

EXHIBIT A-5: SOIL TEST BORING LOGS

BORING LOG NO. B11

PROJECT: Battery Seawall Rehabilitation

CLIENT: Johnson, Mirmiran & Thompson
Charleston, SC

SITE: Murray Drive
Charleston, South Carolina

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_EN155074 THE BATTERY.GPJ TERRACON2015.GDT 9/1/15

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.772243° Longitude: -79.942068°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	DEPTH				
0.8	ASPHALT CONCRETE , 9 inches				
3.0	SILTY SAND (SM) , fine grained, subrounded, light brown, very loose, with shell fragments		X		2-1-1 N=2
5.5	SANDY LEAN CLAY (CL) , brown, soft	5	X		1-1-1 N=2
8.0	SANDY LEAN CLAY (CL) , dark gray, soft		X		WOH/12"-1 N=1
17.0	POORLY GRADED SAND WITH SILT (SP-SM) , fine to medium grained, subrounded, light gray, loose to very loose	10	X		4-4-5 N=9
		15	X		WOH/12"-1 N=1
	SILT (ML) , dark gray, soft to very soft	20	X		1-2-1 N=3
		25	X		WOH/18" N=0
		30	X		WOH/18" N=0
		35	X		WOH/18" N=0
		40	X		2-1-3 N=4
		45	X		WOH/18" N=0
47.0					
52.0	SILTY SAND (SM) , subrounded, gray, very loose	50	X		1-1-2 N=3

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Wash Rotary	See Exhibit A-3 for description of field procedures.	Notes:
Abandonment Method: Borings backfilled with cement-bentonite grout upon completion.	See Appendix B for explanation of symbols and abbreviations.	
WATER LEVEL OBSERVATIONS <i>Water level not determined</i>	<p>1450 5th Street West North Charleston, South Carolina</p>	Boring Started: 7/23/2015 Drill Rig: CME-55 Project No.: EN155074
		Boring Completed: 7/23/2015 Driller: C. Fredrychowski Exhibit: A-5

BORING LOG NO. B11

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**SITE: Murray Drive
Charleston, South Carolina**

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GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.772243° Longitude: -79.942068°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	DEPTH				
62.0	SILTY SAND (SM) , subrounded, olive gray, loose to dense, calcareous, non-reactive	55	X		3-4-3 N=7
67.0	POORLY GRADED SAND (SP) , medium grained, subrounded, gray, medium dense, with phosphate	60	X		8-23-14 N=37
67.0	SANDY SILT (ML) , olive brown, medium stiff to stiff, moderate cementation, calcareous, reactive- Cooper Marl Formation	65	X		3-4-6 N=10
100.0		70	X		6-5-7 N=12
100.0		75	X		4-2-4 N=6
100.0		80	X		4-4-4 N=8
100.0		85	X		2-3-3 N=6
100.0		90	X		6-7-7 N=14
100.0		95	X		6-5-7 N=12
100.0		100	X		2-3-4 N=7
	Boring Terminated at 100 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Wash Rotary	See Exhibit A-3 for description of field procedures.	Notes:
Abandonment Method: Borings backfilled with cement-bentonite grout upon completion.	See Appendix B for explanation of symbols and abbreviations.	
WATER LEVEL OBSERVATIONS Water level not determined	<p>1450 5th Street West North Charleston, South Carolina</p>	Boring Started: 7/23/2015 Drill Rig: CME-55 Project No.: EN155074
		Boring Completed: 7/23/2015 Driller: C. Fredrychowski Exhibit: A-5

BORING LOG NO. B12

PROJECT: Battery Seawall Rehabilitation

CLIENT: Johnson, Mirmiran & Thompson
Charleston, SC

SITE: Murray Drive
Charleston, South Carolina

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.769661° Longitude: -79.934669°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	DEPTH				
0.8	ASPHALT CONCRETE , 9 inches				
3.0	CLAYEY SAND (SC) , fine grained, subrounded, black to grayish brown, loose, with shell fragments		X		5-5-2 N=7
	SILTY SAND (SM) , fine grained, subangular, dark gray, loose, with trace shell fragments	5	X		1-2-2 N=4
			X		WOH/6"-1-1 N=2
8.0	SANDY SILT (ML) , dark gray, very soft to medium stiff		X		WOH/18" N=0
		10	X		WOH/18" N=0
		15	X		WOH/18" N=0
		20	X		WOH/18" N=0
		25	X		WOH/18" N=0
		30	X		WOH/18" N=0
		35	X		WOH/18" N=0
		40	X		WOH/18" N=0
		45	X		WOH/18" N=0
		50	X		WOH/18" N=0

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Wash Rotary

See Exhibit A-3 for description of field procedures.

Notes:

Abandonment Method:
Borings backfilled with cement-bentonite grout upon completion.

