



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation

**CLIENT:** HDR Engineering, Inc.

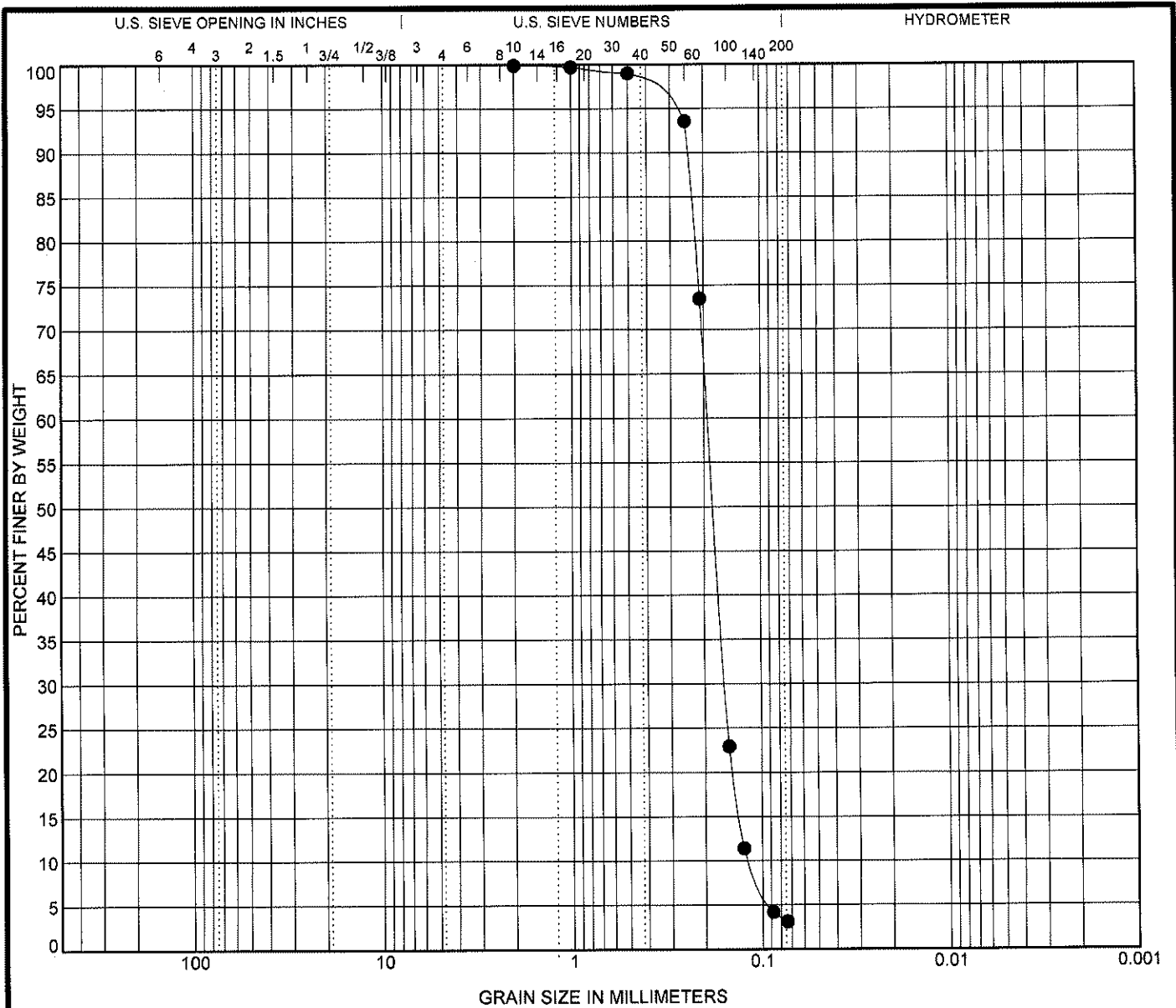
**BORING ID.:** AA-17

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-31' to -32' NAVD	-33' to -34' NAVD	-34' to -35' NAVD	-37' to -38' NAVD	-40' to -41' NAVD
0.07	3.57	0.18	0.18	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-31' to -32' NAVD	-33' to -34' NAVD	-34' to -35' NAVD	-37' to -38' NAVD	-40' to -41' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	99.72	94.00	99.53	99.64	99.98
#35	99.02	91.47	99.26	99.44	99.89
#60	93.58	86.25	98.73	98.89	99.66
#70	73.49	74.26	97.94	97.86	99.34
#100	22.95	34.04	65.38	39.93	65.35
