ROCK ENGINEERING & TESTING LABORATORY INCORPORATED

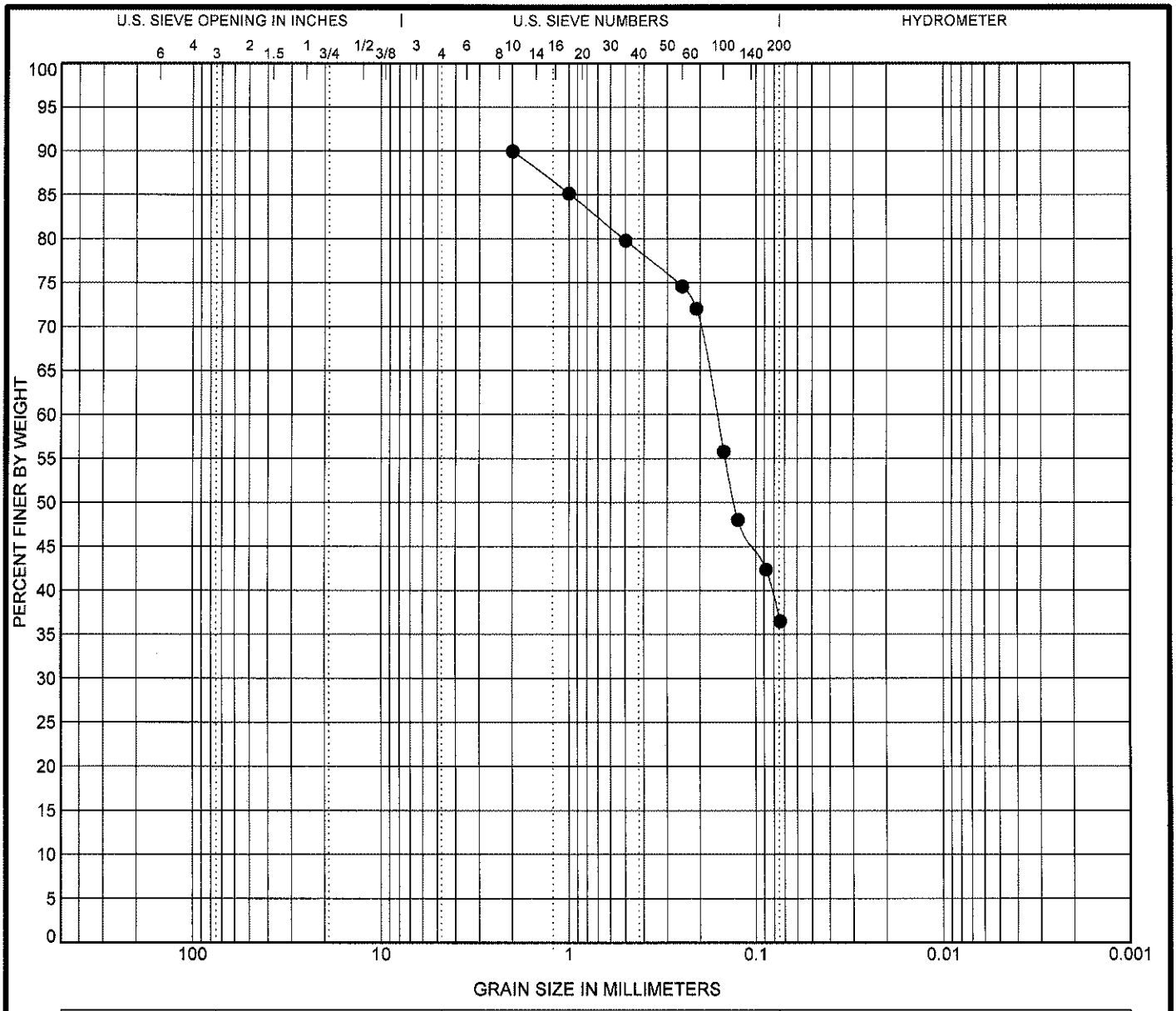
· Geotechnical Engineering
· Construction Materials Testing

