SOIL AND FOUNDATION INVESTIGATIONS

LAWRENCE W. GILBERT, D. ENGR. REG. C.E.

BORINGS ANALYSES TESTING REPORTS

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10 February 1994

Port of Port Arthur c/o Lanier & Associates Consulting Engnieers, Inc. 4101 Magazine Street New Orleans, Louisiana 70115

Subsoil Investigation
Wharf Expansion
Sabine-Neches Ship Channel
Port Arthur, Texas

Gentlemen:

Herein is our report on the results of a subsoil foundation investigation made for the subject project.

Yours very truly,

GORE ENGINEERING, INC.

Lawrence W. Gilbert

LWG:laq

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SUBSOIL INVESTIGATION WHARF EXPANSION SABINE-NECHES SHIP CHANNEL PORT ARTHUR, TEXAS

INTRODUCTION

- 1. This report contains the results of a subsoil foundation investigation made at the subject site. Instructions to proceed with the investigation were received from Lanier and Associates Consulting Engineers, Inc., Consulting Engineers for the project. The study was made for the Port of Port Arthur, Port Arthur, Texas.
- 2. The study included the drilling of soil test borings to determine subsurface conditions and stratification and the performance of soil mechanics laboratory tests on samples obtained from the borings to evaluate their physical characteristics. Engineering analyses were made, based on the borings and test data to develop criteria to be used in foundation design.

SOIL BORINGS AND SUBSOIL CONDITIONS

Field Exploration

3. A total of twenty-three (23) soil test borings were made at the proposed site. Thirteen (13) undisturbed sample type soil test borings (B-1 thru B-6, B-10 thru B-14 and B-26 and B-27) were drilled to depths of 30 to 120 ft. on October 5-14, 1993. The borings were made with a truck mounted drill rig at designated locations approximately as

shown in a plan on Figure 1. Undisturbed sampling was performed continuously in all cohesive or semi-cohesive materials with a three inch diameter thin wall tube sampler. Representative samples were cut from the cores and placed in moisture proof containers for preservation until laboratory testing could be performed.

- 4. When cohesionless material was encountered, which could not be sampled by undisturbed methods, the Standard Penetration test was performed. This test consists of driving a two inch diameter splitspoon sample 1 ft. (after first seating it 6 inches) with a 140 lb. hammer falling 30 inches. The number of blows required to drive the sampler gives an indication of the density of the material.
- 5. Also, ten (10) shallow borings (B-7 thru B-9 and B-15 thru B-21) were made to the 10 ft. depth on October 14-15, 1993 at locations approximately as shown in a plan on Figure 1. These borings were made to determine the uniformity of near surface soils. Undisturbed samples were taken of representative materials and placed in moisture proof containers for preservation until further laboratory visual classification and testing could be made.
- 6. In addition to the above, four (4) borings (B-22 thru B-25) were drilled underwater by others from the mudbottom at locations as shown in plan on Figure 1. These borings were made in conjunction with an environmental study of the area by Lanier and

Associates. In addition, representative samples from the geotechnical borings were furnished to others for purpose of the environmental study.

7. Subsoil profiles developed from the deeper borings showing the general stratification and character of the soils are given on Figures 1 and 2. Logs of all the individual borings showing the detailed stratification and sample depths are given on Figures 3 thru 18.

Subsoil Description

8. Borings B-1 thru B-6 Reference to the subsoil profile "A" and logs of borings B-1 thru B-6 shows that beginning at the ground surface in all borings there is loose tan fine sand with shell, sand and shell, or clay with sand and shell (fill) to the 1 to 2 ft. depth. Below this depth, medium stiff to stiff dark gray, gray, black or gray and tan clay with silt or sand was encountered to the 4 to 7½ ft. depth. However, a layer of stiff greenish gray clay and reddish tan clay was encountered between the 1½ to 4 ft. depth in boring B-5. Beginning at the 4 to 7½ ft. depth in all borings there is medium stiff to stiff reddish tan and light gray or light gray and reddish tan clay to the 10 to 21½ ft. depth. This is underlain in boring B-1 thru B-3 by medium dense sand or clayey sand to the 23½ to 26½ ft. depth.

- 9. Beginning at the 10 to 24 ft. depth in borings B-2 thru B-5, soft to stiff reddish tan and light gray or light gray and reddish tan sandy clay was encountered to the 13½ to 32½ ft. depth. Below this depth there is medium stiff to stiff gray or greenish gray clay, sandy clay or silty clay to the 70½ to 98½ ft. depth. However, a layer of loose reddish tan and light gray clayey sand was encountered in boring B-5 between the 13½ to 15½ ft. depth and a stratum of medium dense reddish tan or gray fine sand or silty fine sand was encountered in borings B-3 thru B-6 beginning at the 15½ to 48½ ft. depth and continuing to the 21½ to 60½ ft. depth. Also, a stratum of medium stiff brownish gray organic clay was encountered between the 78½ and 82 ft. depths in boring B-2 and a stratum of medium stiff reddish tan sandy clay was encountered between the 21½ and 47 ft. depths in boring B-6.
- 10. Beginning at the 70½ to 73 ft. depth in borings B-5 and B-6 there is dense greenish gray clayey sand to the 73 to 79 ft. depth. Below this depth and beginning at the 73½ ft. to 102½ ft. depth in borings B-3 and B-4, stiff to very stiff light gray and reddish tan or greenish gray and reddish tan clay or sandy clay was encountered to the 101 to 108 ft. depth. A layer of loose gray clayey fine sand was encountered between the 98½ and 102½ ft. depths in boring B-3. Beginning at the 101 to 108 ft. depth in borings B-3 thru B-6 there is stiff to very stiff gray clay with silt and sand or concretions to at least the 120 ft. depth. Beginning at the 92½ to 96½ ft. depth in borings B-1 and B-2, dense to very dense gray fine sand was encountered to at least to the 120 ft. depth, the maximum depth explored by borings B-1 thru B-6.

- Borings B-10 thru B-14 Reference to the subsoil profile "B" and logs of borings B-10 thru B-14 shows that beginning at the ground surface there is loose tan fine sand, shell, silty clay or clay with shell (fill) to the 1 to 2 ft. depth. This is followed in boring B-14 by stiff reddish tan and brown clay with silt layers to the 4 ft. depth. Beginning at the 1½ to 4 ft. depth in boring B-13 and B-14 there is loose to medium dense gray clayey fine sand to the 4 to 7 ft. depth. Beginning at the 1 to 4 ft. depth in borings B-10 thru B-13, medium stiff to stiff gray or dark gray clay with silt encountered to the 4½ to 8 ft. depth. Below this depth in borings B-10 thru B-14 medium stiff to very stiff greenish gray and reddish tan or light gray and reddish tan clay was encountered to the 13½ to 17½ ft. depth. This is followed in boring B-11 and B-12 by medium stiff to stiff sandy clay to the 18 to 31 ft. depth and in boring B-14 by medium stiff reddish tan silty clay to the 20½ ft. depth.
- Beginning at the 17 to 31 ft. depth in borings B-10 thru B-14 there is generally loose to medium dense sand, silty sand or clayey sand to the 26 to 47 ft. depth. However, a layer of medium stiff to stiff sandy clay or clay was interbedded within this more granular stratum in borings B-11 and B-12 beginning at the 23½ to 35 ft. depth and continuing to the 38 to 38½ ft. depth. Beginning at the 26 to 37 ft. depth in boring B-13 and B-14 there is medium stiff to stiff light gray and reddish tan clay to the 37½ to 43 ft. depth. Beginning at the 26½ ft. depth in boring B-10 there is stiff reddish tan and light gray clay with sand to the 37½ ft. depth. Beginning at the 37½ to 47 ft. depth in all borings there is medium stiff to stiff gray or greenish gray clay with silt or sand lenses or shell fragments to

the 58 to 82 ft. depth. This is underlain in borings B-11 thru B-14 by stiff greenish gray sandy clay with shell or silt concretions to the 67½ to 87 ft. depth and in boring B-1 by stiff brown organic clay to the 87 ft. depth.

- 13. Beginning at the 67½ to 77 ft. depth in borings B-12 thru B-14 there is stiff to very stiff greenish gray and reddish tan, reddish tan and greenish gray or gray clay. Borings B-13 and B-14 were both terminated in this stratum at the 100 ft. depth, however it extends to at least the 120 ft. depth in boring B-12. Beginning at the 87 ft. depth in borings B-10 and B-11 there is dense to very dense gray fine sand. Boring B-11 was terminated in this stratum at the 100 ft. depth, however it continues to at least the 120 ft.depth in boring B-10, the maximum depth explored by these borings.
- Borings B-7 thru B-9 and B-15 thru B-21 Reference to the logs of borings B-7 thru B-9 and B-15 thru B-21 shows that beginning at the ground surface there is generally loose tan or gray fine sand or shell to the 1 to 6½ ft. depth. This is followed in all borings with the exception of B-18 by medium stiff to stiff dark gray, gray, reddish tan and light gray or greenish gray and reddish tan silty clay or clay to at least the 10 ft. depth, the maximum depth explored by these borings. However, a layer of black cinder was encountered between the 1½ to 3 ft. depth in boring B-9 and a layer of very soft greenish gray clay with sand was encountered between the 5½ to 9 ft. depth in boring B-20. Beginning at the 1 ft. depth in boring B-18 there is stiff greenish gray and reddish tan clay

to the 3 ft. depth. This underlain by loose greenish gray clayey fine sand to the 7 ft. depth and then by lime like material to the 10 ft. depth, the maximum depth explored by these borings.

