



- GEOTECHNICAL ENGINEERING
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April 20, 2009

HDR Engineering, Inc.  
555 North Carancahua Street, Suite 1650  
Corpus Christi, Texas 78478

Attention: Mr. Daniel Heilman, P.E.

SUBJECT: Letter Report  
**SUBSURFACE INVESTIGATION AND LABORATORY TESTING PROGRAM  
FOR THE ANCHORAGE BASIN SAND SOURCE INVESTIGATION  
Anchorage Basin Borrow Area  
Galveston Island, Texas  
RETL Job Number: G109112**

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Dear Mr. Heilman,

This report presents the results of a subsurface investigation and laboratory testing program for the Anchorage Basin Sand Source Investigation. This study was conducted for HDR Engineering, Inc. in support of the West Galveston Island End of Seawall Beach Nourishment Project. The results of this laboratory testing program are to be found in the accompanying report, three copies which are being transmitted herewith.

#### **Authorization**

The scope of work for this project was performed in accordance with RETL Proposal Number P121108A dated January 26, 2009. The proposal was approved and incorporated into an HDR Engineering, Inc. Geotech Subconsultant Agreement and was executed on February 26, 2009.

#### **Purpose and Scope**

The purpose of this exploration was to evaluate the soil conditions at the project location, perform laboratory testing, as directed by representatives of HDR Engineering, Inc., and to generate grain size distribution curves. The soil information will be applied by HDR Engineering, Inc. to determine the viability of the Anchorage Basin as an alternative or supplemental borrow area to the South Jetty Borrow Source.

The scope of the exploration and analysis included the subsurface exploration, field and laboratory testing and preparation of this report.

#### **ROCK ENGINEERING & TESTING LABORATORY, INC.**

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Anchorage Basin  
Galveston Island, Texas

The scope of services did not include an environmental assessment. Any statements in this report regarding odors, colors, unusual or suspicious items or conditions are strictly for the information of the client.

### **General**

The exploration of the subsurface conditions reported herein are considered sufficient in detail and scope to form a reasonable basis for the evaluation of the soil conditions within the Anchorage Basin as an alternative or supplemental borrow area to the South Jetty Borrow Source.

The Geotechnical Engineer states that the findings, recommendations, specifications or professional advice contained herein have been presented after being prepared in a manner consistent with that level of care and skill ordinarily exercised by reputable members of the Geotechnical Engineer's profession practicing contemporaneously under similar conditions in the locality of the project. RETL operates in general accordance with "*Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction*, (ASTM D 3740)." No other representations are expressed or implied, and no warranty or guarantee is included or intended.

This report has been prepared for the exclusive use of HDR Engineering, Inc. for the specific purpose of the Anchorage Basin Sand Source Investigation.

### **Scope of Field Exploration**

The field exploration included reconnaissance of the project site and obtaining vibracore soil samples. During the sample recovery operations, the soils encountered were classified and recorded on boring logs in accordance with "*Standard Guide for Field Logging of Subsurface Exploration of Soil and Rock*, (ASTM D 5434)."

A vessel equipped with a platform configured with a 3-point mooring system and a mechanized A-frame for handling the vibratory corer was utilized to access the boring locations. The borings were performed using a Model 1500 vibratory corer (VC) equipped with a 20-foot long core barrel and was equipped with a Lexan core liner in which the sediment sample was recovered.

Thirty borings were performed for the purpose of determining the geotechnical properties of the subsurface soils at the site. All work for this project was performed at elevations ranging from -22-feet to -36-feet NAVD. HDR Engineering, Inc. determined the number, depth and location of the borings. Ocean Surveys, Inc., a subcontractor to RETL, performed the boring operations. The sample locations were recorded using State Plane NAD 83, Texas South Central Zone map datum. The sample identification and GPS Coordinates at the sample locations are provided in the table below:



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**ANCHORAGE BASIN SAND SOURCE INVESTIGATION**

Anchorage Basin  
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BORING NO.	GPS COORDINATES	
	Northing (Ft.)	Easting (Ft.)
AA-01	13,697,653	3,316,595
AA-02	13,698,267	3,316,725
AA-03	13,698,824	3,316,993
AA-04	13,699,436	3,317,401
AA-05	13,700,293	3,317,717
AA-06	13,697,692	3,317,372
AA-07	13,697,972	3,317,029
AA-08	13,698,396	3,317,267
AA-09	13,698,183	3,317,733
AA-10	13,698,835	3,317,844
AA-11	13,699,483	3,318,163
AA-12	13,700,304	3,318,392
AA-13	13,698,028	3,318,672
AA-14	13,698,747	3,318,773
AA-15	13,699,240	3,318,962
AA-16	13,699,918	3,319,141
AA-17	13,698,322	3,319,855
AA-18	13,699,496	3,319,957
AA-19	13,700,406	3,320,164
AA-20	13,698,014	3,320,905
AA-21	13,698,958	3,321,049
AA-22	13,700,020	3,321,179
AA-23	13,698,522	3,321,488
AA-24	13,698,450	3,322,163
AA-25	13,699,095	3,322,545
AA-26	13,699,510	3,322,110
AA-27	13,699,532	3,323,082
AA-28	13,700,599	3,324,100
AA-29	13,700,790	3,322,827
AA-30	13,700,597	3,325,148

**LABORATORY TESTING PROGRAM**

In addition to the field investigation, a laboratory testing program was conducted to determine additional pertinent engineering characteristics of the subsurface materials necessary in analyzing the behavior of the subsurface soils for the proposed project.



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**ANCHORAGE BASIN SAND SOURCE INVESTIGATION**

Anchorage Basin  
Galveston Island, Texas

Selected samples were subjected to percent material finer than the #200 sieve and sieve analysis of fine and course aggregates (ASTM C 136).

All phases of the laboratory testing program were conducted in general accordance with the applicable ASTM Specification. The results of this test are to be found on the test reports provided as attachments to this report.

The grain size distribution curves were created using the data obtained from the sieve analysis of fine and course aggregates (ASTM C 136). The phi values were obtained from the grain size distribution curves and utilized to determine the following statistical values:

$$\text{Median} = \frac{\phi_{50}}{2}$$

$$\text{Mean} = \frac{(\phi_{84} + \phi_{50} + \phi_{16})}{3}$$

$$\text{Sorting } \sigma = \frac{\phi_{84} - \phi_{16}}{4} + \frac{\phi_{95} - \phi_5}{6.6}$$

**GENERAL COMMENTS**

**General Comments**

The Geotechnical Engineer states that the findings or professional advice contained herein, have been presented after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. No warranties are implied or expressed.

Pursuant to instructions, no further testing or analysis have been performed. Unless notified, the soil samples will be disposed of 3-months after issuance of this report. We appreciate the opportunity to provide our services to you on this project. If you have any questions or comments, please contact us at (361) 883-4555.

Sincerely,



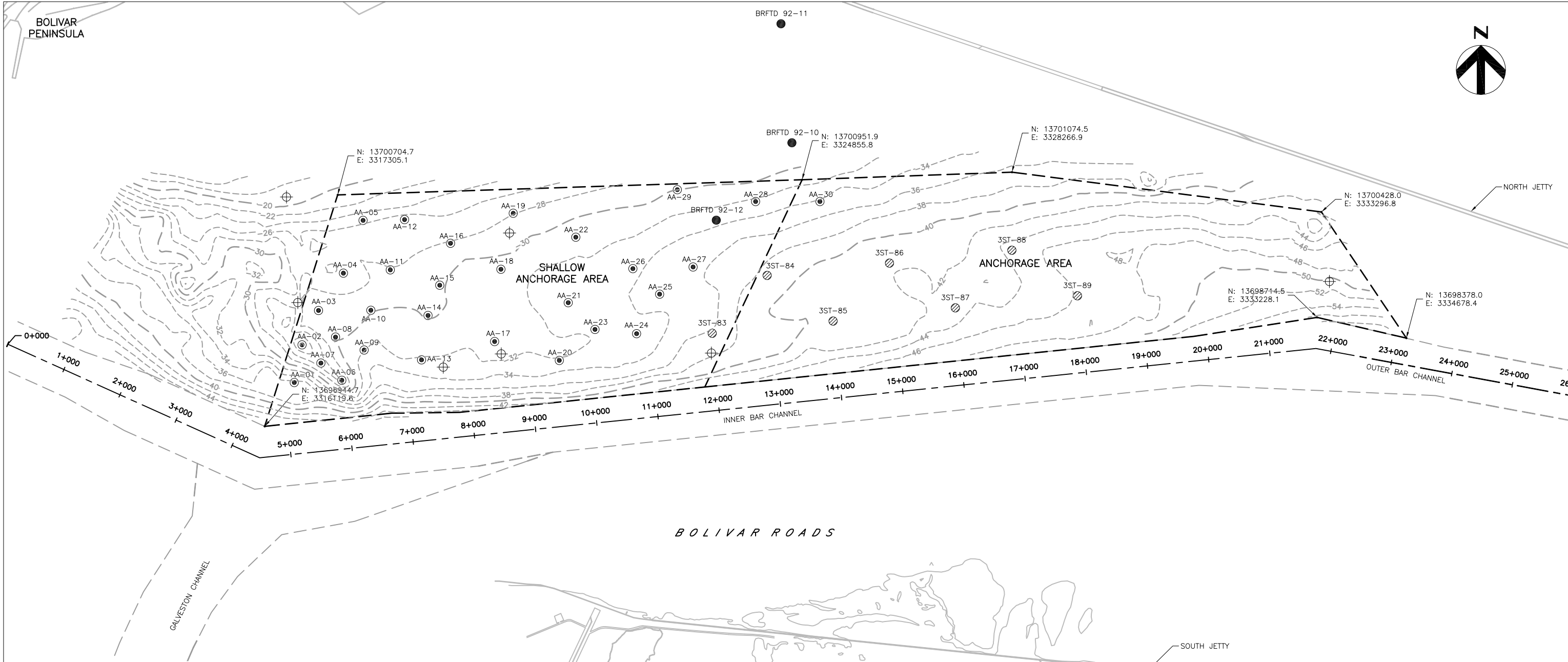
Christopher A. Rock, P.E.  
Branch Manager

Attachments: Boring Location Plan  
Sieve Analysis of Fine and Course Aggregates, (ASTM C 136) Summary Sheets  
Grain Size Distribution Curves





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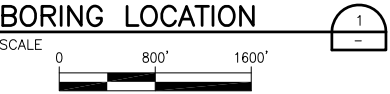
LOCATIONS FOR PROPOSED VIBRACORES				
DESIGNATION	NORTHING	EASTING	LATITUDE	LONGITUDE
AA-01	N 13697657	E 3316600	29-20-44.7	94-46-02.3
AA-02	N 13698269	E 3316726	29-20-50.7	94-46-00.6
AA-03	N 13698827	E 3316994	29-20-56.2	94-45-57.4
AA-04	N 13699433	E 3317399	29-21-02.0	94-45-52.6
AA-05	N 13700291	E 3317718	29-21-10.4	94-45-48.6
AA-06	N 13697693	E 3317373	29-20-44.8	94-45-53.6
AA-07	N 13697973	E 3317033	29-20-47.7	94-45-57.3
AA-08	N 13698395	E 3317271	29-20-51.8	94-45-54.4
AA-09	N 13698185	E 3317736	29-20-49.5	94-45-49.3
AA-10	N 13698831	E 3317845	29-20-55.9	94-45-47.8
AA-11	N 13699487	E 3318161	29-21-02.3	94-45-43.9
AA-12	N 13700304	E 3318392	29-21-10.3	94-45-41.0
AA-13	N 13698024	E 3318669	29-20-47.6	94-45-38.8
AA-14	N 13698746	E 3318774	29-20-54.7	94-45-37.3
AA-15	N 13699238	E 3318965	29-20-59.5	94-45-34.9
AA-16	N 13699919	E 3319140	29-21-06.2	94-45-32.7
AA-17	N 13698323	E 3319857	29-20-50.1	94-45-25.2
AA-18	N 13699497	E 3319959	29-21-01.7	94-45-23.6
AA-19	N 13700407	E 3320159	29-21-10.6	94-45-21.0
AA-20	N 13698016	E 3320908	29-20-46.7	94-45-13.5
AA-21	N 13698954	E 3321053	29-20-56.0	94-45-11.5
AA-22	N 13700018	E 3321176	29-21-06.4	94-45-09.7
AA-23	N 13698519	E 3321488	29-20-51.5	94-45-06.7
AA-24	N 13698450	E 3322165	29-20-50.6	94-44-59.1
AA-25	N 13699092	E 3322539	29-20-56.8	94-44-54.6
AA-26	N 13699507	E 3322105	29-21-01.0	94-44-59.4
AA-27	N 13699534	E 3323083	29-21-01.0	94-44-48.3
AA-28	N 13700598	E 3324099	29-21-11.1	94-44-36.4
AA-29	N 13700790	E 3322827	29-21-13.5	94-44-50.7
AA-30	N 13700598	E 3325145	29-21-10.8	94-44-24.6

NOTES:

- NORTHINGS AND EASTINGS ARE STATE PLANE GRID, NAD'83, TEXAS SOUTH CENTRAL ZONE IN U.S. FEET. GEOGRAPHIC COORDINATES (LAT/LONG) ARE IN NAD'83
- ELEVATION CONTOURS ARE IN NAVD'88 DATUM.
- ELEVATION CONTOURS BASED ON INFORMATION PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT. SURVEY DATE WAS OCTOBER 2008. ELEVATIONS WERE CONVERTED FROM USACE MLT TO NAVD '88 USING THE FOLLOWING CORRELATION:  
0 NAVD '88 = 1.42' MLT.
- APPROXIMATE LOCATIONS OF POTENTIAL OBSTRUCTIONS BASED ON NOAA CHART 11324. HDR DOES NOT GUARANTEE ACCURACY OR COMPLETENESS OF THESE LOCATIONS. ADDITIONAL OBSTRUCTIONS ARE LIKELY TO EXIST.

LEGEND:

- HISTORICAL BORING LOCATIONS FROM USACE (1966)
- PROPOSED VIBRACORE LOCATIONS
- APPROXIMATE LOCATION OF POTENTIAL OBSTRUCTION (SEE NOTE 4)
- VIBRACORE LOCATION FROM RICE UNIVERSITY



TEXAS GENERAL LAND OFFICE  
WEST GALVESTON ISLAND  
END OF SEAWALL NOURISHMENT

BORING LOCATION PLAN - GALVESTON ANCHORAGE AREA

PRELIMINARY

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

ENGINEER: DANIEL J. HEILMAN  
LICENSE NO.: 86936  
DATE: 2/27/09

DATE  
2/27/09  
FIGURE  
F1



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**SAMPLE ID.:** AA-01

**DESCRIPTION:** Anchorage Basin Borrow Source Area

<b>PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)</b>
<b>-38' to -39' NAVD</b>
<b>29.60</b>

<b>ASTM MESH</b>	<b>% FINER BY WEIGHT AFTER REMOVING SHELL</b>
	<b>-38' to -39' NAVD</b>
#10	100.00
#18	37.43
#35	17.06
#60	10.97
#70	9.17
#100	4.76
#120	2.71
#170	0.95
#200	0.69
<b>STATISTICS (EXCLUDING SHELL)</b>	
<b>MEDIAN GRAIN SIZE (mm)</b>	1.30
<b>MEAN GRAIN SIZE (mm)</b>	0.84
<b>SORTING (<math>\sigma</math>)</b>	0.68

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-02

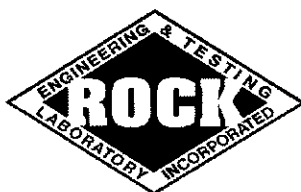
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-22' to -23' NAVD	-24' to -25' NAVD	-27' to -28' NAVD	-29' to -30' NAVD
62.20	46.80	20.56	22.95

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-22' to -23' NAVD	-24' to -25' NAVD	-27' to -28' NAVD	-29' to -30' NAVD
#10	100.00	100.00	100.00	100.00
#18	N/A	27.49	68.63	66.09
#35	N/A	11.94	60.99	59.34
#60	N/A	6.67	58.05	55.30
#70	N/A	5.24	56.43	52.93
#100	N/A	3.27	46.89	33.36
#120	N/A	2.51	41.88	19.33
#170	N/A	2.02	38.33	10.51
#200	N/A	1.88	37.55	8.86
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	N/A	1.80	0.18	0.19
MEAN GRAIN SIZE (mm)	N/A	1.05	N/A	0.28
SORTING ( $\sigma$ )	N/A	0.50	N/A	N/A

\*AA-02; -22' to -23' NAVD was only passed through the #10 sieve.

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-03

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-30' to -31' NAVD	-33' to -34' NAVD	-36' to -37' NAVD
0.52	0.14	0.55

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-30' to -31' NAVD	-33' to -34' NAVD	-36' to -37' NAVD
#10	100.00	100.00	100.00
#18	98.86	99.53	99.00
#35	98.13	99.25	98.56
#60	97.41	98.88	97.78
#70	96.85	98.39	96.67
#100	92.82	90.85	67.32
#120	81.78	72.05	43.12
#170	61.66	48.20	18.91
#200	55.17	43.91	14.09
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	N/A	0.09	0.14
MEAN GRAIN SIZE (mm)	N/A	N/A	0.13
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-03  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-39' to -40' NAVD	-42' to -43' NAVD	-45' to -46' NAVD
5.29	0.07	0.16

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-39' to -40' NAVD	-42' to -43' NAVD	-45' to -46' NAVD
#10	100.00	100.00	100.00
#18	91.52	99.78	99.59
#35	89.74	99.64	99.24
#60	88.36	99.25	98.46
#70	86.96	98.61	96.84
#100	73.12	89.69	29.99
#120	61.46	73.00	13.49
#170	50.59	54.20	4.43
#200	48.04	50.03	2.98
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.08	0.07	0.17
MEAN GRAIN SIZE (mm)	N/A	N/A	0.17
SORTING ( $\sigma$ )	N/A	N/A	0.30

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





- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-04

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-26' to -27' NAVD	-32' to -33' NAVD	-35' to -36' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
N/A	0.01	0.11	0.00	0.02

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-26' to -27' NAVD	-32' to -33' NAVD	-35' to -36' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
#10	N/A	100.00	100.00	100.00	100.00
#18	N/A	99.96	99.64	99.97	99.95
#35	N/A	99.92	99.05	99.89	99.88
#60	N/A	99.68	95.48	98.71	99.75
#70	N/A	97.85	80.15	93.92	99.62
#100	N/A	27.90	17.11	28.51	96.19
#120	N/A	11.35	7.96	8.98	87.46
#170	N/A	3.08	4.70	1.99	79.73
#200	82.10	1.80	4.02	1.25	77.00
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	N/A	0.17	0.18	0.18	N/A
MEAN GRAIN SIZE (mm)	N/A	0.17	0.18	0.17	N/A
SORTING ( $\sigma$ )	N/A	0.24	0.30	0.19	N/A

\*AA-04; -26' to -27' NAVD was only passed through the -#200 sieve.

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



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-05  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-26' to -27' NAVD	-29' to -30' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
0.55	0.08	21.02	1.80

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-26' to -27' NAVD	-29' to -30' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
#10	100.00	100.00	100.00	100.00
#18	99.20	99.08	72.95	97.61
#35	98.78	98.90	68.22	97.17
#60	97.73	98.25	59.44	95.81
#70	97.22	96.82	50.66	91.97
#100	95.31	88.63	35.28	58.85
#120	90.80	82.13	30.27	43.31
#170	80.06	72.82	24.22	35.42
#200	78.39	68.80	21.15	33.98
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	N/A	N/A	0.21	0.15
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-05

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-36' to -37' NAVD	-39' to -40' NAVD	-42' to -46' NAVD
0.18	0.02	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-36' to -37' NAVD	-39' to -40' NAVD	-42' to -46' NAVD
#10	100.00	100.00	100.00
#18	99.53	99.86	99.93
#35	99.32	99.78	99.81
#60	98.96	99.52	99.40
#70	98.08	99.11	99.01
#100	70.84	49.48	63.99
#120	55.44	28.71	38.64
#170	47.06	15.69	22.51
#200	45.45	14.24	19.41
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.11	0.16	0.15
MEAN GRAIN SIZE (mm)	N/A	0.14	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-06

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-26' to -27' NAVD	-29' to -30' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
58.88	16.77	0.00	0.29

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-26' to -27' NAVD	-29' to -30' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
#10	100.00	100.00	100.00	100.00
#18	N/A	73.31	99.80	99.47
#35	N/A	63.48	99.51	99.22
#60	N/A	50.66	99.02	98.45
#70	N/A	40.98	98.61	96.89
#100	N/A	16.82	52.40	40.75
#120	N/A	8.98	35.23	22.84
#170	N/A	4.85	27.12	13.80
#200	N/A	4.30	25.94	12.26
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	N/A	0.26	0.15	0.17
MEAN GRAIN SIZE (mm)	N/A	0.35	N/A	0.15
SORTING ( $\sigma$ )	N/A	1.19	N/A	N/A

\*AA-06; -26' to -27' NAVD was only passed through the #10 sieve.

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-07

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-26' to -27'	-29' to -30'	-32' to -33'	-34' to -35'	-35' to -36'
NAVD	NAVD	NAVD	NAVD	NAVD
72.72	4.46	3.89	20.73	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-26' to -27'	-29' to -30'	-32' to -33'	-34' to -35'	-35' to -36'
	NAVD	NAVD	NAVD	NAVD	NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	N/A	88.72	90.74	67.05	99.98
#35	N/A	75.21	79.74	57.27	99.91
#60	N/A	53.27	57.46	44.68	99.69
#70	N/A	44.34	43.65	38.68	99.26
#100	N/A	29.94	19.20	23.96	60.02
#120	N/A	14.00	8.57	15.77	30.01
#170	N/A	7.22	3.29	10.00	14.00
#200	N/A	6.25	3.11	9.35	11.38
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	N/A	0.25	0.25	0.30	0.16
MEAN GRAIN SIZE (mm)	N/A	0.30	0.30	0.34	0.15
SORTING ( $\sigma$ )	N/A	N/A	1.12	N/A	N/A

\*AA-07; -26' to -27' NAVD was only passed through the #10 sieve.

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





- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-08

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-30' to -31' NAVD	-33' to -34' NAVD	-36' to -37' NAVD
25.33	0.46	2.16

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-30' to -31' NAVD	-33' to -34' NAVD	-36' to -37' NAVD
#10	100.00	100.00	100.00
#18	N/A	99.26	96.09
#35	N/A	99.06	94.42
#60	N/A	98.57	91.61
#70	N/A	97.45	82.85
#100	N/A	29.49	46.51
#120	N/A	3.93	33.71
#170	N/A	3.24	24.71
#200	N/A	3.04	22.35
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	N/A	0.17	0.17
MEAN GRAIN SIZE (mm)	N/A	0.17	N/A
SORTING ( $\sigma$ )	N/A	0.21	N/A

\*AA-08; -30' to -31' NAVD was only passed through the #10 sieve.

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



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-08  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-39' to -40' NAVD	-41' to -42' NAVD	-42' to -43' NAVD
0.26	9.39	N/A

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-39' to -40' NAVD	-41' to -42' NAVD	-42' to -43' NAVD
#10	100.00	100.00	N/A
#18	99.48	84.38	N/A
#35	99.26	77.77	N/A
#60	98.58	71.31	N/A
#70	96.95	68.49	N/A
#100	63.89	57.52	N/A
#120	41.45	50.99	N/A
#170	23.82	40.44	N/A
#200	18.72	40.20	75.80
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.15	0.13	N/A
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

\*AA-08; -42' to -43' NAVD was only passed through the -#200 sieve.

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-09

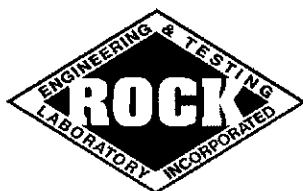
**DESCRIPTION:** Anchorage Basin Borrow Source Area

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 ( $\sigma$ )	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.



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

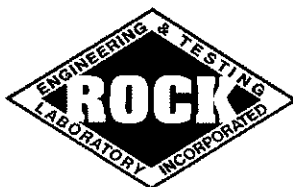
**BORING ID.:** AA-10

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-30' to -31' NAVD	-31' to -32' NAVD	-32' to -33' NAVD
4.57	3.02	0.74

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-30' to -31' NAVD	-31' to -32' NAVD	-32' to -33' NAVD
#10	100.00	100.00	100.00
#18	89.98	94.89	98.87
#35	80.49	91.89	98.50
#60	60.45	78.96	98.02
#70	49.21	64.95	97.48
#100	40.92	24.44	86.43
#120	39.07	14.50	56.19
#170	37.96	11.10	39.17
#200	37.79	10.81	35.96
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.16	0.18	0.12
MEAN GRAIN SIZE (mm)	N/A	0.19	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

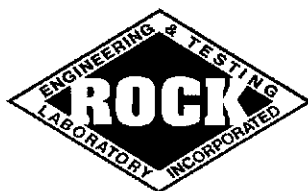
**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-10  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-34' to -35' NAVD	-35' to -36' NAVD	-38' to -39' NAVD
0.25	3.71	0.43

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-34' to -35' NAVD	-35' to -36' NAVD	-38' to -39' NAVD
#10	100.00	100.00	100.00
#18	99.56	93.91	99.40
#35	99.40	92.34	99.36
#60	98.96	90.75	99.21
#70	97.96	88.52	98.76
#100	63.78	37.68	85.96
#120	47.05	14.96	74.57
#170	37.91	2.47	67.53
#200	36.11	0.40	66.81
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.14	0.18	N/A
MEAN GRAIN SIZE (mm)	N/A	0.17	N/A
SORTING ( $\sigma$ )	N/A	0.81	N/A

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





- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-11

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-28' to -29' NAVD	-30' to -31' NAVD	-31' to -32' NAVD	-33' to -34' NAVD	-36' to -37' NAVD
0.19	0.12	0.08	0.00	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-28' to -29' NAVD	-30' to -31' NAVD	-31' to -32' NAVD	-33' to -34' NAVD	-36' to -37' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	99.45	99.82	99.82	99.97	100.00
#35	98.62	99.78	99.60	99.86	99.90
#60	94.72	99.43	98.89	99.43	98.82
#70	89.78	98.87	97.33	96.58	94.13
#100	78.43	86.52	47.34	34.35	23.06
#120	73.60	68.61	29.50	21.36	8.74
#170	67.75	52.79	22.09	16.41	2.34
#200	61.64	47.19	20.49	14.77	1.65
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	N/A	0.08	0.17	0.17	0.18
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	0.14	0.18
SORTING ( $\sigma$ )	N/A	N/A	N/A	N/A	0.25

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-12

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-26' to -27' NAVD	-27' to -28' NAVD	-29' to -30' NAVD	-32' to -33' NAVD
2.93	0.33	0.98	1.09

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-26' to -27' NAVD	-27' to -28' NAVD	-29' to -30' NAVD	-32' to -33' NAVD
#10	100.00	100.00	100.00	100.00
#18	95.36	99.20	98.37	98.70
#35	89.97	98.97	97.74	98.55
#60	60.37	98.33	96.96	98.07
#70	32.48	97.32	96.22	97.06
#100	11.33	87.59	93.23	41.58
#120	4.76	80.24	90.43	22.62
#170	1.93	75.08	85.86	10.17
#200	1.53	73.04	82.50	7.91
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.22	N/A	N/A	0.17
MEAN GRAIN SIZE (mm)	0.24	N/A	N/A	0.15
SORTING ( $\sigma$ )	0.67	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-13

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-32' to -33' NAVD	-34' to -35' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-40' to -41' NAVD
12.15	4.65	0.01	0.38	0.15

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-32' to -33' NAVD	-34' to -35' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-40' to -41' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	79.37	90.31	99.92	99.42	99.59
#35	67.10	83.72	99.79	99.29	99.38
#60	43.35	67.44	99.34	98.90	98.78
#70	28.25	50.65	98.49	98.03	97.23
#100	10.10	23.45	55.94	42.46	39.74
#120	5.66	15.35	31.73	21.53	19.20
#170	2.42	11.45	22.01	10.85	8.00
#200	1.92	10.70	18.83	8.53	5.21
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.28	0.21	0.16	0.17	0.17
MEAN GRAIN SIZE (mm)	0.44	0.25	N/A	0.16	0.16
SORTING ( $\sigma$ )	1.24	N/A	N/A	N/A	0.38

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-14

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-30' to -31' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
2.78	0.19	16.48

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-30' to -31' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
#10	100.00	100.00	100.00
#18	95.72	99.57	82.31
#35	93.64	99.52	72.22
#60	86.66	99.11	60.18
#70	79.27	98.12	57.34
#100	50.83	38.32	41.55
#120	43.68	18.75	32.21
#170	39.73	9.92	26.96
#200	38.69	8.34	25.55
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.15	0.17	0.18
MEAN GRAIN SIZE (mm)	N/A	0.16	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-14  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-35' to -36' NAVD	-38' to -39' NAVD	-41' to -42' NAVD
0.74	0.27	0.87

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-35' to -36' NAVD	-38' to -39' NAVD	-41' to -42' NAVD
#10	100.00	100.00	100.00
#18	98.68	99.43	98.55
#35	98.23	99.14	98.19
#60	97.30	98.56	97.51
#70	95.49	97.21	96.26
#100	26.94	41.99	53.84
#120	12.64	23.22	31.36
#170	6.15	15.89	18.69
#200	5.53	14.83	16.26
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.17	0.17	0.15
MEAN GRAIN SIZE (mm)	0.17	0.15	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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





- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-15

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-30' to -31' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
0.18	0.46	1.69

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-30' to -31' NAVD	-31' to -32' NAVD	-33' to -34' NAVD
#10	100.00	100.00	100.00
#18	99.49	99.23	97.51
#35	98.87	98.92	96.82
#60	96.01	97.80	95.74
#70	84.61	94.27	92.94
#100	26.70	57.36	47.80
#120	13.73	48.74	28.02
#170	7.68	43.13	22.36
#200	6.42	40.84	21.54
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.17	0.14	0.17
MEAN GRAIN SIZE (mm)	0.17	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



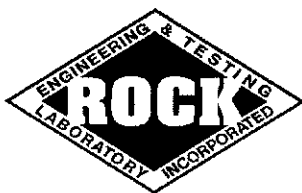
- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-15  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-36' to -37' NAVD	-39' to -40' NAVD	-42' to -43' NAVD
1.05	3.61	0.04

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-36' to -37' NAVD	-39' to -40' NAVD	-42' to -43' NAVD
#10	100.00	100.00	100.00
#18	98.31	94.93	99.91
#35	97.94	93.07	99.84
#60	97.09	84.55	99.43
#70	93.51	66.40	87.13
#100	54.94	21.70	21.03
#120	42.23	11.08	10.49
#170	35.17	7.28	6.41
#200	33.32	6.80	5.74
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.15	0.19	0.18
MEAN GRAIN SIZE (mm)	N/A	0.19	0.18
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-16

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-28' to -29' NAVD	-30' to -31' NAVD	-32' to -33' NAVD
0.00	0.17	0.49

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-28' to -29' NAVD	-30' to -31' NAVD	-32' to -33' NAVD
#10	100.00	100.00	100.00
#18	100.00	99.75	99.12
#35	99.97	99.66	98.82
#60	99.85	99.31	98.43
#70	99.68	98.65	97.75
#100	88.14	54.01	89.16
#120	48.85	34.65	80.28
#170	25.65	23.40	73.34
#200	18.71	20.79	72.13
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.13	0.15	N/A
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

**PROJECT NAME:** Anchorage Basin Sand Source Investigation  
**CLIENT:** HDR Engineering, Inc.  
**BORING ID.:** AA-16  
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-34' to -35' NAVD	-36' to -37' NAVD	-39' to -40' NAVD
0.00	0.07	6.50

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-34' to -35' NAVD	-36' to -37' NAVD	-39' to -40' NAVD
#10	100.00	100.00	100.00
#18	100.00	99.85	90.86
#35	99.98	99.70	88.34
#60	99.80	99.44	80.20
#70	99.44	99.15	63.78
#100	74.51	78.63	20.33
#120	54.25	54.92	8.85
#170	38.84	39.20	2.99
#200	34.63	35.56	1.95
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.13	0.12	0.19
MEAN GRAIN SIZE (mm)	N/A	N/A	0.20
SORTING ( $\sigma$ )	N/A	N/A	0.71

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



- 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.



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-18

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-30' to -31' NAVD	-33' to -34' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-39' to -40' NAVD
0.33	0.13	0.92	0.04	0.03

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-30' to -31' NAVD	-33' to -34' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-39' to -40' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	99.47	99.72	98.20	99.88	99.92
#35	99.23	99.39	96.64	99.61	99.87
#60	98.62	97.91	92.16	99.22	99.69
#70	97.22	94.66	88.18	98.30	99.22
#100	29.15	28.94	59.31	64.78	41.17
#120	11.76	10.88	42.55	48.43	18.25
#170	3.80	1.70	32.13	37.17	5.28
#200	2.65	1.05	30.51	34.93	3.28
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.17	0.17	0.14	0.14	0.17
MEAN GRAIN SIZE (mm)	0.17	0.17	N/A	N/A	0.16
SORTING ( $\sigma$ )	0.25	0.24	N/A	N/A	0.33

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

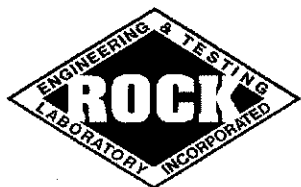
**BORING ID.:** AA-19

**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 ( $\sigma$ )	N/A	N/A	N/A

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



- 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)			
-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 ( $\sigma$ )	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.





- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-20

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-32' to -33' NAVD	-35' to -36' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
16.46	0.03	0.00	0.05

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-32' to -33' NAVD	-35' to -36' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
#10	100.00	100.00	100.00	100.00
#18	78.06	99.89	100.00	99.87
#35	73.88	99.80	99.95	99.70
#60	65.43	99.64	99.81	98.65
#70	52.81	99.45	99.57	87.62
#100	19.82	73.90	78.02	23.79
#120	11.92	51.90	56.54	11.94
#170	7.53	34.69	42.16	4.11
#200	7.07	30.57	37.79	3.22
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.20	0.13	0.12	0.18
MEAN GRAIN SIZE (mm)	0.32	N/A	N/A	0.18
SORTING ( $\sigma$ )	N/A	N/A	N/A	0.30

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-21

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-33' to -34' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-40' to -41' NAVD
0.68	0.12	0.15	0.01

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-33' to -34' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-40' to -41' NAVD
#10	100.00	100.00	100.00	100.00
#18	98.97	99.76	99.72	99.93
#35	98.48	99.70	99.64	99.88
#60	96.90	99.62	99.50	99.69
#70	93.79	99.50	99.32	99.43
#100	36.83	94.71	89.70	72.55
#120	15.94	85.45	64.04	43.10
#170	5.49	76.93	48.35	27.11
#200	3.50	73.73	44.78	22.77
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.17	N/A	0.10	0.14
MEAN GRAIN SIZE (mm)	0.16	N/A	N/A	N/A
SORTING ( $\sigma$ )	0.33	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-22

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-31' to -32' NAVD	-32' to -33' NAVD	-33' to -34' NAVD	-35' to -36' NAVD	-38' to -39' NAVD
0.02	N/A	0.26	0.00	0.84

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-31' to -32' NAVD	-32' to -33' NAVD	-33' to -34' NAVD	-35' to -36' NAVD	-38' to -39' NAVD
#10	100.00	N/A	100.00	100.00	100.00
#18	99.98	N/A	99.58	99.99	99.02
#35	99.94	N/A	99.38	99.98	98.88
#60	99.72	N/A	98.32	99.92	98.46
#70	99.12	N/A	97.30	99.80	97.79
#100	93.74	N/A	57.08	91.79	62.05
#120	86.98	N/A	37.65	82.10	46.44
#170	65.38	N/A	28.51	74.11	39.74
#200	46.05	93.30	26.39	72.22	38.56
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.08	N/A	0.15	N/A	0.14
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A	N/A	N/A

\*AA-22; -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.



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-23

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)				
-32' to -33' NAVD	-34' to -35' NAVD	-36' to -37' NAVD	-39' to -40' NAVD	-41' to -42' NAVD
0.00	0.02	0.00	0.00	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL				
	-32' to -33' NAVD	-34' to -35' NAVD	-36' to -37' NAVD	-39' to -40' NAVD	-41' to -42' NAVD
#10	100.00	100.00	100.00	100.00	100.00
#18	99.85	99.91	99.98	100.00	99.98
#35	99.70	99.67	99.96	99.95	99.93
#60	99.28	99.26	99.85	99.76	99.76
#70	98.38	98.97	99.71	99.31	99.49
#100	61.43	66.78	54.84	77.39	58.16
#120	32.20	49.00	33.34	56.65	29.41
#170	27.42	35.28	28.54	42.74	12.37
#200	23.36	31.58	20.20	39.19	8.85
STATISTICS (EXCLUDING SHELL)					
MEDIAN GRAIN SIZE (mm)	0.15	0.13	0.15	0.12	0.15
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	N/A	0.14
SORTING ( $\sigma$ )	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.



