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September 7, 2012

City of Ithaca Department of Public Works 108 East Green Street Ithaca, New York 14850-5690

Attn: Mr. Thomas West, Assistant City Engineer

Re: Subsurface Exploration and Foundation Report

Ithaca Commons Rehabilitation

Ithaca, New York

CME Report No.: 26677B-01-0912

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Dear Mr. West:

1.0 INTRODUCTION

A renovation of the existing Downtown Ithaca Pedestrian Mall, known as Ithaca Commons, is planned by the City of Ithaca (Client). CME Associates, Inc. (CME) has been retained by Client to provide subsurface exploration and geotechnical engineering services for the subject project. CME conducted a subsurface exploration consisting of Test Borings, Groundwater Observation Wells and laboratory soil testing, on selected soil samples. The scope of services and this report have been provided pursuant to the Contract for Professional Services for Commons Rehabilitation Project Geotechnical Investigation, dated 07/13/12, signed by Client and CME. Please refer to the attached Proposed Development Drawings for an overview of the proposed renovation.

This report presents the subsurface conditions identified in the Test Borings, and provides foundation recommendations for the proposed Pavilion, Gateway Structure and Digital Display Columns. All Test Boring Logs, Groundwater Observation Well Logs, Laboratory Test Reports, a Bird's Eye View Map and a Boring Location Sketch are attached to this report. Geotechnical recommendations for the proposed utility installation, required by the contract, will be presented under separate cover, after CME receives details (Civil Drawings with Cross Sections and Details) of the proposed/existing utilities, from Client.

2.0 PROPOSED RENOVATION

The proposed renovation will include removal and replacement of most existing surface elements (such as pavers, seating, lighting, tree planters, etc.). A new Pavilion , a Gateway Structure and Digital Display Columns are planned. Installation of new utility lines and rehabilitation of existing utility lines are also planned.

The Pavilion finish floor is planned to match existing grade, and is planned to be supported utilizing spread footing foundations. Details of the proposed utility installation were not available to CME at the time of report preparation.

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3.0 EXPLORATION METHODS



3.1 Test Borings

A total of 13 Test Borings were advanced for this project. The Test Boring Locations were selected as close as practical to locations shown on a Plan, entitled "Ithaca Commons – Proposed Boring Locations", provided by Client with the RFP. The field layout of the borings was performed by CME and Client. Boring B-13 was selected near the proposed Pavilion. All other Borings were selected along the existing/proposed utility corridors. Please refer to the attached Boring Location Sketch, labeled BL-1, for as-drilled boring locations. Elevation at grade at each exploration location was determined by CME, using standard survey equipment, and referencing an on-site Benchmark being the top of pavement at the location shown on BL-1. This benchmark is designated elevation 412.82.

The Test Borings were advanced using a Central Mine Equipment Model 55, truck-mounted, rotary exploration drill rig, equipped with 3-1/4" I.D. hollow stem augers. Soil Sampling and Standard Penetration Testing (SPT) were conducted using a 140-pound automatic hammer dropping through a distance of 30 inches to drive a 2-inch O.D. split barrel sampler. This test method is described in ASTM Standard Practice D-1586.

The boring samples were logged and visually classified in the field by a Staff Geologist, and a portion of each sample was placed and sealed in a glass jar. The soil classifications were later reviewed by CME Senior Geologist, Mr. Douglas Hurlbut, in CME's AMRL¹ Accredited East Syracuse Laboratory. The visual soil classifications were made using the modified Burmister Classification System, as described in the attached document entitled "General Information & Key to The Test Boring Logs". Additionally, six boring samples were subjected to a Mechanical Analysis. Please refer the attached *Laboratory Test Summary*, for details.

3.2 Groundwater Observation Wells

Four Groundwater Observation Wells, labeled WB-3, WB-6, WB-9 and WB-12, were installed in boreholes B-3, B-6, B-9 and B-12, respectively, as requested by others. Please refer to the attached Groundwater Observation Well Reports, for well installation details.

3.3 Laboratory Testing

Laboratory testing performed for this project consists of 6 Mechanical Analyses (Sieve Analyses), 10 DIPRA (Ductile Iron Pipe Research Association) tests, 10 Natural Moisture Content tests and 10 Sulfate & Chloride Concentration tests. The Sieve Analyses and DIPRA tests were performed by CME in CME's AMRL Accredited East Syracuse Laboratory. All other tests were performed by CME's subcontractor, Upstate Laboratories, Inc. (ULI). Please refer to the attached Laboratory Test Summary Reports by CME and ULI, for test results.

¹ AMRL – American Association of State Highway & Transportation Officials (AASHTO) Materials Reference Laboratory. AMRL is a Federal Agency having jurisdiction to assess laboratory competence according to the Standards of the United States. CME East Syracuse accreditation includes tests of Portland Cement Concrete, Aggregate and Soil Materials. www.amrl.net

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4.0 SUBSURFACE CONDITIONS



4.1 Surface Conditions and Subsurface Profile

The subject project site is located in a highly urbanized part of the City of Ithaca. The Test Borings were advanced in or near the existing utility corridors, which were covered with roads, sidewalks and various pavement materials.

The Test Borings identified surfacings consisting of Concrete Pavement, Brick & Mortar Pavement, and Concrete & Brick Pavement. Below surfacings, all Borings identified Fill (or Miscellaneous Fill) or native soils, consisting of Silty Sand and Gravel. The Fill was noted in several Borings to about 2 to 8 feet below grade. It is difficult to differentiate the Fill from Virgin Soils at this site, from the Test Boring samples, due to the similar make-up of Fill and Virgin Soils, as noted in the Borings. Test Pits are more appropriate to better differentiate Fill from Native Soils, however, excavating Test Pits is not feasible due to the high traffic area.

Below surfacings and Fill, the explorations identified a soil profile consisting of Silt, underlain by Sand and Gravel, underlain by Sand and Silt. A brief description of each Stratum is given below:

Silt Stratum: Below Fill, a relatively thin layer (about 1 to 3 feet) of Silt containing lesser amounts of Sand was penetrated in Borings B-5, B-7 and B-8. The soils in this Stratum are non-plastic and are sensitive to moisture and vibration. Based on SPT, this Stratum has a consistency of medium stiff to stiff.

Sand and Gravel: Below surfacings, Fill or Silt, all Borings penetrated Sand and Gravel containing lesser amounts of Silt. Based on SPT, this Stratum has a relative density of very loose to compact. This Stratum was penetrated to boring termination depth (20 feet) in all Borings, except Borings B-1, B-3 and B-11. In Borings B-1, B-3 and B-11, this Stratum was penetrated to 14, 8 and 18 feet below grade, respectively, where the Sand and Silt Stratum was encountered.

Sand and Silt: Below Sand and Gravel in Borings B-1, B-3 and B-11, Silty Sand or Sandy Silt was penetrated to Boring termination depth (20 feet). Based on SPT, the Silty Sand has a relative density of very loose to loose and the Sandy Silt is medium stiff to hard in consistency.

4.2 Groundwater Observations

Groundwater level observations and measurements are made by the CME Drillers when groundwater accumulates in the borehole. The CME Drillers note water levels inside the boreholes during advancement and following casing removal. If the hole caves-in after casing removal, the depth of cave-in is noted on the CME borings logs. The drillers also note whether samples retrieved are dry, moist, wet or saturated. The conditions and times of groundwater level observations are noted on the individual Test Boring logs.

Groundwater was observed in Boring B-1 and B-2 at 18.0 and 17.7 feet below existing grade, corresponding to about elevation 392 to 391. Groundwater was not observed in the other borings during the short exploration period, within the exploration depths.

All Groundwater Observation Wells were dry when installed. Groundwater was measured again on 08/21/12, and all wells, except WB-3, remained dry. Groundwater level in WB-3 was measured at elevation 392.6.

Groundwater fluctuations should be expected to occur at this site depending on several factors such as rainfall, seasonal changes, prevailing climate, ambient weather conditions, and adjacent construction operations, among other factors.

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5.0 FOUNDATION RECOMMENDATIONS

The Pavilion and Gateway Structures and the Digital Display Columns may be supported on spread footing foundations designed using the information presented herein. The foundation excavations will likely expose Man-placed Fill or disturbed indigenous soils, resulting from past construction activities. Therefore, CME recommends that all footing foundations be designed to bear on a minimum one foot thick Granular Fill Pad. The Granular Fill Pad shall consist of Run-of-Bank Gravel (DOT Type 4 subbase course), placed in not more than 12" thick lifts, with each lift compacted to a minimum of 98% of Maximum Dry Density, as determined by ASTM D1557. One passing in-place density test per lift per spread footing shall be achieved. The Granular Fill Pad shall be at least 6 " wider than the footing on all four sides, and shall be placed over inorganic Sand and Gravel soil, compacted and approved by the CME Professional Geotechnical Engineer (PGE). Additionally, compaction of undercut grades shall be achieved by a plate tamper with a minimum operational weight of 5,000 lbs, making at least 3 passes.

Footing foundations bearing on satisfactorily placed, compacted and tested Granular Fill Pad, placed over compacted inorganic Sand and Gravel grade, approved by the CME PGE, may be designed using a Presumptive Soil Bearing Pressure of 3,000 psf. Foundations subject to moment shall be sized such that the resultant of axial force and bending moment acts within the middle one third of the footing, and using a maximum edge bearing pressure, q_{max} of 4,000 psf.

All footings for this project shall be designed to bear at least 4'-6" below adjacent finish grade, for frost protection.

Footing foundations designed and installed as recommended in this report are predicted to settle less than about one inch (1"), with differential foundation settlement, predicted to be less than about three quarters of an inch (3/4").

6.0 IMPORTANT OTHER CONSIDERATIONS

We present the information in this section to those using our reports, so they may acquire a better understanding of geotechnical engineering professional practice and the limitations associated with its application to this and other projects.

6.1 Standard of Care and Warranty

We have endeavored to conduct these services in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical engineering profession practicing contemporaneously under similar conditions in the locality of the project. No other representation, express or implied is made. Under no circumstances is any warranty, express or implied, made in connection with the providing of geotechnical engineering services.

6.2 Construction Phase Geotechnical Services

The analysis and recommendations contained in this report are preliminary and are based on the specific data obtained from the referenced subsurface explorations. The explorations indicate subsurface conditions only at the specific locations and times, and only to the depths penetrated. The validity of the recommendations is based in part on CME's assumptions about the stratigraphy, as well as information about the planned construction provided by others. CME's assumptions may be confirmed only during earthwork.

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It is very important to point out that CME's engineering recommendations given in this Report are premised upon CME being retained to provide Construction Phase Geotechnical Services as they relate to site and building earthwork, filling and backfilling, and foundation installations. If others are retained to provide these construction phase services, a complete understanding, interpretation or execution of CME's reported recommendations may not occur. CME will not assume responsibility for the performance of the structures, slabs and pavements when CME is not providing the construction phase services. CME will not be responsible for claims, disputes, costs or schedule delays associated with any of the constructions or earthwork addressed in this Report when CME is not providing construction phase services.

6.3 Closing Comments

Please do not hesitate to contact our office if you have any questions regarding this report, its conclusions, its recommendations, or its application to actual field conditions revealed during construction.

[Anas] Navaratnam Anasthas, P.E.

Christopher R. Paolini, P.E.

Attachment Listing:

Bird's Eye View Map (1 of 1)

Proposed Development Drawings (8 of 8)

Boring Location Sketch, BL-1 (1 of 1)

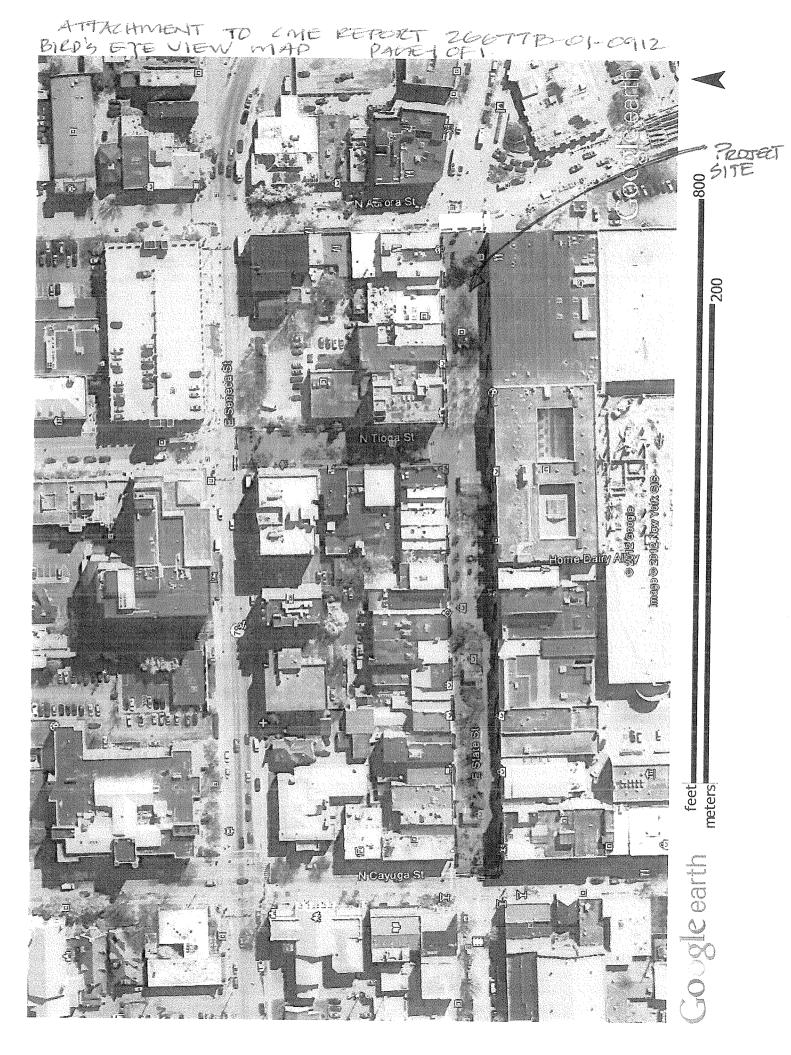
CME Subsurface Exploration-Test Boring Logs, B-1 through B-13 (13 of 13)