See Appendix B for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Water level not determined



Boring Started: 7/24/2015

Boring Completed: 7/24/2015

Drill Rig: CME-55

Driller: C. Fredrychowski

Project No.: EN155074

Exhibit: A-5

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BORING LOG NO. B12

PROJECT: Battery Seawall Rehabilitation

CLIENT: Johnson, Mirmiran & Thompson
Charleston, SC

SITE: Murray Drive
Charleston, South Carolina

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.769661° Longitude: -79.934669°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	DEPTH				
	SANDY SILT (ML) , dark gray, very soft to medium stiff <i>(continued)</i>	55	X		1-2-2 N=4
		60	X		1-1-3 N=4
		65	X		1-1-2 N=3
		70	X		WOH/12"-2 N=2
	72.0				
	SANDY SILT (ML) , olive brown, medium stiff, moderate cementation, calcareous, reactive- Cooper Marl Formation	75.0	X		2-3-4 N=7
	Boring Terminated at 75 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Wash Rotary

See Exhibit A-3 for description of field procedures.

Notes:

Abandonment Method:
Borings backfilled with cement-bentonite grout upon completion.

See Appendix B for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Water level not determined



Boring Started: 7/24/2015

Boring Completed: 7/24/2015

Drill Rig: CME-55

Driller: C. Fredrychowski

Project No.: EN155074

Exhibit: A-5

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EXHIBIT A-6: TEST PIT LOGS

TEST PIT LOG NO. TP @ 00+91

PROJECT: Battery Seawall Rehabilitation

CLIENT: Johnson, Mirmiran & Thompson
Charleston, SC

SITE: Murray Drive
Charleston, South Carolina

GRAPHIC LOG	LOCATION: See Exhibit A-2 Station: 00+91 DEPTH	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
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0.3	CONCRETE, 4 inch sidewalk				
4.5	POORLY GRADED SAND WITH SILT (SP-SM), fine grained, light brown, with concrete and brick debris				

Test Pit Terminated at 4.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: NA

Advancement Method: Mini-excavator	See Exhibit A-3 for description of field procedures.	Notes:	
Abandonment Method: Test pit backfilled by City of Charleston	See Appendix B for explanation of symbols and abbreviations.		
WATER LEVEL OBSERVATIONS Groundwater not encountered.	1450 5th Street West North Charleston, South Carolina	Test Pit Started: 6/24/2015	Test Pit Completed: 6/24/2015
		Excavator: NA	Operator: NA
		Project No.: EN155074	Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL_EN155074 THE BATTERY.GPJ TERRACON2012.GDT 8/11/15

TEST PIT LOG NO. TP @ 04+79

PROJECT: Battery Seawall Rehabilitation

CLIENT: Johnson, Mirmiran & Thompson
Charleston, SC

SITE: Murray Drive
Charleston, South Carolina

GRAPHIC LOG	LOCATION: See Exhibit A-2 Station: 04+79 DEPTH	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
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0.3	CONCRETE, 4 inch sidewalk 				
	SILTY SAND (SM), fine grained, light brown, with shell fragments 				
	SILT (ML), dark bluish gray 				
	SILTY SAND (SM), fine grained, dark bluish gray, with abundant shell 				
	Test Pit Terminated at 6.8 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: NA

Advancement Method: Mini-excavator	See Exhibit A-3 for description of field procedures.	Notes:	
Abandonment Method: Test pit backfilled by City of Charleston	See Appendix B for explanation of symbols and abbreviations.		
WATER LEVEL OBSERVATIONS Groundwater encountered at 6.8 feet.		Test Pit Started: 6/25/2015	Test Pit Completed: 6/25/2015
		Excavator: NA	Operator: NA
		Project No.: EN155074	Exhibit: A-6



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TEST PIT LOG NO. TP @ 40+12

PROJECT: Battery Seawall Rehabilitation

CLIENT: Johnson, Mirmiran & Thompson
Charleston, SC

SITE: Murray Drive
Charleston, South Carolina

GRAPHIC LOG	LOCATION: See Exhibit A-2 Station: 40+12 DEPTH	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
0.3	CONCRETE , 4 inch sidewalk				
0.7	POORLY GRADED SAND (SP) , fine grained, black				
4.0	SANDY LEAN CLAY (CL) , brown				
8.0	SILTY SAND (SM) , fine grained, brown, abundant shell		5	▽	
Test Pit Terminated at 8 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: NA

Advancement Method:
Mini-excavator

See Exhibit A-3 for description of field procedures.

Notes:

Abandonment Method:
Test pit backfilled by City of Charleston

See Appendix B for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ Groundwater encountered at 6.5 feet.



