LOG OF BORING AA-36

Rock Engineering & Testing Lab., Inc.
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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: 10/15/09 - 10/15/09

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -23.02' NAVD

FIELD DATA					LABORATORY DATA								DESCRIPTION OF STRATUM
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 (%)		
	5												
	10												
	15												
	20												
		SS S-1	X	N= WOH									**POORLY GRADED SAND**, with shell fragments, gray and brown, very loose.
	25	SS S-2	X	N= WOH							70		**SANDY CLAY**, dark gray, very soft.
		SS S-3	X	N= 2							30		**CLAYEY SAND**, gray, soft.
		SS S-4	X	N= 2							26		**SILTY CLAYEY SAND**, bluish gray, very loose.
	30	SS S-5	X	N= 4									Same as above, loose.
		SS S-6	X	N= 2							15		Same as above, dark gray and gray, very loose.
	35	SS S-7	X	N= 1							50		**SANDY CLAY**, with shell fragments, dark gray, very soft.
		SS S-8	X	N= 2							73		Same as above, 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. 29.35321 W. 94.76579.
WOH = Weight of Hammer

LOG_OF_BORING_9233 ANCHORAGE BASIN C.GPJ ROCK_ETL.GDT 11/30/09

· Geotechnical Engineering
· Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation
CLIENT: HDR Engineering, Inc.
BORING ID.: AA-36
DESCRIPTION: Anchorage Area C Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-25.02' to -27.02' NAVD	-27.02' to -29.02' NAVD	-29.02' to -31.02' NAVD
0.00	0.01	0.20

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-25.02' to -27.02' NAVD	-27.02' to -29.02' NAVD	-29.02' to -31.02' NAVD
#10	100.00	100.00	100.00
#18	100.00	99.70	99.60
#35	99.90	99.40	99.40
#60	99.60	96.00	98.10
#70	99.50	77.20	86.50
#100	97.20	48.40	44.60
#120	89.10	38.90	35.00
#170	76.30	31.90	28.70
#200	70.30	29.60	26.30
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	N/A	0.17	0.17
MEAN GRAIN SIZE (mm)	N/A	N/A	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.

