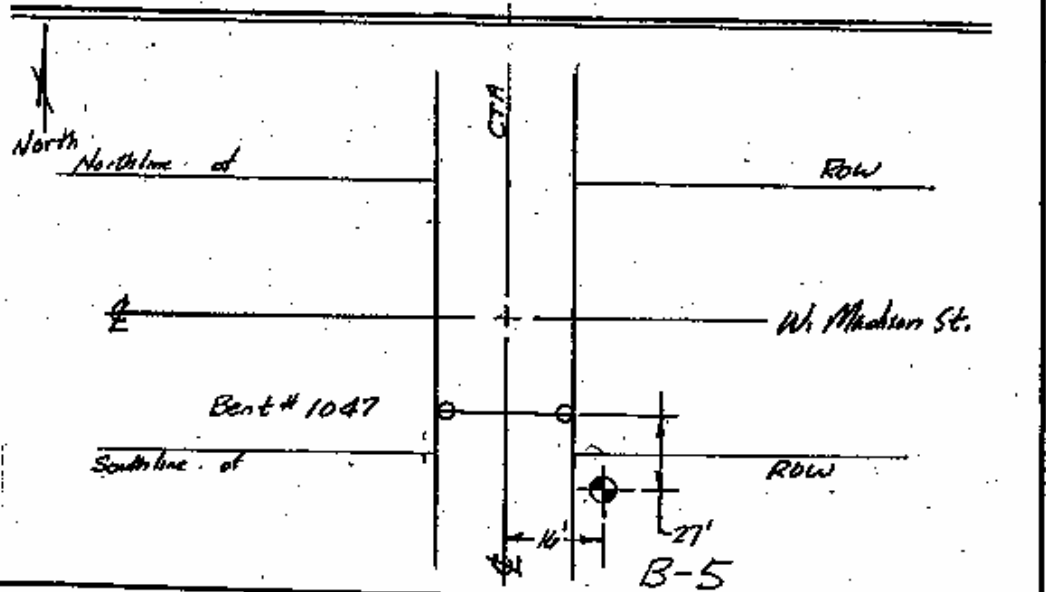
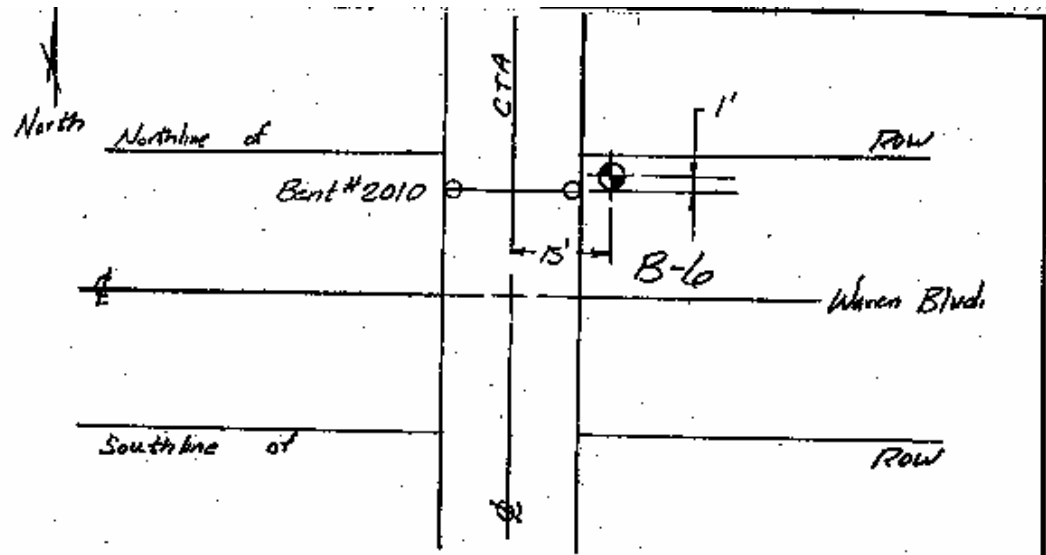
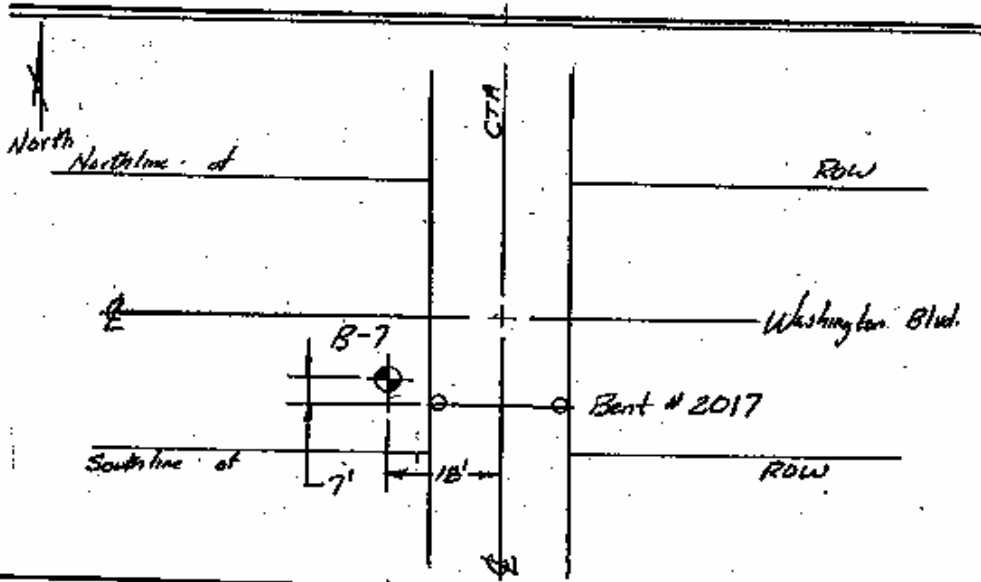
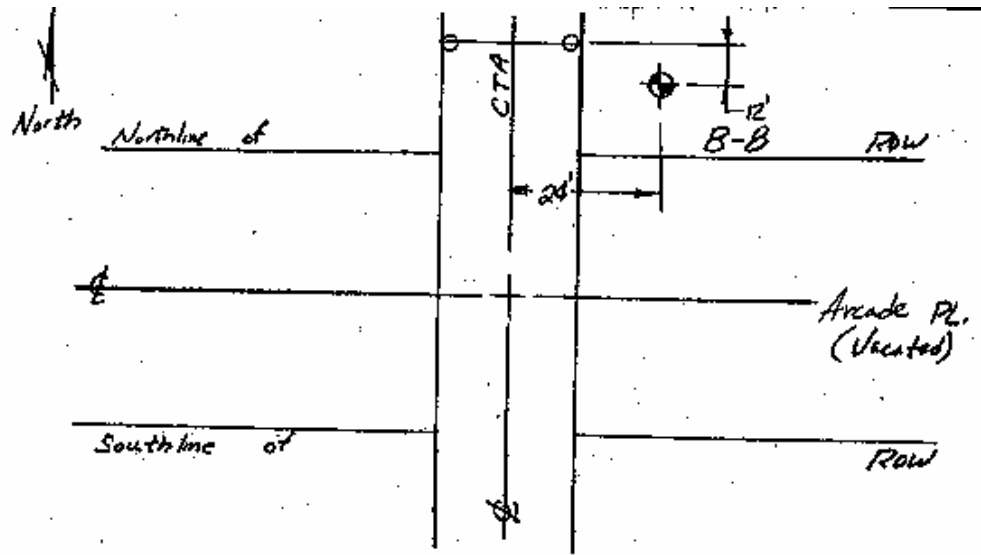


