

LOG OF BORING AA-42

SHEET 1 of 1



Rock Engineering & Testing Lab., Inc.
6817 Leopard St.
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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

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: -17.02' NAVD												
DESCRIPTION OF STRATUM												
	5											
	10											
	15											
	15	SS S-1	N= 0								15	<u>SILTY CLAYEY SAND</u> , with shell fragments, dark gray and bluish gray, very loose.
	20	SS S-2	N= 1									Same as above.
		SS S-3	N= 1								19	Same as above.
	25	SS S-4	N= 7									<u>POORLY GRADED SAND</u> , with shell fragments, gray, loose.
		SS S-5	N= 11								4	Same as above, gray and brown, medium.
		SS S-6	N= 11									Same as above, dark bluish gray.
	30	SS S-7	N= 17								5	<u>POORLY GRADED SAND</u> , with clay and shell fragments, dark bluish gray, medium.
		SS S-8	N= 11									Same as above.
		SS S-9	N= 10								12	Same as above, bluish gray and brown.
	35	SS S-10	N= 4								6	<u>POORLY GRADED SAND</u> , with clay and shell fragments, gray, loose.
		SS S-11	N= 1								75	<u>SANDY CLAY</u> , with shell fragments, dark gray, very soft.
												Boring was extended to an elevation of -39.0-feet NAVD during the drilling operations.

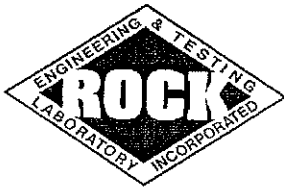
N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - POCKET TORVANE SHEAR STRENGTH

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.

2233 ANCHORAGE BASIN C.GPJ ROCK_ETL.GDT 11/30/09

LOG OF BORING



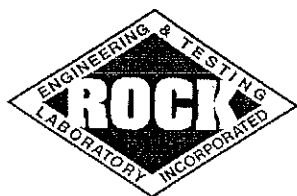
- Geotechnical Engineering
- Construction Materials Testing

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' NAVD	-21.02' to -23.08' NAVD	-25.02' to -27.02' NAVD	-29.02' to -31.02' NAVD
0.31	0.74	0.00	0.07

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-17.02' to -19.02' NAVD	-21.02' to -23.08' NAVD	-25.02' to -27.02' NAVD	-29.02' to -31.02' 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.

