DEPT OF BLDGS 121328205 Job Number

ES825172174 Scan Code

NYC BUILDINGS

TR4: Technical Report
Soil Investigation

Must be typewritten.

Orient and affix BIS job number label here

1 Location Information *Required for all applications.*

House No(s) 217	Street Name WEST 57TH STREET				
Borough Manhattan	Block 1029	Lot 14,19,	BIN	CB No.	
Work on Floor(s)		43,47,50		Apt/Condo No(s)	

2 Applicant Information *Required for all applications.*

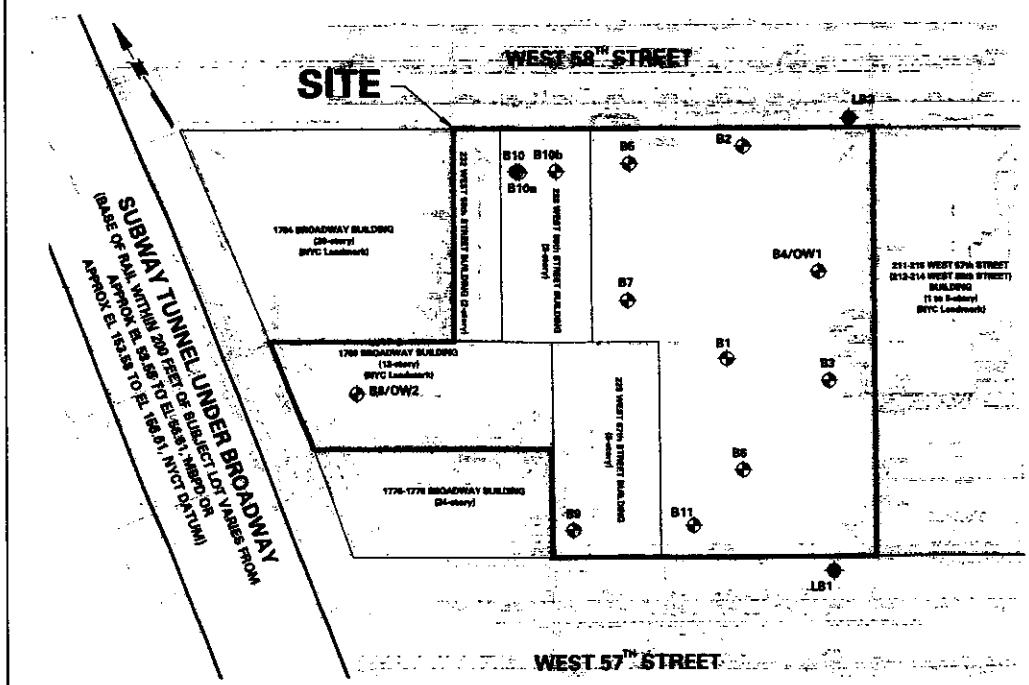
Last Name FRIZZI	First Name RUDOLPH	Middle Initial P
Business Name Langan Eng., Env., Surv., and Land. Arch., D.P.C.		Business Telephone 201-794-6900
Business Address 619 RIVER DRIVE CENTER 1		Business Fax 201-794-0366
City Elmwood Park State N.J.	Zip 07407	Mobile Telephone
E-Mail		License Number 068561
		☒ P.E. ☐ R.A.

3 Required Borings / Test Pits *Required for all applications.*

Number of Test Pits as Required as per NYC Construction Codes: 13 Borings

4 Plot Diagram *Required for all applications.*

Draw in ink to indicate scale. Show building outline or extension and location of all borings and/or test pits by dimensions. Borings and/or test pits shall be distributed according to the NYC Construction Codes.



5 Test Report *Required for all applications.*

Date	Boring/ Test Pit #	Feet Below Curb	Soil Description	Class Number	Remarks
			See attached boring logs.		

6 Statements and Signatures *Required for all applications.*

I hereby state that the above information is correct and complete to the best of my knowledge and that the above tests were performed in accordance with all Administrative Code Provisions and Departmental Rules, Regulations and Directives.

Falsification of any statement is a misdemeanor and is punishable by a fine or imprisonment, or both.

It is unlawful to give to a city employee, or for a city employee to accept, any benefit, monetary or otherwise, either as a gratuity for properly performing the job or in exchange for special consideration. Violation is punishable by imprisonment or fine or both.

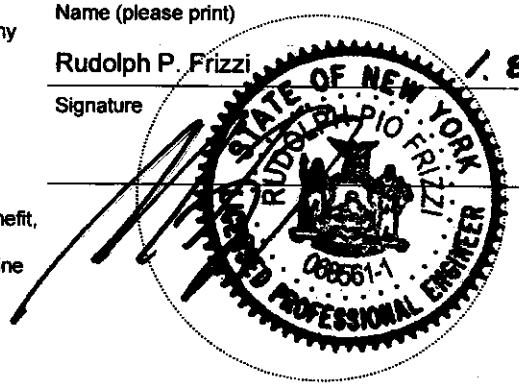
Name (please print)

Rudolph P. Frizzi

Signature

1. 8.13

Date



P.E. / R.A. Seal *(apply seal, then sign and date over seal)*

Approvals - Internal Use Only

Examined and Recommended for Approval		Approved	
Examiner Name		Borough Commissioner Signature	Date
Signature	Date		

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **LB-1** Sheet 1 of 3

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 79 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 11/13/10 — Date Finished: 11/13/10
Drilling Equipment: DK 50 Track-mounted Drill Rig	Completion Depth: 58.7 ft — Rock Depth: 1.8 ft
Size and Type of Bit: 4 7/8" Tricone Roller Bit	Number of Samples: Disturbed 1 — Undisturbed - — Core 12
Casing Diameter (in): 3" I.D. Steel Casing — Casing Depth (ft): 3.75	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Mike Kelley/Cyril Farley
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Amanpreet Ahuja
Sampler Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+79.0				0						Started drilling at 8:59 AM on 11/13/10. Drilled through the sidewalk. SS 0.5'-1.75'
	+78.5		6" THICK CONCRETE SLAB								
		Class 7	Brown to dark gray c-f SAND, some mica schist rock fragments, trace silt (wet) [FILL]		1	S-1	SS	6	3 6 75/3"	75/3"	
	+77.0				2						Drilled to 2'. Roller bit refusal. Started NX rock core C-1 at 10:00 AM at 2'.
		Class 1b	Gray MICA SCHIST (Orange staining in fractures and joints)	8:20	3	C-1	NX CORE BARREL	REC=39"/45" =87%	RQD=35"/45" =78%		
				7:00	4						
				10:00	5						
	+73.3			5:00	6						Finished coring C-1 at 10:30 AM at 5.75'. Advanced 3" I.D. casing to 3.75' Started NX rock core C-2 at 10:46 AM at 5.75'.
			Gray MICA SCHIST	3:00	7	C-2	NX CORE BARREL	REC=55"/60" =92%	RQD=53"/60" =88%		
				2:00	8						
				4:00	9						
				3:00	10						
				2:00	11						Finished coring C-2 at 11:10 AM at 10.75'. Started NX rock core C-3 at 11:07 AM at 10.75'.
				2:45	12	C-3	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
			Gray MICA SCHIST	3:15	13						
		Class 1a		2:00	14						
				4:00	15						
				5:00	16						Finished coring C-3 at 11:22 AM at 15.75'. Started NX rock core C-4 at 11:35 AM at 15.75'.
				3:30	17	C-4	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
			Gray MICA SCHIST	4:00	18						
				5:30	19						
				4:30	20						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **LB-1** Sheet 2 of 3

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 79 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				7:00	20	C-4					Finished coring C-4 at 12:00 PM at 20.75'. Started NX core C-5 at 12:10 PM at 20.75'
			Gray MICA SCHIST	6:00	21						
				6:30	22	C-5	NX CORE BARREL	REC=59"/59" =100%	RQD=59"/59" =100%		
				6:30	23						
				6:00	24						
				4:00	25						Finished coring C-5 at 12:37 PM at 25.7'. Started NX rock core C-6 at 12:51 PM at 25.7'. Core barrel observed to have "instantaneously" advanced from 26.7' to 26.9'. No water return after 26.9'.
			Gray MICA SCHIST	5:00	26						
				7:00	27	C-6	NX CORE BARREL	REC=57"/60" =95%	RQD=57"/60" =95%		
				6:00	28						
				5:00	29						
				4:00	30						Finished coring C-6 at 1:21 PM at 30.7'. Started NX rock core C-7 at 1:35 PM at 30.7'. Stopped at 1:58 PM; core barrel jammed. Resumed coring at 2:07 PM.
			Gray MICA SCHIST	10:00	31						
		Class 1a		7:00	32						
				6:00	33	C-7	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				7:00	34						
				12:00	35						
				11:45	36						Finished coring C-7 at 35.7' at 2:48 PM. Started NX rock core C-8 at 3:21 PM at 35.7'.
			Gray MICA SCHIST	4:30	37						
				9:00	38	C-8	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				9:15	39						
				11:30	40						
				11:15	41						Finished coring C-8 at 40.7' at 4:20 PM. Started NX rock core C-9 at 4:35 PM at 40.7'.
			Gray MICA SCHIST	10:00	42						
				8:15	43	C-9	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				9:15	44						
					45						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **LB-1** Sheet 3 of 3

