Appendix B contains discussions of analytical procedures used in our engineering analyses. Appendix C contains a positioning report by Fugro Chance, Inc., of Lafayette, Louisiana.

For the purposes of discussion and presentation, "driven pipe pile" is used in this report to represent foundation piles, caissons and conductors, unless otherwise specified.

2.2 FIELD AND LABORATORY INVESTIGATIONS

The field investigation was performed on July 4 through 6, 2008, from the R/V *Seaprobe*. The soil conditions were determined by performing four exploratory borings, two at each SPM location with one boring at a selected anchor leg location, and one boring at the proposed PLET location. Enterprise Field Services selected the boring locations. These borings were drilled to a penetration of 131-ft below mudline. The water depths at the boring locations ranged from 123 to 125 ft. A chronological summary of field operations is presented in Appendix A.

2.2.1 Exploratory Borings

FMMG personnel drilled the soil borings with a DMX drill rig positioned over the centerwell of the R/V *Seaprobe*. The vessel was anchored at the boring location by a 4-point mooring system. Soil conditions at the site were explored by drilling a group of four soil borings to 131-ft penetration below the seafloor. The final coordinates for the boring locations are presented in Table 2-1. A plan of borings within Block A-59, of the Galveston Area is presented on Plate 2-1. Fugro Chance, Inc., of Lafayette, Louisiana, conducted surveying utilizing STARFIX and DGPS, and performed a 360-degree scanning sonar survey. The positioning report, prepared by Fugro Chance, is presented in Appendix C. The scanning sonar reports are available from Fugro Chance upon request.

Table 2-1: Final Boring Coordinates
(Texas South Central Zone Coordinates)

FMMG Boring Designation	Fugro Chance Boring Designation	Proposed Boring Coordinates	Final Boring Coordinates	Boring Termination Depth (ft)
SPM #1 PLET	Core 3	X = 3,258,627.75 ft Y = 236,494.60 ft	X = 3,258,640 ft Y = 236,466 ft	131
SPM #1 ANCHOR LEG #2	Core 1	X = 3,257,224.19 ft Y = 236,057.66 ft	X = 3,257,200 ft Y = 236,056 ft	131
SPM #2 PLET	Core 4	X = 3,265,632.42 ft Y = 240,337.08 ft	X = 3,265,647 ft Y = 240,318 ft	131
SPM #2 ANCHOR LEG #6	Core 2	X = 3,266,735.50 ft Y = 241,308.73 ft	X = 3,266,758 ft Y = 241,331 ft	131

Samples were obtained through 5.0-in.-OD, 4.5-in.-IF drill pipe at all the locations. Samples were spaced at 3-ft intervals to 20-ft penetration, at 5-ft intervals to 68-ft penetration, and at 10-ft intervals thereafter to the final boring depth at the SPM #1 ANCHOR LEG #2 and SPM #2 PLET locations. Sampling intervals at the SPM #1 PLET location was completed as follows: 3-ft intervals to 20-ft penetration, 5-ft intervals to 66-ft penetration, and 10-ft intervals thereafter to the final boring depth. Sampling intervals at the SPM #2 ANCHOR LEG #6 location was completed as follows: 3-ft intervals to 20-ft penetration, 5-ft

intervals to 65-ft penetration, and 10-ft intervals thereafter to the final boring depth. The drilling and sampling techniques used to complete this boring are explained in detail in Appendix A.

Two water depths were measured at each boring using a seafloor sensor seated in the drill bit. The water depth measurements are tabulated in Table 2-2. The water depth measurements are intended for the purpose of the geotechnical investigation only, and are not corrected for tidal or other variations. If utilized for other purposes, the water depth measurement should be adjusted to account for meteorological tide and datum corrections. The water depths measuring procedures are explained in detail in Appendix B.

Table 2-2: Measured Water Depths

Boring Designation	Water Depth (ft)	Time and Date of Measurement	Supplemental Water Depth (ft)	Time and Date of Measurement
SPM #1 PLET	123	0240 hours on July 5, 2008	123	0720 hours on July 5, 2008
SPM #1 ANCHOR LEG #2	123	1440 hours on July 4, 2008	122	2200 hours on July 4, 2008
SPM #2 PLET	125	1135 hours on July 5, 2008	125	1650 hours on July 5, 2008
SPM #2 ANCHOR LEG #6	124	0220 hours on July 6, 2008	124	0655 hours on July 6, 2008

2.2.2 Field and Laboratory Tests

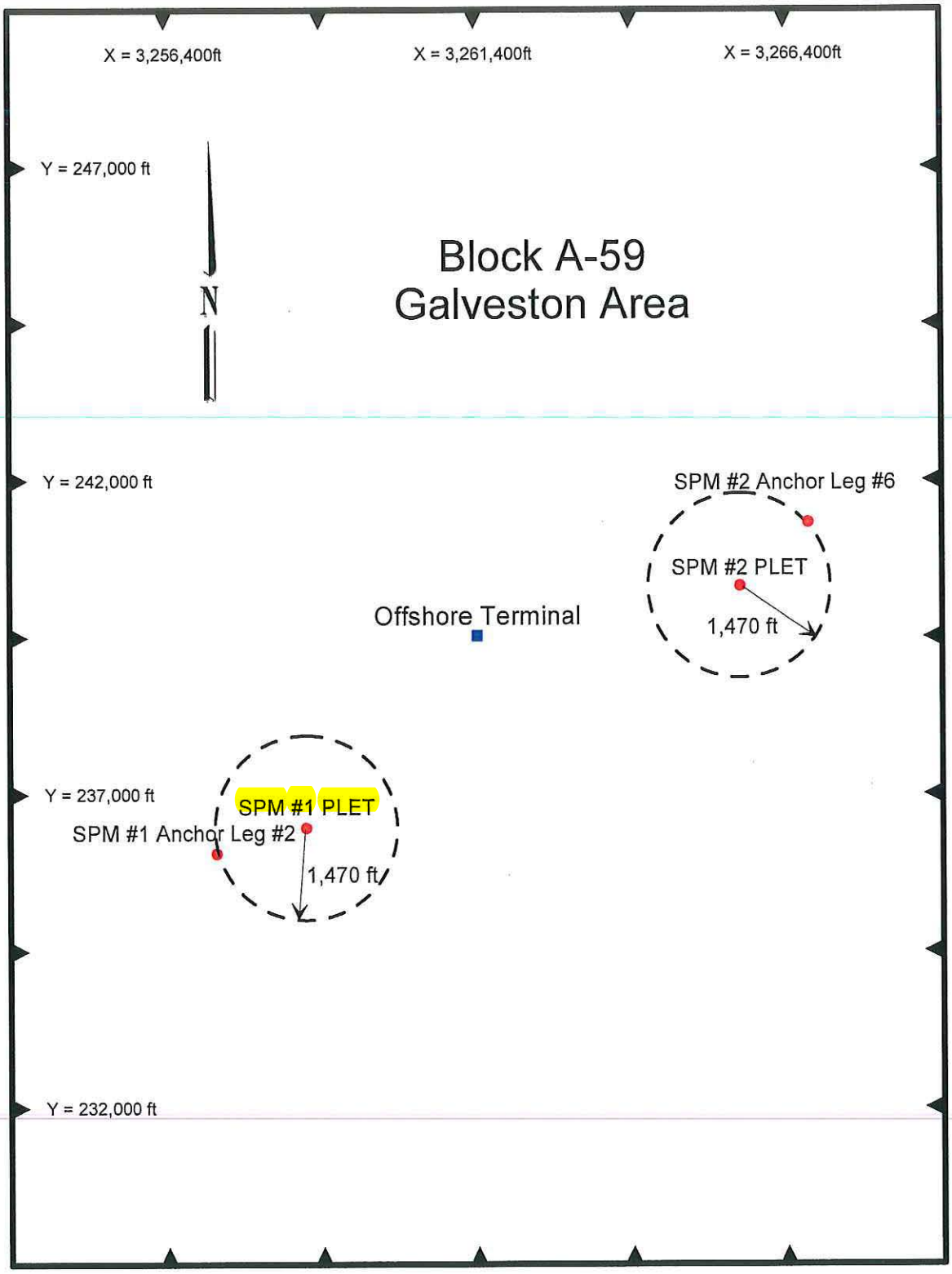
The soil testing program was designed to evaluate pertinent index and engineering properties of the foundation soils. During the field operation, all samples were extruded from the sampler and classified by the soil technician or field engineer. Unit weight, Torvane, pocket penetrometer, miniature vane and unconsolidated-undrained triaxial compression tests were performed in the field on selected cohesive samples. All of the samples were shipped to Fugro's Houston laboratory where Atterberg limit tests, water content tests, and grain-size analyses, as well as additional density tests, unconsolidated-undrained triaxial compression tests, and miniature vane tests, were performed.

A description of relevant laboratory procedures is provided in Appendix A. The strength and classification test results are presented graphically on the Logs of Boring and Test Results in Section 3. Grain-size distribution curves from sieve-analysis and stress-strain curves from triaxial compression tests are presented in Appendix A.

2.3 GENERAL SOIL CONDITIONS

2.3.1 Soil Stratigraphy

The soil stratigraphy at each of the boring locations disclosed by the field and laboratory investigations is presented in Section 3. The soil stratigraphy is based on the classification of soil samples recovered from the boring and observations made during drilling operations. Detailed soil descriptions, for each location, that include textural variations and inclusions are noted on the respective boring log



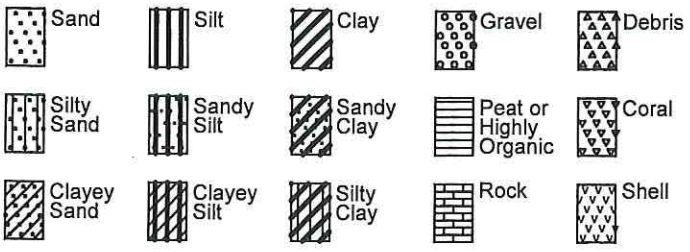
Projection: Texas South Central Zone Coordinates

PLAN OF BORINGS

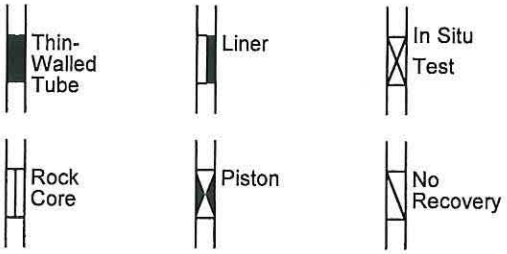
Texas Offshore Port System
Block A-59, Galveston Area

TERMS AND SYMBOLS USED ON BORING LOG

SOIL TYPES

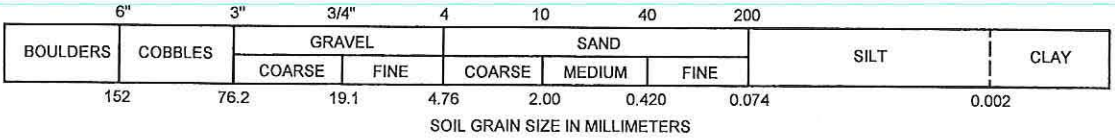


SAMPLER TYPES



SOIL GRAIN SIZE

U.S. STANDARD SIEVE



SOIL GRAIN SIZE IN MILLIMETERS

STRENGTH OF COHESIVE SOILS[1]

Consistency	Undrained Shear Strength, Kips Per Sq Ft
Very Soft	less than 0.25
Soft	0.25 to 0.50
Firm	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	greater than 4.00

DENSITY OF GRANULAR SOILS[2,3]

Descriptive Term	*Relative Density, %
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record

