



Aptim Environmental & Infrastructure, LLC

6401 Congress Avenue, Suite 140

Boca Raton, Florida 33487

Phone # 1-561-391-8102

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

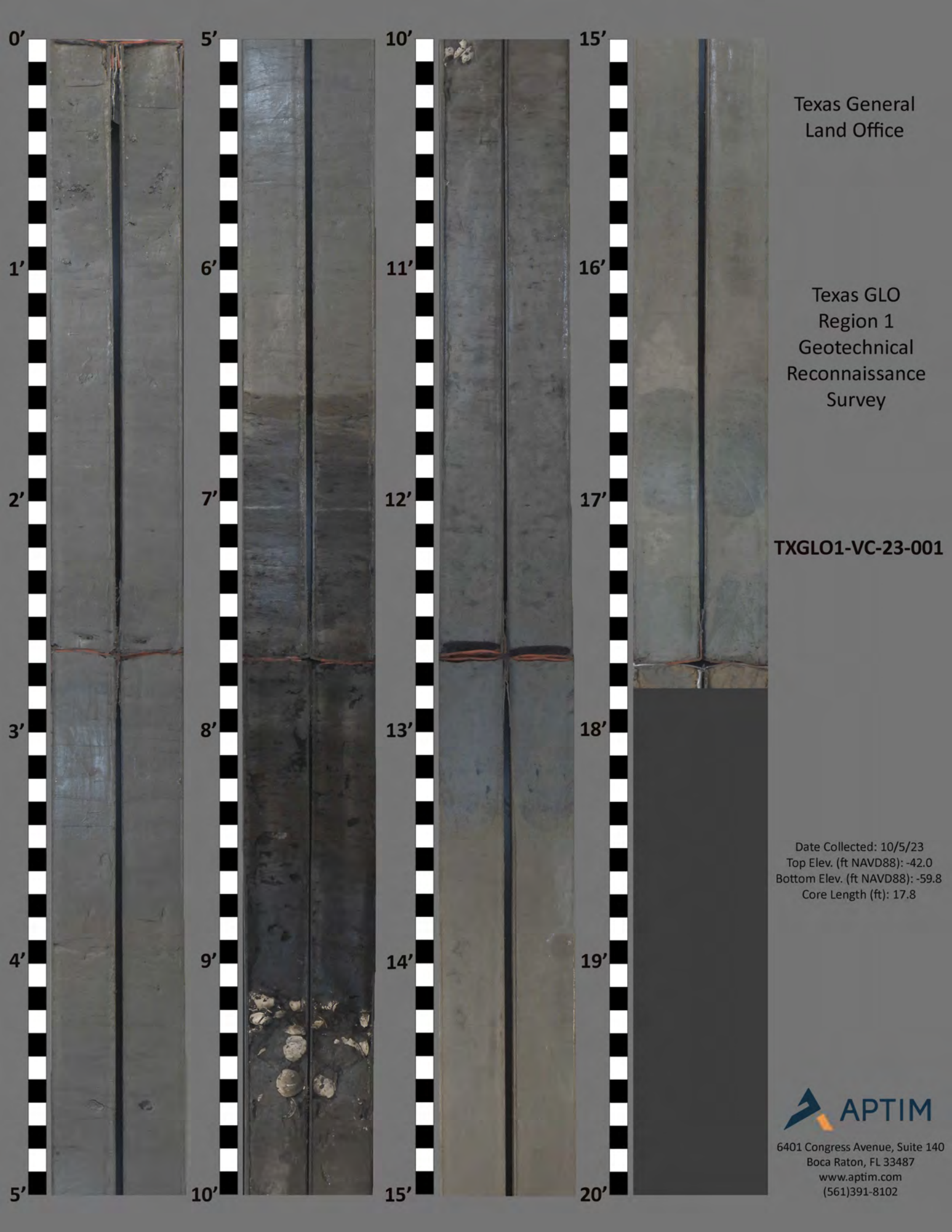
Refers to the Army Corps of Engineers Unified Soils Classification System. Class types are defined primarily by grain size, sorting and percent of material passing the #200 sieve. Classification of materials on the core logs based on visual field examinations are identified on the core logs under the 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	ML		Inorganic silts and very fine sands, rock flour, sandy silts or clayey silts with slight plasticity
GP		Poorly graded gravels or gravel-sand mixtures, w/ little or no fines	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soil, elastic silts
GM		Silty gravels, gravel-sand-silt mixtures	OL		Organic silts and organic silt-clays of low plasticity
GC		Clayey gravels, gravel-sand-clay mixtures	OH		Organic clays of medium to high plasticity, organic silts
SW		Well graded sands or gravelly sands, little or no fines	CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
SP		Poorly graded sands or gravelly sands, little or no fines	CH		Inorganic clays of high plasticity, fat clays
SM		Silty sands, sand-silt mixtures	PT		Peat and other highly organic soils
SC		Clayey sands, sand-clay mixtures	SP-SM		Poorly-graded silty sand
SW-SM		Well-graded silty sand	SM-SC		Silty clayey sand
GW-GM		Well-graded silty gravel	ML-CL		Inorganic silty lean clay
GM-GC		Clayey silty gravel			

