

# LOG OF BORING AA-39



Rock Engineering & Testing Lab., Inc.  
6817 Leopard St.  
Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
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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: -27.82' NAVD
												DESCRIPTION OF STRATUM
	5											
	10											
	15											
	20											
	25											
	30	SS S-1	N=2								5	<b>POORLY GRADED SAND</b> , with clay and shell fragments, gray and brown, very loose.
	31	SS S-2	N=3									Same as above.
	32	SS S-3	N=4								11	Same as above, gray, loose.
	33	SS S-4	N=3								4	<b>POORLY GRADED SAND</b> , with shell fragments, gray, very loose.
	34	SS S-5	N=3								7	Same as above, with clay.
	35	SS S-6	N=11								6	Same as above, medium.
	36	SS S-7	N=9								13	<b>SILTY CLAYEY SAND</b> , with shell fragments, gray, loose.
	40											Boring was extended to an elevation of -41.8-feet NAVD during the drilling operations.
											<b>REMARKS:</b> Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by RETL at GPS Coord. N. 29.35159 W. 94.77094.	

LOG OF BORING 3233 ANCHORAGE BASIN C.G.P.J. ROCK ETL GDT 11/30/09

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



- Geotechnical Engineering
- Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation  
 CLIENT: HDR Engineering, Inc.  
 BORING ID.: AA-39  
 DESCRIPTION: Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-27.82' to -29.82' NAVD	-31.82' to -33.82' NAVD	-33.82' to -35.82' NAVD
31.10	7.55	10.36

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-27.82' to -29.82' NAVD	-31.82' to -33.82' NAVD	-33.82' to -35.82' NAVD
#10	100.00	100.00	100.00
#18	47.10	81.10	73.40
#35	32.59	65.30	51.80
#60	25.13	45.60	38.60
#70	21.29	35.80	30.10
#100	11.50	19.10	13.40
#120	7.70	14.60	7.60
#170	5.30	11.60	4.70
#200	4.70	10.70	4.20
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	1.10	0.28	0.45
MEAN GRAIN SIZE (mm)	0.58	0.36	0.49
SORTING ( $\sigma$ )	1.15	N/A	1.29

