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 %

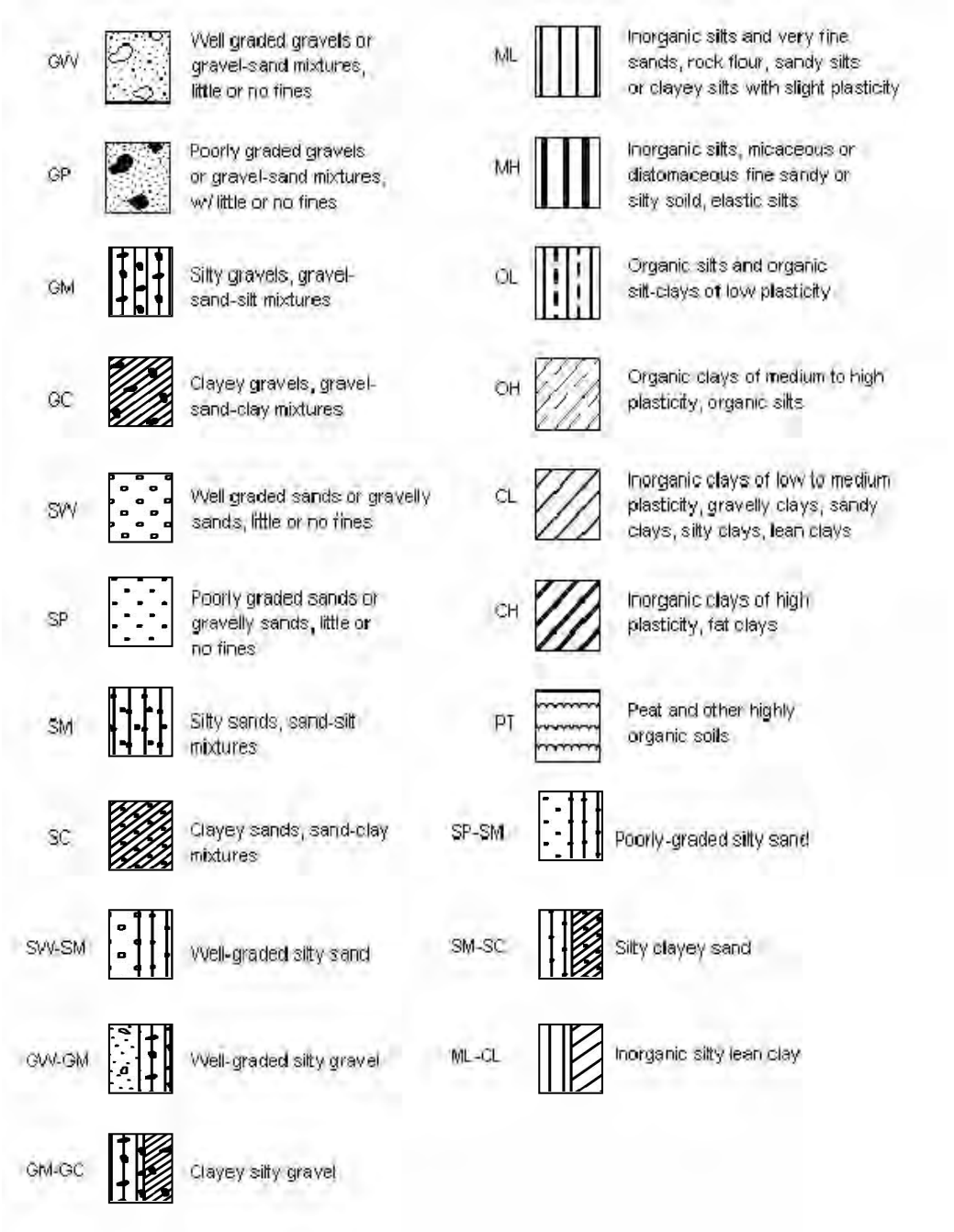
Consistency of Cohesive Soils

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-23-060

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-23-060
LOCATION COORDINATES (ft): X = 3,340,433 Y = 13,630,893

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) 4

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 -54.7 Ft.