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 79 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				9:00	45	C-9					Finished coring C-9 at 45.7' at 5:23 PM. Started NX rock core C-10 at 45.7' at 5:35 PM.
			Gray MICA SCHIST	11:00	46	C-10	NX CORE BARREL	REC=41"/42" =98%	RQD=38"/42" =90%		
				11:00	47						
				10:00	48						
				3:00	49						Finished coring C-10 at 49.2' Started NX rock core C-11 at 49.2' at 6:26 PM.
			Gray MICA SCHIST	15:00	50	C-11	NX CORE BARREL	REC=54"/54" =100%	RQD=54"/54" =100%		
				12:00	51						
		Class 1a		10:00	52						
				9:00	53						
				7:00	54						Finished coring C-11 at 53.7' at 7:19 PM. Started NX rock core C-12 at 53.7' at 7:30 PM.
			Gray MICA SCHIST	13:00	55	C-12	NX CORE BARREL	REC=60"/60" =100%	RQD=56"/60" =93%		
				9:30	56						
				11:00	57						
				10:00	58						
	+20.3		End of Boring at 58.7' at 8:35 AM on 11/13/10.		59						Finished coring C-12 at 58.7' at 8:25 PM.
					60						Borehole backfilled with cuttings upon completion and top of borehole patched with concrete.
					61						
					62						
					63						
					64						
					65						
					66						
					67						
					68						
					69						
					70						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **LB-2** Sheet 1 of 3

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 81 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 11/13/10 — Date Finished: 11/13/10
Drilling Equipment: DK 50 Track-mounted Drill Rig	Completion Depth: 59 ft — Rock Depth: 20 ft
Size and Type of Bit: 3 7/8" Tricone Roller Bit	Number of Samples: Disturbed 7 — Undisturbed - — Core 8
Casing Diameter (in): 4" I.D. Steel Casing — Casing Depth (ft): 15	Water Level (ft.): First ▽ — Completion ▼ — 24 HR. ▼
Casing Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	Drilling Foreman: Greg Marney
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Esmeralda Gaviria
Sampler Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+81.0				0						Started drilling at 8:40 AM on 11/13/10.
					1						Drilled to 1'.
			No recovery		2	S-1	SS	0	4 1 2 1 1		SS 1'-3'
					3						
			Gray CONCRETE PIECE (wet) [FILL]		4	S-2	SS	1	1 2 3 5 3		SS 3'-5'
					5						Drilled to 5'.
			Gray CONCRETE PIECES, some f-m sand, trace cinder (wet) [FILL]		6	S-3	SS	4	4 1 1 2 1		SS 5'-7'
					7						SS 7'-9'
			Gray CONCRETE PIECES, trace white plaster (wet) [FILL]		8	S-4	SS	2	1 1 1 2 3		
					9						Advanced casing to 9'. Drilled to 9'.
		Class 7	Brown f-m SAND, some concrete pieces, trace cinder, trace silt (wet) [FILL]		10	S-5	SS	2	3 1 1 2 1		SS 9'-11'
					11	S-6	SS	3	WOR 1 1 2 1		SS 11'-13'
			Reddish brown f-m SAND, some silt, trace fine gravel, trace brick (wet) [FILL]		12						
					13						Drilled to 15'.
					14						
					15	S-7	SS	0	WOH WOH WOH WOH		SS 15'-17' Advanced casing to 15'.
			No recovery Pushed spoon: Reddish brown fine GRAVEL, trace f-m sand, trace silt (wet) [FILL]		16						
					17						Drilled to 20'.
					18						Rig chattering at 18'.
					19						Difficult drilling at 19'.
	+61.0				20						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **LB-2** Sheet 2 of 3

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 81 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	4:17	20						Roller bit refusal at 20'. Started NX rock core C-1 at 20' at 11:39 AM.
		Class 1b		4:05	21						
				3:50	22	C-1	NX CORE BARREL	REC=60"/60" =100%	RQD=50"/60" =83%		
				4:00	23						
				4:01	24						
	+56.0				25						Finished coring C-1 at 11:59 AM at 25'. Started NX rock core C-2 at 12:28 PM at 25'.
			Gray MICA SCHIST	4:25	26						
				4:20	27	C-2	NX CORE BARREL	REC=46"/48" =96%	RQD=43"/48" =90%		
				3:00	28						
				3:45	29						Finished coring C-2 at 12:48 PM at 29'. Started NX rock core C-3 at 29' at 3:35 PM.
		Class 1a		4:30	30						
			Gray MICA SCHIST	3:00	31	C-3	NX CORE BARREL	REC=53"/60" =88%	RQD=53"/60" =88%		
				4:00	32						
				4:00	33						
				4:00	34						Finished coring C-3 at 34' at 3:49 PM. Started NX rock core C-4 at 4:06 PM at 34'.
	+47.0			4:00	35						
			Gray MICA SCHIST	3:25	36						
				3:00	37	C-4	NX CORE BARREL	REC=60"/60" =100%	RQD=48"/60" =80%		
				3:00	38						
				4:30	39						Finished coring C-4 at 4:27 PM at 39'. Started NX rock core C-5 at 4:41 PM at 39'.
		Class 1b		3:00	40						
			Gray MICA SCHIST	3:30	41	C-5	NX CORE BARREL	REC=52"/60" =87%	RQD=47"/60" =78%		
				3:15	42						
				3:15	43						
				4:30	44						Finished coring C-5 at 4:51 PM at 44'. Started NX rock core C-6 at
	+37.0			3:30	45	C-6					
		Class 1a									

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **LB-2** Sheet 3 of 3

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 81 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	3:30	45	C-6	NX CORE BARREL	REC=56"/60" =93%	RQD=54"/60" =90%		5:12 PM at 44'.
		Class 1a		3:15	46						
				3:00	47						
				3:00	48						
	+32.0			3:00	49						Finished coring C-6 at 49'. Started NX rock core C-7 at 5:44 PM at 49'.
			Gray MICA SCHIST	3:00	50	C-7	NX CORE BARREL	REC=60"/60" =100%	RQD=43"/60" =72%		
				3:00	51						
				3:00	52						
				4:00	53						
		Class 1b		4:00	54						Finished coring C-7 at 5:59 PM at 54'. Started NX rock core C-8 at 7:26 PM at 54'.
			Gray MICA SCHIST	3:00	55	C-8	NX CORE BARREL	REC=53"/60" =88%	RQD=48"/60" =80%		
				3:10	56						
				3:21	57						
				3:52	58						
				4:00	59						Finished coring C-8 at 7:44 PM at 59'.
	+22.0		End of Boring at 59' at 7:44 PM on 11/13/10.		60						Borehole backfilled with cuttings upon completion and patched with concrete.
					61						
					62						
					63						
					64						
					65						
					66						
					67						
					68						
					69						
					70						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B1** Sheet 1 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/7/12 — Date Finished: 8/9/12
Drilling Equipment: B-57 Truck-Mounted Drill Rig	Completion Depth: 83 ft — Rock Depth: 12 ft
Size and Type of Bit: 2 7/8", 3 7/8" Tricone Roller Bits	Number of Samples: Disturbed - — Undisturbed - — Core 14
Casing Diameter (in): 3" & 4" I.D. Steel Casing — Casing Depth (ft): 18.5	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Louis Ramos
Sampler: NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist Bl./6in	N-Value (Blows/ft) 10 20 30 40
	+80.0				0					
		Class 7			1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					
					11					
	+68.0				12					
		Class 1d	Weathered MICA SCHIST (Inferred from drilling)		13					
	+67.0		Gray MICA SCHIST		4:30 14	C-1	NX CORE BARREL	REC=50"/60" =83%	RQD=43"/60" =72%	
					4:35 15					
					4:55 16					
					4:05 17					
		Class 1b			4:55 18					
			Gray MICA SCHIST		3:40 19	C-2	NX CORE BARREL	REC=58"/60" =97%	RQD=49"/60" =82%	
					2:50 20					
					4:30 21					
					4:20 22					

Remarks

(Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Started drilling at 12:00 PM on 8/7/12.
Advanced 4" I.D. casing to a depth of 10'.

Drilled to 13' through brick and concrete demolition debris.
Reddish wash with brick and concrete fragments.

Mica flakes in wash at 12'.
Rig chattering at 12.5'.
Refusal at 13'.
Boring stopped at 13'.
Advanced casing to 13'.
Started NX rock core C-1 at 13'.
Drill rods observed to have "instantaneously" advanced about 1 to 2 inches at a depth of 17'.
Possible seam.
Finished coring C-1 at 18'.
End of days work at 2:37 PM. on 8/7/12.

Resumed drilling at 8:05 AM
Started NX rock core C-2 at 18'.