BORING LOCATION DIAGRAM Renovation of the CTA Lake Street Connector between Lake St. and Van Buren St. Chicago, Illinois	O'BRIEN & ASSOCIATES, INC. CONSULTING ENGINEERS 1235 E. DAVIS STREET ARLINGTON HTS., IL 60005 (847) 398-1441 • (847) 398-2376	PREPARED BY	JW
		APPROVED BY	DOB
		DATE	2/3/05
		JOB NO.	02365
		SCALE	As Shown



BORING LOCATION DIAGRAM Renovation of the CTA Lake Street Connector between Lake St. and Van Buren St. Chicago, Illinois	O'BRIEN & ASSOCIATES, INC. CONSULTING ENGINEERS 1235 E. DAVIS STREET ARLINGTON HTS., IL 60005 (847) 398-1441 • (847) 398-2376		PREPARED BY JH
			APPROVED BY DOP
			DATE 2/3/05
			JOB NO. 02563
			SCALE As Shown



BORING LOCATION DIAGRAM Renovation of the CTA Lake Street Connector between Lake St. and Van Buren St. Chicago, Illinois	O'BRIEN & ASSOCIATES, INC. CONSULTING ENGINEERS 1235 B. DAVIS STREET ARLINGTON HTS., IL 60005 (847) 398-1441 • (847) 398-2376		PREPARED BY JW
			APPROVED BY DOB
			DATE 2/3/03
			JOB NO. 02565
			SCALE As Shown



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STRUCTURE FOUNDATION
BORING LOG

Sh 1 of 2

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 20, 02
Bored By: RH
Checked By: DOB

BORING No.:	Soil Description	DEPTH (ft)	Qu (ksf)	W (%)	Surface Water Elev. After Hours	Groundwater Elev. After Hours	Notes
B-1							
	Station: 6' North of Bent #31005						
	Offset: 17' West of Structure centerline						
	Ground Surface Elevation +12.5 CCD						
	3.5" ASPHALT						
	11.0" CONCRETE +11.25						
	SILTY CLAY - trace to some sand, gravel & cinders - dark brown & gray - stiff (CL) FH +9.0	15	1.5P	20			
		10					
		6					
		2		10			
		2					
	SILTY CLAY - trace sand & gravel - brown & gray - stiff to very stiff (CL)	-5	1.75P	22			
		3		10			
		4					
		5	3.7B	15			
		3		15			
		4					
		-10	2.5P	16			
		2					
		2					
	SILTY CLAY - trace sand & gravel - gray - stiff (CL) +1.0	4	1.0P	19			
		0		10			
		0					
	SILTY CLAY - trace sand & gravel - gray - very soft to medium stiff (CL) Wet -1.0	-15	0.25B	29			
		0		0.4			
		0	0.2B	29			
		0		10			
		-20	0.1B	29			
		0		10			
		2					
		2	0.3B	24			
		0		25			
		0					
		-25	0.3B	28			
		0					
		0					
		2		15			
		3					
		3	1.25B	18			
		0		10			
		0					
		-45	1.4B	23			
		0		10			
		3					
		3					
		5	1.0B	20			
		0		10			
		4					
		3					
		-50	1.0B	21			

H-Standard Penetration to the value of the last few blow counts in each sample zone (ASTM D-1586)
 NR-No Recovery ST-Stiffness
 Type Failure
 S-Shear Failure C-Clear Failure
 U-Unconfined Compressive Strength (ksf)
 W-Water Content, percent dry weight
 NP-Non-Plastic
 Moisture Content (pcf) equal to value above x 16
 VV-Void Ratio (pcf)

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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 2

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02383
Date: December 20, 02
Bored By: RM
Checked By: DOB

BORING No.:	Station:	Offset:	Soil Count	Qu (tsf)	W (%)	Surface Water Elev. n/a	Groundwater Elev. n/a	Groundwater Elev. n/a After Hours	Soil Description	Elevation	Soil Type	Qu (tsf)	W (%)
B-1	5' North of Bent #31005	17' West of Structure centerline											
Ground Surface Elevation +12.5 CDP													
			5						CLAYEY SILT-trace sand & gravel-gray-very dense (CL/ML)	-63.5	50/3*		
			7						SILT-trace fine sand & fractured stone-gray-very dense (ML)	-65.5	NP	18	
			9	3.75P	15								
			10		100				Drillers Observation-Fractured Rock		50/21*		
			13	2.2B	21					-80		NR	
			16								50/3*		
			20		NR					-70.5		NR	
			6						Silt Seams @ -58.5'		50/6*		
			13										
			18	2.0P	14				SILT-trace fine sand-gray-very dense (ML)	-65	NP	18	
			15		7.8						50/4*		
			29										
			28	3.8P	13				SILTY CLAY-trace sand & gravel-gray-hard (CL)		NP	19	
			16								36		
			26								50/6*		
			28	4.5+P	13					-90	NP	21	
			50		1*						50/2*		
			4.5+P	10					Drillers Observation-Cobbles & Boulders	-80.0	NP	19	
			50		6*				Drillers Observation-Cobbles & fractured Stone		50/1*		
			70		NR					-82.5	NR	NR	
			50		1*				Drillers Observation-Apparent Bedrock				
					NR					-84.5			
			26		7.1				End of Boring @ -97.0'				
			50		6*				Hollow Stem Augers to -12.5'				
			75		2.8S				Rotary Drilling to Completion				
									CME Automatic Hammer				
									10.0' Casing Used				
										-100			