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-23-001				10. COORDINATE SYSTEM/DATUM Texas State Plane South		HORIZONTAL NAD 1983	
3. DRILLING AGENCY APTIM				11. MANUFACTURER'S DESIGNATION OF DRILL APTIM SEAS VC-700 Vibracore		VERTICAL NAVD88	
4. NAME OF DRILLER APTIM				12. TOTAL SAMPLES			
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED				13. TOTAL NUMBER CORE BOXES		14. ELEVATION GROUND WATER	
6. THICKNESS OF OVERBURDEN 0.0 Ft.				15. DATE BORING		16. ELEVATION TOP OF BORING -42.0 Ft.	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.				17. TOTAL RECOVERY FOR BORING 17.8 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR SF	
8. TOTAL DEPTH OF BORING 18.9 Ft.							
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	
-42.0	0.0						
-42.7	0.7		Silty LEAN CLAY, soft, trace shell hash, trace whole shell, 1.5" whole bivalve @ 0.3', very dark greenish gray (5GY-3/1), (CL).				
			LEAN CLAY, very soft to soft, trace organics, trace shell hash, trace silt, hardness increases with depth in layer, shell hash distributed in laminae, silt distributed in laminae, (0.25" x 1.0") organic pocket @ 2.6', dark greenish gray (10GY-4/1), (CL).				
-48.5	6.5		Organic FAT CLAY, stiff, trace lean clay, soft, lean clay distributed in laminae, black (10YR-2/1), (OH).				
-51.1	9.1		Clayey SAND, fine grained, quartz, trace organics, trace shell fragments, trace silt, trace whole shell, shell fragments are bivalve fragments up to 1.25" between 9.1' & 10.1', whole shells are whole bivalves up to 1.75", gray (N-5/0), (SC).				
-53.9	11.9		Sandy FAT CLAY, stiff, trace organics, trace silt, sand component is fine grained quartz, dark greenish gray (10G-4/1), (CH).				
-55.4	13.4						
			SAND, fine grained, quartz, little silt, trace clay, clay typically distributed throughout layer, 2.0" clay pockets @ 16.9' and 17.4', Bit sample from 17.7' to 17.8', color is mottled dark greenish gray (5GY-4/1) and greenish gray (10Y-5/1), (SM).		1	Sample #1, Depth = 15.2' Mean (mm): 0.11, Phi Sorting: 0.41 Fines (230): 28.61% Fines (200): 34.15% (SM)	
-59.8	17.8						
-60.9	18.9		No recovery.				
			End of Boring				

REGION 1 RECON GEOTECH GP.1 3/25/24



Texas General
Land Office

Texas GLO
Region 1
Geotechnical
Reconnaissance
Survey

TXGLO1-VC-23-001

Date Collected: 10/5/23
Top Elev. (ft NAVD88): -42.0
Bottom Elev. (ft NAVD88): -59.8
Core Length (ft): 17.8

