DILATOMETER RESULTS

Sounding: DMT-2  Location: C-114  Sounding Date: 06/01/2011  Nominal Elevation: 100 ft

MATERIAL INDEX

<table>
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<tr>
<th>CLAY</th>
<th>Silt</th>
<th>SAND</th>
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<tr>
<td>0.6</td>
<td>1.8</td>
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FRICION ANGLE

\[ \phi (\text{deg}) \]

UNDRAINED SHEAR STRENGTH

\[ Su (\text{bar}) \]

OVERCONSOLIDATION RATIO

\[ OCR \]

CONSTRAINED AND DILATOMETER MODULI

\[ M & Ed (\text{bar}) \]

FIGURE A-5.3
FIGURE A-6
CRANDALL SAMPLER
FIGURE A-6 - Crandall Sampler

Cone Dredge - Drawn by: Juliana M - Date: August 7, 1994

<table>
<thead>
<tr>
<th>Component</th>
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<th>OD</th>
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<td>2.625&quot;</td>
<td>3.125&quot;</td>
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<tr>
<td>Coupling</td>
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<td>2.0&quot;</td>
<td>3.0&quot;</td>
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<td>Sampler Head</td>
<td>3.0&quot;</td>
<td>1.125&quot;</td>
<td>3.125&quot;</td>
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<tr>
<td>Waste Barrel</td>
<td>10.0&quot;</td>
<td>2.625&quot;</td>
<td>3.125&quot;</td>
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<tr>
<td>Sample Rings</td>
<td>1.0&quot;</td>
<td>2.625&quot;</td>
<td>2.750&quot;</td>
</tr>
<tr>
<td>Sample Barrel</td>
<td>8.0&quot;</td>
<td>2.750&quot;</td>
<td>3.125&quot;</td>
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<tr>
<td>Sampler Bit</td>
<td>3.0&quot;</td>
<td>2.625&quot;</td>
<td>3.125&quot;</td>
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</table>
FIGURES A-7.1 THROUGH A-7.6
GROUNDWATER MONITORING WELL DIAGRAMS
(ACE PHASE)
BORING G-6 MONITORING WELL DETAIL
GROUNDWATER

DEPTH FT. BGS

GROUND SURFACE
(ASPHALT CONCRETE)

WATER-TIGHT LOCKING CAP
TOP OF CASING ELEVATION
4 TO 6" BELOW GROUND SURFACE (BCS)
4 3/4" Ø BOREHOLE
(0' - 41.5' BGS)
1" Ø SCHD. 80 PVC BLANK SOLID CASING
(0' - 12.5' BGS)
BENTONITE-CEMENT GROUT
(14' - 15.3' BGS)
MONTEREY SAND PACK # 3
(10.5' - 19.5' BGS)
1" Ø THREADED SCHD. 80 PVC w/ 0.220" SLOTS
(12.5' - 17.5' BGS)
SILT TRAP AT BOTTOM OF CASING
(17.5' BGS)
1" Ø SCHD. 80 PVC BLANK SOLID CASING
(0' - 40.5' BGS)
BENTONITE SLURRY SEAL
(19.5' - 38.5' BGS)

MONTEREY SAND PACK # 3
(38.5' - 46.5' BGS)
1" Ø THREADED SCHD. 80 PVC w/ 0.220" SLOTS
(40.5' - 45.5' BGS)
SILT TRAP AT BOTTOM OF CASING
(45.5' BGS)

BENTONITE CEMENT GROUT
(45.5' - 81.5' BGS)

BOTTOM OF BORE HOLE
(80.5' BGS)

Vertical Scale: 1" = 10'-0"
Horizontal Scale Exaggerated

Key

BGS  Below Ground Surface
TOC  Top Of Casing
"  Feet
"  Inches

WELL NO.: G-6
DRAWN: L. Morley
INSTALLED: 08/12/2009
CHK'D: Jag

SCALE: 1" = 10' Vertical
DATE: December 2, 2011

DRILL CO.: C&L Pacific
TECHNIQUE: Rotary-Wash

FIELD PERSONNEL: A. Redo

PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Wilshire and Fairfax, Los Angeles, CA

