DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		**T8-B3 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	292 feet

GROUNDWATER READINGS
Not encountered during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
230		4	12	86		SM	**Qlw Continued** Silty Sand, fine grained; pale brown (2.5Y 8/2); appears damp and dense At 60.3 to 60.9': Strongly mottled, pale brown (2.5Y 8/2) to strong brown (7.5YR 5/8) At 61.2': Rounded meta-basalt clast, up to 3 inches
						SP-SM	At 62.3 to 63.4': Grades to fine to medium Poorly Graded Sand with Silt
						SM	At 63.4 to 64.7': Distinct oxidized laminations defined by varying color and oxidation
	65						At 65.0 to 66.1': Appears moist, some irregular, lightly cemented pockets
225		5	13	100		SM	Silty Sand, fine grained; varying color, mainly light brownish gray (10Y 6/2) to yellowish brown (10YR 5/8); appears very moist and dense; variable mottling and laminations; lower contact is sharp
						SM	**SAN PEDRO FORMATION [Qsp]** At 69.2': **Marker Bed M_B** - Clay bed (½ inch thick), oxidized; strong brown (7.5YR 5/8) Silty Sand, fine grained; light greenish gray (10Y 7/1); appears moist and dense; lower contact is sharp At 69.4 to 70.0': Wavy, Sandy Silt laminations; light olive gray (5Y 6/2) At 71.0 to 72.4': Becomes light olive gray (5Y 6/2); appears very moist
	70						
220		5	14	100			At 72.5 to 73.2': Becomes light yellowish brown (2.5Y 6/4) At 73.2 to 73.8': Becomes mottled, light olive gray (5Y 6/2) to light yellowish brown (2.5Y 6/4) At 73.8': Highly oxidized; yellowish red (5YR 5/6) lamination At 73.8 to 74.6': Numerous oxidized strong brown (7.5YR 5/6) laminations; trace fine gravel (Jsm) At 74.6': Clay bed (½ to 1 inch thick), olive brown (2.5Y 4/4) At 75.0 to 75.5': **Marker Bed M_A** - Some subrounded gravel, clasts 5 to 15%, up to ¾ inches in size, mainly slate (Jsm) and quartzite
	75					SP	Poorly Graded Sand, fine grained; light greenish gray (10Y 7/1); appears damp and dense; trace mica
215		5	15	70			
	80						

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B3d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		**T8-B3 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	292 feet

GROUNDWATER READINGS
Not encountered during drilling

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.
210	85				
205	90				
200	95				
195	100				

END OF BORING AT 80 FEET

NOTES:
Boring backfilled with cement/bentonite grout from bottom up and patched.

-Munsell colors listed in order of predominance (most predominant color first).
-Where observed, contacts and bedding appear subhorizontal unless otherwise noted.
-Non-recovery intervals are assumed to occur at the bottom of run unless otherwise noted.
-Santa Monica Slate (Jsm) clasts are generally very dark gray, subangular to subrounded slate unless otherwise noted. Modelo Formation (Tm) clasts are generally white to pale yellow to tan, subangular to subrounded shale and sandstone unless otherwise noted.
-The term "clasts" herein describes gravel-size rock fragments (larger than ¼ inch).
-Beds are generally massive unless otherwise noted.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING
Project No.: 4953-10-1561 Figure: T8-B3e

METRO SOIL CORE. S:\70131 GEOTECH\GINTW\FAULT_INVESTIGATION_WSE_LIBRARY AMEC OCTOBER2011 (2).GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.2 FAULT HAZARD INVESTIGATION\3.2 ALL FIELD NOTES\GINT LOGS\101561-TRANSECT 8.GPJ 10/14/11

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Jet Drilling / CME 75		T8-B4
DRILLING METHOD Hollow-Stem Auger	**BOREHOLE LOCATION** See Plate 3	
DATES DRILLED 5/26/11-5/27/11 and 5/31/11	**HOLE DIAMETER** 8 inches	**GROUND EL.** 289 feet
GROUNDWATER READINGS Not encountered during drilling		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
							9 inches of asphalt concrete over 4 inches of base Hand Augered to 6 feet
285	5					CL/ ML	**FILL [Af]** Silty Clay and Clayey Silt, variable fine to coarse grained sand, trace fine gravel; varying color, mainly dark grayish brown (10YR 4/2); appears moist to very moist and very stiff; occasional more gravelly layers with up to 70% gravel (up to ¾ inch)
		1	1	33			At 7.0 to 9.0': No recovery
280	10					CL	Clay with Gravel
		1	2	100			
275	15					CL	Clay
		1	3	90			
270	20						

(CONTINUED ON FOLLOWING FIGURE)

Geologist: BF/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B4a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Jet Drilling / CME 75		**T8-B4 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/26/11-5/27/11 and 5/31/11	8 inches	289 feet
GROUNDWATER READINGS		
Not encountered during drilling		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
		1	4	80		CL	**Af Continued**
							At 23.0 to 24.0': No recovery
265						CL	Clay with Gravel
	25	2	5	74			
							At 27.7 to 29.0': No recovery
260							At 29.0 to 31.5': No sampling
	30						
							At 31.5 to 33.0': No recovery
		2	6	0			At 33.0 to 36.0': No sampling
255							
	35						
		2	7	33			At 36.5': Large concrete fragment
							At 37.5 to 38.0': No sampling
250							
	40						At 39.5 to 43.0': No recovery

(CONTINUED ON FOLLOWING FIGURE)

Geologist: BF/MF
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Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B4b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Jet Drilling / CME 75		**T8-B4 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/26/11-5/27/11 and 5/31/11	8 inches	289 feet

GROUNDWATER READINGS
Not encountered during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.	
		2	8	30		**Af Continued**
						At 43.0 to 43.2': Concrete fragments, up to 1½ inches
245	45	2	9	33	SM	**LAKEWOOD FORMATION [Qlw]** Silty Sand, fine to medium grained, trace clay; yellowish brown (10YR 5/4); appears moist and dense; well sorted; lower contact occurs between runs At 44.0 to 46.0': No recovery
		2	10	50	SM-SC	At 47.0 to 48.0': No recovery
240	50	3	11	72	SP SM-SC	At 48.0 to 48.3': Grades to Poorly Graded Sand, fine grained; light yellowish brown (2.5Y 6/4) Clayey to Silty Sand, fine grained, dark brown (7.5YR 3/4); appears very moist and dense; well sorted; lower contact occurs between runs At 50.0 to 51.5': Becomes yellowish brown (10YR 3/2) At 50.8 to 51.0': Manganesium oxide-rich bed At 51.5 to 51.9': Distinct laminations defined by varying oxidation, silt and manganese oxide content At 51.9 to 53.0': No recovery
		3	12	56		
235	55	4	13	33	CL SM-SC	At 53.0 to 53.4': Clay, trace coarse gravel (Jsm); brown (7.5YR 4/4); appears very moist and very stiff Clayey, Silty Sand with Gravel, fine grained, clasts 25 to 35%, up to 1½ inches, mainly subrounded granitic rock and slate; brown (7.5YR 4/4); appears moist and dense; lower contact occurs between runs Laminated beds of fine to medium grained Silty Sand, varying color At 54.0 to 56.0': No recovery
					GM	**Marker Bed M_C** - Silty Gravel, clasts 50 to 60%, up to 1½ inches, mainly subangular to subrounded granitic rock, meta-basalt and slate, fine to coarse silty sand matrix; strong brown (7.5YR 4/6); appears damp and dense; lower contact occurs between runs Refusal at 57.0' on gravel/cobbles.
230	60					END OF BORING AT 57.0 FEET

NOTES:
Boring backfilled with cement/bentonite grout from bottom up and patched.

-Munsell colors listed in order of predominance (most predominant color first).
-Where observed, contacts and bedding appear subhorizontal unless otherwise noted.
-Non-recovery intervals are assumed to occur at the bottom of run unless otherwise

(CONTINUED ON FOLLOWING FIGURE)

Geologist: BF/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B4c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Jet Drilling / CME 75		**T8-B4 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/26/11-5/27/11 and 5/31/11	8 inches	289 feet
GROUNDWATER READINGS		
Not encountered during drilling		

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.
225	65				
220	70				
215	75				
210	80				

noted.
-Santa Monica Slate (Jsm) clasts are generally very dark gray, subangular to subrounded slate unless otherwise noted. Modelo Formation (Tm) clasts are generally white to pale yellow to tan, subangular to subrounded shale and sandstone unless otherwise noted.
-The term "clasts" herein describes gravel-size rock fragments (larger than ¼ inch).
-Beds are generally massive unless otherwise noted.

Boring redrilled offset approximately 1-foot south-west from original boring location where drilling hit refusal. Drilled down 55-ft and hit refusal during drilling. Possible cobbles and gravels layer.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Geologist: BF/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING
Project No.: 4953-10-1561 Figure: T8-B4d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		T8-B5
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	287 feet

GROUNDWATER READINGS
Not encountered during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
							18 inches of asphaltic concrete Hand augered to 5.5 feet
285	5					CL	**FILL [Af]** Clay, trace coarse sand; dark brown (10YR 3/3); appears moist and very stiff; occasional more sandy beds; lower contact is sharp NOTE: Jsm = Santa Monica Slate Tm = Modelo Formation See end of log for more detailed clast descriptions
						ML/ CL	Silty Clay and Clayey Silt, variable fine sand, trace coarse sand and fine gravel (Jsm and Tm); yellowish brown (10YR 5/4); appears very moist and stiff
						ML	At 6.3 to 6.7': Organic-rich bed, Sandy to Clayey Silt, 10 to 15% fine gravel up to ½ inch; very dark gray (10YR 3/1); appears very moist and stiff
280		1	1	100		ML/ CL	At 7.5 to 8.2': Clayey, Silty Sand
	10						At 9.8 to 10.2': Increasing organic content and gravel
						CL	Clay and Silty Clay, trace coarse sand (Jsm and Tm); dark brown (7.5YR 3/2); appears very moist and medium stiff to stiff; organic-rich
275		1	2	100			At 12.6 to 13.0': Decreasing organics
	15						
270		1	3	100			At 16.9 to 20.0': Organic-rich zones/layers become infrequent, sand increases, occasional sandy silt layers
	20						

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B5a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		**T8-B5 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	287 feet

GROUNDWATER READINGS
Not encountered during drilling

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
						CL	**Af Continued** At 20.3 to 21.1': Becomes mottled, strong brown (7.5YR 5/6) to grayish brown (10YR 5/2)
265		2	4	100		ML	**OLDER ALLUVIAL FAN DEPOSITS [Qfo]** Clayey to Sandy Silt, alternating gravelly and non-gravelly beds; non-gravelly beds yellowish-brown (10YR 5/6), gravelly beds very dark grayish brown (10YR 3/2); clasts 20 to 30%, up to ¾ inch, mainly subangular to subrounded slate (Jsm), shale (Tm) and sandstone (Tm), organic-rich; appears moist to very moist and very stiff; typical bed thickness 4 to 6 inches, lower contact is narrowly gradational
						SM-SC	Clayey, Silty Sand, fine grained, trace coarse sand and fine gravel (Jsm and Tm); dark brown (7.5YR 3/4); appears moist and dense
	25					GM	**OLDER FLUVIAL/ALLUVIAL FAN DEPOSITS (Qfo_{f1}/Qfo)** Silty Gravel, clasts 30 to 60%, up to 2 inches; mainly subangular to subrounded slate (Jsm), some shale (Tm), sandstone (Tm), quartzite and granitic rock also observed; matrix is fine to coarse silty sand; color variable, generally dark brown (7.5YR 3/4); appears moist and dense; lower contact is gradational
260		2	5	56		SM-SC	At 26.5 to 27.8': Clayey, Silty Sand, fine grained, trace coarse sand (Jsm and Tm); dark brown (7.5YR 3/4); appears moist and dense At 27.8 to 30.0': No recovery
	30					GC-GM	At 30.0 to 32.3': Matrix becomes fine to coarse silty, clayey sand
255		2	6	100		SC-SM	At 32.3 to 33.3': Silty, Clayey Sand with Gravel, fine to medium grained, clasts 15-30%, up to ½ inch, mainly subangular to subrounded slate (Jsm), shale (Tm) and sandstone (Tm); dark brown (7.5YR 3/4); appears very moist and dense; gravel decreases with depth, lower contact is sharp
						CL/CH	**ESTUARINE DEPOSITS [Qe]** Clay, trace coarse sand (Jsm and Tm); mottled, yellowish brown (10YR 5/6) to grayish brown (2.5Y 5/2); appears moist and very stiff to hard; trace manganese oxide flecks
						SC/SM	At 34.4 to 35.0': Silty, Clayey Sand with Gravel, fine to coarse grained, clasts 15 to 20%, up to ½ inch, mainly subangular to subrounded slate (Jsm), shale (Tm) and sandstone (Tm); dark grayish brown (10YR 4/2/); appears moist and dense; upper contact is sharp, irregular
	35					ML/CL	At 35.2 to 38.5': Grades to Clayey Silt and Silty Clay, variable fine sand
250		3	7	100			At 38.0 to 40.0': Varve-like bedding
	40						At 39.7 to 40.2': Manganese oxide flecks increase to 5 to 10%

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		**T8-B5 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	287 feet

GROUNDWATER READINGS
Not encountered during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
245	45	3	8	100		ML/ CL	**Qe Continued** **Marker Bed M_E** - Clayey Silt and Silty Clay, variable fine sand; dark grayish brown (10YR 4/2) to brown (10YR 4/3); appears very moist and stiff; lower contact is sharp
						SM	**LAKEWOOD FORMATION [Qlw]** Silty Sand, very fine grained; pale brown (2.5Y 7/3); appears moist and dense
						CL	At 44.6 to 44.8': Clay, brown (10YR 4/3); appears moist and very stiff; upper and lower contacts are sharp
240	50	3	9	94		SM	Silty Sand, very fine grained; mottled, pale brown (2.5Y 7/3) to yellowish brown (10YR 5/8); appears moist and dense; well sorted; lower contact is sharp At 44.8 to 45.5': Highly weathered zone, weathering decreases and coarsens slightly with depth
235	55	4	10	56		SP/ SM	At 51.2 to 52.1': Little or no mottling; pale brown (2.5Y 7/3) Poorly Graded Sand with Silt, fine to medium grained; color variable, generally pale brown (2.5Y 7/4) to yellowish brown (10YR 5/8); appears damp to moist and dense; abundant non-micaceous, mafic sand grains At 52.8 to 55.0': No recovery
230	60	4	11	64		SP/ SM	At 55.4 to 55.9' and 56.6 to 57.8': Becomes highly oxidized, strong brown (7.5YR 5/8) to yellowish red (5YR 4/6) At 55.9 to 56.1': Color becomes dark brown (7.5YR 3/2), abundant mafic sand grains **Marker Bed M_C** - Silty Sand with Gravel, fine to coarse grained; color variable; appears damp and dense; clasts 30 to 40 %, up to 1 inch; mainly subrounded granitic rock and quartzite, lower contact occurs between runs At 58.2 to 60': No recovery

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B5c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		**T8-B5 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	287 feet

GROUNDWATER READINGS
Not encountered during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
225	65	4	12	64		SM	**Qlw Continued** Silty Sand with Gravel, fine to coarse grained, clasts 30 to 50%, most up to 1 inch, maximum 3 inches; mainly subrounded to rounded granitic rock, quartzite and subangular slate (Jsm); varying color, generally strong brown (7.5YR 5/6); appears moist and dense; lower contact is narrowly gradational
							Silty Sand, fine grained; mottled, light yellowish brown (2.5Y 6/3) to yellowish brown (10YR 5/8); appears moist and dense; lower contact is narrowly gradational At 63.2 to 65': No recovery
220	70	5	13	80		SP/SM	Poorly Graded Sand with Silt, fine to medium grained; mottled, pale brown (2.5Y 8/2) to strong brown (7.5YR 5/8); appears moist and dense At 69.0 to 70.0': No recovery
215	75	5	14	100		SM	Silty Sand, fine grained; mottled, light yellowish brown (2.5Y 6/3) to strong brown (7.5YR 5/8); appears moist and dense; well sorted; lower contact is sharp At 73.6 to 75.0': Mottled, light yellowish brown (2.5Y 6/3) to brownish yellow (10YR 6/8)
210	80	5	15	100		SM	**SAN PEDRO FORMATION [Qsp]** At 75.0': **Marker Bed M_B** - Oxidized Clay/Silt bed (<1/2 inch thick), oxidized red Silty Sand, fine grained; light greenish gray (10Y 7/1); appears moist and dense

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B5d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Martini Drilling / CME 75		**T8-B5 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
5/25/11	8 inches	287 feet

GROUNDWATER READINGS
Not encountered during drilling

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.
205	85				
200	90				
195	95				
190	100				

END OF BORING AT 80 FEET

NOTES:
Boring backfilled with cement/bentonite grout from bottom up and patched.

