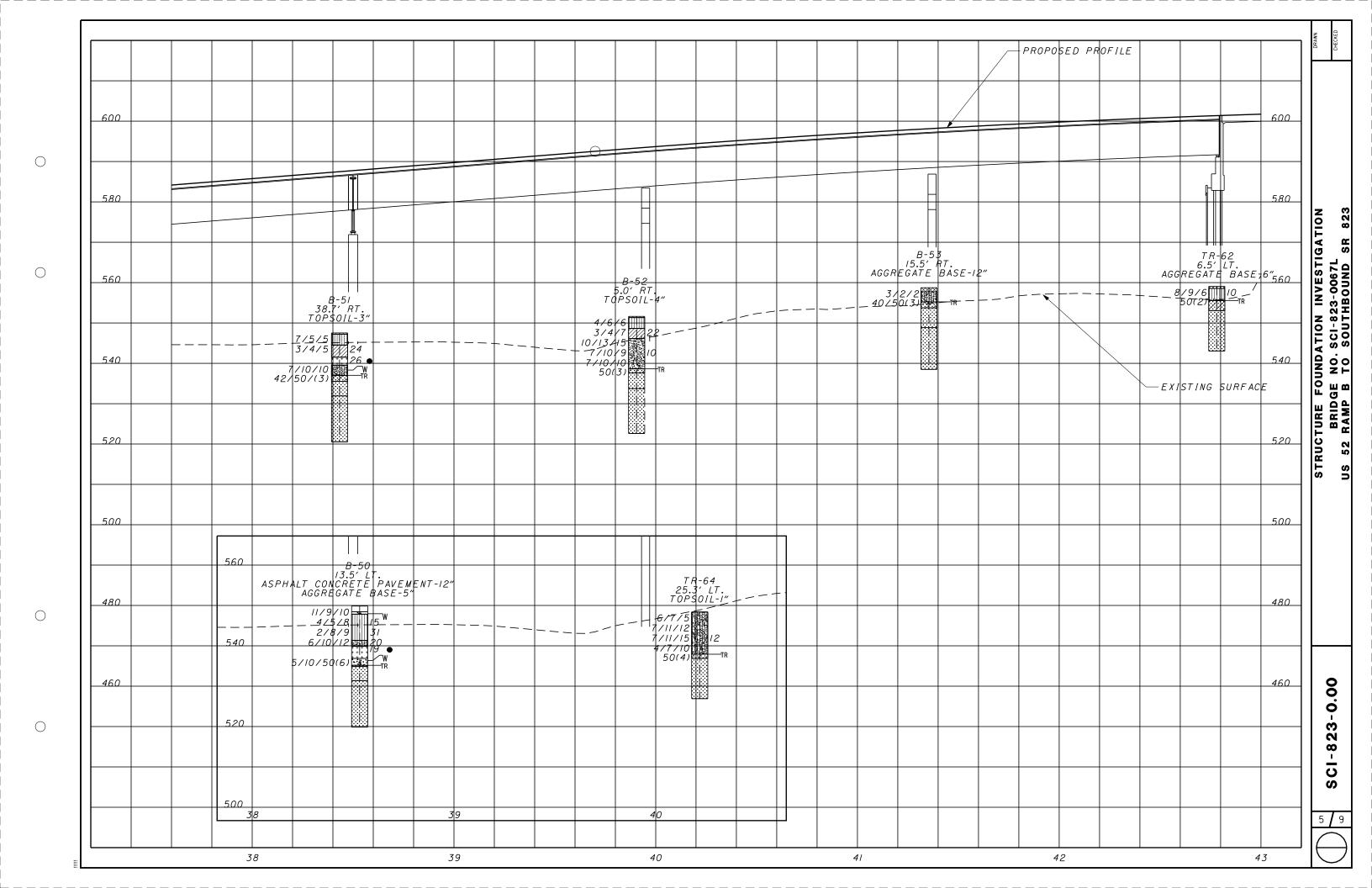


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lient: T					٦.		Project: SCI-823-0.00	-14 - 16	_						٠.	OD I	10.	0121	-307	0.03	—
OG OF:	Boring	_	B-48	Sam	_	_ocation: Sta	. 36+82.8, 27.7 ft. LT of US 52 Ramp B BL Date Drilled: 0	5/15/0 T		3PA	DATI	ON	_				_	_	_	_	—
				No.		Hand	OBSERVATIONS: Water seepage at: 8.5'-10.0'	H	Ī												
		<b>.</b>	Ē		١.	Penetro- meter	Water level at completion: 3.8' (includes drilling water)	۰							STA	NDA	ARD	PEN	IETR/	ATIO	)N (I
Depth	Elev.	ed	Ě		[ទី			8	Sand	Sand	Sand							Con	ntent,		
(ft)	(ft)	Blows	Recovery	Drive	Press / Core	(tsf)	DESCRIPTION	% Aggregate	ပ္ပ	N.S	F. S.	Silt	Say			⊢— Iows		foot		<b>-</b>	
0.1=	542.5	ă	Re	Ĭ <u>E</u>	Ē			<u> 8</u>	8		%	%	š		10		20		30		40
-0.1 —	542.4-						Topsoil - 1" POSSIBLE FILL: Stiff brown and black SANDY SILT (A-	4						Ш		Ш				Ш	117
		2 2		1		1.5	4a), trace fine to coarse sand; slightly organic;	1						Ш		Ш			Ш	Ш	111
-3.0	-539.5 -	<u>2</u>	15				contains roots; moist to wet.	1						Ф		Ш			Ш	Ш	Ш
-3.0	F338.5 -	<b>-</b>					POSSIBLE FILL: Medium stiff brown SILT (A-4b), little	7	l					ИТ		Ш			Ш	Ш	Ш
	1	1 WO	1 18	2		0.75	to some clay, trace gravel; moist.	7	3	-	5	68	18	411		Ш	ΙΉ	<b>•</b>	Ш	Ш	
5 —	1							1					1	Y		Ш			Ш	Ш	
_					ST-	1		1						Ш		Ш			Ш	Ш	
-7.0	-535.5 -	1			1		Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4);	†۱	7	-	8	63	21	Ш		Ш			Ш	Ш	
-				Ц	⊢	1	moist.	1						Ш	M	Ш			Ш	Ш	
-		2 3		3				57	10	_	7	2	,	Ш						lon-F	Plas
10 —		10	16					1						Ш		14	Щ	Ш	Ш	Ш	
