LOG OF BORING B-3

Rock Engineering & Testing Lab., Inc.
4910 Neptune St.
Corpus Christi, TX 78405
Telephone: 361 883 4555
Fax: 361 883 4711

CLIENT: HDR/Shiner Moseley and Associates, Inc.
PROJECT: New East Jetty: Mouth of Colorado River
LOCATION: Matagorda County, TX
NUMBER: G207487

DATE(S) DRILLED: 07/24/07 - 07/24/07

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: EL + 0.5 NAVD' 88

SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	5											**WATER DEPTH= 6'**
		SS S-1	X	N= 5	24	NP	NP	NP			10	**POORLY GRADED SAND**, with silt, brown, wet, loose. (SP-SM)
	10	SS S-2	X	N= 13	22	NP	NP	NP			4	Same as above, trace shell fragments, brown and gray, medium dense. (SP)
		SS S-3	X	N= 7	23							Same as above, loose.
	15	SS S-4	X	N= 8	23	NP	NP	NP			14	**SILTY SAND**, gray, wet, loose. (SM)
		SS S-5	X	N= 20	25							Same as above, medium dense.
	20	SS S-6	X	N= 15	26	NP	NP	NP			4	**POORLY GRADED SAND**, gray, wet, medium dense. (SP)
	25	SS S-7	X	N= 21	23							Same as above.
	30	SS S-8	X	N= 6	24	NP	NP	NP			4	Same as above, loose. (SP)
	35	SS S-9	X	N= 4	31	59	21	38			75	**FAT CLAY**, with sand, gray, very moist, soft. (CH)
	40	SH S-10	■	P= 2.5	24	51	18	33			72	**FAT CLAY**, with sand, gray and brown, moist, very stiff. (CH)
	45	SH S-11	■	P= 2.5	18						31	**CLAYEY SAND**, bluish gray, moist, very stiff.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - POCKET TORVANE SHEAR STRENGTH

REMARKS:
Boring location was determined by RETL. Boring operations were performed by a drilling sub-contractor to RETL.
Coordinates: N 28 35 27.9, W 95 58 57.4

LOG_OF_BORING G207487 NEW JETTY.GPJ ROCK_ETL.GDT 8/28/07

LOG OF BORING B-3

Rock Engineering & Testing Lab., Inc.
4910 Neptune St.
Corpus Christi, TX 78405
Telephone: 361 883 4555
Fax: 361 883 4711

CLIENT: HDR/Shiner Moseley and Associates, Inc.
PROJECT: New East Jetty: Mouth of Colorado River
LOCATION: Matagorda County, TX
NUMBER: G207487
DATE(S) DRILLED: 07/24/07 - 07/24/07

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:

SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	50	SS S-12	X	N= 7	21	NP	NP	NP			5	**POORLY GRADED SAND**, with silt, grayish brown, wet, loose. (SP-SM)
	55	SS S-13	X	N= 72	23							Same as above, very dense.
	60	SS S-14	X	N= 57	25	NP	NP	NP			7	Same as above. (SP-SM)
	65	SS S-15	X	N= 60	22							**POORLY GRADED SAND**, with silt, grayish brown, wet, very dense.
	70	SS S-16	X	N= 7	39						88	**FAT CLAY**, gray, very moist, firm.
	75	SS S-17	X	N= 4	51	69	27	42			90	Same as above, soft. (CH)
												Total Depth of Boring= 75' Below Water Level

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - POCKET TORVANE SHEAR STRENGTH

REMARKS:
Boring location was determined by RETL. Boring operations were performed by a drilling sub-contractor to RETL.
Coordinates: N 28 35 27.9, W 95 58 57.4

LOG_OF_BORING G207487 NEW JETTY.GPJ ROCK_ETL.GDT 8/28/07

The soil conditions encountered at the boring locations have been summarized and soil properties including plasticity, strength, grain size and classification are provided in Tables 3 through 7. The following terms and acronyms are used in these tables:

EL = Approximate depth in feet referenced to water surface elevation.
LL = Liquid Limit, %
PI = Plasticity Index
C = Soil Cohesion, psf (undrained)
ϕ = Angle of Internal Friction, deg. (undrained)
γ_e = Effective soil unit weight, pcf
-#200 = % silt and clay size particles
N = Standard Penetration Value range
P = Hand Penetrometer range, tsf
NP = Non plastic material

TABLE 3: SOIL PROFILE FOR BORINGS B-1 AND B-3

EL	Description	LL	PI	C	ϕ	γ_e	-#200	N or P
-8 to -32	Silty **SAND**/ Poorly Graded **SAND**	NP	NP	0	29	55	4-16	N=4-21
-32 to -42	Fat **CLAY**	51-59	33-38	1500	0	60	72-78	P=2.5
-42 to -47	Clayey **SAND**	33	17	1500	0	60	31-40	P=1.75-2.5
-47 to -67	Poorly Graded **SAND**	NP	NP	0	35	60	5-7	N=7-72
-67 to -75	Fat **CLAY**	69	42	1000	0	55	88-90	N=4-7

TABLE 4: SOIL PROFILE FOR BORING B-2

EL	Description	LL	PI	C	ϕ	γ_e	-#200	N or P
-12 to -16	Silty **SAND**	NP	NP	0	28	55	13	N=8
-16 to -27	Clayey **SAND**	47	31	300	0	55	36-45	N=2-3
-27 to -32	Sandy Fat **CLAY**	---	---	200	0	55	---	N=2
-32 to -42	Sandy Lean **CLAY**	38-47	23-31	2000	0	60	59-68	P=4.25
-42 to -45	Poorly Graded **SAND**	NP	NP	0	30	55	7	N=7

TABLE 8: GENERALIZED SOIL STRATIGRAPHY FOR WATERSIDE ZONE A (BORINGS B-1, B-3, B-4, AND B-5)						
Approximate Elevation, ft (NAVD'88)	**Description**	**C**	**ϕ**	**C'**	**ϕ'**	**γ_e**
-8 to -32	Sand	0	29	0	30	55
-32 to –47	Clay	1500	0	520	25	60
-47 to -67	Sand	0	35	0	35	60
-67 to -75	Clay	1000	0	400	20	55

TABLE 9: GENERALIZED SOIL STRATIGRAPHY FOR LANDSIDE ZONE B (BORING B-6)						
Approximate Elevation, ft (NAVD'88)	**Description**	**C**	**ϕ**	**C'**	**ϕ'**	**γ_e**
-6 to -15	Sand	0	28	0	30	55
-15 to –32	Clay	250	0	200	17.5	50
-32 to -47	Clay	2000	0	520	25	60
-47 to -67	Sand	0	35	0	35	60
-67 to -75	Clay	1000	0	400	20	55

TABLE 10: GENERALIZED SOIL STRATIGRAPHY FOR LANDSIDE ZONE C (BORING B-7)						
Approximate Elevation, ft (NAVD'88)	**Description**	**C**	**ϕ**	**C'**	**ϕ'**	**γ_e**
0 to -32	Sand	0	30	0	30	55
-32 to -40	Clay	2500	0	520	25	60