LOG OF BORING C-31

Rock Engineering & Testing Lab., Inc.
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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: 08/02/08 - 08/02/08

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -12.3' 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	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
	5											
	10											
		SS S-1		N= 2	25						11	**POORLY GRADED SAND**, with shell and clay, dark gray, moist, very loose.
	15	SS S-2		N= 8								Same as above, loose.
		SS S-3		N= 2								Same as above, very loose.
		SS S-4		N= 22								**SILTY CLAYEY SAND**, with shell, gray, moist, medium.
	20	SS S-5		N= 8	22						17	Same as above, loose.
		SS S-6		N= 1								**CLAYEY SAND**, with shell, dark gray, moist, very soft.
	25	SS S-7		N= 10	26						30	Same as above, stiff.
		SS S-8		N= 2								Same as above, soft.
		SS S-9		N= 1								**CLAYEY SAND**, with shell, gray, moist, very soft.
	30	SS S-10		N= 1	36						49	Same as above, very moist.
		SS S-11		N= 0								Same as above, firm.
	35	SS S-12		N= 5	39						89	**SANDY CLAY**, with shell, gray, very moist, very soft.
												Boring was extended to an elevation of -35.3-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. 29.33493 W. 94.72033

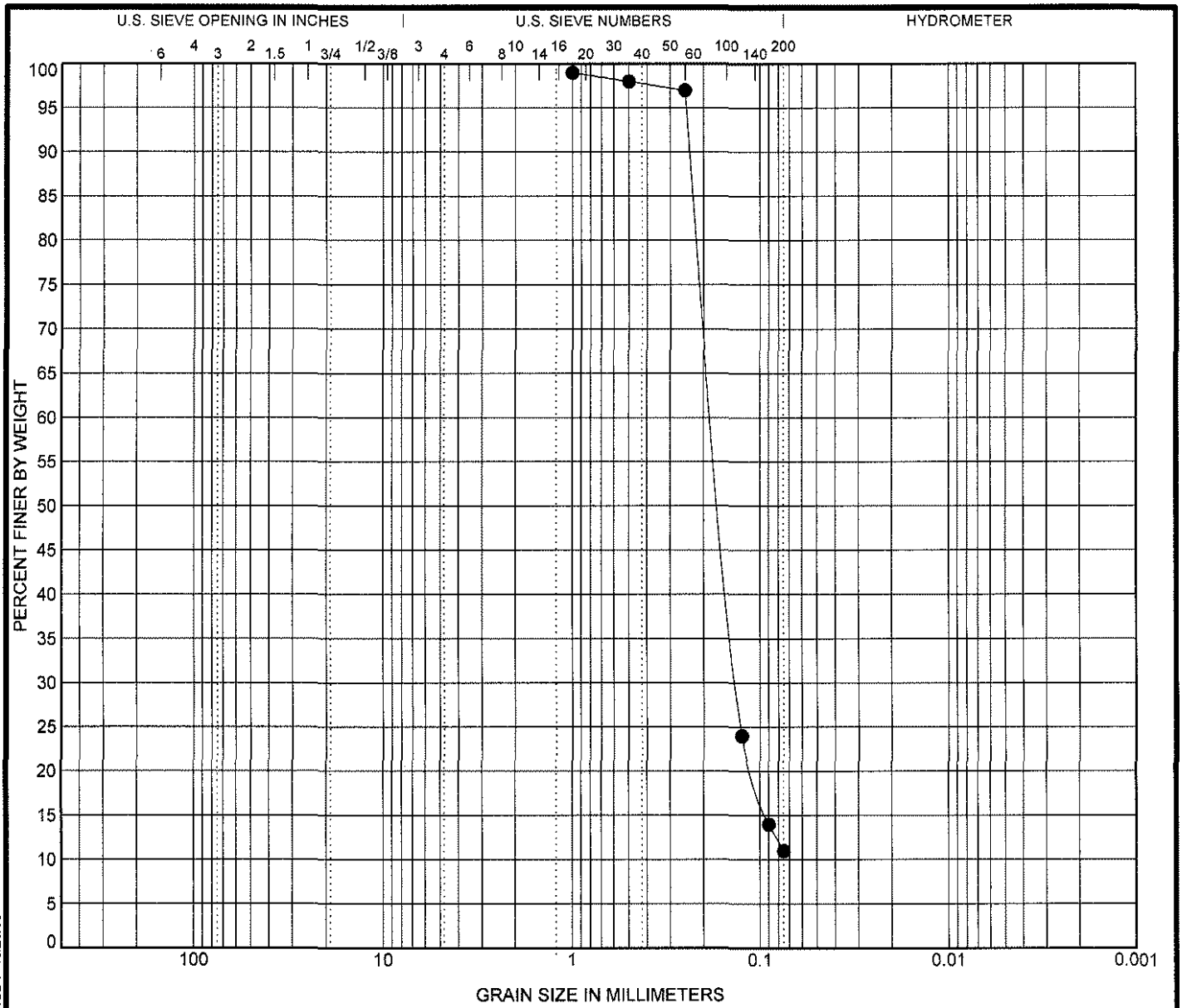
· Geotechnical Engineering
· Construction Materials Testing

