BUFFALO BAYOU
SUMMARY OF TRIAXIAL "R" SHEAR TEST DATA

Boring No.	Depth Ft	Density Data MC %	Density Data UDW p.c.f.	Shear Data φ	Shear Data c psf	Atterberg Limits L.L.	Atterberg Limits P.L.	Gradation Gr	Gradation Sa	Gradation Fines	Classification
				CH							
6ST-28	20-22	28	97	12.4	.4	71	19	0	4	96	Gray Clay (CH)
6ST-69	34-36	25	102	9	1.	55	18	1	3	96	Red Clay (CH)
				CL							
6ST-47	45-46	26	100	13.5	.9	42	17	0	1	99	Red Clay (CL)
6ST-49	24-26	21	106	29.3	.5	28	16	0	20	80	Red Sandy Clay (CL)
6ST-56	25-27	21	107	13.4	.7	50	16	2	6	92	Red Clay (CL)
6ST-61	23-25	21	105	21.7	.7	31	14	0	11	89	Red Clay (CL)
6ST-71	32-34	22	103	27.3	.5	25	15	0	2	98	Red Clay (CL)
6ST-131	43-45	24	99	31.9	.4	31	16	—	—	—	Red Clay (CL)
				CL-ML							
6ST-57	45-47	25	100	39.1	.2	27	20	1	1	98	Red Silty Clay (CL-ML)
				SC							
6ST-28	4-6	13	112	32.4	.3	27	12	0	55	45	Gray Clayey Sand (SC)
				ML							
6ST-13	43-44	21	107	38.4	.8	NP	NP	0	39	61	Red Sandy Silt (ML)

Page ___ Of ___

SUBJECT ___ FILE NO. ___

COMPUTATION ___ DATE ___

COMPUTED BY ___ CHECKED BY ___ DATE ___

SWD FORM 521-J
8 Jan 65

WHITE OAK BAYOU

SUMMARY OF CONSOLIDATED-DRAINED (S) DIRECT SHEAR TEST DATA

Boring No.	Depth Ft.	Density Data MC %	Density Data UDW p.c.f	SHEAR DATA Actual φ	SHEAR DATA Actual C, psf	SHEAR DATA Revised φ	SHEAR DATA Revised C, psf	Atterberg Limits L.L.	Atterberg Limits P.L.	Gradation Gr.	Gradation Sa.	Gradation Fines	Classification
					(CH)								
6ST-29	32-33	24	102	18.1	.5	27.5	0	62.3	22.5	0	0	100	Red Clay (CH)
					CL								
6ST-27	22-24	16	110	28.8	.20	31.5	0	31.5	15.2	0	12	88	Tan Clay (CL)
6ST-28	10-12	21	103	20.0	.25	24.5	0	34.2	13.2	0	20	80	Rust Clay (CL)
6ST-31	37.5-39	25	100	34.5	.05	35.7	0	35.0	14.8	0	15	85	Rust Clay (CL)
					SM								
6ST-31	14-16	3	109	34.2	0.0	34.2	0	NP	NP	0	59	41	Gray Silty Sand (SM)
6ST-113	32-34	—	101	35.0	0.0	35.0	0	—	—				Tan Silty Sand (SM-SP)
					CH								
6ST-123	42-43.5	24	100	20.6	0.5	28.0	0	57	23	0	0	100	Red Clay (CH)
6ST-157	39-40	32	89	17.6	0.4	25.0	0	68	27	0	0	100	Brown Clay (CH)
					CL								
6ST-117	6-8	21	106	17.5	0.6	26.0	0	48	19	2	16	82	Tan Sandy Clay (CL)
6ST-117	14-16	19	108	29.2	0.6	35.5	0	39	13	0	21	79	Red Sandy Clay (CL)
6ST-123	0-2	15	109	22.0	0.6	28.5	0	45	18	0	21	79	Gray Sandy Clay (CL)
6ST-156	30-32	17	106	27.9	0.1	30.6	0	33	19	0	0	100	Red Clay (CL)
6ST-159	10-12	12	113	22.5	0.3	28.0	0	27	13	0	30	70	Tan Sandy Clay (CL)
					CL-ML								
6ST-117	24-26	21	104	33.1	0.1	33.0	0	—	—	0	11	89	Red Clayey Silt (CL-ML)
					ML								
6ST-154	20-22	23	100	32.4	0.1	33.5	0	—	—	8	19	73	Red Sandy Silt (ML)

