

DOCKETED	
Docket Number:	24-OPT-02
Project Title:	Compass Battery Energy Storage
TN #:	255581
Document Title:	Appendix 4-15B_Water Quality Management Plan Part 3
Description:	The Water Quality Management Plan has been prepared to comply with the requirements of the local NPDES Stormwater Program.
Filer:	Erin Phillips
Organization:	Dudek
Submitter Role:	Applicant Consultant
Submission Date:	4/8/2024 4:30:51 PM
Docketed Date:	4/8/2024

BORING LOG NO. B-25

Page 3 of 4

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5310° Longitude: -117.6776° Surface Elev.: 209 (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI	
	CAPISTRANO FORMATION (Tc) recovered as SILTY CLAY with trace SAND (continued) hard	DEPTH	ELEVATION (Ft.)										
				X	13-19-23 N=42								
		55		X	9-14-19 N=33								
		60		X	13-16-24 N=40								
		65		X	14-23-25 N=48								
		70		X	13-21-28 N=49								
		75											

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

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with cement-grout upon completion.

See Supporting Information for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

Boring Started: 09-14-2021

Boring Completed: 09-14-2021

Drill Rig: CME-75

Driller: 2R Drilling

Project No.: 60215170

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

BORING LOG NO. B-25

Page 4 of 4

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5310° Longitude: -117.6776° Surface Elev.: 209 (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI	
	DEPTH ELEVATION (Ft.)												
	76.5 hard 132.5				14-20-27 N=47								
	CAPISTRANO FORMATION (Tc) recovered as SILTY CLAY with trace SAND (continued) Boring Terminated at 76.5 Feet												

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

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any). See Supporting Information for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Boring backfilled with cement-grout upon completion.			
WATER LEVEL OBSERVATIONS Groundwater not encountered	 1421 Edinger Ave, Ste C Tustin, CA	Boring Started: 09-14-2021	Boring Completed: 09-14-2021
		Drill Rig: CME-75	Driller: 2R Drilling
		Project No.: 60215170	

BORING LOG NO. P-1

Page 1 of 1

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5329° Longitude: -117.6775° Surface Elev.: 210 (Ft.) DEPTH
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Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem AugerAbandonment Method:
Boring backfilled with auger cuttings upon completion.

WATER LEVEL OBSERVATIONS

Groundwater not encountered

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

Boring Started: 09-16-2021

Drill Rig: CME-75

Project No.: 60215170

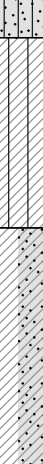
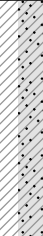
Boring Completed: 09-16-2021

Driller: 2R Drilling

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

Page 1 of 1

CLIENT: Sargent & Lundy LLC
Chicago, IL

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5331° Longitude: -117.6773° Surface Elev.: 209 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES					
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI						
	SILTY SAND (SM), light brown	1.0	208															
	SILTY CLAY (CL-ML), trace sand, olive-brown to brown																	
	LEAN CLAY WITH SAND (CL), trace silt, olive-brown to gray-brown	5.0	204															
	white mottling, very stiff				5-9-10								83					
	Boring Terminated at 10 Feet	10.0	199															

Hammer Type: Automatic

Project No.: 60215170

BORING LOG NO. P-3

Page 1 of 1

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5318° Longitude: -117.6776° Surface Elev.: 212 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	SILTY CLAY WITH SAND (CL-ML), olive-brown to brown very stiff	5.0			6-11-11					8.5	99		83
	Boring Terminated at 5 Feet	207	5										

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

Hammer Type: Automatic

Advancement Method:
Hollow Stem AugerAbandonment Method:
Boring backfilled with auger cuttings upon completion.

WATER LEVEL OBSERVATIONS

Groundwater not encountered

See Exploration and Testing Procedures for a
description of field and laboratory procedures used
and additional data (if any).See Supporting Information for explanation of
symbols and abbreviations.

Notes:

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

Boring Started: 09-16-2021

Drill Rig: CME-75

Project No.: 60215170

Boring Completed: 09-16-2021

Driller: 2R Drilling

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

BORING LOG NO. P-5

Page 1 of 1

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5319° Longitude: -117.6767° Surface Elev.: 208 (Ft.) DEPTH
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Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem AugerAbandonment Method:
Boring backfilled with auger cuttings upon completion.

WATER LEVEL OBSERVATIONS

Groundwater not encountered

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

Boring Started: 09-16-2021

Drill Rig: CME-75

Project No.: 60215170

Boring Completed: 09-16-2021

Driller: 2R Drilling

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

BORING LOG NO. P-6

Page 1 of 1

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5320° Longitude: -117.6767° Surface Elev.: 208 (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	DEPTH ELEVATION (Ft.)												
	SILT (ML) , with clay, trace sand, light-brown to olive-brown												
	5.0	203											
	SILTY CLAY (CL-ML) , trace sand, olive-brown to gray-brown												
	very stiff				7-10-12					21.6	102		88
	10.0	198											
	Boring Terminated at 10 Feet												

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

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Supporting Information for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

Boring Started: 09-16-2021

Boring Completed: 09-16-2021

Drill Rig: CME-75

Driller: 2R Drilling

Project No.: 60215170

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

BORING LOG NO. P-7

Page 1 of 1

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5312° Longitude: -117.6776° Surface Elev.: 211 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	SILTY CLAY WITH SAND (CL-ML), olive-brown to brown stiff	5.0			6-8-9								
													77
	Boring Terminated at 5 Feet	5											

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

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any). See Supporting Information for explanation of symbols and abbreviations.	Notes:
Abandonment Method: Boring backfilled with auger cuttings upon completion.		
WATER LEVEL OBSERVATIONS Groundwater not encountered	 1421 Edinger Ave, Ste C Tustin, CA	Boring Started: 09-16-2021
		Boring Completed: 09-16-2021
		Drill Rig: CME-75
		Driller: 2R Drilling
		Project No.: 60215170

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

BORING LOG NO. P-8

Page 1 of 1

PROJECT: Broad Reach Power Compass BESS

CLIENT: Sargent & Lundy LLC
Chicago, IL

SITE: San Juan Capistrano, CA

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 33.5312° Longitude: -117.6774° Surface Elev.: 209 (Ft.) DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	EXPANSION INDEX	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
							TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI	
	SILTY CLAY (CL-ML) , trace sand, olive-brown to brown	5.0	204										
	LEAN CLAY (CL) , trace silt and sand, olive-brown to gray-brown very stiff	10.0	199										
	Boring Terminated at 10 Feet												

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

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

Boring Started: 09-16-2021

Drill Rig: CME-75

Project No.: 60215170

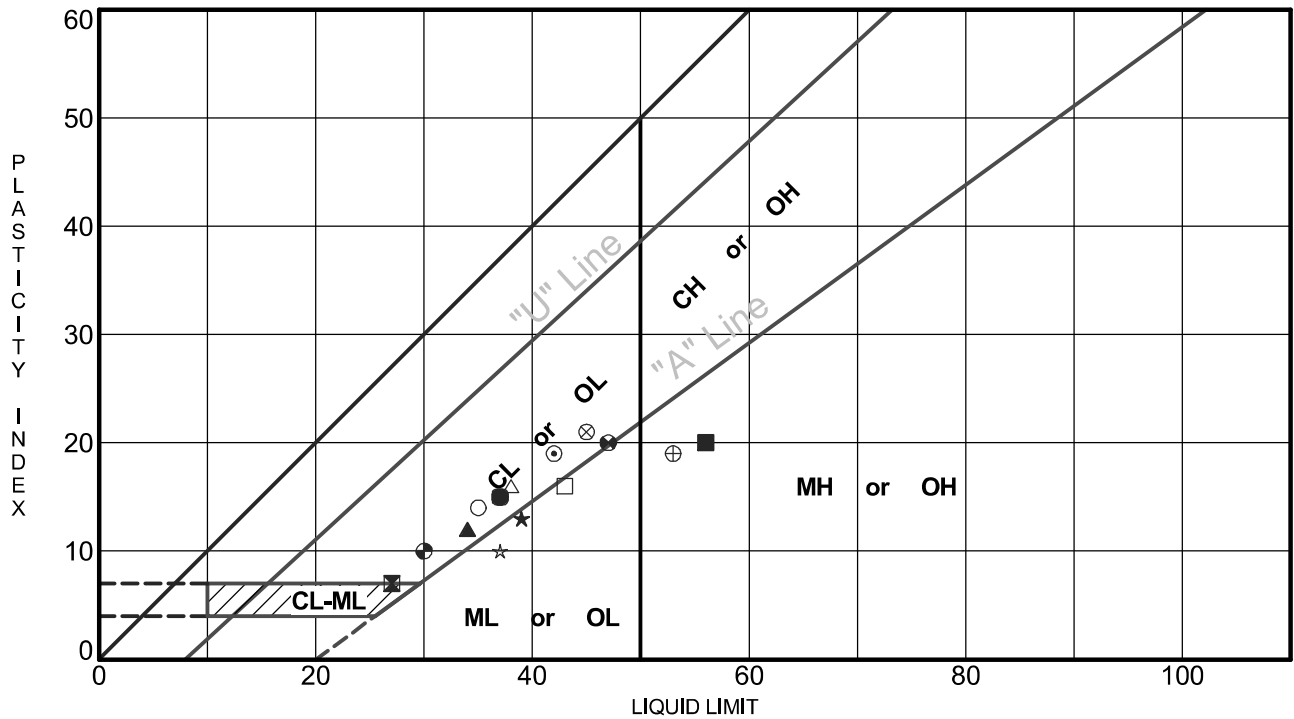
Boring Completed: 09-16-2021

Driller: 2R Drilling

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/19/21

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
● B-1	0 - 4	37	22	15	84.5	CL	LEAN CLAY with SAND
⊠ B-2	5 - 6.5	27	20	7		CL-ML	SILTY CLAY
▲ B-3	7.5 - 9	34	22	12		CL	LEAN CLAY
★ B-4	5 - 6.5	39	26	13		ML	SILT
⊙ B-5	15 - 16.5	42	23	19		CL	LEAN CLAY
⊕ B-8	2.5 - 4	37	22	15		CL	LEAN CLAY
○ B-10	2.5 - 4	35	21	14		CL	LEAN CLAY with SAND
△ B-11	7.5 - 9	38	22	16		CL	LEAN CLAY
⊗ B-11	40 - 41.5	45	24	21		CL	LEAN CLAY
⊕ B-12	65 - 66.5	53	34	19		MH	ELASTIC SILT
□ B-13	15 - 16.5	43	27	16		ML	SILT
⊕ B-14	2.5 - 4	47	27	20		CL	LEAN CLAY
⊕ B-17	0 - 5	30	20	10		CL	LEAN CLAY with SAND
★ B-19	7.5 - 9	37	27	10		ML	SILT
⊗ B-20	5 - 6.5	37	22	15		CL	LEAN CLAY
■ B-24	65 - 66.5	56	36	20		MH	ELASTIC SILT

PROJECT: Broad Reach Power Compass BESS

SITE: San Juan Capistrano, CA

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

PROJECT NUMBER: 60215170

CLIENT: Sargent & Lundy LLC
Chicago, IL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS 60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/12/21

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

Source of Material B-25 @ 0 - 5 feet

Description of Material SANDY LEAN CLAY

Remarks:

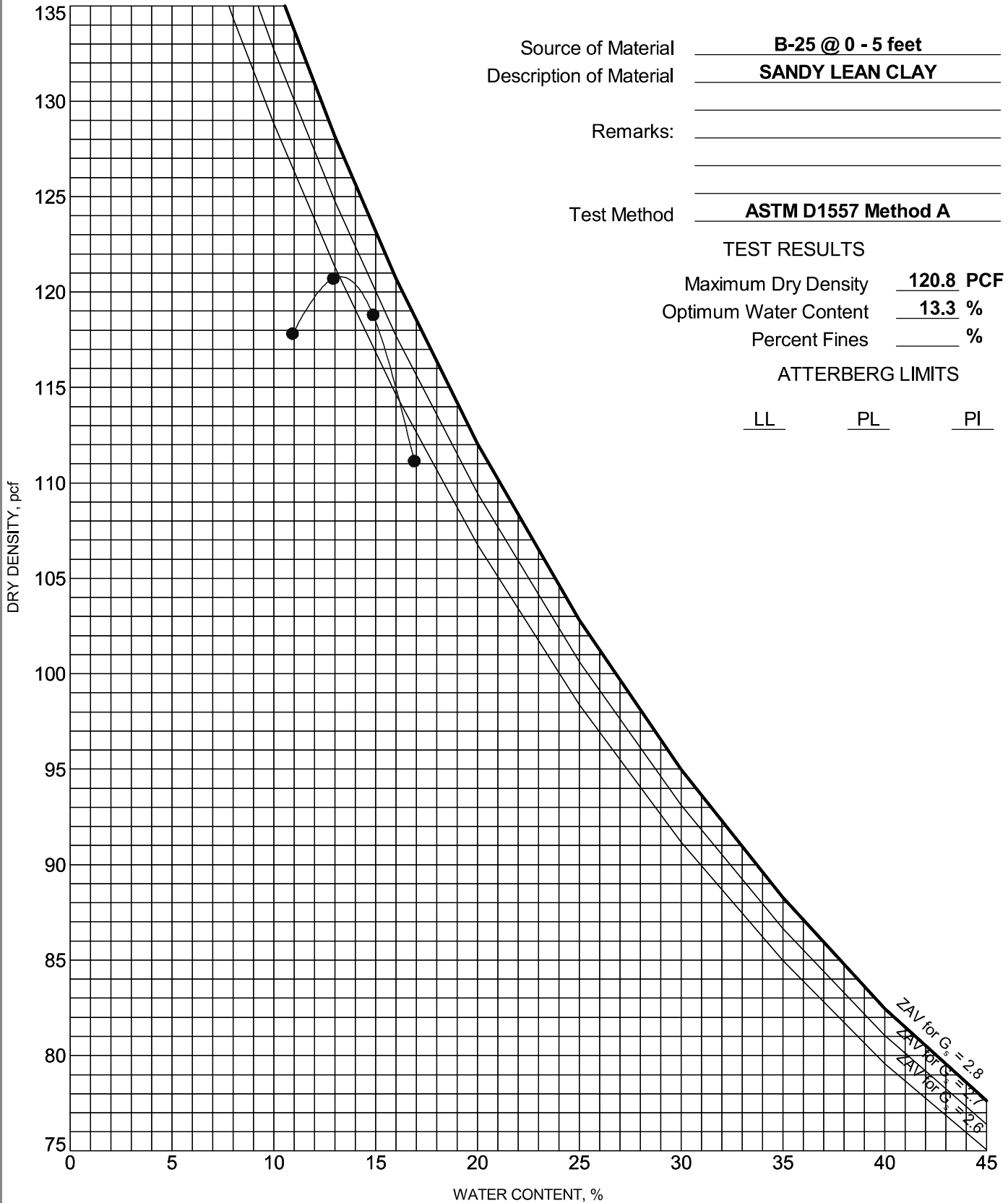
Test Method ASTM D1557 Method A

TEST RESULTS

Maximum Dry Density 120.8 PCF
Optimum Water Content 13.3 %
Percent Fines %

ATTERBERG LIMITS

LL PL PI



PROJECT: Broad Reach Power Compass BESS

SITE: San Juan Capistrano, CA

Terracon

1421 Edinger Ave, Ste C
Tustin, CA

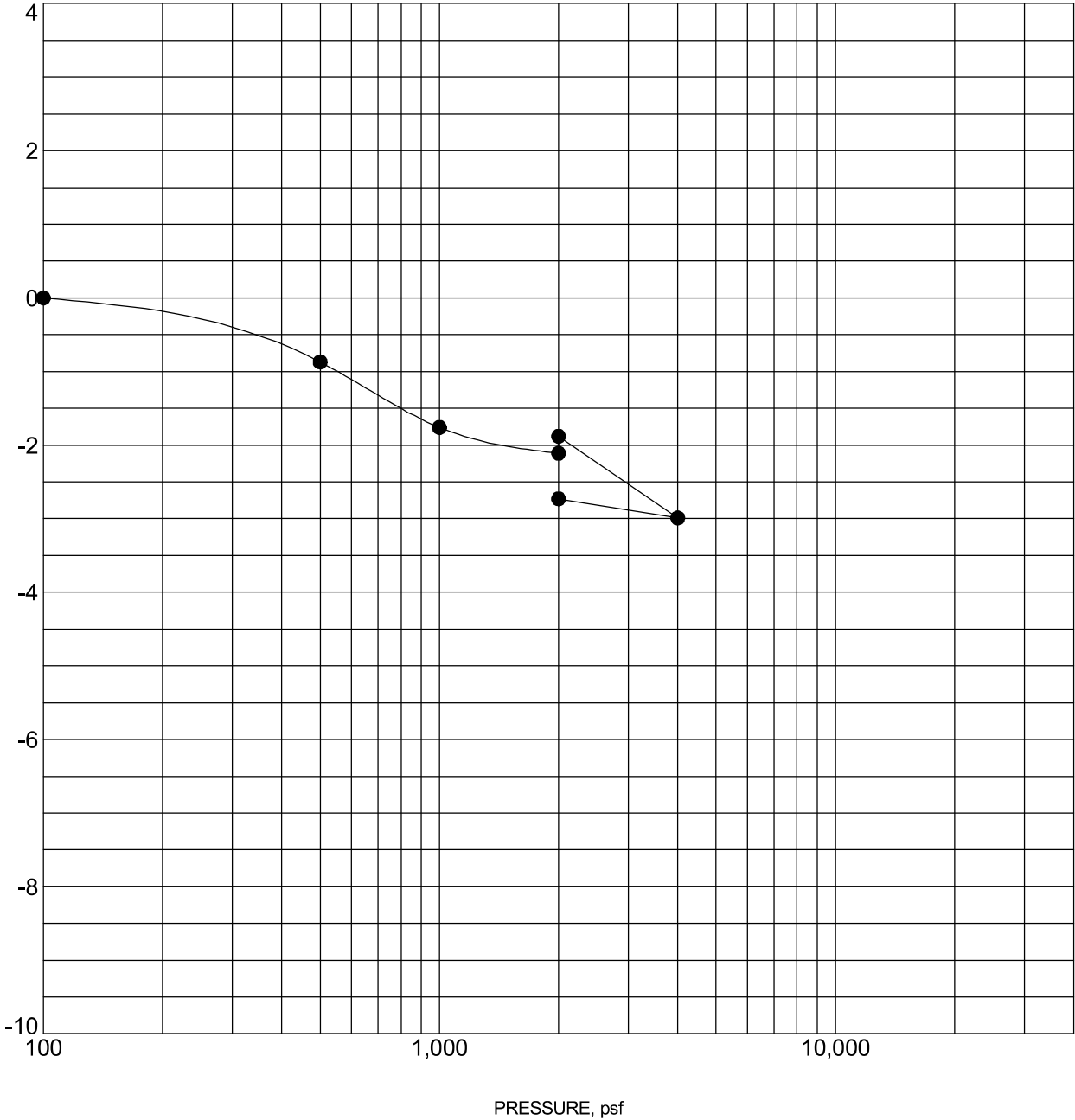
PROJECT NUMBER: 60215170

CLIENT: Sargent & Lundy LLC
Chicago, IL

SWELL CONSOLIDATION TEST
ASTM D4546

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS 60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/12/21

