



- Geotechnical Engineering
- Construction Materials Testing

PROJECT NAME: Anchorage Basin Sand Source Investigation

CLIENT: HDR Engineering, Inc.

BORING ID.: AA-19

DESCRIPTION: Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-28' to -29' NAVD	-30' to -31' NAVD	-33' to -34' NAVD
0.12	0.42	0.25

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-28' to -29' NAVD	-30' to -31' NAVD	-33' to -34' NAVD
#10	100.00	100.00	100.00
#18	99.77	99.20	99.43
#35	99.59	98.93	99.08
#60	99.19	98.55	98.19
#70	98.58	98.00	95.53
#100	87.41	90.89	37.89
#120	76.89	84.88	18.92
#170	59.27	78.48	10.03
#200	41.80	74.81	8.68
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.08	N/A	0.16
MEAN GRAIN SIZE (mm)	N/A	N/A	0.15
SORTING (σ)	N/A	N/A	N/A

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



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PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-34' to -35' NAVD	-37' to -38' NAVD	-39' to -40' NAVD	-41' to -42' NAVD
N/A	0.12	0.27	2.56

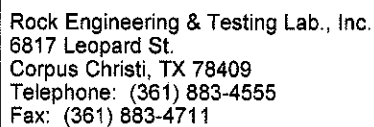
ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-34' to -35' NAVD	-37' to -38' NAVD	-39' to -40' NAVD	-41' to -42' NAVD
#10	N/A	100.00	100.00	100.00
#18	N/A	99.76	99.65	96.54
#35	N/A	99.67	99.61	96.00
#60	N/A	99.44	99.40	95.23
#70	N/A	99.09	98.18	92.73
#100	N/A	84.58	24.88	52.87
#120	N/A	65.99	10.90	35.86
#170	N/A	55.13	5.90	25.91
#200	92.90	52.44	5.23	24.52
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	N/A	N/A	0.17	0.15
MEAN GRAIN SIZE (mm)	N/A	N/A	0.17	N/A
SORTING (σ)	N/A	N/A	N/A	N/A

*AA-19; -34' to -35' NAVD was only passed through the -#200 sieve.