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



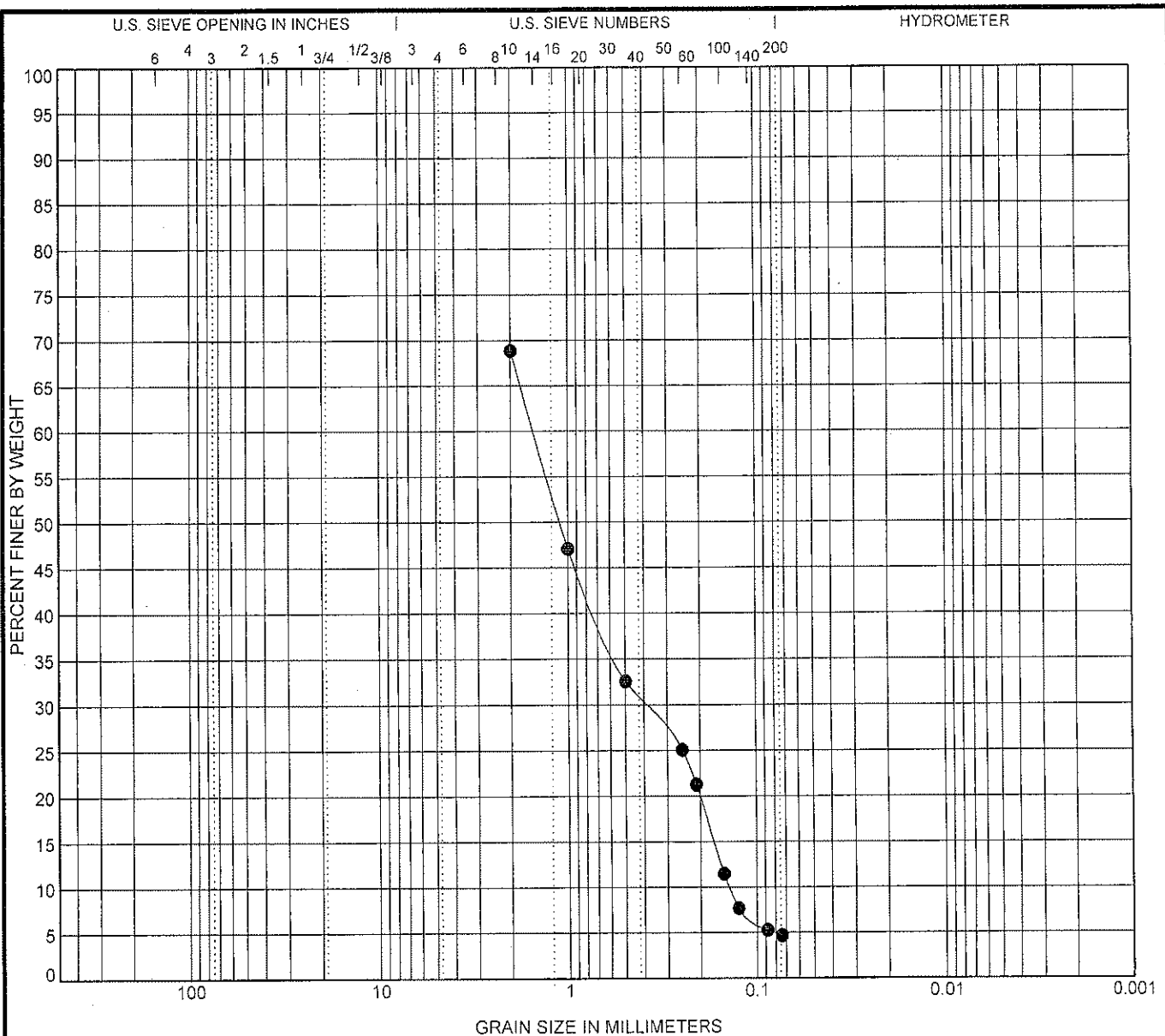
- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Galveston Anchorage Area C Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-39  
**DESCRIPTION:** Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-35.82' to -37.82' NAVD	-37.82' to -39.82' NAVD	-39.82' to -41.82' NAVD
7.93	6.09	0.62

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-35.82' to -37.82' NAVD	-37.82' to -39.82' NAVD	-39.82' to -41.82' NAVD
#10	100.00	100.00	100.00
#18	78.00	84.63	96.70
#35	65.20	75.48	93.20
#60	56.80	70.89	91.20
#70	51.80	68.05	89.50
#100	24.50	25.22	32.20
#120	14.30	12.76	20.50
#170	7.90	6.61	14.10
#200	6.70	5.58	12.90
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.20	0.19	0.18
MEAN GRAIN SIZE (mm)	0.35	0.30	0.15
SORTING ( $\sigma$ )	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-39	(-27.82' to -29.82' NAVD)	AA-39 (-27.82' to -29.82' NAVD)				0.74	10.84

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-39	(-27.82' to -29.82' NAVD)	2	1.507	0.393	0.139	0.0			