-11.0 — -11.5 —	531.5	50/5	5	4			Severely weathered gray SILTSTONE.	┨						Ш		Ш			111	╫	₩,
-11.5 —	F331.0-	Core	Rec	POD	]		Medium hard brown SANDSTONE; very fine to fine	1						Ш		Ш				Ш	П,
-		30"	30"	RQD 0%	R-1		grained, moderately to highly weathered,	1						Ш		Ш			Ш	Ш	
-14.1	528.4 -				ł		carbonaceous, argillaceous, broken.	4						Ш		Ш				Ш	Ш
15.— 15.4	-527.1 -						Soft to medium hard gray SANDSTONE; very fine to fine grained, highly weathered to decomposed,	1						Ш		Ш			Ш	Ш	Ш
-15.4 —	027.1-	Core	Rec	ROD			\argillaceous, broken.	┚						Ш		Ш			Ш	Ш	
-16.8	-525.7 -	60"	60"	RQD 74%	R-2		Medium hard brown SANDSTONE; very fine to fine	1						Ш		Ш			Ш	Ш	Ш
_							grained, moderately to highly weathered, argillaceous, pyritic, highly fractured.	1						Ш		Ш			Ш	Ш	
_							@ 16.0', 16.3', 16.6', clay filled fractures.	1						Ш		Ш			Ш	Ш	
20 —							Medium hard gray SANDSTONE; very fine to fine	1						Ш		Ш			Ш	Ш	
20							grained, moderately weathered, highly fractured.  @ 17.1', 17.6', 18.7', high angle fractures.  @ 18.2', qu=13,427 psi.  @ 19.0', moderately to highly fractured, slightly	1						Ш		Ш			Ш	Ш	
	1						@ 18.2', qu=13,427 psi.   @ 19.0', moderately to highly fractured, slightly	1						Ш		Ш			Ш	Ш	
_							weathered.	1						Ш		Ш			Ш	Ш	
_	İ	Core	Rec	ROD	L			1						Ш		Ш			Ш	Ш	
_		120"	120"	RQD 100%	R-3			1						Ш		Ш			Ш	Ш	
25 —	i							1						Ш		Ш			Ш	Ш	
-							@ 26.4', qu=10,833 psi, Er=3,614,000 psi.							Ш	Ш	Ш			Ш		Ш
-														Ш	Ш	Ш			Ш		Ш
-	1							1							Ш				Ш		Ш
29.0 —	513.5 -	-			$\vdash$		Bottom of Boring - 29.0'	4	1					Ш	Ш	Ш			$H^{\prime}$	$\prod$	Ш