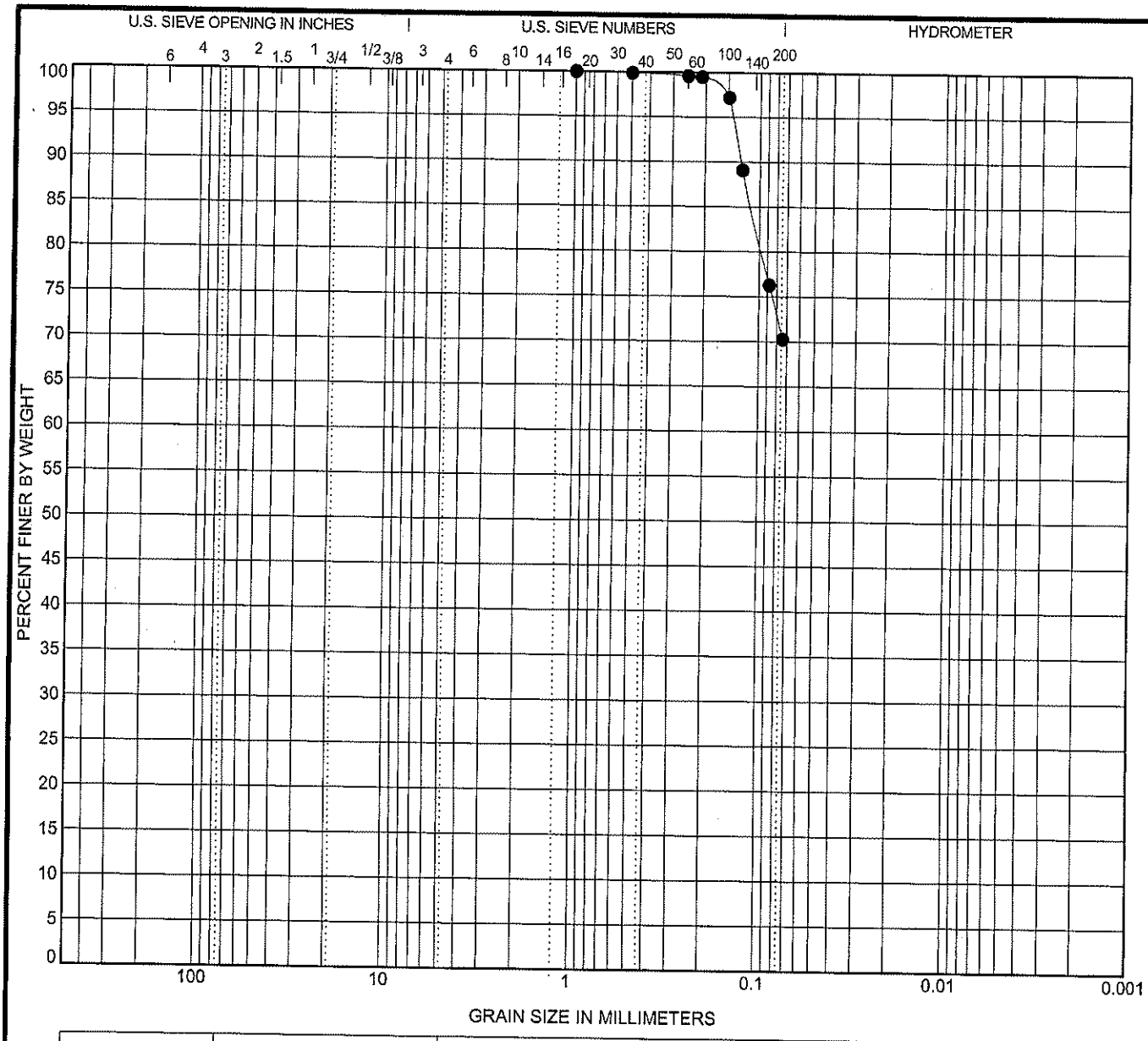
· Geotechnical Engineering
· Construction Materials Testing

PROJECT NAME: Galveston Anchorage Area C Sand Source Investigation
CLIENT: HDR Engineering, Inc.
BORING ID.: AA-36
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
0.50	0.10	0.00

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	98.20	99.80	99.90
#35	97.60	99.70	99.80
#60	93.60	99.40	99.50
#70	75.80	98.40	98.90
#100	37.40	91.70	95.00
#120	24.90	78.70	86.80
#170	16.90	57.30	76.20
#200	14.90	50.10	73.10
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.18	N/A	N/A
MEAN GRAIN SIZE (mm)	0.15	N/A	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-36	(-25.02' to -27.02' NAVD)	AA-36 (-25.02' to -27.02' NAVD)					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AA-36	(-25.02' to -27.02' NAVD)	1				0.0			