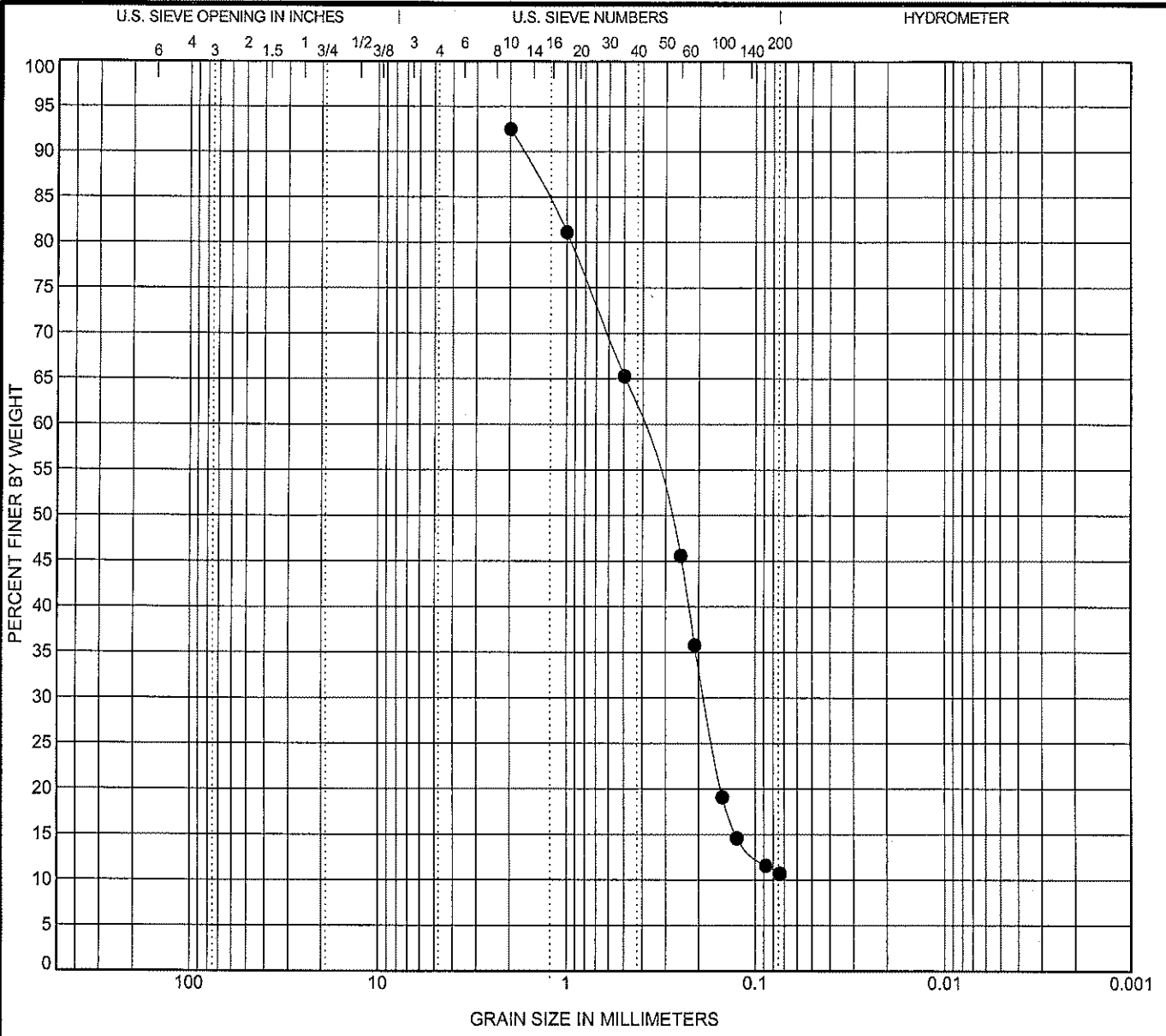
US GRAIN SIZE G109233 ANCHORAGE BASIN C.GPJ US LAB GDT 12/1/03



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### GRAIN SIZE DISTRIBUTION

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 Number: G109233



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-39	(-31.82' to -33.82' NAVD)	AA-39 (-31.82' to -33.82' NAVD)				1.29	6.42

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-39	(-31.82' to -33.82' NAVD)	2	0.415	0.186		0.0			