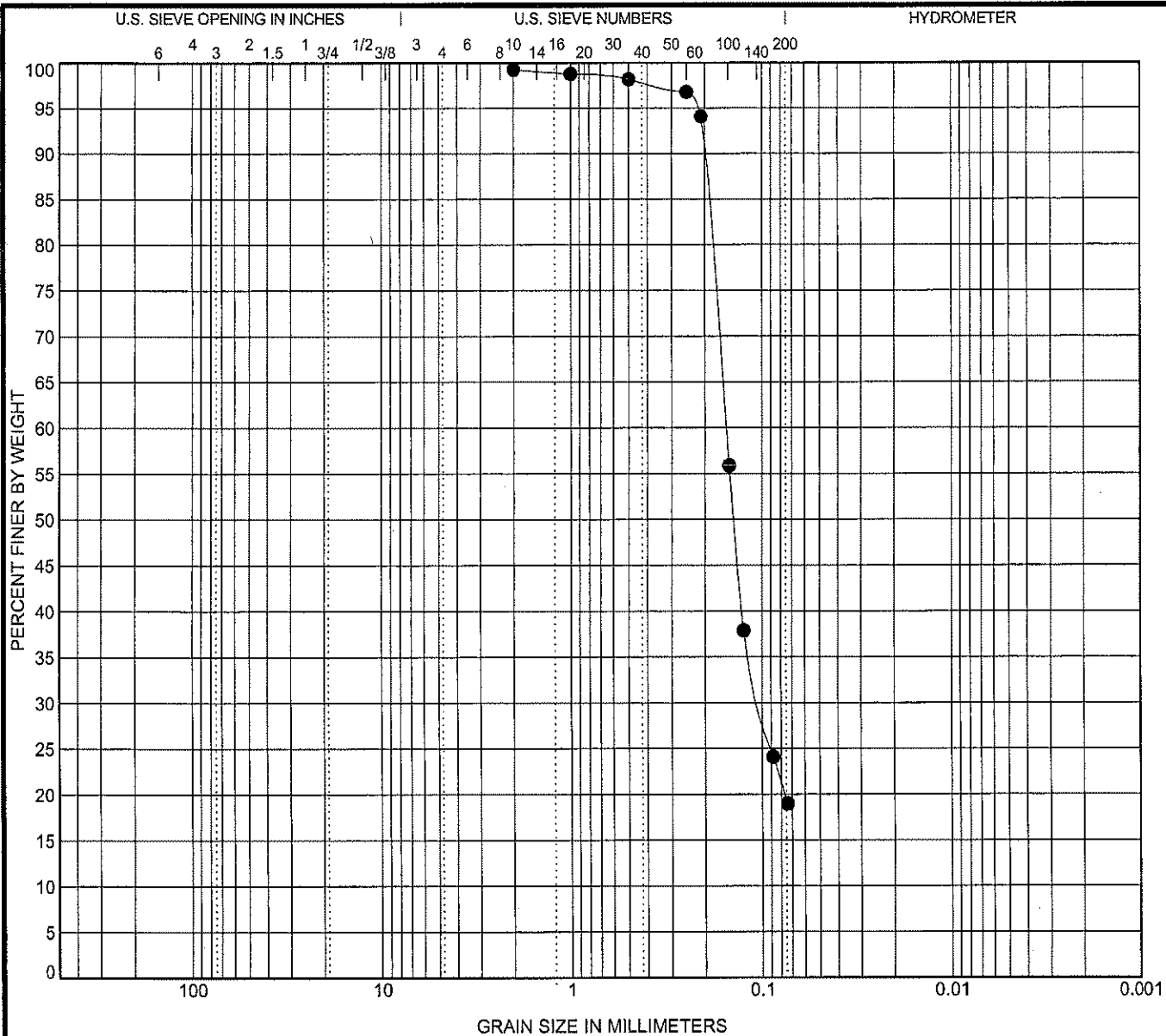
BORING ID.: AA-42

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.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