-Munsell colors listed in order of predominance (most predominant color first).
-Where observed, contacts and bedding appear subhorizontal unless otherwise noted.
-Non-recovery intervals are assumed to occur at the bottom of run unless otherwise noted.
-Santa Monica Slate (Jsm) clasts are generally very dark gray, subangular to subrounded slate unless otherwise noted. Modelo Formation (Tm) clasts are generally white to pale yellow to tan, subangular to subrounded shale and sandstone unless otherwise noted.
-The term "clasts" herein describes gravel-size rock fragments (larger than ¼ inch).
-Beds are generally massive unless otherwise noted.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Geologist: ME/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING
Project No.: 4953-10-1561 Figure: T8-B5e

METRO SOIL CORE. S:\70131 GEOTECH\GINTW\FAULT_INVESTIGATION_WSE_LIBRARY AMEC OCTOBER2011 (2).GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.2 FAULT HAZARD INVESTIGATION\3.2 ALL FIELD NOTES\GINT LOGS\101561-TRANSECT 8.GPJ 10/14/11

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Tri Country Drilling / Deidrich D-120		**T8-B6**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/16/11-6/17/11	8 inches	284 feet

GROUNDWATER READINGS
Encountered at 69-ft during drilling

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
							6 inches of asphaltic concrete over 18 inches of base
						CL	**FILL [Af]** Clay, some fine to coarse sand and trace gravel; brown
280							NOTE: Jsm = Santa Monica Slate Tm = Modelo Formation See end of log for more detailed clast descriptions
	5					SC	Poor recovery 5.0 to 19.0' Clayey Sand, trace gravel; light olive brown (2.5Y 5/4); appears moist and medium dense
		1	1	23			At 5.9 to 9.0': No recovery
275						CL	Clay with gravel; dark grayish brown (2.5Y 4/2); appears moist and stiff
	10						At 10.3 to 14': No recovery
		1	2	26			
270							At 14.7 to 19': No recovery
	15						
		1	3	14			
265						GM	**FLUVIAL DEPOSITS [Qfofl]** Silty Gravel, clasts 50 to 60 %, up to 1½ inches, mainly angular to subangular slate (Jsm) sandstone (Tm); granitic, volcanic and other, matrix is fine to coarse silty sand;
	20						

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MW/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Tri Country Drilling / Deidrich D-120		**T8-B6 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/16/11-6/17/11	8 inches	284 feet

GROUNDWATER READINGS
Encountered at 69-ft during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
		1	4	60		GM	dark gray (10YR 4/1); slightly cemented **Qfofl Continued** appears dry to damp and dense; lower contact is sharp At 22.0 to 24.0': No recovery
260	25					ML	**OLDER ALLUVUAL FAN DEPOSITS [Qfo]** Silt with varying fine sand; color variable, mainly very dark brown (7.5YR 2.5/3); appears moist and stiff
		1	5	50		ML	Clayey to Sandy Silt; trace to some coarse sand and fine gravel (Jsm and Tm) decreasing with depth, light olive brown (2.5Y 5/6); appears moist and medium dense; some clayier layers, color becomes dark yellowish brown (10YR 4/4); lower contact is gradational At 26.5 to 29.0': No recovery
255	30						
		1	6	80		ML	**ESTUARINE DEPOSITS (Qe)** Silt with varying fine sand; very dark brown (7.5YR 2.5/3); appears moist and stiff; some varve like bedding At 33.0 to 34.0': No recovery
250	35						At 34.5 to 36.0': Grades to Clayey Silt with Sand, prominent varve-like bedding
		1	7	46			At 36.0 to 36.3': Silty Sand layer (2 inches thick), fine grained; fine gravel At 36.3 to 39.0': No recovery
245	40					SM/ ML	Silty Sand to Sandy Silt, very fine grained; light olive brown (2.5Y 5/4); appears moist and medium dense; generally thickly bedded, occasional faint varve-like bedding

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MW/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B6b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Tri Country Drilling / Deidrich D-120		**T8-B6 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/16/11-6/17/11	8 inches	284 feet

GROUNDWATER READINGS
Encountered at 69-ft during drilling

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
		1	8	50		SP / SM/ML	**Qe Continued** At 40.0 to 40.4': Sand with Gravel bed, fine to coarse grained At 41.5 to 44.0': No recovery
240	45	2	9	60		SM	At 49.5' Clay Silt bed (½ inch thick); dark reddish brown At 45.9 to 47.0': Silty Sand, very fine grained, thinly bedded clayey and silty layers; light olive brown 2.5Y 5/4); appears moist and dense; some beds slightly cemented At 47.0 to 49.0': No recovery
235	50	2	10	80		ML	Silty Sand as above, becomes coarser with depth Clayey to Sandy Silt; yellowish brown (10YR 5/4); prominent varve like bedding; coarsens with depth
230	55	2	11	60		SM/ML SP SM SP	Sandy Silt to Silty Sand, fine grained, trace coarse sand; light olive brown (2.5Y 5/4), appears moist and dense/stiff, some varve-like bedding At 54.6 to 55.3': Becomes light yellowish brown (2.5Y 6/3); coarsens to fine sand **FLUVIAL DEPOSITS [Qfofl]** Silty Sand with Gravel, fine to coarse grained, coarsens with depth, increasing gravel content, clasts maily Jsm and Tm; color variable; appears moist and dense At 55.7 to 56.4': Sand, very fine grained; light olive brown (2.5Y 5/6); appears moist and dense At 57.0 to 59.0': No recovery
225	60					GM	Silty Gravel, clasts 60 to 70%, up to 2 inches, mainly angualr to subangular granitic rock and quartzite, trace slate (Jsm) and shale (Tm), matrix is fine to coarse silty sand; olive brown (2.5Y 4/3); appears dry; depth of contacts uncertain due to poor recovery

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MW/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Tri Country Drilling / Deidrich D-120		**T8-B6 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/16/11-6/17/11	8 inches	284 feet

GROUNDWATER READINGS
Encountered at 69-ft during drilling

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
		2	12	50		GP	**Qfofl Continued** At 61.5 to 64.0': No recovery Depth of contact uncertain due to poor recovery
220	65	3	13	60		SP-SM	**LAKEWOOD FORMATION [Qlw]** At 64.0 to 64.5': Sandy Silt Poorly Graded Sand with Silt, fine to medium grained, coarsens downward; light yellowish brown (2.5Y 6/3); appears moist and dense; lower contact occurs between runs
						SM	**Marker Bed M_C** - Silty Sand with Gravel, fine grained, clasts 15 to 20%, up to ½ inch, mainly subrounded slate (Jsm) quartzite and granitic rock; color variable; appears moist and dense; lower contact occurs between runs At 67.0 to 69.0': No recovery
215	70	3	14	48		SP-SM	▽ At 69': Groundwater encountered during drilling At 69.0 to 74.0': Poor recovery sample appears wet/disturbed
						SP-SM	Poorly Graded Sand with Silt, fine grained; light olive yellow (2.5Y 6/6) to light olive brown (2.5Y 5/4); appears wet and dense; lower contact occurs between runs At 71.4 to 74.0': No recovery
210	75	3	15	70		SM	At 74.0 to 76.0': Grades to very fine Silty Sand
						ML	Silt interbeds, thin; olive (5Y 4/3); dips 15 to 20 degrees; lower contact is sharp
						SP-SM	Poorly Graded Sand with Silt; pale yellow (5Y 7/6); appears moist and dense At 77.5 to 79.0': No recovery
205	80						At 79.0 to 80.2': Sample appears wet

(CONTINUED ON FOLLOWING FIGURE)

Geologist: ME/MW/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B6d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Tri Country Drilling / Deidrich D-120		**T8-B6 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Hollow-Stem Auger	See Plate 3	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/16/11-6/17/11	8 inches	284 feet

GROUNDWATER READINGS
Encountered at 69-ft during drilling

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	SAMPLE LOC.		
						SP	**Qlw Continued**
			16	56		SP-SM	**SAN PEDRO FORMATION [Qsp]** Poorly Graded Sand with Silt, fine to medium grained; dark grayish green (5Y 3/2); appears moist and dense; thickly bedded; oxidizes upon exposure to air; lower contact is sharp At 81.8 to 84.0': No recovery
200	85						
			17	54			At 86.7 to 89.0': No recovery
195	90						
			18	96			At 91.8 to 93.0': Trace subrounded gravel; mostly granitic
						SM	At 93.0 to 93.8': Becomes very fine grained; dark grayish green (5GY 5/2); appears wet and medium dense; bedding dip near horizontal
190	95						END OF BORING AT 94 FEET
185	100						

NOTES:
Boring backfilled with cement/bentonite grout from bottom up and patched.

-Munsell colors listed in order of predominance (most predominant color first).
-Where observed, contacts and bedding appear subhorizontal unless otherwise noted.
-Non-recovery intervals are assumed to occur at the bottom of run unless otherwise noted.
-Santa Monica Slate (Jsm) clasts are generally very dark gray, subangular to subrounded slate unless otherwise noted. Modelo Formation (Tm) clasts are generally white to pale yellow to tan, subangular to subrounded shale and sandstone unless otherwise noted.
-The term "clasts" herein describes gravel-size rock fragments (larger than ¼ inch).
-Beds are generally massive unless otherwise noted.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Geologist: ME/MW/MF
Prepared/Date: WL/PK 10/13/2011
Checked/Date: MF/MW 10/13/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: T8-B6e

APPENDIX C-2 LOGS OF BORINGS – CURRENT GEOTECHNICAL INVESTIGATION

Amec, Current Geotechnical Investigation

Rotary Wash Borings:

G-154, G-156, G-159, G-161, G-162, G-164, G-165, G-166A/B, G-168, G-169, G-171, G-173, G-174A, and G-200Alt - Lab Testing

Sonic Core Borings:

S-110 and S-111 – Lab Testing

Cone Penetrometer Tests:

C-115, C-117, ~~and~~ C-118, C-119, C-119A, C-120, C-120A, and C-120A1

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-154
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 696+10, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/9/2011 - 2/10/2011	4-7/8 inches	274 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/9/2011. Ground-water level measured at 50 feet below the ground surface on 2/10/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
Santa Monica/Century City Station	0										Grass Surface
										ML	**FILL [Af]** SANDY SILT - moist, brown to dark brown
	5										**QUATERNARY YOUNGER ALLUVIUM [Qal]**
			9.3	16.2	103	8				ML	SILT with SAND - medium stiff, moist, dark brown, slightly porous, some clay
	10	24	5.1	16.2	-					CL	SANDY LEAN CLAY - very stiff, moist, dark brown
	15		8.6	21.9	100	16					Becomes stiff, dark olive brown, trace sand
	20	14	11.8	26.8	-					ML	SILT with SAND - stiff, moist, gray, some clay
	25		9.2	16.6	114	90/10"					Becomes hard
			8.7	17.3	110	88/10"				CL	**QUATERNARY OLDER ALLUVIUM [Qalo]** LEAN CLAY with SAND - very stiff to hard, moist, brown and gray
	30	26	12.2	19.1	-						Some thin layers of Silty Sand
			5.3	13.4	113	55	78				Trace gravel (up to 3/8 inch in size), thin layer of Silty Sand
	35	42	11.6	17.1	-		46			SM	SILTY SAND - dense, moist, brown, fine to medium-grained, trace gravel
			10.9	21.6	103	20				CH	FAT CLAY - very stiff, moist, gray, trace sand
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 4/4/2011
Checked/Date: LT/PE 9/20/2011

MTA Westside Subway Extension
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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.48a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-154 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 696+10, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/9/2011 - 2/10/2011	4-7/8 inches	274 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/9/2011. Ground-water level measured at 50 feet below the ground surface on 2/10/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Santa Monica/Centuty City Station