PROJECT NAME: West Galveston Island Large Scale Beach Nourishment Project
CLIENT: HDR, Inc.
BORING ID.: C-31
DESCRIPTION: South Jetty Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-12.3' TO -14.3' NAVD	-20.3' TO -22.3' NAVD	-24.3' TO -26.3' NAVD	-30.3' TO -32.3' NAVD	-34.3' TO -35.3' NAVD
1.56	**14.52**	**1.90**	**3.07**	**0.25**

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-12.3' TO -14.3' NAVD	-20.3' TO -22.3' NAVD	-24.3' TO -26.3' NAVD	-30.3' TO -32.3' NAVD	-34.3' TO -35.3' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	99.00	88.70	98.70	97.20	99.60
#35	98.10	83.40	97.90	95.60	99.40
#60	96.70	80.70	96.90	94.90	99.20
#70	N/A	N/A	N/A	N/A	99.20
#100	N/A	N/A	N/A	N/A	98.90
#120	23.60	31.60	41.40	79.10	98.20
#170	13.60	21.10	32.60	59.40	93.10
#200	11.40	16.50	30.10	49.30	88.50
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.18	0.18	0.16	0.07	N/A
MEAN GRAIN SIZE (mm)	0.16	N/A	N/A	N/A	N/A
SORTING (σ)	N/A	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
●	**C-31**	(-12.3' to -14.3' NAVD)	**Borrow Area (-12.3' to -14.3' NAVD)**				**1.41**	**2.49**

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-31**	(-12.3' to -14.3' NAVD)	**1**	**0.176**	**0.132**		**0.0**	**88.0**	**11.0**	