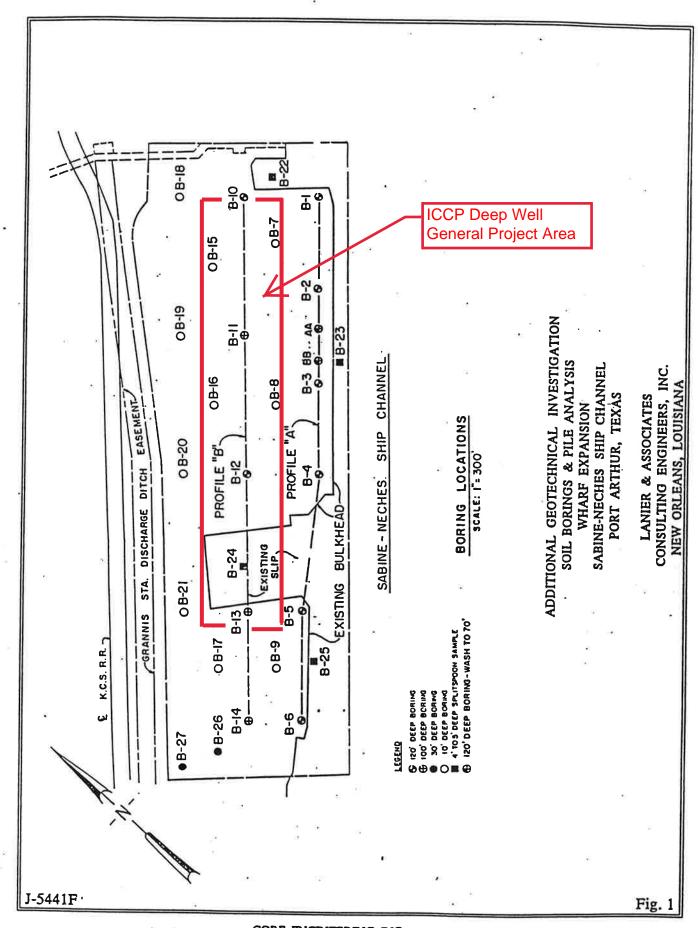
Borings B-26 and B-27 Reference to the logs of borings B-26 and B-27 shows that beginning at the ground surface there is stiff brown and tan silty clay or loose tan fine sand to the 1 ft. depth. This is underlain by medium stiff to stiff tan and gray, gray or greenish gray and reddish tan clay to the 13 to 13½ ft. depth. However, a layer of medium stiff tan and brown silty clay was encountered between the 7 to 11 ft. depth in boring B-26. Beginning at the 13 to 13½ ft. depth in both borings there is stiff to very stiff reddish tan and greenish gray or reddish tan clay or sandy clay to the 18 to 21½ ft. depth. This is underlain by medium dense greenish gray clay or reddish tan fine sand to the 25½ to 27 ft. depth and then by medium stiff to stiff reddish tan silty clay or clay to at least the 30 ft. depth, the maximum depth explored by these borings.

B-6 and B-10 thru B-14, groundwater was measured at depths ranging from 1.3 to 6.2 ft. below the surface. In the shallower borings, borings B-7 thru B-9 and B-15 thru B-21, groundwater was measured at depths ranging from 1.1 to 1.3 below the surface. Also, groundwater was measured at depths of 4.7 to 5.5 ft. below the surface at borings B-26 and B-27. Groundwater was measured shortly after drilling and may not have become fully

static at the time of measurement. In any event, groundwater could fluctuate due to seasonal precipitation, drainage, prolonged drought or the water level in the nearby Sabine-Neches Ship Channel. If groundwater is important to construction, it should be measured at that time.

LABORATORY TESTS

- 17. In order to develop the physical properties of the soils, soil mechanics laboratory test were performed on samples obtained from the borings. This testing consisted primarily of Natural Moisture Content, Unit Weight and Unconfined Compression. Triaxial Shear Tests were performed on some of the more granular materials and Atterberg Limits were performed on selected samples. The results of all the laboratory tests are tabulated along side the boring logs at the appropriate sample and depth on Figures 3 thru 18.
- 18. The unconfined compressive strength is used to determine lateral earth pressures for use in bulkhead wall analyses, load-deflection (P-Y) parameters of soil for use in lateral load analyses of a proposed Monopile and the undrained shear strength or cohesion for slope stability analyses. It also gives a measure of "skin friction" values used to estimate pile load capacities. The Atterberg Limits along with the Natural Moisture Content give an indication of the compressibility of the soils and are used empirically to estimate settlements.



Soil and Foundation Investigations Betairie, Louisiana

Boring No. AA

LOG OF BORING

Date of Boring: 9 Jan 199

Project: SOIL BORINGS & PILE ANALYSIS - WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA Recorded By: D. A. Hil

Sample	SA Depth	MPLE in Feet	STRATUM Depth	VISUAL CLASSIFICATION	*Blows per	T	Scale	PENARKS	
No.	From	To	in feet	**	Foot	Log	(ft)	CAMMOO	
×				WASH			20		
ū		ž × 1					40	2	0 9);
×				© 			60		
1 2	74.5	80.0		STIFF GRAY CLAY W/SILT LENSES			80	ŧi	
3 4 5	84.5 86.5 88.5	88.0 90.0		STIFF GREENISH GRAY CLAY W/SILT DENSE LIGHT GRAY FINE SAND	30 = .6° 30 = .6°	////	_:	× 5	(* *)
6	93.5		- 93.5- - 98.5-	MEDIUM DENSE LIGHT GRAY FINE SAND	20			(8	
7 8 9	103.5 108.5	100.0 105.0 110.0		DENSE LIGHT GRAY FINE SAND	30 = .4' 30 = .5' 30 = .4'		100 - CLAY	SILT SA	<u>מאט</u>
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			- 120.0		30 = ,5		Predom Hodify *140 lh 30 in. spoon s	ORGANIC inant type boing type ligh	old. nt. ppe

Soil and Foundation Investigations Betairie, Louisiana

Boring No. BB

LOG OF BORING

Date of Boring: 10 Jan 19

Project: SOIL BORINGS & PILE ANALYSIS - WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL

PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA Recorded By: D. A. Hill

.,	Sample	SA Depth	MPLR in Feet	STRATUM Depth	VISUAL CLASSIFICATION	"Blows	Symbol	
	Bo.	From	To	in feet	?	Foot	Log	(ft)
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					IV		:=	_
					9			40
		wji						_
								60
ŀ	1	71.5	72.0	70.0	STIFF GRAY CLAY W/ORGANIC			
Ì	2	71.5 74.5	75.0	73.0	STIFF GRAF CLAF W/ORGANIC		<i>44</i> 4	
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1	4	84.5	85.0		STIFF GREENISH GRAY CLAY W/SHELL	1		- N
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	6	94.5	95.0	İ		ľ	////	_ (SEE IEAI)
	7	99.5	100.0	I				100
T	8	104.5	105.0	- 102.0			<i>}}}}</i>	200
	9		110.0	114.0	STIFF GRAY CLAY W/ORGANIC		////	- CLAY SILT SAND
	10 11	114.5 119.5	115.0 120.0	10 10	STIFF GREENISH GRAY CLAY			120
					(c ^(NE))			ORGANIC Predominant type bold. Nodifying type light. # # # # # # # # # # # # # # # # # # #

Soll and Foundation Investigations Metairie, Louisiana

Boring No. B-1

LOG OF BORING AND TEST RESULTS

Date of Boring: 5 Oct 199:

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

_	0	WPLE	CADTAUM	r	1 -01							Recorded	By: D. /	A. H13
Sample	Depti	in Feet	Depth in feet	VISUAL CLASSIFICATION	*Blows	Symbol		COMP. (qu)	CONTENT		VEIGHT	177	KRBERG L	LIKITS
llo.	From	_			Foot	Log		(lbs/sq.ft)	(percent)	DRY	12.7	_	P.L.	
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3	2.	5 3.0	4:0	STIFF BLACK CLAY W/SILT		III	_	3345	28.2	87.6	112.2			
4	5.	6.0)	MEDIUM STIFF GRAY & TAN CLAY W/SILT		m	-	1445	30.7	87.5		56	20	36
5	8.	9.0	7.0		_	1////		1105	25.0					
6	11.			MEDIUM STIFF TO STIFF LIGHT GRAY RED TAN CLAY	DESH	\ ////	10	1135 2005	35. 2 31. 2	81.7 86.7	110.4	55	24	31
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8		7,5,5-51,		STIFF REDDISH TAN & LIGHT GRAY CLAY & SILT CONCRETIONS	WSILT	V///		2465	30.8	87.0	113.8			
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10	23.	25.0		MEDIUM DENSE REDDISH TAN FINE SAND	9				24.7					
_			26.5		-	iiii	_							_
11	29.5	30.0	32.0	STIFF REDDISH TAN & LIGHT GRAY CLAY LENSES & LAYERS	W/SILT		30.	2165	35.7	80.4	109. 1			247
12	34.5	35.0						2210	35.2	81.5	110.2			-
13	39.5	40.0				////	40.	2375	37.3	78.7	108. 1			
14	44.5	45.0			ĺ	<i>{///\</i>		2250	40.6	25.5				
_		-				////	=:	2230	40.6	76.7	107.8	68	20	48
15	49.5	50.0				////	50							
16	54.5	55.0		MEDIUM STIFF TO STIFF GRAY CLAY W/SII LENSES & LAYERS	r	////	-	2240	42.7	74.8	106.8			
17	59.5	60.0				////	60	1605	35.9	80.3	109.1			
18	64.5	65.0				////	_	1620	37.6	79.9	109.9		*	
19	69.5	70.0				////	70	15 10	41.9	74.3	105.4			
20	74.5	75.0	-	~	5	////							9	
21	79.5	80.0		43 K		//// <u>}</u>	10	2300	46.7	70.0	102.7	87	42	45
22	84.5	85.0		(W/TRACE ORGANIC @ 84.5 - 85.0)		///}-	ō.	1980	49.9	67.2	100.7			
3	89.5	90.0	87.5	ERY STIFF GREENISH GRAY CLAY W/SILT		////	0	4665	28.4	89.6	115.0			-
4	94.5	95.0		STILL STEELISH GRAI CEAL HYSIEL		////		4060	25.5	93.7	117.6	52	25	27
5	96.5 98.5	98.0 100.0	96.5		30 = .4"	1	00		21.6					_
,	103.5	105.0			30 = ,3*									
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	13.5			201 - 20		1			25.3					
					30 = .4	-							77	
0 1	18.5	120.0	120.0		30 = .5"	12	20							

CLAY SILT SAID

*140 lb. hazmer dropped 30 in. on 2 in. splitspoon sampler after first being seated 6 in.