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-24

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-33' to -34' NAVD	-35' to -36' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
0.21	0.77	0.00	0.02

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-33' to -34' NAVD	-35' to -36' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
#10	100.00	100.00	100.00	100.00
#18	99.58	98.90	99.94	99.89
#35	99.34	98.78	99.89	99.84
#60	98.64	98.62	99.84	99.76
#70	97.30	98.41	99.81	99.67
#100	37.45	82.59	99.38	98.14
#120	14.23	63.36	96.94	89.18
#170	3.96	50.99	92.71	78.51
#200	0.93	49.00	91.47	76.45
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.17	0.08	N/A	N/A
MEAN GRAIN SIZE (mm)	0.16	N/A	N/A	N/A
SORTING ( $\sigma$ )	0.31	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-25

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-34' to -35' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-39' to -40' NAVD
0.11	0.83	0.00	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-34' to -35' NAVD	-35' to -36' NAVD	-37' to -38' NAVD	-39' to -40' NAVD
#10	100.00	100.00	100.00	100.00
#18	99.83	98.90	99.95	99.95
#35	99.72	98.65	99.89	99.93
#60	99.42	97.78	99.62	99.89
#70	98.80	95.46	99.08	99.84
#100	84.36	38.54	55.26	98.89
#120	73.02	18.09	24.42	88.83
#170	63.75	8.17	13.41	73.41
#200	57.36	6.29	10.78	68.05
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	N/A	0.17	0.14	N/A
MEAN GRAIN SIZE (mm)	N/A	0.16	0.14	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-26

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)		
-33' to -34' NAVD	-35' to -36' NAVD	-38' to -39' NAVD
0.03	1.01	0.05

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL		
	-33' to -34' NAVD	-35' to -36' NAVD	-38' to -39' NAVD
#10	100.00	100.00	100.00
#18	99.88	98.49	99.91
#35	99.48	97.85	99.88
#60	98.73	96.43	99.80
#70	98.28	94.84	99.71
#100	72.78	65.93	96.76
#120	46.57	42.85	86.76
#170	26.45	26.96	72.78
#200	22.52	17.84	68.11
STATISTICS (EXCLUDING SHELL)			
MEDIAN GRAIN SIZE (mm)	0.14	0.14	N/A
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-27

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-35' to -36' NAVD	-36' to -37' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
0.10	8.43	0.05	0.00

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-35' to -36' NAVD	-36' to -37' NAVD	-38' to -39' NAVD	-40' to -41' NAVD
#10	100.00	100.00	100.00	100.00
#18	99.68	90.44	99.89	99.99
#35	99.43	89.66	99.82	99.93
#60	98.84	88.12	99.66	99.71
#70	97.91	86.70	99.44	99.42
#100	81.69	73.83	86.03	81.02
#120	63.94	49.50	47.41	45.13
#170	53.04	31.32	29.17	24.48
#200	36.47	28.03	24.76	20.12
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	0.08	0.13	0.13	0.13
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A	N/A

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





- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**BORING ID.:** AA-29

**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)			
-30' to -31' NAVD	-31' to -32' NAVD	-34' to -35' NAVD	-37' to -38' NAVD
N/A	0.01	0.01	N/A

ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL			
	-30' to -31' NAVD	-31' to -32' NAVD	-34' to -35' NAVD	-37' to -38' NAVD
#10	N/A	100.00	100.00	N/A
#18	N/A	99.94	99.96	N/A
#35	N/A	99.91	99.95	N/A
#60	N/A	99.70	99.84	N/A
#70	N/A	99.36	99.73	N/A
#100	N/A	89.64	94.08	N/A
#120	N/A	55.52	70.38	N/A
#170	N/A	31.73	49.10	N/A
#200	47.10	26.14	43.43	23.90
STATISTICS (EXCLUDING SHELL)				
MEDIAN GRAIN SIZE (mm)	N/A	0.13	0.09	N/A
MEAN GRAIN SIZE (mm)	N/A	N/A	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A	N/A	N/A

\*AA-29; -30' to -31' NAVD and -37' to -38' NAVD were only passed through the -#200 sieve.

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



- Geotechnical Engineering
- Construction Materials Testing

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

**CLIENT:** HDR Engineering, Inc.

**SAMPLE ID.:** AA-30

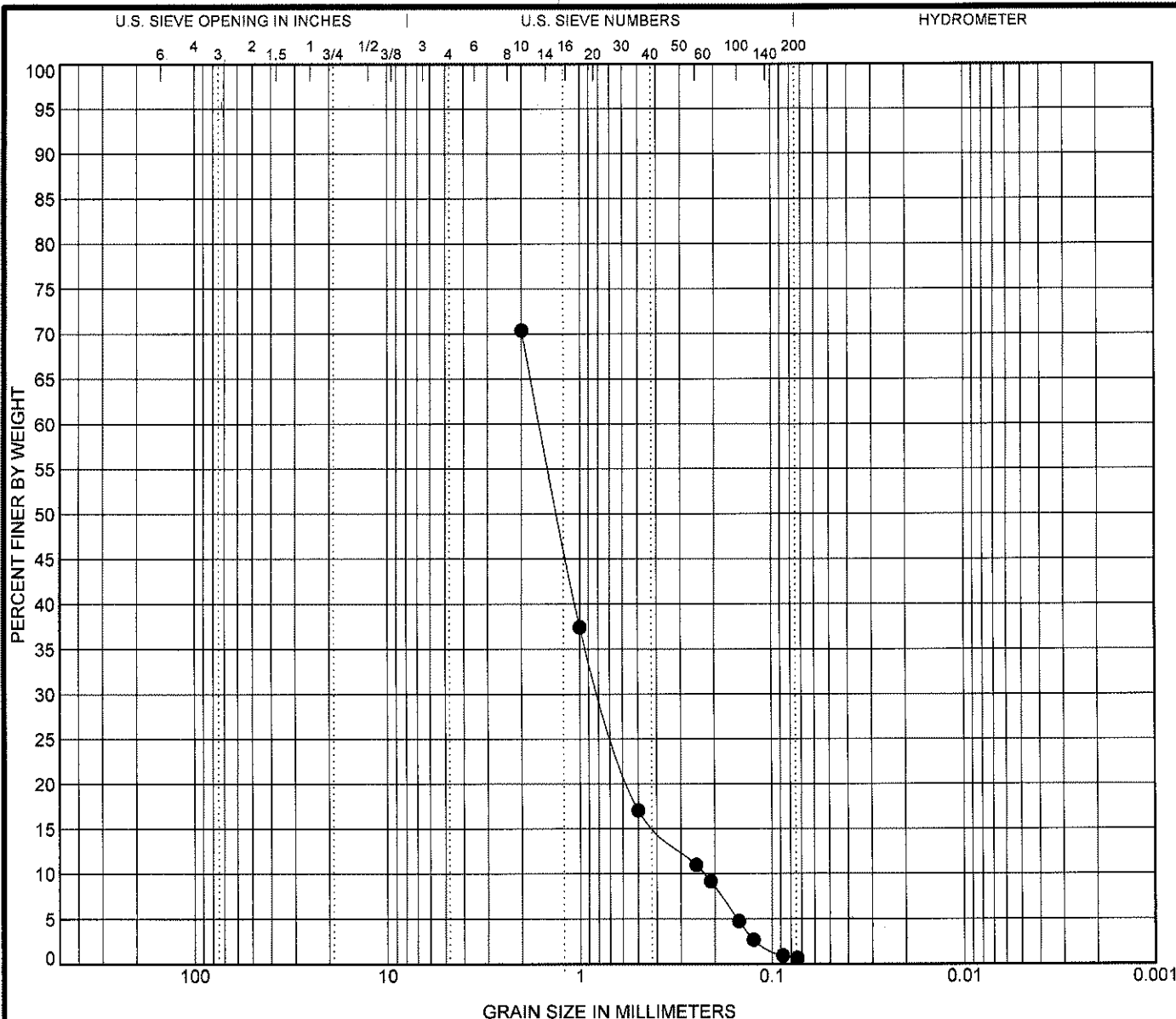
**DESCRIPTION:** Anchorage Basin Borrow Source Area

PERCENT SHELL BY WEIGHT (BASED ON #10 SIEVE)	
-34' to -35' NAVD	-35' to -36' NAVD
0.01	N/A

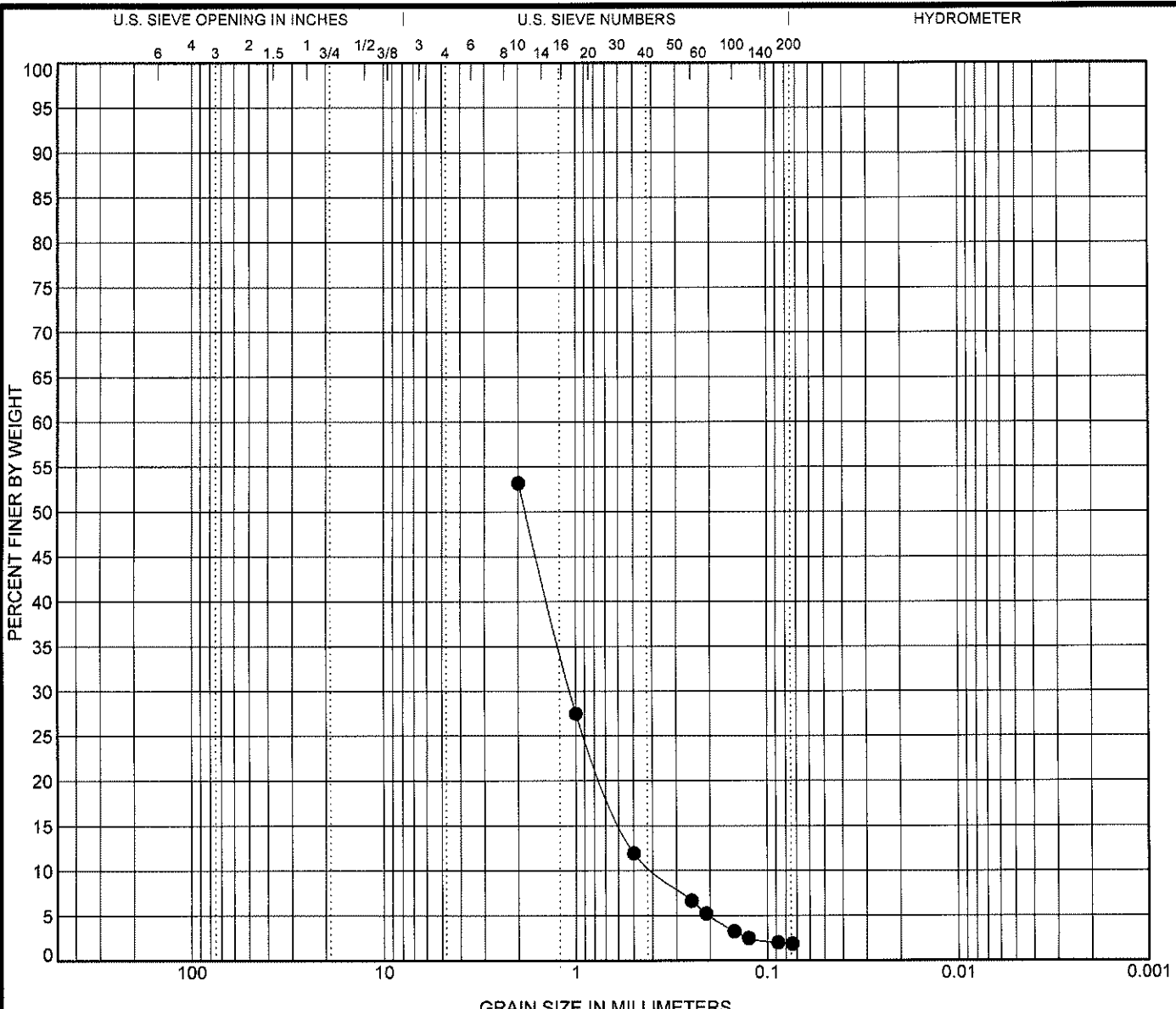
ASTM MESH	% FINER BY WEIGHT AFTER REMOVING SHELL	
	-34' to -35' NAVD	-35' to -36' NAVD
#10	100.00	N/A
#18	99.98	N/A
#35	99.95	N/A
#60	99.89	N/A
#70	99.76	N/A
#100	96.42	N/A
#120	86.39	N/A
#170	75.18	N/A
#200	64.26	84.00
STATISTICS (EXCLUDING SHELL)		
MEDIAN GRAIN SIZE (mm)	N/A	N/A
MEAN GRAIN SIZE (mm)	N/A	N/A
SORTING ( $\sigma$ )	N/A	N/A

\*AA-30; -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.



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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-02	(-24' to -25' NAVD)	Borrow Area (-24' to -25' NAVD)					

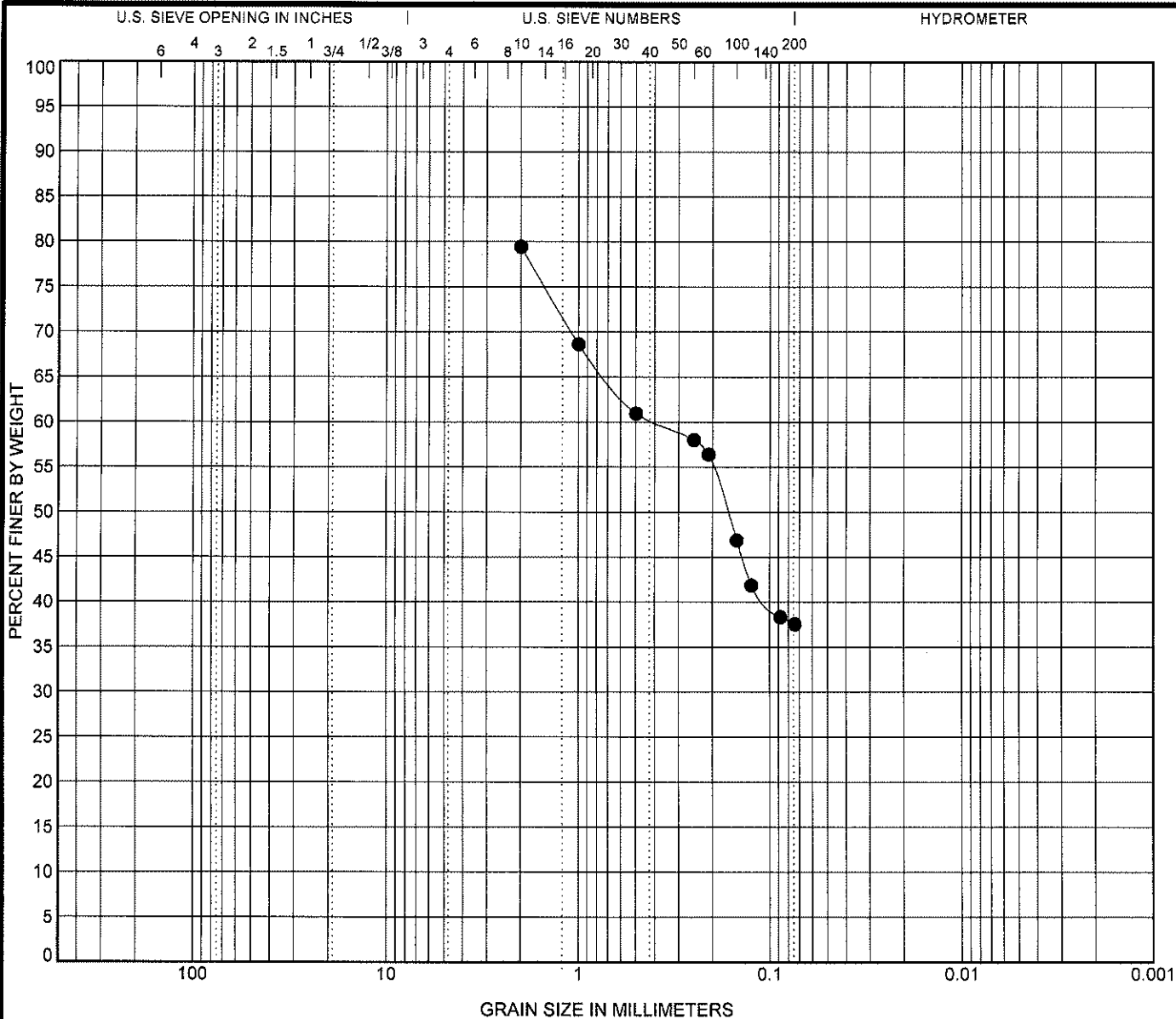
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-02	(-24' to -25' NAVD)	2		1.07	0.387	0.0			

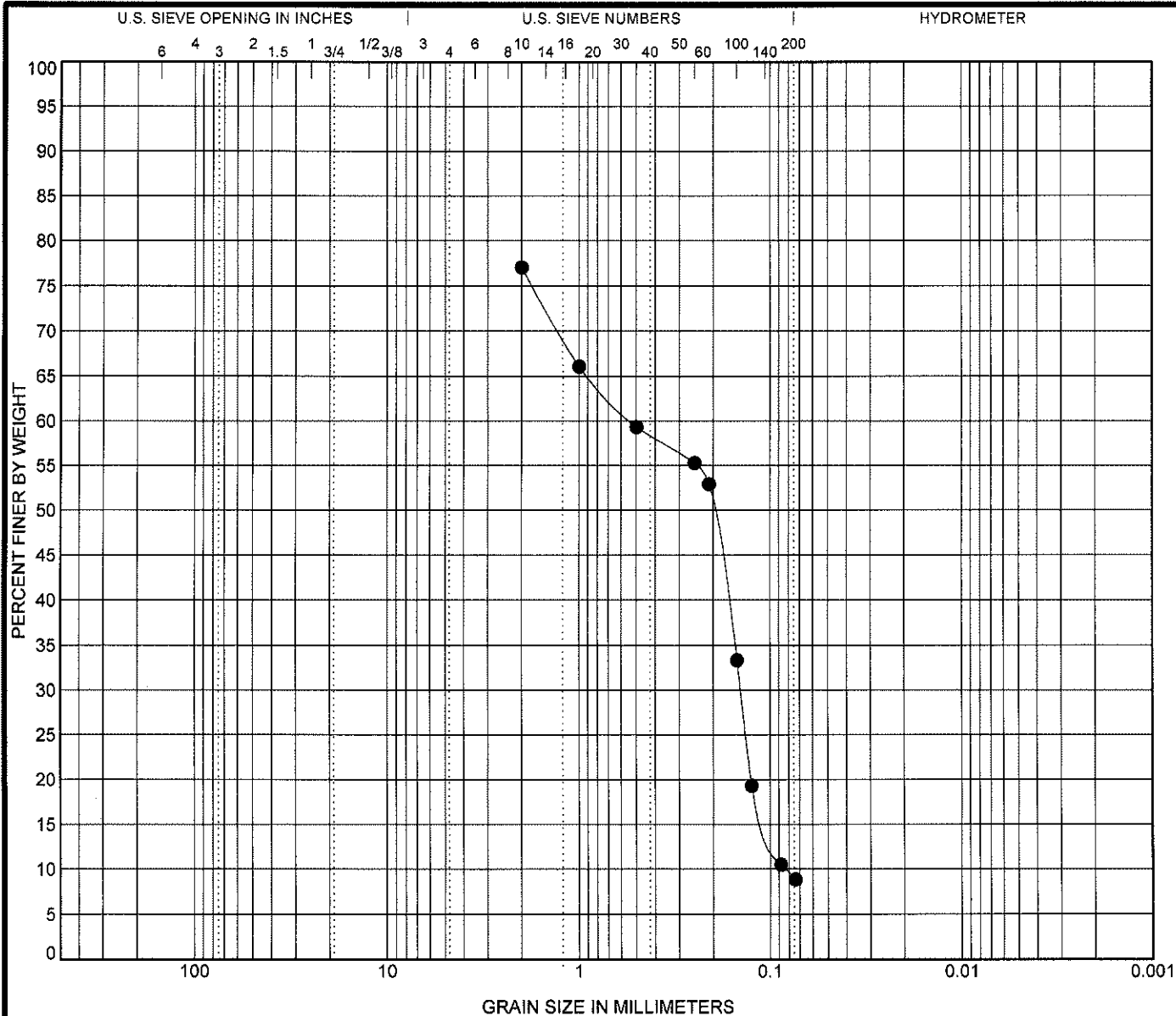


Rock Engineering & Testing Lab., Inc.  
6817 Leopard St.  
Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
Fax: (361) 883-4711

**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-02	(-29' to -30' NAVD)	Borrow Area (-29' to -30' NAVD)								0.46	6.41
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● AA-02	(-29' to -30' NAVD)	2	0.535	0.143	0.083	0.0					



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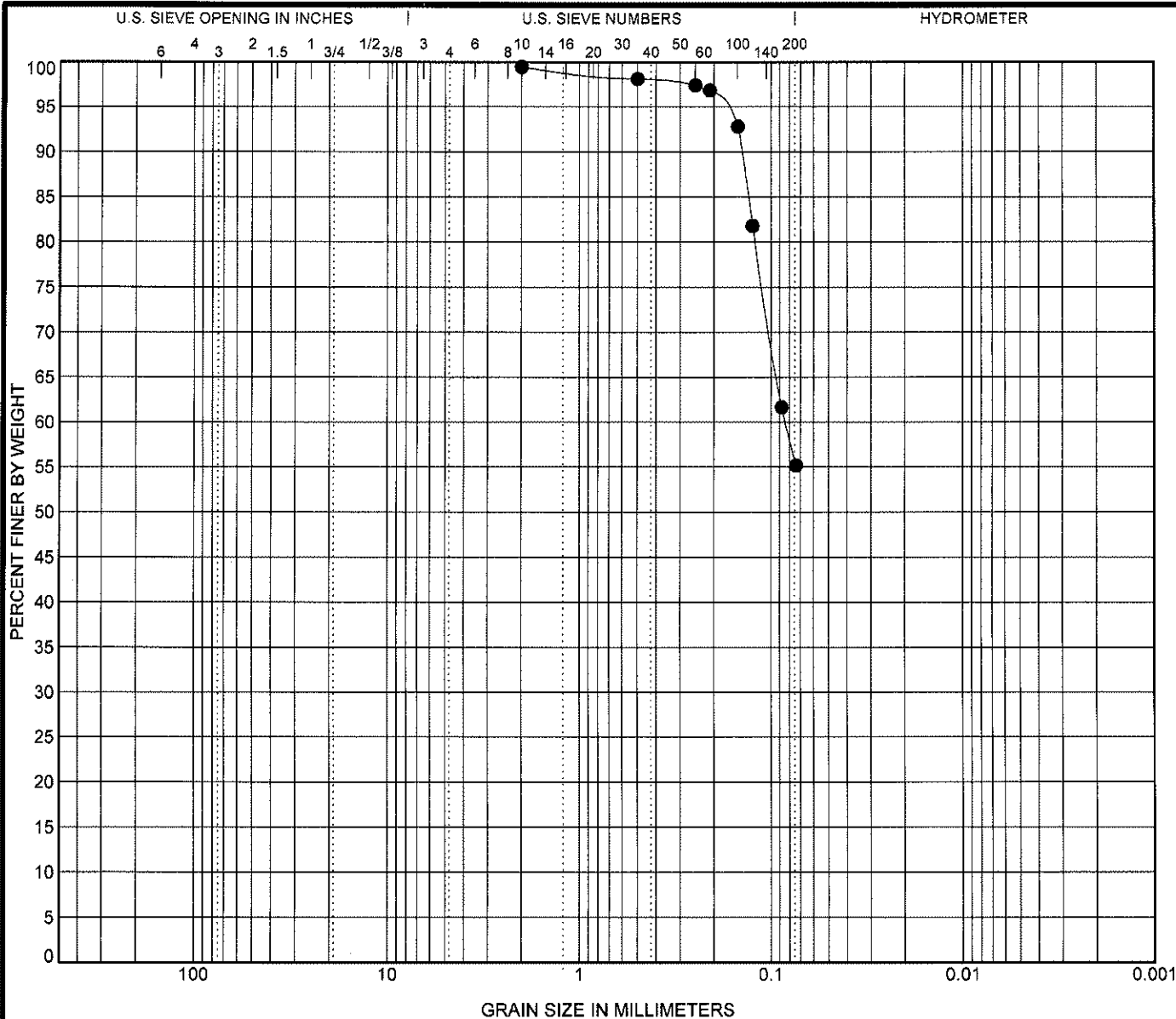
## GRAIN SIZE DISTRIBUTION

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 4/6/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-03	(-30' to -31' NAVD)	Borrow Area (-30' to -31' NAVD)					

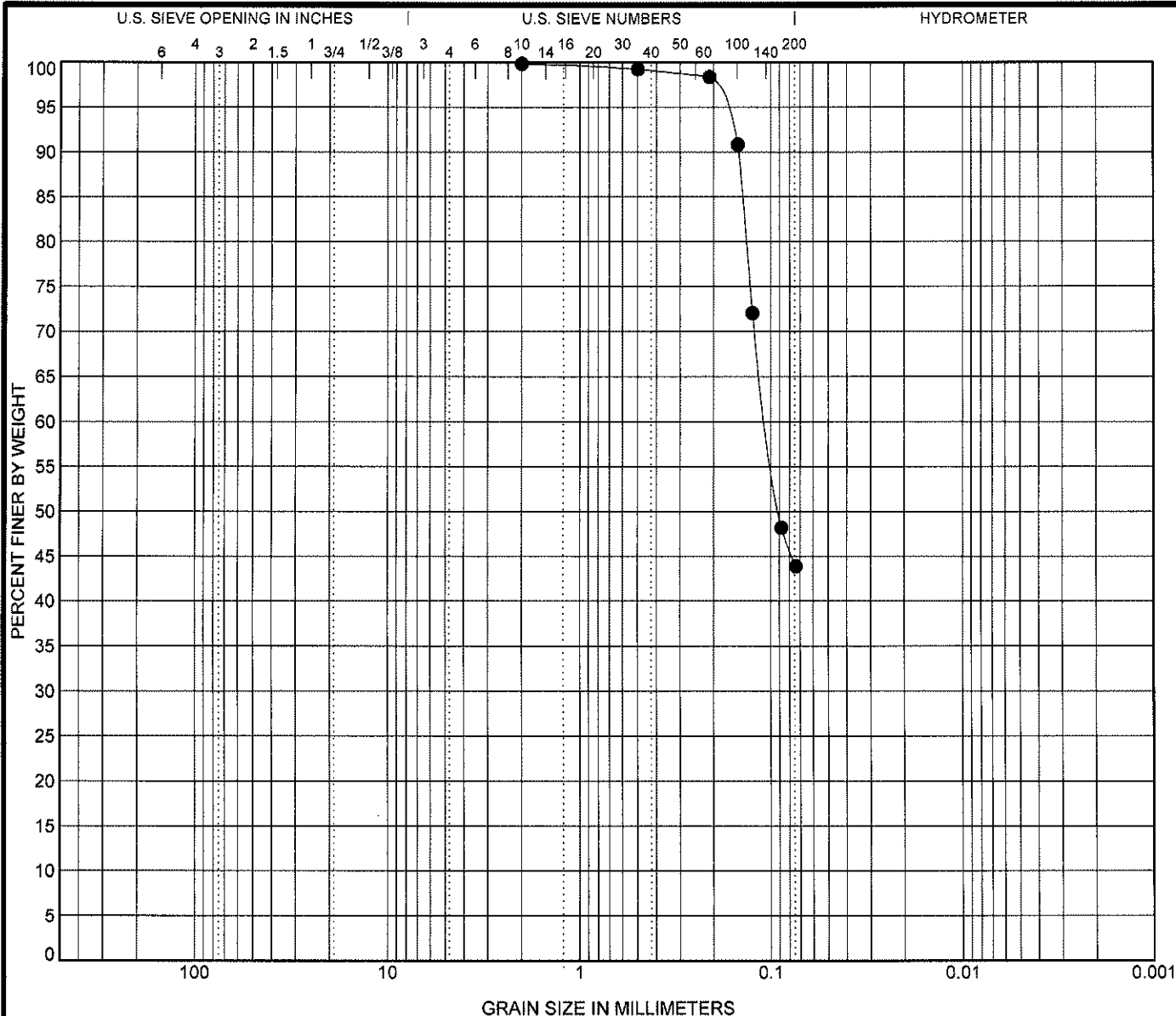
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-03	(-30' to -31' NAVD)	2	0.084			0.0			



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## 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-03	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-03	(-33' to -34' NAVD)	2	0.105			0.0			

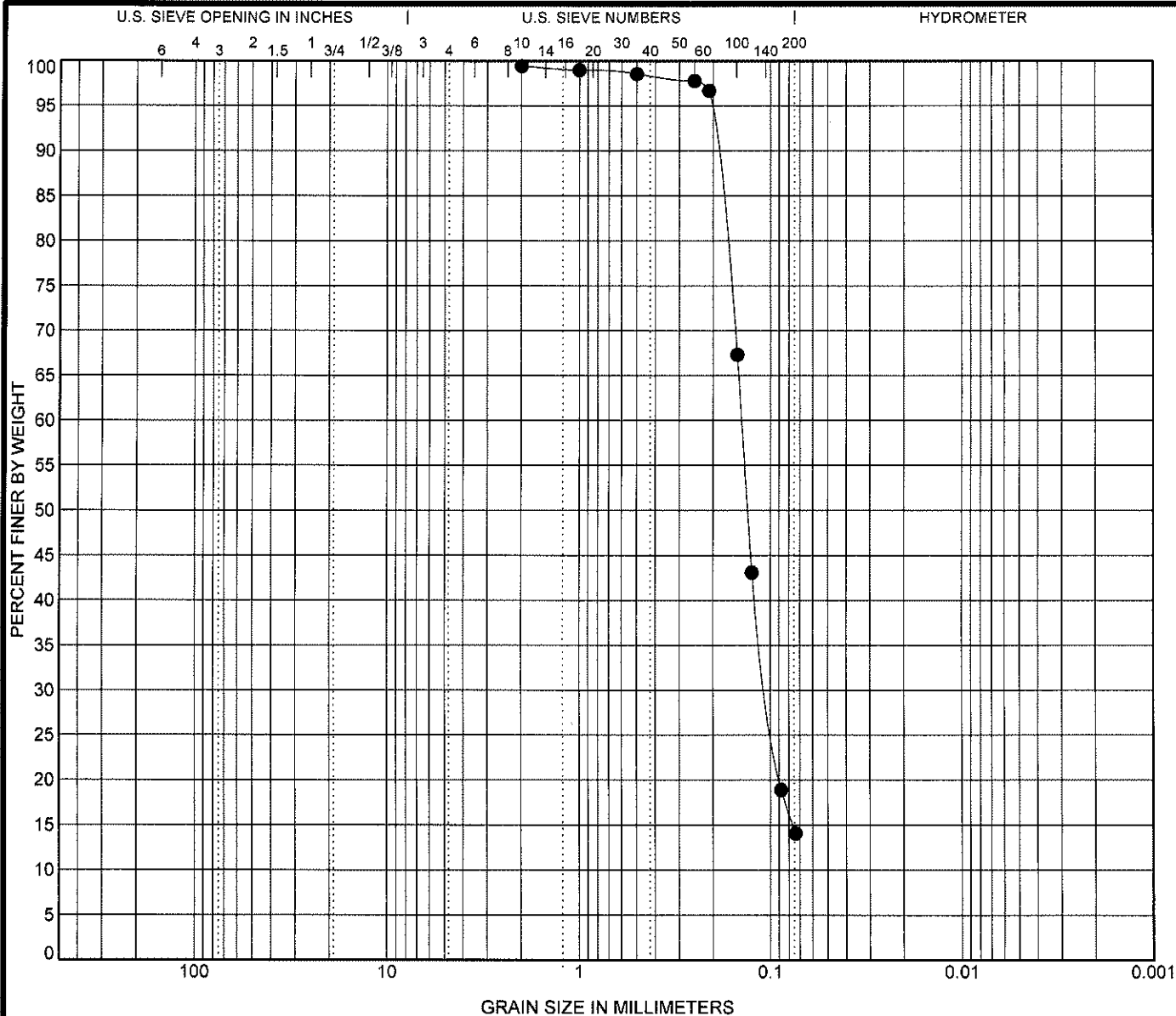


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## GRAIN SIZE DISTRIBUTION

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-03	(-36' to -37' NAVD)	Borrow Area (-36' to -37' NAVD)					

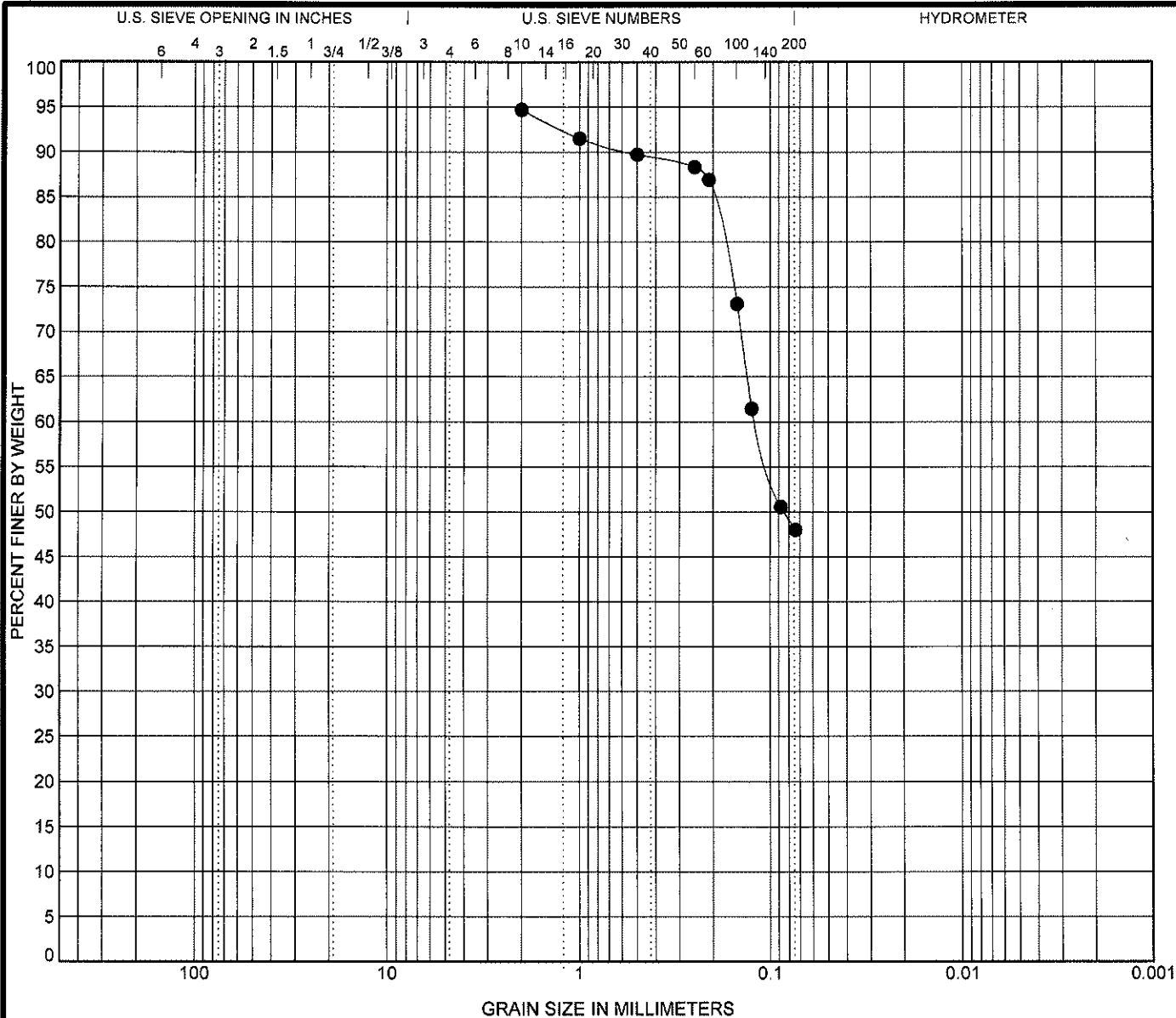
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-03	(-36' to -37' NAVD)	2	0.141	0.103		0.0			



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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-03	(-39' to -40' NAVD)	Borrow Area (-39' to -40' NAVD)					