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Client:	TranSyst	ems, Inc					Project: SCI-823-0.00										Job	No.	01	21-3	070.0	03		]
LOG OF	: Boring		B-49			Location: Sta	. 36+88.1, 27.3 ft. RT of US 52 Ramp B BL Date Drilled:	05/2	23/07															]
				Sam No		Hand	WATER OBSERVATIONS: Water seepage at: 13.9'-14.1'	ŀ		•	BRAI	DAT	ION											
			Ē		e	Penetro- meter	Water level at completion: 3.8' (includes drilling water)		<b>æ</b>	_	_	_			١.						TRAT		(N)	
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	    •	Press / Core	(tsf)	DESCRIPTION		% Aggregate	C. Sand	A. Sand	F. Sand	Sii.	% Clay	N	PL					nt, %	ᄔ	•	
_ o_	549.1	욻	ž	Pie	윤			_	%	%	.W.	%	%	%	Ļ	1		/s pe		ot - 30		40	<u> </u>	
	-547.8 -	9					Asphalt Concrete Pavement - 12" Aggregate Base - 4"								Ш			Ш		Ш	Ш			ı
-2.0	-547.1 -	6 9	18	搶		4.0	POSSIBLE FILL: Medium dense brown COARSE AND FINE SAND (A-3a), trace to little gravel; damp.										Į,			Ш				
-		5 5		2		4.0	POSSIBLE FILL: Very stiff to hard gray SANDY SILT (A- 4a), some fine to coarse sand, trace gravel; contains		3	3	_	27	44	23			M.		Щ					
5—	l	7	18				rock fragments; damp .								Ш		Ø	Ш		Ш				
-6.0	-543.1 -				ST-	4.0	POSSIBLE FILL: Very stiff to hard gray SILT (A-4b), little fine to coarse sand, trace gravel; damp.		4	7	_	9	64	16		V			, Щ					
<b>—8.5</b> —	540.6	w					Soft to medium stiff brown and gray SILT (A-4b),								Ш	11		Ш		Ш				
10 —		<sup></sup> он	14	3		0.5	little to some fine sand, trace gravel; little clay; contains roots; damp to moist.								M					Ш				
-		WOH 1	16	4		0.5									$\bigvee$									
	-535.6 -														M	$\dagger$	+	$\!$	$\prod$					
—14.5 <i>—</i> —15.0—	534.6 - 534.1 -	19 50/3	15	5			Very dense brown COARSE AND FINE SAND (A-3a), little silty clay, little gravel; contains rock fragments; addamp.														11	#	50÷	$\epsilon$
-	-	Core 24"	Rec 23"	RQE 0%	R-1		Severely weathered brown SANDSTONE.								Ш			Ш		Ш		Ш		1
-		Core	Rec	RQE			Medium hard brown SANDSTONE; very fine to fine grained, highly weathered, argillaceous, highly fractured to broken; contains clay filled low angle fractures.																	
—19.9 <i>—</i> -	-529.2 -	60"	60"	26%	R-2		Medium hard gray SANDSTONE; very fine to fine grained, slightly weathered, slightly argillaceous, moderately to highly fractured.																	
-				DCT			@ 20.2-20.8', decomposed argillaceous zone, broken. @ 21.3', qu=11,938 psi. @ 23.5', moderately fractured.																	
25 — -		Core 60"	Rec 60"	RQE 80%	'R-3		@ 25.5'-26.2', high angle fractures.																	
-		Core 36"	Rec 36"	RQE 100%	R-4		@ 27.6', qu=12,784 psi, Er=4,772,258 psi.													$\  \ $				
30.0	519.1						Bottom of Boring - 30.0'								Ш		Ш				Ш	Ш	Ш	J

STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO. SCI-823-0067L US 52 RAMP B TO SOUTHBOUND SR 823

