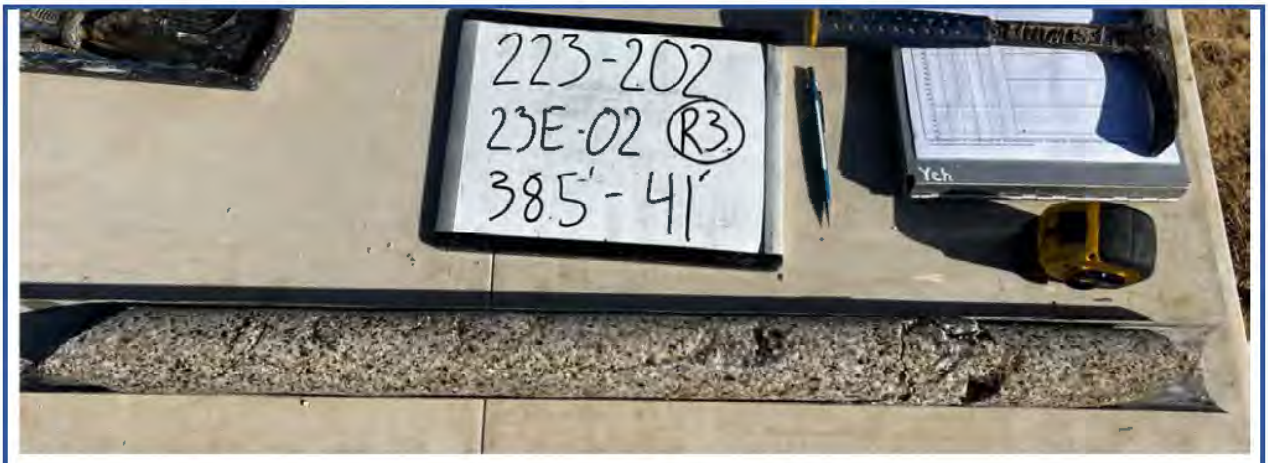
DOCKETED	
Docket Number:	21-AFC-02
Project Title:	Willow Rock Energy Storage Center
TN #:	254828
Document Title:	Willow Rock Energy Storage Center SAFC Volume II - Appendix 511A - Part II
Description:	N/A
Filer:	Amanda Cooey
Organization:	Ellison Schneider Harris & Donlan LLP
Submitter Role:	Applicant Representative
Submission Date:	3/4/2024 3:13:57 PM
Docketed Date:	3/4/2024

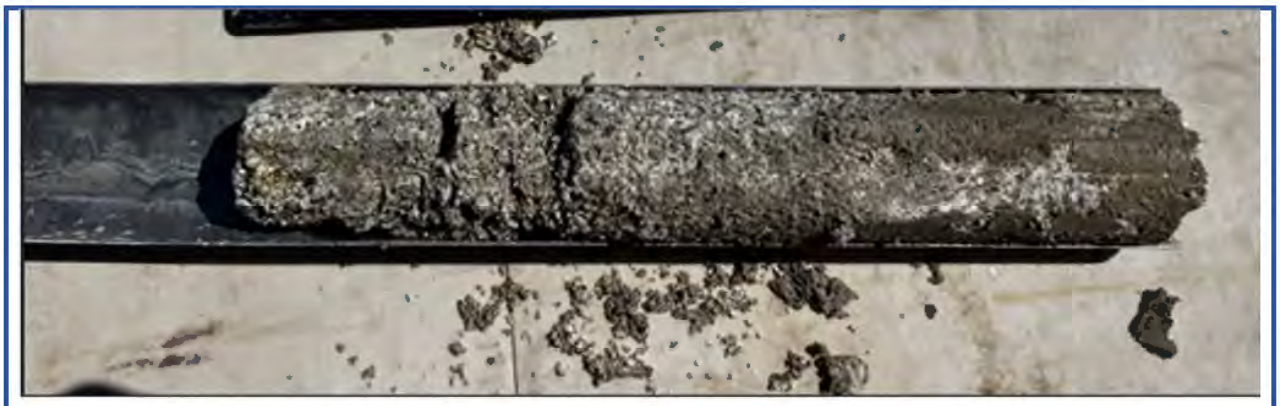
23E-02 Run 1 From 31.0 feet to 35.5 feet

23E-02 Run 2 from 35.5 feet to 38.5 feet

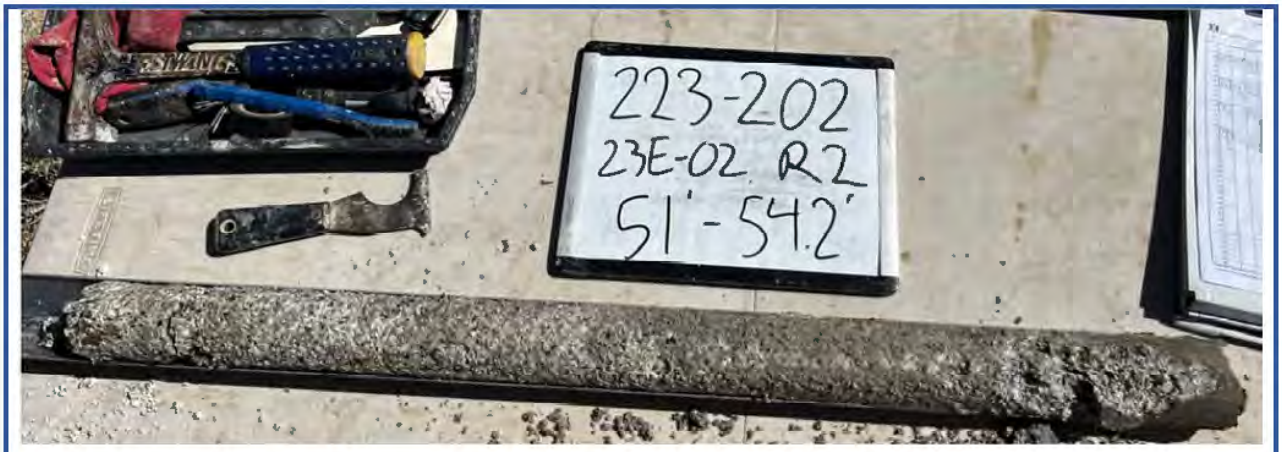


23E-02 Run 3 From 38.5 feet to 41 feet

23E-02 Run 4 from 41 feet to 46 feet



23E-02 Run 1 from 50.0 to 51.0 feet



23E-02 Run 2 from 51.0 to 54.2 feet

23E-02 Run 2 from 54.2 to 56.0 feet

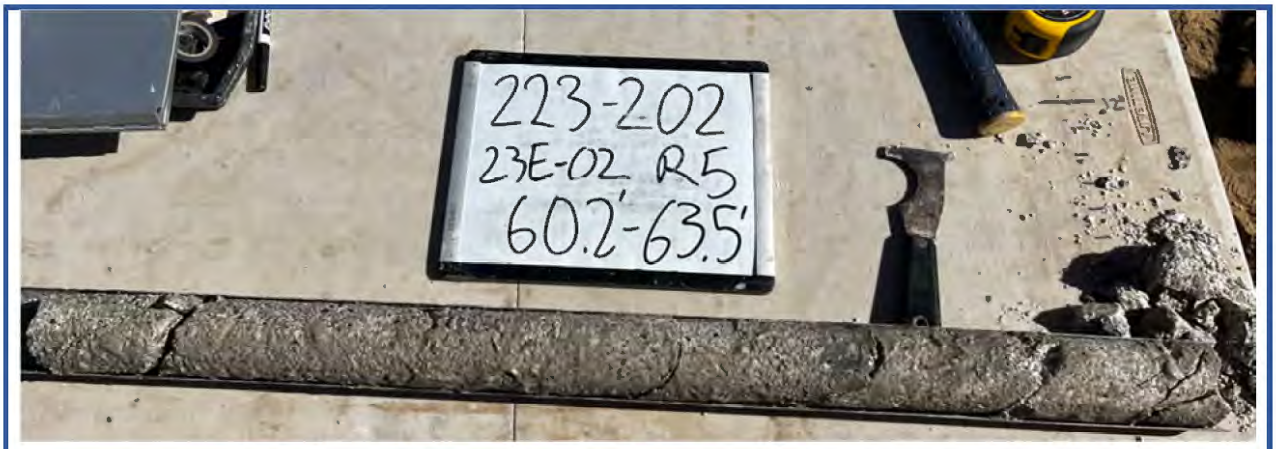
23E-02 Run 2 from 35.5 to 38.5 feet

23E-02 Run 4 from 41 to 46 feet

23E-02 Run 5 from 56.0 to 60.2 feet

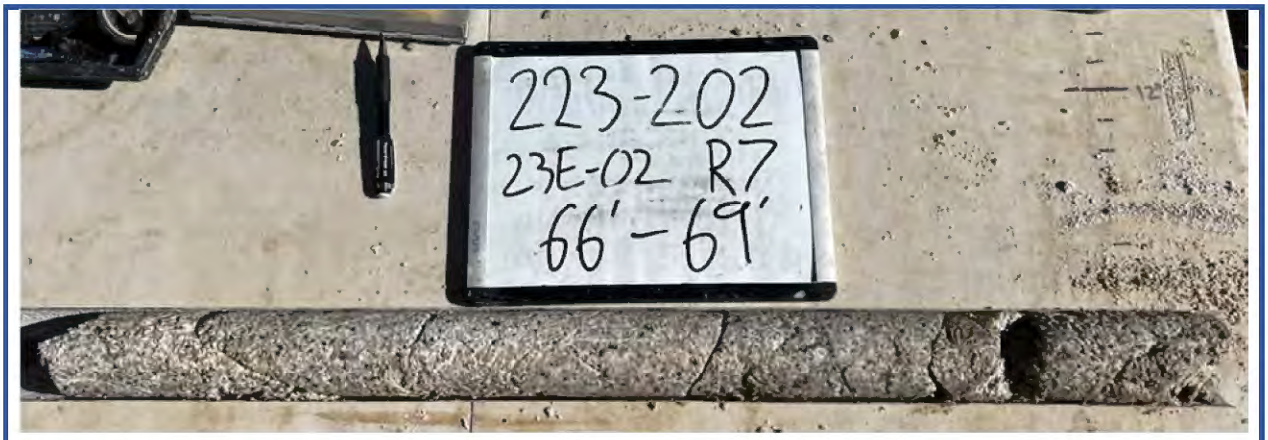
23E-02 Run 5 from 46 feet to 51 feet

23E-02 Run 4 from 56 to 60.2 feet

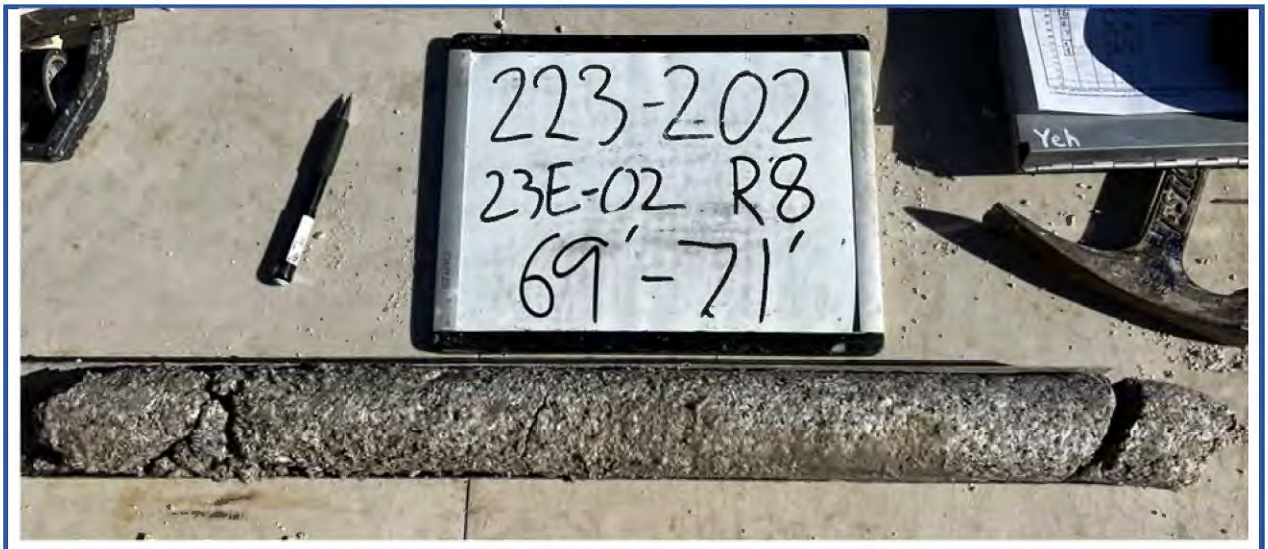


23E-02 Run 5 from 60.2 to 63.5 feet

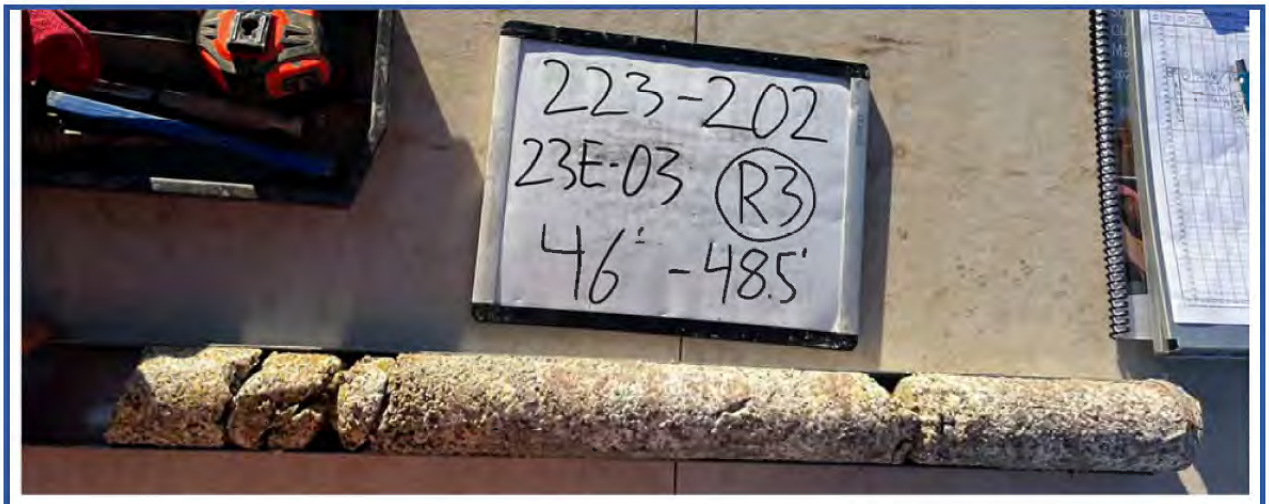
23E-02 Run 6 from 63.5 to 66.0 feet



23E-02 Run 7 from 66.0 to 69.0 feet



23E-02 Run 8 from 69.0 to 71.0 feet



23E-03 Run 3 from 46.0 to 48.5 feet

23E-03 Run 4 from 48.5 to 51.0 feet

23E-03 Run 6 from 54.8 to 60.0 feet

23E-04 Run1 From 31.0 feet to 36.0 feet

23E-04 Run 2 From 36.0 feet 37.7 feet

23E-04 Run 3 From 37.7 feet 41.0 feet

23E-04 Run 4 From 41.0 feet 46.0 feet

23E-04 Run 5 From 46.0 feet 51.0 feet

23E-05 Run 1 from 50.0 feet to 51.0 feet

23E-05 Run 2 from 51.0 feet to 53.8 feet

23E-05 Run 3 from 53.8 feet to 56.0 feet

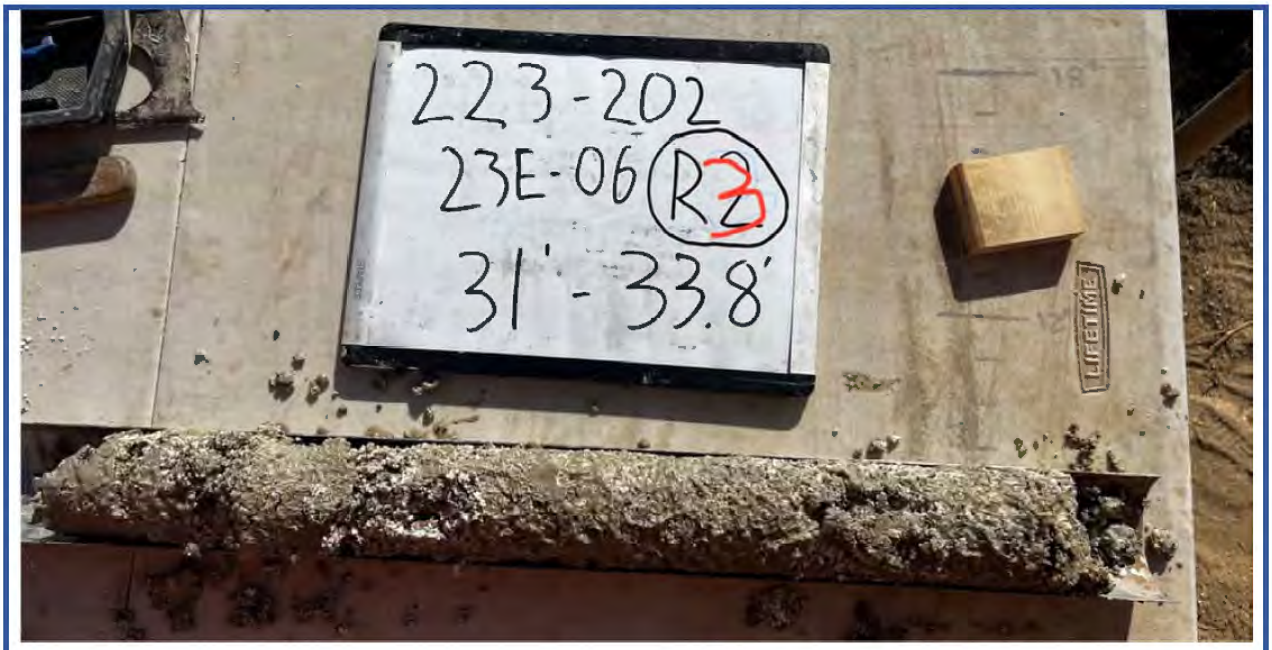
23E-05 Run 4 from 56.0 feet to 58.5 feet