N-Standard Penetration is the value of the last two blow counts in each sample case (ASTM D-1586)
 NR-No Recovery ST-Shallow Tube
 Type Failure: B-Blade Failure S-Shear Failure Q-Uncorrected Compressive Strength (tsf) W-Water Content, percent dry weight
 E-Estimated Value P-Parameater NP-Non-Plastic
 tsf-dry weight (pcf) noted in bold above *S-Vs-Vertical Shear (psf)

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STRUCTURE FOUNDATION
BORING LOG

Sh. 1 of 2

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 23, 02
Bored By: RL
Checked By: DOB

BORING No.: B-2	SOIL SAMPLES	Qu (tsf)	W (%)	Surface Water Elev. n/a Groundwater Elevation n/a Groundwater Elevation n/a After Hours	Soils Moisture Content (%)	Soils Unit Weight (pcf)	Soils S _u (tsf)	Soils W (%)
Ground Surface Elevation +13.8 CCB								
3.0" ASPHALT, 9.0" CRUSHED STONE +12.9								
	9				0			
	6				0			
	2	NP	17		0	0.25P	27	
SANDY GRAVELLY CLAY with CINDERS & STONE-black (FILL) -10.3								
	4		10.4		0			
	4				0			
	5	2.38	19		-30	0	0.25P	28
SILTY CLAY- trace sand & gravel- brown & gray-very stiff (CL)								
	4		10.8		0			
	5				0			
	6	2.58	20		0	0.25P	27	
	4				0			
	6				0			
	4		NR		-35	0	0.5P	28
-10								
+2.8								
	1				0			
	2				1			
	3	1.0P	24		2	0.5P	28	
SILTY CLAY- trace sand & gravel- gray-stiff (CL) +0.3								
	1				2			16
	1				3			
	1	0.25P	28		-40	3	0.6P	16
SILTY CLAY- trace sand & gravel- gray-very soft to medium stiff (CL) Wet								
	1				2			16
	2				4	0.6P	17	
	1	0.25P	27					
	0				3			
	0				3			
	0				-45	3		NR
	0							
	0				4			10
	0				7			
	0				7	1.1P	19	
	0				4			10
	0				8			
	0				-50	10	1.4P	18
	0	0.25P	28					

H-Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D-1586)
 NR-No Recovery ST-Shallow Tube
 Type Failure: B-Bulge Failure E-Strain Failure
 U-Undrained Compressive Strength (tsf)
 W-Water Content, percent dry weight
 SP-Spec-Points
 Unit dry weight (pcf) noted in holes above or
 US-Vertical Stress (pcf)



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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 2

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02383
Date December 23, 02
Bored By: RM
Checked By: DOB

BORING No.: **B-2**
Station: **7' South of Bent #1016**
Offset: **14' East of Structure centerline**

Ground Surface Elevation +13.8' CCB	Blow Counts	Qu (ksf)	W (%)	Surface Water Elev. n/a Groundwater Elevation n/a Groundwater Elevation n/a After Hours	Blow Counts	Qu (ksf)	W (%)
...Continue							
-37.2	10			SILTY CLAY-	15		
	12			trace sand & gravel-	20		
	18	NP	19	gray-hard (CL)	26	4.5+P	13
-39.7							
	10			CLAYEY SILT to SILT-	13		
	16			gray-dense (ML)	17		
-55	20	4.5+P	19		20	NP	24
-42.2							
	10			SILTY CLAY-	12		
	13	4.8S	12	trace sand & gravel-	21		
	13			gray-hard (CL)	37	6.1B	12
	11				22		
	13				21		
NOTE: Fractured Stone from							
-55.0' to -66.0'							
	15	5.2S	12		18	4.8S	11
	14				15		
	18			CLAYEY SILT-	23		
	21	NR		trace fine sand-	30	NP	16
				gray-very dense (ML)			
	20						
	29				14		
-65	33	4.5+P	10	SILT-	20		
-52.2				trace fine sand-gray-	22	NP	24
				dense to very dense (ML)			
	50	6"			16		
				SILTY CLAY with Fractured STONE-	23		
				gray-very dense (GP)	27	NP	25
-54.7							
	13				25		
	13			SILTY FINE SAND-	50	6"	
-70	14	6.3B	14	gray-very dense (SM)	95	NP	16
				Drillers Observation-Fractured Rock			
	13			-81.2			
	16			-82.2			
	18	5.8B	14	Drillers Observation-	50	4"	
				Apparent Bedrock			
				-84.2			
	14			End of Boring @ -84.0'			
	19			Yellow Slurk Appears to -10.0'			
	19			Rubry Drilling to Completion			
	23	6.1B	14	ONE Automatic Hammer			
-75				10.0' Casing Used	-100		

N-Standard Penetration is the value of the last ten blow counts in each sample zone (ASTM D-1586)
NI-16 Recovery 5T-Shelby Tube

Q-Unevaluated Compressive Strength (ksf)
W-Water Content, percent dry weight
NP-Non-Plastic
E-Estimated Value P-Pneumatometer

Q-Unevaluated Compressive Strength (ksf)
W-Water Content, percent dry weight
NP-Non-Plastic

Moist. dry weight (pcf) noted in field above unit
15-Year Shear (ksf)

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STRUCTURE FOUNDATION
BORING LOG

Sh. 1 of 3

Project: CIA Bus Line Renovation

OBA JOB NO. 02363

Location: Lake Street Connector, Chicago, Illinois

Date December 26, 02

County: Cook

Bored By RF

Client: Bus Line Managers

Checked By DOB

BORING No.: B-3

Station: 5' North of Bent #1027

Offset: 15' East of Structure centerline

Soil Description	Depth (ft)	W (%)	Qu (ksf)	Surface Water Elev. n/a	Groundwater Elev. n/a	Groundwater Elev. n/a	Hours	Blow Counts	Qu (ksf)	W (%)
Ground Surface Elevation +14.0 CCD										
5.0" CONCRETE	0									
37.0" SANDY GRAVEL & CINDERS	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									

N-Standard Penetration to the value of the last two blow counts at each sample size (ASTM D-1586)
 NR-No Recovery BT-Shaly Tube
 O'BRIEN & ASSOCIATES, INC.
 S-Side Failure Q-Shear Failure Qu-Unconfined Compressive Strength (ksf)
 E-Estimated Value P-Perimeter M-Molar Content, percent dry weight
 W-Water Content, percent dry weight
 U-Urban Clay
 V-Vegetation



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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 26, 02
Bored By: BH
Checked By: DOB