#120	11.42	24.41	40.99	20.93	40.24
#170	4.21	19.37	23.22	11.69	22.62
#200	3.13	18.26	18.46	10.03	18.96
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.19	0.18	0.14	0.16	0.14
MEAN GRAIN SIZE (mm)	0.18	N/A	N/A	0.15	N/A
SORTING ( $\sigma$ )	0.37	N/A	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-17	(-31' to -32' NAVD)	<b>Borrow Area (-31' to -32' NAVD)</b>				<b>1.09</b>	<b>1.64</b>

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-31' to -32' NAVD)	<b>2</b>	<b>0.192</b>	<b>0.156</b>	<b>0.117</b>	<b>0.0</b>			

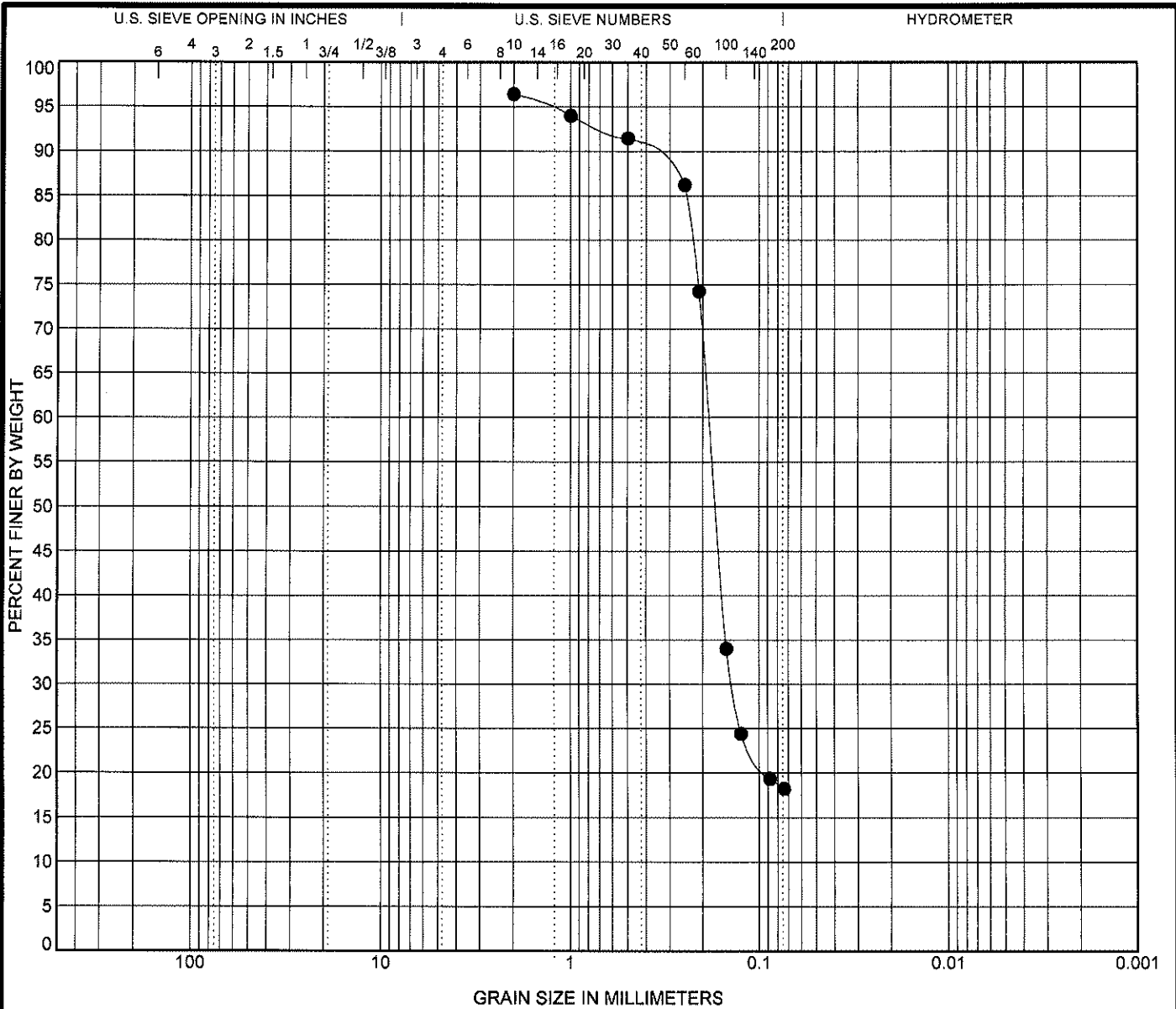
US GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ US LAB.GDT 4/9/09