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B1** Sheet 2 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+57.0	Class 1b		5:00	22	C-2					Drill rig chattering at 22'. Heavy chattering at 22.5'. Finished coring C-2 at 23'. Started NX rock core C-3 at 23'.
			Gray MICA SCHIST	4:20	23	C-3	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				3:00	24						
				6:45	25						Slow drilling from 25' to 28'.
				6:30	26						
				7:20	27						
				3:40	28	C-4	NX CORE BARREL	REC=57"/60" =95%	RQD=55"/60" =92%		Finished coring C-3 at 28'. Hole collapsed at approximately 17'. Advanced 3" I.D. casing to 18.5'. Drilling stopped at 10:30 AM for equipment repairs. Resumed at 10:55 AM. Drilled using 2 7/8" roller bit to 28'. Slow drilling and rig chattering at 30'.
			Gray MICA SCHIST	4:00	29						
				4:50	30						
				3:00	31						
				3:45	32						
				3:00	33						Finished coring C-4 at 33' Started NX rock core C-5 at 33'.
			Gray MICA SCHIST	3:00	34	C-5	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				4:30	35						Equipment jammed at 33.5'.
		Class 1a		3:30	36						
				3:30	37						
				3:00	38						Finished coring C-5 at 38'. Started NX rock core C-6 at 38'.
			Gray MICA SCHIST	3:00	39	C-6	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				3:00	40						
				3:00	41						
				3:30	42						
				2:50	43						Finished coring C-6 at 43'. Started NX rock core C-7 at 43'.
			Gray MICA SCHIST	2:50	44	C-7	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				3:00	45						
				3:00	46						
				3:30	47						
				3:00	48						Finished coring at 48'. Started NX rock core C-8 at 48'.
			Gray MICA SCHIST		49	C-8					
					49.5						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B1** Sheet 3 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				3:00	49.5	C-8	NX CORE BARREL	REC=60"/60" =100%	RQD=57"/60" =95%		
				3:00	50						
				3:30	51						
				3:30	52						
				3:30	53						Finished coring C-8 at 53'. End of days work at 2:30 PM on 8/8/12. Resumed drilling at 7:50 AM on 8/9/12. Started NX rock core C-9 at 53'.
			Gray Gneissic MICA SCHIST	2:30	54	C-9	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				3:00	55						
				3:30	56						
				3:30	57						
				3:30	58						Finished coring at 58'. Started NX rock core C-10 at 58'.
			Gray MICA SCHIST with quartz inclusions	3:00	59	C-10	NX CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		
				3:00	60						
				3:00	61						
				3:00	62						
				3:30	63						Finished coring at 63'. Started NX rock core C-11 at 63'.
		Class 1a		3:00	64	C-11	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
			Gray MICA SCHIST	3:00	65						
				3:00	66						
				3:00	67						
				3:00	68						Finished coring at 68'. Started NX rock core C-12 at 68'.
				3:00	69	C-12	NX CORE BARREL	REC=60"/60" =100%	RQD=59"/60" =98%		
			Gray MICA SCHIST with quartz inclusions in top 2'	3:00	70						
				3:00	71						
				3:00	72						
				3:00	73						Finished coring at 73'. Started NX rock core C-13 at 73'.
				3:00	74	C-13	NX CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		
			Gray Gneissic MICA SCHIST	5:00	75						
				7:00	76						
				7:00	77						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B1** Sheet 4 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		Class 1a		4:00	77	C-13					
	+2.0				78						Finished coring at 78'. Started NX rock core C-14 at 78'.
			Gray MICA SCHIST	5:00	79	C-14	NX CORE BARREL	REC=58"/60" =97%	RQD=48"/60" =80%		
		Class 1b		5:00	80						
				5:00	81						
				5:00	82						
				5:00	83						
	-3.0		End of Boring at 83' on 8/9/12.								Finished coring at 83'. Backfilled borehole with cuttings upon completion.
					84						
					85						
					86						
					87						
					88						
					89						
					90						
					91						
					92						
					93						
					94						
					95						
					96						
					97						
					98						
					99						
					100						
					101						
					102						
					103						
					104						
					104.5						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B2** Sheet 1 of 5

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/8/12 — Date Finished: 8/13/12
Drilling Equipment: AD-2 Truck-Mounted Drill Rig	Completion Depth: 100 ft — Rock Depth: 14.5 ft
Size and Type of Bit: 2 7/8", 3 7/8", 4 7/8", 6" Tricone Roller Bits	Number of Samples: Disturbed 1 — Undisturbed - — Core 16
Casing Diameter (in): 3" & 4" I.D. Steel Casing — Casing Depth (ft): 17	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Eddie Fontanez
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: Safety — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+80.0				0						Started drilling at 10:50 AM on 8/8/12. Drilled to 8' through brick and concrete demolition debris using 6" tricone roller bit.
		Class 7			1						
					2						
					3						
					4						
					5						
					6						
					7						
					8						Advanced 4" I.D. casing to 8'. Reddish brown wash.
					9						
					10						
					11						
					12						
			Red and gray BRICK AND CONCRETE FRAGMENTS [FILL] (dry)		13	S-1	SS	6	6 18 42 75/0"	60	Drilled to 13'. Hard drilling/obstruction at 12' to 13'. SS 13' to 14.5'
	+65.0				14						
		Class 1d	Weathered MICA SCHIST (inferred from drilling)		15						
					16						
	+63.0				17	C-1					Drilled to 17'. Rig chattering at 15'. Mica flakes in wash at 15'.
		Class 1b		9:00	18						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B2** Sheet 2 of 5

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40
			Gray MICA SCHIST	4:40	18					
				6:20	19					
		Class 1b		4:40	20	C-1	NX CORE BARREL	REC=52"/60" =87%	RQD=46.5"/60" =78%	
				7:05	21					
	+58.0				22					
			Gray MICA SCHIST	5:05	23					
				5:45	24	C-2	NX CORE BARREL	REC=47"/48" =98%	RQD=47"/48" =98%	
				4:45	25					
				5:40	26					
			Gray MICA SCHIST	8:20	27					
				4:00	28					
				4:00	29					
				4:00	30					
		Class 1a		4:30	31	C-3	NX CORE BARREL	REC=120"/120" =100%	RQD=120"/120" =100%	
				5:30	32					
				5:30	33					
				4:00	34					
				8:30	35					
				7:00	36					
			Gray MICA SCHIST	8:00	37					
				8:00	38					
				8:00	39	C-4	NX CORE BARREL	REC=120"/120" =100%	RQD=120"/120" =100%	
				8:00	40					
					40.5					

Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Advanced 4" I.D. casing to 15'.
Drilled to 17' using 3 7/8" roller bit.
Roller bit refusal at 17'.
Advanced 3" I.D. casing to 17'.
Started NX rock core C-1 at 17'.

Difficult drilling at 21.5'.
Finished coring C-1 at 22'.
End of days work at 2:45 PM on 8/8/12.
Resumed drilling at 7:50 AM on 8/9/12.
Started NX core C-2 at 22'.

Difficult drilling at 26'.
Finished coring C-2 at 26'.
Started NX rock core C-3 at 26'.

Finished coring C-3 at 36'.
Started NX rock core C-4 at 36'.

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Log of Boring **B2** Sheet 3 of 5

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST with quartz inclusions at 41'	8:00	40.5						
				8:00	41						
				8:00	42						
				8:00	43	C-4	NX CORE BARREL	REC=120"/120" =100%	RQD=120"/120" =100%		
				8:00	44						
				8:00	45						
				8:00	46						Finished coring C-4 at 46'. Started NX rock core C-5 at 46'. REC=36"/36" =100% RQD=31"/36" =86%
			Gray MICA SCHIST	4:30	47	C-5	NX CORE BARREL	REC=100%	RQD=86%		
				4:30	48						
				5:00	49						Core jammed at 49'. Finished coring C-5 at 49'. End of days work at 2:45 PM on 8/9/12. Resumed drilling at 7:30 AM on 8/10/12. Started NX rock core C-6 at 49'.
			Gray MICA SCHIST with quartz inclusions at 53'	5:00	50						
				5:30	51	C-6	NX CORE BARREL	REC=53"/54" =98%	RQD=53"/54" =98%		
		Class 1a		5:15	52						
				5:45	53						
				6:00	54						Finished coring C-6 at 53.5'. Started NX rock core C-7 at 53.5'.
			Gray MICA SCHIST with quartz inclusions at 55'	4:00	55	C-7	NX CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		
				4:00	56						
				4:00	57						
				4:00	58						
			Gray MICA SCHIST with quartz inclusions at 62'	4:00	59						Finished coring C-7 at 58.5'. Started NX rock core C-8 at 58.5'.
				4:00	60						
				4:15	61	C-8	NX CORE BARREL	REC=54"/54" =100%	RQD=52"/54" =96%		
				7:45	62						
				15:00	63						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B2** Sheet 4 of 5

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	12:00	63	C-9	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		Slow/hard drilling at 63'. Finished coring C-8 at 63'. Started NX rock core C-9 at 63'.
				4:30	64						
				6:30	65						
				6:30	66						
				6:30	67						
				5:00	68	C-10	NX CORE BARREL	REC=60"/60" =100%	RQD=57"/60" =95%		Finished coring C-9 at 68'. Started NX rock core C-10 at 68'.
			Gray MICA SCHIST	5:00	69						
				5:00	70						
		Class 1a		5:00	71						
				5:00	72						
				3:30	73	C-11	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-10 at 73'. End of days work at 2:45 PM on 8/10/12. Resumed drilling at 7:50 AM on 8/13/12. Started NX rock core C-11 at 73'.
			Gray MICA SCHIST	3:30	74						
				3:30	75						
				3:30	76						
				3:30	77						
				3:00	78	C-12	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-11 at 78'. Started NX rock core C-12 at 78'.
			Gray MICA SCHIST	4:00	79						
	0.0			4:00	80						
		Class 1a	Gray to white PEGMATITE	4:00	81						
	-2.0			5:00	82						
				5:15	83	C-13	NX CORE BARREL	REC=60"/60" =100%	RQD=59.5"/60" =99%		Finished coring C-12 at 83'. Started NX rock core C-13 at 83'.
		Class 1a	Gray MICA SCHIST	5:15	84						
					85						
					85.5						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B2** Sheet 5 of 5