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GRAIN SIZE DISTRIBUTION

Project: Prop. Large Scale Beach Nourishment Project

Location: South Jetty Borrow Source Area; Galveston, Texas

Number: G108558

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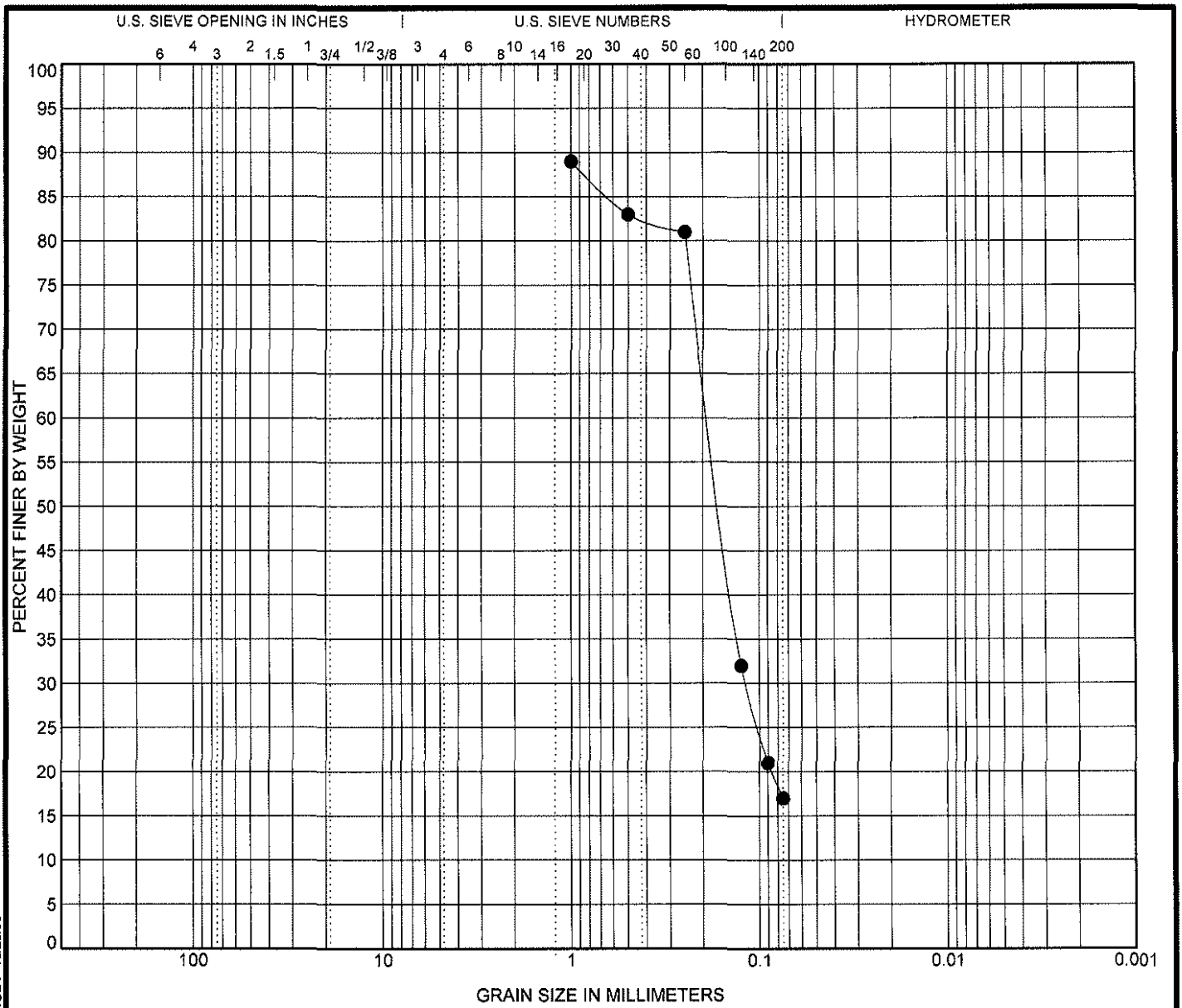

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-31**	(-20.3' to -22.3' NAVD)	**Borrow Area (-20.3' to -22.3' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-31**	(-20.3' to -22.3' NAVD)	**1**	**0.186**	**0.118**		**0.0**	**72.0**	**17.0**	

