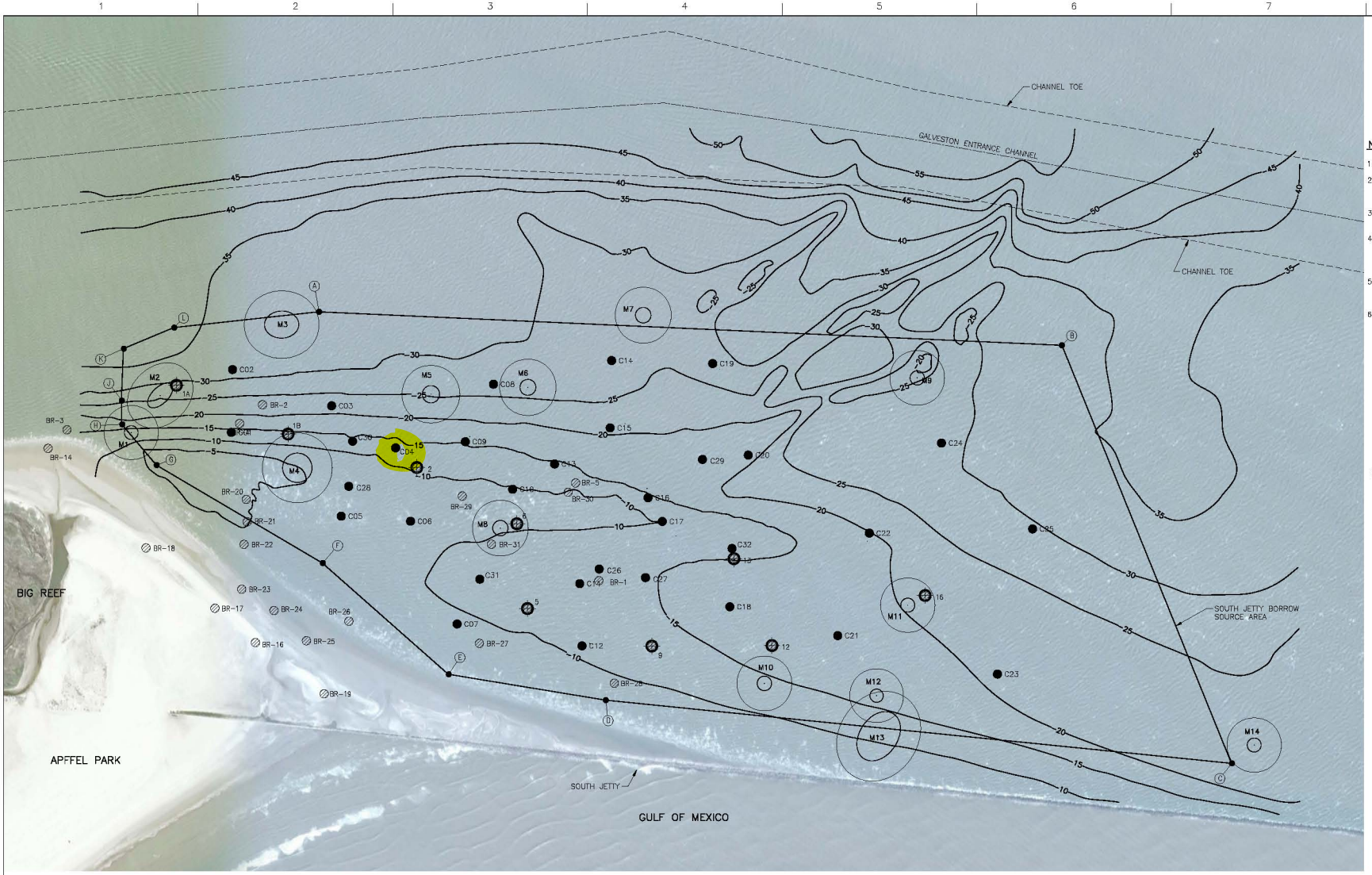
BORING NO.	GPS COORDINATES	
C-01	N. 29.33841	W. 94.72652
C-02	N. 29.33981	W. 94.72643
C-03	N. 29.33892	W. 94.72394
C-04	N. 29.33793	W. 94.72235
C-05	N. 29.33645	W. 94.72380
C-06	N. 29.33628	W. 94.72204
C-07	N. 29.33395	W. 94.72095
C-08	N. 29.33927	W. 94.71980
C-09	N. 29.33801	W. 94.72057
C-10	N. 29.33691	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:



N

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 PBS&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

Nalsmith Marine Services

HDR SHINER MOSELEY

ISSUE	DATE	DESCRIPTION
1	10/20/08	REVISED SOIL BORING LOCATIONS AND SCALE
0	10/17/08	ISSUED TO TGLO

PROJECT MANAGER	DANIEL J. HEILMAN
DRAWN BY	BRUCE L. JACKSON
CHECKED BY	LAUREN AUGUSTIN
PROJECT NUMBER	88091

PRELIMINARY

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

WEST GALVESTON ISLAND
END OF SEAWALL BEACH NOURISHMENT

BORROW SOURCE AREA

FILENAME	00V101.DWG
SCALE	AS SHOWN

SHEET V101

C:\PWworking\DAL\dms93360\00V101.DWG, 10/20/2008 4:00:32 PM

LOG OF BORING C-04

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: -12.8' NAVD

SOIL SYMBOL	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 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											
	10											
	15	SS S-1		N= 2	29						6	**POORLY GRADED SAND**, with clay and shell, dark gray, moist, very loose.
		SS S-2		N= 1								Same as above.
		SS S-3		N= 2	27						4	Same as above.
	20	SS S-4		N= 20								**POORLY GRADED SAND**, with clay and shell, dark gray, moist, medium.
		SS S-5		N= 9	26						11	Same as above, loose.
	25	SS S-6		N= WOH	34						26	**SILTY CLAYEY SAND**, with shell, dark gray, very moist, very loose.
		SS S-7		N= 1								Same as above.
		SS S-8		N= 1								Same as above.
	30	SS S-9		N= 33	38						51	**SANDY CLAY**, with shell, dark gray, very moist, very stiff.
		SS S-10		N= WOH								Same as above, very soft.
		SS S-11		N= 3								Same as above, soft.
												Boring was extended to an elevation of -34.8-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. 29.33793 W. 94.72235

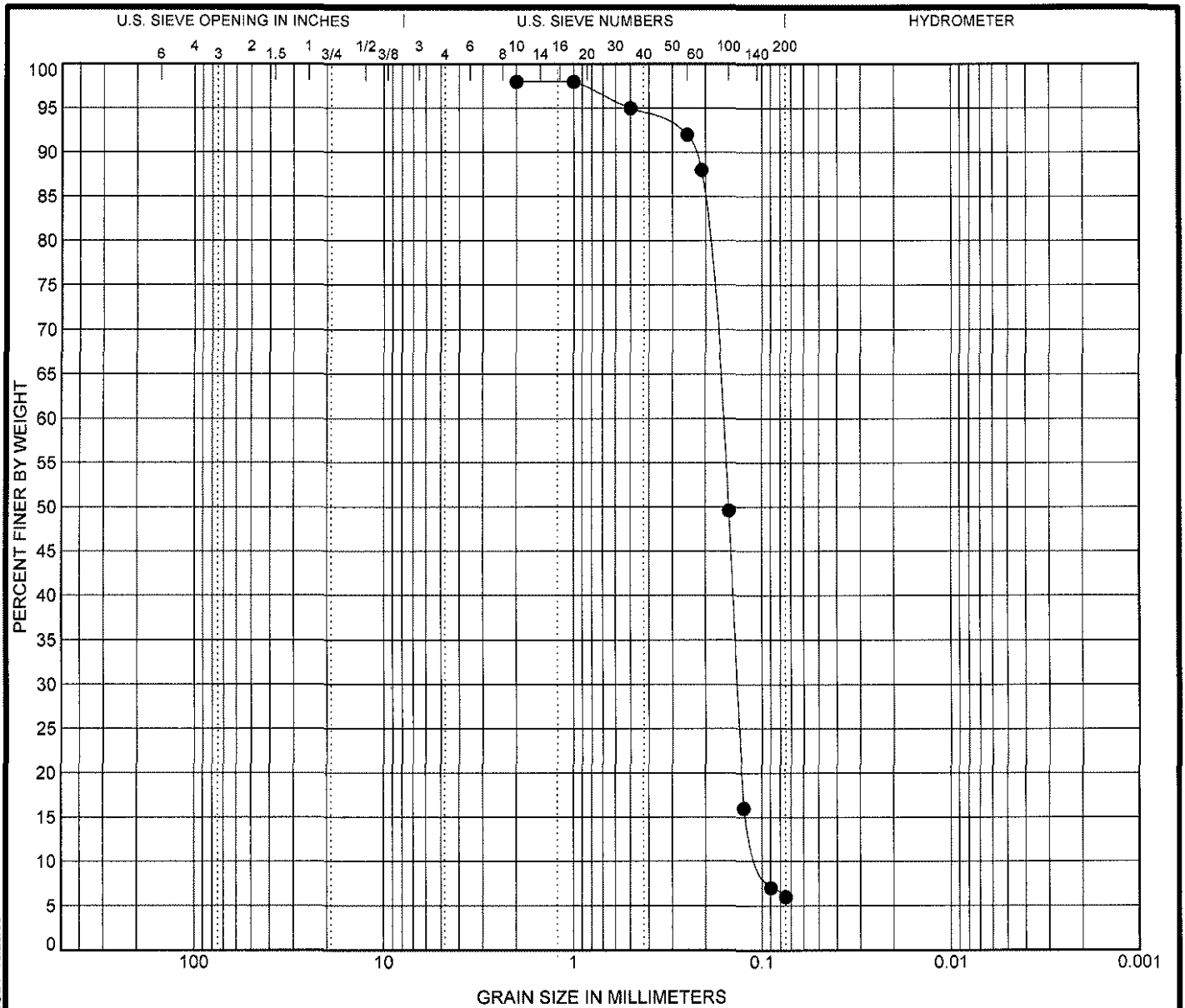
· Geotechnical Engineering
· Construction Materials Testing