BORING No.:	SOIL SAMPLE NO.	Qu (tsf)	W (%)	Surface Water Elev. n/a	Groundwater Elevation n/a	Groundwater Elevation n/a	Soil Description	Soil Sample No.	Qu (tsf)	W (%)
B-3										
							Ground Surface Elevation +14.0 CDP			
	3		0.4				SILTY CLAY- trace sand & gravel- gray-medium stiff to stiff (CL)	15		7.0
	4							20		
	6	1.38	23					28	4.5+P	17
							-64.5			
	3		7.6					22		
	4							30		
	5	1.28	22				SILT- trace fine sand- gray-very dense (ML)	37	NP	19
							-80			
	3		8.8					23		
	4							35		
	6	1.38	25					35	NP	22
							-89.5			
	2		8.8					5		10.4
	4							5		
	4	1.18	28				SILTY CLAY- trace sand & gravel- gray-stiff to very stiff (CL) Wet	4		8.6
							-85	4	2.88	24
							Drillers Observation-Cobbles	6		
							-89.0	6	2.08	27
								NR		
	6							4		10.4
	10							5		
	11	NP	25				SILT- trace fine sand- gray-medium dense (ML)	8	1.68	23
							-85			
							-82.0			
	8		11.6					4		10.4
	10							4		
	16	5.38	13				SILTY CLAY- trace to some sand & gravel- gray-hard (CL)	6	1.78	25
							-79.0			
	10		11.6				Drillers Observation-Cobbles	50	1"	
	15									
	16	5.98	13							
							-70			
							-85			
							-82.0			
	11		11.6					4		9.7
	16							6		
	16	4.5+P	14				SILTY CLAY- trace sand & gravel- gray-stiff to very stiff (CL)	6	1.68	27
							-75			
	10		11.6					8		8.6
	13							10		
	18	6.18	13					15	2.08	24
							-100			

N-Standard Penetration in the value of the test but
how credits in each sample zone (ASTM D-1586)
SR-S Recovery ST-Shelby Tube

Type Failure S-Shear Failure
E-Estimated Value P-Penetrometer

Q-Uncorrected Compressive Strength (tsf)
W-Water Content percent dry weight
NP-Not Possible

tsf dry weight (pcf)
pcf wet & bulge above wt
VS-Visual State (pcf)

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STRUCTURE FOUNDATION
BORING LOG

Sh 3 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 28, 02
Bored By: RH
Checked By: OOB

BORING No.: B-3	Station: 5' North of Bent #1027	Offset: 15' East of Structure centerline	Depth (ft)	Qu (tsf)	W (%)	Surface Water Elev.	n/a	Penetration	Qu (tsf)	W (%)
						Groundwater Elev. n/a	Groundwater Elev. n/a			
Ground Surface Elevation +14.0 CCP										
SILTY CLAY— trace sand & gravel— gray—stiff to very stiff (CL)										
			10							
			16	3.0P	21					
			18							
			16	3.0P	20					
			-92.0							
Drillers Observation—Fractured Rock										
			50.0"							
Drillers Observation— Apparent Bedrock										
			-95.0							
End of Boring @ -109.0'										
Hollow Stem Augers to -15.0'										
Rotary Drilling to Completion										
CME Automatic Hammer										
15.0' Casing Used										
			-110							
			-115							
			-120							
			-125							

N—Standard Penetration is the value of the last ten blow counts in each sample zone (ASTM D-1586)
NR—No Recovery ST—Shrinky Tube

Q—Tip Load
E—Edge Failure S—Shear Failure
C—Estimated Value P—Penetration

Qu—Unconfined Compressive Strength (tsf)
W—Water Content, percent dry weight
SP—Non-Plastic

Unit dry weight (pcf)
noted in holes above unit
V—Vane Shear (pcf)

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STRUCTURE FOUNDATION
BORING LOG

Sh 1 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 30, 02
Bored By: RH
Checked By: DOB

BORING No.:	Station:	Offset:	Qu (ton)	W (%)	Surface Water Elev. n/a Groundwater Elevation n/a Groundwater Elevation n/a After Hours	↓	↓	Qu (ton)	W (%)
B-4	3' North of Bent #1037	15' West of Structure centerline							
Ground Surface Elevation +14.8 CCD									
CLAYEY TOPSOIL with SAND & STONE—dark brown to black (FIR)			2		SILTY CLAY—trace sand & gravel—gray—very soft to soft (CL) Wet			0	
			0					0	
			3	NP				0.25P	28
		+10.5							
SILTY SANDY CLAY—trace gravel—dark brown to brown (FIR)			2					0	
			2					0	
			5	NP				0.25P	28
		+7.0							
SILTY CLAY—trace sand & gravel—brown & gray—very stiff (CL)			4	2.5P				0	0.25P 28
			3					0	
			5					0	
			10	3.5P				0.25P	28
		+3.0							
SILTY CLAY—trace sand & gravel—gray—medium stiff to stiff (CL)			2					0	
			5	1.1P				0.25P	28
			1					0	
			2					0	
			15	0.5P				1	0.5P 18
		-2.0			SILTY CLAY—trace sand & gravel—gray—medium stiff to stiff (CL)			0	
			0					0	
			1	0.25P				0.5P	19
SILTY CLAY—trace sand & gravel—gray—very soft to soft (CL) Wet			0					0	
			0					4	
			20	0.25P				5	0.75P 24
			0					2	
			0					4	
			0	0.25P				5	1.5P 19
			0					2	10S
			0					3	
			25	0.25P				4	0.8P 20

N-Standard Penetration to the value of the feet from blow counts in each sample zone (ASTM D-1586)
N1-No Recovery ST-Shelly Soil

Qp-Point Load
B-Bearing Capacity
E-Estimated Value P-Penetrometer

Qu-Unconfined Compressive Strength (ton)
W-Water Content, percent dry weight
SP-Standard Penetration

Silt dry weight (pcf) noted in falling blow test
VS-Visual Observation (pcf)

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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02263
Date: December 30, 02
Bored By: RH
Checked By: DOB

BORING No.: B-4
Station: 3' North of Bent #1037
Offset: 5' West of Structure centerline

