

October 22, 2008

Attn.: Mr. Daniel Heilman, P.E.

RETL Job No.: G108558

**WEST GALVESTON ISLAND LG. SCALE BEACH NOURISHMENT PROJECT**

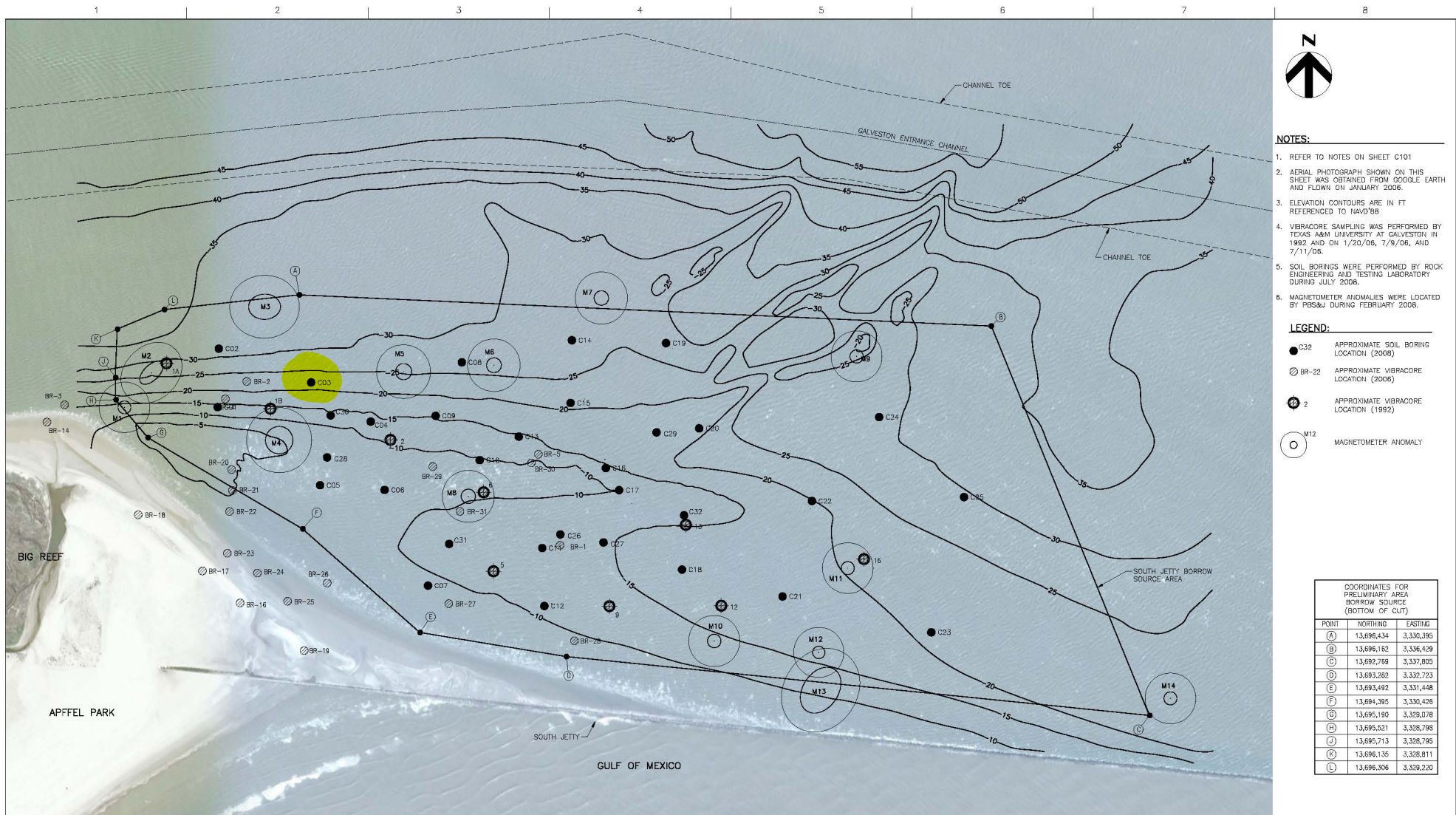
South Jetty Borrow Source Area

Galveston, Texas

BORING NO.	GPS COORDINATES	
C-01	N. 29.33841	W. 94.72652
C-02	N. 29.33981	W. 94.72643
C-03	N. 29.33892	W. 94.72394
C-04	N. 29.33793	W. 94.72235
C-05	N. 29.33645	W. 94.72380
C-06	N. 29.33628	W. 94.72204
C-07	N. 29.33395	W. 94.72095
C-08	N. 29.33927	W. 94.71980
C-09	N. 29.33801	W. 94.72057
C-10	N. 29.33691	W. 94.71941
C-11	N. 29.33475	W. 94.71779
C-12	N. 29.33336	W. 94.71779
C-13	N. 29.33744	W. 94.71832
C-14	N. 29.33970	W. 94.71677
C-15	N. 29.33820	W. 94.71687
C-16	N. 29.33661	W. 94.71597
C-17	N. 29.33607	W. 94.71563
C-18	N. 29.33411	W. 94.71399
C-19	N. 29.33955	W. 94.71420
C-20	N. 29.33748	W. 94.71338
C-21	N. 29.33338	W. 94.71127
C-22	N. 29.33564	W. 94.71037
C-23	N. 29.33239	W. 94.70724
C-24	N. 29.33759	W. 94.70845
C-25	N. 29.33560	W. 94.70621
C-26	N. 29.33506	W. 94.71728
C-27	N. 29.33483	W. 94.71611
C-28	N. 29.33711	W. 94.72358
C-29	N. 29.33742	W. 94.71455
C-30	N. 29.33811	W. 94.72344
C-31	N. 29.33493	W. 94.72033
C-32	N. 29.33541	W. 94.73054