SCI-823-0.00



Client:	FranSyste	ems, Inc			_		Project: SCI-823-0.00									Jo	b No	o. <b>O</b> 1	121-3	3070.0	03	
LOG OF:	Boring		B-50			ocation: Sta	. 38+53.3, 13.5 ft. LT of US 52 Ramp B BL Date Drilled	05/23	3/07					_								
			(	Sam No	ple	Hand Penetro-	WATER OBSERVATIONS: Water seepage at: 1.9'-2.0', 13.5'-14.7' Water level at completion: 8.1' (includes drilling water)	ŀ	T	G	RAL	DATIO	ON	1		STAN	NDAF	RD P	ENE	TRAT	TION (	(N)
Depth	Elev.	r6"	(in) /		8	meter	valor over at composition. C.1 (meaded animing water)	- 1	<b>e</b>	ᅵ	ᆔ	ē		-	Na	tural N	<b>Moist</b>	ure (	Conte	ent. %	, -	•
(ft)	(ft) 549.9	Blows per	Recovery	Drive	Press / Core	(tsf)	DESCRIPTION		₹1	% C. Sand	Σ	% F. Sand	% Silt	% Clay		PL H Blo 10	ws p	er fo	ot -	$\subset$	LL 40	_
"_							Asphalt Concrete Pavement - 12" Aggregate Base - 5"		1						Ш	Ш	П	Ш	$\prod$	ПП	Ш	
—1.4 — —2.0 —	-548.5 - -547.9 -	11 <sub>9</sub> 10	18	1			POSSIBLE FILL: Medium dense brown (A-3a), little gravel; damp.											)				
5 —		4 5 8	18	2		4.0	POSSIBLE FILL: Very stiff to hard mottled brown and gray SANDY SILT (A-4a), little fine to coarse sand, trace to little gravel; damp. ② 3.5"-6.0", gray.		9	17	-	10	43	21			∦	Н	┪			
-		2 8 9	18	3		4.5	@ 6.0'-8.5', brown, contains rock fragments.										4			•		
—8.5 — —10.0—	-541.4 - -539.9 -	6 10 12	18	4			Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), little fine to coarse sand, little slit; damp.															
-	-000.0				ST- 1	1.0	Medium stiff to stiff brown SILT (A-4b), some fine to coarse sand, little clay; moist.		٥	4	-	29	51	16			╟					
	-536.9 -	5 10 50/6	18	5A 5B			Very dense brown COARSE AND FINE SAND (A-3a), little silt, little gravel; moist to wet.															$\left  \left  \right  \right $
<b>⊏15:</b> 3=	535.2 534.9 7	Core	Rec	RQE			Severely weathered brown SANDSTONE.  Medium hard brown SANDSTONE; very fine to fine	$\dashv$						-	Ш		Ш	Ш				<b>50+</b> [0
-		24"	22"	0%	/R-1		grained, moderately to highly weathered, broken, contains iron staining.															
-18.5 20	-531.4 -	Core 60"	Rec 60"	RQI 15%	R-2		Medium hard gray SANDSTONE; very fine to fine grained, moderately weathered, slightly argillaceous, highly fractured. @ 19.9-20.3', argillaceous zone, highly weathered. @ 20.6', 21.2', argillaceous zones, low angle fractures.															
25 —		Core 60"	Rec 60"	RQI 93%	R-3		@ 22.9', moderately fractured.															
30.0	519.9	Core 36"	Rec 35"	RQI 97%	R-4		@25.9', qu=7,575 psi, Er=2,524,923 psi.  Bottom of Boring - 30.0'															