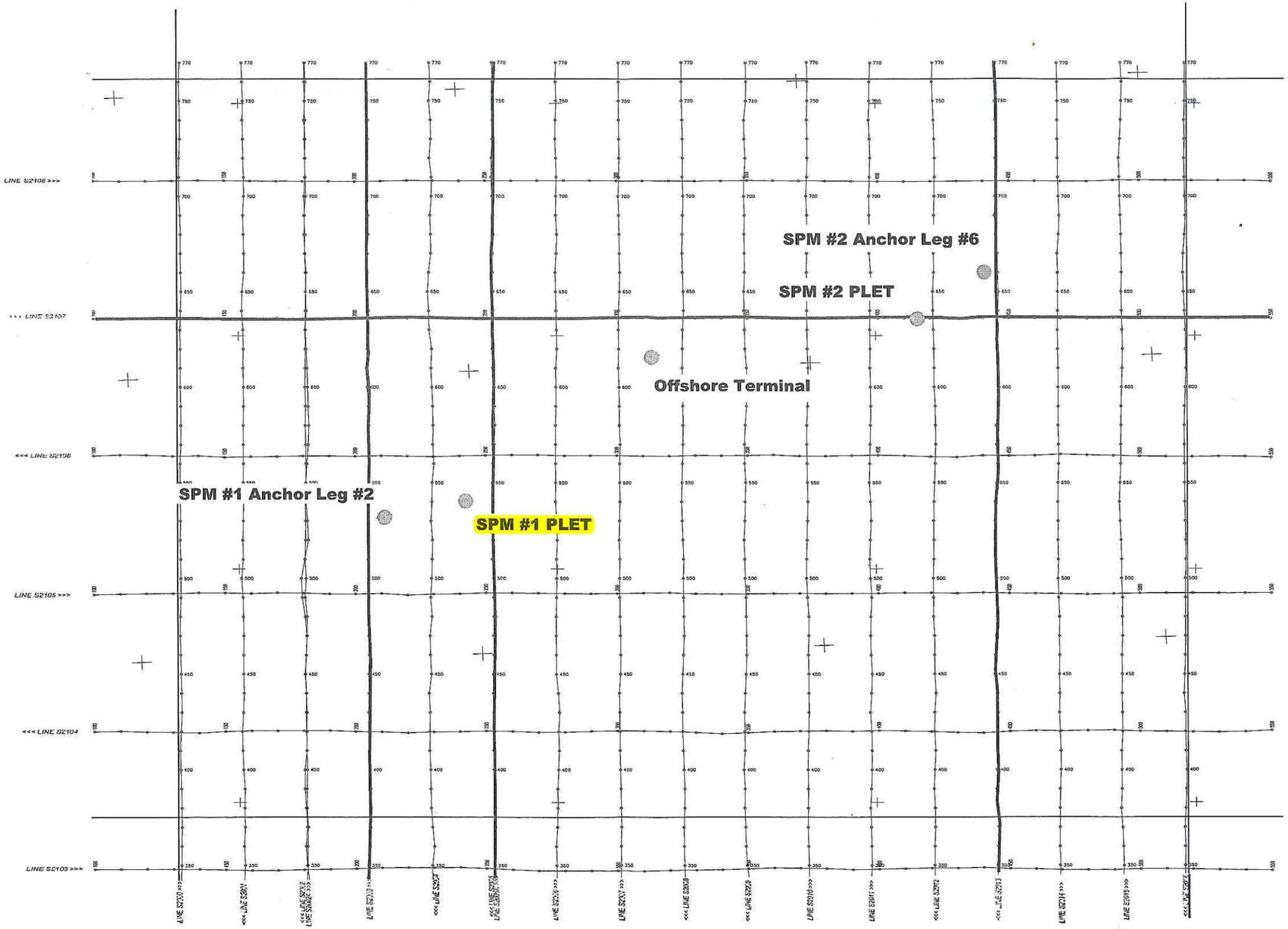
SOIL STRUCTURE[1]

Slickensided	Having planes of weakness that appear slick and glossy. The degree of slickensidedness depends upon the spacing of slickensides and the ease of breaking along these planes.
Fissured	Containing shrinkage or relief cracks, often filled with fine sand or silt, usually more or less vertical.
Pocket	Inclusion of material of different texture that is smaller than the diameter of the sample.
Parting	Inclusion less than 1/8 inch thick extending through the sample.
Seam	Inclusion 1/8 inch to 3 inches thick extending through the sample.
Layer	Inclusion greater than 3 inches thick extending through the sample.
Laminated	Soil sample composed of alternating partings or seams of different soil types.
Interlayered	Soil sample composed of alternating layers of different soil types.
Intermixed	Soil sample composed of pockets of different soil types and layered or laminated structure is not evident.
Calcareous	Having appreciable quantities of carbonate.

REFERENCES:

(1) ASTM D 2488
(2) ASCE Manual 56 (1976)
(3) ASTM D 2049

Information on each boring log is a compilation of subsurface conditions and soil or rock classifications obtained from the field as well as from laboratory testing of samples. Strata have been interpreted by commonly accepted procedures. The stratum lines on the log may be transitional and approximate in nature. Water level measurements refer only to those observed at the times and places indicated in the text, and may vary with time, geologic condition or construction activity.



MAP OF SOIL BORINGS AND SUBBOTTOM PROFILE LINES

Texas Offshore Port System

Block A-59, Galveston Area

3 SITE SPECIFIC SOIL AND PILE DESIGN INFORMATION

3.1 SPM #1 PLET LOCATION

3.1.1 Introduction

The field investigation at the location designated as SPM #1 PLET was performed on July 4 and 5, 2008. Soil sampling was performed to 131-ft penetration at Texas South Central Zone Coordinates X = 3,258,640 ft and Y = 236,466 ft. The measured water depth was 123 ft.

3.1.2 Soil Stratigraphy

The soil stratigraphy disclosed by the field and laboratory investigations is presented on the boring log, Plate 3-1. The soil stratigraphy is based on the classification of soil samples recovered from the boring and observations made during drilling operations. A generalized summary of the major soil strata is tabulated below.

Stratum	Penetration, ft From	To	Description
I	0	2	Very soft sandy lean clay
II	2	18	Loose to medium dense silty fine sand
III	18	77	Soft to firm sandy silty clay interlayered with medium dense sandy silt to silty fine sand
IV	77	131	Stiff to very stiff clay

Detailed soil descriptions that include textural variations and inclusions are noted on the boring log. A key to the terms and symbols used on the boring log is presented on Plate 2-2. The Roman numeral representing each stratum is also shown on the boring log and on relevant plates. The variation in soil stratigraphy across this site is indicated in a comparison (integration) of the geophysical and geotechnical soil information presented on Plate 3-2.

3.1.2.1 Interpretation of Soil Properties

The shear strength and submerged unit weight profiles shown on Plates 3-3 and 3-4, respectively, best represent the assembled test results plotted on the boring log. These profiles were used in the engineering analyses.

3.1.3 Pile Design Information

The pile design information developed for this study includes ultimate axial capacities, axial load-pile movement data, and lateral soil resistance-pile deflection (p-y) characteristics. The analytical methods used to develop this information are presented briefly in Section 2.5 and in more detail in Appendix B.

3.1.3.1 Axial Pile Design

Ultimate Axial Capacity. The unit skin friction and unit end bearing values plotted on Plates 3-5 and 3-6, respectively were calculated using the API RP 2A methods described in Appendix B. These values were used to calculate the ultimate axial compressive and tensile capacities for 24-in.-diameter pipe piles,

driven to final penetration at the boring location. Axial capacity curves for driven pipe piles (conductors, caissons, anchor and foundation piles) are presented on Plate 3-7.

API RP 2A recommends that pile penetrations be selected using appropriate factors of safety or pile resistance factors. These factors are discussed in Section 2.5.1 of this report.

Axial Load Transfer Data. Axial load-pile movement analyses are usually performed using a computer solution based on methods developed by Reese (1964) or Matlock, et al. (1976). Plates 3-8 and 3-9 presents the results as side load-side movement (t-z) and tip load-tip movement (Q-z) data for 24-in.-diameter driven pipe piles, respectively. The presented Q-z data should be used for foundation piles and neglected for caissons and conductor design. In developing the axial load transfer data in the cohesive soils, a post-peak adhesion ratio of 0.90 was utilized.

3.1.3.2 Lateral Pile Design Data

The soil resistance-pile deflection (p-y) characteristics of the soils at the boring location were developed for individual 24-in.-diameter driven pipe piles. These data may be used in lateral load analyses of driven piles, conductors and caissons. The p-y data for cyclic loading were developed to 100-ft penetration using procedures that have been outlined in API RP 2A and briefly explained in Appendix B. The stratigraphy and parameters used to develop the p-y data are presented on Plate 3-10. The p-y data for 24-in.-diameter driven pipe piles are presented on Plate 3-11. P-y values presented at 100-ft penetration may be used for lateral load analyses at greater depths.

3.1.4 Seafloor Bearing Capacity

Ultimate bearing capacity equations for the near-surface soils were taken from a design method developed by Skempton (1951) and Brown and Meyerhof (1969) based on undisturbed shear strength. The following equations can be used to determine the ultimate bearing capacity for horizontal tubular members and mud mats resting on the seafloor:

	q_u =	770	for tubular members,
	q_u =	770	for mud mats for $B \leq 3$, and
	q_u =	$(770 + 9B)(1 + 0.2\ B/L)$	for mud mats for $3 < B \leq 50$ ft
where:	q_u =	ultimate bearing capacity, psf;	
	B =	width of mud mat, ft; and	
	L =	length of mud mat, ft.	

For horizontal tubular members penetrating less than one radius, the projected area at the mudline should be used to calculate the ultimate bearing capacity of the members. For members penetrating one radius or more, the diameter should be used. For triangular-shaped mud mats, B should be taken as 75 percent of the least altitude and L should be taken as the longest side.

API RP 2A recommends that appropriate factors of safety be applied to the capacity values. These factors are discussed in Section 2.6.1

Checked By: AH Date: 9/9/08

Approved By: DH Date: 9/18/08

By: T...01 3/14/...

Report No. 0201-6505

X = 3,258,640'
Y = 236,466'

Texas South Central Zone Coordinates
SEAFLOOR AT EL. - 123'

Penetration Below Seafloor, [feet]			BLOW COUNT
0	I	VERY SOFT GRAY SANDY LEAN CLAY (2.0')	WOH
		LOOSE TO MEDIUM DENSE GRAY SILTY FINE SAND	10
			20
10	II		10
			5
		(18.0')	10
20		SOFT TO FIRM GRAY SANDY SILTY CLAY INTERLAYERED WITH MEDIUM DENSE SANDY SILT TO SILTY FINE SAND	10
			PUSH
30		Note: See PLATE 3-1b for detailed soil stratigraphy to 40-ft penetration.	10
			10
40			10
		-with a few clay pockets and shell fragments at 44'	10
	III		
50		-with olive gray bands at 49'	PUSH
		-with few shell fragments at 54'	20
		-greenish gray, 58' to 66'	
60		-mottled with brownish yellow, with sand pockets, partings, and seams, and claystones at 59'	20
			10
70			
		-with a few clay pockets and pockets of organic matter at 74' (77.0')	PUSH
		STIFF TO VERY STIFF GRAY CLAY	
80			
		-lean, mottled with olive gray, with many calcareous nodules at 85'	PUSH
90			
		-with a few silt pockets, 94' to 106'	PUSH
100	IV		
			PUSH
110			
			PUSH
120			
		-brown, mottled with gray, with a few silt pockets and partings, 124' to 131'	PUSH
		-lean, with gas blisters and a few calcareous nodules at 125'	
130		-with a few silt seams at 130' (131.0')	PUSH
140			
150			
160			
170			
180			
190			
200			

IDENTIFICATION TESTS, [%]
20 40 60 80
SUBMERGED UNIT WEIGHT, [kcf]
0.03 0.04 0.05 0.06

UNDRAINED SHEAR STRENGTH
[ksf]
0.5 1.0 1.5 2.0

(4.16, 75.5)
(3.5, 85.0)
(3, 86.0)

Penetration Below Seafloor, [feet]

SAMPLING TECHNIQUES

Number of blows of a 175-lb weight (hammer) dropped approximately 5 ft to produce a maximum of 24 in. of penetration of a 2.25-in.-OD, 2.125-in.-ID thin-walled tube sampler. "PUSH" denotes a 3.00-in.-OD, 2.83-in.-ID thin-walled tube sampler was advanced 24 in. with the weight of the drill string. "WOH" denotes a 2.50-in.-OD, 2.125-in.-ID liner sampler was advanced 24 in. with the weight of the hammer.