23E-05 Run 5 from 58.5 feet to 61.0 feet

23E-05 Run 6 from 61.0 feet to 66.0 feet

23E-05 Run 7 from 66.0 feet to 71.0 feet

23E-06 Run 2 From 26.0 feet to 31.0 feet

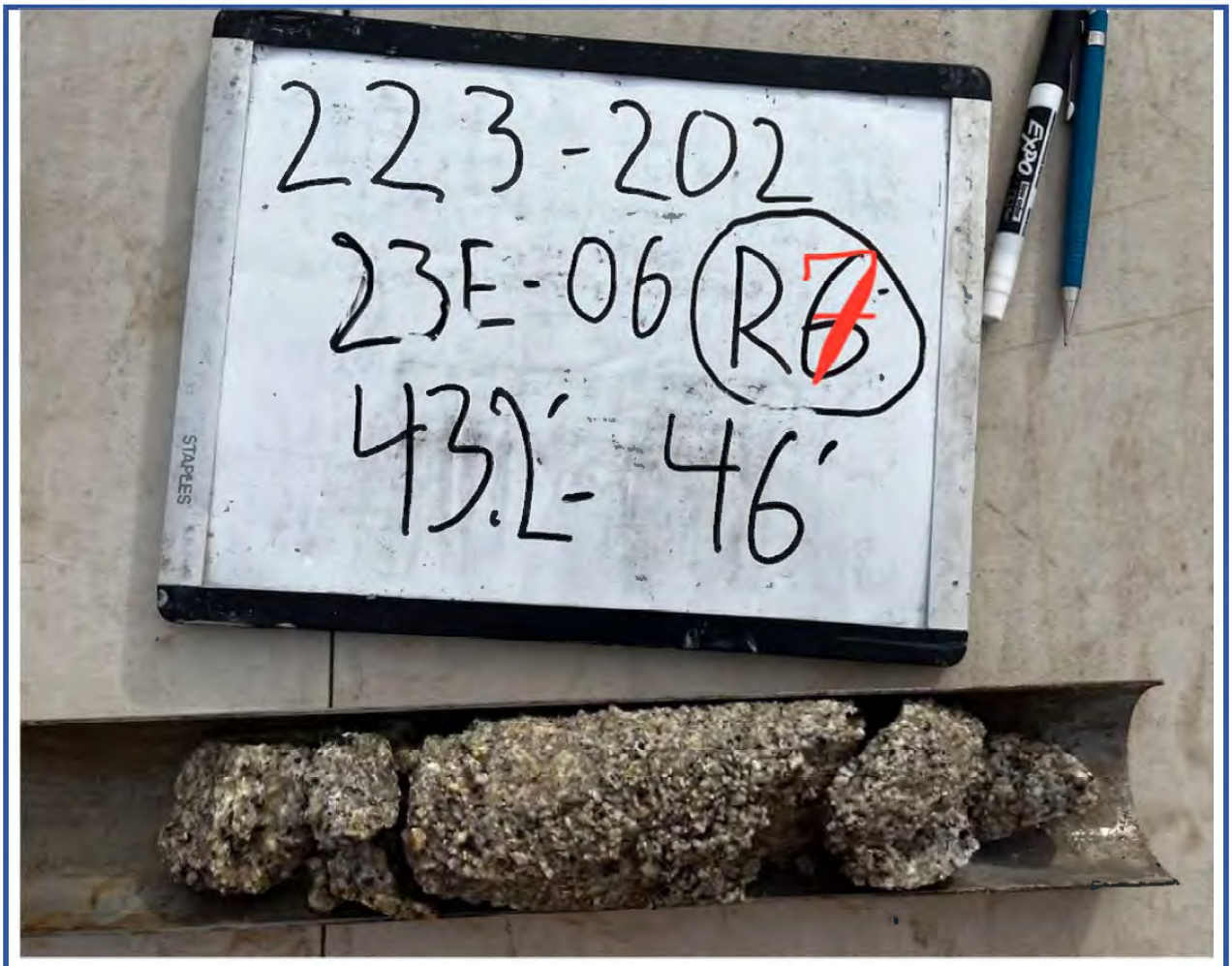


23E-06 Run 3 From 31.0 to 33.8 feet

23E-06 Run 4 From 33.8 to 36 feet

23E-06 Run 5 From 36.0 feet to 41.0 feet

23E-06 Run 6 From 41.0 feet to 43.2 feet



23E-06 Run 7 From 43.2 feet to 46.0 feet

23E-06 Run 8 From 46.0 feet to 51.0 feet

23E-06 Run 9 From 51.0 feet to 52.8 feet

23E-06 Run 10 From 52.8 feet to 53.8 feet

23E-06 Run 11 From 53.8 feet to 56.0 feet

23E-06 Run 12 From 56.0 feet to 59.5 feet

23E-06 Run 13 From 59.5 feet to 61.0 feet

23E-07 Run 1 from 30.0 feet to 31.0 feet

23E-07 Run 2 from 31.0 feet to 36.0 feet

23E-07 Run 3 from 36.0 feet to 38.10 feet

23E-07 Run 4 from 38.10 feet to 41.0 feet

23E-07 Run 5 from 41.0 feet to 46.0 feet

23E-07 Run 6 from 46.0 feet to 51.0 feet

23E-07 Run 7 from 51.0 feet to 53.5 feet

23E-07 Run 8 from 53.5 feet to 56.0 feet

23E-07 Run 9 from 56.0 feet to 61.0 feet

23E-08 Run 1 from 25.0 feet to 29.7 feet

23E-08 Run 2 from 29.7 feet to 31.0 feet

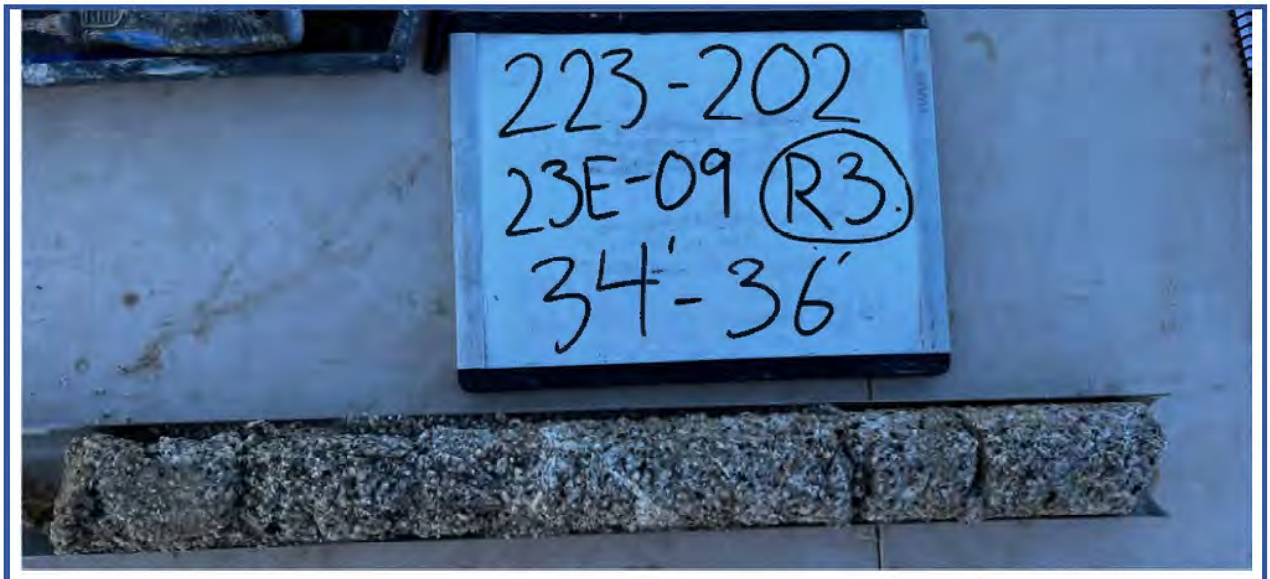
23E-08 Run 3 from 31.0 feet to 33.5 feet

23E-08 Run 4 from 33.5 feet to 36.0 feet

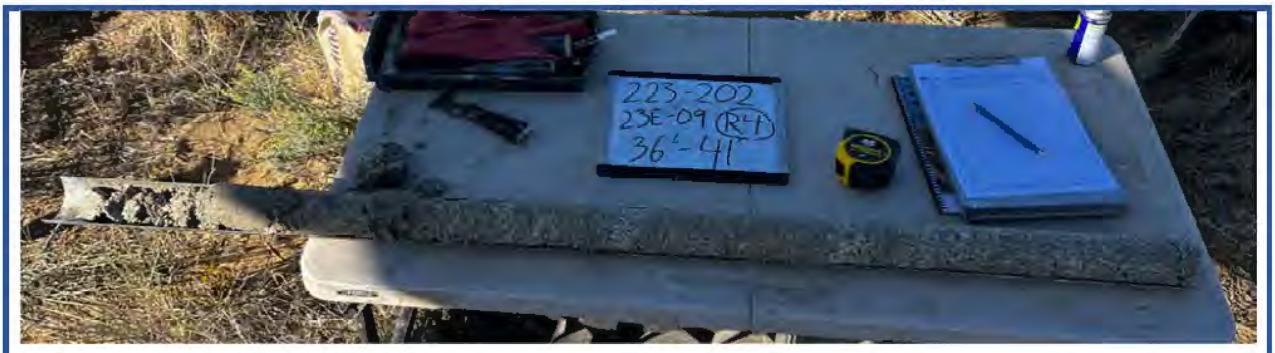
23E-08 Run 5 from 36.0 feet to 38.5 feet

23E-08 Run 7 from 41.0 feet to 43.5 feet

23E-09 Run 2 From 31.0 feet to 34.0 feet



23E-09 Run 3 From 34.0 feet to 36.0 feet



23E-09 Run 4 From 36.0 feet to 41.0 feet

23E-09 Run 5 From 41.0 feet to 46.0 feet

23E-09 Run 6 From 46.0 feet to 49.7 feet

23E-09 Run 7 From 49.7 feet to 51.0 feet

23E-10 Run 2 From 31.0 feet to 33.5 feet

23E-10 Run 3 From 33.5 feet to 36.0 feet

23E-10 Run 4 From 36.0 feet to 41.0 feet

23E-10 Run 5 From 41.0 feet to 46.0 feet

23E-10 Run 6 From 46.0 feet to 49.5 feet

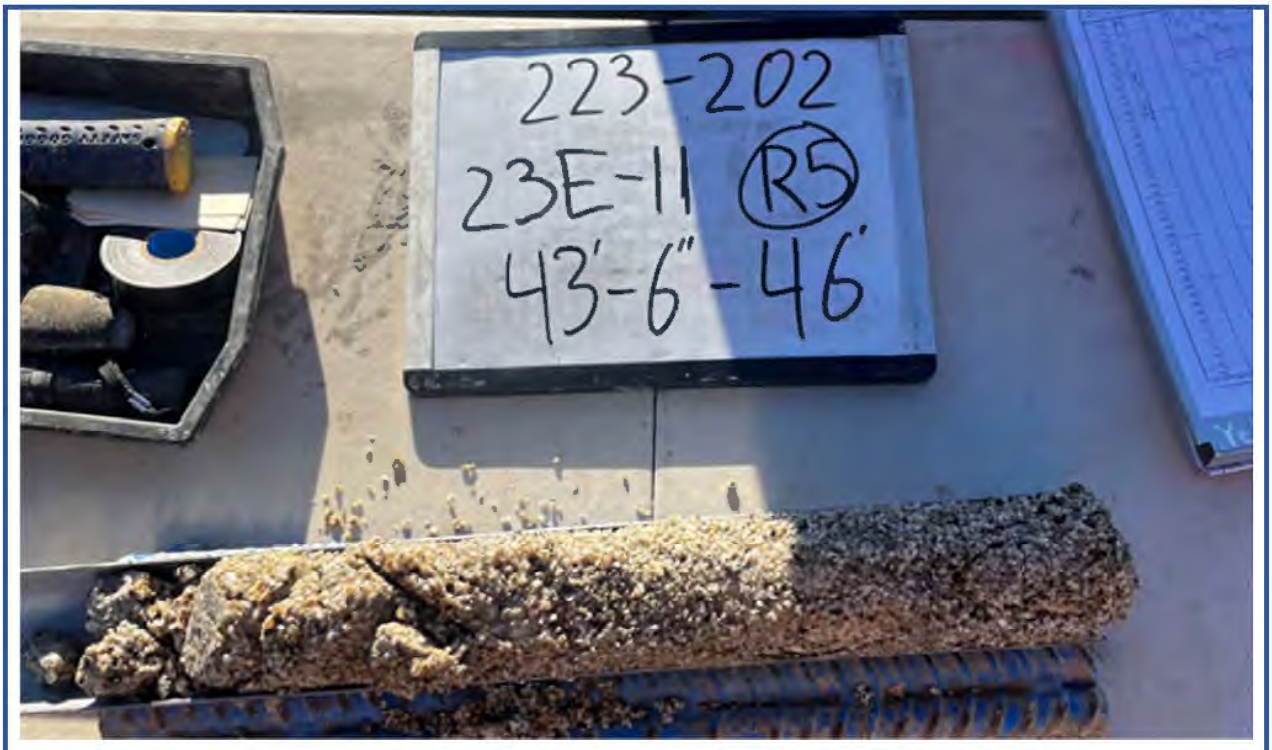
23E-10 Run 7 From 49.5 feet to 51.0 feet

23E-10 Run 8 From 51.0 feet to 56.0 feet

23E-10 Run 9 From 56.0 feet to 61.0 feet

23E-11 Run 1 From 30.0 feet to 31.0 feet

23E-11 Run 2 From 31.0 feet to 35.3 feet



23E-11 Run 5 From 43.6 feet to 46.0 feet

23E-11 Run 6 From 46.0 feet to 51.0 feet

23E-11 Run 7 From 51.0 feet to 56.0 feet

APPENDIX B - LABORATORY TEST RESULTS

SUMMARY OF LABORATORY TEST RESULTS

Sample Information							Gradation			Atterberg		Corrosion				Compaction					
Boring No.	Sample No.	Depth (ft)	Sample Type	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Moisture Content (%)	Gravel (%)	Sand (%)	Fines (%)	Plasticity Index (PI)	Liquid Limit (LL)	pH	Resistivity (Ω - cm)	SO_4^{2-} (mg/kg)	Cl^- (mg/kg)	Max. Dry Unit Weight, $\gamma_{d,MAX}$ (pcf)	Optimum Moisture Content (%)	R-Value	Expansion Index	Additional Testing	Soil/Rock Classification
23E-01	59	2.5	MCAL	108	105	3	0	84	16	--	--	7.70	450	14	3	--	--	--	--	--	SILTY SAND (SM)
23E-01	60	5.0	MCAL	107	97	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	SILTY SAND (SM)
23E-01	61	10.0	MCAL	120	110	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-02	C	0.0	BULK	124	115	8	1	74	25	--	--	7.70	546	14	<2	129	8	--	--	CU, SE	SILTY SAND (SM)
23E-02	35	2.5	MCAL	110	107	3	9	74	17	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-02	36	5.0	MCAL	106	102	4	0	78	21	--	--	7.79	491	16	<2	--	--	--	--	UC	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-02	37	10.0	MCAL	138	129	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-02	39	20.0	MCAL	130	121	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-02	R7	67.5	RCORE HQ	153	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-03	A	0.0	BULK	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	--	--	CLAYEY SAND (SC)
23E-03	9B	5.0	MCAL	124	114	9	--	--	--	--	--	--	--	--	--	--	--	--	--	CU	DECOMPOSED QUARTZ MONZONITE: CLAYEY SAND (SC)
23E-03	10	10.0	MCAL	137	130	5	--	--	--	--	--	6.90	367	83	296	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-03	11	15.0	MCAL	141	130	8	9	76	15	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-03	R5	52.8	RCORE HQ	154	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-04	46	2.5	MCAL	105	97	8	--	--	--	--	--	6.68	3,095	19	11	--	--	--	--	--	SILTY SAND (SM)
23E-04	47	5.0	MCAL	101	98	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-04	R3	39.0	RCORE HQ	155	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-05	B	0.0	BULK	--	--	--	--	--	--	--	--	--	--	--	--	124	10	--	--	--	CLAYEY SAND (SC)
23E-05	24	2.5	MCAL	105	97	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Well-graded SAND (SW)
23E-05	25	5.0	MCAL	101	98	3	2	74	24	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

PROJECT NAME: Hydrostor Zevsar Energy Storage	
PROJECT NO.: 223-202	REVISION DATE: 11-16-23
PROJECT MANAGER: Judd King	PREPARED BY: Ekta Patel
CHECKED BY: Jamie Ross	SHEET: 1 of 3

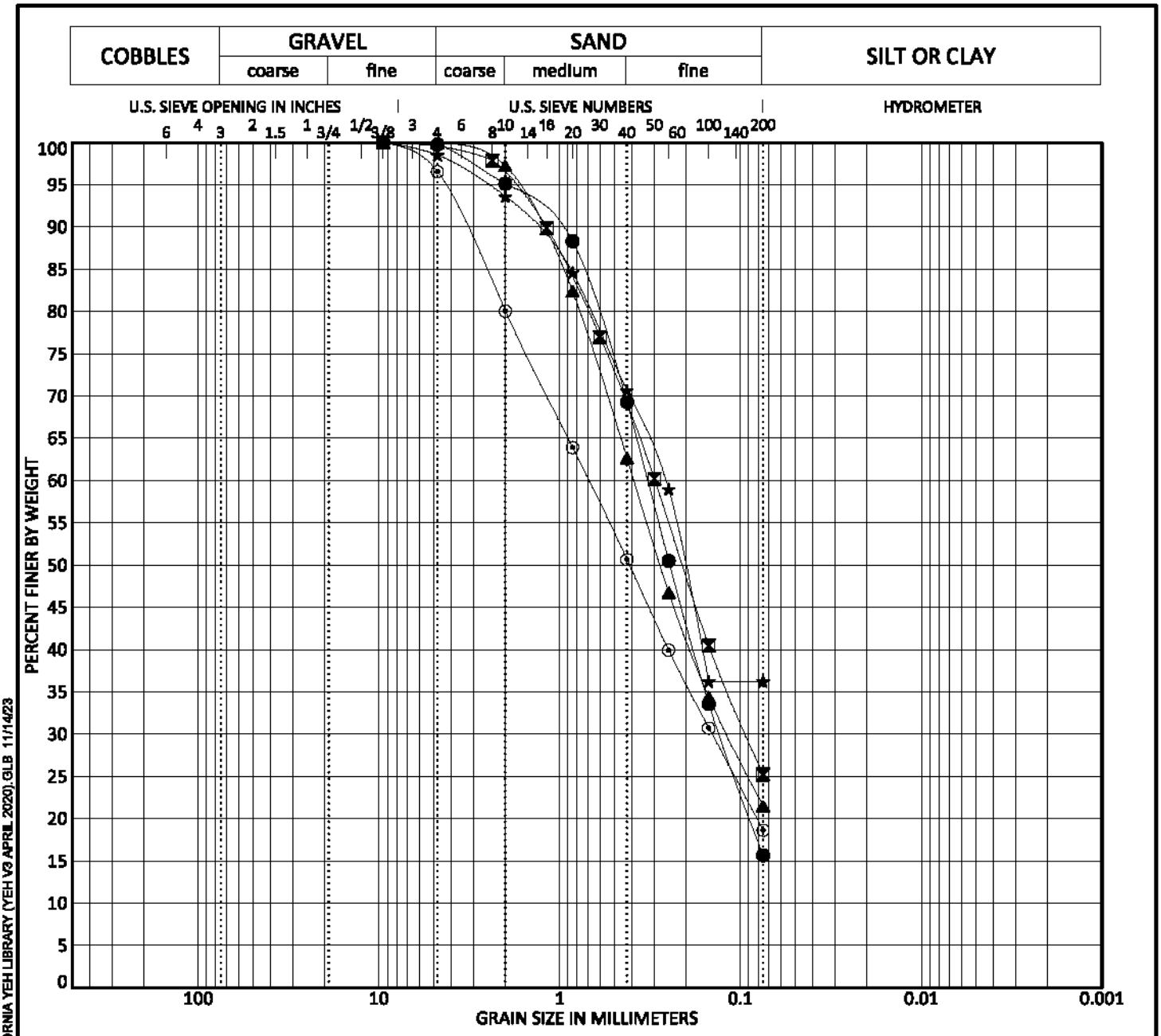
YEH SUMMARY OF TEST RESULTS 223-202 ES HYDROSTOR ZEVSAR ENERGY STORAG_GINT.GPJ CALIFORNIA YEH LIBRARY (YEH V3 APRIL 2020).GLB 11/16/23