SUBJECT
COMPUTATION
COMPUTED BY
DATE
CHECKED BY
DATE
FILE NO.
Page ___ of ___

SWD FORM 521-J
8 Jan 65

STA.	Y	X	ELEV.	DESCRIPTION
B-1	721,311.87	3,155,008.92	35.730	R.R. SPIKE
B-2	721,228.31	3,154,923.28	34.720	R.R. SPIKE
B-3	721,763.62	3,154,378.93	32.976	R.R. SPIKE
B-175	721,772.07	3,153,709.31	26.387	
B-176	721,418.27	3,153,680.90	40.329	R.R. SPIKE
B-177	721,325.12	3,154,102.72	35.397	
B-178	721,185.90	3,154,411.23	34.105	IRON PIN
B-179	721,164.46	3,154,591.31	33.359	
B-180	720,978.39	3,154,749.06		R.R. SPIKE
B-181	720,952.73	3,154,889.72	33.346	
B-182	721,049.47	3,155,027.90	33.749	IRON PIN
B-183	720,554.89	3,155,302.19	37.317	"X" ON CONC. BLK.
B-184	720,369.26	3,155,479.57	39.171	
B-185	720,874.21	3,155,497.56		
B-186	720,981.41	3,155,478.96		
B-187	721,034.10	3,155,285.11		R.R. SPIKE
B-188	721,169.13	3,155,248.43		R.R. SPIKE
STA-131	720,361.75	3,155,357.84		

Galveston Dist. Lab. Report No. 1013

BUFFALO BAYOU, TEXAS

WHITE OAK BAYOU PROPOSED ALIGNMENT

SCALE 100' 0' 100'

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS APRIL 1963

TO ACCOMPANY GENERAL DESIGN MEMORANDUM NO. 1 BUFFALO AND WHITE OAK BAYOUS AND WHITE OAK BAYOU FEATURE DESIGN MEMORANDUM NO. 2, MILE 1.07 TO YALE STREET. DATED: APRIL 1963

FILE: HSC 402-133

Sheet 6 of 7

PLATE 45

CORE BORINGS
WHITE OAK BAYOU, HOUSTON

Core Hole No.	Coordinates X	Coordinates Y	M.S.L. Elev.
6 St 26	3,155,165	720,440	37.60
27	3,155,450	720,370	39.3
28	3,155,275	720,465 ?	36.2
29	3,155,325	720,950	28.2
30	3,155,000	720,930	33.8
31	3,154,495	721,145	33.4
* 32	3,153,575	722,170	21.0
* 33	3,153,240	722,540	22.0
** 34	Never	drilled	
* 35	3,152,640	723,275	21.5
* 36	3,152,510	723,625	13.0
37	3,151,210	724,895	14.1
** 38			
39	3,150,300	725,020	31.6
** 40			
41	3,149,115	725,590	21.3
** 42			
** 43			
44	3,147,545	725,075	35.2
45	3,147,700	724,925	37.9
** 46	3,147,280	724,730	12.0
47	3,146,780	724,755	31.4
48	3,146,405	724,485	22.1
49	3,145,305	724,905	24.3
** 50	3,144,990	724,180	24.5
** 51	3,144,870	723,910	17.0
** 52			
** 53			
54	3,143,480	723,365	32.1
55	3,142,790	723,450	44.0
56	3,142,755	723,735	43.8
57	3,142,515	723,515	47.0
58	3,142,420	723,840	37.5
59	3,142,325	723,500	48.8
* 60			
61	3,141,890	724,290	43.8
62	3,141,750	724,970	47.9
63	3,140,570	725,070	51.0
64	3,140,200	725,465	50.5
65	3,138,940	725,205	49.0
66	3,137,960	726,015	50.5
67	3,137,385	726,500	46.2
68	3,130,375	734,185	61.5
69	3,126,995	738,435	69.9