PROJECT NAME: Anchorage Basin Sand Source Investigation
CLIENT: HDR Engineering, Inc.
BORING ID.: AA-09
DESCRIPTION: Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-32' to -33' NAVD	-33' to -34' NAVD	-34' to -35' NAVD	-36' to -37' NAVD	-38' to -39' NAVD
25.83	10.03	0.22	0.15	1.19

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-32' to -33' NAVD	-33' to -34' NAVD	-34' to -35' NAVD	-36' to -37' NAVD	-38' to -39' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	N/A	85.17	99.66	99.72	97.89
#35	N/A	79.80	99.49	99.50	97.18
#60	N/A	74.59	98.94	98.98	95.94
#70	N/A	72.05	98.08	98.16	92.76
#100	N/A	55.81	58.32	44.00	20.49
#120	N/A	48.04	39.44	28.66	9.27
#170	N/A	42.38	29.63	19.90	4.25
#200	N/A	36.50	27.65	17.70	3.70
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	N/A	0.13	0.15	0.17	0.18
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	N/A	0.18
SORTING (σ)	N/A	N/A	N/A	N/A	0.30

*AA-09; -32' to -33' NAVD was only passed through the #10 sieve.
*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-09**	(-33' to -34' NAVD)	**Borrow Area (-33' to -34' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**AA-09**	(-33' to -34' NAVD)	**2**	**0.163**			**0.0**			

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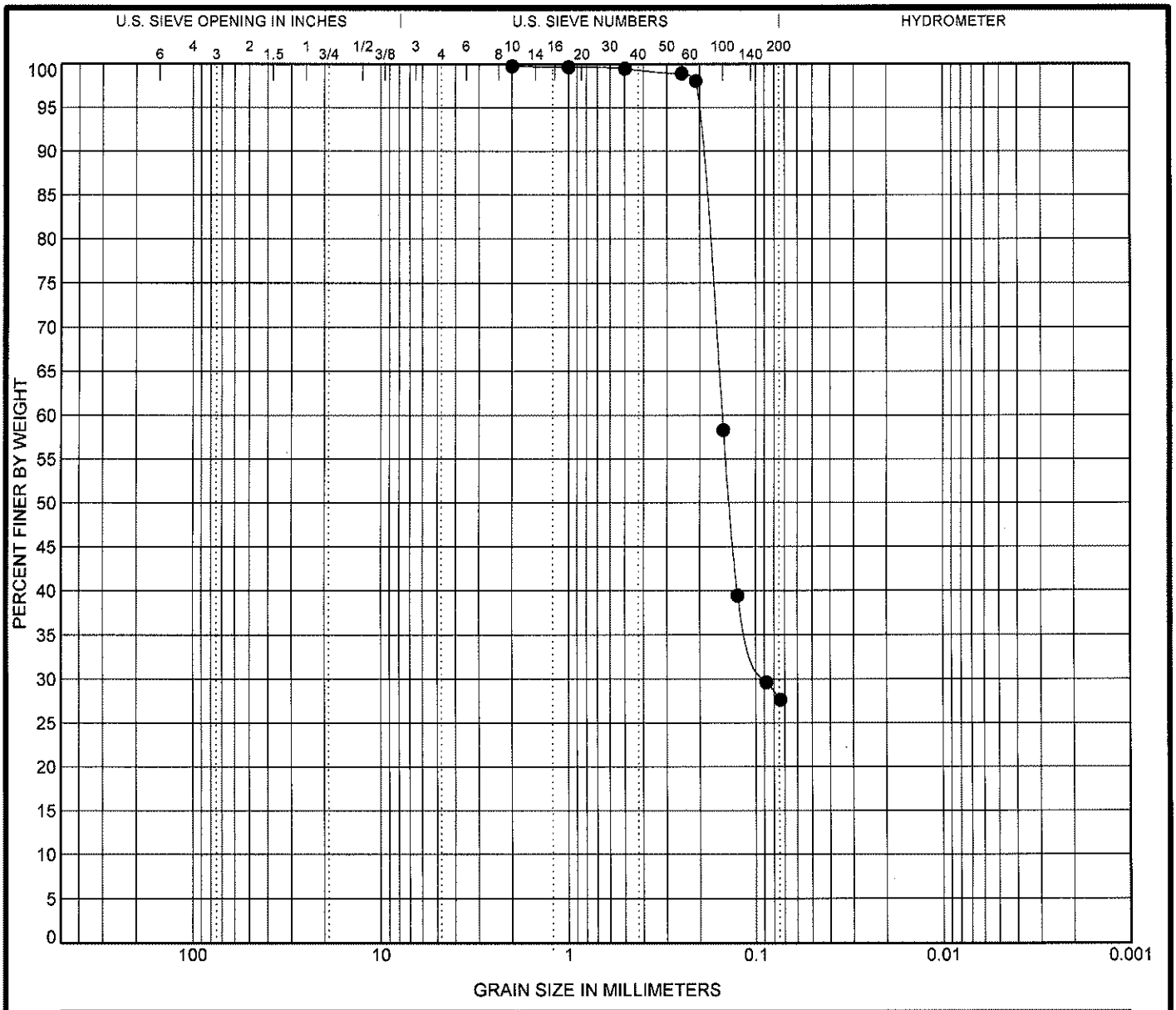
GRAIN SIZE DISTRIBUTION