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist Bl./6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				5:30	85.5						
				5:30	86	C-13	NX CORE BARREL				
				5:30	87						
					88						Finished coring C-13 at 88'. Started NX rock core C-14 at 88'.
			Gray MICA SCHIST	5:00	89	C-14	NX CORE BARREL	REC=60"/60" =100%	RQD=57"/60" =95%		
				5:00	90						
				5:00	91						
				4:30	92						
		Class 1a		9:30	93						Difficult drilling at 92.5'. Finished coring C-14 at 93'. Started NX rock core C-15 at 93'.
				4:30	94						
			Gray MICA SCHIST	4:30	95	C-15	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				4:30	96						
				4:30	97						Finished coring C-15 at 98'. Started NX rock core C-16 at 98'. Core barrel jammed at 99'. REC=24"/24" =100% RQD=24"/24" =100%
				4:30	98						
				8:30	99	C-16	NX	REC=100%	RQD=100%		
			Gray MICA SCHIST	4:00	100						Finished coring C-16 at 100'. Backfilled borehole with cuttings upon completion.
	-20.0		End of Boring at 100' at 12:30 PM on 8/13/12.		101						
					102						
					103						
					104						
					105						
					106						
					107						
					108						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B3 (O.C.)** Sheet 1 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/9/12 — Date Finished: 8/14/12
Drilling Equipment: B-57 Truck-Mounted Drill Rig	Completion Depth: 85 ft — Rock Depth: 17 ft
Size and Type of Bit: 2 7/8", 3 7/8", 4 7/8", 6" Tricone Roller Bits	Number of Samples: Disturbed - — Undisturbed - — Core 14
Casing Diameter (in): 3" & 4" I.D. Steel Casing — Casing Depth (ft): 15	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Louis Ramos
Sampler: NX/NV Core Barrels	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40
	+80.0				0					
		Class 7			1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					
					11					
					12					
					13					
					14					
	+65.0				15					
	+64.8		2" THICK STEEL PLATE							
			CONCRETE	20:00	16					
				10:00						
	+63.0				17					
				10:00			C-1	NX CORE BARREL	REC=97%	RQD=28%
		Class 1d	Weathered MICA SCHIST		18					
				5:00						
					19					
				5:00						
	+60.0				20					

Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Started drilling at 1:30 PM on 8/9/12.

Drilled to 13.5' using a tricone roller bit.
Reddish brown wash with brick and concrete demolition debris fragments.

Advanced 4" I.D. casing to 13.5'.
End of the days work at 2:25 PM on 8/9/12.
Resumed drilling at 7:00 AM on 8/10/12.
Advanced 3" I.D. casing to 15'.
Drilled to15'.
Hard drilling at 15'.
Drilled to 17' using NX core barrel.
Very difficult drilling at 15'.
White wash at 16'.
Started NX rock core C-1 at 17'.
REC=35"/36" =97%
RQD=10"/36" =28%

Mica flakes in wash at 18'.

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B3 (O.C.)** Sheet 2 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	2:45	20	C-2	NX CORE BARREL	REC=59"/60" =98%	RQD=52"/60" =87%		Finished coring C-1 at 20'. Started NX rock core C-2 at 20'.
				2:30	21						
				2:30	22						
				4:15	23						
				6:15	24						
			Gray MICA SCHIST Foliations dip towards approx. S33°W at approx. 49° to 57° with the horizontal	5:30	25	C-3	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=56"/60" =93%		Finished coring C-2 at 25'. Started NV oriented rock core C-3 at 25' at 11:10 AM.
				5:30	26						
				5:30	27						
				5:30	28						
				5:30	29						
				6:00	30	C-4	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-3 at 30' Started NV oriented rock core C-4 at 30'.
			Gray MICA SCHIST Foliations dip towards approx. N55°W to N84°W at approx. 46° to 64° with the horizontal	6:00	31						
		Class 1a		6:00	32						
				6:00	33						
				6:00	34						
				6:00	35	C-5	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-4 at 35'. End of days work at 1:10 PM on 8/10/12. Resumed drilling on 8/13/12. Started NV oriented rock core C-5 at 7:20 AM at 35'.
			Gray MICA SCHIST Foliations dip towards approx. N45°W to N68°W at approx. 49° to 80° with the horizontal	5:30	36						
				5:30	37						
				5:30	38						
				5:30	39						
				5:30	40	C-6	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-5 at 40'. Started NV oriented rock core C-6 at 40'.
			Gray MICA SCHIST with quartz inclusion at 44.5'	5:15	41						
				5:15	42						
				5:30	43						
				6:00	44						
	+35.0			6:00	45						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B3 (O.C.)** Sheet 3 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		Class 1a	Gray MICA SCHIST Foliations dip towards approx. N10°W to N30°W at approx. 52° to 67° with the horizontal	6:30	45	C-7	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-6 at 45'. Started NV oriented rock core C-7 at 45'.
	+30.0			6:30	46						
				6:30	47						
				6:30	48						
				6:30	49						
				6:30	50						Finished coring C-7 at 50'. Started NV oriented rock core C-8 at 50'.
		Class 1b	Gray MICA SCHIST (Yellow staining in fractures and joints at 51' to 53')	6:30	51	C-8	NV CORE BARREL (O.C.)	REC=58"/60" =97%	RQD=47"/60" =78%		
				6:30	52						
				6:30	53						
				6:30	54						
	+25.0			6:30	55						Finished coring C-8 at 55'. Started NV oriented rock core C-9 at 55'.
			Gray MICA SCHIST with quartz inclusion at 57'	7:00	56	C-9	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=58"/60" =97%		
				7:00	57						
				7:00	58						
				7:00	59						
				7:00	60						Finished coring C-9 at 60'. Started NV oriented rock core C-10 at 60'.
		Class 1a	Gray MICA SCHIST with quartz inclusions	7:00	61	C-10	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=60"/60" =100%		
				7:00	62						
				7:00	63						
				7:00	64						
				7:00	65						Finished coring C-10 at 65'. End of days work at 2:30 PM on 8/13/12. Resumed drilling on 8/14/12 Started NV oriented rock core C-11 at 7:10 AM at 65'
			Gray MICA SCHIST with quartz inclusions	7:00	66	C-11	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=60"/60" =100%		
				7:00	67						
				7:00	68						
				7:00	69						
				7:00	70						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B3 (O.C.)** Sheet 4 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	6:30	70						Finished coring C-11 at 70'. Started NV oriented rock core C-12 at 70'.
				6:30	71						
				6:30	72	C-12	NV CORE BARREL (O.C.)	REC=59"/60" =98%	RQD=55"/60" =92%		
				6:30	73						
				6:30	74						
				6:30	75						Finished coring C-12 at 75'. Started NV oriented rock core C-13 at 75'.
			Gray MICA SCHIST with quartz inclusions	6:30	76						
				6:30	77						
		Class 1a		6:30	78	C-13	NV CORE BARREL (O.C.)	REC=60"/60" =100%	RQD=58"/60" =97%		
				6:30	79						
				6:30	80						Finished coring C-13 at 80'. Started NX rock core C-14 at 80'.
			Gray MICA SCHIST with quartz inclusions	3:00	81						
				3:00	82						
				3:00	83	C-14	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				3:00	84						
	-5.0			3:00	85						Finished coring at 85'. Backfilled borehole with cuttings upon completion.
			End of Boring at 85' on 8/14/12.		86						
					87						
					88						
					89						
					90						
					91						
					92						
					93						
					94						
					95						

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Log of Boring **B4/OW1** Sheet 1 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/13/12 — Date Finished: 8/15/12
Drilling Equipment: AD-2 Truck-Mounted Drill Rig	Completion Depth: 85 ft — Rock Depth: 14.5 ft
Size and Type of Bit: 2 7/8", 3 7/8", 4 7/8", 6" Tricone Roller Bits	Number of Samples: Disturbed - — Undisturbed - — Core 14
Casing Diameter (in): 3" & 4" I.D. Steel Casing — Casing Depth (ft): 20	Water Level (ft.): First ▽ - — Completion ▼ 13 — 24 HR. ▼ 13
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Eddie Fontanez
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+80.0				0						Started drilling at 1:45 PM on 8/13/12. Advanced 4" I.D. casing to 16'.
					1						
					2						
					3						Reddish brown wash with brick and concrete demolition debris fragments.
					4						
					5						
					6						
					7						
					8						
					9						
					10						
					11						
					12						
					13						End of days work at 3:02 PM on 8/13/12. Resumed drilling at 7:25 AM on 8/14/12.
					14						
					15						
					16						
					17						
					18						
	+62.0	Class 7									