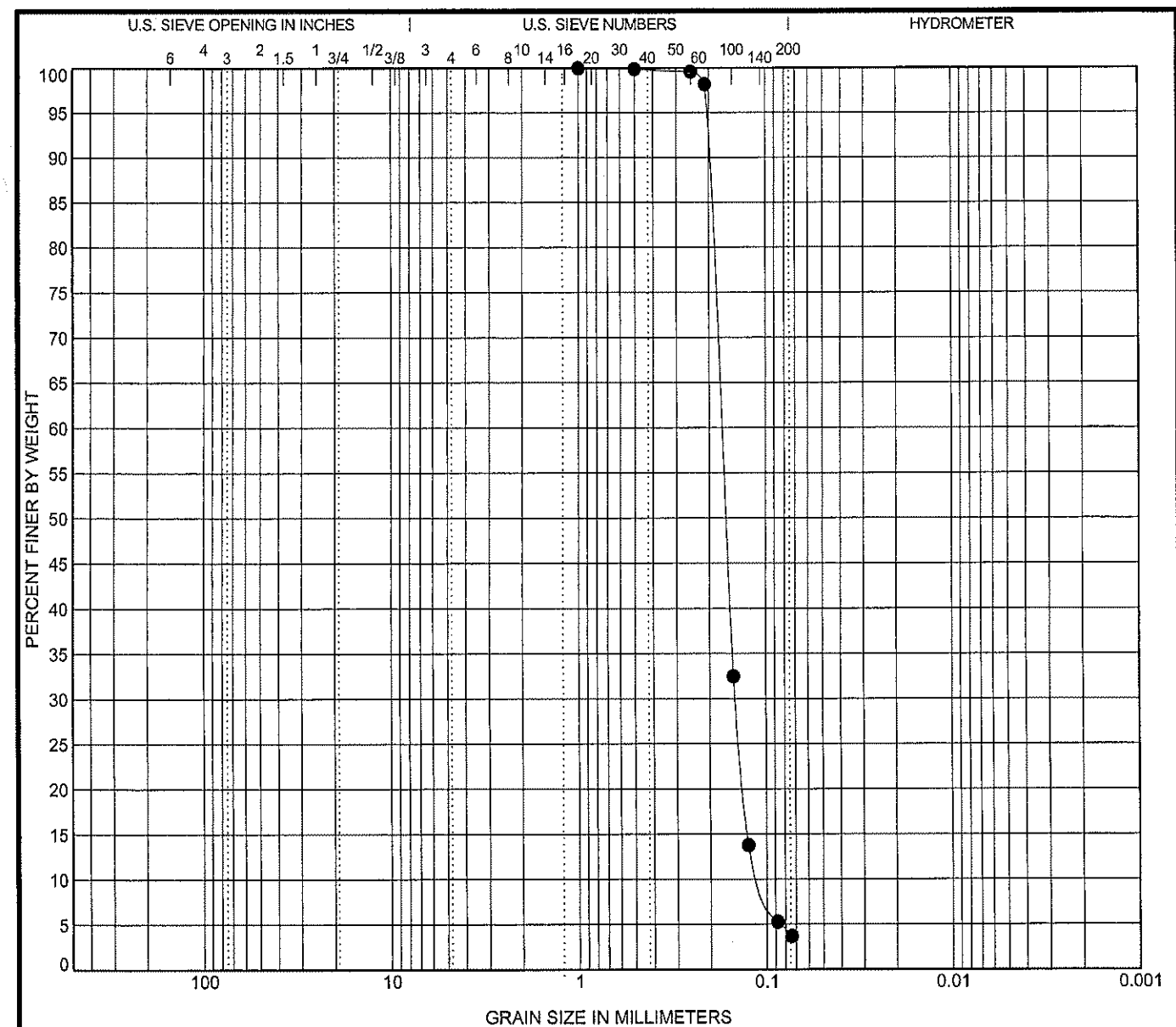
Specimen ID		Depth	Classification				LL	PL	PI	Cc	Cu
●	AA-42 (-21.02' to -23.02' NAVD)		AA-42 (-21.02' to -23.02' NAVD)								
Specimen ID		Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	AA-42 (-21.02' to -23.02' NAVD)		2	0.155	0.102		0.0				



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GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area C Sand Source Inv.
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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-42	(-25.02' to -27.02' NAVD)	AA-42 (-25.02' to -27.02' NAVD)				1.15	1.61

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-42	(-25.02' to -27.02' NAVD)	1	0.172	0.146	0.107	0.0			