Test Pit Started: 6/30/2015

Test Pit Completed: 6/30/2015

Excavator: NA

Operator: NA

Project No.: EN155074

Exhibit: A-6

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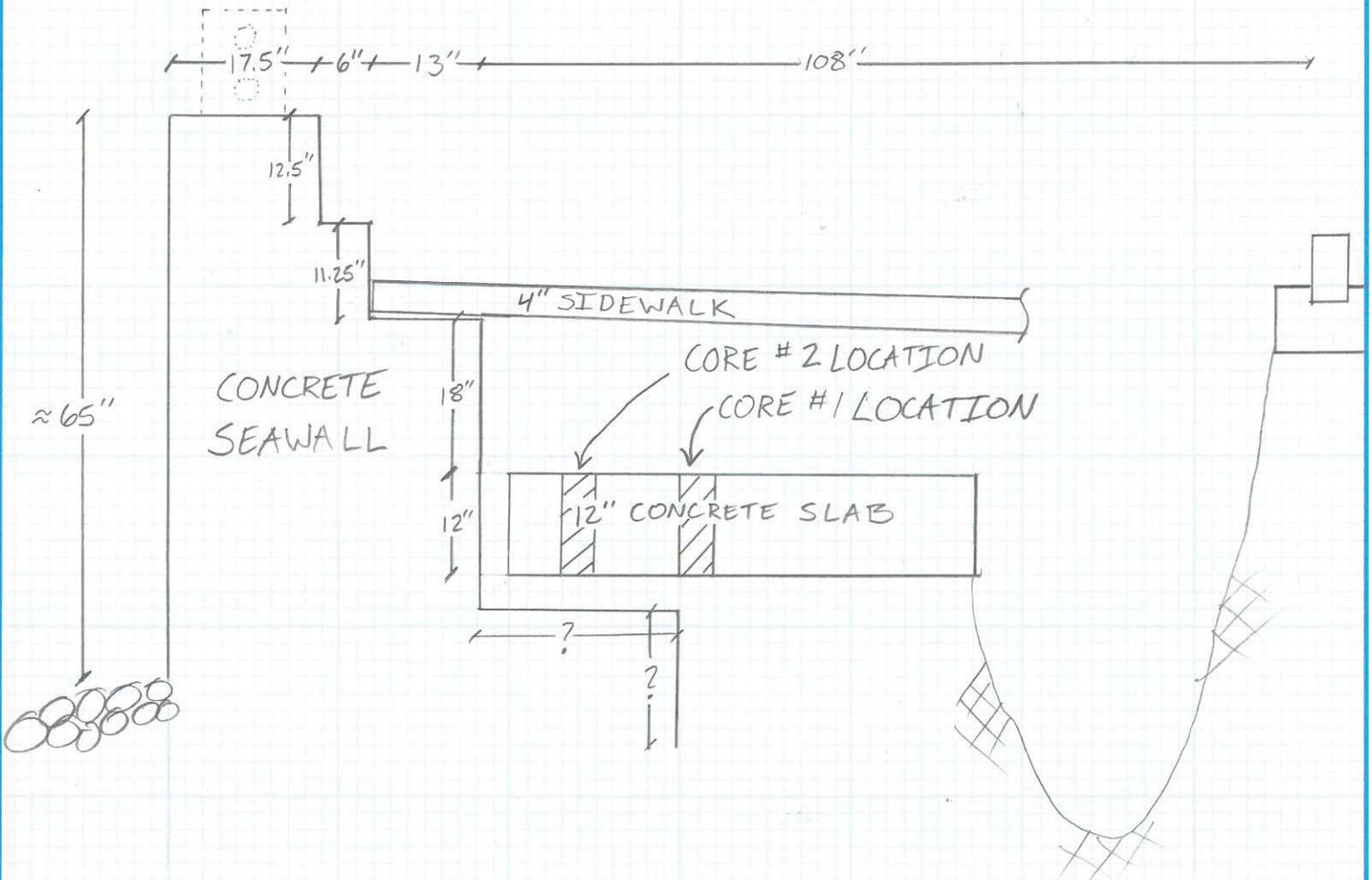
EXHIBIT A-7: EXISTING CONDITION SKETCHES

PROJECT: BATTERY SEAWALL

Page 1 of 1

JOB NO. ENISS074 Date 6/24/15 Comp. By T. Smoak CHECKED BY: _____

TEST PIT @ STATION 00+91 N.T.S.