AXIAL STRAIN, %



Specimen Identification			Classification	γ_d , pcf	WC, %
●	B- 1	5 - 6.5 ft	LEAN CLAY with SAND	100	18.7

NOTES: Water added at 2,000 psf

PROJECT: Broad Reach Power Compass BESS

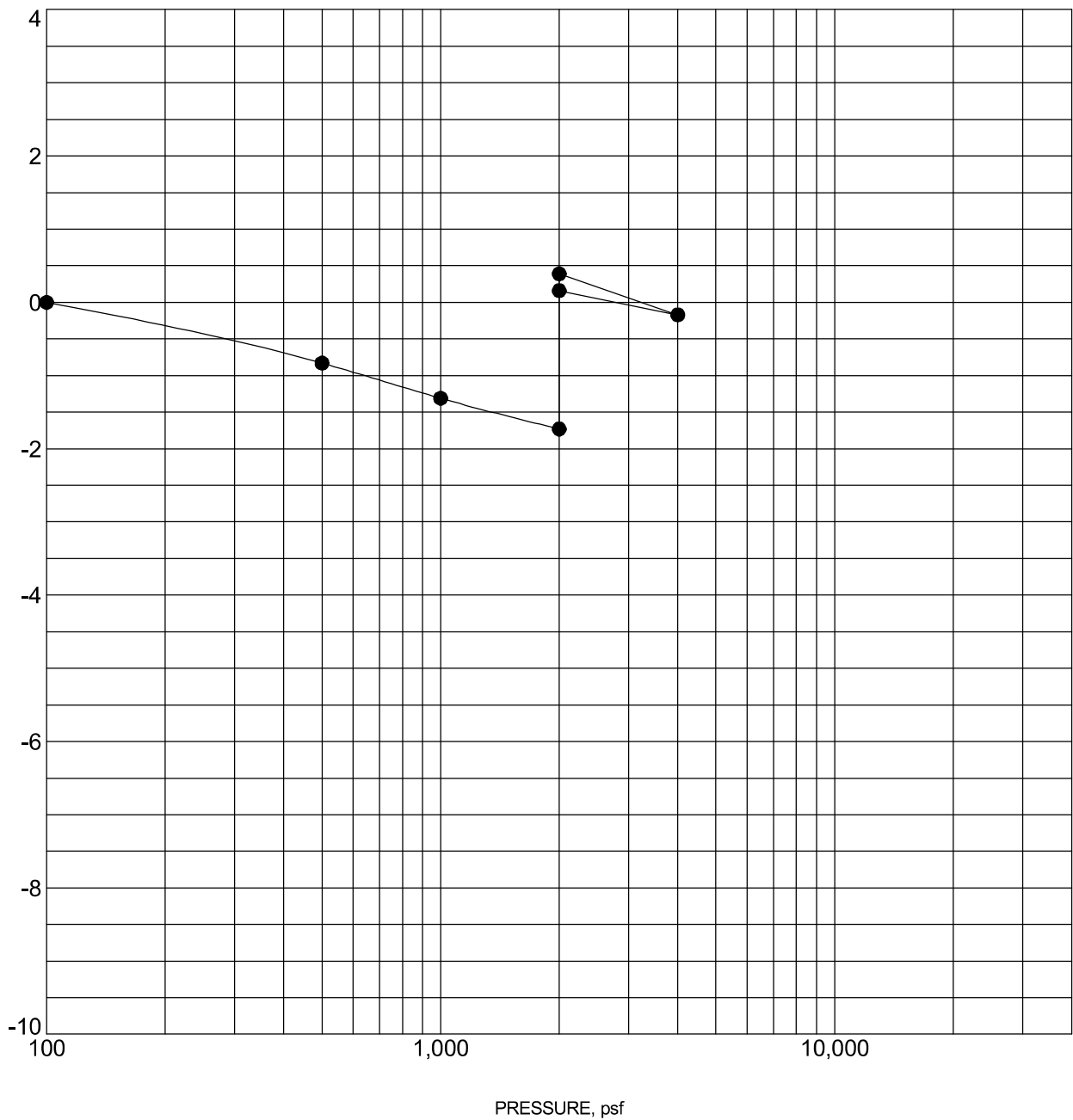
SITE: San Juan Capistrano, CA

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

PROJECT NUMBER: 60215170

CLIENT: Sargent & Lundy LLC
Chicago, IL

SWELL CONSOLIDATION TEST
ASTM D4546



Specimen Identification			Classification	γ_d , pcf	WC, %
●	B- 3	5 - 6.5 ft	LEAN CLAY with SAND	103	17.4

NOTES: Water added at 2,000 psf

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS 60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/12/21

PROJECT: Broad Reach Power Compass BESS

SITE: San Juan Capistrano, CA

Terracon
1421 Edinger Ave, Ste C
Tustin, CA

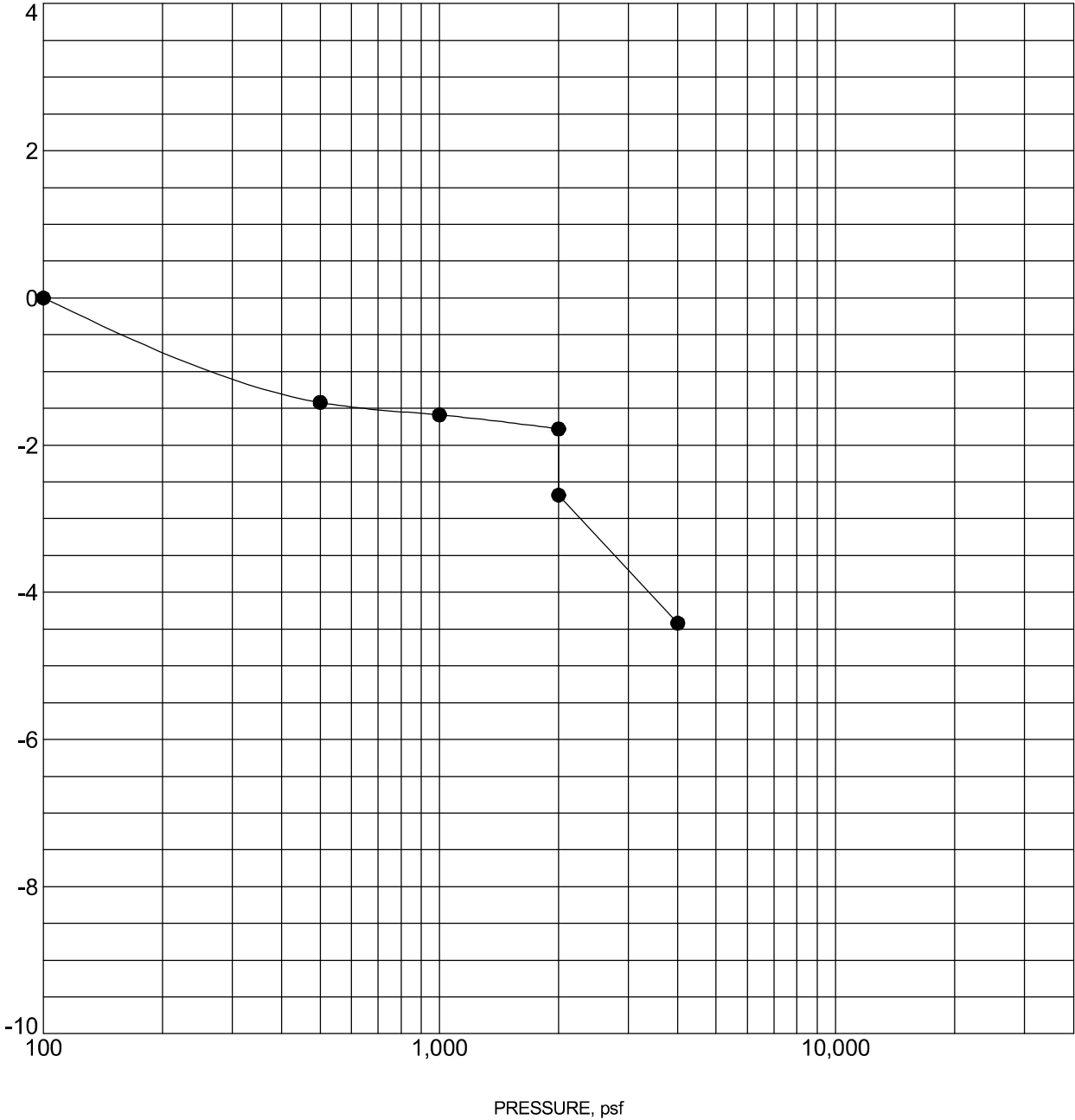
PROJECT NUMBER: 60215170

CLIENT: Sargent & Lundy LLC
Chicago, IL

SWELL CONSOLIDATION TEST
ASTM D4546

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS 60215170 COMPASS BESS.GPJ TERRACON_DATATEMPLATE.GDT 10/12/21

AXIAL STRAIN, %



Specimen Identification			Classification	γ_d , pcf	WC, %
●	B-20	2.5 - 4 ft	SANDY SILT	92	11.6

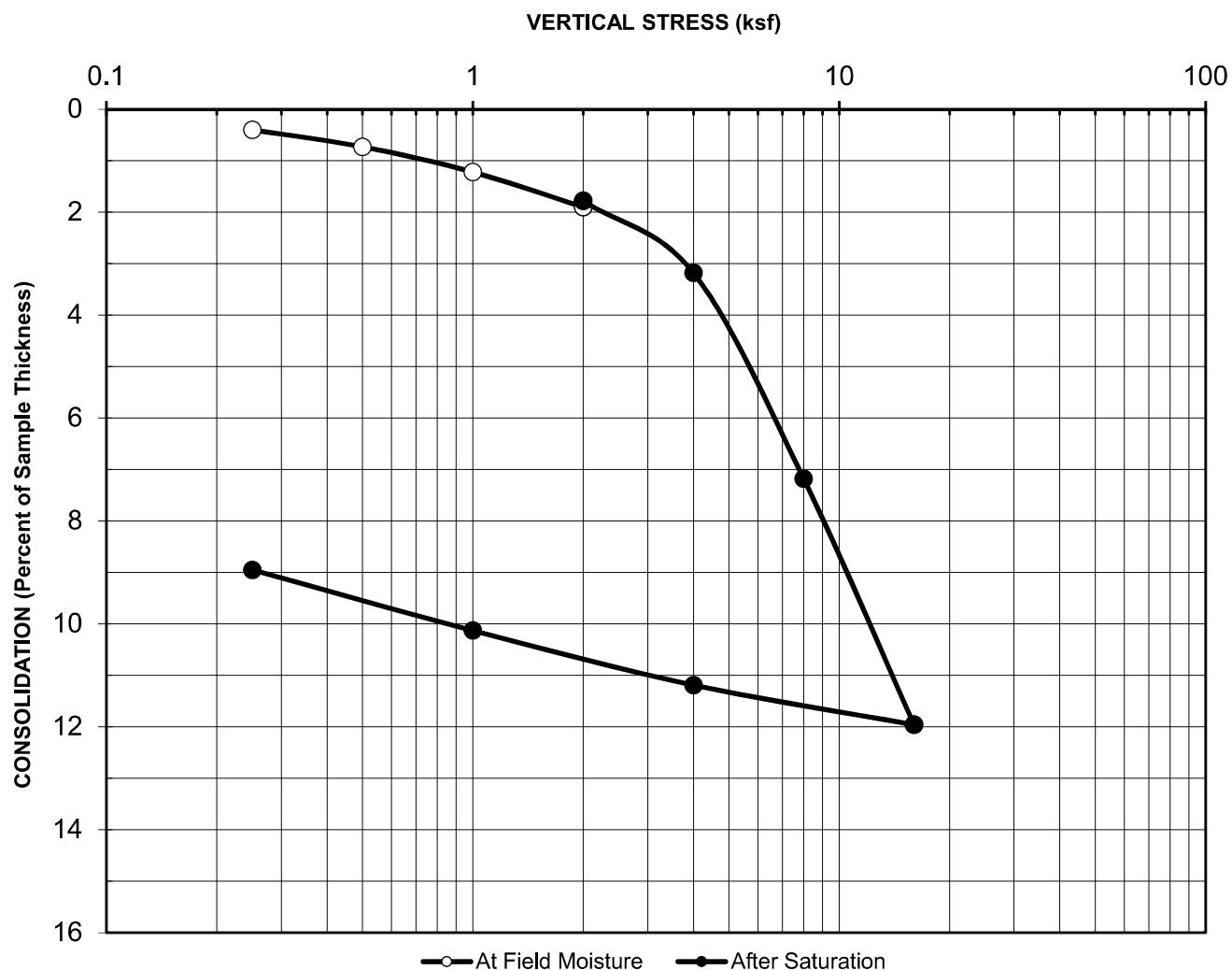
NOTES: Water added at 2,000 psf

PROJECT: Broad Reach Power Compass BESS	 1421 Edinger Ave, Ste C Tustin, CA	PROJECT NUMBER: 60215170
SITE: San Juan Capistrano, CA		CLIENT: Sargent & Lundy LLC Chicago, IL

**AP Engineering and Testing, Inc.**

DBE | MBE | SBE

2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.comBoring No. : B-15Initial Dry Unit Weight (pcf): 96.3Sample No.: -Initial Moisture Content (%): 14.2Depth (feet): 7.5Final Moisture Content (%): 22.2Sample Type: Mod CalAssumed Specific Gravity: 2.7Soil Description: Lean Clay Initial Void Ratio: 0.75Remarks: Swell= 0.12% upon inundation**CONSOLIDATION CURVE
ASTM D 2435**Project Name: Compass BESSProject No.: 6E+07Date: 9/22/2021AP No: 21-0953 Sheet No: 1

**AP Engineering and Testing, Inc.**

DBE | MBE | SBE

2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com**CORROSION TEST RESULTS**Client Name: TerraconAP Job No.: 21-0953Project Name: Compass BESSDate: 09/23/21Project No.: 60215170

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
B-1	-	0	Lean Clay	1,867	8.0	50	27
B-3	-	0	Silty Clay	2,215	8.0	46	40
B-12	-	0	Lean Clay	1,461	8.0	64	23
B-25	-	0	Lean Clay	1,313	8.1	91	36

NOTES: Resistivity Test and pH: California Test Method 643

Sulfate Content : California Test Method 417

Chloride Content : California Test Method 422

ND = Not Detectable

NA = Not Sufficient Sample

NR = Not Requested

**AP Engineering and Testing, Inc.**

DBE|MBE|SBE

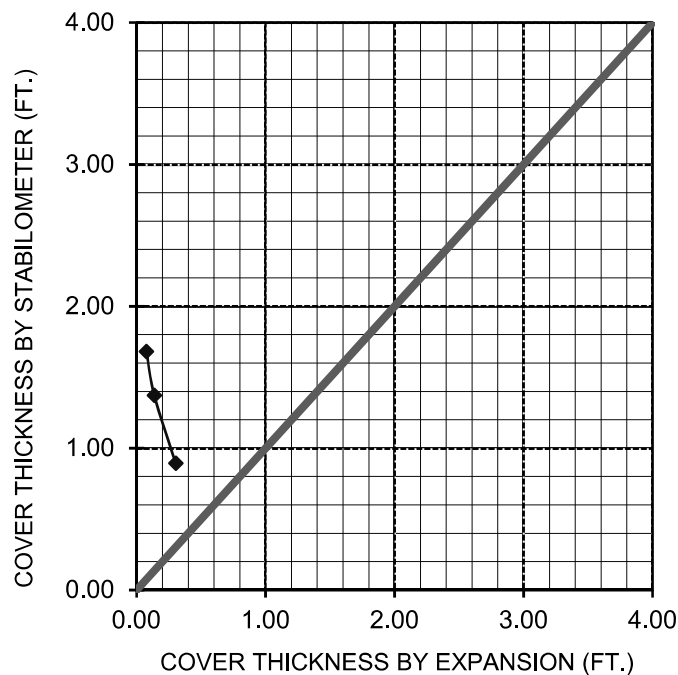
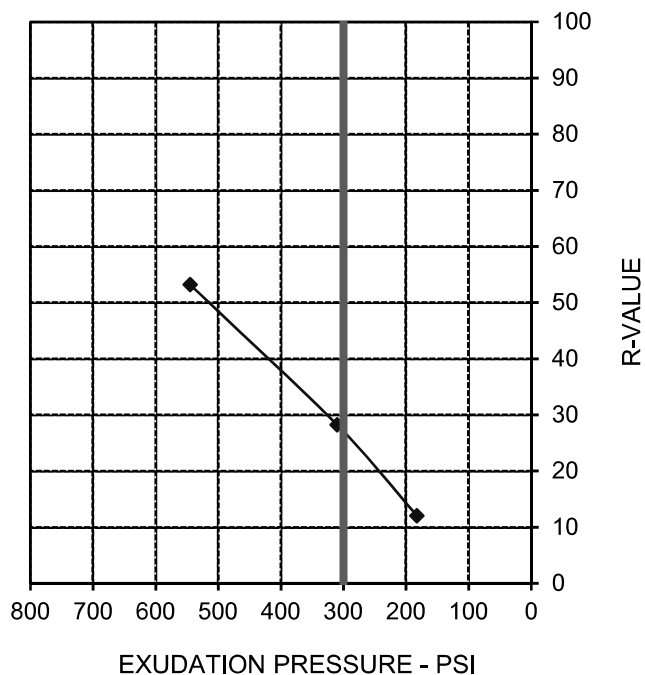
2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com**R-VALUE TEST DATA**

ASTM D2844

Project Name: Compass BESSTested By: STDate: 09/23/21Project Number: 60215170Computed By: KMDate: 09/24/21Boring No.: B-15Checked By: APDate: 09/28/21Sample No.: - Depth (ft.): 0Location: N/ASoil Description: Sandy silty clay