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
		26	10.0	16.9	-			☒		ML	SILT - very stiff, moist, brown and gray, trace sand, trace gravel (up to 1/4 inch in size), some clay
			11.4	12.6	115	68	31	☒		SC	CLAYEY SAND with GRAVEL - very dense, moist, brown and gray, fine-grained, gravel (up to 3/4 inch in size)
	45	37	7.2	17.3	-			☒		CL	LEAN CLAY with GRAVEL - hard, moist, brown and gray, gravel (up to 1/2 inch in size)
											Coarse gravel (6 inch layer)
			12.0	11.1	118	85/8"	24	☒		SM	SILTY SAND with GRAVEL - very dense, moist, brown and gray, fine to coarse-grained, gravel (up to 1/2 inch in size)
	50	58	10.2	9.1	-			☒		GW	WELL GRADED GRAVEL - very dense, moist, gray, gravel (up to 3/4 inch in size)
			11.8	10.3	129	68	14	☒		GC	CLAYEY GRAVEL with SAND - very dense, wet, brown, fine to coarse-grained, gravel (up to 3/4 inch in size)
	55	83		1.7	-			☒		GW	WELL GRADED GRAVEL - very dense, brown, gravel (up to 1 inch in size), very little recovery
			8.5	10.3	119	87	16	☒		SM	SILTY SAND with GRAVEL - very dense, wet, brown and gray, fine to coarse-grained, gravel (up to 3/4 inch in size)
	60	23	10.2	30.1	-			☒		ML	SILT - very stiff, wet, olive brown, trace sand, trace iron oxide stains, some clay
				18.5	110	36		☒		CL	LEAN CLAY with SAND - very stiff to hard, moist, brown and gray
	65	29	10.5	21.6	-			☒			Iron oxide stains
			10.1	26.3	99	37		☒		SM	SILTY SAND - dense, wet, olive brown, fine-grained
	70	25	5.6	21.9	-			☒		ML	SANDY SILT - very stiff, very moist, olive brown, some clay
			9.8	24.0	93	32		☒		CL	LEAN CLAY - very stiff, moist, olive brown
	75	39	7.8	27.1	-			☒		ML	SILT - hard, moist, brown and gray, some clay
											Thin layer of Silty Sand, fine-grained
195			9.2	33.7	87	32		☒		CL	LEAN CLAY with SAND - very stiff, moist, olive gray
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 4/4/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.48b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-154 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 696+10, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/9/2011 - 2/10/2011	4-7/8 inches	274 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/9/2011. Ground-water level measured at 50 feet below the ground surface on 2/10/2011.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
		43	8.0	21.4	-			☒	
			7.2	33.2	93	28		⊠	
190	85	36	8.1	17.4	-			☒	
185	90								
180	95								
175	100								
170	105								
165	110								
160	115								
155	120								

SM SILTY SAND - dense, wet, grayish brown, fine-grained

CL LEAN CLAY - very stiff, moist, dark gray, trace sand

Becomes hard, brown and gray, with sand, trace gravel (up to 1 inch in size), iron oxide stains

END OF BORING AT 86½ FEET

NOTES:

Hand augered upper 6 feet to avoid damage to utilities.
Borehole grouted with cement-bentonite slurry.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

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Field Tech: AR
Prepared/Date: JF 4/4/2011
Checked/Date: LT/PE 9/20/2011

MTA Westside Subway Extension
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LOG OF BORING
Project No.: 4953-10-1561 Figure: A-2.48c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-156
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 706+80, Lt 40 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/14/2011 - 2/15/2011	4-7/8 inches	282 feet

GROUND-WATER READINGS
Ground-water level measured at 27 feet and 45 feet below the ground surface in shallow and deep monitoring wells, respectively on 6/10/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
280	0										8-inch thick Grass Surface, No Base Course
										SM	**FILL [Af]** SILTY SAND - moist, brown, fine to medium-grained, some gravel, layer of base course
	5										**QUATERNARY YOUNGER ALLUVIUM [Qal]**
275			1.9	9.6	-	12				SM	SILTY SAND with GRAVEL - loose, moist, brownish red, fine to coarse-grained, fine gravel (up to 1/4 inch in size)
			2.1	17.3	106	17					Becomes medium dense, trace gravel
	10	12	4.7	15.7	-					CL	SANDY LEAN CLAY - stiff, moist, brown, fine to medium sand
270			1.7	16.1	108	11				SC	CLAYEY SAND - loose, moist, brown, fine to medium-grained, some coarse
	15										**QUATERNARY OLDER ALLUVIUM [Qalo]**
		15	3.2	33.5	-					CL-ML	SILTY CLAY - stiff, moist, brown, trace fine sand
265			2.1	15.4	104	14	36			SM	SILTY SAND - medium dense, moist, olive brown, fine to medium-grained, some coarse, trace fine gravel (up to 1/2 inch in size)
	20	14	2.5	14.2	-					ML	SILT - stiff, moist, brown, some fine sand, thin layers of Silty Clay
260			1.5	13.7	117	28				SM	SILTY SAND - medium dense, moist, brown, fine to medium-grained, some gravel (up to 1/4 inch in size)
	25	20	2.1	12.0	-						▽
255			1.2	15.9	112	26	42				Trace gravel (up to 1/2 inch in size)
	30	20	2.6	23.6	-					ML	SILT - stiff, moist, brown, some fine sand, some clay
250			1.2	21.8	100	16					
	35	17	2.8	31.2	-		90			CH	FAT CLAY - very stiff, moist, dark brown, trace fine sand
245			1.4	-	-	32				CL	LEAN CLAY with SAND - hard, moist, brown, very fine sand, trace fine gravel
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/29/2011
Checked/Date: LT/PE 9/20/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.49a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-156 (Continued)
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 706+80, Lt 40 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/14/2011 - 2/15/2011	4-7/8 inches	282 feet

GROUND-WATER READINGS
Ground-water level measured at 27 feet and 45 feet below the ground surface in shallow and deep monitoring wells, respectively on 6/10/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
240		23	2.8	26.4	-		82				Becomes very stiff
				-	-	26					(Sample not recovered)
	45										▼
235		25	3.6	26.6	-						
			1.0	16.2	110	46	63			CL	SANDY LEAN CLAY - hard, moist, light brown, fine sand
	50	25	2.3	18.3	-		58				Very stiff, trace gravel (up to 3/8 inch in size)
230			1.0	14.5	113	51				SM	SILTY SAND - dense, very moist, brown, fine to medium-grained, some coarse
										ML	SANDY SILT - moist, brown, fine sand
	55	92/11"	2.8	22.0	-					SM	SILTY SAND with GRAVEL - very dense, very moist, brown, fine to coarse-grained, gravel (up to 1/4 inch in size)
225			1.5	7.2	118	65/6"					Gravel (up to 1 inch in size)
	60	76	2.5	13.0	-		21				Gravel (up to 3/4 inch in size)
220			1.4	13.5	112	75/6"					
	65	81	2.1	15.2	-		19				
			1.0	9.4	123	100/10"				GW	WELL GRADED GRAVEL - very dense, wet, fine to coarse-grained, gravel (up to 1 inch in size)
	70	65	2.4	21.2	-		28			SM	SILTY SAND - very dense, wet, brown, fine to coarse-grained, trace gravel (up to 1/2 inch in size)
			0.8	23.5	96	47				CL-ML	SILTY CLAY - hard, moist, grayish brown, trace fine sand
Tunnel	75	57/6"	1.5	2.1	-					SM	SILTY SAND with GRAVEL - very dense, moist, brown, fine to medium-grained, slate gravel (up to 2 inches in size)
			0.8	15.5	116	38				ML	SILT - hard, wet, grayish dark brown, trace fine sand, trace gravel, some clay
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/29/2011
Checked/Date: LT/PE 9/20/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.49b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-156 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 706+80, Lt 40 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/14/2011 - 2/15/2011	4-7/8 inches	282 feet

GROUND-WATER READINGS
Ground-water level measured at 27 feet and 45 feet below the ground surface in shallow and deep monitoring wells, respectively on 6/10/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
		27	2.1	17.1	-					CL-ML	SILTY CLAY - very stiff, moist, gray, with layers of Clayey Silt
			0.8	23.5	101	60					Becomes hard
	85	41	2.5	15.6	-						Trace gravel
195										CL	SANDY LEAN CLAY - hard, moist, light brown, fine sand
	90		0.5	12.9	108	46					
190											
	95	50		-	-						(Sample not recovered)
185										SW	WELL GRADED SAND with GRAVEL - very dense, wet, dark gray, fine to coarse-grained
	100		0.7	6.9	122	81				ML	SANDY SILT - moist, brown to gray, fine sand
180											
	105	41	1.9	21.7	-					CL-ML	SILTY CLAY - hard, moist, brown to gray
175											Alternating with clay layers
	110		1.0	23.5	100	50					Thin layer of Silty Sand, brown
170										CL	SANDY LEAN CLAY - hard, moist, gray and brown, fine sand
	115	28	1.5	8.9	-						Some gravel
165											
	120										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/29/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.49c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-156 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 706+80, Lt 40 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/14/2011 - 2/15/2011	4-7/8 inches	282 feet

GROUND-WATER READINGS
Ground-water level measured at 27 feet and 45 feet below the ground surface in shallow and deep monitoring wells, respectively on 6/10/2011. See last page of this boring for details.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
160	125		1.4	11.2	121	70		⊠	
155	130								
150	135								
145	140								
140	145								
135	150								
130	155								
125	160								

Becomes hard

END OF BORING AT 121 FEET

NOTES:

Montoring well was installed on 6/10/2011. See well construction diagram for G-156.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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LOG OF BORING
Project No.: 4953-10-1561 Figure: A-2.49d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-159
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 721+84, Lt 519 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/22/2011	4-7/8 inches	276 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/22/2011. Ground-water level measured at 15 feet below the ground surface 10 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
275	0										12-inch thick Asphalt Concrete over 12-inch thick Portland Cement Concrete, No Base Course **FILL [Af]**
270	5		11.3	16.4	100	8/4"		⊠		ML	**QUATERNARY OLDER ALLUVIUM [Qalo]** SILT with SAND - medium stiff, moist, olive brown and gray
265	10	14	8.7	26.0	-			⊠		ML	SANDY SILT - stiff, moist, brown and gray
260	15		7.6	16.0	103	11		⊠		SM	SILTY SAND - loose, wet, brown, fine to medium-grained, trace gravel
255	20	11	9.4	16.9	-			⊠		CL	SANDY LEAN CLAY - stiff, moist, gray and brown, trace gravel (up to 3/4 inch in size), scattered calcium carbonate nodules
250	25		9.6	14.2	116	31		⊠			Becomes very stiff, trace gravel (up to 1/4 inch in size)
245	30	26	8.8	22.9	-			⊠			Decrease in sand content, becomes olive gray, trace iron oxide stains
240	35		6.5	18.6	109	27		⊠			Becomes brown
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/29/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.50a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-159 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 721+84, Lt 519 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/22/2011	4-7/8 inches	276 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/22/2011. Ground-water level measured at 15 feet below the ground surface 10 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
235	45	22	8.5	19.3	-			⊠			
230			3.9	21.4	103	29		▨			
225	50	29	8.1	20.8	-			⊠			
220	55		8.6	19.2	101	35	78	▨		MH	ELASTIC SILT with SAND - very stiff, moist, gray
215	60	43	4.3	20.0	-			⊠		CL	LEAN CLAY with SAND - hard, moist, brown and gray, trace gravel (up to 1/8 inch in size)
210	65		8.5	16.6	112	71	50	▨		SM	SILTY SAND - very dense, moist, brown, fine to medium-grained, trace gravel (up to 3/8 inch in size), with clay
	70									CL	SANDY LEAN CLAY - hard, moist, brownish gray
205		52	7.6	19.4	-		39	⊠		SC	CLAYEY SAND - very dense, moist, brown, fine to coarse-grained, gravel (up to 3/8 inch in size)
	75									CL	LEAN CLAY - hard, moist, brown, trace sand
200			4.8	36.7	87	53	91	▨		SM	SILTY SAND - dense, wet, light brown, fine to medium-grained, trace gravel
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/29/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.50b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-159 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 721+84, Lt 519 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/22/2011	4-7/8 inches	276 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/22/2011. Ground-water level measured at 15 feet below the ground surface 10 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS			
195		74	5.9	23.4	-			☒		CH	SANDY FAT CLAY - hard, moist, gray, trace calcium carbonate nodules, trace gravel	
	85		5.0	16.2	113	48	63	⊠			Trace gravel (up to 3/8 inch in size)	
	90	90/11"	4.3	15.7	-		50	☒		SC	CLAYEY SAND - very dense, moist, gray, fine to medium-grained, trace iron oxide stains, trace gravel (up to 1/8 inch in size)	
Tunnel	95		-	-	-	80/10"		○		SM	SILTY SAND - very dense, moist, brown, fine to medium-grained, some coarse sand and gravel (Sample not recovered)	
	100	47	4.7	24.5	-			☒		ML	SANDY SILT - hard, very moist, olive brown, trace iron oxide stains	
	105									CL	LEAN CLAY with SAND - hard, moist, gray, some calcium carbonate nodules	
170			5.6	18.0	111	44		⊠				
	110	37	3.6	19.4	-			☒				
165	115											
160			4.2	31.3	87	51		⊠			Becomes dark gray	
	120										Coarse gravel layer	

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/29/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.50c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-159 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 721+84, Lt 519 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/22/2011	4-7/8 inches	276 feet

GROUND-WATER READINGS
Drilling mud bailed on 2/22/2011. Ground-water level measured at 15 feet below the ground surface 10 minutes after bailing of drilling mud.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS	
155		39	5.5	26.8	-			☒		Becomes light greenish gray, trace sand
	125									END OF BORING AT 121½ FEET
150										
	130									NOTES:
145										Hand augered upper 6 feet to avoid damage to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.
	135									"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches
140										*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches
	140									**Photo Ionization Detector used for OVA readings
135										
	145									
130										
	150									
125										
	155									
120										
	160									

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Field Tech: AR
Prepared/Date: JF 3/29/2011
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LOG OF BORING
Project No.: 4953-10-1561 Figure: A-2.50d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-161
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 681+50, Rt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/3/2011 - 2/4/2011	4-7/8 inches	258 feet

GROUND-WATER READINGS
Bailed drilling mud to 45 feet. Ground-water level measured at 29 feet below ground surface 30 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
255	5										4-inch thick Asphalt Concrete over 12-inch thick Portland Cement Concrete and 2-inch thick Base Course
										SC	**FILL [Af]** CLAYEY SAND - moist, gray
250	10		0.0	15.3	109	Push		⊠		CL	SANDY LEAN CLAY - moist, dark brown, trace brick fragments
										CL	**QUATERNARY YOUNGER ALLUVIUM [Qal]** LEAN CLAY - very soft, moist, gray
245	15	10	0.0	25.4				⊠			Becomes stiff, dark olive brown
			0.2	-	-	18		○		SM	SILTY SAND with Gravel - medium dense, moist, olive brown, fine to medium-grained, gravel (up to 1/4" in size), some clay, sample disturbed
240	20									CL	LEAN CLAY with Sand - soft, moist, olive brown
235	25	5	0.1	23.5				⊠			
			0.0	24.6	94	4		⊠			▽
230	30									ML	SANDY SILT - stiff, wet, olive gray
		10	0.0	27.3				⊠		SM	**QUATERNARY OLDER ALLUVIUM [Qalo]** SILTY SAND - loose, wet, gray, fine-grained
225	35			-	-	30		○			Becomes medium dense, some gravel (Sample not recovered)
220	40									SM	

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 3/31/2011
Checked/Date: JAG/PE 6/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.51a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-161 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 681+50, Rt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/3/2011 - 2/4/2011	4-7/8 inches	258 feet

GROUND-WATER READINGS
Bailed drilling mud to 45 feet. Ground-water level measured at 29 feet below ground surface 30 minutes after bailing of drilling mud.

