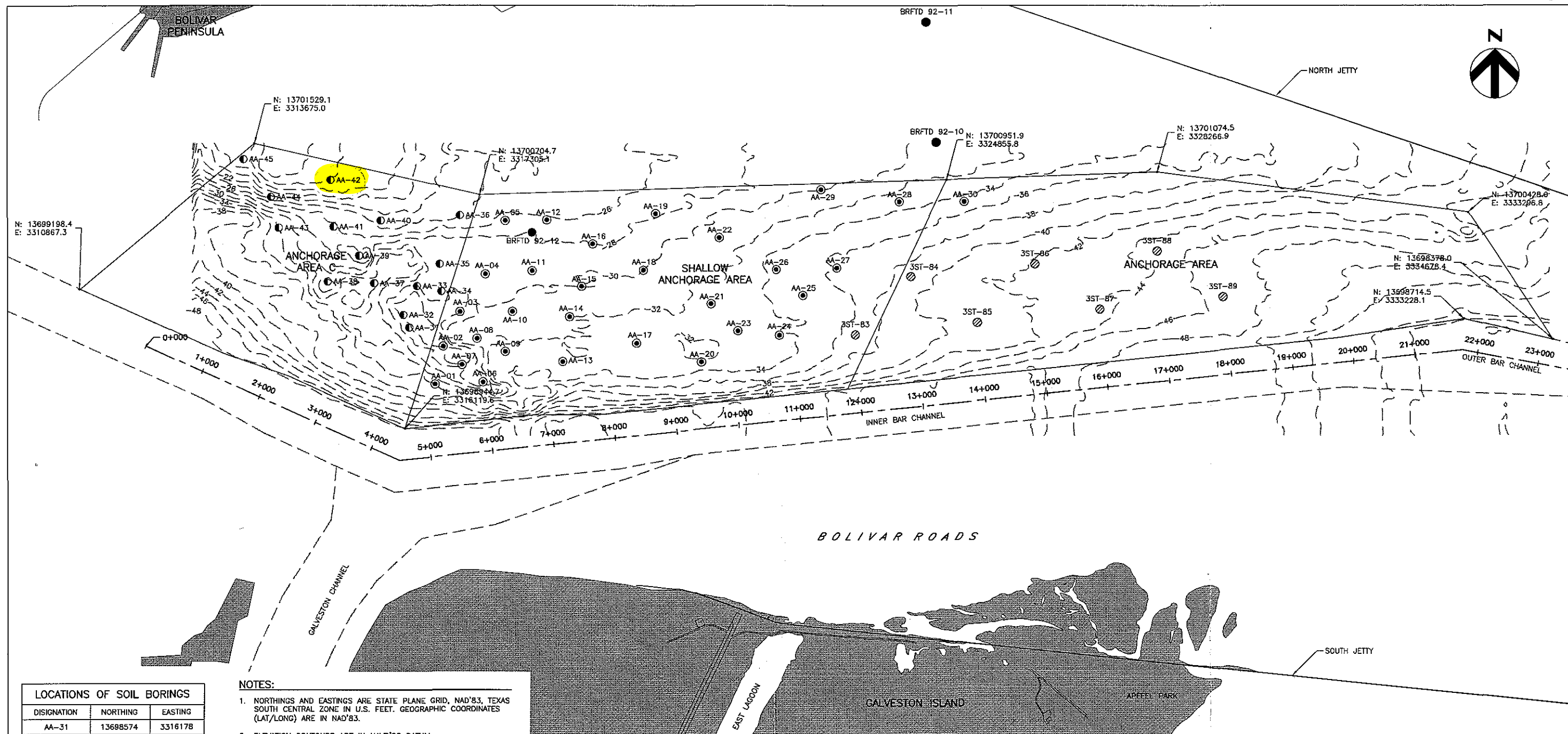


1391 Tech
Downers



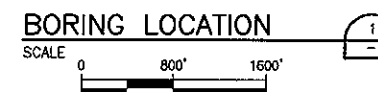
LOCATIONS OF SOIL BORINGS		
DISIGNATION	NORTHING	EASTING
AA-31	13698574	3316178
AA-32	13698778	3316085
AA-33	13699244	3316297
AA-34	13699156	3316692
AA-35	13699595	3316661
AA-36	13700379	3316989
AA-37	13699288	3315613
AA-38	13699316	3314867
AA-39	13699731	3315371
AA-40	13700296	3315711
AA-41	13700196	3314956
AA-42	13700944	3314910
AA-43	13700178	3314070
AA-44	13700672	3313951
AA-45	13701278	3313502

NOTES:

- NORTHINGS AND EASTINGS ARE STATE PLANE GRID, NAD'83, TEXAS SOUTH CENTRAL ZONE IN U.S. FEET. GEOGRAPHIC COORDINATES (LAT/LONG) ARE IN NAD'83.
- ELEVATION CONTOURS ARE IN NAVD'88 DATUM.
- ELEVATION CONTOURS BASED ON INFORMATION PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT. SURVEY DATE WAS JUNE 2009. ELEVATIONS WERE CONVERTED FROM USACE MLT TO NAVD '88 USING THE FOLLOWING CORRELATION:
0 NAVD '88 = 1.42' MLT.
- VIBRACORES WERE PERFORMED BY ROCK ENGINEERING AND TESTING LABORATORY, INC (RETL) AND OCEAN SURVEYS, INC DURING MARCH 2009.
- SOIL BORINGS WERE PERFORMED BY RETL DURING OCTOBER 2009.