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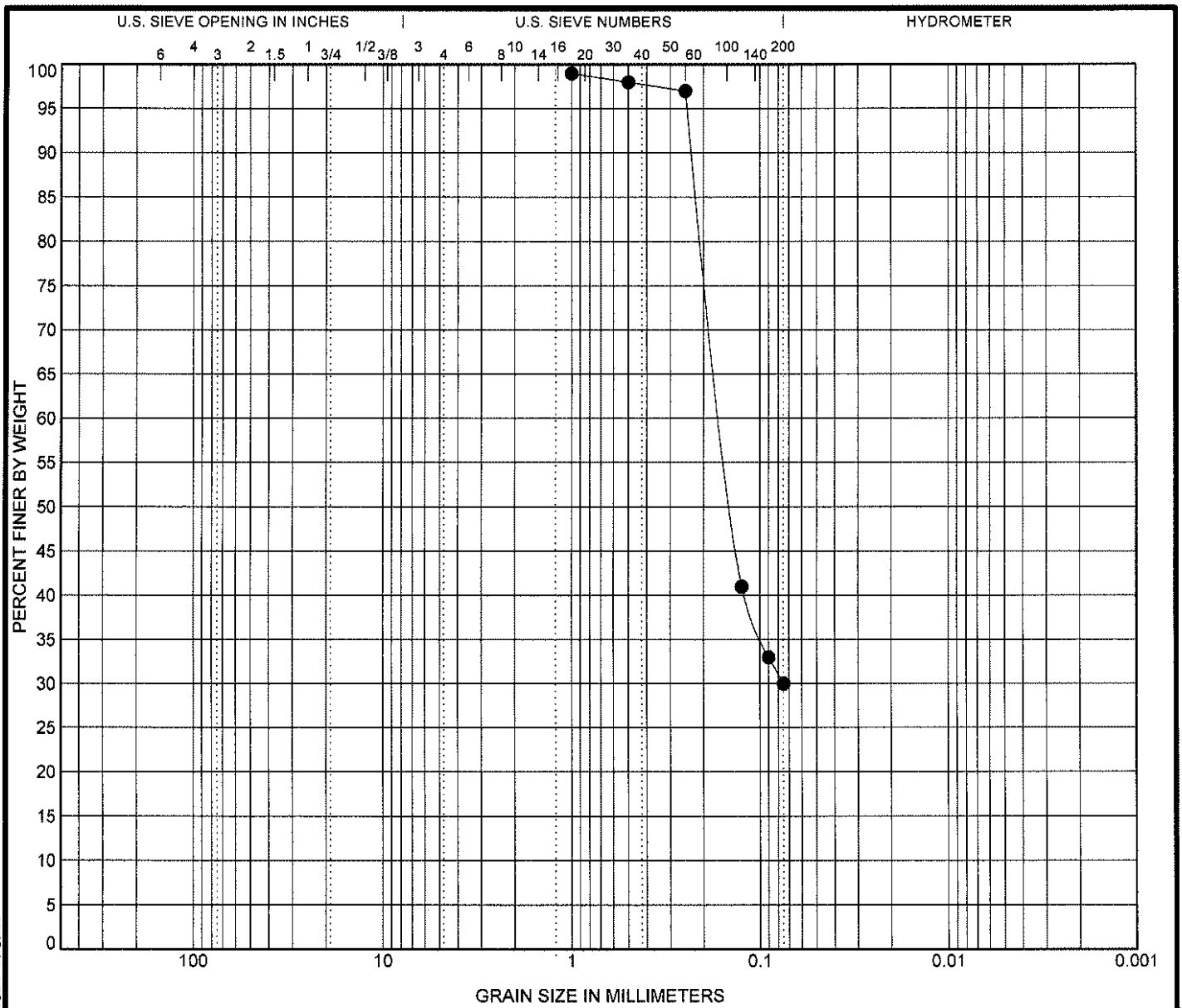

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-31**	(24.3' to -26.3' NAVD)	**Borrow Area (-24.3' to -26.3' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-31**	(24.3' to -26.3' NAVD)	**1**	**0.158**	**0.075**		**0.0**	**69.0**	**30.0**	