MTA WESTSIDE SUBWAY EXTENSION
Groundwater Monitoring Well

FIGURE NO. A-7.2

PROJECT NO. 4903-1-1421
BORING G-11 MONITORING WELL DETAIL
GROUNDWATER

DEPTH
FT. BGS

GROUND SURFACE
(ASPHALT CONCRETE)

WATER-TIGHT LOCKING CAP
TOP OF CASING ELEVATION
4 TO 6" BELOW GROUND SURFACE (BGS)

4 7/8" Ø BOREHOLE
(0' - 91.5' BGS)

1" Ø SCHD. 80 PVC BLANK SOLID CASING
(0' - 27.3' BGS)

BENTONITE-CEMENT GROUT
(14" - 29' BGS)

MONTEREY SAND PACK # 3
(25' - 34' BGS)

1" Ø THREADED SCHD. 80 PVC w/ 0.020" SLOTS
(27.3' - 32.5' BGS)

SILT TRAP AT BOTTOM OF CASING
(32.5' BGS)

1" Ø SCHD. 80 PVC BLANK SOLID CASING
(0' - 55' BGS)

BENTONITE SLURRY SEAL
(34' - 53' BGS)

MONTEREY SAND PACK # 3
(53' - 62' BGS)

1" Ø THREADED SCHD. 80 PVC w/ 0.020" SLOTS
(55' - 60' BGS)

SILT TRAP AT BOTTOM OF CASING
(60' BGS)

BOTTOM OF BORE HOLE
(91.5' BGS)

Key

BGS Below Ground Surface
TOC Top Of Casing
" Feet
" Inches

Vertical Scale: 1" = 10'-0"
Horizontal Scale Exaggerated

WELL NO.: C-11
DRAWN: L. Morley
INSTALLED: 06/15/2009
CHK'D: Jag

SCALE: 1" = 10' Vertical
DATE: December 2, 2011

DRILL CO.: C&L Pacific
TECHNIQUE: Rotary-Wash

FIELD PERSONNEL: A. Recto
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Wilshire and Beverly, Los Angeles, CA

MTA WESTSIDE SUBWAY EXTENSION
Groundwater Monitoring Well
FIGURE NO. A-7.4

AMEC Environment & Infrastructure
5638 E. Slauson Avenue, Los Angeles, California 90040
Phone (323) 888-5200 Fax (323) 884-0599
FIGURES A-8.1 THROUGH A-8.11
GROUNDWATER MONITORING WELL DIAGRAMS (PE PHASE)
GROUNDWATER OBSERVATION WELL G-104

A. TOTAL DEPTH OF BORING: 100' BGS
B. DIAMETER OF BORING: 8"Ø, 4¾"Ø AT BOTTOM 10' DRILLING METHOD: ROTARY-WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 35' (A), 65' (B) MATERIAL: PVC
E. CASING DIAMETER: 2"Ø (EACH)
F. DEPTH TO TOP OF SCREEN: 25' (A) & 65' (B)
G. PERFORATION LENGTH: 10" (A), 20" (B) PERFORATION SIZE: 0.020" SLOTS
H. SUBSURFACE SEAL: 1' CONCRETE, 6' GROUT
I. SEAL: 1'-22', 39'-63', 89'-100' (BGS) MATERIAL: HYDRATED BENTONITE (CHIPS)
   i. 1'-22': BENTONITE CEMENT GROUT OVER 1' OF BENTONITE CHIPS HYDRATED
   ii. 39'-63': BENTONITE CHIPS HYDRATED
   iii. 89'-100': BENTONITE CHIPS HYDRATED
J. SAND PACK: 22'-39', 63'-89' (BGS) MATERIAL: #3 SAND PACK w/ TRANSITION SAND AT TOP AND FILTER FABRIC Sock PLACED OVER SCREEN
   i. 22'-39'
   ii. 63'-89'
K. WATER LEVELS ON 07/29/2011 WERE AS FOLLOWS:
   A. 33.3 FEET BELOW TOC
   B. 34.5 FEET BELOW TOC