SUMMARY OF LABORATORY TEST RESULTS

Sample Information							Gradation			Atterberg		Corrosion				Compaction					
Boring No.	Sample No.	Depth (ft)	Sample Type	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Moisture Content (%)	Gravel (%)	Sand (%)	Fines (%)	Plasticity Index (PI)	Liquid Limit (LL)	pH	Resistivity (Ω - cm)	SO_4^{2-} (mg/kg)	Cl^- (mg/kg)	Max. Dry Unit Weight, $\gamma_{d,max}$ (pcf)	Optimum Moisture Content (%)	R-Value	Expansion Index	Additional Testing	Soil/Rock Classification
23E-05	R4	55.5	RCORE HQ	161	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-05	R4	57.2	RCORE HQ	155	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-05	R6	65.0	RCORE HQ	163	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-06	1	5.0	MCAL	113	108	4	--	--	--	--	--	--	--	--	--	--	--	--	--	CU	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-06	2	10.0	MCAL	139	126	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-06	R9	51.1	RCORE HQ	159	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-06	R12	59.1	RCORE HQ	158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-06	R6	60.6	RCORE HQ	148	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	P, UC	QUARTZ MONZONITE
23E-07	77	2.5	MCAL	89	83	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: WELL-GRADED SAND (SW)
23E-07	78	5.0	MCAL	108	104	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: WELL-GRADED SAND
23E-07	83	49.0	RCORE HQ	160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-07	82	57.5	RCORE HQ	149	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-08	17A/B	2.5	BULK	100	91	11	--	--	--	--	--	--	--	--	--	--	--	--	--	CU	CLAYEY SAND with GRAVEL (SC)
23E-08	18	5.0	MCAL	105	95	10	1	62	36	--	--	8.50	422	16	4	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-09	52	3.5	MCAL	102	90	14	--	--	--	--	--	--	--	--	--	--	--	--	--	CU	CLAYEY SAND (SC)
23E-09	53	5.0	MCAL	109	104	5	3	78	19	--	--	7.13	362	37	500	--	--	--	--	--	SILTY SAND (SM)
23E-09	55	15.0	MCAL	131	121	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: SILTY SAND (SM)
23E-10	72	2.5	MCAL	96	90	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Well-graded SAND (SW)
23E-10	73	5.0	MCAL	109	105	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: WELL-GRADED SAND (SW)
23E-10	84	46.0	RCORE HQ	158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE

SUMMARY OF LABORATORY TEST RESULTS

Sample Information				Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Moisture Content (%)	Gradation			Atterberg		Corrosion				Compaction		R-Value	Expansion Index	Additional Testing	Soil/Rock Classification
Boring No.	Sample No.	Depth (ft)	Sample Type				Gravel (%)	Sand (%)	Fines (%)	Plasticity Index (PI)	Liquid Limit (LL)	pH	Resistivity (Ω - cm)	SO_4^{2-} (mg/kg)	Cl^- (mg/kg)	Max. Dry Unit Weight, $\gamma_{d,\,max}$ (pcf)	Optimum Moisture Content (%)				
23E-10	85	50.0	RCORE HQ	154	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE
23E-11	65	2.5	MCAL	112	106	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	CLAYEY SAND (SC)
23E-11	66	5.0	MCAL	84	80	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DECOMPOSED QUARTZ MONZONITE: WELL-GRADED SAND (SW)
23E-11	71	56.0	RCORE HQ	151	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	UC	QUARTZ MONZONITE



Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	23E-01	2.5 ft	SILTY SAND (SM)	–	--	--	--	--
⊠	23E-02	0.0 ft	SILTY SAND (SM)	–	--	--	--	--
▲	23E-02	5.0 ft	SILTY SAND (SM)	–	--	--	--	--
★	23E-08	5.0 ft	SILTY SAND (SM)	–	--	--	--	--
⊙	23E-09	5.0 ft	SILTY SAND (SM)	–	--	--	--	--

Specimen Identification			D100	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	23E-01	2.5 ft	9.5	0.327	0.246	0.131	–	0.2	84.1	15.6	
⊠	23E-02	0.0 ft	9.5	0.298	0.21	0.093	–	1.0	73.7	25.2	
▲	23E-02	5.0 ft	9.5	0.389	0.279	0.119	–	0.1	78.4	21.5	
★	23E-08	5.0 ft	9.5	0.262	0.204	–	–	1.5	62.3	36.2	
⊙	23E-09	5.0 ft	9.5	0.693	0.412	0.144	–	3.5	77.9	18.6	

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

GRAIN SIZE DISTRIBUTION

PROJECT NAME: ES Hydrostor Zevsar Energy Storage	PROJECT NO.: 223-202
REVISION DATE: 9-19-23	PROJECT MANAGER: Judd King
PREPARED BY: Ekta Patel	CHECKED BY: Judd King
	SHEET: 1 of 1

YEH SIEVE 223-202 ES HYDROSTOR ZEVSAR ENERGY STORAG_GINT.GPJ CALIFORNIA YEH LIBRARY (YEH V3 APRIL 2020).GLB 11/14/23

Sieve Analysis - Pit Run

CT 202

10/17/2023

Yeh and Associates, Inc.
56 E. Main Street
Suite 104
Ventura CA, 93001

Date Tested 10/10/2023
Sample Rec. Date 10/6/2023
Date Sampled 10/4/2023
Sampled By Client
Sample Id 1T9

Project No 0107
Client Reference No
Project Yeh - On-Call Master Agreement

Material Source 23E-02 #C @ 0-5'
Material Description Silty Sand (SM); pale brown (light olive when wet), dry
Location Detail 23E-02 #C @ 0-5'

Sieve Size	Indiv Wt. Retained	Indiv % Retained	Cumulative Percent Retained	Cumulative Percent Passing	Spec Min%	Spec Max%	Pass Fail
3/8in	0.0	0.0 %	0.0	100			
No.4	12.5	2.5 %	2.5	98			
Minus No.4	497.7						
Total Sample Wt	510.2						
No.8	10.2	2.1 %	2.1	96			
No.16	38.9	8.0 %	10.1	88			
No.30	62.5	12.9 %	23.0	75			
No.50	81.5	16.8 %	39.8	59			
No.100	95.8	19.7 %	59.5	39			
No.200	73.9	15.2 %	74.8	25			

Fines Only:

Wet Original Wt.	485.2	
Dry Original Wt.	485.2	
Washed Wt.	380.1	
- No. 200 Washed Out	105.1	
- No.200 Sieved Out	17.3	
Total - No.200	122.4	= 25.2 %

ASTM D4318

Liquid Limit
Plastic Limit
Plasticity Index

Caltrans CT226

Moisture 0.0 %

Remarks

Technician Adam Sinutko
Digital Signature By User Login

Manager Evan Folk
Digital Signature By User Login

System Link http://umt.vehalo.com/assignments/1F391A03-A533-4696-86AD-0602C19CA8B5
System Path Yeh - On-Call Master Agreement / SOILS / AGGREGATE LAB / 0107 SieveCustomSplit AS231009-2

Sieve Analysis - Pit Run

CT 202

10/17/2023

Yeh and Associates, Inc.
56 E. Main Street
Suite 104
Ventura CA, 93001

Date Tested 10/10/2023
Sample Rec. Date 10/6/2023
Date Sampled 9/18/2023
Sampled By Client
Sample Id 1T8

Project No 0107
Client Reference No
Project Yeh - On-Call Master Agreement

Material Source 23E-05 #B @ 0-5'
Material Description Clayey Sand (SC); pale brown, dry
Location Detail 23E-05 #B @ 0-5'

NonPlastic

Sieve Size	Indiv Wt. Retained	Indiv % Retained	Cumulative Percent Retained	Cumulative Percent Passing	Spec Min%	Spec Max%	Pass Fail
3/8in	0.0	0.0 %	0.0	100			
No.4	1.8	0.4 %	0.4	100			
Minus No.4	508.2						
Total Sample Wt	510.0						
No.8	14.3	2.8 %	2.8	97	0	0	
3/8in	30.9	6.1 %	8.9	91			
No.30	56.5	11.2 %	20.1	80			
No.50	82.7	16.3 %	36.4	63			
No.100	94.9	18.7 %	55.2	45			
No.200	61.1	12.1 %	67.2	33			

Fines Only:

Wet Original Wt.	506.4		
Dry Original Wt.	506.4		
Washed Wt.	351.1		
- No. 200 Washed Out	155.3		
- No.200 Sieved Out	10.7		
Total - No.200	166.0	= 32.8 %	

ASTM D4318

Liquid Limit
Plastic Limit
Plasticity Index

Caltrans CT226

Moisture 0.0 %

Remarks

Technician Adam Sinutko
Digital Signature By User Login

Manager Evan Folk
Digital Signature By User Login

System Link http://umt.vehalo.com/assignments/678BF456-BBDE-4916-077A-6E9A3D46D0A2
System Path Yeh - On-Call Master Agreement / SOILS / AGGREGATE LAB / 0107 SieveCustomSplit AS231009-1

Union MATERIALS TESTING

LABORATORY COMPACTION CHARACTERISTICS OF SOIL

10/17/2023

Yeh and Associates, Inc.
56 E. Main Street
Suite 104
Ventura CA, 93001

Client Reference No
Project No 0107
Project Yeh - On-Call Master Agreement

Date Sampled 10/4/2023
Date Tested 10/16/2023
Sampled By Client
Sample ID 1T9

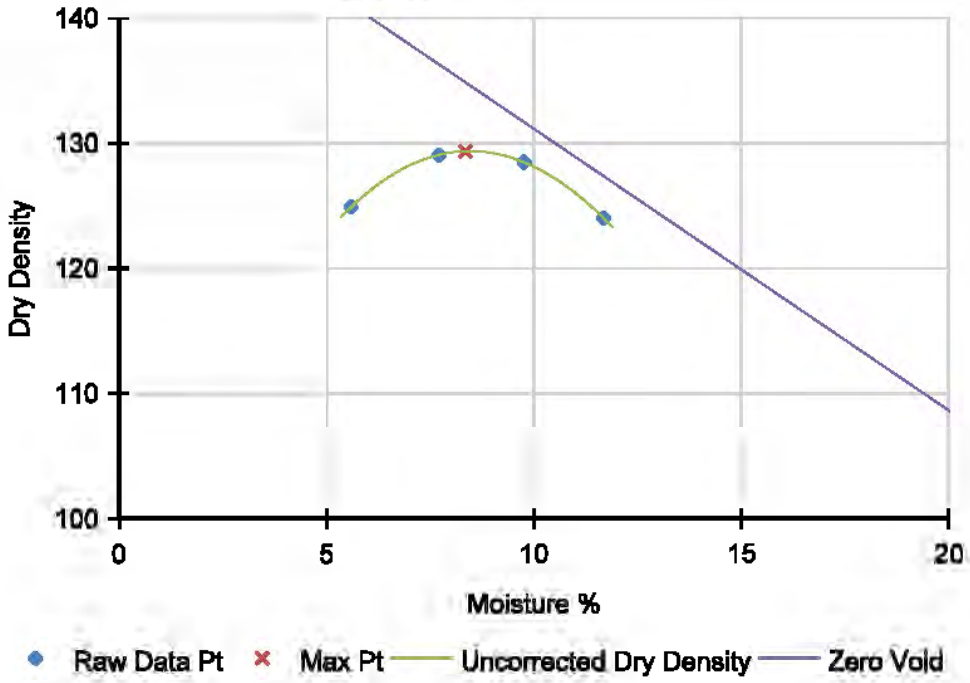
Material Criteria
Material Source Zevsar Hydroster Energy Storage (Yeh #223-202)
Material Description Silty Sand (SM); pale brown (light olive when wet), dry
Location Detail 23E-02 #C @ 0-5'

Test Standard ASTM D1557
Compaction Method A
Rock Correction No
Rock Replacement No
Rock Specific Gravity
Specific Gravity Determination

Method of Sample Preparation Used Wet
Type of Compaction Rammer Used Manual
Type of Rammer Face 2" Round

Optimum Moisture	8.4
Maximum Dry Dens	129.3

Moisture Density Curve



Sieve Analysis

Sieve Size	%Retained
+3/4"	0.0
+3/8"	0.0
+#4	2.5
Minus #4	97.5

Data Pt	Moisture %	Dry Density
1	5.6	124.9
2	7.7	129.1
3	9.8	128.5
4	11.7	124.0

Tested By Adam Sinutko

Manager Evan Folk

Lab Equipment

Union MATERIALS TESTING

LABORATORY COMPACTION CHARACTERISTICS OF SOIL

10/17/2023

Yeh and Associates, Inc.
56 E. Main Street
Suite 104
Ventura CA, 93001

Client Reference No
Project No 0107
Project Yeh - On-Call Master Agreement

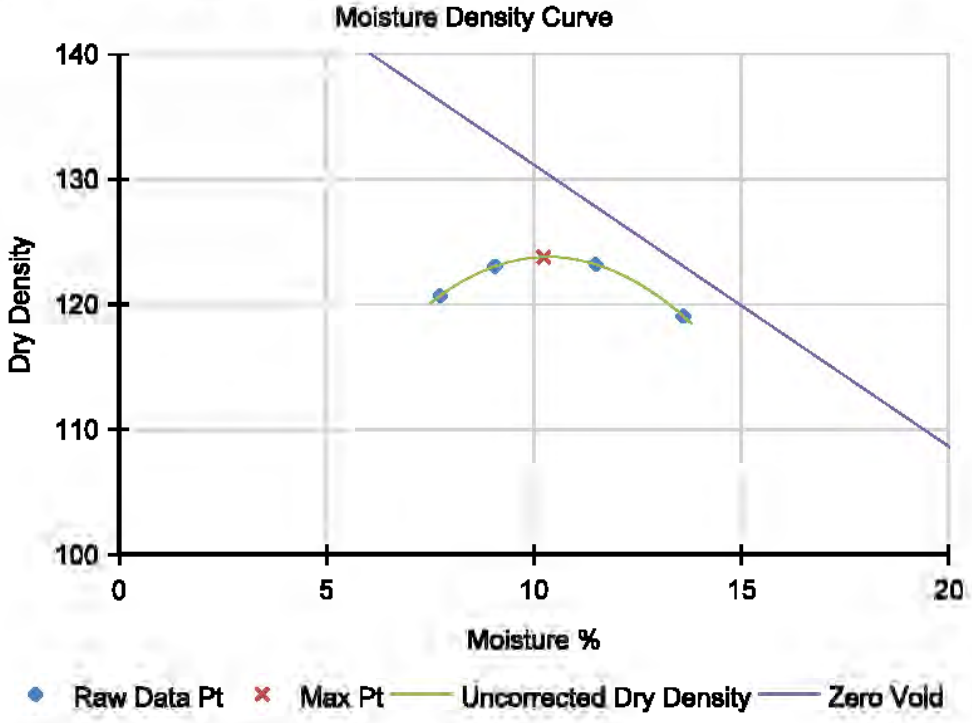
Date Sampled 9/18/2023
Date Tested 10/16/2023
Sampled By Client
Sample ID 1T8

Material Criteria
Material Source Zevsar Hydroster Energy Storage (Yeh #223-202)
Material Description Clayey Sand (SC); pale brown, dry
Location Detail 23E-05 #B @ 0-5'

Test Standard ASTM D1557
Compaction Method A
Rock Correction No
Rock Replacement No
Rock Specific Gravity
Specific Gravity Determination

Method of Sample Preparation Used Wet
Type of Compaction Rammer Used Manual
Type of Rammer Face 2" Round

Optimum Moisture	10.2
Maximum Dry Dens	123.8



Sieve Analysis

Sieve Size	%Retained
+3/4"	0.0
+3/8"	0.0
+#4	1.0
Minus #4	99.0

Data Pt	Moisture %	Dry Density
1	7.7	120.7
2	9.1	123.0
3	11.5	123.2
4	13.6	119.1

Tested By Adam Sinutko

Manager Evan Folk

Lab Equipment

Sand Equivalent Value of Soils and Fine Aggregate

11/10/2023

Caltrans CT217

Client Yeh and Associates, Inc.
Address Yeh and Associates, Inc.
56 E. Main Street
Suite 104
Ventura CA, 93001
Client Reference No
Project No 0107
Project Yeh - On-Call Master Agreement
Material Source Zevsar Hydroster Energy Storage (Yeh #223-202)
Material Description Silty Sand (SM); pale brown (light olive when wet), dry
Location Detail 23E-02 #C @ 0-5'

Date Tested 10/10/2023
Sample Rec Date 10/6/2023
Date Sampled 10/4/2023
Sampled By Client

Prep Method Dry
Shaker Method Mechanical Shaker

	Specification
Sand Reading Average	2.6
Clay Reading Average	12.5
Sand Equivalent Value	21.0

Remarks

Technician Adam Sinutko
Digital Signature By User Login

Manager Evan Folk
Digital Signature By User Login

Union MATERIALS TESTING

Resistance Value Data Summary

Caltrans CT301

10/17/2023

Client Yeh and Associates, Inc.
Address Yeh and Associates, Inc.
56 E. Main Street
Suite 104
Ventura CA, 93001

Client Reference No
Project No 0107
Project Yeh - On-Call Master Agreement
Material Source Zevsar Hydroster Energy Storage (Yeh #223-202)
Material Description Clayey Sand (SC); reddish Brown, moist
Location Detail 23E-03 #A @ 0-5'

Date Tested 10/12/2023
Sample Rec. Date 10/6/2023
Date Sampled 10/4/2023

Sampled By Client
Sampl Id 1TB

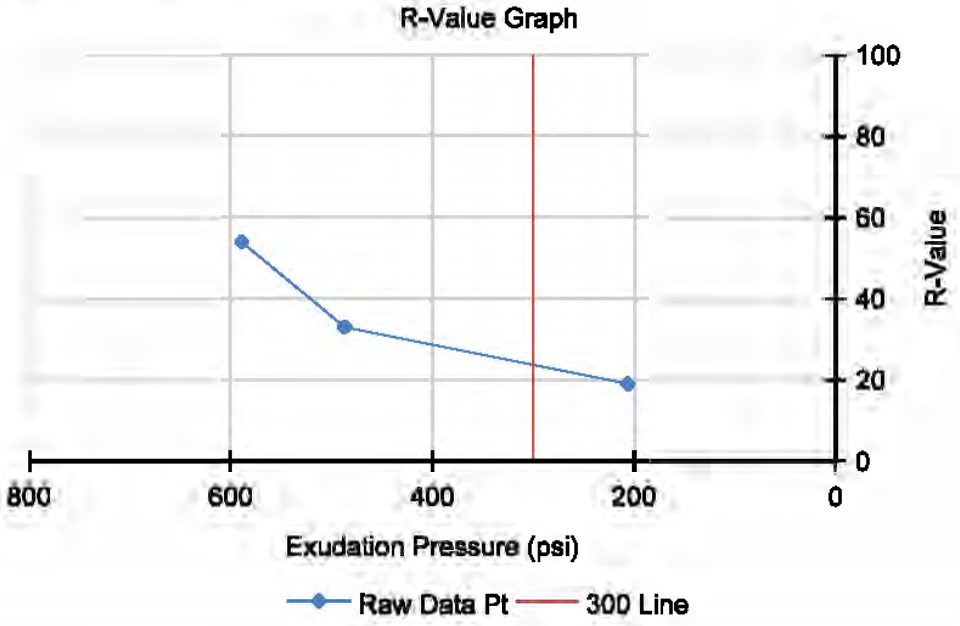
Initial Moisture Content: 9.9 %

Dry Unit Weight (PCF)	Water Content (%)	Exudation Pressure (psi)	Expansion Pressure (psf)	R-Value
125.2	9.9 %	589	0	54
124.9	10.7 %	487	0	33
118.6	11.9 %	207	0	19