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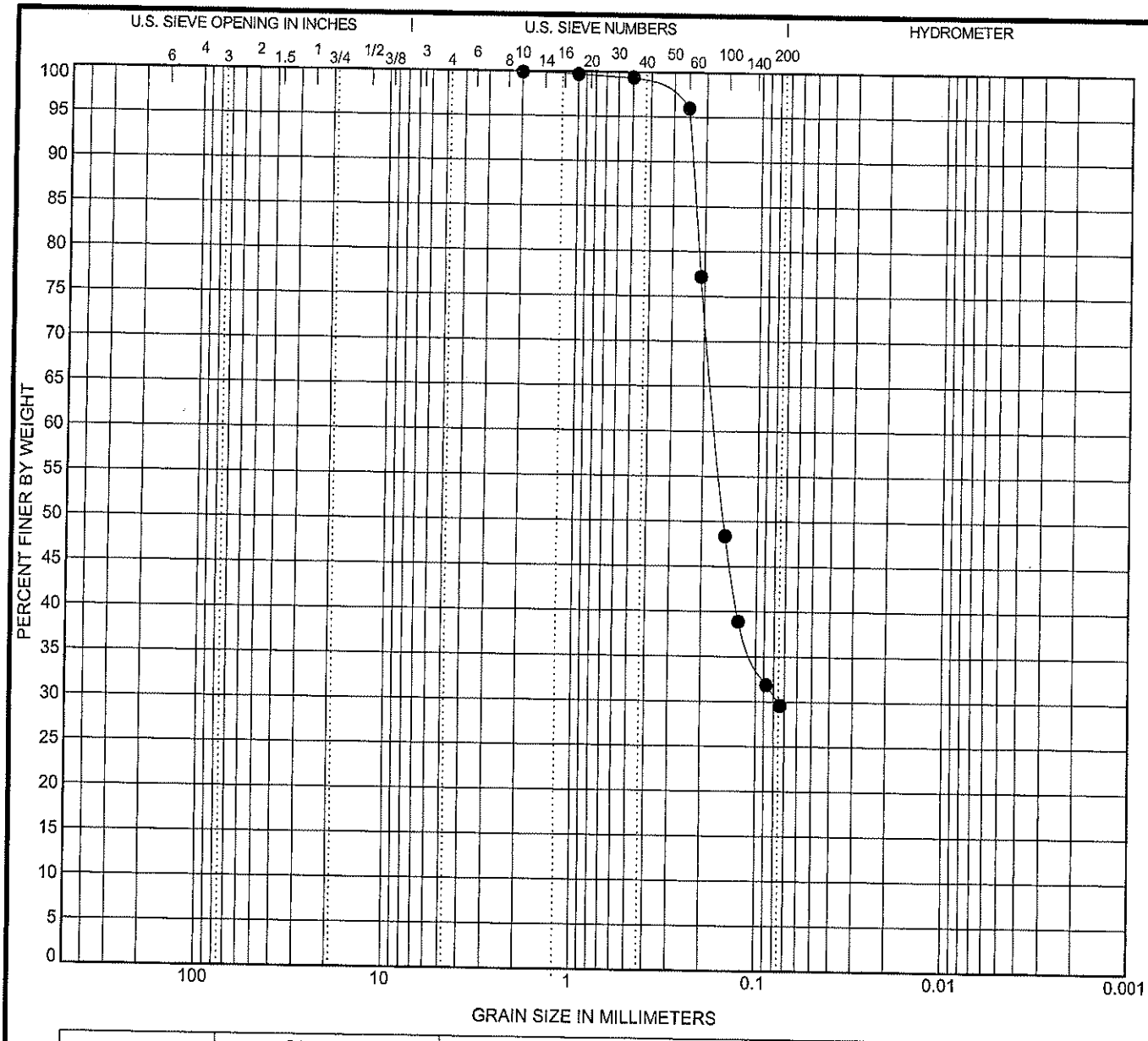
GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area C Sand Source Inv.

Location: Anchorage Area C, Galveston, Texas

Number: G109233

US_GRAIN_SIZE ...09233 ANCHORAGE BASIN C.GPJ 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-36	(-27.02' to -29.02' NAVD)	**AA-36 (-27.02' to -29.02' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AA-36	(-27.02' to -29.02' NAVD)	**2**	**0.171**	**0.076**		**0.0**			