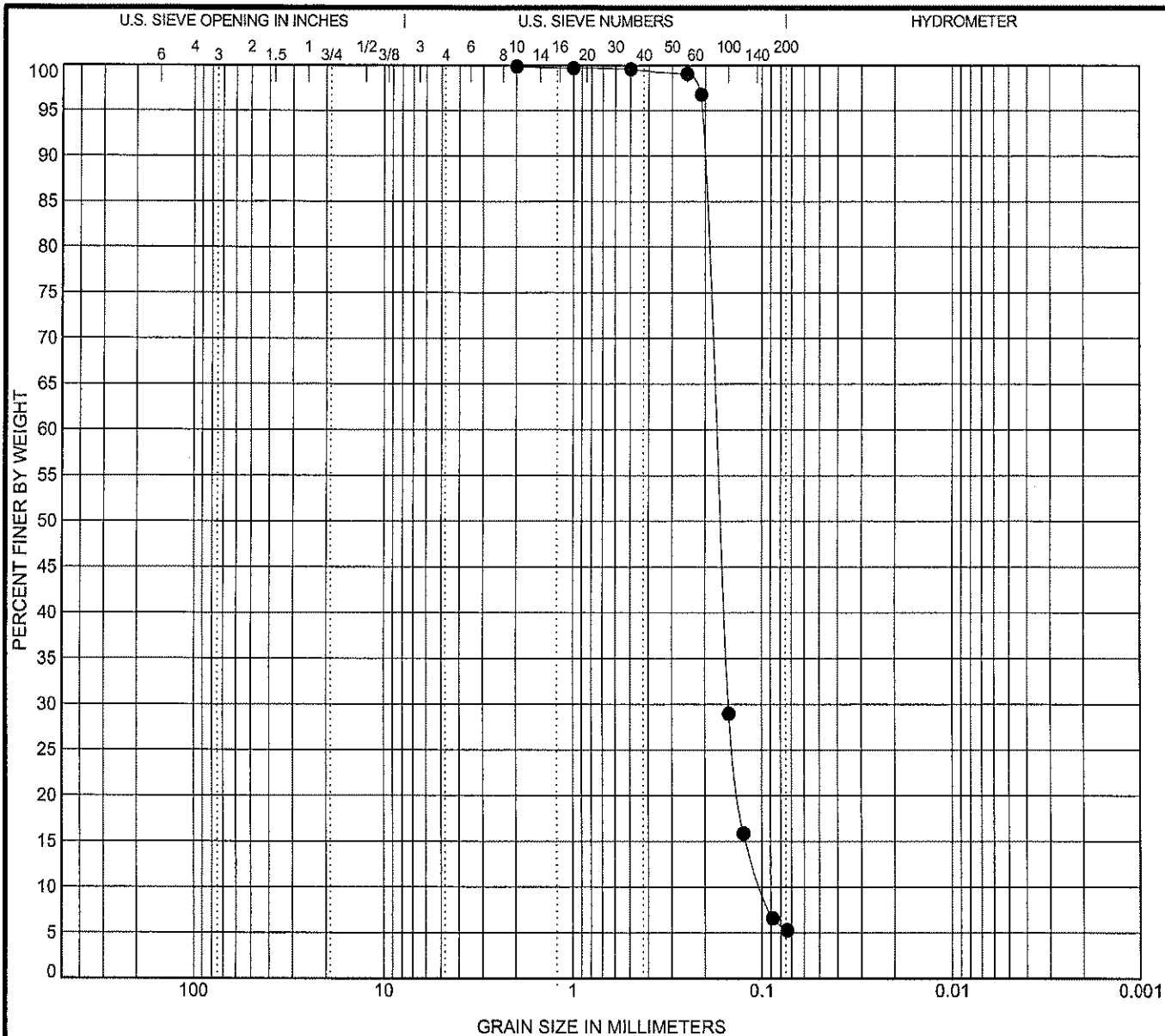


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US GRAIN SIZE G109233 ANCHORAGE BASIN C.GPJ US LAB.GDT 12/1/09



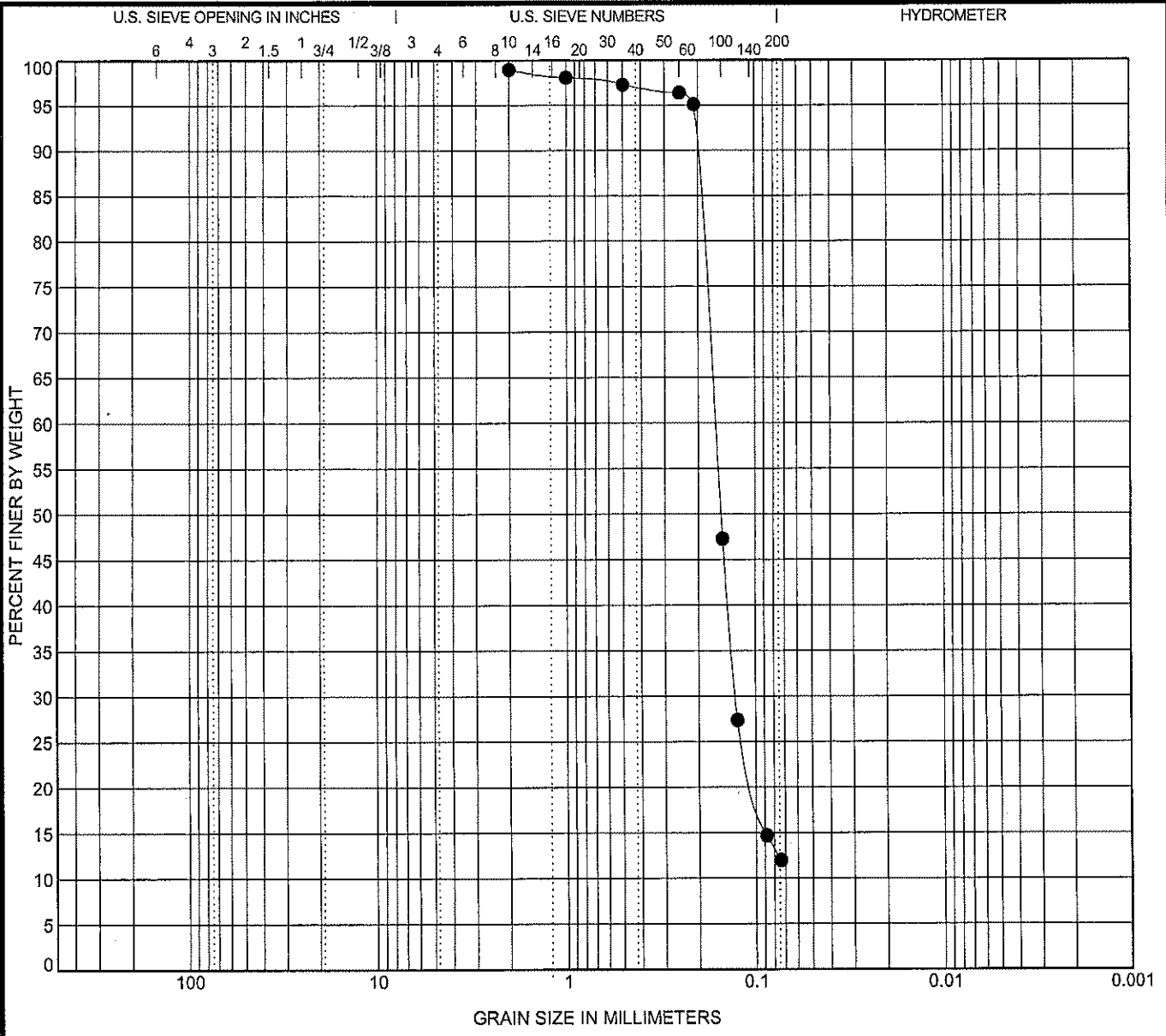
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

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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-42	(-33.02' to -35.02' NAVD)	AA-42 (-33.02' to -35.02' NAVD)				1.54	2.51

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-42	(-33.02' to -35.02' NAVD)	2	0.163	0.128		0.0			