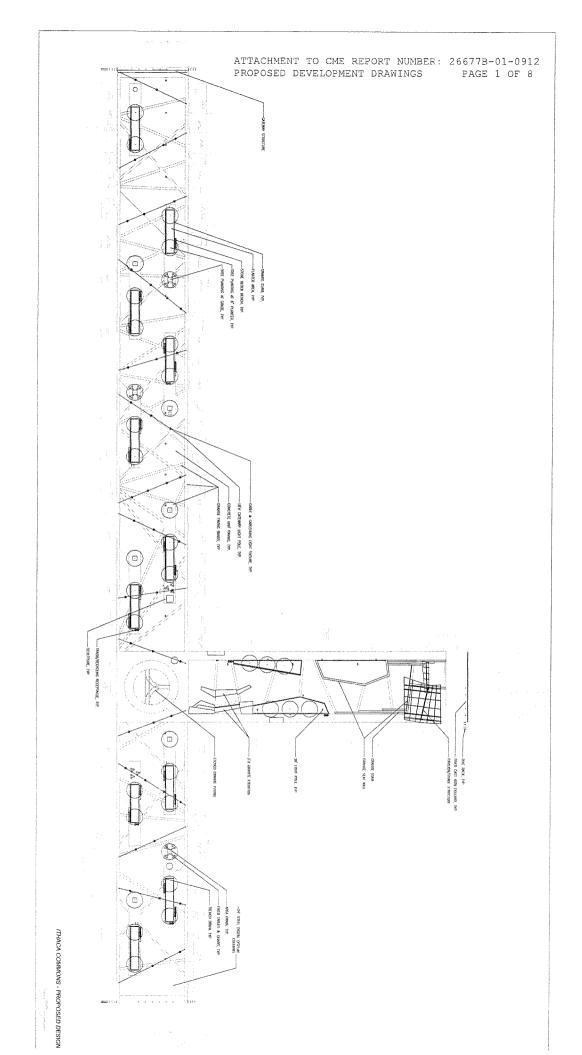
Groundwater Observation Well Reports, WB-3, WB-6, WB-9 and WB-12 (4 of 4)

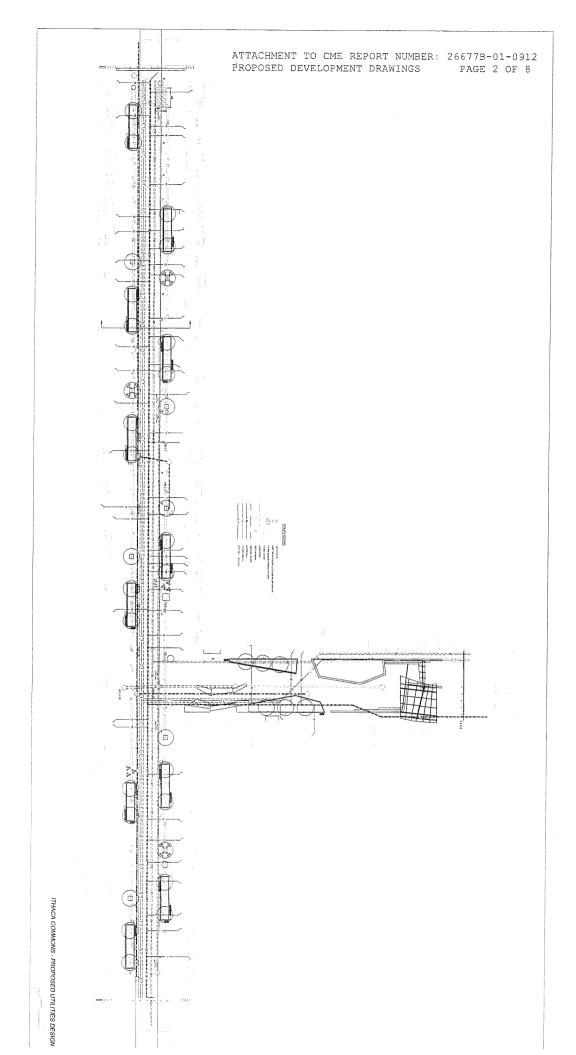
CME Laboratory Test Summary Report (5 of 5)

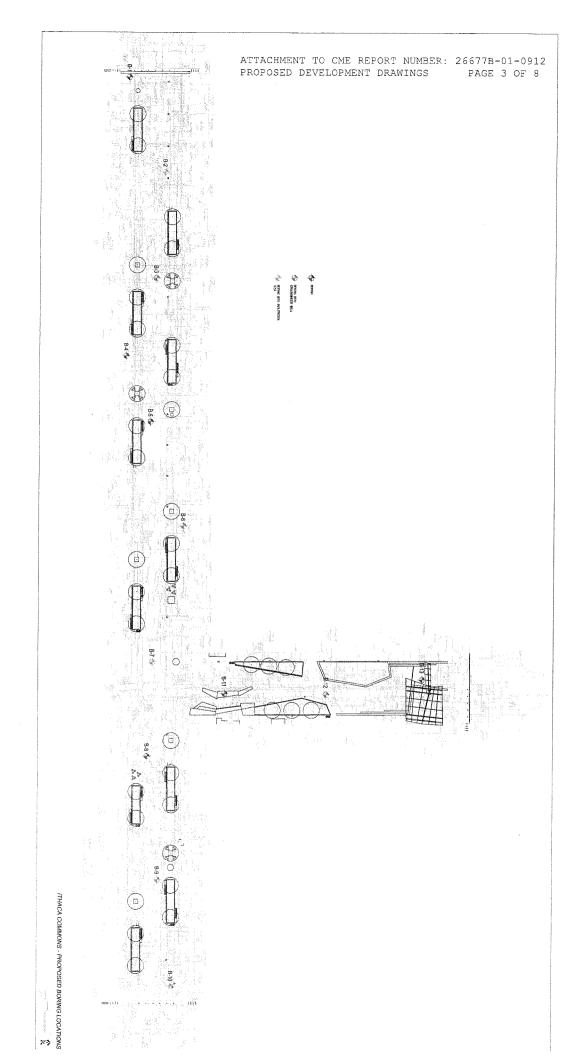
ULI Laboratory Test Summary Report (8 of 8)

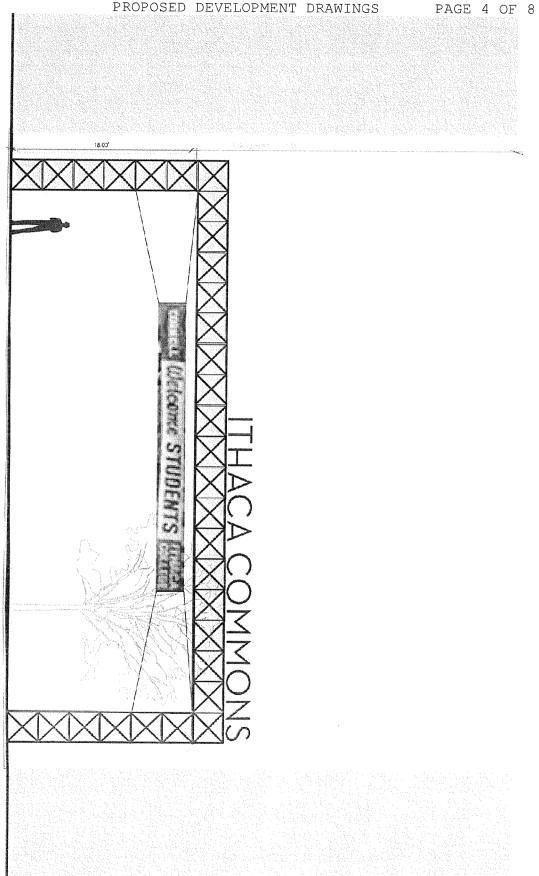
General Information & Key to the Test Boring Logs (4 of 4)