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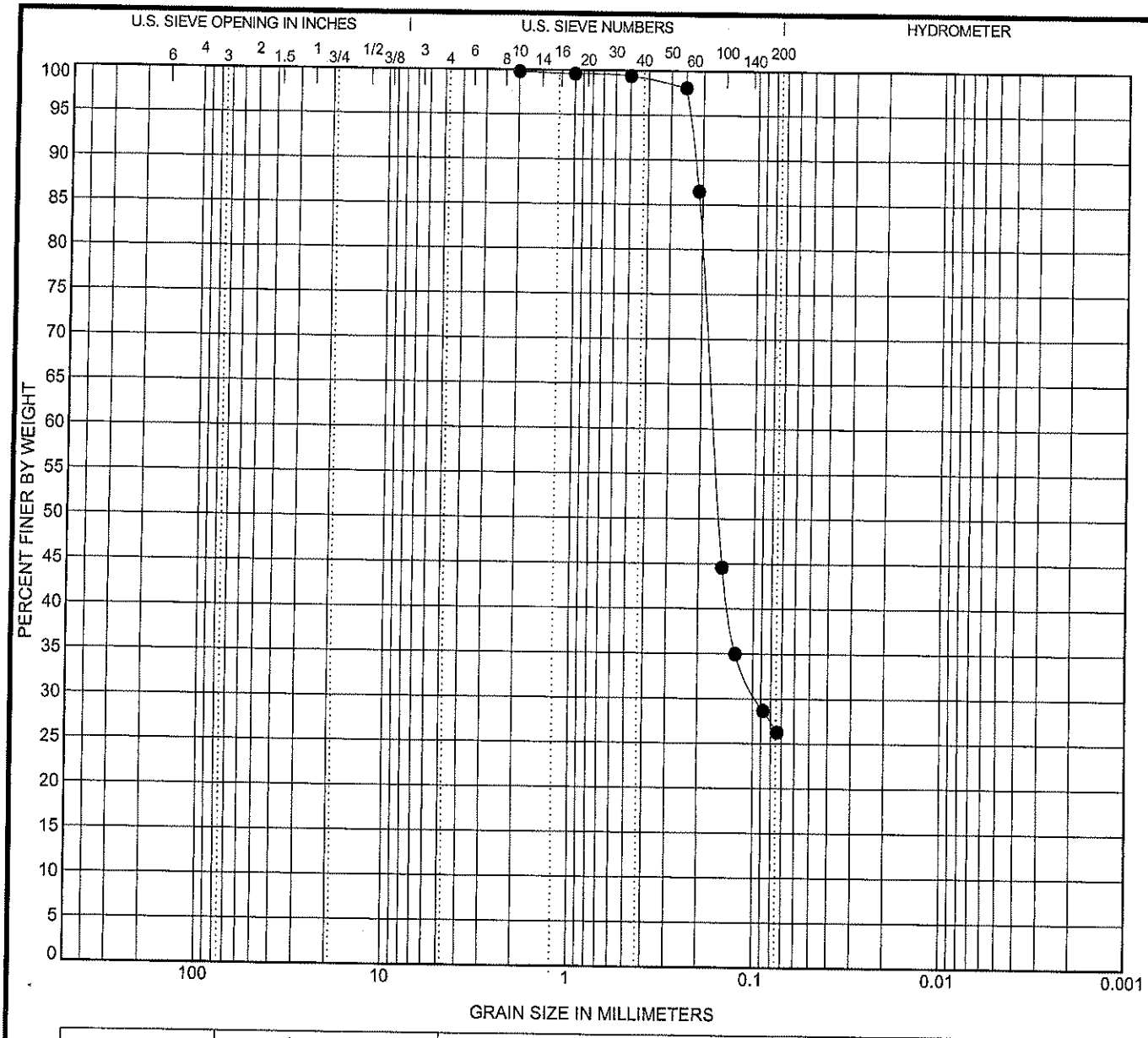
GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area C Sand Source Inv.

Location: Anchorage Area C, Galveston, Texas

Number: G109233

US_GRAIN SIZE _...9233 ANCHORAGE BASIN C.GPJ 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-36	(-29.02' to -31.02' NAVD)	AA-36 (-29.02' to -31.02' NAVD)					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AA-36	(-29.02' to -31.02' NAVD)	2	0.169	0.095		0.0			

