



## 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

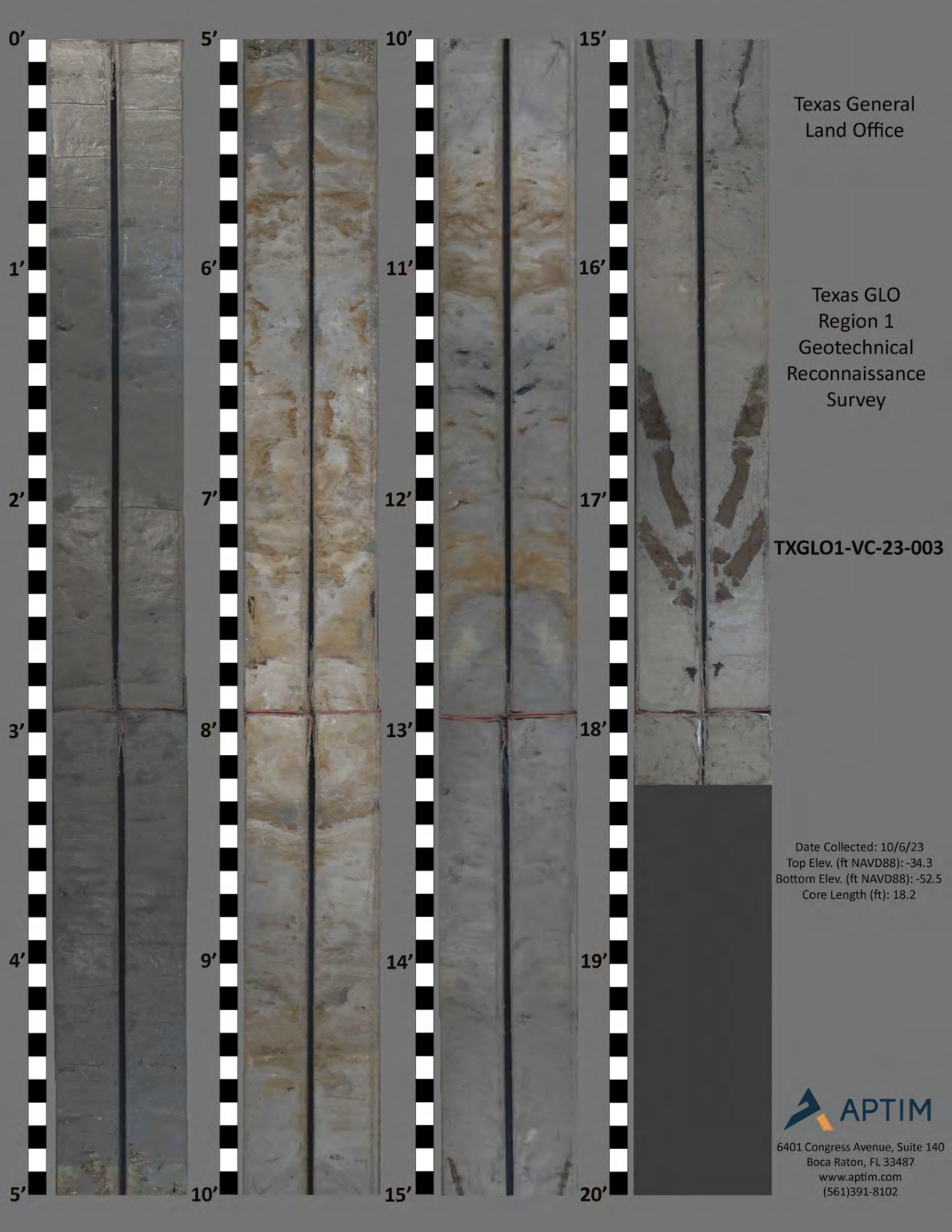
Refers to the Army Corps of Engineers Unified Soils Classification System. Class types are defined primarily by grain size, sorting and percent of material passing the #200 sieve. Classification of materials on the core logs based on visual field examinations are identified on the core logs under the 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	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	
<b>1. PROJECT</b> TX GLO Region 1 Recon Geotechnical Sand Search Jefferson, Chambers, Galveston and Brazoria Co. 				<b>9. SIZE AND TYPE OF BIT</b> 3.0 In.			
<b>2. BORING DESIGNATION</b> TXGLO1-VC-23-003				<b>10. COORDINATE SYSTEM/DATUM</b> Texas State Plane South		<b>HORIZONTAL</b> NAD 1983	
<b>3. DRILLING AGENCY</b> APTIM				<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> APTIM SEAS VC-700 Vibracore		<b>VERTICAL</b> NAVD88	
<b>4. NAME OF DRILLER</b> APTIM				<b>12. TOTAL SAMPLES</b> 0		<b>DISTURBED</b> 0	
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED				<b>13. TOTAL NUMBER CORE BOXES</b>		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
<b>6. THICKNESS OF OVERBURDEN</b> 0.0 Ft.				<b>14. ELEVATION GROUND WATER</b>		<b>UNDISTURBED (UD)</b> 3	
<b>7. DEPTH DRILLED INTO ROCK</b> 0.0 Ft.				<b>15. DATE BORING</b>		<b>STARTED</b> 10-06-23	
<b>8. TOTAL DEPTH OF BORING</b> 19.0 Ft.				<b>16. ELEVATION TOP OF BORING</b> -34.3 Ft.		<b>COMPLETED</b> 10-06-23	
				<b>17. TOTAL RECOVERY FOR BORING</b> 18.2 Ft.			
				<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> 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	
-34.3	0.0						
-35.6	1.3		LEAN CLAY, very soft, little silt, trace shell hash, silt and shell hash typically distributed in laminae, silt increases with depth in layer, 1.5" silt pocket with shell hash @ 1.1', very dark gray (2.5Y-3/1), (CL).				
-39.2	4.9		LEAN CLAY, soft, little silt, trace rock fragments, trace sand, fine grained, quartz, trace shell hash, sand and shell hash distributed in silt pockets up to 1.0", rock fragments are fragments of partially lithified clay up to 0.19", 0.5" pocket of rock fragments @ 4.4', very dark greenish gray (10Y-3/1), (CL).				