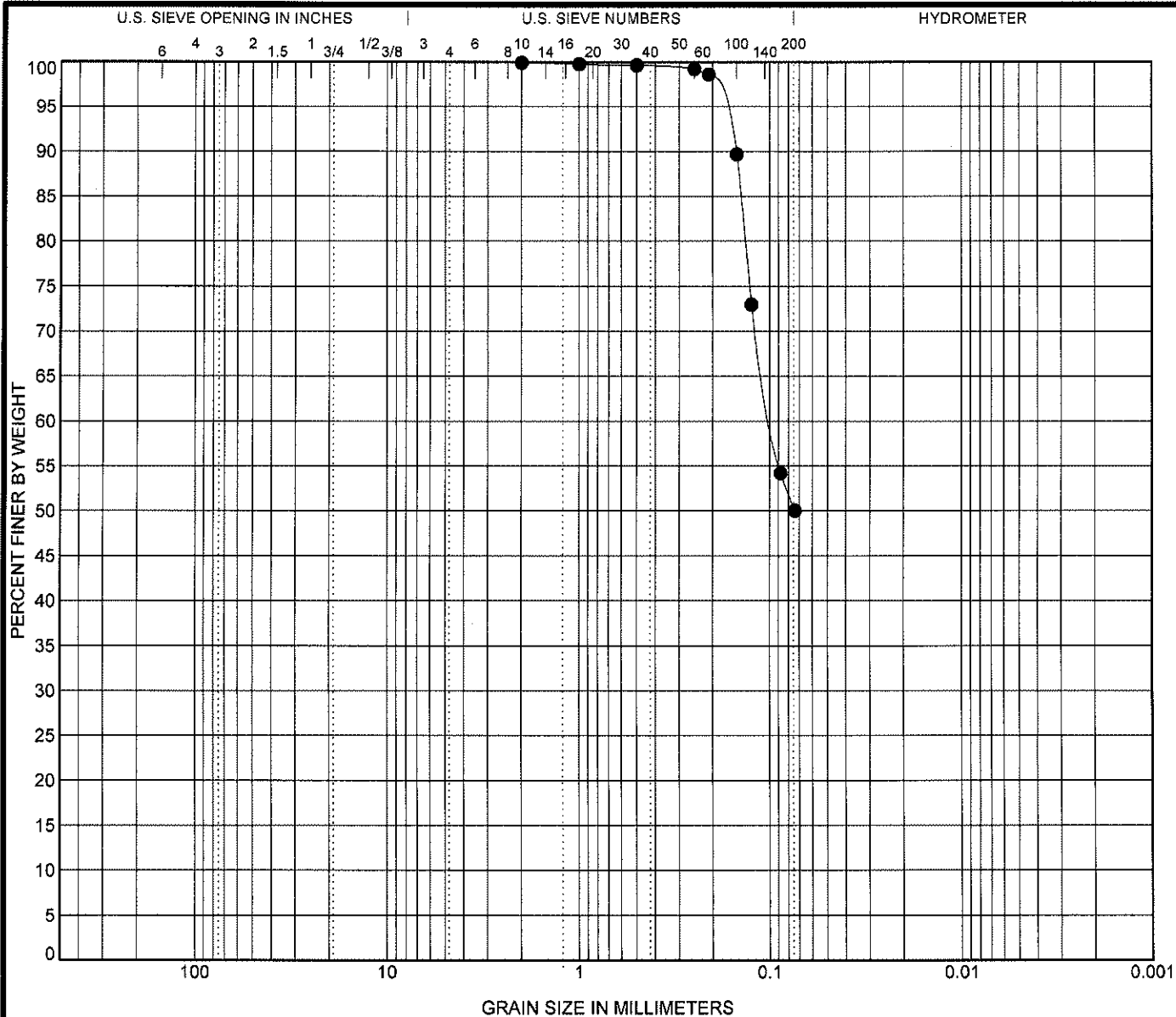
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-03	(-39' to -40' NAVD)	2	0.119			0.0			

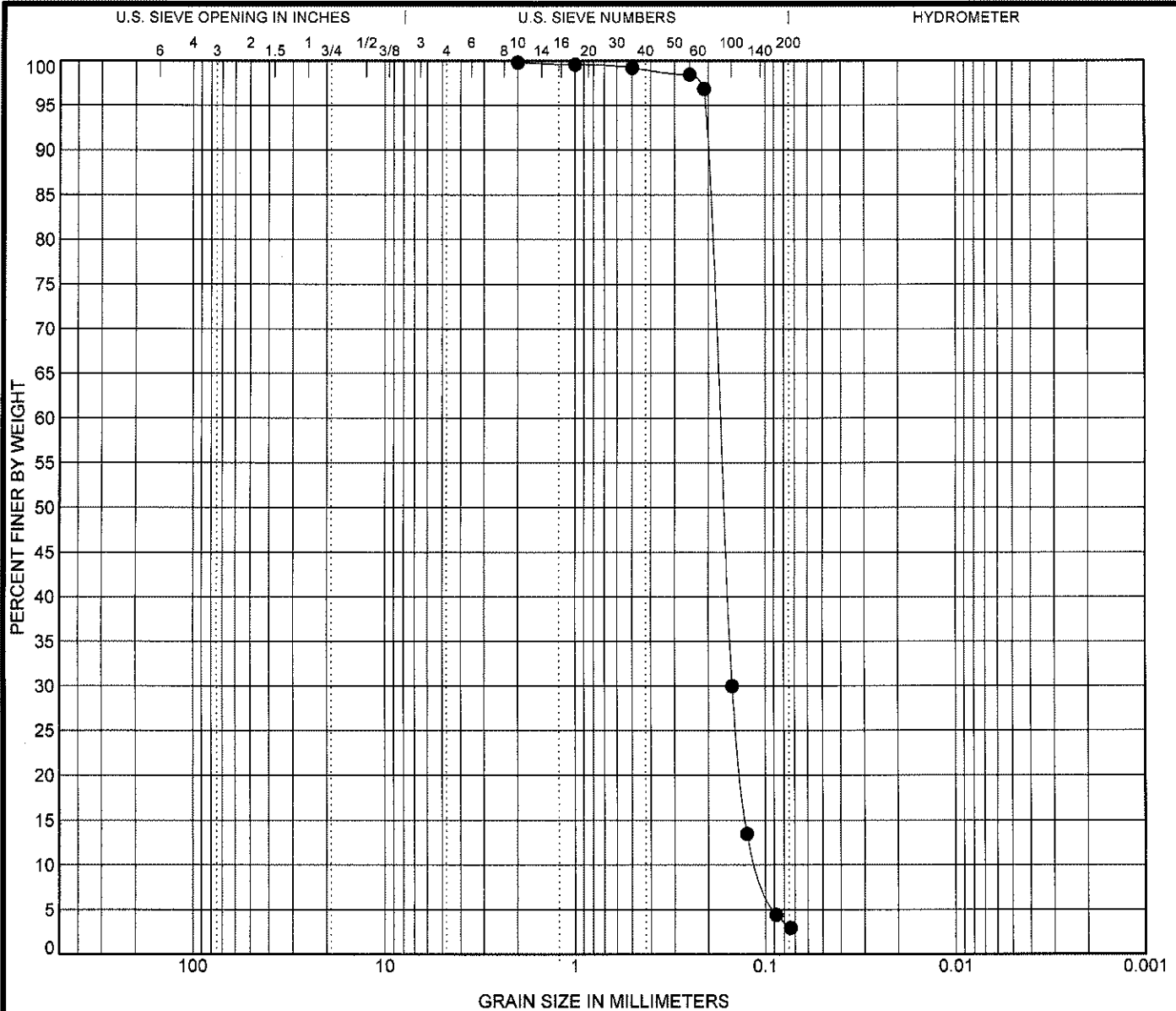


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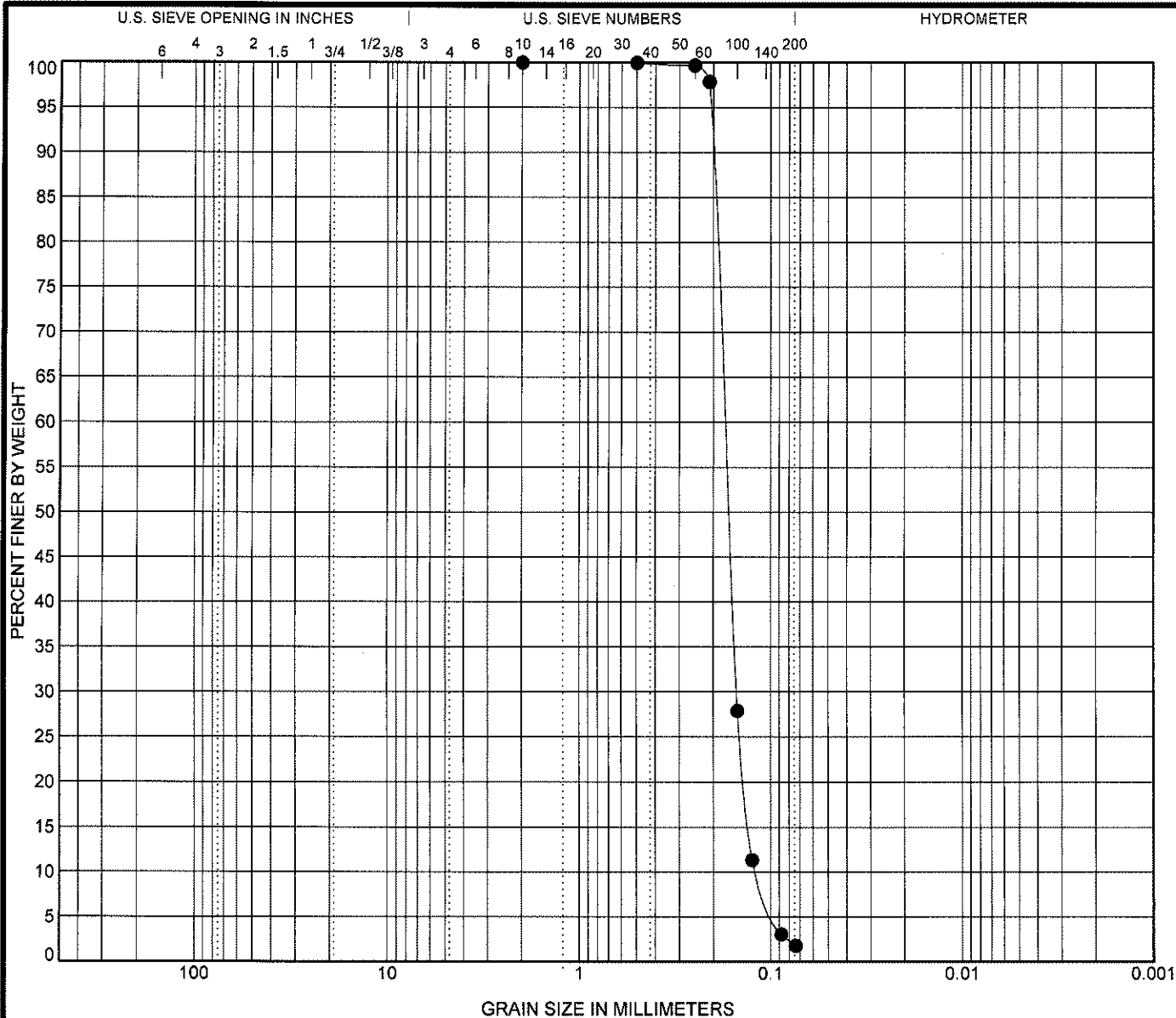
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

[illegible]

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

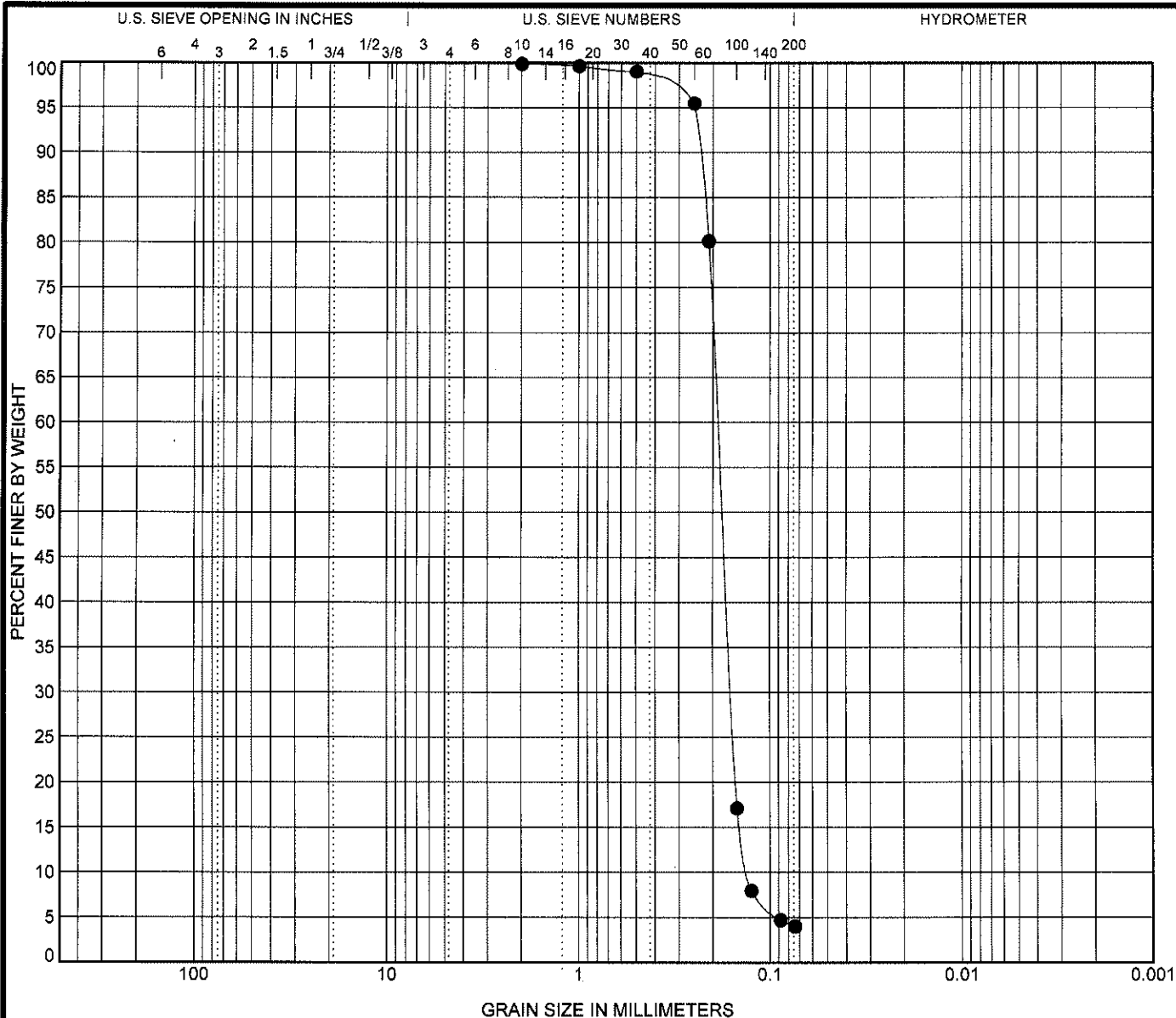
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-04	(-32' to -33' NAVD)	<b>Borrow Area (-32' to -33' NAVD)</b>				<b>1.10</b>	<b>1.48</b>

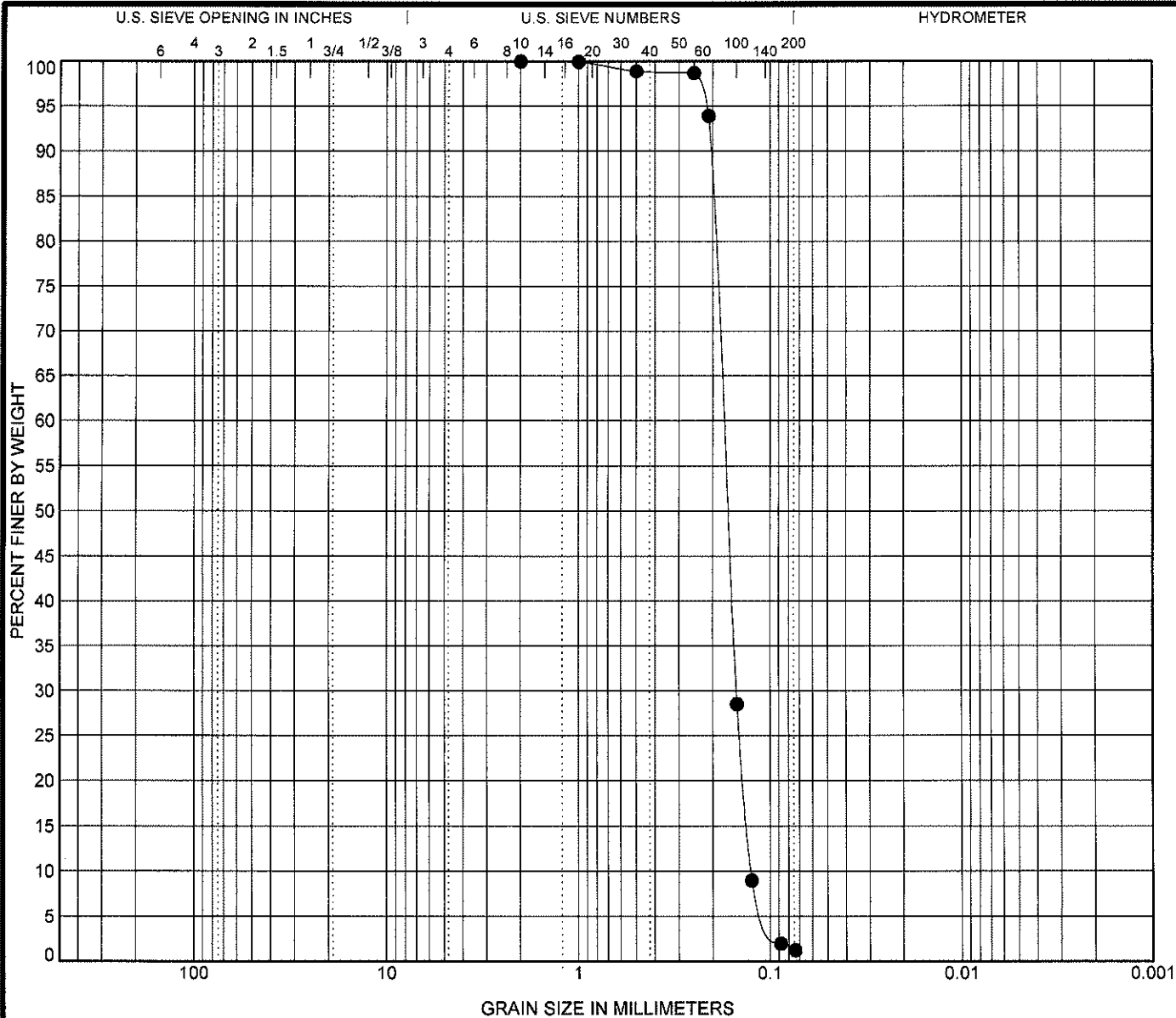
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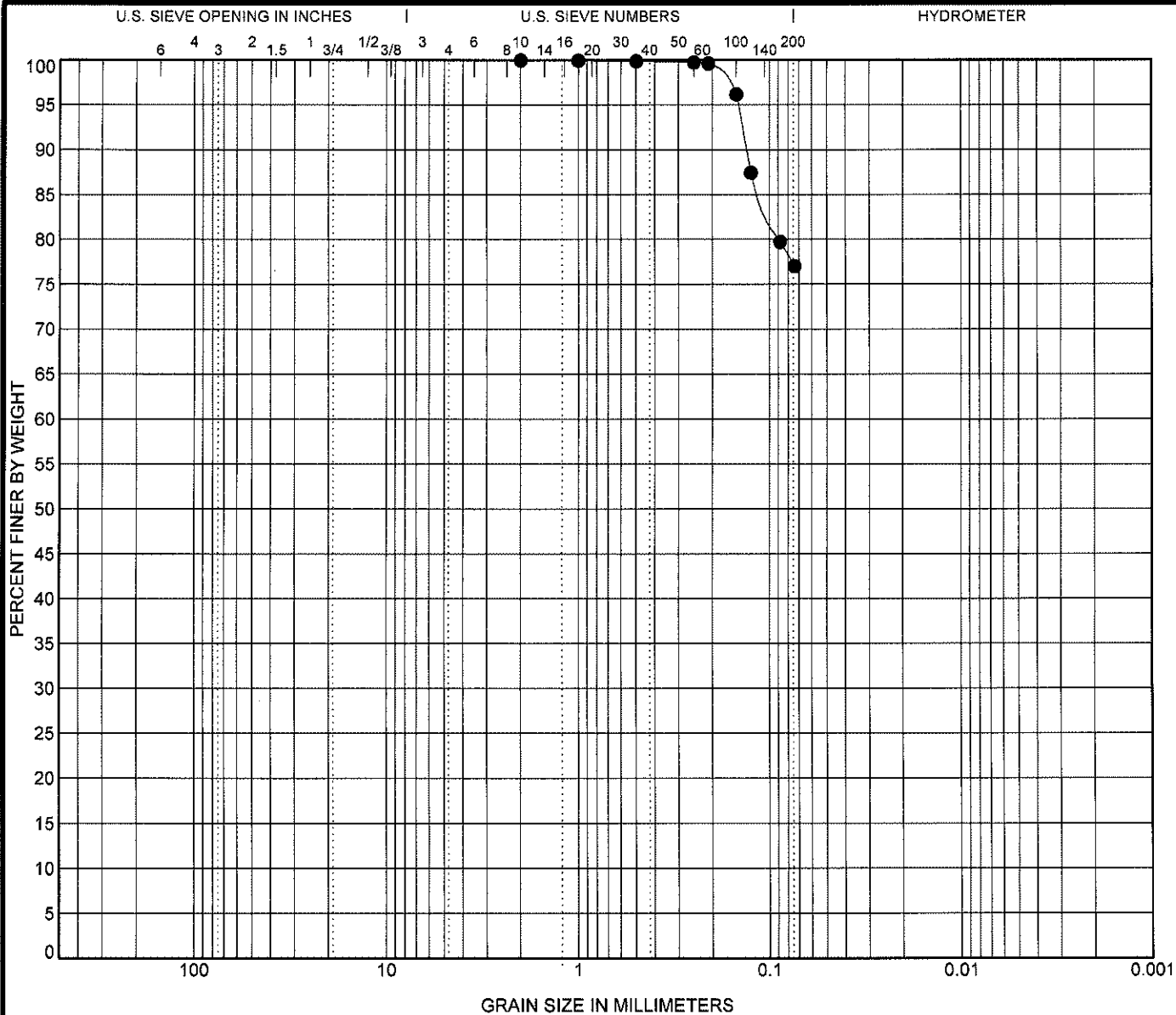
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-04	(-40' to -41' NAVD)	Borrow Area (-40' to -41' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-04	(-40' to -41' NAVD)	2				0.0			

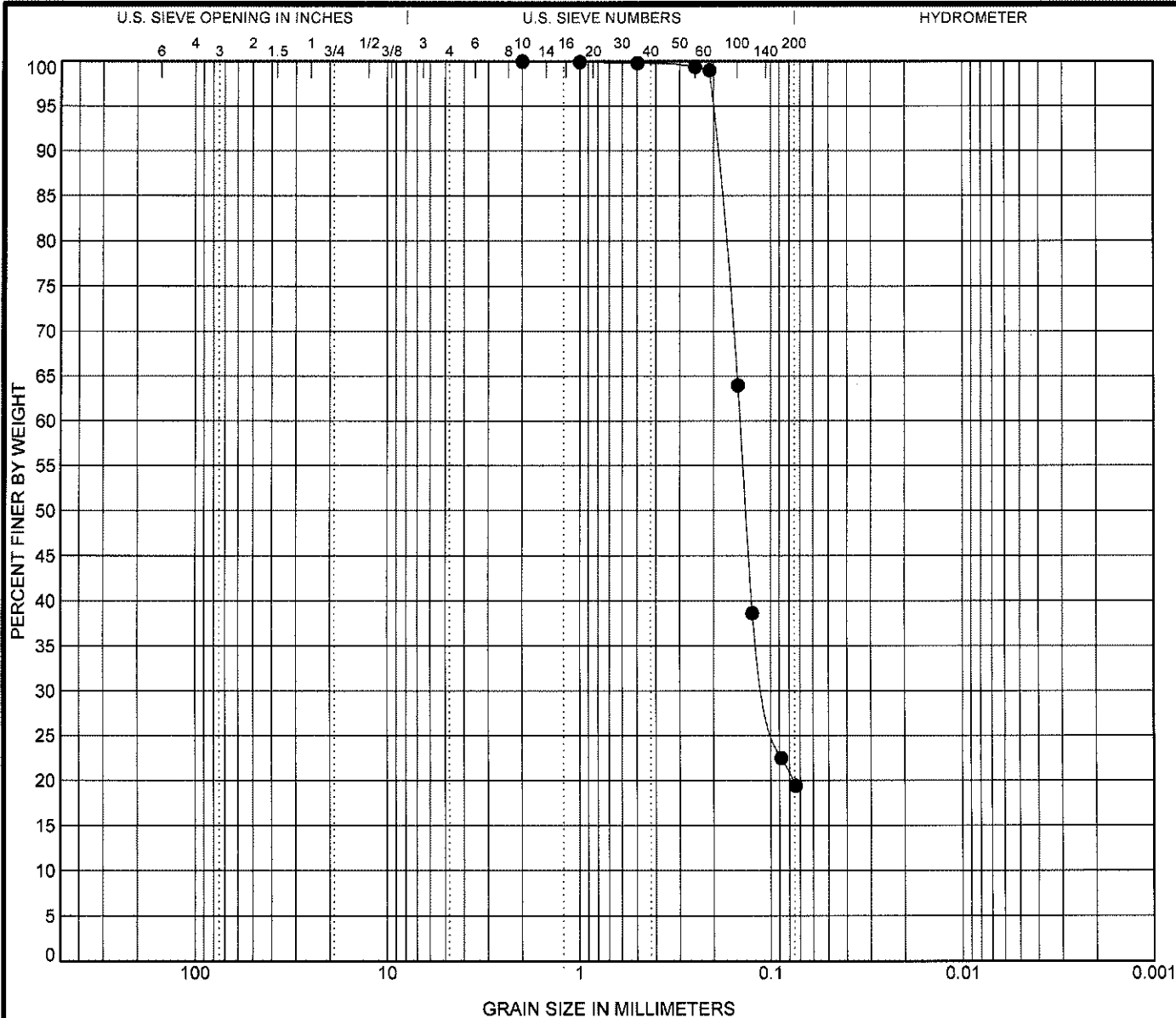


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-05 (-42' to -46' NAVD)		Borrow Area (-42' to -46' NAVD)					

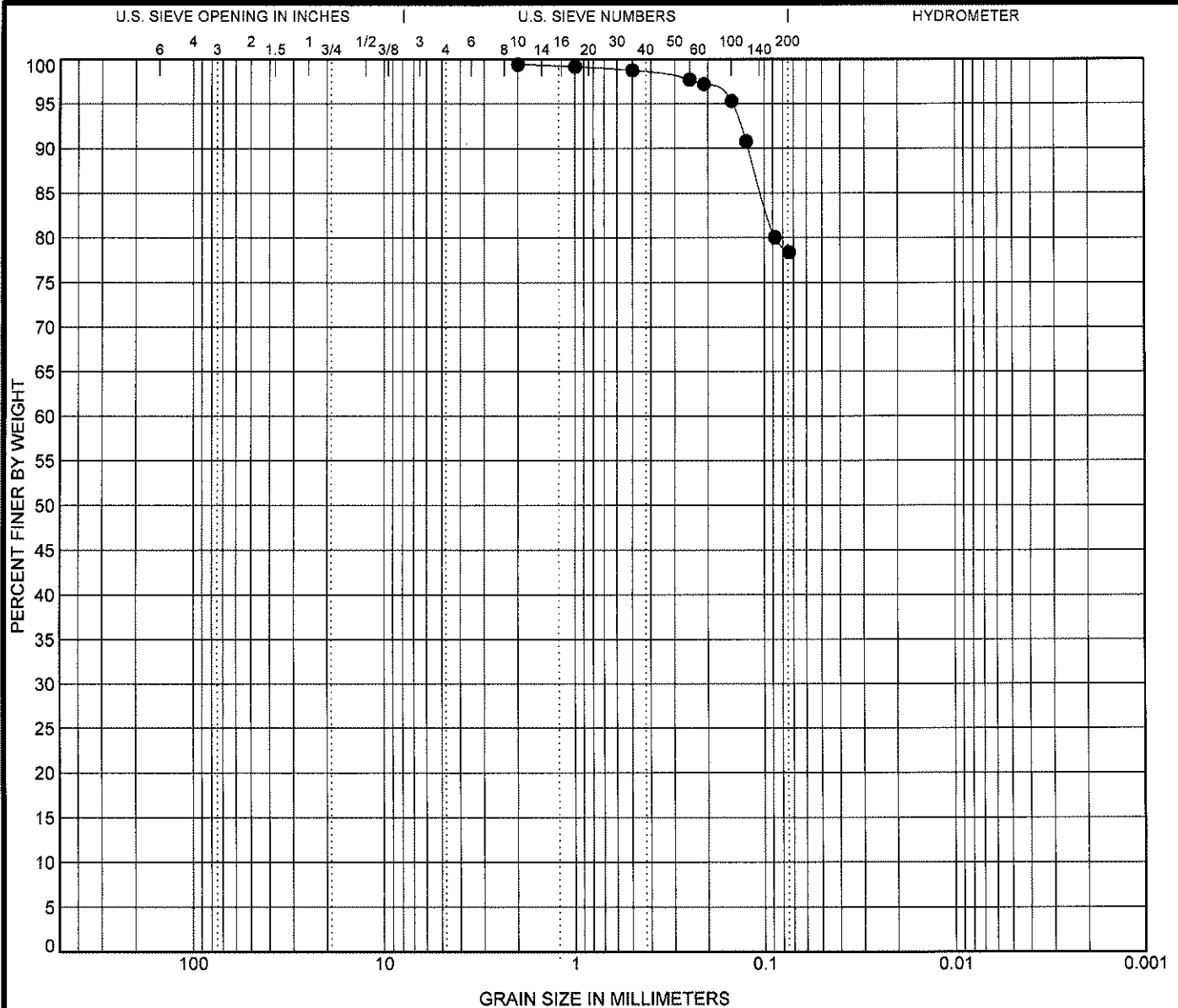
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-05 (-42' to -46' NAVD)		2	0.145	0.104		0.0			



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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-05	(-26' to -27' NAVD)	Borrow Area (-26' to -27' NAVD)								

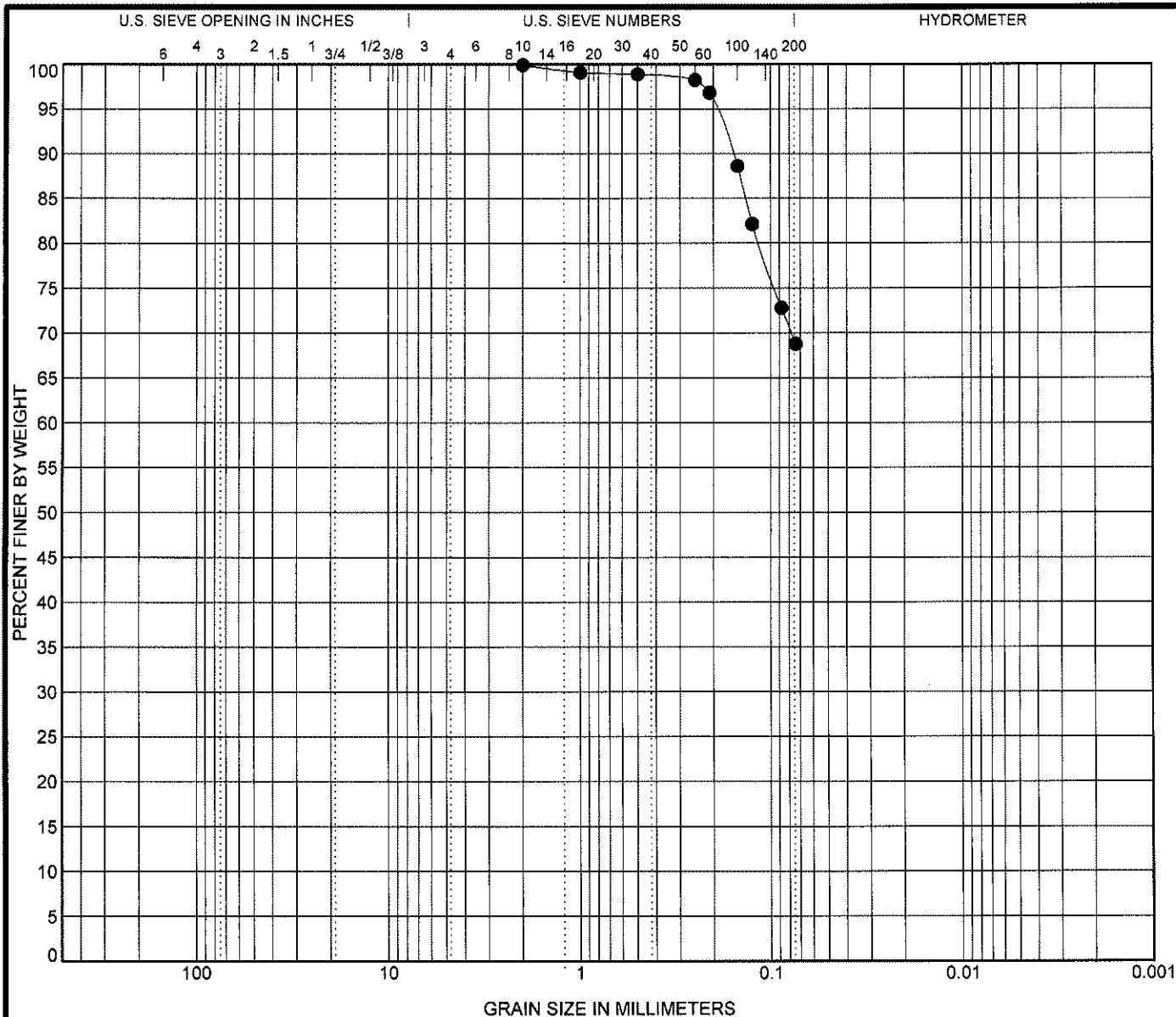
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-05	(-26' to -27' NAVD)	2				0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

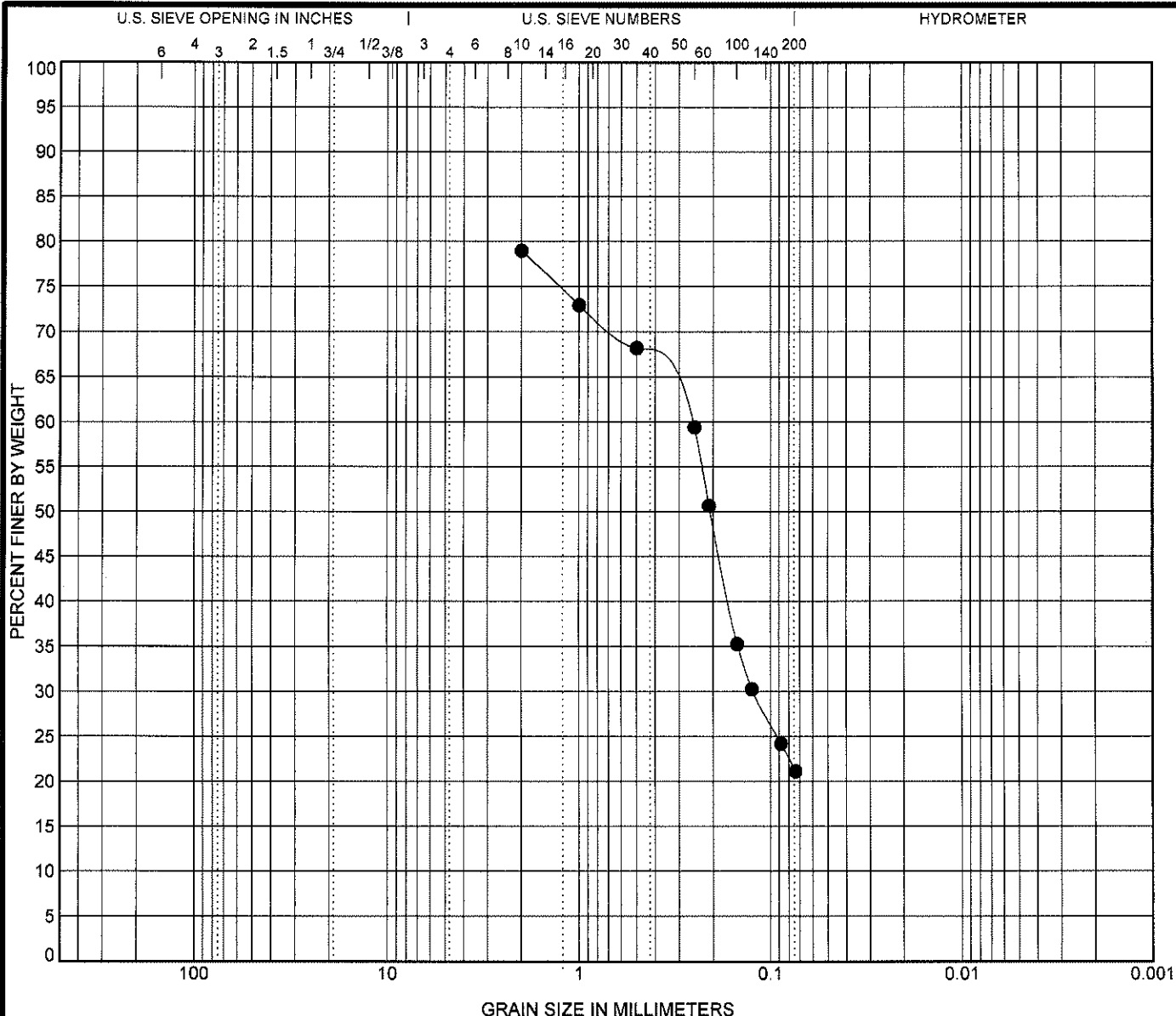
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-05 (-29' to -30' NAVD)		Borrow Area (-29' to -30' NAVD)					

[illegible]