In addition, forty surface grab samples from onshore and offshore of the Gulf beach along west Galveston Island were obtained and delivered to RETL by a representative of HDR, Inc. The ground surface elevations at the offshore grab sample locations are provided in the table below:

C:\P\Working\DAL\dms93560\00V101.DWG, 10/20/2008 4:00:32 PM



- NOTES:**
1. REFER TO NOTES ON SHEET C101
  2. AERIAL PHOTOGRAPH SHOWN ON THIS SHEET WAS OBTAINED FROM GOOGLE EARTH AND FLOWN ON JANUARY 2006.
  3. ELEVATION CONTOURS ARE IN FT REFERENCED TO NAVD'88
  4. VIBRACORE SAMPLING WAS PERFORMED BY TEXAS A&M UNIVERSITY AT GALVESTON IN 1992 AND ON 1/20/06, 7/9/06, AND 7/11/06.
  5. SOIL BORINGS WERE PERFORMED BY ROCK ENGINEERING AND TESTING LABORATORY DURING JULY 2008.
  6. MAGNETOMETER ANOMALIES WERE LOCATED BY PGS&J DURING FEBRUARY 2008.

- LEGEND:**
- C32 APPROXIMATE SOIL BORING LOCATION (2008)
  - ⊗ BR-22 APPROXIMATE VIBRACORE LOCATION (2006)
  - ⊗ 2 APPROXIMATE VIBRACORE LOCATION (1992)
  - M12 MAGNETOMETER ANOMALY

COORDINATES FOR PRELIMINARY AREA BORROW SOURCE (BOTTOM OF CUT)		
POINT	NORTHING	EASTING
(A)	13,696,434	3,330,395
(B)	13,696,162	3,336,429
(C)	13,692,769	3,337,805
(D)	13,693,282	3,332,723
(E)	13,693,492	3,331,448
(F)	13,694,395	3,330,428
(G)	13,695,190	3,329,078
(H)	13,695,521	3,328,798
(J)	13,695,713	3,328,795
(K)	13,696,135	3,328,811
(L)	13,696,306	3,329,220