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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
		25	0.0	18.0			19	☒			SILTY SAND with Gravel - medium dense, wet, grayish brown, fine to medium-grained, gravel (up to 1/4" in size), with layers of Poorly Graded Sand
215	45			-	-	30		○			(Sample not recovered)
210	50	62	0.2	10.8			17	☒			Becomes very dense, dark gray, gravel (up to 1" in size)
205	55		0.0	28.0	93	11		⊠		SP	POORLY GRADED SAND - medium dense, wet, brown, fine to medium-grained
										ML	SILT - stiff, moist, brown, trace sand
200	60	50	0.0	16.9				☒		SC	CLAYEY SAND - wet, olive brown, fine-grained
										ML	SILT - hard, moist, olive brown to olive gray
195	65		0.1	23.0	102	28		⊠		SM	SILTY SAND - wet, olive gray
190	70	38	0.0	17.9				☒		CL	LEAN CLAY - very stiff, moist, olive gray, trace sand
185	75		0.0	21.8	106	30	80	⊠		CL	Becomes hard, gray, trace gravel (up to 1/4" in size)
180	80										LEAN CLAY with Sand - very stiff, wet, gray, fine sand

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 3/31/2011
Checked/Date: JAG/PE 6/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.51b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-161 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 681+50, Rt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/3/2011 - 2/4/2011	4-7/8 inches	258 feet

GROUND-WATER READINGS
Bailed drilling mud to 45 feet. Ground-water level measured at 29 feet below ground surface 30 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
175	85	24	0.0	32.1				☒		CL/CH	LEAN to FAT CLAY - very stiff, wet, olive gray
170	90		0.0	17.6	111	31	66	⊠		CL	SANDY LEAN CLAY - very stiff, wet, olive brown to olive grayish brown
165	95	39	0.0	28.2				☒		CL	LEAN CLAY - hard, wet, olive brown to olive gray, trace iron oxide stains
										SP	POORLY GRADED SAND - dense, wet, brown, fine to medium-grained
160	100		0.1	19.9	109	36	43	⊠		SC	CLAYEY SAND - dense, wet, gray, trace gravel (up to 1/4" in size)
155	105	46	0.0	14.7			66	☒		CL	SANDY LEAN CLAY - hard, wet, reddish brown and some olive gray, trace gravel (up to 1/4" in size)
150	110		0.0	15.3	114	45		⊠			Alternating with layers of Lean Clay with Sand, olive brown
145	115	33	0.0	26.3				☒			Becomes olive gray and some reddish blue, trace sand
140	120		0.0	12.8	124	45		⊠		SC	CLAYEY SAND with Gravel - dense, wet, olive brown to reddish brown, medium to coarse-grained, gravel (up to 1/4" in size)

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 3/31/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.51c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-161 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 681+50, Rt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/3/2011 - 2/4/2011	4-7/8 inches	258 feet

GROUND-WATER READINGS
Bailed drilling mud to 45 feet. Ground-water level measured at 29 feet below ground surface 30 minutes after bailing of drilling mud.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
135	125	59	0.1	22.2				☒		SP	POORLY GRADED SAND with Gravel - very dense, wet, gray, gravel (up to 1/2" in size), thin layer of Lean Clay
130	130										END OF BORING AT 121½ FEET
125	135										
120	140										NOTES:
115	145										Hand augered upper 6 feet due to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.
110	150										"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches
105	155										*Number of blows required to drive the Crandall Sampler 12 inches using a 340 pound hammer falling 18 inches
100	160										**Photo Ionization Detector used for OVA readings

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: DW
Prepared/Date: JF 3/31/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.51d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-162
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 685+60, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	251 feet

GROUND-WATER READINGS
Bailed drilling mud to 42 feet. Ground-water level measured at 24 feet below ground surface 30 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
250	0										4-inch thick Asphalt Concrete over 12-inch thick Portland Cement Concrete and 3-inch thick Base Course
										SC	**FILL [Af]** - CLAYEY SAND - moist, brown, with fine gravel
										CL	**QUATERNARY YOUNGER ALLUVIUM [Qal]** SANDY LEAN CLAY - moist, brown
245	5		0.0	23.3	101	Push				CL/ CH	LEAN to FAT CLAY - very soft, moist, olive brown, trace fine sand
										ML	SANDY SILT - soft, moist, olive brownish gray, trace slate gravel (up to 1/4" in size)
240	10		0.0	18.0	104	5					
235	15	4	0.1	22.2							Becomes olive brown
230	20		0.2	27.1	91	5				CL	SANDY LEAN CLAY - soft, moist, olive brown, trace fine sand, trace gravel (up to 1/4" in size)
											▽ Becomes wet
225	25	Push	0.0	30.8							Becomes very soft, trace sand, trace gravel (up to 1/4" in size)
220	30			-	-	12				CL	**QUATERNARY OLDER ALLUVIUM [Qalo]** SANDY LEAN CLAY - stiff, wet, olive brown, trace fine sand, trace gravel (up to 1/4" in size) (Sample not recovered)
215	35	12	0.0	21.7							Trace gravel (up to 1/2" in size)
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: KP/JF 3/28/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.52a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-162 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 685+60, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	251 feet

GROUND-WATER READINGS
Bailed drilling mud to 42 feet. Ground-water level measured at 24 feet below ground surface 30 minutes after bailing of drilling mud.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS			
210			0.0	-	-	65		○				(Sample not recovered) Becomes hard, more gravel
	45											
205		38	0.0	7.8				⊠			SC	CLAYEY SAND with Gravel - dense, wet, olive brown, gravel (up to 1/2" in size)
	50											
200				-	-	51		○				(Sample not recovered)
	55											
195		40	0.0	13.9			27	⊠			SC	CLAYEY SAND - dense, wet, olive brown, fine to coarse-grained, gravel (up to 1" in size)
	60											
190		30	0.0	19.8			62	⊠			CL	SANDY LEAN CLAY - very stiff, wet, olive brown
185	65											
	70											
180			0.0	9.1	116	80/10"	14	⊠	Pressuremeter		SC	CLAYEY SAND with Gravel - very dense, wet, olive brown, fine to coarse grained, gravel (up to 1" in size), iron oxide stains
	75											
175												
	80											

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: KP/JF 3/28/2011
Checked/Date: JAG/PE 6/30/2011

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-162 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 685+60, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	251 feet

GROUND-WATER READINGS
Bailed drilling mud to 42 feet. Ground-water level measured at 24 feet below ground surface 30 minutes after bailing of drilling mud.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
170			0.0	19.8	109	32		⊠	Pressuremeter	CL	LEAN CLAY with Sand - very stiff, wet, olive brown, trace gravel (up to 1/2" in size), trace iron oxide stains
	85										
165		92/9"	0.0	16.0			34	⊠		SC-SM	SILTY, CLAYEY SAND with Gravel - very dense, wet, olive brown, fine to coarse-grained, abundant slate gravel (up to 1-1/4" in size)
	90										
160			0.0	18.2	109	45		⊠		CH	FAT CLAY with Sand - hard, wet, olive gray, fine sand, trace fine gravel
		30	0.0	20.2			77	⊠			Becomes very stiff, olive brown to olive gray
	95										
155			0.1	19.2	113	29		⊠			
	100	40	0.0	20.1			58	⊠		CL	SANDY LEAN CLAY - hard, wet, olive gray, trace gravel (up to 1/4" in size)
150			0.0	20.3	106	35		⊠		CL/CH	LEAN to FAT CLAY - hard, wet, olive gray, trace sand
	105										
145				-	-	45		○			(Sample not recovered)
	110										
140			0.0	26.2	99	73/9"		⊠			With calcium carbonate nodules
	115										
135			0.0	10.8	122	36		⊠		SP	POORLY GRADED SAND - medium dense, wet, brown, fine to medium-grained, trace coarse
	120										

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: KP/JF 3/28/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.52c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-162 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 685+60, Lt 20 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	251 feet

GROUND-WATER READINGS
Bailed drilling mud to 42 feet. Ground-water level measured at 24 feet below ground surface 30 minutes after bailing of drilling mud.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS	
130	125		0.0	15.5	113	68		⊠		Becomes very dense, trace gravel (up to 1/4" in size)
125	130									END OF BORING AT 121 FEET
120	135									
115	140									
110	145									
105	150									
100	155									
95	160									

NOTES:

Hand augered upper 5 feet due to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 340 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: DW
Prepared/Date: KP/JF 3/28/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.52d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-164
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 692+60, Rt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	249 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/27/2011. Ground-water level measured at 38 feet below the ground surface on 1/28/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
											5-inch thick Asphalt Concrete over 8-inch thick Base Course
											FILL [Af]
										CL	SANDY LEAN CLAY - moist, dark brown and gray, trace slate gravel (up to 1-1/4 inches in size)
245	5										
			0.0	12.5	116	12					**QUATERNARY YOUNGER ALLUVIUM [Qal]**
										CL	SANDY LEAN CLAY - stiff, dark reddish brown, trace gravel (up to 1/4 inch in size)
240	10										
		10	0.0	19.4	-						Thin layer of Silty Sand
235	15										
			0.0	13.4	104	8					Becomes medium stiff, moist, olive brown
230	20										
		13		-	-						Increase in sand content (Sample not recovered)
225	25										
											QUATERNARY OLDER ALLUVIUM [Qalo]
			0.3	16.1	105	18	75			ML	SILT with SAND - stiff, moist, olive brown
220	30										
		10	0.0	21.9	-		59				Becomes dark olive brown, some clay
215	35		0.1	32.0	90	9	89			ML	SILT - medium stiff, moist, dark olive brown, trace fine sand
		17	0.0	18.7	-		28			SM	SILTY SAND - medium dense, moist, gray, fine to medium-grained, trace gravel (up to 3/8 inch in size)
210	40									SP	POORLY GRADED SAND - mediume dense, wet, gray, fine to medium-grained, trace iron oxide stains
			0.0	22.6	103	24				SM	

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/28/2011
Checked/Date: LT/PE 9/20/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.53a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-164 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 692+60, Rt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	249 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/27/2011. Ground-water level measured at 38 feet below the ground surface on 1/28/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
205	45	54	0.0	11.4	-		15	☒	NV		SILTY SAND with GRAVEL - medium dense, wet, gray, fine to medium-grained, with silt seams, trace iron oxide stains
											Becomes very dense, fine to coarse-grained, gravel (up to 3/4 inch in size)
										SM	SILTY SAND - dense, wet, brownish gray, fine to medium-grained, some coarse sand, trace slate gravel, with 4-inch cobble
200	50		0.0	10.3	119	57	10	⊠		GW-GM	POORLY GRADED GRAVEL with SILT and SAND - dense, wet, gray, fine to coarse-grained, gravel (up to 1 inch in size)
		29	0.1	26.7	-		91	☒		CH	SANDY FAT CLAY - very stiff, moist, olive green, fine sand, trace iron oxide stains
195	55		0.2	27.6	97	16		⊠	NV		**LAKEWOOD FORMATION [Qlw]**
										CH	SANDY FAT CLAY - stiff, moist, olive brown and gray, trace slate gravel
		27	1.0	21.2	-		55	☒			Becomes olive gray and greenish gray, calcium carbonate nodules
	60		1.1	12.6	109	70	20	⊠		SM	SILTY SAND - very dense, moist, light brown, fine to medium-grained
		50/6"	1.5	17.6	-			☒	NV	SP	POORLY GRADED SAND - very dense, wet, light greenish gray, fine to coarse-grained
	65		1.2	19.5	107	90	12	⊠			Some coarse sand
Tunnel	70	50/5"	1.1	20.1	-		12	☒		SM	SILTY SAND - very dense, wet, light greenish yellow and gray, fine to medium-grained
			1.6	20.1	105	75		⊠		SP	POORLY GRADED SAND - very dense, wet, yellowish brown, fine to medium-grained
	75	50/4"	0.9	17.3	-		18	☒			Becomes yellowish brown and gray, with coarse sand, with gravel up to (1/2 inch in size)
170	80		1.0	19.4	100	75		⊠			Becomes yellowish gray

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/28/2011
Checked/Date: LT/PE 9/20/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.53b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-164 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 692+60, Rt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	249 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/27/2011. Ground-water level measured at 38 feet below the ground surface on 1/28/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
165	85	50/2"		-	-			○			(Sample not recovered) 4-inch to 6-inch thick cobble layer
			1.2	18.2	101	80		⊠			Becomes olive gray, fine to medium-grained, iron oxide stains
160	90	93/11"	1.3	24.0	-		22	⊠		SM	SILTY SAND - very dense, wet, olive gray, fine to medium-grained, iron oxide stains
155	95		1.5	23.8	98	78		⊠		SP	**SAN PEDRO FORMATION [Qsp]** POORLY GRADED SAND - very dense, wet, olive gray, fine to medium-grained, trace silt
150	100	95/10"	1.9	31.5	-			⊠			Becomes dark gray, fine-grained, trace shell fragments
145	105									ML	SANDY SILT - hard, moist, dark gray, with clay
			1.1	16.6	102	75		⊠		SM	SILTY SAND - very dense, wet, dark gray, fine-grained, trace shell fragments
140	110	87	0.9	24.7	-			⊠			Trace gravel, trace shell fragments
135	115		0.9	17.6	111	100		⊠		ML	SANDY SILT - hard, moist, blueish gray, trace shell fragments, with clay
130	120										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/28/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.53c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-164 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 692+60, Rt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/26/2011 - 1/28/2011	4-7/8 inches	249 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/27/2011. Ground-water level measured at 38 feet below the ground surface on 1/28/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
125	125	61	0.8	22.0	-			☒		CL	LEAN CLAY with SAND - hard, moist, blueish gray
120	130		0.9	17.6	96	125		⊠		SP-SM	POORLY GRADED SAND with SILT - very dense, moist, blueish gray, fine to medium-grained, trace gravel, organic odor
115	135	50/4"	0.6	16.1	-			☒		SP	POORLY GRADED SAND - very dense, moist, blueish gray, fine to medium-grained Increase in gravel content
110	140		1.0	10.0	118	100		⊠			
105	145	50/4"	0.8	16.9	-			☒			Trace organic odor
100	150		0.8	12.5	116	100/5"		⊠		SM	SILTY SAND - very dense, wet, dark gray, fine to meduim-grained, some coarse, trace gravel, organic odor
95	155	50/5"	0.7	14.0	-			☒			Trace gravel (up to 1/4 inch in size)
90	160										END OF BORING AT 150½ FEET

NOTES:
Hand augered upper 6 feet to avoid damage to utilities.
Borehole grouted with cement-bentonite slurry and patched with asphalt concrete

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

Downhole Test: NV = Noise/Vibration

Field Tech: AR
Prepared/Date: JF 3/28/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.53d

LA METRO PB-TUNNEL ZONE S:\70131 GEOTECH\GINTW\LIBRARY MACTEC JUNE2011.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\NEW TEMPLATE - MARCH 14, 2011\4953-10-1561_(161-181).GPJ 10/3/11

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-165
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 698+10, Rt 30 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/5/2011 and 3/19/2011	4-7/8 inches	281 feet