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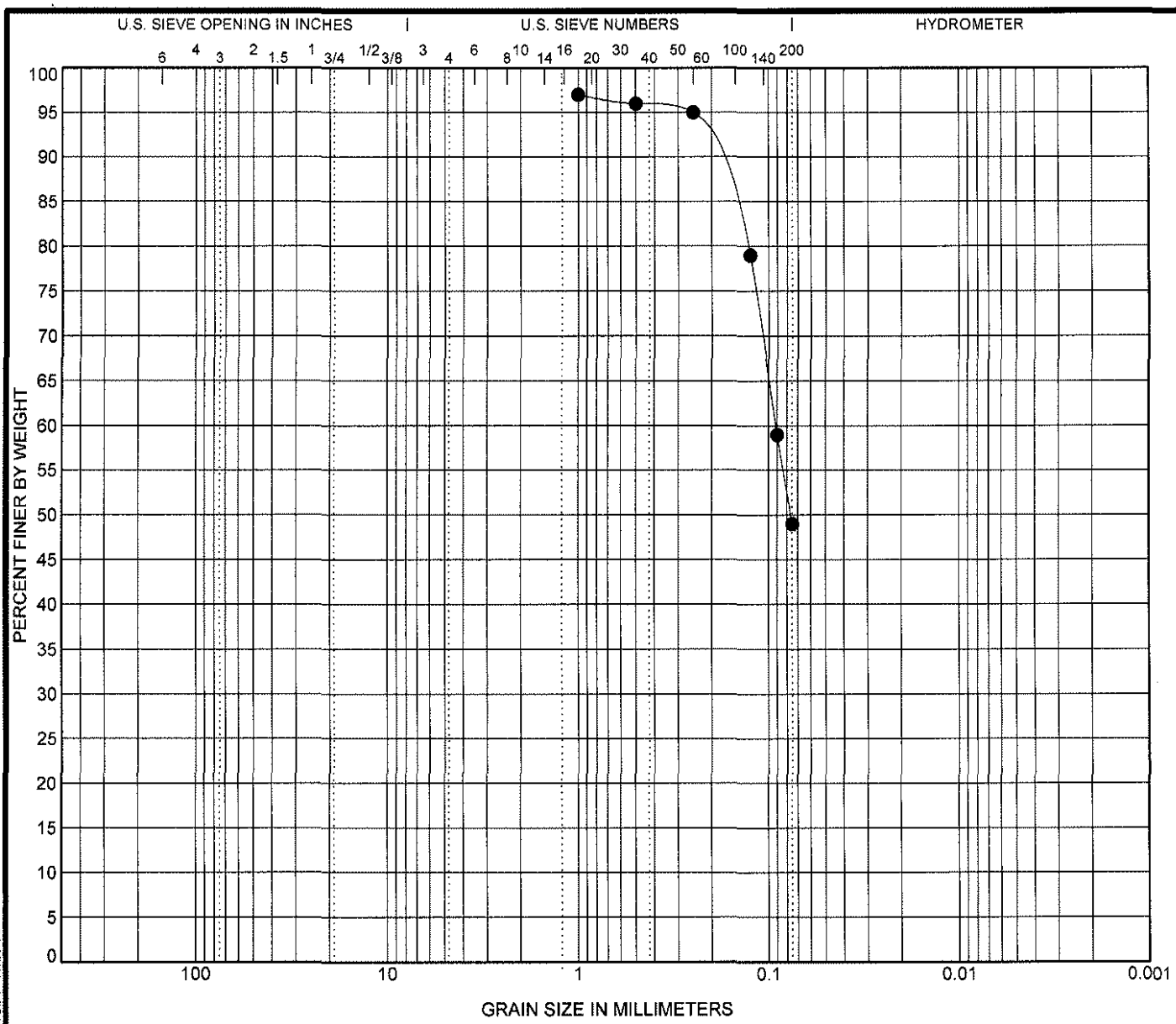

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-31**	(-30.3' to -32.3' NAVD)	**Borrow Area (-30.3' to -32.3' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-31**	(-30.3' to -32.3' NAVD)	**1**	**0.091**			**0.0**	**48.0**	**49.0**	