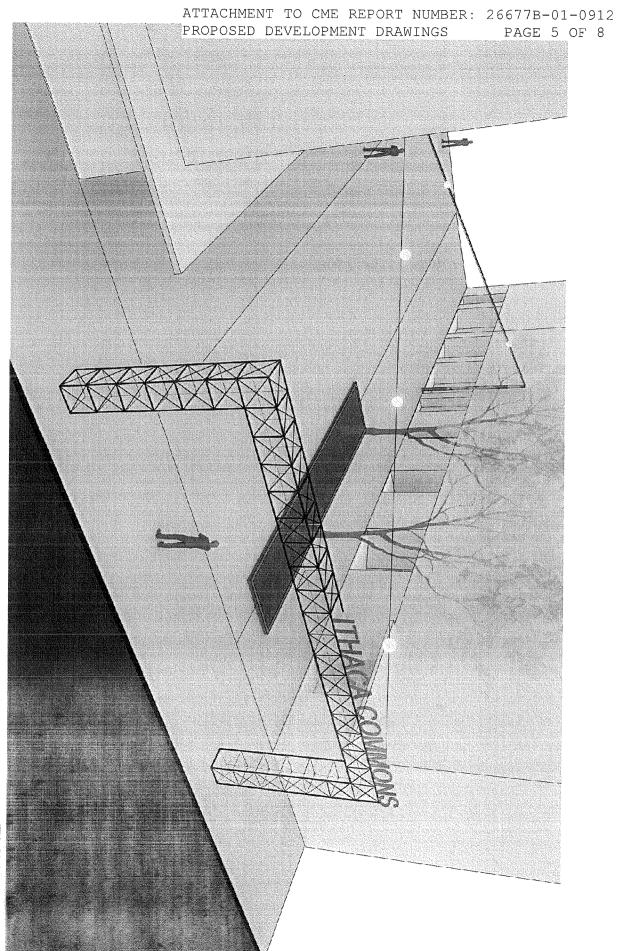




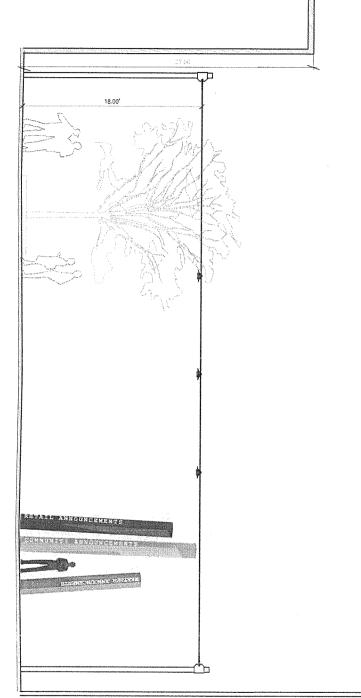




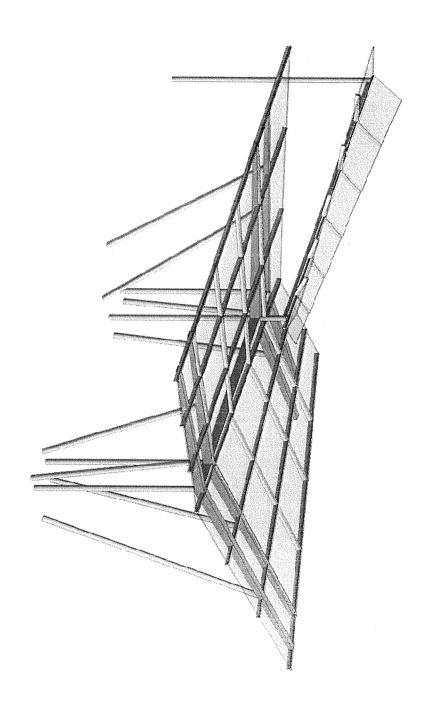


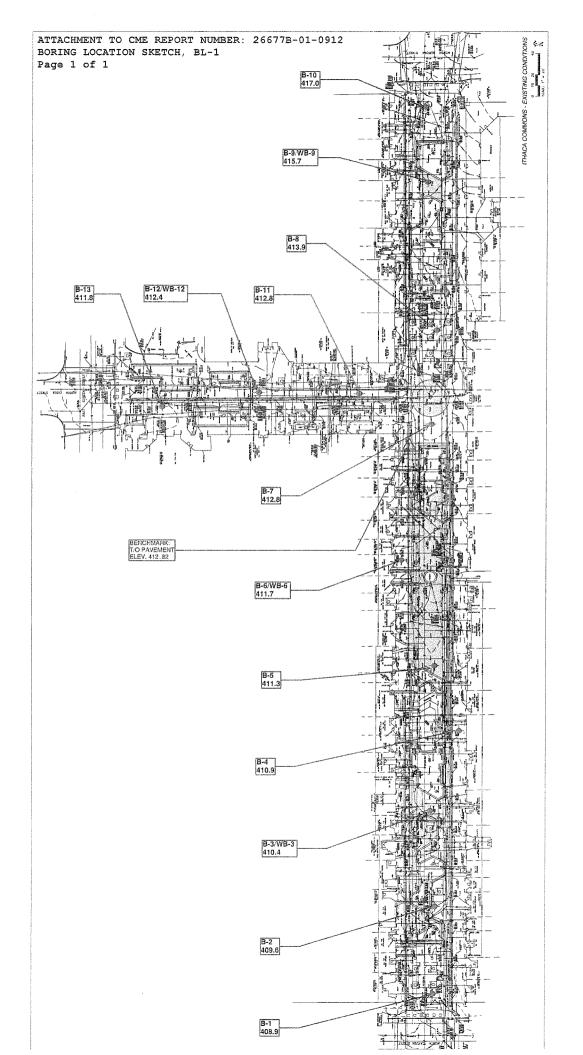


ITHACA COMMONS - PROPOSED GATEWAY STRUCTURE



ATTACHMENT TO CME REPORT NUMBER: 26677B-01-0912 PROPOSED DEVELOPMENT DRAWINGS PAGE 7 OF 8





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G E 5 18.5 20.0 SS/2 12-8-5 Brown cmf GRAVEL and cmf SAND, little SILT (saturated, medium compact) R 20 XXX Bottom of Boring @ 20.0'	13	A	1				The state of the s						1
G E 5 18.5 20.0 SS/2 12-8-5 Brown cmf GRAVEL and cmf SAND, little SILT (saturated, medium compact) R 20 XXX Bottom of Boring @ 20.0'													
E SILT (saturated, medium compact) 13 Brown cmf GRAVEL and cmf SAND, little SILT (saturated, medium compact) Bottom of Boring @ 20.0'		U											
E SILT (saturated, medium compact) 13 Brown cmf GRAVEL and cmf SAND, little SILT (saturated, medium compact) Bottom of Boring @ 20.0'			-		į								
E SILT (saturated, medium compact) R Bottom of Boring @ 20.0'		G	_	10.5	26.5	0.7.17	теричения по						
R Bottom of Boring @ 20.0'	1	_	5	18.5	20.0	SS/2	12-8-5	- 1			,	•	13
20 XXX Bottom of Boring @ 20.0'		E	e de la constante de la consta				The Control of the Co		SIL	T (saturated, medium c	ompact)		
20 XXX Bottom of Boring @ 20.0'		_											
Bottom of Borning C 20.0	20	1					THE PERSON NAMED IN COLUMN TO THE PE						
was a more a money of the desertion of the territory of t			77 77	1	1 523 5				Bott	tom of Boring @ 20.0'			

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods Remarks:

BORING NO · B.3

	CIVIE.	<u>Associa</u>				BORING N					Page 1 of 1		
			SUB!	SURF	ACE E	XPLORAT	ION -	·TE	ST BORIN	VG L	.OG		
Project						thaca, New York		eport		7B-01-	0912	***	
Client:					Public Worl				arted: 08/13		Finished:	08/13/1	2
Locano	n of Borin				cation Sketo		El	evatio	on of Surface of I				
Casing:	3-1/4"	ID H. Sto				Beau Fletcher			GROUND WA	TER (DBSERVATION	IS	74-1
	Hammer:					Fryan Howe	Date	•	Time		Depth	Cas	ing At
Other:	_				pector:		08/13/		While drilling			Noted	
Soil Sar	_	2" OD Sp				WJ	08/13/	12	Before casing ren	noved	None Noted	2	0.1
	r Hamme Model of				Fall: 3 IE 45c Truck	0 in.							
IVIARE G	t Wiodel O				AMPLES	Civiounted			CLASSIFICA	TION	OF MATERIA	<u> </u>	
	T		1	oth of				Т	CLASSITICA			11.	T
Depth	Casing	Sample	Sampl	le (Feet)	Sample Type/	Blows On	Depth Of		c – coarse		d – 35 to 50 % me – 20 to 35 %		SPT "N"
Scale (Feet)	Blows/ Foot	I.D.	F	_	Recovery	Sampler	Change		m – medium		le – 10 to 20 %		or
(4 5 5 5)			From	То	(Inches)	Per 6 inches	(feet)		f – fine	tra	ce – 0 to 10 %		RQD
0	XXX						0.2	2 "]	Brick and Morta	r Pave	ment		1
	H						0.7		Concrete				1
		1	0.7	2.0	SS/8	4-13-12		Gre	y cmf SAND, so	ome m	f GRAVEL, litt	le SILT	12
	0							(mc	ist, medium cor	npact)	~Possible F	ill~	
		2	2.0	4.0	SS/16	12-10-12-8		Bro	wn cmf SAND,	some i	mf GRAVEL, I	ittle	22
	L							SIL	T (moist, mediu	m com	pact)		
	-												
	L	3	4.0	6.0	SS/16	10-8-5-10		Sim	ilar Soil (moist,	mediu	m compact)		13
-													
5	О												
	W	4	6.0	8.0	SS/12	11-5-6-4		G.	3 6 3 /	4.			
	77	**	0.0	0.0	33/12	11-3-0-4		Sim	ilar Soil (moist,	mediu	m compact)		11
													-
							8.0						
		5	8.0	10.0	SS/15	10-2-2-2	0.0	Bro	wn SILT, some	fine S /	ND (wet med	ium	4
								stiff		ime or	m (wet, med	iuiti	-
	S								,				
10	T												
	Е												
	M												
			12.5	1.7.0	9940				_				
	-	6	13.5	15.0	SS/0	3-2-2		No I	Recovery				4
	Living and the state of the sta												
15	A												
	11												
	U		77			-							
	_												
-	G					4.00							
		7	18.5	20.0	SS/5	3-4-5		Simi	lar Soil (wet, sti	ff)			9
***************************************	Е	-				anger and a death	1		ered to 20.1' to s		l		
		- California				- Calabatan		Ŭ				nero con contractor de la contractor de	
	R	naarea a				and the second s							
20	XXX				C Core	WH Weight of I		Botto	om of Boring @	20.1			

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods Remarks:

	CME	<u>Associa</u>				BORING N				Page 1 of 1		
			SUBS	SURF	ACE E	XPLORATI	ION –	TEST B	ORING L	OG		
Project:						haca, New York		port No.:	26677B-01-			
Client:					ublic Work			te Started:	08/10/12		08/10/12	2
Location	n of Borir				ation Sketch	h	Ele		face of Boring:			
Casing:	3 1/4"	ID H. Ste			FIGATION iller: Be	eau Fletcher		GROU	IND WATER C	BSERVATIONS		
	Hammer:		in Auge			ryan Howe	Date		Time	Depth	Casi	ng At
Other:					pector:	. <u>y</u> 220 // 2	08/10/1	2 While dr	illing	None N	Noted	
Soil San		2" OD Sp				WJ	08/10/1		asing removed	None Noted		0.0
	Hamme) in.	08/10/1		ing removed	None Noted	0	ut
Make &	Model of	<u>`</u>	_		IE 45c Truck	Mounted	08/10/1		ing removed	caved @ 16.4'		ut
		LUGC	1		AMPLES			CLASS	SIFICATION	OF MATERIA	L	Т
Depth	Casing			oth of e (Feet)	Sample	Blows	Depth		an	d - 35 to 50 %		SPT
Scale	Blows/	Sample I.D.	Dumpi	1	Type/	On	Of	c – coars		ne – 20 to 35 %		"N"
(Feet)	Foot	1.D.	From	То	Recovery (Inches)	Sampler Per 6 inches	Change (feet)	m – med f – fine		le – 10 to 20 % ce – 0 to 10 %		or RQD
	323232			ļ								
0	XXX	1	0.4		0016		0.4		ete Pavement			
	Н	1	0.4	2.0	SS/6	6-8-4		-		ome mf GRAVE	EL,	12
	_							trace SILT	(moist, mediun			
	0	2	2.0	4.0	99/10	2450			~Possible			
	L	2	2.0	4.0	SS/12	3-4-5-8				nf GRAVEL, lit	tle	9
	L							SILT (mois	t, loose)			
	L	3	4.0	6.0	SS/4	0007		T) (T	CAND	CODANE		
	L	3	4.0	0.0	33/4	8-8-8-7				nf GRAVEL, tra	ice	16
5	0							SIL1 (mois	t, medium com	pact)		
3	U											
	W	4	6.0	8.0	SS/10	10-3-8-6		Cimilar Cail	(moist, mediu			
	* *	7	0.0	0.0	33/10	10-3-6-0		Sililiai Soli	(moist, mediu	iii compact)		11
								Hard auger	ina			
								Trova conger	····8			
		5	8.0	10.0	SS/6	14-6-4-6		Similar Soil	(moist, mediu	m compact)		10
									(• •p• .)		10
	S					9						
10	T											
	Е											
	M											
					,							
		6	13.5	15.0	SS/0	6-2-1		No Recover	у			3
15	Α											
	U											
											j	į
	G	7	10.7	20.0	55.75	12.46	***************************************	a: ., a .,				
	_	7	18.5	20.0	SS/5	12-4-8		Sımılar Soil	(wet, medium	compact)		12
	Е											
	R					-						
20							-	D - 44 C E				
*SS S	XXX					WII Weight of		Bottom of B	oring @ 20.0'			

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods Remarks:

	<u>CME</u>	Associa	ates, I	nc.		BORING I	VO.: В-	-5		Page 1 of 1		
					FACE E				EST BORING I	OG	****	
Projec	t: Ithaca	Commo	ns Reh	abilitatio	on Project, I	thaca, New York			t No.: 26677B-01-			-
Client:					Public Worl				Started: 08/08/12		8/08/1	12
Locane	on of Bori				cation Sketc	:h	E	levat	ion of Surface of Boring:			·· ··
Casing	: 3-1/4	" ID H. St	em Auge	er Dr		eau Fletcher	 		GROUND WATER (
	Hammer	:				ryan Howe	Date		Time	Depth	Cas	ing At
Other: Soil Sa		2" OD Sp	alit Rorre			oug Hurlbut WJ	08/08/		While drilling	None N		
	r Hamme					0 in.	08/08/		Before casing removed After casing removed	None Noted None Noted		8.5'
	& Model o	f Drill Ri	g:	CM	1E 45c Truck		08/08/		After casing removed	caved @ 13.0'		out out
		LOG	OF BO	RING S	AMPLES				CLASSIFICATION			
Depth	Casing			pth of le (Feet)	Sample	Blows	Depth		an	d - 35 to 50 %		SPT
Scale	Blows/	Sample I.D.	Samp	(1'eet)	Type/ Recovery	On	Of		c – coarse so	me – 20 to 35 %		"N"
(Feet)	Foot	1.15.	From	То	(Inches)	Sampler Per 6 inches	Change (feet)		a	tle – 10 to 20 % ace – 0 to 10 %		or RQD
0	XXX	-		-			0.25	2 "				RQB
	Н						0.25		Concrete & Brick Pave one Dust	ment		-
		1	0.5	2.0	SS/18	14-15-16			own cmf GRAVEL, sor	ne cmf SAND litt	le.	31
	О							}	LT, trace BRICK (moist			
		2a	2.0	3.0	SS/12	12-9-4-4	3.0		milar Soil (moist)			
	L	2b	3.0	4.0				Br	own SILT, trace fine SA	ND (moist, stiff)		13
	L	3	4.0	6.0	SS/0	5-5-5-6		No	Recovery			10
5	О						6.0		Ţ			
								 -				-
	W	4	6.0	8.0	SS/8	7-6-8-6			own cmf GRAVEL and LT (moist, medium com			14
		5	8.0	10.0	SS/12	10-31-10-9		Sir	nilar Soil (wet, compact)		41
	S											
10	Т											
	Е					TO THE PARTY OF TH						
	М											
		6	13.5	15.0	SS/10	3-6-5-8		Sin	nilar Soil (moist, mediur	m compact)		11
15	A											
	U	an was										
	G											
		7	18.5	20.0	SS/6	10-6-8		Bro	wn cmf GRAVEL and c	emf SAND, trace		14
	Е	- Paris		Total and the second			1		T (saturated, medium co			- 1
20	R XXX						-					
4U	$\Delta\Delta\Delta$	1	ł	i		1	ì	Rot	tom of Boring @ 200'		- 1	1