GROUND-WATER READINGS
Ground-water level measured at 26 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
280	0										4-inch thick Asphalt Concrete, No Base Course
										SP	**FILL [Af]**
											POORLY GRADED SAND - moist, fine to medium-grained, with silt and clay, trace gravel (up to 1½ inches in size)
275	5										
											QUATERNARY OLDER ALLUVIUM [Qalo]
										SM	SILTY SAND - moist, brown, fine to coarse-grained, trace fine gravel
270	10		0.3	16.8	109	Push					
		9	0.1	24.2	-					CL	LEAN CLAY - stiff, moist, light brown
265	15									SP	POORLY GRADED SAND - loose, moist, brown, fine to coarse-grained
			0.1	22.7	101	10	49			SC	CLAYEY SAND - loose, moist, brown, fine-grained, trace gravel (up to 3/8 inch in size)
	20	11	0.2	22.1	-						Thin layer of Sandy Silt
260										CL	SANDY LEAN CLAY - stiff, moist, reddish brown, trace gravel (up to 1/4 inch in size)
			0.1	17.6	106	12					Trace sand
255	25	23	0.0	13.1	-		48			SC	▽ CLAYEY SAND - medium dense, moist, brown, fine to medium-grained, trace gravel (up to 1/2 inch in size)
			0.0	18.4	112	26					
250	30	20	0.0	15.6	-						
	35		0.1	21.1	101	12					Thin layer of Silty Sand
245		15	0.1	25.4	-					SM	SILTY SAND - medium dense, moist, brown, fine to medium-grained
	40									CL	LEAN CLAY - stiff, moist, brown

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.54a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-165 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 698+10, Rt 30 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/5/2011 and 3/19/2011	4-7/8 inches	281 feet

GROUND-WATER READINGS
Ground-water level measured at 26 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
240			0.1	19.6	97	16		⊠		SC	CLAYEY SAND - medium dense, moist, brown and gray, fine-grained
		17	0.0	24.8	-		76	⊠		CL	LEAN CLAY with SAND - very stiff, moist, brown, trace gravel (up to 3/8 inch in size)
235	45		0.0	28.9	95	15		⊠		SM	SILTY SAND - medium dense, moist, brown, fine to medium-grained
	50	41	0.0	18.4	-			⊠		CL	LEAN CLAY - hard, moist, brown
230			0.0	18.9	105	30		⊠			Trace fine sand
	55	36/10"	0.0	17.3	-		58	⊠	NV		Alternating with layers of Sandy Lean Clay, trace gravel (up to 3/8 inch in size)
225										SM	SILTY SAND - dense, moist, brown, fine-grained
			0.0	21.0	101	24		⊠		CL	LEAN CLAY - very stiff, moist, light brown, with fine sand
	60										
220		17	0.1	31.4	-			⊠			With calcium carbonate nodules and iron oxide stains
	65		0.0	19.4	97	18		⊠	NV		▼
215		28	0.0	25.5	-		77	⊠			With sand
	70										
210			0.1	37.5	82	26		⊠			Becomes olive gray to olive brown, trace iron oxide stains
											Becomes hard
		68/11"	0.0	16.4	-			⊠	NV		**LAKEWOOD FORMATION [Qlw]**
	75									SM	SILTY SAND - very dense, moist, gray, fine-grained
Tunnel			0.2	14.5	105	50/6"		⊠			Becomes light brown and gray
	80	95/11"		16.9	-		15	⊠			

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.54b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-165 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 698+10, Rt 30 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/5/2011 and 3/19/2011	4-7/8 inches	281 feet

GROUND-WATER READINGS
Ground-water level measured at 26 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
Tunnel			0.1	19.1	94	80					Becomes yellowish brown, trace medium sand, trace silt
	85	90/11"	0.2	23.9	-						Becomes dark gray, fine to coarse-grained
										CL	LEAN CLAY - hard, moist, greenish gray, trace fine sand
										SM	SILTY SAND - very dense, moist, olive brown to gray, fine to medium-grained
			0.2	18.2	100	79/10"					
	90	88/10"	1.1	20.7	-		28				Becomes greenish gray to gray, trace iron oxide stains
	95		1.2	23.8	99	56					
185		97/11"	0.6	15.9	-						Becomes yellowish brown
	100		0.4	14.1	108	75/10"					Trace coarse sand
180		63	0.1	24.3	-		32				Brown to olive brown, fine-grained
	105		0.1	22.6	99	42/10"					Becomes dense
175		91	0.0	26.1	-					SC	CLAYEY SAND - very dense, moist, brown to olive brown, fine-grained
	110			-	-	50/3"					(Sample not recovered)
170											**SAN PEDRO FORMATION [Qsp]**
	115	50/10"	0.3	20.2	-					SP	POORLY GRADED SAND - very dense, moist, gray, fine-grained
165			0.0	18.8	106	60/10"					Trace coarse sand
	120										

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.54c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-165 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 698+10, Rt 30 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/5/2011 and 3/19/2011	4-7/8 inches	281 feet

GROUND-WATER READINGS
Ground-water level measured at 26 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
160		59	0.0	27.2	-		86	☒		MH	ELASTIC SILT - hard, moist, gray
	125									SP	POORLY GRADED SAND - very dense, moist, gray, fine to medium-grained
155			0.0	17.5	-	50/10"		○			(Sample not recovered)
	130										With gravel
150		50/5"	0.1	14.9	-			☒			Trace fine gravel, trace organic odor
	135										
145			4.6	13.5	97	50/1"		⊠			Fine to coarse-grained, trace gravel (up to 1/2 inch in size)
	140										
140			3.4	18.6	94	50/5"		⊠			
	145										
135			0.5	13.3	116	50/5"		⊠			
	150		0.4	18.9	95	50/5"		⊠			END OF BORING AT 150½ FEET
130											NOTES: Hand augered upper 8 feet to avoid damage to utilities. Montoring well was installed on 4/22/2011. See well construction diagram for G-165.
	155										
125											
	160										

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 340 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

Downhole Test: NV = Noise/Vibration

Field Tech: DW
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.54d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-166A/B
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 700+30, Rt 25 and 60 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/5/2011, 3/19/2011, 4/18/2011 - 4/20/2011	4-7/8 inches	290 feet

GROUND-WATER READINGS
Ground-water level measured at 43 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
										CL	**FILL [Af]** LEAN CLAY - moist, light brown and gray, trace gravel, trace brick fragments
285	5									SM	SILTY SAND - moist, brown and gray, fine to coarse-grained, with slate gravel
280	10		6.6	9.3	118	49				SW	**QUATERNARY OLDER ALLUVIUM [Qalo]** WELL GRADED SAND with GRAVEL - dense, moist, brown, fine to coarse-grained, trace silt, gravel (up to 1/4 inch in size)
		32	4.0	8.7	-		20			SM	SILTY SAND - dense, moist, brown, fine to medium-grained, some gravel (up to 3/4 inch in size)
275	15		3.2	7.4	114	32					Becomes medium dense, some gravel (up to 1 inch in size)
		54	3.2	20.9	-					CL	LEAN CLAY - hard, moist, light brown, trace gravel (up to 1/4 inch in size)
270	20									SM	SILTY SAND - very dense, moist, reddish brown, fine to medium-grained, trace gravel (up to 1/8 inch in size)
			4.5	6.8	112	65/11"					
265	25	33	4.3	12.8	-		75			CL	LEAN CLAY with SAND - hard, moist, brown, fine to coarse sand, trace gravel (up to 3/8 inch in size)
			2.9	11.0	84	70					Becomes dark reddish brown
260	30	49	5.1	10.9	-					CL	SANDY LEAN CLAY - hard, moist, brown, fine to medium sand
255	35		4.7	10.4	118	82					Trace gravel (up to 1/4 inch in size), thin layer of Sandy Silt
											Thin layer of Silty Sand, olive brown
		29	3.4	22.6	-					CL	LEAN CLAY - very stiff, moist, olive brown
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.55a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-166A/B (Continued)
DRILLING METHOD Rotary Wash	**BOREHOLE LOCATION** Sta 700+30, Rt 25 and 60 feet	
DATES DRILLED 3/5/2011, 3/19/2011, 4/18/2011 - 4/20/2011	**HOLE DIAMETER** 4-7/8 inches	**GROUND EL.** 290 feet

GROUND-WATER READINGS
Ground-water level measured at 43 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
			2.5	22.2	98	21					Trace sand, trace iron oxide stains
		18	4.5	29.9	-						
245	45		4.7	20.5	108	20					Becomes olive gray, trace iron oxide stains
240	50	37	4.7	19.9	-						Becomes hard
				19.8	107	46	87				Becomes dark olive brown
235	55	30		25.0	-				NV		Becomes very stiff, olive brown
230	60			22.0	101	34	77			CH	FAT CLAY with SAND - very stiff, moist, light gray and brown, very fine sand, calcium carbonate nodules
225	65			56.7	66	12			NV	MH	ELASTIC SILT - stiff, moist, light gray, calcium carbonate nodules
		30		31.9	-		99				Becomes very stiff, light olive gray
220	70								PMT		Thin layer of Lean to Fat Clay, gray
				18.2	97	60				SP	**LAKEWOOD FORMATION [Qlw]** POORLY GRADED SAND - dense, wet, light brown, fine to medium-grained, trace gravel (up to 3/4 inch in size)
Tunnel	75								NV		
	80	95	6.3	16.0	-						

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.55b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-166A/B (Continued)
DRILLING METHOD Rotary Wash	**BOREHOLE LOCATION** Sta 700+30, Rt 25 and 60 feet	
DATES DRILLED 3/5/2011, 3/19/2011, 4/18/2011 - 4/20/2011	**HOLE DIAMETER** 4-7/8 inches	**GROUND EL.** 290 feet

GROUND-WATER READINGS
Ground-water level measured at 43 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
								☒			Becomes very dense, some coarse sand, trace silt, trace gravel
	85			23.0	89	75/6"	16	☒		SM	**SAN PEDRO FORMATION [Qsp]** SILTY SAND - very dense, moist, gray, very fine-grained
Tunnel	90	50/6"	5.4	21.7	-			☒		SP-SM	POORLY GRADED SAND with SILT - very dense, moist, light gray, fine-grained
										ML	SANDY SILT - hard, moist, light greenish gray
195	95		4.9	13.3	92	75/6"		☒		SP	POORLY GRADED SAND - very dense, moist, light gray, fine to medium-grained
190	100	99/10"	9.5	20.6	-		49	☒		SM	SILTY SAND - very dense, moist, greenish gray, fine to medium-grained Becomes fine-grained
185	105		6.7	20.8	103	80/10"	49	☒			Becomes light brown
180	110	50/6"	4.5	17.8	-			☒		SP	POORLY GRADED SAND - very dense, moist, gray, fine to medium-grained
175	115		4.5	12.8	123	47	45	☒		SC	CLAYEY SAND - dense, moist, dark grayish green, fine to medium-grained
	120									SP	POORLY GRADED SAND - very dense, moist, greenish gray, fine to coarse-grained, with gravel

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.55c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-166A/B (Continued)
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 700+30, Rt 25 and 60 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/5/2011, 3/19/2011, 4/18/2011 - 4/20/2011	4-7/8 inches	290 feet

GROUND-WATER READINGS
Ground-water level measured at 43 feet and 64½ feet below the ground surface in shallow and deep monitoring wells, respectively on 4/22/2011. See last page of this boring for details.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
		50/5"	4.7	12.2	-						Becomes blueish gray, fine-grained
165	125		4.1	-	-	100/3"				SW	WELL GRADED SAND - very dense, wet, gray, fine to coarse-grained, with gravel 6-inch to 8-inch thick cobble layer (Sample not recovered)
160	130	50/4"	1.9	18.9	-					SP	POORLY GRADED SAND - very dense, wet, light gray, fine-grained
155	135		3.9	15.7	96	75/6"					Becomes gray, moist Trace gravel
150	140	50/5"	3.6	20.9	-		34			SM	SILTY SAND - very dense, moist, gray, fine-grained, trace gravel (up to 3/8 inch in size)
145	145		3.0	20.5	88	75/6"				SP	POORLY GRADED SAND - very dense, moist, gray, fine-grained
140	150	50/4"	4.1	17.9	-						
135	155										END OF BORING AT 151 FEET
	160										

NOTES:
Hand augered upper 5 feet to avoid damage to utilities. Boring G-166A was terminated at 74 feet and backfilled. Boring G-166B was sampled between 74 feet and 151 feet. Montoring well was installed on 4/20/2011. See well construction diagram for G-166.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches
*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches
**Photo Ionization Detector used for OVA readings
Downhole Tests: PMT = Pressuremeter, NV = Noise/Vibration

Field Tech: AR
Prepared/Date: JF 5/11/2011
Checked/Date: LT/RM 9/20/2011

MTA Westside Subway Extension
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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.55d

LA METRO PB-TUNNEL ZONE S:\70131 GEOTECH\GINTW\LIBRARY MACTEC JUNE2011.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\NEW TEMPLATE - MARCH 14, 2011\4953-10-1561_(161-181).GPJ 10/3/11

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-168
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 707+00, Lt 30 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/12/2011 - 1/14/2011	4-7/8 inches	284 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
280	5										8-inch thick Asphalt Concrete over 10-inch thick Base Course
											FILL [Af]
										CL-ML	SILTY CLAY - moist, light brown, trace fine sand
											Becomes more sandy, trace gravel
											Becomes clayey, trace slate gravel (up to 1/4 inch in size)
			1.3	15.3	118	30				SC	CLAYEY SAND - moist, brown, trace gravel
		26	0.7	13.7	-						**QUATERNARY OLDER ALLUVIUM [Qalo]**
	10									SM	SILTY SAND - medium dense, moist, brown and gray, fine to medium-grained, some coarse sand, some gravel
			1.2	12.2	113	13					Becomes brown, trace clay and slate gravel
		15	0.8	22.1	-					CL	LEAN CLAY with SAND - stiff, moist, olive brown, fine sand, trace gravel
	15										
			0.9	26.7	95	19					Becomes stiff to very stiff, trace sand, trace iron oxide stains
	20										
		16	0.7	31.5	-						Becomes olive gray to gray
			1.3	23.7	-	34					
	25										
		30	0.6	26.6	-						
			1.5	17.3	107	37					Becomes olive brown to gray, trace fine sand, trace iron oxide stains
	30										
		28	0.6	29.7	-						
	35										
			1.2	18.7	113	36					Becomes with sand, olive brown, fine sand
		24	0.8	17.2	-		87				Trace sand
	40										

Century City / Constellation Station

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/17/2011
Checked/Date: LT/RM 9/20/2011

MTA Westside Subway Extension
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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.56a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-168 (Continued)**
DRILLING METHOD Rotary Wash	**BOREHOLE LOCATION** Sta 707+00, Lt 30 feet	
DATES DRILLED 1/12/2011 - 1/14/2011	**HOLE DIAMETER** 4-7/8 inches	**GROUND EL.** 284 feet
GROUND-WATER READINGS Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