Vertical Scale: 1" = 10'-0"
Horizontal Scale Exaggerated

Key
BGS Below Ground Surface
TOC Top Of Casing
" Feet
" Inches

WELL NO.: G-104 DRAWN: L. Morley
INSTALLED: 05/03/2011 CHK'D: Jag
SCALE: 1" = 10' Vertical DATE: December 2, 2011
DRILL CO.: C & L Drilling TECHNIQUE: Rotary-Wash
FIELD PERSONNEL: Larry Hong
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Wilshire west of Crenshaw, Los Angeles, CA

MTA WESTSIDE SUBWAY EXTENSION
Parsons Brinckerhoff
WELL CONSTRUCTION DETAIL
Groundwater Observation Well

FIGURE NO. A-8.1 PROJECT NO. 4903-11-1421
GROUNDWATER OBSERVATION WELL G-109

CAST IRON TRAFFIC COVER
GROUND SURFACE (ASPHALT CONCRETE)

A. TOTAL DEPTH OF BORING: 141' BGS
B. DIAMETER OF BORING: 8'2" 4\(\frac{1}{2}\)" AT BOTTOM 66'
   DRILLING METHOD: ROTARY-WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 30' (A), 70' (B)
   MATERIAL: PVC
E. CASING DIAMETER: 2"Ø (EACH)
F. DEPTH TO TOP OF SCREEN: 20' (A) & 50' (B)
G. PERFORATION LENGTH: 10' (A), 20' (B)
   PERFORATION SIZE: 0.020" SLOTS
H. SUBSURFACE SEAL: 1' CONCRETE, 6' GROUT
I. SEAL:
   Ia. 1'-18', 32'-48', 72'-141' (BGS)
   Ib. 1'-16': BENTONITE CEMENT GROUT OVER 1' OF BENTONITE CHIPS HYDRATED
   Ic. 32'-48': BENTONITE CHIPS HYDRATED
   Id. 72'-141': BENTONITE CHIPS HYDRATED
J. SAND PACK: 18'-32', 48'-72' (BGS)
   MATERIAL: #3 SAND PACK
   w/ TRANSITION SAND AT TOP AND FILTER FABRIC
   SOCK PLACED OVER SCREEN
   Jc. 18'-32'
   Jd. 48'-72'
K. WATER LEVELS ON 07/29/2011 WERE AS FOLLOWS:
   A. 28.5 FEET BELOW TOC
   B. 40.9 FEET BELOW TOC

Vertical Scale: 1" = 10'-0"
Horizontal Scale Exaggerated

Key
BGS Below Ground Surface
TOC Top Of Casing
" Feet
" Inches

WELL NO.: G-109
DRAWN: L. Morley
INSTALLED: 05/11/2011
CHK'D: Jag

MTA WESTSIDE SUBWAY EXTENSION
Parsons Brinckerhoff

WELL CONSTRUCTION DETAIL
Groundwater Observation Well

SCALE: 1" = 10' Vertical
DATE: December 2, 2011
TECHNIQUE: Rotary-Wash

FIELD PERSONNEL:
C & L Drilling

PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Wilshire west of Hudson, Los Angeles, CA

