LOG OF BORING C-13

Rock Engineering & Testing Lab., Inc.
6817 Leopard St.
Corpus Christi, TX 78409
Telephone: (361) 883-4555
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CLIENT: HDR, Inc.
PROJECT: Prop. Large Scale Beach Nourishment Project
LOCATION: S. Jetty Borrow Source Area; Galveston, TX
NUMBER: G108558
DATE(S) DRILLED: 07/30/08 - 07/30/08

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -14.5' 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
	5											
	10											
	15	SS S-1		N= 3	24						3	**POORLY GRADED SAND**, with shell, gray, moist, very loose.
		SS S-2		N= 8								Same as above, loose.
	20	SS S-3		N= 12	19						3	Same as above, medium.
		SS S-4		N= 2	21						4	**POORLY GRADED SAND**, with shell, gray, moist, very loose.
		SS S-5		N= WOH								Same as above, with clay.
	25	SS S-6		N= 2	23						23	**SILTY CLAYEY SAND**, with shell, gray, moist, very loose.
		SS S-7		N= 3								Same as above.
	30	SS S-8		N= 2	50						88	**SANDY CLAY**, with shell, gray, very moist, soft.
		SS S-9		N= WOH								Same as above, very soft.
		SS S-10		N= 5								Same as above, firm.

Boring was extended to an elevation of -33.5-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, Inc. Boring operations were performed by RETL.
GPS Coord. N. 29.33744 W. 94.71832

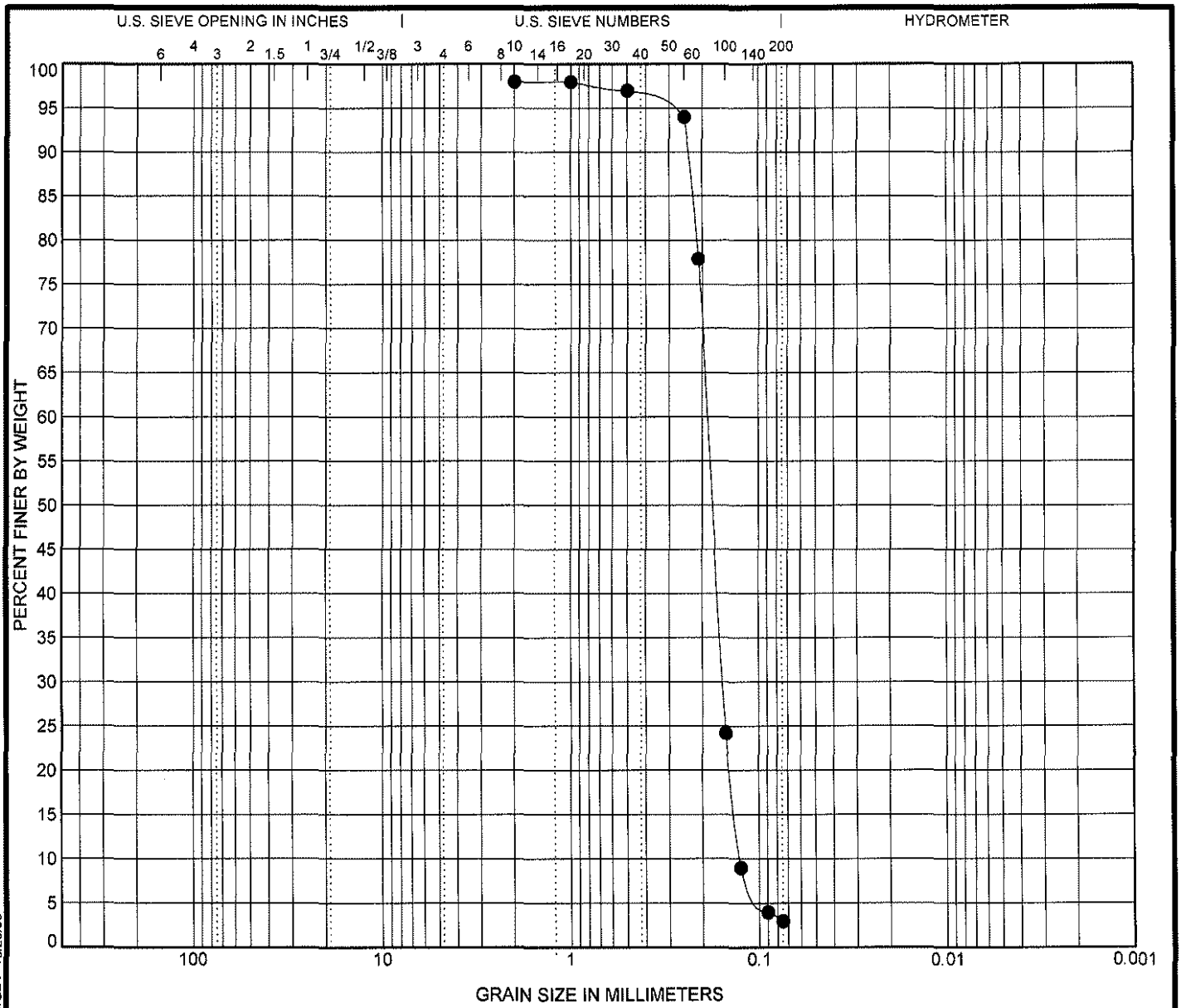
· Geotechnical Engineering
· Construction Materials Testing