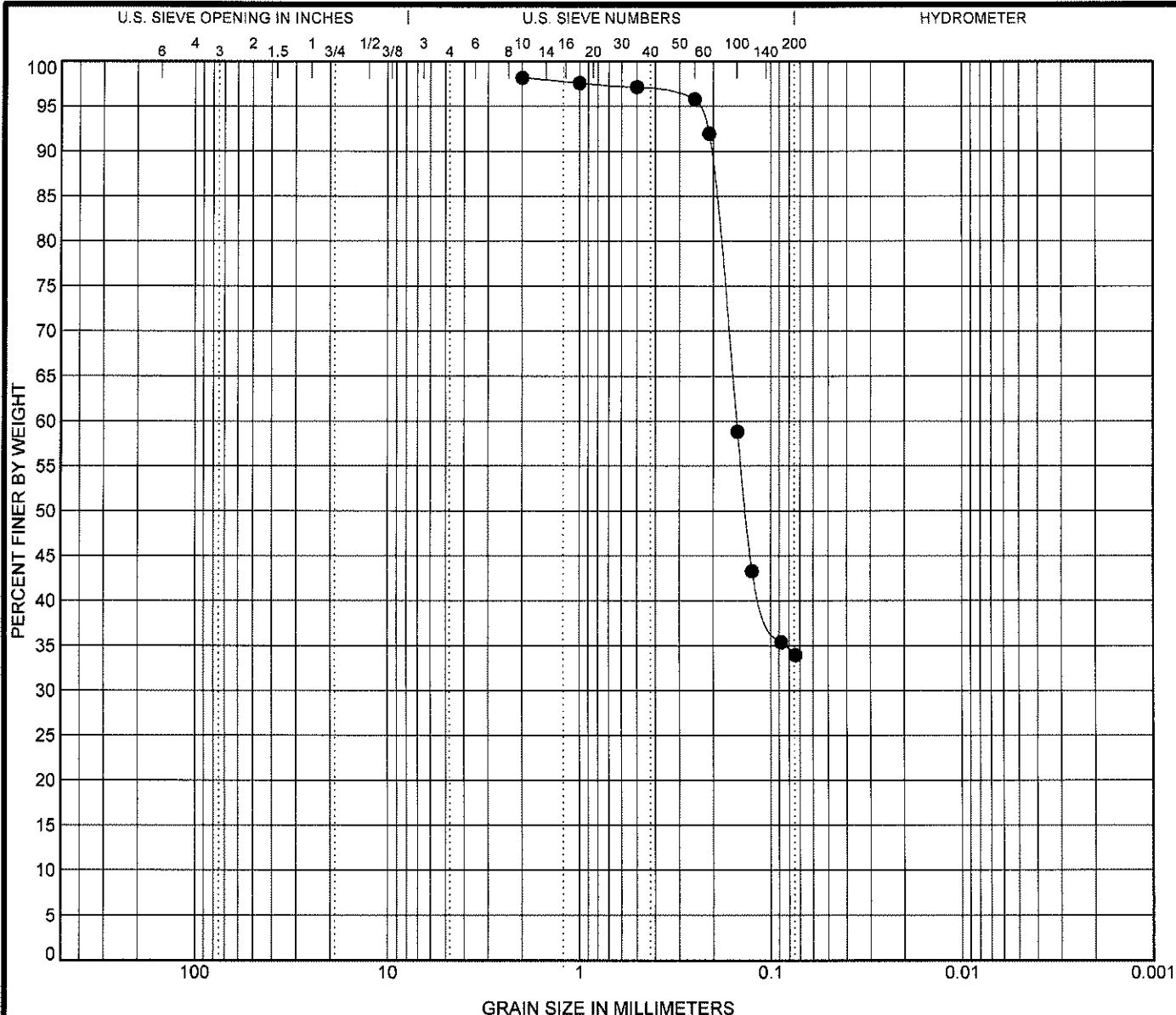
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-05	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)					

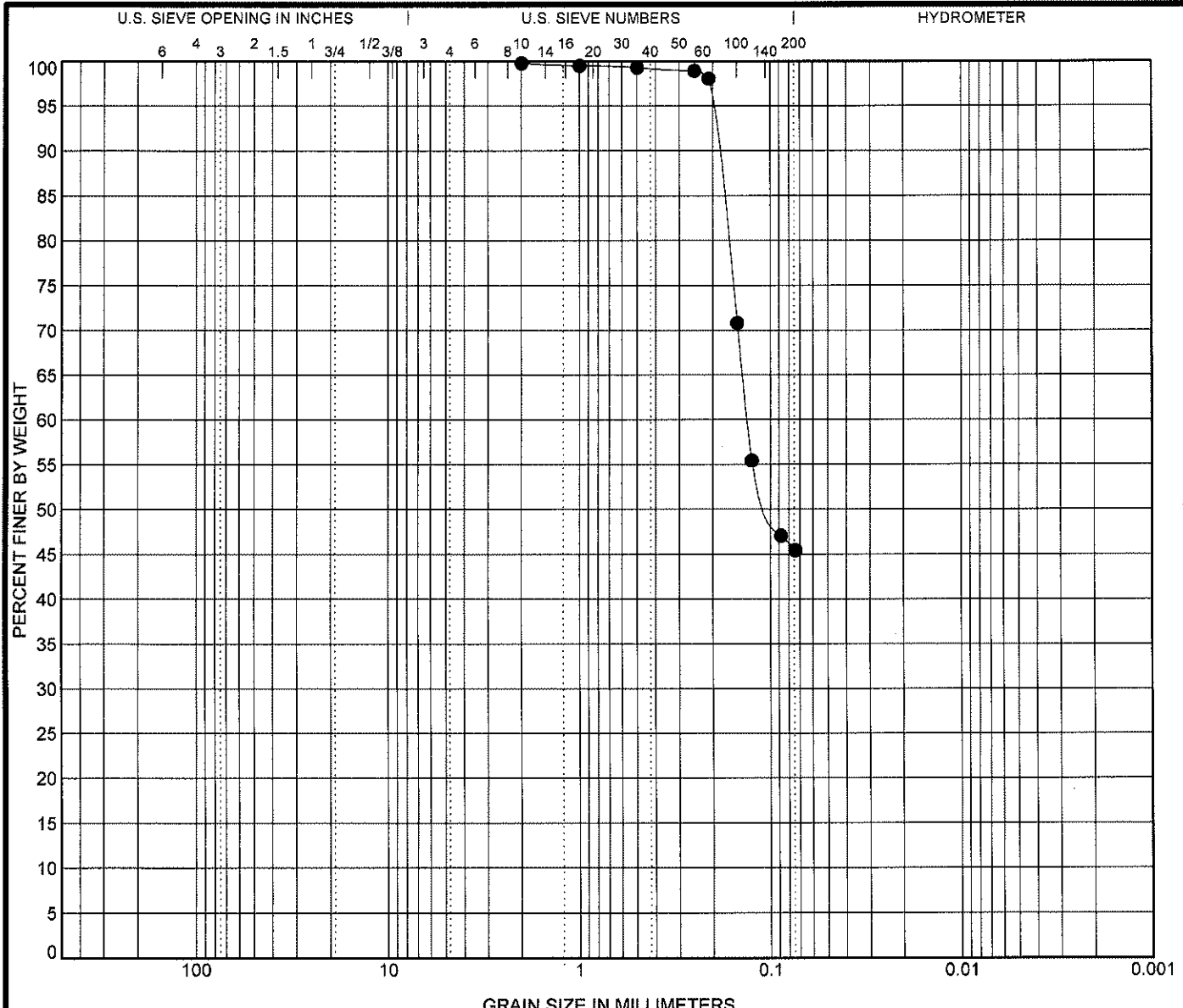
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-05	(-33' to -34' NAVD)	2	0.151			0.0			



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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-05 (-36' to -37' NAVD)		Borrow Area (-36' to -37' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-05 (-36' to -37' NAVD)		2	0.132			0.0			

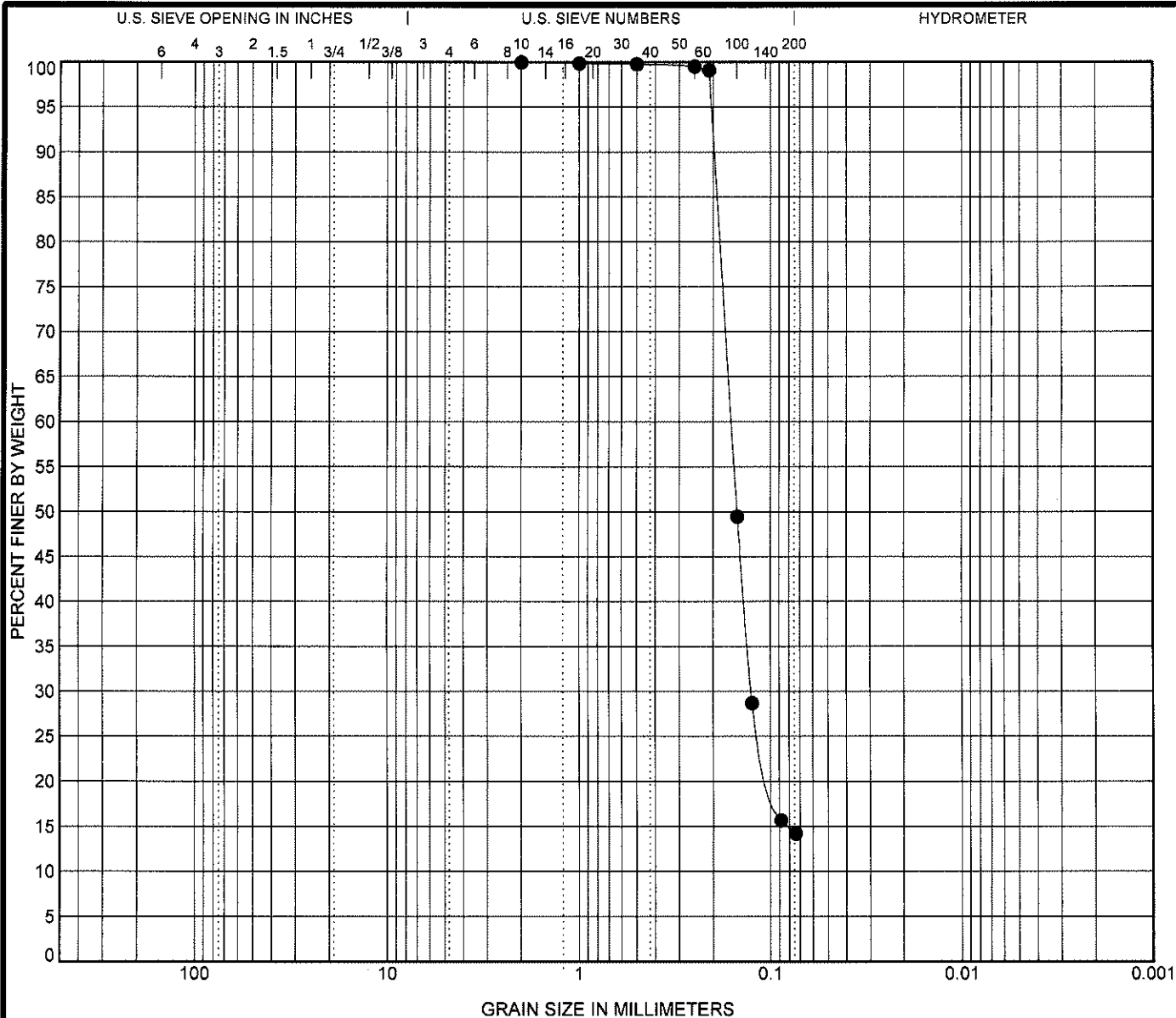


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

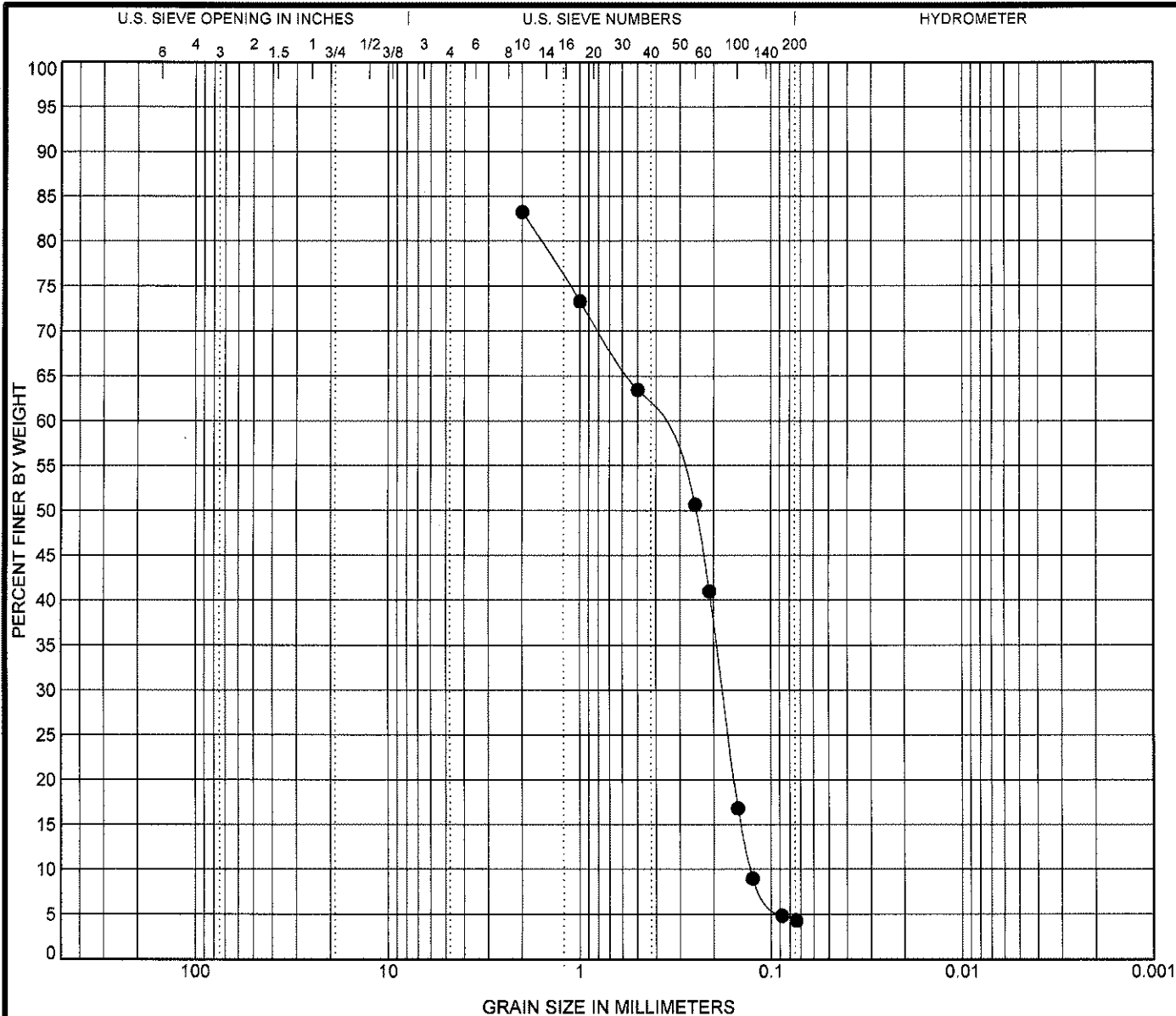
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-05 (-39' to -40' NAVD)		Borrow Area (-39' to -40' NAVD)					

[illegible]

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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-06	(-29' to -30' NAVD)	Borrow Area (-29' to -30' NAVD)							0.61	3.24
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● AA-06	(-29' to -30' NAVD)	2	0.414	0.18	0.128	0.0				



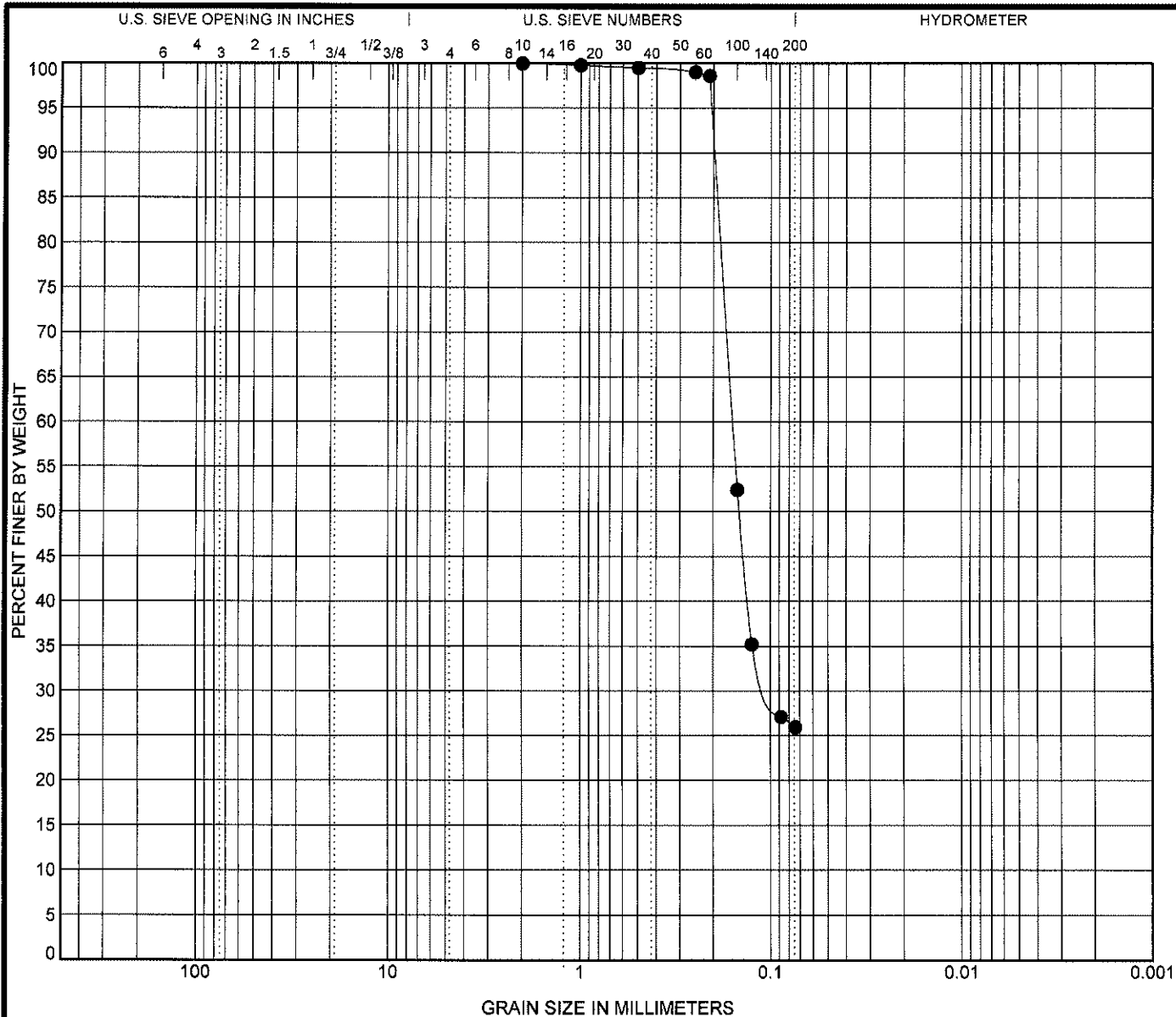
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-06 (-31' to -32' NAVD)		Borrow Area (-31' to -32' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-06 (-31' to -32' NAVD)		2	0.158	0.1		0.0			

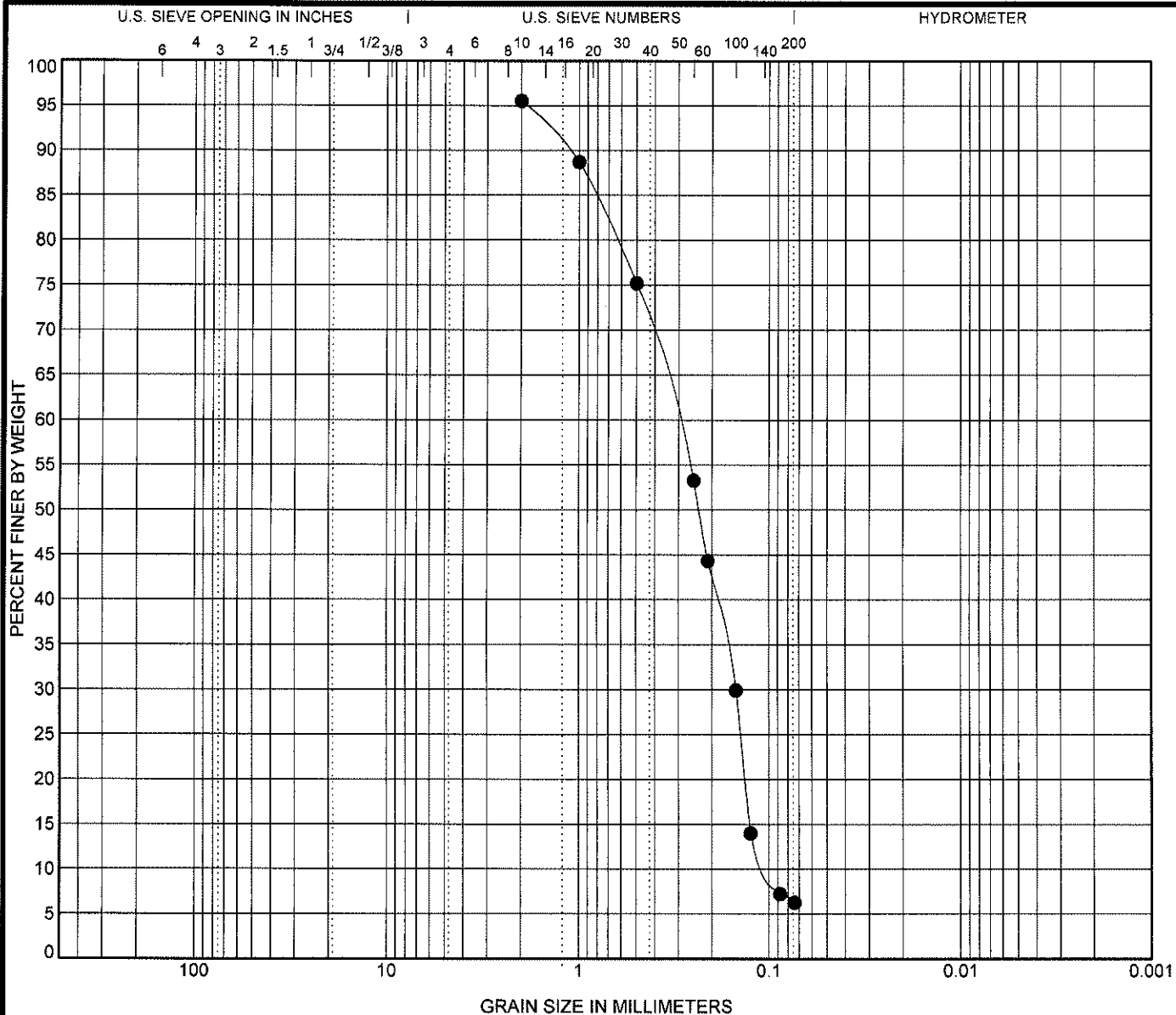


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-07 (-29' to -30' NAVD)		Borrow Area (-29' to -30' NAVD)				0.71	3.04

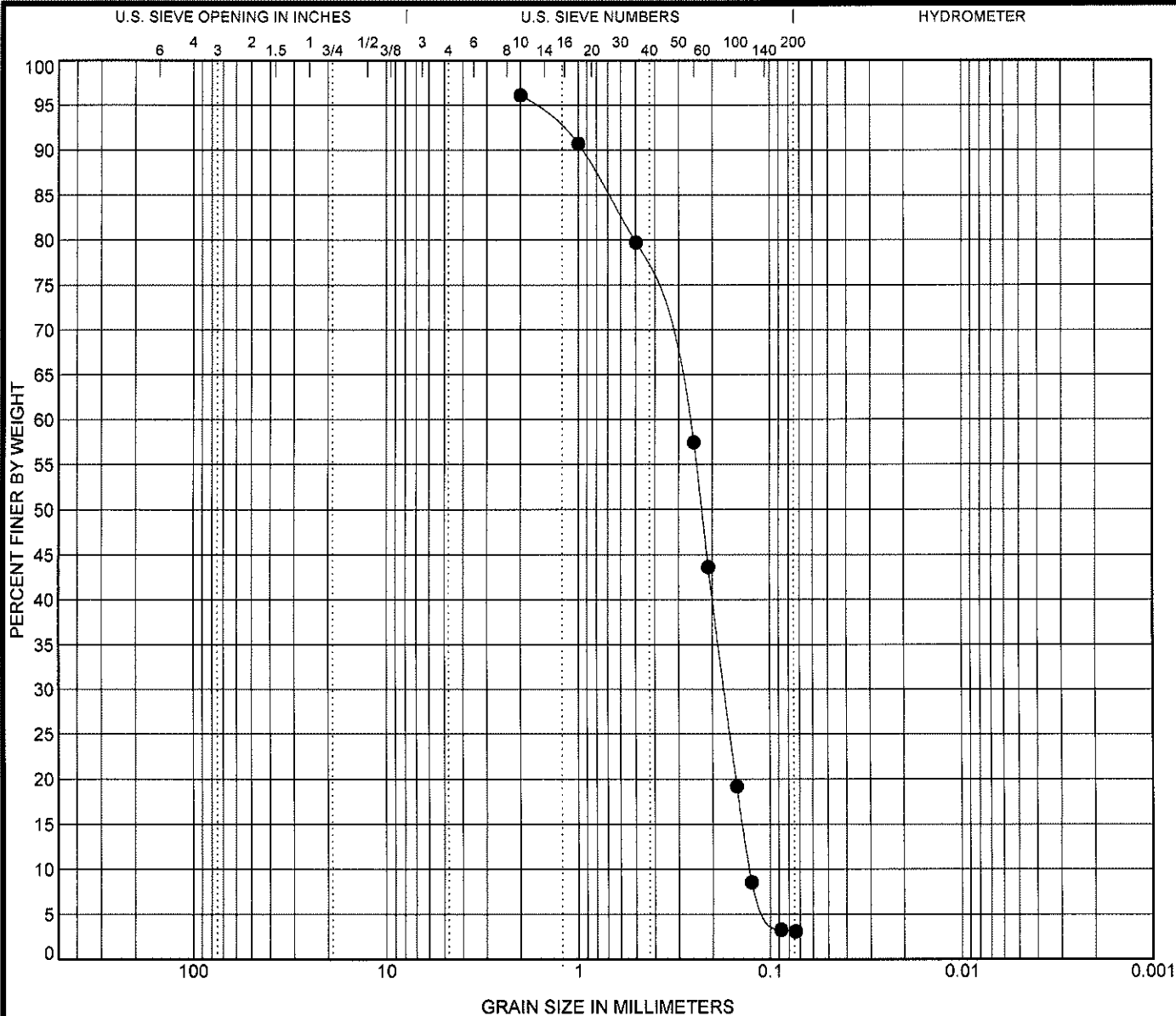
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-07 (-29' to -30' NAVD)	2	0.309	0.149	0.102	0.0				



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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-07	(-32' to -33' NAVD)	Borrow Area (-32' to -33' NAVD)				0.87	2.11

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-07	(-32' to -33' NAVD)	2	0.271	0.173	0.128	0.0			

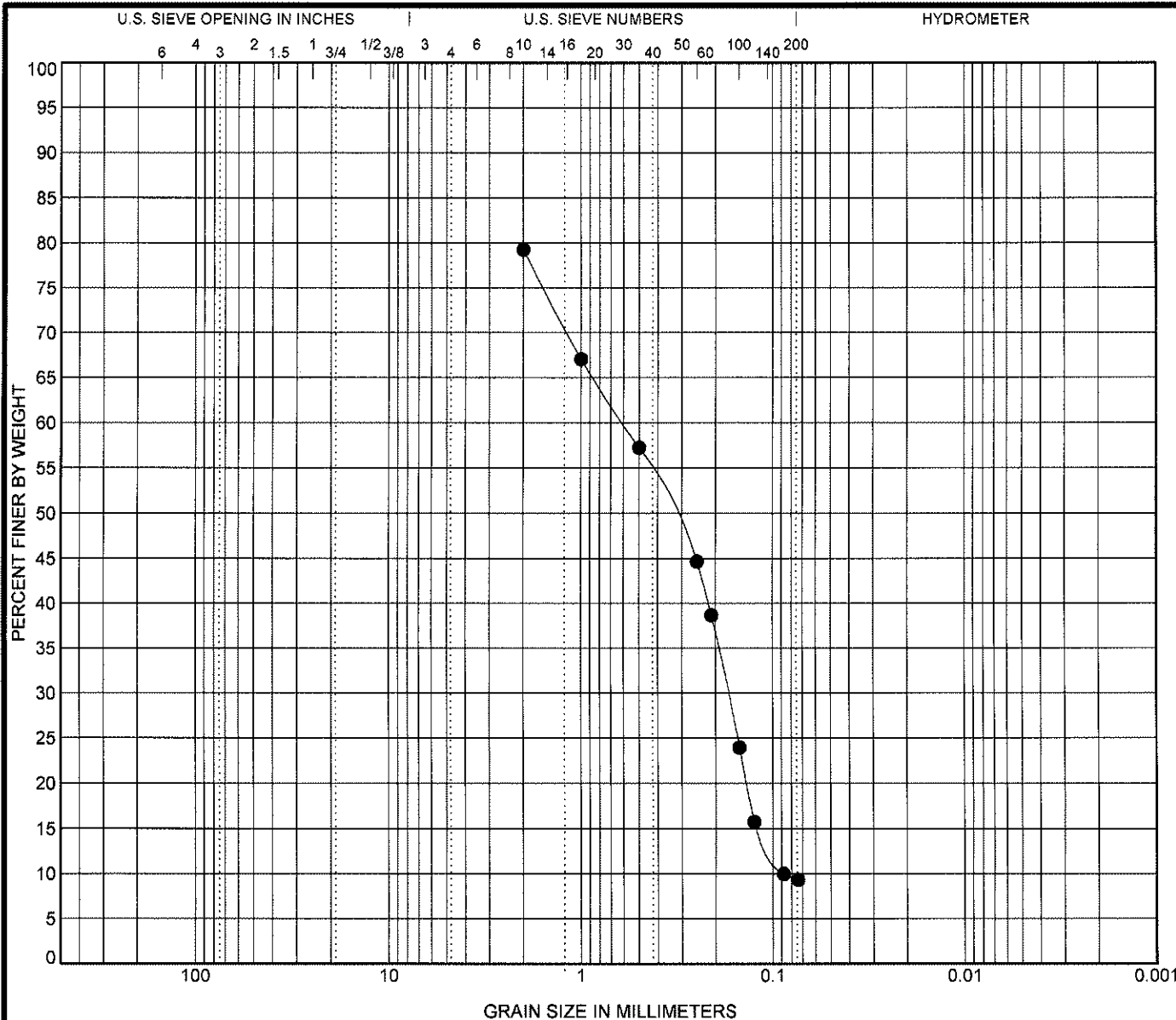


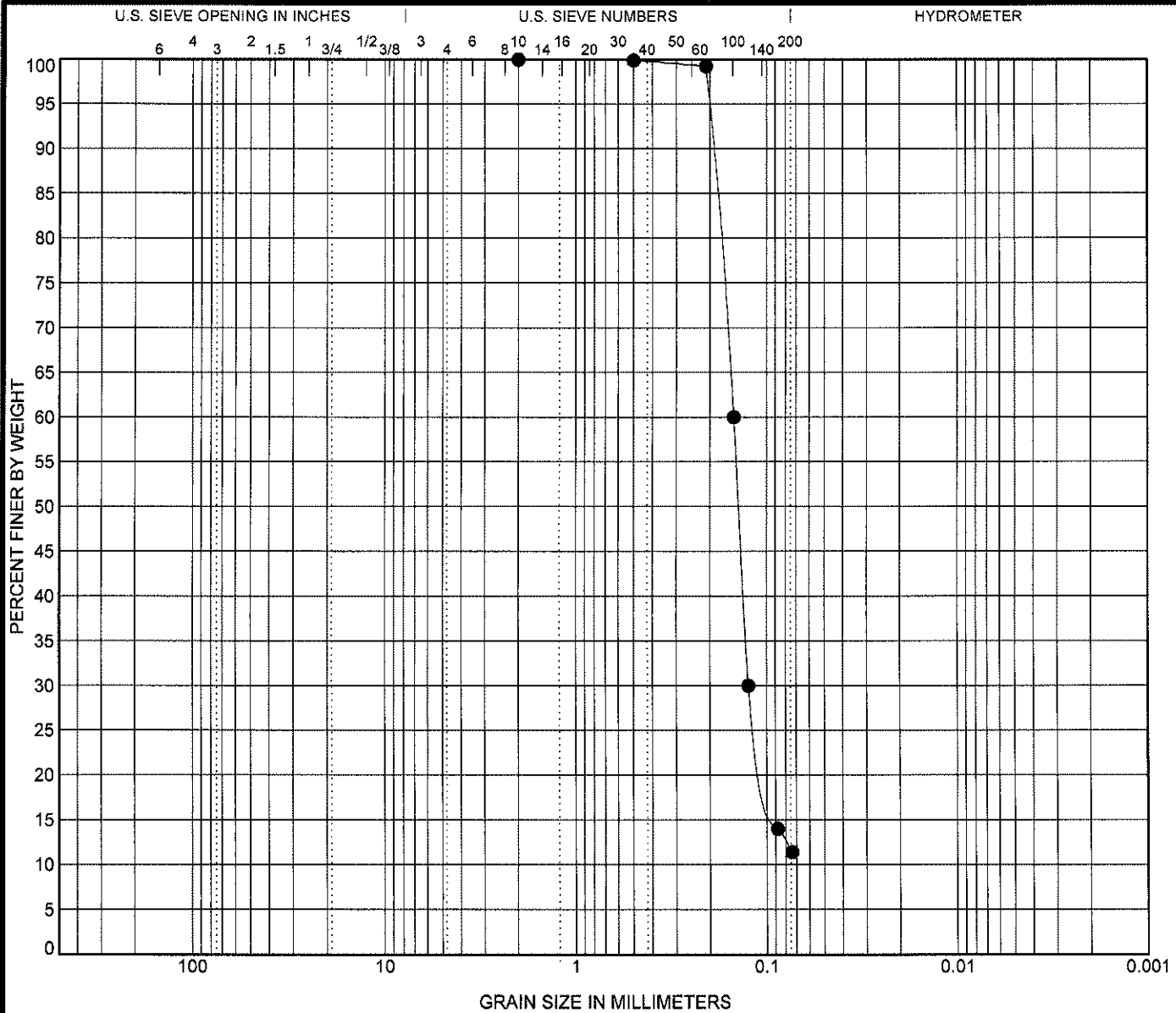
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-07	(-35' to -36' NAVD)	Borrow Area (-35' to -36' NAVD)				1.55	2.21

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-07	(-35' to -36' NAVD)	2	0.149	0.125		0.0			

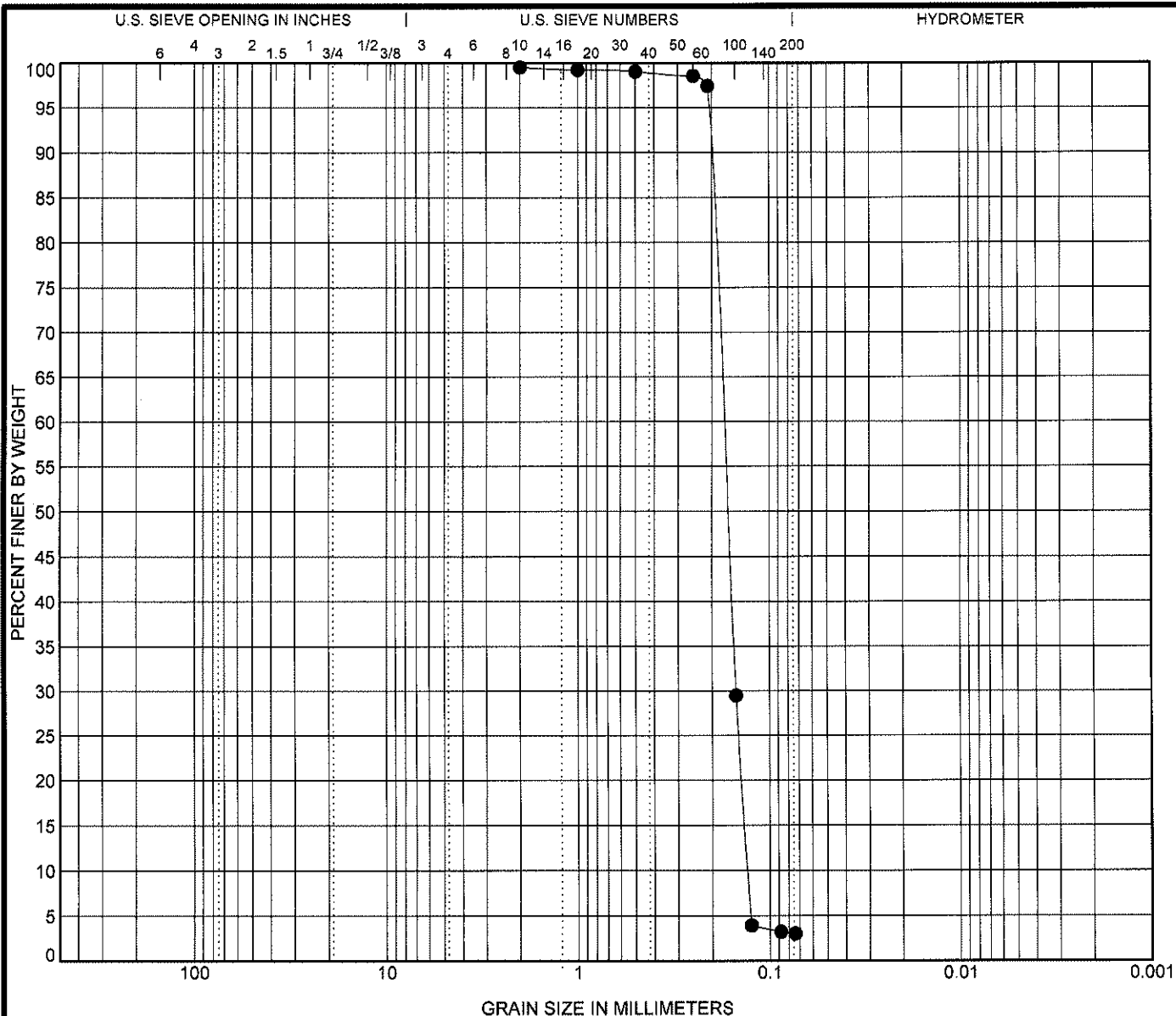


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-08	(-33' to 34' NAVD)	Borrow Area (-33' to -34' NAVD)				0.99	1.33