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-17	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-33' to -34' NAVD)	2	0.186	0.138		0.0			

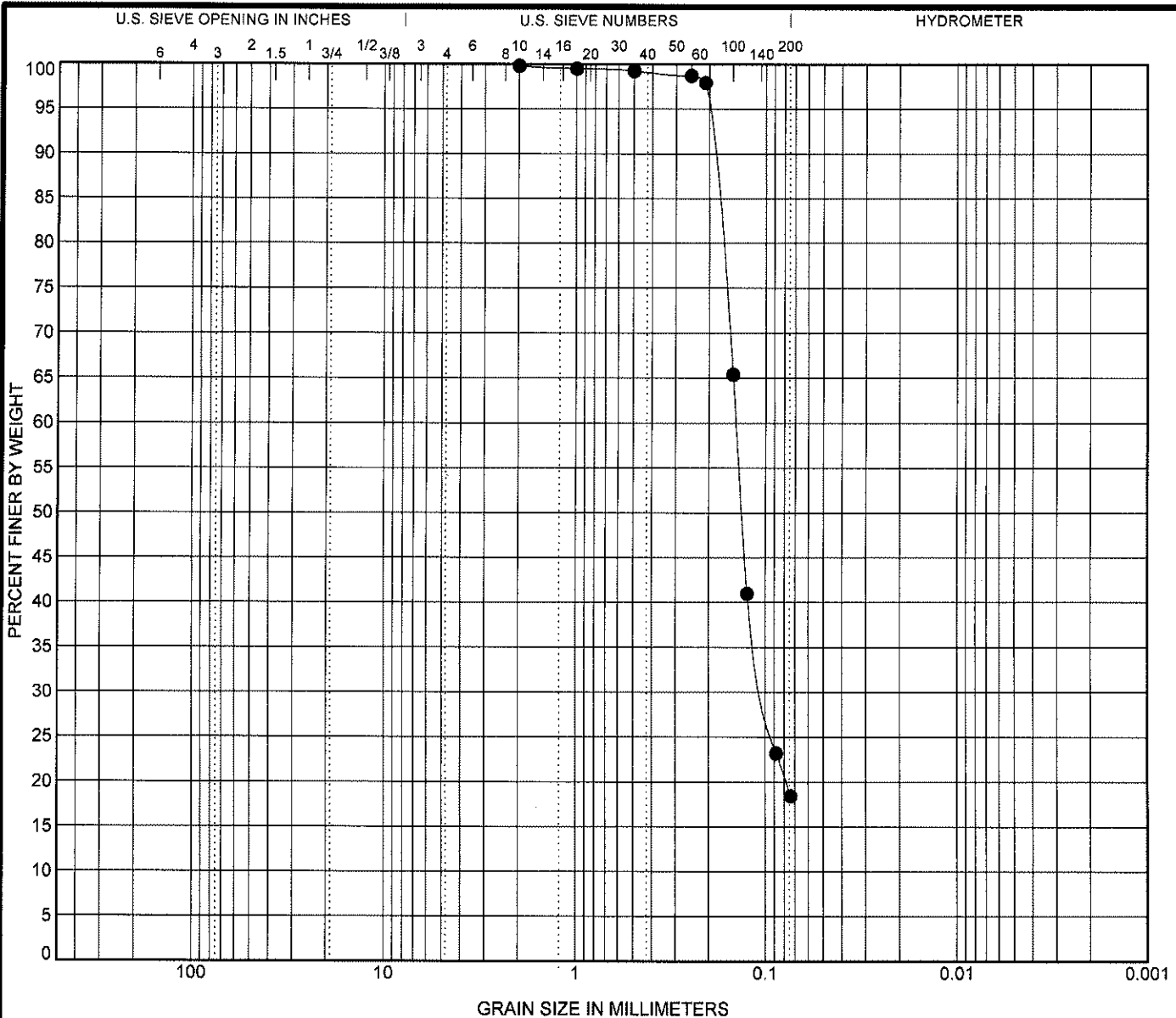
U.S. GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE G.P.J. US. LAB. G.D.T. 4/9/09