Depth (ft)	Soil Description	S _u (lb)	Q _u (lb)	W (%)	Surface Water Elev. n/a Groundwater Elev. n/a After Hours	Depth (ft)	Soil Description	S _u (lb)	Q _u (lb)	W (%)
0						0				
2	SILTY CLAY- trace sand & gravel- gray-medium stiff to stiff (CL)		0.68	23		2	SILTY CLAY- trace to some sand & gravel- gray-hard (CL)		5.08	13
3						3				
4						4				
2						8				
4						14				
-55			0.68	22		-60			4.5+P	15
2						8				
4						18				
7			0.88	23		21			5.48	14
3						9				
3						17				
-60			1.08	22		-65			4.5+P	23
2						8				
4						14				
7			0.68	26		22			4.5+P	24
-48.6						-74.5				
3						3				
3	SILTY CLAY to CLAYEY SILT- trace sand & gravel- gray loose to medium dense (CL/ML)		2.9P	22		9	SILTY CLAY- trace sand & gravel- gray-very stiff (CL) Wet		2.6P	26
-66						-90				
3						4				
4						8				
7			1.0P	34		12			2.6P	26
-64.6						-79.6				
10						50	Drillers Observation-Cobbles			
10						50				
-70			4.5+P	10		-95				
10	SILTY CLAY- trace to some sand & gravel- gray-hard (CL)					-82.6				
12						7				
14			4.5+P	13		10	SILT- trace fine sand- gray-medium stiff (ML)			
8						12			NP	26
13						8				
13						8				
-75			4.5+P	14		-85.0-100			NP	26

S-Standard Penetration S is the value of the last foot
See also to work sample 200 (ASTM D-1586)
NP-No Recovery ST-Silty Silts
O'BRIEN & ASSOCIATES, INC.

1-Open Fellers
2-Silty Fellers
3-Shell Fellers
4-Gravel Fellers
5-Gravel Fellers
6-Gravel Fellers
7-Gravel Fellers

Dr-Descent Compressor Strength (lb)
S-Siltar Content, percent dry weight
SP-Siltar-Results

Unit dry weight (pcf)
moist & before correction
GS-Gravel Size (mm)



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**STRUCTURE FOUNDATION
 BORING LOG**

Sh 3 of 3

Project: CTA Blue Line Renovation OBA JOB NO. 02383
 Location: Lake Street Connector, Chicago, Illinois Date: December 30, 02
 County: Cook Bored By: REI
 Client: Blue Line Manager Checked By: DRE

BORING No.: B-4
 Station: X North of Bent #1037
 Offset: 15' West of Structure centerline

Description	Depth (ft)	W (ft)	Surface Water Elev.		n/a	Groundwater Elev. n/a	Groundwater Elev. n/a	Qu (ksf)	W (ft)
			Before	After					
Ground Surface Elevation +14.0 CCB									
Drillers Observation - Fractured Stone	50 ft	NE							
	-88.0								
Drillers Observation - Apparent Bedrock	-87.0 - 105'								
	-130								
End of Boring @ -105.0'									
Hollow Stem Augers to -10.0'									
Rotary Drilling to Completion									
CME Automatic Hammer									
10.0' Casing Used									
	-110								
	-115								
	-120								
	-125								
	-130								
	-135								
	-140								
	-145								
	-150								

Standard Penetration is the value of the test for blow counts in each sample zone (ASTM D-1586)
 W-10 Recovery W-10 Blows/ft
 O-Brien & Associates, Inc.
 1-Standard Penetration 2-Standard Penetration
 3-Blow Penetration 4-Blow Penetration
 5-Blow Penetration 6-Blow Penetration
 7-Blow Penetration 8-Blow Penetration
 9-Blow Penetration 10-Blow Penetration
 11-Blow Penetration 12-Blow Penetration
 13-Blow Penetration 14-Blow Penetration
 15-Blow Penetration 16-Blow Penetration
 17-Blow Penetration 18-Blow Penetration
 19-Blow Penetration 20-Blow Penetration



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STRUCTURE FOUNDATION
BORING LOG

Sh 1 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 30, 02
Bored By: RH
Checked By: DOB

BORING No.: B-5	DEPTH FEET	QU (ton)	W (%)	Surface Water Elev. Groundwater Elev. After Hours	r _{v/a} r _{v/a} r _{v/a}	STRAIN GAGE	QU (ton)	W (%)
Ground Surface Elevation +15.0 CCD								
4.0" CONCRETE	4						0	
5.0' 8.0" CRUSHED STONE & GRADATION (F#1)	10						0	
	10	NP	9				0	0.25P 28
NOTE: Boring Offset 9 times due to obstruction between 5.0' & 8.0'	12						0	
	31						0	
	-5.19	NP	6				-30	0.25P 28
	+8.0							
CRUSHED STONE with WOOD	50/2"						0	
		NP	28				0	0.25P 28
	+8.0							
	2		88				0	
	4						0	
SILTY CLAY- trace sand & gravel- brown & gray- stiff (CL) Wet	-10	6	1.38	30			-35	0.25P 28
	+4.0							
	2		108				0	
	3						0	
SILTY CLAY- trace sand & gravel- gray- stiff (CL)	4	1.38	23				0	0.25P 27
	1						0	
	3						0	
	-15	2	1.0P	23			-40	1.0.25P 27
	1						0	
	2						0	
	-3.0	3	1.0P	23			0	0.25P 21
	1						0	
SILTY CLAY- trace sand & gravel- gray- very soft to soft (CL) Wet	0						0	
	-20	0	0.25P	27			-45	1.0.25P 32
	0						1	
	0						2	
	0	0.25P	27				1	0.5P 23
	0						1	
	0						2	
	-25	0	0.25P	28			-50	2.0.75P 23

N-Standard Penetration is the value of the last low blow counts in each sample zone (ASTM D-1586)
NR-No Recovery ST-Shaly Soil
O'BRIEN & ASSOCIATES, INC.

Type Failure
B-Block Failure S-Shear Failure
E-Estimated Value P-Pneumometer

QU-Unconfined Compressive Strength (ton)
W-Water Content, percent dry weight
NP-Non-Plastic

Unit dry weight (pcf) noted in holes above NR
VS-Vertical Shear (pcf)



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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 30, 02
Bored By: RM
Checked By: DOB

BORING No.:	Soils	Qu (tsf)	W (%)	Surface Water Elev. n/a Groundwater Elev. n/a Groundwater Elev. n/a After Hours	Soils	Qu (tsf)	W (%)
B-5							
Station: 27' South of Bent #1047							
Offset: 18' East of Structure Centerline							
Ground Surface Elevation +75.0 CCP							
	3				3		
SILTY CLAY-- trace sand & gravel-- gray--medium stiff to stiff (CL)	4	1.0P	13		4	0.5P	32
				-63.5			
	3		17		6		
	4				14		
	5	1.3P	17		20	4.5+P	13
	3				8		
	5				13		
	7	1.5P	18		21	4.5+P	12
				-68.5			
	3		17		7		11
	5				18		
	8	1.0P	19		22	4.0P	13
	3		18		8		15
	5				19		
	7	1.0P	20		22	4.5+P	13
	3				7		15
	4				14		
	4	0.75P	23		21	4.5P	15
	3				7		15
	3				15		
	4	0.75P	21		23	4.0P	16
	3				8		15
	3				10		
	4	0.75P	20		12	2.7P	15
	3				7		8
	4				8		
	4	0.75P	23		13	3.0P	25
				-58.0			
	2				7		
SILTY CLAY-- trace sand & gravel--gray-- soft to medium stiff (CL) Wet	3				11		
	4	0.25P	33		14		20

H-Standard Penetration is the value of the last 100 blow counts in each sample tube (ASTM D-1586)
 NP-No Recovery ST-Slurry Tube
 O'BRIEN & ASSOCIATES, INC.