WATER TABLE AT 3.7' (SEE TEXT)

Soil and Foundation Investigations Metairie, Louisiana

Boring No. B-2

LOG OF BORING AND TEST RESULTS

Date of Boring: 5 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Sample		PLE im Feet	STRATUM Depth	VISUAL CLASSIFICATION	aBlonz	Symbol	Scale COMP. (qu)	CONTENT		VEIGH?	100	ED 3 600 -	74
No.	From	To	in feet	42	Foot	log	(ft) (lbs/sq.ft)		DRY	V57	L.L.	ERBERG L	P.
2	2.5		- 1.5	LOOSE TAN FINE SAND (FILL)		7777		22.0		*	1 8.0.	1 2.6.	1.
3		1 1		STIFF DARK GRAY CLAY W/SILT		Y////	2165	27.9	89. 1	114.0			
- 4	5.5		- 7.5-	•		(////	2010	31.7	85.3	112.3	62	18	4
4	8.5		11			////	10 1585	28.6	90.0	115.8			
5	11.5	12.0		MEDIUM COVER ON COVER VICINI CRAV	1	\////	2065	32.2	82.9	109.6			
6	14.5	15.0		MEDIUM STIFF TO STIFF LIGHT GRAY E REDDISH TAN CLAY W/SILT	1	////	_ 1975	27. 1	91.9	116.8	58	26	٠;
7	19.5	20.0		K (E		////	20 6040	19.0	104.0	123.8			
8	21.5	23.0	21.5	MEDIUM DENSE REDDISH TAN FINE SAND	28		>	22.1					
9	24.0	25.5	24.0		11	1111	-	29.5					_
10	29.5	20.0		STIFF REDDISH TAN SANDY CLAY	1	////	ر ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ						
	29.3	30.0	32.5-	(W/SAND LAYERS @ 29.5 - 30.0)			30 1300	28.4	86.3	110.8			
11	34.5	35.0	37.5-	STIFF GREENISH GRAY CLAY			2090	30.5	82.2	107.3			
12	39.5	40.0	37.0			////	40 2545	41.6	75.8	107.3			
13	44.5	45.0				////	_						
14	49.5	50.0				$\langle /// \rangle$	50 1890	42, 3	73.6	104.7	82	20	
, ,		0		STIFF GRAY CLAY W/SILT LENSES			10,0	12,5	73.0	104.7	82	28	5
15	54.5	55.0	ĺ	,		////	2 120	42.0	74.2	105.4			
16	59.5	60.0				////	50_						
17	64.5	65.0				////	2150	34.0	83.4	111.7	57	20	3
18	69.5	70.0				////}	2210	45.0	71.0	103.0			
19	74.5	75.0		≈ ×		////	2150	40.7	74.6	105.0		3	
20	79.5	80.0	78.5	Market and the second			1800	75.0	47.9	83.8	147	60	- 8
+		-	82.0	MEDIUM STIFF BROWNISH GRAY ORGANIC C	AY								_
21	84.5	85.0		MEDIUM STIFF GREENISH GRAY SANDY CLA	,	////	1700	22.4	96.0	117.5			
22	89.5	90.0				////s	<u>0</u> (760)	20.9	95.5	115.5	22	12	1
23	92.5	94.0	92.5		30 = .4"	···		19.4					_
24	95.0	96.5			30 = .41		54						
5	98.5	100.0			30 = .5'	1	۵۵	31.8	160				
6	103.5	105.0	Į,	VERY DENSE GRAY FINE SAND	30 = .2*	-				,			
7	108.5	10.0			30 = .5*		סנ	18.7				×	
a :	113.5 1	15.0			30 = .4	•••		8	2.				
	118.5 1	20.0						3"					
3 1 .	10.3 1	20.0	120.0		30 = 35		20-	267					

Soil and Foundation Investigations Metairie, Louisiana

Boring No. B-3

LOG OF BORING AND TEST RESULTS

Date of Boring: 7 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS
FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

		MPCE	STEATUR		"Blows	T -		UNCONFINED	PATER	CW10	DDICE	_	d By: D.	
aple No.	Depth From	in Feet	Depth in feet	VISUAL CLASSIFICATION	bet		15 Tel 177, 151	COMP. (qu)	CONTENT	(lbs.	VRICHT /cv.(t.)	1	TERRET	LIN
1		0 .5		LOOSE TAN STAR CAME W/GUELL	Foot	log	an	()bs/sq.ft)	(percent)	DRY	VET	L.L.	_	_
2	2.	5 3.0	1	STIFF DARK GRAY CLAY W/SILT	1	7777		2555	25.8	91.6	115.2			
3	5. 5	6.0	4.0			1111	-	2620	24.8	94.9			_	-
4	8.1	9.0	I	SMITTER LINES COLUMN TO THE CO	1	<i>V////</i>					110.4			
		1		STIFF LIGHT GRAY & REDDISH TAN CLAY W/SILT LENSES	1	<i>V///</i>	10	1755	30.3	86. 1	112.2			
5	11.6	12.0		(FISSURED AT 8.5 - 9.0')	1	V///								
6	14.5	15.0	1	1	1	V///		3330	18.9	100.8	119.8			
			18.0		1	VIII								
7	19.5	20.0				0110	20	1130*	21.7	97.8	119.0	_	- 4	_
				MEDIUM DENSE TAN & REDDISH TAN CLAYS	1	16186X				,,,,	113.0			
8	24.5	25.0	- 23.5		-	VAIR A		870	24.0	OF /	110			_
			27 6	SOFT LIGHT GRAY & REDDISH TAN SANDY			_	870	24.8	95.4	119.1			
9	29.5	30.0	- 27.5			11///	30						-	_
)	MEDIUM STIFF REDDISH TAN CLAY W/SILT		VIII	_	13 15	25. 4	92.0	115.4			
10	34.5	35.0		& SAND LAYERS		V///								
	37.3	33.0	- 36.5	14		V///	-		26.8					
	20.5	100	30.5			1111								
11	39.5	40.0		STIFF GRAY & REDDISH TAN CLAY W/SAND	1	////	40	2425	27.3	90.3	115.0			
-			43.0	LENSES										
2	44.5	45.0		MEDIUM STIFF GRAY CLAY W/SAND LENSES		////	2	1100	32.3	84.8	112.2			
			40.5			<i>////</i>								
3	48.5	50.0	- 48.5-		19		-0		26.8			- 12	- 1	_
4	51.0	52.5) ii		25			\cap	22. 1					
5	53.5	55.0		MEDIUM DENSE GRAY FINE SAND	16		_	(/						
- 1							-	1						
6	58.5	60.0			12	. 6	0	V						
\neg			60.5			לווו								_
7	64.5	65.0				////		1565		•••				
						////	•2	4565	21. 1	101.3	122.7			
8	69.5	70.0			1 (////	0							
1		75.5			(////	_	3970	21.4	98.4	119.5	50	17	
,	74.5	75.0		STIFF TO VERY STIFF GREENISH GRAY		////				2				
1	73.3	75.0	- 1	CLAY W/SILT CONCRETIONS		////	5)						-	F): 5
			- 1		,	////	_							
9	79.5	80.0	- 1)	. ,	////	_	2985	24. 1	94.6	117.4			
			- 1		,	////								
1	84.5	85.0	- 4		. ,	////		4010	21.5	99.3	120.7			
+		-	87.0		/	////								
	89.5	90.0	1	COTTON COLUMN IN		90	0_	3280	25.0	93.8	117.3	56	17	
1	1			STIFF GRAY CLAY W/SAND LENSES		////								
	94.5	95.0			1	////		2025	25.4	91.8	115.1			
	96.0	97.5	96.0	STIFF GRAY CLAY W/SAND LAYERS	16	////			30.7				_	_
	99.5	100.0	98.5	TOOSE STANK STANKEY STANK STANK		HANDE	00 (940*	23.7	94.4	116.8	26		-
1			102.5	LOOSE GRAY CLAYEY FINE SAND	72	4/9/6	= 2	\		24.4	110.0	26	-010 6	
	02.5		~		20	777			32.0				_	-
1.	03.3	108.0	- 1	STIFF GREENISH GRAY CLAY W/SAND LENSE (FISSURED)	s /			1415	34.4	82.9	111.4	75	21	
1	09.5	110.0	108.0	¥		11/1/11	0	2225				_		_
		_]		12	<i>Y</i>	///	-	2205	44. 1	72.4	104.4	91	24	
1	14.5	115.0	1	STIFF TO VERY STIFF GRAY CLAY W/SAND	1	////								
			-			11/1		- 0	e:					
1	19.5	120.0			1	1/1/12	_		H					
-		24,0	120.0			(LL)12		5000	22.7	98.0	120.2			
		_		ORGANIC "140 lb. hanner dropped 30 in. on 2 in. splitspoon sampler				o from 1-poi		-				

