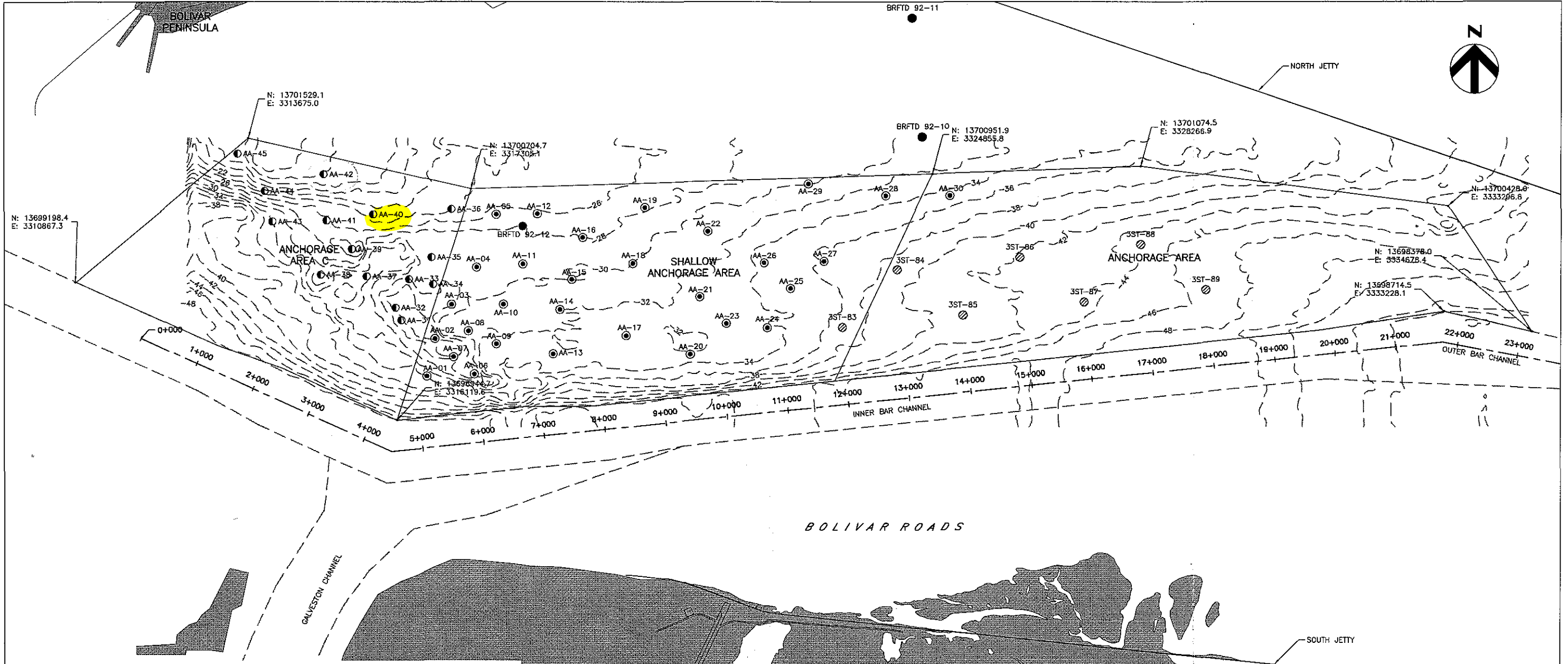


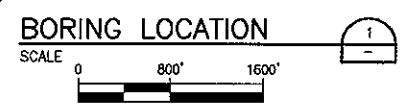
1391 Tech
Drawings



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



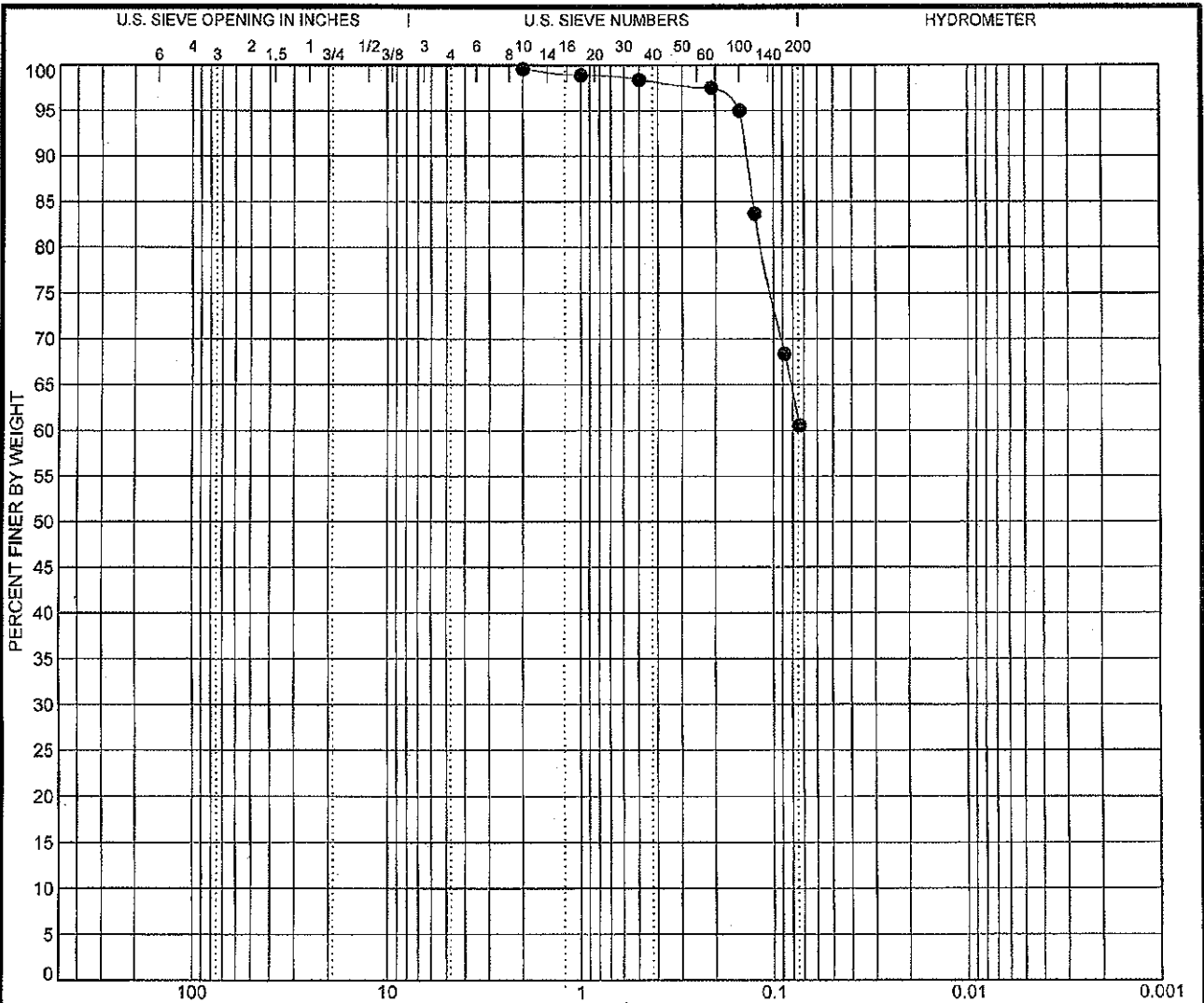
- Geotechnical Engineering
- Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation
CLIENT: HDR Engineering, Inc.
BORING ID.: AA-40
DESCRIPTION: Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-23.32' to -25.32' NAVD	-25.32' to -27.32' NAVD	-27.32' to -29.32' NAVD	-29.32' to -31.32' NAVD	-35.32' to -37.32' NAVD
0.40	13.31	7.28	0.24	0.54