BORING NO.: B-6

Γ	CIVIE.	Associa				BORING				Page 1 of 1		
									EST BORING L			
Project						thaca, New York		-	t No.: 26677B-01-			
Client:	City o n of Boria		_		ublic Work				tarted: 08/09/12		8/09/1	2
Locano	n or born				ation Sketc	n	Ele	evati	ion of Surface of Boring:			
Casing:	3-1/4	'ID H. Sto	em Auge	r Dri		eau Fletcher			GROUND WATER O	DBSERVATIONS		
	Hammer:					ryan Howe	Date		Time	Depth	Casi	ng At
Other:						oug Hurlbut	08/09/		While drilling	None N	oted	
Soil Sar	-	2" OD Sp				WJ	08/09/		Before casing removed	None Noted	20	0.0'
	r Hamme) in.	08/09/		After casing removed	None Noted	С	out
Make o	Model o				IE 45c Truck AMPLES	Mounted	08/09/1	12	After casing removed	caved @		ut
		LOG		oth of	AMILLES			1	CLASSIFICATION	OF MATERIAL		1
Depth	Casing	Sample		e (Feet)	Sample	Blows	Depth			d – 35 to 50 %		SPT
Scale	Blows/	I.D.			Type/ Recovery	On Sampler	Of Change			me – 20 to 35 % le – 10 to 20 %		"N" or
(Feet)	Foot		From	То	(Inches)	Per 6 inches	(feet)			ce – 0 to 10 %		RQD
0	XXX						0.6	7"	Company David David			
	H	1	0.6	2.0	SS/7	4-3-6	0.0	+	Concrete Pavement	CD AND		1
	11	1	0.0	2.0	33//	4-3-0			ey cmf SAND, some mi LT (wet, loose)	I GRAVEL, trace		9
	0	2	2.0	4.0	SS/5	6-8-9-10			nilar Soil (moist, mediu	m comment)		17
-		2	2.0	7.0	33/3	0-0-9-10		311	mai son (moist, mean	m compact)		17
	L								~Possible	s Edi		
	1								~FOSSIDIR	: rm~		
	L	3	4.0	6.0	SS/18	13-8-9-11		Br	own cmf GRAVEL, son	no omf CANID		17
	L]	7.0	0.0	33/10	13-0-9-11			le SILT (moist, medium			17
5	О							1111	ie SILT (moist, medium	r compact)		
	w	4	6.0	8.0	SS/13	9-10-7-9		Sir	nilar Soil (moist, mediu	m compact)		17
		·	0.0		00/13	710,7	;	Jii.	imai 5011 (moist, media	m compact)		17
		5	8.0	10.0	SS/14	25-17-8-9		Gra	ey/Brown cmf GRAVE	some cmf SAN	D	25
								1	ne SILT (moist, medium		υ,	2.3
	S							001	ino bili i (moist) modium	ii compact)		
10	T											
	Е											
	M											
		6	13.5	15.0	SS/11	8-9-6-3		Sin	nilar Soil (moist, medium	m compact)		15
										• •		
15	A											
	U					To the second se						
	G											
		7	18.5	20.0	SS/7	2-6-7	į	Sin	nilar Soil (moist, mediur	n compact)		13
	Е											
						World Strand Administration of the Control of the C	· ·					
20	R					- Inches de la constante de la	-	~				
20 *SS S	XXX			od Tubo	C Coro	Will Waish &		Bot	tom of Boring @ 20.0'			

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods

BORING NO.: B-7

	<u></u>	Associa			-	BORING N				Page 1 of 1		
			SUB	SURI	FACE E	XPLORAT:	ION -	- T	EST BORING I	LOG		
Projec	t: Ithaca	a Commo	ns Reha	abilitatio	on Project, I	thaca, New York	R	epor	t No.: 26677B-01-		***	******
Client:	City o on of Bori				Public Worl				Started: 07/25/12)7/25/1	12
Locan	on or born		See Bo	ring Lo	cation Sketo	ch	E .	levat	ion of Surface of Boring:			
Casing	: 3-1/4	" ID H. St	em Auge	er Dr		Beau Fletcher			GROUND WATER (DBSERVATIONS	т	
1	Hammer:					Fryan Howe	Date	e .	Time	Depth	Cas	ing At
Other:					spector: C	hristine Linguanti	07/25/	/12	While drilling	None N	Voted	
Soil Sa		2" OD Sp				WJ	07/25/		Before casing removed	None Noted		8.5'
	er Hamme & Model o					0 in.	07/25/		After casing removed	None Noted		out
MAKE	x iviouei o			RINGS	ME 45c Truck AMPLES	Mounted	07/25/	12	After casing removed	caved @ 14.6'		out
			T	pth of				1	CLASSIFICATION	OF MATERIAL		
Depth	Casing	Sample		le (Feet)	Sample Type/	Blows On	Depth Of			d – 35 to 50 %		SPT
Scale (Feet)	Blows/ Foot	I.D.	_		Recovery	Sampler	Change			me – 20 to 35 % de – 10 to 20 %		"N" or
(1 001)	1000		From	То	(Inches)	Per 6 inches	(feet)			ice – 0 to 10 %		RQD
0	XXX						0.6	7"	Concrete Pavement			
	Н	1	0.6	2.0	SS/10	8-8-8	3.0		own cmf SAND, some	cmf GRAVEL so)me	16
									LT (moist, medium com		JIIIC	10
	0						2.0		~Fil	-		
	-	2	2.0	4.0	SS/12	4-2-4-7		Br	own SILT, some cmf SA	AND (wet, mediu	m	6
	L							sti		, ,		
		_					4.0					
	L	3	4.0	6.0	SS/11	3-19-22-22			own cmf GRAVEL and	cmf SAND, little)	41
5								SII	LT (moist, compact)			
5	0											
	w	4	6.0	8.0	00/0	601010		_				
	**	4	0.0	8.0	SS/8	6-8-10-10			own cmf GRAVEL and		;	18
								SII	LT (moist, medium com	pact)		
		5	8.0	10.0	SS/10	21-16-20-17		Bro	own cmf GRAVEL and	amf CAND Little		26
					55/10	21 10 20 17			T (moist, compact)	cini sand, nuie		36
	S								or (moist, compact)			
10	Т											
	Е											
	M											
			10.5		~ ~							
		6	13.5	15.0	SS/2	26-16-20			wn cmf SAND and SIL	T, little mf GRA	VEL	36
								(we	t, compact)			
15	A											
	11				-							
	U											
	G					Ì						
		7	18.5	20.0	SS/4	16-11-35		Bro	wn cmf GRAVEL, som	e cmf SAND sor	ne	46
	Е	***************************************							Γ (moist, compact)	0.1110, 301		70
		***************************************							* * * * * * * * * * * * * * * * * * * *			
	R	-				T. C.						
20	XXX							Bott	om of Boring @ 20.0'	*****		
588 - Si	alit Snoor	II IIn	dicturbo	of Tuba	C Come 1	WH - Weight of F	τ	0 5	1			

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods Remarks:

	CIVIE.	Associa		-		BORING N				Page 1 of 1		
			SUBS	SURF	ACEE	XPLORAT]	ION –		EST BORING L	OG		
Project						thaca, New York	Re	epor	t No.: 26677B-01-	0912		
Client:			-		Public Work		Da	ate S	Started: 07/25/12	Finished: 0	7/25/1	2
Locatio	n of Borii				ation Sketc	h	El	evat	ion of Surface of Boring:			
Casing:	2 1/4	METHO ID H. Sto			FIGATION D	eau Fletcher			GROUND WATER C	BSERVATIONS		
	3-1/4 Hammer:		em Auge			ryan Howe	Date	;	Time	Depth	Casi	ng At
Other:						hristine Linguanti	07/25/	12	While drilling	None N	oted	
Soil Sar	npler:	2" OD Sp	lit Barre			WJ	07/25/		Before casing removed	None Noted		3.5'
	r Hamme					O in.	07/25/	12	After casing removed	None Noted		out
Make &	Model o				IE 45c Truck	Mounted	07/25/	12	After casing removed	caved @ 11.3'		out
-	1	LOG	T		AMPLES				CLASSIFICATION	OF MATERIAL	,	
Depth	Casing			oth of e (Feet)	Sample	Blows	Depth		an	d - 35 to 50 %		SPT
Scale	Blows/	Sample	Sampi	T (Feet)	Type/	On	Of		c – coarse son	ne – 20 to 35 %		"N"
(Feet)	Foot	I.D.	From	То	Recovery (Inches)	Sampler Per 6 inches	Change (feet)			le – 10 to 20 % ce – 0 to 10 %		or RQD
	******				,			<u> </u>				RQD
0	XXX		0.75	2.0	0.010	10.1.1	0.75		Concrete Pavement		····	
***************************************	Н	1	0.75	2.0	SS/8	18-24-23		1	rown cmf GRAVEL and	cmf SAND, little	;	47
	0			-				SI	LT (dry, compact)	77/11		
		2-	20	2.0	00/14	25 12 5 0	7	-	~Possible			
	L	2a	2.0	3.0	SS/14	25-12-7-9	2.0	1	own cmf GRAVEL and	cmf SAND (dry,		19
	L	2b	3.0	4.0			3.0		edium compact)	NID . DOOT		4
	L	20	3.0	4.0			4.0	Br	rown SILT, some mf SA	ND, trace ROOT	S	
	L	3	4.0	6.0	SS/12	8-12-13-15	4.0	D	own amf CD AVEL and	CCANID 1541		- 0.5
5	О	,	4.0	0.0	33/12	0-12-13-13			own cmf GRAVEL and LT, trace ROOTS (mois			25
								31	L1, trace ROO15 (filois	i, medium compa	C()	
	W	4	6.0	8.0	SS/8	15-13-14-17		Si	milar Soil (moist, mediu	m compost)		27
		,	0.0	0.0	00/0	15 15 17 17		311	miai 3011 (moist, mediu	in compact)		21
		5	8.0	10.0	SS/7	15-11-13-11		Sir	milar Soil (moist, mediu	m compact)		24
	-								mai bon (moist, media	an compact)		2-
	S											
10	Т											
-												
	Е											
	M											
		6	13.5	15.0	SS/5	22-14-18		Sir	milar Soil (moist, compa	ct)		32
-						ta t						
15	A											
	U											
-												
	G	_										
	_	7	18.5	20.0	SS/6	40-26-21		Sin	milar Soil (moist, compa	et)		47
	E										Ì	
30	R								0.75			
20	XXX							Bo	ttom of Boring @ 20.0'			