R-value at Exudation Pressure of 300 psi: 24

Grading Analysis

Sieve Size	As Received	As Used
2"	100 %	100 %
1.5"	100 %	100 %
1"	100 %	100 %
3/4"	100 %	100 %
1/2"	100 %	100 %
3/8"	100 %	100 %
No. 4	100 %	100 %



Remarks

Technician Adam Sinutko
Digital Signature By User Login

Manager Evan Folk
Digital Signature By User Login

Lab Address 2247 Statham Blvd. Oxnard CA, 93033
System Link http://umt.vahalo.com/assignments/F530C02A-B599-4BC4-A228-1F09D919262C
System Path Yeh - On-Call Master Agreement / SOILS / AGGREGATE LAB / 0107 Rvalue AS231009-1

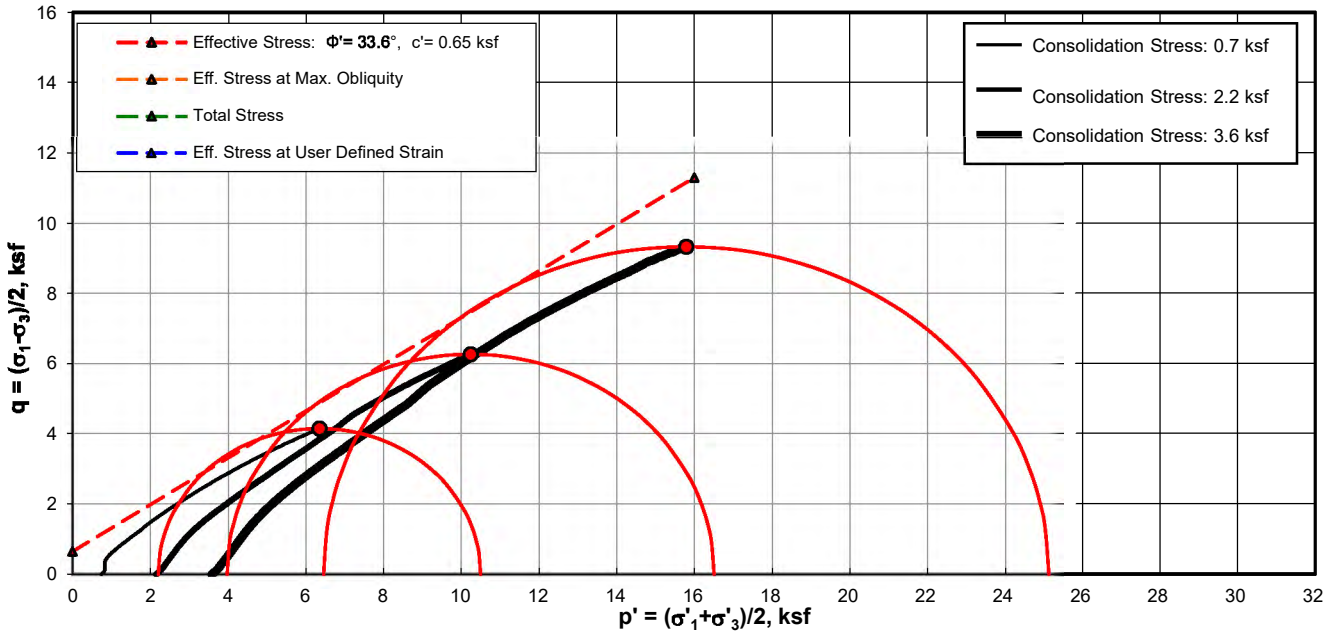
Corrosivity Tests Summary

CTL # 687-209 Date: 10/23/2023 Tested By: PJ Checked: PJ

Client: Yeh and Associates Project: Zevsar Hydrostor Energy Storage Proj. No: 223-202

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
23E-03	10	10	-	-	-	296	83	0.0083	-	-	-	-	6.8	Gray Silty SAND
23E-08	18	5	-	-	-	4	16	0.0016	-	-	-	-	7.7	White Silty SAND
23E-01	59	2.5	-	-	-	3	14	0.0014	-	-	-	-	3.6	Yellowish Brown Silty SAND
23E-02	c	0-5	-	-	-	<2	14	0.0014	-	-	-	-	3.9	Yellowish Brown Silty SAND, trace Gravel
23E-02	36	5	-	-	-	<2	16	0.0016	-	-	-	-	3.6	Gray Silty SAND
23E-04	46	2.5	-	-	-	11	19	0.0019	-	-	-	-	5.9	Brown Silty SAND
23E-09	53	5	-	-	-	500	37	0.0037	-	-	-	-	5.5	Yellowish Brown Silty SAND



SAMPLE ID

Boring Number	23E-02
Sample Number	C
Specimen Depth	0.0 ft
USCS Classification	Silty SAND (SM): light brown, moist, compacted to 90% R.C.

CLASSIFICATION

Trial ID	A	B	C
Liquid Limit	---	---	---
Plastic Limit	---	---	---
Plastic Index	---	---	---
Passing #4 (4.75 mm)	---	---	---
Passing #200 (0.075 mm)	---	---	---
Estimated Gs	2.70	2.70	2.70

INITIAL

Trial ID	A	B	C
Water Content, %	8.4%	17.5%	16.2%
Dry Unit Weight, pcf	114.8	114.4	117.2
Saturation, %	48%	100%	100%
Void Ratio	0.47	0.47	0.44
Diameter, in	2.42	2.46	2.45
Height, in	5.00	4.87	4.77

PRE-SHEAR

Water Content, %	17.5%	16.2%	16.0%
Dry Unit Weight, pcf	114.4	117.2	117.6
Saturation, %	100%	100%	100%
Void Ratio	0.47	0.44	0.43

TEST SUMMARY

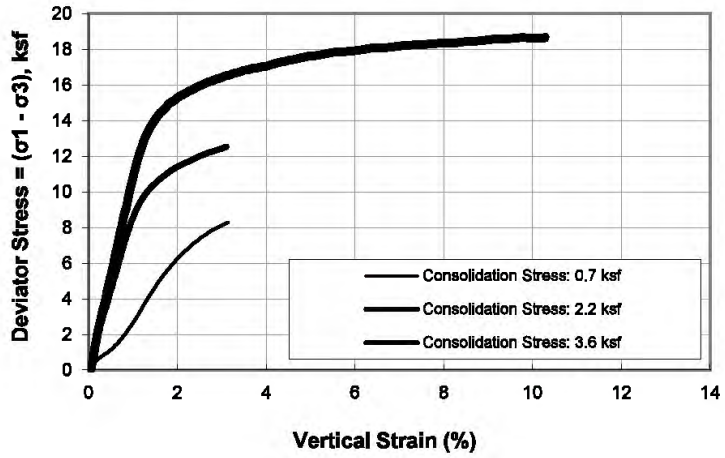
Trial ID	A	B	C
B-Parameter	0.98	0.98	0.98
t_{50}, minutes	N/A	N/A	N/A
Strain Rate, %/min	0.02	0.02	0.02
Cell Pressure, ksf	10.8	12.2	13.7
Back Pressure, ksf	10.1	10.1	10.1
Consolidation Stress, ksf	0.7	2.2	3.6
Deviator Stress @ Failure, ksf	8.2	12.4	18.4
Axial Strain @ Failure, %	3.1	3.1	10.3
σ'_{1F}, ksf	10.4	16.4	24.9
σ'_{3F}, ksf	2.2	4.0	6.5
Tested By:	ND	ND	ND
Date Tested:	10/20/23	10/21/23	10/23/23

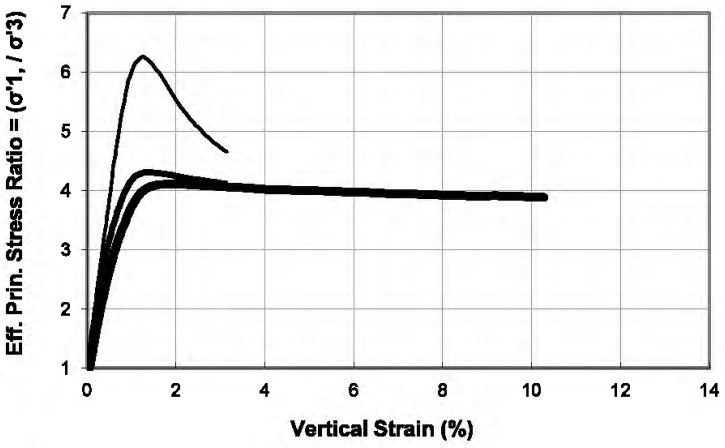
REMARKS

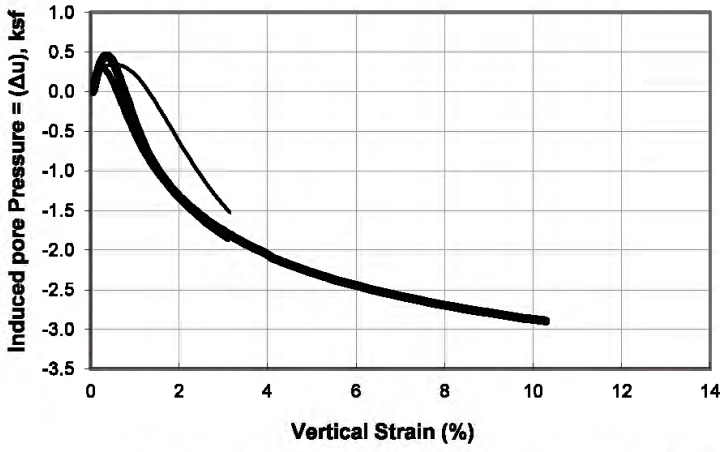
Test Method: ASTM 4767 (modified for staged testing)
Project: Zevsar Energy Storage Project

Tested by: N. Derbidge, CalPoly GeoE lab
Checked by: E.Patel, Yeh and Associates

CONSOLIDATED UNDRAINED TRIAXIAL TEST

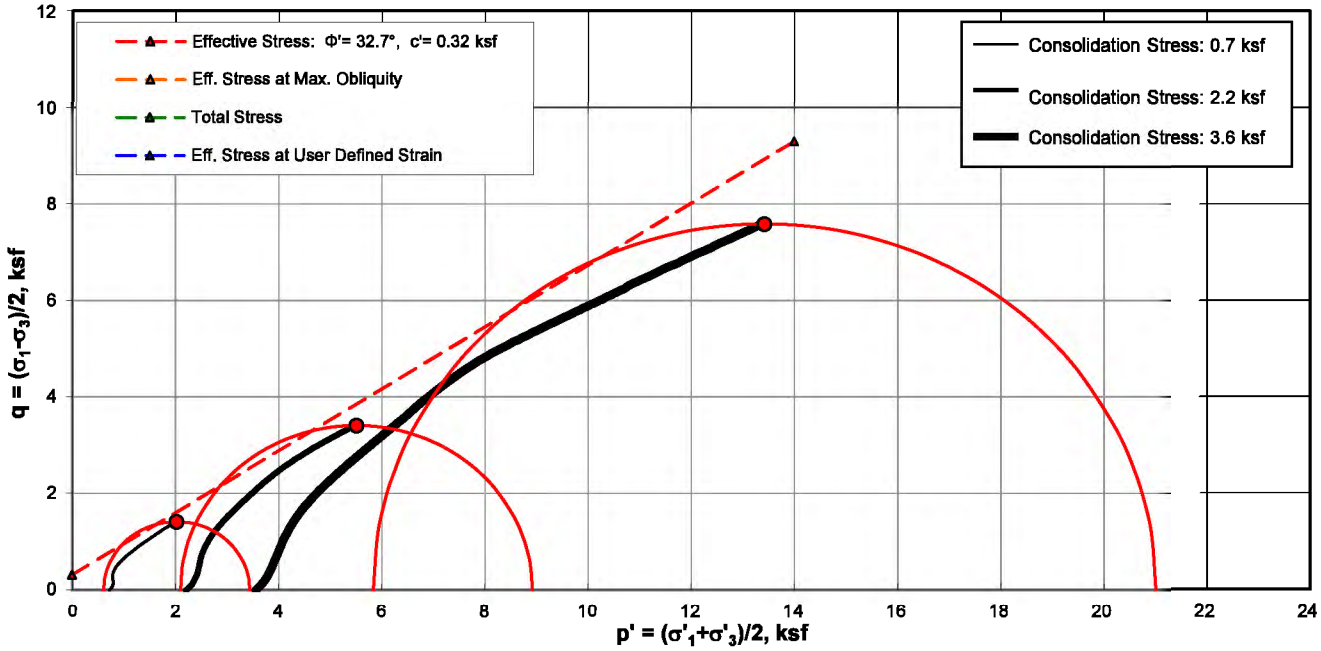






A	23E-02	#C	0.0 ft	Silty SAND (SM): light brown, moist, compacted to 90% R.C.
B	23E-02	#C	0.0 ft	
C	23E-02	#C	0.0 ft	

CONSOLIDATED UNDRAINED TRIAXIAL TEST



SAMPLE ID

Boring Number	23E-03
Sample Number	9
Specimen Depth	5.0 ft
USCS Classification	Silty SAND (SM): reddish brown, dry, cemented

INITIAL

Trial ID	A	B	C
Water Content, %	8.6%	19.1%	17.8%
Dry Unit Weight, pcf	114.0	111.1	113.8
Saturation, %	49%	100%	100%
Void Ratio	0.48	0.52	0.48
Diameter, in	2.42	2.48	2.48
Height, in	5.00	4.88	4.78

PRE-SHEAR

Water Content, %	19.1%	17.8%	17.2%
Dry Unit Weight, pcf	111.1	113.8	115.1
Saturation, %	100%	100%	100%
Void Ratio	0.52	0.48	0.46

REMARKS

Test Method: ASTM 4767 (modified for staged testing)
Project: Zevsar Energy Storage Project
Tested by: N. Derbidge, CalPoly GeoE lab
Checked by: E.Patel, Yeh and Associates

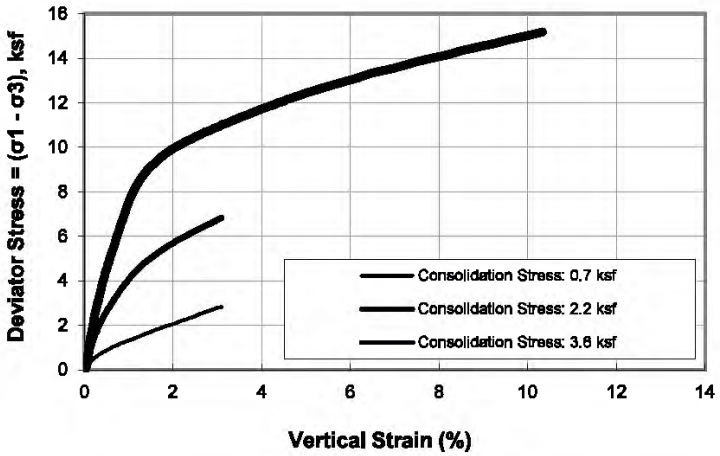
CLASSIFICATION

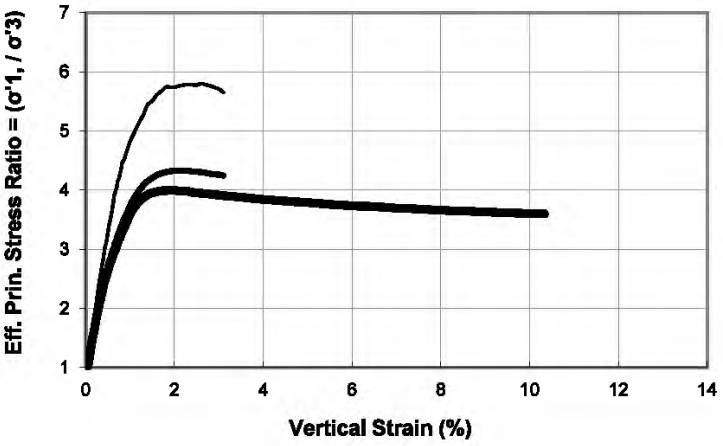
Trial ID	A	B	C
Liquid Limit	---	---	---
Plastic Limit	---	---	---
Plastic Index	---	---	---
Passing #4 (4.75 mm)	---	---	---
Passing #200 (0.075 mm)	---	---	---
Estimated Gs	2.70	2.70	2.70

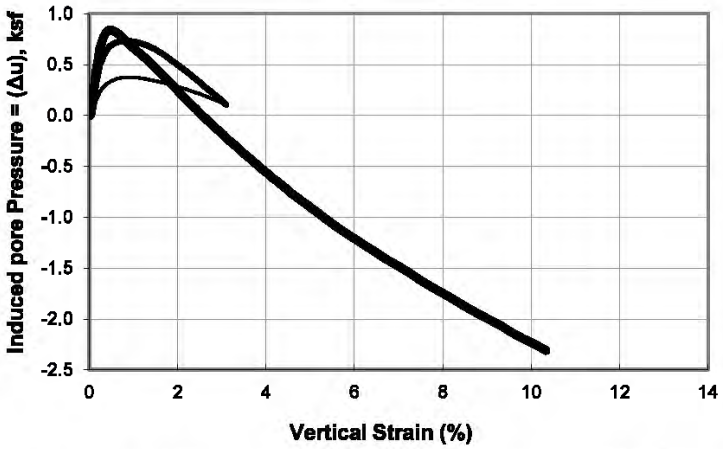
TEST SUMMARY

Trial ID	A	B	C
B-Parameter	0.98	0.98	0.98
t_{50}, minutes	N/A	N/A	N/A
Strain Rate, %/min	0.02	0.02	0.02
Cell Pressure, ksf	10.8	12.3	13.7
Back Pressure, ksf	10.1	10.1	10.1
Consolidation Stress, ksf	0.7	2.2	3.6
Deviator Stress @ Failure, ksf	2.8	6.7	15.0
Axial Strain @ Failure, %	3.1	3.1	10.3
σ'_{1F}, ksf	3.4	8.8	20.8
σ'_{3F}, ksf	0.6	2.1	5.8
Tested By:	ND	ND	ND
Date Tested:	10/10/23	10/11/23	10/12/23