* Core Holes covered up by fill material
** Core Holes not drilled

HOLE NO. 6ST-28

DEPARTMENT OF THE ARMY
DIVISION Southwestern
INSTALLATION Galv Dist, Eng Div

DRILLING LOG

1. PROJECT: White Oak Bayou
SHEET OF
2. LOCATION (Coordinates or Station): Pasadena, Texas (3,155,275 - 720,465)
3. DRILLING AGENCY: U. S. Army Corps of Engineers 120' R
4. HOLE NO. (As shown on drawing title and file No.): 6ST-28
5. NAME OF DRILLER: K. D. West
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED; DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 60.0
10. SIZE AND TYPE OF BIT: Shelby Tube-6"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): M.S.L.
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NO. CORE BOXES
15. ELEV. GROUND WATER: —
16. DATE HOLE: STARTED 6/3/60; COMPLETED 6/4/60
17. ELEV. TOP OF HOLE: 36.2
18. TOTAL CORE RECOVERY FOR BORING (%)
19. SIGNATURE OF INSPECTOR: Both Elev. -23.8

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
0.0	2.0	NW CH	Tan-black sandy clay w/gray fill, soft	Lab SM	w=12 γ=105	Fines=24 Cont. 1 34.2	0.50
2.0	4.0		Rotten wood, fill	Wood	X	Jar 1 32.2	
4.0	6.0		Dark gray silty clay, fill, plastic stiff		w=28 γ=94	Cont. 2	0.75
6.0	8.0	NW	Gray-tan sandy clay, fill, soft		w=9 γ=113	-sandy Cont. 3	0.25
8.0	10.0		Red-gray sandy clay, fill, stiff			Cont. 4	1.25
10.0	12.0	CL	Tan-gray sandy clay, plastic stiff, fill	CL	w=21 γ=104	LL=36 Cont. 5	0.75
12.0	14.0		Tan-gray sandy clay, plastic, stiff fill			-Sandy Cont. 6	1.00
14.0	16.0		Tan-gray sandy clay, plastic stiff, fill			Cont. 7	1.00
16.0	18.0		Red-gray sandy clay, plastic stiff, fill			Cont. 8 18.2	0.75
18.0	20.0		Gray-red sandy clay, w/wood fill, plastic,	GM	w=19	Fines=33 Jar 2 16.2	0.75
20.0	22.0		Gray-med-fine sand, dry			Jar 3	
22.0	24.0		Gray- med-fine sand, dry		w=15	Jar 4	
24.0	25.0	SM	Tan coarse sand, washed away	SM		No sample	
25.0	27.0		Tan coarse sand, plastic, stiff		γ=100	Fines=41 Cont. 9	0.75
27.0	30.0		Tan, coarse, sand, washed away, soft			No sample	
30.0	32.0		Tan coarse sand, soft			Cont. 10 4.2	0.50
32.0	34.0		Red silty sandy clay, stiff		w=23	Cont. 11	1.50
34.0	36.0	NW CL	Red silty sandy clay, stiff	CL	γ=103	Cont. 12 LL=25	1.50
36.0	38.0		Red clayey sand, silt, v/stiff			Cont. 13 -1.8	2.75
38.0	40.0		Red silty clay, v/stiff	ML	w=22 γ=105	Cont. 14 Fines=92 -3.8	3.25
40.0	41.5	NW CH	Red beaumont clay, hard		w=24	Cont. 15	4.25
41.5	43.0		Red beaumont clay, v/stiff	CH	γ=101	LL=54 Cont. 16 -6.8	3.25
43.0	44.5	NW	Red sandy clay, v/stiff		w=21	Cont. 17	2.25
44.5	46.0	CL	Red silty sandy clay, v/stiff	CL	γ=106	LL=35 Cont. 18	2.50
46.0	47.5		Red silty clay, stiff			Cont. 19 -11.3	1.25