Soil and Foundation Investigations Metairie, Louisiana

Boring Eo. B-4

LOG OF BORING AND TEST RESULTS

Date of Boring: 7 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Sample		IPLE in Feat	STRATUS Depth	VISUAL CLASSIFICATION	*Blows	C		DMCONFINED	PATER		WEIGHT	1		
No.	From	To	in feet		per Foot	1 -		COMP. (qu)			/cu. (t.)	17	TELEFIC	Linits
1	-(± .9	STIFF BROWN & TAN CLAY W/SAND & SHEL	,L. Poot	Log	an	(lbs/sq.ft)	(percent)	DET	APJ	l. L.	P.L.	P. 1
2	2.5	3.0		E PETROLEUM ODOR		7777		2270	27.2	91.2	116.0			_
3	5.5	6.0	1.0	STIFF GREENISH GRAY & REDDISH TAN		11111		2855	25.5	04.4				
-	_	_	7.0	CLAY	-	1444		2033	23.3	94.4	118.5			
4	8.5	9.0	1	x	1	Y////	10	2240	26.6	91.6	116.0			
5	11.5	12.0		STIFF REDDISH TAN & LIGHT GRAY CLAY	1	<i>\\\\\</i>		5485	22.0	99.4	121.3			
6	14.5	15.0		(FISSURED AT 14.5 - 15.0')		<i>Y////</i>		1735	27.3	91. 1	116.0			
			17.5	1 10		1////								
7	19.5	20.0	10000	it R		V///	20	1930	25. 1	95.9	120.0	72		
	-			STIFF REDDISH TAN & LIGHT GRAY SANDY		<i>\///</i>								
8	24.5	25.0	- 23.5		_	7777	_	1360	23.0	93.4	114.9			-
					1	(////					ina Tia			
9	29.5	30.0		MEDIUM STIFF TO STIFF REDDISH TAN	i	(///)	30							
- 1				& LIGHT GRAY CLAY W/SAND LAYERS (PISSURED)	1	<i>\\\\\</i>								
10	34.5	35.0		(1233)	1	$V//\Lambda$		815	28. 1	04.0	100.0			
<u>,, </u>			- 36.5					013	20.1	84.9	108.8			
11 12	36.5 38.5	38.0 40.0			20		40		22.5			3		
	30.0	10.0			13									
,,]														
13	43.5	45.0		MEDIUM DENSE TO DENSE REDDISH TAN FI	17 NE	••••	_		22.9					
)1			SAND		••••								
14	48.5	50.0			16		50	*						
					1									
15	53.5	55.0			30 = .9"		_							
\neg			- 56.5-			iiii								_
16	59.5	60.0		=	1	1////	60	845	24.8	90.9	113.4			
						1////								
17	64.5	65.0		STIFF GRAY CLAY W/SAND LENSES (FISSUI	ED)	1////		3905	22.6	98.9	121.3	54	15	
					1	VIII	-	0.00	22.0	70. 7	121.5	34	15	39
18	69.5	70.0			l	V///	70	1400	21.2					
					l	V///		1400	21.2	93.4	113.2			
19	74.5	75.0	73.5			1444								
-	1651155	100000				<i>{////</i>			18.8					•
20	79.5	80.0				<i>{////</i> }	80		17				5/0	
-0	75.3	80.0		A ^c		<i>{////</i>	<u> </u>	3340	24.6	94.5	117.7		55	
					-	<i>(///</i>)								
21	84.5	85.0				<i>{////</i> }-	-							
				STIFF GREENISH GRAY & REDDISH TAN		(////								
22	89.5	90.0	- 1	CLAY W/SHELL FRAGMENTS	6	(////	90	2185	29.4	85.7	110.9		4	
- 1			- 1			V///								
23	94.5	95.0	- 1			<i>\\\\</i> _	6	3770	30.2	85.6	111.5	70	29	41
			- 1									-		
24	99.5	100.0	- 1	*		W/M_{\perp}	100							
- 1						////	-							
25 3	104.5	105.0				////		3635	20.7	85.3	111 6			
						////		3033	30.7	65.5	111.5			
26 1	09.5	110.0	108.0			1111	10	2150	44.0	20.1	105.5			
à.						////	-	2150	44.0	/3.1	105.2	(F)		
	14.5	115.0		STIFF GRAY CLAY W/SILT & SAND							107			
1						////								
. 1	10.6	120.0		(FISSURED AT 119.5 - 120.0')	3									
יו מי			200 0	17100UKED AT 117.3 - [20.01]			.20				104.6			and the second second

Soil and Foundation Investigations Hetairie, Louisiana

Boting No. B-5

LOG OF BORING AND TEST RESULTS

Date of Boring: 12 Oct

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. H

Sample	Dept	MPLE in Feet	STRATUM Depth	VISUAL CLASSIFICATION	*Blovs	Symbol	Scale	COMP. (qu)	CONTENT	(1hc	VEIGHT (cu.ft.)		7777777777
No.	From		in feet	LOOSE THE SAME SAME WELLS AND	Foot		(11)	(lbs/sq.ft)		DRY	VET.	L.L.	P.L.
2	2.	0 .5 5 3.0	F -3	STIFF GREENISH GRAY & REDDISH TAN		iii	-	2510	22. 1	97.9	119.5		1
3	5.	5 6.0	4.0	STIFF DARK GRAY CLAY W/SILT		<i>\///</i>	-	2620	23, 2	99.8	122.9		
4	8.	5 9.0	7.0	STIFF LIGHT GRAY & REDDISH TAN		- 1////	-	2045	25.8	92.5			
5	11.	5 12.0	- 10.0	CLAY (FISSURED) STIFF REDDISH TAN & LIGHT GRAY SANDY		7777	10	1775			116.4		
6	14.	5 15.0	- 13.5	CLAY (FISSURED) LOONE BENDISH TAN & LIGHT GRAY CLAYE		_////	_		21.7	99.6	121.2		
7	15.		- 15.5	FINE SAND	15	Trinit	-	1000*	20.9	100.2	121.1		
8	18.	20.0		ē	14		20						
9	23.	25.0		MEDIUM DENSE REDDISH TAN SILTY FINE	28		_		23.2				
10	28.	30.0		JAND	27		30						
11	33.5	35.0			11		-						
12	38.5	40.0			16		40		26.8				
13	43.5	45.0	47.0-		13								
14	49.5	50.0		MEDIUM STIFF GRAY CLAY W/SILT			50	1545	43.5	73.4	105.3		
15	54.5	55.0	57.0-					1585	45.6	71.8	104.6	78	34
16	59.5	60.0		STIFF GREENISH GRAY SANDY CLAY W/MUCH			60	1635	18.5	91.8	108.8		
17	64.5						-	2640	18.8	100.7	119.6		
18 19	70.5	70.0	70.5	DENCE CREENICH CRAY CLAYER THE		$/\!\!/\!\!/\!\!/$	70	1470	21.4	99.3	120.6	31	20
20	74.5	75.0	73.0	DENSE GREENISH GRAY CLAYEY FINE SAND	31	9999	_						
			78.0	STIFF GREENISH GRAY & REDDISH TAN CLAY			-	3625	30.5	86.8	113.3		•
21	79.5	80.0		VERY STIFF LIGHT GRAY & REDDISH TAN SANDY CLAY		$/\!/\!/$	80	4500	20.3	101.2	121.7		
22		85.0	87.5			////	•	6550	18.8	103.3	122.7	40	15
23		90.0		STIFF GREENISH GRAY & REDDISH TAN CLAY			90	3040	29.9	86.6	112.5		
25	1	100.0					100	1920	31.0	02.2	100 7	5 (27
26 1	104.5	105.0	101.0					2840	41.4	75.2	109.7	56	
7 1	109.5	110.0		STIFF GRAY CLAY W/SILT CONCRETIONS			110	20.0	44,3		200.7	3	
8 1	14. 5	115.0		a .		////		2245	44.7	72.9	105.5	88	33
9 1	19.5	120.0	.	1				21.0					
	1710	120.0	120.0			IIII	120	2290	45.8	70.6	102.9		





"140 lb. hanner dropped 30 in. on 2 in. splitspoon sampler offer first being desired 6 in

REMARKS: *equivalent Qu from 1-point trianial test WATER TABLE AT 4.2' (SEE TEXT)