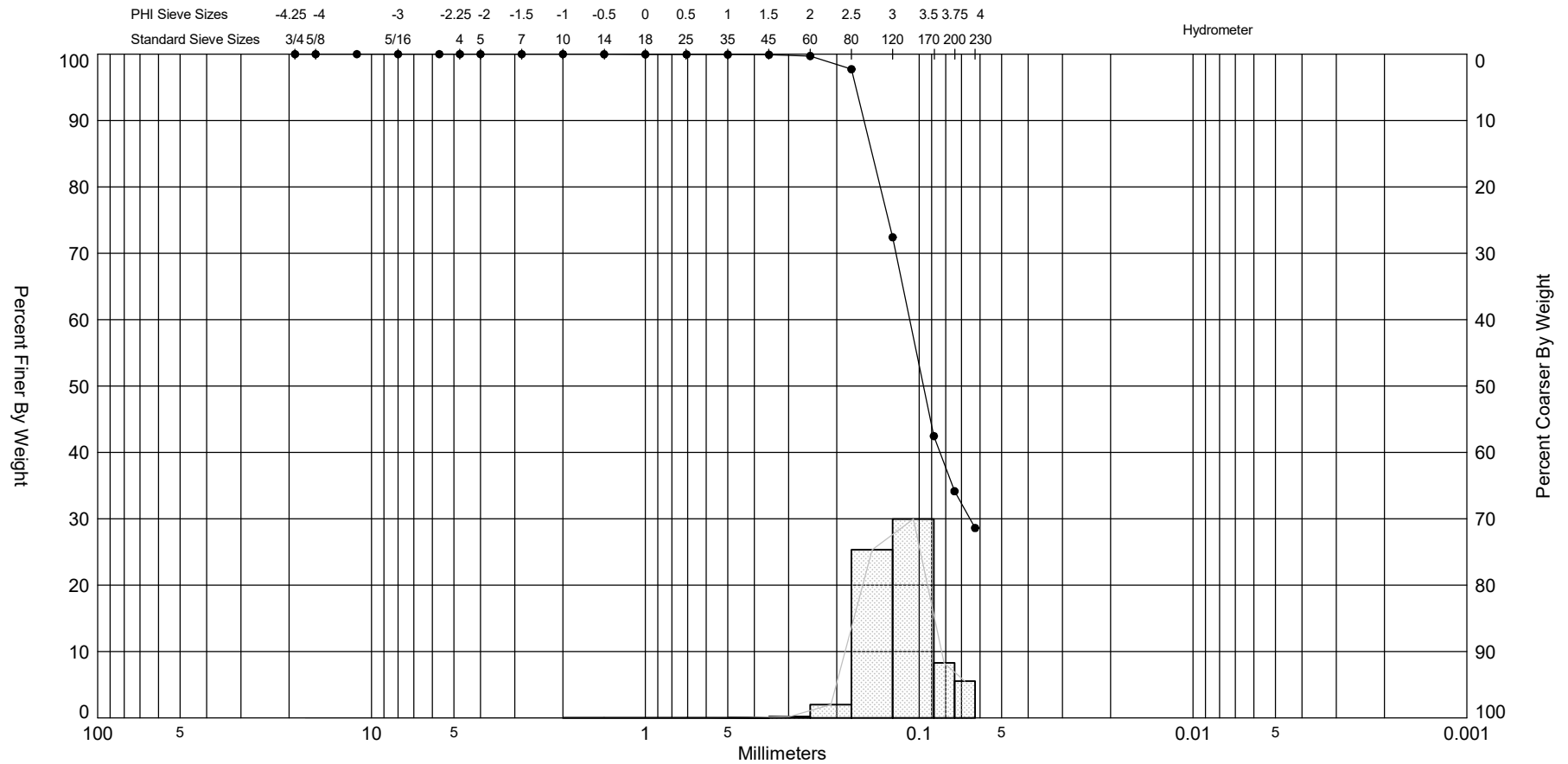


6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
www.aptim.com
(561)391-8102

REGION1_RECON_GEOTECH.GPJ 3/6/24

Granularmetric Report Depths and elevations based on measured values				 APTIM 6401 Congress Avenue, Suite 140 Boca Raton, FL 33487 ph (561) 391-8102			
Project Name: TX GLO Region 1 Recon Geotechnical Sand Search							
Sample Name: TXGLO1-VC-23-001 #1							
Analysis Date: 01-16-24							
Analyzed By: MS							
Easting (ft): 3,617,000		Northing (ft): 13,779,737		Coordinate System: Texas State Plane South		Elevation (ft): -57.2 NAVD88	
USCS: SM		Munsell: Wet - 10Y-5/1 Dry - 5Y-7/2 Washed - 5Y-7/1		Comments:			
Dry Weight (g): 99.97	Wash Weight (g): 74.88	Pan Retained (g): 3.49	Sieve Loss (%): 0.02	Fines (%): #200 - 34.15 #230 - 28.61	Organics (%):	Carbonates (%):	Shell Hash (%):
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	0.00	0.00	0.00	0.00	
14	-0.50	1.41	0.02	0.02	0.02	0.02	
18	0.00	1.00	0.01	0.01	0.03	0.03	
25	0.50	0.71	0.01	0.01	0.04	0.04	
35	1.00	0.50	0.02	0.02	0.06	0.06	
45	1.50	0.35	0.03	0.03	0.09	0.09	
60	2.00	0.25	0.19	0.19	0.28	0.28	
80	2.50	0.18	1.99	1.99	2.27	2.27	
120	3.00	0.13	25.31	25.32	27.58	27.59	
170	3.50	0.09	29.94	29.95	57.52	57.54	
200	3.75	0.07	8.31	8.31	65.83	65.85	
230	4.00	0.06	5.54	5.54	71.37	71.39	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
			3.37	2.95	2.77	2.55	
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
Statistics	3.13	0.11	0.41	-0.44	6.21		