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-17	(-34' to -35' NAVD)	<b>Borrow Area (-34' to -35' NAVD)</b>					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-34' to -35' NAVD)	2	0.143	0.101		0.0			

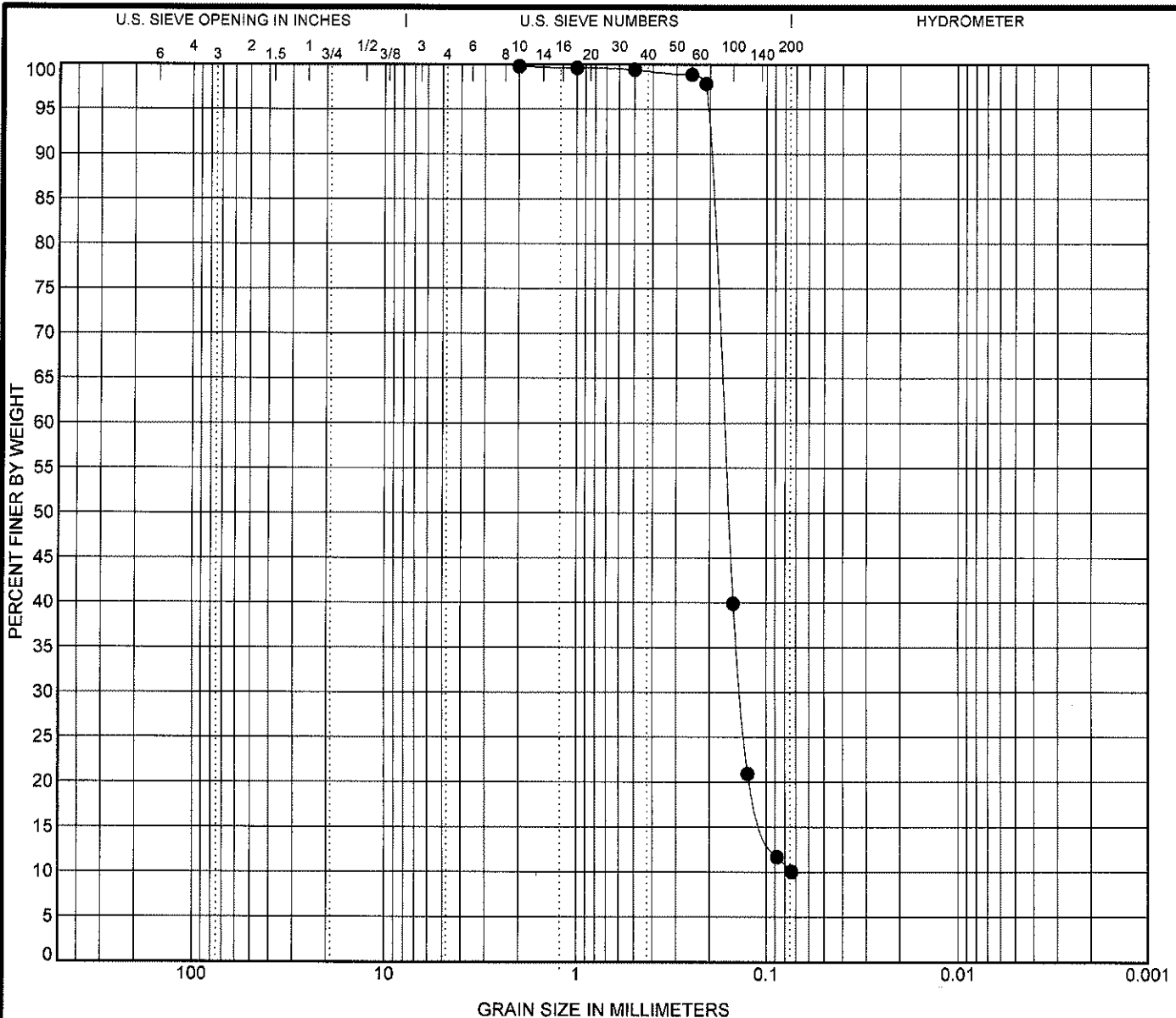
U.S. GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE GP.J US LAB.GDT 4/9/09