Project: Anchorage Basin Sand Source Investigation

Location: Anchorage Basin; Galveston, Texas

Number: G109112

US_GRAIN SIZE_G109112 PROP. ANCHORAGE BASIN SAND SOURCE.GPJ US_LAB.GDT 4/6/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**AA-09**	(-34' to -35' NAVD)	**Borrow Area (-34' to -35' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**AA-09**	(-34' to -35' NAVD)	**2**	**0.151**	**0.089**		**0.0**			

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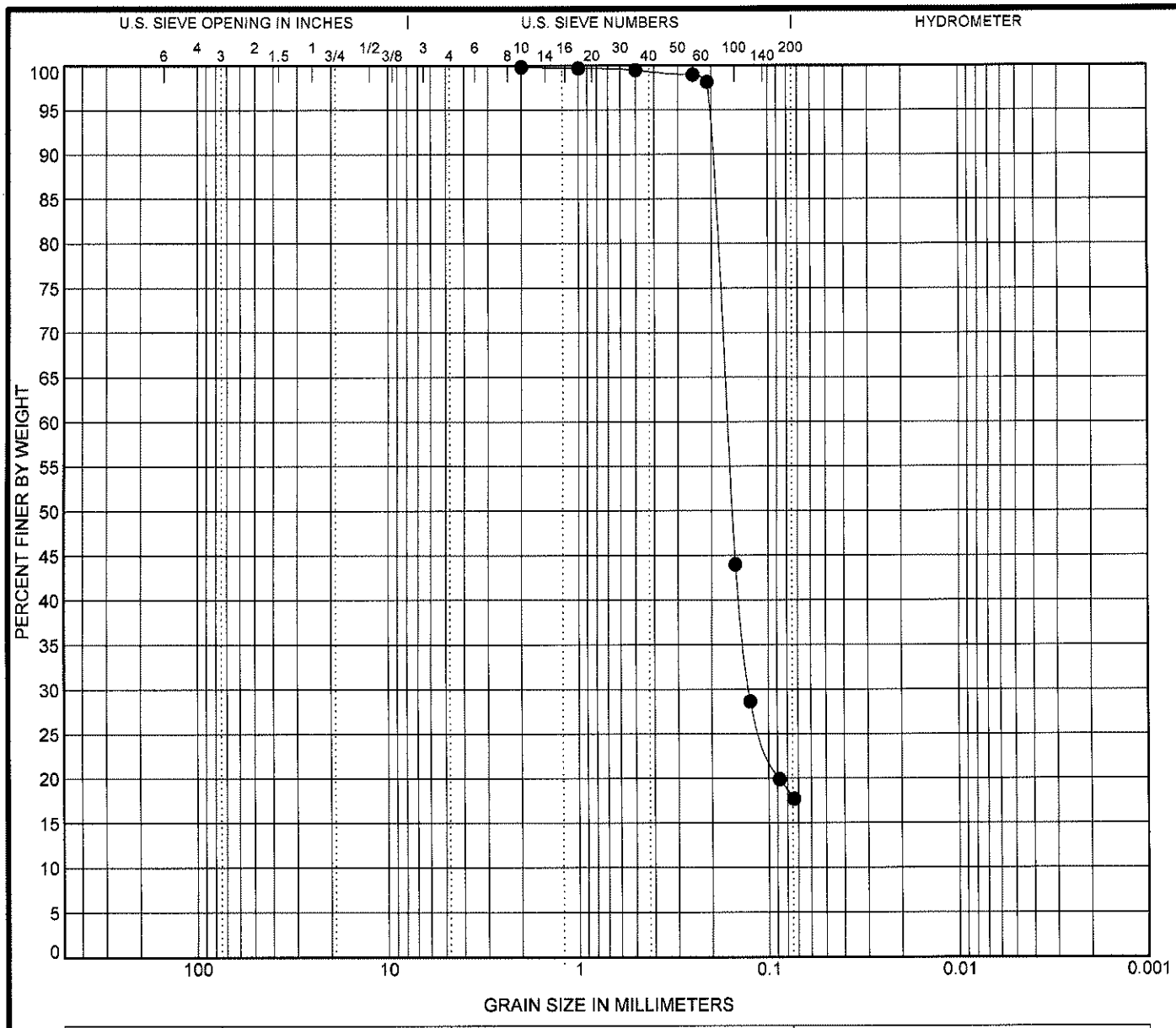
US_GRAIN_SIZE_G109112 PROP. ANCHORAGE BASIN SAND SOURCE.GPJ US_LAB.GDT 4/6/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**AA-09**	(-36' to -37' NAVD)	**Borrow Area (-36' to -37' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**AA-09**	(-36' to -37' NAVD)	**2**	**0.165**	**0.127**		**0.0**			