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

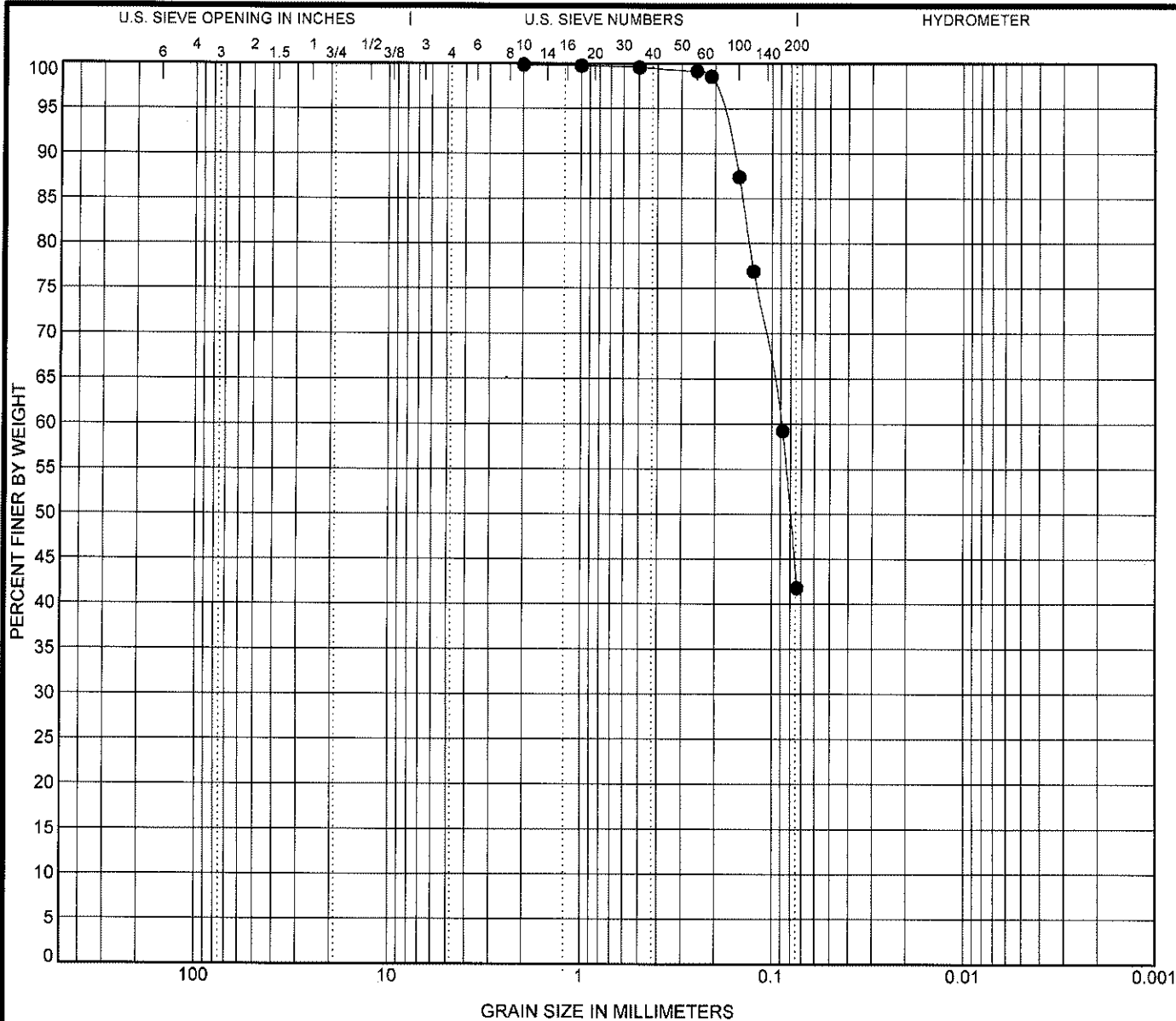