Type Failure
 C-Edge Failure S-Shear Failure
 E-Estimated Value P-Penetrometer

Qu-Unconfined Compressive Strength (tsf)
 W-Water Content, percent dry weight
 NP-No Penetration

Unit dry weight (pcf)
 noted in notes above as
 VS-Vane Shear (pcf)



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STRUCTURE FOUNDATION
BORING LOG

Sh 3 of 3

Project: CTA Blue Line Renovation OBA JOB NO. 02363
 Location: Lake Street Connector, Chicago, Illinois Date December 30, 02
 County: Cook Bored By RR
 Client: Blue Line Managers Checked By DOB

BORING No.:	Station:	Offset:	Blow Count	Qu (ksf)	W (%)	Surface Water Elev. n/a Groundwater Elev. n/a Groundwater Elev. n/a After Hours	↓	Qu (ksf)	W (%)
B-5	27' South of Bent #1047	15' East of Structure centerline							
Ground Surface Elevation +15.0 CCD									
....Continue									
		-88.0	6						
			7						
			7	NP	20				
CLAYEY SILT to SILT- trace fine sand-gray- loose to medium dense (ML)			5						
			7						
		-105	8	NP	20		-130		
			4						
			4						
			5	NP	22				
			4						
			5						
		-110	6	NP	20		-135		
		-98.0							
Drillers Observation- Fractured Rock			50/2"						
		-97.5			NR				
Drillers Observation- Apparent Bedrock									
		-115					-140		
		-100.5							
End of Boring @ -115.5' Hollow Stem Augers to -10.0' Rotary Drilling to Completion CME Automatic Hammer 5.0' Casing Used									
		-120					-145		
		-125					-150		

N-Standard Penetration is the value of the last low blow counts in each sample zone (ASTM D-1586)
 NP-No Recovery ST-Shaly Silt
 Type Failure S-Shear Failure Q-Unconfined Compressive Strength(ksf)
 S-Split Failure S-Shear Failure W-Water Content, percent dry weight
 S-Settlement Value P-Penetrometer NP-Non-Plastic
 Unit dry weight (pcf) noted in bottom above W
 VD-Vertical Shear (pcf)



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STRUCTURE FOUNDATION
BORING LOG

Sh 1 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

GBA JOB NO. 02363
Date: December 20, 02
Bored By: RH
Checked By: DOB

BORING No.:	Station:	Offset:	Soils	Qu (tsf)	W (%)	Surface Water Elev. n/a Groundwater Elevation n/a Groundwater Elevation n/a After Hours	Soils	Qu (tsf)	W (%)
B-6	1' North of Bent #2010	15' East of Structure centerline							
Ground Surface Elevation +15.5 EOB									
4.0" CONCRETE									
26.0" CINDERS, SAND & STONE-black			2				0		
			1				0		
	+13.0		2	NP	23		0	<0.25P	27
SILTY Fine SAND- trace gravel-brown & gray- very loose to loose (SM)			2				0		
			3				0		
			3	NP	26		-30	0	<0.25P 27
	+8.0		3				0		
			6				0		
			8	4.5+P	21		0	<0.25P	27
SILTY CLAY- trace sand & gravel- brown & gray-stiff to hard (CL)			2		86		0		
			4				0		
			5	1.4B	27		-35	0	0.25P 28
	+4.6		2				0		
			2				0		
			3	0.25P	17		0	0.25P	28
SILTY CLAY- trace sand & gravel- gray-very soft to soft (CL) Wet			2				5		
			2				3		
			2	<0.25P	23		-15	5	0.25P 20
			2				-40	5	0.25P 20
			1				-25.6		
			2				1		
			2	<0.25P	23		4	1.0P	19
			0				4		
			0				2		06
			0				4		
			0	<0.25P	26		-20	9	1.0P 19
			0				4		
			0				2		06
			0	<0.25P	23		4	0.8P	20
			0				3		06
			0				4		
			0	<0.25P	27		-25	5	1.4B 19

SP-Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D-1586)
 NR-No Recovery SP-30-By Tube
 O'BRIEN & ASSOCIATES, INC.

Type Failure
 B-Bulge Failure S-Shear Failure
 E-Estimated Value P-Parameter

Qu-Unconfined Compressive Strength (tsf)
 W-Water Content, percent dry weight
 NP-Non-Plastic

tsf dry weight (pcf) noted in italics above etc.
 VS-Vers Shear (pcf)



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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 3

Project: CTA Blue Line Renovation OBA JOB NO. 02363
 Location: Lake Street Connector, Chicago, Illinois Date: December 20, 02
 County: Cook Bored By: RH
 Client: Blue Line Managers Checked By: DCB

BORING No.: **B-6**
 Station: 1' North of Bent #2010
 Offset: 15' East of Structure centerline

Soil Description	Blow Counts	Qu (tsf)	W (%)	Surface Water Elev. \pm /a Groundwater Elevation \pm /a After Hours	Blow Counts	Qu (tsf)	W (%)	
Ground Surface Elevation <u>+13.5 CLM</u>								
SILTY CLAY- trace sand & gravel- gray-medium stiff to stiff (CL)	3		09		8		18	
	4				21			
	6	0.9B	19		22	7.5B	14	
	3		06		11		16	
	5				18			
	-55	7	1.7B	20	-80	24	5.9B	14
	3		04		12		16	
	4				22			
	7	1.8B	20		22	6.6B	12	
	3		03		8		11	
	5				11			
	-60	7	1.3B	20	-85	16	5.8B	17
4		04		19		06		
5				19				
7	1.4B	21		28	4.5+P	20		
3		06		8		06		
5				8				
-85	8	0.8B	25	-90	9	3.5P	25	
-50.0								
Medium to Coarse SAND- trace gravel-gray- medium dense (SP)	4				9		06	
	6				10			
	7	NP	20		8	3.5P	24	
	5				10		06	
	7				10			
	-70	7	NR		-95	10	3.5P	24
-65.5								
SILTY CLAY- trace sand & gravel- gray-very stiff to hard (CL)	9				10			
	20				11			
	25	4.5+P	17		12	NP	25	
	10				10			
	14		15		10			
	-75	22	5.1B	14	-100	9	NP	24

M-Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D-1586)
 NP-No Recovery ST-Shelby Tube
 O'BRIEN & ASSOCIATES, INC.