PROJECT NAME: West Galveston Island Large Scale Beach Nourishment Project
CLIENT: HDR, Inc.
BORING ID.: C-13
DESCRIPTION: South Jetty Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-14.5' TO -16.5' NAVD	-18.5' TO -20.5' NAVD	-20.5' TO -22.5' NAVD	-24.5' TO -26.5' NAVD	-28.5' TO -30.5' NAVD
1.71	13.03	10.26	5.70	N/A

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-14.5' TO -16.5' NAVD	-18.5' TO -20.5' NAVD	-20.5' TO -22.5' NAVD	-24.5' TO -26.5' NAVD	-28.5' TO -30.5' NAVD
#10	100.00	100.00	100.00	100.00	N/A
#18	98.10	81.70	95.90	92.30	N/A
#35	96.60	64.80	77.90	84.60	N/A
#60	93.70	51.90	62.10	76.70	N/A
#70	77.89	44.44	40.33	N/A	N/A
#100	24.19	19.98	10.69	N/A	N/A
#120	9.00	7.90	9.70	35.00	N/A
#170	3.60	3.90	4.60	28.90	N/A
#200	3.40	3.30	3.90	23.40	88.40
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.18	0.24	0.22	0.18	N/A
MEAN GRAIN SIZE (mm)	0.18	0.36	0.30	N/A	N/A
SORTING (σ)	0.34	1.23	1.02	N/A	N/A

*C-13; -28.5' to -30.5' 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	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-13**	(-14.5' to -16.5 NAVD)	**Borrow Area (-14.5' to -16.5' NAVD)**				**1.02**	**1.48**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-13**	(-14.5' to -16.5 NAVD)	**2**	**0.188**	**0.156**	**0.127**	**0.0**	**95.0**	**3.0**	