CLASSIFICATION TESTS

- ▼ SOLUBILITY IN HCL, [%]
- ■ PERCENT PASSING -200 SIEVE, [%]
- ● WATER CONTENT (W), [%]
- □ SUBMERGED UNIT WEIGHT (SUW)

PLASTIC LIMIT (PL) LIQUID LIMIT (LL)
+----------+

STRENGTH TESTS

- ⊗ POCKET PENETROMETER (PP)
- ⊕ TORVANE (TV)
- ◇ REMOTE VANE (RV)
- ◆ MINIATURE VANE (MV) (◈ RESIDUAL (MVres) VALUE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL (UU)

(Open symbols indicate remolded (r) tests)

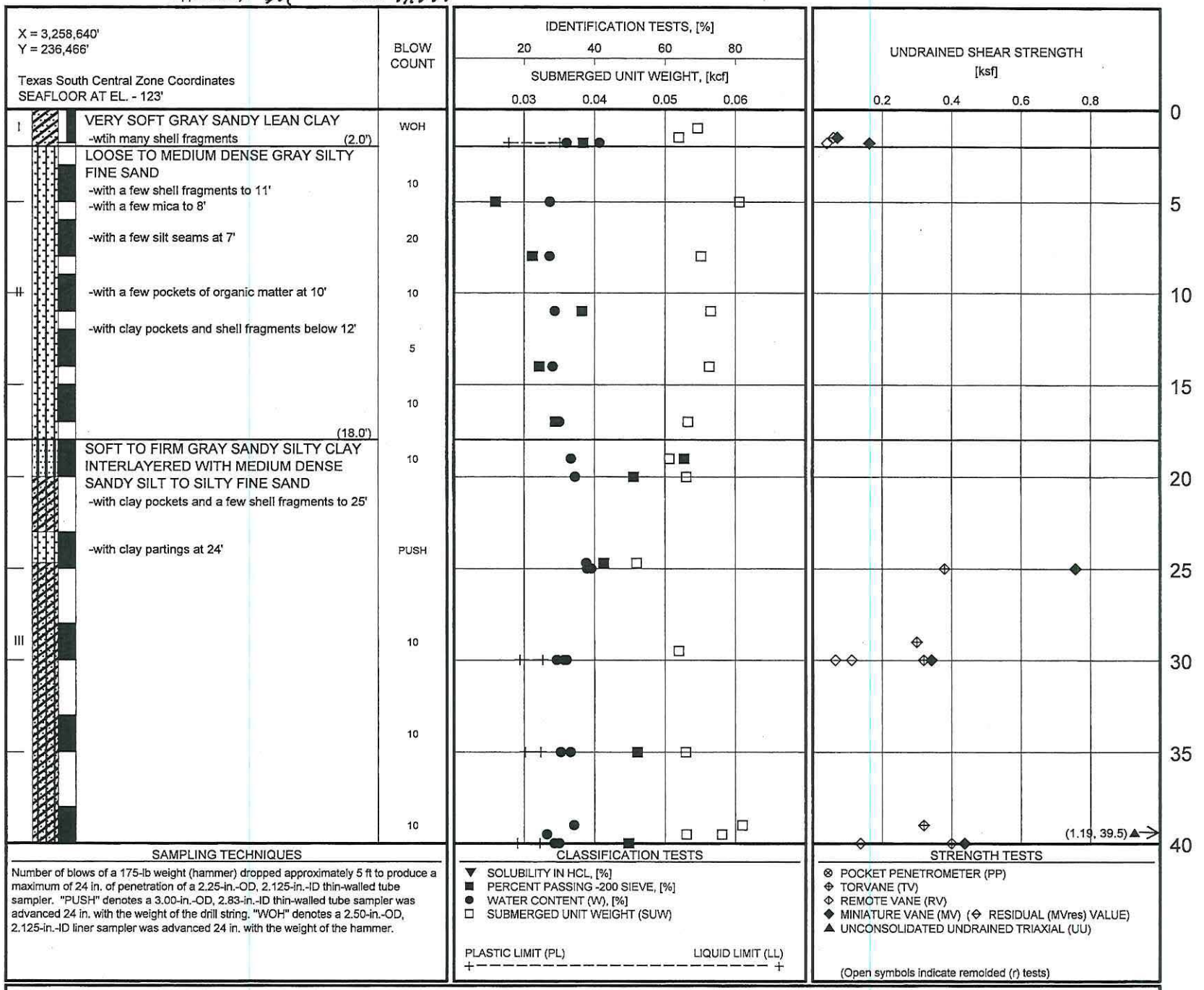
LOG OF BORING AND TEST RESULTS

Texas Offshore Port System, SPM #1 PLET

Block A-59, Galveston Area

PLATE 3-1a

hecked: AW Dat: 9/9/[illegible]
Approved By: DA Date: 9/19/[illegible]
By: [illegible] 3/14/[illegible]



SAMPLING TECHNIQUES

Number of blows of a 175-lb weight (hammer) dropped approximately 5 ft to produce a maximum of 24 in. of penetration of a 2.25-in.-OD, 2.125-in.-ID thin-walled tube sampler. "PUSH" denotes a 3.00-in.-OD, 2.83-in.-ID thin-walled tube sampler was advanced 24 in. with the weight of the drill string. "WOH" denotes a 2.50-in.-OD, 2.125-in.-ID liner sampler was advanced 24 in. with the weight of the hammer.

CLASSIFICATION TESTS

- ▼ SOLUBILITY IN HCL, [%]
- ■ PERCENT PASSING -200 SIEVE, [%]
- ● WATER CONTENT (W), [%]
- □ SUBMERGED UNIT WEIGHT (SUW)

PLASTIC LIMIT (PL) — LIQUID LIMIT (LL)

STRENGTH TESTS

- ⊗ POCKET PENETROMETER (PP)
- ⊕ TORVANE (TV)
- ◇ REMOTE VANE (RV)
- ◆ MINIATURE VANE (MV) (◈ RESIDUAL (MVres) VALUE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL (UU)

(Open symbols indicate remolded (r) tests)

LOG OF BORING AND TEST RESULTS

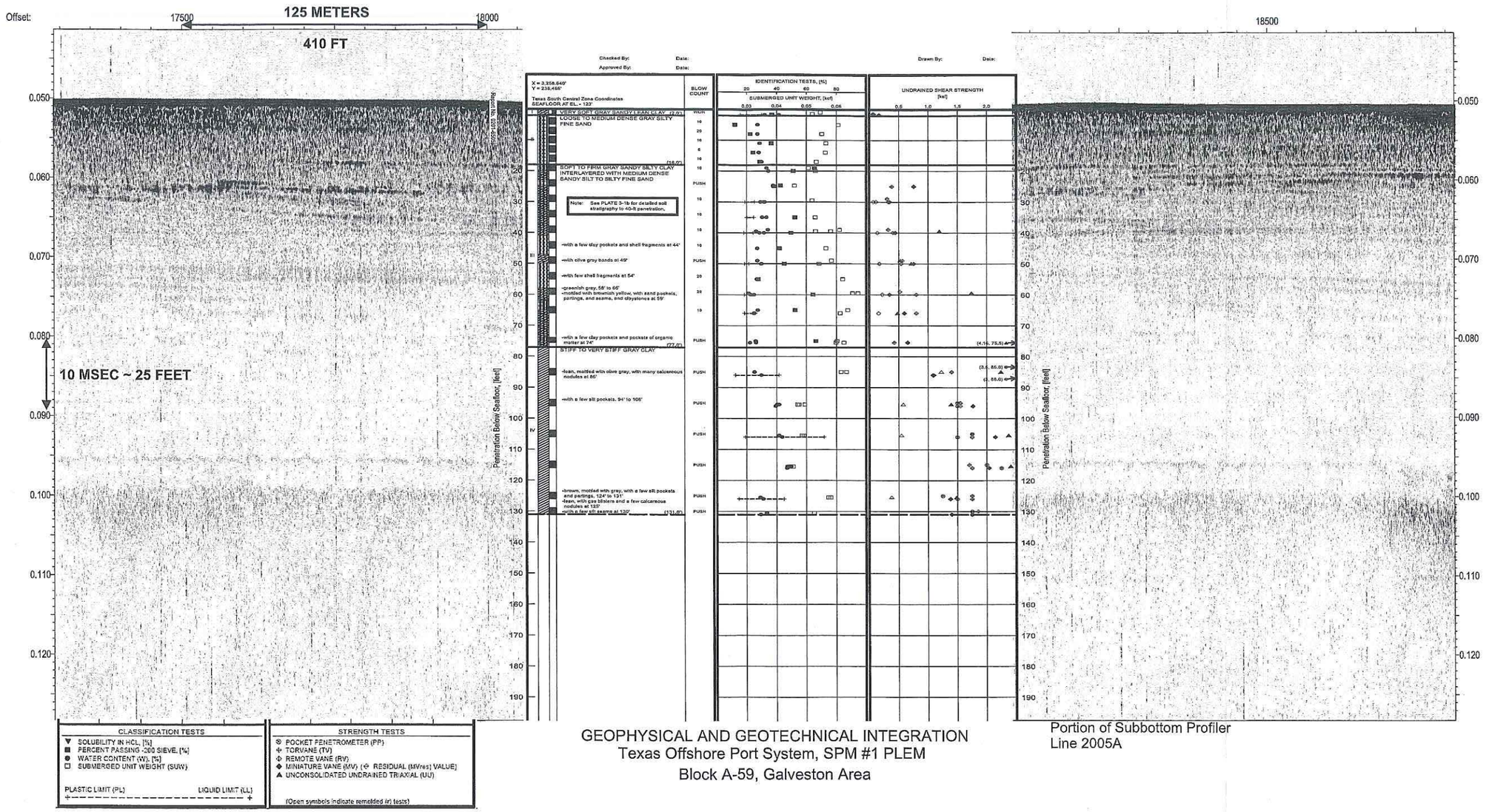
Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Report No. 0201-6505

PLATE 3-1b

S

N



CLASSIFICATION TESTS

- ▼ SOLUBILITY IN HCL, [%]
- ■ PERCENT PASSING -200 SIEVE, [%]
- ● WATER CONTENT (W), [%]
- □ SUBMERGED UNIT WEIGHT (SUW)

PLASTIC LIMIT (PL) — LIQUID LIMIT (LL)

STRENGTH TESTS

- ⊗ POCKET PENETROMETER (PP)
- ⊕ TORVANE (TV)
- ⊕ REMOTE VANE (RV)
- ◆ MINIATURE VANE (MV) (◇ RESIDUAL (MVres) VALUE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL (UU)

(Open symbols indicate remolded (r) tests)

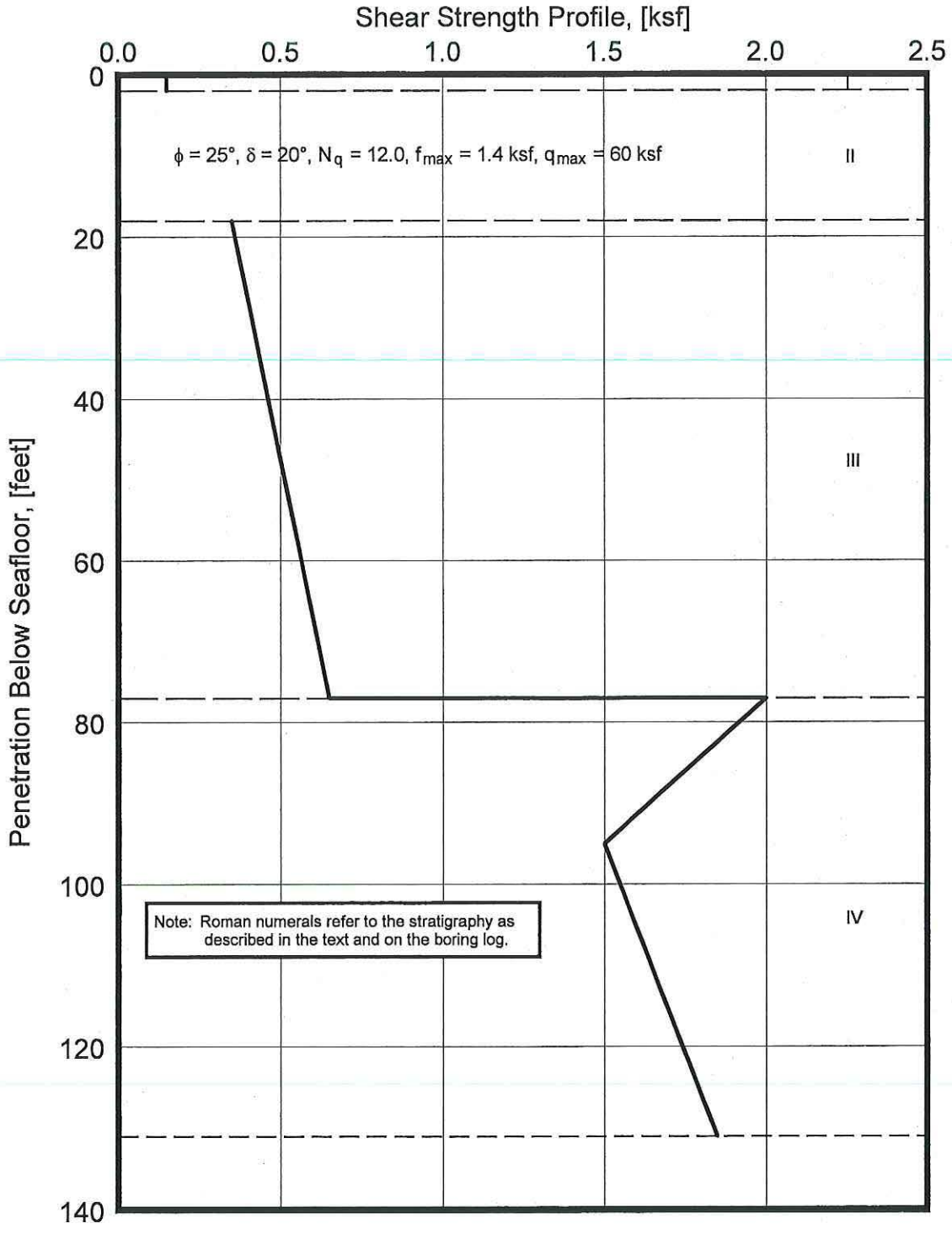
GEOPHYSICAL AND GEOTECHNICAL INTEGRATION
Texas Offshore Port System, SPM #1 PLEM
Block A-59, Galveston Area