HOLE NO. 6ST-28

DEPARTMENT OF THE ARMY

DIVISION Southwestern

INSTALLATION Galv Dist, Eng Div

DRILLING LOG

1. PROJECT: White Oak Bayou

SHEET OF

2. LOCATION (Coordinates or Station)

3. DRILLING AGENCY

4. HOLE NO. (As shown on drawing title and file No.)

5. NAME OF DRILLER

6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED — DEGREES WITH VERTICAL

7. THICKNESS OF OVER-BURDEN

8. DEPTH DRILLED INTO ROCK

9. TOTAL DEPTH OF HOLE

10. SIZE AND TYPE OF BIT

11. DATUM FOR ELEVATION SHOWN (TBM or MSL)

12. MANUFACTURER'S DESIGNATION OF DRILL

13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED

14. TOTAL NO. CORE BOXES

15. ELEV. GROUND WATER

16. DATE HOLE: STARTED 6/3/60 COMPLETED 6/4/60

17. ELEV. TOP OF HOLE

18. TOTAL CORE RECOVERY FOR BORING (%)

19. SIGNATURE OF INSPECTOR

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
						-11.3	
47.5	48.0	SC	Red clayey sand, stiff	ML	w=18 γ=109	Fines=80 Cont. 20	1.50
						-11.8	
48.0	53.0	SM	Red fine water sand, soft	SM	w=20	Jar 5 Fines=18	
						-16.8	
53.0	55.0		Red fine water sand, soft	ML	w=24	Jar 6 Fines=96	
						-18.8	
55.0	56.5	CH	Red beaumont clay, hard		w=30 LL=54	Cont. 21	4.00
56.5	58.5		Red beaumont clay, v/stiff	CH	γ=91	Cont. 22	3.00
58.5	60.0	CL	Red-blue silty clay, v/stiff			Cont. 23	2.00
						-23.8	
			Bottomed in above at 60.0 No water encountered				

White Oak Bayou
Channel Rectification
Houston, Texas

TEST DATA SUMMARY

Sheet 5 of 56

Elev 36.2 FEATURE Log of Soil Borings

BORING NO.	SAMPLE NO.	DEPTH OR ELEV. OF SAMPLE	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D/A	ATTERBERG LIMITS LL	PL	BAR L.S. %	NATURAL WATER CONTENT %	NATURAL DRY DENSITY LBS./CU.FT.	LABORATORY CLASSIFICATION
65T-28	-60-	0.0	0-12	10-16-38								
	2825		12	64	24	0.75			3.0	12.2	105.3	Dk-Br-Bu, SiSa(SM) w/Wood & Gr.
		2.0										
	2826		No	Test		—					—	Decayed Wood
		4.0										
	2827		0	15	85	0.75	36.4		13.5	28.2	93.8	D, Cl(CL) Med.
		6.0										
	2828		4	20	76	0.25	36.9		14.0	~~8.6~~	112.6	Mott. Bu, G, R-B, SaCl(CL), v/so.
		8.0										
	2829		5	23	72	1.00	36.3		12.0	19.4	105.0	Bu-G-R, SaCl(CL), Med.
		10.0										
	2830		0	20	80	0.50	34.2	13.2	11.0	20.6	103.8	Bu-L-R, Cl(CL), So.
		12.0								(22)	(102)	Sandy
	2831		Same	as 60	(2832)	0.75				22.5		Mott. R-L-T, Cl(CL), Med Medium
		14.0										
	2832		0	20	80	0.75	35.6		11.0	20.9	102.5	Mott R-L-T, Cl(CL), Med.
		16.0										
	2833		Same	as 60-	2832	1.50				23.1	99.1	Mott. R-L-T, Cl(CL) St.
		18.0	13-21									
	2834		34	33	33	—			0.5	19.1	—	R, SiSaGr(GM)
		20.0		0-0-56								
	2835		0	56	44	—			1.0	14.8	—	G-T, SiSa(SM)
		22.0		0-0-56								Dense
	2836		0	56	44	—			3.0	15.4	—	G-T, SiSa(SM)
		24.0										
	—		No Sample							(15)	—	T, Sand (SM)
		25.0		0-0-64								
	2837		0	64	36	2.25			1.0	15.3	87.2	Lt. Br, SiSa(SM)
		27.0										
	—		No Sample								—	T, Sand. (SM)
		30.0		0-0-60								
	2838		0	60	40	1.00			2.0	15.4	112.2	T, SiSa(SM)
		32.0										
	2839		0	3	97	2.00	21.5		6.0	22.6	103.8	T-Ru, Cl(CL), St. w/CH layers
		34.0								(23)		
	2840		Same	as 60-	2841	1.75				23.0	103.5	T-Ru, Cl(CL), St. w/Calc. bands v/st
		36.0										
	2841		0	4	96	2.00	29.1		5.0	22.9	103.1	T-Ru, Cl(CL), St. w/Calc. bands
		38.0										
	2842		0	8	92	1.75			1.0	22.1	104.7	T-Ru, Si(ML) w/Cl layers
		40.0										
	2843		0	0	100	1.50	53.9		15.5	25.8	102.1	T-Ru, Cl(CH), St, Calc.
		41.5								(24)		
	2844		Same	as 60-	2843	3.25				22.7	100.8	T-Ru, Cl(CH), St, Calc.
		43.0										