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods

BORING NO · B-9

SUBSURFACE EXPLORATION - TEST BORING LOG Client Edition Commons Realization Project Client City of Ithaca Department of Public Works		CME A	<u>Associa</u>	2 1 12 20 1 1 1 1			BORING N				Page 1 of 1		
Client City of thace Department of Public Works Date Started: 08/10/12 Nished: 08/10/12								ION -	TES	T BORING	LOG		
	1							Re	eport No		-0912	***************************************	
METHODS OF INVESTIGATION Casing 3-1/4" Deli II series Deliter Deliter Deliter Bryan Howe Inspector Doug Harden Bryan Howe Inspector Doug Harden Smill Sampler 2° CID Spite Barrol Red Size: AWJ O88/10/12 Before casing removed None Nucl. 20.3 O87/10/12 Malee Removed None Nucl. 20.3 O87/10/10 O87/10/10 O87/10/10 O87/10/10 O87/10/10 O87/10/10 O87/10 O87/10 O87/10 O87/10 O87/10 O87/10 O87/10	1											08/10/12	2
Custing 3-1/48" Depth Custing Attended Depth	Locatio	n of Borin					<u>h</u>	Ele					
Casing Hammer: Depth Parce Bryan Howe Inspector: Dopg Hursh Sampler 1 Sampler Sample	Cacina	3.1///					oon Elatabar			GROUND WATER	OBSERVATIONS	5	
Other 2" OD Spill Barrel Rod Size AWJ Sample Through Rod Size AWJ Size Before casing removed None Noted OS/10/12 After casing removed None				III Auge				Date	.	Time	Depth	Casi	ng At
Soil Sampler 2" OD Spilt Barrel Rod Size AWJ OS/10" After casing removed None Noted 20.3								08/10/	12 Wi	nile drilling	None	Noted	
Sampler Hammer We 40 lbs Auto Fall 30 in.	Soil Sar	npler:	2" OD Sp	lit Barre	l Ro).3'
Depth Depth Sample Research Sample Receivery Sample Receivery Receivery								08/10/2	12 Aft	ter casing removed	None Noted	0	ut
Depth Scale Depth Scale Depth Scale Depth Scale Depth Scale Depth Dept	Make &	Model of					Mounted						
Depth Scale Casing Sample Feet Sample Feet Substitute Feet		T	LUGU	T		AMPLES	T		<u>C</u>	LASSIFICATION	NOF MATERIA	L	T
Scale Blows Sumple Foot LD Foom To Recovery Recovery Sampler Change Cheen Foot LD Foom To Recovery Sampler Change Cheen Change Cheen	Depth	Casing								á	and – 35 to 50 %		SPT
Foot Foot Foot Foot To (toches) Per 6 inches (feet) F-fine trace - 0 to 10 % RQD	Scale	Blows/			T (1 22.)		1	Į.					1
No.	(Feet)	Foot	1.10.	From	То	1							
H		VVV							0 " 5 1				NQD
1	0	1									ement	***************************************	1
C		П	1	0.5	2.0	55/0	4 12 7	0.5			A CID LIVINI		
L 2 2.0 4.0 SS/5 5.4-3-5 Similar Soil (moist, loose) 7 7			1	0.5	2.0	33/9	4-12-/					ittle	19
L			2	2.0	4.0	00/5	5 4 2 5		1				_
L 3 4.0 6.0 SS/1 12-21-21-17 Brown cmf SAND, some cmf GRAVEL, little SILT (wet, compact) W 4 6.0 8.0 SS/0 20-18-12-18 No Recovery 30 Similar Soil (moist, medium compact) 18 S 10 T Hard augering from 11.0' to 13.0' Hard augering from 11.0' to 13.0' 15 A U G T 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) 16 Augered to 20.3' to set Well Bottom of Boring @ 20.3'		T	2.	2.0	4.0	33/3	3-4-3-3		Simila	, ,	•		7
SILT (wet, compact) SILT (wet, compact)		L								~Possit	le Fill~		
SILT (wet, compact) SILT (wet, compact)		r	2	4.0	6.0	00/1	12 21 21 17			COLDID	6.000 1 7.777 1		
S			3	4.0	0.0	33/1	12-21-21-17		1		emi GRAVEL, I	ittle	42
W 4 6.0 8.0 SS/0 20-18-12-18 No Recovery 30	5								SILT ((wet, compact)			
Similar Soil (moist, medium compact) 18 18 18 18 18 18 18 1	J	0											
Similar Soil (moist, medium compact) 18 18 18 18 18 18 18 1		w	1	6.0	80	88/0	20 10 12 10		No Do				20
S		''	7	0.0	0.0	33/0	20-10-12-10		No Re	covery			30
S													
S													
S			5	8.0	10.0	SS/14	16-8-10-15		Simila	r Soil (moiet madi	um compost)		10
T				0.0	10.0	00/11	10 0 10 15		Omma	i bon (moist, medi	um compact)		10
T		S											
E Hard augering from 11.0' to 13.0'													
E Hard augering from 11.0' to 13.0'	10	T											
M 6 13.5 15.0 SS/1 14-8-9 Similar Soil (moist, medium compact) 17 U G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well R 20 XXX Bottom of Boring @ 20.3' Bottom of Boring @ 20.3'													
M 6 13.5 15.0 SS/1 14-8-9 Similar Soil (moist, medium compact) 17 15 A U G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well 20 XXX Bottom of Boring @ 20.3' Bottom of Boring @ 20.3'		Е						***************************************	Hard o	ugering from 11 0	' to 13.0'		
15 A U G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (moist, medium compact) E XXX Bottom of Boring @ 20.3'			***************************************						1120000		10 13.0		
15 A U G F E 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well Bottom of Boring @ 20.3'		M	and the second									***************************************	
15 A U G F E 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well Bottom of Boring @ 20.3'													
15 A U G F R 20 XXX Similar Soil (wet, medium compact) Augered to 20.3' to set Well Bottom of Boring @ 20.3'			6	13.5	15.0	SS/1	14-8-9		Similar	r Soil (moist, medi	um compact)		17
U G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well R 8 8 9 8 9 8 9 8 9 8 9 8 9 9 9 9 9 9 9										, , ,	1 /		
U G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well R 8 8 9 8 9 8 9 8 9 8 9 8 9 9 9 9 9 9 9					***************************************							opposition.	
U G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well R 8 8 9 8 9 8 9 8 9 8 9 8 9 9 9 9 9 9 9													
G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well R 20 XXX Bottom of Boring @ 20.3'	15	A										-	
G 7 18.5 20.0 SS/1 5-6-10 Similar Soil (wet, medium compact) Augered to 20.3' to set Well R 20 XXX Bottom of Boring @ 20.3'													
The state of the		U											
The state of the													
E Augered to 20.3' to set Well R Bottom of Boring @ 20.3'		G		ļ				E.					
R Bottom of Boring @ 20.3'			7	18.5	20.0	SS/1	5-6-10						16
20 XXX Bottom of Boring @ 20.3'		Е	ļ			The state of the s			Augere	d to 20.3' to set W	ell		
20 XXX Bottom of Boring @ 20.3'		_						7					
3 0 0 0 mg C 20.3		1					-						
									Bottom	of Boring @ 20.3	1		

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods Remarks:

	CME.	Associa		WHO THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS		BORING N				Page 1 of 1		Ab.
T		- C-	SUBS	SURF	ACE EX	XPLORAT	ION -		EST BORING L			
Project: Client:	ttnaca City o	Commo f Ithaca I	ns Rena Departm	bilitatio ent of P	n Project, It Jublic Work	haca, New York			t No.: 26677B-01-08/09/12		5/09/1	2
	n of Boria	ng:	See Bor	ing Loc	ation Sketcl				ion of Surface of Boring:		10211	<i>_</i>
Casing:	2 1/4	METHO ID H. Ste	DDS OF	INVEST	TIGATION ller: Be	eau Fletcher			GROUND WATER C	BSERVATIONS		
	3-1/4 Hammer:		em Auge			eau Fietener ryan Howe	Date	:	Time	Depth	Cas	ing At
Other:		411 OD 4			pector: De	oug Hurlbut	08/09/		While drilling	None No		
Soil Sar	-	2" OD Sp r: Wt.				WJ) in.	08/09/1		Before casing removed After casing removed	None Noted None Noted		0.3
		f Drill Ri			IE 45c Truck		08/09/1		After casing removed	caved @ 16.0'		out out
	1	LOG	T		AMPLES				CLASSIFICATION			
Depth	Casing	Sample		oth of e (Feet)	Sample Type/	Blows On	Depth Of			d – 35 to 50 % ne – 20 to 35 %		SPT "N"
Scale (Feet)	Blows/ Foot	I.D.	From	То	Recovery (Inches)	Sampler Per 6 inches	Change (feet)		m – medium litt	le - 10 to 20 % ce - 0 to 10 %		or RQD
0	XXX						0.5	5.5	5" Concrete Pavement			
	Н	1	0.5	2.0	SS/7	3-3-5		1	rey/Brown cmf SAND, stle SILT (moist, loose)	ome mf GRAVEL	٠,	8
	О								~Possible	e Fill~		
**************************************	L	2	2.0	4.0	SS/15	5-4-3-2		Sin	milar Soil (moist, loose)			7
	L	3	4.0	6.0	SS/6	6-3-5-4		Br	own cmf SAND, little m	of GRAVEL, little		8
5	0	7.44						SI	LT (wet, loose)			
**************************************	W	4	6.0	8.0	SS/5	2-3-3-6		Sir	milar Soil (wet, loose)			6
		5	8.0	10.0	SS/2	4-4-5-6		G:				
	C		0.0	10.0	33/2	4-4-5-0		311	milar Soil (wet, loose)			9
10	S											
10	Т											
	E											
	M											
		6	13.5	15.0	SS/6	3-6-9		Sir	nilar Soil (wet, medium	compact)		15
15	A						2000					
	U											
	G	_										
	Е	7	18.5	20.0	SS/6	11-5-8	11000	Sin	nilar Soil (wet, medium	compact)		13
	R			T T T T T T T T T T T T T T T T T T T								

²⁰ XXX Bottom of Boring @ 20.0'
*SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods
Remarks:

BORING NO.: B-11

	CIVIE.	Associa				BORING N				Page 1 of 1		
			SUB:	SURF	ACE E	XPLORAT	ION -	T	EST BORING L	OG.		
Project	: Ithaca	Commo	ns Reha	bilitatio	n Project, I	haca, New York	Re	por	t No.: 26677B-01-			****
Client:					ublic Work				Started: 07/25/12		7/25/12	2
Locatio	n of Borin				ation Sketc	h	Ele	evat	ion of Surface of Boring:			
Casing:	3 1///	METHO ID H. Sto	DDS OF	INVEST	FIGATION iller: B	eau Fletcher	<u> </u>		GROUND WATER O	BSERVATIONS		
	Hammer:		em Auge			eau Fleicher ryan Howe	Date		Time	Depth	Casi	ng At
Other:						hristine Linguanti	07/25/	12	While drilling	None N	oted	-
Soil Sar	npler:	2" OD Sp	lit Barre			WJ	07/25/		Before casing removed	None Noted		3.5'
	r Hamme			/Auto	Fall: 30) in.	07/25/	12	After casing removed	None Noted		ut
Make &	Model o		×		IE 45c Truck	Mounted	07/25/	12	After casing removed	caved @ 15.0'	0	ut
	1	LOGO	OF BOI	RING S.	AMPLES			,	CLASSIFICATION	OF MATERIAL		
Depth	Casing			oth of	Sample	Blows	Depth	ĺ	an	d – 35 to 50 %		SPT
Scale	Blows/	Sample	Sampi	le (Feet)	Type/	On	Of		c – coarse son	me – 20 to 35 %		"N"
(Feet)	Foot	I.D.	From	То	Recovery (Inches)	Sampler Per 6 inches	Change (feet)			le – 10 to 20 % ce – 0 to 10 %		or
					(mienes)	Ter o menes	(ICCI)		I – Inic Gra	ce = 0 to 10 %		RQD
0	XXX		İ				0.6	1	oncrete Pavement			
	H	1	0.6	2.0	SS/4	9-10-9		Br	own cmf GRAVEL and	cmf SAND, som	2	19
								SI	LT (moist, medium com	pact)		
	0	2	2.0	4.0	SS/3	6-7-6-9		Br	own cmf GRAVEL and	cmf SAND, little		13
								SI	LT (moist, medium com	pact)		
	L											
	L	3	4.0	6.0	SS/2	5-4-4-5		Siı	milar Soil (moist, loose)			8
5	0											
				}								
	W	4	6.0	8.0	SS/8	6-8-15-15		Sir	milar Soil (moist, mediu	m compact)		23
										- '		
		5	8.0	10.0	SS/10	15-9-15-7		Sir	nilar Soil (moist, mediu	m compact)		24
										-		
	S											
10	T											
	Е											
							-				***************************************	
	M											
			13.5	15.0	SS/0	5-7-6		No	Recovery (2 attempts)			13
						- The state of the			- '			l
						The state of the s						
15	A						ŀ					
	U						18.0					
Policies and the second					Control of the Contro	and the same of th			****************			
	G			l			No.					-
		6	18.5	20.0	SS/2	15-20-17		Bro	own SILT, some cmf SA	ND, little mf		37
	E		***************************************	MINISTER					AVEL (moist, hard)			
							-		,			
	R			Annana								
20	XXX							Bot	tom of Boring @ 20.0'			
*CC C	114 C	TT TT	1' . 1	100 1	- C - C	WH Weight of						

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods Remarks:

BORING NO.: B-12

	CIVIE	<u>Associa</u>				BORING N				Page 1 of 1		
			SUB:	SURF	FACE E	XPLORAT	ION –	TE	ST BORING	LOG		
Project						thaca, New York		port N				
Client:	on of Boria				Public Work ation Sketc			te Sta	rted: 08/13/12 n of Surface of Boria	Finished:	08/13/12	2
Docum					FIGATION	11	Ele	valioi	GROUND WATE		S	
Casing		' ID H. St		r Dr	iller: B	eau Fletcher	Date		Time		,	
Casing Other:	Hammer:					ryan Howe				Depth		ng At
Soil Sai	mpler:	2" OD Sp	olit Barre			oug Hurlbut WJ	08/13/1 08/13/1		Vhile drilling Before casing remove		Noted	0.0'
Sample	r Hamme	r: Wt.	140 lbs.			O in.	08/13/1		After casing removed	None Noted		ut
Make &	Model o				IE 45c Truck	Mounted						
	T	LOG (AMPLES				CLASSIFICATIO	N OF MATERIA	\L	
Depth	Casing	Sample		oth of le (Feet)	Sample	Blows	Depth			and - 35 to 50 %		SPT
Scale	Blows/ Foot	I.D.		Τ	Type/ Recovery	On Sampler	Of Change		c – coarse m – medium	some – 20 to 35 % little – 10 to 20 %		"N" or
(Feet)	Foot		From	То	(Inches)	Per 6 inches	(feet)		f - fine	trace - 0 to 10 %		RQD
0	XXX						0.4	5" C	oncrete Pavement			
	Н	1	0.4	2.0	SS/12	9-12-12			vn cmf SAND, son	ne mf GRAVEL, ti	race	24
									(wet, medium cor			
	0	_										
	_	2	2.0	4.0	SS/10	7-8-6-3		Simi	lar Soil (moist, me	dium compact)		14
	L											
	L	3	4.0	6.0	SS/11	11-13-18-18		Cimil	lan Cail (maist assu			2.1
		3	7.0	0.0	33/11	11-15-16-16		SIIIII	lar Soil (moist, con	ipact)		31
5	О											
	W	4	6.0	8.0	SS/18	16-14-24-59		Simil	lar Soil (moist, con	npact)		38
		5	8.0	100	00/1/	1,7 11 12 12		a				
		3	8.0	10.0	SS/16	15-11-13-13		Simil	lar Soil (moist, med	lium compact)		24
	S											
							-					
10	Т											
	Е											
	M	***************************************										
		6	13.5	15.0	SS/6	13-12-14		Cimit	or Soil (maint and	(i		26
			1.0.0	15.0	33/0	15-12-14		SHIIII	ar Soil (moist, med	num compact)		26

	The state of the s											
15	A						-					
							-					
	U				İ	***						
	C						-				İ	
	G	7	18.5	20.0	SS/4	22 17 11		C:'1	on C = 11 (31		Walders was	20
	Е	/	10.5	20.0	33/4	32-17-11			ar Soil (wet, mediu red to 20.1' to set V	•	- A	28
	-					a portugui anno de la companio de la	1	ruger	eu 10 20.1 10 SET V	rell		
	R											
20	XXX								m of Boring @ 20.	1'		
*00 0	1'. 0	TT T7	1	1.00 1	~ ~	WH - Weight of						