-43.3	9.0		Sandy FAT CLAY, firm, trace organics, trace shell hash, trace silt, trace whole shell, oxidation throughout layer, sand component is fine grained quartz distributed in pockets up to 1.0", 2.5" shell hash pocket @ 4.9', (0.5" x 0.75") whole bivalve @ 5.0', possible bioturbation between 6.0' & 6.5' and between 7.7' & 8.0', 0.25" organic pocket @ 7.7', 1.5" clay pocket @ 8.5', 1.0" clay pocket @ 8.7', color is mottled yellowish brown (10YR-5/6) and gray (5Y-6/1), (CH).				
-46.7	12.4		FAT CLAY, hard, trace sand, fine grained, quartz, trace silt, trace wood fragments, sand increases with depth in layer, 0.75" partially lithified clay pocket @ 9.4', oxidation between 9.0' & 9.4' and between 10.5' & 11.1', 0.5" organic pocket @ 10.0', 2.5" organic pocket @ 11.4', possible bioturbation between 11.8' & 12.2', color is mottled dark yellowish brown (10YR-4/4) and dark gray (2.5Y-4/1), (CH).		T1	Sample #T1, Depth = 10.3' Ave. Field Vane (tsf): 0.46	
-52.5	18.2		FAT CLAY, hard, trace sand, fine grained, quartz, trace silt, trace wood fragments, hardnesses decreases with depth in layer, sand increases with depth in layer, wood fragments are possible tree roots, possible bioturbation between 13.0' & 13.6', 14.4' & 16.1' and between 17.7' & 17.9', 1.5" sand pockets @ 14.9' and 16.1', 2 (0.25" x 7.0") wood fragments @ 14.9', wood fragments up to 4.25" between 16.4' & 17.6', Bit sample from 17.9' to 18.2', dark gray (2.5Y-4/1), (CH).		T2	Sample #T2, Depth = 13.4' Ave. Field Vane (tsf): 0.56	
-53.3	19.0		No recovery.		T3	Sample #T3, Depth = 16.3' Ave. Field Vane (tsf): 0.26	
			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-23-003

Date Collected: 10/6/23  
Top Elev. (ft NAVD88): -34.3  
Bottom Elev. (ft NAVD88): -52.5  
Core Length (ft): 18.2



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## Mini Vane Shear Test Results

CORE ID	SAMPLE DEPTH (ft)	TORVANE (kg/cm <sup>2</sup> )	TORVANE (tsf)	TORVANE (kpa)	DESCRIPTION <sup>1</sup>
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