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 ½	-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

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

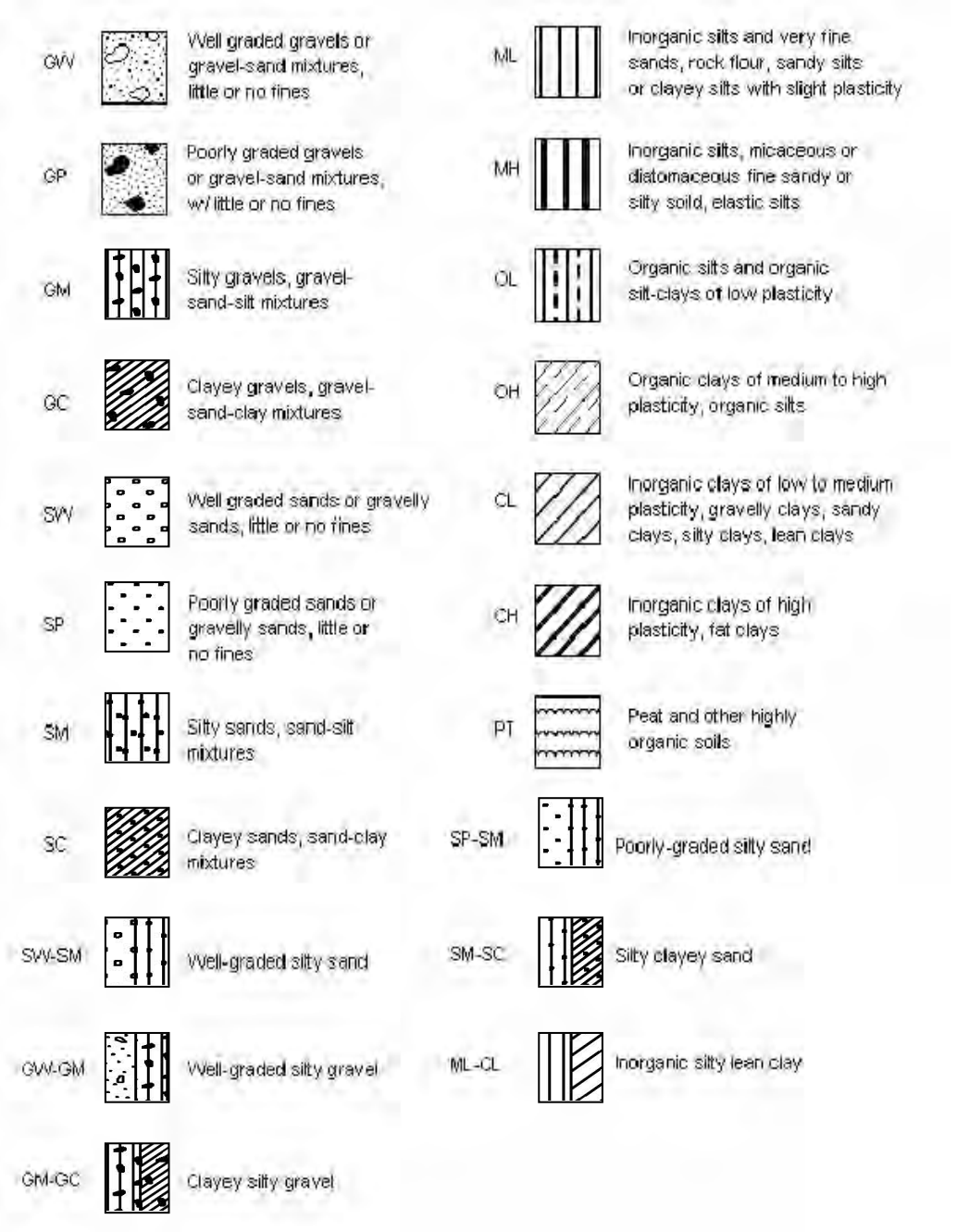
Consistency of Cohesive Soils

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.



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

Boring Designation TXGLO1-VC-23-053

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.

APTIM

9. SIZE AND TYPE OF BIT 3.0 In.

10. COORDINATE SYSTEM/DATUM: Texas State Plane South | HORIZONTAL: NAD 1983 | VERTICAL: NAVD88

2. BORING DESIGNATION: TXGLO1-VC-23-053
LOCATION COORDINATES (ft): X = 3,340,423 Y = 13,713,939

11. MANUFACTURER'S DESIGNATION OF DRILL: APTIM SEAS VC-700 Vibracore
☐ AUTO HAMMER ☐ MANUAL HAMMER

3. DRILLING AGENCY: APTIM
CONTRACTOR FILE NO.:

12. TOTAL SAMPLES: DISTURBED 0 | UNDISTURBED (UD) 3

4. NAME OF DRILLER: APTIM

13. TOTAL NUMBER CORE BOXES

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL:
BEARING:

14. ELEVATION GROUND WATER

15. DATE BORING: STARTED 10-12-23 | COMPLETED 10-12-23

6. THICKNESS OF OVERBURDEN 0.0 Ft.

16. ELEVATION TOP OF BORING -19.1 Ft.

7. DEPTH DRILLED INTO ROCK 0.0 Ft.

17. TOTAL RECOVERY FOR BORING 19 Ft.

8. TOTAL DEPTH OF BORING 19.4 Ft.

18. SIGNATURE AND TITLE OF INSPECTOR
SM

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
-19.1	0.0					
-20.1	1.0		LEAN CLAY, very soft, trace shell hash, trace silt, shell hash and silt distributed in laminae, very dark gray (2.5Y-3/1), (CL).		T1	Sample #T1, Depth = 0.5' Ave. Field Vane (tsf): 0.00
-23.3	4.2		LEAN CLAY, firm, trace coral, trace sand, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, silt distributed in laminae, shell hash distributed between 2.7' & 3.2', 0.5" bivalve fragment @ 2.9', sand distributed in laminae between 3.2' & 4.2', (0.5" x 0.75") coral fragment with annelids @ 3.2', dark greenish gray (5GY-4/1), (CL).		T2	Sample #T2, Depth = 2.2' Ave. Field Vane (tsf): 0.05
-27.6	8.5		SAND, fine grained, quartz, trace clay, firm, trace shell hash, trace silt, silt and fat clay interbedded with sand, shell hash typically distributed in laminae between 6.6' & 6.8', 3.0" pocket of shell hash @ 8.3', gray (2.5Y-5/1), (SW-SM).			
-29.8	10.7		Sandy SILT, little clay, trace shell fragments, trace whole shell, sand component is fine grained quartz, clay distributed in pockets up to 1.5", (0.25" x 0.5") whole bivalve @ 9.0', shell fragments distributed between 10.3' & 10.5', dark greenish gray (10GY-4/1), (ML).			
-32.6	13.5		SAND, fine grained, quartz, little clay, trace shell hash, trace silt, shell hash distributed between 11.0' & 11.6', 1.5" clay pocket @ 12.4', 2.75" clay pocket @ 13.2', gray (5Y-5/1), (SW-SM).			
-34.2	15.1		FAT CLAY, firm, little sand, fine grained, quartz, trace shell hash, trace silt, interbedded sand and clay throughout layer, shell hash distributed within sand, dark greenish gray (10GY-4/1), (CH).			
-36.6	17.5		FAT CLAY, firm, trace shell fragments, trace silt, trace whole shell, shell fragments are typically bivalve fragments up to 2.0", (1.0" x 1.25") shell fragment with annelids @ 15.6', 2.0" gastropod fragment and 3.0" whole bivalve @ 17.3', gray (N-5/0), (CH).			
-38.1	19.0		FAT CLAY, very stiff, trace sand, fine grained, quartz, sand distributed in laminae, Bit sample from 18.7' to 19.0', gray (N-5/0), (CH).		T3	Sample #T3, Depth = 18.0' Ave. Field Vane (tsf): 0.26
-38.5	19.4		No recovery.			
			End of Boring			