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Client: T	ranSyst	ems, Inc			Ţ		Project: SCI-823-0.00								Joh	No.	012	1-307	′0.03	
LOG OF:	Boring		B-51		_	ocation: Sta	. 38+43.3, 38.7 ft. RT of US 52 Ramp B BL Date Drilled: 05	/16/0												
				Sam No		Hand	WATER OBSERVATIONS: Water seepage at: 9.2'		Г	FAI	DATI	ON	П							
			E		۰	Penetro- meter	Water level at completion: 7.5' (includes drilling water)	٩					ΙI		STAN					N (N)
Depth	Elev.	De C	<u></u>		ঠ	(tsf)		ege.	and	Sand	Sand		$ $		tural M PL ⊢		re Co	ntent.	,% - ⊣ L	. •
(ft)	(ft)	Blows per	Recovery	Drive	Press / Core	(isi)	DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F. S	Silt	Clay		Blov	vs pe	r foot		$\circ$	
_0.9=	547.5 -547.2 -		<u> </u>	╫≏	1		Topsoil - 3"	*	8	*	*	%	8	Ш	10 	711	т	30 TTT	пт⁴	ю ППП
-		7_		╽.			Very stiff brown SANDY SILT (A-4a), little clay,	1					H	Ш		Ш		Ш	Ш	
-		5	16	1		2.5	trace gravel; damp.						ΙI	Ш	Ш	Ш		Ш	Ш	
-3.0	-544.5 -			Ш			Very stiff brown SILT AND CLAY (A-6a), trace fine	1					ΙI	Ш	Ш	Ш		Ш	Ш	
5_		3 4 5	18	2		2.5	sand; moist.	0	0	-	3	70	27		ДП	╢	╬	₩	Ш	
•	-541.5 -							4						Ш	Ш	Ш		Ш	Ш	
-					ST-	2.5	Very stiff brown SILT (A-4b), little clay, trace fine sand; moist to wet.	0	0	_	8	76	16	Ш	$\Pi N$	Ш	╬	,	Ш	
<b>-8.0</b>	-539.5			Ш	Ė		Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4),	┨						Ш		Ш		Ш	Ш	
10 —		7 10 10	18	3			little clay; damp.													
-10.5	-537.0 -	42					Severely weathered brown SANDSTONE.	1						Ш			$\prod$	₩	Щ	
-12.0	-535.5 -	42 50/3	9	4	4		Medium hard brown SANDSTONE; very fine to fine	4					ΙI	Ш		Ш		Ш	$   ^{}$	50
15 —		Core 30"	Rec 30"	RQI 0%	R-1		grained, highly weathered, micaceous, broken.  @ 12.7'-15.6', iron staining, gray, highly fractured.													
	-531.9						Medium hard gray SANDSTONE; very fine to fine	-						Ш		Ш		Ш	Ш	
-		Core 60"	Rec 60"	RQE 81%	R-2		grained, moderately weathered, argillaceous, highly fractured.													
							@ 18.1', qu=12,065 psi. @ 18.2'-18.8', contains argillaceous fractures.						ΙI	Ш		Ш		Ш	Ш	
20				-	-		@ 19.5', moderately to highly fractured, slightly						ΙI	Ш		Ш		Ш	Ш	
~							weathered.						ΙI	Ш		Ш		Ш	Ш	
							@ 21.3', qu=7,605 psi, Er=3,710,318 psi.						ΙI	Ш		Ш		Ш	Ш	
_		Core	Rec 90"	RQE	R-3									Ш		Ш		Ш	Ш	
-		90"	90"	96%	, I ~~								ΙI	Ш		Ш		Ш	Ш	
25 —																				
	-520.5 -																			
-							Bottom of Boring - 27.0'													
-																				
30				Ш	_			1	L					Ш	Ш	Ш	Ш	Ш	Ш	Ш

STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO. SCI-823-0067L US 52 RAMP B TO SOUTHBOUND SR 823