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B4/OW1** Sheet 2 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
					18						Drilled to 18'. Roller bit refusal at 18'. Advanced 4" I.D. casing to 18'. Started NX rock core C-1 at 18'. Greenish gray wash at 19'.
			Gray MICA SCHIST	1:30	19	C-1	NX CORE BARREL	REC=46"/48" =96%	RQD=42"/48" =88%		
				2:00	20						
				3:30	21						
				3:45	22						Finished coring C-1 at 22'. Advanced 3" I.D. casing to 20'. Started NX rock core C-2 at 22'.
			Gray MICA SCHIST	3:40	23	C-2	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				4:40	24						
				4:10	25						
				4:40	26						
				4:00	27						Finished coring C-2 at 27'. Started NX rock core C-3 at 27'.
			Gray MICA SCHIST	4:50	28	C-3	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
		Class 1a		7:10	29						
				4:30	30						
				5:00	31						
				4:00	32						Finished coring C-3 at 32'. Started NX rock core C-4 at 32'.
			Gray MICA SCHIST	3:30	33	C-4	NX CORE BARREL	REC=57"/60" =95%	RQD=52"/60" =87%		
				4:30	34						
				4:30	35						
				5:00	36						Difficult drilling at 36'. Heavy rig chatter at 36.5' Finished coring C-4 at 37'. Started NX rock core C-5 at 37'.
				6:00	37						
			Gray MICA SCHIST	4:40	38	C-5	NX CORE BARREL	REC=41"/42" =98%	RQD=37"/42" =88%		
				5:30	39						
				5:00	40						
	+39.5			4:30	40.5						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B4/OW1** Sheet 3 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
					40.5						Finished coring C-5 at 40.5'. Started NX rock core C-6 at 40.5'.
				4:30	41						
			Gray MICA SCHIST	4:30	42	C-6	NX CORE BARREL	REC=50"/54" =93%	RQD=42.5"/54" =79%		
		Class 1b		4:30	43						
				4:30	44						
				4:30	45						
	+35.0										Finished coring C-6 at 45'. End of work day at 3:10 PM on 8/14/12. Resumed drilling at 7:30 AM on 8/15/12. Started NX rock core C-7 at 45'.
				3:30	46						
			Gray MICA SCHIST	2:45	47	C-7	NX CORE BARREL	REC=59.5"/60" =99%	RQD=59.5"/60" =99%		
				3:45	48						
				3:30	49						
				3:30	50						Finished coring C-7 at 50'. Started NX rock core C-8 at 50'.
				3:30	51						
			Gray MICA SCHIST with quartz inclusions	3:30	52	C-8	NX CORE BARREL	REC=60"/60" =100%	RQD=57"/60" =95%		
				3:30	53						
				3:30	54						
		Class 1a		3:30	55						Finished coring C-8 at 55'. Started NX rock core C-9 at 55'.
				3:30	56						
			Gray MICA SCHIST	3:30	57	C-9	NX CORE BARREL	REC=57"/60" =95%	RQD=56"/60" =93%		
				3:30	58						
				3:30	59						
				3:30	60						Finished coring C-9 at 60'. Started NX rock core C-10 a 60'.
				4:15	61						
			Gray MICA SCHIST with quartz inclusions	4:20	62	C-10	NX CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		
				5:00	63						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B4/OW1** Sheet 4 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				4:50	63						
				5:30	64	C-10					
				7:00	65						Finished coring C-10 at 65'. Started NX rock core C-11 at 65'. Rig chatter at 65.5'
			Gray MICA SCHIST with quartz inclusions	6:45	66						
				6:00	67	C-11	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				6:30	68						
				6:30	69						
				4:30	70						Finished coring C-11 at 70'. Started NX rock core C-12 at 70'.
			Gray MICA SCHIST	4:30	71						
				6:00	72	C-12	NX CORE BARREL	REC=54"/60" =90%	RQD=54"/60" =90%		
		Class 1a		6:30	73						
				6:15	74						
				9:10	75						Finished coring C-12 at 75'. Started NX rock core C-13 at 75'.
			Gray MICA SCHIST	6:30	76						
				8:15	77	C-13	NX CORE BARREL	REC=57"/60" =95%	RQD=57"/60" =95%		
				11:10	78						
				11:30	79						
				11:25	80						Finished coring C-13 at 80' Started NX rock core C-14 a 80'.
			Gray MICA SCHIST with quartz inclusions	5:00	81						
				1:50	82	C-14	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				2:30	83						
				3:00	84						
	-5.0		End of Boring at 85' on 8/15/12.		85						Finished coring C-14 at 85'. Backfilled borehole with cuttings upon completion.
					85.5						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B5** Sheet 1 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/14/12 — Date Finished: 8/17/12
Drilling Equipment: B-57 Truck-Mounted Drill Rig	Completion Depth: 85 ft — Rock Depth: 19 ft
Size and Type of Bit: 2 7/8", 3 7/8", 4 7/8", 6" Tricone Roller Bits	Number of Samples: Disturbed 1 — Undisturbed - — Core 13
Casing Diameter (in): 3" & 4" I.D. Steel Casing — Casing Depth (ft): 22	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Louis Ramos
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: Safety — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+80.0				0						Started drilling at 12:45 PM on 8/14/12.
					1						
					2						Reddish brown wash with cement, concrete and brick demolition debris fragments.
					3						
					4						
					5						
					6						Advanced 4" I.D. casing to 6'. Obstruction encountered at 6'.
					7						
					8						
					9						
		Class 7			10						Drilled to 10' with a roller bit.
					11						
					12						
					13						Advanced 4" I.D. casing to 15'. Light colored wash with sand and yellow brick demolition debris fragments. Roller bit refusal at 15'. Started NX core at 15'.
					14						
				3:00	15		NX	REC=0%	RQD=0%		REC=0"/24" =0% RQD=0"/24" =0%
			No recovery	0:10	16						Easy drilling after 16'. Finished coring at 17'. End of days work at 2:25 PM on 8/14/12. Resumed drilling at 7:05 AM on 8/15/12. SS 17' -19'
					17	S-1	SS	1	5 6 7	13•	
			Gray CONCRETE FRAGMENT (dry) [FILL]		18				100		
	+61.0				19						
	+60.0	Class 1d	Weathered MICA SCHIST (inferred from drilling)		20						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B5** Sheet 2 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	6:00	20	C-1	NX CORE BARREL	REC=60"/60" =100%	RQD=59"/60" =98%		Drilled to 20'. Mica flakes in wash. Advanced 4" I.D. casing to 20'. Started NX rock core C-1 at 20'.
				5:45	21						
				5:30	22						
				5:30	23						
				5:30	24						
			Gray MICA SCHIST with quartz inclusions	3:25	25	C-2	NV CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		Finished coring C-1 at 25'. Advanced 3" I.D. casing to 22'. Started NV oriented rock core C-2 at 25'.
				3:45	26						
				4:00	27						
				3:45	28						
				4:00	29						
			Gray MICA SCHIST	3:45	30	C-3	NV CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-2 at 30'. Started NV oriented core C-3 at 30'.
		Class 1a		4:45	31						
				5:15	32						
				5:15	33						
				4:45	34						
			Gray MICA SCHIST	4:30	35	C-4	NV CORE BARREL	REC=56"/60" =93%	RQD=56"/60" =93%		Finished coring C-3 at 35'. Started NV oriented rock core C-4 at 35'.
				4:30	36						
				4:30	37						
				4:30	38						
				4:30	39						
			Gray MICA SCHIST	5:00	40	C-5	NV CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-4 at 40'. End of days work at 2:10 PM on 8/15/12. Resumed drilling at 7:10 AM on 8/16/12. Started NV oriented rock core C-5 at 40'.
				5:00	41						
				5:00	42						
				5:00	43						
				5:00	44						
	+35.0			5:00	45						