0 5 10 15 20 25

REGION1_RECON_GEOTECH.GPJ 3/25/24

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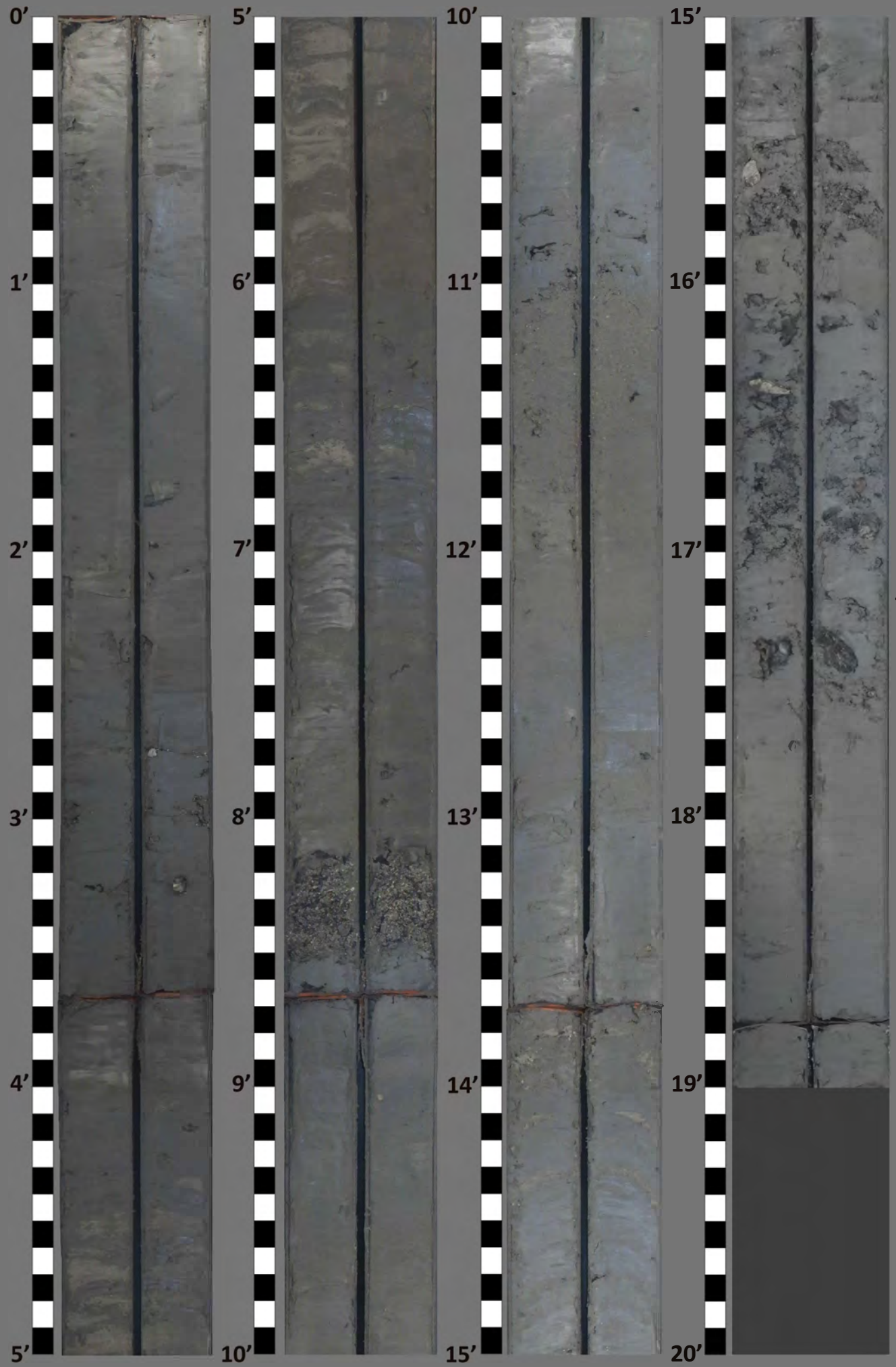

Texas General Land Office

Texas GLO Region 1 Geotechnical Reconnaissance Survey

TXGLO1-VC-23-053

Date Collected: 10/12/23
Top Elev. (ft NAVD88): -19.1
Bottom Elev. (ft NAVD88): -38.1
Core Length (ft): 19.0

APTIM
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Mini Vane Shear Test Results

CORE ID	SAMPLE DEPTH (ft)	TORVANE (kg/cm²)	TORVANE (tsf)	TORVANE (kpa)	DESCRIPTION[1]
TXGLO1-VC-23-048	2.2	2.8	0.28	269.68	Very Stiff
	4.8	1.5	0.15	147.10	Stiff
TXGLO1-VC-23-049	3.0	1.5	0.15	147.10	Stiff
	4.0	5.0	0.51	490.33	Hard
	5.1	1.5	0.15	147.10	Stiff
	9.4	6.5	0.67	637.43	Hard
	15.5	9.5	0.97	931.63	Hard
TXGLO1-VC-23-050	4.8	1.0	0.10	98.07	Stiff
	8.1	1.5	0.15	147.10	Stiff
	10.4	2.0	0.20	196.13	Very Stiff
	11.7	2.0	0.20	196.13	Very Stiff
	14.7	2.5	0.26	245.17	Very Stiff
TXGLO1-VC-23-051	1.0	1.0	0.10	98.07	Stiff
	1.8	1.5	0.15	147.10	Stiff
	3.1	3.5	0.36	343.23	Hard
	6.4	10.0	1.02	980.67	Hard
	11.0	10.0	1.02	980.67	Hard
TXGLO1-VC-23-052	1.0	0.0	0.00	0.00	Very Soft
	3.0	0.0	0.00	0.00	Very Soft
	11.5	7.5	0.77	735.50	Hard
	14.6	8.0	0.82	784.53	Hard
	16.0	9.0	0.92	882.60	Hard
TXGLO1-VC-23-053	0.5	0.0	0.00	0.00	Very Soft
	2.2	0.5	0.05	49.03	Firm
	18.0	2.5	0.26	245.17	Very Stiff
TXGLO1-VC-23-054	0.6	0.0	0.00	0.00	Very Soft
	2.2	0.0	0.00	0.00	Very Soft
	7.0	0.3	0.03	24.52	Soft
	13.7	1.0	0.10	98.07	Stiff
TXGLO1-VC-23-055	0.3	0.5	0.05	49.03	Firm
	1.6	1.0	0.10	98.07	Stiff
	3.1	1.0	0.10	98.07	Stiff
	8.9	4.0	0.41	392.27	Hard
	14.1	4.8	0.49	465.82	Hard
TXGLO1-VC-23-056	No Torvane Conducted				
TXGLO1-VC-23-057	6.4	1.5	0.15	147.10	Stiff
TXGLO1-VC-23-058	0.8	0.5	0.05	49.03	Firm
	4.2	1.0	0.10	98.07	Stiff
	12.9	1.5	0.15	147.10	Stiff
	15.5	2.0	0.20	196.13	Very Stiff