



Aptim Environmental & Infrastructure, LLC

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Legend for Geotechnical Data

Grain Size Scale for Sediments

Unified Soil Classification System (USCS) (ASTM D2487/2488)		APTIM Standard Sieve Stack		
		Sieve Number	Size (phi)	Size (mm)
Gravel	Coarse Gravel	3/4	-4.25	19.03
	Fine Gravel	5/8	-4.00	16.00
		7/16	-3.50	11.20
		5/16	-3.00	8.00
		3 1/2	-2.50	5.60
		4	-2.25	4.75
Sand	Coarse Sand	5	-2.00	4.00
		7	-1.50	2.80
		10	-1.00	2.00
	Medium Sand	14	-0.50	1.40
		18	0.00	1.00
		25	0.50	0.71
		35	1.00	0.50
	Fine Sand	45	1.50	0.36
		60	2.00	0.25
		80	2.50	0.18
		120	3.00	0.13
		170	3.50	0.09
		200	3.75	0.08
Fines	Silt/Clay	230	4.00	0.06

Proportional Definition of Descriptive Terms

<u>Descriptive Term</u>	<u>Range of Proportions</u>
Sandy, gravelly, etc.	35 % to 50 %
Some	20 % to 35 %
Little	10 % to 20 %
Trace	1 % to 10 %

Consistency of Cohesive Soils

Description	Consistency Index	Approximate Undrained Shear Strength (kPa)	Field Identification
Hard		Over 300	Indented with difficulty by thumbnail, brittle.
Very Stiff	>1	150-300	Readily indented by thumbnail, still very tough.
Stiff	0.75-1	75-150	Readily indented by thumb but penetrated only with difficulty. Cannot be moulded in the fingers.
Firm	0.5-0.75	40-75	Can be penetrated several centimeters by thumb with moderate effort and moulded in fingers by strong pressure.
Soft	< 0.5	20-40	Easily penetrated several centimeters by thumb, easily moulded.
Very Soft		Less than 20	Easily penetrated several centimeters by fist, exudes between fingers when squeezed in fist.

Source: *Engineering Properties of Soils and Rocks, Fourth Edition by Fred G. Bell*

USCS Classifications

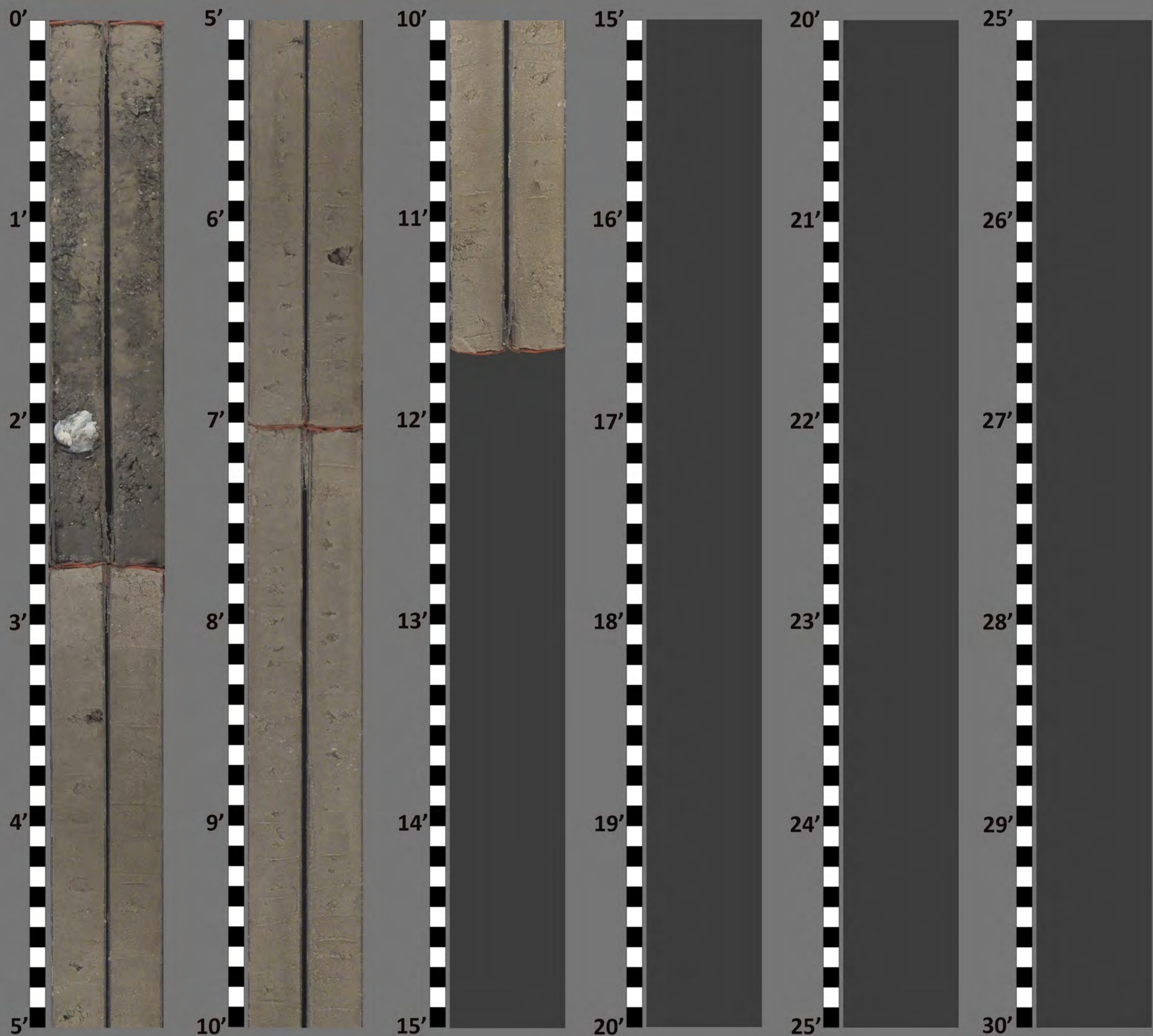
Refers to the Army Corps of Engineers Unified Soils Classification System. Class types are defined primarily by grain size, sorting and percent of material passing the #200 sieve. Classification of materials on the core logs based on visual field examinations are identified on the core logs under the Classification of Materials Description. Classifications based on laboratory sieve analyses are identified on the core logs in the Legend and under Remarks.