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-23.32' to -25.32' NAVD	-25.32' to -27.32' NAVD	-27.32' to -29.32' NAVD	-29.32' to -31.32' NAVD	-35.32' to -37.32' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	98.90	67.90	80.83	99.50	99.17
#35	98.40	56.20	72.41	99.00	98.96
#60	97.90	48.50	66.27	98.38	97.84
#70	97.50	43.10	61.42	97.59	93.14
#100	95.00	29.50	37.92	59.78	40.86
#120	83.70	19.90	20.71	36.01	29.34
#170	68.40	14.00	11.04	22.18	22.10
#200	60.60	12.60	9.03	18.80	20.06
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	N/A	0.27	0.18	0.14	0.17
MEAN GRAIN SIZE (mm)	N/A	0.39	0.30	N/A	N/A
SORTING (σ)	N/A	N/A	N/A	N/A	N/A

*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
● AA-40	23.3'	AA-40 (-23.3' to -25.3' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-40	23.3'	2				0.0			

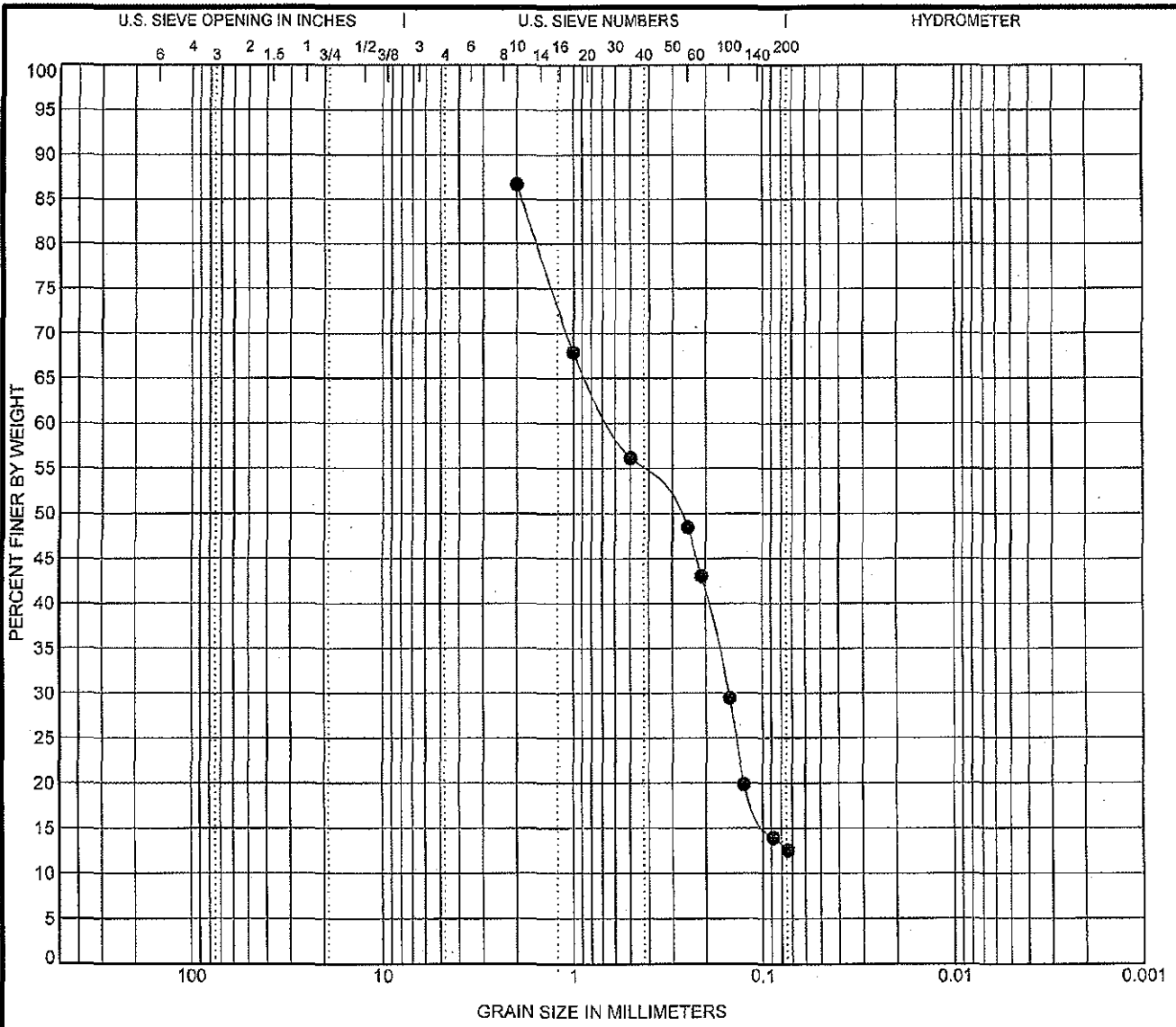
U.S. GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.3 U.S. LAB.GDT. 11/17/09