* Laboratory Penetrometer Reading

DLR-853

6D FORM 053-R
23 AUG. 56

White Oak Bayou
Channel Rectification
Houston, Texas

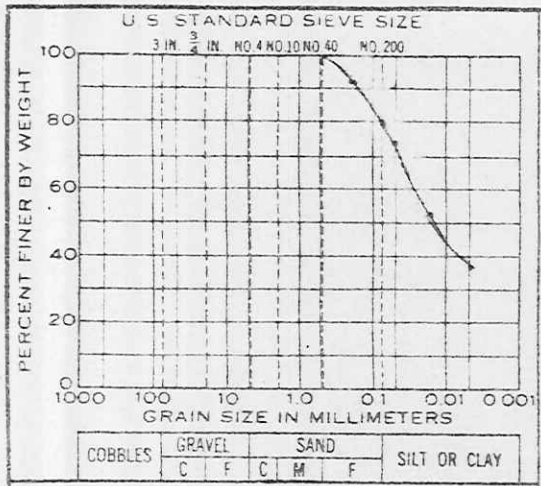
TEST DATA SUMMARY

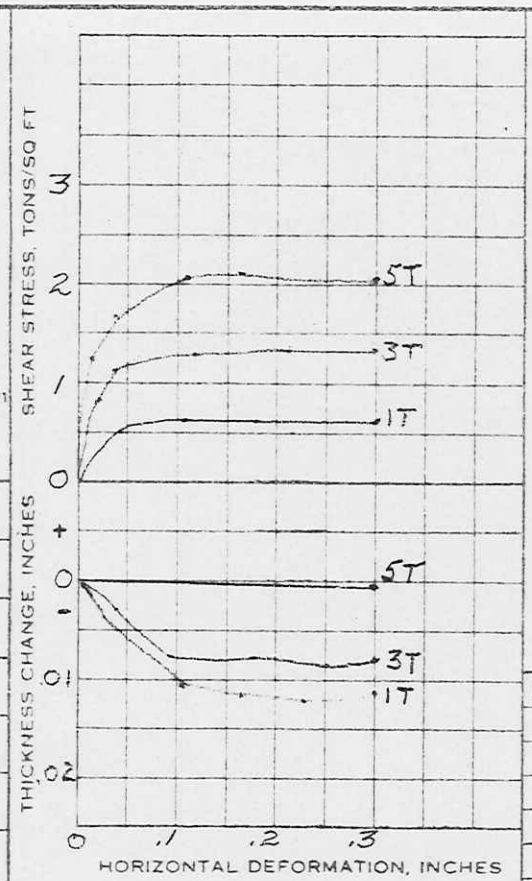
FEATURE Log of Soil Borings

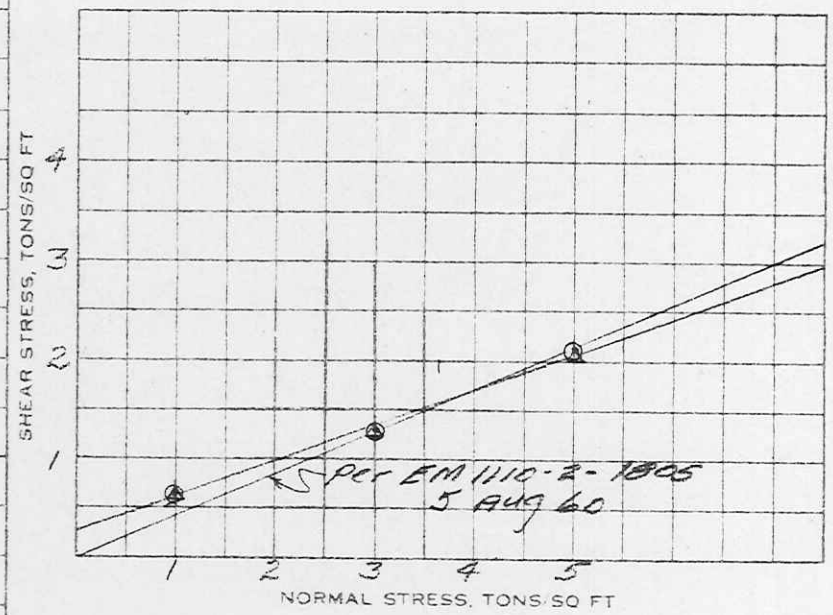
BORING NO.	SAMPLE NO.	DEPTH OR ELEV. OF SAMPLE	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D/% D	ATTERBERG LIMITS LL	PL	BAR L.S. %	NATURAL WATER CONTENT %	NATURAL DRY DENSITY LBS./CU.FT.	LABORATORY CLASSIFICATION
6ST-28	-60-	43.0										
Cont.	2845		0	6	94	3.50	37.1		9.0	22.4	106.4	T-Ru, Cl(CL), v/st. w/ Calc. pockets.
		44.5										
	2846		Same as 60-2845			1.50				20.0	107.9	T-Ru, Cl(CL) v/st. w/calc. pockets.
		46.0								(21)		
	2847		0	4	96	4.25	33.4		9.0	21.3	103.5	Ru, Cl(CL), Hd, Calc
		47.5										
	2848		0	20	80	2.00			0.5	18.2	109.3	Ru, Si(ML)
		48.0	0-0-82							(18)		SM
	2849		0	82	18	—			0.0	19.5	—	R, SiSa(SM)
		53.0										
	2850		0	4	96	—			0.0	24.2	—	R, Si(ML)
		55.0										
	2851		0	1	99	3.25	54.0		21.0	27.2	95.8	R, Cl(CH), v/st. w/ SiSa layers