LEGEND:

- HISTORICAL BORING LOCATIONS FROM USACE (1966)
- VIBRACORE LOCATIONS (SEE NOTE 4)
- VIBRACORE LOCATION FROM RICE UNIVERSITY
- BORING LOCATIONS (SEE NOTE 5)



TEXAS GENERAL LAND OFFICE ANCHORAGE AREA C SAND SOURCE INVESTIGATION

BORING LOCATION PLAN - GALVESTON ANCHORAGE AREA

DATE	11/30/09
FIGURE	EX A



- Geotechnical Engineering
- Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation

CLIENT: HDR Engineering, Inc.

BORING ID.: AA-42

DESCRIPTION: Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-17.02' to -19.02'	-21.02' to -23.08'	-25.02' to -27.02'	-29.02' to -31.02'
NAVD	NAVD	NAVD	NAVD
0.31	0.74	0.00	0.07

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-17.02' to -19.02'	-21.02' to -23.08'	-25.02' to -27.02'	-29.02' to -31.02'
	NAVD	NAVD	NAVD	NAVD
#10	100.00	100.00	100.00	100.00
#18	99.30	98.80	100.00	99.70
#35	98.60	98.20	99.90	99.60
#60	96.90	96.80	99.60	99.10
#70	94.80	94.10	98.20	96.80
#100	58.80	55.90	32.51	29.00
#120	35.80	37.90	13.80	15.90
#170	20.80	24.10	5.30	6.60
#200	14.80	19.00	3.70	5.30
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.14	0.15	0.17	0.18
MEAN GRAIN SIZE (mm)	0.13	0.14	0.17	0.17
SORTING (σ)	N/A	N/A	0.28	N/A

*The -#10 material was utilized as the total sample for Grain Size Distribution Curve calculations.



- Geotechnical Engineering
- Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation

CLIENT: HDR Engineering, Inc.

BORING ID.: AA-42

DESCRIPTION: Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-33.02' to -35.02' NAVD	-35.02' to -37.02' NAVD	-37.02' to -39.02' NAVD
1.01	27.54	2.46

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-33.02' to -35.02' NAVD	-35.02' to -37.02' NAVD	-37.02' to -39.02' NAVD
#10	100.00	100.00	100.00
#18	98.10	50.00	96.00
#35	97.30	35.00	95.10
#60	96.40	28.30	94.50
#70	95.10	25.80	94.10
#100	47.30	18.10	92.00
#120	27.40	12.90	89.10
#170	14.70	8.00	81.70
#200	12.00	6.40	75.30
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.16	1.00	N/A
MEAN GRAIN SIZE (mm)	0.14	0.53	N/A
SORTING (σ)	N/A	N/A	N/A

*The #10 material was utilized as the total sample for Grain Size Distribution Curve calculations.

Date: 10-16-09

Project Location:

BORING LOG

GALVESTON

Type: HSA

Boring No.: AA-42

Location:

Depth Feet	Symbol	Sample	N-Blows Per Foot	MATERIAL DESCRIPTION	H ₂ O on Rod H ₂ O Upon Comp. Cave Upon Comp.
1.0 2.5		1	1/10	Grey Brown fine sand 20.5	605-29.35497
3.5 5.0		2	2/10	Grey fine sand fine	94.77225
6.0 7.5		3	1/10	Same	00W-19
8.0 9.5		4	1/10	Grey dirty soil (no picture)	
10.0 11.5		5	1/10	Same (no picture)	
12.0 13.5		6	1/10	Grey fine sand	
14.0 15.5		7	1/10	4/10 fine	
16.0 17.5		8	1/10	Same	
18.0 19.5		9	1/10	Same	
20.0 21.5		10	1/10	Same (shells on bottom)	
22.0 23.5		11	1/10	Shell frag (no pic)	29.35193
24.0 25.5		12	1/10	Same	94.76802
26.0 27.5		13	1/10	grey silt	
28.0 29.5					
30.0 31.5					
32.0 33.5					
34.0 35.5					
36.0 37.5					
38.0 39.5					
40.0 41.5					
42.0 43.5					
44.0 45.5					
46.0 47.5					
48.0 49.5					
50.0					

LOG OF BORING AA-42

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 Engineering, Inc.

PROJECT: Galveston Anchorage Area C Sand Source Inv.

LOCATION: Anchorage Area C, Galveston, Texas

NUMBER: G109233

DATE(S) DRILLED: 10/16/09 - 10/16/09

DRILLING METHOD(S):

Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -17.02' NAVD

DESCRIPTION OF STRATUM

20'

SILTY CLAYEY SAND, with shell fragments, dark gray and bluish gray, very loose.
Same as above.

Same as above.

POORLY GRADED SAND, with shell fragments, gray, loose.

Same as above, gray and brown, medium.

Same as above, dark bluish gray.

POORLY GRADED SAND, with clay and shell fragments, dark bluish gray, medium.
Same as above.

Same as above, bluish gray and brown.

POORLY GRADED SAND, with clay and shell fragments, gray, loose.

SANDY CLAY, with shell fragments, dark gray, very soft.

Boring was extended to an elevation of -39.0-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 Engineering, Inc. Boring operations were performed by RETL at GPS Coord. N. 29.35497 W. 94.77225.

LOG OF BORING G109233 ANCHORAGE BASIN C.G.P.1 ROCK ETL GDT 11/30/09