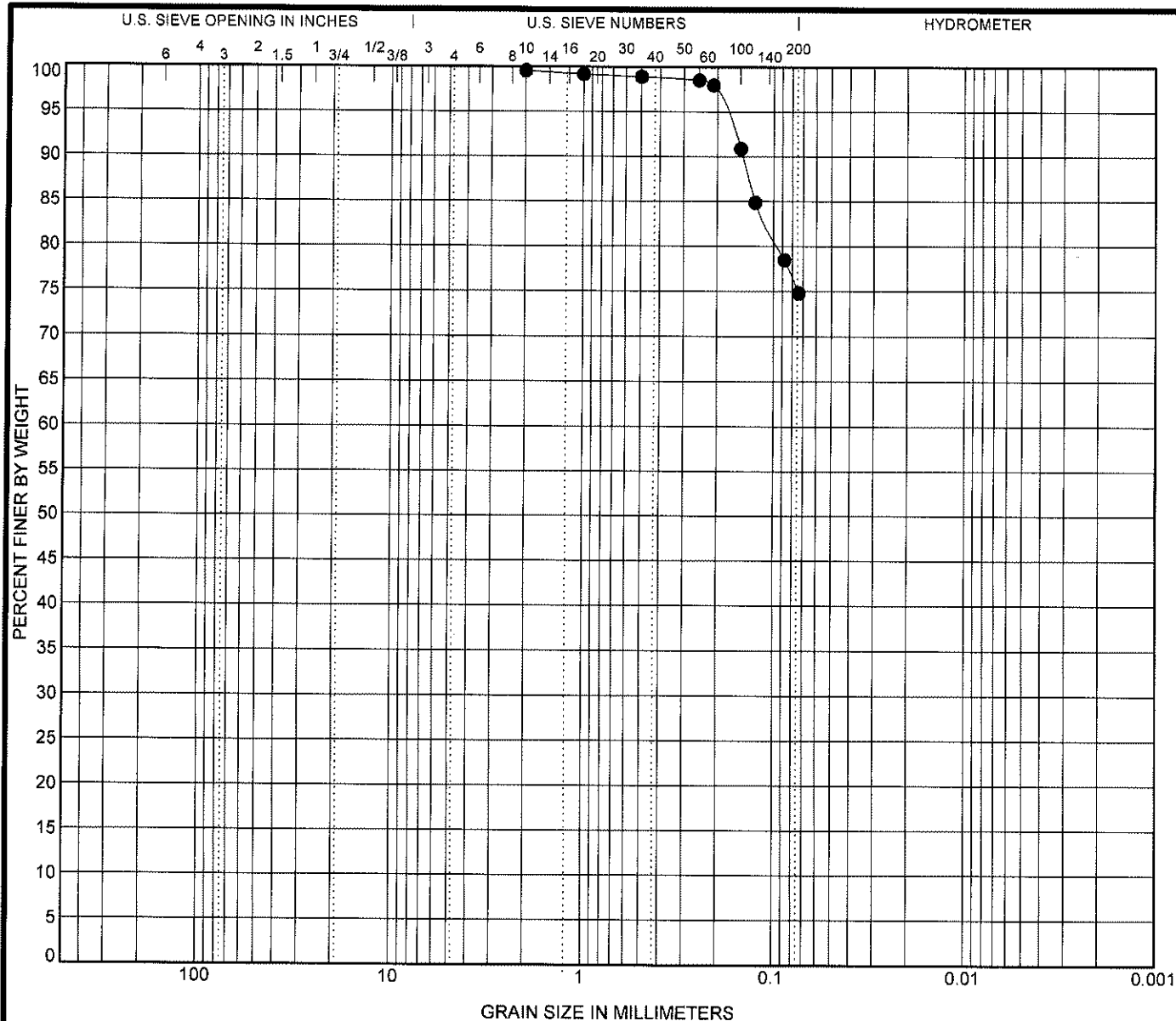
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