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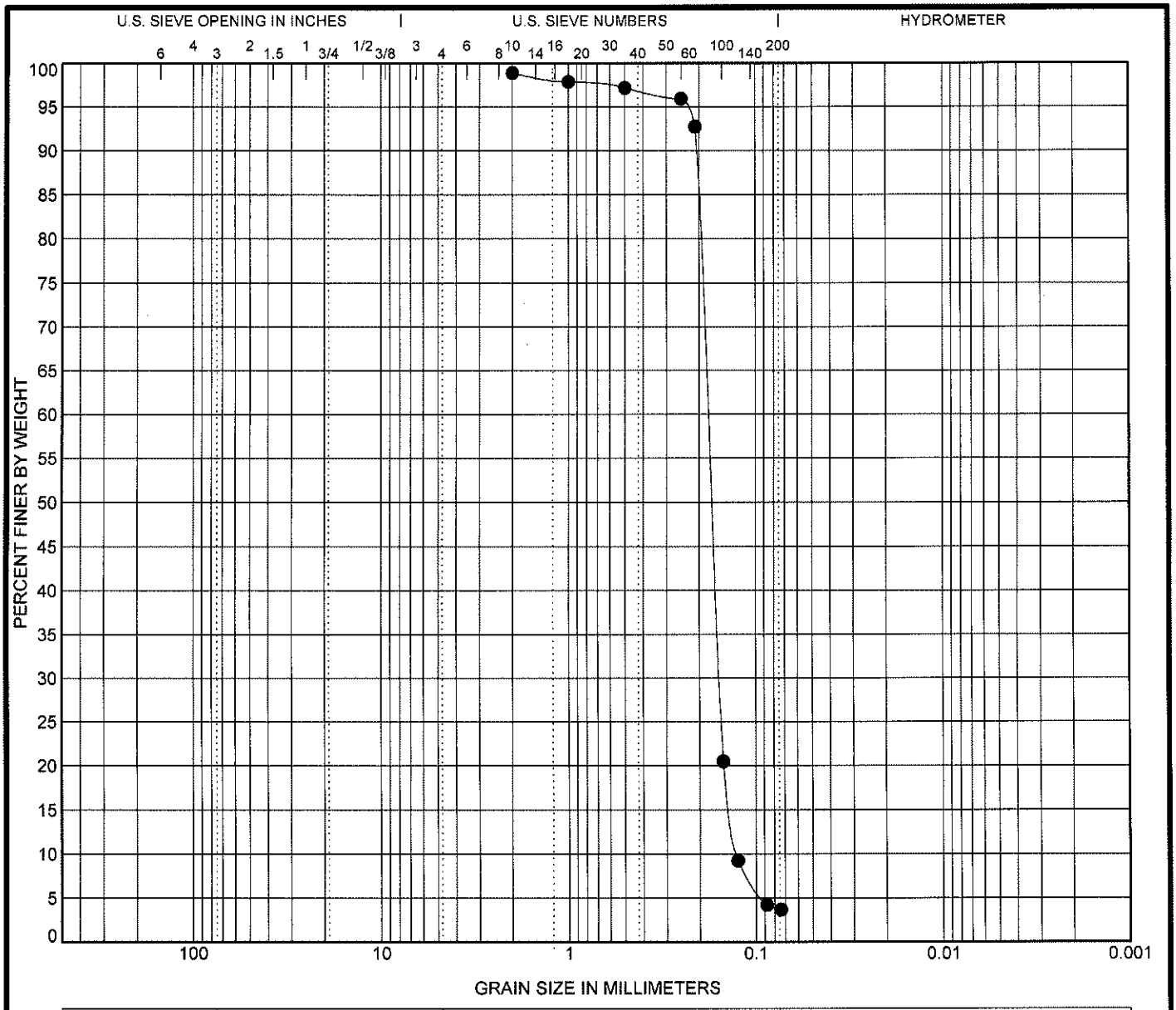

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**AA-09**	(-38' to -39' NAVD)	**Borrow Area (-38' to -39' NAVD)**				**1.07**	**1.42**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**AA-09**	(-38' to -39' NAVD)	**2**	**0.18**	**0.156**	**0.126**	**0.0**			

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GRAIN SIZE DISTRIBUTION

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LOG OF BORING AA-09

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CLIENT: HDR Engineering, Inc.
PROJECT: Anchorage Basin Sand Source Investigation
LOCATION: Anchorage Basin; Galveston, Texas
NUMBER: G109112
DATE(S) DRILLED: 03/11/09 - 03/11/09

DRILLING METHOD(S): Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -32' NAVD

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 (%)	DESCRIPTION OF STRATUM
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31											
	32											**POORLY GRADED SAND**, with shell fragments, gray.
	33	S-1										
	34	S-2									37	**CLAYEY SAND**, with shell fragments, gray.
	35	S-3									28	**SILTY CLAYEY SAND**, dark gray.
	36	S-4										Same as above, gray.
	37	S-5									18	Same as above.
	38	S-6										**SILTY CLAYEY SAND**, gray.
	39	S-7									4	**POORLY GRADED SAND**, gray.
												Boring was extended to an elevation of -39-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 Ocean Surveys, Inc.
GPS Coord. N. 13,698,183' E. 3,317,733'