PROJECT: BATTERY SEAWALL

Page 1 of 1

JOB NO. ENISS074

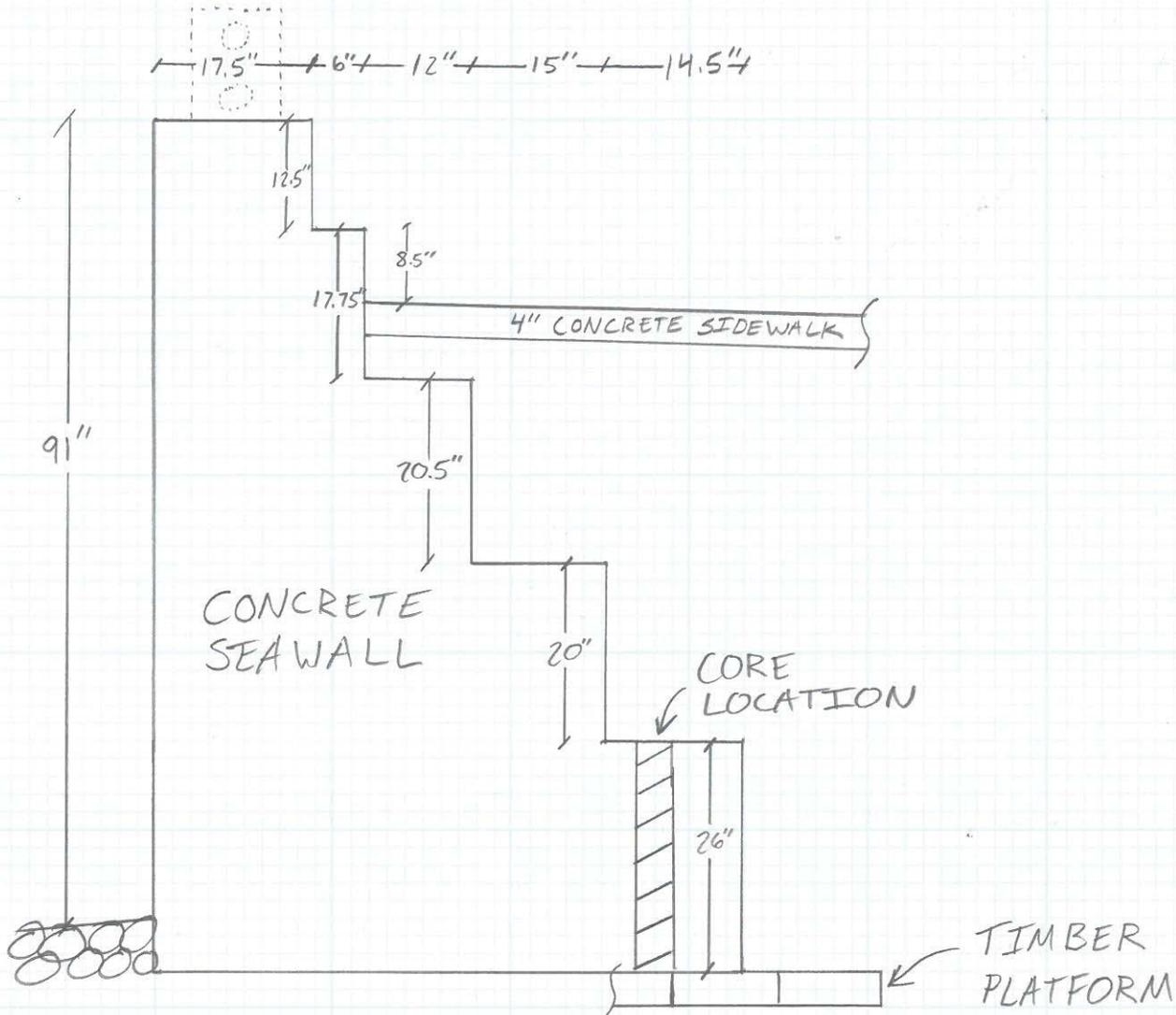
Date 6/25/15

Comp. By T. Smoak

CHECKED BY: _____

TEST PIT @ STATION 04+79

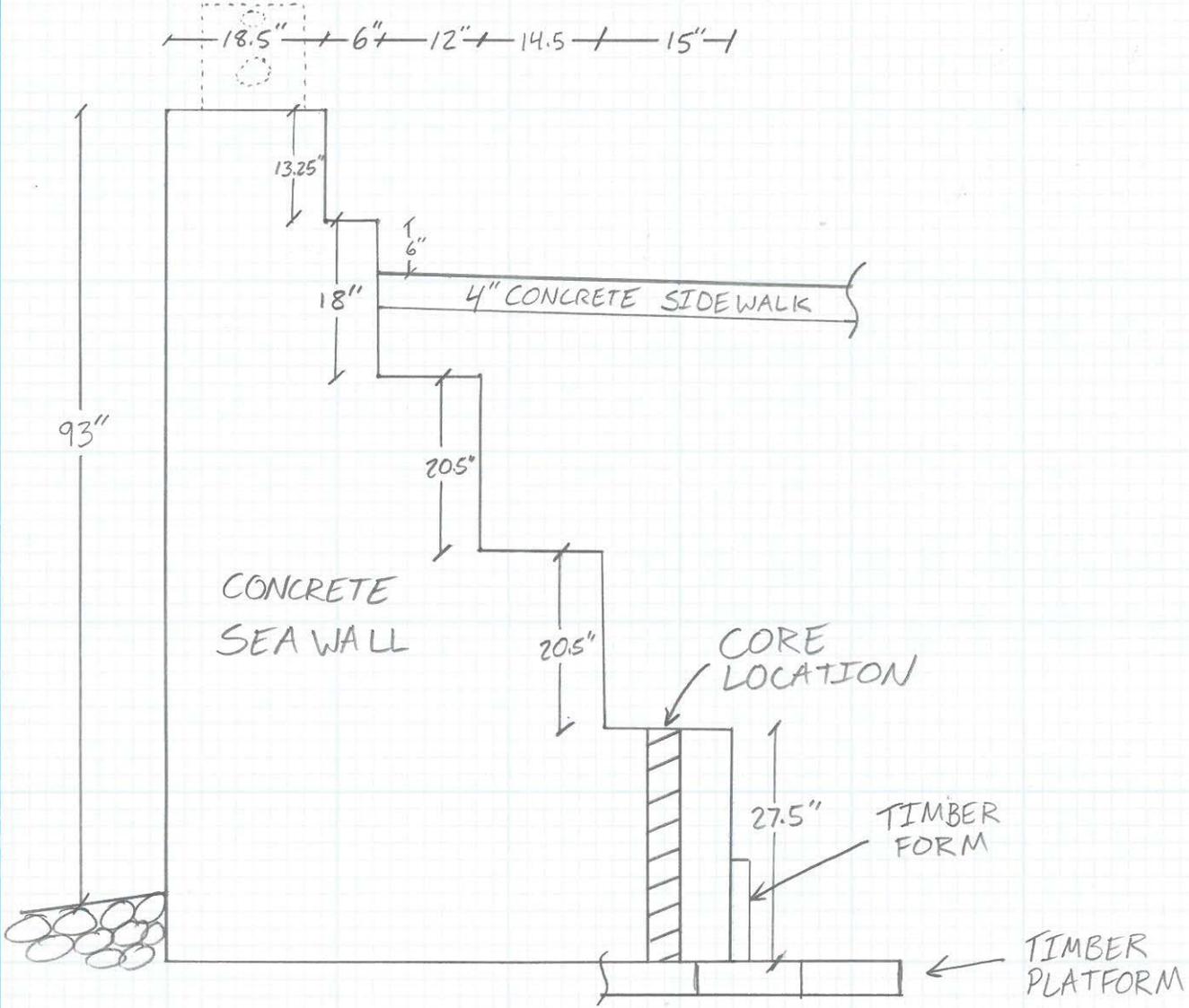
N.T.S.



PROJECT: BATTERY SEAWALL Page 1 of 1

JOB NO. EN155074 Date 6/30/15 Comp. By T.Smoak CHECKED BY: _____

TEST PIT @ STATION 18+26 N.T.S.



PROJECT: BATTERY SEAWALL Page 1 of 1

JOB NO. ENISS074 Date 6-30-15 Comp. By T. Smoak CHECKED BY: _____

TEST PIT @ STATION 40+12 N.T.S.

18.5" 6" 11.5" 12.5" 14.75"