REGION1_RECON_GEOTECH.GPJ 3/6/24



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
TXGLO1-VC-23-001 #1	—●—	-57.2	SM	#200 - 34.15 #230 - 28.61			3.37	3.13	-0.44	6.21	0.41	Project Name:	TX GLO Region 1 Recon Geotechnical Sand Search
Comments:												Analysis Date:	01-16-24
Depths and elevations based on measured values												Analyzed By:	MS
							APTIM 6401 Congress Avenue, Suite 140 Boca Raton, FL 33487 ph (561) 391-8102					Easting (X, ft):	3,617,000
												Northing (Y, ft):	13,779,737
												Horizontal Datum:	NAD 1983
												Vertical Datum:	NAVD88



Mini Vane Shear Test Results

CORE ID	SAMPLE DEPTH (ft)	TORVANE (kg/cm ²)	TORVANE (tsf)	TORVANE (kpa)	DESCRIPTION ¹
TXGLO1-VC-23-001	No Torvane Conducted				
TXGLO1-VC-23-002	3.0	1.5	0.15	147.10	Stiff
	6.0	1.0	0.10	98.07	Stiff
TXGLO1-VC-23-003	10.3	4.5	0.46	441.30	Hard
	13.4	5.5	0.56	539.37	Hard
	16.3	2.5	0.26	245.17	Very Stiff
TXGLO1-VC-23-004	9.1	3.0	0.31	294.20	Very Stiff
	11.9	5.0	0.51	490.33	Hard
	14.1	6.0	0.61	588.40	Hard
TXGLO1-VC-23-005	4.8	6.0	0.61	588.40	Hard
	7.5	5.0	0.51	490.33	Hard
	13.5	5.5	0.56	539.37	Hard
	16.5	3.5	0.36	343.23	Hard
TXGLO1-VC-23-006	No Torvane Conducted				
TXGLO1-VC-23-007	9.0	5.5	0.56	539.37	Hard
	15.1	1.5	0.15	147.10	Stiff
TXGLO1-VC-23-008	7.1	5.5	0.56	539.37	Hard
	8.1	9.0	0.92	882.60	Hard
	10.2	8.0	0.82	784.53	Hard
	16.0	8.0	0.82	784.53	Hard
TXGLO1-VC-23-009	No Torvane Conducted				
TXGLO1-VC-23-010	8.0	7.0	0.72	686.47	Hard
	10.0	8.5	0.87	833.57	Hard
	12.5	9.5	0.97	931.63	Hard
TXGLO1-VC-23-011	4.4	5.5	0.56	539.37	Hard
	16.0	6.5	0.67	637.43	Hard
TXGLO1-VC-23-012	0.8	0.0	0.00	0.00	Very Soft
	2.6	1.0	0.10	98.07	Stiff
TXGLO1-VC-23-013	3.0	2.5	0.26	245.17	Very Stiff
	6.4	3.0	0.31	294.20	Very Stiff
	13.7	8.0	0.82	784.53	Hard
TXGLO1-VC-23-014	0.8	0.0	0.00	0.00	Very Soft
	1.9	2.0	0.20	196.13	Very Stiff
	5.0	2.5	0.26	245.17	Very Stiff
	10.0	2.8	0.28	269.68	Very Stiff
	18.0	3.0	0.31	294.20	Very Stiff
TXGLO1-VC-23-015	No Torvane Conducted				
TXGLO1-VC-23-016	2.4	7.0	0.72	686.47	Hard
	5.5	7.5	0.77	735.50	Hard