		56.5								(30)		
	2852		Same as 60-2851			2.75				31.6	89.5	R, Cl(CH), v/st. w/ SiSa layers
		58.5										
	2853		0	1	99	2.25	55.4		16.0	31.2	88.1	G-R, Cl(CH), v/st. w/Si layers
		60.0										
			Bottomed @ 60.5' in G-R, Cl(CH) v/st.									
6ST-29	-60-	0.0	3-25									
	2496		28	37	35	—			2.0	7.6	—	T-Gr, GrSiSa(SM) w/shell
		2.5										
	2497		0	23	77	1.25	42.6		14.0	24.2	99.8	T-G-Ru, SaCl(CL), St, Fill app.
		4.5										
	2498		Same as 60-2497			1.25			(10)	21.6	98.9	T-G-Ru, SaCl(CL), St. Fill app.
		6.5										
	2499		0	26	74	1.75	32.2		9.0	16.4	107.9	T-G, SaCl(CL), St. Fill & debris
		7.5										
	2500		1	24	75	—	36.9		9.0	20.9	—	T-G, SaCl(CL), w/wood. Dist.
		9.0										
	—		No Sample			—	Drillers Classification					G-T, SaCl (w/Fill)
		11.0										
	2501		0	38	62	2.50			2.0	18.7	Crumb.	D, SaSi (ML)
		12.5										
	2502		Same as 60-2503			4.50				16.5	113.6	R, Cl(CL), Hd, Calc.
		14.0										
	2503		0	13	87	3.25	37.0		12.0	17.5	112.9	R, Cl(CL) v/st. w/calc. nod.
		15.0										
	2504		0	34	66	1.50			2.0	20.1	107.2	R-G, SaSi(ML)
		16.0										