Mold Number	A	C	B		R-VALUE	By Exudation:	27
Water Added, g	61	75	92			By Expansion:	*N/A
Compact Moisture(%)	15.8	17.2	18.9			At Equilibrium:	27
Compaction Gage Pressure, psi	250	180	125			(by Exudation)	
Exudation Pressure, psi	545	310	183		Remarks	Gf = 1.34, and 1.1 % Retained on the 3/4" *Not Applicable	
Sample Height, Inches	2.4	2.5	2.5				
Gross Weight Mold, g	2979	2989	3004				
Tare Weight Mold, g	1967	1968	1966				
Net Sample Weight, g	1012	1021	1038				
Expansion, inches $\times 10^{-4}$	91	41	23				
Stability 2,000 (160 psi)	22/52	40/92	55/125				
Turns Displacement	4.11	4.70	5.11				
R-Value Uncorrected	56	28	12				
R-Value Corrected	53	28	12				
Dry Density, pcf	110.4	105.5	105.8				
Traffic Index	8.0	8.0	8.0				
G.E. by Stability	0.89	1.37	1.68				
G.E. by Expansion	0.30	0.14	0.08				



**AP Engineering and Testing, Inc.**

DBE | MBE | SBE

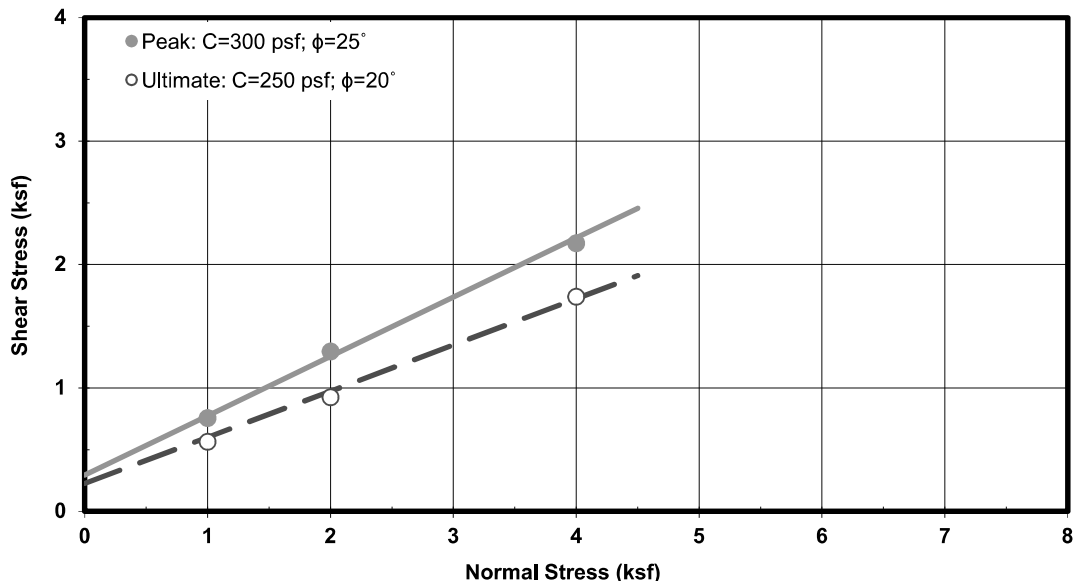
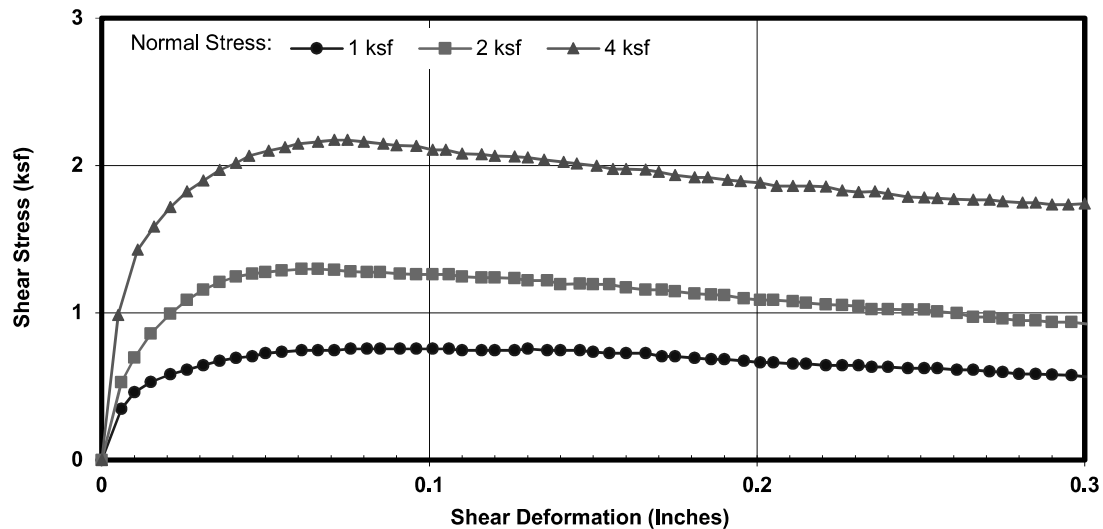
2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com**DIRECT SHEAR TEST RESULTS**
ASTM D 3080

Client: Terracon
Project Name: Compass BESS
Project No.: 60215170
Boring No.: B-10
Sample No.: - **Depth (ft):** 10
Sample Type: Mod. Cal.
Soil Description: Clay
Test Condition: Inundated **Shear Type:** Regular

Tested By: LS **Date:** 09/24/21
Computed By: NR **Date:** 09/27/21
Checked by: AP **Date:** 09/28/21

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
108.4	79.5	36.3	41.5	88	100	1	0.755	0.564
						2	1.296	0.924
						4	2.172	1.740



**AP Engineering and Testing, Inc.**

DBE|MBE|SBE

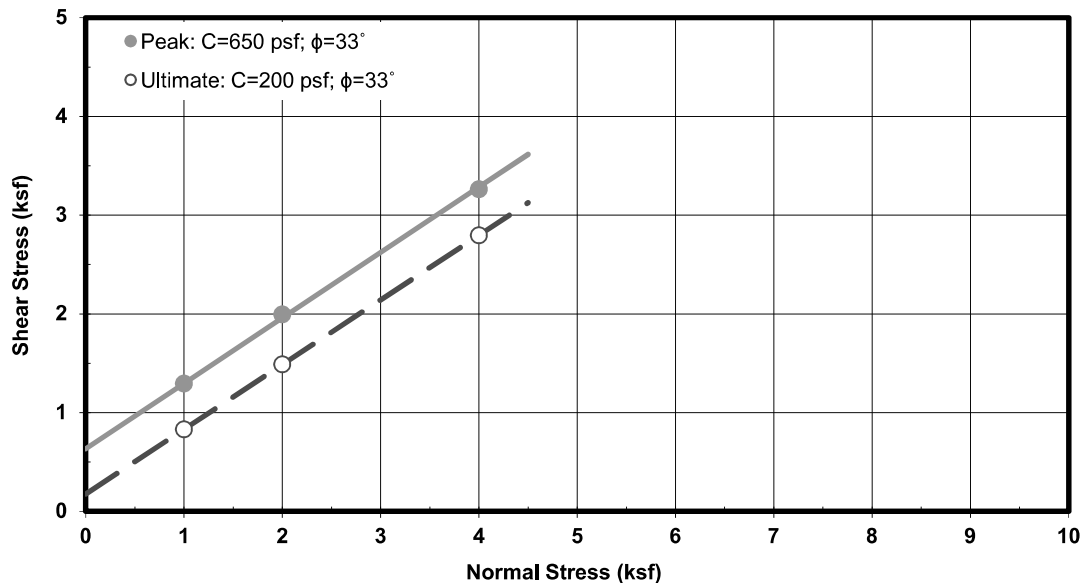
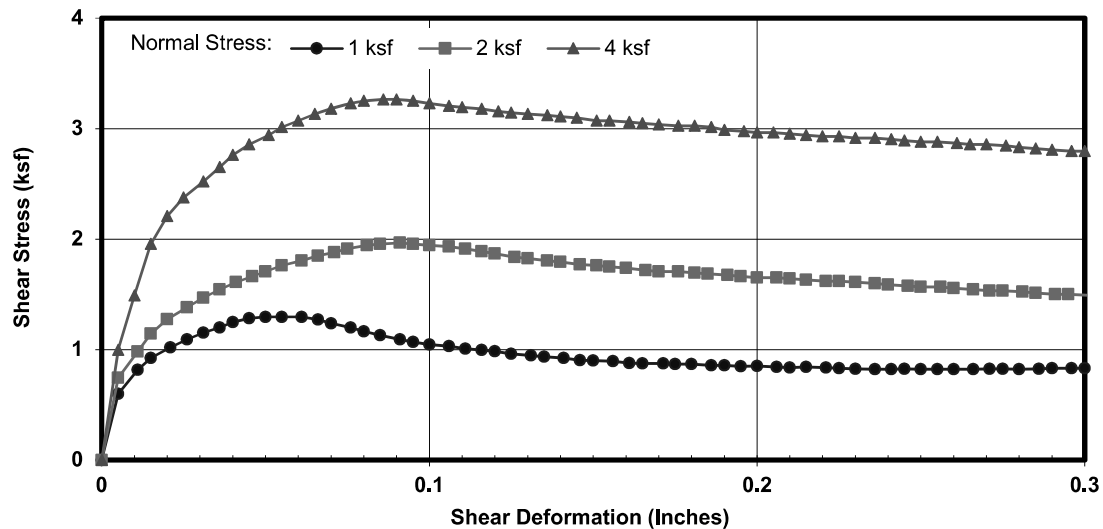
2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com**DIRECT SHEAR TEST RESULTS**
ASTM D 3080

Client: Terracon
Project Name: Compass BESS
Project No.: 60215170
Boring No.: B-12
Sample No.: - Depth (ft): 10
Sample Type: Mod. Cal.
Soil Description: Clay
Test Condition: Inundated Shear Type: Regular

Tested By: LS Date: 09/24/21
Computed By: NR Date: 09/27/21
Checked by: AP Date: 09/28/21

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
124.4	107.3	15.9	21.2	75	100	1	1.296	0.831
						2	1.996	1.490
						4	3.264	2.796



**AP Engineering and Testing, Inc.**

DBE|MBE|SBE

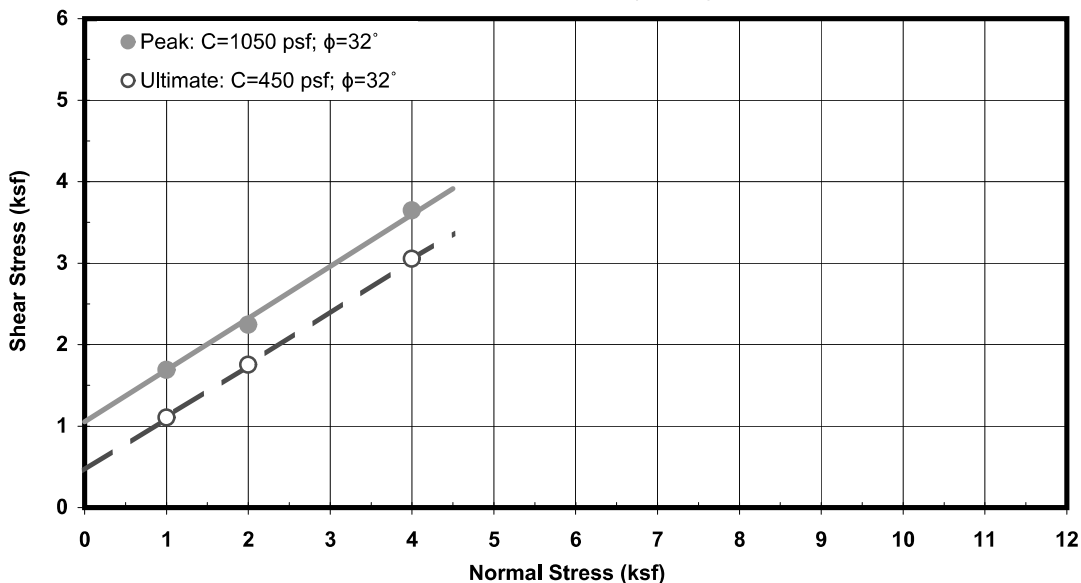
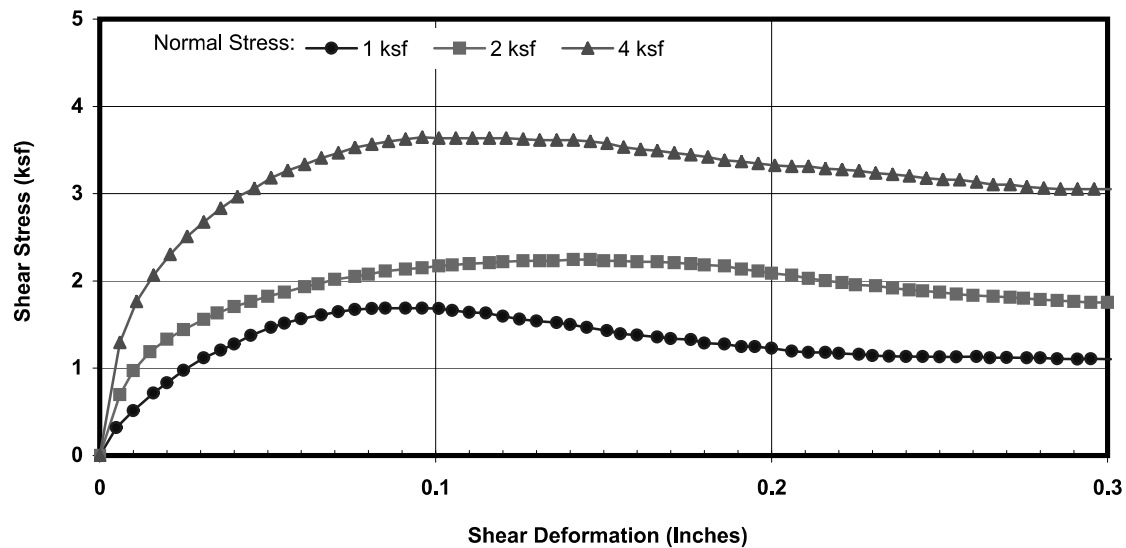
2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com**DIRECT SHEAR TEST RESULTS**
ASTM D 3080

Client: Terracon
Project Name: Compass BESS
Project No.: 60215170
Boring No.: B-13
Sample No.: - Depth (ft): 10
Sample Type: Mod. Cal.
Soil Description: Silt
Test Condition: Inundated Shear Type: Regular

Tested By: LS Date: 09/23/21
Computed By: NR Date: 09/24/21
Checked by: AP Date: 09/28/21

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
128.3	105.5	21.6	22.0	98	100	1	1.688	1.103
						2	2.244	1.752
						4	3.648	3.052



AP Engineering and Testing, Inc.

DBE | MBE | SBE

2607 Pomona Boulevard | Pomona, CA 91768

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UNCONSOLIDATED UNDRAINED TRIAXIAL TEST (UU,Q)
ASTM D 2850

Client Name:	Terracon		
Project Name:	Compass BESS		
Project No.:	60215170		
Boring No.:	B-5		
Sample No.:	-	Depth (feet):	60
Soil Description	Silty Clay		

Tested By: ST Date: 09/23/21
Checked by: AP Date: 09/28/21

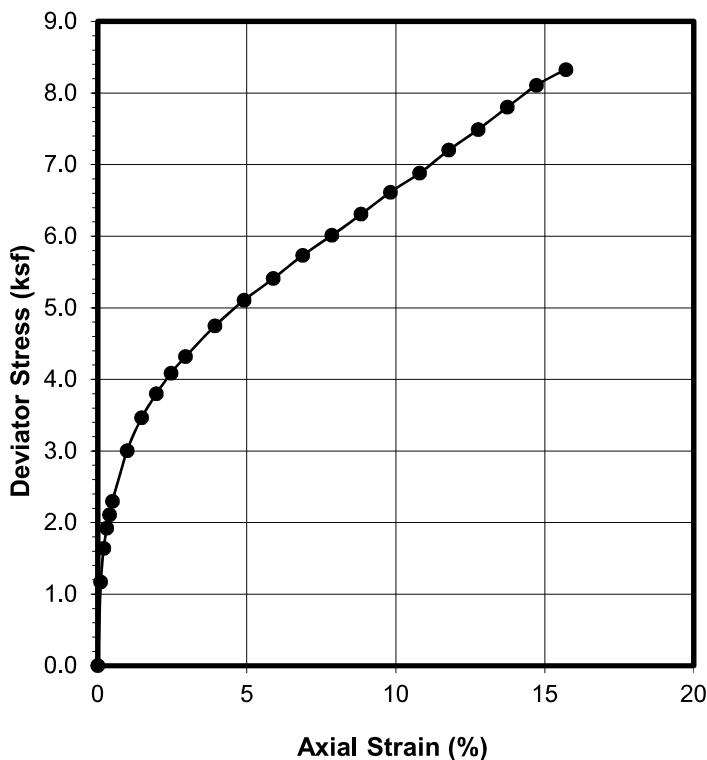
Sample Type: Mod. Cal.