GW		Well graded gravels or gravel-sand mixtures, little or no fines
GP		Poorly graded gravels or gravel-sand mixtures, w/ little or no fines
GM		Silty gravels, gravel-sand-silt mixtures
GC		Clayey gravels, gravel-sand-clay mixtures
SW		Well graded sands or gravelly sands, little or no fines
SP		Poorly graded sands or gravelly sands, little or no fines
SM		Silty sands, sand-silt mixtures
SC		Clayey sands, sand-clay mixtures
SW-SM		Well-graded silty sand
GW-GM		Well-graded silty gravel
GM-GC		Clayey silty gravel
ML		Inorganic silts and very fine sands, rock flour, sandy silts or clayey silts with slight plasticity
MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty silt, elastic silts
OL		Organic silts and organic silt-clays of low plasticity
OH		Organic clays of medium to high plasticity, organic silts
CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
CH		Inorganic clays of high plasticity, fat clays
PT		Peat and other highly organic soils
SP-SM		Poorly-graded silty sand
SM-SC		Silty clayey sand
ML-CL		Inorganic silty lean clay

Note: Information is after ACOE Atlantic Division Manual # 1110-1-1 titled *Engineering and Design Geotechnical Manual for Surface and Subsurface Investigations*

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT TX GLO Region 1 Recon Geotechnical Sand Search Jefferson, Chambers, Galveston and Brazoria Co.			9. SIZE AND TYPE OF BIT 3.0 In.	
2. BORING DESIGNATION TXGLO1-VC-23-100			10. COORDINATE SYSTEM/DATUM Texas State Plane South	
3. DRILLING AGENCY APTIM			11. MANUFACTURER'S DESIGNATION OF DRILL APTIM SEAS VC-700 Vibracore	
4. NAME OF DRILLER APTIM			12. TOTAL SAMPLES 2	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED			13. TOTAL NUMBER CORE BOXES 0	
6. THICKNESS OF OVERBURDEN 0.0 Ft.			14. ELEVATION GROUND WATER	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.			15. DATE BORING 10-19-23	
8. TOTAL DEPTH OF BORING 13.6 Ft.			16. ELEVATION TOP OF BORING -59.1 Ft.	
			17. TOTAL RECOVERY FOR BORING 11.6 Ft.	
			18. SIGNATURE AND TITLE OF INSPECTOR BF	

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS The USCS classification system defines silt as the percent passing the No.200 (0.075 mm) sieve
-59.1	0.0					
-61.8	2.7		Shelly SAND, fine grained, quartz, little clay, trace silt, shell component is bivalve fragments typically up to 1.0", whole bivalves up to 1.5" and shell hash, 3.0" bivalve fragment @ 2.0', 3.0" clay pocket @ 2.4', color is mottled dark grayish brown (2.5Y-4/2) and brown (10YR-5/3), (GW).			
					1	Sample #1, Depth = 5.0' Mean (mm): 0.18, Phi Sorting: 0.42 Fines (230): 1.66% Fines (200): 1.72% (SP)
					2	Sample #2, Depth = 9.0' Mean (mm): 0.19, Phi Sorting: 0.32 Fines (230): 1.93% Fines (200): 1.99% (SP)
-70.7	11.6		SAND, fine grained, quartz, trace shell hash, trace silt, brown (10YR-5/3), (SP).			
-72.7	13.6		No recovery.			
			End of Boring			