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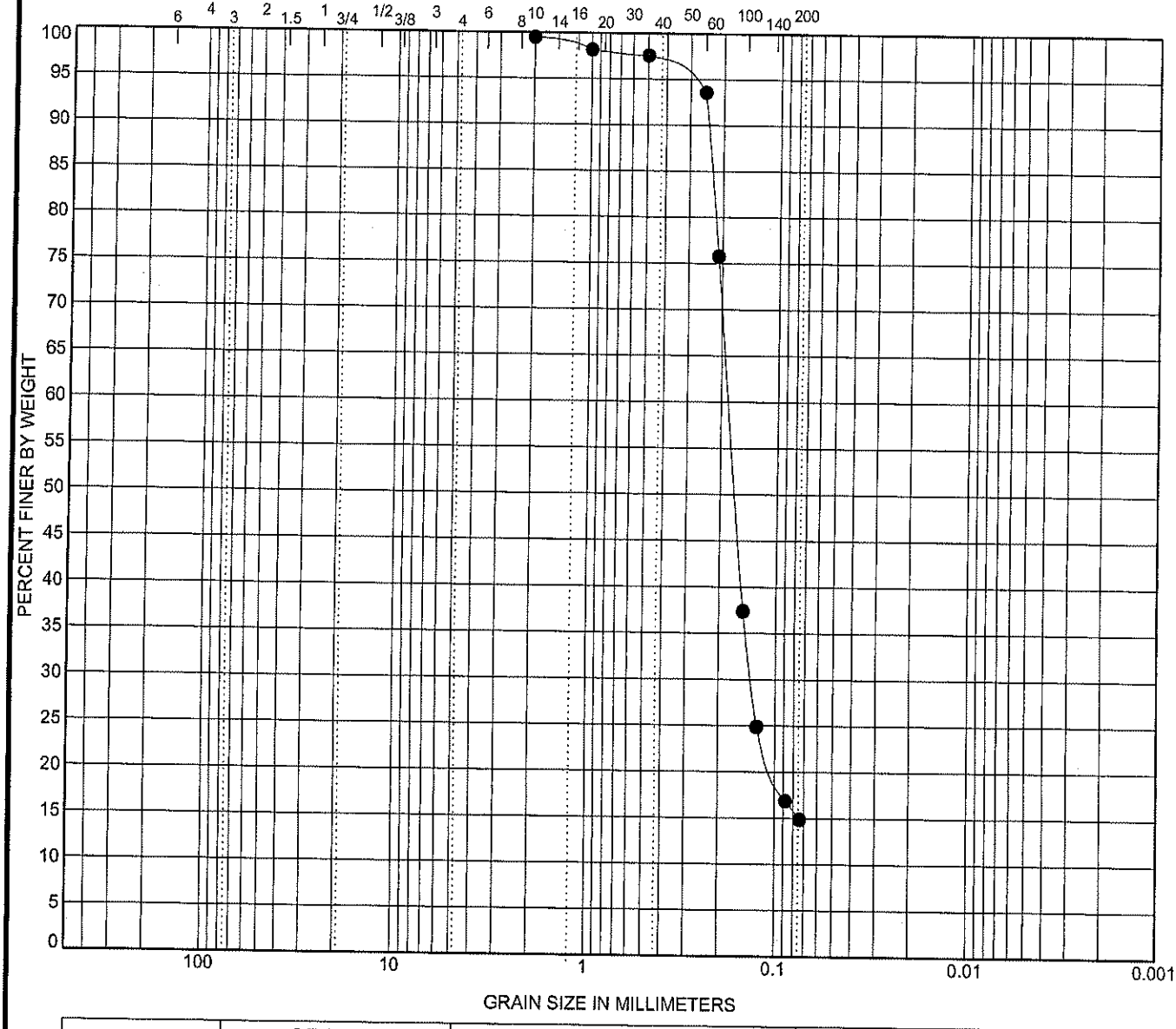
GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area C Sand Source Inv.

Location: Anchorage Area C, Galveston, Texas

Number: G109233

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	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	AA-36	(-33.02' to 35.02' NAVD)	**AA-36 (-33.02' to -35.02' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AA-36	(-33.02' to 35.02' NAVD)	**2**	**0.182**	**0.134**		**0.0**			