Sample Diameter (inch):	2.409
Sample Height (inch):	5.093
Sample Weight (g):	784.51
Wt. of Wet Soil+Container (g):	125.17
Wt. of Dry Soil+Container (g):	113.09
Wt. of Container (g):	50.47

Wet Unit Weight (pcf):	<u>128.7</u>
Dry Unit Weight (pcf):	<u>107.9</u>
Moisture Content (%):	<u>19.3</u>
Void Ratio for $G_s=2.7$:	<u>0.56</u>
% Saturation:	<u>92.7</u>

TEST DATA

Cell Pressure (ksf):	7.00
Back Pressure (ksf):	0.0
Tested Total Confining Pressure (ksf):	7.00
Shear Rate (%/min):	0.3
Maximum Deviator Stress (ksf):	8.33
Ultimate Deviator Stress (ksf):	8.33
Ultimate Undrained Shear Strength (ksf):	4.16
Axial Strain @ Maximum Stress (%)	15.71

[illegible]

[illegible]

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST (UU,Q)
ASTM D 2850

Client Name:	Terracon		
Project Name:	Compass BESS		
Project No.:	60215170		
Boring No.:	B-19		
Sample No.:	-	Depth (feet):	45
Soil Description	Silty Clay		

Tested By: ST Date: 09/23/21
Checked by: AP Date: 09/28/21

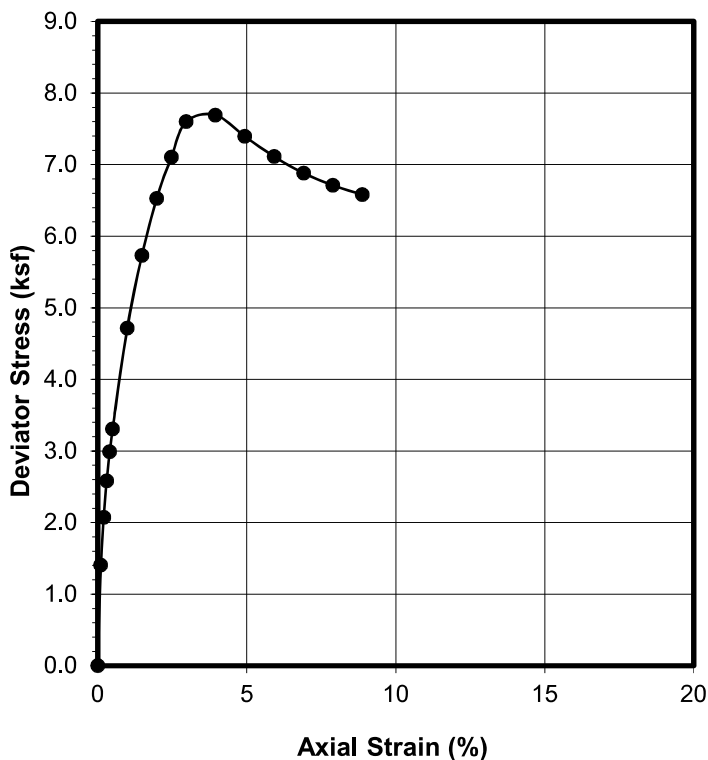
Sample Type: Mod. Cal.

Sample Diameter (inch):	2.395
Sample Height (inch):	5.070
Sample Weight (g):	679.89
Wt. of Wet Soil+Container (g):	105.81
Wt. of Dry Soil+Container (g):	92.53
Wt. of Container (g):	51.56

Wet Unit Weight (pcf):	<u>113.3</u>
Dry Unit Weight (pcf):	<u>85.6</u>
Moisture Content (%):	<u>32.4</u>
Void Ratio for $G_s=2.7$:	<u>0.97</u>
% Saturation:	<u>90.3</u>

TEST DATA

Cell Pressure (ksf):	5.00
Back Pressure (ksf):	0.0
Tested Total Confining Pressure (ksf):	5.00
Shear Rate (%/min):	0.3
Maximum Deviator Stress (ksf):	7.69
Ultimate Deviator Stress (ksf):	6.58
Ultimate Undrained Shear Strength (ksf):	3.29
Axial Strain @ Maximum Stress (%)	3.94

[illegible]

FIELD ELECTRICAL RESISTIVITY TEST DATA

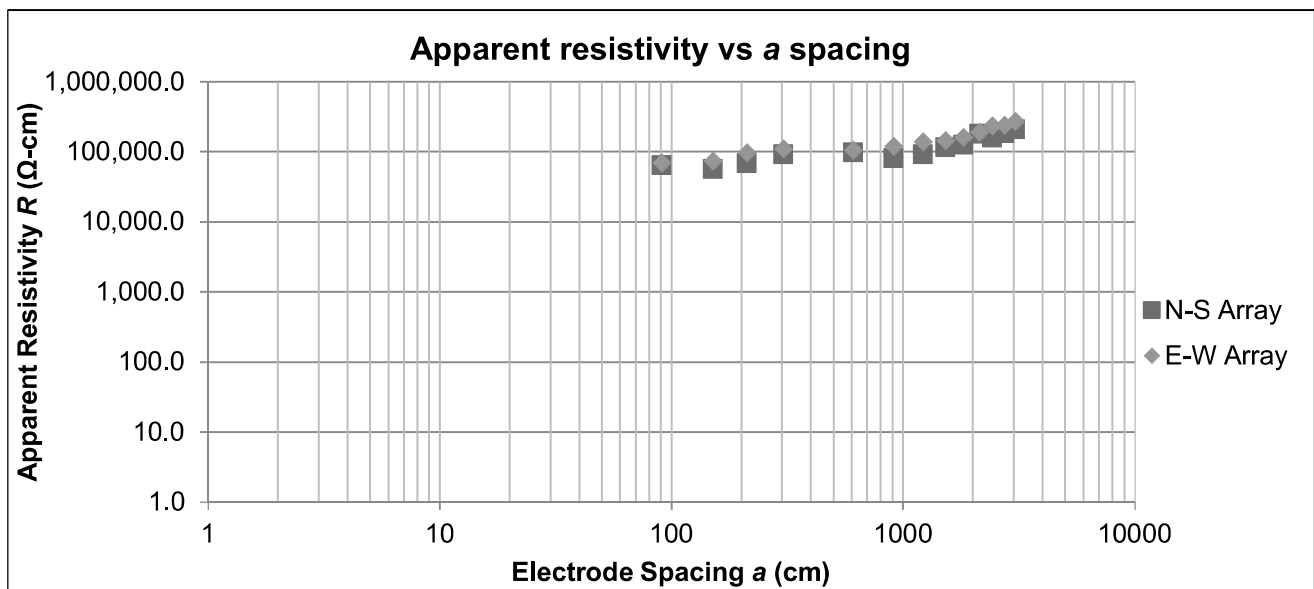
Compass BESS ■ San Juan Capistrano, Orange County, California
October 13, 2021 ■ Terracon Project No. 60215170



Array Loc.	Traverse 1 and 2 (See Site Plan)		
Instrument	The Mini Sting	Weather	Sunny
Serial #		Ground Cond.	Bare soil
Cal. Check	7/14/2021	Tested By	N.B.,C.M.
Test Date	October 4, 2021	Method	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012
Notes & Conflicts			

Apparent resistivity ρ is calculated as :
$$\rho = \frac{4\pi aR}{1 + \frac{2a}{\sqrt{a^2 + 4b^2}} - \frac{a}{\sqrt{a^2 + b^2}}}$$

Electrode Spacing a		Electrode Depth b		Traverse 1		Traverse 2	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance R	Apparent Resistivity ρ	Measured Resistance R	Apparent Resistivity ρ
				Ω	(Ω -cm)	Ω	(Ω -cm)
3	91	4	10	108.20	63150	118.50	69160
5	152	4	10	58.06	55870	76.99	74080
7	213	4	10	50.47	67800	71.57	96150
10	305	12	30	47.09	91750	56.30	109690
20	610	12	30	24.91	95880	27.60	106230
30	914	12	30	14.06	80900	20.57	118350
40	1219	12	30	11.75	90090	17.89	137170
50	1524	12	30	11.84	113450	15.15	145170
60	1829	12	30	10.80	124170	14.05	161540
70	2134	12	30	13.26	177860	14.12	189390
80	2438	12	30	10.16	155680	15.15	232140
90	2743	12	30	10.47	180490	13.90	239610
100	3048	12	30	10.73	205530	14.3	273910
120	3658	12	30	11.21	257680	13.51	310550
140	4267	12	30	8.715	233670		
160	4877	12	30	5.98	183260		



FIELD ELECTRICAL RESISTIVITY TEST DATA

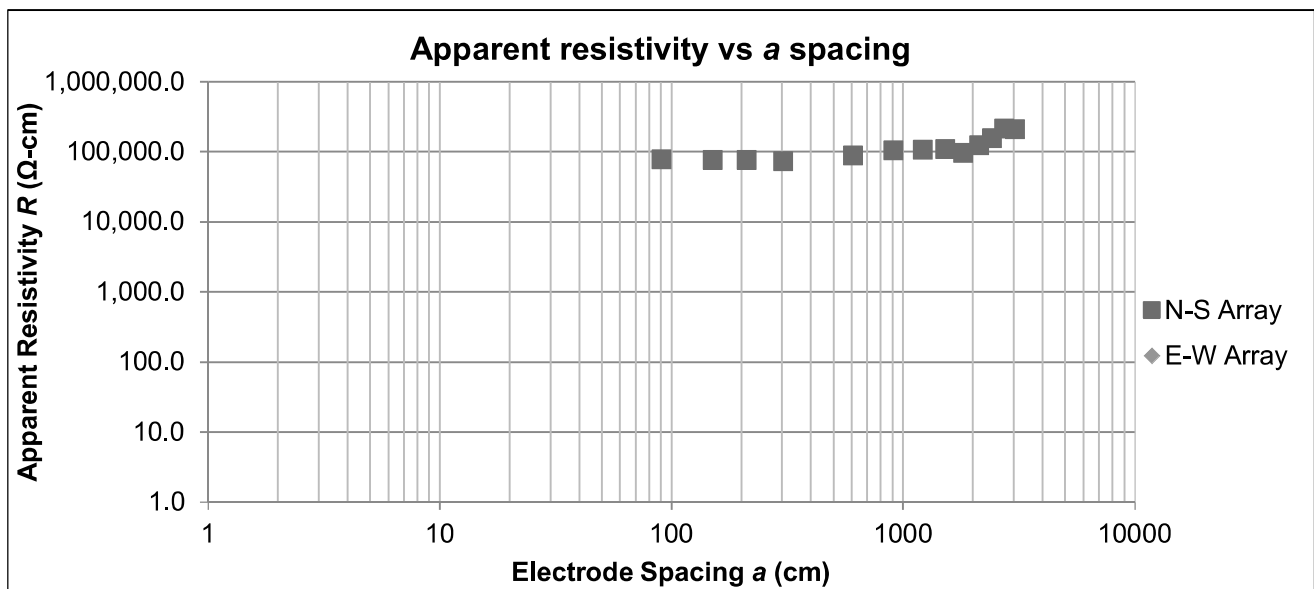
Compass BESS ■ San Juan Capistrano, Orange County, California
October 13, 2021 ■ Terracon Project No. 60215170



Array Loc.	Traverse 3 (See Site Plan)		
Instrument	The Mini Sting	Weather	Cloudy
Serial #		Ground Cond.	Bare soil
Cal. Check	7/14/2021	Tested By	N.B.,C.M.
Test Date	October 6, 2021	Method	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012
Notes & Conflicts			

Apparent resistivity ρ is calculated as :
$$\rho = \frac{4\pi aR}{1 + \frac{2a}{\sqrt{a^2 + 4b^2}} - \frac{a}{\sqrt{a^2 + b^2}}}$$

Electrode Spacing a		Electrode Depth b		Traverse 3			
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance R	Apparent Resistivity ρ		
				Ω	(Ω -cm)		
3	91	4	10	131.70	76860		
5	152	4	10	78.10	75150		
7	213	4	10	55.73	74870		
10	305	12	30	37.21	72500		
20	610	12	30	22.86	87990		
30	914	12	30	17.79	102360		
40	1219	12	30	13.85	106190		
50	1524	12	30	11.20	107320		
60	1829	12	30	8.32	95700		
70	2134	12	30	9.06	121480		
80	2438	12	30	10.00	153220		
90	2743	12	30	12.20	210310		
100	3048	12	30	10.73	205530		
120	3658	12	30	11.81	271470		
140	4267	12	30	11.74	314780		
160	4877	12	30	11.67	357630		



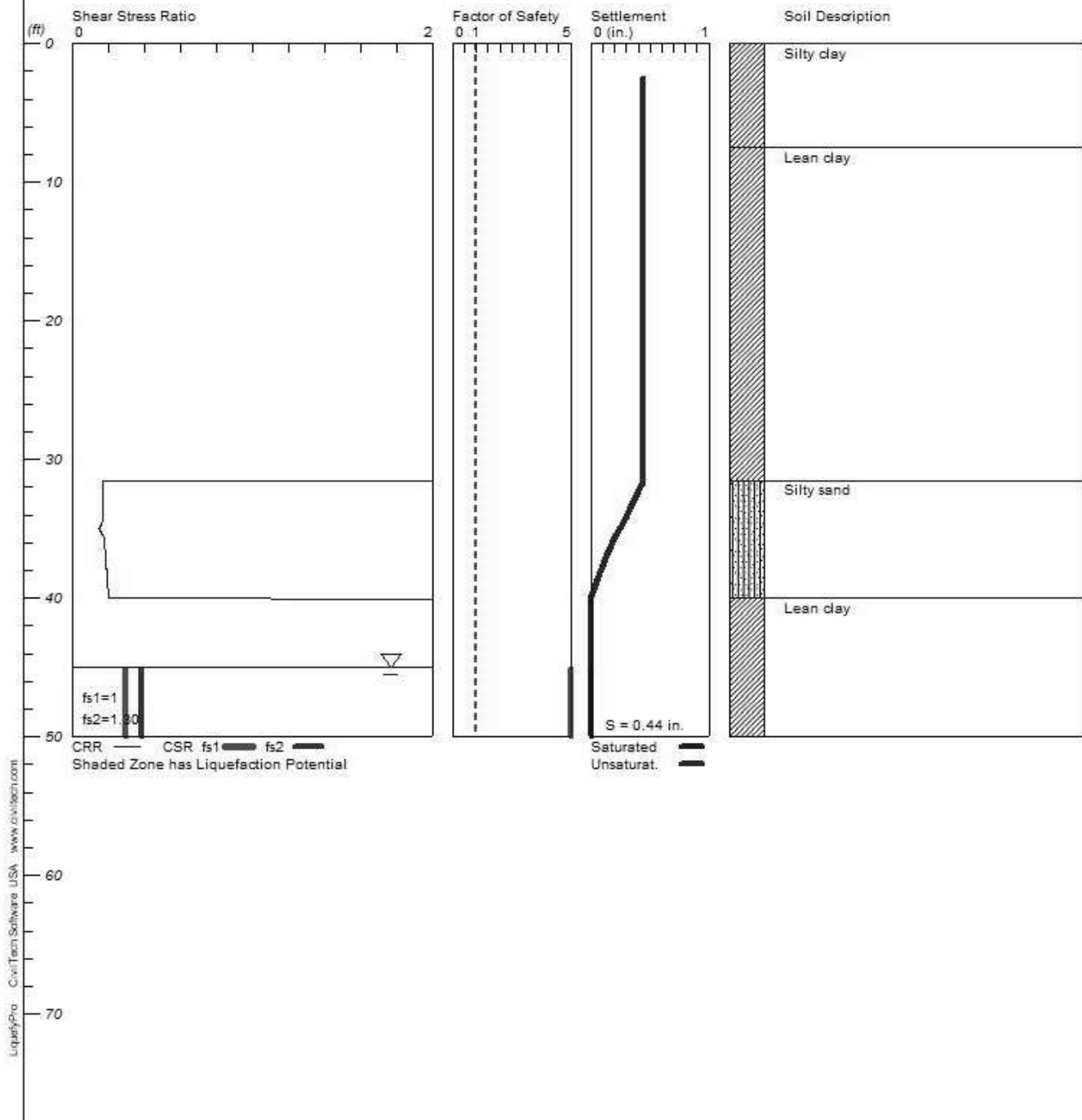
SUPPORTING INFORMATION

LIQUEFACTION ANALYSIS

Broad Reach Power Compass BESS

Hole No.=B-2 Water Depth=45 ft

Magnitude=7.69
Acceleration=0.563g



LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\vvnnguyen\OneDrive - Terracon Consultants Inc\Desktop\Liquefaction\60215170\B-2.liq
Title: Broad Reach Power Compass BESS
Subtitle: 60215170

Surface Elev.=
Hole No.=B-2
Depth of Hole= 50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration= 0.56 g
Earthquake Magnitude= 7.69

Input Data:

Surface Elev.=
Hole No.=B-2
Depth of Hole=50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration=0.56 g
Earthquake Magnitude=7.69
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.42
7. Borehole Diameter, Cb= 1.15
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.3
Plot two CSR (fs1=1, fs2=User)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
2.50	18.00	104.00	NoLiq
5.00	9.00	105.00	NoLiq
7.50	8.00	105.00	NoLiq
10.00	8.00	110.00	NoLiq
15.00	5.00	110.00	NoLiq
20.00	5.00	110.00	NoLiq
25.00	7.00	115.00	NoLiq
30.00	6.00	115.00	NoLiq
35.00	7.00	115.00	25.00
40.00	10.00	120.00	NoLiq

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.44 in.
Total Settlement of Saturated and Unsaturated Sands=0.44 in.
Differential Settlement=0.222 to 0.293 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
2.50	2.00	0.36	5.00	0.00	0.44	0.44
3.00	2.00	0.36	5.00	0.00	0.44	0.44
3.50	2.00	0.36	5.00	0.00	0.44	0.44
4.00	2.00	0.36	5.00	0.00	0.44	0.44
4.50	2.00	0.36	5.00	0.00	0.44	0.44
5.00	2.00	0.36	5.00	0.00	0.44	0.44
5.50	2.00	0.36	5.00	0.00	0.44	0.44
6.00	2.00	0.36	5.00	0.00	0.44	0.44
6.50	2.00	0.36	5.00	0.00	0.44	0.44
7.00	2.00	0.36	5.00	0.00	0.44	0.44
7.50	2.00	0.36	5.00	0.00	0.44	0.44
8.00	2.00	0.36	5.00	0.00	0.44	0.44
8.50	2.00	0.36	5.00	0.00	0.44	0.44
9.00	2.00	0.36	5.00	0.00	0.44	0.44
9.50	2.00	0.36	5.00	0.00	0.44	0.44
10.00	2.00	0.36	5.00	0.00	0.44	0.44