SCI-823-0.00

00.05	TranSyst				٦.		Project: SCI-823-0.00	F 14 0 "									. 012			_
UG OF:	Boring		B-52	Samp	_	ocation: Sta	. 39+90.5, 5.0 ft. RT of US 52 Ramp B BL Date Drilled: 0	5/16/0		GRA	DAT	ION	_			—	—	—	—	_
				No.		Hand	OBSERVATIONS: Water seepage at: None	H	T	T		J.1	П							
Depth (ft)	Elev.	per 6"	ery (in)		Press / Core	Penetro- meter (tsf)	Water level at completion: 5.5' (includes drilling water)	% Aggregate	Sand	Sand	and			Na	STAN atural N	Moistu		NETR ontent,		
` '	(ft) 551.6	Blows	Recovery	Drive	Press	(tsi)	DESCRIPTION	% Agg	% C. S	% M. S	% F. Sand	% Silt	% Clay		. –	ws pe	er foot	t - 30	<b>0</b>	
-0.3 —	551.3	<b>1</b>					Topsoil - 4" Hard brown SANDY SILT (A-4a), little to some clay;	-						Ш			Ш	Ш		Ш
-	-	<sup>4</sup> 6	12	1		4.5+	contains rock fragments; dry to damp.													
-3.0	548.6	3					Hard brown SILT AND CLAY (A-6a), trace fine to coarse	1						Ш			Ш	Ш		Ш
5 —		<sup>3</sup> 4 <sub>7</sub>	18	2		4.25	sand; moist.	٥	1	-	4	62	34	Ш	IA	+	<b> </b>	$\dagger \dagger$		Ш
-5.5	546.1	10					Medium dense brown GRAVEL WITH SAND (A-1-b), trace to	1						Ш		Ш	iIII	Ш		Ш
-		13 15	17	3			little clay; damp.													
_		7 10	40	4				57	12	-	18	1.					И	,	Non-F	las
10 —	1	9	18				Ø 40 €L 1941a o 14							Ш			įΠ	Ш		Ш
_		7 10 10	18	5			@ 10.5', little silt.													
-13.0 —	538.6	-					Severely weathered brownish gray SANDSTONE.	4						Ш		4	711	₩	Ш	Ш
14.0 —	537.6	50/3	3	. 6			Medium hard brown SANDSTONE; very fine to fine	-						Ш				Ш		1
15 — -		Core 60"	Rec 60"	RQD 30%	R-1		grained, moderately to highly weathered, argillaceous, highly fractured to broken, contains iron stained, fractured.													
-17.9	533.7						M. F. a bank as CANDOTONE as South Sta							Ш			1111			
_	1						Medium hard gray SANDSTONE; very fine to fine grained, slightly to moderately weathered,													
20 —							argillaceous, moderately to highly fractured. ② 19.5', qu=11,770 psi, Er=4,965,071 psi. ② 20.3'-20.8', argillaceous zone.													
- 25 —	-	Core 120"	Rec 120"	RQD 90%	R-2		@ 24.2', qu=11,230 psi.													
-	-522.6																			
29.0 — 30	T <sup>322.6</sup> .						Bottom of Boring - 29.0'	1		l							Ш		!	Ш

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Client: T		ems, Inc			_		Project: SCI-823-0.00										Jo	ob N	lo.	012	1-30	70.0	3		
LOG OF:	Boring		TR-62			ocation: Sta	. 42+78.1, 6.5 ft. LT of US 52 Ramp B BL Date Drilled:	3/18/	05	_					_										_
				Sam No	ple	Hand	WATER OBSERVATIONS: Water seepage at: None	ŀ	Т	G	RAD	DATI	ON												
		19	(ii)		e	Penetro- meter	Water level at completion: None (prior to coring) 1.9' (includes drilling water)	.	<u>e</u>	_	_				١.						VETE		ON	(N)	
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Drive	Press / Core	(tsf)	DESCRIPTION		% Aggregate	% C. Sand	M. San	% F. Sand	% Silt	% Clay			L	<u>—</u>		foot	nten	, 76   	- ш		•
.0-	559.1	꾧	8	ă	Ę.			;	<u> </u>	š.	~	%	%	%	<b> </b>	_	10	TT	20		30	$\overline{\mathbf{T}}$	40	_	_
-0.5 - -	-558.6 -	8 9 6	14	1		3.5	Aggregate base - 6"  Very stiff gray SANDY SILT (A-4a), little gravel, little clay; contains sandstone fragments; damp.	7	17	15	-	6	46	16			lack		H	$\frac{\parallel}{\parallel}$					
_3.5	-555.6 -	50/2	2	2			Severely weathered gray SANDSTONE.													$\dagger$	$\left  \cdot \right $	$\parallel$	$\frac{1}{1}$	50	7
5 — -6.0 —	-553.1 -						Hard gray SANDSTONE; very fine to fine grained,																		ı
-							slightly weathered, argillaceous, micaceous, thinly bedded, slightly fractured.																		l
10 —							@ 9.3', qu = 10,794 psi.																		
-		Core 120"	Rec 120"	78%	R-1		@ 11.2'-11.3', high angle fracture.																		
-																									
15 — -16.0 —	-543.1 -						Bottom of Boring - 16.0'																		ì
-							Bottom of Boring - 18.0																		
20 —																									
-																									
-																									
25 —																									
7															$\  \ $										
<del>-</del>																									

STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO. SCI-823-0067L US 52 RAMP B TO SOUTHBOUND SR 823