Portion of Subbottom Profiler
Line 2005A

Drawn By: MW Date: 8/24/08

Checked By: DMP Date: 8/25/08

Approved By: DL Date: 9/8/08



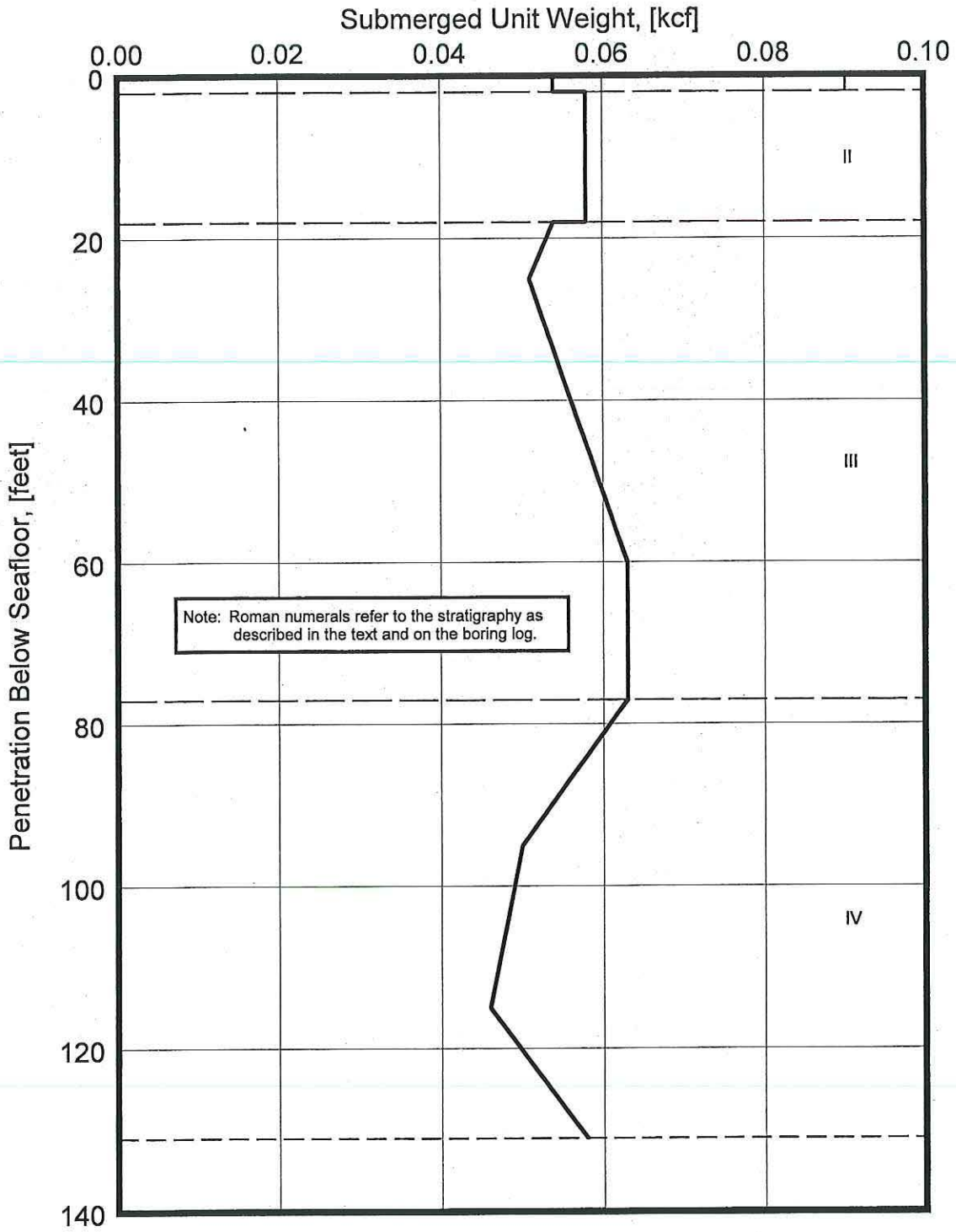
DESIGN STRENGTH PARAMETERS

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Drawn By: MEJ Date: 8/24/08

Checked By: PMP Date: 8/25/08

Approved By: [signature] Date: 9/19/08



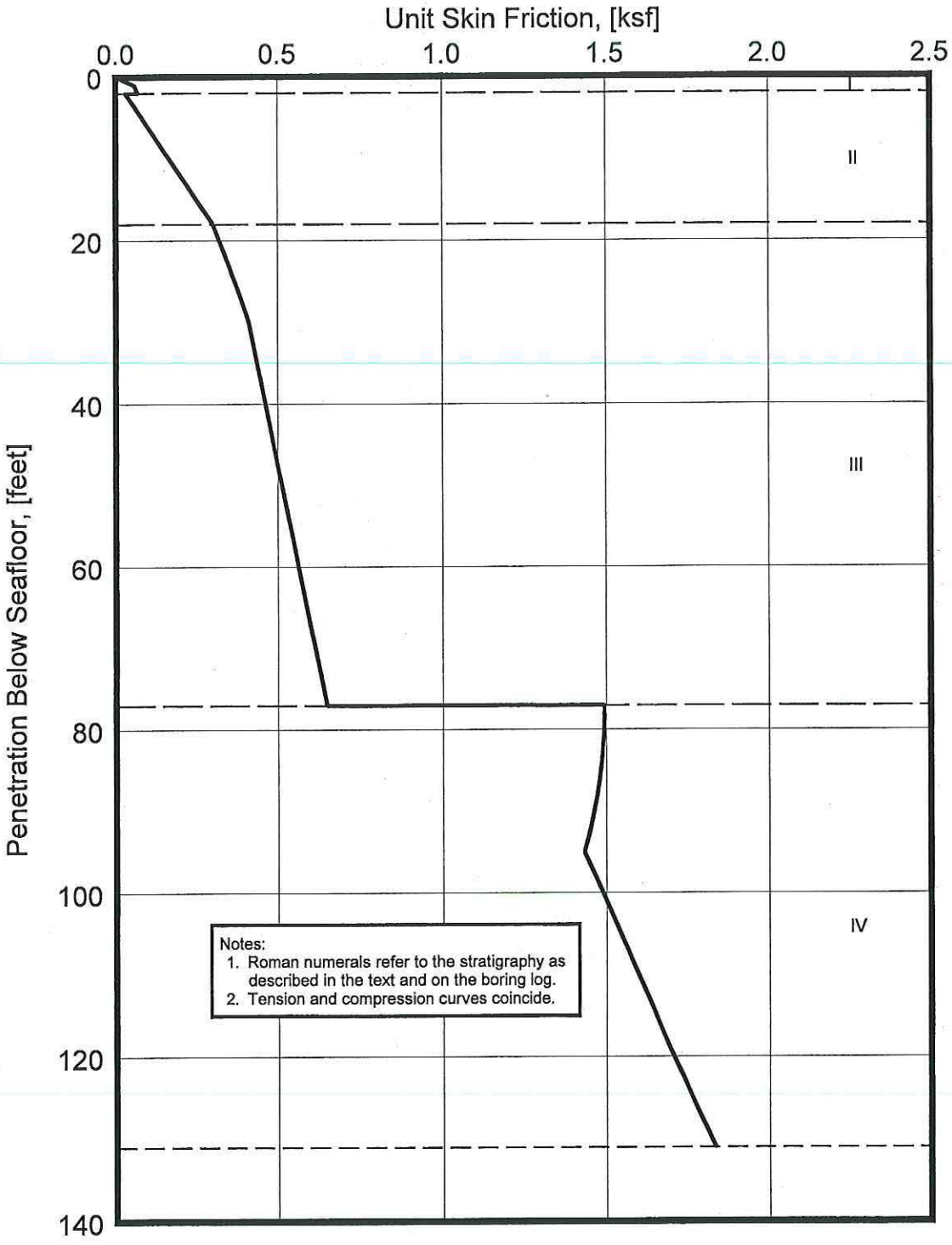
DESIGN SUBMERGED UNIT WEIGHT

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Drawn By: MW Date: 8/21/08

Checked By: DMP Date: 8/25/08

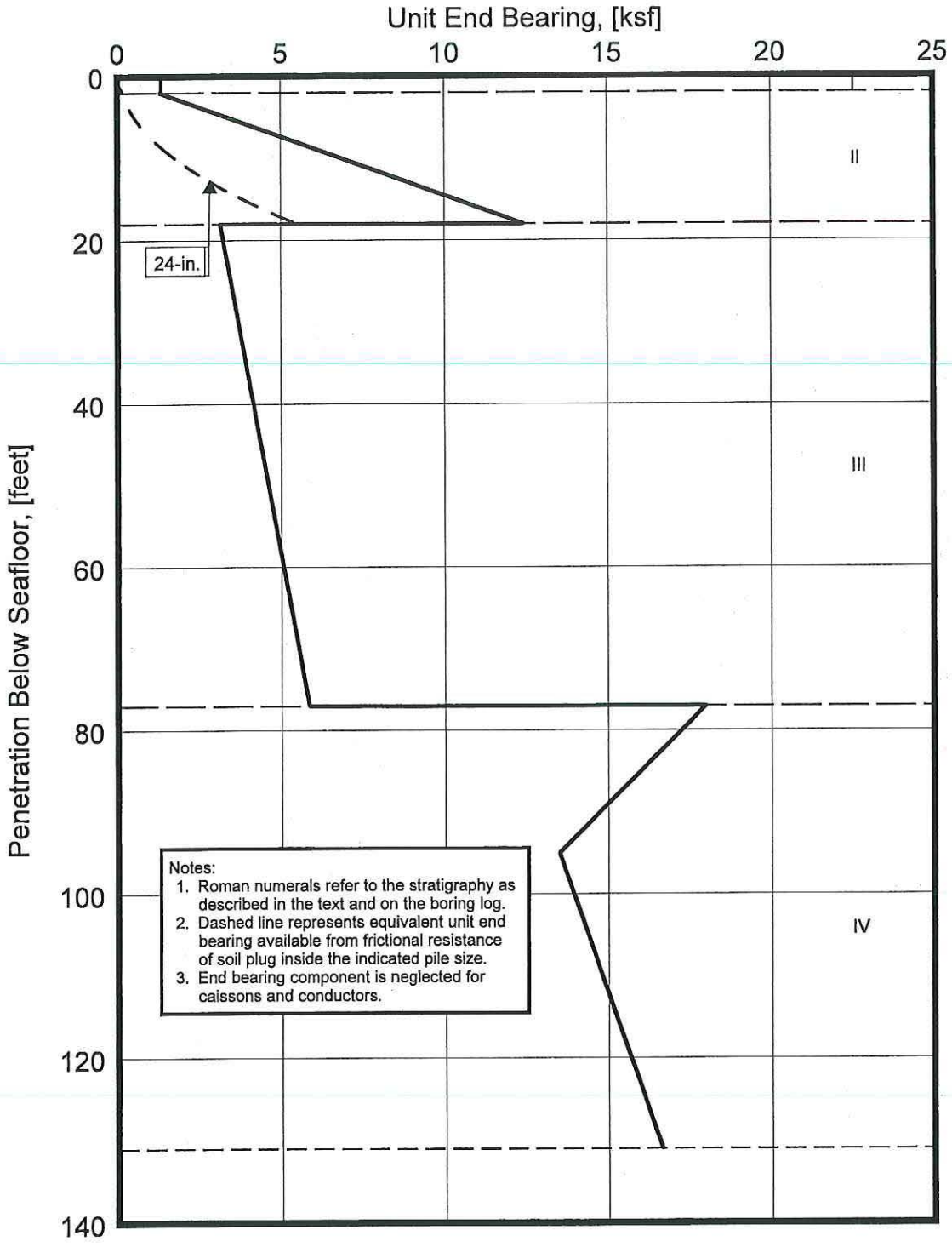
Approved By: AR Date: 9/18/08



UNIT SKIN FRICTION
API RP 2A (2000) Method

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Date: 8/21/08
Drawn By: HW
Date: 8/25/08
Checked By: PMP
Date: 9/8/08
Approved By: D.