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GRAIN SIZE DISTRIBUTION

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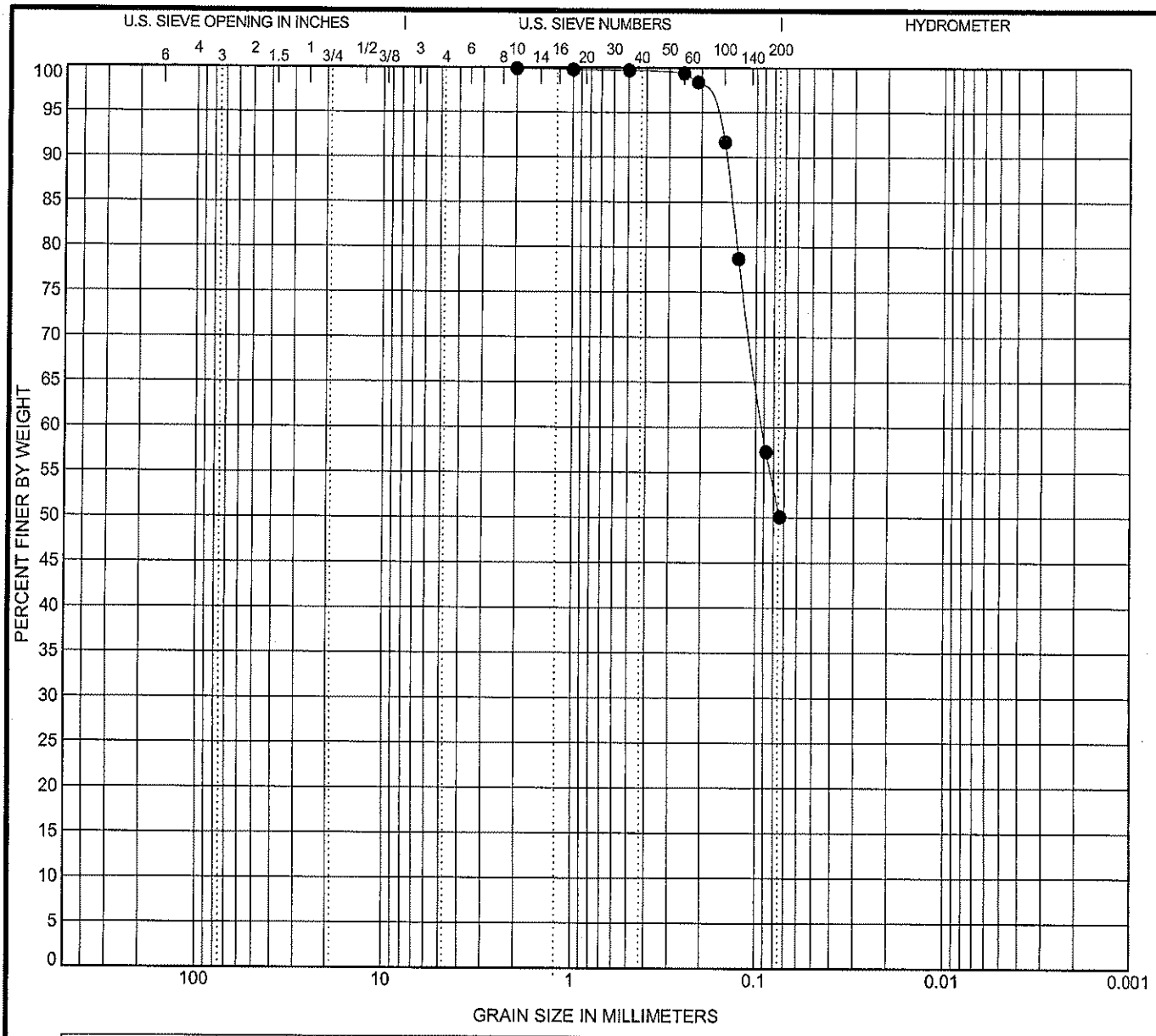
Location: Anchorage Area C, Galveston, Texas

Number: G109233

US GRAIN SIZE ...109233 ANCHORAGE BASIN C.GPJ 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-36	(-35.02' to -37.02' NAVD)	AA-36 (-35.02' to -37.02' NAVD)					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AA-36	(-35.02' to -37.02' NAVD)	2	0.092			0.0			