[illegible]

GRAIN SIZE DISTRIBUTION

Project: Anchorage Basin Sand Source Investigation
Location: Anchorage Basin; Galveston, Texas
Number: G109112





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-19 (-30' to -31' NAVD)		Borrow Area (-30' to -31' NAVD)					

[illegible]

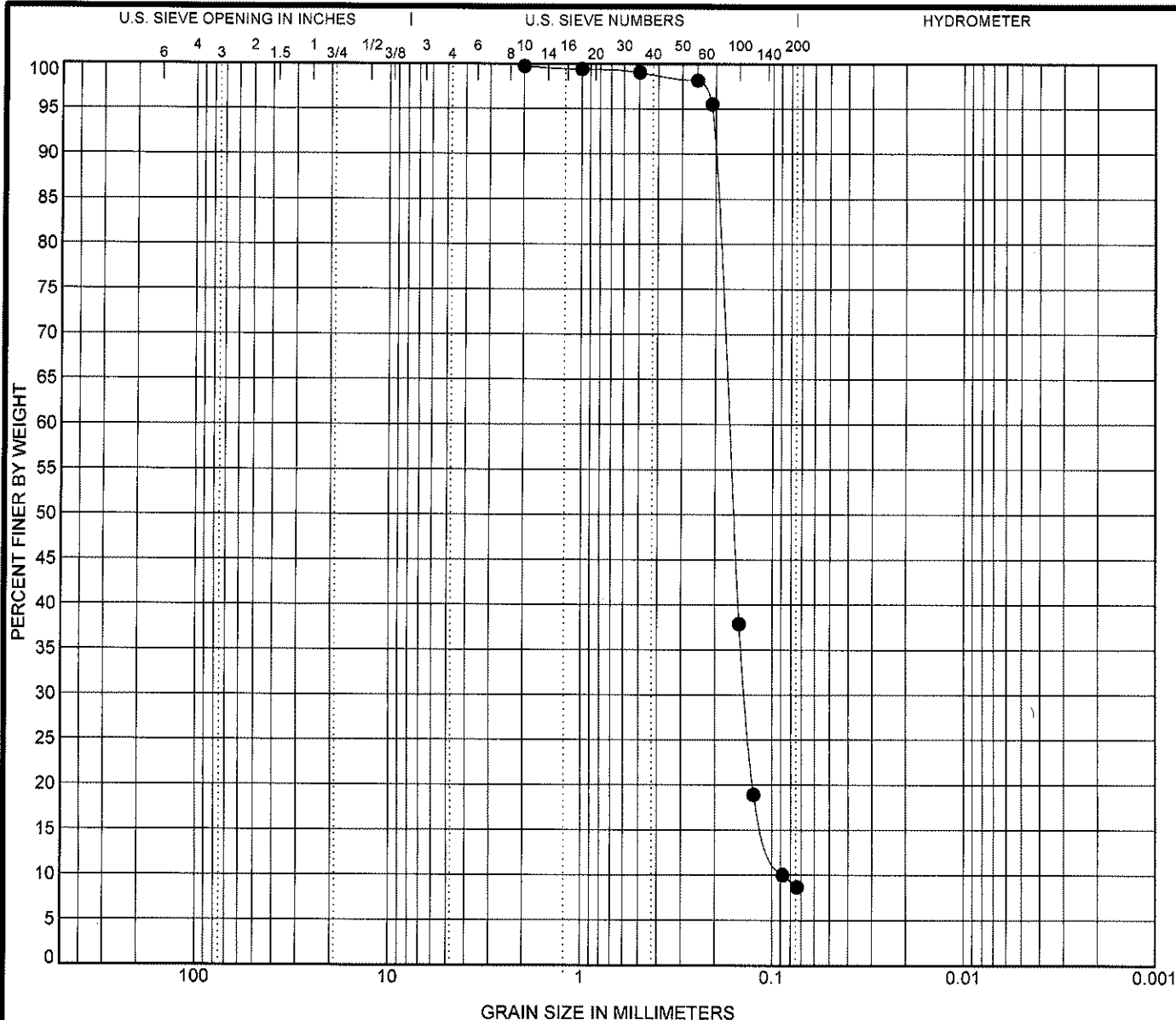
Rock Engineering & Testing Lab., Inc.
6817 Leopard St.
Corpus Christi, TX 78409
Telephone: (361) 883-4555
Fax: (361) 883-4711

GRAIN SIZE DISTRIBUTION

Project: Anchorage Basin Sand Source Investigation

Location: Anchorage Basin; Galveston, Texas

Number: G109112



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-19	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)				1.29	1.94

[illegible]