PROJECT NAME: West Galveston Island Large Scale Beach Nourishment Project
CLIENT: HDR, Inc.
BORING ID.: C-04
DESCRIPTION: South Jetty Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-12.8' TO -14.8' NAVD	**-16.8' TO -18.8' NAVD**	**-20.8' TO -22.8' NAVD**	**-22.8' TO -24.8' NAVD**	**-28.8' TO -30.8' NAVD'**
2.02	**12.16**	**1.49**	**N/A**	**N/A**

ASTM MESH	**% FINER BY WEIGHT AFTER REMOVING SHELL**				
	-12.8' TO -14.8' NAVD	**-16.8' TO -18.8' NAVD**	**-20.8' TO -22.8' NAVD**	**-22.8' TO -24.8' NAVD**	**-28.8' TO -30.8' NAVD'**
#10	100.00	100.00	100.00	N/A	N/A
#18	97.66	76.69	98.02	N/A	N/A
#35	95.24	56.04	94.14	N/A	N/A
#60	91.60	44.54	90.32	N/A	N/A
#70	88.00	39.90	87.40	N/A	N/A
#100	49.60	22.60	60.88	N/A	N/A
#120	15.95	8.52	23.17	N/A	N/A
#170	6.83	4.56	13.20	N/A	N/A
#200	5.51	4.14	10.92	25.60	51.30
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.16	0.36	0.16	N/A	N/A
MEAN GRAIN SIZE (mm)	0.16	0.44	0.15	N/A	N/A
SORTING (σ)	N/A	1.38	N/A	N/A	N/A

*C-04; -22.8' to -24.8' NAVD and C-04; -28.8' to -30.8' NAVD were only passed through the -#200 sieve.
*The -#10 material was utilized as the total sample for Grain Size Distribution Curve calculations.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-04** (-12.8' to -14.8' NAVD)		**Borrow Area (-12.8' to -14.8' NAVD)**				**1.10**	**1.64**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-04** (-12.8' to -14.8' NAVD)		**2**	**0.164**	**0.135**	**0.1**	**0.0**	**92.0**	**6.0**	