Soil and Foundation Investigations Betairie, Louisiana

Boring No. B-6

LOG OF BORING AND TEST RESULTS

Date of Boring: 13 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

ample		MPCE in Feet	STRATUM Depth	VISUAL CLASSIFICATION	*Blows	C	ONCONFINE	PATER	0417	VEIGHT	Recorded		
lo.	Fron	To	in feet	TABLE CARRIET TO ALL TO	Foot	Log	(ft) (lbs/sq.ft			/cs. (t.)	_	TEXESTRE	
1			- 1.5	FAND & SHELL (FILL)		12.70K		/ Prices	DEI	187	L.L.	P. L.	<u> </u>
2	2.5	3.0	4.0	STIFF GRAY CLAY W/SILT		V////	3385	19.2	99.3	118.4			
3	5. :	6.0)	MEDIUM STIFF DARK GRAY CLAY W/SILT LENSES & PETROLEUM ODOR			1145	23. 1	89.6	110.3			_
4	8. 5	9.0	7.0			1777	10 1820	23.5	96.3	118.9			_
5	11.5	12.0		STIFF LIGHT GRAY & REDDISH TAN CLAY (FISSURED)	1	V///	— 2355	26.5					
6	14.5	15.0		(FISSURED)	1	V///			93. 5	- 9			
ŭ	2441.5	13.0			1	VIII	_ 3685	20.8	101.2	122.2			29
7	18.0	19.5	18.0	MEDIUM DENSE REDDISH TAN FINE SAND	22	VIII.	20	27.5					
8	19.5	21.0	21.5	BOTON DENSE REDDISH TAN FIRE SAND	18			18.5					
9	24.5	25.0				////	1000						
						1///	_ 1330 •	24.1	95.9	119.0			
10	29.5	30.0		9		1///	30						
-	-,,,	55.5		MEDIUM STIFF REDDISH TAN SANDY CLAY W/CLAY LAYERS	1	1///	1735	24.9	95.3	119.0	57	14	4
11	34.5	35.0		Wedn't Bribes	I	1111							
-	•	33.0		(2)	1	1111	-						
2	39.5	40.0				1111	10						
ا "	37.5	10.0					1045	25.0	95.4	119.2			
13	44.5	45.0											
.	11.5	45.0				////	_ 1175	25.4	92.3	115.7	41	14	2
14	40.5	50.0	- 47.0-			1111	50						
1	49.5	50.0		MEDIUM STIFF TO STIFF GRAY CLAY W/SAN	ıb	////	1425	34.5	80.8	108.7			
_				LENSES & LAYERS	1								
5	54,5	55.0			1	<i>V///</i> }-	2445	34.7	81.9	110.3	55	19	3
			- 57.0-			KKKA.							
16	59.5	60.0		STIFF GREENISH GRAY SILTY CLAY W/MUCH	1	KKKK	0	19.9					
		1		SHELL		KXXX							
17	64.5	65.0	- 1			KKKK)-	3 100	17.8	100.1	117.9			
			68.5			_(געגע							
8	69.5	70.0		TIFF GREENISH GRAY SANDY CLAY		////	2245	19.7	92.5	110.7			
9	73.0	74.5	73.0										
١	75.5	77.0		ENSE GREENISH GRAY CLAYEY SAND	30 = .7'	9191814-	E1	21.2					0. E S
	75.5	77.0	79.0		30 = .9'	WAR B	2						
1	79.5	80.0	/9.07			////	4925	18. 1	103.6	122.4			
. 1			, h	ERY STIFF LIGHT GRAY & REDDISH TAN									
2	84.5	85.0		SANDY CLAY (FISSURED)		////-							
- 1					,							7.6	
3	89.5	90.0				////	1735	30.3	84.5	110. 1	39	17	2:
T			91.5									_	-
1	94.5	95.0	s	TIFF GREENISH GRAY & REDDISH TAN CLA	. [////-	2930	32.6	81.8	108.5			
				W/SILT LENSES	C	////							
5	99.5	100.0			į,	////1	2635	33.2	81.5	108.6	0.		
-			103.0										
5]	104.5	105.0	3		V	////_	3560	43.6	73.6	105.7			
					V					10		_29	
' '	109.5	110.0	٦	FIFF GRAY CLAY W/SILT LENSES	V	///)11	0						
			- 1	lt.	4	///	77						
1	14.5	115.0	- 1		Y	///	2240	48.6	69.4	103.2	95	30	65
1				1	Y	///			•			-	J.
	19.5	20.0	120.0		(12	0 2560	51.1	68.1	102.9			

Soll and Foundation Investigations Metairie, Louisiana

Boring No. B-7

LOG OF BORING AND TEST RESULTS

Date of Boring: 15 Oct 1993

Project:

WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

auple	SAM Depth	in Feet	STRATUM Depth	VISUAL CLASSIFICATION	bet "Bjonz	Symbol	Scale COMP. (qu) CONTEMP (lbs./c		100000000 110
Ilo.	Fron	Ťo	in feet		Foot	log	(ft) (lhs/sq.ft) (percent) DET	#1.EC.7	ATTEMBERG LIBITS
1 2	1.5	2.0	0	LOOSE TAN FINE SAND W/MUCH SHELL			12.0	101 5-1	h 2.h 2.
3	3.5	4.0	3.5	STIFF DARK GRAY CLAY W/SHELL	+	iii	31.6	6:	2 16
4	5.5	6.0		STIFF GREENISH GRAY & REDDISH TAN		7777			2 16 4
5	7.5 9.5	8.0		CLAY		V///	26.5 32.0		
			- 10.0	e 2			32.0		æ
1 2 3 4	.0 1.5 3.5 5.5	.5 2.0 4.0 6.0	- 3.0-	Boring Number B-8 LOOSE TAN FINE SAND LOOSE BROWN FINE SAND W/SHELL STIFF DARK GRAY CLAY		::: ////	11. 2 7. 5 27. 8		
5	7.5 9.5	8.0	- 7.0-			<i>}}}}</i>	34.0		
6	9.5	10.0	10.0	STIFF GREENISH GRAY & REDDISH TAN CL	Y		10		
ı			.0	Boring Number B-9	i.				3
Ž	1.5	2.0	1.54	OOSE REDDISH TAN FINE SAND (FILL)		2000000	11. 0 12. 8		
	3.5 5.5	6.0		TIFF DARK GRAY SILTY CLAY		NXX	19. 1		
+	7.5	8.0	2 0			(XXXX)	21.6	37	18 1
4	9.5	10.0	10.0	EDIUM STIFF TO STIFF GREENISH GRAY F REDDISH TAN CLAY	/		20.7		
				S 65					×.
1				I				Đ)	*
1			1			- 1	(6)		

Soll and Foundation Investigations Metairie. Louisiana

Boring No. B-10

LOG OF BORING AND TEST RESULTS

Date of Boring: 12 Oct 199

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Sample	Depth	MPLE in Feet	STRATUM Depth	VISUAL CLASSIFICATION	*Blows	S	Sec. 1	COMP. (qm)	CONTENT		WEIGH?		Ву: D.	
No.	From	70	in feet		per Foot	Log		(lbs/sq.ft)	(Descent)	DRY	cu.ft.)	_	TERBERG	_
1			1:8	SHELL (FILL)		7:17/				UKI	757	L.L.	P.L.	P. 1
2	2.5	1		STIFF DARK GRAY CLAY		<i>\\\\\</i>	1	1800	32.3	82.5	109. 1			
3	5.5	6.0	7.0			Y////	-	2130	30.8	86.4	113.0			
4	8.5	9.0		STIFF LIGHT GRAY & REDDISH TAN CLAY			10	2005	25.8	94.7	119.1			
5	11.5	12.0		W/SILT		Y////		2200	28.8	91. 1	117.4			
6	14.5	15.0		1		V///	_	3670	26.7	93.3	118.2			3
7	19.5	-20.0	- 17.0	MEDIUM DENSE REDDISH TAN & TAN CLAYE FINE SAND		8/38/	20	1280*	23.4	93.8	115.8			
8	22.0		- 22.0-	MEDIUM DENSE REDDISH TAN SILTY FINE SAND	25	111011			23.4					
9	24.5	26.0	- 26.5-	SAND	19	Minni	_		24.9					
10	29.5	30.0		STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES		////	30	2990	36.1	82.0	111.6			
11	34.5	35.0	- 37.5-	(FISSURED AT 34.5 - 35.0')				1505	31.3	84.6	111.1			
12	39.5	40.0		ě!			40	2665	41.6	75.9	107.5			
13	44.5	45.0		4			-							
14	49.5	50.0				//// }	50	2400	43.3	73.9	105.9	88	23	65
15	54.5	55.0		MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LENSES		////		1645	47.1	70.0	102.9			
16	59.5	60.0				////	60	2065	29.6	85.6	110.9			
17	64.5	65.0				////	_							
18	69.5	70.0		=		////	70	2005	45.4	72. 1	104.8	96	24	72
19	74.5	75.0				////	-							•
20	79.5	80.0	82.0			////	30	2270	52.6	66.5	101.5			
21	N+24	85.0		TIFF BROWN ORGANIC CLAY				3015	74.4	51.3	89.5	148	56	92
22	87.0	88.5	0.10		30 = .7"	••••	00		26.0	e:				_
23	90.0	91.5			30 = .4"	• • • •			19.9					
24	93.5	95.0			30 = .4*	• • • •	ē							
25	98.5	100.0	b	ENSE TO VERY DENSE GRAY FINE SAND	30 = .5°	1	00		20.6					
26	103.5	105.0			30 = .3*		00							
27 3	108.5	110.0			30 = .4*	1	10		21.5				59	
28 1	113.5	115.0			30 = .4"	::: <u> </u>					•			
	- 1	20.0		l l										



"140 lb. hanner dropped 30 im. on 2 im. splitspoon sampler after first being seated 6 im.