7. DEPTH DRILLED INTO ROCK 0.0 Ft.

17. TOTAL RECOVERY FOR BORING 19.4 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
-54.7	0.0					
-58.6	3.9		FAT CLAY, hard, trace rock fragments, trace shell hash, trace silt, trace whole shell, 2.0" shell hash pocket @ top of layer, (1.0" x 2.0") rock fragment @ 0.1', partially lithified clay lamina @ 2.5', whole bivalves up to 2.5" between 3.4' & 3.9', color is mottled yellowish brown (10YR-5/6) and olive gray (5Y-5/2), (CH).		T1	Sample #T1, Depth = 2.4' Ave. Field Vane (tsf): 0.67
-59.8	5.1		Sandy SILT, trace shell hash, trace whole shell, sand component is fine grained quartz, 1.0" shell hash pocket @ 3.9', whole bivalves up to 2.0" between 3.9' & 4.4', light olive brown (2.5Y-5/4), (ML).			
-64.0	9.3		Sandy SILT, little clay, trace shell fragments, trace shell hash, trace whole shell, sand component is fine grained quartz, clay distributed in pockets up to 0.5", shell fragments up to 0.5" between 8.4' & 9.3', (1.25" x 1.5") whole bivalve @ 8.5', (1.5" x 1.75") whole bivalve @ 8.9', light olive brown (2.5Y-5/3), (ML).			
-67.0	12.3		FAT CLAY, stiff, little silt, trace sand, fine grained, quartz, trace shell fragments, trace whole shell, sand and silt distributed in pockets up to 1.0", (0.75" x 1.0") whole bivalve @ 9.5', 1.75" pocket of bivalve fragments up to 1.5" @ 9.9', color is mottled gray (2.5Y-5/1) and light olive brown (2.5Y-5/3), (CH).		T2	Sample #T2, Depth = 11.1' Ave. Field Vane (tsf): 0.15
-68.8	14.1		FAT CLAY, hard, trace organics, trace silt, 0.5" organic pockets @ 12.5' and 13.5', possible bioturbation @ 13.3', gray (2.5Y-5/1), (CH).		T3	Sample #T3, Depth = 13.1' Ave. Field Vane (tsf): 0.61
-74.1	19.4		FAT CLAY, hard, trace organics, trace sand, fine grained, quartz, trace silt, trace wood fragments, silt distributed in laminae, 0.25" sand pockets @ 14.6' and 17.7', 2.0" organic pocket @ 15.2', 0.25" organic pocket @ 16.6', Bit sample from 19.0' to 19.4', (1.0" x 2.0") wood fragment in the bit sample, dark gray (5Y-4/1), (CH).		T4	Sample #T4, Depth = 17.0' Ave. Field Vane (tsf): 0.61
			End of Boring			

0 5 10 15 20 25

REGION1_RECON_GEOTECH.GPJ 3/25/24

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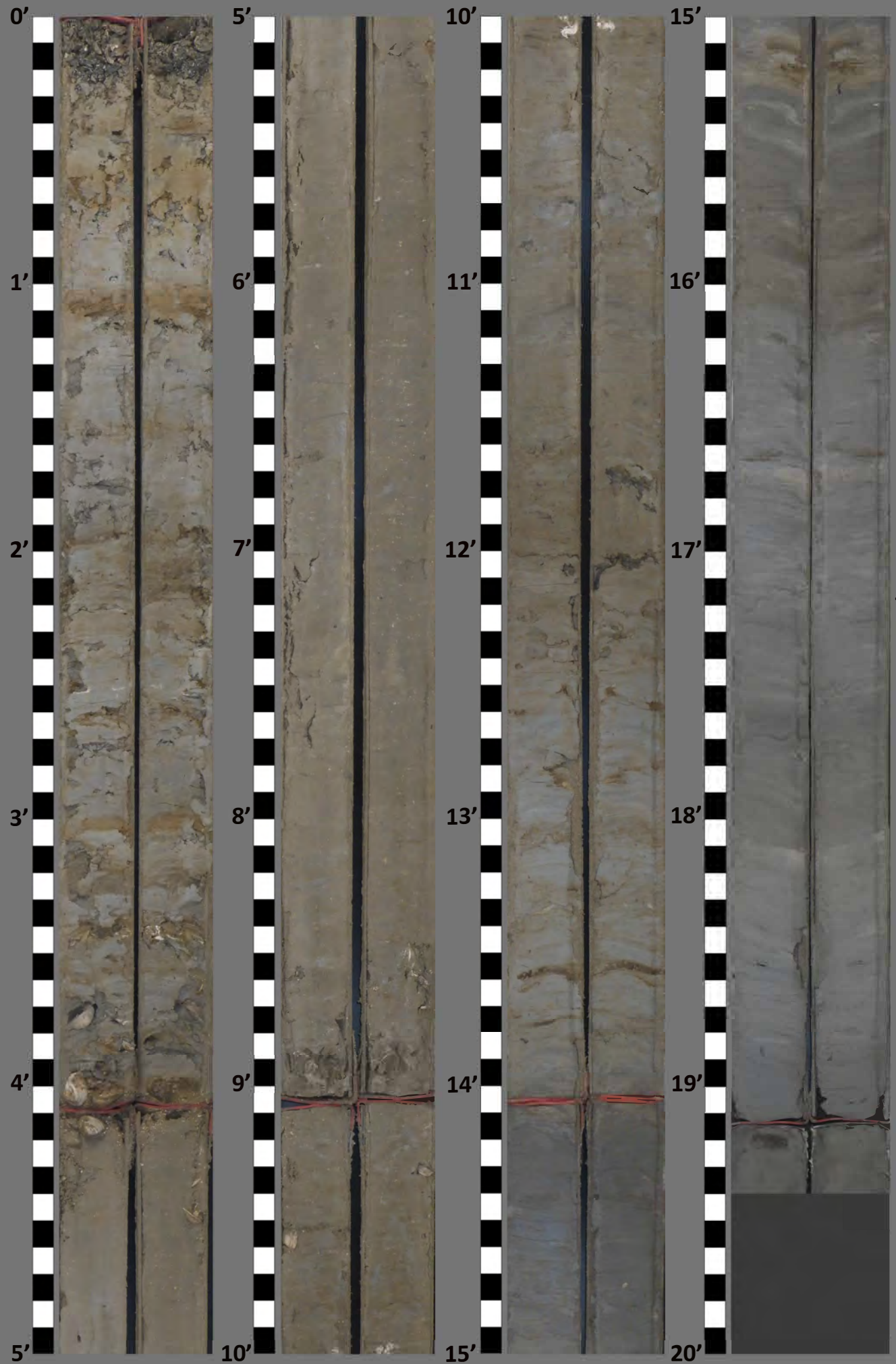