SCI-823-0.00

OG OF:	ranSyste Boring		TR-64		٦ı	ocation: Sta	Project: SCI-823-0.00   Date Drilled:   40+21.8, 25.3 ft. LT of US 52 Ramp B BL   Date Drilled:	3/30/0!	5										1-307		_
				Sam No	ple		WATER OBSERVATIONS:	L		3RA	DATI	ON									_
Depth	Elev.	per 6"	ery (in)	No		Hand Penetro- meter	Water level at completion: 0.0' (inside hollowstern augers)	regate	and	and	and			Na	ntura		istur		NETR/	% -	
(ft)	(ft) 548.4	Blows per	Recovery	Drive	Press / Core	(tsf)	DESCRIPTION	% Aggregate	% C. Sand	% M. S	% F. Sand	% Silt	% Clay			3low:		foot			.L 10
-0.1 <i>-</i> - -		6 7 5	14	1			\tag{Topsoil - 1"}  Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4),  trace clay; contains sandstone fragments; damp to  moist.	1													
- 5 —		7 11 12	16	2														<i>t</i> 0			
-		7 11 15	17	3				21	19	-	25	28	7			$lack {\mid \mid}$				lon-F	Plast
10 — 10.5 —	E27 C	4 7 10	16	4																	
_	-536.9 -	50/4	2	5			Severely weathered brown SANDSTONE.											Ш	$\uparrow \uparrow \uparrow$	╫	Щ
15 —		Core 120"	Rec 118"	RQD 11%	R1		Hard brown and gray SANDSTONE; very fine to fine grained, moderately to highly weathered, thickly bedded to massive, highly fractured.  ② 15.3', clay seam  ② 15.7', gray.														
20 —	500.0						@ 19.5', qu = 12,706 psi.														
-21.5 — - -	-526.9 -						Bottom of Boring - 21.5'														
25 — - -																					
-																					

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Client: T	ranSyste	ms, Inc			_		Project: SCI-823-0.00									Job	No.	012	1-30	70.03		_
LOG OF:	Boring		TR-71A			ocation: Sta.	35+09.8, 9.1 ft. LT of US 52 Ramp B BL Date Drilled: 07	/31/0		-				_								_
				Sam No		Hand	WATER OBSERVATIONS: Water seepage at: 9.5'-12.5'	H	Γ	3RA	DAT	ION										
			(ii)		ø	Penetro- meter	Water level at completion: None (prior to coring) 3.3' (includes drilling water)	۾ ا													ON (N)	)
Depth (ft)	Elev. (ft)	per (	ery		3	(tsf)	<b>,</b>	<u>6</u>	and	and	Sand		_	N		alM≪ .⊢	oistu	re Co	ntent	,%. —⊢I	. •	•
,,	542.8	Blows per 6"	Recovery	Drive	Press / Core	(131)	DESCRIPTION	% Aggregate	% C. Sand	% W.	% F. S	l 🗷	% Clay			Blow	/s pe	r foot	30	$\bigcirc$	 40	
_0.5 _	-542.3 -						Topsoil - 6"	Ť	Ť	Ť	Ť	۲	Ť	Ш	ПΪ	ĬΠ	ΠĨ	Ш	ТЙ	Ш	ĬΠ	Π
-		4 5 4	15	1		2.25	Stiff to very stiff brown SANDY SILT (A-4a); damp to moist.								d							
		3 7		2			@ 3.0', mottled brown and gray.	١,				١.				$\mathbb{N}$		Ш	Ш	Ш		
5 —		10	16	2		2.25		°	1	-	8	9	1				Þ	Ш				
-		3 5 8	18	3		3.0																
-		2 3 8	18	4		_		14	8	_	23	42	13			$\int$	•	Ш				
10 —		- 0					@ 10.5', moist to wet.							Ш	Ш	$\mathbb{H}$		Ш	Ш	Ш	Ш	П
-		1 4 5	18	5		_									d							
-13.5 -13.5	-529.3 -	50/3	_	6			Severely weathered brown SANDSTONE.	1						Ш	Ш		Ш	111	†††	₩	Щ,	$\prod$
15 —	-020.9		2				Medium hard brown SANDSTONE; fine to medium grained, moderately to highly weathered, broken, contains argillaceous seams.														) au	
-							@ 16.7', high angle fracture. @ 16.9', highly fractured.															
	522 O	Core 120"	Rec 110"	RQE 49%	R-1																	
-							Hard gray SANDSTONE; fine to medium grained, slightly to moderately weathered, pyritic (halos), micaceous, thickly bedded to massive, highly to moderately fractured.  @ 21.6', qu = 10,209 psi.															
	-518.9 -						Bottom of Boring - 23.9'	1														
25 —																						
-																						$\ $
-																						$\ $
30_								L						Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	$\prod$