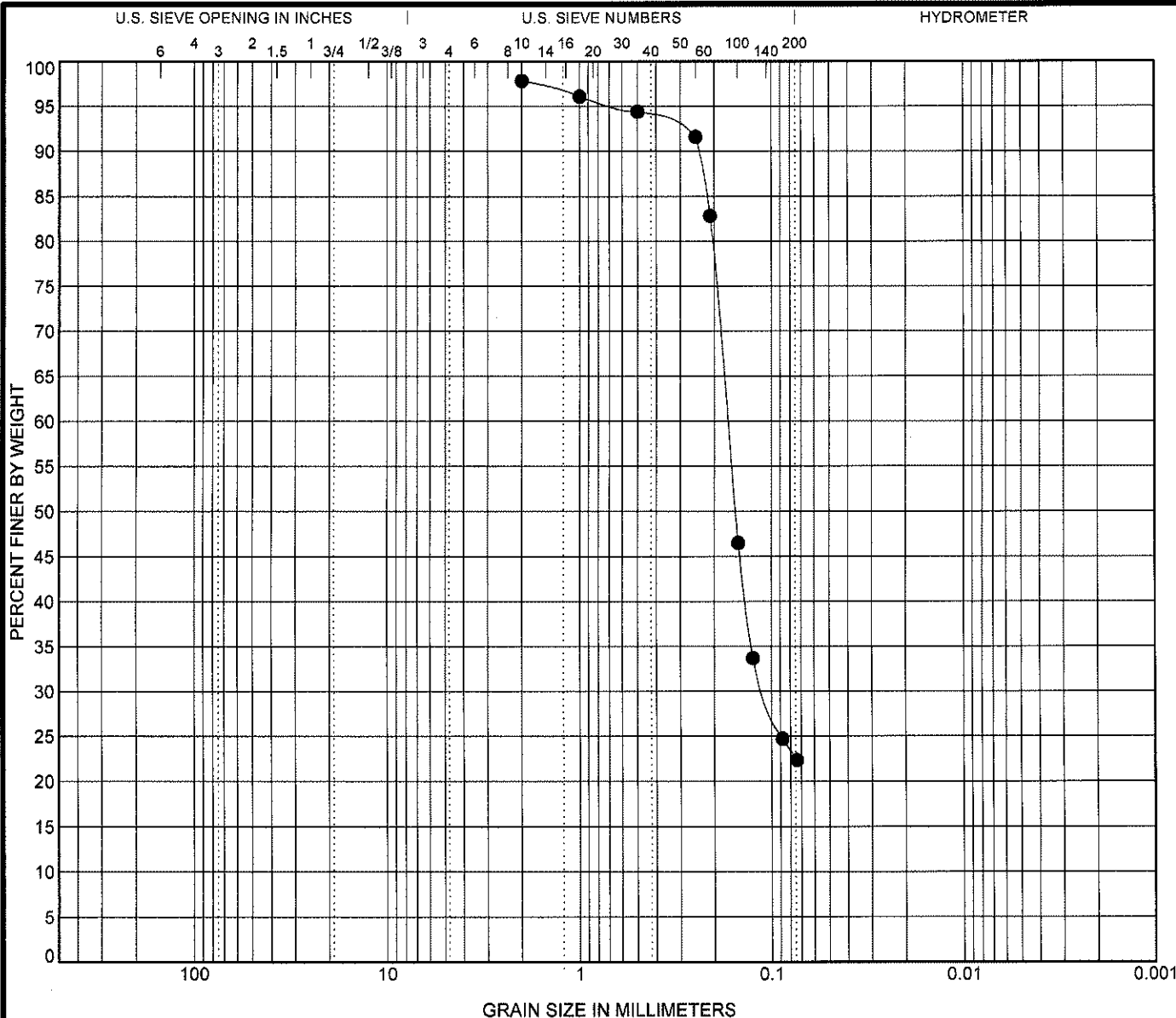
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-08	(-33' to 34' NAVD)	2	0.174	0.149	0.13	0.0			



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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-08 (-36' to -37' NAVD)		Borrow Area (-36' to -37' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-08 (-36' to -37' NAVD)		2	0.169	0.108		0.0			

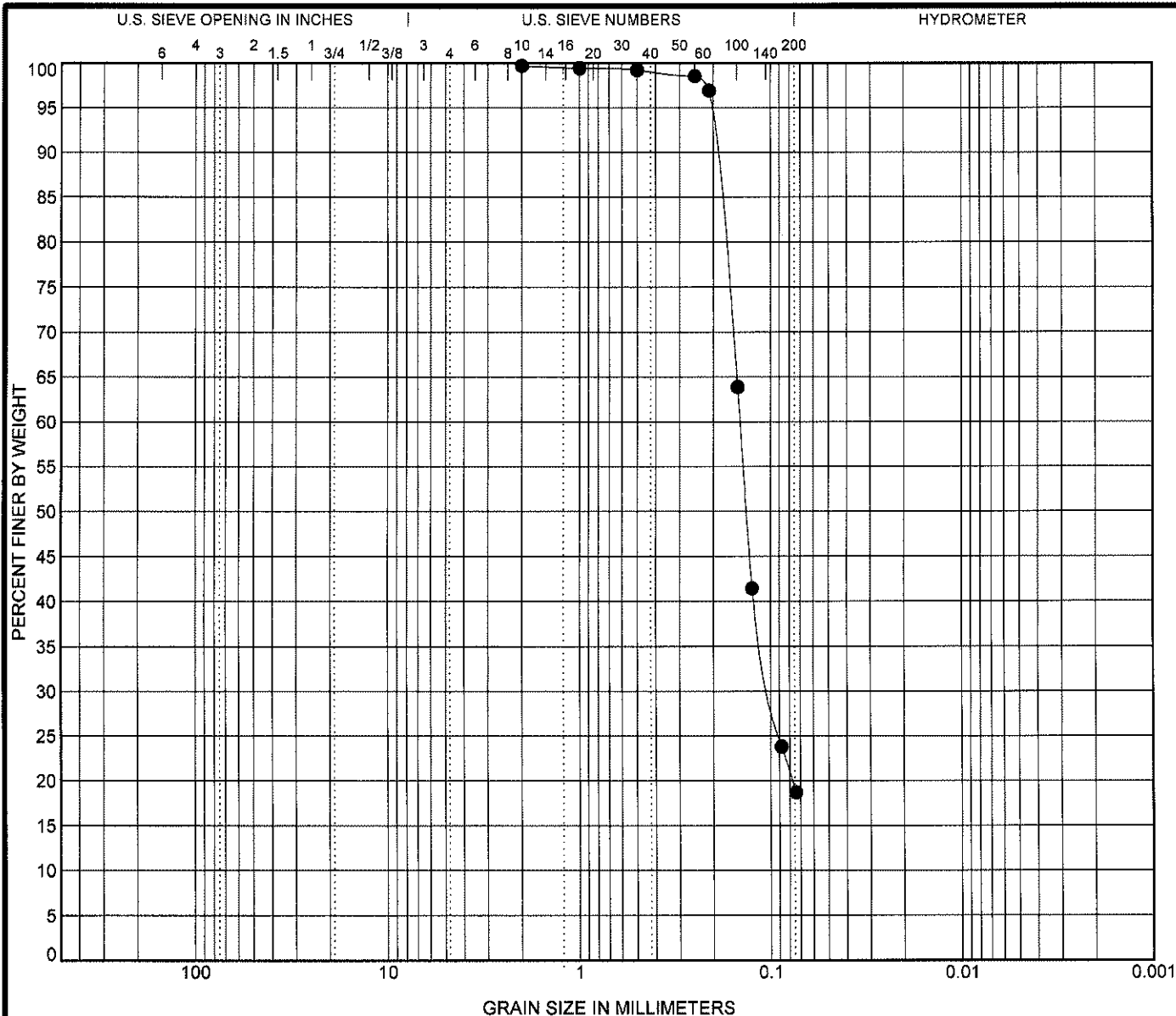


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-08 (-39' to -40' NAVD)		<b>Borrow Area (-39' to -40' NAVD)</b>					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-08 (-39' to -40' NAVD)		2	0.145	0.1		0.0			

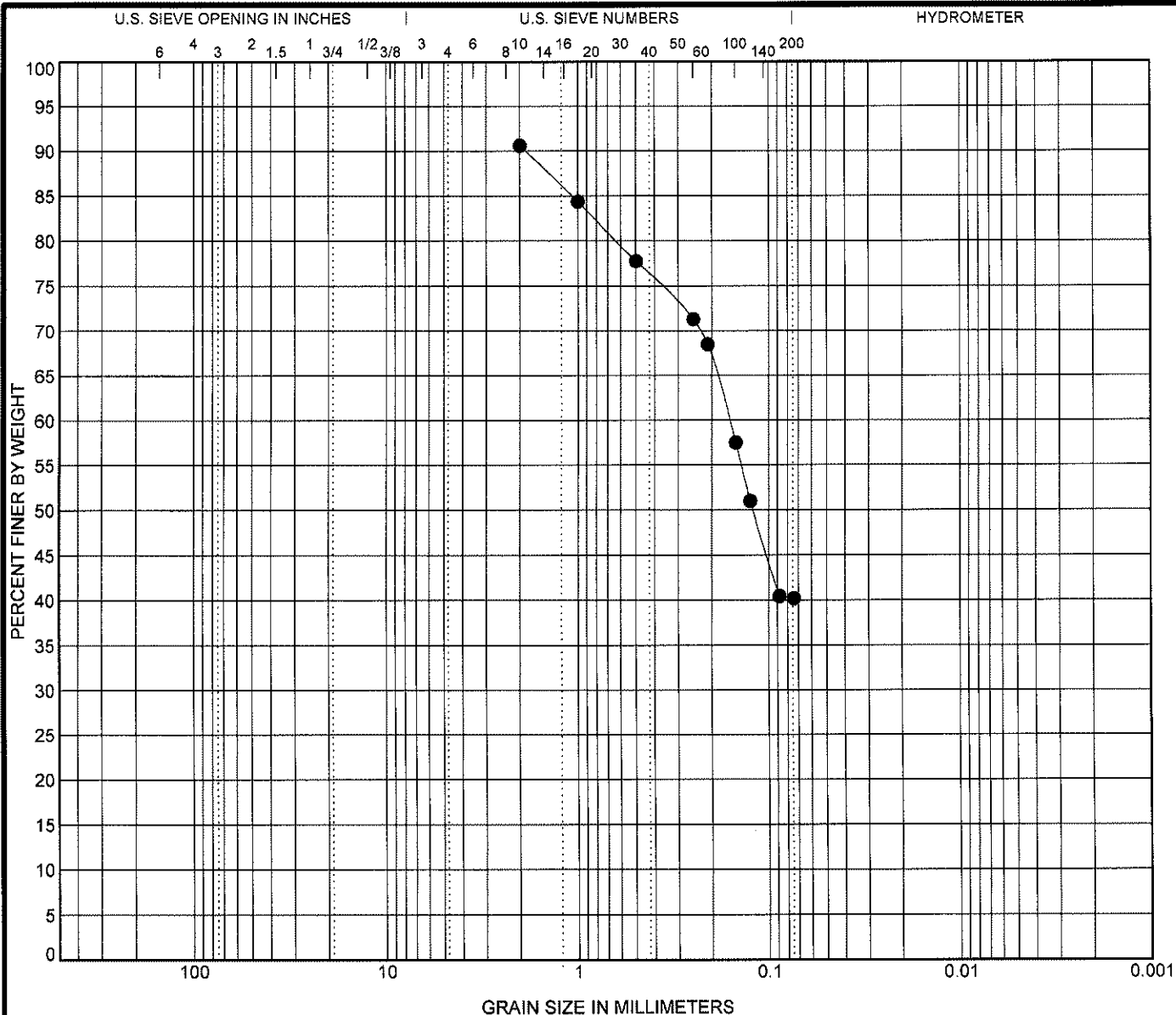


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-08 (-41' to -42' NAVD)		Borrow Area (-41' to -42' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-08 (-41' to -42' NAVD)		2	0.161			0.0			

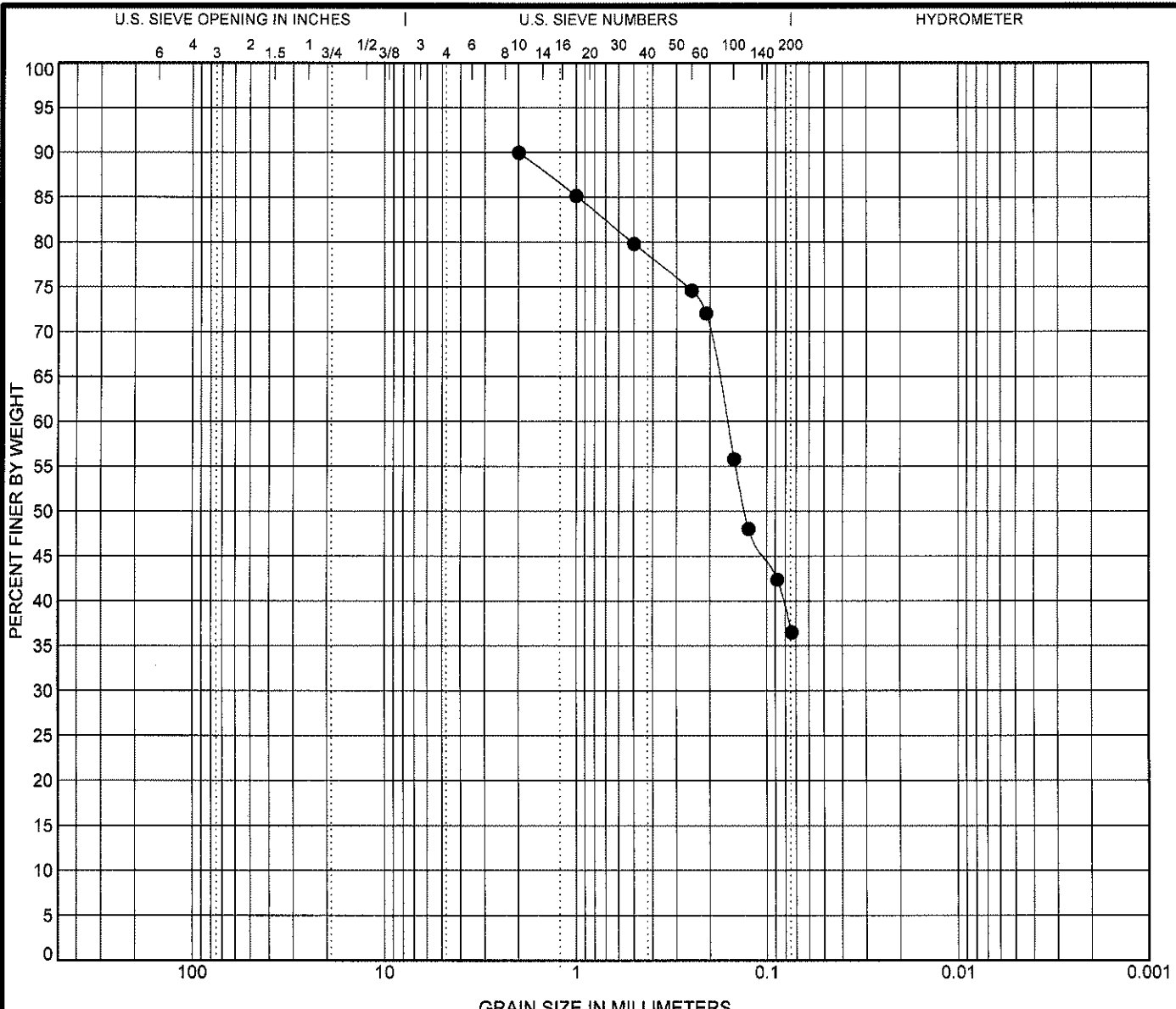


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-09	(-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			



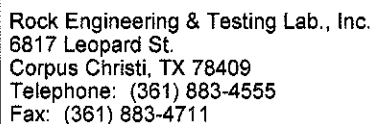
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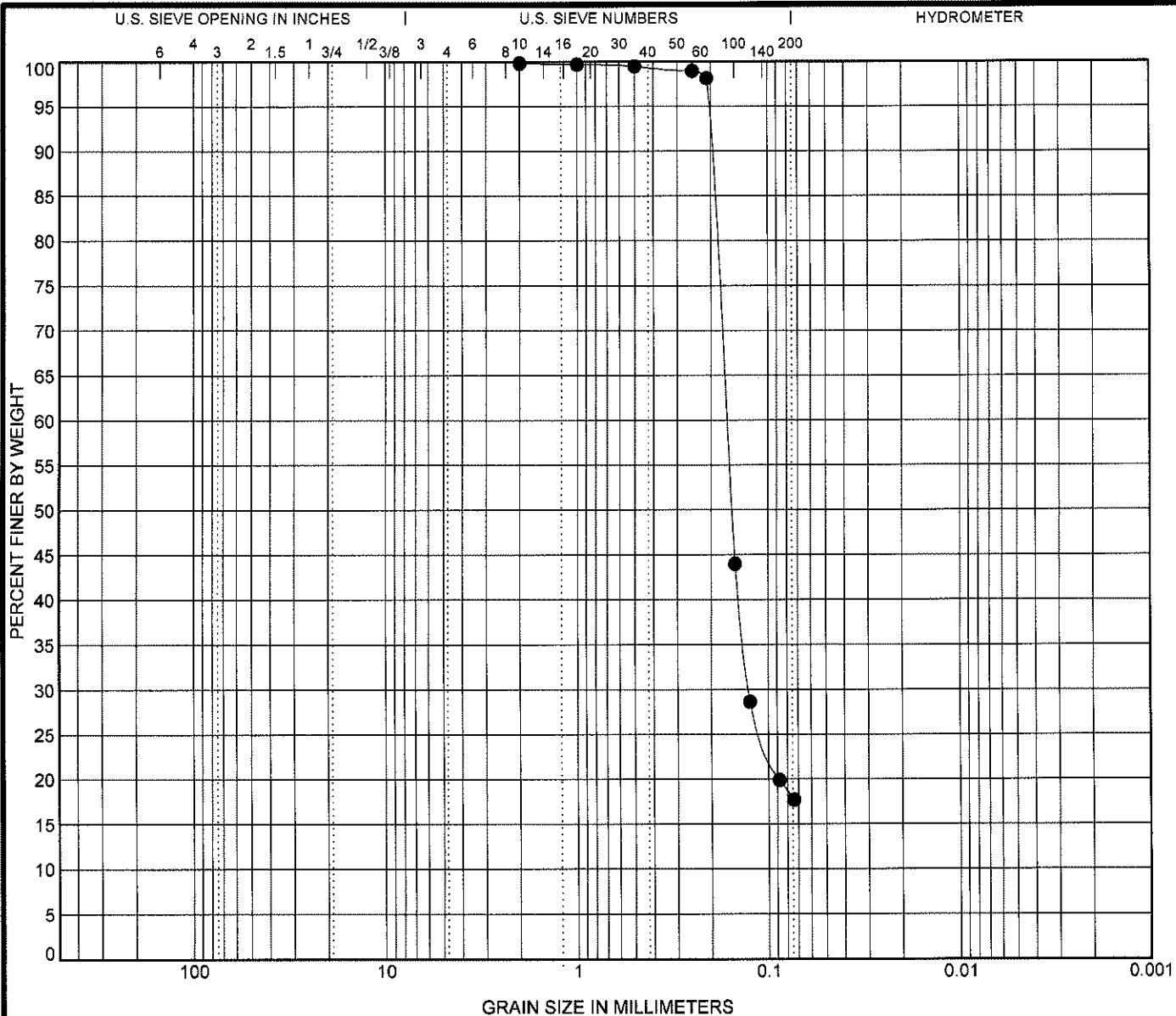
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Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
<b>AA-09</b>	(-34' to -35' NAVD)	<b>Borrow Area (-34' to -35' NAVD)</b>					



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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	(-36' to -37' NAVD)	Borrow Area (-36' to -37' NAVD)					

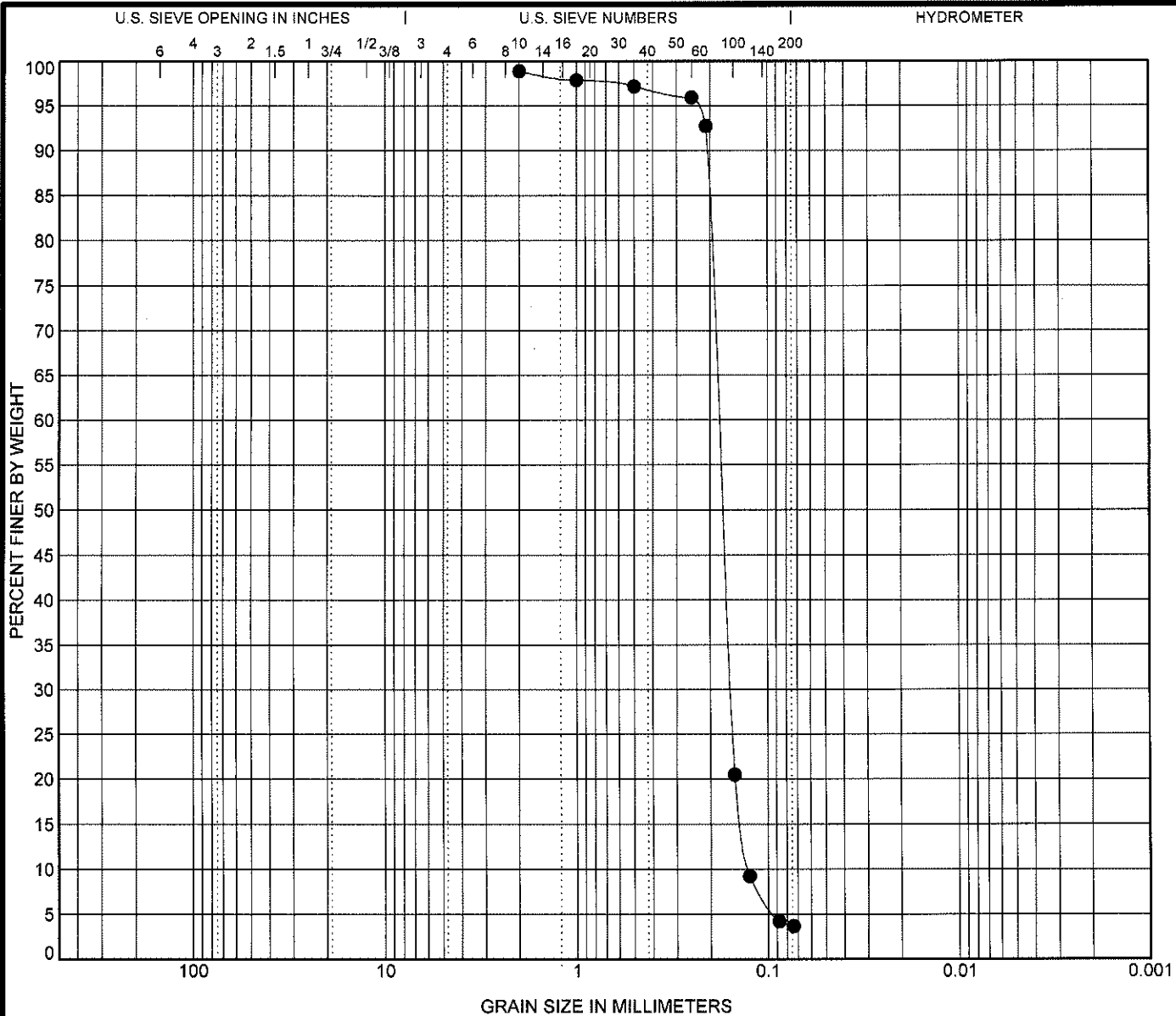
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-09	(-36' to -37' NAVD)	2	0.165	0.127		0.0			



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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			

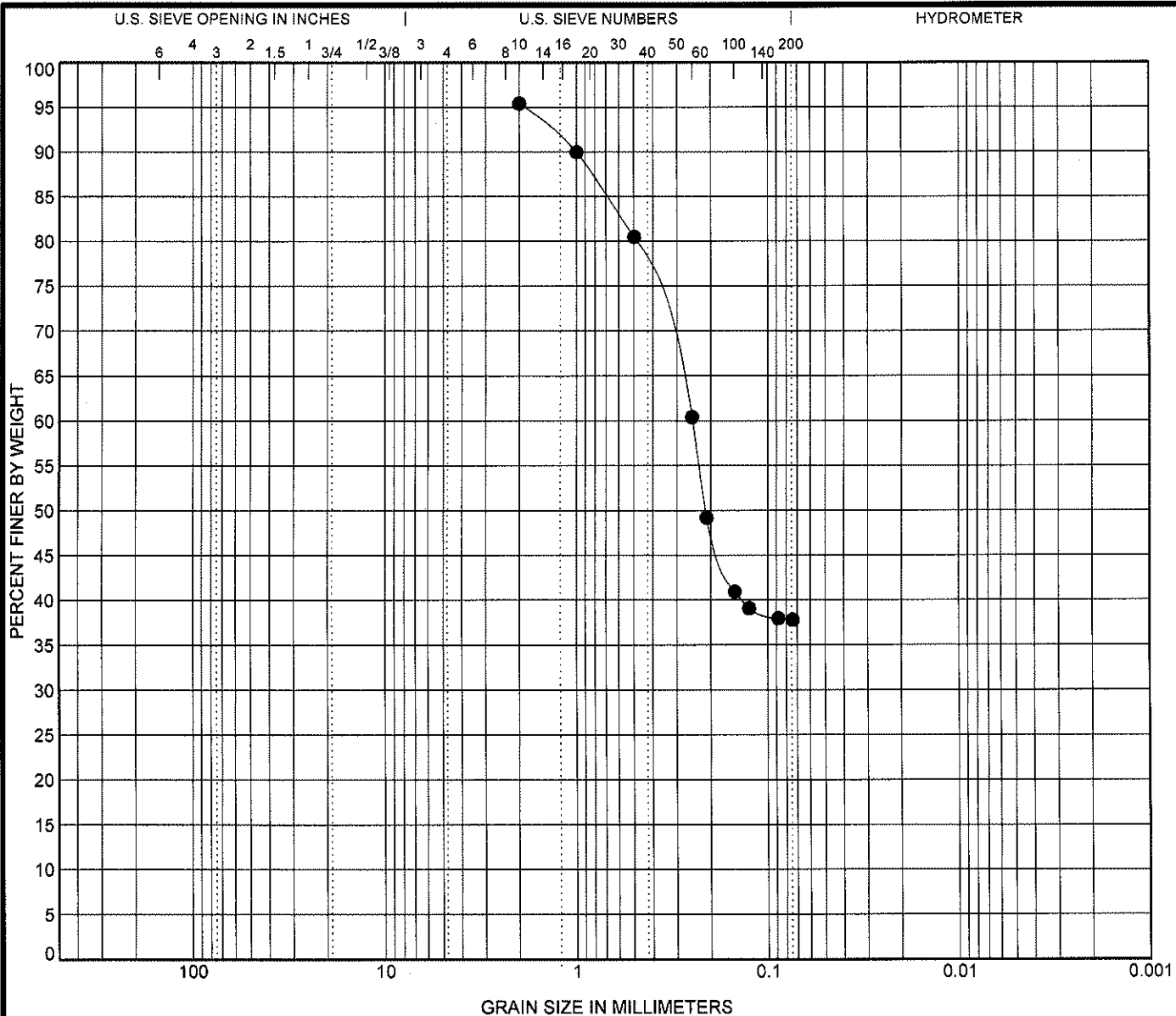


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### GRAIN SIZE DISTRIBUTION

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 4/8/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-10 (-30' to -31' NAVD)		Borrow Area (-30' to -31' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-10 (-30' to -31' NAVD)		2	0.248			0.0			

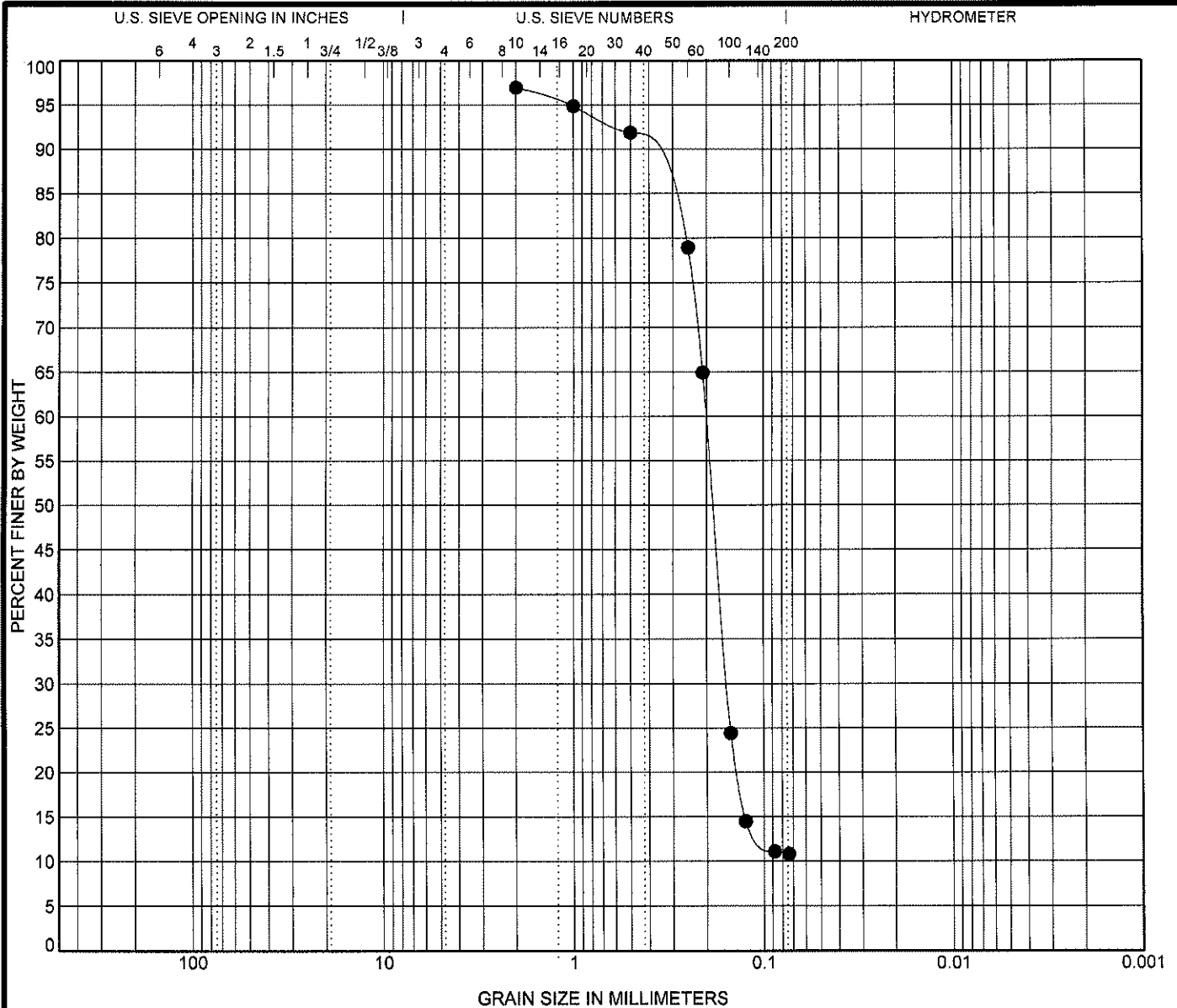


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US GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ US LAB.GDT. 4/6/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-10	(-31' to -32' NAVD)	Borrow Area (-31' to -32' NAVD)				2.66	4.42

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-10	(-31' to -32' NAVD)	2	0.201	0.156		0.0			

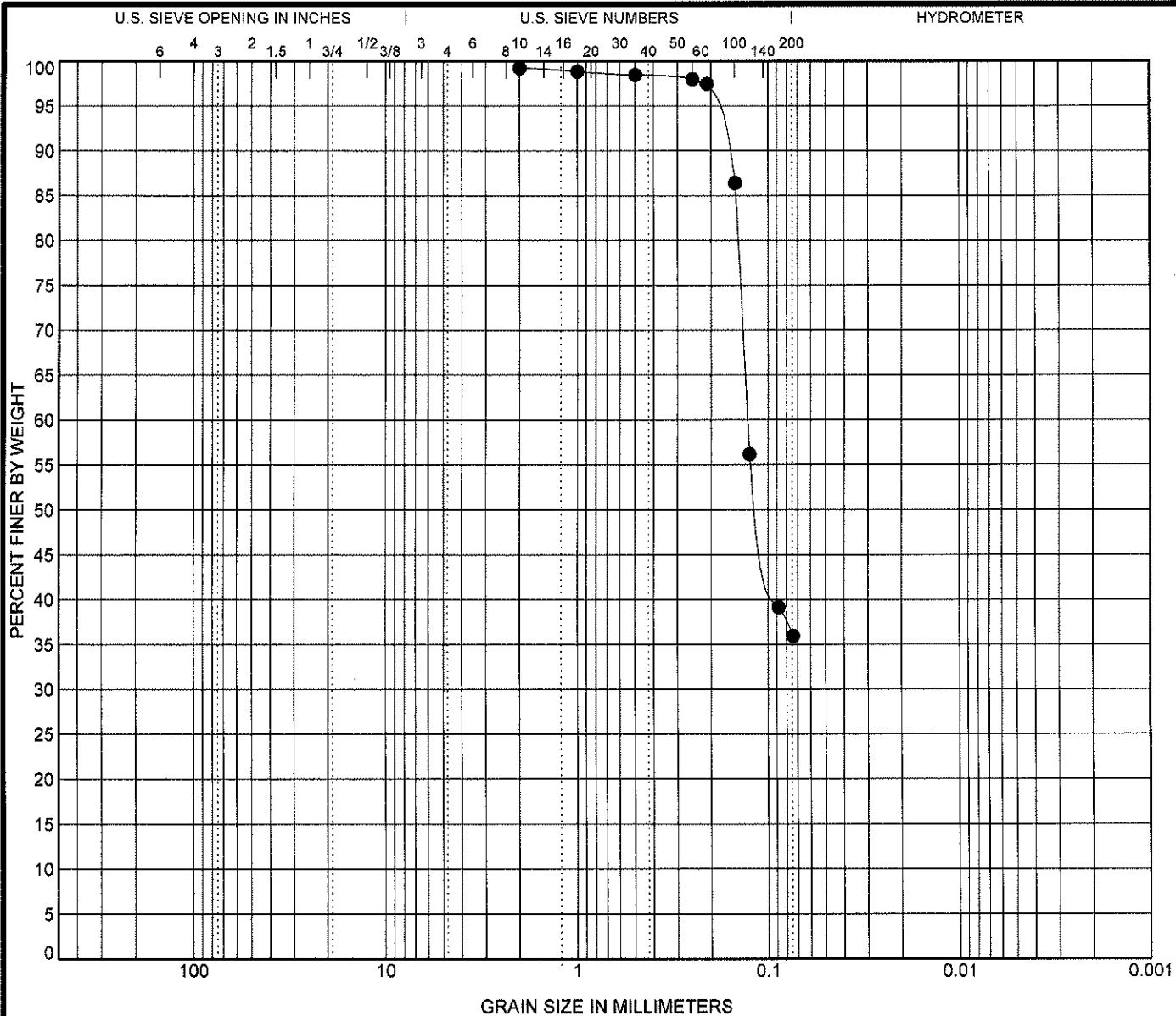


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-10	(-32' to -33' NAVD)	Borrow Area (-32' to -33' NAVD)					