10.50	2.00	0.36	5.00	0.00	0.44	0.44
11.00	2.00	0.36	5.00	0.00	0.44	0.44
11.50	2.00	0.36	5.00	0.00	0.44	0.44
12.00	2.00	0.36	5.00	0.00	0.44	0.44
12.50	2.00	0.36	5.00	0.00	0.44	0.44
13.00	2.00	0.35	5.00	0.00	0.44	0.44
13.50	2.00	0.35	5.00	0.00	0.44	0.44
14.00	2.00	0.35	5.00	0.00	0.44	0.44
14.50	2.00	0.35	5.00	0.00	0.44	0.44
15.00	2.00	0.35	5.00	0.00	0.44	0.44
15.50	2.00	0.35	5.00	0.00	0.44	0.44
16.00	2.00	0.35	5.00	0.00	0.44	0.44
16.50	2.00	0.35	5.00	0.00	0.44	0.44
17.00	2.00	0.35	5.00	0.00	0.44	0.44
17.50	2.00	0.35	5.00	0.00	0.44	0.44
18.00	2.00	0.35	5.00	0.00	0.44	0.44
18.50	2.00	0.35	5.00	0.00	0.44	0.44
19.00	2.00	0.35	5.00	0.00	0.44	0.44
19.50	2.00	0.35	5.00	0.00	0.44	0.44
20.00	2.00	0.35	5.00	0.00	0.44	0.44
20.50	2.00	0.35	5.00	0.00	0.44	0.44
21.00	2.00	0.35	5.00	0.00	0.44	0.44
21.50	2.00	0.35	5.00	0.00	0.44	0.44
22.00	2.00	0.35	5.00	0.00	0.44	0.44
22.50	2.00	0.35	5.00	0.00	0.44	0.44
23.00	2.00	0.35	5.00	0.00	0.44	0.44
23.50	2.00	0.35	5.00	0.00	0.44	0.44
24.00	2.00	0.35	5.00	0.00	0.44	0.44
24.50	2.00	0.35	5.00	0.00	0.44	0.44
25.00	2.00	0.34	5.00	0.00	0.44	0.44
25.50	2.00	0.34	5.00	0.00	0.44	0.44
26.00	2.00	0.34	5.00	0.00	0.44	0.44
26.50	2.00	0.34	5.00	0.00	0.44	0.44
27.00	2.00	0.34	5.00	0.00	0.44	0.44
27.50	2.00	0.34	5.00	0.00	0.44	0.44
28.00	2.00	0.34	5.00	0.00	0.44	0.44
28.50	2.00	0.34	5.00	0.00	0.44	0.44
29.00	2.00	0.34	5.00	0.00	0.44	0.44
29.50	2.00	0.34	5.00	0.00	0.44	0.44
30.00	2.00	0.34	5.00	0.00	0.44	0.44
30.50	2.00	0.34	5.00	0.00	0.44	0.44
31.00	2.00	0.34	5.00	0.00	0.44	0.44
31.50	2.00	0.34	5.00	0.00	0.44	0.44
32.00	0.17	0.33	5.00	0.00	0.42	0.42
32.50	0.17	0.33	5.00	0.00	0.39	0.39
33.00	0.17	0.33	5.00	0.00	0.36	0.36
33.50	0.17	0.33	5.00	0.00	0.33	0.33
34.00	0.17	0.33	5.00	0.00	0.31	0.31
34.50	0.17	0.33	5.00	0.00	0.28	0.28
35.00	0.15	0.33	5.00	0.00	0.24	0.24
35.50	0.17	0.32	5.00	0.00	0.21	0.21
36.00	0.18	0.32	5.00	0.00	0.18	0.18
36.50	0.18	0.32	5.00	0.00	0.16	0.16
37.00	0.18	0.32	5.00	0.00	0.13	0.13
37.50	0.19	0.32	5.00	0.00	0.11	0.11
38.00	0.19	0.32	5.00	0.00	0.08	0.08
38.50	0.19	0.31	5.00	0.00	0.06	0.06
39.00	0.19	0.31	5.00	0.00	0.04	0.04
39.50	0.20	0.31	5.00	0.00	0.02	0.02
40.00	0.20	0.31	5.00	0.00	0.00	0.00
40.50	2.00	0.31	5.00	0.00	0.00	0.00
41.00	2.00	0.31	5.00	0.00	0.00	0.00
41.50	2.00	0.31	5.00	0.00	0.00	0.00
42.00	2.00	0.30	5.00	0.00	0.00	0.00
42.50	2.00	0.30	5.00	0.00	0.00	0.00
43.00	2.00	0.30	5.00	0.00	0.00	0.00
43.50	2.00	0.30	5.00	0.00	0.00	0.00
44.00	2.00	0.30	5.00	0.00	0.00	0.00
44.50	2.00	0.30	5.00	0.00	0.00	0.00
45.00	2.00	0.30	5.00	0.00	0.00	0.00
45.50	2.00	0.30	5.00	0.00	0.00	0.00
46.00	2.00	0.30	5.00	0.00	0.00	0.00
46.50	2.00	0.30	5.00	0.00	0.00	0.00
47.00	2.00	0.30	5.00	0.00	0.00	0.00
47.50	2.00	0.30	5.00	0.00	0.00	0.00
48.00	2.00	0.30	5.00	0.00	0.00	0.00
48.50	2.00	0.30	5.00	0.00	0.00	0.00
49.00	2.00	0.30	5.00	0.00	0.00	0.00
49.50	2.00	0.30	5.00	0.00	0.00	0.00
50.00	2.00	0.30	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft²)

CRRm Cyclic resistance ratio from soils

CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)

F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf

S_sat Settlement from saturated sands

S_dry Settlement from Unsaturated Sands

S_all Total Settlement from Saturated and Unsaturated Sands

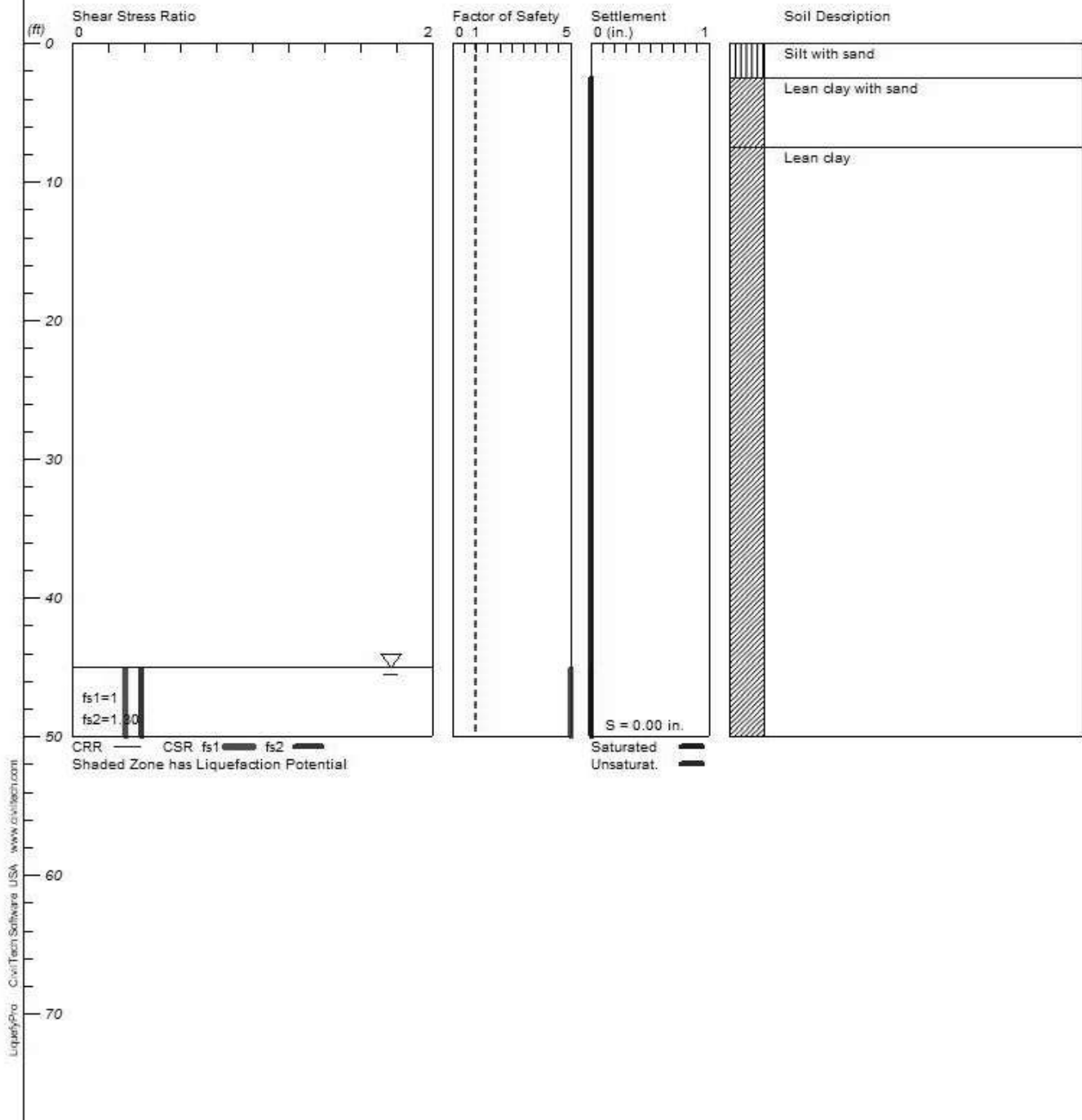
NoLiq No-Liquefy Soils

LIQUEFACTION ANALYSIS

Broad Reach Power Compass BESS

Hole No.=B-3 Water Depth=45 ft

Magnitude=7.69
Acceleration=0.563g



LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\vvnnguyen\OneDrive - Terracon Consultants Inc\Desktop\Liquefaction\60215170\B-3.liq
Title: Broad Reach Power Compass BESS
Subtitle: 60215170

Surface Elev.=
Hole No.=B-3
Depth of Hole= 50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration= 0.56 g
Earthquake Magnitude= 7.69

Input Data:

Surface Elev.=
Hole No.=B-3
Depth of Hole=50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration=0.56 g
Earthquake Magnitude=7.69
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
 2. Settlement Analysis Method: Tokimatsu, M-correction
 3. Fines Correction for Liquefaction: Stark/Olson et al.*
 4. Fine Correction for Settlement: During Liquefaction*
 5. Settlement Calculation in: All zones*
 6. Hammer Energy Ratio, Ce = 1.42
 7. Borehole Diameter, Cb = 1.15
 8. Sampling Method, Cs = 1.2
 9. User request factor of safety (apply to CSR) , User= 1.3
Plot two CSR (fs1=1, fs2=User)
 10. Use Curve Smoothing: Yes*
- * Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
2.50	21.00	120.00	NoLiq
5.00	13.00	120.00	NoLiq
7.50	18.00	123.00	NoLiq
10.00	22.00	123.00	NoLiq
15.00	18.00	123.00	NoLiq
20.00	12.00	123.00	NoLiq
25.00	12.00	120.00	NoLiq
30.00	9.00	118.00	NoLiq
35.00	5.00	120.00	NoLiq
40.00	8.00	120.00	NoLiq
45.00	7.00	120.00	NoLiq
50.00	10.00	120.00	90.00

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=0.00 in.
Differential Settlement=0.000 to 0.000 in.

Depth ft	CRRm	CSRfs	F.S.	S sat. in.	S dry in.	S all in.
2.50	2.00	0.36	5.00	0.00	0.00	0.00
3.00	2.00	0.36	5.00	0.00	0.00	0.00
3.50	2.00	0.36	5.00	0.00	0.00	0.00
4.00	2.00	0.36	5.00	0.00	0.00	0.00
4.50	2.00	0.36	5.00	0.00	0.00	0.00
5.00	2.00	0.36	5.00	0.00	0.00	0.00
5.50	2.00	0.36	5.00	0.00	0.00	0.00
6.00	2.00	0.36	5.00	0.00	0.00	0.00
6.50	2.00	0.36	5.00	0.00	0.00	0.00
7.00	2.00	0.36	5.00	0.00	0.00	0.00
7.50	2.00	0.36	5.00	0.00	0.00	0.00
8.00	2.00	0.36	5.00	0.00	0.00	0.00
8.50	2.00	0.36	5.00	0.00	0.00	0.00
9.00	2.00	0.36	5.00	0.00	0.00	0.00

[illegible]

* F.S.<1, Liquefaction Potential Zone

(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft²)

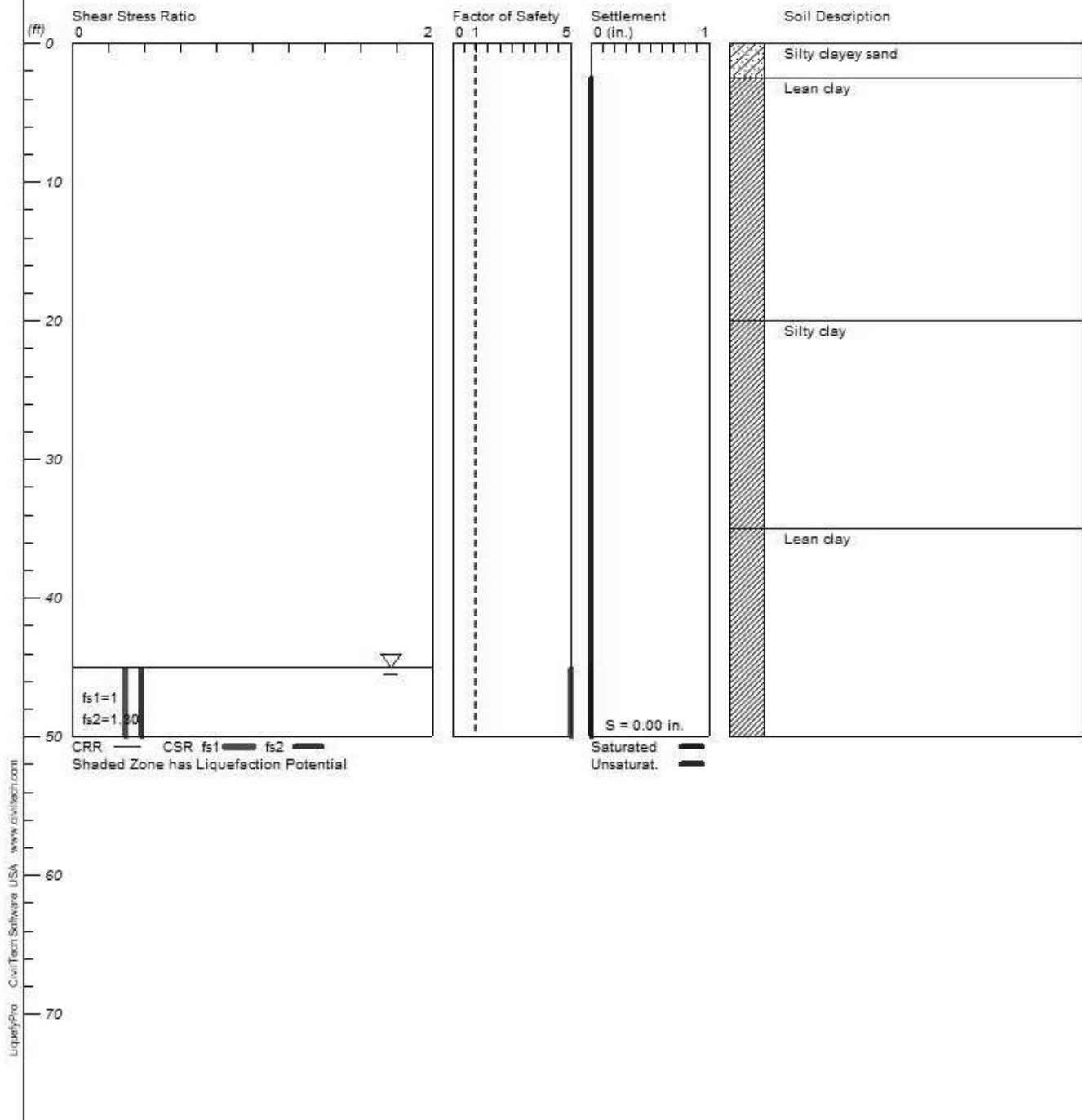
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

Broad Reach Power Compass BESS

Hole No.=B-7 Water Depth=45 ft

Magnitude=7.69
Acceleration=0.563g



LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\vvnnguyen\OneDrive - Terracon Consultants Inc\Desktop\Liquefaction\60215170\B-7.liq
Title: Broad Reach Power Compass BESS
Subtitle: 60215170

Surface Elev.=
Hole No.=B-7
Depth of Hole= 50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration= 0.56 g
Earthquake Magnitude= 7.69

Input Data:

Surface Elev.=
Hole No.=B-7
Depth of Hole=50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration=0.56 g
Earthquake Magnitude=7.69
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
 2. Settlement Analysis Method: Tokimatsu, M-correction
 3. Fines Correction for Liquefaction: Stark/Olson et al.*
 4. Fine Correction for Settlement: During Liquefaction*
 5. Settlement Calculation in: All zones*
 6. Hammer Energy Ratio, Ce = 1.42
 7. Borehole Diameter, Cb = 1.15
 8. Sampling Method, Cs = 1.2
 9. User request factor of safety (apply to CSR) , User= 1.3
Plot two CSR (fs1=1, fs2=User)
 10. Use Curve Smoothing: Yes*
- * Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
2.50	7.00	104.00	NoLiq
5.00	7.00	116.00	NoLiq
7.50	11.00	117.00	NoLiq
10.00	11.00	117.00	NoLiq
15.00	10.00	120.00	NoLiq
20.00	4.00	120.00	NoLiq
25.00	3.00	120.00	NoLiq
30.00	4.00	120.00	NoLiq
35.00	4.00	120.00	NoLiq
40.00	5.00	120.00	NoLiq
45.00	8.00	120.00	NoLiq
50.00	6.00	120.00	90.00

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=0.00 in.
Differential Settlement=0.000 to 0.000 in.