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Log of Boring **B5** Sheet 3 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST Foliations dip at approx. S45°E at approx. 55° with the horizontal	5:00	45	C-6	NV CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		Finished coring C-5 at 45'. Started NV oriented rock core at 45'.
				5:00	46						
				5:00	47						
				5:00	48						
				5:00	49						
				5:00	50						Finished coring C-6 at 50'. Started NV oriented rock core C-7 at 50'.
			Gray MICA SCHIST	5:00	51	C-7	NV CORE BARREL	REC=60"/60" =100%	RQD=59"/60" =98%		
				5:00	52						
				5:00	53						
				5:00	54						
				5:00	55						Finished coring C-7 at 55'. Started NV oriented rock core C-8 at 55'.
			Gray MICA SCHIST	5:00	56	C-8	NV CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
		Class 1a		5:00	57						
				5:00	58						
				5:00	59						
				5:00	60						Finished coring C-8 at 60'. Started NV oriented rock core C-9 at 60'.
			Gray MICA SCHIST with quartz inclusions	6:00	61	C-9	NV CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				6:00	62						
				6:00	63						
				6:00	64						
				6:00	65						Finished coring C-9 at 65'. Started NV oriented rock core C-10 at 65'.
			Gray MICA SCHIST	11:00	66	C-10	NV CORE BARREL	REC=59"/60" =98%	RQD=59"/60" =98%		
				11:00	67						
				11:00	68						Finished coring C-10 at 70'. End of days work at 2:15 PM on 8/16/12.
				11:00	69						
	+10.0			11:00	70						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B5** Sheet 4 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	12:00	70	C-11	NV CORE BARREL	REC=59"/60" =98%	RQD=59"/60" =98%		Started NV oriented rock core C-11 at 70'. Resumed drilling at 7:00 AM on 8/17/12.
				12:00	71						
				12:00	72						
				12:00	73						
				12:00	74						
				12:00	75						Finished coring C-11 at 75'. Started NX rock core C-12 at 75'.
			Gray MICA SCHIST	8:00	76	C-12	NX CORE BARREL	REC=51"/60" =85%	RQD=51"/60" =85%		
		Class 1a		8:00	77						
				8:00	78						
				8:00	79						
				8:00	80						Finished coring C-12 at 80'. Started NX rock core C-13 at 80'.
			Gray MICA SCHIST with quartz inclusions	7:30	81	C-13	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				7:30	82						
				7:30	83						
				7:30	84						
	-5.0			7:30	85						Finished coring C-13 at 85'. Backfilled borehole with cuttings upon completion.
			End of Boring at 85' at 12:20 PM on 8/17/12.		86						
					87						
					88						
					89						
					90						
					91						
					92						
					93						
					94						
					95						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B6** Sheet 1 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/16/12 — Date Finished: 8/20/12
Drilling Equipment: AD-2 Truck-Mounted Drill Rig	Completion Depth: 85 ft — Rock Depth: 15 ft
Size and Type of Bit: 2 7/8", 3 7/8", 4 7/8", 6" Tricone Roller Bits	Number of Samples: Disturbed - — Undisturbed - — Core 15
Casing Diameter (in): 3" I.D. Steel Casing — Casing Depth (ft): 13	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Eddie Fontanez
Sampler: NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+80.0				0						Started drilling at 11:30 AM on 8/16/12.
					1						
					2						
					3						Advanced 3" I.D. casing to 13' through brick and concrete demolition debris. Reddish wash with brick and concrete fragments.
					4						
					5						
		Class 7			6						
					7						
					8						
					9						
					10						
					11						
	+67.0				12						
		Class 7	Red and gray BRICK AND CONCRETE FRAGMENTS (dry) [FILL]		13						Obstruction encountered at 13'.
	+65.0				14						Drilled to 15' with NX core barrel. Brown wash at 14.5' Started NX rock core C-1 at 15'. Mica flakes observed. Odor observed.
			Gray Weathered MICA SCHIST (Orange staining on fractures and joints)	3:15	15	C-1	NX	REC=75%	RQD=0%		REC=18"/24" =75% RQD=0"/24" =0%
				3:30	16						
		Class 1d		2:45	17	C-2	NX CORE BARREL	REC=42"/48" =88%	RQD=10"/48" =21%		Finished coring C-1 at 17'. Started NX rock core C-2 at 17'.
			Gray Weathered MICA SCHIST (Orange staining on fractures and joints)	3:00	18						
				3:45	19						
					20						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring B6 Sheet 2 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		Class 1d		10:25	20	C-2					Difficult drilling at 21'. Finished coring C-2 at 21'. Started NX rock core C-3 at 21'.
	+59.0			2:30	21						
		Class 1b	Gray MICA SCHIST	2:30	22	C-3	NX CORE BARREL	REC=57"/60" =95%	RQD=45.5"/60" =76%		
				3:00	23						
				5:30	24						
				6:45	25						
	+54.0			7:20	26						Finished coring C-3 at 26'. Started NX rock core C-4 at 26'.
			Gray MICA SCHIST	5:20	27	C-4	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				3:45	28						
				3:30	29						
				5:45	30						
				2:10	31						Finished coring C-4 at 31'. End of days work at 2:45 PM on 8/15/12. Resumed drilling at 7:30 AM on 8/17/12. Started NX rock core C-5 at 31'.
			Gray MICA SCHIST	4:00	32	C-5	NX CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		
				4:45	33						
				3:35	34						
		Class 1a		4:50	35						
				8:20	36						Finished coring C-5 at 36'. Started NX rock core C-6 at 36'. Difficult drilling.
			Gray MICA SCHIST	8:45	37	C-6	NX CORE BARREL	REC=60"/60" =100%	RQD=56.5"/60" =94%		
				7:15	38						
				4:15	39						
				8:15	40						
				8:10	41						Finished coring C-6 at 41'. Started NX rock core C-7 at 41'.
			Gray MICA SCHIST	15:00	42	C-7	NX CORE BARREL	REC=54"/54" =100%	RQD=54"/54" =100%		Very slow drilling.
				18:00	43						
					44						
				22:00	45						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B6** Sheet 3 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	3:15	45	C-8	NX CORE BARREL	REC=52"/54" =96%	RQD=52"/54" =96%		Finished coring C-7 at 45.5'. Started NX rock core C-8 at 45.5'.
				3:20	46						
				3:10	47						
				2:55	48						
				4:10	49						
			Gray MICA SCHIST	2:55	50	C-9	NX CORE BARREL	REC=60"/60" =100%	RQD=54"/60" =90%		Finished coring C-8 at 50'. Started NX rock core C-9 at 50'.
		Class 1a		2:45	51						
				3:10	52						
				3:25	53						
				3:45	54						
			Gray MICA SCHIST	3:30	55	C-10	NX CORE BARREL	REC=60"/60" =100%	RQD=55"/60" =92%		Finished coring C-9 at 55'. Started NX rock core C-10 at 55'.
				3:15	56						
				4:00	57						
				8:45	58						
				6:20	59						
	+20.0			8:20	60						Finished coring C-10 at 60'. End of days work at 2:45 PM on 8/17/12. Resumed drilling at 9:20 AM on 8/20/12. Started NX rock core C-11 at 60'.
			Gray MICA SCHIST	9:55	61	C-11	NX CORE BARREL	REC=58"/60" =97%	RQD=42"/60" =70%		
		Class 1b		12:45	62						
				3:35	63						Easy drilling at 63'.
				5:40	64						
	+15.0			3:15	65						Finished coring C-11 at 65'. Started NX rock core C-12 at 65'.
			Gray MICA SCHIST	3:55	66	C-12	NX CORE BARREL	REC=57"/60" =95%	RQD=53.5"/60" =89%		
		Class 1a		4:00	67						
				4:35	68						
				4:55	69						
					70						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B6** Sheet 4 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	4:20	70						Finished coring C-12 at 70'. Started NX rock core C-13 at 70'.
				4:15	71						
				4:30	72						
				5:35	73	C-13	NX CORE BARREL	REC=54"/60" =90%	RQD=53.5"/60" =89%		
				5:45	74						
				5:10	75						Finished coring C-13 at 75'. Started NX rock core C-14 at 75'.
			Gray Gneissic MICA SCHIST with quartz inclusions	6:20	76						
		Class 1a		5:15	77						
				6:40	78	C-14	NX CORE BARREL	REC=60"/60" =100%	RQD=60"/60" =100%		
				6:55	79						
				5:55	80						Finished coring C-14 at 80'. Started NX rock core C-15 at 80'.
			Gray MICA SCHIST	6:55	81						
				7:15	82						
				5:30	83	C-15	NX CORE BARREL	REC=59"/60" =98%	RQD=59"/60" =98%		
				6:45	84						
	-5.0		End of Boring at 85' at 1:50 PM on 8/20/12.		85						Finished coring C-15 at 85'. Backfilled borehole with cuttings upon completion.
					86						
					87						
					88						
					89						
					90						
					91						
					92						
					93						
					94						
					95						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring B7 Sheet 1 of 4

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 81 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/17/12 — Date Finished: 8/21/12
Drilling Equipment: B-57 Truck-Mounted Drill Rig	Completion Depth: 85 ft — Rock Depth: 3.5 ft
Size and Type of Bit: 2 7/8", 3 7/8", 4 7/8", 6" Tricone Roller Bits	Number of Samples: Disturbed - / Undisturbed - / Core 16
Casing Diameter (in): 3" & 4" I.D. Steel Casing — Casing Depth (ft): 8	Water Level (ft.): First ▽ - / Completion ▼ - / 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Louis Ramos
Sampler: NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+81.0				0						Started drilling at 12:30 PM on 8/17/12.
		Class 7			1						Drilled to 5'. Reddish wash with brick and concrete demolition debris.
	+77.5				2						
		Class 1d	Weathered MICA SCHIST (inferred from drilling)		3						Gray wash with mica flakes in wash at 3.5'
	+76.0				4						
		Class 1b	Gray MICA SCHIST	2:30	5	C-1	NX CORE BARREL	REC=54.5"/60" =91%	RQD=47.5"/60" =79%		Roller bit refusal at 5'. Advanced 4" I.D. casing to 5'. Started NX rock core C-1 at 5'.
				4:15	6						
				4:30	7						
				5:45	8						
				5:30	9						
	+71.0				10						Finished coring C-1 at 10'. Advanced 3" I.D. casing to 8'. End of days work at 2:10 PM on 8/17/12. Resumed drilling at 7:10 AM on 8/21/12. Started NX rock core C-2 at 10'.
		Class 1a	Gray MICA SCHIST	9:00	11	C-2	NX CORE BARREL	REC=58"/60" =97%	RQD=58"/60" =97%		
				8:35	12						
				6:45	13						
				6:10	14						
				5:30	15						
	+66.0										Finished coring C-2 at 15'. Started NX rock core C-3 at 15'.
		Class 1b	Gray MICA SCHIST	5:10	16	C-3	NX CORE BARREL	REC=51"/60" =85%	RQD=42"/60" =70%		
				4:45	17						
				4:50	18						
				0:10	19						Very easy drilling at 18'-19'.
				4:15	20						
	+61.0										

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B7** Sheet 2 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 81 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	5:30	20						Finished coring C-3 at 20'. Started NX rock core C-4 at 20'.
				5:30	21						
				5:30	22						
				5:30	23	C-4	NX CORE BARREL	REC=58"/60" =97%	RQD=58"/60" =97%		
				5:30	24						
				3:10	25						Finished coring C-4 at 25'. Started NX rock core C-5 at 25'.
			Gray MICA SCHIST	2:40	26						
				2:30	27						
				2:45	28	C-5	NX CORE BARREL	REC=59"/60" =98%	RQD=58"/60" =97%		
				3:15	29						
				2:35	30						Finished coring C-5 at 30'. Started NX rock core C-6 at 30'.
			Gray MICA SCHIST	3:00	31						
		Class 1a		3:15	32						
				4:15	33	C-6	NX CORE BARREL	REC=57"/60" =95%	RQD=55.5"/60" =93%		
				4:10	34						
				3:30	35						Finished coring C-6 at 35'. Started NX rock core C-7 at 35'.
			Gray MICA SCHIST	3:30	36						
				3:30	37						
				3:30	38	C-7	NX CORE BARREL	REC=56"/60" =93%	RQD=56"/60" =93%		
				3:30	39						
				2:30	40						Finished coring C-7 at 40'. Started NX rock core C-8 at 40'.
			Gray MICA SCHIST	2:30	41						
				2:30	42						
				2:30	43	C-8	NX CORE BARREL	REC=56.5"/60" =94%	RQD=56.5"/60" =94%		
				2:30	44						
	+36.0			2:30	45						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring B7 Sheet 3 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 81 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	3:15	45	C-9	NX CORE BARREL	REC=58"/60" =97%	RQD=52"/60" =87%		Finished coring C-8 at 45'. Started NX rock core C-9 at 45'.
				2:45	46						
				2:30	47						
				3:00	48						
				3:00	49						
		Class 1a	Gray MICA SCHIST	3:30	50	C-10	NX CORE BARREL	REC=58.5"/60" =98%	RQD=51.5"/60" =86%		Finished coring C-9 at 50'. Started NX rock core C-10 at 50'
				3:30	51						
				3:30	52						
				3:30	53						
				3:30	54						
	+26.0			3:30	55						Finished coring C-10 at 55'. Started NX rock core C-11 at 55'.
			Gray MICA SCHIST	4:00	56	C-11	NX CORE BARREL	REC=47"/60" =78%	RQD=44"/60" =73%		
		Class 1b		3:45	57						
				3:55	58						
				3:30	59						
				3:25	60						Finished coring C-11 at 60'. End of days work at 1:30 PM on 8/20/12. Resumed drilling at 8:02 AM on 8/21/12. Started NX rock core C-12 at 60'.
	+21.0			3:15	61	C-12	NX CORE BARREL	REC=60"/60" =100%	RQD=57"/60" =95%		
			Gray MICA SCHIST	2:10	62						
				3:25	63						
				3:00	64						
				3:00	65						Finished coring C-12 at 65'. Started NX rock core C-13 a 65'.
		Class 1a	Gray MICA SCHIST with quartz inclusions	4:35	66	C-13	NX CORE BARREL	REC=59"/60" =98%	RQD=57"/60" =95%		
				5:05	67						
				5:20	68						Rig chattering at 67.5'.
				6:55	69						
				3:45	70						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring B7 Sheet 4 of 4