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-17	(-37' to -38' NAVD)	Borrow Area (-37' to -38' NAVD)				1.49	2.27

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-37' to -38' NAVD)	2	0.168	0.136		0.0			

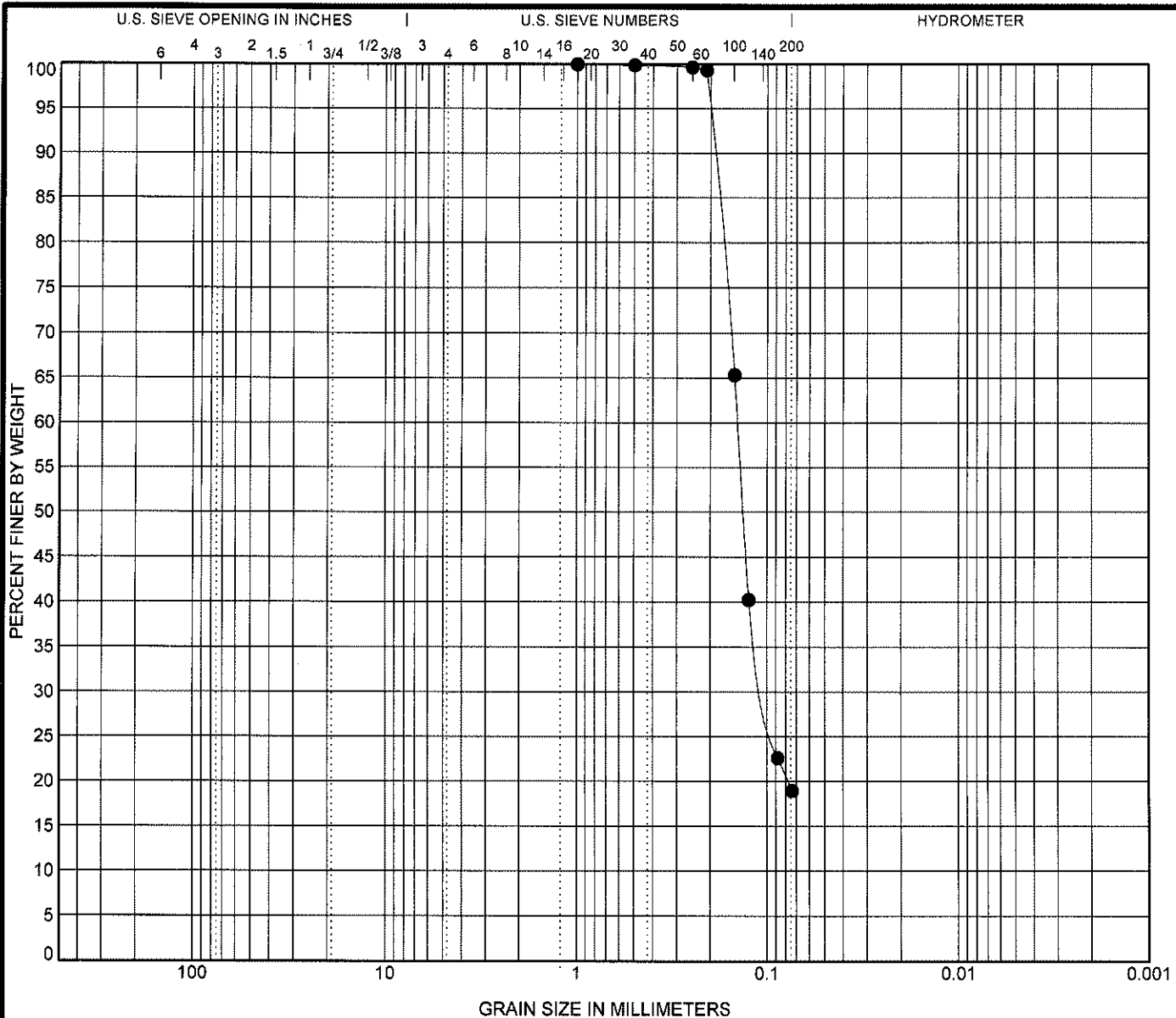
U.S. GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE.GPJ US LAB.GDT\_49/09