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

GRAIN SIZE DISTRIBUTION

Project: Prop. Anchorage Area "C" Sand Source Inv.
 Location: Galveston Island, Texas
 Number: G109233



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-40	25.3'	AA-40 (-25.3' to -27.3' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-40	25.3'	2	0.626	0.151		0.0			

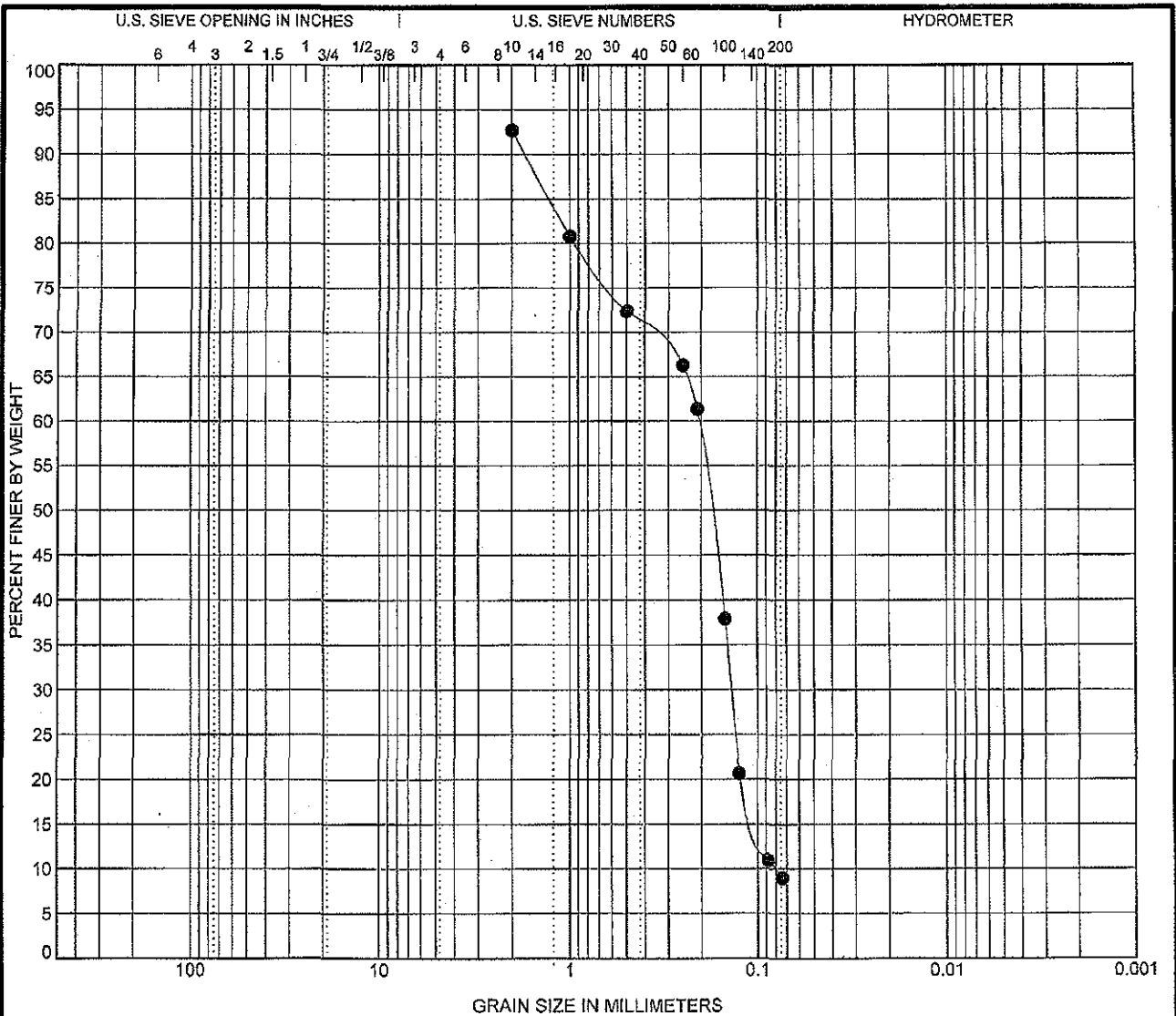
US GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.J. US LAB.GDT 11/17/09