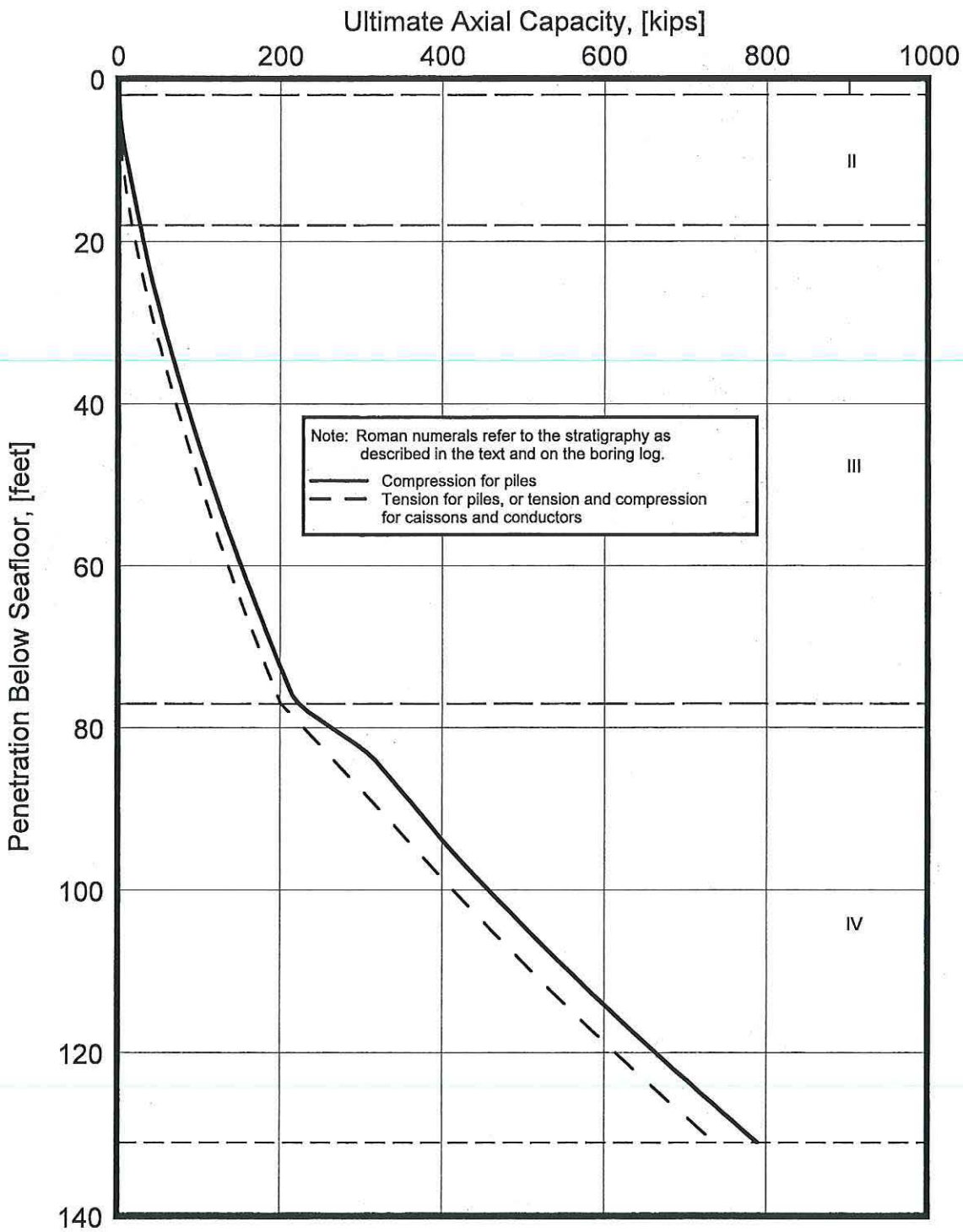
UNIT END BEARING
API RP 2A (2000) Method

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Drawn By: AW Date: 8/24/08

Checked By: PMP Date: 8/25/08

Approved By: [illegible] Date: 9/18/08



ULTIMATE AXIAL CAPACITY
API RP 2A (2000) Method
24-in.-Diameter Driven Pipe Piles
Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Drawn By: MAH Date: 8/24/08

Checked By: PMP Date: 8/25/08

Approved By: DS Date: 9/19/08

PENETRATION BELOW MUDLINE (feet)		CURVE POINTS							
		1	2	3	4	5	6	7	8
0.0	t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
1.0	t	0.00	0.02	0.03	0.04	0.05	0.06	0.05	0.05
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
2.0	t	0.00	0.02	0.03	0.05	0.06	0.07	0.06	0.06
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
2.0	t	0.00	0.03	0.03					
	z	0.00	0.10	24.00					
18.0	t	0.00	0.30	0.30					
	z	0.00	0.10	24.00					
18.0	t	0.00	0.09	0.15	0.23	0.27	0.30	0.27	0.27
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
25.0	t	0.00	0.11	0.18	0.28	0.33	0.37	0.33	0.33
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
29.0	t	0.00	0.12	0.20	0.30	0.36	0.40	0.36	0.36
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
77.0	t	0.00	0.19	0.32	0.49	0.58	0.65	0.58	0.58
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
77.0	t	0.00	0.45	0.75	1.12	1.35	1.49	1.35	1.35
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
95.0	t	0.00	0.43	0.72	1.08	1.29	1.43	1.29	1.29
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
115.0	t	0.00	0.50	0.83	1.24	1.49	1.65	1.49	1.49
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00
131.0	t	0.00	0.55	0.92	1.38	1.65	1.83	1.65	1.65
	z	0.00	0.04	0.07	0.14	0.19	0.24	0.48	24.00

Notes: 1. "t" is mobilized soil-pile adhesion, [ksf].
2. "z" is axial pile displacement, [in.].
3. Data for tension and compression coincide.

AXIAL LOAD TRANSFER DATA

(T-Z DATA)

API RP 2A (2000) Method

24-in.-Diameter Driven Pipe Piles

Texas Offshore Port System, SPM #1 PLET

Block A-59, Galveston Area

PENETRATION BELOW MUDLINE (feet)		CURVE POINTS						
		1	2	3	4	5	6	7
77.0	Q	0	5	9	14	17	18	18
	z	0.00	0.05	0.31	1.01	1.75	2.40	24.00
83.0	Q	0	13	26	39	47	52	52
	z	0.00	0.05	0.31	1.01	1.75	2.40	24.00
95.0	Q	0	11	21	32	38	42	42
	z	0.00	0.05	0.31	1.01	1.75	2.40	24.00
131.0	Q	0	13	26	39	47	52	52
	z	0.00	0.05	0.31	1.01	1.75	2.40	24.00

Notes: 1. "Q" is mobilized end bearing capacity, [kips].
2. "z" is axial tip displacement, [in.].

Drawn By: MW Date: 8/27/08

Checked By: [illegible] Date: 8/27/08

Approved By: [illegible] Date: 8/28/08

AXIAL LOAD TRANSFER DATA

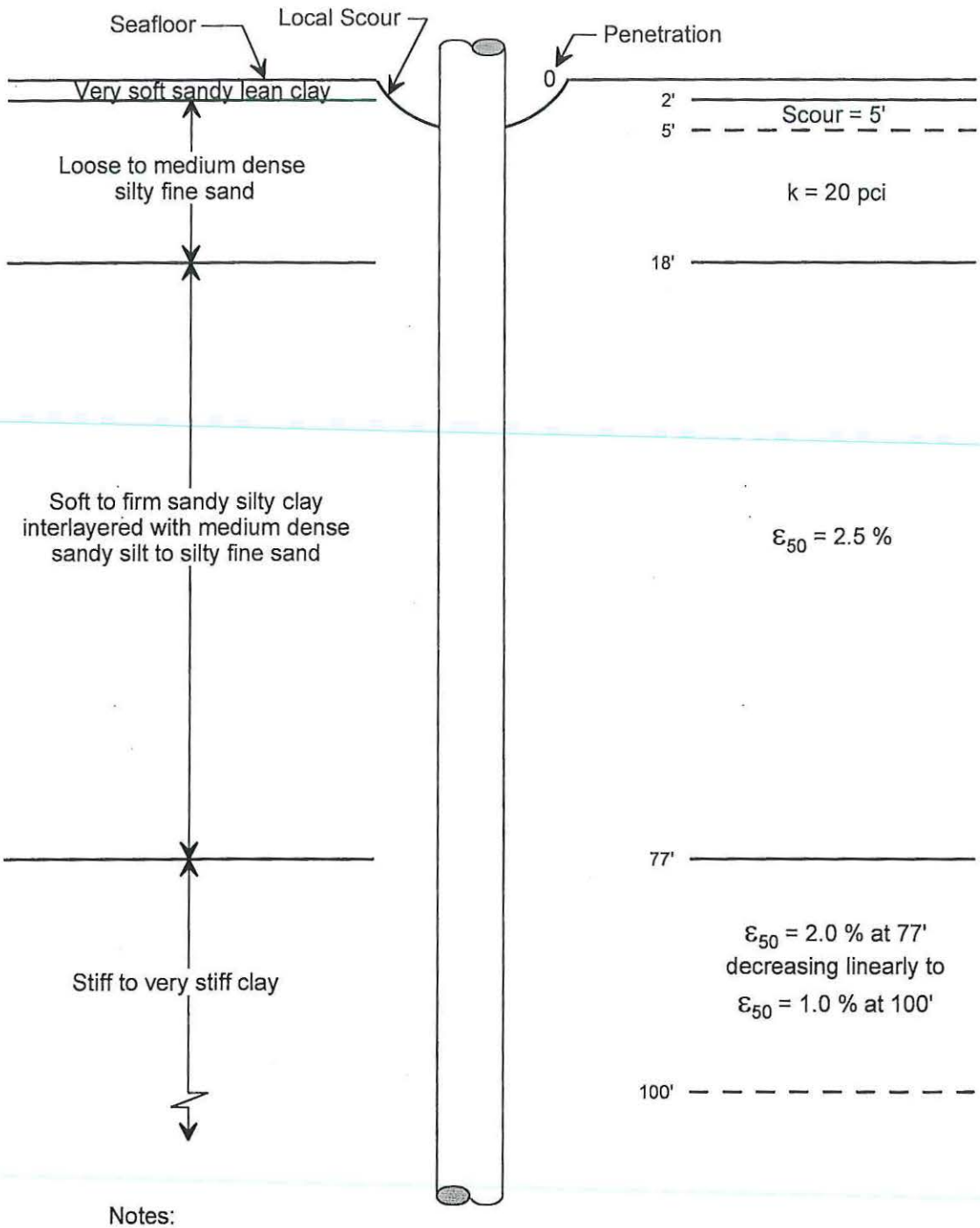
(Q-Z DATA)

API RP 2A (2000) Method

24-in.-Diameter Driven Pipe Piles

Texas Offshore Port System, SPM #1 PLET

Block A-59, Galveston Area



Notes:

1. ε_{50} is axial strain at half of peak deviator stress for cohesive soils.
2. Soil strength parameters are shown on Plate 3-3.
3. Submerged unit weight profile is shown on Plate 3-4.
4. k is the modulus of horizontal subgrade reaction for granular soils.

STRATIGRAPHY AND PARAMETERS FOR P-Y DATA

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Date: 8/21/08
Drawn By: MW
Date: 8/25/08
Checked By: RMP
Date: 9/18/08
Approved By: QA

PENETRATION BELOW MUDLINE (feet)		CURVE POINTS							
		1	2	3	4	5	6	7	8
0.0	p	0	0						
	y	0.00	24.00						
5.0	p	0	0						
	y	0.00	24.00						
7.0	p	0	41	68	90	113	129	134	136
	y	0.00	0.05	0.08	0.12	0.18	0.28	0.41	24.00
9.0	p	0	124	206	272	342	391	408	412
	y	0.00	0.07	0.13	0.18	0.28	0.43	0.62	24.00
11.0	p	0	248	414	546	687	786	819	828
	y	0.00	0.10	0.17	0.25	0.37	0.57	0.83	24.00
13.0	p	0	335	558	737	927	1060	1105	1116
	y	0.00	0.11	0.20	0.28	0.43	0.66	0.95	24.00
15.0	p	0	434	724	955	1201	1375	1433	1447
	y	0.00	0.12	0.22	0.32	0.48	0.74	1.06	24.00
18.0	p	0	607	1012	1335	1679	1922	2003	2023
	y	0.00	0.14	0.26	0.37	0.56	0.86	1.24	24.00
18.0	p	0	79	121	179	263	378	378	
	y	0.00	0.04	0.15	0.45	1.50	4.50	24.00	
77.0	p	0	146	224	331	487	702	702	
	y	0.00	0.04	0.15	0.45	1.50	4.50	24.00	
77.0	p	0	450	690	1020	1500	2160	2160	
	y	0.00	0.03	0.12	0.36	1.20	3.60	24.00	
95.0	p	0	338	518	765	1125	1620	1620	
	y	0.00	0.02	0.07	0.22	0.73	2.19	24.00	
100.0 (and below)	p	0	349	534	790	1162	1673	1673	
	y	0.00	0.02	0.06	0.18	0.60	1.80	24.00	

Notes: 1. "p" is soil resistance, [lb/in.].
2. "y" is lateral deflection, [in.].