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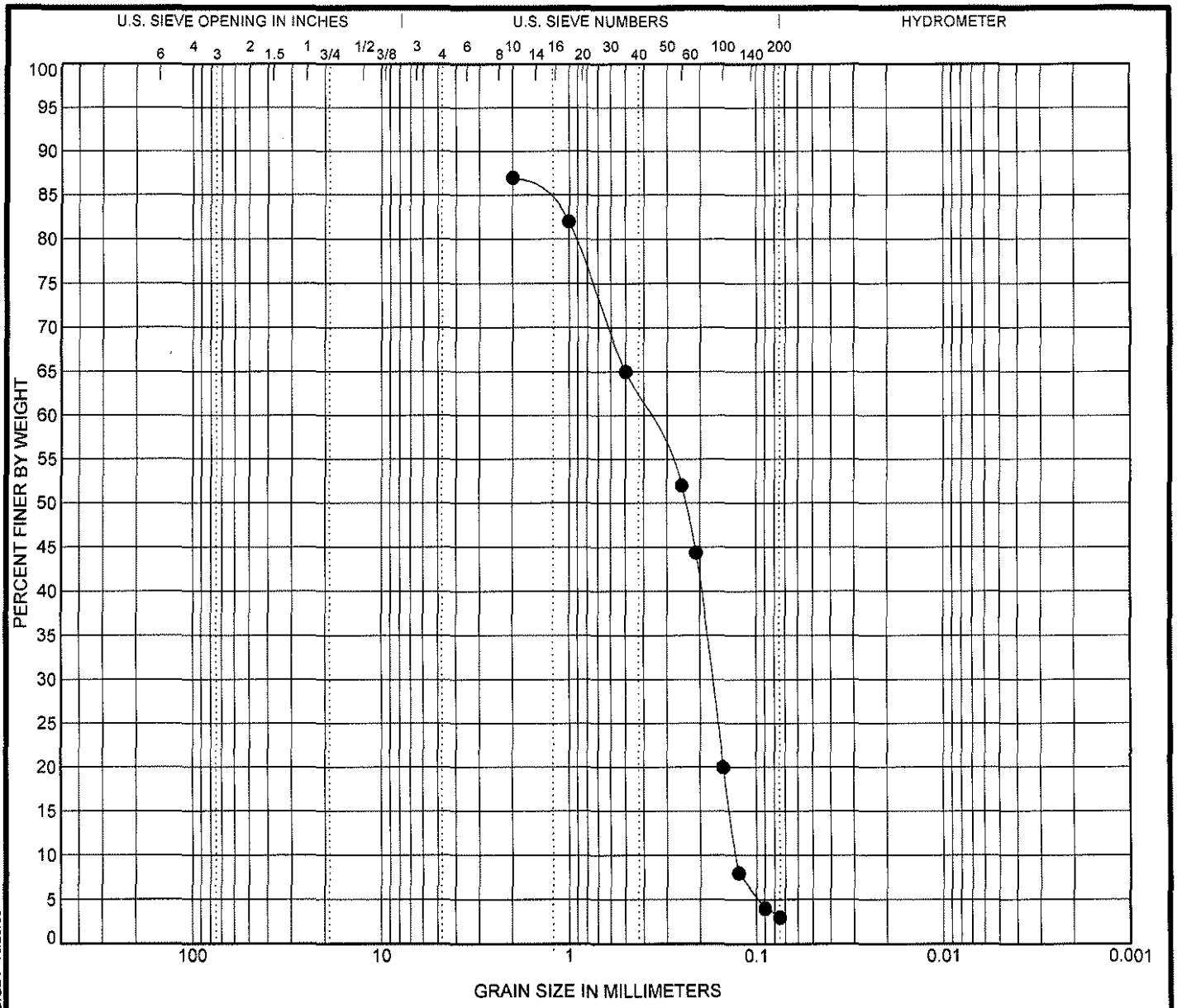
GRAIN SIZE DISTRIBUTION

Project: Prop. Large Scale Beach Nourishment Project

Location: South Jetty Borrow Source Area; Galveston, Texas

Number: G108558

US_GRAIN_SIZE G108558B PROP. LARGE SCALE BEACH NOURISHMENT PROJECT.GPJ US_LAB.GDT 10/20/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-13**	(-18.5' to -20.5' NAVD)	**Borrow Area (-18.5' to -20.5' NAVD)**				**0.60**	**2.97**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-13**	(-18.5' to -20.5' NAVD)	**2**	**0.383**	**0.172**	**0.129**	**0.0**	**84.0**	**3.0**	