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

GRAIN SIZE DISTRIBUTION

Project: Prop. Anchorage Area "C" Sand Source Inv.
 Location: Galveston Island, Texas
 Number: G109233



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-40	27.3'	AA-40 (-27.3' to -29.3' NAVD)				1.14	2.55

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-40	27.3'	2	0.206	0.137	0.081	0.0			

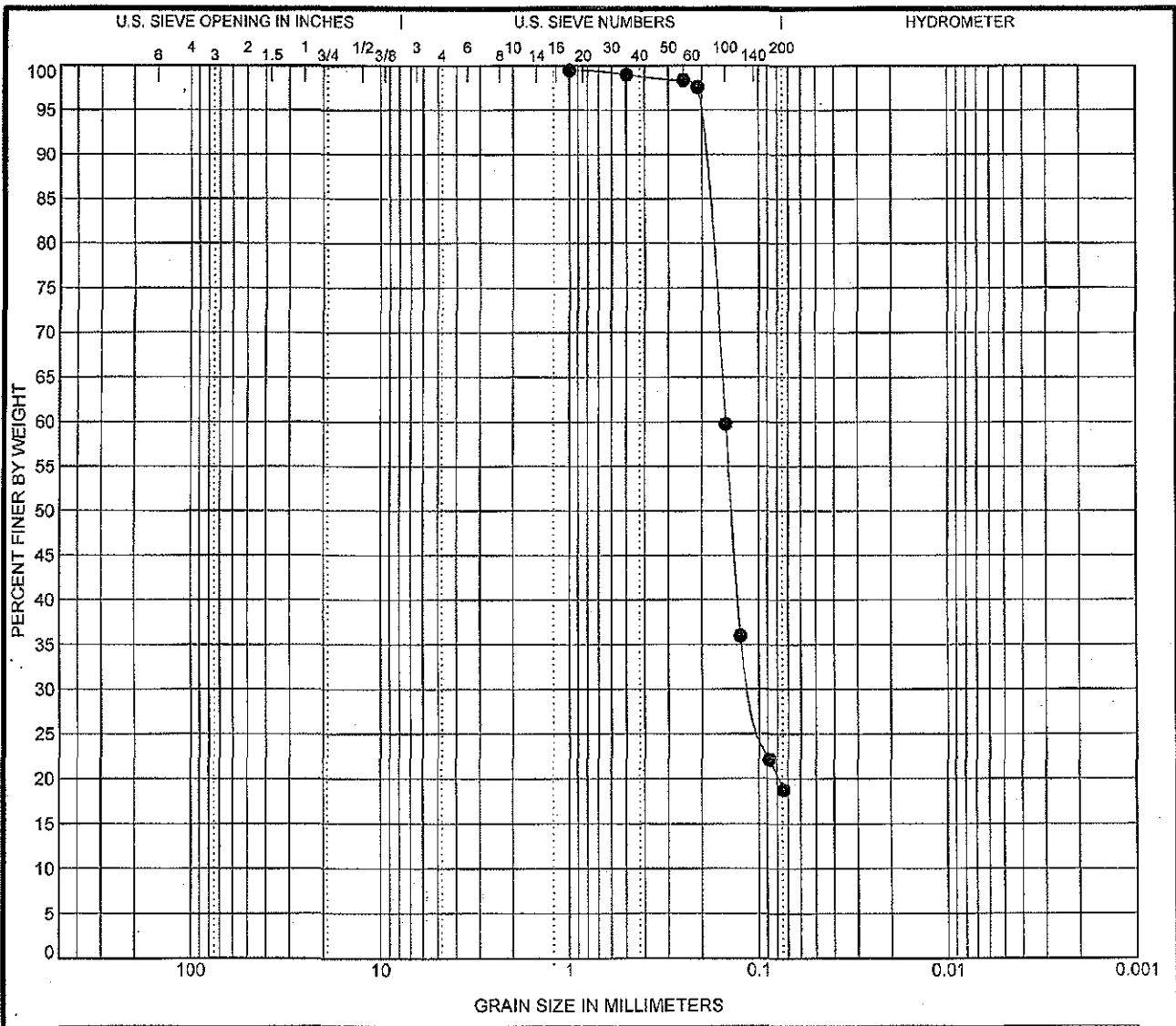
U.S. GRAIN SIZE: G109233 ANCHORAGE BASIN C.G.P.J. U.S. LAB. GDT. 1/17/09