FIGURE NO. A-8.2
PROJECT NO. 4903-11-1421
GROUNDWATER OBSERVATION WELL G-139

A. TOTAL DEPTH OF BORING: 111.5 BGS
B. DIAMETER OF BORING: 8"Ø AT BOTTOM 5.5' DRILLING METHOD: ROTARY-WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 50' (A), 60' (B)
   MATERIAL: PVC
E. CASING DIAMETER: 2"Ø (EACH)
F. DEPTH TO TOP OF SCREEN: 25' (A) & 75' (B)
G. PERFORATION LENGTH: 25' (A), 5' (B)
   PERFORATION SIZE: 0.020" SLOTS
H. SUBSURFACE SEAL: 1' CONCRETE, 6' GROUT
I. SEAL: 1'-23', 53'-73', 83'-111.5' (BGS)
   MATERIAL: HYDRATED BENTONITE (CHIPS)
   Ia: 1'-23': BENTONITE CEMENT GROUT OVER 1' OF BENTONITE CHIPS HYDRATED
   Ib: 53'-73': BENTONITE CHIPS HYDRATED
   Ic: 83'-111.5': BENTONITE CHIPS HYDRATED
J. SAND PACK: 23'-63', 73'-83' (BGS)
   MATERIAL: #3 SAND PACK
   w/ TRANSITION SAND AT TOP AND FILTER FABRIC
   SOCK PLACED OVER SCREEN
   J1: 23'-63'
   J2: 73'-83'
K. WATER LEVELS ON 07/29/2011 WERE AS FOLLOWS:
   A. 36.3 FEET BELOW TOC
   B. 42.2 FEET BELOW TOC

Vertical Scale: 1" = 10'-0"
Horizontal Scale Exaggerated

Key
BGS Below Ground Surface
TOC Top Of Casing
" Feet
" Inches

AMEC Environment & Infrastructure
5628 E. Slauson Avenue, Los Angeles, California 90040
Phone (323) 888-6000  Fax (323) 884-6986

L. Morley
Jag

G-139
05/20/2011

MTA WESTSIDE SUBWAY EXTENSION
Parsons Brinckerhoff
Figure No. A-8.3

WELL CONSTRUCTION DETAIL
Groundwater Observation Well

WELL NO.: G-139
DRAWN: L. Morley
INSTALLED: 05/20/2011
CHK'D: Jag

SCALE: 1" = 10' Vertical
DATE: December 2, 2011

DRILL CO.: C & L Drilling
TECHNIQUE: Rotary-Wash

FIELD PERSONNEL: Angel Recio
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Wilshire west of Almont, Century City, CA
GROUNDWATER OBSERVATION WELL G-156

A. TOTAL DEPTH OF BORING: 120' BGS
B. DIAMETER OF BORING: 8"Ø
DRILLING METHOD: ROTARY-WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 35' (A), 100' (B)
MATERIAL: PVC
E. CASING DIAMETER: 2½" (EACH)
F. DEPTH TO TOP OF SCREEN: 15' (A) & 50' (B)
G. PERFORATION LENGTH: 20' (A), 50' (B)
PERFORATION SIZE: 0.020" SLOTS
H. SUBSURFACE SEAL: 1" CONCRETE, 6" GROUT
I. SEAL: 1½-13', 37-48', 102-120' (BGS)
MATERIAL: HYDRATED BENTONITE (CHIPS)
   1. 1½-13': BENTONITE CEMENT GROUT OVER
      1' OF BENTONITE CHIPS HYDRATED
   2. 08-48': BENTONITE CHIPS HYDRATED
   3. 102-120': BENTONITE CHIPS HYDRATED
J. SAND PACK: 13-37', 48-102' (BGS)
MATERIAL: # 3 SAND PACK
W/ TRANSITION SAND AT TOP AND FILTER FABRIC
SOCK PLACED OVER SCREEN
   1. 13-37'
   2. 48-102'
K. WATER LEVELS ON 06/10/2011 WERE AS FOLLOWS:
   A. 27.02 FEET BELOW TOC
   B. 45.38 FEET BELOW TOC

Vertical Scale: 1" = 10'-0"
Horizontal Scale Exaggerated

Key
BGS Below Ground Surface
TOC Top Of Casing
* Feet
" Inches

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5638 E. Skilunion Avenue, Los Angeles, California 90040
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MTA WESTSIDE SUBWAY EXTENSION
Parsons Brinckerhoff
WELL CONSTRUCTION DETAIL
Groundwater Observation Well