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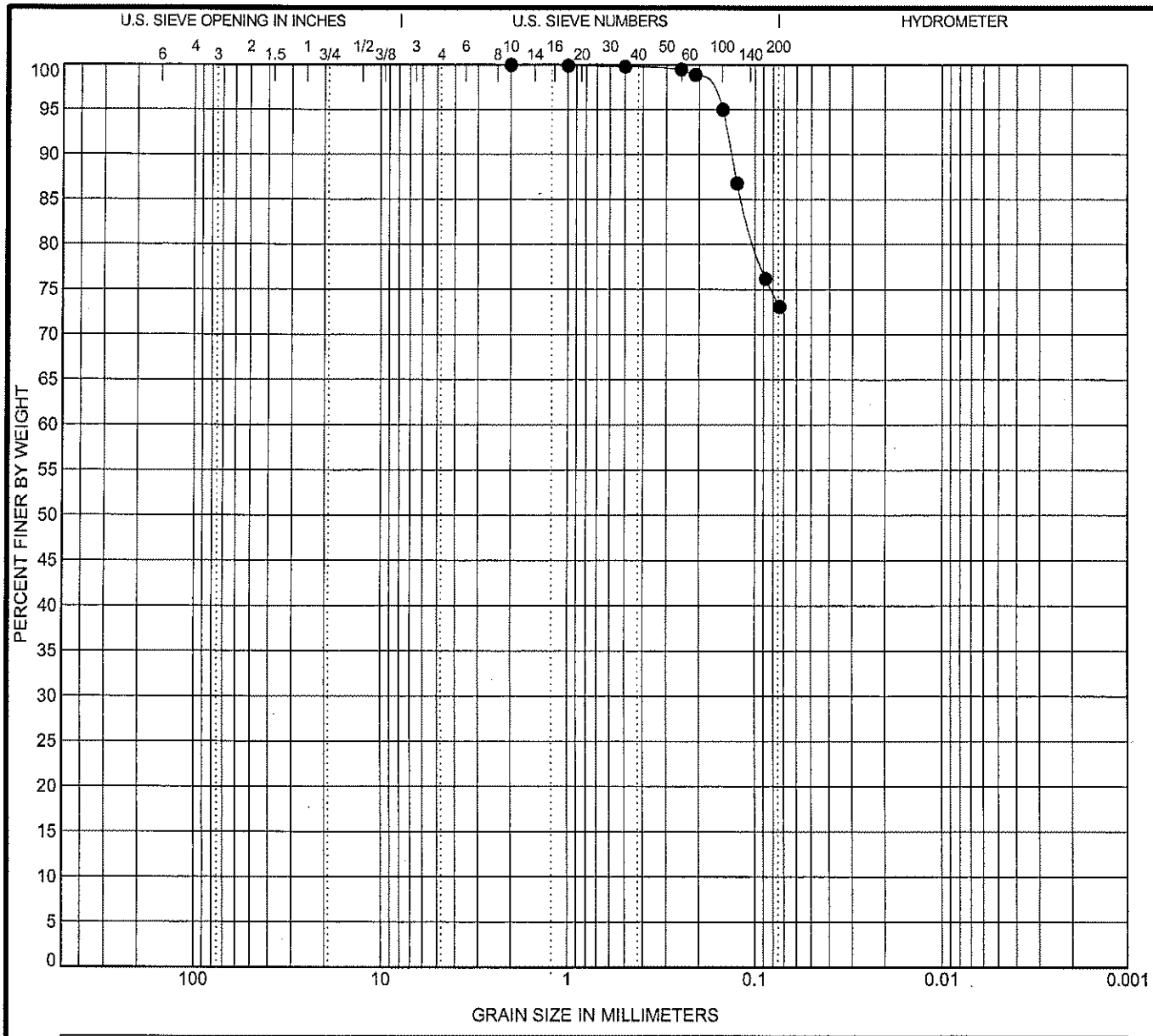
GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area 'C' Sand Source Inv.