^{*}SS – Split Spoon, U – Undisturbed Tube, C – Core, WH – Weight of Hammer & Rods

		~	SUD	UNI	ACE E.	APLUKATI		TEST BORIN			
Project:	: Ithaca	Commo	ns Reha	bilitatio	n Project, It	haca, New York	-		B-01-09		
Client:					ublic Work			e Started: 07/24/			7/24/12
Location	n of Bori	0			ation Sketc	h	Ele	vation of Surface of B			
Casing:	3_1/4'	' ID H. Ste	m Auge	INVESI	TIGATION ller: B	eau Fletcher		GROUND WA	TER OB	SERVATIONS	
	Hammer:		in Auge			ryan Howe	Date	Time		Depth	Casing
Other:						hristine Linguanti	07/24/1	2 While drilling		None N	oted
Soil San	npler:	2" OD Sp	lit Barre			WJ	07/24/1		oved	None Noted	18.5
		r: Wt.		'Auto	Fall: 30) in.	07/24/1:			None Noted	out
Make &	Model o	f Drill Rig			E 45c Truck	Mounted	07/24/1:	2 After casing remov	ved	caved @ 15.2'	out
	Ţ	LOGC	F BOF	RING SA	AMPLES	T		CLASSIFICAT	TION O	F MATERIAL	,
Depth	Casing			oth of	Sample	Blows	Depth		and -	– 35 to 50 %	
Scale	Blows/	Sample	Sampi	e (Feet)	Type/	On	Of	c – coarse		e – 20 to 35 %	
(Feet)	Foot	I.D.	From	То	Recovery (Inches)	Sampler Per 6 inches	Change (feet)	m – medium f – fine		- 10 to 20 %	
					(literies)	rei o niches	(leet)	1 – Ime	trace	e – 0 to 10 %	F
0	XXX						0.5	5½" Concrete Paven	nent		
	Н	1	0.5	2.0	SS/8	14-18-19		Brown cmf GRAVE	L and c	mf SAND, little	
								SILT, trace BRICK	(moist)	•	
	О							~Misc	ellaneo	us Fill~	
		2	2.0	4.0	SS/12	10-5-4-7		Brown SILT and mf	SAND	(moist)	
	L										
							4.0				
	L	3	4.0	6.0	SS/10	7-9-9-5		Brown cmf GRAVE	L and c	mf SAND, little	;
							1	SILT (moist, mediur			
5	О							•	•	,	
	W	4	6.0	8.0	SS/8	14-19-14-15		Brown cmf GRAVE	L and c	mf SAND, trace	, :
								SILT (moist, compac		, , , , , , , , , , , , , , , , , , , ,	
								and a (moist, vompu			
		5	8.0	10.0	SS/12	20-20-41-21		Similar Soil (moist,	verv cor	mnact)	
										puet)	
	S										
10	T										
	Ε										
i	M										
ļ											
		6	13.5	15.0	SS/3	3-4-6		Brown cmf SAND, s	ome SII	T little mf	
							į.	GRAVEL (wet, med			1
				-				· (**Ct, 1110U.	0011	upaci)	
					-						
15	A	****									
						T THE SAME					f
	U						ĺ				ļ
				***************************************							-
	G	***************************************				re constituine par established and established					
	ū	7	18.5	20.0	SS/6	22-25-14	1	Danaria and CARID	. a err m		
	Е	′	10.0	20.0	33/0	42-23-14	1	Brown cmf SAND ar		, trace tine	3
	11						1	GRAVEL (wet, comp	pact)		
	R					TO A CONTROL OF THE PARTY OF TH					
20	XXX						_		20.01		
2U	$\Delta \Delta \Delta \Delta$		- 1	1				Bottom of Boring @	20.0		1



roje	ct	Ithaca Commons Re	habilitation Pr	roiect	Report No.	26677	B-01-0812
		Ithaca, New York			Boring No.	B-3	0 01 0012
lien	t	City of Ithaca Depart	tment of Publ	ic Works	Well No.	WB-3	
Conti	actor	CME Associates, Inc.			Location	See Bo	ring Location Plar
rille		J. Wood	Driller	D. Hurlbut	Surface Elevation	n 410.4'	
nsta	llation D	ate 08/13/12	200-201-201-201-201-201-201-201-201-201-		Sheet	1	of 1
Summarize Soil Conditions (not to scale)	Please ref	er to Boring Log B-3			Elevation/Depth of rise Below ground surface. Thickness & Type of surface. Diameter of PVC Type of backfill around Diameter of Borehole Thickness & Type of se Bentonite Depth to top of filter paragraphs. Depth of bottom of rise Screen gauge or size of Type of backfill/filter paragraphs. Type of backfill/filter paragraphs.	riser riser f openings ack around point	20.4′
F		hidde child Africa di Africa i contra di metro de la companiona populari bista minima con i su que com a mengana		1	to bottom of point		#1 Silica Sand to 20
			<u> </u>		Depth of bottom of bor		20.4′
ites	: 5" bolt	-down protective cur	b box install	ed to closely matcl	h existing grade for well p	rotection.	



riller	Ithaca, New York City of Ithaca Dep		- Juli	Report No.		
ontra riller	City of Ithaca Dep			Boring No.	B-6	B-01-0812
riller		artment of Publ	ic Works	Well No.	WB-6	
	actor CME Associates, Ir			Location		oring Location Plan
ıstal		Driller	D. Hurlbut	Surface Elevat	tion 411.7'	
	lation Date 08/09/12		and see an an an an an an an an an an an an an	Sheet	1	of 1
THE STANKEN WERE THE STANKEN OF THE	Please refer to Boring Log B-6			Elevation/Depth of ribelow ground surface Thickness & Type of Diameter of PVC	e.	411.5' / -0.2' 24" HD50 Grout with Sakrete
				Type of backfill arour Diameter of Borehole Thickness & Type of	3	Auger Cuttings 7.0"
				Depth to top of filter Depth of bottom of ri	pack	_3" Granular Bentor 8.0' 10.2'
				Screen gauge or size		0.010″
The signature of the state of t				Type of backfill/filter Depth of bottom of portion Depth & Type of Backto bottom of point	oint . kfill	int #1 Silica San 20.2' #1 Silica Sand to 20
	5" bolt-down protective cu	-		Depth of bottom of bo	orehole	20.2



Proje	ct	Ithaca Commons R	ehabilitation D	roject	Report No.	26677	B-01-0812
Project Ithaca Commons Rel Ithaca, New York		enablitation r	roject	Boring No.	B-9	D-01-0612	
lien	t	City of Ithaca Depa	rtment of Pub	lic Works	Well No.	WB-9	
	actor	CME Associates, Inc			Location		oring Location Plan
rille		J. Wood	Driller	D. Hurlbut	Surface Eleva		
nsta	llation D	oate 08/10/12			Sheet	1	of 1
Summarize soil conditions (not to scale)	Please re	fer to Boring Log B-9			Elevation/depth of ribelow ground surface Thickness & Type of Diameter of PVC Type of backfill arou Diameter of Borehol Thickness & Type of Depth to top of filter Depth of bottom of ribelow Screen gauge or size Type of backfill/filter Depth of bottom of ribelow Depth of ribelow Depth of bottom of ribelow Depth of bottom of ribelow Depth of bottom of ribelow Depth of bottom of ribelow Depth of bot	nd riser e seal pack riser e of openings pack around pooint kfill	20.1" #1 Silica Sand to 20.
					Depth of bottom of b	oorehole	20.1′
otes	: 5" bolt	t-down protective cu	rb box install	led to closely match	existing grade for wel	I protection.	-



				R OBSERVATIO	N WELL REPORT			
Project Ithaca Commons Rehabilitation Project			Report No.	26677B-01-0812				
Ithaca, New York		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Boring No.	B-12	7415444444			
lien		City of Ithaca Depar		ks	Well No.	WB-12		
	ractor	CME Associates, Inc			Location		oring Locati	ion Plan
)rille	er allation D	J. Wood	D riller D.	Hurlbut	Surface Elevation			
HISLC		ate 08/13/12		and the state of t	Sheet	1 1	of	1
	Please re	fer to Boring Log B-12			Elevation/depth of riser below ground surface. Thickness & Type of sur		415.6 24" HD5 with sa	
6				<u> </u>	Diameter of PVC		1.0	0"
scale					Type of backfill around i	riser	Auger (Cuttings
narize Soil Conditions (not to scale)					Diameter of Borehole		7.	0"
ions (,					Thickness & Type of sea	1	3" Granula	r Benton
Condit					Depth to top of filter pac	ck .	8.0	<u>Oʻ</u>
Soil					Depth of bottom of riser		10.3	3′
Summarize					Screen gauge or size of	openings	0.01	10"
জ					Type of backfill/filter pac	ck around po	oint <u>#1 S</u>	ilica Sand
HOLINGAR WATER CONTROL OF THE PARTY OF THE P				1	Depth of bottom of point Depth & Type of Backfill to bottom of point Depth of bottom of bore	_	20.3 #1 Silica Sai 20.3	nd to 20



www.cmeassociates.com

LABORATORY TEST SUMMARY Ithaca Commons Rehabilitation Project, Ithaca, New York CME Report No.: 26677L-01-0912 September 4, 2012 Page 1 of 5

CME Representatives obtained soil samples from Test Borings advanced as part of the Subsurface Exploration Program conducted for the subject project. Selected samples were delivered to CME's East Syracuse facility, an AASTHO AMRL¹ accredited laboratory for various laboratory testing. The results are presented below:

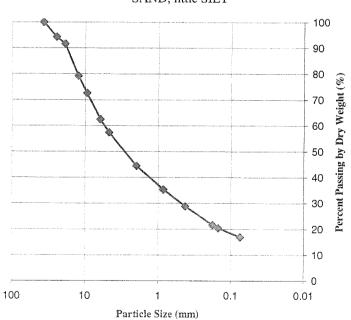
Sample ID Notations: B - Test Boring, S - Sample

I. Mechanical Analysis (ASTM D422)

Sample II	D: I	3-1, 0	.5'-4.0

Sieve	Particle	Percent
Designation	Size (mm)	Passing
1 1/2"	37.5	100
1"	25.0	94
3/4"	19.0	92
1/2"	12.5	79
3/8"	9.50	73
1/4"	6.25	. 62
No. 4	4.75	57
No. 10	2.00	44
No. 20	0.850	35
No. 40	0.425	29
No. 80	0.180	22
No. 100	0.150	20
No. 200	0.075	17

Burmister Classification: Brown cmf GRAVEL and cmf SAND, little SILT



¹ AMRL – American Association of State Highway & Transportation Officials (AASHTO) Materials Reference Laboratory. AMRL is a Federal Agency having jurisdiction to assess laboratory competence according to the standards of the United States. CME East Syracuse accreditation includes tests of Portland Cement Concrete, Aggregate and Soil Materials. www.amrl.net

LABORATORY TEST SUMMARY CME Report No.: 26677L-01-0912

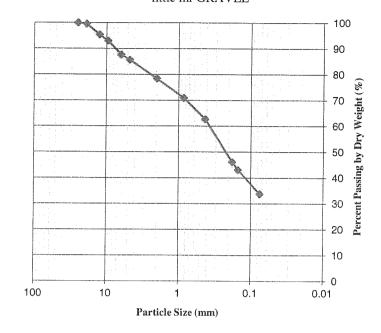
Page 2 of 5



Sample ID: B-2, S-1

Sieve Designation	Particle Size (mm)	Percent Passing
1"	25.0	100
3/4"	19.0	99
1/2"	12.5	95
3/8"	9.50	93
1/4"	6.25	88
No. 4	4.75	86
No. 10	2.00	78
No. 20	0.850	71
No. 40	0.425	63
No. 80	0.180	46
No. 100	0.150	43
No. 200	0.075	34

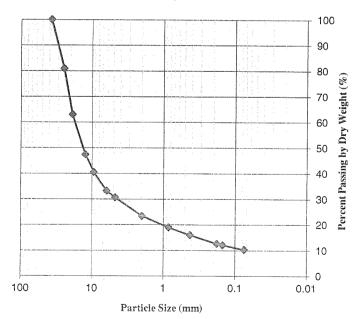
Burmister Classification: Brown cmf SAND, some SILT, little mf GRAVEL



Sample ID: B-5, 0.5'-3.0'

Sieve	Particle	Percent
Designation	Size (mm)	Passing
1 1/2"	37.5	100
1"	25.0	81
3/4"	19.0	63
1/2"	12.5	47
3/8"	9.50	40
1/4"	6.25	33
No. 4	4.75	31
No. 10	2.00	23
No. 20	0.850	19
No. 40	0.425	16
No. 80	0.180	13
No. 100	0.150	12
No. 200	0.075	10

<u>Burmister Classification:</u> Brown cmf GRAVEL, some cmf SAND, little SILT



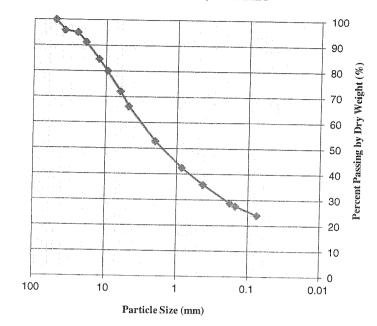
LABORATORY TEST SUMMARY CME Report No.: 26677L-01-0912 Page 3 of 5