* Laboratory Penetrometer Reading

DLR-853







Classification Bu-L-R, Cl (CL)

LL	34.2	G	
PL	13.2	D_{10}	

Test No.	1	2	3
Initial Water Content, W_0 %	20.6	20.6	20.6
Dry Density Lbs/Cu Ft	103.6	102.7	102.8
Void Ratio, e_0			
Saturation, S_0 %			
Duration of Test hrs.	5	6 3/4	7
WC after Test, W_f %	22.7	20.2	18.8
Normal Stress, σ T/Sq Ft	1	3	5
Max. Shear Stress, τ T/Sq Ft	.60	1.31	2.07

Type of Test
- Control
.001"/min approx
- Consolidated
- Drained

Type of Specimen
undisturbed
3 in. square
3/4 in. thickness

SHEAR VALUES	Ø	TAN Ø	C, T/SQ FT
Maximum	22.5	.414	
Ultimate			

Remarks:

Project White Oak Bayou Channel Rectification

Area Houston, Texas

Boring No. 6ST-28 Sample No. 60-2830

Elev or Depth 10.0-12.0 Date

DIRECT SHEAR TEST REPORT

DLE 853 Plate 2

2082

BUFFALO BAYOU, TEXAS
WHITE OAK BAYOU CHANNEL RECTIFICATION
SUMMARY OF UNCONFINED COMPRESSION TEST DATA
MOUTH TO 56+50

TABLE 3

Boring Number	Depth, feet	Density Data MC %	Density Data UDW Lb/cu ft	LL	PL	Bar L.S.	Gradation Gr	Gradation Sa	Gradation Fines	% Strain @ Max stress	Max strain Lbs/sq ft	Classification
6ST-28	32.0-34.0	22	103	49	-	18	0	22	78	3.5	4239	Red sandy clay,v/stiff (CL)
6ST-30	28.0-30.0	22	105	53	-	19	0	0	100	4.9	5606	Red clay, hard (CH)
6ST-169	12.0-14.0	27	97	57	-18	+8	0	1	99	8.0	1360	Red clay, med. (CH)
6ST-169	14.0-16.0	22	103	42	-13	+3	1	12	88	11.7	1200	Red clay, med. (CL)
6ST-170	20.0-22.0	21	104	52	-15	+5	22	14	64	2.0	800	Red clay, gravelly (CH)
6ST-170	22.0-24.0	22	102	47	-14	-	20	21	59	9.3	1200	Red clay, gravelly (CL)

PLATE 18

Classification Rust - Light Red Clay (CL)

LL 34.2	G		
PL 13.2	D_{10}		
Test No.	1	2	3
Initial Water Content, W_0 %	20.6	20.6	20.6
Dry Density Lbs/Cu ft	103.6	102.7	102.8
Void Ratio, e_0			
Saturation, S_0 %			
Duration of Test (to τ)	300'	405'	420'
WC after Test, W_f %	22.7	20.2	18.8
Normal Stress, σ T/sq ft	1	3	5
Max. Shear Stress, τ T/sq ft	.60	1.31	2.07

SHEAR VALUES	Ø	TAN Ø	C, T/SQ FT
Maximum	24.5°	.455	0.0

Type of Test
Strain - Control
Rate, 0.001 in/min
x Consolidated
x Drained

Type of Specimen
Undisturbed
3.0 in. square
0.75 in. thickness

Remarks:
5 Test

Project	WHITE OAK BAYOU		
	Foundation Materials		
Area	Galveston District		
Boring No. 6ST-28		Sample No. 60-2830	
Elev or Depth 10.0 - 12.0		Date 1961	

DIRECT SHEAR TEST REPORT

~~SHEET 2 of 5~~ FILE NO. H.S.C. 402-133

APPENDIX B EXHIBIT 8