Texas General Land Office

Texas GLO Region 1 Geotechnical Reconnaissance Survey

TXGLO1-VC-23-060

Date Collected: 10/12/23
Top Elev. (ft NAVD88): -54.7
Bottom Elev. (ft NAVD88): -74.1
Core Length (ft): 19.4

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-23-059	1.6	1.5	0.15	147.10	Stiff
	2.3	2.5	0.26	245.17	Very Stiff
	3.5	2.0	0.20	196.13	Very Stiff
	5.2	4.0	0.41	392.27	Hard
	10.0	7.0	0.72	686.47	Hard
TXGLO1-VC-23-060	2.4	6.5	0.67	637.43	Hard
	11.1	1.5	0.15	147.10	Stiff
	13.1	6.0	0.61	588.40	Hard
	17.0	6.0	0.61	588.40	Hard
TXGLO1-VC-23-061	No Torvane Conducted				
TXGLO1-VC-23-062	1.0	0.3	0.03	24.52	Soft
	2.6	1.0	0.10	98.07	Stiff
	5.0	4.0	0.41	392.27	Hard
TXGLO1-VC-23-063	1.5	4.5	0.46	441.30	Hard
	5.0	2.5	0.26	245.17	Very Stiff
	11.0	2.8	0.28	269.68	Very Stiff
	15.0	2.5	0.26	245.17	Very Stiff
TXGLO1-VC-23-064	0.3	0.0	0.00	0.00	Very Soft
	0.7	0.5	0.05	49.03	Firm
	13.1	2.5	0.26	245.17	Very Stiff
TXGLO1-VC-23-065	1.8	2.0	0.20	196.13	Very Stiff
	6.1	1.3	0.13	122.58	Stiff
TXGLO1-VC-23-066	0.5	0.3	0.03	24.52	Soft
	3.1	1.5	0.15	147.10	Stiff
	13.0	5.5	0.56	539.37	Hard
TXGLO1-VC-23-067	0.1	0.0	0.00	0.00	Very Soft
	3.0	0.5	0.05	49.03	Firm
TXGLO1-VC-23-068	0.3	0.3	0.03	24.52	Soft
	3.5	1.5	0.15	147.10	Stiff
	7.4	3.0	0.31	294.20	Very Stiff
	11.2	7.8	0.79	760.02	Hard
	15.0	8.0	0.82	784.53	Hard
TXGLO1-VC-23-069	0.4	0.0	0.00	0.00	Very Soft
	3.5	0.8	0.08	73.55	Firm
TXGLO1-VC-23-070	0.7	0.3	0.03	24.52	Soft
	1.9	2.0	0.20	196.13	Very Stiff
	3.3	2.0	0.20	196.13	Very Stiff
	5.5	3.5	0.36	343.23	Hard
	11.9	0.0	0.00	0.00	Very Soft