CONSOLIDATED UNDRAINED TRIAXIAL TEST

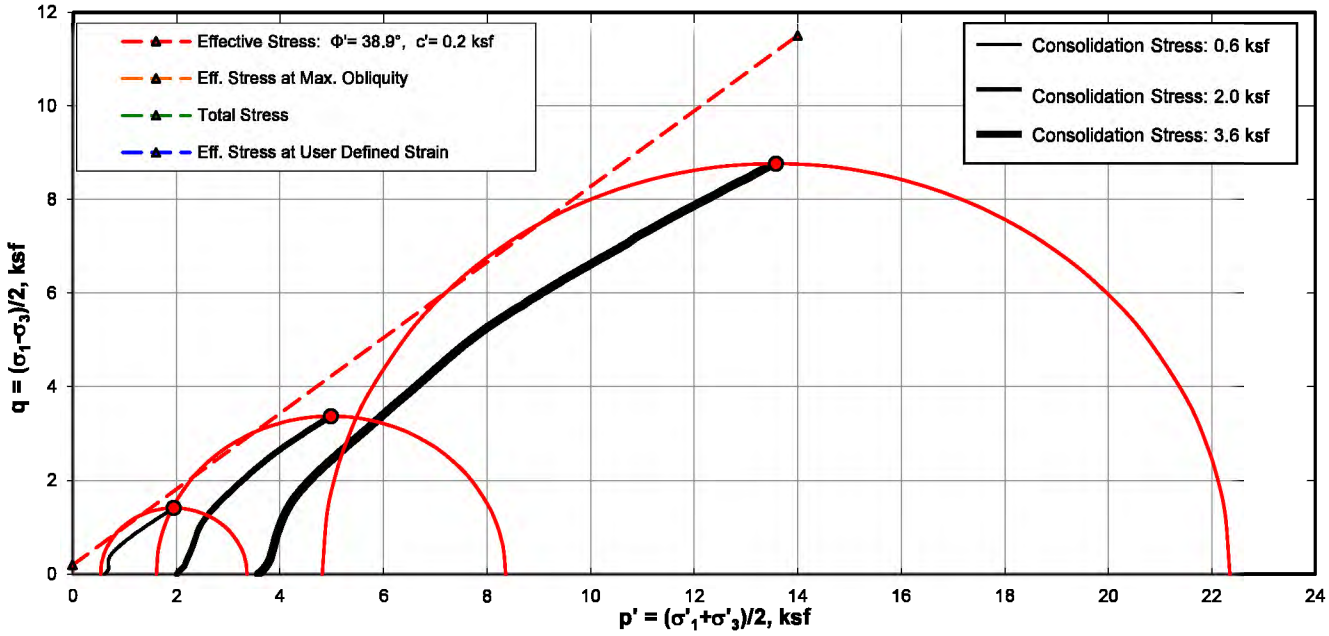






A	23E-03	#9	5.0 ft	Silty SAND (SM): reddish brown, dry, cemented
B	23E-03	#9	5.0 ft	
C	23E-03	#9	5.0 ft	

CONSOLIDATED UNDRAINED TRIAXIAL TEST



SAMPLE ID

Boring Number	23E-06
Sample Number	1
Specimen Depth	5.0 ft
USCS Classification	Silty SAND (SM): light gray brown, dry

INITIAL

Trial ID	A	B	C
Water Content, %	4.1%	20.9%	19.4%
Dry Unit Weight, pcf	108.3	107.8	110.6
Saturation, %	20%	100%	100%
Void Ratio	0.56	0.56	0.52
Diameter, in	2.42	2.45	2.45
Height, in	5.00	4.89	4.77

PRE-SHEAR

Water Content, %	20.9%	19.4%	18.2%
Dry Unit Weight, pcf	107.8	110.6	112.9
Saturation, %	100%	100%	100%
Void Ratio	0.56	0.52	0.49

REMARKS

Test Method: ASTM 4767 (modified for staged testing)
Project: Zevsar Energy Storage Project

Tested by: N. Derbidge, CalPoly GeoE lab
Checked by: E.Patel, Yeh and Associates

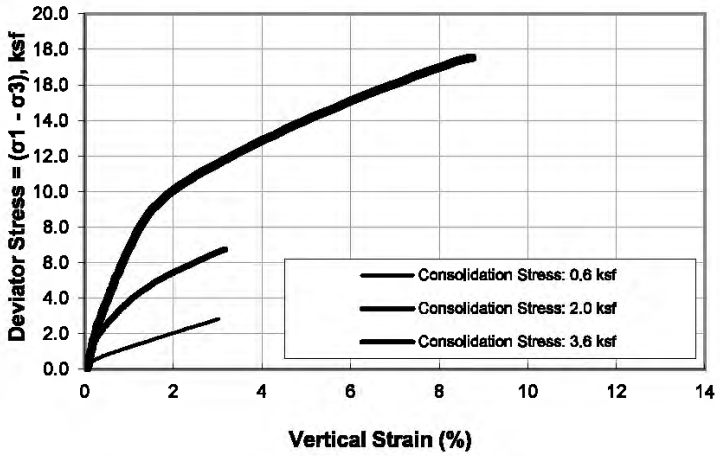
CLASSIFICATION

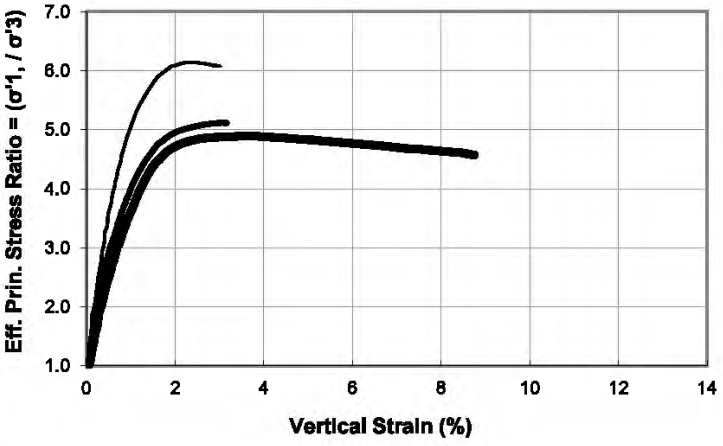
Trial ID	A	B	C
Liquid Limit	—	---	—
Plastic Limit	—	---	—
Plastic Index	—	---	—
Passing #4 (4.75 mm)	---	—	---
Passing #200 (0.075 mm)	---	—	---
Estimated Gs	2.70	2.70	2.70

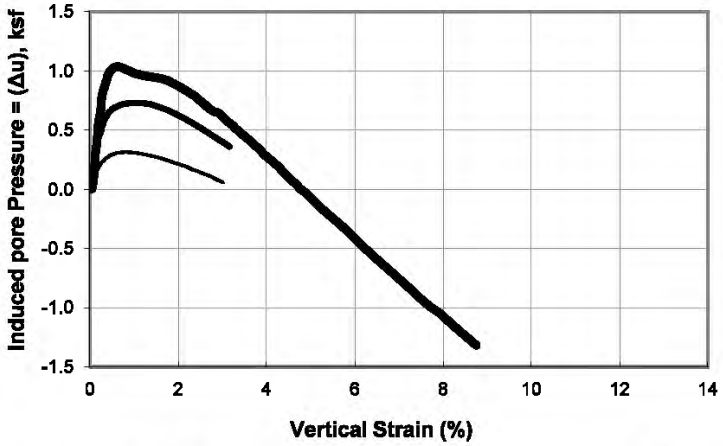
TEST SUMMARY

Trial ID	A	B	C
B-Parameter	0.98	0.98	0.98
t_{50}, minutes	N/A	N/A	N/A
Strain Rate, %/min	0.02	0.02	0.02
Cell Pressure, ksf	10.8	12.2	13.7
Back Pressure, ksf	10.2	10.2	10.1
Consolidation Stress, ksf	0.6	2.0	3.6
Deviator Stress @ Failure, ksf	2.8	6.7	17.3
Axial Strain @ Failure, %	3.0	3.2	8.7
σ'_{1F}, ksf	3.3	8.3	22.1
σ'_{3F}, ksf	0.5	1.6	4.8
Tested By:	ND	ND	ND
Date Tested:	10/11/23	10/12/23	10/17/23

CONSOLIDATED UNDRAINED TRIAXIAL TEST

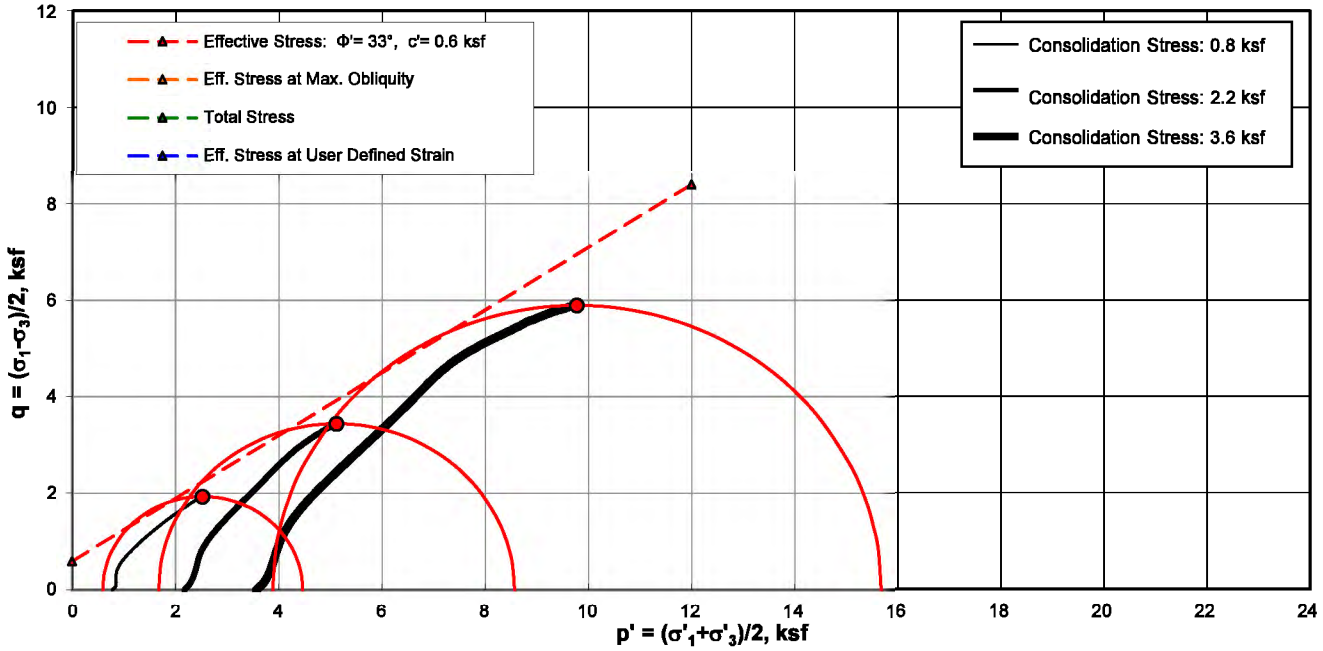






A	23E-06	#1	5.0 ft	Silty SAND (SM): light gray brown, dry
B	23E-06	#1	5.0 ft	
C	23E-06	#1	5.0 ft	

CONSOLIDATED UNDRAINED TRIAXIAL TEST



SAMPLE ID

Boring Number	23E-08
Sample Number	17B
Specimen Depth	2.5 ft
USCS Classification	Clayey SAND (SC): light gray to tan, dry, cemented

INITIAL

Trial ID	A	B	C
Water Content, %	10.8%	31.1%	29.9%
Dry Unit Weight, pcf	90.6	91.6	93.2
Saturation, %	34%	100%	100%
Void Ratio	0.86	0.84	0.81
Diameter, in	2.42	2.44	2.44
Height, in	5.00	4.88	4.78

PRE-SHEAR

Water Content, %	31.1%	29.9%	29.2%
Dry Unit Weight, pcf	91.6	93.2	94.2
Saturation, %	100%	100%	100%
Void Ratio	0.84	0.81	0.79

REMARKS

Test Method: ASTM 4767 (modified for staged testing)
Project: Zevsar Energy Storage Project
Tested by: N. Derbidge, CalPoly GeoE lab
Checked by: E.Patel, Yeh and Associates

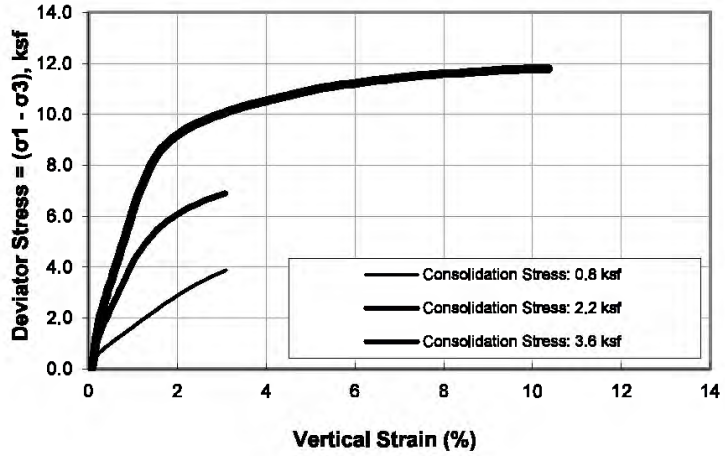
CLASSIFICATION

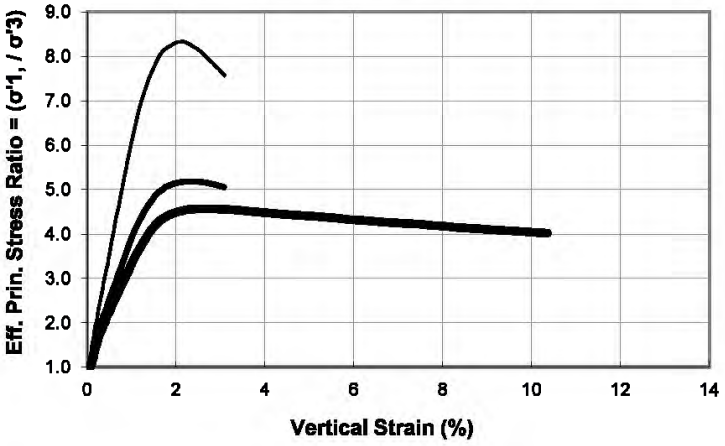
Trial ID	A	B	C
Liquid Limit	—	—	—
Plastic Limit	---	---	---
Plastic Index	—	—	—
Passing #4 (4.75 mm)	—	---	---
Passing #200 (0.075 mm)	—	---	---
Estimated Gs	2.70	2.70	2.70

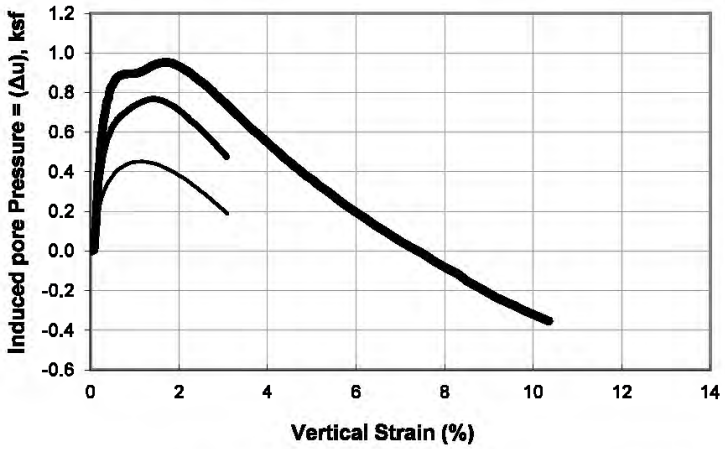
TEST SUMMARY

Trial ID	A	B	C
B-Parameter	0.98	0.98	0.98
t_{50}, minutes	N/A	N/A	N/A
Strain Rate, %/min	0.02	0.02	0.02
Cell Pressure, ksf	10.8	12.3	13.7
Back Pressure, ksf	10.0	10.1	10.1
Consolidation Stress, ksf	0.8	2.2	3.6
Deviator Stress @ Failure, ksf	3.8	6.8	11.6
Axial Strain @ Failure, %	3.1	3.1	10.3
σ'_{1F}, ksf	4.4	8.5	15.5
σ'_{3F}, ksf	0.6	1.7	3.9
Tested By:	ND	ND	ND
Date Tested:	10/10/23	10/11/23	10/12/23

CONSOLIDATED UNDRAINED TRIAXIAL TEST

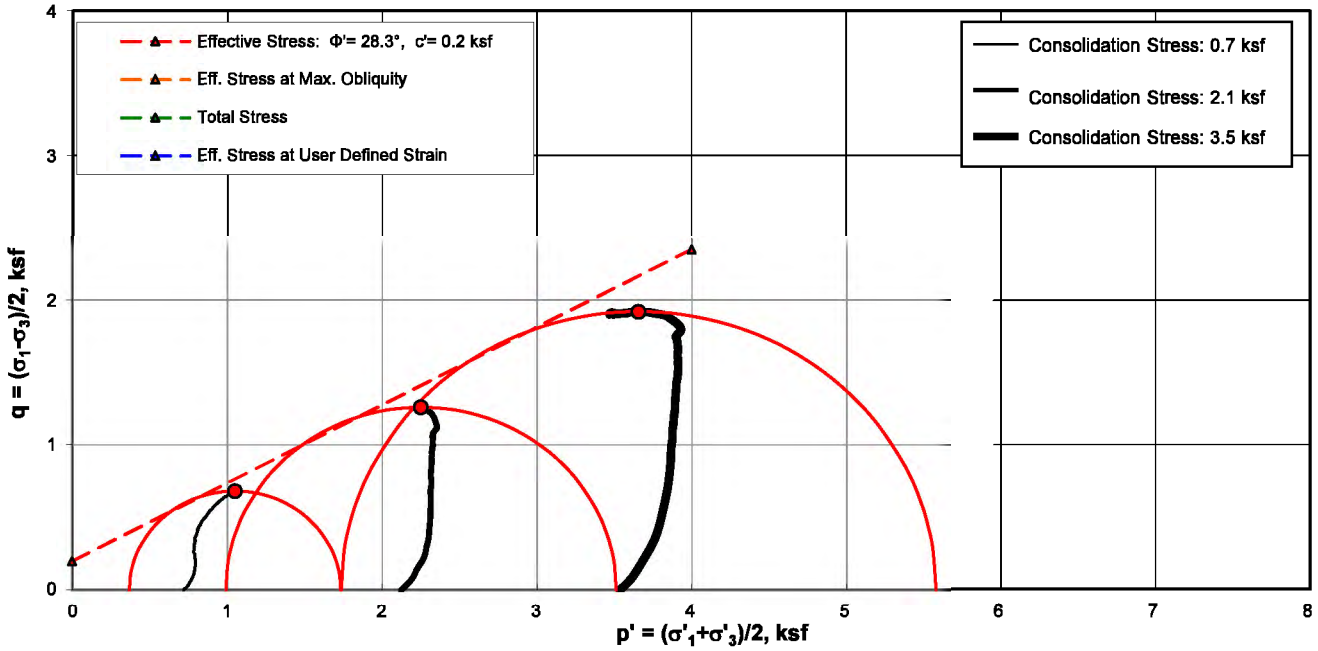






A	23E-08	#17B	2.5 ft	Clayey SAND (SC): light gray to tan, dry, cemented
B	23E-08	#17B	2.5 ft	
C	23E-08	#17B	2.5 ft	