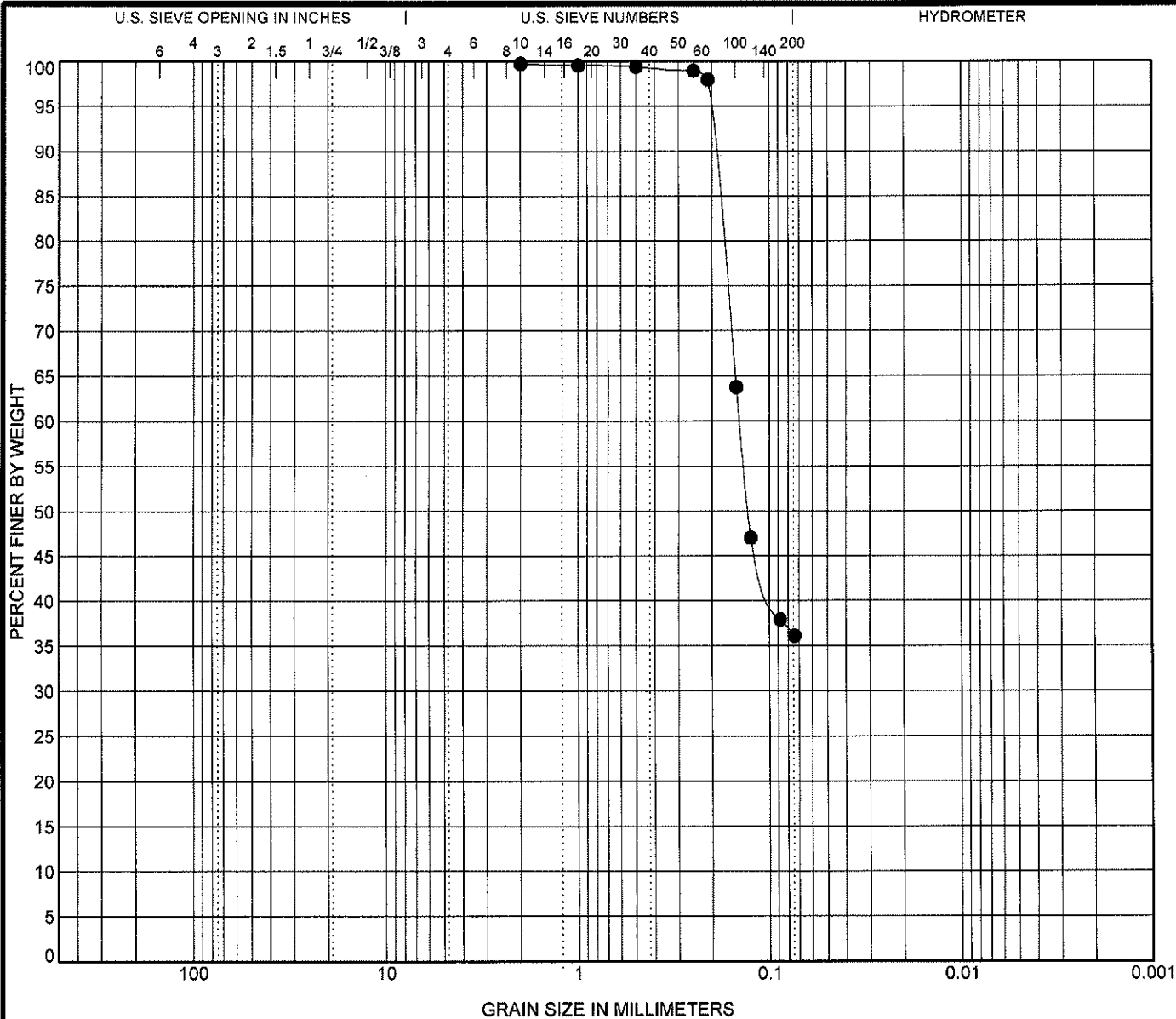
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-10	(-32' to -33' NAVD)	2	0.128			0.0			



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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-10	(-34' to -35' NAVD)	Borrow Area (-34' to -35' NAVD)					

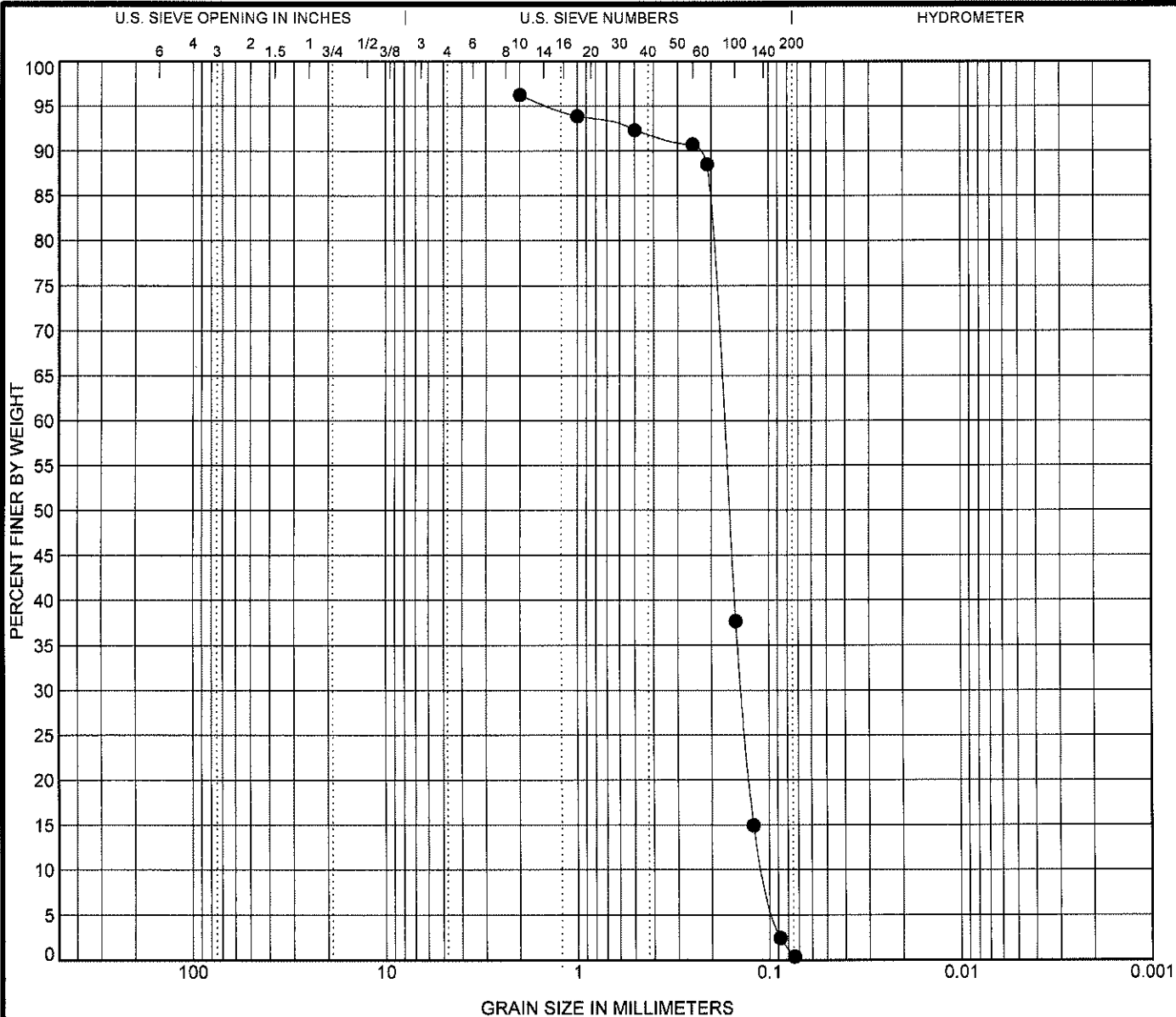
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-10	(-34' to -35' NAVD)	2	0.143			0.0			



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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-10	(-35' to -36' NAVD)	Borrow Area (-35' to -36' NAVD)				1.04	1.62

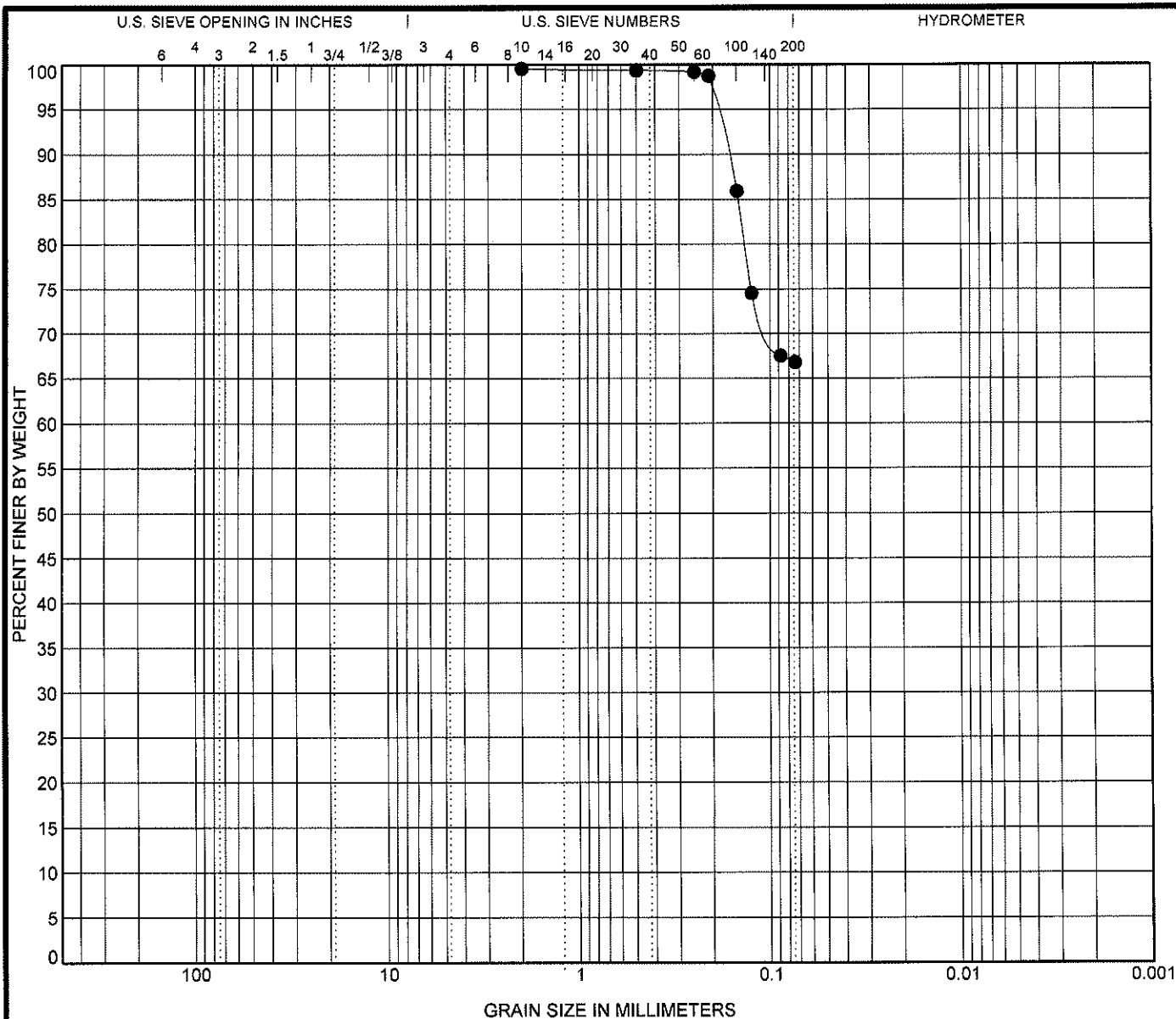
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-10	(-35' to -36' NAVD)	2	0.173	0.139	0.107	0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

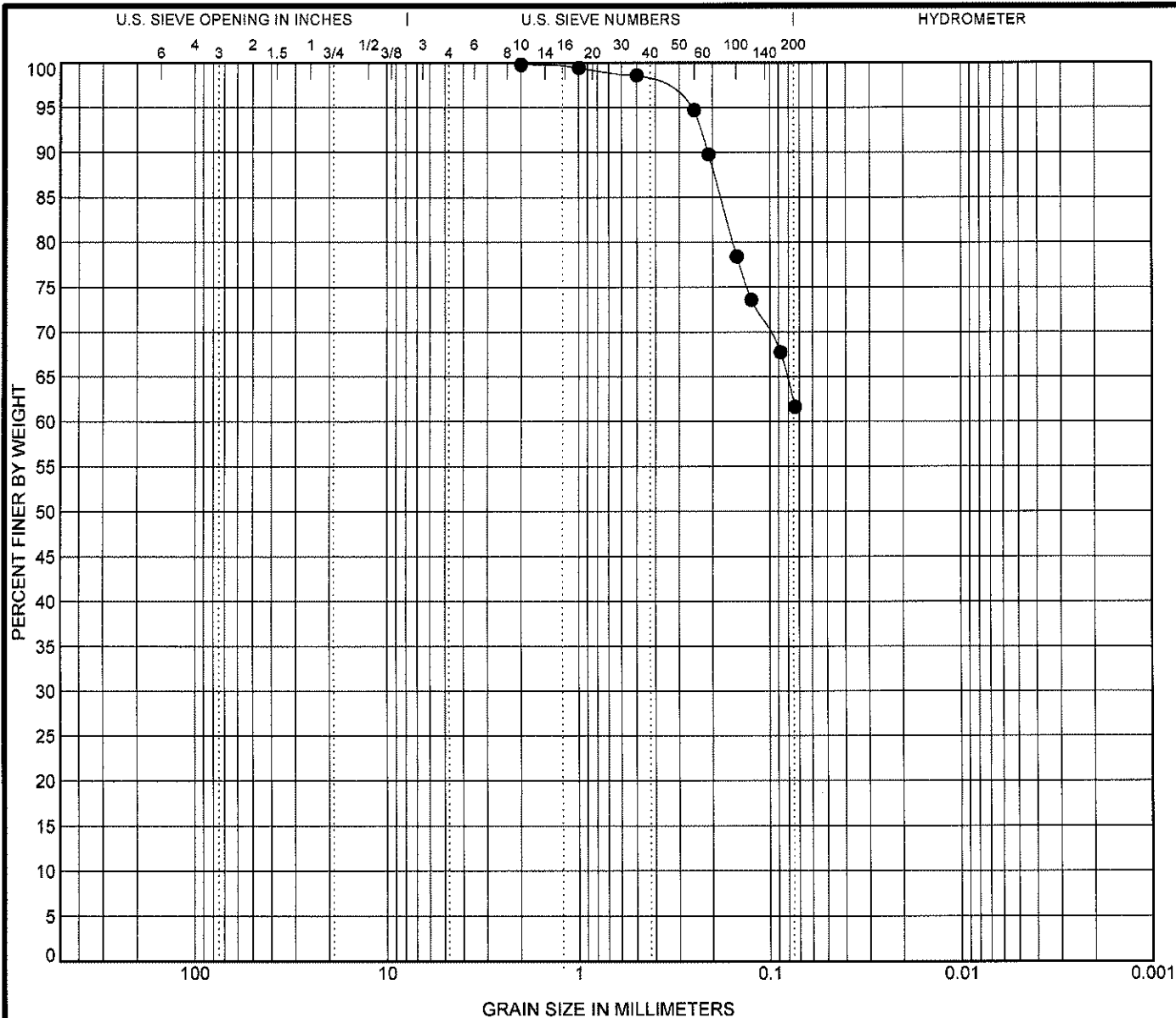
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-10 (-38' to -39' NAVD)		Borrow Area (-38' to -39' NAVD)					

[illegible]

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

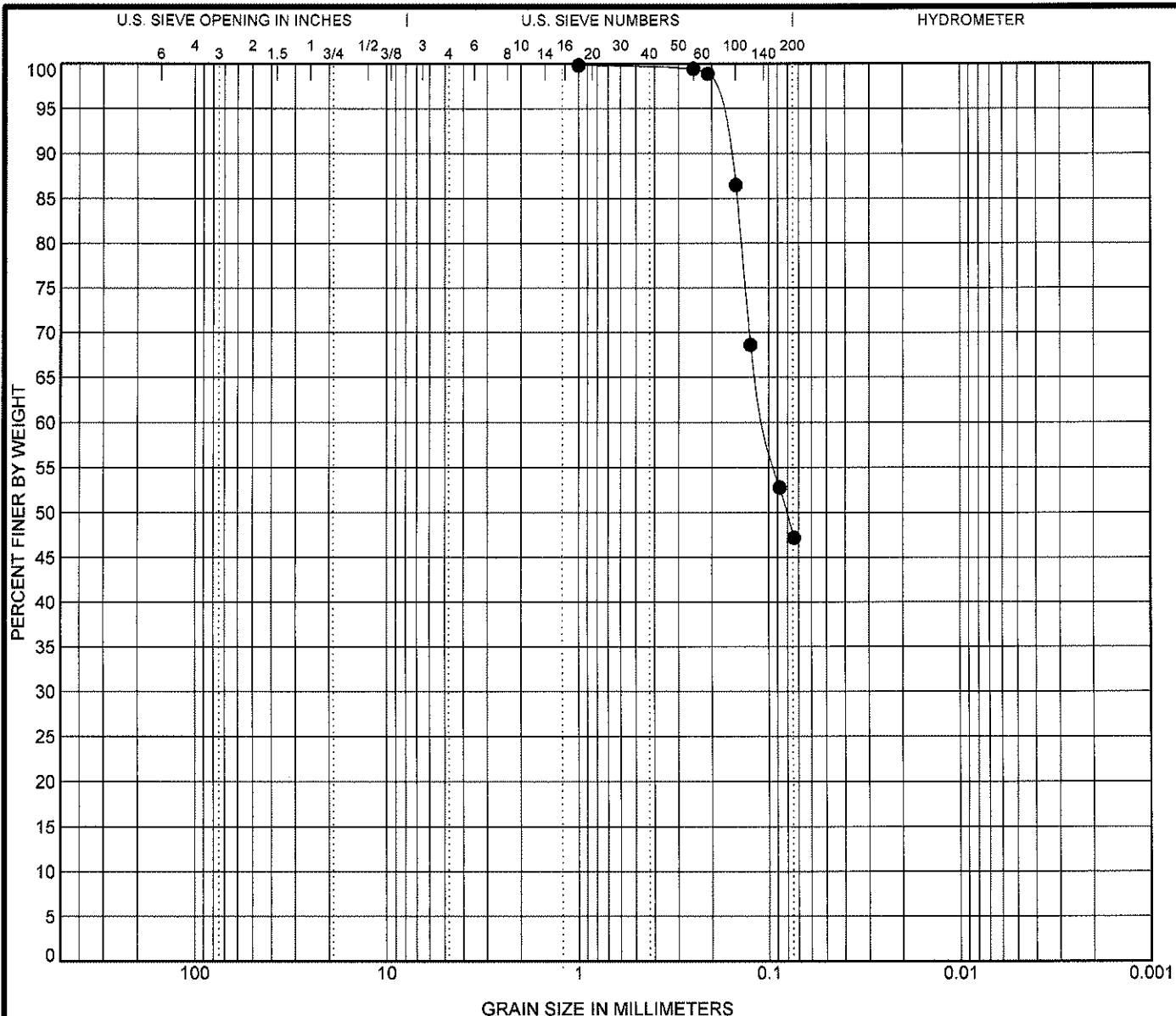
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-11 (-28' to -29' NAVD)		Borrow Area (-28' to -29' NAVD)					

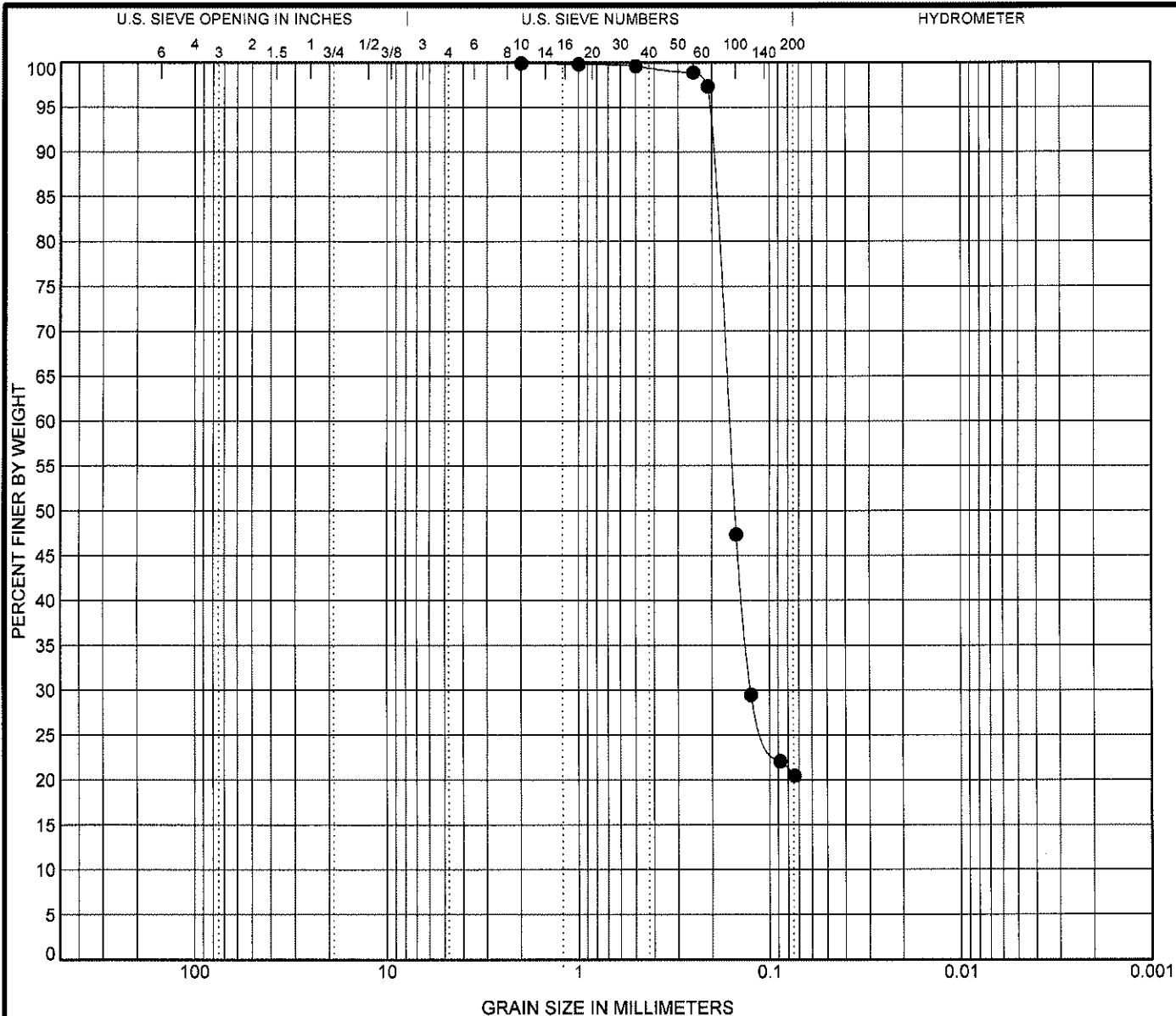
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-11 (-31' to -32' NAVD)		Borrow Area (-31' to -32' NAVD)					

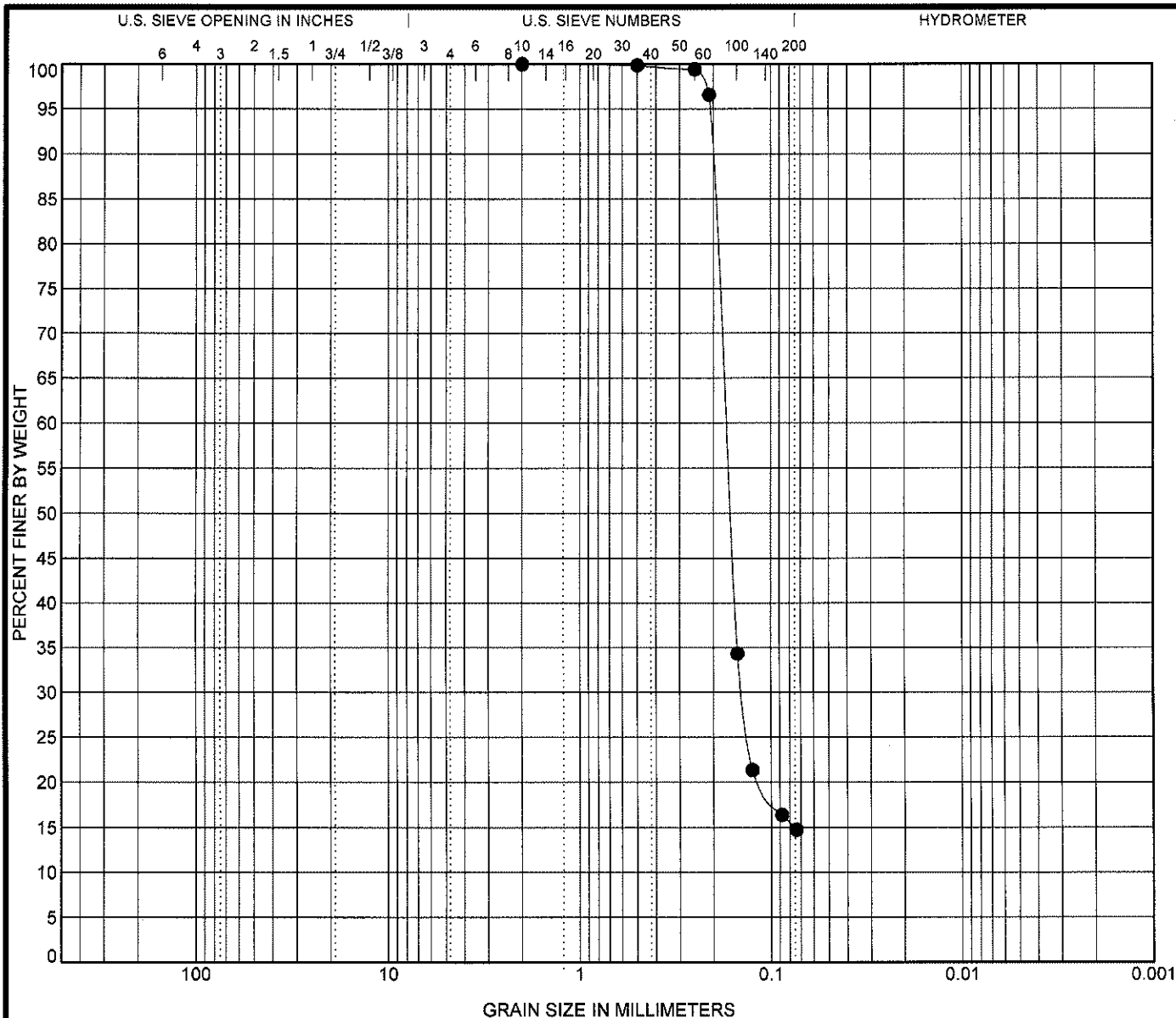
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-11 (-31' to -32' NAVD)		2	0.163	0.126		0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

[illegible]

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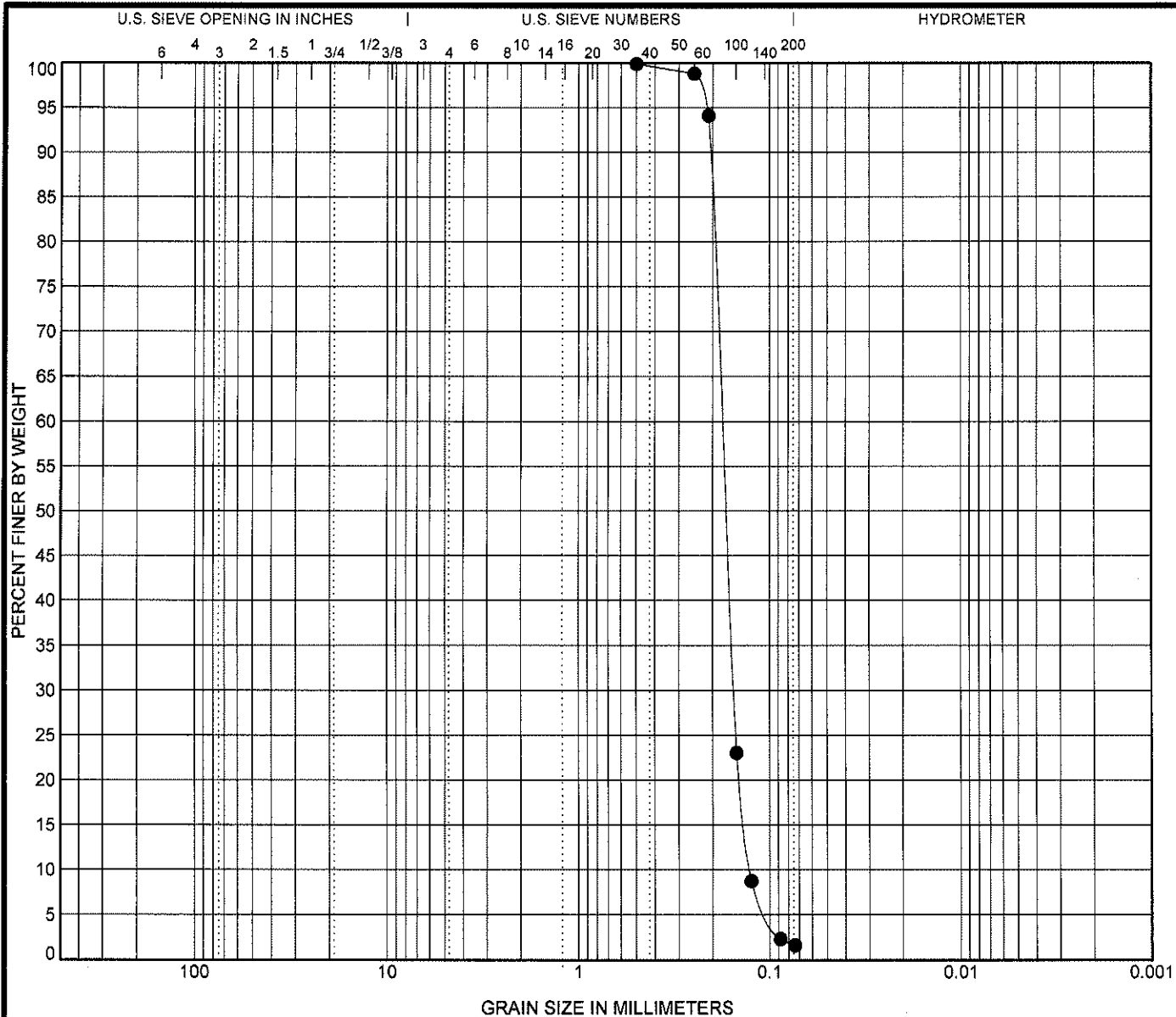
Project: Anchorage Basin Sand Source Investigation

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-11	(-36' to -37' NAVD)	Borrow Area (-36' to -37' NAVD)				1.05	1.40

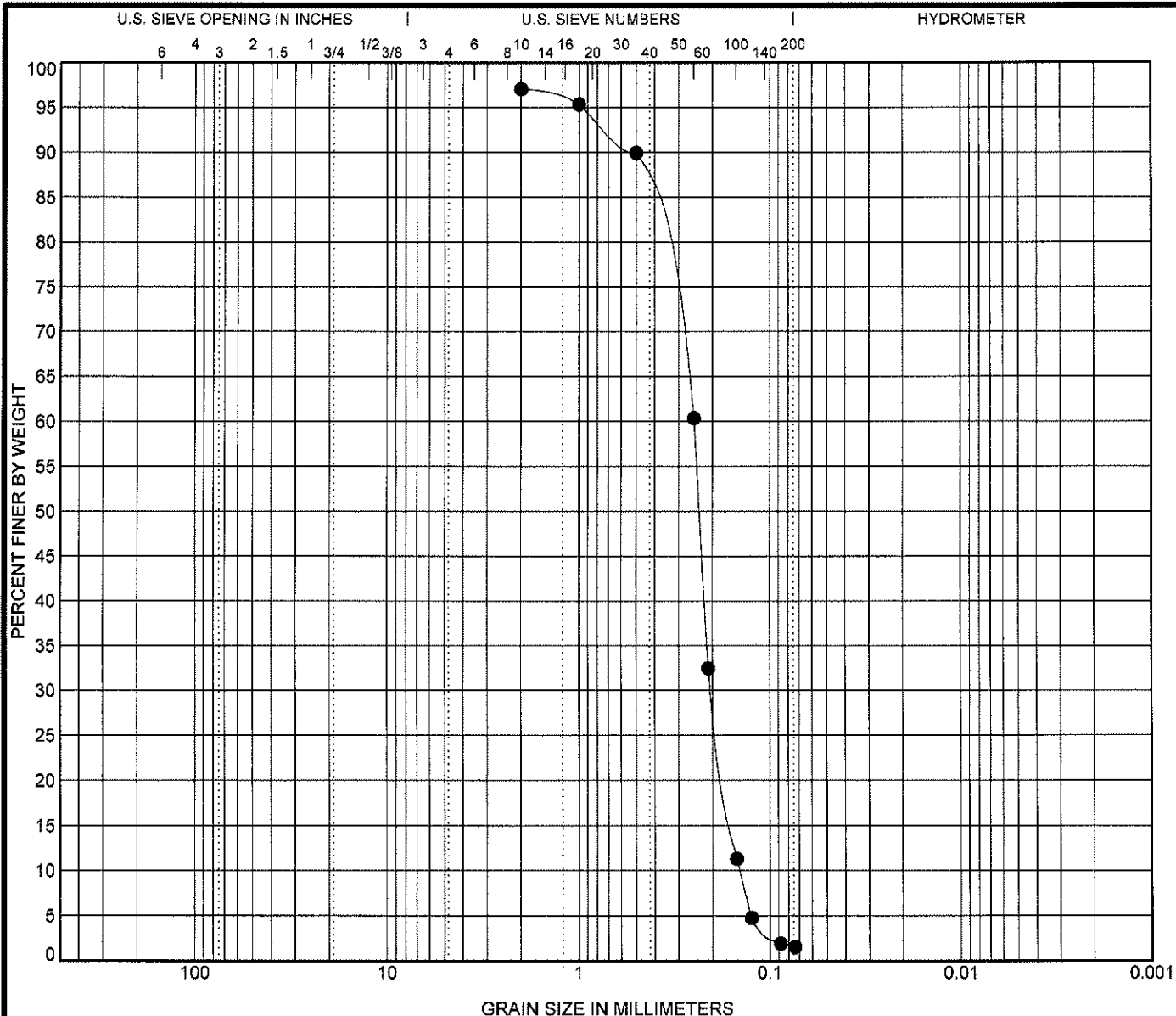
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-11	(-36' to -37' NAVD)	0.5	0.178	0.154	0.127	0.0			



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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-12 (-26' to -27' NAVD)		Borrow Area (-26' to -27' NAVD)				1.13	1.73

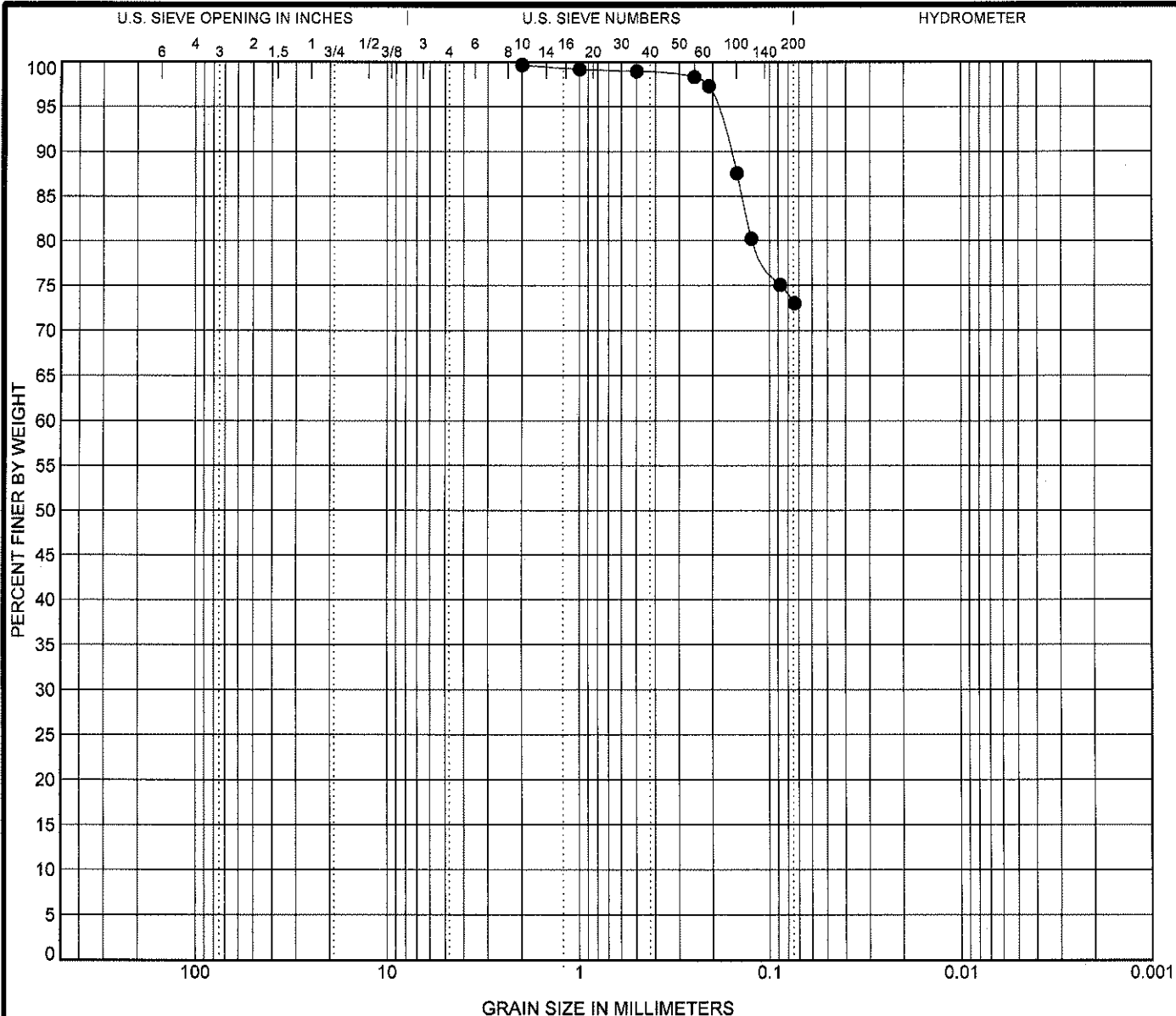
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-12 (-26' to -27' NAVD)		2	0.249	0.202	0.144	0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