Depth ft	CRRm	CSRfs	F.S.	S sat. in.	S dry in.	S all in.
2.50	2.00	0.36	5.00	0.00	0.00	0.00
3.00	2.00	0.36	5.00	0.00	0.00	0.00
3.50	2.00	0.36	5.00	0.00	0.00	0.00
4.00	2.00	0.36	5.00	0.00	0.00	0.00
4.50	2.00	0.36	5.00	0.00	0.00	0.00
5.00	2.00	0.36	5.00	0.00	0.00	0.00
5.50	2.00	0.36	5.00	0.00	0.00	0.00
6.00	2.00	0.36	5.00	0.00	0.00	0.00
6.50	2.00	0.36	5.00	0.00	0.00	0.00
7.00	2.00	0.36	5.00	0.00	0.00	0.00
7.50	2.00	0.36	5.00	0.00	0.00	0.00
8.00	2.00	0.36	5.00	0.00	0.00	0.00
8.50	2.00	0.36	5.00	0.00	0.00	0.00
9.00	2.00	0.36	5.00	0.00	0.00	0.00

[illegible]

* F.S.<1, Liquefaction Potential Zone

(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft²)

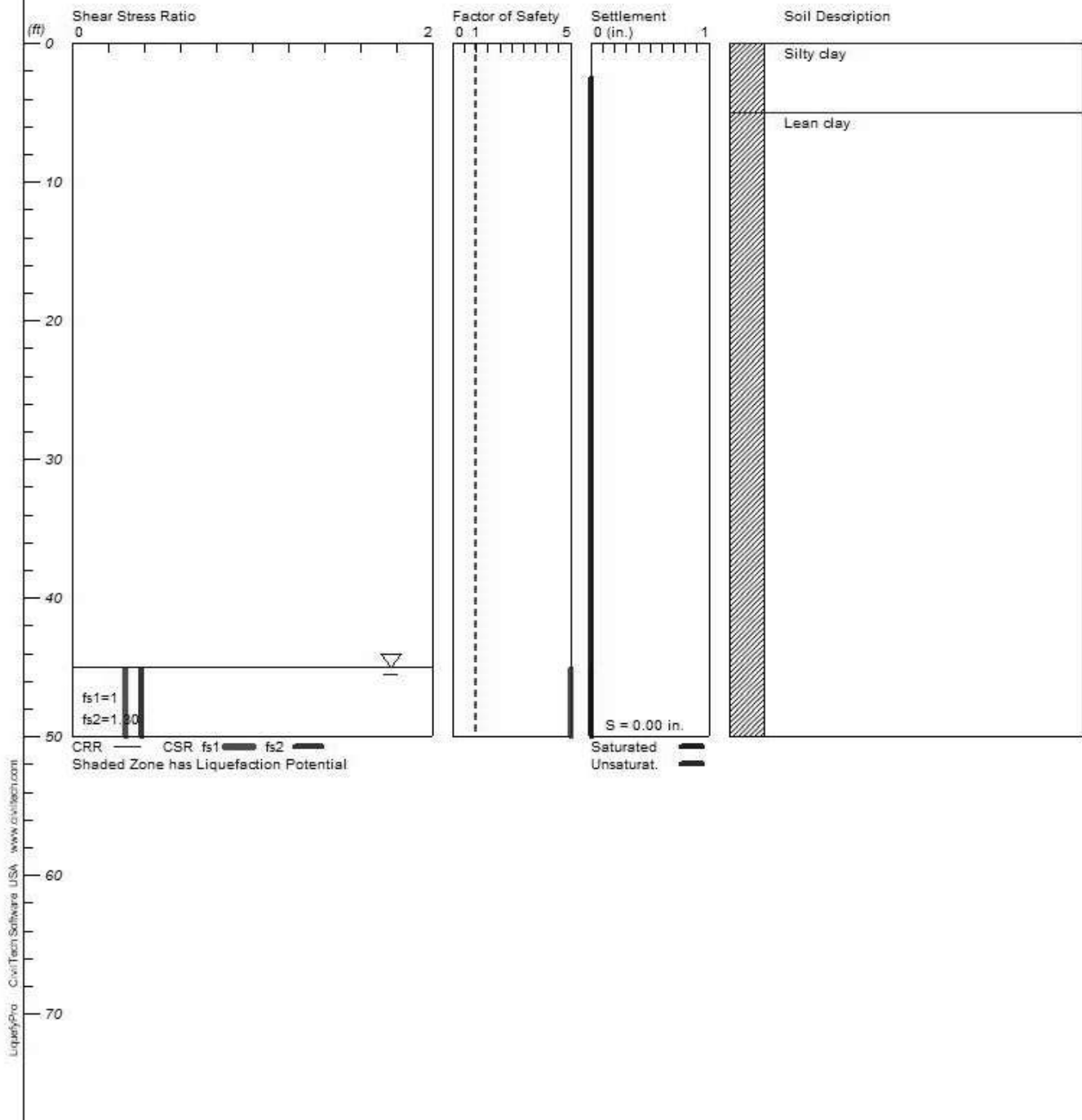
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

Broad Reach Power Compass BESS

Hole No.=B-15 Water Depth=45 ft

Magnitude=7.69
Acceleration=0.563g



LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\vvnnguyen\OneDrive - Terracon Consultants Inc\Desktop\Liquefaction\60215170\B-15.liq
Title: Broad Reach Power Compass BESS
Subtitle: 60215170

Surface Elev.=
Hole No.=B-15
Depth of Hole= 50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration= 0.56 g
Earthquake Magnitude= 7.69

Input Data:

Surface Elev.=
Hole No.=B-15
Depth of Hole=50.00 ft
Water Table during Earthquake= 45.00 ft
Water Table during In-Situ Testing= 47.00 ft
Max. Acceleration=0.56 g
Earthquake Magnitude=7.69
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
 2. Settlement Analysis Method: Tokimatsu, M-correction
 3. Fines Correction for Liquefaction: Stark/Olson et al.*
 4. Fine Correction for Settlement: During Liquefaction*
 5. Settlement Calculation in: All zones*
 6. Hammer Energy Ratio, Ce = 1.42
 7. Borehole Diameter, Cb = 1.15
 8. Sampling Method, Cs = 1.2
 9. User request factor of safety (apply to CSR) , User= 1.3
Plot two CSR (fs1=1, fs2=User)
 10. Use Curve Smoothing: Yes*
- * Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
2.50	10.00	104.00	NoLiq
5.00	11.00	105.00	NoLiq
7.50	14.00	105.00	NoLiq
10.00	13.00	110.00	NoLiq
15.00	10.00	110.00	NoLiq
20.00	5.00	110.00	NoLiq
25.00	5.00	115.00	NoLiq
30.00	6.00	115.00	NoLiq
35.00	7.00	115.00	NoLiq
40.00	8.00	120.00	NoLiq
45.00	9.00	120.00	NoLiq
50.00	14.00	120.00	90.00

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.00 in.
Total Settlement of Saturated and Unsaturated Sands=0.00 in.
Differential Settlement=0.000 to 0.000 in.

Depth ft	CRRm	CSRfs	F.S.	S sat. in.	S dry in.	S all in.
2.50	2.00	0.36	5.00	0.00	0.00	0.00
3.00	2.00	0.36	5.00	0.00	0.00	0.00
3.50	2.00	0.36	5.00	0.00	0.00	0.00
4.00	2.00	0.36	5.00	0.00	0.00	0.00
4.50	2.00	0.36	5.00	0.00	0.00	0.00
5.00	2.00	0.36	5.00	0.00	0.00	0.00
5.50	2.00	0.36	5.00	0.00	0.00	0.00
6.00	2.00	0.36	5.00	0.00	0.00	0.00
6.50	2.00	0.36	5.00	0.00	0.00	0.00
7.00	2.00	0.36	5.00	0.00	0.00	0.00
7.50	2.00	0.36	5.00	0.00	0.00	0.00
8.00	2.00	0.36	5.00	0.00	0.00	0.00
8.50	2.00	0.36	5.00	0.00	0.00	0.00
9.00	2.00	0.36	5.00	0.00	0.00	0.00

[illegible]

* F.S.<1, Liquefaction Potential Zone

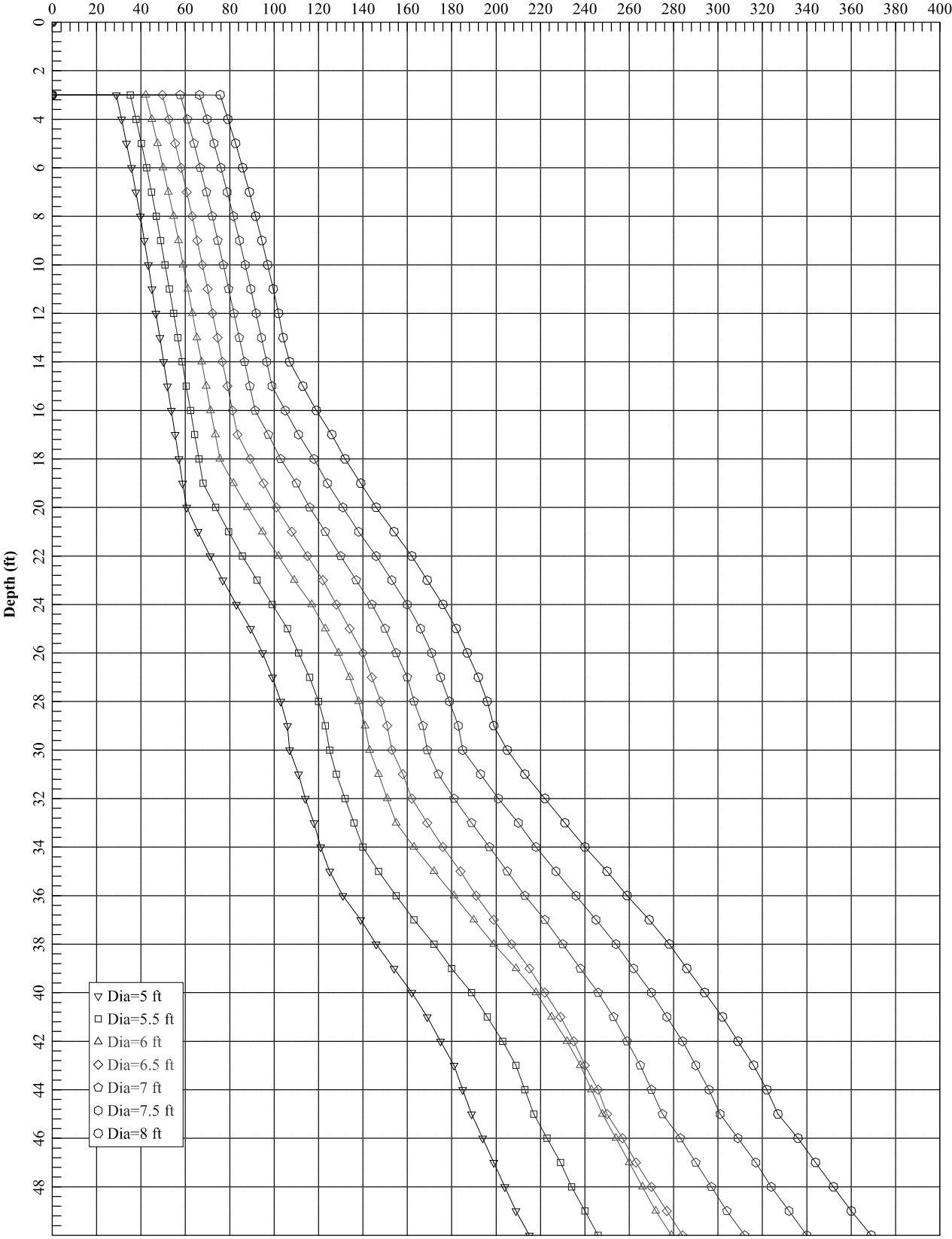
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

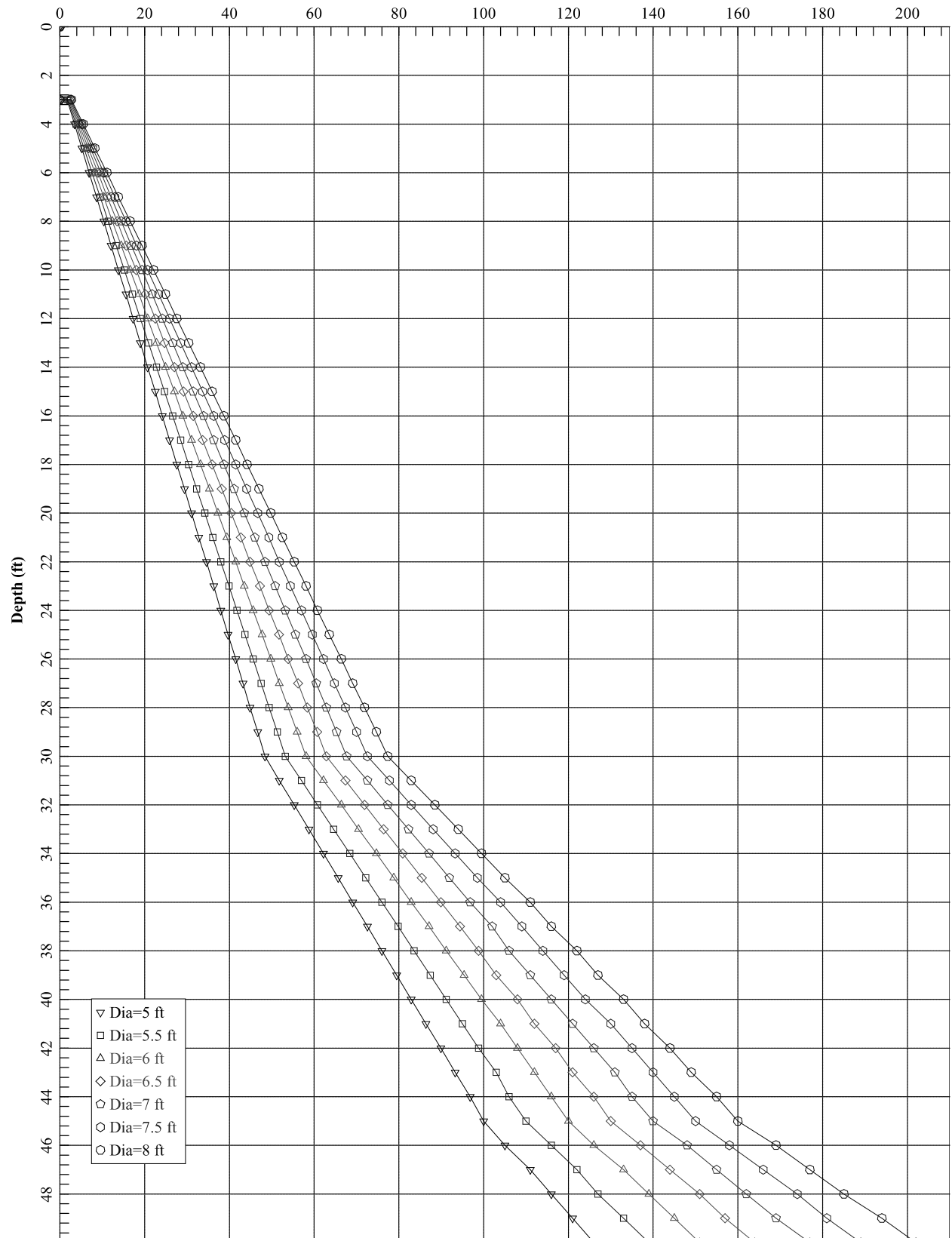
1 atm (atmosphere) = 1 tsf (ton/ft²)

CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

**Drilled Shaft Allowable Downward Capacity
Total Resistance/F.S. (tons)**



Drilled Shaft Allowable Side Resistance
Side Resistance/F.S. (tons)



GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING				WATER LEVEL		Water Initially Encountered	FIELD TESTS	(HP) Hand Penetrometer
						Water Level After a Specified Period of Time		(T) Torvane
						Water Level After a Specified Period of Time		(b/f) Standard Penetration Test (blows per foot)
						Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.		N N value
								(PID) Photo-Ionization Detector
								(OVA) Organic Vapor Analyzer
								(WOH) Weight of Hammer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS	RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
	Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-Value Blows/Ft.
	Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1
	Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4
	Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8
	Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15
	Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30
				Hard	> 8,000	> 30
						> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

<u>Major Component of Sample</u>	<u>Particle Size</u>
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

<u>Term</u>	<u>Plasticity Index</u>
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A					Soil Classification	
					Group Symbol	Group Name ^B
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	Cu ≥ 4 and 1 ≤ Cc ≤ 3 ^E		GW	Well-graded gravel ^F
			Cu < 4 and/or [Cc<1 or Cc>3.0] ^E		GP	Poorly graded gravel ^F
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH		GM	Silty gravel ^{F, G, H}
			Fines classify as CL or CH		GC	Clayey gravel ^{F, G, H}
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	Cu ≥ 6 and 1 ≤ Cc ≤ 3 ^E		SW	Well-graded sand ^I
			Cu < 6 and/or [Cc<1 or Cc>3.0] ^E		SP	Poorly graded sand ^I
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH		SM	Silty sand ^{G, H, I}
			Fines classify as CL or CH		SC	Clayey sand ^{G, H, I}
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots on or above “A”		CL	Lean clay ^{K, L, M}
			PI < 4 or plots below “A” line ^J		ML	Silt ^{K, L, M}
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay ^{K, L, M, N}
			Liquid limit - not dried			Organic silt ^{K, L, M, O}
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line		CH	Fat clay ^{K, L, M}
			PI plots below “A” line		MH	Elastic Silt ^{K, L, M}
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay ^{K, L, M, P}
			Liquid limit - not dried			Organic silt ^{K, L, M, Q}
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

^A Based on the material passing the 3-inch (75-mm) sieve.