**SOUTH JETTY BORROW SOURCE AREA**

SCALE: 0 400' 800'

1  
C101

		<table><tr><td>1</td><td>10/20/08</td><td>REVISED SOIL BORING LOCATIONS AND SCALE</td></tr><tr><td>0</td><td>10/17/08</td><td>ISSUED TO TOLG</td></tr><tr><td>ISSUE</td><td>DATE</td><td>DESCRIPTION</td></tr></table>	1	10/20/08	REVISED SOIL BORING LOCATIONS AND SCALE	0	10/17/08	ISSUED TO TOLG	ISSUE	DATE	DESCRIPTION	<table><tr><td>PROJECT MANAGER</td><td>DANIEL J. HELLMAN</td></tr><tr><td>DRAWN BY</td><td>BRUCE L. JACKSON</td></tr><tr><td>CHECKED BY</td><td>LAUREN AUGUSTIN</td></tr><tr><td>PROJECT NUMBER</td><td>88091</td></tr></table>	PROJECT MANAGER	DANIEL J. HELLMAN	DRAWN BY	BRUCE L. JACKSON	CHECKED BY	LAUREN AUGUSTIN	PROJECT NUMBER	88091	<p><b>PRELIMINARY</b></p> <p>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.</p>	<p><b>WEST GALVESTON ISLAND END OF SEAWALL BEACH NOURISHMENT</b></p>	<p><b>BORROW SOURCE AREA</b></p>	<table><tr><td>FILENAME</td><td>00V101.DWG</td><td>SHEET</td></tr><tr><td>SCALE</td><td>AS SHOWN</td><td><b>V101</b></td></tr></table>	FILENAME	00V101.DWG	SHEET	SCALE	AS SHOWN	<b>V101</b>
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## LOG OF BORING C-03

SHEET 1 of 1



Rock Engineering & Testing Lab., Inc.  
6817 Leopard St.  
Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
Fax: (361) 883-4711

CLIENT: HDR, Inc.

PROJECT: Prop. Large Scale Beach Nourishment Project

LOCATION: S. Jetty Borrow Source Area; Galveston, TX

NUMBER: G108558

DATE(S) DRILLED: 08/01/08 - 08/01/08

DRILLING METHOD(S):

Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -21.7' NAVD

DESCRIPTION OF STRATUM

SOIL SYMBOL	FIELD DATA				LABORATORY DATA						
	Elevation, Ft. [NAVD]	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU. FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI			
	5										
	10										
	15										
	20										
	25	SS S-1	N= WOH	36							31
		SS S-2	N= WOH								
		SS S-3	N= WOH								
		SS S-4	N= 3								
	30	SS S-5	N= WOH								
		SS S-6	N= 4								

**CLAYEY SAND** with shell fragments, dark gray, very moist, very soft.

Same as above.

Same as above.

**CLAYEY SAND** with shell fragments, dark gray, moist, soft.

Same as above, very soft.

Same as above, soft.

Boring was extended to an elevation of -33.7-feet NAVD during the drilling operations.

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

## REMARKS:

Boring depth and location was determined by HDR, Inc. Boring operations were performed by RETL.  
GPS Coord. N. 29.33892 W. 94.72394



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** West Galveston Island Large Scale Beach Nourishment Project

**CLIENT:** HDR, Inc.

**BORING ID.:** C-03

**DESCRIPTION:** South Jetty Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)
-21.7' TO -23.7' NAVD
N/A

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL
	-21.7' TO -23.7' NAVD
#10	N/A
#18	N/A
#35	N/A
#60	N/A
#120	N/A
#170	N/A
#200	31.00
STATISTICS (EXCLUDING SHELL)	
MEDIAN GRAIN SIZE (mm)	N/A
MEAN GRAIN SIZE (mm)	N/A
SORTING ( $\sigma$ )	N/A

\*C-03; -21.7' to -23.7' NAVD was only passed through the -#200 sieve.