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-17	(-40' to -41' NAVD)	<b>Borrow Area (-40' to -41' NAVD)</b>					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-40' to -41' NAVD)	1	0.144	0.102		0.0			

US\_GRAIN\_SIZE\_G109112 PROP\_ANCHORAGE BASIN SAND SOURCE GPJ\_US\_LAB\_GDT\_4/9/09



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

# LOG OF BORING AA-17



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

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: -31' NAVD

DESCRIPTION OF STRATUM

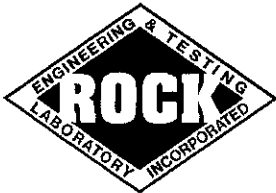
SOIL SYMBOL	FIELD DATA					LABORATORY DATA							MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	Elevation, Ft. [NAVD]	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)				
						LL	PL	PI						
	21													
	22													
	23													
	24													
	25													
	26													
	27													
	28													
	29													
	30													
	31													
	32	S-1									3	<b>POORLY GRADED SAND</b> , with shell fragments, gray. Same as above.		
	33	S-2										<b>SILTY CLAYEY SAND</b> , with shell fragments, gray.		
	34	S-3									18	Same as above.		
	35	S-4									19	<b>POORLY GRADED SAND</b> , with clay, gray.		
	36	S-5										Same as above.		
	37	S-6										Same as above.		
	38	S-7									10	<b>SILTY CLAYEY SAND</b> , gray.		
	39	S-8										Same as above.		
	40	S-9										Same as above.		

LOG OF BORING G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ ROCK\_ETL\_GDT 4/28/09

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. 13,698,322' E. 3,319,855'

# LOG OF BORING AA-17



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

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: -31' NAVD

DESCRIPTION OF STRATUM

Same as above.

Boring was extended to an elevation of -41-feet NAVD during the drilling operations.

**REMARKS:**

Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by Ocean Surveys, Inc.  
GPS Coord. N. 13,698,322' E. 3,319,855'

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

LOG OF BORING G109112 PROP. ANCHORAGE BASIN SAND SOURCE.GPJ ROCK\_ETL\_GDT\_4/28/09

SOIL SYMBOL	FIELD DATA				LABORATORY DATA						
	Elevation, Ft. [NAVD]	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	ATTERBERG LIMITS			MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)
					LL	PL	PI				
41		S-10									19