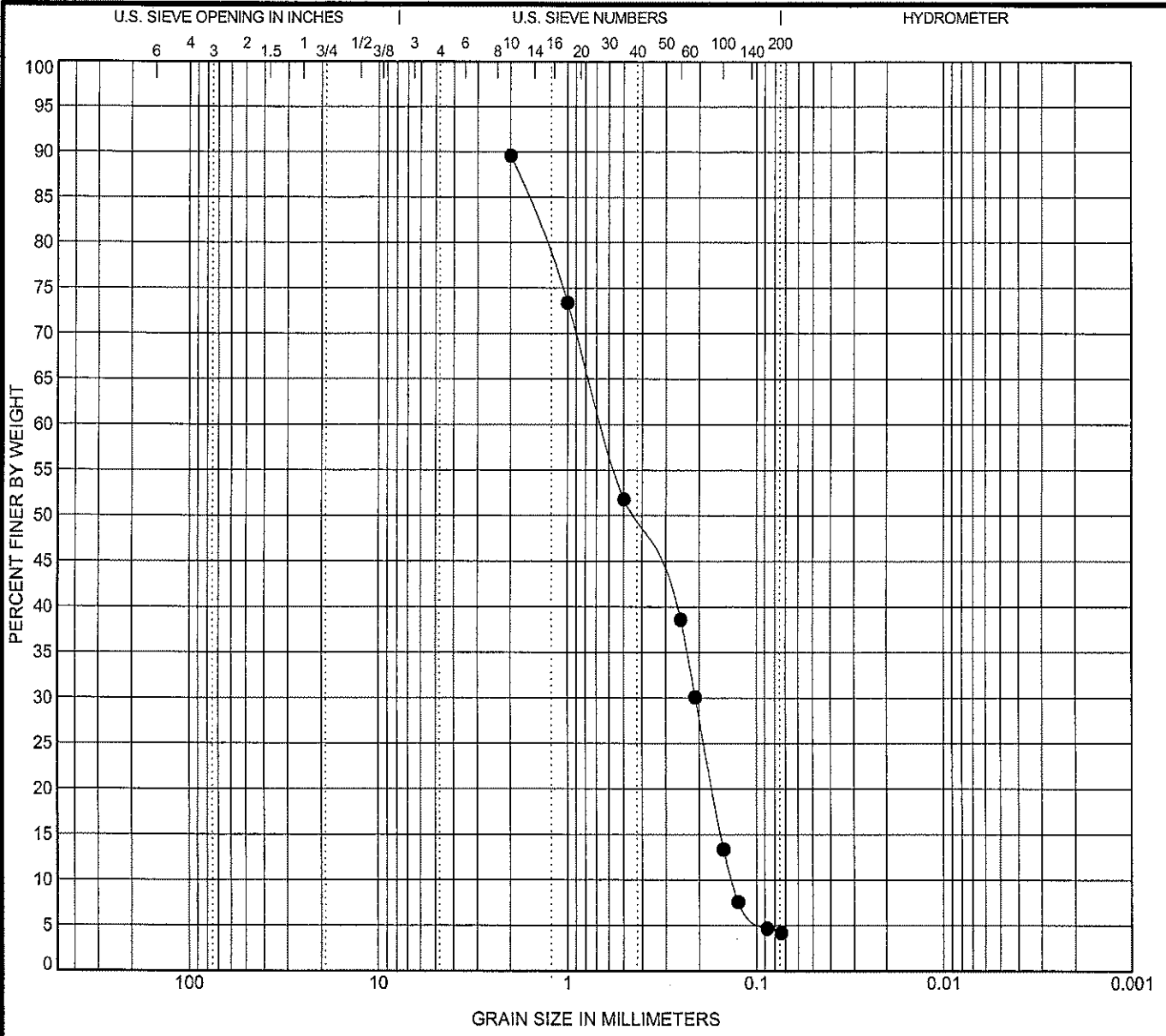


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U.S. GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.J. U.S. LAB. GDT. 12/1/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-39	(-33.82' to -35.82' NAVD)	AA-39 (-33.82' to -35.82' NAVD)				0.50	4.84

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-39	(-33.82' to -35.82' NAVD)	2	0.651	0.21	0.134	0.0			