WELL NO.: G-156 DRAWN: L. Morley
INSTALLED: 02/15/2011 CHECKED: Jag
SCALE: 1" = 10' Vertical DATE: December 2, 2011
DRILL CO.: C & L Drilling TECHNIQUE: Rotary-Wash
FIELD PERSONNEL: Angel Reaño
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Santa Monica Blvd, Century City, CA

FIGURE NO. A-8.4 PROJECT NO. 4903-1-1421
GROUNDWATER OBSERVATION WELL G-165

A. TOTAL DEPTH OF BORING: 150’ BDS
B. DIAMETER OF BORING: 6’Ø
    DRILLING METHOD: ROTARY WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 43’ (A), 105’ (B)
    MATERIAL: PVC
E. CASING DIAMETER: 2’Ø (EACH)
F. DEPTH TO TOP OF SCREEN: 15’ (A) & 55’ (B)
G. PERFORATION LENGTH: 28’ (A), 50’ (B)
    PERFORATION SIZE: 0.010” SLOTS
H. SUBSURFACE SEAL: 1’ CONCRETE, 6’ GROUT
I. SEAL: 1’-13”, 45-50’, 110-150’ (BGS)
    MATERIAL: HYDRATED BENTONITE (CHIPS)
    1’-13”: #8 OF BENTONITE CEMENT GROUT
    OVER 4’ OF BENTONITE CHIPS HYDRATED
    45-50”: BENTONITE CHIPS HYDRATED
    110-150”: BENTONITE CHIPS HYDRATED
J. SAND PACK: 13’-45’, 50-110’ (BGS)
    MATERIAL: #3 SAND PACK
    13’-45”: 3 SAND PACK
    50-110”: 3 SAND PACK
K. WATER LEVELS ON 04/22/2011 WERE AS FOLLOWS:
    A. 26.0 FEET BELOW TOC
    B. 64.5 FEET BELOW TOC

Vertical Scale: 1” = 10’-0”
Horizontal Scale Exaggerated

Key
BGS Below Ground Surface
TOC Top Of Casing
" Feet
" Inches

WELL NO.: G-165
DRAWN: L. Morley
INSTALLED: 03/19/2011
CHK'D: H.P. Jagi
SCALE: 1” = 10’ Vertical
DATE: December 2, 2011
DRILL CO.: C & L Drilling
TECHNIQUE: Rotary-Wash
FIELD PERSONNEL: Daniel Wader
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Beverly Hills High School, Beverly Hills, CA

MTA WESTSIDE SUBWAY EXTENSION
Groundwater Observation Well

FIGURE NO. A-8.5

AMEC Environment & Infrastructure
5638 E. Slauson Avenue, Los Angeles, California 90040
Phone (323) 883-5000 Fax (323) 883-5099

Parsons Brinckerhoff
GROUNDWATER OBSERVATION WELL G-166

A. TOTAL DEPTH OF BORING: 150' BGS
B. DIAMETER OF BORING: 8"Ø, 4½"Ø BOTTOM 20' DRILLING METHOD: ROTARY WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 50' (A), 125' (B) MATERIAL: PVC
E. CASING DIAMETER: 2"Ø (EACH)
F. DEPTH TO TOP OF SCREEN: 20' (A) & 60' (B)
G. PERFORATION LENGTH: 30' (A), 65' (B) PERFORATION SIZE: 0.010" SLOTS
H. SUBSURFACE SEAL: 1' CONCRETE, 6' GROUT
I. SEAL: 1-17', 5½-9½', 126-150' (BGS) MATERIAL: HYDRATED BENTONITE (CHIPS)
   I. 1-17': 12' OF BENTONITE CEMENT GROUT OVER 4' OF BENTONITE CHIPS HYDRATED
   II. 5½-9½': BENTONITE CHIPS HYDRATED
   III. 126-150': BENTONITE CHIPS HYDRATED
J. SAND PACK: 17'-51', 59'-126' (BGS) MATERIAL: #3 SAND PACK
   J. 17'-51'
   J. 59'-126'
K. WATER LEVELS ON 04/22/2011 WERE AS FOLLOWS:
   A. 43.0 FEET BELOW TOC
   B. 64.5 FEET BELOW TOC