Sample ID: B-7, S-1

Sieve	Particle	Percent
Designation	Size (mm)	Passing
2"	50.0	100
1 1/2"	37.5	96
1"	25.0	95
3/4"	19.0	91
1/2"	12.5	85
3/8"	9.50	80
1/4"	6.25	72
No. 4	4.75	66
No. 10	2.00	53
No. 20	0.850	42
No. 40	0.425	36
No. 80	0.180	29
No. 100	0.150	28
No. 200	0.075	24

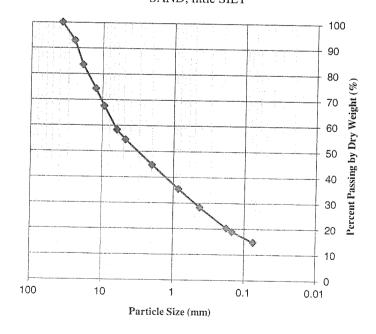
Burmister Classification: Brown cmf SAND, some cmf GRAVEL, some SILT



Sample ID: B-8, S-1

Particle	Percent
Size (mm)	Passing
37.5	100
25.0	93
19.0	84
12.5	74
9.50	68
6.25	58
4.75	55
2.00	45
0.850	35
0.425	28
0.180	20
0.150	19
0.075	15
	Size (mm) 37.5 25.0 19.0 12.5 9.50 6.25 4.75 2.00 0.850 0.425 0.180 0.150

Burmister Classification: Brown cmf GRAVEL and cmf SAND, little SILT



LABORATORY TEST SUMMARY CME Report No.: 26677L-01-0912

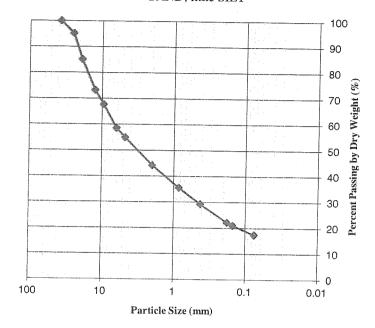
Page 4 of 5



Sample ID: B-13, S-1

Sieve	Particle	Percent
Designation	Size (mm)	Passing
1 1/2"	37.5	100
1"	25.0	95
3/4"	19.0	85
1/2"	12.5	73
3/8"	9.50	68
1/4"	6.25	59
No. 4	4.75	55
No. 10	2.00	44
No. 20	0.850	36
No. 40	0.425	29
No. 80	0.180	22
No. 100	0.150	21
No. 200	0.075	17

Burmister Classification: Brown cmf GRAVEL and cmf SAND, little SILT





II. <u>Ductile Iron Pipe Research Association (DIPRA)</u> Test

Sample ID	Sample Depth (ft.)	Material Description
B-1, S-3	4' to 6'	Brown cmf GRAVEL and cmf SAND, little SILT
B-2, S-4	8' to 10'	Brown cmf GRAVEL and cmf SAND, trace SILT
B-3, S-3	4' to 6'	Brown cmf SAND, some mf GRAVEL, little SILT
B-4, S-4	6' to 8'	Brown cmf SAND, some mf GRAVEL, trace SILT
B-7, S-4	6' to 8'	Brown cmf SAND and cmf GRAVEL, little SILT
B-8, S-4	6' to 8'	Brown cmf GRAVEL and cmf SAND, trace SILT, trace ROOTS
B-9, S-3	4' to 6'	Brown cmf SAND, some cmf GRAVEL, little SILT
B-11, S-4	6' to 8'	Brown cmf GRAVEL and cmf SAND, trace SILT
B-12, S-3	4' to 6'	Brown cmf GRAVEL and cmf SAND, little SILT
B-13, S-4	6' to 8'	Brown cmf GRAVEL and cmf SAND, trace SILT

TABLE 1- DIPRA TEST RESULTS										
Sample ID	Resistivity ohm-cm.	Redox Potential (mv)	pН	Sulfides	Moisture	DIPRA Points				
B-1, S-3	4720	173	9.8	Negative	Good	3				
B-2, S-4	1438	117	8.1	Negative	Good	10				
B-3	1962	191	10.6	Negative	Fair	9				
B-4, S-4	3500	170	11.7	Negative	Fair	4				
B-7, S-4	3370	107	8.0	Negative	Good	0				
B-8, S-4	1404	115	7.8	Negative	Good	10				
B-9, S-3	843	171	11.3	Negative	Poor	15				
B-11, S-4	2450	122	7.9	Negative	Good	2				
B-12, S-3	1977	144	12.7	Negative	Fair	9				
B-13, S-4	2740	112	8.6	Negative	Good	1				

If you have any questions regarding this report please contact our office.

Kelly Teeter Laboratory Supervisor

Shipping: 6034 Corporate Dr. * E. Syracuse, NY 13057-1017 * (315) 437-0255 * Fax (315) 437-1209 Mailing: Box 169 * Syracuse, NY 13206

Albany (518) 459-3134 * Binghamton (607) 239-4413 * Buffalo (716) 972-0371 Rochester (866) 437-0255 * New Jersey (908) 581-4285

Doug Hurlbut CME Associates, Inc. 6035 Corporate Drive East Syracuse, NY 13057 (315) 952-1425

Friday, August 31, 2012

RE: Analytical Report:

Order No.: U1208458

Ithaca Commons/26677

Dear Doug Hurlbut:

Upstate Laboratories, Inc. received 10 sample(s) on 8/16/2012 for the analyses presented in the following report.

All analytical results relate to the samples as received by the laboratory.

All analytical data conforms with standard approved methodologies and quality control. Our quality control narrative will be included should any anomalies occur.

We have included the Chain of Custody Record as part of your report. The NYS DOH requires that all samples received by the laboratory must have a Collection Date and Time, and a Relinquished By signature. You may need to reference this form for a more detailed explanation of your samples. Samples will be disposed of approximately one month from final report date.

Should you have any questions regarding these tests, please feel free to give us a call.

Thank you for your patronage.

Sincerely,

UPSTATE LABORATORIES, INC.

Anthony J. Scala President/CEO

Confidentiality Statement: This report is meant for the use of the intended recipient. It may contain confidential information, which is legally privileged or otherwise protected by law. If you have received this report in error, you are strictly prohibited from reviewing, using, disseminating, distributing or copying the information.

NY Lab ID 10170 NJ Lab ID NY750 PA Lab ID 68-01096

Analytical Report		Date: 31-Aug-12					
CLIENT: CME Associates, Inc. Project: Ithaca Commons/26677				Lab Order	: U1208458		
Lab ID: U1208458-001 Client Sample ID: B-1,S-4,6ft-8ft			Collection Dat Matri	e: 8/8/201: x: SOIL	2		
Analyses	Result	Limit	Qual Units	DF	Date Analyzed		
CHLORIDE SOILS BY EPA METHOD 925	1		Lab Code: CL_S _	AUTO	Analyst: CAS		
Chloride	121	22.7	mg/Kg-dry	1	8/21/2012		
PERCENT MOISTURE BY ASTM D2216			Lab Code: PMOIS	ST.	Analyst: NKA		
Percent Moisture	11.9	0.0100	wt%	1	8/17/2012		
SULFATE IN SOLIDS BY EPA METHOD S	9038		Lab Code: SULFA	TE_S	Analyst: CAG		
Sulfate	ND	113	mg/Kg-dry	1	8/28/2012		
Lab ID: U1208458-002 Client Sample ID: B-2,S-3,4ft-6ft			Collection Date Matrix	e: 7/27/201 c: SOIL	12		
Analyses	Result	Limit	Qual Units	DF	Date Analyzed		
CHLORIDE SOILS BY EPA METHOD 925	1		Lab Code: CL_S _	AUTO	Analyst: CAS		
Chloride	169	23.5	mg/Kg-dry	1	8/21/2012		
PERCENT MOISTURE BY ASTM D2216			Lab Code: PMOIS	т	Analyst: NKA		
Percent Moisture	14.9	0.0100	wt%	1	8/17/2012		
SULFATE IN SOLIDS BY EPA METHOD S	0038		Lab Code: SULFA	TE_S	Analyst: CAG		
Sulfate	ND	118	mg/Kg-dry	1	8/17/2012		

Approved	Ву:	PFF	Date:	8-31-12 Page 1 of 5
Qualifiers:	#	Accreditation not offered by NYS DOH for this parameter	垮	Low Level
	**	Value exceeds Maximum Contaminant Value	В	Analyte detected in the associated Method Blank
	Е	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
	Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recovery limits

Sulfate

Analytical Rep	oort			1	Date: 31-Aug	7-12
	CME Associates, Inc. Ithaca Commons/26677				Lab Order	: U1208458
Lab ID:	U1208458-003			Collection D		12
Client Sample ID	: B-3,S-4,6ft-8ft			Mat	rix: SOIL	
Analyses		Result	Limit	Qual Units	DF	Date Analyzed
CHLORIDE SOILS	BY EPA METHOD 9257	I		Lab Code: CL_	S AUTO	Analyst: CAS
Chloride		232	22.3	mg/Kg-dry	1	8/21/2012
PERCENT MOIST	JRE BY ASTM D2216			Lab Code: PMC	IST	Analyst: NKA
Percent Moisture		10.3	0.0100	wt%	1	8/17/2012
SULFATE IN SOLI	DS BY EPA METHOD 9	038		Lab Code: SUL I	FATE_S	Analyst: CAG
Sulfate		ND	111	mg/Kg-dry	1	8/28/2012
Lab ID:	U1208458-004			Collection Da	ite: 8/10/201	2
Client Sample ID:	B-4,S-4,6ft-8ft			Matı	rix: SOIL	
Analyses		Result	Limit	Qual Units	DF	Date Analyzed
CHLORIDE SOILS	BY EPA METHOD 9251			Lab Code: CL_S	S AUTO	Analyst: CAS
Chloride		76.5	21.4	mg/Kg-dry	1	8/21/2012
PERCENT MOISTU	JRE BY ASTM D2216			Lab Code: PMO (IST	Analyst: NKA
Percent Moisture		6.40	0.0100	wt%	1	8/17/2012
SULFATE IN SOLI	DS BY EPA METHOD 90	38		Lab Code: SULF	ATE_S	Analyst: CAG

Approved	Ву:	PFF	Date:	8-31-12	Page 2 of 5
Qualifiers:	#	Accreditation not offered by NYS DOII for this parameter	*	Low Level	
	非非	Value exceeds Maximum Contaminant Value	В	Analyte detected in the associated	d Method Blank
	E	Value above quantitation range	H	Holding times for preparation or	analysis exceeded
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Lin	nit
	Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted	recovery limits

107

mg/Kg-dry

8/28/2012

ND

Analytical Repo	ort		Date; 31-Aug-12					
	CME Associates, Inc. thaca Commons/26677				Lab Orde	r: U1208458		
Lab ID: Client Sample ID:	U1208458-005 B-6,S-4,6ft-8ft			Collection Dat Matri	te: 8/9/20 x: SOIL	12		
Analyses		Result	Limit	Qual Units	DF	Date Analyzed		
CHLORIDE SOILS	BY EPA METHOD 925	1		Lab Code: CL_S	_AUTO	Analyst: CAS		
Chloride		47.3	22.1	mg/Kg-dry	1	8/21/2012		
PERCENT MOISTU	RE BY ASTM D2216			Lab Code: PMOIS	ST.	Analyst: NKA		
Percent Moisture		9.45	0.0100	wt%	1	8/17/2012		
SULFATE IN SOLID	S BY EPA METHOD 9	038		Lab Code: SULFA	ATE_S	Analyst: CAG		
Sulfate		ND	110	mg/Kg-dry	1	8/28/2012		
Lab ID: Client Sample ID:	U1208458-006 B-7,S-3,4ft-6ft			Collection Dat	e: 7/25/20 x: SOIL)12		
Analyses		Result	Limit	Qual Units	DF	Date Analyzed		
CHLORIDE SOILS	BY EPA METHOD 925	I		Lab Code: CL_S _	AUTO	Analyst: CAS		
Chloride		227	21.4	mg/Kg-dry	1	8/21/2012		
PERCENT MOISTUI	RE BY ASTM D2216			Lab Code: PMOIS	эт	Analyst: NKA		
Percent Moisture		6.43	0.0100	wt%	1	8/17/2012		
SULFATE IN SOLID	S BY EPA METHOD 9	038		Lab Code: SULFA	ATE_S	Analyst: CAG		
Sulfate		ND	107	mg/Kg-dry	1	8/17/2012		

Approved	Ву:	PFF	Date:	8-31-12	Page 3 of 5
Qualifiers:	#	Accreditation not offered by NYS DOH for this parameter	*	Low Level	
	**	Value exceeds Maximum Contaminant Value	В	Analyte detected in the associated M	lethod Blank
	E	Value above quantitation range	II	Holding times for preparation or and	lysis exceeded
	J	Analyte detected helow quantitation limits	ND	Not Detected at the Reporting Limit	
	Q	Outlying QC recoveries were associated with this parameter	\$	Spike Recovery outside accepted rec	cvery limits