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 81 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist Bl./6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				3:50	70						Finished coring C-13 at 70'. Started NX rock core C-14 at 70'. Rig chatter at 71.5'.
		Class 1a	Gray MICA SCHIST with quartz inclusions	4:30	71	C-14	NX CORE BARREL	REC=60"/60" =100%	RQD=57"/60" =95%		
				5:40	72						Drill rods "instantaneously"" advanced about 1" at 72.5'
				7:30	73						
				7:50	74						
	+6.0				75						Finished coring C-14 at 75'. Started NX rock core C-15 at 75'.
				4:30	76						
			Gray MICA SCHIST	4:55	77	C-15	NX CORE BARREL	REC=57"/60" =95%	RQD=45"/60" =75%		
				5:40	78						
				6:20	79						
				5:10	80						Finished coring C-15 at 80'. Started NX rock core C-16 at 80'.
		Class 1b		5:00	81						
			Gray MICA SCHIST	5:00	82	C-16	NX CORE BARREL	REC=58"/60" =97%	RQD=48"/60" =80%		
				5:00	83						
				5:00	84						
				5:00	85						Finished coring C-16 at 85'. Backfilled borehole with cuttings upon completion.
	-4.0		End of Boring at 85' at 11:10 AM on 8/21/12.		86						
					87						
					88						
					89						
					90						
					91						
					92						
					93						
					94						
					95						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B8/OW2** Sheet 1 of 2

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 65 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 8/21/12 — Date Finished: 8/24/12
Drilling Equipment: Portable Electric Drill Rig	Completion Depth: 35 ft — Rock Depth: 1.5 ft
Size and Type of Bit: 2 15/16" Tricone Roller Bit	Number of Samples: Disturbed 1 — Undisturbed - — Core 9
Casing Diameter (in): 3" I.D. Steel Casing — Casing Depth (ft): 1.16	Water Level (ft.): First ▽ - — Completion ▼ 9.5 — 24 HR. ▼ 13.5
Casing Hammer: Donut — Weight (lbs): 140 — Drop (in): 24	Drilling Foreman: Deon Dewar
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: Donut — Weight (lbs): 140 — Drop (in): 24	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale
	+65.0				0
			12" THICK CONCRETE SLAB		
	+64.0	Class 7	Gray f-m SAND, trace silt, trace mica flakes (dry) [DECOMPOSED ROCK]		1
	+63.5	Class 1d	Gray Weathered MICA SCHIST	32:00	
	+63.0			49:20	2
			Gray MICA SCHIST	18:35	3
				38:45	4
			Gray MICA SCHIST	30:10	5
				24:15	6
			Gray MICA SCHIST	38:05	7
				85:00	8
		Class 1a		56:35	9
				28:15	10
			Gray MICA SCHIST	42:25	11
				76:45	12
				26:40	13
				24:30	14
				24:20	15
					16

Sample Data

Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40
S-1	SS	6	11	
C-1	NX	83%	50/1" (0%)	50/1"
C-2	NX	REC=100%	RQD=100%	
C-3	NX	REC=94%	RQD=94%	
C-4	NX CORE BARREL	REC=59"/60" =98%	RQD=56"/60" =93%	
C-5	NX CORE BARREL	REC=59"/60" =98%	RQD=59"/60" =98%	

Remarks
(Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Started to setup at boring location at 10:10 AM on 8/21/12.
Started drilling at 1:35 PM.
Gray wash.
Brown wash at 1'.
SS 1' -1.6'
Advanced 3" I.D. casing to 1.16'.
Started NX rock core C-1 at 2:25 PM at 1.6'.
REC=4.6"/5" =93%
RQD=0"/5" =0%
Finished coring C-1 at 2'.
End of days work at 3:10 PM on 8/21/12.
Resumed drilling at 7:00 AM on 8/23/12.
Started NX rock core C-2 at 7:58 AM at 2'.
REC=24"/24" =100%
RQD=24"/24" =100%
Finished coring C-2 at 9:07 AM at 4'.
Started NX rock core C-3 at 9:14 AM at 4'.
REC=22.5"/24" =94%
RQD=22.5"/24" =94%
Finished coring C-3 at 10:24 AM at 6'.
Started NX rock core C-4 at 10:31 AM at 6'.
Core barrel jammed at 8.25'.

Finished coring C-4 at 3:02 PM at 11'.
End of days work at 3:19 PM on 8/22/12.
Resumed drilling on 8/23/12
Started NX rock core C-5 at 7:59 AM at 11'.
Core barrel jammed at 11.5'

Water loss at 15'.

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B8/OW2** Sheet 2 of 2

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 65 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
			Gray MICA SCHIST	42:05	16	C-6	NX CORE BARREL	REC=58.5"/60" =98%	RQD=51.5"/60" =86%		Finished coring C-5 at 16' at 11:33 AM. Started NX rock core C-6 at 12:02 PM at 16'.
				35:25	17						
				20:20	18						
				18:05	19						
				27:10	20						
					21						Finished coring C-6 at 21' at 2:32 PM. Drilled to 21'. Started NX rock core C-7 at 3:19 PM at 21'.
			Gray MICA SCHIST	13:30	22	C-7	NX CORE BARREL	REC=48"/48" =100%	RQD=48"/48" =100%		
				25:30	23						
				27:50	24						
				18:15	25						Finished coring C-7 at 25' at 4:48 PM. End of days work at 4:57 PM on 8/23/12. Resumed drilling at 7:20 AM on 8/24/12. Started NX rock core C-8 at 7:40 AM at 25'.
		Class 1a	Gray MICA SCHIST	12:00	26	C-8	NX CORE BARREL	REC=57.25"/60" =95%	RQD=53.5"/60" =89%		
				26:45	27						Rig chattering at 28'.
				18:30	28						
				15:35	29						Rig chattering at 29'.
				10:35	30						Finished coring C-8 at 9:09 AM at 30'. Started NX rock core at 9:27 AM at 30'. Rig chattering at 30.5'. Easy drilling at 30.25'. Water lost at 30.75'. Core barrel jammed at 31'.
			Gray MICA SCHIST	11:55	31	C-9	NX CORE BARREL	REC=60"/60" =100%	RQD=58"/60" =97%		
				12:20	32						
				9:20	33						
				10:30	34						
				9:15	35						Finished coring C-9 at 10:51 AM at 35'. Upon completion of boring installed 2" diameter observation well to a depth 35'. The well was screened between 5' and 35'.
	+30.0		End of Boring at 35' at 2:45 PM on 8/24/12.		36						

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ENGINEERING & ENVIRONMENTAL SERVICES

Log of Boring **B9** Sheet 1 of 1

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 65 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 12/27/12 — Date Finished: 12/31/12
Drilling Equipment: Portable Electric Drill Rig	Completion Depth: 16 ft — Rock Depth: 6 ft
Size and Type of Bit: 2 7/8" Tricone Roller Bit	Number of Samples: Disturbed 2 — Undisturbed - — Core 2
Casing Diameter (in): 3" I.D. Steel Casing — Casing Depth (ft): 6	Water Level (ft.): First ▽ 5 — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	Drilling Foreman: Deon Dewar
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Ransom Hennefer
Sampler Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40
	+65.0				0					
	+64.5		6" THICK CONCRETE SLAB							
		Class 7	Light brown f-c SAND, some fine gravel, trace concrete fragments, trace brick fragments, trace silt [FILL] (dry)		1	S-1	SS	4	5 7 3 8	10
					2					
					3					
					4					
			Light brown f-c SAND, some fine gravel, trace concrete fragments, trace brick fragments, trace rock fragments, [FILL] (wet) ▽		5	S-2	SS	1	9 14 50/1"	50/1"
	+59.0				6					
			PEGMATITE (Orange staining observed on fractures and joints)	34:05	7	C-1	NX CORE BARREL	REC=53"/60" =88%	RQD=41"/60" =68%	
	+57.5			52:20						
			Gray MICA SCHIST	44:30	8					
				20:00	9					
				27:10	10					
		Class 1b			11					
			Gray MICA SCHIST	40:00	12	C-2	NX CORE BARREL	REC=52"/60" =87%	RQD=35"/60" =58%	
				35:00	13					
				28:00	14					
				18:00	15					
				25:00	16					
	+49.0		End of Boring at 16' on 12/31/12 at 2:00 PM.		17					
					18					
					19					
					20					

Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Drillers arrived at 9:30 AM on 12/27/12.
Began coring through 6" basement slab at 12:40 PM.
SS 0.5'-2.5'

Advanced casing to 4.5'.
Drilled to 5' with 2 7/8" bit.
Brown wash.