P-Y DATA
(CYCLIC LOADING)
API RP 2A (2000) Method
24-in.-Diameter Driven Pipe Piles
Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Date	Time From	Time To	Description of Activities
July 4, 2008	****	2350	Arrive in Block A-59, Galveston Area, SPM #1 PLET location onboard the vessel *R/V Seaprobe.*
	2350	2400	Set 4-pt anchors.
July 5, 2008	0000	0115	Set 4-pt anchors.
	0115	0130	Rig up to drill and sample.
	****	0130	Estimate water depth of 117 ft with vessel's echo sounder and 122 ft using wireline technique.
	0130	0140	Run scanning sonar.
	0140	0240	Run drill pipe to mudline.
	****	0240	Measure water depth of 123 ft using bottom sensor/pipe tally and 121.0 ft with the pressure transducer.
	0240	0655	Drill and sample. Boring terminated at 131-ft penetration.
	0655	0720	Pull drill pipe above mudline and reposition vessel.
	****	0720	Measure supplemental water depth of 123 ft with the bottom sensor/pipe tally and 122.0 ft with pressure transducer.
	0720	0740	Pull drill pipe to deck and secure equipment for travel.
	0740	0825	Pull anchors.
	0825	****	Depart location.

SUMMARY OF FIELD OPERATIONS

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

Checked By: AW Date: 9/5/08
Approved By: DA Date: 9/18/08

Drawn By: Tomol Date: 9/5/08

Report No. 0201-6505

Summary of Test Results

Job No.: 0201-6505-2 05-Sep-2008 (Ver. #5)
Boring: Texas Offshore Port System, SPM #1 PLET
Block: A-59
Area: Galveston

		Identification Tests						Strength Estimate (ksf)		Miniature Vane Tests (ksf)			Compression Tests								
Sample No.	Depth (ft)	Liquidity Index	Liquid Limit (%)	Plastic Limit (%)	Moisture Content (%)	Submerged Unit Weight (pcf)	Passing No. 200 Sieve	Penetrometer	Torvane	Undisturbed	Remolded	Residual	Type Test	Moisture Content (%)	Confining Pressure (psi)	Undisturbed Strength (ksf)	Remolded Strength (ksf)	ε_{50} Strain (%)	Submerged Unit Weight (pcf)	Failure Strain (%)	Type of Failure
1	1.00					55															
2	1.50					52				0.07		0.06									
3	1.80				32						0.04										
3	1.80	1.13	30	16	32																
3	1.80				41		37			0.16											
4	5.00				27	61	12														
5	8.00				27	55	22														
6	11.00				29	57	36														
7	14.00				28	56	24														
8	17.00				30	53	29														
9	19.00				33	51	65														
10	20.00				34	53	51														
11	24.70				38	46	43														
12	25.00				39				0.38	0.76											
12	25.00				38																
13	29.00								0.30												
14	29.50					52															
15	30.00	1.94	25	19	31																
15	30.00				29						0.07										
15	30.00				32				0.32	0.34											
15	30.00										0.11										
16	35.00	2.25	25	20	30																

NOTES:

TYPE OF TEST
U - Unconfined Compression
UU- Unconsolidated-Undrained Triaxial
CU- Consolidated-Undrained Triaxial

TYPE OF FAILURE
A - Bulge
B - Single Shear Plane
C - Multiple Shear Plane
D - Vertical Fracture

Plus Signs [+] denote tests which exceeded the capacity of the measuring device.

NP = Non Plastic Material

PLATE A-5a

FUGRO

Checked By: AW Date: 9/5/08
Approved By: DC Date: 9/10/08

Drawn By: Tamol Date: 9/5/08

Report No. 0201-6505

Summary of Test Results

Job No.: 0201-6505-2 05-Sep-2008 (Ver. #5)
Boring: Texas Offshore Port System, SPM #1 PLET
Block: A-59
Area: Galveston

		Identification Tests						Strength Estimate (ksf)		Miniature Vane Tests (ksf)			Compression Tests								
Sample No.	Depth (ft)	Liquidity Index	Liquid Limit (%)	Plastic Limit (%)	Moisture Content (%)	Submerged Unit Weight (pcf)	Passing No. 200 Sieve	Penetrometer	Torvane	Undisturbed	Remolded	Residual	Type Test	Moisture Content (%)	Confining Pressure (psi)	Undisturbed Strength (ksf)	Remolded Strength (ksf)	ε_{50} Strain (%)	Submerged Unit Weight (pcf)	Failure Strain (%)	Type of Failure
16	35.00				33	53	52														
17	39.00				34	61			0.32												
18	39.50					53							UU	26	120	1.19		9.7	58	20	A
19	40.00										0.14										
19	40.00				30		50		0.40	0.44											
19	40.00	1.66	24	18	29																
20	45.00				27	57	42														
21	49.00								0.56				UU	27	75	0.53		4.4	58	20	A
22	49.50																				
23	50.00	1.80	25	19	30		45		0.54	0.76			UU	30	76	0.72		2.7	54	12	A
23	50.00										0.17										
24	55.00				27	62	28														
25	59.00								0.52												
26	59.50					67							UU	21	80	1.74		7.2	65	20	A
27	60.00	.91	23	18	23																
27	60.00				25		64		0.80	0.34											
27	60.00										0.22										
28	65.00				27	64	52														
29	65.50																				
30	66.00	.92	26	19	25				0.80	0.60			UU	25	80	0.48		3.7	61	16	A
30	66.00										0.16										
31	75.00				26	60	66														

NOTES:

TYPE OF TEST
U - Unconfined Compression
UU- Unconsolidated-Undrained Triaxial
CU- Consolidated-Undrained Triaxial

TYPE OF FAILURE
A - Bulge
B - Single Shear Plane
C - Multiple Shear Plane
D - Vertical Fracture

Plus Signs [+] denote tests which exceeded the capacity of the measuring device.

NP = Non Plastic Material

PLATE A-5b

Checked By: AW Date: 9/5/08
Approved By: DA Date: 9/18/08

Drawn By: Tomol Date: 9/5/08

Report No. 0201-6505

Summary of Test Results

Job No.: 0201-6505-2 05-Sep-2008 (Ver. #5)
Boring: Texas Offshore Port System, SPM #1 PLET
Block: A-59
Area: Galveston

		Identification Tests						Strength Estimate (ksf)		Miniature Vane Tests (ksf)			Compression Tests								
Sample No.	Depth (ft)	Liquidity Index	Liquid Limit (%)	Plastic Limit (%)	Moisture Content (%)	Submerged Unit Weight (pcf)	Passing No. 200 Sieve	Penetrometer	Torvane	Undisturbed	Remolded	Residual	Type Test	Moisture Content (%)	Confining Pressure (psi)	Undisturbed Strength (ksf)	Remolded Strength (ksf)	ε_{50} Strain (%)	Submerged Unit Weight (pcf)	Failure Strain (%)	Type of Failure
32	75.50				26	60			0.42	0.65			UU	22	86	4.16		8.2	62	20	A
33	85.00							3.50	1.40				UU		127		1.23		63		
33	85.00												UU	25	120	2.24		1.9	62	19	B
34	85.50																				
35	86.00	.60	42	12	30			3.00	1.10	1.08											
36	95.00							1.50	1.55												
37	95.50				40	47							UU	40	120		0.57		48		
37	95.50												UU	42	120	1.39		0.5	49	2	C
38	96.00				39			1.50	1.55	1.76											
39	105.00							1.75	1.75												
40	105.50												UU	42	119	2.37		0.7	48	3	B
40	105.50												UU		120		0.54		49		
41	106.00	.47	72	19	44			1.50	1.75	2.15											
42	115.00							2.00	1.70												
43	115.50				47	44							UU	50	120	2.41		0.5	46	2	AC
44	116.00				47			2.25	1.75	2.04											
45	125.00							1.25	1.75												
46	125.50												UU		121		0.37		58		
46	125.50												UU	29	120	1.48		1.9	57	10	B
47	126.00	.54	45	15	31			1.50	1.75	1.38											
48	130.00							1.75	1.85												
49	130.50				33	53															

NOTES:

TYPE OF TEST
U - Unconfined Compression
UU- Unconsolidated-Undrained Triaxial
CU- Consolidated-Undrained Triaxial

TYPE OF FAILURE
A - Bulge
B - Single Shear Plane
C - Multiple Shear Plane
D - Vertical Fracture

Plus Signs [+] denote tests which exceeded the capacity of the measuring device.

NP = Non Plastic Material

PLATE A-5c

Checked By: AW Date: 9/5/08
Approved By: DL Date: 9/10/08

Drawn By: Tomol Date: 9/5/08

Report No. 0201-6505

Summary of Test Results

Job No.: 0201-6505-2 05-Sep-2008 (Ver. #5)
Boring: Texas Offshore Port System, SPM #1 PLET
Block: A-59
Area: Galveston

		Identification Tests						Strength Estimate (ksf)		Miniature Vane Tests (ksf)			Compression Tests								
Sample No.	Depth (ft)	Liquidity Index	Liquid Limit (%)	Plastic Limit (%)	Moisture Content (%)	Submerged Unit Weight (pcf)	Passing No. 200 Sieve	Penetrometer	Torvane	Undisturbed	Remolded	Residual	Type Test	Moisture Content (%)	Confining Pressure (psi)	Undisturbed Strength (ksf)	Remolded Strength (ksf)	ε_{50} Strain (%)	Submerged Unit Weight (pcf)	Failure Strain (%)	Type of Failure
50	131.00				29			1.75	1.75	1.40											

NOTES:

TYPE OF TEST
U - Unconfined Compression
UU- Unconsolidated-Undrained Triaxial
CU- Consolidated-Undrained Triaxial

TYPE OF FAILURE
A - Bulge
B - Single Shear Plane
C - Multiple Shear Plane
D - Vertical Fracture

Plus Signs [+] denote tests which exceeded the capacity of the measuring device.