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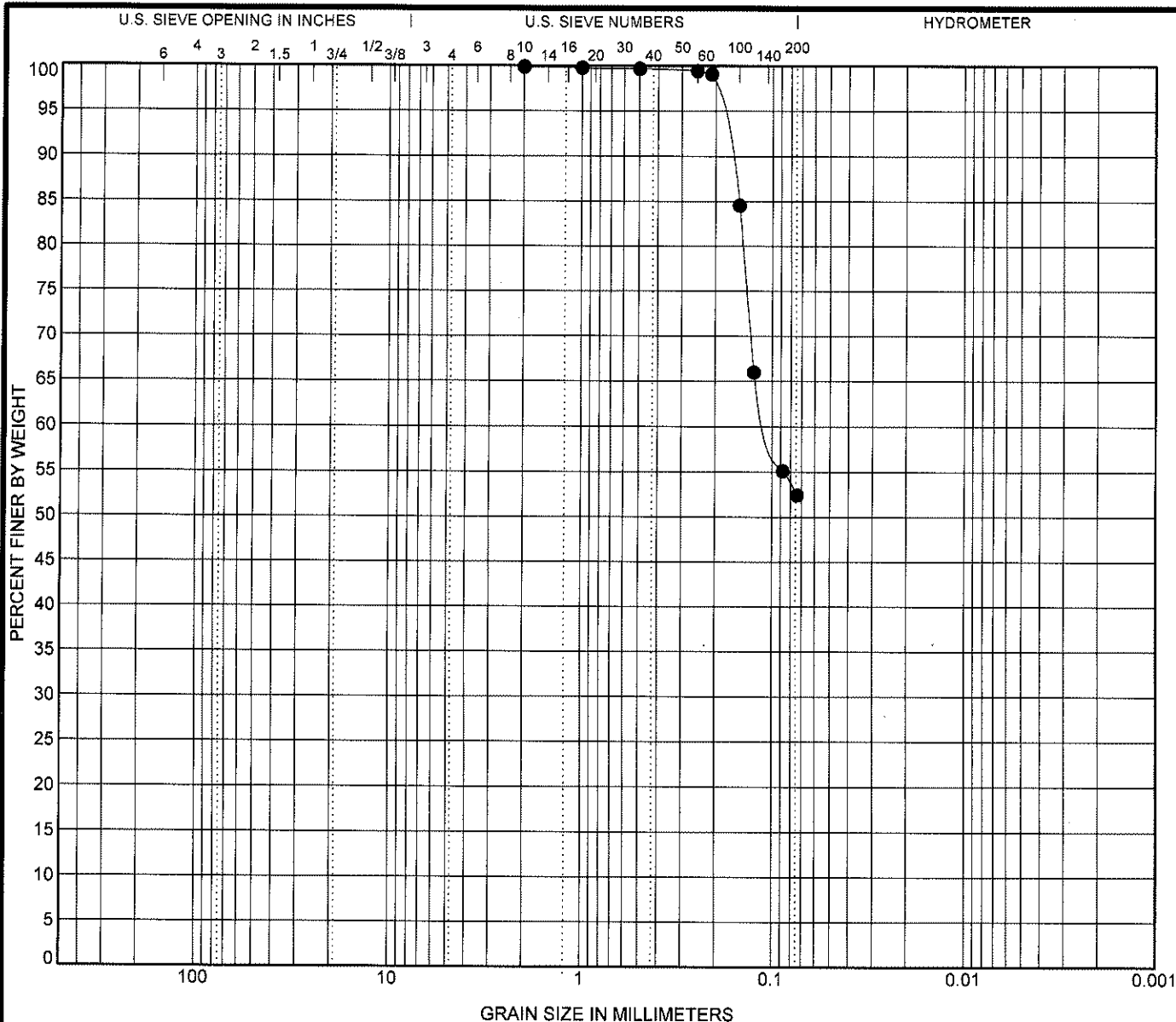
GRAIN SIZE DISTRIBUTION

Project: Anchorage Basin Sand Source Investigation

Location: Anchorage Basin; Galveston, Texas

Number: G109112

U.S. GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE.GPJ US LAB.GDT 4/13/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-19	(-37' to -38' NAVD)	Borrow Area (-37' to -38' NAVD)					