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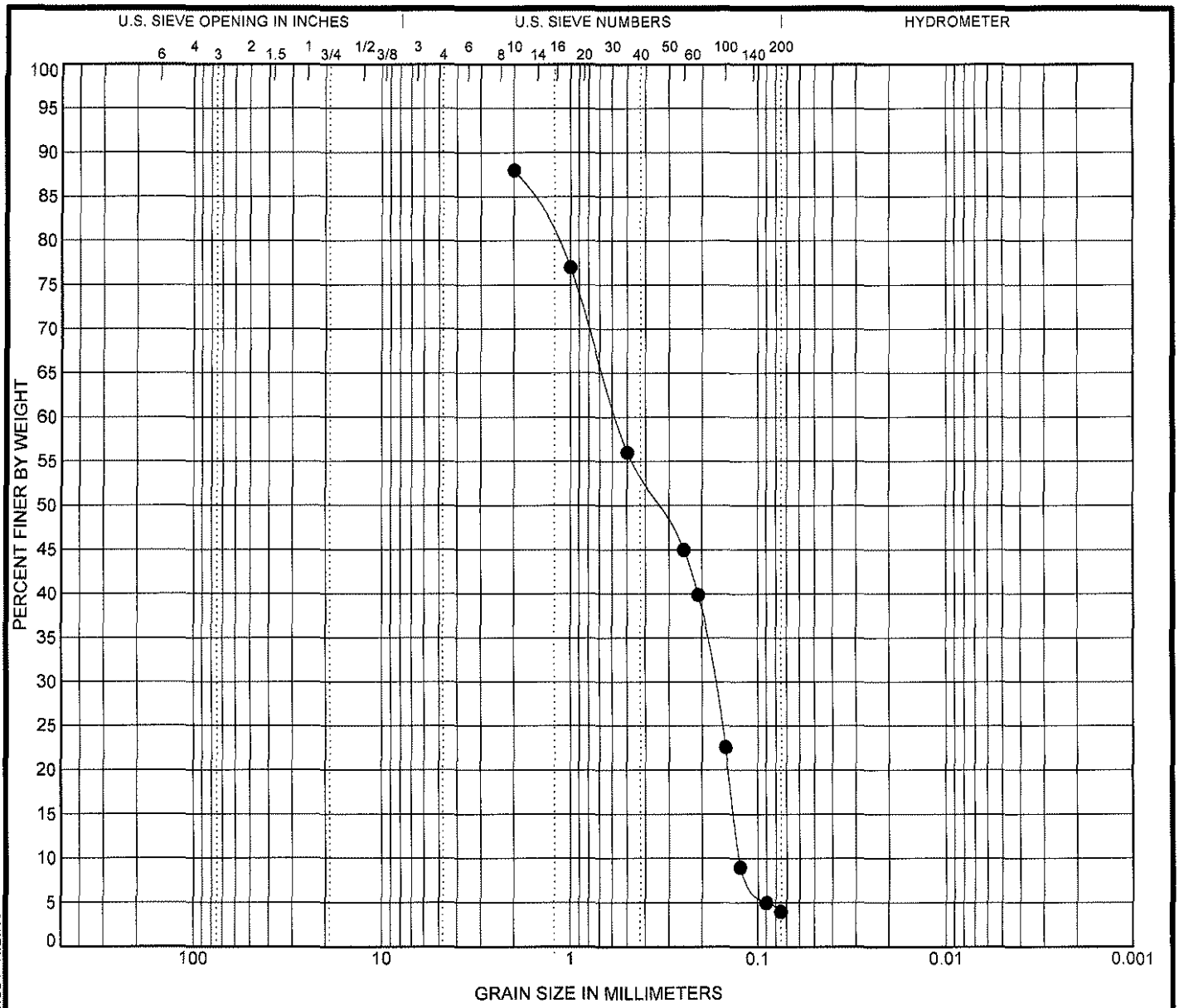
GRAIN SIZE DISTRIBUTION

Project: Prop. Large Scale Beach Nourishment Project

Location: South Jetty Borrow Source Area; Galveston, Texas

Number: G108558

US_GRAIN_SIZE_G108558B PROP_LARGE SCALE BEACH NOURISHMENT PROJECT.GPJ US_LAB.GDT 10/20/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-04**	(-16.8' to -18.8' NAVD)	**Borrow Area (-16.8' to -18.8' NAVD)**				**0.42**	**4.50**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-04**	(-16.8' to -18.8' NAVD)	**2**	**0.571**	**0.173**	**0.127**	**0.0**	**84.0**	**4.0**	

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Location: South Jetty Borrow Source Area; Galveston, Texas