Type Failure: B-Surge Failure S-Shear Failure
 E-Estimated Value P-Penetrometer

Qu-Unconfined Compressive Strength (tsf)
 W-Water Content percent dry weight
 NP-Non-Plastic

Unit dry weight (pcf) noted in holes above #4
 VS-Visual Shear (pcf)



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**STRUCTURE FOUNDATION
BORING LOG**

Sh 3 of 3

Project: <u>CTA Blue Line Renovation</u>	OBA JOB NO. <u>02563</u>
Location: <u>Lake Street Connector, Chicago, Illinois</u>	Date: <u>December 20, 02</u>
County: <u>Cook</u>	Bored By: <u>RH</u>
Client: <u>Blue Line Managers</u>	Checked By: <u>DOB</u>

BORING No.: B-6
Station: 1' North of Bent #2010
Offset: 15' East of Structure centerline

Description Soils Diagrams Cores Notes	Depth (ft)	Qu (tsf)	W (%)	Surface Water Elev. Groundwater Elev. n/a Groundwater Elev. n/a After Hours	Moist. Content % n/a n/a	Soils Diagrams Cores Notes	Qu (tsf)	W (%)
Continues	-85.0							
Drillers Observation-- Apparent Bedrock	-87.0							
End of Boring @ -102.5' Hollow Stem Augers to -15.0' Rotary Drilling to Completion CME Automatic Hammer 15.0' Casing Used	-105							
	-110							
	-115							
	-120							
	-125							
	-130							
	-135							
	-140							
	-145							
	-150							

H-Standard Penetration Test value of the last five blow counts in each sample zone (ASTM D-1586)
 MR-Me Recovery SP-Spinner Tube
 Type Fillers
 S-Surge Fillers P-Pneumometer
 E-Estimated Value
 Qc-Unconfined Compressive Strength (tsf)
 S-Soils Contact, percent dry weight
 NP-Non-Plastic
 Unit dry weight (pcf)
 noted in holes above test
 VS-Value Shear (pcf)

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STRUCTURE FOUNDATION
BORING LOG

Sh 1 of 2

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Monorail

OBA JOB NO. 02363
Date: December 23, 02
Bored By: RBH
Checked By: OOB

BORING No.: B-7	Soils	Qu (tsf)	W (%)	Surface Water Elev. n/a Groundwater Elev. n/a Groundwater After Hours n/a	Soils	Qu (tsf)	W (%)
Station: 7' North of Bent #2017							
Offset: 18' West of Structure centerline							
Ground Surface Elevation +18.0 CGD							
4.0" ASPHALT, 7.0" CONCRETE +14.9							
CRUSHED STONE- medium dense (FI)	10					0	
	10					0	
+13.0	7	NP	4			0	<0.25F 28
SILTY CLAY- trace to some sand, gravel & clinders-dark brown, gray & black (FI) Wet	4					0	
	4					0	
+10.5	-5	3	30			-30	0 <0.25F 28
SILTY CLAY- trace sand & gravel- brown & gray- very stiff to hard (CL)	3					0	
	3					0	
	4	3.0P	25			0	<0.25F 28
	2		18			0	
	5					0	
	-10	8	2.88	16		-35	0 <0.25F 28
	4		10			0	
	7					0	
	9	4.08	14			0	<0.25F 27
+2.5							
SILTY CLAY- trace sand & gravel- gray-medium stiff (CL)	2					0	
	4					1	
0.0	-15	4	0.5P	15		-40	2 <0.25F 27
SILTY CLAY- trace sand & gravel- gray-very soft to soft (CL) Wet	1					0	
	2					1	
	3	<0.25F	28			1	0.25P 20
	2					1	
	2					1	
	-20	2	<0.25F	27		-45	2 0.5P 22
	0					0	
	0					2	
	0	<0.25F	28			2	0.75P 23
	0					2	
	0					3	
	0					3	
	-25	0	<0.25F	27		-50	4 1.48 20

Standard Penetration is the value of the last ten blow counts in each sample (ASTM D-1586)
NP-No Recovery ST-Sticky Tube
Type Failure S-Sign Failure S-Shear Failure
E-Estimated Value P-Parallels
Qu-Undrained Compressive Strength (tsf)
W-Water Content, percent dry weight
SP-Standard Penetration
Unit dry weight (pcf)
Number 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50
V3-Vertical Shear (pcf)

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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 2

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: December 23, 07
Bored By: RH
Checked By: DOB

BORING No.: **B-7**
Station: 7' North of Bent #2017
Offset: 18' West of Structure centerline

Borehole Column	Qu (tsf)	W (%)	Surface Water Elev. \pm /s		SPT Blows	Qu (tsf)	W (%)	
			Groundwater Elevation \pm /s	Groundwater Elevation \pm /s After Hours				
Ground Surface Elevation +16.0 CGD								
			Continue		-60.0			
4		106			9			
5			Fine SANDY SILT-		15			
6	1.8B	17	trace gravel-gray-dense (ML)		25	NP	16	
-82.6								
2		106			15		11.4	
3					27			
-55	3	1.0B	19	SILTY CLAY-	-80	39	5.1S	15
trace sand & gravel-gray-hard (CL)								
3		106			22		12.1	
4					38	10.5B		
8	1.0B	19			40	5'	12	
2		86			6		0.2	
4					13			
-60	4	1.0B	26		-55	20	5.7B	24
2		86			7		10.6	
2					14			
5	1.1B	23			19	5.9B	22	
-72.0								
2		106			15			
3					23			
-65	4	1.0B	19	SILT-	-80	38	NP	23
trace fine sand-gray-dense to very dense (ML)								
2		86			8			
4					15			
3	1.1B	25			21	NP	24	
-77.5								
2					50	5'		
2								
-70	3	0.75P	26	SILTY CLAY & Fractured STONE-	-95	NP	10	
gray-very dense (GC)								
-79.5								
2								
3								
5	0.5P	24		Drillers Observation-				
Apparent Bedrock								
-81.5								
-87.5								
8				End of Boring @ -87.5'				
Hollow Stem Augers to -15.0'								
Rotary Drilling to Completion								
CME Automatic Hammer								
-75	21	4.5+P	13	15.0' Casing Used	-100			

N-Standard Penetration is the value of the test
blow counts in each sample size (ASTM D-1586)
NR-No Recovery ST-Shallow Tube

Type Fallers
B-Blade Fallers S-Sher Fallers
E-Estimated Value P-Pneumometer

Qu-Unconfined Compressive Strength (tsf)
W-Moist Content, percent dry weight
NP-Non-Plastic

Unit dry weight (pcf)
noted in hollow stems etc
VS-Visc Shear (pcf)

O'BRIEN & ASSOCIATES, INC.