CONSOLIDATED UNDRAINED TRIAXIAL TEST



SAMPLE ID

Boring Number	23E-09
Sample Number	52
Specimen Depth	2.5 ft
USCS Classification	Clayey SAND (SC): reddish brown, dry, cemented

CLASSIFICATION

Trial ID	A	B	C
Liquid Limit	---	---	---
Plastic Limit	---	---	---
Plastic Index	---	---	---
Passing #4 (4.75 mm)	---	---	---
Passing #200 (0.075 mm)	---	---	---
Estimated Gs	2.70	2.70	2.70

INITIAL

Trial ID	A	B	C
Water Content, %	13.8%	32.3%	29.4%
Dry Unit Weight, pcf	89.8	90.0	93.9
Saturation, %	42%	100%	100%
Void Ratio	0.88	0.87	0.80
Diameter, in	2.42	2.44	2.42
Height, in	5.00	4.91	4.79

PRE-SHEAR

Water Content, %	32.3%	29.4%	27.9%
Dry Unit Weight, pcf	90.0	93.9	96.1
Saturation, %	100%	100%	100%
Void Ratio	0.87	0.80	0.75

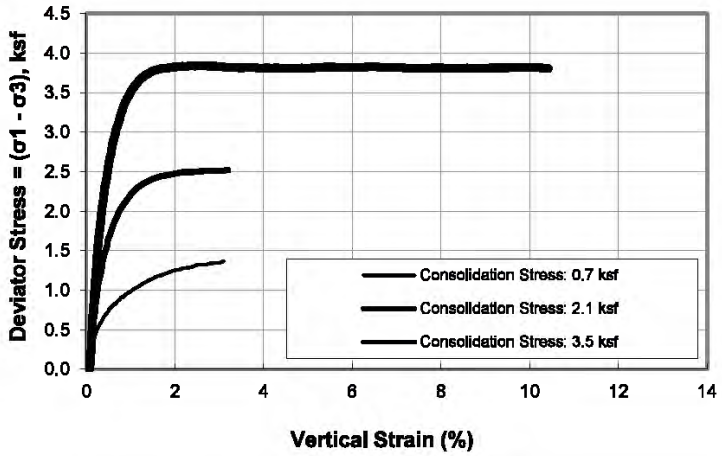
TEST SUMMARY

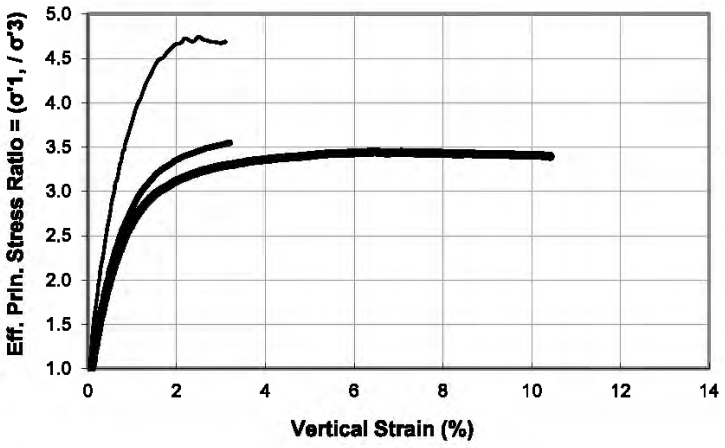
Trial ID	A	B	C
B-Parameter	0.98	0.98	0.98
t_{50}, minutes	N/A	N/A	N/A
Strain Rate, %/min	0.02	0.02	0.02
Cell Pressure, ksf	10.8	12.3	13.7
Back Pressure, ksf	10.1	10.2	10.2
Consolidation Stress, ksf	0.7	2.1	3.5
Deviator Stress @ Failure, ksf	1.3	2.5	3.8
Axial Strain @ Failure, %	3.1	3.2	2.6
σ'_{1F}, ksf	1.7	3.5	5.5
σ'_{3F}, ksf	0.4	1.0	1.7
Tested By:	ND	ND	ND
Date Tested:	10/10/23	10/11/23	10/12/23

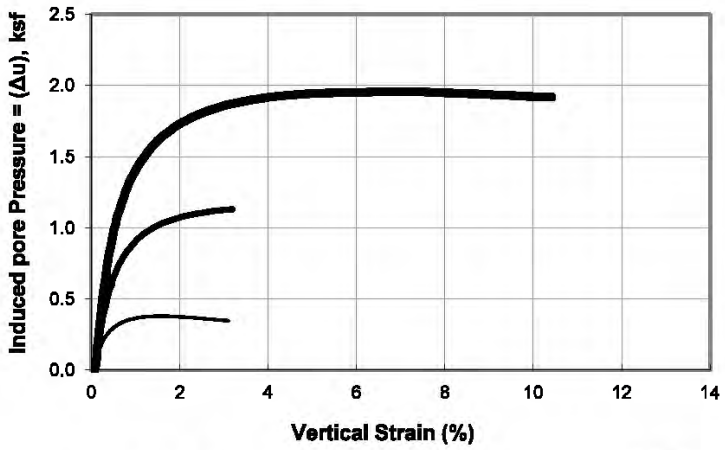
REMARKS

Test Method: ASTM 4767 (modified for staged testing)
Project: Zevsar Energy Storage Project
Tested by: N. Derbidge, CalPoly GeoE lab
Checked by: E.Patel, Yeh and Associates

CONSOLIDATED UNDRAINED TRIAXIAL TEST







A	23E-09	#52	2.5 ft	Clayey SAND (SC): reddish brown, dry, cemented
B	23E-09	#52	2.5 ft	
C	23E-09	#52	2.5 ft	

CONSOLIDATED UNDRAINED TRIAXIAL TEST

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage
Client:	Yeh & Associates
Date:	10/15/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-02
Sample Number:	N/A
Sample Depth:	67.5-68
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	153.4
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.10
Comp. Strength (psi):	77

Images

Sample ID	
Boring Number:	23E-03
Sample Number:	N/A
Sample Depth:	52.8-53.3
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	154.3
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.04
Comp. Strength (psi):	147

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage
Client:	Yeh & Associates
Date:	10/15/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-04
Sample Number:	N/A
Sample Depth:	39.0-39.5
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	155.3
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.05
Comp. Strength (psi):	647

Images

Sample ID	
Boring Number:	23E-05
Sample Number:	N/A
Sample Depth:	55.5-56.0
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	160.9
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.05
Comp. Strength (psi):	1940

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage
Client:	Yeh & Associates
Date:	10/15/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-05
Sample Number:	N/A
Sample Depth:	57.2-57.7
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	155.2
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.03
Comp. Strength (psi):	97

Images

Sample ID	
Boring Number:	23E-05
Sample Number:	N/A
Sample Depth:	65.0-65.5
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	162.9
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.05
Comp. Strength (psi):	5770

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage
Client:	Yeh & Associates
Date:	10/15/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-06
Sample Number:	N/A
Sample Depth:	55.1-56.1
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	158.7
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.09
Comp. Strength (psi):	866

Images

Sample ID	
Boring Number:	23E-06
Sample Number:	N/A
Sample Depth:	59.1-59.6
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	158.4
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.03
Comp. Strength (psi):	218

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage
Client:	Yeh & Associates
Date:	10/15/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-06
Sample Number:	N/A
Sample Depth:	60.6-61.1
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	147.7
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.04
Comp. Strength (psi):	209

Images

Sample ID	
Boring Number:	
Sample Number:	
Sample Depth:	
Classification:	

Properties	
Moisture Condition:	
Moisture Content:	
Unit Weight (pcf):	
Dry Unit Weight (pcf):	
Length/Diameter :	
Comp. Strength (psi):	

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage Project
Client:	Yeh & Associates
Date:	10/16/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-07
Sample Number:	#83
Sample Depth:	49-49.6
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	160.1
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.12
Comp. Strength (psi):	2463

Images

Sample ID	
Boring Number:	23E-07
Sample Number:	#82
Sample Depth:	57.5-58
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	148.8
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.16
Comp. Strength (psi):	70

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage Project
Client:	Yeh & Associates
Date:	10/16/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-10
Sample Number:	#84
Sample Depth:	46-46.7
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	158.3
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.10
Comp. Strength (psi):	983

Images

Sample ID	
Boring Number:	23E-10
Sample Number:	#85
Sample Depth:	50-50.8
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	153.8
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.10
Comp. Strength (psi):	1588

Images

Unconfined Uniaxial Compressive Strength Test of Intact Rock Cores

ASTM D7012 - 1.5.1 Method C: Uniaxial Compressive Strength of Intact Rock Cores

PROJECT	
Job No.:	223-202
Project:	Zevsar Energy Storage Project
Client:	Yeh & Associates
Date:	10/16/2023
Test Method:	ASTM D7012 (1.5.3 Method C: Uniaxial Compressive Strength of Intact Rock Core Specimens)

Sample ID	
Boring Number:	23E-11
Sample Number:	#71
Sample Depth:	56-56.6
Classification:	Core

Properties	
Moisture Condition:	As Received
Moisture Content:	Not Determined
Unit Weight (pcf):	150.5
Dry Unit Weight (pcf):	Not Determined
Length/Diameter :	2.13
Comp. Strength (psi):	249

Images

Sample ID	
Boring Number:	
Sample Number:	
Sample Depth:	
Classification:	

Properties	
Moisture Condition:	
Moisture Content:	
Unit Weight (pcf):	
Dry Unit Weight (pcf):	
Length/Diameter :	
Comp. Strength (psi):	

Images

SAMPLE ID

Boring Number	23E-06
Sample Number	5
Sample Depth, ft	32.8 to 33.33
Classification	Poorly-graded SAND with silt (SP-SM): light gray and white, moist, partially cemented

SAMPLE PROPERTIES

	Intial	Final
Mass, g	726.52	777.17
Water Content, %	8.3%	15.8%
Dry Density, pcf	111.2	111.2
Saturation, %	43%	83%
Void Ratio	0.52	0.52
Diameter, in	2.42	2.42
Height, in	5.00	5.00
Area, in^2	4.60	4.60
Volume, in^3	23.00	23.00

CLASSIFICATION

Sieve Size	% Passing
3/8-in. (9.5mm)	—
#4 (4.75mm)	—
#16 (1.18mm)	—
#30 (0.6mm)	—
#100 (0.150mm)	—
#200 (0.075mm)	—

Other Parameters	
Liquid Limit	—
Plastic Limit	—
Plasticity Index	—
Estimated Gs	2.7

TEST SUMMARY

Sample Type	MC
Permeant	Deaired Tap-Water
Pipette Area, cm^2	0.263
k_{avg} 20°C, cm/s	4.6E-03
Tested By	GLF

REMARKS

Test Method: ASTM D5084 (Method C)

Project: Zevsar Energy Storage Project

PERMEATION DATA

Trial	Date	Time, sec	$Temp_{Avg}$, °C	σ', ksf	μ, ksf	i_o	i_f	k_t, cm/s
1	10/18/23	35	24.1	4.3	9.4	1.5	0.3	5.0E-03
2	10/18/23	35	24.1	4.3	9.4	1.5	0.3	5.0E-03
3	10/18/23	35	24.1	4.3	9.4	1.5	0.3	5.0E-03
4	10/18/23	40	24.1	4.3	9.4	1.8	0.3	5.0E-03
5	10/18/23	40	24.1	4.3	9.4	1.8	0.3	5.1E-03
6	10/18/23	40	24.1	4.3	9.4	1.8	0.3	5.0E-03

SAMPLE IMAGES

HYDRAULIC CONDUCTIVITY

APPENDIX C – MONITORING WELL DATA

Yeh and Associates, Inc.
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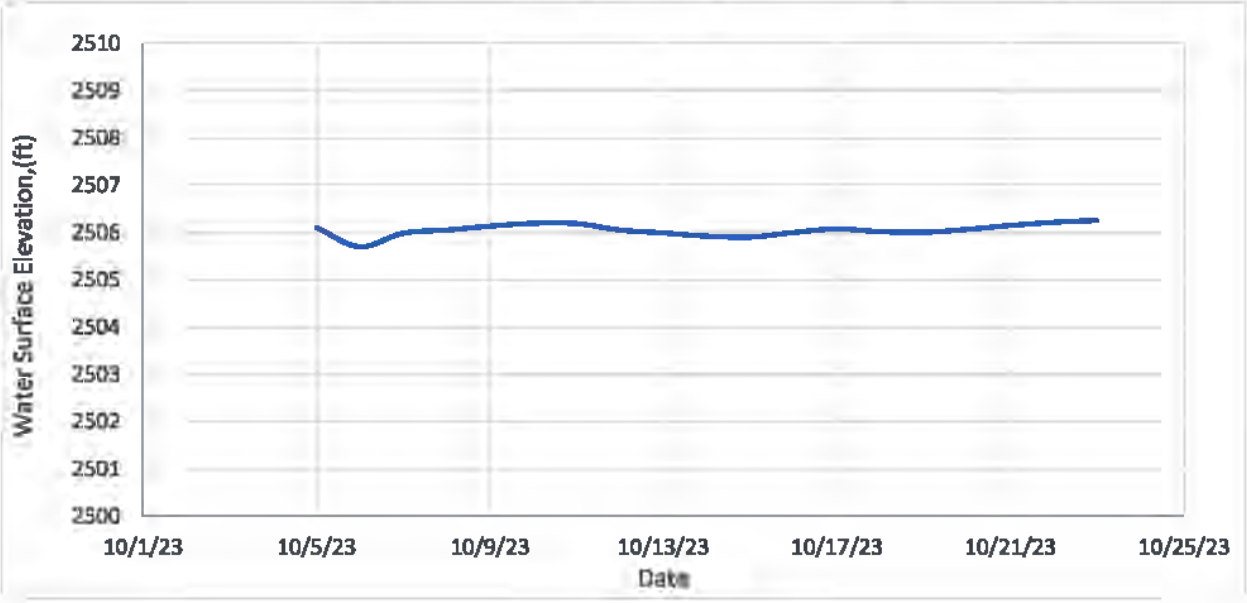
MW Name/ID:	23E-05MW		**Project Name**	Hydrostor Zevsar Energy Storage
Boring Name:	23E-05		**Project No.**	223-202
Well info:	0 to 20	Solid		
	20 to 70	Screen		
Instrument ID:	Open standpipe with Level Logger			
Depth to Levelogger from top of casing (ft)	70.95			
Top of Casing Elev (ft)	2550			
Levelogger Elevation (ft)	2479			
Ground Surface Elev. (ft)	2547			

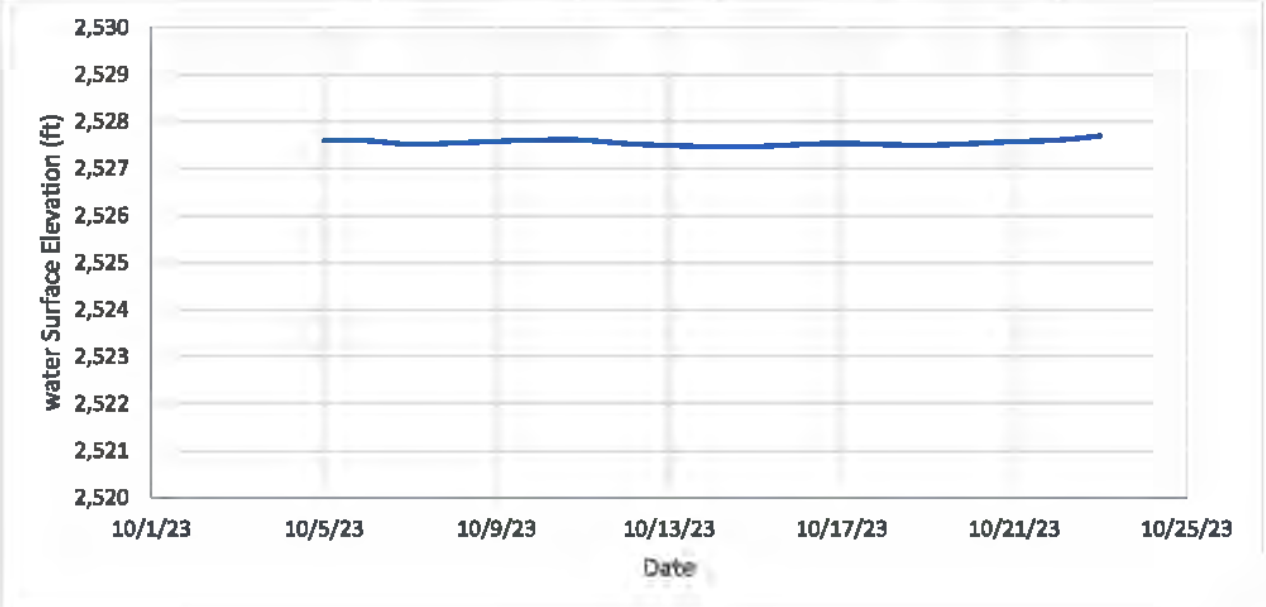
Measurement Date	Top Depth Measurement Reference: Ground Surface or Top of Pipe Casing	Water Depth below TOC (ft)	Water Depth Below Ground Surface (ft)	Water Surface Elevation (ft)	Notes
10/5/2023	Casing	43.9	40.9	2506.1	Manual Reading During Instrumentation Installation
10/23/2023	Casing	43.75	40.75	2506.3	Manual Reading



Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

MW Name/ID:	23E-11MW		**Project Name**	Hydrostor Zevsar Energy Storage
Boring Name:	23E-11		**Project No.**	223-202
Well info:	0 to 30	Solid		
	30 to 60	Screen		
Instrument ID:	Open standpipe with Level Logger			
Depth to Levelogger from top of casing (ft)	55.9			
Top of Casing Elev (ft)	2570.0			
Levelogger El. (ft)	2514.1			
Ground Surface Elev. (ft)	2567.3			

Measurement Date	Top Depth Measurement Reference: Ground Surface or Top of Pipe Casing	Water Depth (ft)	Water Depth Below Ground Surface (ft)	Water Surface Elevation (ft)	Notes
10/5/2023	Casing	42.45	39.7	2527.6	Manual Reading During Instrumentation Installation
10/23/2023	Casing	42.35	39.6	2527.7	Manual Reading



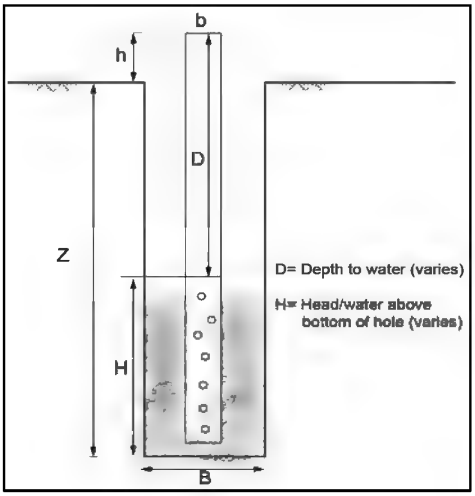
APPENDIX D – INFILTRATION TEST DATA

Infiltration Test

References: Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures, Central Coast LID Initiative, December 2013
Caltrans Test 749 and 750
Riverside County LID/BMP Handbook, September 2011