SS 4.9'-6'
Odor observed.

Advanced casing to 6'.
Drilled to 6'.
Roller bit refusal at 6'.
Started NX rock core C-1 at 6' at 9:30 AM.
Difficult drilling at 7'.
No water return.

Finished coring C-1 at 11' at 2:45 PM.
End of day's work on 12/28/12 at 3:00 PM.
Resumed drilling at 7:00 AM on 12/31/12.
Started NX rock core C-2 at 11' at 7:15 AM.
No water return.

Finished coring C-2 at 16' at 11:30 AM.
End of day's work on 12/31/12 at 2:00 PM.
Borehole backfilled with cuttings and patched with cement upon completion.

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Log of Boring **B10** Sheet 1 of 1

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 12/27/12 — Date Finished: 12/27/12
Drilling Equipment: Portable Electric Drill Rig	Completion Depth: 0.5 ft — Rock Depth: -
Size and Type of Bit: Thin Wall Coring Bit	Number of Samples: Disturbed - / Undisturbed - / Core -
Casing Diameter (in): - — Casing Depth (ft): -	Water Level (ft.): First ▽ - / Completion ▼ - / 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Cyril Farley
Sampler: -	Inspecting Engineer: David Park
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40
	+80.0		6" THICK CONCRETE SLAB	0					
	+79.5		End of Boring at 0.5' at 2:20 PM on 12/27/12.	1					
				2					
				3					
				4					
				5					
				6					
				7					
				8					
				9					
				10					
				11					
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					

Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Drillers arrived at 9:45 AM on 12/27/12.
Started coring through 6" concrete slab at 2:00 PM.
Encountered I-beam at 0.5' depth.
Relocated borehole 1' east.
Borehole was patched with cement upon completion.

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Log of Boring **B10A** Sheet 1 of 1

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 12/27/12 — Date Finished: 12/27/12
Drilling Equipment: Portable Electric Drill Rig	Completion Depth: 4 ft — Rock Depth: -
Size and Type of Bit: Thin Wall Coring Bit	Number of Samples: Disturbed - — Undisturbed - — Core -
Casing Diameter (in): - — Casing Depth (ft): -	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Cyril Farley
Sampler: -	Inspecting Engineer: David Park
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Depth Scale
	+80.0			0
	+79.5		6" THICK CONCRETE SLAB	1
			VOID SPACE	2
				3
	+76.0			4
			End of Boring at 4' at 3:00 PM on 12/27/12.	5
				6
				7
				8
				9
				10
				11
				12
				13
				14
				15
				16
				17
				18
				19
				20

Sample Data: Number | Type | Recov. (in) | Penetr. resist BL/6in | N-Value (Blows/ft) 10 20 30 40

Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)

Started drilling at 2:30 PM on 12/27/12.
Cored through 6" concrete slab.
Encountered 3.5' void space.
Possible air duct at 4'.
Relocated borehole 20' east.

Borehole patched with cement upon completion.

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Log of Boring **B10B** Sheet 1 of 2

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 12/28/12 — Date Finished: 12/31/12
Drilling Equipment: Portable Electric Drill Rig	Completion Depth: 25 ft — Rock Depth: 15 ft
Size and Type of Bit: Thin Wall Coring Bit, 2 7/8" Tricone Roller Bit	Number of Samples: Disturbed 1 — Undisturbed - — Core 3
Casing Diameter (in): 3" I.D. Steel Casing — Casing Depth (ft): 13	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	Drilling Foreman: Cyril Farley
Sampler: 2" O.D. Split Spoon/NX Core Barrel	Inspecting Engineer: Ransom Hennefer/ David Park
Sampler Hammer: Donut — Weight (lbs): 140 — Drop (in): 30	

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist Bl./6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+80.0				0						Started day on 12/28/12 at 7:00 AM. Cored through 6" floor slab. Enountered 4' void space.
	+79.5		6" THICK CONCRETE SLAB								
			VOID SPACE		1 2 3 4						
	+75.5										Cored through 6" concrete slab.
	+75.0		6" THICK CONCRETE SLAB		5	S-1	SS	1	50/5"	50/5"	SS 5'-5.5'
	+74.5	Class 7	Dark brown Gravely f-c SAND, some concrete pieces, trace brick fragments, trace silt (wet) [FILL]								
	+74.0		6" THICK CONCRETE SLAB		6						Encountered 7' void space (basement corridor)
			VOID SPACE		7 8 9 10 11 12 13 14						
	+67.0		2' THICK CONCRETE SLAB								Advanced casing to 13'. Cored through basement slab to 15' with NX core barrel.
	+65.0	Class 1a	Gray MICA SCHIST with quartz inclusions (Orange staining in fractures and joints)	55:00 50:00	15 16 17	C-1	NX CORE	REC=100%	RQD=77%		Started NX rock core C-1 at 15' at 12:20 PM. REC=24"/24" =100% RQD=18.5"/24" =77% Finished coring at 17' at 2:05 PM. Started NX rock core C-2 at 17' at 2:25 PM. End of day's work at 3:20 P on 12/28/12. REC=32.5"/36" =90% RQD=32.5"/36" =90%
	+63.0	Class 1b	Gray MICA SCHIST with quartz inclusions at 17.5' and 20'.	55:00 47:00 55:00	18 19 20	C-2	NX CORE	REC=90%	RQD=90%		

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Log of Boring **B10B** Sheet 2 of 2

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)	Building Code	Sample Description	Coring (min)	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		Class 1b	Gray MICA SCHIST	63:00 70:00 60:00 45:00 30:00	20–25	C-3	NX CORE BARREL	REC=60"/60" =100%	RQD=53"/60" =88%		Started drilling at 7:45am on 12/31/12. Finished coring at 20' at 10:00 AM. Started NX rock core C-3 at 20' at 10:18 AM. Finished coring at 25' at 2:40 PM. Backfilled borehole with cuttings and patched with concrete upon completion.
	+55.0		End of Boring at 25' at 2:40 PM on 12/31/12.		25						

26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

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Log of Boring **B11** Sheet 1 of 2

Project: Proposed 221 W 57th Street Development	Project No.: 009229202
Location: New York, N.Y.	Elevation and Datum: Approx. el 80 (MBPD)
Drilling Company: Warren George, Inc.	Date Started: 12/28/12 — Date Finished: 12/28/12
Drilling Equipment: B-57 Truck-Mounted Drill Rig	Completion Depth: 34.5 ft — Rock Depth: 22 ft
Size and Type of Bit: 3 7/8" Tricone Roller Bit	Number of Samples: Disturbed - — Undisturbed - — Core 3
Casing Diameter (in): 4" I.D. Steel Casing — Casing Depth (ft): 16	Water Level (ft.): First ▽ - — Completion ▼ - — 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman: Eddie Cardona
Sampler: NX Core Barrel	Inspecting Engineer: David Park
Sampler Hammer: - — Weight (lbs): - — Drop (in): -	

Material Symbol	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+80.0	Red and gray BRICK AND CONCRETE FRAGMENTS (dry) [FILL]	0						Drillers arrived at 7:00 AM on 12/28/12. Started drilling at 7:30 AM. Advanced casing to 16'. The driller added EZ mud to the mud tub. Drilled to 21' with roller bit.
		Class 7	10						Reddish brown wash.
			18						Rig chattering at 18.5'.
			20						

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Log of Boring **B11** Sheet 2 of 2

Project	Project No.
Proposed 221 W 57th Street Development	009229202
Location	**Elevation and Datum**
New York, N.Y.	Approx. el 80 (MBPD)

Material Symbol	Elev. (ft)		Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	N-Value (Blows/ft) 10 20 30 40	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		Class 7		20						Roller bit refusal at 21'. Driller cored through 1 foot of concrete using NX-core barrel. Tan-white wash. Started NX rock core C-1 at 22' at 9:10 AM. White-gray wash at 24'. REC=15"/36" =42% RQD=9.5"/36" =26%
	+59.0			21						
			1' THICK CONCRETE	22	-	NX	11			
	+58.0			23	C-1	NX CORE	REC=42%	RQD=26%		
		Class 1d	Weathered gray MICA SCHIST	24						
	+56.0		Gray MICA SCHIST							
	+55.0			25						Low return at 25'. Finished coring at 25' at 9:42 AM. Started NX rock core C-2 at 25' at 9:55 AM. Gray wash
			Gray MICA SCHIST	26						
				27						
				28	C-2	NX CORE BARREL	REC=60"/60" =100%	RQD=54.5"/60" =91%		
				29						
		Class 1a		30						Finished coring at 10:20 AM at 30'. Started NX rock core C-3 at 10:38 AM.
				31						
			Gray MICA SCHIST	32						Gray wash.
				33						
				34	C-3	NX CORE BARREL	REC=52"/54" =96%	RQD=52"/54" =96%		
	+45.5			35						Finished coring at 11:10 AM at 34.5'. Borehole backfilled with cuttings upon completion.
			End of Boring at 34.5' at 12:30 PM.	36						
				37						
				38						
				39						
				40						
				41						
				42						
				43						
				44						
				45						

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