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ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
			1.4	32.1	87	50		⊠		CL	LEAN CLAY - hard, moist, olive gray to greenish gray, cemented silt pods and calcium carbonate nodules
	45										**LAKEWOOD FORMATION [Qlw]**
		68	0.5	25.8	-			⊠		SM	SILTY SAND - very dense, moist, blueish gray to light gray, fine to medium-grained
										ML	SILT - hard, moist, bluish gray, some clay
										SM	SILTY SAND - very dense, moist, blueish gray to greenish gray, fine-grained
	50		1.1	18.4	105	75/9"		⊠			
										SP	POORLY GRADED SAND - very dense, moist, light gray, fine to medium-grained 6-inch thick cobble at 50½ feet
		97/9"	0.4	17.9	-			⊠			Becomes greenish gray
	55									SM	SILTY SAND - very dense, moist, blueish gray, fine to medium-grained, some coarse sand 6 to 8-inch thick cobble at 55½ feet
			1.4	12.7	112	100/5"	15	⊠			Some gravel (up to 1/2 inch in size)
	60										**SAN PEDRO FORMATION [Qsp]**
										SP	POORLY GRADED SAND - very dense, moist, blueish gray to greenish gray, fine to medium-grained
		93/9"	0.5	10.2	-			⊠			Thin layer of Silty Sand
	65										
			1.3	22.0	100	50/5"	21	⊠		SM	SILTY SAND - very dense, moist, greenish to blueish gray, fine to medium-grained
	70										
		50/5"	1.0	18.0	-			⊠		SP	POORLY GRADED SAND - very dense, moist, dark gray, fine to medium-grained
	75										
			1.2	14.4	100	50/3"		⊠			
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/17/2011
Checked/Date: LT/RM 9/20/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.56b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-168 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 707+00, Lt 30 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/12/2011 - 1/14/2011	4-7/8 inches	284 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
Century City / Constellation Station											
	85	50/3"	1.0	13.1	-		22	☒		SM	SILTY SAND - very dense, moist, dark gray, fine to medium-grained
				-	-	100/ 4½"		○			(Sample not recovered)
	90		1.2	27.2	92	70/5"		⊠		SP	POORLY GRADED SAND - very dense, moist, dark gray, fine to medium-grained
190	95										
		43	1.0	10.3	-		81	☒		CH	FAT CLAY with SAND - hard, moist, dark gray, fine to medium sand
185	100									SP	POORLY GRADED SAND - moist, gray, fine to medium-grained, some coarse sand, trace gravel
			1.2	9.9	119	75/5"		⊠		SM	SILTY SAND with GRAVEL - very dense, slightly moist to moist, dark gray, fine to coarse-grained
180	105										
175	110										
		50/4"	1.2	13.8	-		19	☒			Gravel (up to 3/4 inch in size)
170	115										END OF BORING AT 112 FEET
165	120										

NOTES:
Hand augered upper 5 feet to avoid damage to utilities.
Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches
*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

Field Tech: AR
Prepared/Date: JF 3/17/2011
Checked/Date: LT/RM 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.56c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-169
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 714+20, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/10/2011 - 1/12/2011	4-7/8 inches	292 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/12/2011. Ground-water level measured at 48 feet below the ground surface 30 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Century City / Constellation Station

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
											8-inch thick Asphalt Concrete over 6-inch thick Base Course
											FILL [Af]
										CL-ML	SILTY CLAY - moist, brown with some gray, trace slate gravel
	5		0.2	25.7	93	15				CL	LEAN CLAY with SAND - moist, olive brown, fine sand, trace gravel
		14	0.2	14.2	-					SM	SILTY SAND - moist, light brown, fine to medium-grained
	10		0.7	17.5	109	10				CL	SANDY LEAN CLAY - moist, brown to dark gray, fine sand
		4/6"	0.3	21.1	-					CL	LEAN CLAY with SAND - soft, moist, light brown, fine to coarse sand
	15		0.4	25.9	101	11					Becomes stiff, thin layer of Silt, trace clay and sand
	20	15	0.5	21.2	-						Becomes olive brown, trace very fine sand
			0.1	27.3	97	17					
	25	25	0.1	27.2	-						Becomes very stiff, trace organics
	30		0.6	13.0	120	41					**LAKEWOOD FORMATION [Qlw]**
										SC	CLAYEY SAND - dense, moist, olive brown, fine to medium-grained, trace gravel
		43	0.4	15.7	-		43			SM	SILTY SAND - dense, moist, light brown, fine-grained, with some clay
	35		0.3	14.7	109	72/11"					Alternating with layers of Poorly Graded Sand, light gray
		90	0.4	14.9	-		12			SP-SM	POORLY GRADED SAND with SILT - very dense, moist, brown, fine to medium-grained
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/30/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.57a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-169 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 714+20, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/10/2011 - 1/12/2011	4-7/8 inches	292 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/12/2011. Ground-water level measured at 48 feet below the ground surface 30 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Century City / Constellation Station

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
			0.1	19.0	101	94/8"		⊠			Becomes light brown, trace iron oxide stains
	45	96/11"	0.6	18.4	-			⊠			Gray to olive brown
			0	12.8	106	50/5"		⊠	PMT	▽	Becomes brown
	50										Some gravel
		84	0.2	24.2	-			⊠		SM	SILTY SAND - very dense, moist, brown, fine-grained
	55		0.3	17.7	107	93/10"	26	⊠		SP-SM	POORLY GRADED SAND with SILT - very dense, moist, light brown to yellowish brown, fine to medium-grained, iron oxide stains
	60									SM	SILTY SAND - very dense, moist, olive brown, fine to medium-grained, iron oxide stains
		63	0.1	21.8	-			⊠			
	65										**SAN PEDRO FORMATION [Qsp]**
			0	18.3	94	93/10"	33	⊠		SM	SILTY SAND - very dense, moist, light bluish gray, fine to medium-grained
	70										
		50/6"	0.1	22.9	-			⊠		SP-SM	POORLY GRADED SAND with SILT - very dense, moist, bluish gray, fine to medium-grained, shell fragments, some slate gravel
	75										
			0.1	30.5	86	66	15	⊠		SM	SILTY SAND - very dense, moist, bluish gray to gray, fine to medium-grained
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/30/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.57b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-169 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 714+20, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/10/2011 - 1/12/2011	4-7/8 inches	292 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/12/2011. Ground-water level measured at 48 feet below the ground surface 30 minutes after bailing of drilling mud.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
Century City / Constellation Station											
	85	93	0.1	14.6	-						Some coarse sand, trace gravel
				19.0	103	90/11"	11			SW-SM	WELL GRADED SAND with SILT and GRAVEL - very dense, wet, bluish gray to gray, fine to medium-grained, gravel (up to 1 inch in size)
	90	50/4"		29.4	-					SP	POORLY GRADED SAND - very dense, wet, dark gray, fine-grained
	95			17.3	112	51	55			CL	SANDY LEAN CLAY - hard, moist, dark gray, fine sand, trace gravel (up to 3/8 inch in size), some shell fragments
195	100	44	1.5	13.4	-					ML	SILT - hard, moist, dark bluish gray, trace sand
190	105		0	14.6	116	87/8"					Becomes gray
185											Trace gravel
	110	50/4"	0	23.8	-					SP	POORLY GRADED SAND - very dense, wet, dark gray, fine to medium-grained
180	115			-	-	91/9"					(Sample not recovered)
175										SM	SILTY SAND - very dense, wet, dark gray, fine to medium-grained
	120										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: JF 3/30/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.57c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-169 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 714+20, Lt 10 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
1/10/2011 - 1/12/2011	4-7/8 inches	292 feet

GROUND-WATER READINGS
Drilling mud bailed on 1/12/2011. Ground-water level measured at 48 feet below the ground surface 30 minutes after bailing of drilling mud.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
170	125	50/6"		27.1	-			☒	
165	130								
160	135								
155	140								
150	145								
145	150								
140	155								
135	160								

END OF BORING AT 121 FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

Downhole Test: PMT = Pressuremeter

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared/Date: JF 3/30/2011
Checked/Date: LT/PE 9/20/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.57d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-171
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 726+70, Lt 25 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/28/2011, 3/1/2011 - 3/2/2011	4-7/8 inches	271 feet

GROUND-WATER READINGS
Bailed drilling mud to 72 feet on 3/1/2011. Ground-water level measured at 68 feet below ground surface on 3/2/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
270											7-inch thick Asphalt Concrete over 4-inch thick Base Course
										ML	**LAKEWOOD FORMATION [Qlw]** CLAYEY SILT - moist, olive, some fine sand
	5										
265			3.3	-	-	17					Becomes light brown
										SM	SILTY SAND - medium dense, moist, olive yellow, fine to very fine-grained
	10										
260		25	10.2	-							
	15										
255			1.6	-	-	39					Becomes dense, light olive to light olive yellow, thin layer of Poorly Graded Sand with Silt
										SP-SM	POORLY GRADED SAND with Silt - very dense, moist, brown, fine to medium-grained, some shell fragments
	20										
250		64	8.6	24.5							
	25										
245			4.1	16.4		52					(Sample not recovered) Becomes dense, olive yellow
	30										
240		71	8.5	21.9							Becomes olive, some oxidized seems, trace fine subrounded gravel (up to 1/4" in size)
										SP	POORLY GRADED SAND with Gravel - very dense, moist, light brown, fine to medium grained, some coarse, gravel (up to 1/2" in size)
	35										
235			2.3	5.9	106	69					
	40									ML	

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: DR/JF 5/31/2011
Checked/Date: JAG/PE 6/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.58a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-171 (Continued)**
DRILLING METHOD Rotary Wash	**BOREHOLE LOCATION** Sta 726+70, Lt 25 feet	
DATES DRILLED 2/28/2011, 3/1/2011 - 3/2/2011	**HOLE DIAMETER** 4-7/8 inches	**GROUND EL.** 271 feet

GROUND-WATER READINGS
Bailed drilling mud to 72 feet on 3/1/2011. Ground-water level measured at 68 feet below ground surface on 3/2/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
230		79		-				○			SANDY SILT - hard, moist, light brown, fine sand, trace gravel (Sample not recovered)
			6.2	22.3	91	80/10"		⊠			Becomes olive to light olive brown, trace iron oxide stains
225	45	98	7.2	21.3				⊠		SM	SILTY SAND - very dense, moist to wet, light olive to olive, very fine to fine-grained, trace medium
			6.2	14.5	101	81		⊠			Becomes light olive brown, trace iron oxide stains
220	50	63	2.9	12.0				⊠			Thin layer of Clayey Silt
			5.3	13.2	101	84/10"	47	⊠			Becomes light brown to olive yellow, with light gray iron oxide stains, scattered with small grayish clay pockets
215	55	54	4.1	22.5				⊠			Increase in silt content
			7.6	17.9	103	75/7"		⊠			Trace medium sand, with iron oxide stains
210	60	70	2.9	23.5			55	⊠		ML	SANDY SILT - hard, moist, olive, very fine to fine sand, trace shell fragments
			6.7	23.5	97	66	84	⊠		ML	SILT with Sand - hard, moist, bluish gray, fine sand, with iron oxide stains
205	65	50/5"	2.3	18.7				⊠		SM	**SAN PEDRO FORMATION [Qsp]** SILTY SAND with Gravel - very dense, moist, light gray, fine-grained, some medium
			6.1	25.6	90	86/6"		⊠			Some gravel (up to 3/4" in size) ▼ Becomes wet, olive to light olive gray, increase in silt content
200	70	53/6"	3.2	14.4			13	⊠			Some gravel (up to 1/2" in size)
			4.3	15.8	106	75/7"		⊠		SP-SM	POORLY GRADED SAND with Silt - very dense, wet, olive, fine to medium-grained, trace gravel
195	75	50/5"	9.2	19.0			12	⊠			Trace fine subrounded gravel (up to 1/4" in size)
	80		3.1	21.8	100	50/6"		⊠			Becomes olive to light olive gray

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: DR/JF 5/31/2011
Checked/Date: JAG/PE 6/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.58b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-171 (Continued)**
DRILLING METHOD Rotary Wash	**BOREHOLE LOCATION** Sta 726+70, Lt 25 feet	
DATES DRILLED 2/28/2011, 3/1/2011 - 3/2/2011	**HOLE DIAMETER** 4-7/8 inches	**GROUND EL.** 271 feet

GROUND-WATER READINGS
Bailed drilling mud to 72 feet on 3/1/2011. Ground-water level measured at 68 feet below ground surface on 3/2/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS			
190		72/9"	2.8	25.2			81	☒		ML	SILT with Sand - hard, wet, dark gray, very fine sand, trace shell fragments
			8.4	12.8	106	110/3"		⊠		SP-SM	POORLY GRADED SAND with Silt - very dense, wet, dark gray, fine to medium-grained, trace gravel
	85										
185		90/6"	4.8	11.5				☒			Some coarse, trace fine rounded gravel (up to 1/2" in size)
			5.2	-	-	100/4"	6	⊠			Increase in silt content
	90										
180		50/5"	2.6	17.5				☒			Cobble (up to 8" in size)
			2.3	12.4	107	75/6"		⊠			
	95										
175		50/6"	2.9	15.5				☒			
			4.1	16.2	107	66/10"		⊠		CL-ML	SILTY CLAY - hard, wet, dark gray, trace fine sand
										SM	SILTY SAND - very dense, dark gray, fine to medium-grained, some clay
	100										
170		50/6"	2.6	17.3				☒			Trace gravel (up to 1/2" in size)
			4.4	17.9	109	75		⊠		CL-ML	SILTY CLAY - hard, wet, dark gray, trace fine sand, trace shell fragments, trace iron oxide stains
	105										
165		90/11"	3.2	21.9				☒		SM	SILTY SAND - very dense, wet, olive gray, fine to medium-grained, with clayey silt interbeds
											Trace gravel
	110										
160			2.0	11.8	121	75/6"		⊠			Becomes fine-grained, some medium to coarse
											More gravel
	115										
155		50/3"	3.7	6.2				☒		SP-SM	POORLY GRADED SAND with SILT - very dense, wet, dark gray, fine-grained, some medium to coarse, trace fine gravel (up to 1/4" in size), thin layer of Silty Sand
											Gravel layer with shell fragments
	120										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: DR/JF 5/31/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.58c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-171 (Continued)
DRILLING METHOD Rotary Wash	**BOREHOLE LOCATION** Sta 726+70, Lt 25 feet	
DATES DRILLED 2/28/2011, 3/1/2011 - 3/2/2011	**HOLE DIAMETER** 4-7/8 inches	**GROUND EL.** 271 feet

GROUND-WATER READINGS
Bailed drilling mud to 72 feet on 3/1/2011. Ground-water level measured at 68 feet below ground surface on 3/2/2011.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
150	125		2.3	7.0	-	100/5"		⊠	
145	130								
140	135								
135	140								
130	145								
125	150								
120	155								
115	160								

Becomes olive gray, fine to medium-grained, trace coarse, some fine gravel (up to 1/2" in size)

END OF BORING AT 120½ FEET

NOTES:

Hand augered upper 5 feet due to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared/Date: DR/JF 5/31/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.58d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-173
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 731+20, Lt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/23/2011	4-7/8 inches	280 feet