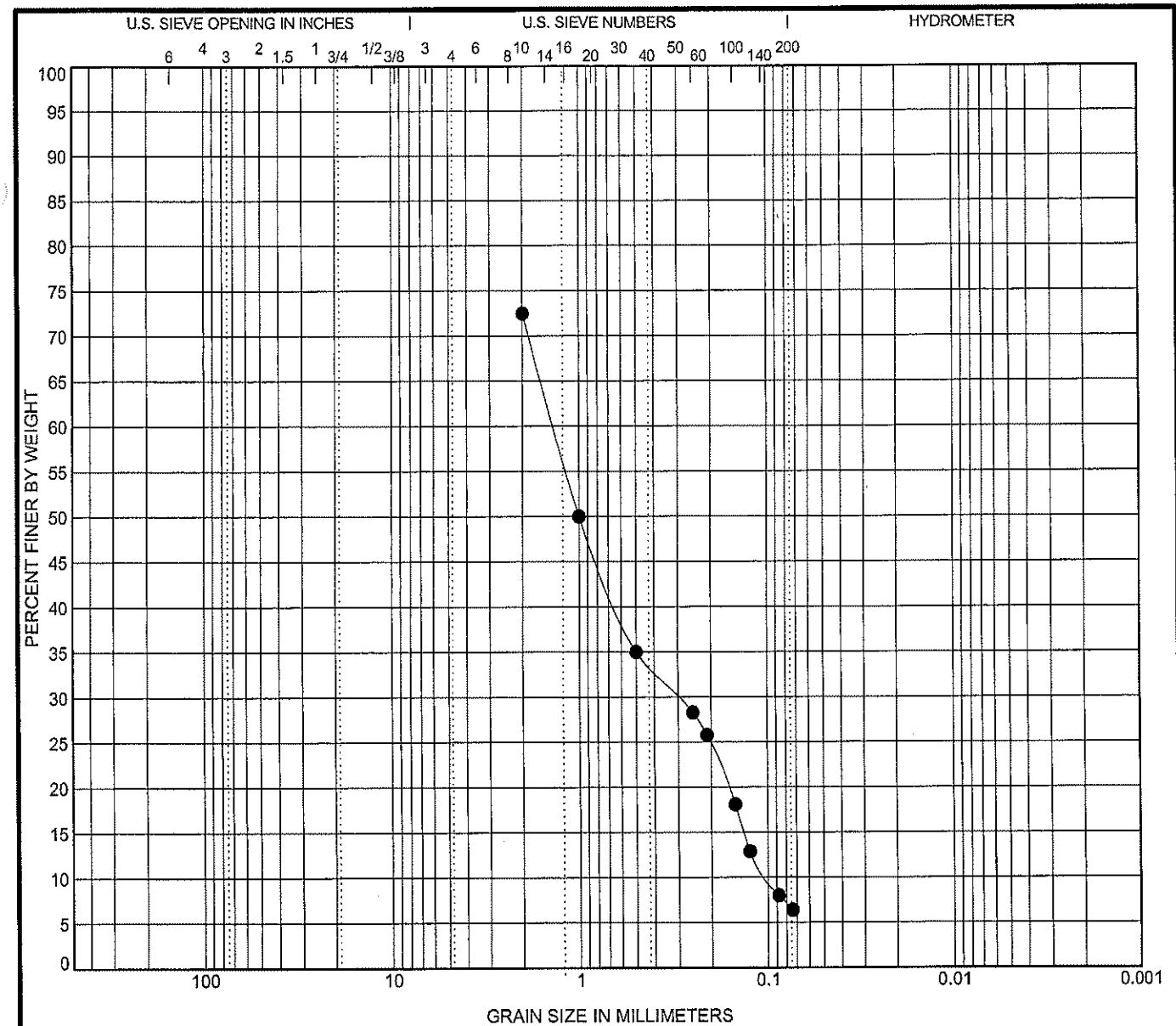


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U.S. GRAIN SIZE G109233 ANCHORAGE BASIN C.G.P.J. US LAB.GDT 12/1/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-42	(-35.02' to -37.02' NAVD)	AA-42 (-35.02' to -37.02' NAVD)				0.64	13.40