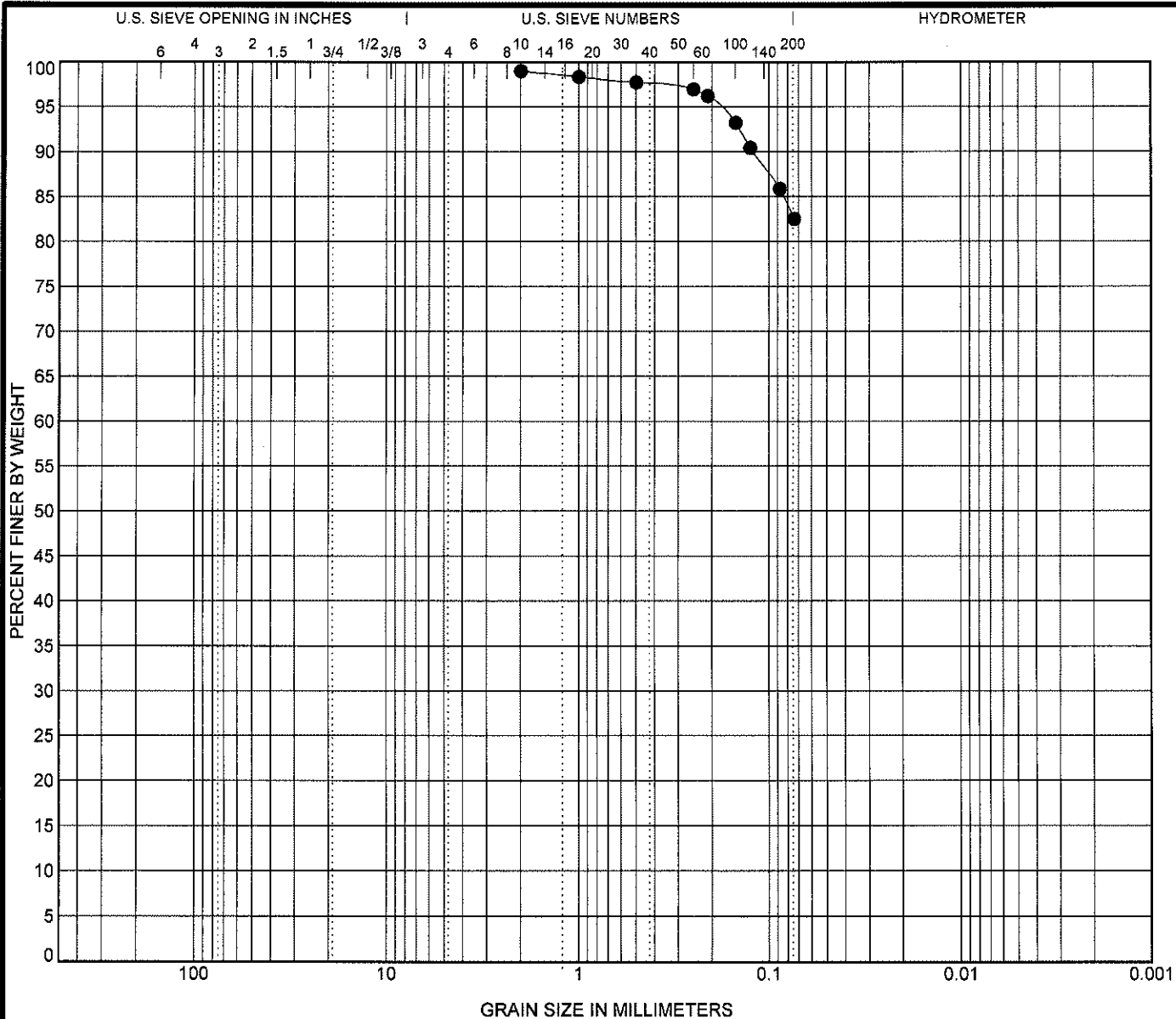
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-12	(-27' to -28' NAVD)	Borrow Area (-27' to -28' NAVD)					

[illegible]

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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-12	(-29' to -30' NAVD)	Borrow Area (-29' to -30' NAVD)					

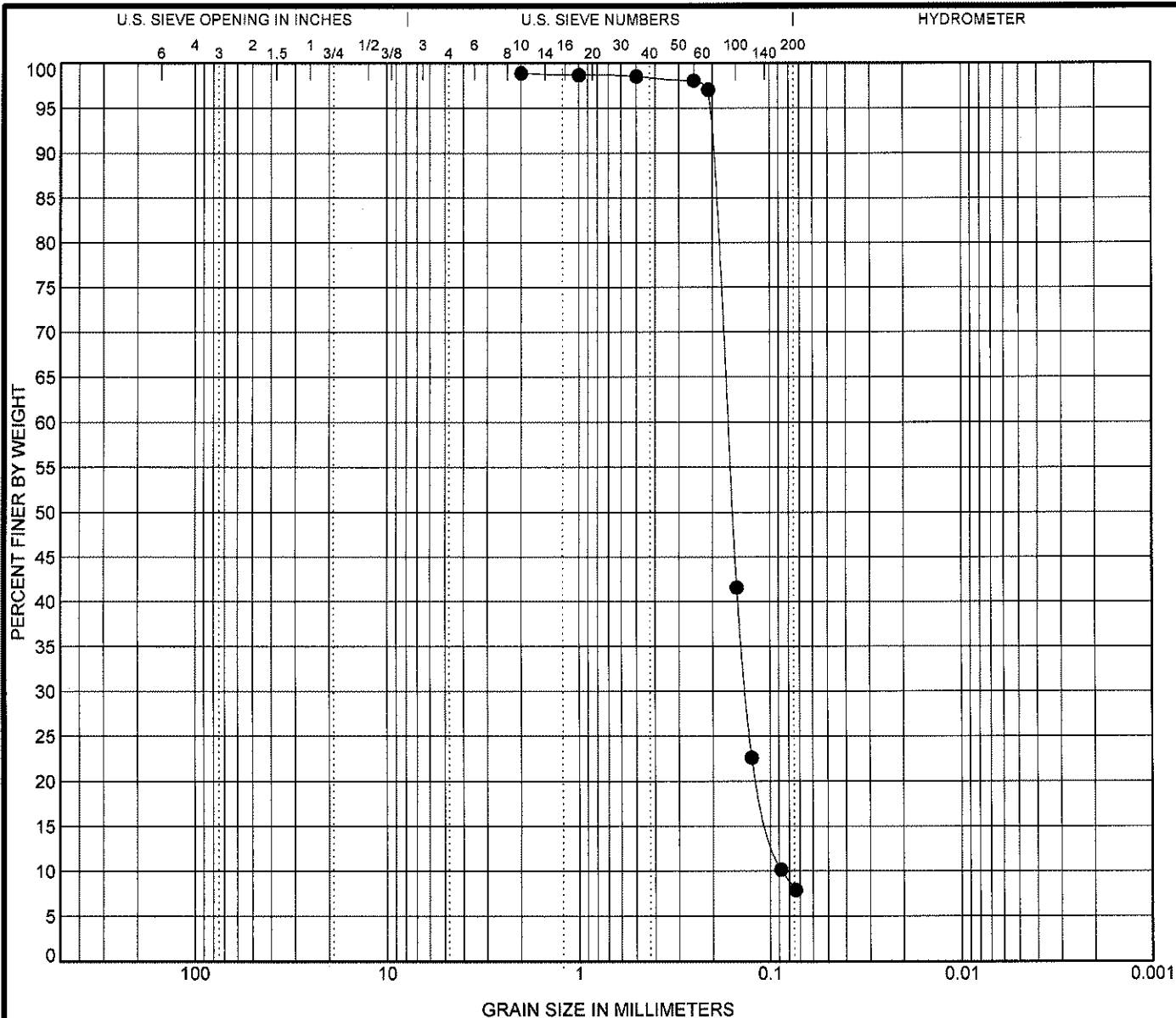
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-12	(-29' to -30' NAVD)	2				0.0			



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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-12 (-32' to -33' NAVD)		Borrow Area (-32' to -33' NAVD)				1.24	1.92

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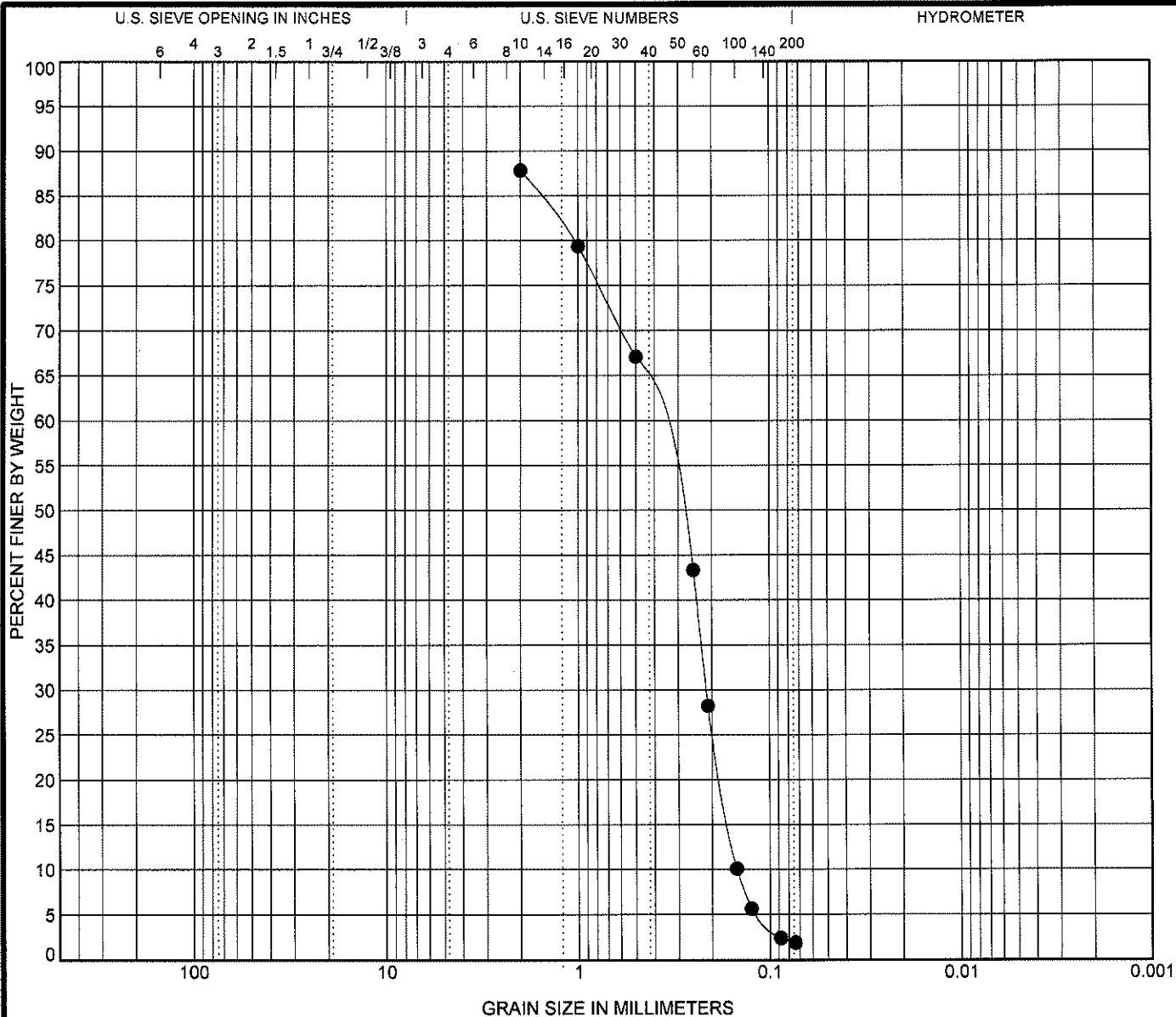
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## GRAIN SIZE DISTRIBUTION

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-13 (-32' to -33' NAVD)		Borrow Area (-32' to -33' NAVD)				0.76	2.74

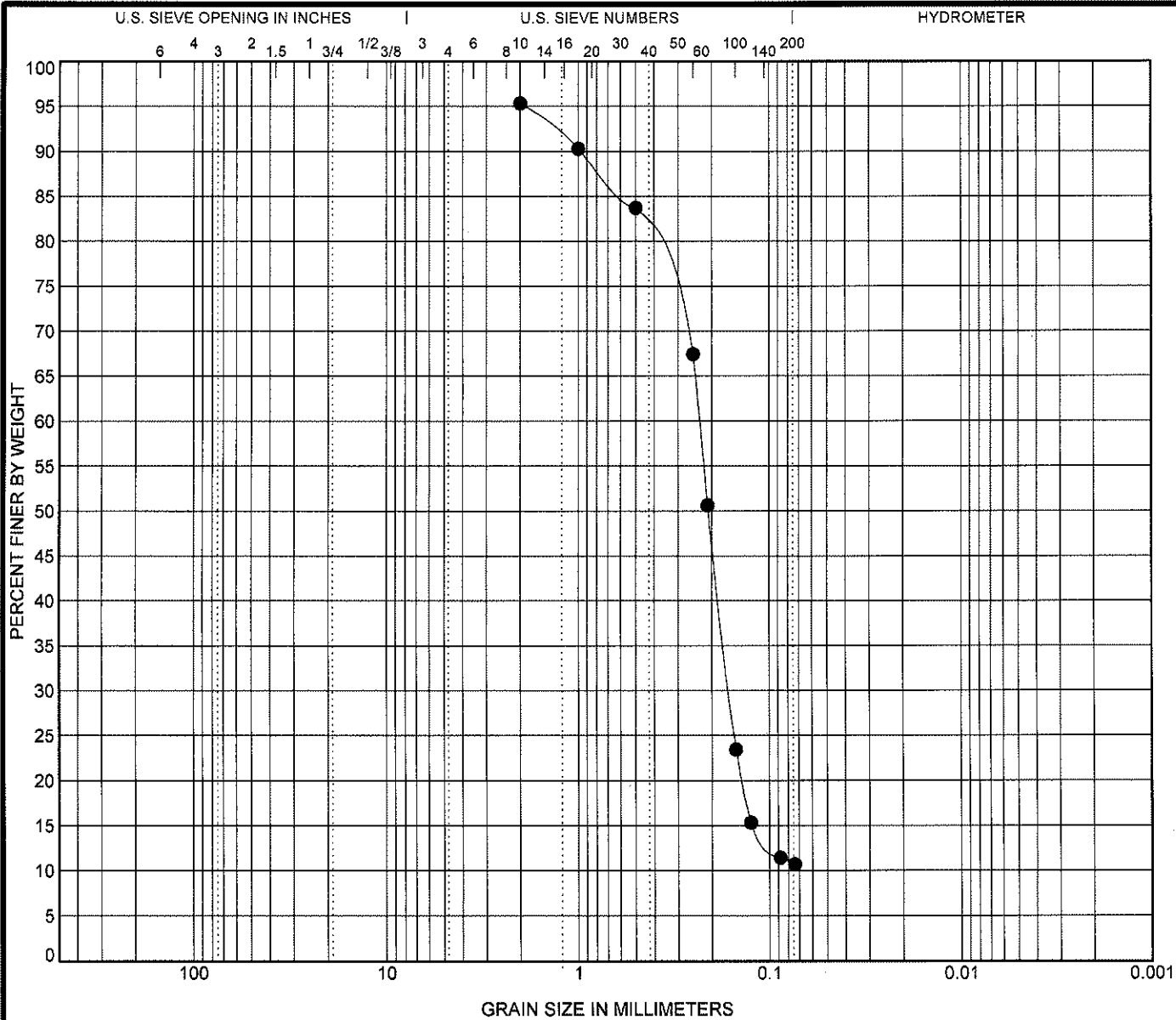
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-13 (-32' to -33' NAVD)		2	0.406	0.214	0.148	0.0			



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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-13	(-34' to -35' NAVD)	Borrow Area (-34' to -35' NAVD)							1.80	3.68

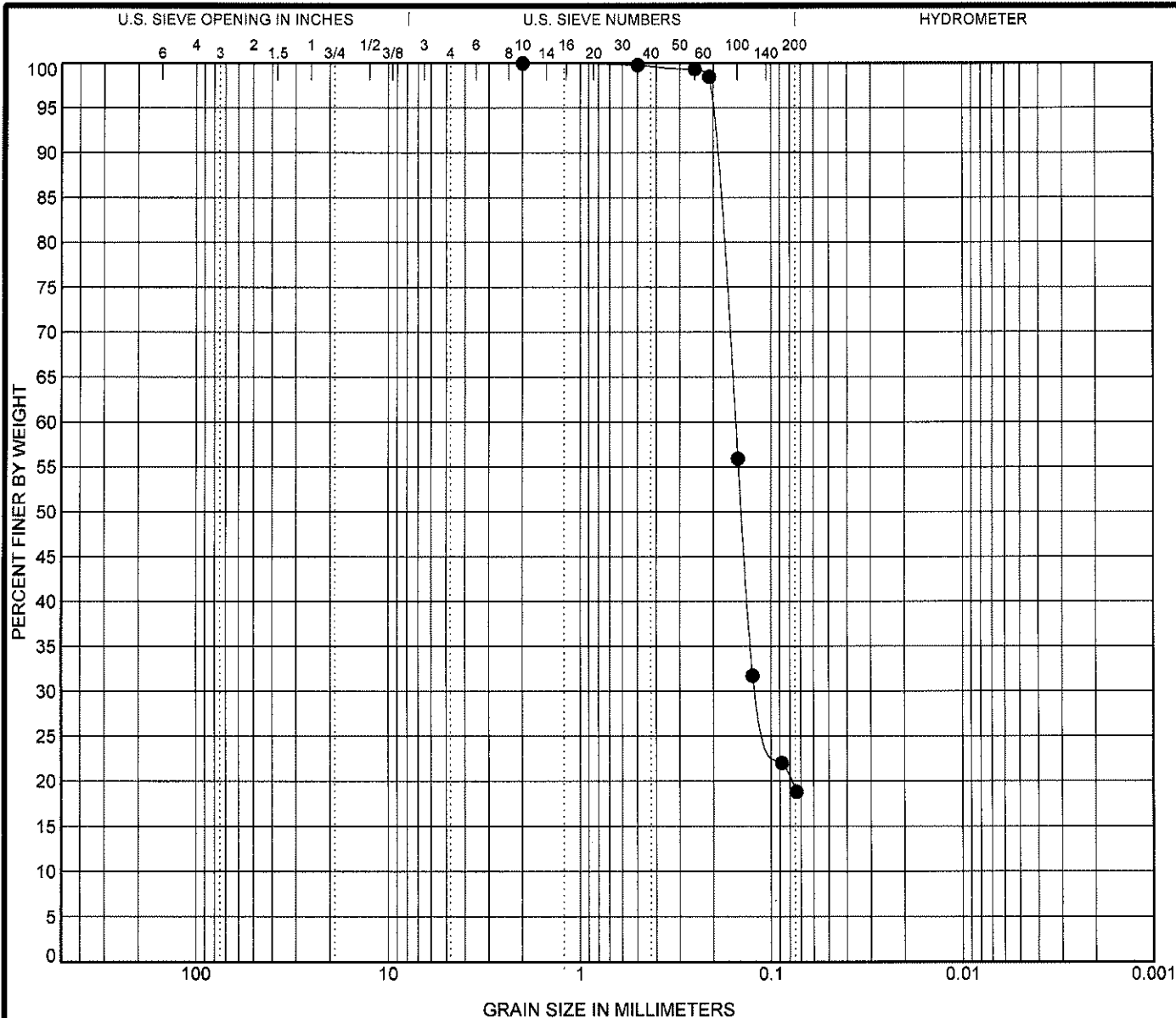
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-13	(-34' to -35' NAVD)	2	0.231	0.162		0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

[illegible]

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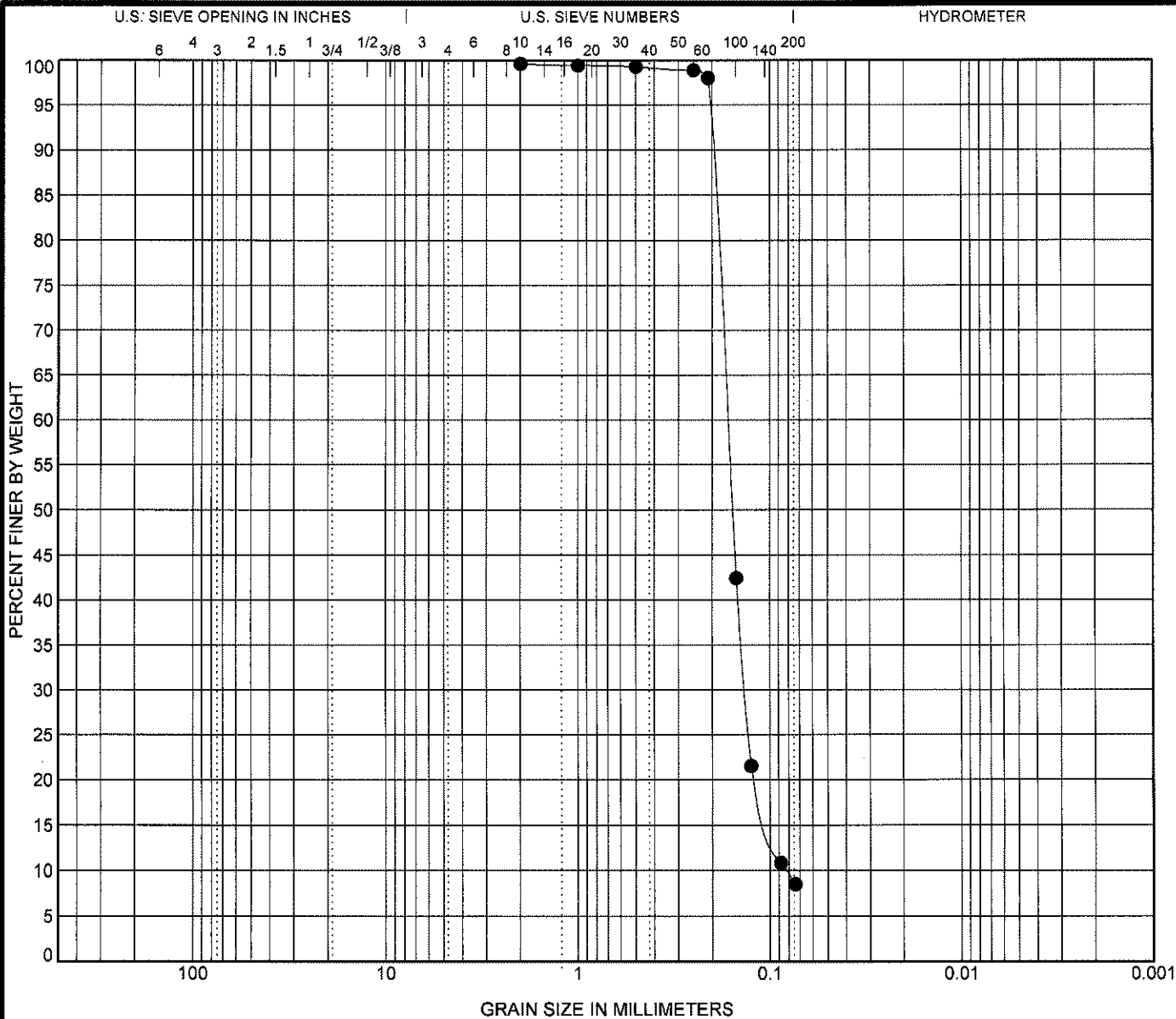
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Project: Anchorage Basin Sand Source Investigation

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Number: G109112





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-13	(-37' to -38' NAVD)	Borrow Area (-37' to -38' NAVD)				1.31	2.01

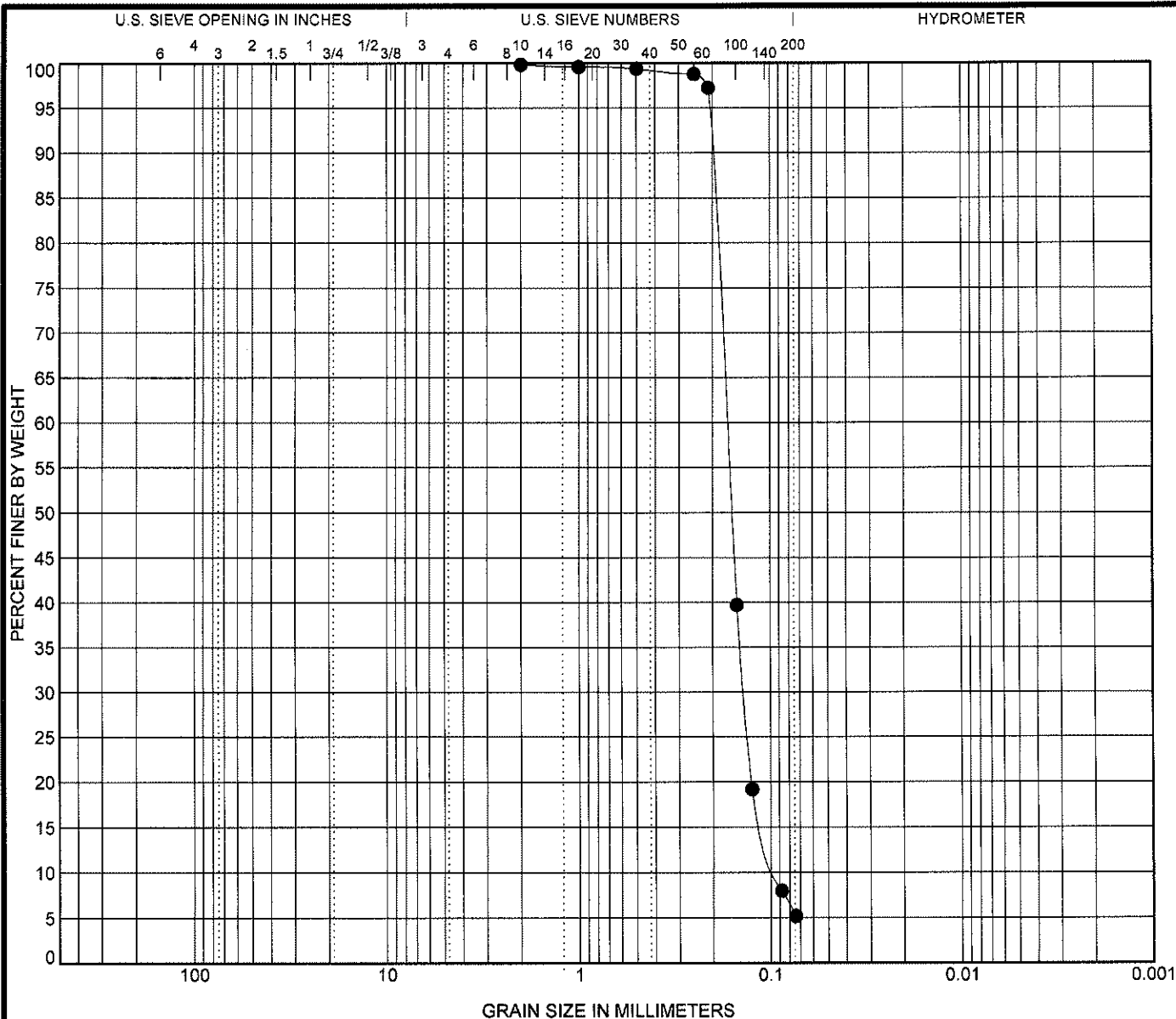
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-13	(-37' to -38' NAVD)	2	0.166	0.134	0.083	0.0			



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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-13	(-40' to -41' NAVD)	Borrow Area (-40' to -41' NAVD)							1.19	1.79
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● AA-13	(-40' to -41' NAVD)	2	0.168	0.137	0.094	0.0				

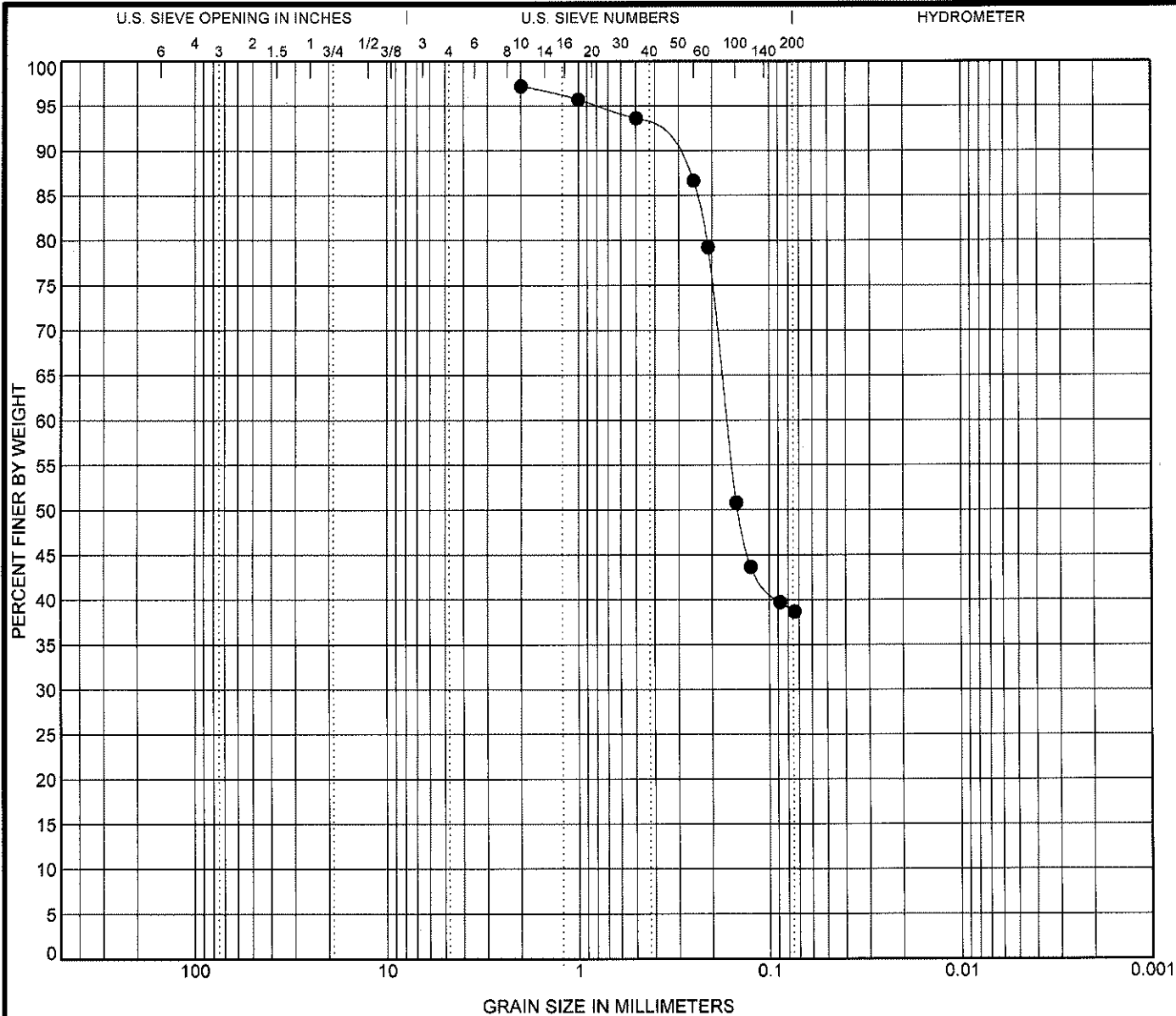


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US GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ US LAB GDT 4/9/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

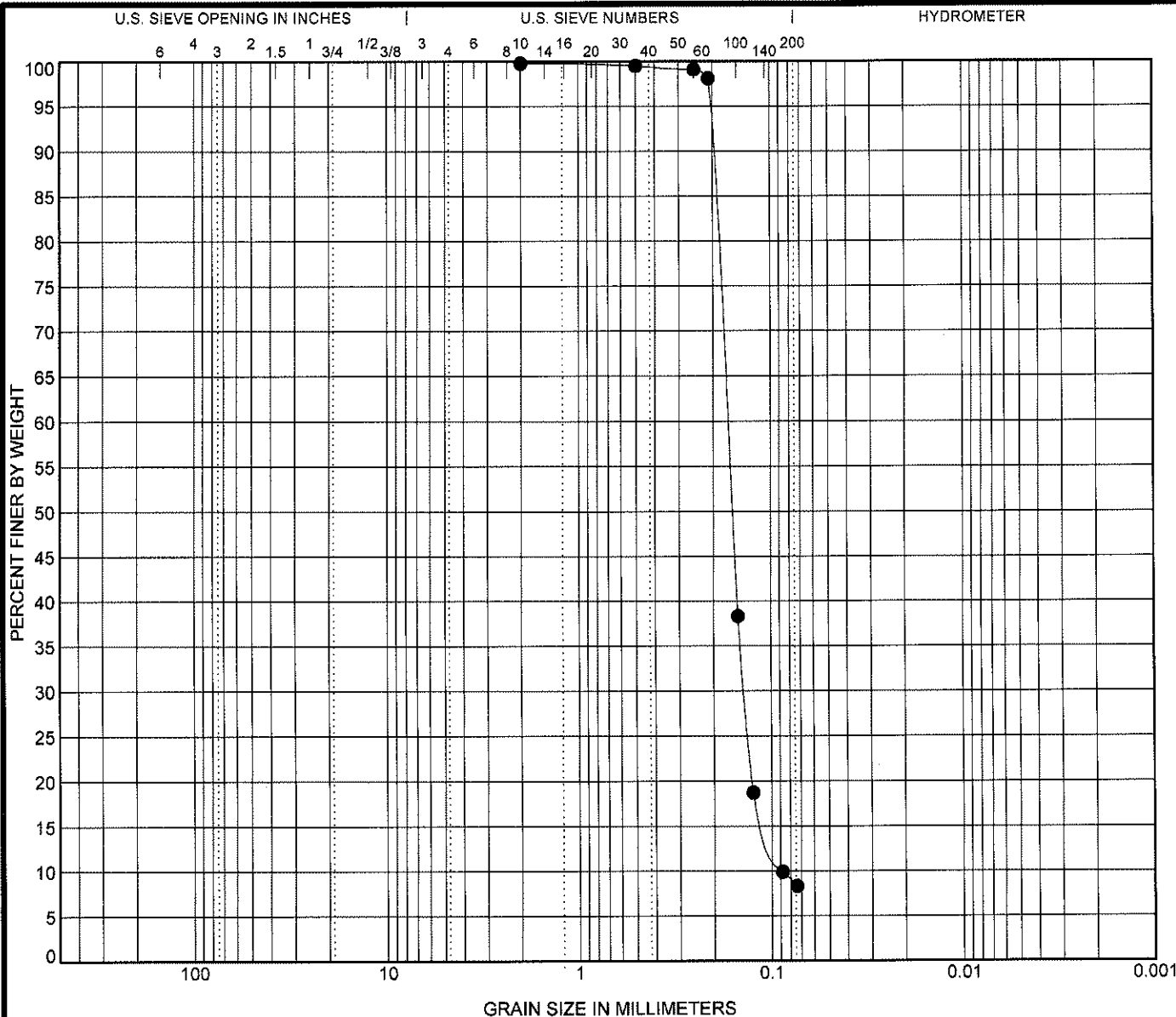
Specimen ID	Depth	Classification					LL	PL	PI	Cc	Cu
● AA-14	(-30' to -31' NAVD)	Borrow Area (-30' to -31' NAVD)									
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● AA-14	(-30' to -31' NAVD)	2	0.166			0.0					



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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-14 (-31' to -32' NAVD)		Borrow Area (-31' to -32' NAVD)				1.28	1.91

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-14 (-31' to -32' NAVD)		2	0.169	0.138	0.088	0.0			