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CONSULTING ENGINEERS
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STRUCTURE FOUNDATION
BORING LOG

Sh 1 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date January 15, 03
Bored By RH
Checked By DOB

BORING No.:	Blow Counts	Q _u (tsf)	W (%)	Surface Water Elev. n/a	Groundwater Elevation +11.0 #0	Groundwater Elevation n/a	Hours	Q _u (tsf)	W (%)
B-8									
Station: 12' South of Bent #1042									
Offset: 24' East of Structure centerline									
Ground Surface Elevation +15.0 OCB									
1.0" ASPHALT, 7.0" CONCRETE									
4.0" SAND with STONE +14.0									
Fine SAND- trace gravel-brown- loose to medium dense (SP)	6 5 3	NP	8						30
	5 5 5								
		NP	10					6	0.75P 23
	4 4 6	NP	23						24
	4 4 2	NP	26						26
	0 1 2	-	62						19
	0 1 1	-	72						20
	0 0 0	0.5P	73						23
	1 1 3	1.0P	38						20
	1 1 1	1.0P	36						17
	1 2 3	-	22						18

N-Standard Penetration is the value of the last two blow counts in each sample zone (ASTM D-1586)
RH-No Recovery ST-Shabby Tube

Type Failure
B-Bulge Failure S-Shear Failure
E-Estimated Value P-Penetrometer

Q_u-Unconfined Compressive Strength (tsf)
W-Water Content, percent dry weight
NP-Non-Plastic

Unit dry weight (pcf) noted in notes above etc
VS-Vertical Shear (pcf)

O'BRIEN & ASSOCIATES, INC.



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STRUCTURE FOUNDATION
BORING LOG

Sh 2 of 3

Project: CTA Blue Line Renovation
Location: Lake Street Connector, Chicago, Illinois
County: Cook
Client: Blue Line Managers

OBA JOB NO. 02363
Date: January 15, 03
Bored By: RH
Checked By: DOB

BORING No.: **B-8**
Station: 12' South of Bent #1042
Offset: 24' East of Structure centerline

Soil Description	Blow Counts	Qu (ton)	W (%)	Surface Water Elev. n/a Groundwater Elevation +11.0 WD Groundwater Elevation n/a After Hours	Blow Counts	Qu (ton)	W (%)
Ground Surface Elevation +15.0 CCD							
SILTY CLAY- trace sand & gravel- gray-medium stiff to very stiff (CL)	3		10		16		17
	4				18		
	6	1.1B	19		16	5.2B	14
				-43.5			
SANDY SILT- gray-medium dense (ML)	4		10		7		
	4				10		
	5.5	0.8B	20		10	NP	16
				-58.0			
SILTY CLAY- trace to some sand & gravel- gray-very stiff to hard (CL)	3		10		16		14
	8				21		
	8	0.9B	23		25	6.8B	13
				-48.0			
CLAYEY SANDY SILT- gray-medium dense (ML)	4		11		17		17
	6				24		
	6.5	1.3B	16		24	7.4B	13
				-51.0			
SILT- trace fine sand- gray-medium dense (ML)	6				14		10
	8				19		
	10	NP	17		22	4.5+P	23
				-53.0			
SILT- trace fine sand- gray-medium dense (ML)	9				10		10
	7				13		
	5.5	NP	15		20	4.2B	23
				-61.0			
SILT- gray- medium dense to dense (ML)	3				6		8
	8				7		
	7	NP	22		11	2.0B	26
				-68.0			
SILTY CLAY- trace sand & gravel- gray-hard (CL)	6				8		
	6				9		
	7.5	NP	26		12	2.75P	22
				-75.0			
SILT- gray- medium dense to dense (ML)	8				10		
	8				18		
	10	NP	27		13	NP	25
				-81.0			
SILTY CLAY- trace sand & gravel- gray-hard (CL)	8		18		12		
	13				14		
	7.5	8.0B	23		17	NP	23

N-Standard Penetration is the value of the last ten blow counts in each sample zone (ASTM D-1586)
NP-No Recovery ST-Silty Clay

Type Failure
S-Side Failure S-Shear Failure
E-Expanded Value P-Preconsolidated

Qu-Unconfined Compressive Strength(ton)
W-Water Content, percent dry weight
NP-No Penetration

Unit dry weight (pcf)
noted in italics above or
vp-Vane Shear (pcf)



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STRUCTURE FOUNDATION
BORING LOG

Sh 3 of 3

Project: CTA Blue Line Renovation OBA JOB NO. 02383
 Location: Lake Street Connector, Chicago, Illinois Date January 15, 03
 County: Cook Bored By RH
 Client: Blue Line Managers Checked By DOB

BORING No.: B-8
 Station: 12' South of Bent #1042
 Offset: 24' East of Structure centerline

	Blow Counts	Qu (tsf)	W (%)	Surface Water Elev. Groundwater Elevation Groundwater Elevation After Hours	n/a +11.0 n/a	WD	Blow Counts	Qu (tsf)	W (%)
Ground Surface Elevation +15.0 OGD									
SILT-gray- medium dense to dense (ML)	50/1*		NR						
-88.0									
Drillers Observation- Apparent Bedrock							-130		
-90.0-105									
End of Boring @ -105.0' Hollow Stem Augers to -15.0' Rotary Drilling to Completion CME Automatic Hammer									
-110							-135		
-115							-140		
-120							-145		
-125							-150		

N-Standard Penetration is low value of the last two
blow counts in each sample zone (ASTM D-1586)
NR-No Recovery ST-Shelby Tube

Type Fallers
E-Slug Failure S-Shear Fallers
E-Estimated Value P-Pneumometer

Qu-Unconfined Compressive Strength(tsf)
W-Water Content, percent dry weight
NR-Non-Plastic

tsf-dry weight (pcf)
soils in holes above soil
US-Test Stress (pcf)

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