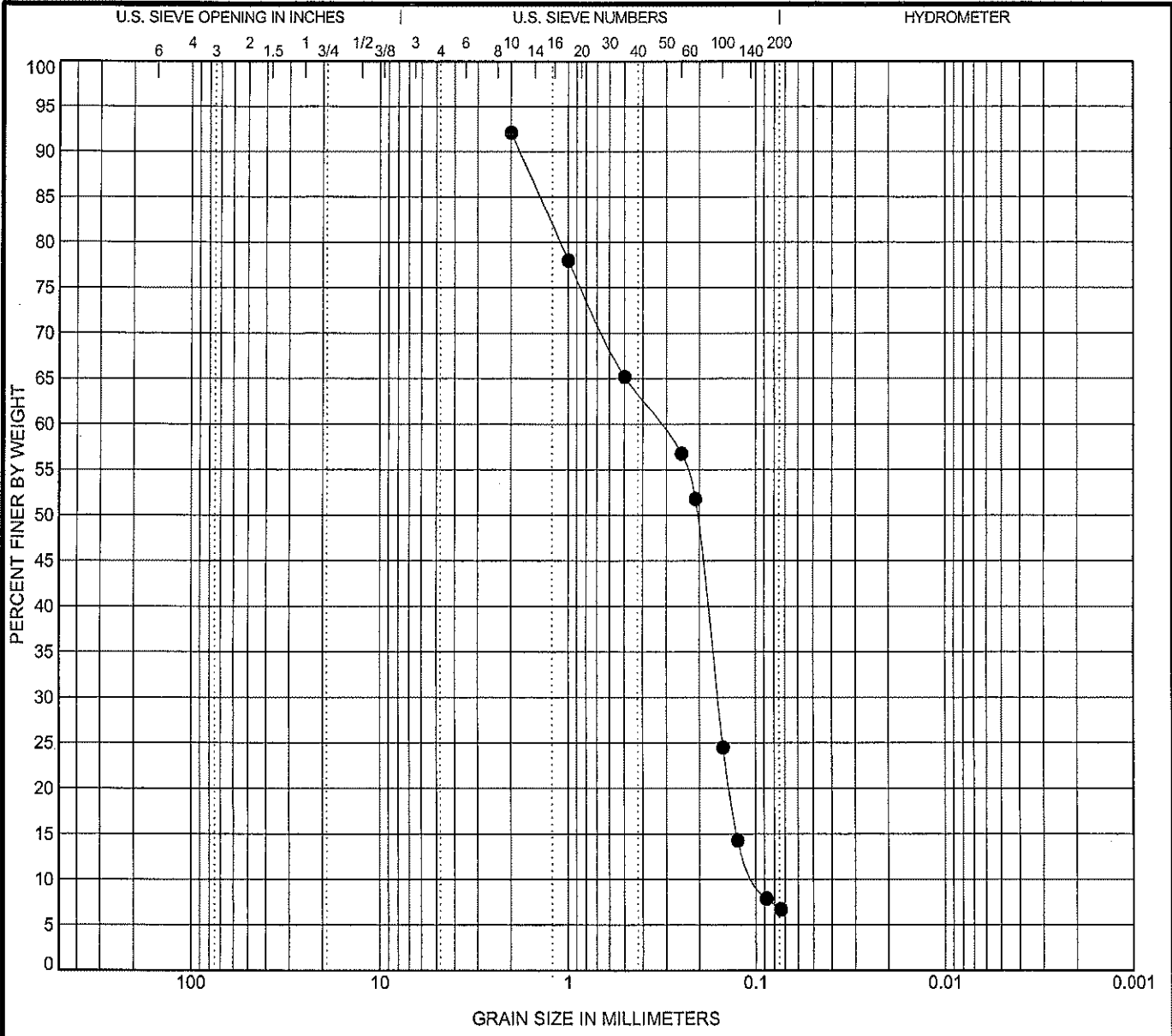
US GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.J. US LAB.GDT 12/1/08



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-39 (-35.82' to -37.82' NAVD)		AA-39 (-35.82' to -37.82' NAVD)				0.79	3.30

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-39 (-35.82' to -37.82' NAVD)		2	0.326	0.16	0.099	0.0			