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. SCI-823-0067L
US 52 RAMP B TO SOUTHBOUND SR 823

SCI-823-0.00

Client: T	ranSyste	ms, Inc.					Project: SCI-823-0.00									Job	No.	01	21-3	070.0	3		1
LOG OF:	Boring		TR-73A			Location: Sta.	36+42.9, 16.2 ft. LT of US 52 Ramp B BL Date Drilled: 07/	27/0															
				Samı No.	ple		WATER OBSERVATIONS:	L	G	RAE	DATI	ON											ı
			_	T	Г	Hand Penetro-	Water seepage at: 7.3'-7.4', 11.0'-12.0'  Water level at completion: None (prior to coring)								ST	ANE	DAR	D PE	NET	RATI	ON (	(N)	
Donth	Elev	<u>ق</u>	Ē		g	meter	1.6' (includes drilling water)	욡	P	٠	-			Na	atura	al Mo	oistu	re Co	onter	nt, %	_	•	ı
Depth (ft)	Elev. (ft)	Blows per 6"	Recovery		Press / Core	(tsf)		Beg	San	San	Sand	ᅟᆂ	8		PL	-					ш	•	ı
_	544.8	Blow	Sec.	Drive	<u>\$</u>		DESCRIPTION	% Aggregate	% C. Sand	% M. Sand	% F.	% Silt	% Clay		10			r foo 0	t - 31	, (	) 40		ı
_0.5 _	-544.3 -						Topsoil - 6"								Ш			Ш	Ш	Ш	П	Ш	1
		4 4		1			Stiff to very stiff brown SILT AND CLAY (A-6a), trace fine to coarse sand, trace gravel; damp to moist.	1	1	_	4	61	33		Ш		Ш	Ш	Ш	Щ			
3.0	-541.8 -	5	16	•			This is sound surface graver, surface to those								þ			ПΙ	Ш				
3.U	-041.6 -	4					Stiff brown SILT (A-4b), some clay, trace fine to	1							}	M			Ш	Ш			
5 —		<sup>7</sup> 6	18	2		2.0	coarse sand, trace gravel; moist.	1	1	-	7	67	24		Ш	H		H	ĦΙ	Ш			
_															Ш	M			Ш	Ш			
_		4 4		3		1.5									Ш	И				Ш			
_		8	18	1											Ш	φ			Ш	Ш			
_		3 5		4		1.5									Ш	/11			Ш	Ш			
10 —		<sup>3</sup> 4	18	1		1.5									Ш				Ш	Ш			
—10.5 —	-534.3 -	5					Medium dense brown GRAVEL WITH SAND AND SILT (A-2-4);	1							$\prod$	$\mathbb{N}$	$\prod$		Ш	Ш			
—12.0 —	-532.8 -	ĕ <sub>19</sub>	18	5A 5B			damp to moist.  Severely weathered brown SANDSTONE.	28	15	-	27	22	8		Ш	•	H	H	Ш	Ш			
_				1			Severely weathered brown SANDSTONE.								Ш				P	₩	$\prod$		
—13.9 <del>—</del>	-530.9 -	50/3	\_3	_6_	1		Medium hard brown SANDSTONE; fine grained, highly	1							Ш				Ш	Ш	$\prod$	<b>50</b> +	C
15							weathered, micaceous, thickly bedded, broken,								Ш				Ш	Ш	Ш		
-							contains clay filled seams.  @ 16.3'-17.9', argillaceous.								Ш				Ш	Ш			
-							ي ان.٥-۱۱.۶, algillaceous.								Ш				Ш	Ш			
_		Core	Rec	POD	J										Ш				Ш	Ш			
—19.2 —	-525.6 -	120"	107"	RQD 55%	R-1		Hard gray SANDSTONE; fine grained, slightly	┨							Ш				Ш	Ш			
20 —							weathered, thickly bedded to massive, slightly								Ш				Ш	Ш			
_							fractured. @ 19.2'-19.6', qu = 11,260 psi.								Ш				Ш	Ш			
_															Ш				Ш	Ш			
	E20.0				L												Ш						
—23.9 — 25 —	-320.8 -						Bottom of Boring - 23.9'										Ш						
25 —																	Ш						
																	Ш						
																	Ш						
																	Ш						
30																	Ш		Ш			Ш	

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STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO. SCI-823-0067L US 52 RAMP B TO SOUTHBOUND SR 823

SCI-823-0.00