GROUND-WATER READINGS
Bailed drilling mud to 77 feet on 2/22/2011. Ground-water level measured at 57 feet below ground surface on 2/23/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
											4-inch thick Asphalt Concrete over 8-inch thick Base Course
										SM	**FILL [Af]** - SILTY SAND - moist, brown
											QUATERNARY OLDER ALLUVIUM [Qalo]
										CL	SANDY LEAN CLAY - very soft, moist, brown, with slate gravel fragments
275	5			16.5	110	Push					Plant roots present
270	10			20.7	103	9				SC	CLAYEY SAND - loose, moist, brown, fine-grained, trace gravel (up to 1/2" in size)
265	15	18	0.1	18.7						CL	SANDY LEAN CLAY - very stiff, moist, brown, trace gravel
260	20		0.0	12.0	114	14	46			SC	CLAYEY SAND - dense, moist, brown, fine-grained, trace gravel (up to 1/4" in size)
255	25	18		22.0						CL	LEAN CLAY - very stiff, moist, brown
											LAKEWOOD FORMATION [Qlw]
										SM	SILTY SAND - medium dense, moist, olive brown, fine-grained, trace clay
250	30		0.0	23.9	101	21					Trace iron oxide stains
										CL	LEAN CLAY - very stiff, moist, gray, with iron oxide stains
245	35	50		17.0			41			SM	SILTY SAND - dense to very dense, moist, olive gray, fine-grained
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: KP/JF 3/29/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.59a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-173 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 731+20, Lt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/23/2011	4-7/8 inches	280 feet

GROUND-WATER READINGS
Bailed drilling mud to 77 feet on 2/22/2011. Ground-water level measured at 57 feet below ground surface on 2/23/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
				-	-	26		○			(Sample not recovered) Becomes medium dense
				3.7	97	53		⊠		SP	POORLY GRADED SAND - dense to very dense, slightly moist, brown, fine-grained
235	45	89/11"		9.0				⊠			Becomes dark brown, trace iron oxide stains
										SM	SILTY SAND with Gravel - very dense, moist, yellowish brown, fine to medium-grained, with slate gravel (up to 1/8" in size)
230	50			12.3	110	81	13	⊠			
225	55			15.1		83/11"		⊠		SP	POORLY GRADED SAND - very dense, moist, olive brown and gray, fine-grained
220	60		0.0	21.6	99	65	27	⊠	NV	SM	SILTY SAND - very dense, wet, light olive gray, fine-grained, with iron oxide stains
215	65										
210	70			19.6	103	59		⊠	NV		Becomes brown
205	75								Pressuremeter		
		73/10"	0.0	24.0			54	⊠		ML	**SAN PEDRO FORMATION [Qsp]** SANDY SILT - hard, wet, olive brown to olive gray, with shell fragments
	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: KP/JF 3/29/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

MACTEC

LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.59b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-173 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 731+20, Lt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/23/2011	4-7/8 inches	280 feet

GROUND-WATER READINGS
Bailed drilling mud to 77 feet on 2/22/2011. Ground-water level measured at 57 feet below ground surface on 2/23/2011.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
				21.9	101	54	85	⊠	NV		With iron oxide stains
195	85									SM	SILTY SAND - very dense, wet, olive brown, fine-grained, with iron oxide stains
		84		22.6				☒		SP-SM	POORLY GRADED SAND with Silt - very dense, wet, brown, fine to medium-grained, with dark manganese nodules
190	90								Pressuremeter		
		66		20.0			9	☒			Becomes fine-grained
185	95									MH	ELASTIC SILT with Sand - hard, wet, dark gray to black, with shell fragments
180	100		0.0	29.3	90	66	78	⊠			
175	105		0.0	19.8		50/3"		⊠		SP	POORLY GRADED SAND - very dense, wet, gray, fine-grained, trace slate gravel fragments
170	110		0.1	19.5	105	37		⊠		ML	SANDY SILT - hard, wet, dark gray, some fossils, interbedded, trace sulfor odor, weak
165	115	42	0.0	29.6				☒			Thin layer of Lean Clay, gray
	120										END OF BORING AT 116½ FEET

NOTES:

Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

Field Tech: DW
Prepared/Date: KP/JF 3/29/2011
Checked/Date: JAG/PE 6/30/2011

(CONTINUED ON FOLLOWING FIGURE)

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-173 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 731+20, Lt 5 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/21/2011 - 2/23/2011	4-7/8 inches	280 feet

GROUND-WATER READINGS
Bailed drilling mud to 77 feet on 2/22/2011. Ground-water level measured at 57 feet below ground surface on 2/23/2011.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
155	125								
150	130								
145	135								
140	140								
135	145								
130	150								
125	155								
	160								

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 340 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: DW
Prepared/Date: KP/JF 3/29/2011
Checked/Date: JAG/PE 6/30/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-1.59d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-174A
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 735+85, Rt 180 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/8/2011 - 3/10/2011	4-7/8 inches	270 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
											36-inch thick Asphalt Concrete
											FILL [Af]
										SP-SM	POORLY GRADED SAND with SILT - moist, brown, fine to coarse-grained
										ML	SANDY SILT with GRAVEL - moist, dark brown, slate gravel
265	5		0.2	15.5	114	Push				CL	**QUATERNARY OLDER ALLUVIUM [Qalo]** SANDY LEAN CLAY with GRAVEL - very soft, moist, dark brown, some iron oxide stains, subangular to subrounded fine gravel
260	10	18	0.1	30.4	-		90				Alternating with layers of Lean Clay, very stiff, brown, trace fine sand
										SM	SILTY SAND - medium dense, moist, brown, fine-grained
255	15		0.1	14.5	101	30					Becomes orangish brown
										SP-SM	POORLY GRADED SAND with SILT - dense, moist, brown, fine-grained
250	20	28	0.2	14.4	-						Fine to medium-grained, trace coarse, fine gravel, alternating with layers of Sandy Silt and Silty Sand
245	25		0.0	23.1	93	15				CL	SANDY LEAN CLAY - stiff, moist, dark brown, trace fine gravel
240	30	23	0.0	22.7	-		41			SC	CLAYEY SAND - medium dense, moist, brown, fine-grained, some silt
											Thin layer of Lean Clay, brown to gray
235	35		0.0	13.7	119	26					Some slate fine gravel
	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 5/18/2011
Checked/Date: LT/PE 9/22/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.60a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-174A (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 735+85, Rt 180 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/8/2011 - 3/10/2011	4-7/8 inches	270 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS			
		32	0.2	14.5	-			☒		SP	POORLY GRADED SAND - dense, moist, brown, fine to medium-grained, trace coarse, trace fine gravel
225	45		0.1	19.6	106	27		⊠		SC	CLAYEY SAND - dense, moist, brown, fine to medium-grained, trace gravel
220	50	16	0.1	19.6	-			☒			Becomes gray, fine-grained, trace fine gravel
215	55		0.0	20.0	101	27		⊠		CL	LEAN CLAY - very stiff, moist, brown
210	60	29	0.0	20.3	-			☒			
205	65		0.1	15.5	114	39		⊠			Alternating with layers of Lean Clay with Sand, hard, reddish brown with gray mottling, trace fine slate gravel
200	70	33	0.0	24.7	-			☒			
195	75		0.0	22.8	107	19		⊠			Becomes stiff, brown, trace fine sand, some calcium carbonate nodules
Tunnel	80										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 5/18/2011
Checked/Date: LT/PE 9/22/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.60b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-174A (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 735+85, Rt 180 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/8/2011 - 3/10/2011	4-7/8 inches	270 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
Tunnel	85	75/11"	0.0	26.9	-		71	☒			Becomes hard, grayish brown, with thin layers of Poorly Graded Sand, trace gravel (up to 3/8 inch in size)
	90		0.0	25.8	98	18		⊠			Becomes stiff, gray, some calcium carbonate nodules
	95	45	0.0	20.7	-		65	☒			Alternating with layers of Sandy Lean Clay, hard, brown with gray mottling, fine sand
170	100		0.0	15.3	114	85/8"		⊠			Becomes grayish brown, trace fine sand, trace gravel
		36	0.0	22.0	-			☒			Becomes light brown to gray, fine sand
165	105		0.1	13.6	112	48	37	⊠		SC	CLAYEY SAND - dense, moist, gray, fine to medium-grained, trace gravel (up to 3/4 inch in size)
160	110	51	0.0	16.6	-			☒		CL	LEAN CLAY - hard, moist, gray, some iron oxide stains
											Becomes brown to gary, fine to medium sand
155	115		0.0	23.3	-	27		○		SM	SILTY SAND - medium dense, moist, dark brown, fine-grained
	120										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DW
Prepared/Date: JF 5/18/2011
Checked/Date: LT/PE 9/22/2011

MTA Westside Subway Extension
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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.60c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-174A (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta 735+85, Rt 180 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
3/8/2011 - 3/10/2011	4-7/8 inches	270 feet

GROUND-WATER READINGS
Ground-water level not measured.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
			0.0	16.2	113	29		⊠	
145	125								
140	130								
135	135								
130	140								
125	145								
120	150								
115	155								
	160								

Thin layer of Lean Clay, very stiff, light brown to gray, with iron oxide stains

END OF BORING AT 121 FEET

NOTES:

Hand augered upper 4 feet to avoid damage to utilities. Boring G-174 was terminated due to loss of SPT sampler in the hole. Boring G-174A was started in close proximity to G-174 and sampled from 74 feet to 121 feet. Boring was converted into a monitoring well with 2 piezometers per attached well detail.

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 340 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

Field Tech: DW
Prepared/Date: JF 5/18/2011
Checked/Date: LT/PE 9/22/2011

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		G-200Alt
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta723+77, Lt 13½ feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/13/2011 and 6/14/2011	4-7/8 inches	294 feet

GROUND-WATER READINGS
Drilling mud bailed on 6/13/2011; ground-water level measured at 17 feet below ground surface on 6/14/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
											3-inch thick Asphalt Concrete over 3-inch thick Base Course
										CL	**QUATERNARY OLDER ALLUVIUM [Qalo]** SANDY LEAN CLAY - very stiff, moist, dark gray, fine sand
290	5										
			0	19.5	105	7					
285	10										
		15	0.1	19.0	-		69				Becomes stiff, greenish gray to dark olive, more sand, trace gravel
280	15										
			0.3	21.5	105	8					Becomes very stiff, olive
275											▼
	20										Becomes wet, light brown, very fine sand
		19	0	20.3	-						Some gravel
270	25									SM	SILTY SAND - medium dense, moist, olive, fine to medium-grained
			0.1	22.2	104	24	49			CL	SANDY LEAN CLAY - wet, olive, very fine sand, layers of Clayey Sand
265	30										
		26	0.1	26.7	-					SM	SILTY SAND - medium dense, wet, light brown, fine-grained
260	35									CL	SANDY LEAN CLAY - stiff, wet, light olive, very fine sand, trace fine sand seems
			0	22.0	103	16					
255	40										

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: YN 8/23/2011
Checked/Date: LT/Jag/PE 9/28/11

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.75a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-200Alt (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta723+77, Lt 13½ feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/13/2011 and 6/14/2011	4-7/8 inches	294 feet

GROUND-WATER READINGS
Drilling mud bailed on 6/13/2011; ground-water level measured at 17 feet below ground surface on 6/14/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
		18	0.3	23.2	-			☒			Becomes very stiff
250	45		0.5	16.0	112	35	20	⊠		SM	SILTY SAND - medium dense, moist, light olive brown, fine to coarse-grained, trace gravel
245	50	14	0.7	35.3	-		95	☒		CH	FAT CLAY - stiff, moist, olive brown, trace very fine sand
240	55		0.5	36.3	88	14		⊠			
235	60	50/6"	0.1	13.9	-		21	☒		SM	SILTY SAND with GRAVEL - very dense, wet, brown and gray, fine to coarse-grained, gravel (up to ½-inch in size), trace clay
230	65		0.3	16.8	106	30	47	⊠		CL	LEAN CLAY with SAND - very stiff, wet, brown to light gray and olive, very fine sand, trace calcium carbonate nodules
225	70	23	0.2	23.7	-			☒		SC	CLAYEY SAND - very stiff
Tunnel	75		0.4	19.4	103	36	75	⊠		ML	Trace silt **LAKEWOOD FORMATION [Qlw]** SILT with SAND - very stiff, moist, brown, fine to medium sand, trace gravel, some clay, iron oxide stains
	80									SC	

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: YN 8/23/2011
Checked/Date: LT/Jag/PE 9/28/11

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.75b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-200Alt (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta723+77, Lt 13½ feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/13/2011 and 6/14/2011	4-7/8 inches	294 feet

GROUND-WATER READINGS
Drilling mud bailed on 6/13/2011; ground-water level measured at 17 feet below ground surface on 6/14/2011.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS		
Tunnel	85	39	0.2	18.0	-			☒			CLAYEY SAND - dense, wet, olive, fine to medium-grained, trace gravel
											Increase in gravel content
										CL	SANDY LEAN CLAY - very stiff, wet, light olive, fine to coarse sand
	90		0.1	20.7	106	30	68	⊠		SM	SILTY SAND - wet, light olive, fine to medium-grained, some coarse
											SAN PEDRO FORMATION [Qsp]
										CL	SANDY LEAN CLAY - very stiff, wet, light olive, fine sand
200	95	26	0.0	32.4	-			☒			
			0.0	14.6	108	37	66	⊠			Becomes hard, gray, thin layers of Clayey Silt
195	100										
		27	0.1	34.9	-			☒			Becomes very stiff, fine to medium sand
190	105										
			0.2	27.5	95	31	93	⊠		CH	FAT CLAY - very stiff, moist, gray, some fine to coarse sand, trace fine gravel
185	110									SP	POORLY GRADED SAND - very dense, wet, bluish gray, fine to medium-grained
		50/6"	0.0	18.3	-			☒			
180	115										
			0.0	17.9	112	87/10"		⊠			Layers of Silty Clay, very fine sand
175	120										END OF BORING AT 116 FEET

NOTES:
Hand augered upper 5 feet due to utilities. Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared/Date: YN 8/23/2011
Checked/Date: LT/Jag/PE 9/28/11

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-2.75c

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
C & L Drilling / Mayhew 1000		**G-200Alt (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Rotary Wash	Sta723+77, Lt 13½ feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
6/13/2011 and 6/14/2011	4-7/8 inches	294 feet

GROUND-WATER READINGS
Drilling mud bailed on 6/13/2011; ground-water level measured at 17 feet below ground surface on 6/14/2011.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	OVA (ppm)**	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	DOWNHOLE TESTS
170	125								
165	130								
160	135								
155	140								
150	145								
145	150								
140	155								
135	160								

"N" Value Standard Penetration Test: Number of blows required to drive the SPT sampler 18 inches using a 140 pound automatic hammer falling 30 inches

*Number of blows required to drive the Crandall Sampler 12 inches using a 300 pound hammer falling 18 inches