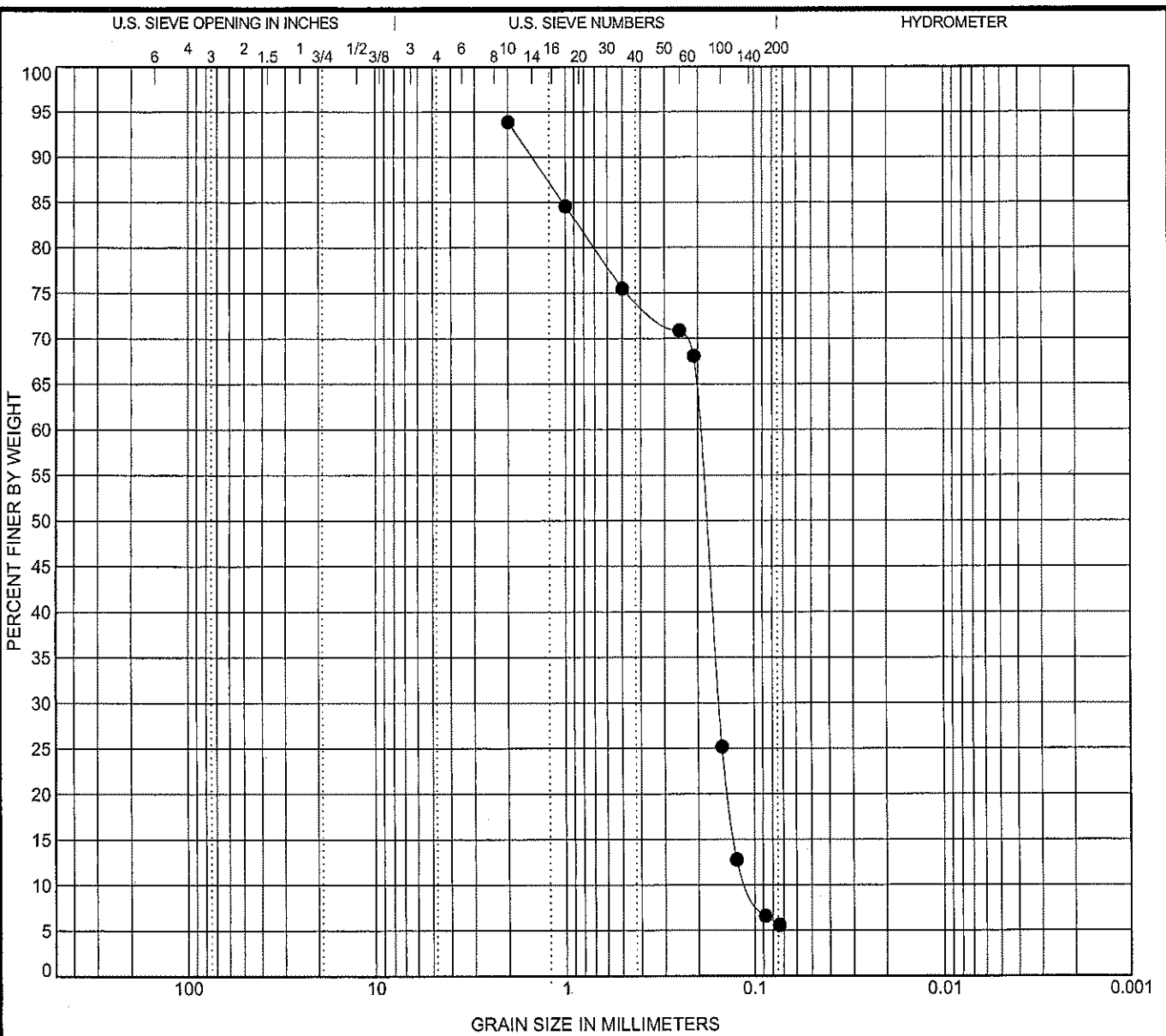


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U.S. GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.J. U.S. LAB. GDT 12/1/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-39	(-37.82' to -39.82' NAVD)	AA-39 (-37.82' to -39.82' NAVD)				1.14	1.85

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-39	(-37.82' to -39.82' NAVD)	2	0.197	0.155	0.107	0.0			