Location: Anchorage Area C, Galveston, Texas

Number: G109233

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	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	AA-36	(-37.02' to -39.02' NAVD)	AA-37 (-37.02' to -39.02' NAVD)					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AA-36	(-37.02' to -39.02' NAVD)	2				0.0			

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GRAIN SIZE DISTRIBUTION

Project: Galveston Anchorage Area C Sand Source Inv

Location: Anchorage Area C, Galveston, Texas

Number: G109233

US_GRAIN_SIZE_G109233 ANCHORAGE BASIN C.GPJ US_LAB.GDT 12/1/09

Figure 31: AA-35; Sample 5

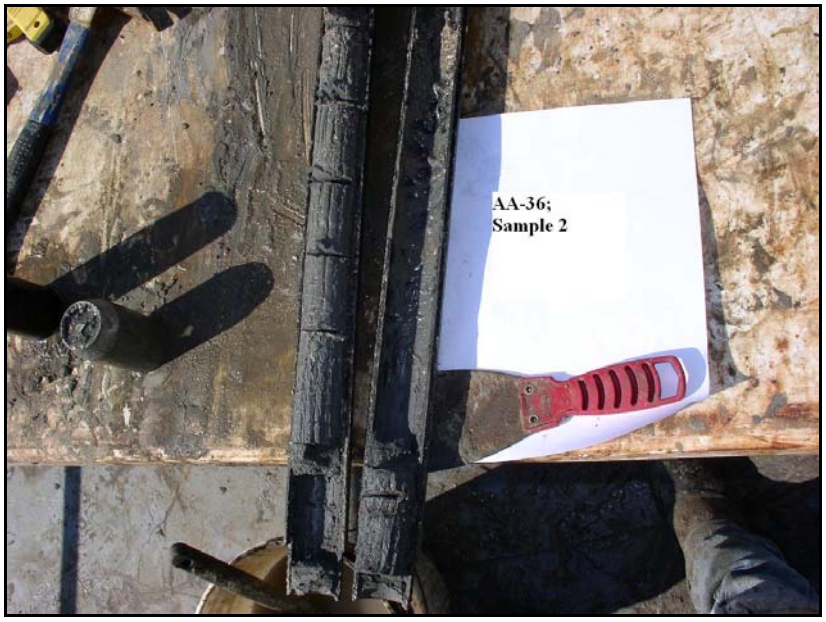

Figure 32: AA-36; Sample 2

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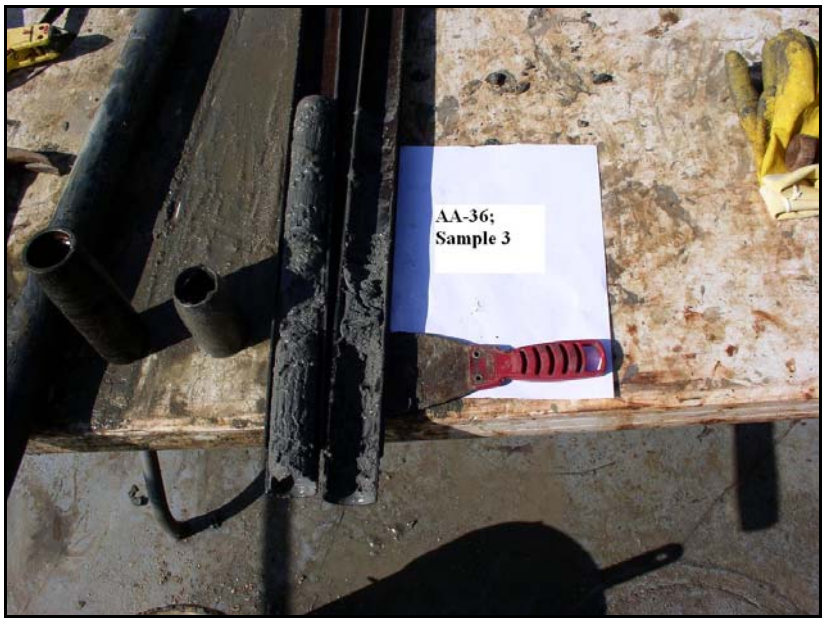

Figure 33: AA-36; Sample 3

Figure 34: AA-36; Sample 4

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Figure 35: AA-36; Sample 5

Figure 36: AA-36; Sample 6

Figure 37: AA-36; Sample 7

Figure 38: AA-36; Sample 8