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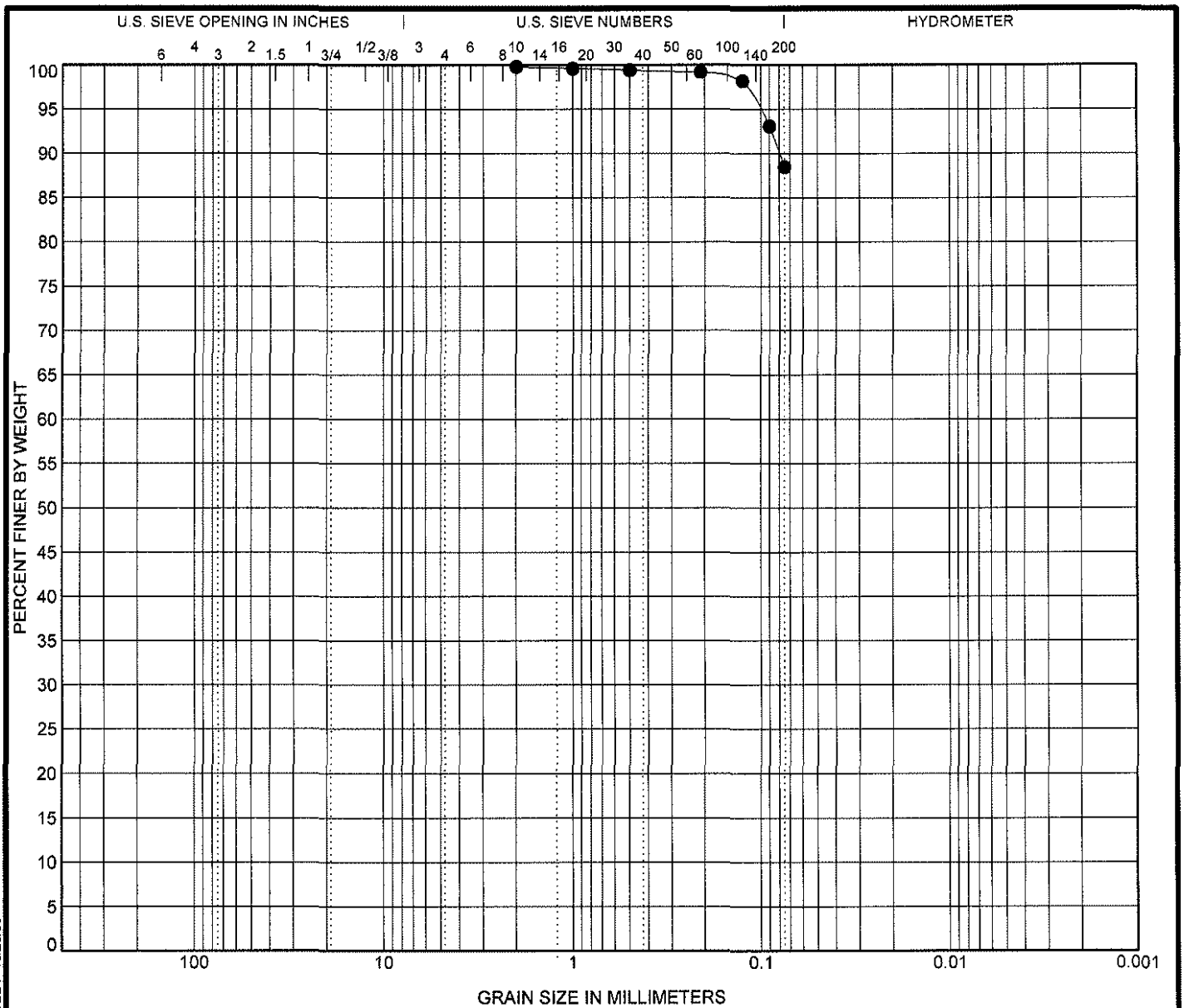

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
●	**C-31**	(-34.3' to -35.3' NAVD)	**Borrow Area (-34.3' to -35.3' NAVD)**					

	Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**C-31**	(-34.3' to -35.3' NAVD)	**2**				**0.0**	**11.3**	**88.5**	

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