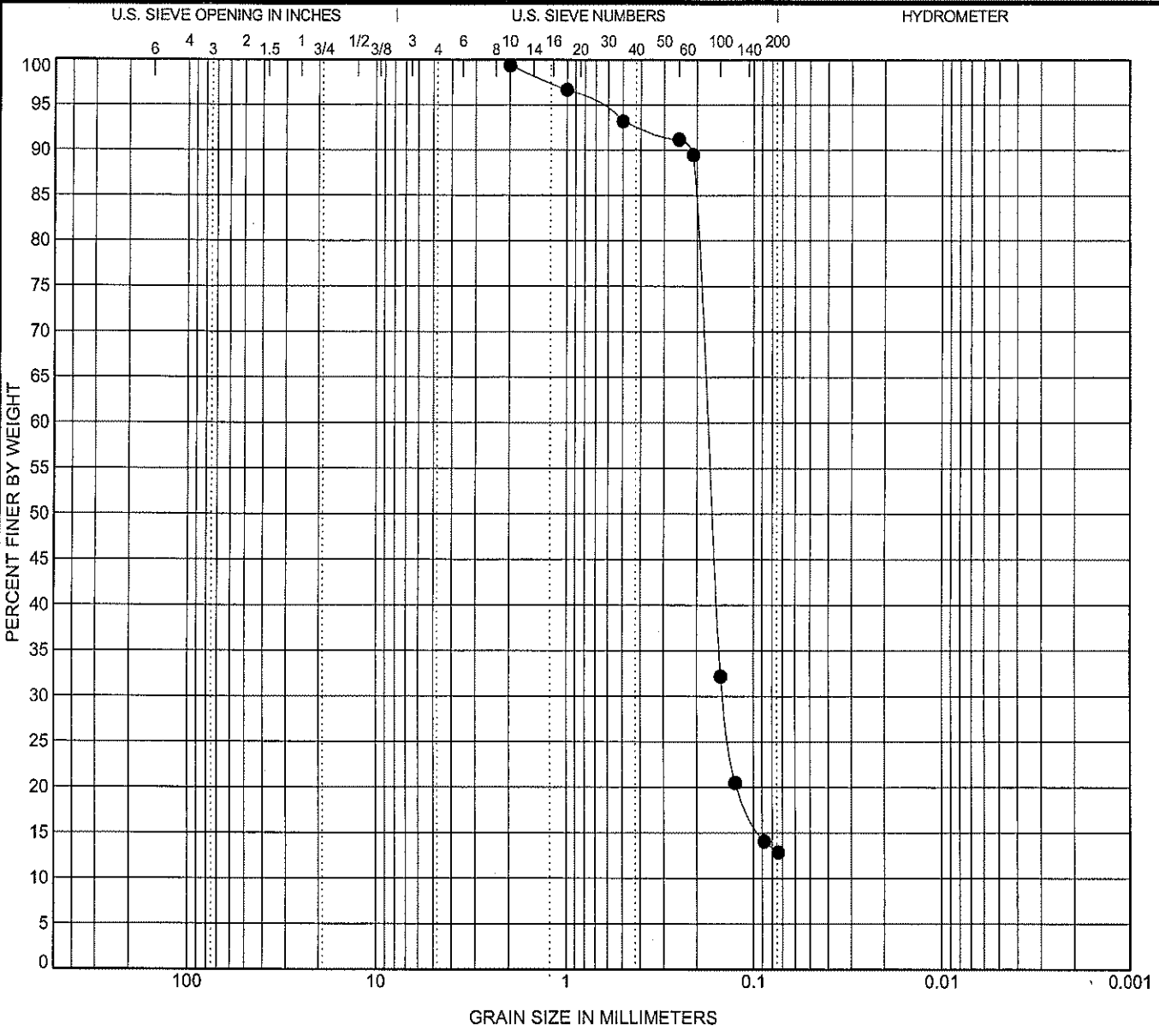
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-39	(-39.82' to -41.82' NAVD)	AA-39 (-39.82' to -41.82' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-39	(-39.82' to -41.82' NAVD)	2	0.176	0.144		0.0			