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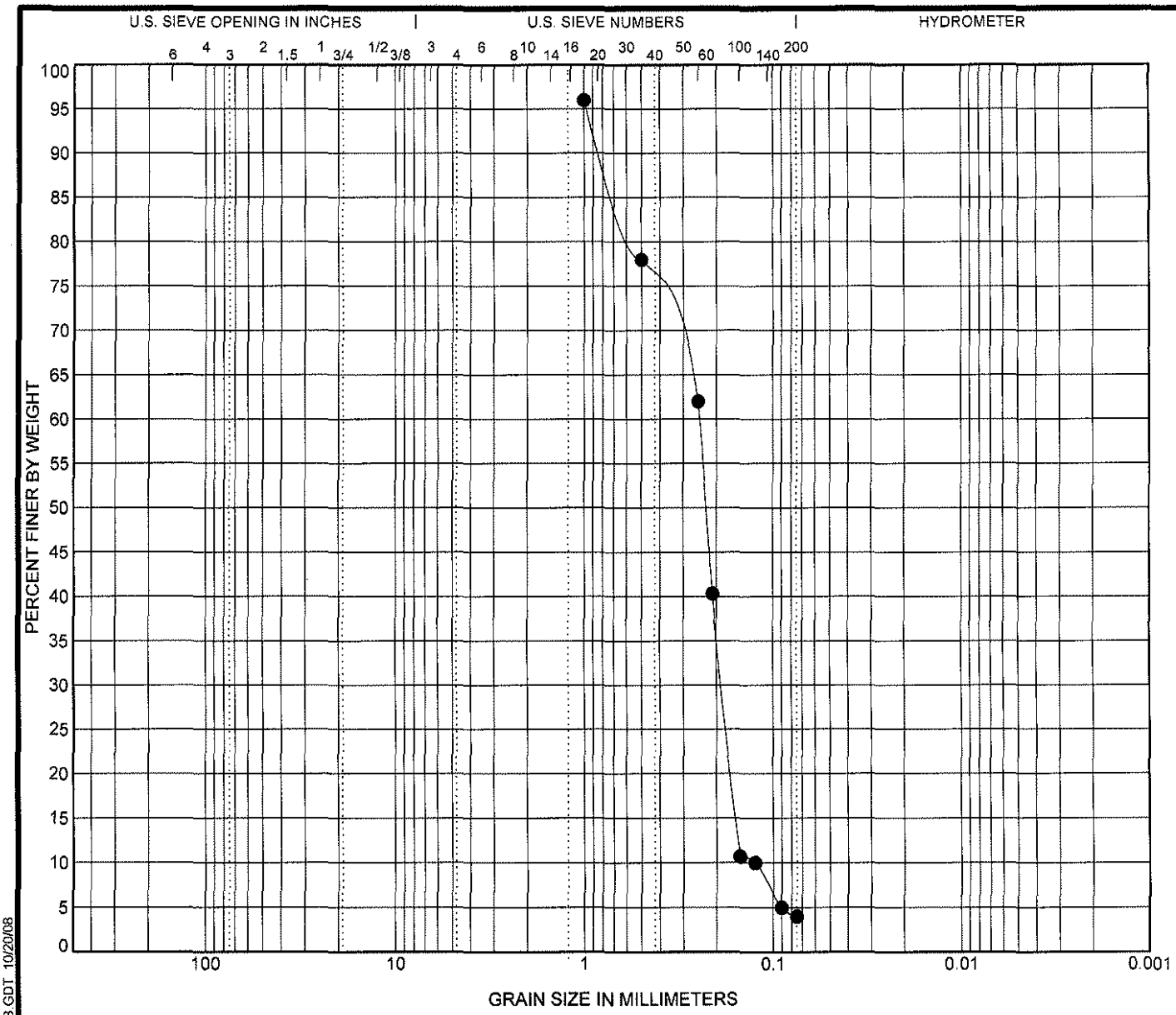

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-13**	(-20.5' to -22.5' NAVD)	**Borrow Area (-20.5' to -22.5' NAVD)**				**1.13**	**1.97**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-13**	(-20.5' to -22.5' NAVD)	**1**	**0.246**	**0.187**	**0.125**	**0.0**	**92.0**	**4.0**	