Sulfate

Analytical Report Date: 31-Aug-12 CLIENT: CME Associates, Inc. Lab Order: U1208458 Project: Ithaca Commons/26677 Lab ID: U1208458-007 Collection Date: 7/25/2012 Client Sample ID: B-8,S-3,4ft-6ft Matrix: SOIL Analyses Result Limit Qual Units \mathbf{DF} Date Analyzed CHLORIDE SOILS BY EPA METHOD 9251 Lab Code: CL_S_AUTO Analyst: CAS Chloride 467 21.0 mg/Kg-dry 8/21/2012 PERCENT MOISTURE BY ASTM D2216 Lab Code: PMOIST Analyst: NKA Percent Moisture 4.98 0.0100 wt% 8/17/2012 SULFATE IN SOLIDS BY EPA METHOD 9038 Lab Code: SULFATE_S Analyst: CAG Sulfate ND 105 mg/Kg-dry 1 8/17/2012 Lab ID: U1208458-008 Collection Date: 8/9/2012 Client Sample ID: B-10,S-4,6ft-8ft Matrix: SOIL Analyses Result Limit Qual Units DF Date Analyzed **CHLORIDE SOILS BY EPA METHOD 9251** Lab Code: CL_S_AUTO Analyst: CAS Chloride 340 22.4 mg/Kg-dry 8/21/2012 PERCENT MOISTURE BY ASTM D2216 Lab Code: PMOIST Analyst: NKA Percent Moisture 10.6 0.0100 wt% 8/17/2012 SULFATE IN SOLIDS BY EPA METHOD 9038 Lab Code: SULFATE_S Analyst: CAG

Approved	Ву:	PFF	Date:	8-31-12	Page 4 of 5
Qualifiers:	#	Accreditation not offered by NYS DOH for this parameter	#	Low Level	
	法米	Value exceeds Maximum Contaminant Value	B	Analyte detected in the associated M	Method Blank
	E	Value above quantitation range	Н	Holding times for preparation or an	alysis exceeded
	J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limi	t
	Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted re	covery limits

112

mg/Kg-dry

1

8/28/2012

ND

8/28/2012

Upstate Laboratories, Inc.

Sulfate

Analytical I	Report			D	ate: 31-Au	.g-12
CLIENT: Project:	CME Associates, Inc. Ithaca Commons/26677				Lab Orde	1/4
Lab ID: Client Sample	U1208458-009 • ID : B-12,S-4,6ft-8ft			Collection Da Matr	te: 8/13/20)12
Analyses	***************************************	Result	Limit	Qual Units	DF	Date Analyzed
CHLORIDE SO	DILS BY EPA METHOD 925	i		Lab Code: CL_S	_AUTO	Analyst: CAS
Chloride		241	21.3	mg/Kg-dry	1	8/21/2012
PERCENT MO	ISTURE BY ASTM D2216			Lab Code: PMO I	ST	Analyst: NKA
Percent Moistu	re	6.14	0.0100	wt%	1	8/17/2012
SULFATE IN S	OLIDS BY EPA METHOD 9	038		Lab Code: SULF	ATE_S	Analyst: CAG

107

 Lab ID:
 U1208458-010
 Collection Date: 7/24/2012

 Client Sample ID:
 B-13,S-3,4ft-6ft
 Matrix: SOIL

ND

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed
CHLORIDE SOILS BY EPA METHOD 9	251		Lab Code: CL_S _	AUTO	Analyst: CAS
Chloride	106	21.1	mg/Kg-dry	1	8/21/2012
PERCENT MOISTURE BY ASTM D2216	5		Lab Code: PMOIS	T	Analyst: NKA
Percent Moisture	5.28	0.0100	wt%	1	8/17/2012
SULFATE IN SOLIDS BY EPA METHOR	9038		Lab Code: SULF A	TE_S	Analyst: CAG
Sulfate	ND	106	ma/Ka-drv	1	8/17/2012

mg/Kg-dry

Approved	Ву:	PFF	Date:	8-31-12	Page 5 of 5	
Qualifiers:	#	Accreditation not offered by NYS DOH for this parameter	*	Low Level		
	**	Value exceeds Maximum Contaminant Value	В	B Analyte detected in the associated Method Blank		
	E	Value above quantitation range	H			
	J	Analyte detected below quantitation limits	ND			
	Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recev	ery limits	

U pstate Laboratories, Lac.
6034 Corporate Drive • E. Syracuse, NY 13057-1017
(315) 437 0255

Chain of Custody Record

רמי יער ערעע	rax 437 1209)			
Client Area into The	/=1	2	7	Z CLAP			Special Turnaround
intact /	Site Continue (city (ctate)	Cuery / or	0611	2 Le			Time
100 Tartor 922-142	Size Location (city/state)			Cat Orio 10 K			(Lab Notification
	Time	Grab or IIII II					. required)
			U1208458	1) 2) (3) 4) 5)	6) 7)	9 (8	10) Remarks
8-1,5-4,6'-8' 8/8	5011	Erab					Please retira
B-2 5-3 4'-6' 1/27	nation		2	X			1
R-3 5-4 6-8 8/13			(i)	X)			200
B-4, 5-4, 6-8' 8/10			4	×,			Bent in the
8-6,54,6,-8, 8/9			S	8			٠,
B-7, 6-3, 4, 6, 7/25			0	8			Spotal to les
B-8'S-3'4'-6' 1/25				8			
B-10,5-4,6-8, 8/9	40		CO	8)			
國一年,5-4,6-8 8/13		,	9				
45/4 7-15 8-5 8-8		4	<u></u>	(XIVI)			
perameter and method	sample bottle:	type size	pres.	Sampled by: (Please Print)			ULI Internal Use Only
266		1/8/9		Derglas the	200		Delivery (check one): ULI Sampled
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₩E!			1	MMI	5		
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®H.			R	Relinquished by: (Signature)	Date	- T	Received by: (Signature)
AT TA							
10)			æ	Relinquished by: (Signature)			Rec'd for Lab by: (Signature)
Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.	with the numbered columns	in the upper right-ha	and corner.		36	d	Menh

Syracuse

Rochester

Buffalo

Albany

Binghamton

Fair Lawn (NJ)

Sample Receipt Checklist

Client Name CME ASSOCIATES CICERO		Date and Time Receive	8/16/2012
Work Order Number U1208458		Received by: BLM	
Checklist completed by Signature	P 81612	Reviewed by PF	8-16-12 Date
Matrix:	Carrier name: Client		
Shipping container/cooler in good condition?	Yes 🗹	No ☐ Not Present	П
Custody seals intact on shippping container/cooler	? Yes 🗌	No Not Present	V
Custody seals intact on sample bottles?	Yes 🗌	No Not Present	✓
Chain of custody present?	Yes 🗹	No 🗌	
Chain of custody signed when relinquished and re-	ceived? Yes 🗹	No 🗌	
Chain of custody agrees with sample labels?	Yes 🗸	No 🗆	
Samples in proper container/bottle?	Yes ⊻	No 🗌	
Sample containers intact?	Yes 🗸	No []	
Sufficient sample volume for indicated test?	Yes 🗸	No 🗌	
All samples received within holding time?	Yes 🗸	No 🗆	
Container/Temp Blank temperature in compliance?	Yes 🗌	No 🗹	
Ice present in cooler /5.3	Yes [No 🗹 Ice Melted _	N/A or Unknown
,	No VOA vials submitted	Yes 🗌 No 🗌	
Water - pH acceptable upon recelpt?	Yes ✓	No 🗆	
Ac	justed? Ch	necked by	-
Any No and/or NA (not applicable) response must b	e detailed in the comments sectio	n be	
Client contacted Dove Hurzeut Da	te contacted: 8-21-12	Person contacted	CHE ACCOUNTS
# COD	% ₁		CME ASSOCIATES
		ECEIPT TEMPERA	
Comments: Client	notified at will	rdow of out of	range temp-
ak to	77 1h	9 A-16-21 (no	
U.S. V.			
Corrective Action			

GENERAL INFORMATION & KEY TO TEST BORING LOGS

The Subsurface Exploration - Test Boring Logs produced by CME Associates, Inc. present the observations and mechanical data collected by the driller while at the site, supplemented, at times, by classification of the materials removed from the borings as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals. The data presented on the Exploration Logs together with the recovered samples will provide a basis for evaluating the character of the subsurface conditions relative to the proposed construction. The evaluation must consider all the recorded details and their significance relative to each other. Often, analyses of standard boring data indicate the need for additional testing and sampling procedures to more accurately evaluate the subsurface conditions. Any evaluations of the contents of CME's report and the recovered samples must be performed by Licensed Professionals having experience in Soil Mechanics and Foundation Engineering. The information presented in this Key defines some of the procedures and terms used on the CME Exploration Logs to describe the conditions encountered. Refer to the Log on page 3 for key number.

Les No.

The figures in the DEPTH SCALE column define the vertical scale of the Boring Log.

- 2. CASING BLOWS/FOOT shows the number of blows required to advance the casing a distance of 12 inches. The casing size, the hammer weight and the length of drop are noted under the Methods of Investigation. If the casing is advanced by means other than driving, the method of advancement will be indicated under Methods of Investigation at the top of the Log.
- 3. The SAMPLE I.D. is used for identification on the sample containers and in the Laboratory Test Report or Summary.
- 4. The DEPTH OF SAMPLE column gives the exact depth range from which a sample was recovered.

If Hollow Stem Augers or Coring is used, it will be so noted in this column.

- 5. The SAMPLE TYPE/RECOVERY column is used to signify the various type of sample attempt. "SS" is Split Spoon, "P" is piston tube, "U" is Undisturbed tube. For soil samples, the recovered length of the sample is also indicated, in inches. If a rock core sample is taken, the core bit size designation is given here.
- 6. BLOWS ON SAMPLER shows the results of the "Standard Penetration Test (SPT) ASTM D1586", recording the number of blows required to drive a split spoon sampler into the soil beneath the casing. The number of blows required for each six inches of penetration is recorded. The total number of blows required for the 6 inch to 18 inch interval is summarized in the SPT "N" column and represents the "Standard Penetration Number". The outside diameter of the sampler, the hammer weight and the length of drop are noted in the Methods of Investigation portion of the log. A "WH" or "WR" in this column indicates that the sample spoon advanced the 6 inch interval under Weight of Hammer or Weight of Rods, respectively.
- 7. The **DEPTH OF CHANGE** column designates the depth (in feet) that the driller noted a compactness or stratum change. In soft materials or soil strata exhibiting a consistent relative density, it is difficult for the driller to determine the exact change from one stratum to the next. In addition, a grading or gradual change may exist. In such cases the depth noted is approximate or estimated only and may be represented by a dashed line.
- 8. CLASSIFICATION OF MATERIAL Soil materials encountered and sampled are described by the driller on the original log. Notes of driller observations are also placed in this column. Recovered samples may also be visually classified by a Soil Technician upon receipt in the Laboratory. Visual sample classification is by Burmister System and strata may be classified additionally by the Unified System. The Burmister System is a type of visual-manual textural classification estimated by the Driller or Technician on the basis of weight-fraction of the recovered soil. See Table 1 "Classification of Materials". The description of the relative soil compactness or consistency is based upon the standard penetration number as defined in Table 2. The description of the soil moisture condition is described as dry, moist, wet, or saturated. Water used to advance the boring may have affected the in-situ moisture content of the sample. Special terms are used as required to describe materials in greater detail, such terms are listed in ASTM D653. When sampling gravelly soils with a standard two-inch O.D. Split Spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders, cobbles, and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing and sampler blows or through the "action" of the drill rig as reported by the driller.

Primary Soil Type	Descriptive Term of Compactness	Range of Standard Penetration Resistance (N)	
COARSE GRAINED SOILS	Very loose	less than 4 blows per foot	
	Loose	4 to 10	
(More than half of Material	Medium compact 10 to 30		
is larger than No. 200 sieve size.)	Compact	30 to 50	
	Very compact	Greater than 50	
FINE GRAINED SOILS	Descriptive Term of Consistency	Range of Standard Penetration Resistance (N)	
	Very soft	less than 2 blows per foot	
	Soft	2 to 4	
(More than half of material is smaller than No. 200 sieve size.)	Medium stiff	4 to 8	
	Stiff	8 to 15	
	Very stiff	15 to 30	
	Hard	Greater than 30	

^{*}The number of blows of 140 pound weight falling 30 inches to drive 2 inch O.D., 1-3/8 inch I.D. sampler 12 inches is defined as the Standard Penetration Resistance designated "N".

	TABLE 3 - ROCK	CLASSIFICATION TERMS
Rock Class	ification Terms	Field Test or Meaning of Term
Hardness	Soft	Scratched by fingernail
	Medium Hard	Scratched easily by penknife
 	Hard	Scratched with difficulty by penknife
	Very Hard	Cannot be scratched by penknife
Weathering	Very Weathered Weathered Sound	Judged from the relative amounts of disintegration, iron staining, core recovery, clay seams, etc.
Bedding	Laminated Thinly bedded	less than 1 inch 1 inch to 4 inches
(Natural Breaks	Bedded	4 inches to 12 inches
in Rock Layers)	Thickly bedded	12 inches to 36 inches
	Massive	greater than 36 inches