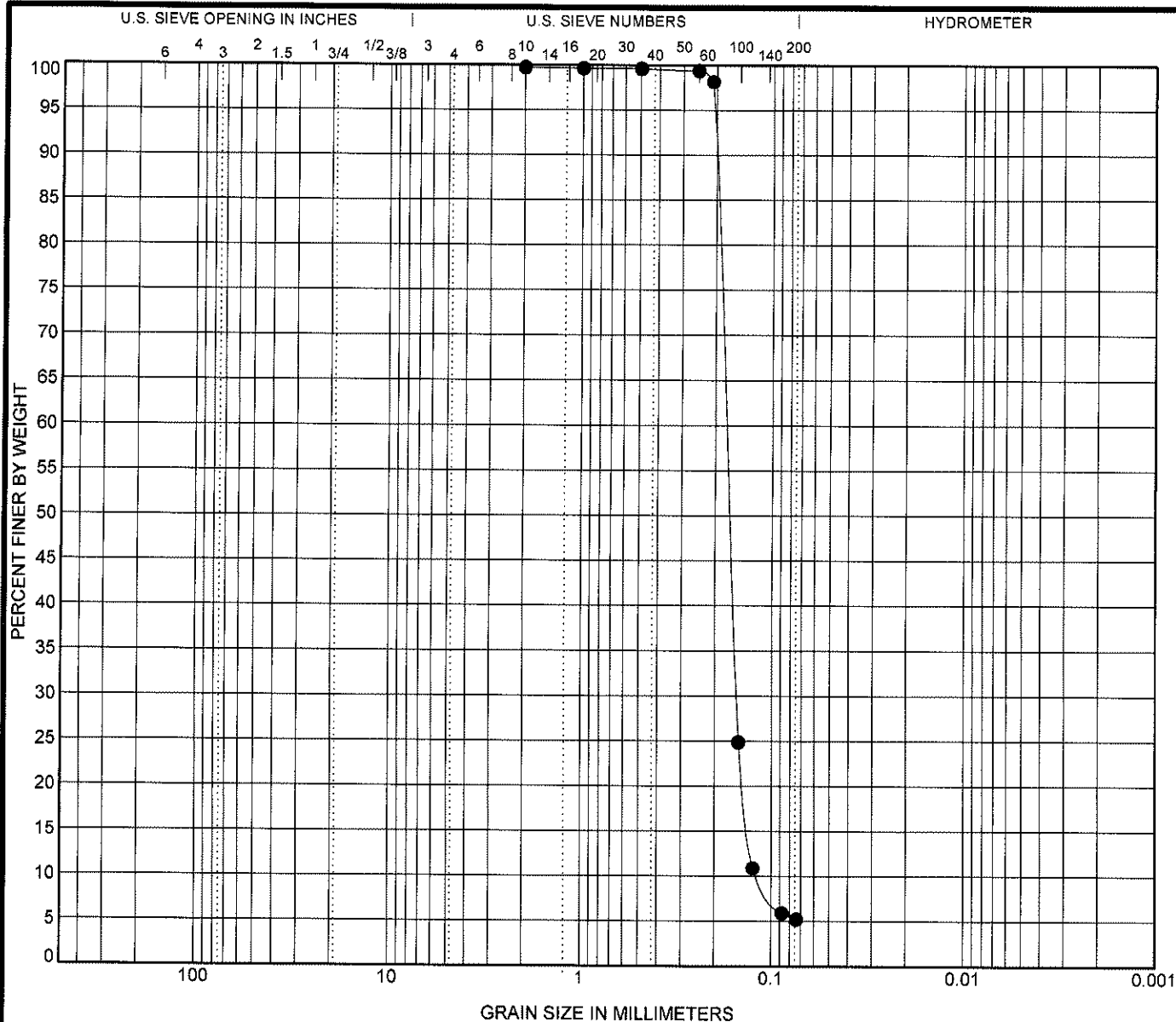
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-19	(-37' to -38' NAVD)	2	0.103			0.0			



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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-19 (-39' to -40' NAVD)		Borrow Area (-39' to -40' NAVD)				1.13	1.50

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-19 (-39' to -40' NAVD)		2	0.176	0.153	0.117	0.0			