Number: G108558

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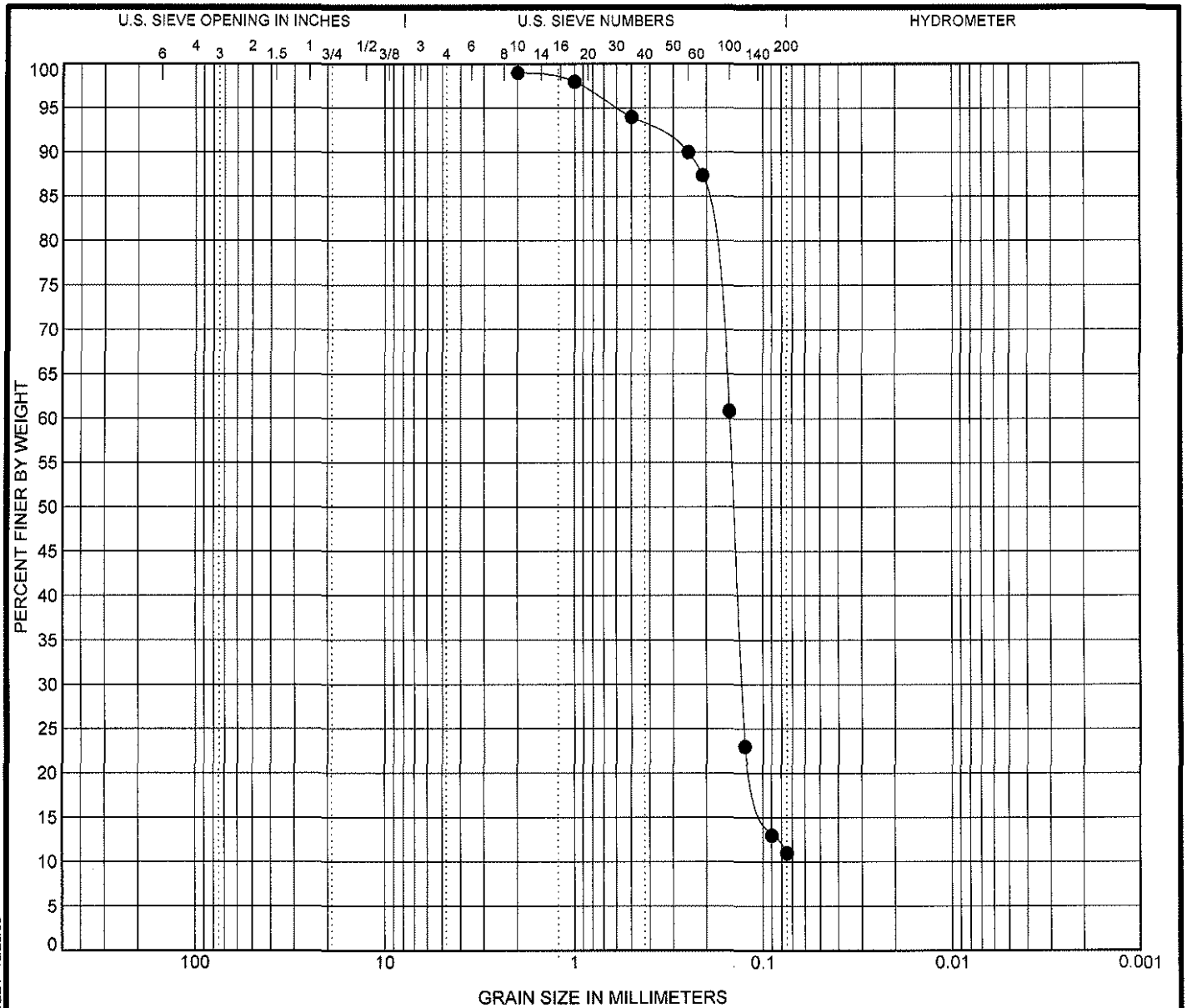

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-04**	(-20.8' to -22.8' NAVD)	**Borrow Area (-20.8' to -22.8' NAVD)**				**1.63**	**2.18**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-04**	(-20.8' to -22.8' NAVD)	**2**	**0.149**	**0.129**		**0.0**	**88.0**	**11.0**	

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Location: South Jetty Borrow Source Area; Galveston, Texas

Number: G108558