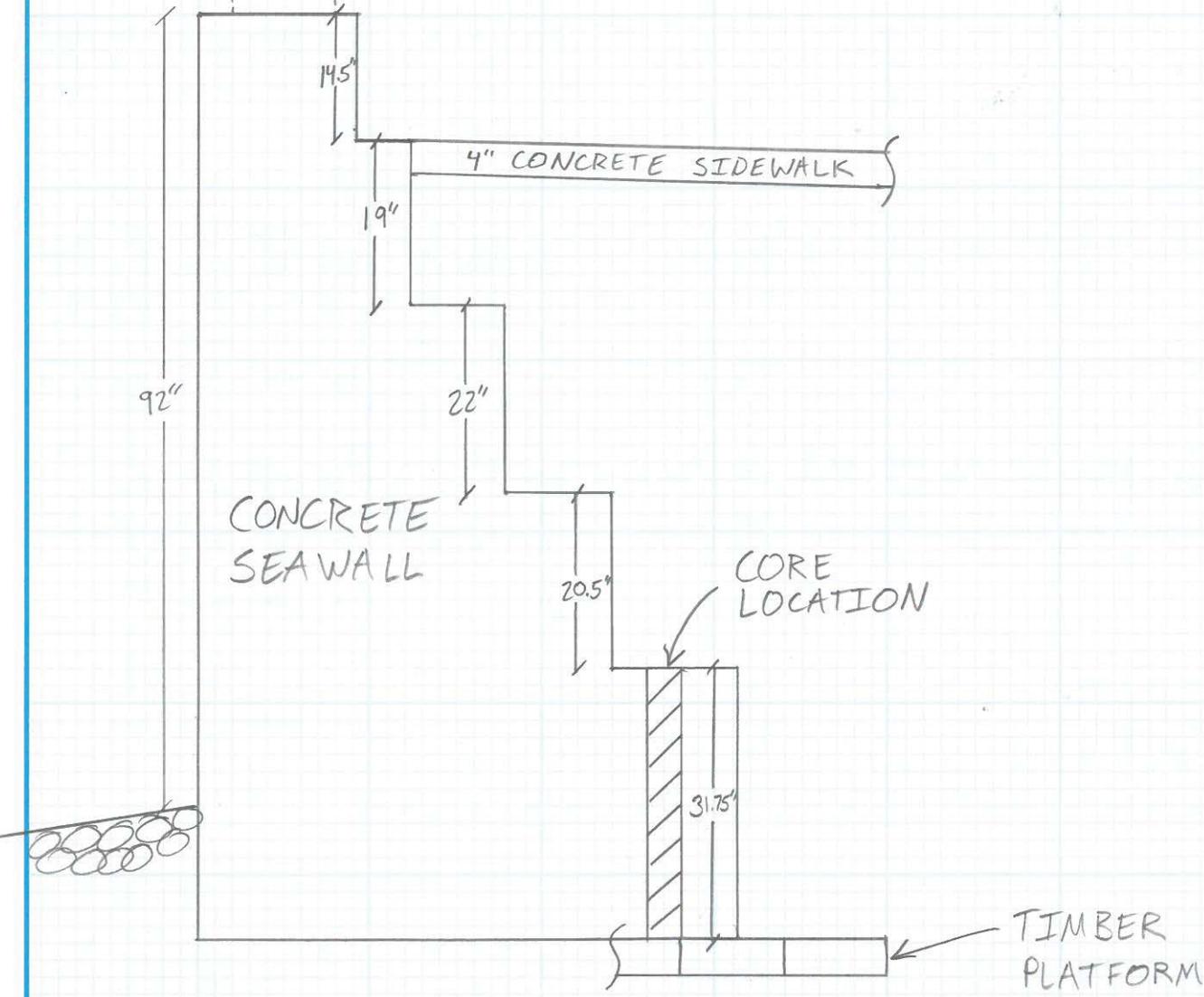


EXHIBIT A-8: CORE PHOTOS

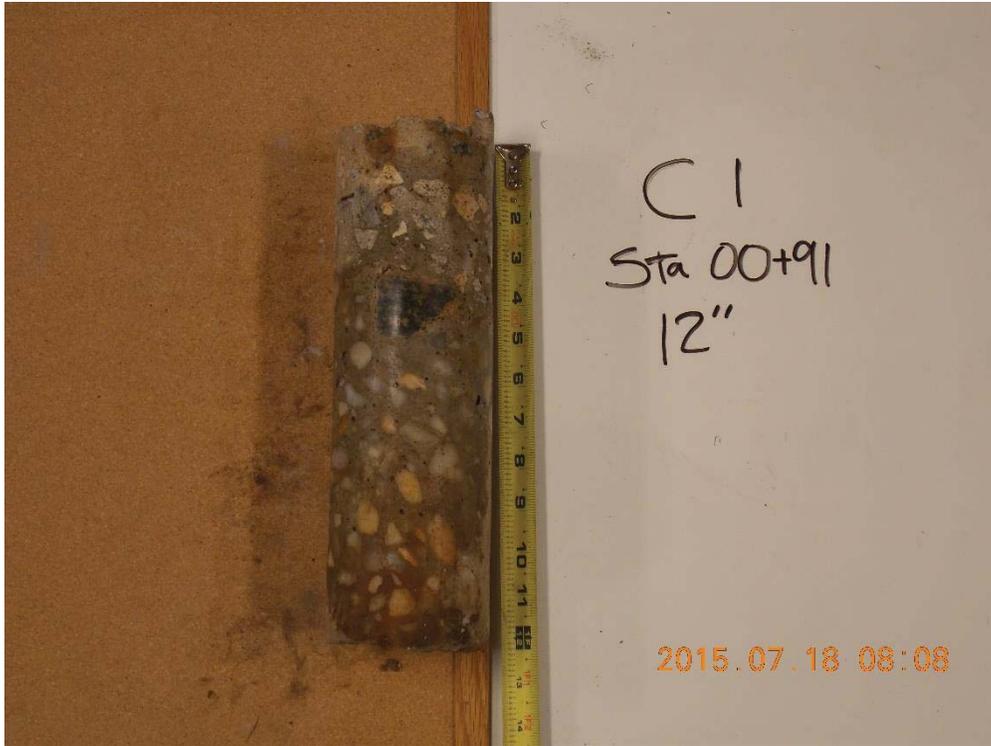


Photo 1 Core #1 from Slab encountered at Station 00+91

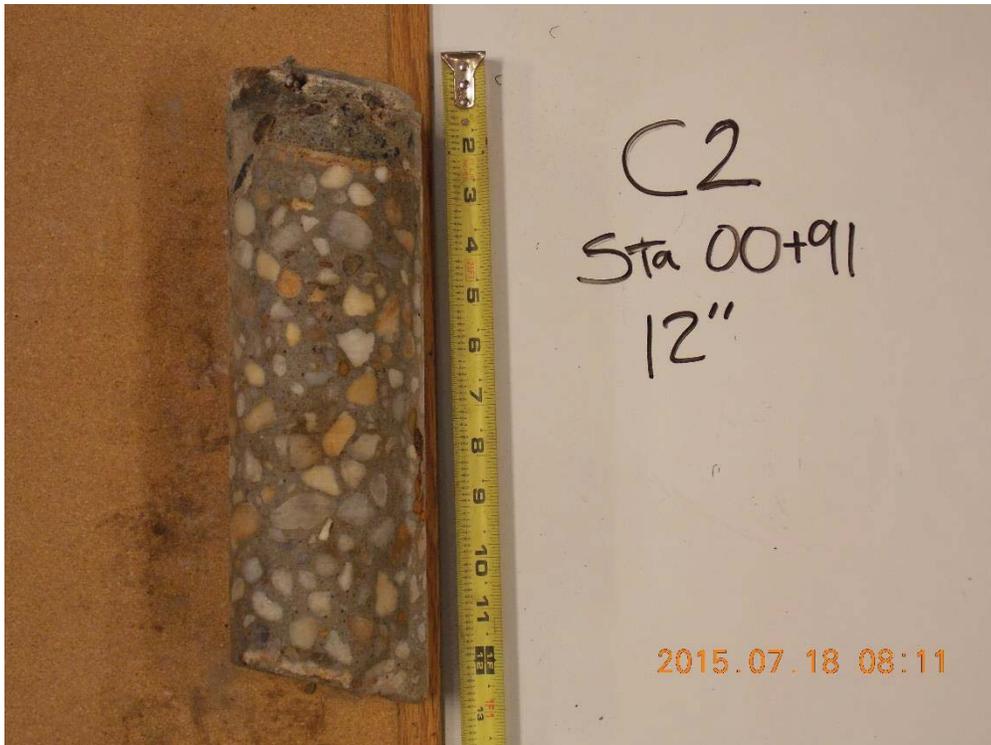