Texas General Land
Office

Texas GLO Region 1 Geotechnical
Reconnaissance Survey

TXGLO1-VC-23-100

Date Collected: 10/19/23
Top Elev. (ft NAVD88): -59.1
Bottom Elev. (ft NAVD88): -70.7
Core Length (ft): 11.6

Granularmetric Report				 APTIM 6401 Congress Avenue, Suite 140 Boca Raton, FL 33487 ph (561) 391-8102			
Depths and elevations based on measured values							
Project Name: TX GLO Region 1 Recon Geotechnical Sand Search							
Sample Name: TXGLO1-VC-23-100 #1							
Analysis Date: 02-20-24							
Analyzed By: SM							
Easting (ft):		Northing (ft):		Coordinate System:		Elevation (ft):	
3,129,121		13,472,566		Texas State Plane South		-64.1 NAVD88	
USCS:		Munsell:		Comments:			
SP		Wet - 10YR-5/3 Dry - 10YR-7/3 Washed - 10YR-8/2					
Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
107.73	106.00	0.04	0.01	#200 - 1.72 #230 - 1.66			
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3.5	-2.50	5.66	0.00	0.00	0.00	0.00	
4	-2.25	4.76	0.00	0.00	0.00	0.00	
5	-2.00	4.00	0.05	0.05	0.05	0.05	
7	-1.50	2.83	0.05	0.05	0.10	0.10	
10	-1.00	2.00	0.11	0.10	0.21	0.20	
14	-0.50	1.41	0.17	0.16	0.38	0.36	
18	0.00	1.00	0.11	0.10	0.49	0.46	
25	0.50	0.71	0.10	0.09	0.59	0.55	
35	1.00	0.50	0.10	0.09	0.69	0.64	
45	1.50	0.35	0.26	0.24	0.95	0.88	
60	2.00	0.25	4.18	3.88	5.13	4.76	
80	2.50	0.18	53.90	50.03	59.03	54.79	
120	3.00	0.13	42.14	39.12	101.17	93.91	
170	3.50	0.09	4.49	4.17	105.66	98.08	
200	3.75	0.07	0.22	0.20	105.88	98.28	
230	4.00	0.06	0.07	0.06	105.95	98.34	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
3.13	2.87	2.76	2.45	2.20	2.11	2.00	
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
Statistics	2.45	0.18	0.42	-2.85	28		

Granularmetric Report				 APTIM 6401 Congress Avenue, Suite 140 Boca Raton, FL 33487 ph (561) 391-8102			
Depths and elevations based on measured values							
Project Name: TX GLO Region 1 Recon Geotechnical Sand Search							
Sample Name: TXGLO1-VC-23-100 #2							
Analysis Date: 02-20-24							
Analyzed By: SM							
Easting (ft):		Northing (ft):		Coordinate System:		Elevation (ft):	
3,129,121		13,472,566		Texas State Plane South		-68.1 NAVD88	
USCS:		Munsell:		Comments:			
SP		Wet - 10YR-5/3 Dry - 10YR-7/3 Washed - 10YR-8/2					
Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
109.62	107.54	0.04	0.00	#200 - 1.99 #230 - 1.93			
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3.5	-2.50	5.66	0.00	0.00	0.00	0.00	
4	-2.25	4.76	0.00	0.00	0.00	0.00	
5	-2.00	4.00	0.00	0.00	0.00	0.00	
7	-1.50	2.83	0.00	0.00	0.00	0.00	
10	-1.00	2.00	0.03	0.03	0.03	0.03	
14	-0.50	1.41	0.01	0.01	0.04	0.04	
18	0.00	1.00	0.01	0.01	0.05	0.05	
25	0.50	0.71	0.01	0.01	0.06	0.06	
35	1.00	0.50	0.02	0.02	0.08	0.08	
45	1.50	0.35	0.09	0.08	0.17	0.16	
60	2.00	0.25	5.80	5.29	5.97	5.45	
80	2.50	0.18	67.74	61.80	73.71	67.25	
120	3.00	0.13	31.16	28.43	104.87	95.68	
170	3.50	0.09	2.38	2.17	107.25	97.85	
200	3.75	0.07	0.18	0.16	107.43	98.01	
230	4.00	0.06	0.07	0.06	107.50	98.07	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
2.99	2.79	2.64	2.36	2.16	2.09	1.96	
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
Statistics	2.39	0.19	0.32	-0.13	10.13		