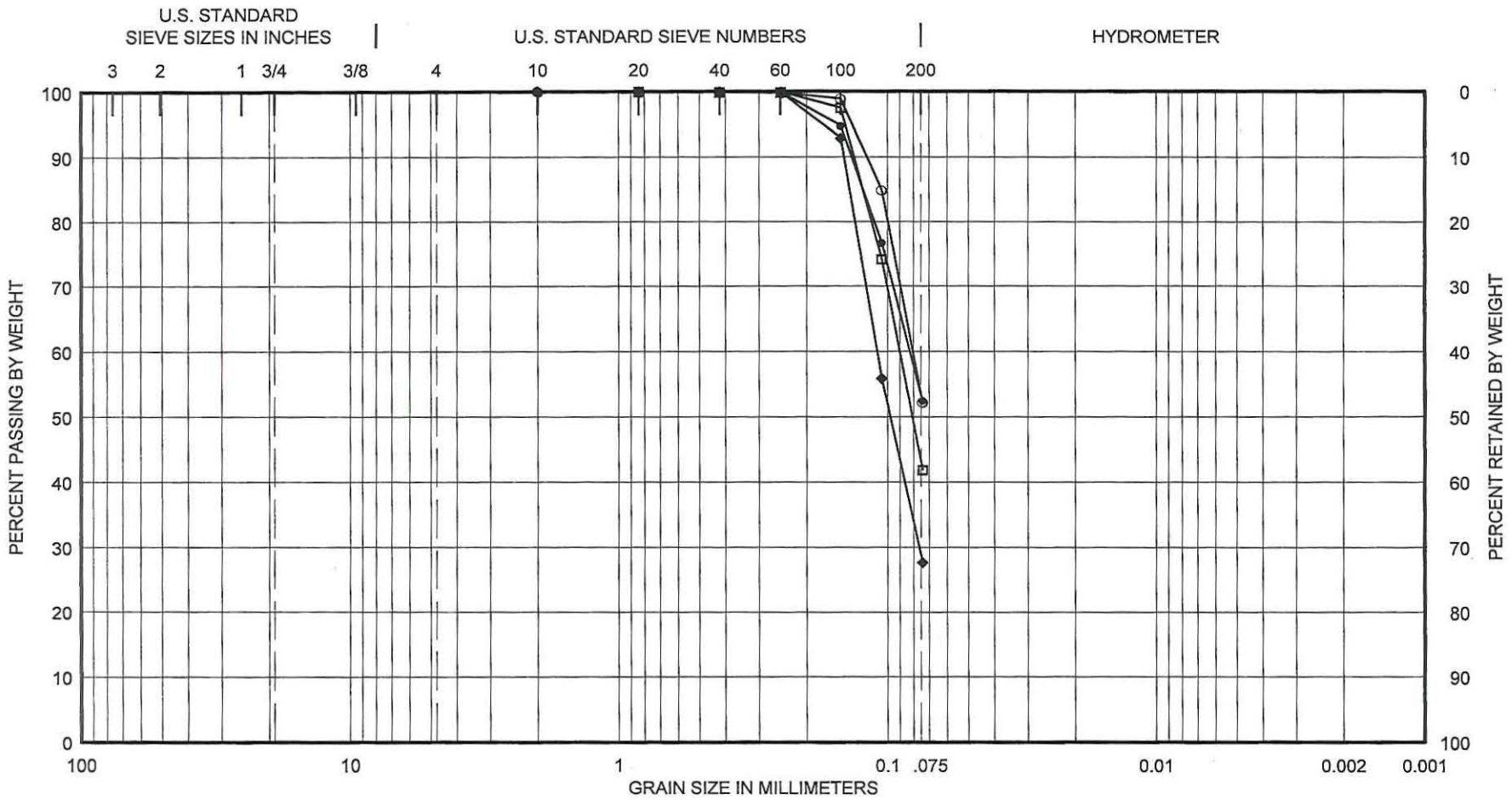
NP = Non Plastic Material

PLATE A-5d

Checked by: AW Date: 7/5/08
Approved by: M Date: 9/19/08

Drawn by: Tenet Date: 9/5/08

Report No. 0201-6505



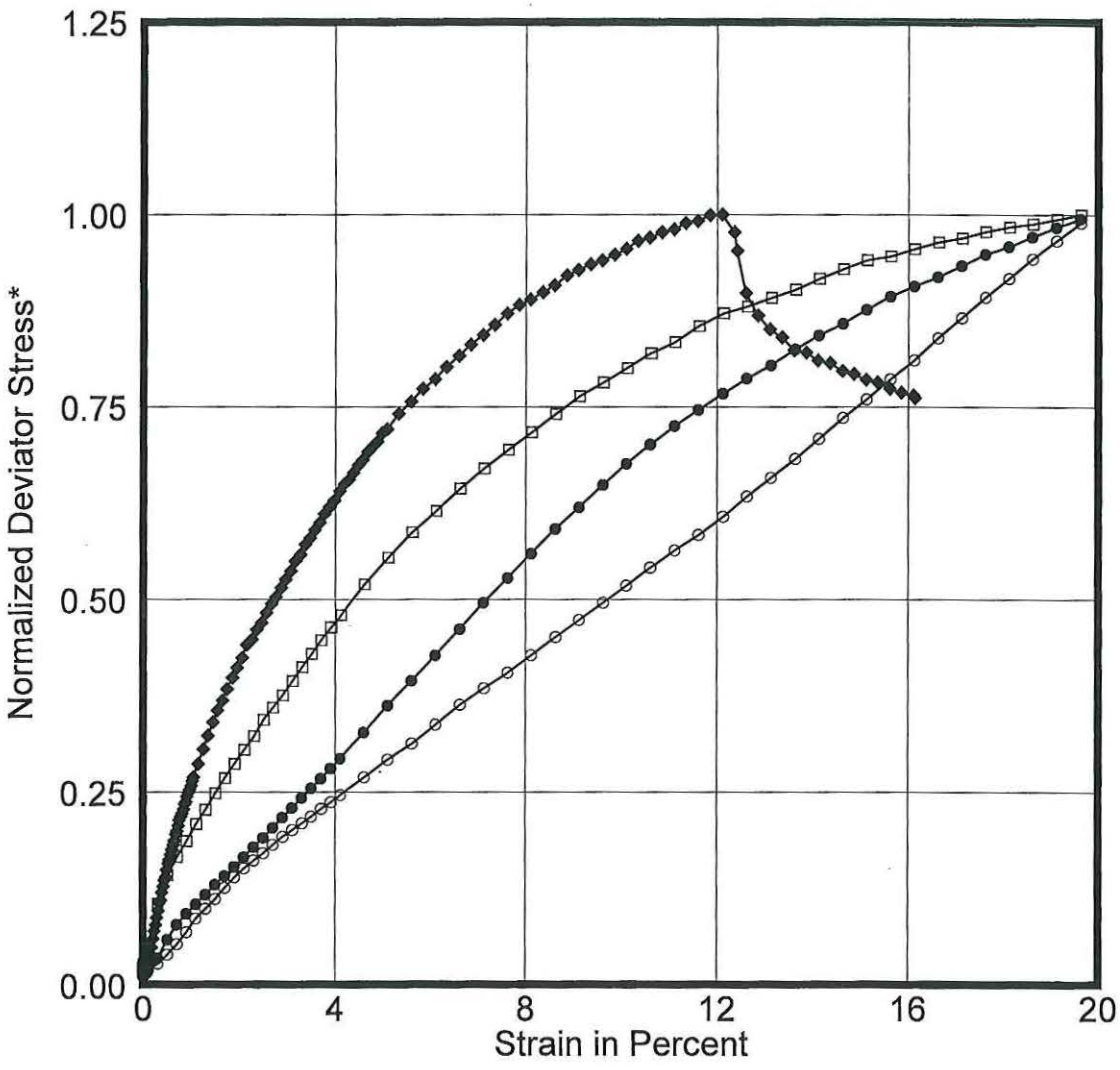
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

SAMPLE NO.	DEPTH, FT	SYMBOL	CLASSIFICATION
16	35.00	○	SANDY SILTY CLAY (CL -ML)
20	45.00	□	SILTY FINE SAND (SM) with a few clay pockets and shell fragments
24	55.00	◆	SILTY FINE SAND (SM) with a few shell fragments
28	65.00	●	SANDY SILTY (ML)

GRAIN-SIZE DISTRIBUTION CURVES

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

PLATE A-9b



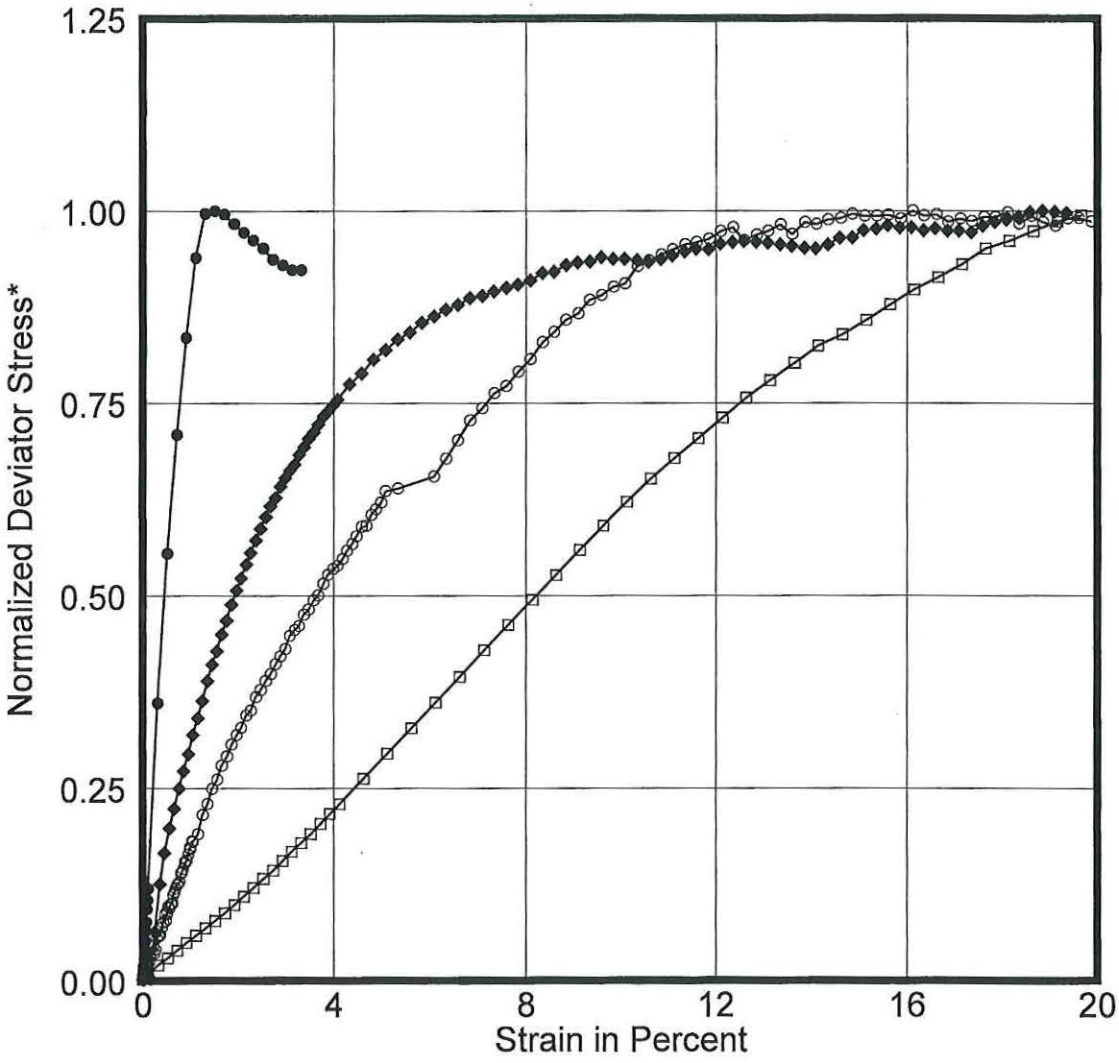
Curve	Sample No.	Depth [ft]	Test Type	Confining Pressure [psi]	Maximum Deviator Stress [ksf]	ε50 [%]
○—○	18	39.50	UU	120.2	2.38	9.7
□—□	21	49.00	UU	75.1	1.05	4.4
◆—◆	23	50.00	UU	75.8	1.43	2.7
●—●	26	59.50	UU	80.0	3.48	7.2

* Normalized with respect to maximum deviator stress.

Drawn By: TMC Date: 9/5/08
Checked By: KW Date: 9/5/08
Approved By: [illegible] Date: 9/19/08

STRESS-STRAIN CURVES
Unconsolidated-Undrained Triaxial Compression Test

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area



Curve	Sample No.	Depth [ft]	Test Type	Confining Pressure [psi]	Maximum Deviator Stress [ksf]	ε50 [%]
○—○	30	66.00	UU	80.3	0.96	3.7
□—□	32	75.50	UU	86.2	8.33	8.2
◆—◆	33	85.00	UU	119.9	4.48	1.9
●—●	37	95.50	UU	120.3	2.79	0.5

* Normalized with respect to maximum deviator stress.

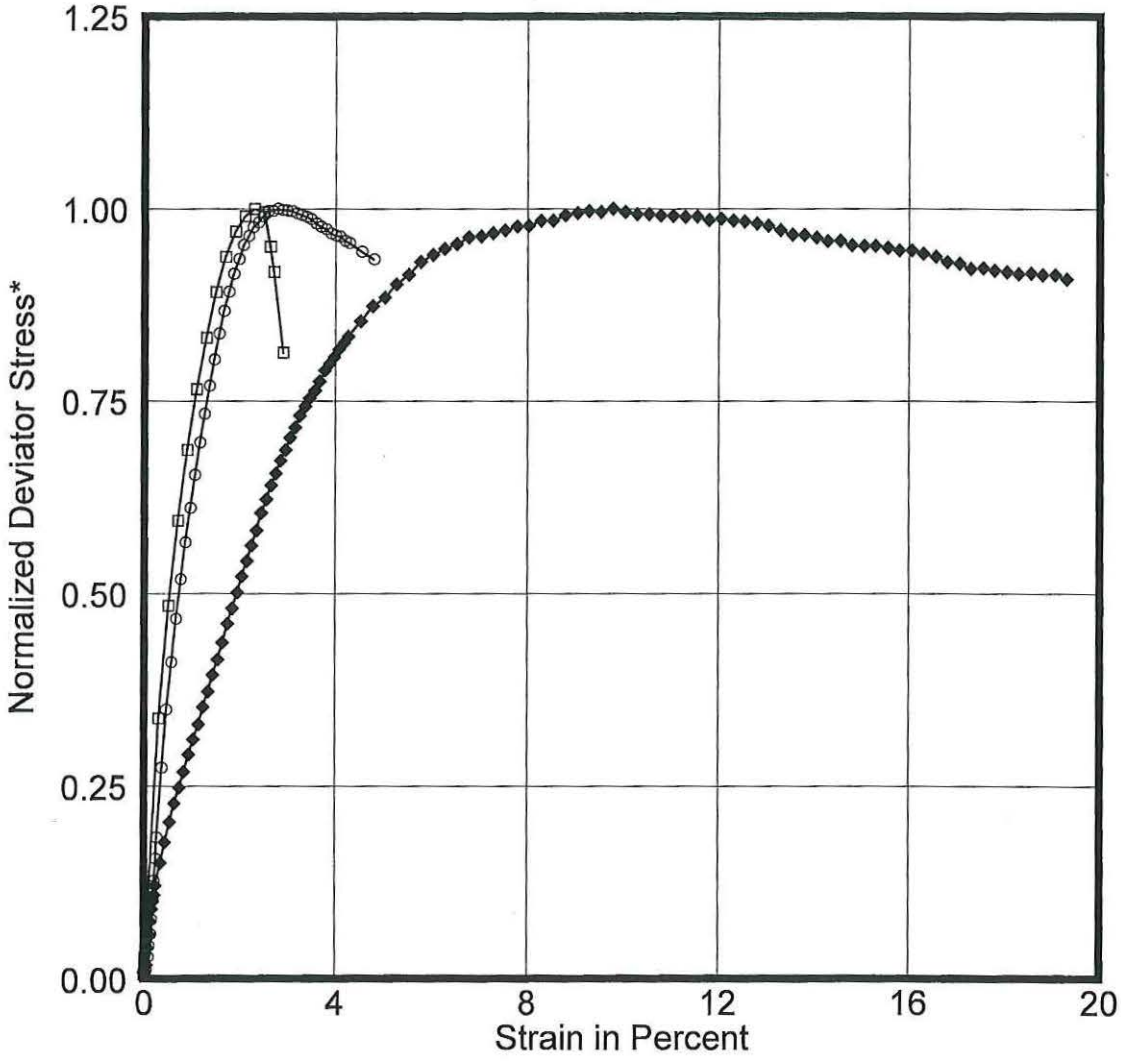
Drawn By: [illegible] Date: 9/5/08

Checked By: HC Date: 9/5/08

Approved By: [illegible]

STRESS-STRAIN CURVES
Unconsolidated-Undrained Triaxial Compression Test

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area



Curve	Sample No.	Depth [ft]	Test Type	Confining Pressure [psi]	Maximum Deviator Stress [ksf]	ε50 [%]
○—○	40	105.50	UU	119.3	4.74	0.7
□—□	43	115.50	UU	120.3	4.82	0.5
◆—◆	46	125.50	UU	120.4	2.97	1.9

* Normalized with respect to maximum deviator stress.