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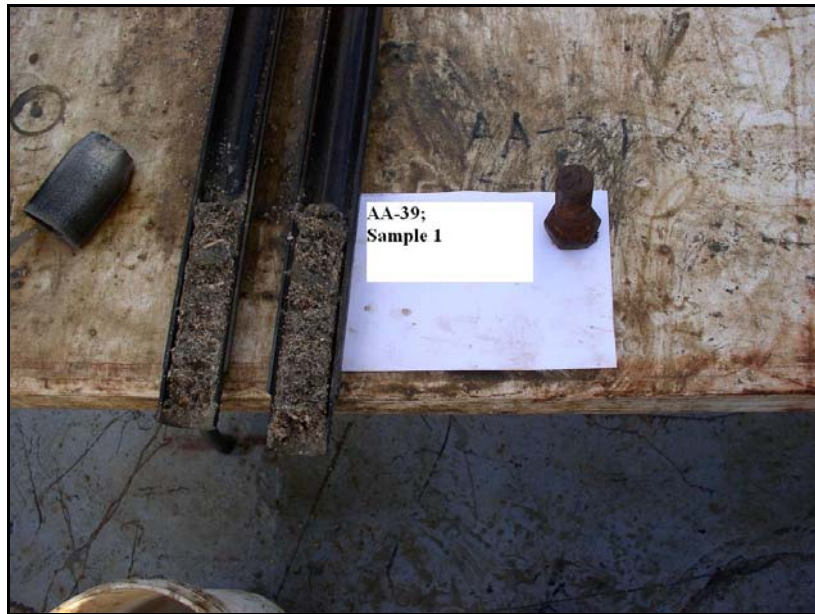


Figure 49: AA-39; Sample 1



Figure 50: AA-39; Sample 2

December 8, 2009  
Attn.: Ms. Lauren Augustin  
RETL Job No.: G109233

**PROP. GALVESTON ANCHORAGE AREA C SAND SOURCE INVESTIGATION**  
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Figure 51: AA-39; Sample 3



Figure 52: AA-39; Sample 4

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Figure 53: AA-39; Sample 5



Figure 54: AA-39; Sample 6

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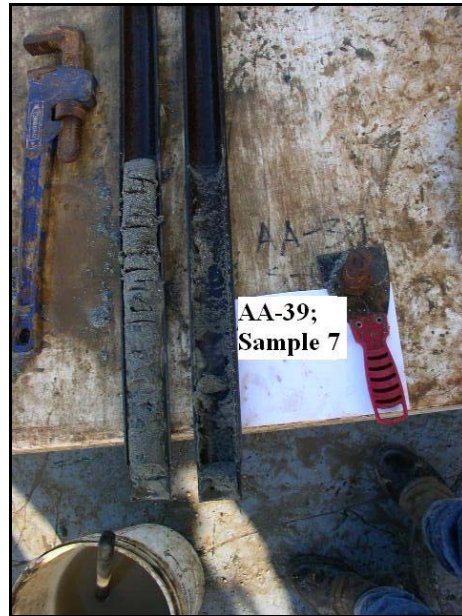


Figure 55: AA-39; Sample 7

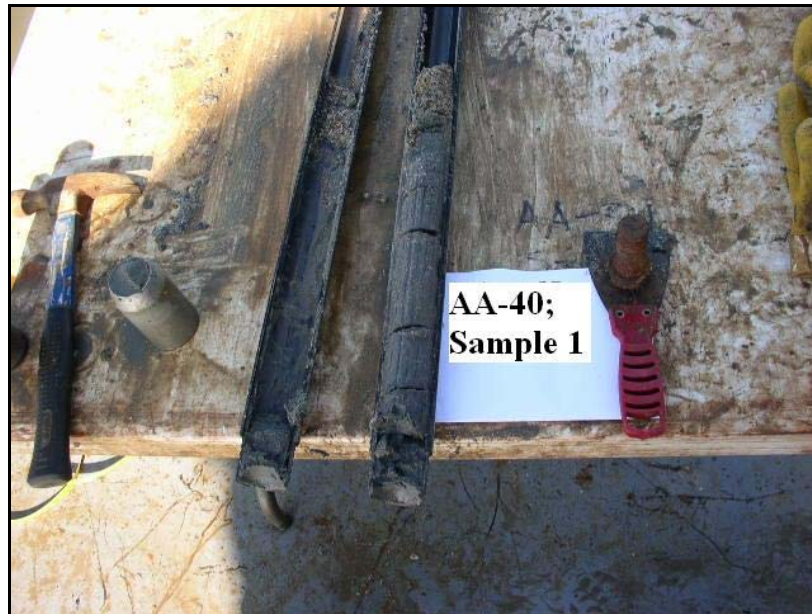


Figure 56: AA-40; Sample 1

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