Photo 2 Core #2 from Slab encountered at Station 00+91

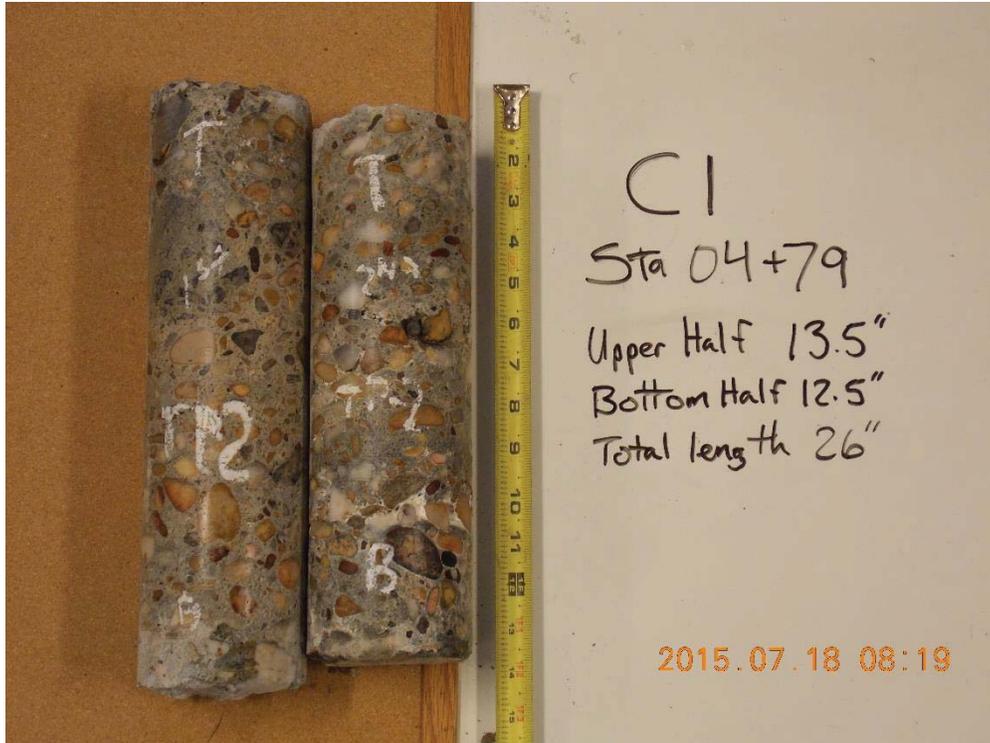


Photo 3 Core from bottom step of wall at Station 04+79

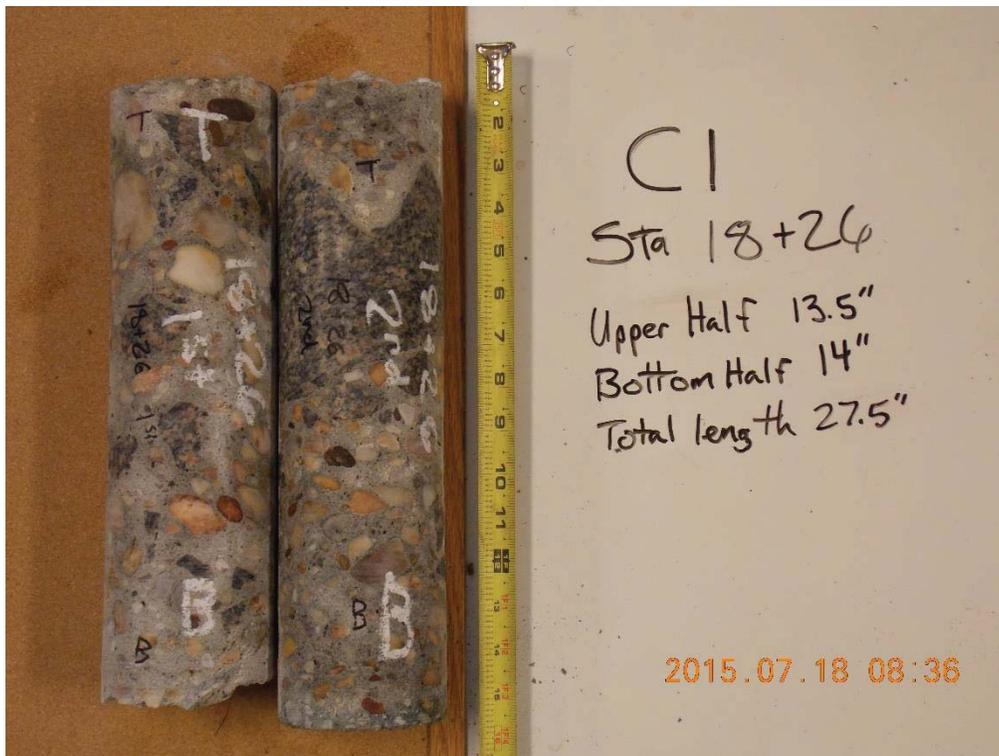


Photo 4 Core from bottom step of wall at Station 18+26