FREE WATER AT 6' (SEE TEXT)

Soil and Foundation Investigations Metairie, Louisiana

Boring No. B-11

LOG OF BORING AND TEST RESULTS

Date of Boring: 11 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Depth Pros .0 .0 .2.5 .5.5 .5.5 .11.5 .14.5 .19.5 .24.5 .29.5 .31.0 .33.5	6.0 9.0 12.0 15.0	STRATUS Depth in feet00 1.5	STIFF DARK GRAY CLAY W/SAND STIFF LIGHT GRAY & REDDISH TAN CLAY STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT	*Blovs per Foot	Syabol Log		ONCONFINED COMP. (qu) (1bs/sq.ft) 2210 3285 2350 2200 3010	9ATER CONTENT (percent) 29.3 26.1 33.6 31.4 32.7		VEIGHT cru.ft.) VET 109.6 118.0 112.4 114.7	L.L.	P.L.	INITS
.0 2.5 5.5 8.5 11.5 14.5 19.5 24.5 29.5	.5 3.0 6.0 9.0 12.0 15.0 20.0 25.0	- 1.5 - 7.0 - 10.0	STIFF DARK GRAY CLAY W/SAND STIFF LIGHT GRAY & REDDISH TAN CLAY STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT STIFF LIGHT GRAY & REDDISH TAN SANDY				2210 3285 2350 2200	29.3 26.1 33.6 31.4	84.8 93.6 84.1 87.3	109.6 118.0 112.4 114.7	i. b.	P.L.	1.1
2.5 5.5 8.5 11.5 14.5 19.5 24.5 29.5	6.0 9.0 12.0 15.0 20.0 25.0	- 7.0· - 10.0·	STIFF DARK GRAY CLAY W/SAND STIFF LIGHT GRAY & REDDISH TAN CLAY STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT STIFF LIGHT GRAY & REDDISH TAN SANDY			10	3285 2350 2200	26. 1 33. 6 31. 4	93.6 84.1 87.3	118.0 112.4 114.7			
8.5 11.5 14.5 19.5 24.5 29.5	9.0 12.0 15.0 20.0 25.0	- 7.0- - 10.0-	STIFF LIGHT GRAY & REDDISH TAN CLAY STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT STIFF LIGHT GRAY & REDDISH TAN SANDY			10	2350 2200	33.6	84.1	112.4			
11.5 14.5 19.5 24.5 29.5	12.0 15.0 20.0 25.0 30.0	- 10.0-	STIFF GREENISH GRAY & REDDISH TAN CLAY M/SILT STIFF LIGHT GRAY & REDDISH TAN SANDY			10	2200	31.4	87.3	114.7			
14.5 19.5 24.5 29.5 31.0	15.0 20.0 25.0 30.0		STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT STIFF LIGHT GRAY & REDDISH TAN SANDY										
19.5 24.5 29.5	20.0 25.0 30.0	- 17.0-	CLAY M/SILT STIFF LIGHT GRAY & REDDISH TAN SANDY				3010	32.7	85.0				
24.5 29.5 31.0	25. 0 30. 0	- 17.0-	STIFF LIGHT GRAY & REDDISH TAN SANDY						JJ. 0	112.8			28
29.5	30.0	-		1	11111	20	2035	25. 2	90.7	113.5			
31.0			4										
	32.5	- 31.0-	(FISSURED @ 29.5 - 30.0')		////	30	1170	27. 1	91.3	116.0			
33.3	35.0		MEDIUM DENSE LIGHT GRAY & REDDISH TAN SILTY FINE SAND	15	Hibbit			29.5					
	-	- 35.5	MEDIUM STIFF LIGHT GRAY & REDDISH	* 10	WW.			20.7					
37.5	38.0 40.0	38.5	TAN SANDY CLAY	<u></u>	1///		1215	27.9	90.5	115.7	31	19	1
11.0	42.5		MEDIUM DENSE LIGHT GRAY & REDDISH TAN SILTY FINE SAND	12	Hildi	40		21.1					
13.5	45.0	45.0	(PISSURED # 43.5 - 45.0')	10	IH (HIH			21.7					
19.5	50.0					50	935	38.6	79.5	110.2			
4.5	55.0		MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LAYERS		$\langle\!\langle\!\rangle\!\rangle$	-	2870	41.6	76.3	108. 1			
4.5	60.0					<u>6</u> 0	2355	45.0	73.1	106.0	82	25	57
9.5 4.5	70.0	-				<u>7</u> 0	2235	45.5	71.8	104.5		5	- 22
9.5	80.0	76.5	STIFF GREENISH GRAY SANDY CLAY		///	<u>10</u>	2565	21.7	98.6	120.0			_
4.5	85.0				////_		3340	21. 1	99.4	120.4	27	15	12
7.0	88.5	87.0		31	444			22.0					
9.5	91.0	1	DENSE GRAY FINE SAND	29	9	0							
3.5	95.0			30 = .81	-	8							-
3.5 1	00.0	100.0		30 = .6"	1	<u>0</u> 0	2	21.8					
				*									
			5									727	
			19										
												Gi.	
1: 19 4 9 4 7 9 3 3	3.5 9.5 4.5 9.5 4.5 9.5 1.5 9.5 1.5 9.5	3.5 45.0 9.5 50.0 4.5 55.0 3.5 60.0 4.5 65.0 6.5 70.0 6.5 75.0 6.5 85.0 6.5 85.0 6.5 85.0 6.5 91.0 6.5 95.0 6.5 95.0	3.5 45.0 45.0- 9.5 50.0 4.5 55.0 9.5 60.0 6.5 65.0 9.5 70.0 6.5 75.0 76.5 9.5 80.0 1.5 85.0 1.5 85.0 1.5 95.0 1.5 95.0 1.5 95.0	1.0 42.5 3.5 45.0 45.0 (FISSURED # 43.5 - 45.0*) 9.5 50.0 4.5 55.0 MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LAYERS 9.5 60.0 1.5 65.0 9.5 70.0 1.5 75.0 76.5 9.5 80.0 STIFF GREENISH GRAY SANDY CLAY 1.5 85.0 1.0 88.5 1.5 91.0 DENSE GRAY FINE SAND 1.5 95.0 1.5 100.0 100.0	1.0 42.5 3.5 45.0 45.0 45.0 (FISSURED # 43.5 - 45.0') 1.0 9.5 50.0 MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LAYERS 1.5 65.0 75.0 76.5 1.5 85.0 STIFF GREENISH GRAY SANDY CLAY 1.5 85.0 DENSE GRAY FINE SAND 1.5 95.0 30 = .8' 1.5 100.0 100.0	1.0 42.5 3.5 45.0 45.0 45.0 (FISSURED # 43.5 - 45.0*) 9.5 50.0 MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LAYERS 9.5 60.0 6.5 70.0 6.5 70.0 76.5 9.5 95.0 DENSE GRAY FINE SAND 13 10 10 10 10 10 10 10 10 10 10 10 10 10	1.0 42.5	1.0 42.5 3.5 45.0 45.0 45.0 MEDIUM STIFF TO STIFF GRAY CLAY W/SAND LAYERS 1.5 65.0 1.5 75.0 1.5 85.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0 1.5 95.0	1.0 42.5 3.5 45.0 45.0 45.0 (FISSURED @ 43.5 - 45.0*) 13 10 21.7 145.0 45.0 45.0 (FISSURED @ 43.5 - 45.0*) 13 10 21.7 150 935 38.6 160 41.6 45.6 65.0 45.6 60.0 170 41.6 60 170 41.6	1.0 42.5 3.5 45.0 46.0 46.0 46.0 47.0	1.0 42.5 3.5 45.0 45.0 45.0 45.0 45.0 45.0 45.0 45.0	1.0 42.5 3.5 45.0 45.0 45.0 45.0 45.0 45.0 45.0 45.0	1.0 42.5 75.0 76.5 70.0 1.5 85.0 76.5 STIFF GREENISH GRAY SANDY CLAY

Soil and Foundation Investigations Betairie, Louisiana

Boring No. B-12

LOG OF BORING AND TEST RESULTS

Date of Boring: 8 Oct 199:

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Recorded By: D. A. Hill

_	T c	WPLE	STRATU									lecorded	By: D.	A. Hi
Sample	Depti	in Feet		VISUAL CLASSIFICATION	*Blows	Symbol	Scale	COMP. (qu)	CONTENT		WEIGHT /cs. (t.)	17	783BANG	1 14190
No.	From			<u> </u>	Foot			(1bs/sq.ft)	(percent)	DET	757	L.L.		P. I.
2	2.		5 2.			7777	_	1100	20.4					1 4.1.
3	5.		4.1			Y///	_	1190	29.6	83.6	0.000			
1	8.			MEDIUM STIFF GREENISH GRAY & REDDI	5H	<i>\////</i>	(950	33. 1	81.8	108.9			- 1++
			T	VERY STIFF GREENISH GRAY & REDDISH	-	- \///	10_	1865	29.2	88.5	114.4	75	21	5.1
5	11.		12	TAN CLAY		<i>V////</i>	1	4375	22.0	98.8	120.5			
6	14.	15.		MEDIUM STIFF LIGHT GRAY & REDDISH	PAN		-	1780	21.4	98.8	120.0			U2
7	19.	20.		LOOSE LIGHT GRAY & REDDISH TAN CLAY	(E)		20	650*	22.4	95.9	117.4	22	-	NP
8	24.	25.	23.	WITH REDUISH TAN & GREENISH GRAY (LJ Y	VIII		3 160	24.1	95.6	118.6		-	_
9	29.5	30.		MEDIUM STIFF TO STIFF LIGHT GRAY			30	1325	22.8	97.2	119.4			
10	34.5	35.0		E REDDISH TAN SANDY CLAY W/SAND LAYERS (FISSURED)	10		_	865	19.3	94.6	112.8			
11	38.0	39.	38.0		14		40		23.1					_
12	41.0	42.5	5	MEDIUM DENSE REDDISH TAN FINE SAND	18									
13	43.5	45.0	1 -	1	21				23.3					
14	49.5	50.0	47.0	MEDIUM STIFF GRAY CLAY W/SHELL		1111	50_	1860	41.0	75.0	105.7			
15	54.5	55.0	l	FRAGMENTS			_	1925	36.5	81.3	111.0			
16	59.5	60.0	58.0			////	0_							_
17	64.5	65.0		STIFF GREENISH GRAY SANDY CLAY W/MUG SHELL	2)		-		20.9			38	17	21
18	69.5	70.0	- 67.5				0_	16 10	23.7	95.0	117.5			
19	74.5	75.0		20		////	- 0	1445	22.2	95.7	116.9			
20	79.5	80.0				//// }	0_		•					
21	84.5	85.0		¥		////		1185	23.9	88.9	110.1	48	19	29
22	89.5	90.0		STIFF GREENISH GRAY & REDDISH TAN CL (FISSURED)	PAY	////	<u> </u>	2270	31.2	83.6	109.7			
23	94.5	95.0				////	ŝ							
24	99.5	100.0				///\ <u>}</u>	00	16 10	28. 1	81.6	104.5			
25 1	104.5	105.0				////		2505	28.0	89.0	113.9			
:6 1	09.5	110.0		.8		//// <u> </u>	<u>o</u>	3985	31.0	84.9	111.2		3	
7]	14.5	115.0	114.0			////		2465	41.9	74.3	105 4	85	20	62
8 1	19.5	120.0	120.0	STIFF GRAY CLAY W/SILT		////			-570.5	.1.3	103. 1	0.5	29	56
	27.101		120.01			11/12	0	2045	44.0	71.8	103.4			

CLAY SILT SILT SAND CON ORGANIC on 2 in. splitspoon sampler after first being seated 5 in.