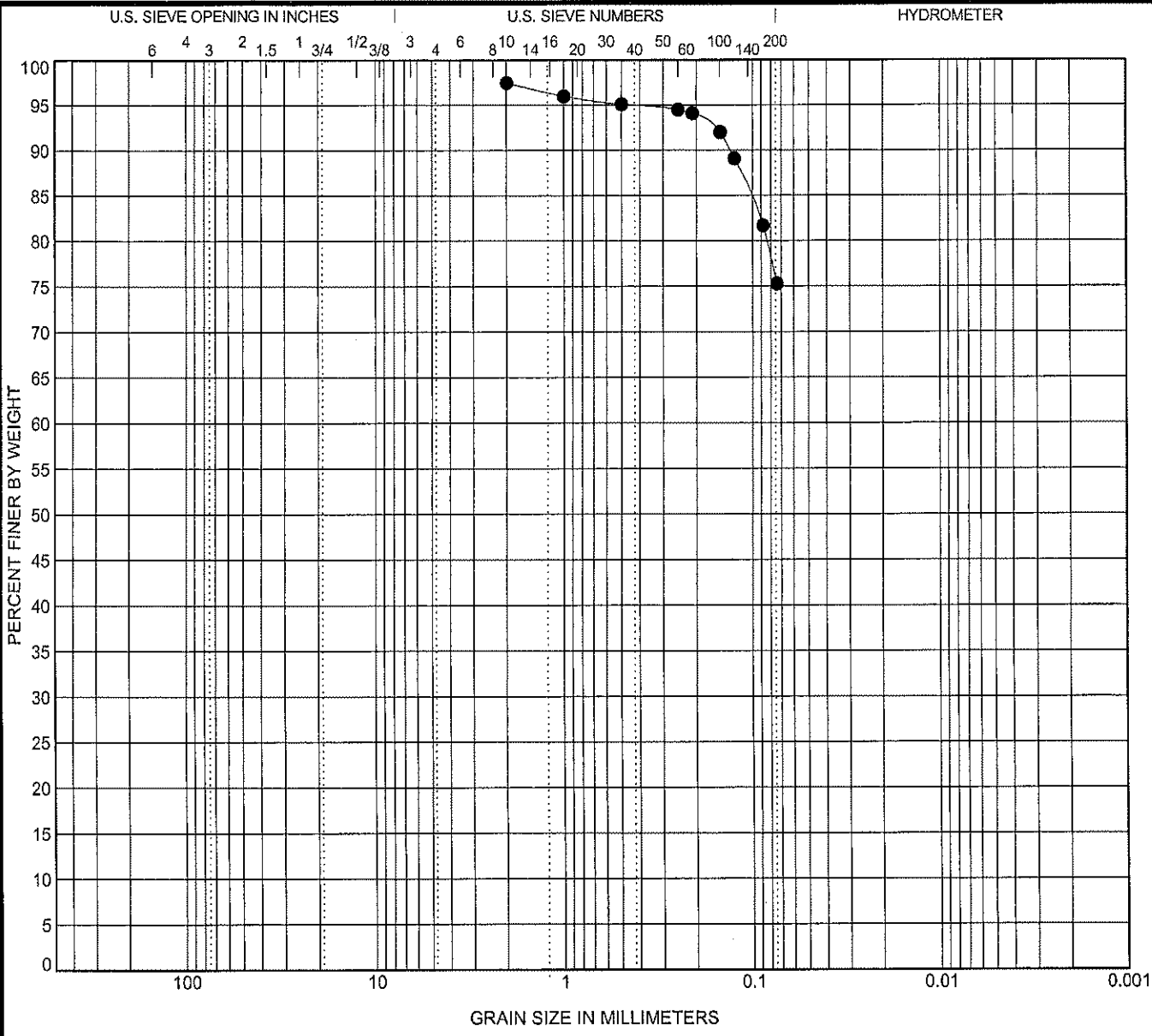
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-42	(-35.02' to -37.02' NAVD)	2	1.361	0.298	0.102	0.0			



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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-42	(-37.02' to -39.02' NAVD)	AA-42 (-37.02' to -39.02' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-42	(-37.02' to -39.02' NAVD)	2				0.0			



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



Figure 69: AA-42; Sample 1



Figure 70: AA-42; Sample 2

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

PROP. GALVESTON ANCHORAGE AREA C SAND SOURCE INVESTIGATION
Anchorage Area C, Galveston, Texas

ROCK ENGINEERING AND TESTING LABORATORY, INC.
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Figure 71: AA-42; Sample 4



Figure 72: AA-42; Sample 5

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Figure 73: AA-42; Sample 6



Figure 74: AA-42; Sample 7

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Figure 75: AA-42; Sample 8



Figure 76: AA-42; Sample 9

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Figure 77: AA-42; Sample 1



Figure 78: AA-43; Sample 1

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