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project No.:	223-202	**Percolation Test No.:**	23IN-01
Project Name:	ES Hydrostor Zevsar Energy Storage	**Surface Elevation (ft):**	2553.3
Project MGR:	J. King	**Completion Depth, Z (ft):**	4.583
Tested By:	C. Kuchta - J. King	**Pipe Above Grade, h (ft)**	1.79167
Excavation Method:	12" Auger	**Pipe Diameter, b (in)**	2
Weather:	Sunny, Hot	**Hole Diameter, B (in):**	12
Installation Date:	9/18/2023	**Backfill**	Native
Test Date:	9/19/2023		



Constant Head Test Data	
Time (min)	30
Volume of Water (gal)	0.14
Volume of Water(in^3)	32
Rate (gal/hr)	0
Rate (in^3/hr)	65

Test Notes
Added 10 gallons of water for saturdation
9/19 No water visible in hole

Falling Head Percolation Test Data Table

Time	H (inches)	Δ (inches)	ΔT (minutes)	R (min/inch)	I_t (in/hr)
0:52	26.8	0.0	-		
0:53	26.5	0.3	2	6.33	0.959
0:56	26.0	0.5	2	4.33	1.420
1:00	25.0	1.0	4	4.00	1.579
1:05	24.0	1.0	5	5.00	1.309
1:07	23.8	0.3	2	9.00	0.744
1:24	21.3	2.5	17	6.70	1.054
1:29	20.5	0.8	5	7.00	1.077
1:40	19.5	1.0	11	10.75	0.728
2:01	18.5	1.0	21	21.00	0.390
2:14	17.0	1.5	13	8.83	0.982
2:45	14.8	2.3	31	13.89	0.687
---	---	---	---	---	---
2:47	22.3	---	---	---	---
2:48	22.0	0.3	1	6.00	1.194
2:50	21.8	0.3	2	7.33	0.987
2:52	21.5	0.3	2	8.00	0.914
2:55	21.3	0.3	2	10.00	0.738
2:58	21.0	0.3	3	12.00	0.622
3:00	20.8	0.3	2	8.00	0.942
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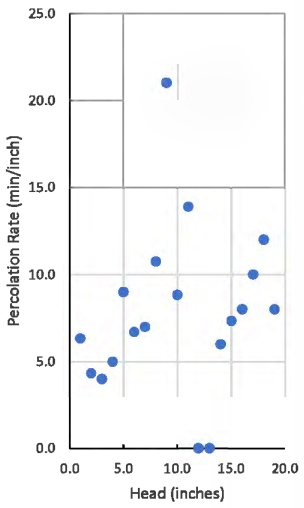
Plotted Data



Average Percolation Rate, R:	12.07	Minutes/Inch
Average Percolation Rate, R:	4.97	Inches/Hour
Average Infiltration Rate, I_t:	0.73	Inches/Hour

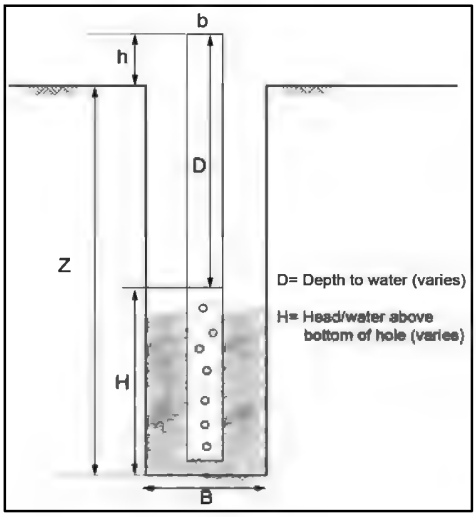
LEGEND:
H = Water head in test hole
Δ = Drop in water level between observations
T = Time interval between observations
R = Percolation Rate
I_t = Infilation Rate (Porchet)

Infiltration Test

References: Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures, Central Coast LID Initiative, December 2013
Caltrans Test 749 and 750
Riverside County LID/BMP Handbook, September 2011

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project No.:	223-202	**Percolation Test No.:**	23IN-02
Project Name:	ES Hydrostor Zevsar Energy Storage	**Surface Elevation (ft):**	2527.7
Project MGR:	J. King	**Completion Depth, Z (ft):**	6.4167
Tested By:	C. Kuchta - J. King	**Pipe Above Grade, h (ft)**	0.625
Excavation Method:	12" Auger	**Pipe Diameter, b (in)**	2
Weather:	Sunny, Hot	**Hole Diameter, B (in):**	12
Installation Date:	9/18/2023	**Backfill**	Native
Test Date:	9/19/2023		



Constant Head Test Data	
Time (min)	30
Volume of Water (gal)	0.07
Volume of Water(in^3)	16.17
Rate (gal/hr)	0.14
Rate (in^3/hr)	32

Test Notes
Added 10 gallons water to saturate
9/19 No water visible in hole prior to testing

Falling Head Percolation Test Data Table

Time	H (inches)	Δ (inches)	ΔT (minutes)	R (min/inch)	I_t (in/hr)
0:04	40.0	0.0	-		
0:11	38.5	1.5	7	4.33	0.983
0:13	38.0	0.5	2	4.00	1.091
0:17	37.3	0.8	5	6.00	0.738
0:19	37.0	0.3	2	6.00	0.748
0:21	36.5	0.5	2	4.00	1.132
0:29	35.3	1.3	9	6.87	0.674
0:35	34.5	0.8	6	7.56	0.629
0:47	33.5	1.0	12	11.50	0.423
0:49	33.0	0.5	3	5.50	0.903
0:58	32.3	0.8	8	11.00	0.459
1:26	30.0	2.3	28	12.56	0.420
1:42	29.0	1.0	16	16.25	0.341
2:16	27.0	2.0	34	17.00	0.342
2:43	25.5	1.5	27	18.00	0.342
3:02	24.8	0.8	19	24.67	0.259
---	---	---	---	---	---
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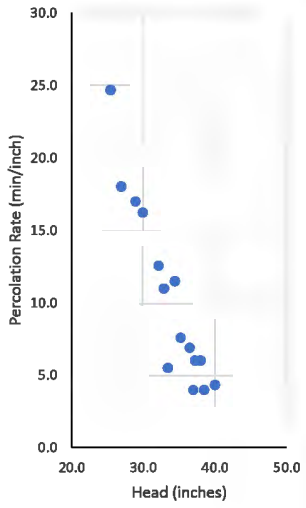
---	---	---	---	---	---

Plotted Data



Average Percolation Rate, R:	17.69	Minutes/Inch
Average Percolation Rate, R:	3.39	Inches/Hour
Average Infiltration Rate, I_t:	0.34	Inches/Hour

LEGEND:

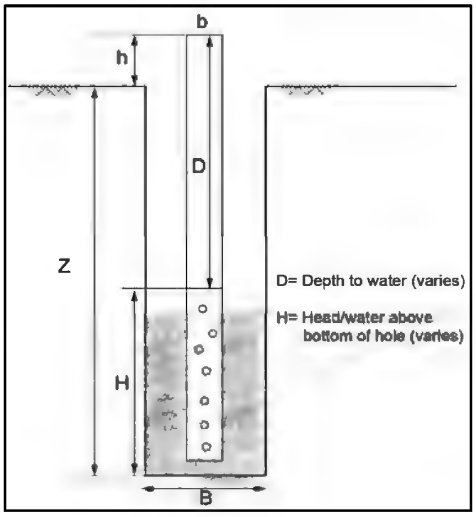
H = Water head in test hole
Δ = Drop in water level between observations
T = Time interval between observations
R = Percolation Rate
I_t = Infilation Rate (Porchet)

Infiltration Test

References: Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures, Central Coast LID Initiative, December 2013
Caltrans Test 749 and 750
Riverside County LID/BMP Handbook, September 2011

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project No.:	223-202	**Percolation Test No.:**	23IN-03
Project Name:	ES Hydrostor Zevsar Energy Storage	**Surface Elevation (ft):**	2527
Project MGR:	J. King	**Completion Depth, Z (ft):**	4.167
Tested By:	C. Kuchta - J. King	**Pipe Above Grade, h (ft)**	1.083
Excavation Method:	12" Auger	**Pipe Diameter, b (in)**	2
Weather:	Sunny, Hot	**Hole Diameter, B (in):**	12
Installation Date:	9/18/2023	**Backfill**	Native
Test Date:	9/19/2023		



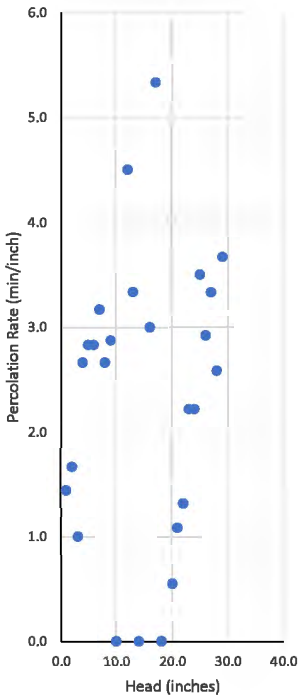
Constant Head Test Data	
Time (min)	30
Volume of Water (gal)	0.76
Volume of Water(in^3)	176
Rate (gal/hr)	2
Rate (in^3/hr)	351

Test Notes
10 gallons of water used to saturate hole
9/19 No water visible in hole prior to testing

Falling Head Percolation Test Data Table

Time	H (inches)	Δ (inches)	ΔT (minutes)	R (min/inch)	I_t (in/hr)
0:00	12.0	0.0	-		
0:02	10.5	1.5	2	1.44	8.745
0:03	10.0	0.5	1	1.67	8.151
0:03	9.5	0.5	1	1.00	14.118
0:04	9.0	0.5	1	2.67	5.510
0:06	8.5	0.5	1	2.83	5.407
0:07	8.0	0.5	1	2.83	5.647
0:09	7.5	0.5	2	3.17	5.288
0:13	6.0	1.5	4	2.67	6.923
0:19	4.0	2.0	6	2.88	7.826
---	---	---	---	---	---
0:09	9.5	0.0	-		
0:11	9.0	0.5	2	4.50	3.265
0:14	8.3	0.8	3	3.33	4.645
---	---	---	---	---	---
0:00	6.0	0.0	-		
0:02	5.3	0.8	2	3.00	6.957
0:06	4.5	0.8	4	5.33	4.286
---	---	---	---	---	---
0:07	22.0	0.0	-		
0:08	20.0	2.0	1	0.55	13.636
0:09	19.0	1.0	1	1.08	7.385
0:14	15.3	3.8	5	1.31	6.822
0:16	14.5	0.8	2	2.22	4.531
0:23	11.5	3.0	7	2.22	5.063
0:28	10.0	1.5	5	3.50	3.740
0:37	7.0	3.0	9	2.92	5.366
0:41	5.8	1.3	4	3.33	5.760
0:43	4.8	1.0	3	2.58	8.446
0:44	4.5	0.3	1	3.67	6.438

Plotted Data



Average Percolation Rate, R:	3.45	Minutes/Inch
Average Percolation Rate, R:	17.41	Inches/Hour
Average Infiltration Rate, I_t:	5.90	Inches/Hour

LEGEND:

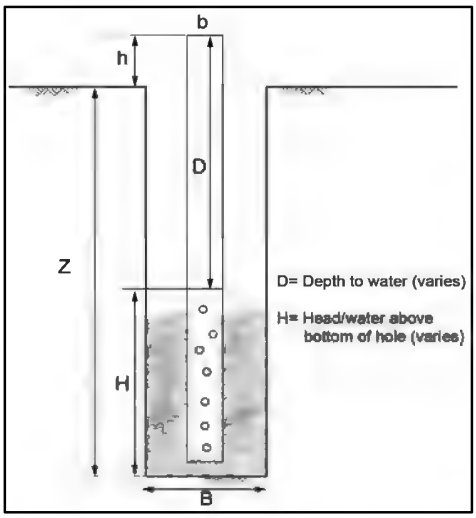
H = Water head in test hole
Δ = Drop in water level between observations
T = Time interval between observations
R = Percolation Rate
I_t = Infilation Rate (Porchet)

Infiltration Test

References: Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures, Central Coast LID Initiative, December 2013
Caltrans Test 749 and 750
Riverside County LID/BMP Handbook, September 2011

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project No.:	223-202	**Percolation Test No.:**	23IN-04
Project Name:	ES Hydrostor Zevsar Energy Storage	**Surface Elevation (ft):**	2532.9
Project MGR:	J. King	**Completion Depth, Z (ft):**	4.583
Tested By:	C. Kuchta - J. King	**Pipe Above Grade, h (ft)**	1.25
Excavation Method:	12" Auger	**Pipe Diameter, b (in)**	2
Weather:	Sunny, Hot	**Hole Diameter, B (in):**	12
Installation Date:	9/18/2023	**Backfill**	Native
Test Date:	9/20/2023		



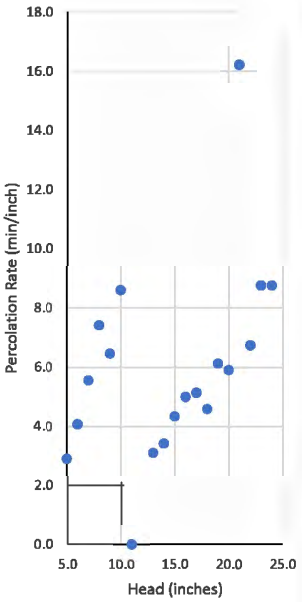
Constant Head Test Data	
Time (min)	30
Volume of Water (gal)	0.98
Volume of Water(in^3)	226
Rate (gal/hr)	2
Rate (in^3/hr)	453

Test Notes
Saturated with 10 gallons of water
9/19 No water visible in hole, same for 9.20

Falling Head Percolation Test Data Table

Time	H (inches)	Δ (inches)	ΔT (minutes)	R (min/inch)	I_t (in/hr)
0:00	16.6	0.0	-		
0:02	15.4	1.2	2	1.86	5.091
0:04	14.2	1.2	2	1.47	6.870
0:06	13.0	1.2	3	2.08	5.206
0:10	11.7	1.3	4	2.65	4.427
0:15	9.9	1.8	5	2.92	4.480
0:27	7.0	2.9	12	4.08	3.858
0:49	3.0	4.0	22	5.56	4.042
0:57	2.0	1.1	8	7.41	4.421
1:04	0.8	1.2	8	6.46	6.398
1:13	-0.2	1.0	8	8.59	6.394
---	---	---	---	---	---
1:17	18.4	#VALUE!	-		
1:34	13.0	5.4	17	3.12	3.088
1:41	10.8	2.2	7	3.43	3.515
1:48	9.4	1.4	6	4.34	3.162
1:54	8.2	1.2	6	5.00	3.052
2:00	7.0	1.2	6	5.14	3.306
2:05	6.2	6.8	31	4.59	3.116
2:17	4.2	1.9	12	6.12	3.589
2:23	3.3	1.0	6	5.90	4.514
2:29	2.9	0.4	6	16.20	1.822
2:39	1.1	5.9	40	6.73	3.789
2:45	0.5	0.6	5	8.75	5.391
2:50	-0.1	0.6	5	8.75	6.397
---	---	---	---	---	---

Plotted Data



Average Percolation Rate, R:	7.46	Minutes/Inch
Average Percolation Rate, R:	8.04	Inches/Hour
Average Infiltration Rate, I_t:	4.83	Inches/Hour

LEGEND:

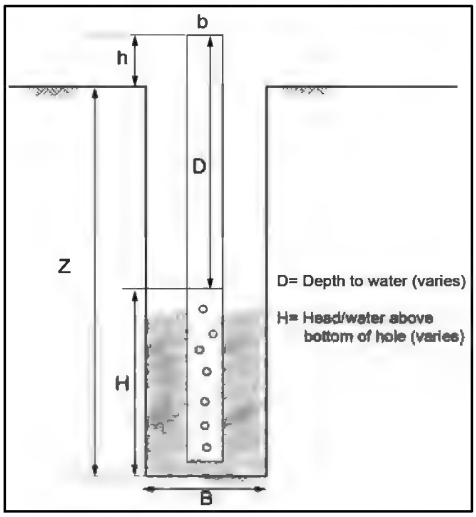
H = Water head in test hole
Δ = Drop in water level between observations
T = Time interval between observations
R = Percolation Rate
I_t = Infilation Rate (Porchet)

Infiltration Test

References: Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures, Central Coast LID Initiative, December 2013
Caltrans Test 749 and 750
Riverside County LID/BMP Handbook, September 2011

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project No.:	223-202	**Percolation Test No.:**	23IN-05
Project Name:	ES Hydrostor Zevsar Energy Storage	**Surface Elevation (ft):**	2526.3
Project MGR:	J. King	**Completion Depth, Z (ft):**	6.25
Tested By:	C. Kuchta - J. King	**Pipe Above Grade, h (ft)**	1.33
Excavation Method:	12" Auger	**Pipe Diameter, b (in)**	2
Weather:	Sunny, Hot	**Hole Diameter, B (in):**	12
Installation Date:	9/18/2023	**Backfill**	Native
Test Date:	9/20/2023		



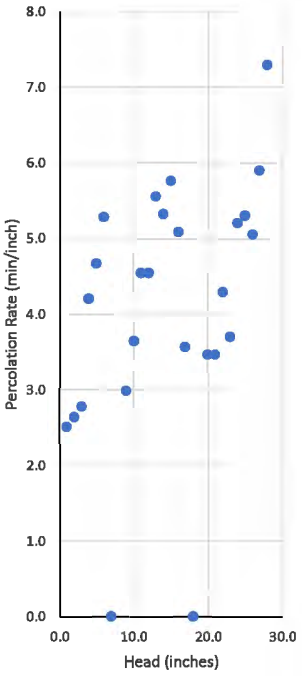
Constant Head Test Data	
Time (min)	30
Volume of Water (gal)	0.98
Volume of Water(in^3)	226
Rate (gal/hr)	2
Rate (in^3/hr)	453

Test Notes
Saturated with 10 gallons of water
9/19 No water visible on bottom of hole, same for 9/20

Falling Head Percolation Test Data Table

Time	H (inches)	Δ (inches)	ΔT (minutes)	R (min/inch)	I_t (in/hr)
0:21	20.4	0.0	-		
0:24	19.0	1.4	4	2.51	3.160
0:30	16.9	2.0	5	2.64	3.257
0:32	16.2	0.7	2	2.78	3.313
0:51	11.5	4.7	20	4.20	2.541
0:59	9.8	1.7	8	4.66	2.822
1:07	8.3	1.6	8	5.29	2.822
---	---	---	---	---	---
1:23	21.7	0.0	-		
1:37	17.3	4.4	13	2.98	2.681
1:44	15.4	1.9	7	3.65	2.555
1:50	14.0	1.3	6	4.55	2.237
1:56	12.7	1.3	6	4.55	2.418
2:02	11.6	1.1	6	5.56	2.134
2:07	10.6	1.1	6	5.32	2.398
2:19	8.5	2.0	12	5.76	2.492
2:25	7.4	1.1	5	5.09	3.219
2:31	5.8	1.7	6	3.57	5.250
---	---	---	---	---	---
2:38	20.6	0.0	-		
2:41	19.6	1.1	4	3.47	2.244
2:46	18.1	1.4	5	3.47	2.374
2:55	16.1	2.0	9	4.29	2.088
2:59	15.0	1.1	4	3.70	2.621
3:03	14.3	0.7	4	5.21	1.959
3:10	13.0	1.3	7	5.30	2.042
3:14	12.1	0.8	4	5.06	2.289
3:18	11.4	0.7	4	5.90	2.066
3:20	11.2	0.2	2	7.29	1.729