Photo 5 Front Panel Face Core at Station 18+26

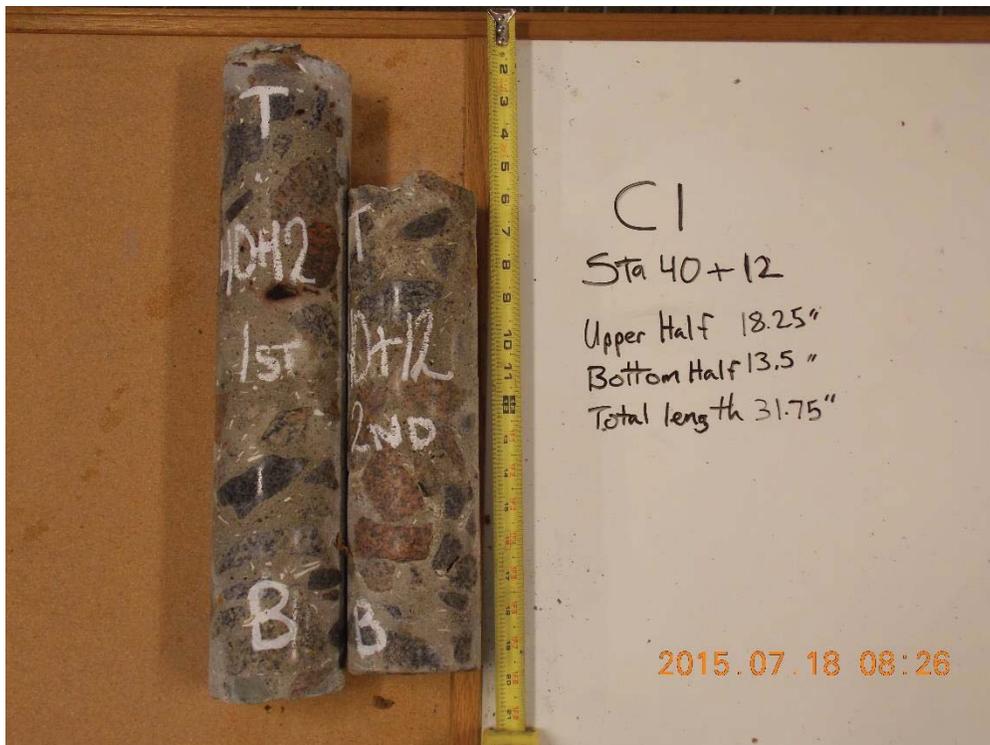


Photo 6 Core from bottom step of wall at Station 40+12



Photo 7 Front Panel Face Core at Station 18+26