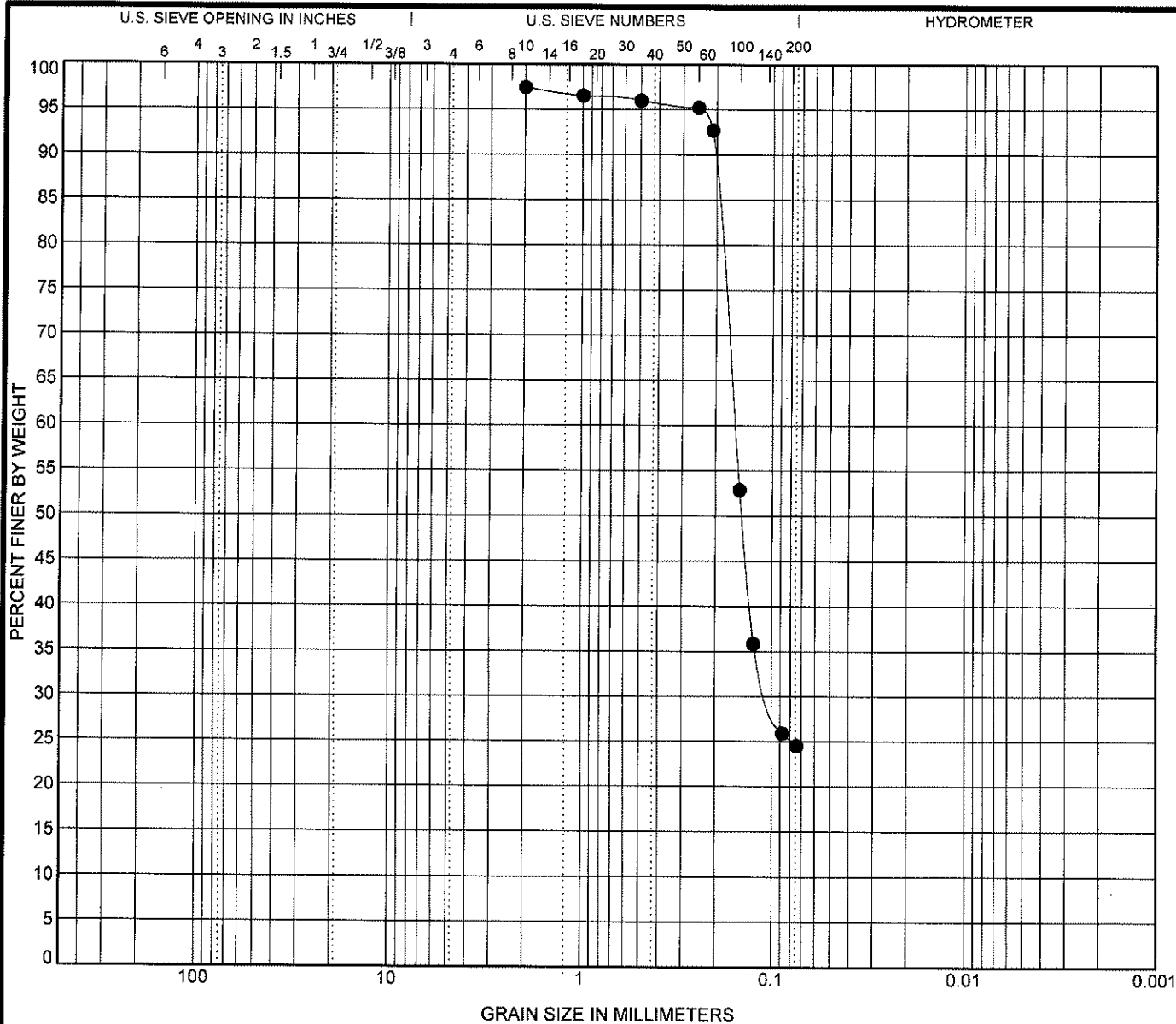
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-19	(-41' to -42' NAVD)	Borrow Area (-41' to -42' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-19	(-41' to -42' NAVD)	2	0.158	0.102		0.0			



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GRAIN SIZE DISTRIBUTION

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LOG OF BORING AA-19

SHEET 1 OF 2



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Telephone: (361) 883-4555
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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

	FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Vibracore	
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:	
						LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				SURFACE ELEVATION: -28' NAVD	
						LL	PL	PI				DESCRIPTION OF STRATUM	
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29	S-1									42		<u>CLAYEY SAND</u> , gray.
	30	S-2											Same as above.
	31	S-3									75		<u>SANDY CLAY</u> , dark gray.
	32	S-4											Same as above.
	33	S-5											Same as above.
	34	S-6									9		<u>POORLY GRADED SAND</u> , with clay, gray.
	35	S-7									93		<u>SANDY CLAY</u> , dark gray.
	36	S-8											Same as above.
	37	S-9											Same as above.
	38	S-10									52		<u>SANDY CLAY</u> , gray.
	39	S-11											<u>POORLY GRADED SAND</u> , with clay, gray.
	40	S-12									5		Same as above.
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. 13,700,406' E. 3,320,164'	

LOG OF BORING G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ ROCK ETL GDT 4/28/09

LOG OF BORING AA-19

SHEET 2 OF 2



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 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: -28' NAVD

DESCRIPTION OF STRATUM

SILTY CLAYEY SAND gray.

Same as above.

Boring was extended to an elevation of -42-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. 13,700,406' E. 3,320,164'