REMARKS: "equivalent Qu from 1-point triaxial test WATER TABLE AT 2.1' (SEE TEXT)

Soil and Foundation Investigations Betairie, Louisiana

Boring Mo. B-13

LOG OF BORING AND TEST RESULTS

Date of Boring: 14 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Sample		IPLE in Feet	Depth	TISOAL CLASSIFICATION	"Blove		Scale	COMP. (qu)	CONTENT		VEICHT cu.ft.)	177	TRIBEG I	12100
Jo.	From	To	in feet		Foot	log		(lbs/sq.ft)		DRY	VE7	L.L	P.L.	
2	2.5		1.5	MEDIUM STIFF REDDISH TAN SILTY CLAY W/SF	ELL	nn							1.6.	1
_		-	4.0	MEDIUM DENSE GRAY CLAYEY FINE SAND		9/119	1	1960*	6.5	94.6	100.8			
3.	5.5		8.0	MEDIUM STIFF GRAY CLAY W/SILT		Y///	7-	1955	22. 1	99.3	121.2			
1	8.5	9.0	0.0			VIII	10	2885	25.3	94.9	118.9			_
5	11.5	12.0		STIFF GREENISH GRAY & REDUISH TAN CLAY W/SAND		<i>V///</i>		3885	19.9	101.3	121.5	37	14	
6	14.5	15.0		A 85		////	1	2000	20.9	101.1	122.2			23
7	19.5	20.0	- 17.0-	LOOSE REDDISH TAN CLAYEY FINE SAND			20	980	22.6	95.4	117.0			_
_	22 5	25.0	- 23.5-			18/8/6								
8	23.5	92.0 5.0		MEDIUM DENSE REDDISH TAN FINE SAND	11		-							
9	26.0			FEDERAL REDUISM TAR FIRE SAND	22									
10	28.5	30.0			25	•••	30							
11	34.5	35.0	- 32.5- - 37.0-	LOOSE REDDISH TAN & LIGHT GRAY FINE SAND W/CLAY LAYERS			-	860	25.0	93.4	116.8	120		
12	39.5	40.0		MEDIUM STIFF LIGHT GRAY & REDDISH TAN CLAY (FISSURED)			40	810	19.5	101.8	121.7			
13	44.5	45.0	- 43.0-	STIFF GRAY CLAY W/SAND LEMSES & LAYER	s	V////	_	2270	30.8	86.7	113.4			
14	49.5	50.0	- 47.5-	MEDIUM STIFF GRAY CLAY W/SILT LENSES			50	1660	40.6	77.6	109.1			
15	55.5	56.0	57.5-				-	1535	43.5	73.5	105.5			
16	59.5	60.0	1000	STIFF GREENISH GRAY CLAY W/MUCH SHELL			60		17.3					
17	64.5	65.0	63.5					3385	18.2	100.5	118.8			_
18	69.5	70.0		STIFF GREENISH GRAY SANDY CLAY M/SHELL 6 SHELL FRAGMENTS (FISSUMED @ 69.5 - 70.0')	*	$/\!/\!/$	70	1510	22.3	89.9	109.9	27	20	
19	74.5	75.0	11	STIFF GREENISH GRAY & REDUISH TAN CLAY	,	////		2840	22.9	87.5	107.5			•
0	79.5	80.0	76.5			////	80	4620	35.9	81.2	110.3		•	
21	84.5	85.0		STIFF TO VERY STIFF REDDISH TAN & GREENISH GRAY CLAY W/SAND LAYERS)±				*		110.0			
						////	-			ā			3	
2	89.5	90.0		(LARGE SAND LAYER # 89.5 - 90.0')		////	90	1340*	22.9	90.9	111.7	33	18	:
3	94.5	95.0		-		////								
4	99.5	100.0	100.0				100	2305	29.3	86.2	111.4			
							ANGUE							

										196				

Soil and Foundation Investigations Metairie, Louisiana

Boring No. B-14

LOG OF BORING AND TEST RESULTS

Date of Boring: 14 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

4.0- 7.0- 7.5- 0.5-	WISUAL CLASSIFICATION MEDIUM STIFF TAN & BROWN CLAY W/SHELL STIFE REDDISH TAN & BROWN CLAY W/SILT LOOSE TAN SILTY FINE SAND STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (FISSURED) MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY W/SILT (FISSURED)	*Blows per Foot	Symbol Log	10	(1bs/sq.ft) 2245 1685 2575 5420	CONTENT			L.L. 42	P.L.	INITS P.1
7.5- 0.5-	ETIFF REDDISH TAN & BROWN CLAY W/SILT LAYERS LOOSE TAN SILTY FINE SAND STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (FISSURED) MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY	12		10	2245 1685 2575 5420	20.0 3.8 31.3 24.9	97.7 87.3 96.7	117.2 114.6 120.8	b.b.	P. In	7.1
4.0- 7.0- 7.5- 0.5-	ETIFF REDDISH TAN & BROWN CLAY W/SILT LAYERS LOOSE TAN SILTY FINE SAND STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (FISSURED) MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY	12		10	1685 2575 5420	3.8 31.3 24.9	87.3 96.7	114.6	42	16	
7.0- 7.5- 0.5-	LOOSE TAN SILTY FINE SAND STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (FISSURED) MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY	12			2575 5420	31.3 24.9	87.3 96.7	114.6	42	16	2
7.5- 0.5- 6.0-	STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (FISSURED) MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY	12			2575 5420	31.3 24.9	96.7	120.8	42	16	2
7.5- 0.5- 6.0-	W/SILT (FISSURED) MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY	12			2575 5420	24.9	96.7	120.8	42	16	2
6.0-	MEDIUM STIFF REDDISH TAN SILTY CLAY MEDIUM DENSE REDDISH TAN FINE SAND STIFF LIGHT GRAY & REDDISH TAN CLAY	12504		- 20_	5420				42	16	2
6.0-	MEDIUM DENSE REDDISH TAN FINE SAND	12504		20_		21.9	101.6	123.9			
6.0-	MEDIUM DENSE REDDISH TAN FINE SAND	12504		20_							*
6.0-	MEDIUM DENSE REDDISH TAN FINE SAND	12504		20_							_
6.0-	STIFF LIGHT GRAY & REDDISH TAN CLAY	12504	: ;;;;;		1705	23.8	95.0	117.6			
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			1111	7							
7.5	I			30	15 10	31.8	84.4	111.2			
′. • [_	1400	30.7	85. 1	111.2			
- 1				40	2450	36.5	80.0	109.2			
	EDIUM STIFF TO STIFF GRAY CLAY W/SILT			-	3690	38.3	78.4	108.4			
	LENSES & LAYERS			50_							
			////	-01	1670	48.5	69.4	103.0	84	28	56
		(//// }	50							
				•	1590	45.7	71.0	103.4			
			$/\!/\!/$	70_	1840	21.2	91.8	111.3			
.0-				-	2855	21.1	99.4	120. 4	39	15	24
.0	ERY STIFF GREENISH GRAY & REDDISH TAU CLAY	/	/// <u> </u>	0_	4400	23. 1	90.7	111.7			
	TYPE PERFECT DAYS A SECOND DAYS		///>		3690	25.9	92.3	116.2			
		E	//// <u>}</u> ²	0_							
		8		ş.	2555	26.9	91.0	115.5	47	25	22
.0			///1	00	2070	25.5	90.1	113. 1			
1					06						
5	.0-	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) VERY STIFF GREENISH GRAY & REDDISH TAN CLAY STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) VERY STIFF GREENISH GRAY & REDDISH TAD CLAY STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) VERY STIFF GREENISH GRAY & REDDISH TAD CLAY STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) VERY STIFF GREENISH GRAY & REDDISH TAD CLAY STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) - 2855 - VERY STIFF GREENISH GRAY & REDDISH TAN CLAY STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES - 2555 - 2555	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) - 2855 21.1 - 2855 21.1 - 2855 21.1 - 3690 23.1 - 3690 25.9 STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES - 2555 26.9	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) - 2855 21.1 99.4 - 2855 21.1 99.4 - 2855 21.1 99.7 - 3690 25.9 92.3 STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES - 2555 26.9 91.0	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) - 2855 21.1 99.4 120.4 - 2855 21.1 99.7 111.7 - 3690 25.9 92.3 116.2 STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES - 2555 26.9 91.0 115.5	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) - 2855 21.1 99.4 120.4 39 - 2855 21.1 99.7 111.7 - 3690 25.9 92.3 116.2 STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES - 2555 26.9 91.0 115.5 47	STIFF GREENISH GRAY SANDY CLAY W/SILT CONCRETIONS (FISSURED @ 69.5 - 70.0) - 2855 21.1 99.4 120.4 39 15 - 2857 21.1 99.4 120.4 39 15 - 2858 21.1 99.4 120.4 39 15 - 3690 23.1 90.7 111.7 - 3690 25.9 92.3 116.2 STIFF REDDISH TAN & LIGHT GRAY CLAY W/SAND LENSES - 2555 26.9 91.0 115.5 47 25