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

$$^E Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

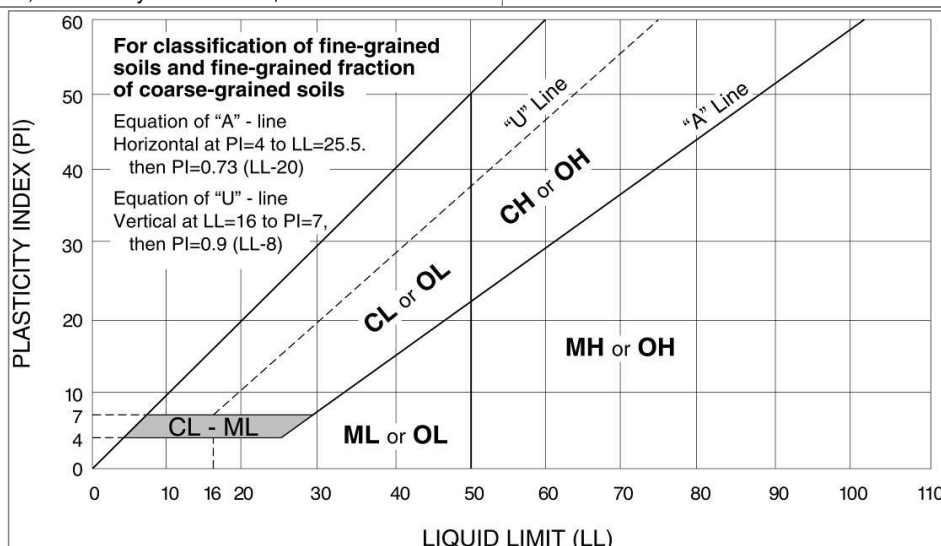
^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



Attachment H

Per Example E.9: Sizing to Achieve Target Average Annual Capture Efficiency, Flow-based Biotreatment BMPs

Given:

- No Infiltration Condition
- Imperviousness off onsite surfacing = 100%
- Imperviousness of offsite surfacing = 0.00%
- Imperviousness of contributing areas = 42.26%
- The BMP is located in an area with an 85th percentile, 24-hour storm of 0.85 inches.
- No HSC provided upstream
- An underground detention basin that meets the acceptance criteria in Appendix J
- No infiltration assumed

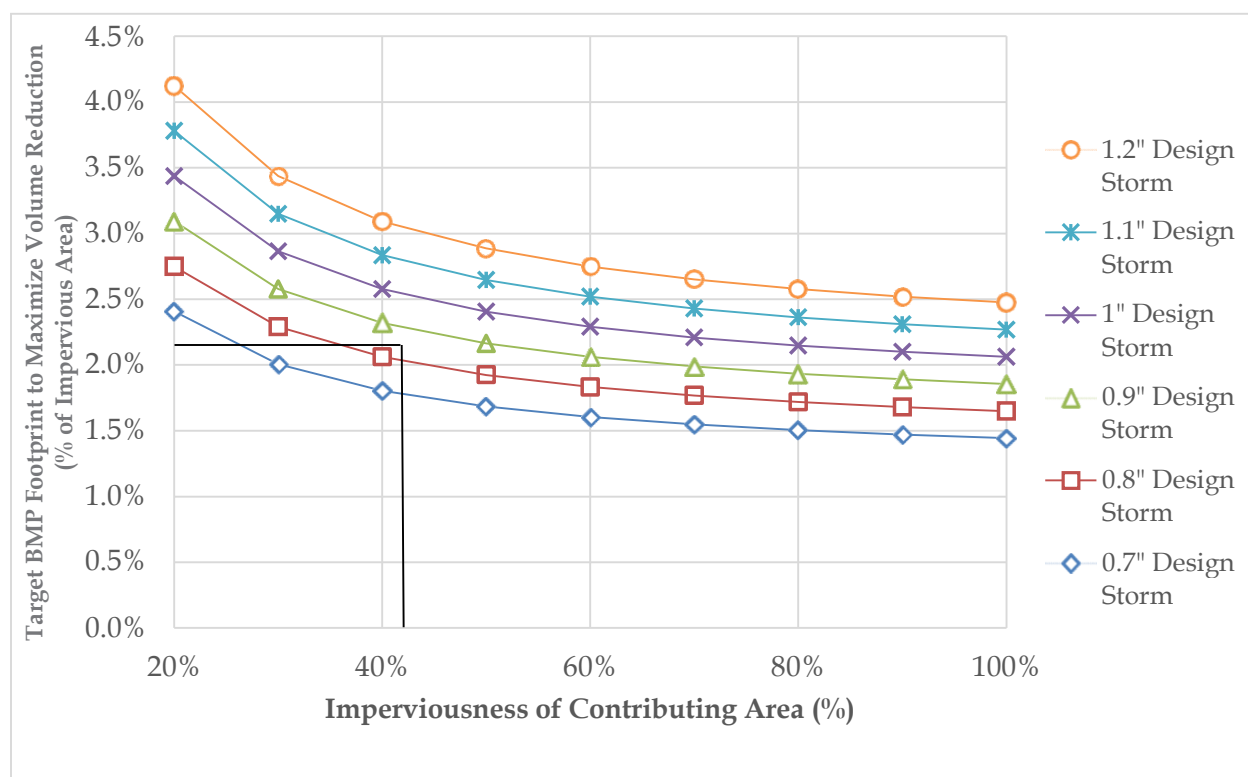
Given:
• No Infiltration Condition • Drainage Area (Total)= 24.09 acres: 10.18 acres (onsite) + 13.91 acres (offsite) • Imperviousness off contributing areas = 42.26% • The BMP is located in an area with an 85th percentile, 24-hour storm of 0.85 inches. • No HSC provided upstream • An underground detention basin that meets the acceptance criteria in Appendix J • No infiltration assumed
Required
• Determine compact biofiltration design flowrate and size supplemental infiltration gallery
Solution
1. Time of Concentration = 14.98 minutes per methods in Section E.2.3 2. Intensity from Figure E-7 below: $I = 0.2125$ in/hr 3. $C = 0.4226 * 0.75 + 0.15 = 0.0475$ 4. $Q = 0.0475 * 0.2125 \text{ in/hr} * 24.09 \text{ acre} = 0.2434 \text{ cfs}$ 5. $Q_{\text{design}} = 0.2434 * 150\% = \mathbf{0.3651 \text{ cfs}}$ 6. Per Graph E 4.2 below, the footprint of upstream and downstream BMPs needs to be 2.15 percent of the tributary impervious area. 7. $\text{Area} = 10.18 \text{ acre} * 0.0215 * 43560 \text{ sq-ft/acre} = \mathbf{9533.9772 \text{ sq. ft or } 0.2189 \text{ acres}}$

E.4.2 Calculating the Target Biofiltration Footprint to Maximize Volume Reduction

This section applies to Biofiltration BMPs within DMAs categorized as “Biotreatment with Partial Infiltration,” specifically **BIO-1** (Bioretention with Elevated Underdrain Discharge) and **BIO-5** (Compact Biofiltration with Supplemental Retention). The footprint of biofiltration BMPs is an important factor in the degree to which incidental volume reduction is expected to occur in these BMPs.

Figure E-9 provides a simple method to determine the target biofiltration BMP footprint to maximize volume reduction. This is expressed as a percent of the tributary impervious area. In some cases, this factor may control the sizing of biofiltration BMPs. It is used as a check in various sizing methods. Based on the design capture storm depth and the DMA imperviousness, the best match from this figure should be used. The presence of documented and supported space constraints (as discussed in **Section 4.2.4** of the TGD) can be considered in establishing a target footprint smaller than the target in **Figure E-9**.

Figure E-9. Target Biofiltration Footprint to Maximize Volume Reduction



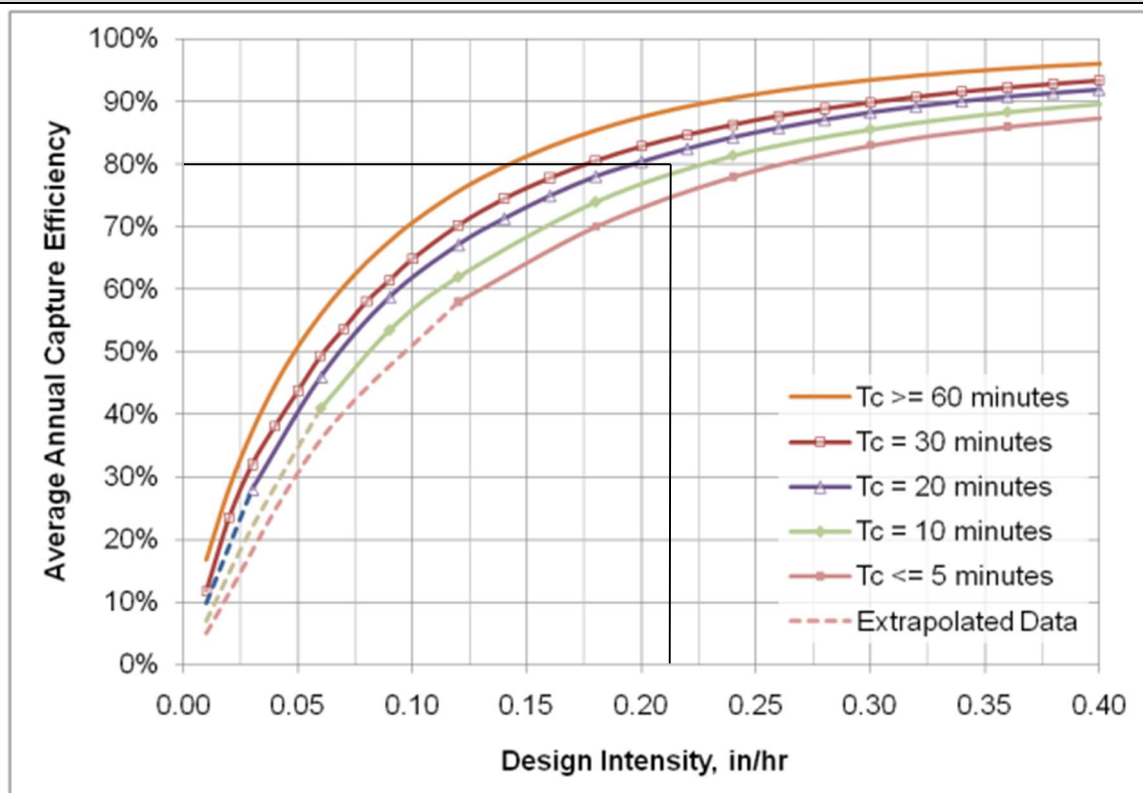
E.4.2.1 Basis for Target Footprint for Incidental Volume Reduction

This TGD establishes the goal that BMPs should achieve incidental volume reduction of 40 percent of average annual volume reduction. This is intended to provide equivalent pollutant load reduction in biofiltration BMPs as would be achieved in full infiltration BMPs. This

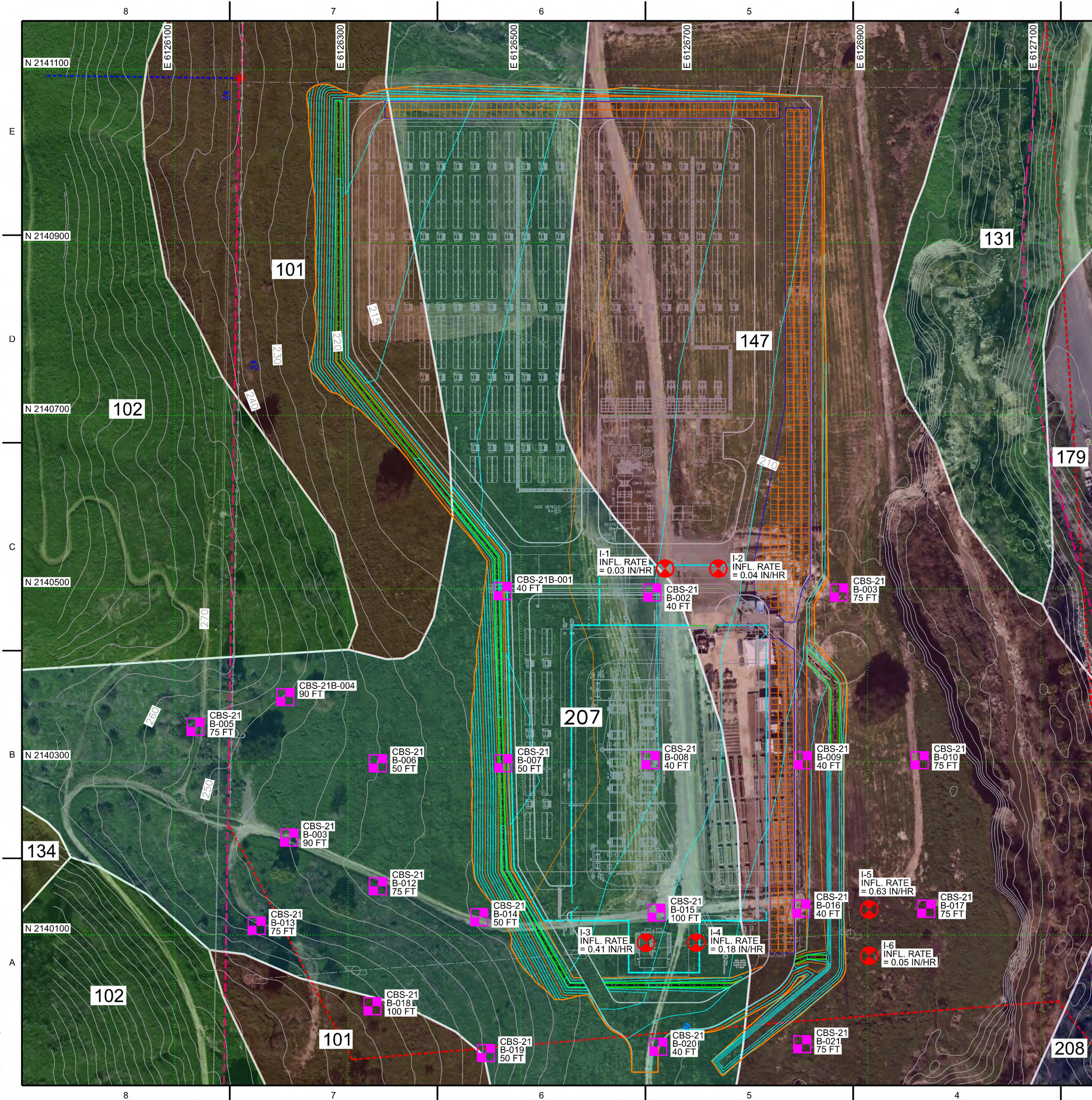
Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Provide time of concentration assumptions:

Graphical Operations

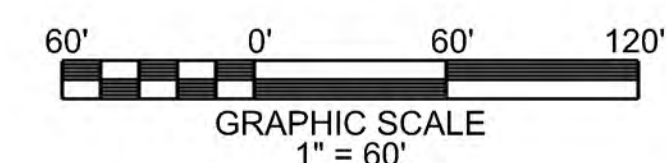


Provide supporting graphical operations. See Example III.7.



PERMIT ONLY
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MAP UNIT SYMBOL	MAP UNIT NAME	HYDROLOGIC SOIL GROUP
101	ALO CLAY, 15 TO 30 PERCENT SLOPES, DRY	D
102	ALO CLAY, 30 TO 50 PERCENT SLOPES, WARM MAAT, MLRA 20	D
131	BOTELLA LOAM, 2 TO 9 PERCENT SLOPES, WARM MAAT, LOWER MAP, MLRA 19	C
134	CALLEGUAS CLAY LOAM, 50 TO 75 PERCENT SLOPES, ERODED	D
147	CORRALITOS LOAMY SAND, MODERATELY FINE SUBSTRATUM	A
179	MYFORD SANDY LOAM, THICK SURFACE, 2 TO 9 PERCENT SLOPES	D
191	RIVERWASH	
206	SORRENTO LOAM, 0 TO 2 PERCENT SLOPES, WARM MAAT, MLRA 19	C
207	SORRENTO LOAM, 2 TO 9 PERCENT SLOPES, WARM MAAT, MLRA 19	C
208	SORRENTO LOAM, 0 TO 2 PERCENT SLOPES, WARM MAAT, MLRA 19	C



LEGEND

- | | | |
|---|-----------------------------------|----------------------------------|
|  | I-2
INFL. RATE
= 0.04 IN/HR | INFILTRATION BORING |
|  | CBS-21
B-017
75 FT | STANDARD SOIL BORING - 40' DEPTH |

NOTES

- | | |
|----|--|
| 1. | GEOTECHNICAL ENGINEERING REPORT PREPARED BY TERRACON CONSULTANTS, INC. "BROAD REACH POWER COMPASS BESS, SAN JUAN CAPISTRANO, ORANGE COUNTY, CA", NOVEMBER 3, 2021, REVISION 1. |
| 2. | FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND, SEE DRAWING CMP-CS-002. |

REFERENCE DRAWINGS

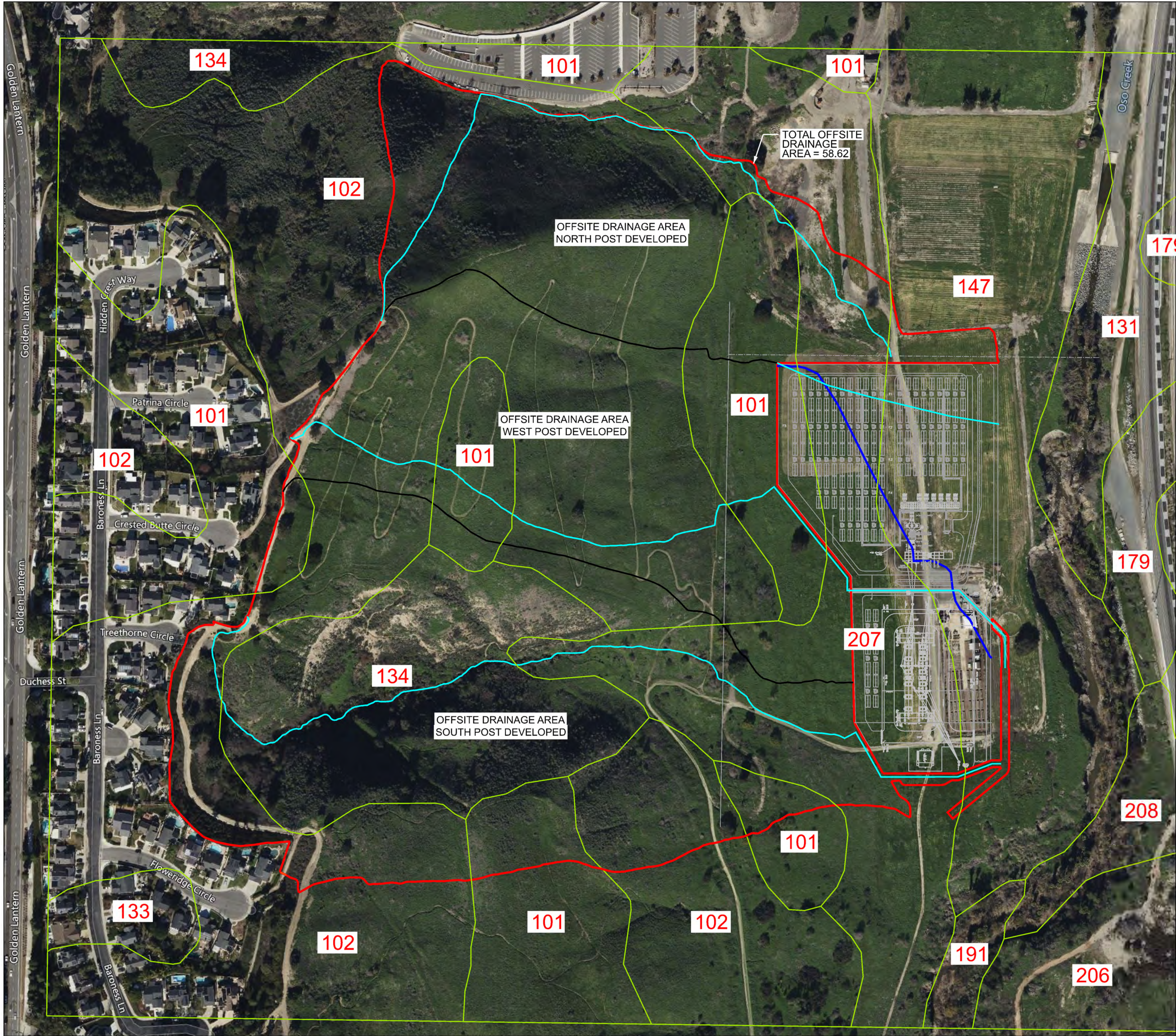
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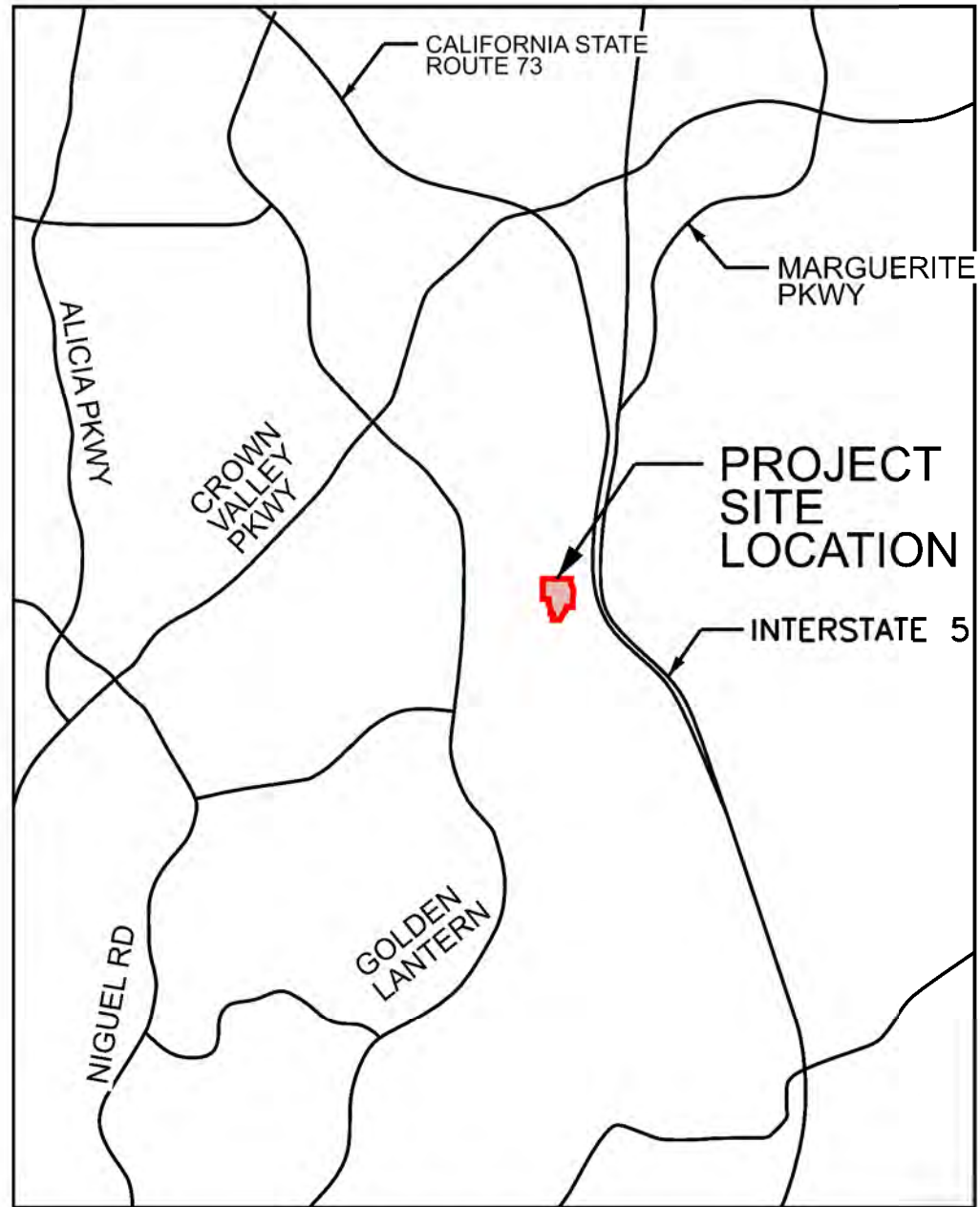
THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