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

GRAIN SIZE DISTRIBUTION

Project: Prop. Anchorage Area "C" Sand Source Inv.
 Location: Galveston Island, Texas
 Number: G109233



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-40	29.3'	AA-40 (-29.3' to -31.3' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-40	29.3'	1	0.149	0.107		0.0			

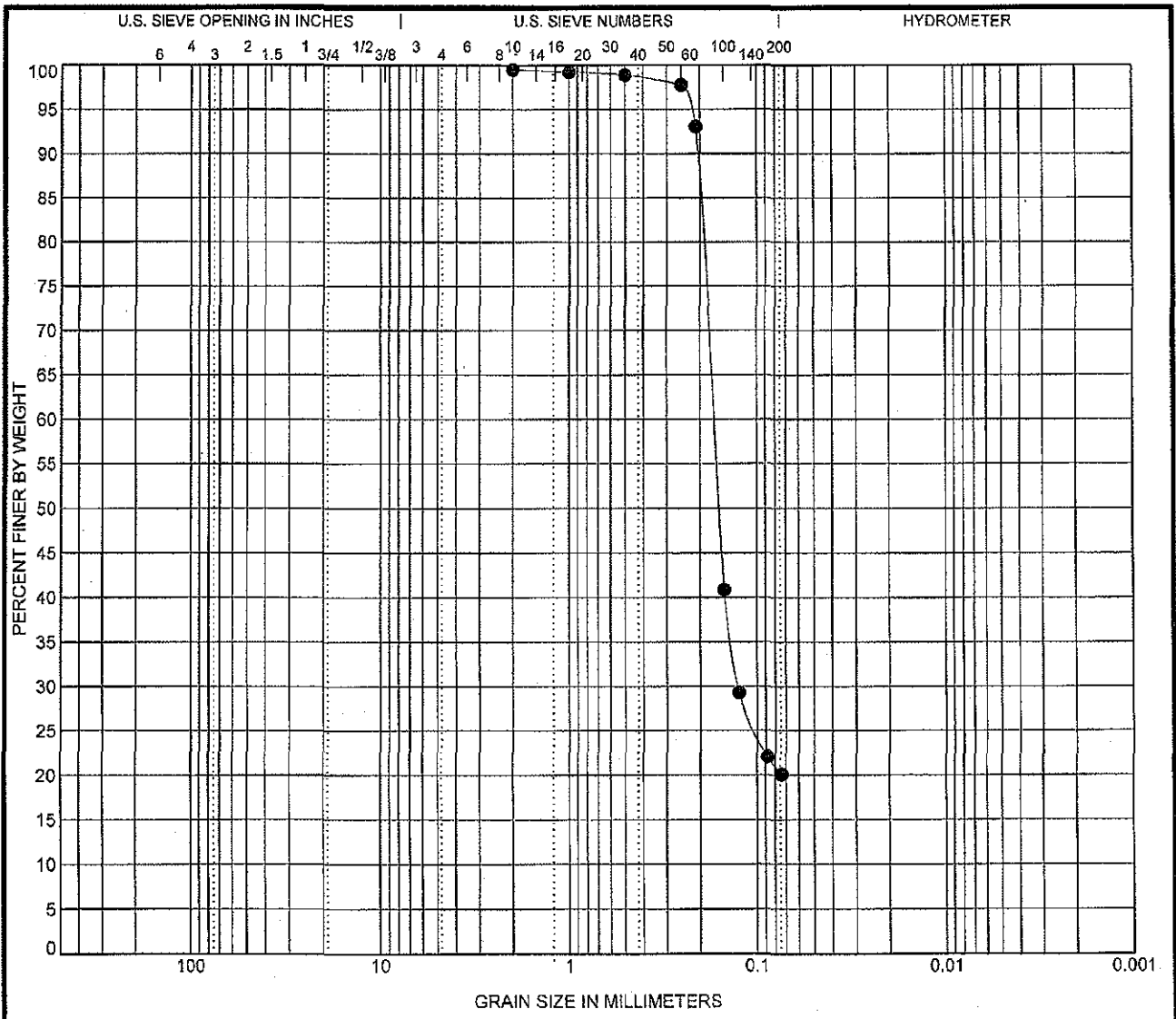
US GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.J. US LAB.GDT. 1/17/09