Vertical Scale: 1" = 10'-0"  Horizontal Scale: Exaggerated

WELL NO.: G-166  DRAWN: L. Morley
INSTALLED: 04/20/2011  CHK'D: H.P. Jag
SCALE: 1" = 10' Vertical  DATE: December 2, 2011
DRILL CODE: C & L Drilling  TECHNIQUE: Rotary-Wash
FIELD PERSONNEL: Angel Recio
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Beverly Hills High School, Beverly Hills, CA

MTA WESTSIDE SUBWAY EXTENSION
Parsons Brinckerhoff

WELL CONSTRUCTION DETAIL
Groundwater Observation Well
FIGURE NO. A-8.6
PROJECT NO. 4903-1-1421
GROUNDWATER OBSERVATION WELL G-174A

A. TOTAL DEPTH OF BORING: 120' BGS
B. DIAMETER OF BORING: 8"Ø, 8"Ø AT BOTTOM 5' DRILLING METHOD: ROTARY-WASH
C. TOP OF BOX ELEVATION: NA
D. CASING LENGTH: 68' (A), 110' (B) MATERIAL: PVC
E. CASING DIAMETER: 2"Ø (EACH)
F. DEPTH TO TOP OF SCREEN: 28' (A) & 80' (B)
G. PERFORATION LENGTH: 40' (A), 30' (B) PERFORATION SIZE: 0.020" SLOTS
H. SUBSURFACE SEAL: 1' CONCRETE, 6' GROUT
I. SEAL: 1'-25', 70'-75', 112'-120' (BGS) MATERIAL: HYDRATED BENTONITE (CHIPS)
   1. 1'-25': BENTONITE CEMENT GROUT OVER 1' OF BENTONITE CHIPS HYDRATED
   2. 70'-75': BENTONITE CHIPS HYDRATED
   3. 112'-120': BENTONITE CHIPS HYDRATED
J. SAND PACK: 25'-70', 75'-112' (BGS) MATERIAL: #3 SAND PACK w/TUITION SAND AT TOP AND FILTER FABRIC
   SOCK PLACED OVER SCREEN
   Jr. 25'-70'
   Jb. 75'-112'
K. WATER LEVELS ON 03/29/2011 WERE AS FOLLOWS:
   A. 0 FEET BELOW TOC (OVERFLOWING TO GS)
   B. 0 FEET BELOW TOC (OVERFLOWING TO GS)

Vertical Scale: 1" = 10' 0"
Horizontal Scale: Exaggerated

Key

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<td>Top Of Casing</td>
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<td>&quot;</td>
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<tr>
<td>&quot;</td>
<td>Inches</td>
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5638 E. Elsinore Avenue, Los Angeles, California 90040
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MTA WESTSIDE SUBWAY EXTENSION
Parsons Brinckerhoff

WELL CONSTRUCTION DETAIL
Groundwater Observation Well

WELL NO.: G-174A
DRAWN: L. Morley
INSTALLED: 3/10/2011
DATE: December 2, 2011

SCALE: 1" = 10' Vertical
DRILL CO.: C & L Drilling
TECHNIQUE: Rotary-Wash
FIELD PERSONNEL: Larry Hong
PROJECT NAME: MTA Westside Subway Extension
WELL LOCATION: Santa Monica & Fox Hills, Los Angeles, CA

FIGURE NO. A-8.7
PROJECT NO. 4903-1.1-1421