Plotted Data



Average Percolation Rate, R:	5.22	Minutes/Inch
Average Percolation Rate, R:	11.49	Inches/Hour
Average Infiltration Rate, I_t:	2.70	Inches/Hour

LEGEND:

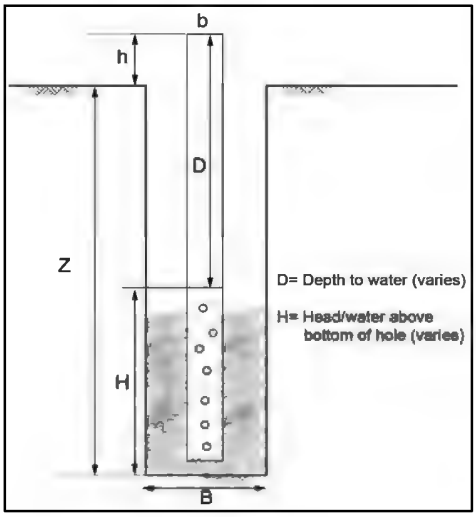
H = Water head in test hole
Δ = Drop in water level between observations
T = Time interval between observations
R = Percolation Rate
I_t = Infilation Rate (Porchet)

Infiltration Test

References: Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures, Central Coast LID Initiative, December 2013
Caltrans Test 749 and 750
Riverside County LID/BMP Handbook, September 2011

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project No.:	223-202	**Percolation Test No.:**	23IN-06
Project Name:	ES Hydrostor Zevsar Energy Storage	**Surface Elevation (ft):**	2526.7
Project MGR:	J. King	**Completion Depth, Z (ft):**	6.75
Tested By:	C. Kuchta - J. King	**Pipe Above Grade, h (ft)**	0.70833
Excavation Method:	12" Auger	**Pipe Diameter, b (in)**	2
Weather:	Sunny, Hot	**Hole Diameter, B (in):**	12
Installation Date:	9/18/2023	**Backfill**	Native
Test Date:	9/20/2023		



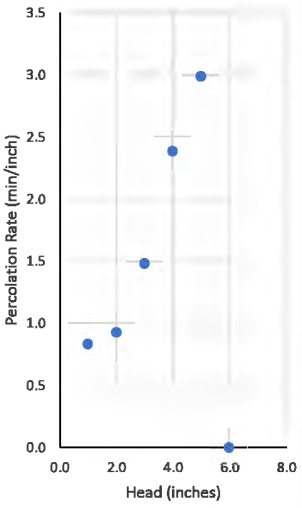
Constant Head Test Data	
Time (min)	30
Volume of Water (gal)	0.17
Volume of Water(in^3)	39
Rate (gal/hr)	0
Rate (in^3/hr)	79

Test Notes
Saturated with 10 gallons of water
9/19 No water present in hole, same for 9/20 prior to testing

Falling Head Percolation Test Data Table

Time	H (inches)	Δ (inches)	ΔT (minutes)	R (min/inch)	I_t (in/hr)
0:44	19.3	0.0	-		
0:45	18.1	1.2	1	0.83	9.954
0:46	17.0	1.1	1	0.93	9.455
0:54	11.6	5.4	8	1.48	7.015
1:02	8.3	3.4	8	2.38	5.842
1:10	5.5	2.8	8	2.99	6.095
---	---	---	---	---	---
1:31	17.9	0.0	-		
1:39	13.7	4.2	8	1.96	4.885
1:46	10.8	2.9	7	2.34	5.046
1:51	8.9	1.9	6	2.99	4.688
1:58	7.1	1.8	6	3.47	4.730
2:03	5.5	1.6	6	3.69	5.262
2:09	4.2	1.3	6	4.55	5.051
---	---	---	---	---	---
2:15	20.0	0.0	-		
2:21	16.7	3.4	6	1.74	4.858
2:26	14.1	2.5	6	2.28	4.287
2:33	11.5	2.6	6	2.37	4.806
2:43	8.1	3.4	10	3.05	4.603
2:48	6.6	1.6	5	3.15	5.513
2:57	5.0	1.6	9	5.82	3.513

Plotted Data

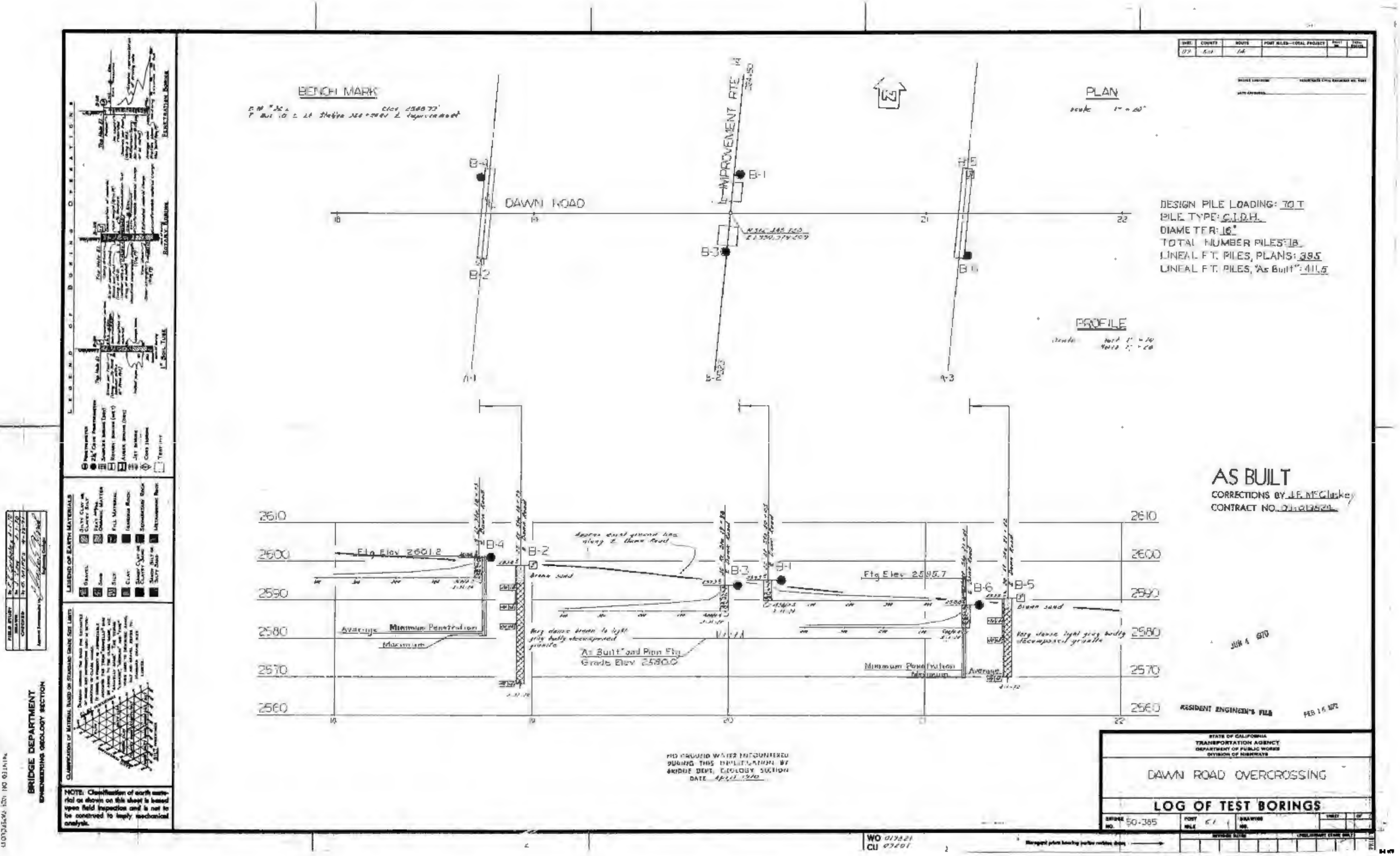


Average Percolation Rate, R:	3.40	Minutes/Inch
Average Percolation Rate, R:	17.66	Inches/Hour
Average Infiltration Rate, I_t:	5.29	Inches/Hour

LEGEND:

H = Water head in test hole
Δ = Drop in water level between observations
T = Time interval between observations
R = Percolation Rate
I_t = Infilation Rate (Porchet)

APPENDIX E - PREVIOUS STUDIES AND PERTINENT DATA


BENCH MARK
PLAN
PROFILE
IMPROVEMENT RTE 14
DAWN ROAD
B-1
B-2
B-3
B-4
B-5
B-6
DESIGN PILE LOADING: 70 T
PILE TYPE: C.I.D.H.
DIAMETER: 16"
TOTAL NUMBER PILES: 18
LINEAL FT. PILES, PLANS: 395
LINEAL FT. PILES, "As Built": 411.5
AS BUILT
CORRECTIONS BY J.E. McCluskey
Ftg Elev 2601.2
Ftg Elev 2595.7
"As Built" and Plan Ftg Grade Elev 2580.0
Average
Minimum Penetration
Maximum
2610
2600
2590
2580
2570
2560
NO GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT. GEOLOGY SECTION
RESIDENT ENGINEER'S FILE
STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
DAWN ROAD OVERCROSSING
LOG OF TEST BORINGS
BRIDGE NO. 50-385
BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION
LEGEND OF EARTH MATERIALS
LEGEND OF BORING OPERATIONS
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.
50-385
WO 017821
CU 07201

Groundwater Level Report

Station 349444N1181360W001

Station Data | Groundwater Level Data

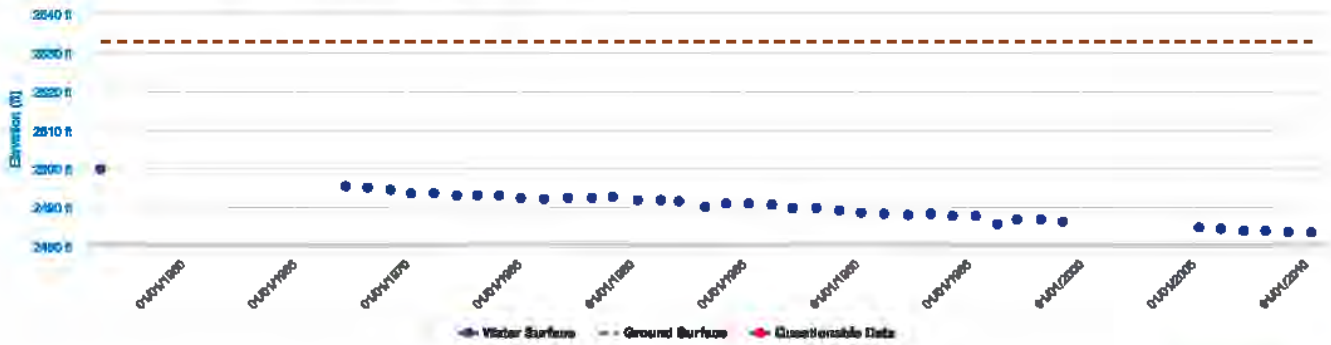
State Well Number:	10N12W22J001S
Local Well Name:	10N12W22J001S
Site Code:	349444N1181360W001
Latitude (NAD83):	34.9444
Longitude (NAD83):	-118.136
Basin Subbasin Name (Code):	Fremont Valley (6-046)
Well Use Type:	Unknown
Well Status:	Active
WCR Number:	
Reference Point Elevation (NAVD88 ft):	2532.780
Ground Surface Elevation (NAVD88 ft):	2532.780
Well Depth (feet bgs):	
Perforated Interval Depths (feet bgs):	

Groundwater Level Report

Station 349444N1181360W001

Station Data | **Groundwater Level Data**

Groundwater Levels for Well 349444N1181360W001



Download Data

Measurement Date (PST)	Reference Point Elevation	Ground Surface Elevation	Distance from RP to WS	Groundwater Elevation	Ground Surface to Water Surface	Measurement Issue	Submitting Organization	Collecting Organization	Water Level Measurement Comments
05/18/1956 00:00:00	2532.780	2532.780	33	2499.78	33		Department of Water Resou...	United States Geological Survey	
04/13/1967 00:00:00	2532.780	2532.780	37.27	2495.51	37.27		Department of Water Resou...	United States Geological Survey	
04/02/1968 00:00:00	2532.780	2532.780	37.84	2494.94	37.84		Department of Water Resou...	United States Geological Survey	
04/16/1969 00:00:00	2532.780	2532.780	38.22	2494.56	38.22		Department of Water Resou...	United States Geological Survey	
03/17/1970 00:00:00	2532.780	2532.780	39.26	2493.52	39.26		Department of Water Resou...	United States Geological Survey	
03/17/1971 00:00:00	2532.780	2532.780	39.2	2493.58	39.2		Department of Water Resou...	United States Geological Survey	
03/14/1972 00:00:00	2532.780	2532.780	39.82	2492.96	39.82		Department of Water Resou...	United States Geological Survey	
02/12/1973 00:00:00	2532.780	2532.780	39.83	2492.95	39.83		Department of Water Resou...	United States Geological Survey	
02/11/1974 00:00:00	2532.780	2532.780	39.68	2493.1	39.68		Department of Water Resou...	United States Geological Survey	
02/04/1975 00:00:00	2532.780	2532.780	40.25	2492.53	40.25		Department of Water Resou...	United States Geological Survey	
02/11/1976 00:00:00	2532.780	2532.780	40.56	2492.22	40.56		Department of Water Resou...	United States Geological Survey	

03/07/1977 00:00:00	2532.780	2532.780	40.4	2492.38	40.4		Department of Water Resou...	United States Geological Survey
03/30/1978 00:00:00	2532.780	2532.780	40.27	2492.51	40.27		Department of Water Resou...	United States Geological Survey
02/28/1979 00:00:00	2532.780	2532.780	40.19	2492.59	40.19		Department of Water Resou...	United States Geological Survey
04/18/1980 00:00:00	2532.780	2532.780	40.85	2491.93	40.85		Department of Water Resou...	United States Geological Survey
04/24/1981 00:00:00	2532.780	2532.780	41.05	2491.73	41.05		Department of Water Resou...	United States Geological Survey
02/18/1982 00:00:00	2532.780	2532.780	41.18	2491.6	41.18		Department of Water Resou...	United States Geological Survey
04/14/1983 00:00:00	2532.780	2532.780	42.67	2490.11	42.67		Department of Water Resou...	United States Geological Survey
03/05/1984 00:00:00	2532.780	2532.780	41.8	2490.98	41.8		Department of Water Resou...	United States Geological Survey
03/25/1985 00:00:00	2532.780	2532.780	41.78	2491	41.78		Department of Water Resou...	United States Geological Survey
03/25/1986 00:00:00	2532.780	2532.780	42.16	2490.62	42.16		Department of Water Resou...	United States Geological Survey
02/22/1987 00:00:00	2532.780	2532.780	43.01	2489.77	43.01		Department of Water Resou...	United States Geological Survey
03/28/1988 00:00:00	2532.780	2532.780	43.14	2489.64	43.14		Department of Water Resou...	United States Geological Survey
03/23/1989 00:00:00	2532.780	2532.780	43.73	2489.05	43.73		Department of Water Resou...	United States Geological Survey
03/15/1990 00:00:00	2532.780	2532.780	44.34	2488.44	44.34		Department of Water Resou...	United States Geological Survey

1 to 25 of 40 records

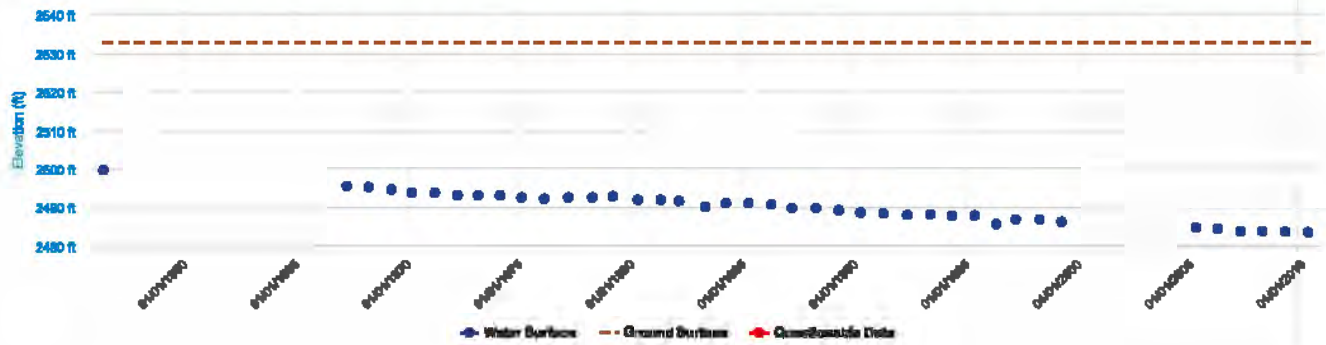
Back to Search

Groundwater Level Report

Station 349444N1181360W001

Station Data | Groundwater Level Data

Groundwater Levels for Well 349444N1181360W001



Download Data

Measurement Date (PST)	Reference Point Elevation	Ground Surface Elevation	Distance from RP to WS	Groundwater Elevation	Ground Surface to Water Surface	Measurement Issue	Submitting Organization	Collecting Organization	Water Level Measurement Comments
03/21/1991 00:00:00	2532.780	2532.780	44.63	2488.15	44.63		Department of Water Resou...	United States Geological Survey	
04/16/1992 00:00:00	2532.780	2532.780	44.77	2488.01	44.77		Department of Water Resou...	United States Geological Survey	
04/19/1993 00:00:00	2532.780	2532.780	44.59	2488.19	44.59		Department of Water Resou...	United States Geological Survey	
04/11/1994 00:00:00	2532.780	2532.780	45.15	2487.63	45.15		Department of Water Resou...	United States Geological Survey	
04/20/1995 00:00:00	2532.780	2532.780	45.15	2487.63	45.15		Department of Water Resou...	United States Geological Survey	
04/19/1996 00:00:00	2532.780	2532.780	47.14	2485.64	47.14		Department of Water Resou...	United States Geological Survey	
03/03/1997 00:00:00	2532.780	2532.780	45.96	2486.82	45.96		Department of Water Resou...	United States Geological Survey	
03/16/1998 00:00:00	2532.780	2532.780	45.95	2486.83	45.95		Department of Water Resou...	United States Geological Survey	
03/18/1999 00:00:00	2532.780	2532.780	46.63	2486.15	46.63		Department of Water Resou...	United States Geological Survey	
03/28/2005 00:00:00	2532.780	2532.780	48.08	2484.7	48.08		Department of Water Resou...	United States Geological Survey	
03/27/2006 00:00:00	2532.780	2532.780	48.37	2484.41	48.37		Department of Water Resou...	United States Geological Survey	

03/26/2007 00:00:00	2532.780	2532.780	48.92	2483.86	48.92		Department of Water Resou...	United States Geological Survey
03/24/2008 00:00:00	2532.780	2532.780	48.81	2483.97	48.81		Department of Water Resou...	United States Geological Survey
03/23/2009 00:00:00	2532.780	2532.780	49.1	2483.68	49.1		Department of Water Resou...	United States Geological Survey
03/29/2010 00:00:00	2532.780	2532.780	49.3	2483.48	49.3		Department of Water Resou...	United States Geological Survey

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