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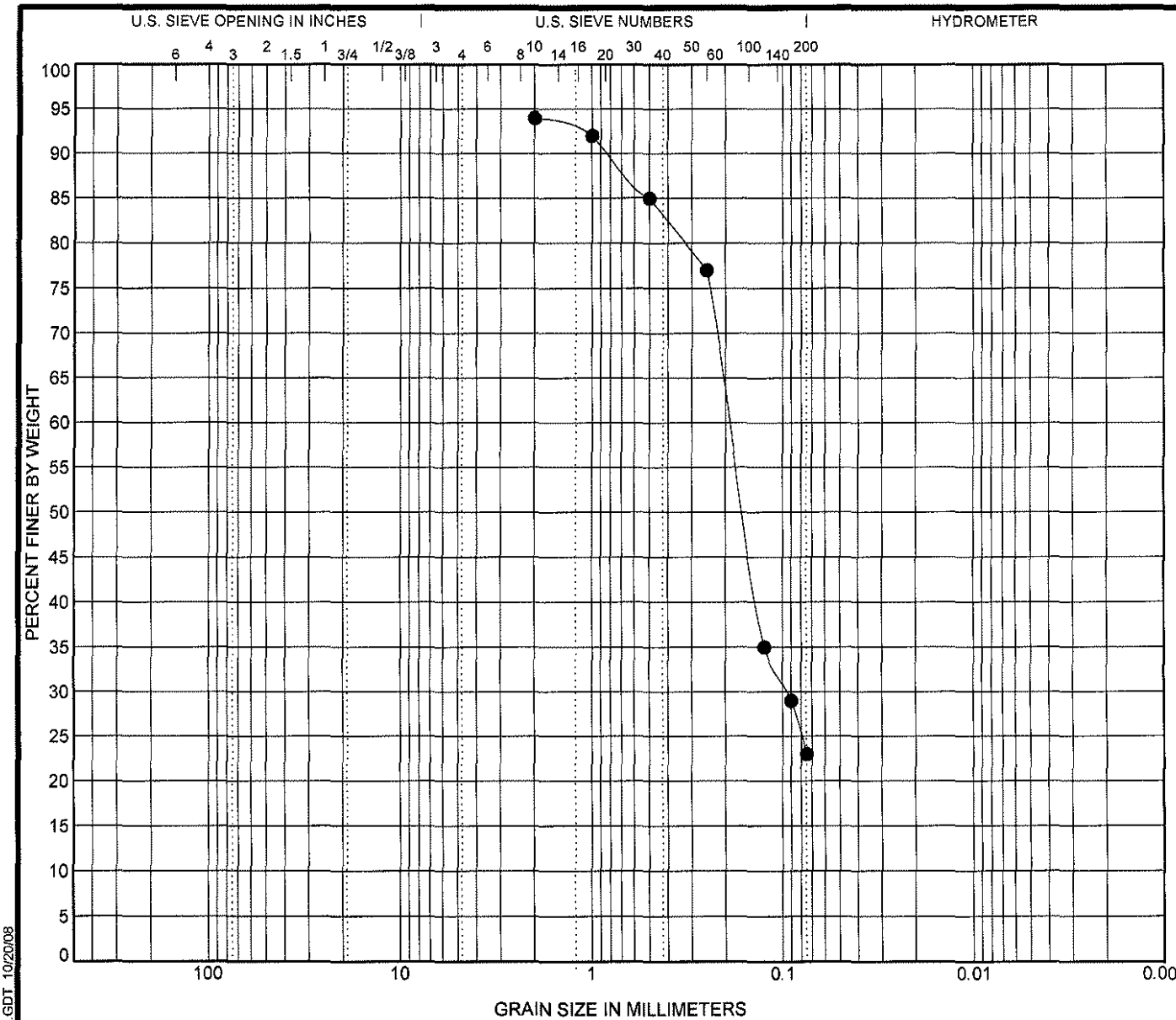

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-13**	(-24.5' to -26.5' NAVD)	**Borrow Area (-24.5' to -26.5' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-13**	(-24.5' to -26.5' NAVD)	**2**	**0.189**	**0.095**		**0.0**	**71.0**	**23.0**	

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