**Photo Ionization Detector used for OVA readings

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared/Date: YN 8/23/2011
Checked/Date: LT/Jag/PE 9/28/11

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LOG OF BORING
Project No.: 4953-10-1561 Figure: A-2.75d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		S-110
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	710+7, Lt 78 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/22/2011 - 2/24/2011	6 inches	282 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
280	5						SM	**FILL [Af]** SILTY SAND - moist to wet, brown, fine grained, some gravel and cobble (up to 3 inches in size), layers of Poorly Graded Sand with Silt, some glass debris
							ML	**QUATERNARY OLDER ALLUVIUM [Qalo]** SANDY SILT - wet, very dark brown (10YR 2/2), trace to some subangular gravel, (up to ¾- inch in size), mainly slate shale and siltstone, some dispersed organics, trace clay
275			1	62				At 6 to 8.5': No core recovery
	10							Becomes dark yellowish brown (10YR 3/4), more gravel, fewer organics
270			2	50				Becomes very dark brown (10YR 2/2), trace fine gravel
								Becomes dark yellowish brown (10YR 4/6)
	15						CL-ML	SILTY CLAY - soft to medium stiff, wet, dark yellowish brown (10YR 4/6), trace fine gravel
265								At 17.0 - 27.0': Samples recovered in bags
							ML	SANDY SILT with GRAVEL - medium stiff, wet, very dark brown (10YR 2/2) to dark yellowish brown (10YR 4/3), subangular shale, slate and sandstone (up to ¾- inch in size), occasional sand lenses
	20						CL-	SILTY CLAY - medium stiff, moist, very dark brown, varying fine sand,

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.10a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-110 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	710+7, Lt 78 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/22/2011 - 2/24/2011	6 inches	282 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
260	25		3	90				ML	trace coarse sand and fine gravel, layers of Silt with Clay
								ML	SANDY SILT with GRAVEL - stiff, wet, very dark brown, some clay
255								SM	SILTY SAND with GRAVEL - moist, brown to dark grayish brown, fine to coarse grained, mainly subrounded to subangular slate and sandstone gravel (up to 1 inch in size)
	30		4	100				ML	SILT - very soft, wet, brown (7.5YR 4/3) to very dark grayish brown (10YR 2/2), fine to coarse sand, trace fine gravel, slate and sandstone, poorly consolidated, trace clay
250					22.2	59		ML	SANDY SILT - soft to medium stiff, wet, mottled grayish brown (10YR 5/2) to brown (7.5YR 4/4), fine sand, trace medium to coarse, texture defined by variable oxidation (alternating oxidized and unoxidized)
	35		5	100	21.3				Lenticular sand lense (2-inch thick)
245									Zone of sand and gravel
	40		6	100					

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.10b

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-110 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	710+7, Lt 78 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/22/2011 - 2/24/2011	6 inches	282 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
					9.7	13	GC-GM	SILTY, CLAYEY GRAVEL with SAND - medium dense, wet, dark brown (10YR 3/3), mainly subangular slate, some metabasalt and quartzite, fine to coarse sand, grades to fine to coarse gravels (up to 1 inch in size), lower contact is gradational
240							CL	LEAN CLAY - stiff, wet, strongly mottled, dark grayish brown (2.5YR 3/4) to brown (7.5YR 4/4), occasional dark reddish brown (5YR 3/4) mottling, subhorizontal, dark brown Becomes dark brown, (¼ inch thick), bedding appears subhorizontal
			7	100	17.8			
	45							Prominent wavy, subhorizontal laminations, very dark grayish brown (10YR 4/2) to dark reddish brown (5YR 3/2)
235								Subrounded sandstone clast (1 inch in size)
			8	100	38.0	99		
	50							Occasional fine to medium sand
230								Mottling becomes less prominent, brown (7.5YR 4/4) with some dark grayish brown (10YR 4/2) mottling
			9	100	20.0			
	55							Some wavy, subhorizontal laminations
225							GC	CLAYEY GRAVEL - loose, wet, brown (7.5YR 4/2), clasts up to 3 inches in size, mainly subangular to subrounded slate More sand
			10	100			CL	SANDY LEAN CLAY - very stiff, wet, brown (10YR 4/4), fine sand, trace medium to coarse
	60							

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.10c

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT
Boart Longyear / 600T Trusonic Drilling Rig

BORING NO. **S-110 (Continued)**

DRILLING METHOD	BOREHOLE LOCATION	GROUND EL.
Sonic Coring	710+7, Lt 78 feet	282 feet
DATES DRILLED	**HOLE DIAMETER**	
2/22/2011 - 2/24/2011	6 inches	

GROUND-WATER READINGS
Ground-water level not measured.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
					17.1	68		CL	At 61.4': Some gravel (up to ¾ inch in size) Becomes yellowish brown (10YR 5/4)
220									
	65		11	100					
					16.7	37		SM	Layer of Silty Sand, fine to coarse grained, some fine gravel (up to ¾ inch in size), clasts (up to 1 inch in size), mainly subangular slate and subrounded shale and sandstone, Clayey Sand lenses
					14.0	19		SM	SILTY SAND with GRAVEL - wet, yellowish brown (6YR 5/4), fine to coarse grained, fine gravel (up to 3/4 inch in size), mainly subangular to subrounded slate, some subrounded shale
	70		12	100					
					6.3	29			More sand Clasts (up to 3 inches in size), mainly angular to subangular slate, some subangular sandstone, varying colors
Tunnel					16.7				Granitic clast, unweathered, subrounded, (2 inches in size)
	75		13	100	11.6				Becomes very dark grayish brown (10YR 3/2), clasts (up to ¾-inch in size), mainly subangular slate and subangular to subrounded shale and sandstone, matrix is fine to coarse grained sand, some silt
								ML	SANDY SILT - stiff, wet, brown (10YR 4/4), trace fine gravel, layers of Clayey Sand
					12.1	10		SW-SM	WELL GRADED SAND with SILT and GRAVEL - dense, wet, brown (10YR 4/4), fine to coarse grained, fine to coarse gravel (up to 1 inch in size), mainly subrounded slate and shale
	80		14	100					

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.10d

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-110 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	710+7, Lt 78 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/22/2011 - 2/24/2011	6 inches	282 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
Tunnel					9.9	38		SM	SILTY SAND - dense, wet, fine to coarse grained, some fine gravel (up to ½ inch in size)
									Sharp contact, erosional, appears to dip 10-20 degrees
	85		15	100				CL-ML	SILTY CLAY - very stiff, wet, brown (7.5YR 4/4), some fine sand, trace fine to coarse gravel, alternating layers of Silty Sand and Sandy Silt
					18.9				Becomes dark yellowish brown (10YR 4/4)
									Becomes brown (7.5YR 4/3)
	195								Becomes dark grayish brown (10YR 4/2) mottled with faint brown (7.5YR 4/4), some wavy, subhorizontal laminations
			16	100					Becomes strongly mottled, dark brown (7.5YR 3/3) to very dark gray (7.5YR 3/3)
	90							ML	SANDY SILT with GRAVEL - very stiff, wet, brown (7.5YR 4/4), clasts (up to ¾-inch in size), mainly angular to subangular slate, subangular shale and sandstone, some subrounded quartzite, some clay
	190								
			17	100				GM	SILTY GRAVEL - dense, wet, dark grayish brown (10YR 5/2), clasts (up to ¾-inch in size), mainly subangular slate, lesser subangular to subrounded shale and sandstone, some subangular granite clasts, trace to some clay
	95								
	185								
			18	100					More clay, gradational
	100								

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.10e

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-110 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	710+7, Lt 78 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/22/2011 - 2/24/2011	6 inches	282 feet
GROUND-WATER READINGS		
Ground-water level not measured.		

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
			19	100			GM-GC	SILTY, CLAYEY GRAVEL - very stiff, wet, very dark gray (2.5YR 3/1), clasts (up to ¾- inch in size), mainly subangular to subrounded slate, shale and sandstone, fine to coarse sand, irregular sharp contact, oxidized beds
180							ML	SANDY SILT with GRAVEL - stiff, wet, very dark grayish brown (10YR 3/2) to brown (10YR 4/4), clasts (up to ½- inch in size, some to 1 inch), mainly subangular to subrounded slate, some subrounded to rounded shale and sandstone, trace gravel, some clay
			20	100			CL-ML	SILTY CLAY - very stiff, wet, dark brown (7.5YR 3/3) to dark gray (2.5YR 4/1), mottled, varying color, trace coarse sand, trace manganese oxide
	105							Increasing sand, some fine gravel, some wavy subhorizontal laminations
175							ML	SANDY SILT with GRAVEL - very stiff, moist, brown to dark gray, clasts (up to 1 inch in size), subangular to subrounded slate, subrounded shale and sandstone Layers of Sandy Silty Clay, some brown (7.5YR 4/2) mottling, trace coarse sand, some wavy subhorizontal laminations
			21	100				
	110							More gravel, subhorizontal laminations, fine to coarse
							CL	LEAN CLAY - very stiff, wet, olive brown (2.5Y 4/3) mottling with strong brown (7.5YR 4/4), trace coarse sand, trace calcium carbonate nodules, occasional sand pockets
170								
			22	100				Calcium carbonate nodules (up to ¼ inch in size), some rounded fine gravel
	115						ML	SANDY SILT with GRAVEL - very stiff, wet, olive brown (2.5YR 4/3) and yellowish brown (10YR 5/4) mottling, some coarse sand, fine gravel (up to ¾ inch in size), subangular slate and subrounded shale and sandstone, calcium carbonate nodules (up to ¼ inch in size)
165								
								Becomes light yellowish brown (2.5Y 6/3), more fine gravel (up to ½- inch in size, some ¾- inch), subangular slate, fewer shale and sandstone
			23	100				
120								

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.10f

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic Drilling Rig		**S-110 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	710+7, Lt 78 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/22/2011 - 2/24/2011	6 inches	282 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
160								ML	Becomes light yellow brown (2.5YR 6/3)
	125								END OF BORING AT 122 FEET
155									NOTES:
									Consistency description on this log is based on pocket penetrometer test results and/or visual observation of soil samples.
	130								Hand augered upper 6 feet to avoid damage to utilities.
150									Borehole grouted with cement-bentonite slurry and patched with asphalt concrete.
	135								
145									
	140								

Field Tech: PR/MF
Prepared/Date: YN/WL 10/1/2011
Checked/Date: LT/PE 9/30/2011

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LOG OF BORING
Project No.: 4953-10-1561 Figure: A-3.10g

METRO SOIL CORE MC 200 TUNNEL ZONE S:\70131 GEOTECH\GINTW\LIBRARY MACTEC JUNE2011.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\NEW TEMPLATE - MARCH 14, 2011\SONIC GINT LOGS\101561 SONIC (101-110).GPJ 10/3/11

METRO SOIL CORE MC 200 TUNNEL ZONE S:\70131 GEOTECH\GINTW\LIBRARY MACTEC JUNE2011.GLB
G:\PROJECT_DIRECTORIES\4953\2010\101561_METRO_WESTSIDE_EXTENSION\6.2.3.1 GEOTECHNICAL DESIGN\3.2 ALL FIELD NOTES\GINT LOG\NEW TEMPLATE - MARCH 14, 2011\SONIC GINT LOGS\101561 SONIC (111-120).GPJ 10/3/11

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

DRILLING COMPANY/DRILLING EQUIPMENT
Boart Longyear / 600T Trusonic drill rig

BORING NO. **S-111**

DRILLING METHOD	BOREHOLE LOCATION	GROUND EL.
Sonic Coring	692+57, Rt 16 feet	249 feet
DATES DRILLED	**HOLE DIAMETER**	
2/14/2011 - 2/18/2011	6 inches	

GROUND-WATER READINGS
Ground-water level not measured.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.	
245	5						CL-ML	12-inch thick Asphalt Concrete **FILL [Af]** SILT to SILTY CLAY with GRAVEL - moist, dark brown to gray (7.5YR 3/3 to 7.5Y 6/1), slate gravel (up to 1 inch in size)
240	10	1	1	65	12.7		CL-ML	No core recovery from 7½ to 11' **QUATERNARY YOUNGER ALLUVIUM [Qal]** SILTY CLAY - stiff, very moist, dark brown to dark yellowish brown (7.5YR 3/3 to 10YR 3/4), trace to some coarse sand, some subangular to subrounded slate gravel (up to ½ inch in size), layer of Silt
235	15						ML	SILT - moist, dark yellowish brown (10YR 3/4), fine sand and trace to some clay, some slate gravel (up to 1½ inches in size), few shale fragments, alternating with layers of Sandy Silt
230	20							No core recovery from 17 to 20'

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: DL
Prepared/Date: PK/WL 10/1/2011
Checked/Date: HP/PE 10/2/2011

MTA Westside Subway Extension
Los Angeles, California

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.11a

DRILLING COMPANY/DRILLING EQUIPMENT		BORING NO.
Boart Longyear / 600T Trusonic drill rig		**S-111 (Continued)**
DRILLING METHOD	**BOREHOLE LOCATION**	
Sonic Coring	692+57, Rt 16 feet	
DATES DRILLED	**HOLE DIAMETER**	**GROUND EL.**
2/14/2011 - 2/18/2011	6 inches	249 feet

GROUND-WATER READINGS
Ground-water level not measured.

THIS RECORD IS AN INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	BOX #	RUN #	% RECOVERY	MOISTURE CONTENT (% of dry wt.)	PERCENT PASSING No. 200 SIEVE	SAMPLE LOC.		
		2	2	70				ML	Becomes dark yellowish brown (10YR 3/4), fine sand and trace gravel, subrounded to well rounded slate gravel (up to ¾ inch in size)
								SM	SILTY SAND - moist, dark yellowish brown, fine to medium-grained, some gravel, subrounded to well rounded (up to 1 inch in size)
225	25							ML	**QUATERNARY OLDER ALLUVIUM [Qalo]** SILT with SAND - moist, dark yellowish brown (10YR 3/4), fine sand, trace subrounded to well rounded gravel (up to 1-inch in size)
									Some clay
		3	3	80					No core recovery from 27' to 27.9'
220	30							ML	SANDY SILT - moist, dark yellowish brown (10YR 3/4), fine grained, trace clay, occasional slate gravel (up to 2 inches in size), disturbed, alternating with layers of Silty Sand
								ML	SILT - moist, dark yellowish brown, fine sand, some shale fragments, some clay
									More clay
215	35		4	100					Lenses of Silty Sand, moist, dark olive brown (2.5YR 3/3), massive
								SM	SILTY SAND with GRAVEL - moist, dark olive green (5Y 3/3), fine to medium grained, slate gravel, subround to suboval (up to 1½ inches in size), 3 to 4-inch thick, occasional interbedded Sandy Silt
						16			Becomes wet, fine to coarse grained, gravel (up to ¾ inch in size)
210	40		5	100					Becomes fine to medium grained, trace gravel (up to ½ inch in size)

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING

Project No.: 4953-10-1561 Figure: A-3.11b