Soil and Foundation Investigations Metairie, Louisiana

Boring No. B-15

LOG OF BORING AND TEST RESULTS

Date of Boring: 15 Oct 199

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

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aple		in Feet	Depth in feet	VISUAL CLASSIFICATION	ber	Symbol	Scale COMP. (qu)	CONTENT		/cu.ft.)	ATT	KRRENG I	JRITS
Bo.	From	70	0		Foot	Log	(ft) (lbs/sq.ft)		DRY	727	L.L.	P.L.	1
2	1.5	2.0	V 2000	LOOSE TAN FINE SAND (1/WOOD # 1.5-2.0)			7. 9 11. 1					
3	3.5	4.0	- 3.0			1777	 	29.2	-		56	26	
4	5.5	6.0		STIFF DARK GRAY CLAY W/SAND			/-				36	26	
5	7.5	8.0	0.0					33.9					
6	9.5	10.0	- 10.0-	STIFF REDDISH TAN & LIGHT GRAY CLAY		m	10	29.5					_
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4	5.5	6.0	1	MEDIUM STIFF GRAY CLAY W/SHELL	ľ	////	Es:						
			7.5		/		_	33.1					
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2	1.5	2.0		TIFF REDDISH TAN & LIGHT GRAY CLAY W/SHELI	L & SAN	777		21.4	_		49	13	3
3	3.5 5.5	6.0	323	OOSE TAN FINE SAND		••••	_						
5	7.5	8.0	6.5					21.5					
	9.5	10.0		EDIUM STIFF GRAY CLAY W/SAND LENSES	. V		10	26.2					
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1				Boring Number 9-18		- 1							
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	1.5	2.0	1.0 s	TIFF GREENISH GRAY & REDDISH TAN CLAY	1	777		23.5				_	
	3.5 5.5	6.0		OOSE GREENISH GRAY CLAYEY FINE SAND	0	MOX		21.6					
- 1	7.5		7.0	THE SAME		1865		17.7		24	19		NE
-		8.0			155	ASSES			_				_
1			L	ME-LIKE MATERIAL	155	200	•						
		10.0	10.0	ME-LIKE MATERIAL	8	1	0						

DURES:

Soil and Foundation Investigations Betairie, Louisiana

Boring No. B-19

LOG OF BORING AND TEST RESULTS

Date of Boring: 15 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

	SAN	PLE	STRATUR	1	*Blows	т —	DECORETRED	VATER	DETE	WEIGHT	Lecorded	-,	
Sample	Depth	in Feat	Depth in feet	VISUAL CLASSIFICATION	ber		Scale COMP. (qu)		(lbs.	/cu.ft.)	ATT	erberg L	INITS
10.	1.5	70	0		Foot	Log	(ft) ()bs/sq.ft)		DRY	VE?	L.L.	l.L.	P. I.
3	3.5	4.0	0	LOOSE TAN FINE SAND W/SHELL	-	m		10.3					
4	5.5			STIFF DARK GRAY CLAY W/SILT		Y////	+	28.9			58	13	45
5	7.5 9.5		9.0	STIFF LIGHT GRAY & REDDISH TAN CLAY STIFF REDDISH TAN & LIGHT GRAY CLAY		<i>V///</i>	10	29.7					
- 8	9,5	10.0	10.0	STIFF REDDISH TAN E LIGHT GRAY CLAY	-	m		27.9					
							WATER 1	TABLE AT	3.0'	(SEE TE	XT)		9•
				:a :									
	53 ()			0.									
										2			
				Boring Number B-20									
1	.0	.5	0-	LOOSE TAN FINE SAND				13.0					
3	1.5 3.5	2.0 4.0	-1.9	LOOSE GRAY FINE SAND W/CLAY LAYERS				13.0 16.3 20.2					
4 5	5.5 7.5	6.0 8.0	- 5.5-	VERY SOFT GREENISH GRAY CLAY W/SAND	-	וווו							
6	9.5	10.0	- 9.0-	STIFF REDDISH TAN & LIGHT GRAY CLAY	<u> </u>	////	230	35.6 35.3	79.5	107.5	52	13	39
		-10.0	- 10.0-	OTT. 10001311 TAN & DIGHT GRAT CLAST		1111		31.3					
ı							WATER	TABLE AT	7.2'	(SEE T	EXT)		
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1													
- 1				K									
	- 0	5	0-	Boring Number B-21									
2	1.5 3.5	2.0	- 3.0-	LOOSE TAN FINE SAND		• • •		12.0					
3	5.5	6.0	- 5.0-	LOOSE GRAY FINE SAND W/CLAY LENSES		m		13.3					
5	7.5	8.0		MEDIUM STIFF GRAY CLAY W/SAND LENSES	× .	////	10	23.0					
6	9.5	10.0	- 10.0	STIFF REDDISH TAN & GREENISH GRAY CLA	Y	////	10	31.3					=
		- 1		N .			WATER TABLE	5 hT 2 0	. /er	SE MEVM)			
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Soil and Foundation Investigations Setairie, Louisiana

Boring No. B-26

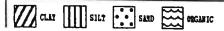
LOG OF BORING AND TEST RESULTS

Date of Boring: 6 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS
LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

Sample	Depth	PLR in Feet	STRATUM Depth	VISUAL CLASSIFICATION	*Blows	Symbol	Scale COMP. (qu)	CONTRACT	ONIT VI	EIGHT	ecorded By: D. A. H
lo.	From	To	in feet		Foot	Log	(ft) (lbs/sq.ft)	(percent)	DRY	EE?	L.L. P.L. P.
1	1.5	2.0	- 1.0	STIFF BROWN & TAN SILTY CLAY		7777					1 5.
2	1.5		3.5	& BRICK (PETROLEUM ODOR)		1///	820	23.6	90.5	111.9	
3	3.5 5.5	6.0		STIFF GREENISH GRAY & REDDISH TAN CLAY W/SILT (PETROLEUM ODOR)		<i>\///</i>	- 2475 2135	22. 1 22. 7	96.2 91.6	117.4 112.4	
5	7.5	8.0	- 7.0		_	18686		_===	DW.		
6	9.5	10.0		MEDIUM STIFF TAN & BROWN SILTY CLAY		ממממ	10 480	19.4	88.7	105.9	
7	11.5	12.0	- 11.0	MEDIUM STIFF GRAY CLAY W/SAND LEN. &	LAYS.	ללללל					
8	14.5	15.0	- 13.5		LISSES LE	\///	3130	22.4	98.3	120.3	
					1	<i>\///</i>	F 3330		30.5	120.5	
_	اء دا			STIFF TO VERY STIFF REDISH TAN & TAN CLAY W/SAND LAYERS	1	<i>Y////</i>	20 4470				
9	19.5	20.0		1		Y////	4470	19.5	99.8	119.3	
10	21.5	23.0	- 21.5		22	777					
11	24.0	25.5		HEDIUM DENSE REDDISH TAN FINE SAND	23		L				
		7				****					
12	29.5	30.0		MEDIUM STIFF REDDISH TAN SILTY CLAY		XXXX	30 355		70.		
-	29.3	30.0	- 30.0-	W/SILT (PISSURED)	_	LKKK	355	31.1	79.6	104.3	
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Soil and Foundation Investigations Metairie, Louisiana

Boring No. B-27

LOG OF BORING AND TEST RESULTS

Date of Boring: 6 Oct 1993

Project: WHARF EXPANSION - SABINE-NECHES SHIP CHANNEL - PORT ARTHUR, TEXAS

FOR: PORT OF PORT ARTHUR - PORT ARTHUR, TEXAS

LANIER & ASSOCIATES CONSULTING ENGINEERS, INC. - NEW ORLEANS, LOUISIANA

	SAIG	LB La Foot	STRATUM Depth	TICHE CLECIPICATE	*Blovs	[Scale COMP. (qu)	PATER	ONIT	RIGHT		By: D. A.
ample No.	Fron	n Feet	in feet	VISUAL CLASSIFICATION	per Foot	Log	(ft) (lbs/sq.ft)	(percent)				BREEC LINI
1	.0	. 5	- 1.0	LOOSE TAN FINE SAND				· percent/	DRY	757	L.L.	P. L. 1
3	1.5	2.0 4.0		STIFF TAN & GRAY CLAY W/SAND W/PETROL	EUM	////	2400	18. 1 9. 0	85.4	100.8		
4	5.5	6.0	- 5.0	IMPORTING COTTER DARK COMV CTAV W/CTTM		<i>\}}</i>		55.7				
5	7.5	8.0	- 7.0			////	1340	23.0	92.7	114.0		
6 7	9.5		D) 19	MEDIUM STIFF GRAY CLAY (W/PETROLEUM ODOR)	j	////	1290	23.7	91.0	112 6		
_			- 13.0			Щ				112.6		
8	14.5	15.0		STIFF GREENISH GRAY & REDDISH TAN SAN	DY	/////	3120	17.9	102.7	121.1		
9	18.0	19.5	- 18.0	CLAY W/SILT CONCRETIONS	18	1111						
10	20.5		[i] (i	MEDIUM DENSE GREENISH GRAY FINE SAND	17	****	20					
- 1						••••						
11	23.5	25.0	- 25.5		21	1111						
				STIFF REDDISH TAN CLAY W/SILT LAYERS		Y////	11 232,541	5696 8				
12	29.5	30.0	- 30.0-				30 955	29.6	84,8	109.9		
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