Drawn By: TMM Date: 9/5/08
Checked By: RJJ Date: 9/5/08
Approved By: DM Date: 9/12/08

STRESS-STRAIN CURVES
Unconsolidated-Undrained Triaxial Compression Test

Texas Offshore Port System, SPM #1 PLET
Block A-59, Galveston Area

ENTERPRISE FIELD SERVICES, LLC

SOIL BORINGS
TEXAS OFFSHORE PORT SYSTEM
SPM #1 and SPM #2
GALVESTON AREA BLOCK A59

1. INTRODUCTION:

Fugro Chance Inc. (CHANCE) was contracted by Fugro-McClelland Marine Geosciences, Inc. to position the *M/V "Seaprobe"* for a soil boring in Galveston Area, Block A59, Offshore Texas.

2. REQUIREMENTS:

Positioning requirements were transmitted, via e-mail, to Mr. Tony Parker of ***CHANCE*** by Mr. Frank Ortiz of Fugro-McClelland Marine Geosciences, Inc. A "Survey Request" form dated June 25, 2008 e-mailed to Mr. Manuel Lopez of Enterprise Field Services, LLC, confirmed these requirements. A copy of this form was also e-mailed to Mr. Frank Ortiz.

Requirements were as follows:

A) Proposed Location – SPM #1 and SPM #2

The Texas South Zone Coordinates are:

CORE 1 (Leg #2 – West)	CORE 2 (Leg #6 – East)
Y = 236,057.66'	Y = 241,308.73'
X = 3,257,224.19'	X = 3,266,735.50'
CORE 3 (PLET #1)	**CORE 4 (PLET #2)**
Y = 236,494.60'	Y = 240,337.08'
X = 3,258,627.75'	X = 3,265,632.42'

3. CHANCE PERSONNEL:

Party Chief - C. Evans

4. EQUIPMENT AND METHOD:

A) Primary Positioning System - **STARFIX® Satellite Positioning System**

Continuous dynamic positioning through the use of Navstar GPS with differential signals from multiple reference stations corrected for ionospheric and tropospheric effects transmitted via the **STARFIX®** equatorial geosynchronous satellite.

B) Secondary Positioning System - **Differential Global Positioning System (DGPS)**

DGPS utilizes the Navstar Satellite Constellation with data from selected reference sites transmitted via LF radio-link for enhanced accuracy through differential techniques.

CORE 3 (PLET #1)

Y = 236,466.44'
X = 3,258,639.61'

Latitude: 28° 25' 32.548" N
Longitude: 95° 05' 00.846" W

This location being 6,786.44' FSL and 4,603.80' FWL of Block A59, Galveston Area

CORE 4 (PLET #2)

Y = 240,317.51'
X = 3,265,646.77'

Latitude: 28° 26' 08.328" N
Longitude: 95° 03' 40.960" W

This location being 5,202.49' FNL and 4,229.04' FEL of Block A59, Galveston Area

6. CONFIRMATION:

DGPS was used for confirmation.

The results were as follows:

CORE 1 (Leg #2 - West)

Y = 236,057'
X = 3,257,200'

CORE 2 (Leg #6 - East)

Y = 241,331'
X = 3,266,757'

CORE 3 (PLET #1)

Y = 236,467'
X = 3,258,640'

CORE 4 (PLET #2)

Y = 240,318'
X = 3,265,648'

7. HSE INCIDENTS:

No incidents.

8. CHRONOLOGY:

July 4, 2008

1000 Conducted job change in field; aboard "Seaprobe" on standby at location GA. A59 due to weather; start time for job
1200 Preparing to set out anchors at proposed Core 1 location
1203 PB #1 Anchor on bottom
1217 PB #1 Anchor removed from bottom; will re-set per Captain

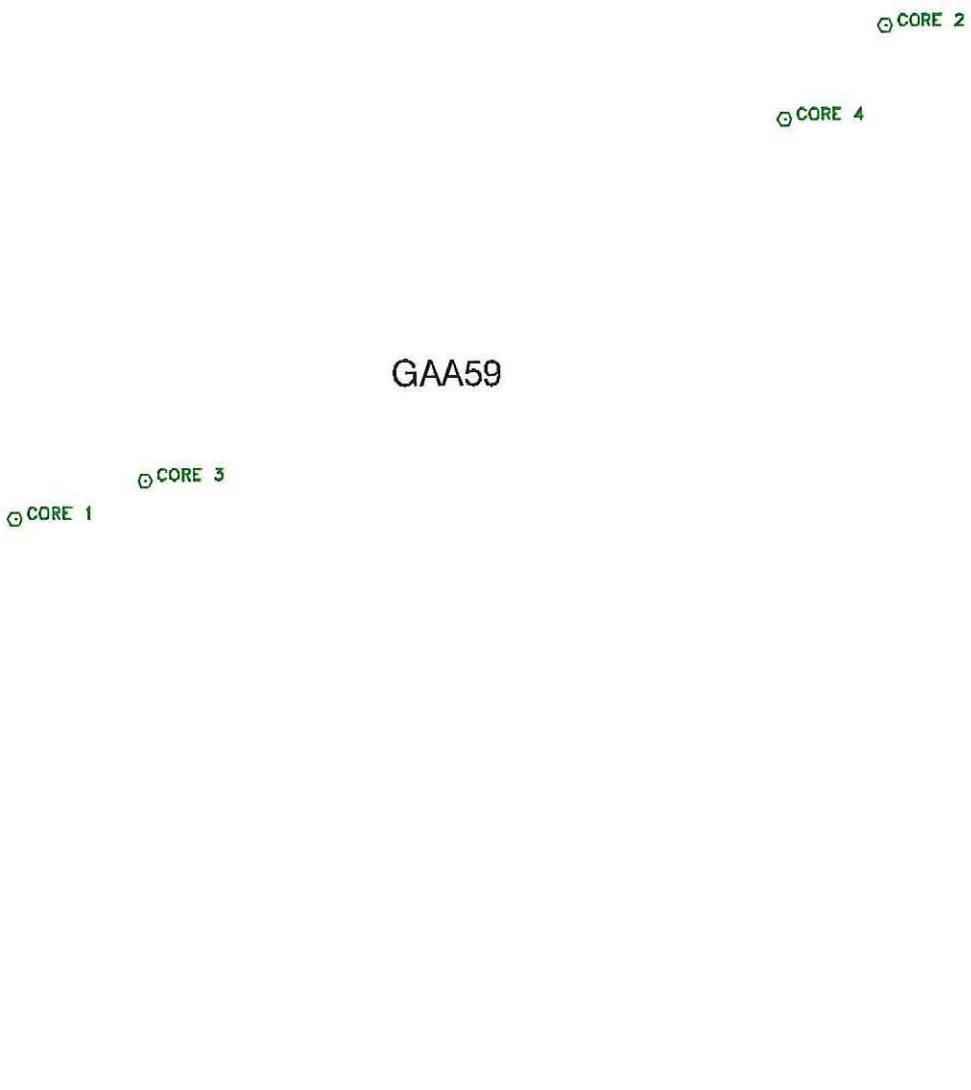
1218 PB #1 Anchor on bottom
1236 SB #2 Anchor on bottom
1250 SS #3 Anchor on bottom
1304 PS #4 Anchor on bottom
1340 Vessel on location; deployed Sonar; conducting site investigation at proposed Core #1 site
1355 Archiving Sonar data on proposed core site
1431 Sonar on deck; starting final tie; drill crew performing soil boring
1531 Final tie at Core #1 complete; emailing Lafayette office for final tie confirmation
1550 Received final tie confirmation; soil boring continues
2240 Core #1 complete; preparing to start anchor recovery
2251 SS #3 Anchor off bottom
2311 PS #4 Anchor off bottom
2320 SB #2 Anchor off bottom
2333 PB #1 Anchor off bottom; anchor recovery complete
2345 En route to proposed Core #3 site 1500' away
2354 At proposed Core #3 site; PB #1 Anchor on bottom
2400 Continuing to set out anchors at proposed Core 3 location

July 5, 2008

0001 Continuing to set out anchors
0006 SB #2 Anchor on bottom
0022 SS #3 Anchor on bottom
0047 PS #4 Anchor on bottom; moving onto location
0106 Vessel on location; preparing to deploy Sonar
0126 Deployed Sonar; conducting site investigation at proposed Core #3 site
0205 Sonar on deck; starting final tie
0305 Final tie at Core #3 complete
0330 Received final tie confirmation; drill crew performing soil boring
0745 Core #3 complete; preparing to start anchor recovery
0756 PS #4 Anchor off bottom
0811 SS #3 Anchor off bottom
0822 SB #2 Anchor off bottom
0831 PB #1 Anchor off bottom; anchor recovery complete
0845 En route to proposed Core #4 site
0854 At proposed Core #4 location; PB #1 Anchor on bottom
0907 SB #2 Anchor on bottom
0921 SS #3 Anchor on bottom
0937 PS #4 Anchor on bottom; moving onto location
1015 Vessel on location; deployed Sonar
1018 Conducting site investigation at proposed Core #4 site
1031 Sonar on deck; starting final tie; drill crew performing soil boring
1131 Final tie at Core #4 complete; emailing Lafayette office for final tie confirmation
1300 Received final tie confirmation from office; soil boring continues
1730 Core #4 complete; preparing to start anchor recovery
1747 SS #3 Anchor off bottom
1759 PS #4 Anchor off bottom
1809 SB #2 Anchor off bottom
1818 PB #1 Anchor off bottom; anchor recovery complete

FINAL SOIL BORINGS

LOCATION	CALLNS	CALLEW	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE
CORE 1	6,376.44' FSL	3,164.33' FWL	3,257,200.14'	236,056.44'	28° 25' 28.968"N	95° 05' 17.113"W
CORE 2	4,189.22' FNL	3,117.76' FEL	3,266,758.05'	241,330.78'	28° 26' 17.984"N	95° 03' 28.137"W
CORE 3	6,786.44' FSL	4,603.80' FWL	3,258,639.61'	236,466.44'	28° 25' 32.548"N	95° 05' 00.846"W
CORE 4	5,202.49' FNL	4,229.04' FEL	3,265,646.77'	240,317.51'	28° 26' 08.328"N	95° 03' 40.960"W



I HEREBY CERTIFY THAT THE ABOVE FINAL SOIL BORINGS ARE CORRECT.

DIGITAL COPY
ORIGINAL PLAT SIGNED 7/7/08

REC. PROFESSIONAL LAND SURVEYOR NO. 4903
STATE OF LOUISIANA

NOTES:
1) SURVEYED COORDINATES TRANSFORMED FROM NAD83 (CPS DATUM) TO NAD27 (CHART DATUM) USING NADCON VERSION 2.1.

Printed: 7/7/08

ENTERPRISE FIELD SERVICES, LLC

FINAL SOIL BORINGS
NO LEASE NUMBER (PROP. ANC & PLET)
BLOCK A59
GALVESTON AREA
GULF OF MEXICO

FUGRO CHANCE INC.
200 Dulles Dr. Lafayette, Louisiana 70506-3001 (337) 237-1500

GEODETIC DATUM: NAD27
PROJECTION: TEXAS SOUTH CENTRAL
GRID UNITS: US SURVEY FEET

SCALE IN FEET 0 2,000'

Job No.: 08-01931 | Date: 7/7/08 | Drwn: TCG | Chart: 1 Of: 1

Dwgfile: D:\WellPermit\TXsc\GA\Permit\A59_CORE_NO LEASE_0801931