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

GRAIN SIZE DISTRIBUTION

Project: Prop. Anchorage Area "C" Sand Source Inv.
 Location: Galveston Island, Texas
 Number: G109233



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-40	35.3'	AA-40 (-35.3' to -37.3' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-40	35.3'	2	0.169	0.126		0.0			

GRAIN SIZE DISTRIBUTION



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

Project: Prop. Anchorage Area "C" Sand Source Inv.
 Location: Galveston Island, Texas
 Number: G109233

U.S. GRAIN SIZE G109233 ANCHORAGE BASIN C.GPJ U.S. LAB.GDT 11/17/09

Date: 10-16-89
 Project Location:

BORING LOG
 GALVESTON
 Type: HSA

Boring No.: AA-40
 Location:

Depth Feet	Symbol	Sample	N-Blows Per Foot	MATERIAL DESCRIPTION	H ² O on Red H ² O Upon Comp. Cave Upon Comp.
1.0 - 2.5		1	1/10	Grey sandy silt	GPS. 29.35311 94.76981
3.5 - 6.0		2	1/10	(Small sample) sand frag/silt	no picture row 24'
6.0 - 7.5		3	1/10	Shell frag / grey fine sand	
8.5 - 10.0		4	1/2	grey silty sand	
11.0 - 12.5		5	WH	grey silt	
13.5 - 15.0		6	WH	same	
16.5 - 20.0		7	1/3	grey sil-y. sand w shell frag	
23.5 - 25.0		8	1/2	same	
28.5 - 30.0		9			
33.5 - 35.0		10			
38.5 - 40.0		11			
43.5 - 45.0		12			
48.5 - 50.0		13			

LOG OF BORING AA-40

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

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): Hollow Stem Auger			
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			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION:
						LL	PL	PI				SURFACE ELEVATION: -23.32' NAVD
DESCRIPTION OF STRATUM												
	5											12'
	10											
	15											
	20											
	25	SS S-1	X	N= 0						61	SANDY CLAY , dark bluish gray, very soft.	
	26	SS S-2	X	N= 1						13	SILTY CLAYEY SAND , with shell fragments, gray, very loose.	
	27	SS S-3	X	N= 5						9	POORLY GRADED SAND , with clay and shell fragments, gray, loose.	
	28	SS S-4	X	N= 5						19	SILTY CLAYEY SAND , with shell fragments, bluish gray, loose.	
	29	SS S-5	X	N= WOH							Same as above, very loose.	
	30	SS S-6	X	N= 1							Same as above.	
	31	SS S-7	X	N= 3						20	SILTY CLAYEY SAND , with shell fragments, bluish gray, very loose.	
	32	SS S-8	X	N= 4							SANDY CLAY , with shell fragments, bluish gray, firm.	
	33										Boring was extended to an elevation of -39.3-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. 29.35311 W. 94.76981.
 WOH = Weigh of Hammer

LOG OF BORING G109233 ANCHORAGE BASIN C.GPJ ROCK ETL.GDT 11/20/09