HOLD INFORMATION		
NO.	DESCRIPTION	
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RELEASE INFORMATION		
REV.	DATE	DESCRIPTION
0A	06-17-2022	ISSUED FOR PERMIT
0B	02-23-2024	ISSUED FOR PERMIT
ISSUE PURPOSE: PERMIT		
SPECIFICATION: -		
PROJECT NO.: 14089-012		
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CALIFORNIA.		
CAD FILE NAME: ATTACHMENT 1.DWG		
PREPARED BY: JC		
REVIEWED BY: MT		
APPROVED BY: --		
ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.		
 SARGENT & LUNDY 55 EAST MONROE STREET CHICAGO, ILLINOIS 60603-5780		
 BROAD REACH POWER		
PROJECT		
COMPASS BATTERY ENERGY STORAGE		
DRAWING TITLE		
SOIL AND GEOLOGIC INFILTRATION MAP		
DRAWING NUMBER		REVISION
ATTACHMENT 1		0B
SHEET	1 OF 1	

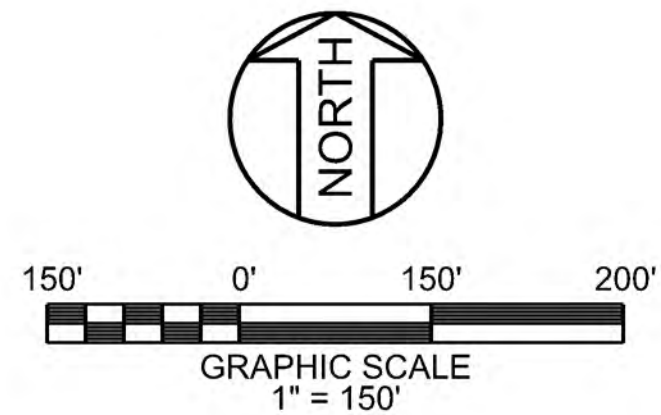
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Form GDD-0401-01-09, ANSI (Imperial) MicroStation Border - Size D - 22 x 34
Revision 11A, Revision Date: 04-30-2010



PERMIT ONLY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE: 1" = 800'



LEGEND	
	TIME OF CONCENTRATION PRE-DEVELOPED
	TIME OF CONCENTRATION POST-DEVELOPED
	OFFSITE DRAINAGE AREA
	NORTH, WEST, AND SOUTH DRAINAGE DELINEATIONS

NOTES	

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APPROVED BY: --		
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 SARGENT & LUNDY 55 EAST MONROE STREET CHICAGO, ILLINOIS 60603-5780		
 BROAD REACH POWER		
PROJECT		
COMPASS BATTERY ENERGY STORAGE		
DRAWING TITLE		
OFFSITE DRAINAGE AREA		
DRAWING NUMBER		REVISION
EXHIBIT-CMP-004		0C
SHEET 1 OF 1		

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	TRAVIS ANTONISSEN 949-237-8866 TRAVIS.ANTONISSEN@ADSPIPE.COM
ADS SALES REP:	MATT NOBLE 951-603-6551 MATTHEW.NOBLE@ADSPIPE.COM
PROJECT NO:	S331285



COMPASS BATTERY ENERGY STORAGE

LAGUNA NIGUEL - CA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-7200.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

- STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

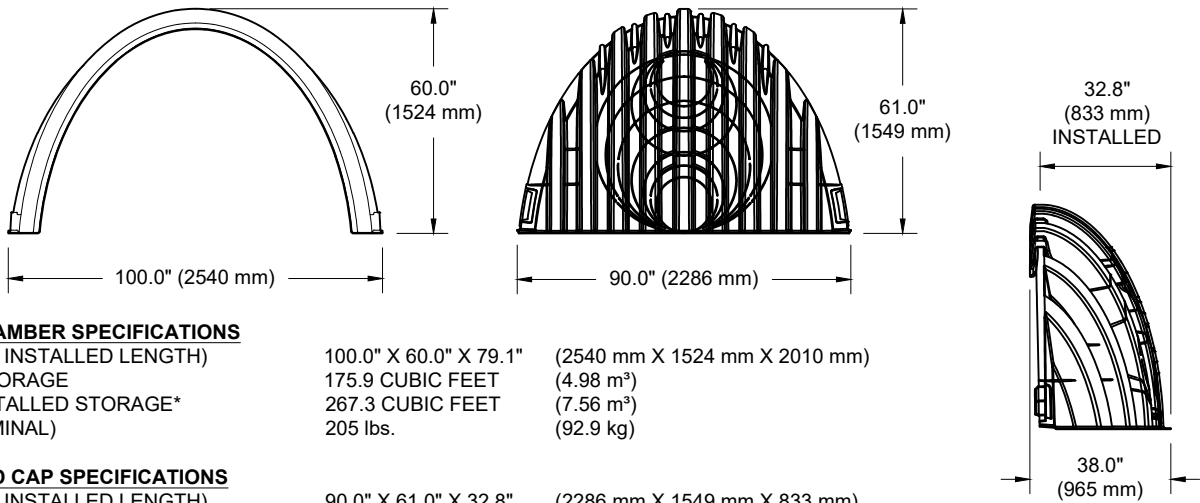
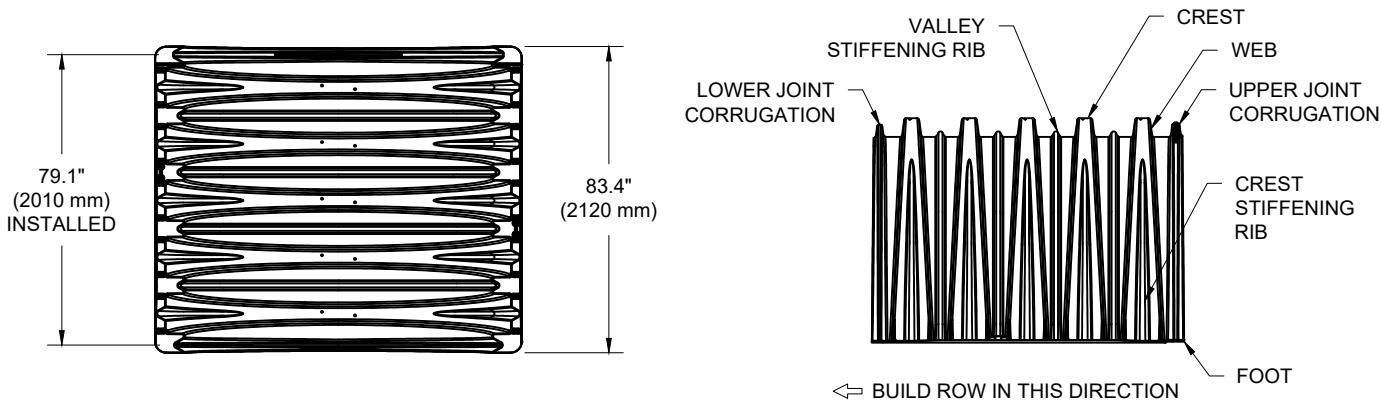
- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

MC-7200 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)

CHAMBER STORAGE

MINIMUM INSTALLED STORAGE*

WEIGHT (NOMINAL)

100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
175.9 CUBIC FEET	(4.98 m ³)
267.3 CUBIC FEET	(7.56 m ³)
205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)

END CAP STORAGE

MINIMUM INSTALLED STORAGE*

WEIGHT (NOMINAL)

90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
39.5 CUBIC FEET	(1.12 m ³)
115.3 CUBIC FEET	(3.26 m ³)
90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"

PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

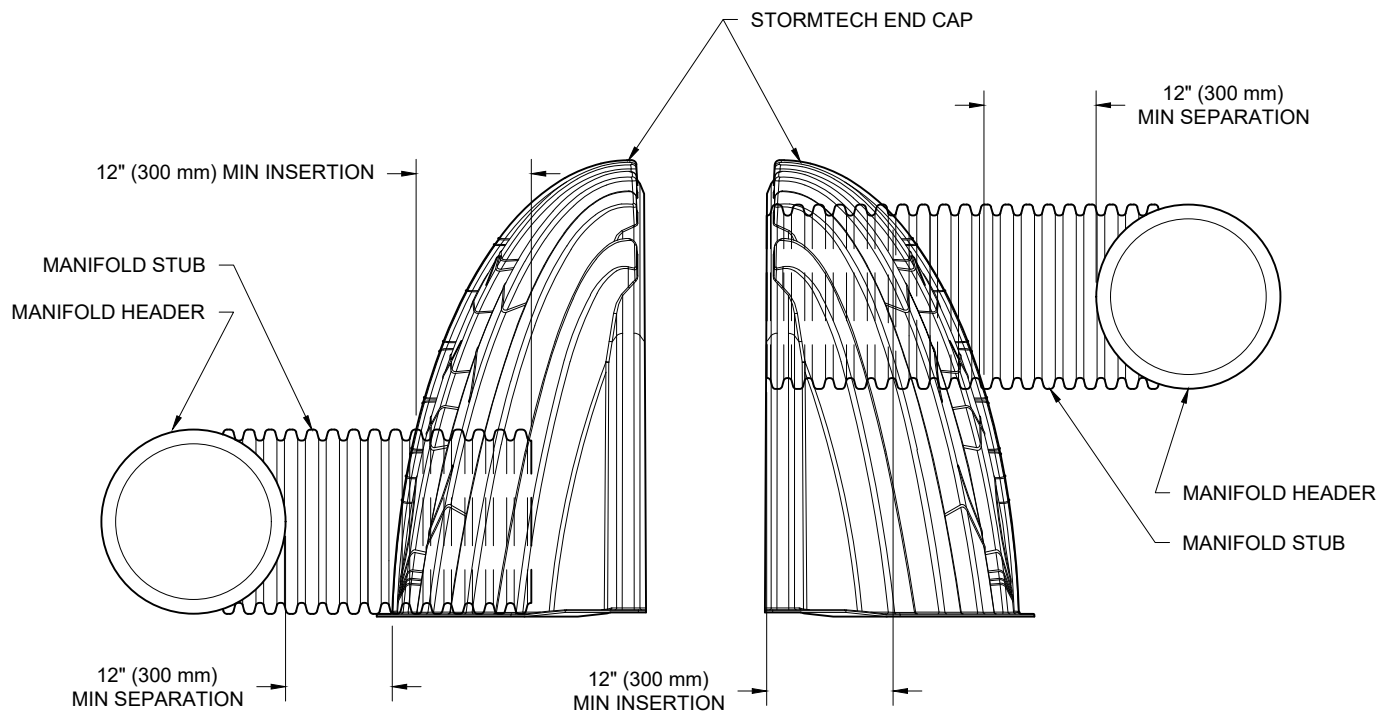
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW		---	1.97" (50 mm)
MC7200IEPP18B			
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW		---	2.26" (57 mm)
MC7200IEPP24B			
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

NOTE: ALL DIMENSIONS ARE NOMINAL

COMPASS BATTERY ENERGY STORAGE

LAGUNA NIGUEL - CA

DATE:	01/05/23	DRAWN:	MM
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PROJECT #: S331285

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Chamber System

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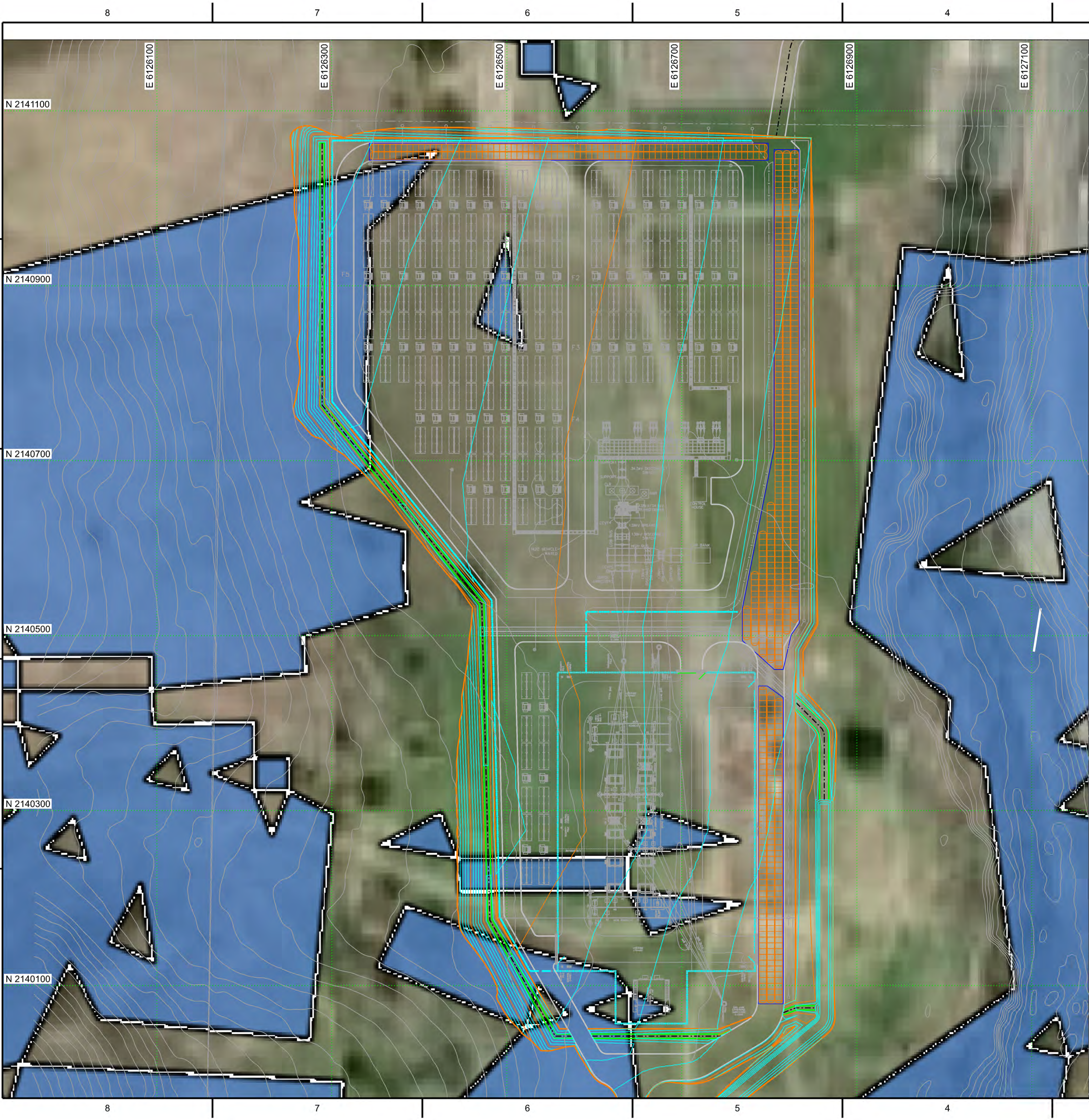
4640 TRUEMAN BLVD
HILLIARD, OH 43026



4 SHEET OF 4

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Form GGG-0401-01-09, ANSI (Imperial) MicroStation Border - Size D - 22 x 34
Revision 11A, Revision Date: 04-30-2010

Attachment L



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APPROVED BY: --		
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 BROAD REACH POWER		
PROJECT		
COMPASS BATTERY ENERGY STORAGE		
DRAWING TITLE		
POTENTIAL COARSE SEDIMENT YIELD MAP		
DRAWING NUMBER		REVISION
ATTACHMENT 2		0B
SHEET	1 OF 1	

NOTES

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