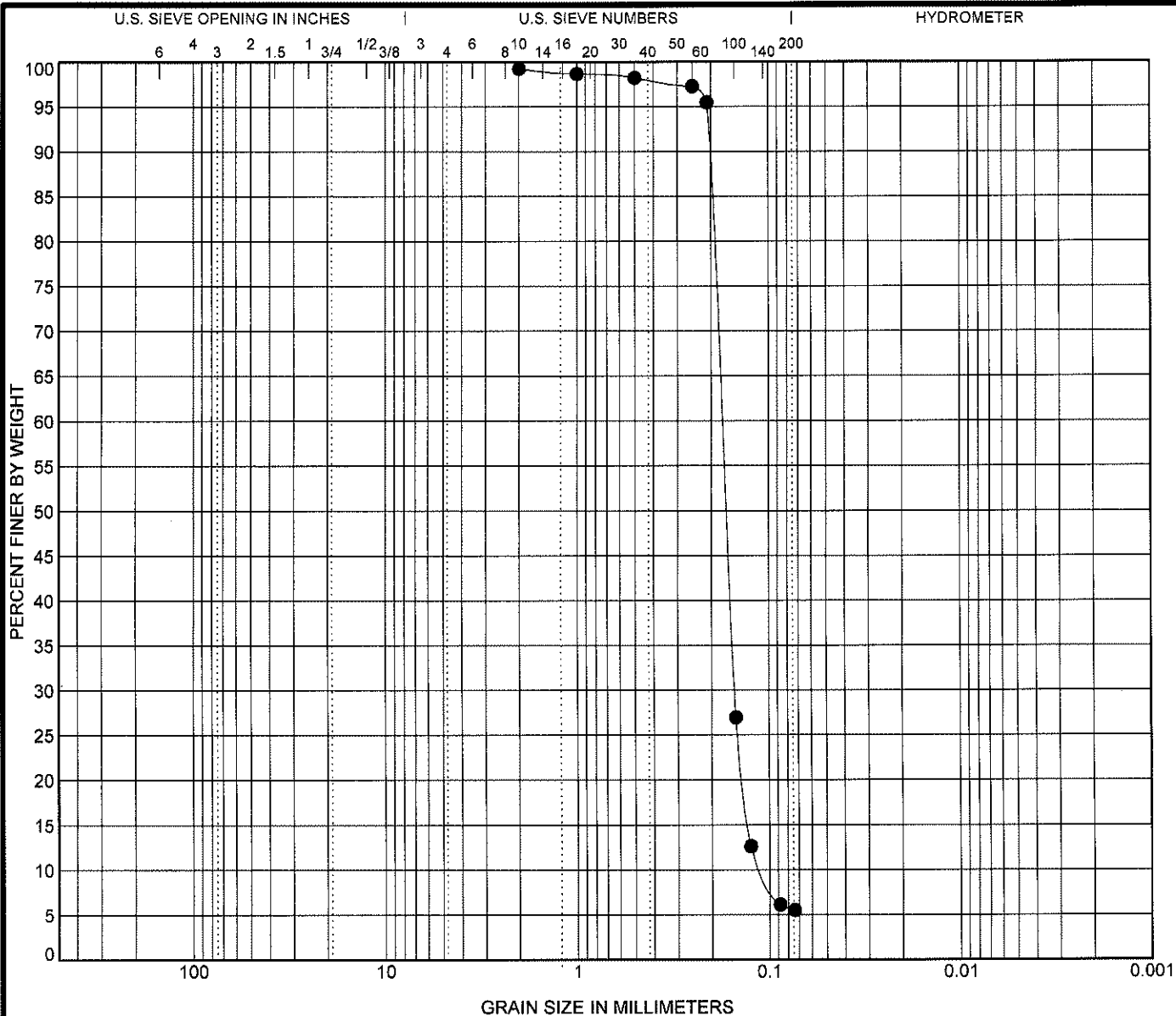


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-14 (-35' to -36' NAVD)		Borrow Area (-35' to -36' NAVD)				1.20	1.62

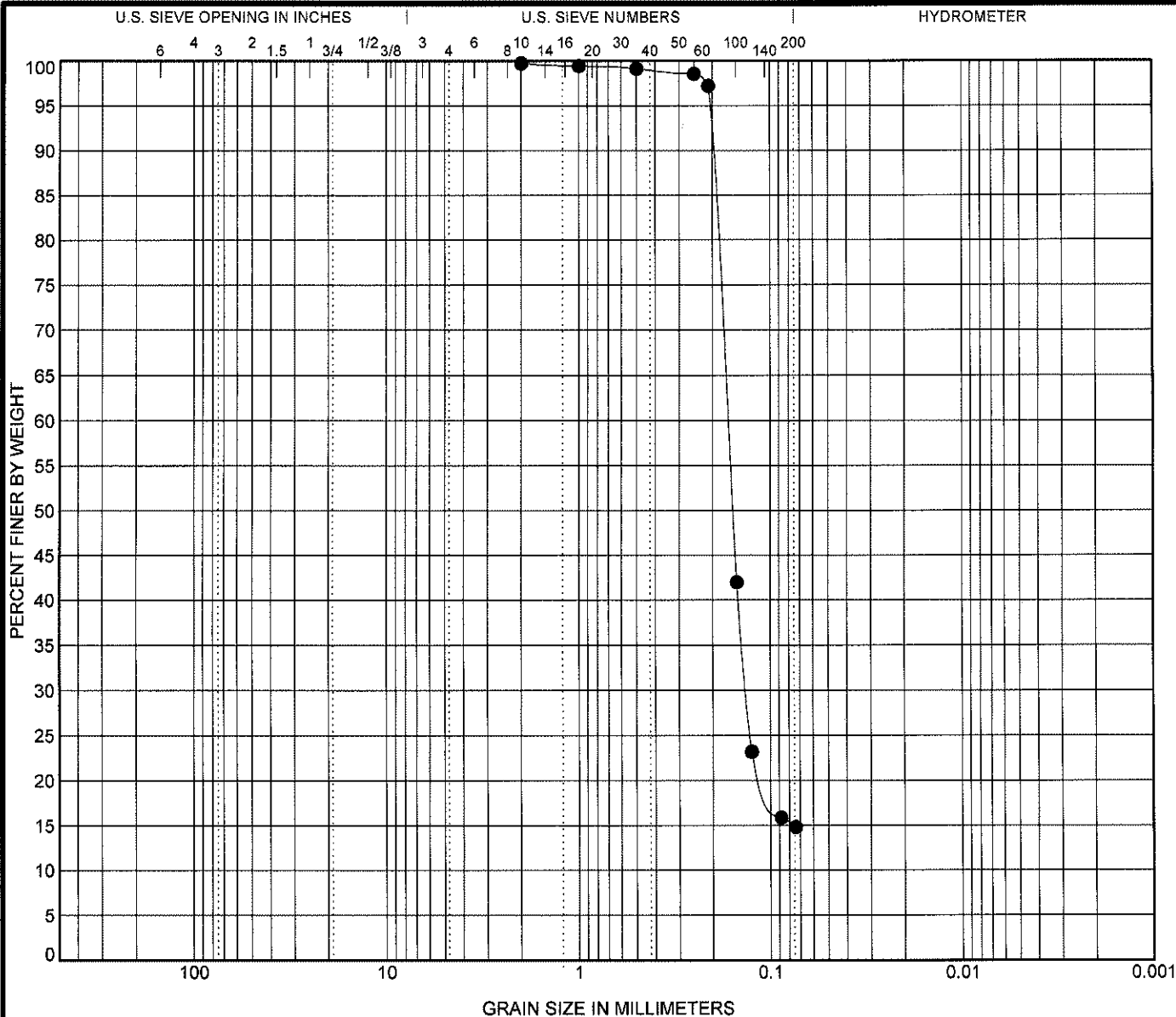
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-14 (-35' to -36' NAVD)		2	0.176	0.151	0.108	0.0			



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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-14 (-38' to -39' NAVD)		Borrow Area (-38' to -39' NAVD)					

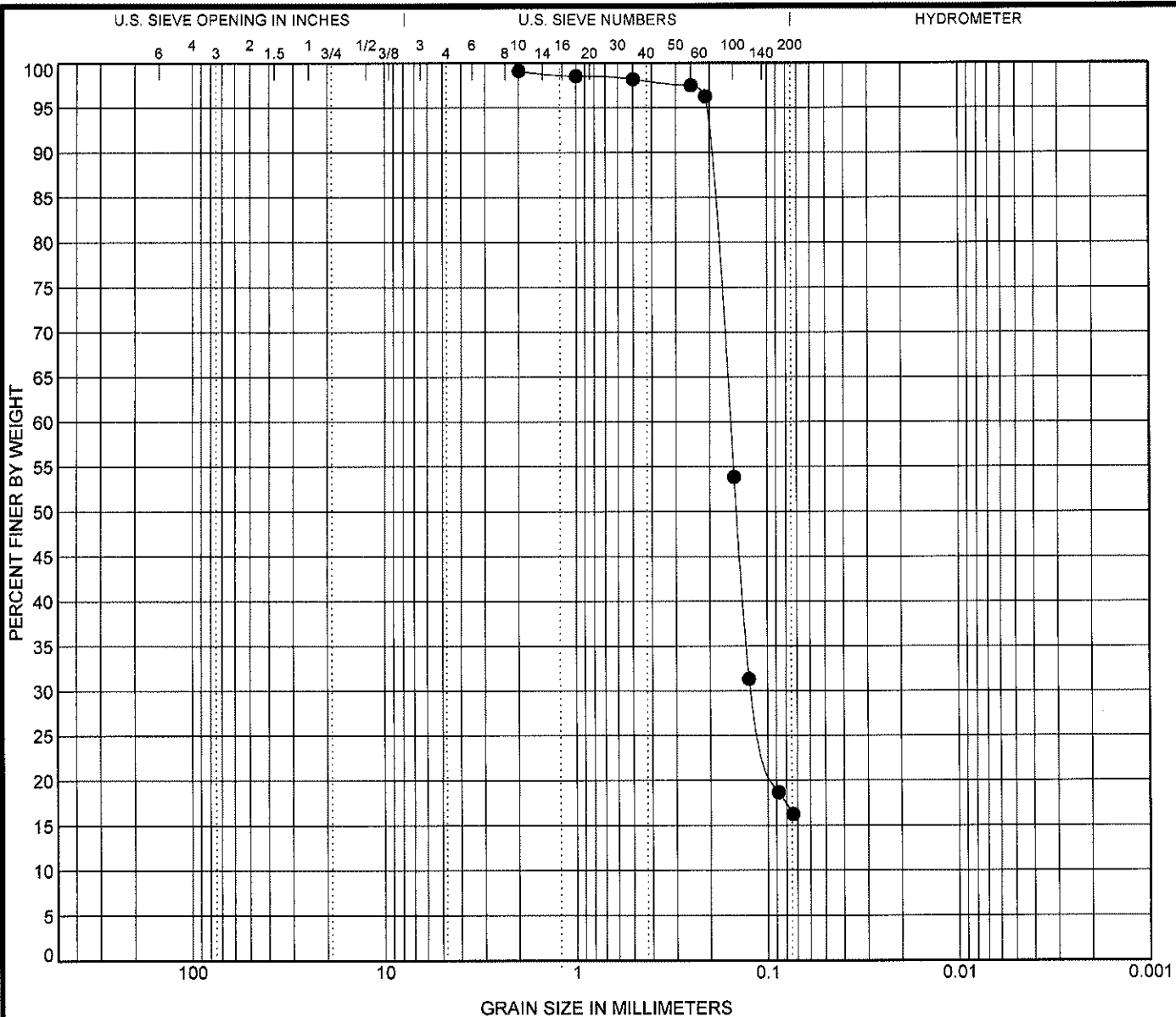
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-14 (-38' to -39' NAVD)	2	0.167	0.133		0.0				



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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-14	(-41' to -42' NAVD)	Borrow Area (-41' to -42' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-14	(-41' to -42' NAVD)	2	0.157	0.12		0.0			



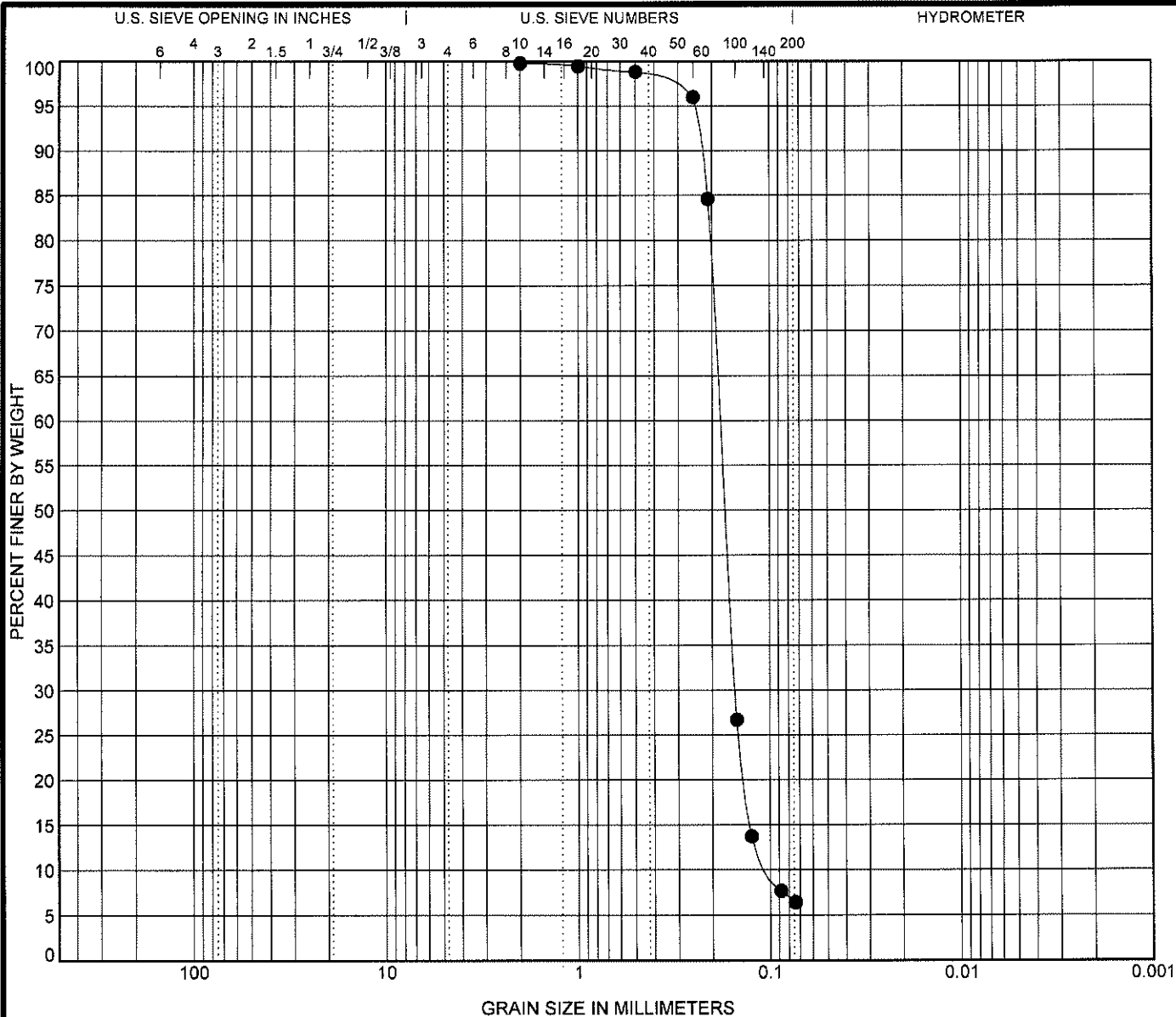
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### GRAIN SIZE DISTRIBUTION

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 4/9/09





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-15 (-30' to -31' NAVD)		Borrow Area (-30' to -31' NAVD)				1.26	1.80

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-15 (-30' to -31' NAVD)		2	0.182	0.152	0.101	0.0			

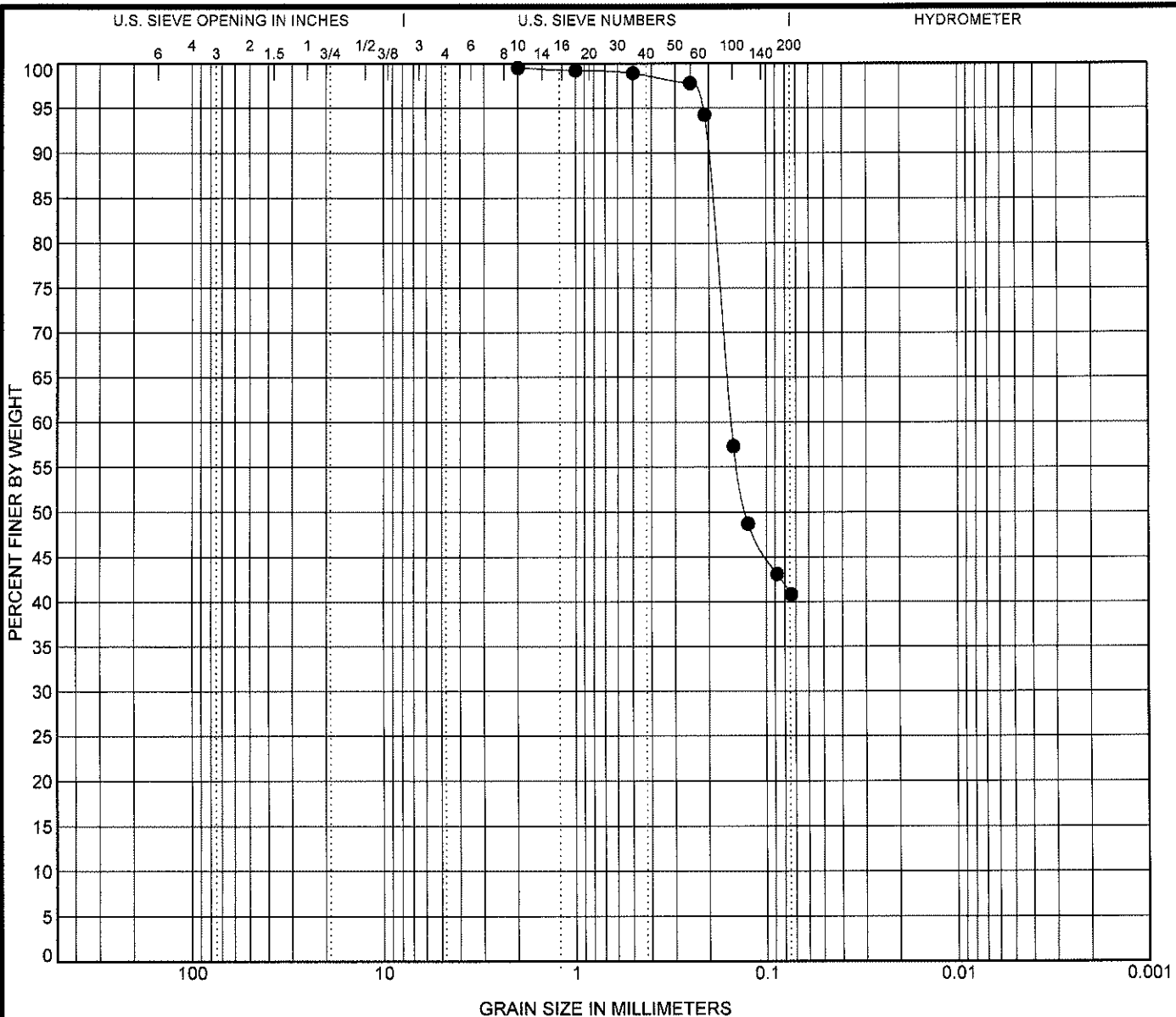


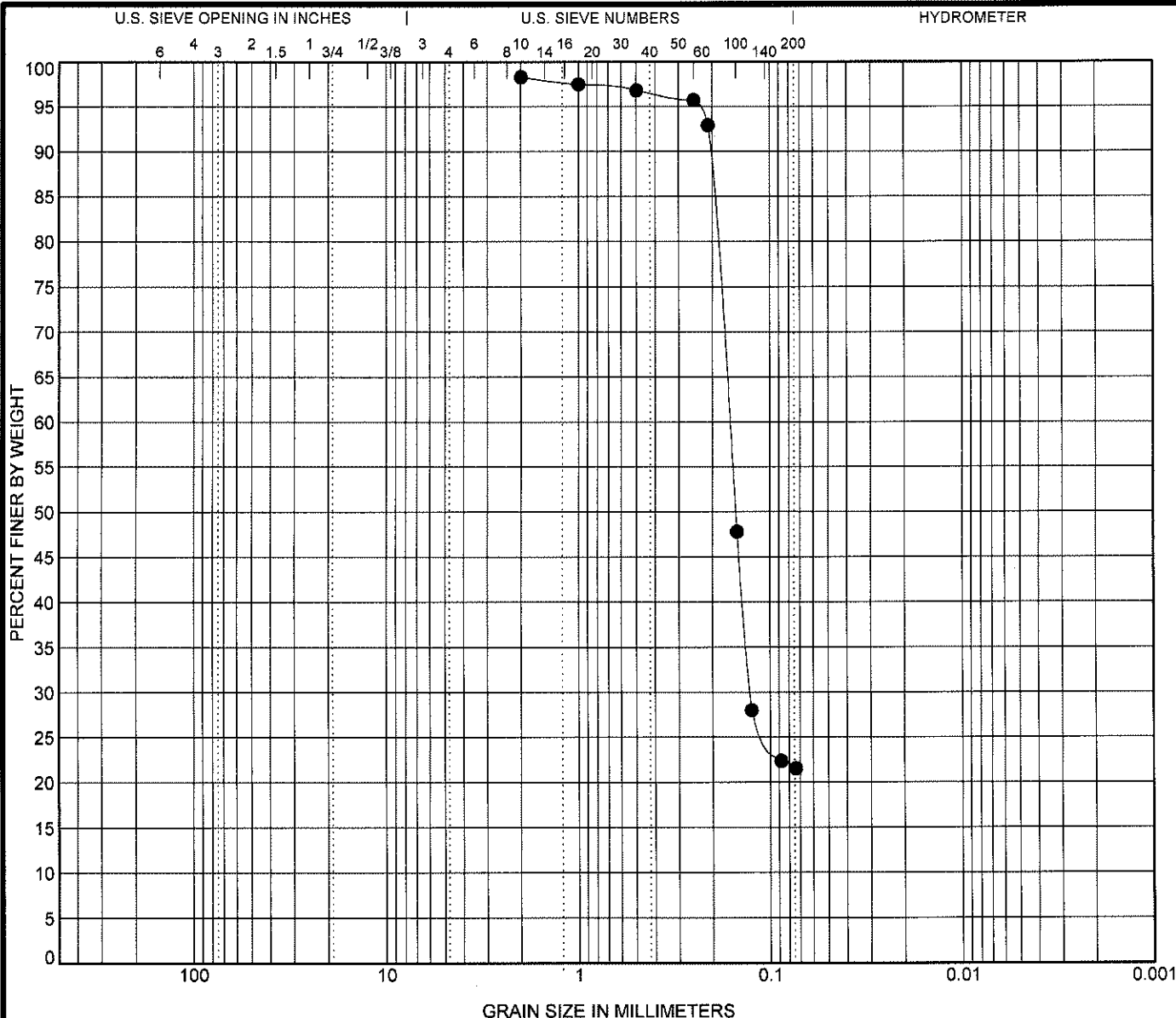
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US GRAIN SIZE G109112 PROP ANCHORAGE BASIN SAND SOURCE GPJ US LAB GDT 4/9/09





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-15 (-33' to -34' NAVD)		Borrow Area (-33' to -34' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-15 (-33' to -34' NAVD)		2	0.163	0.127		0.0			

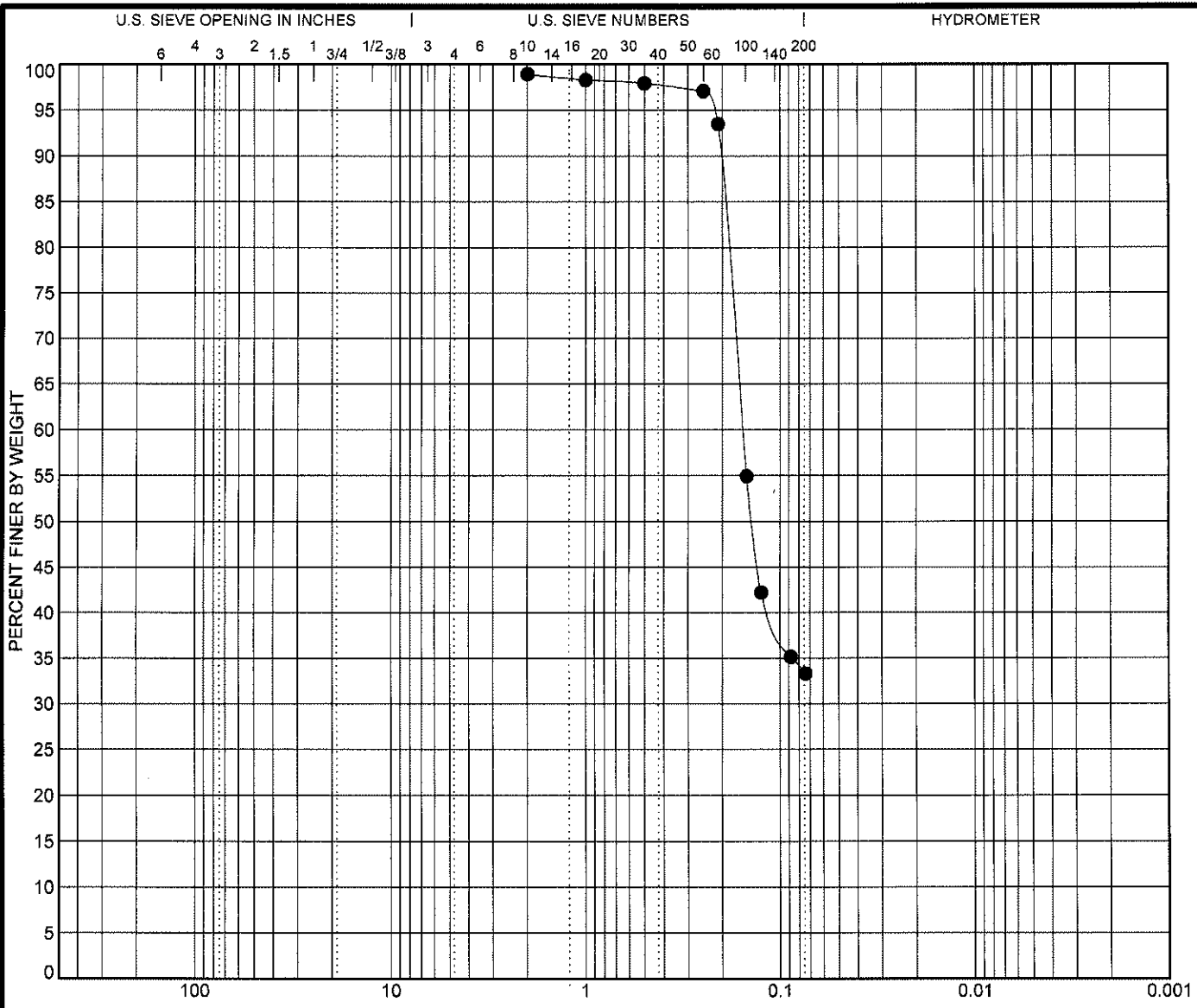


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US GRAIN SIZE G109112 PROP ANCHORAGE BASIN SAND SOURCE GPJ US LAB GDT 4/9/09



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-15 (-36' to -37' NAVD)		Borrow Area (-36' to -37' NAVD)					

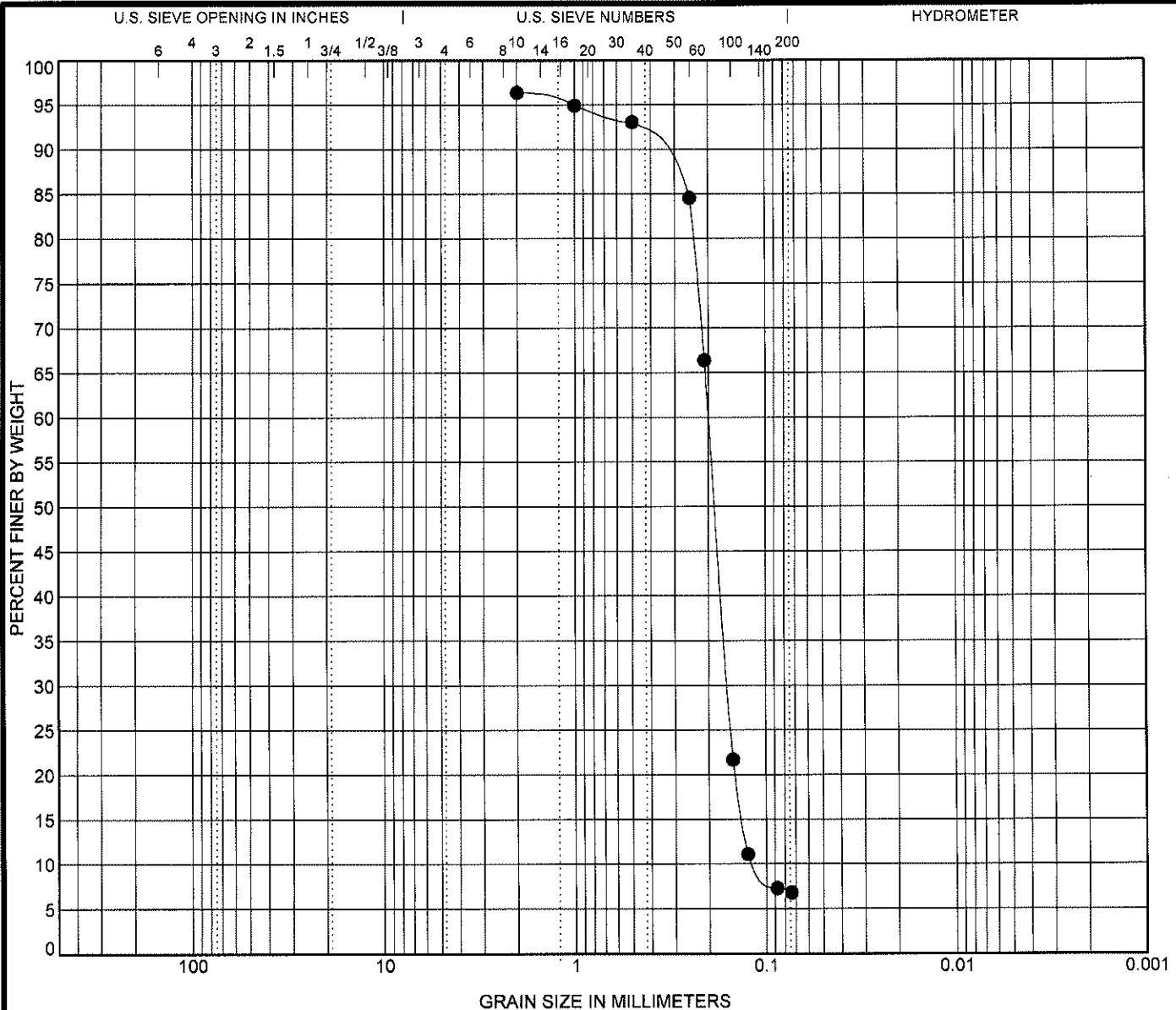
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-15 (-36' to -37' NAVD)		2	0.156			0.0			



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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-15 (-39' to -40' NAVD)		Borrow Area (-39' to -40' NAVD)				1.11	1.77

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-15 (-39' to -40' NAVD)		2	0.2	0.159	0.113	0.0			

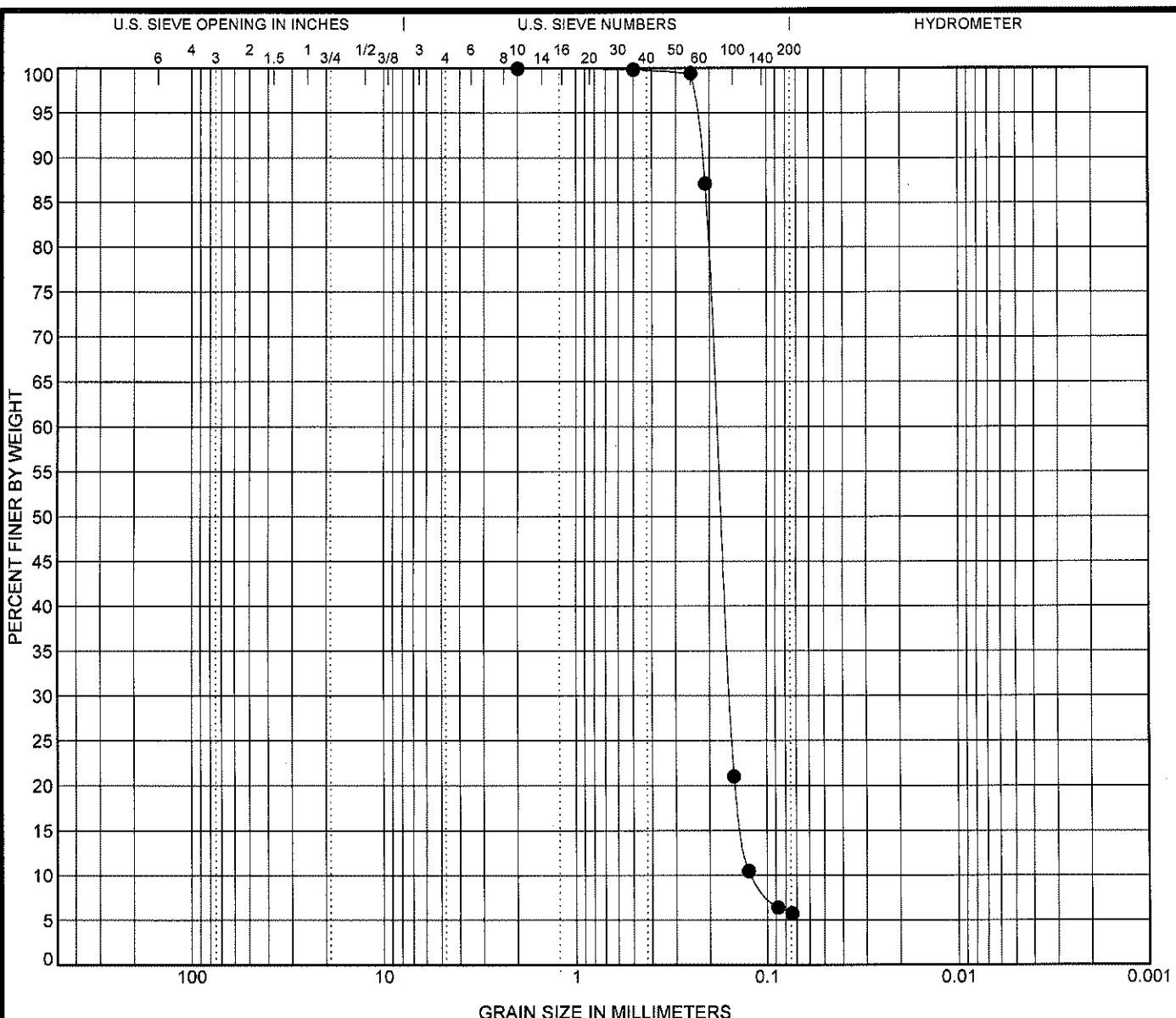


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-15	(-42' to -43' NAVD)	Borrow Area (-42' to -43' NAVD)				1.11	1.52

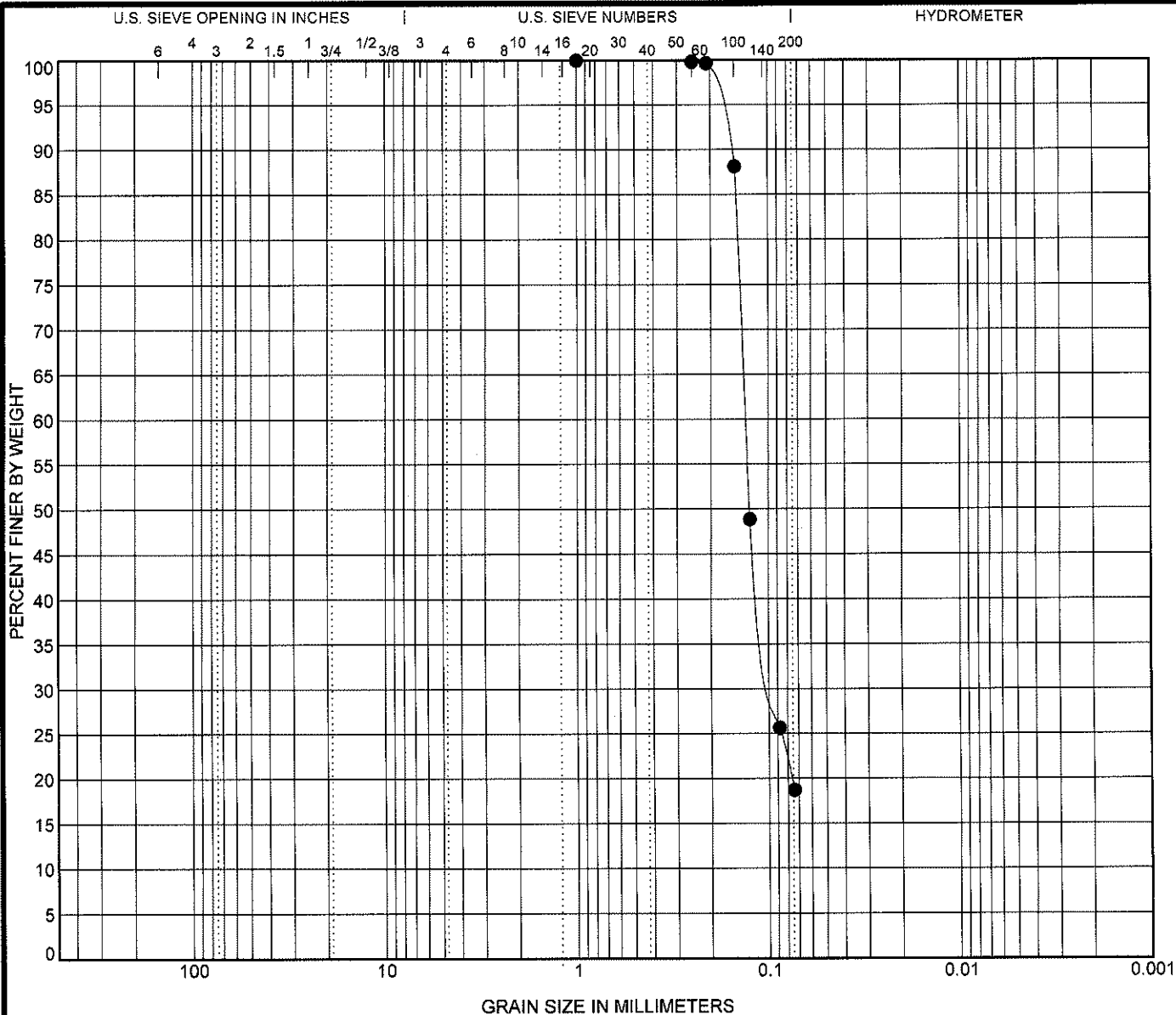
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-15	(-42' to -43' NAVD)	2	0.182	0.156	0.12	0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

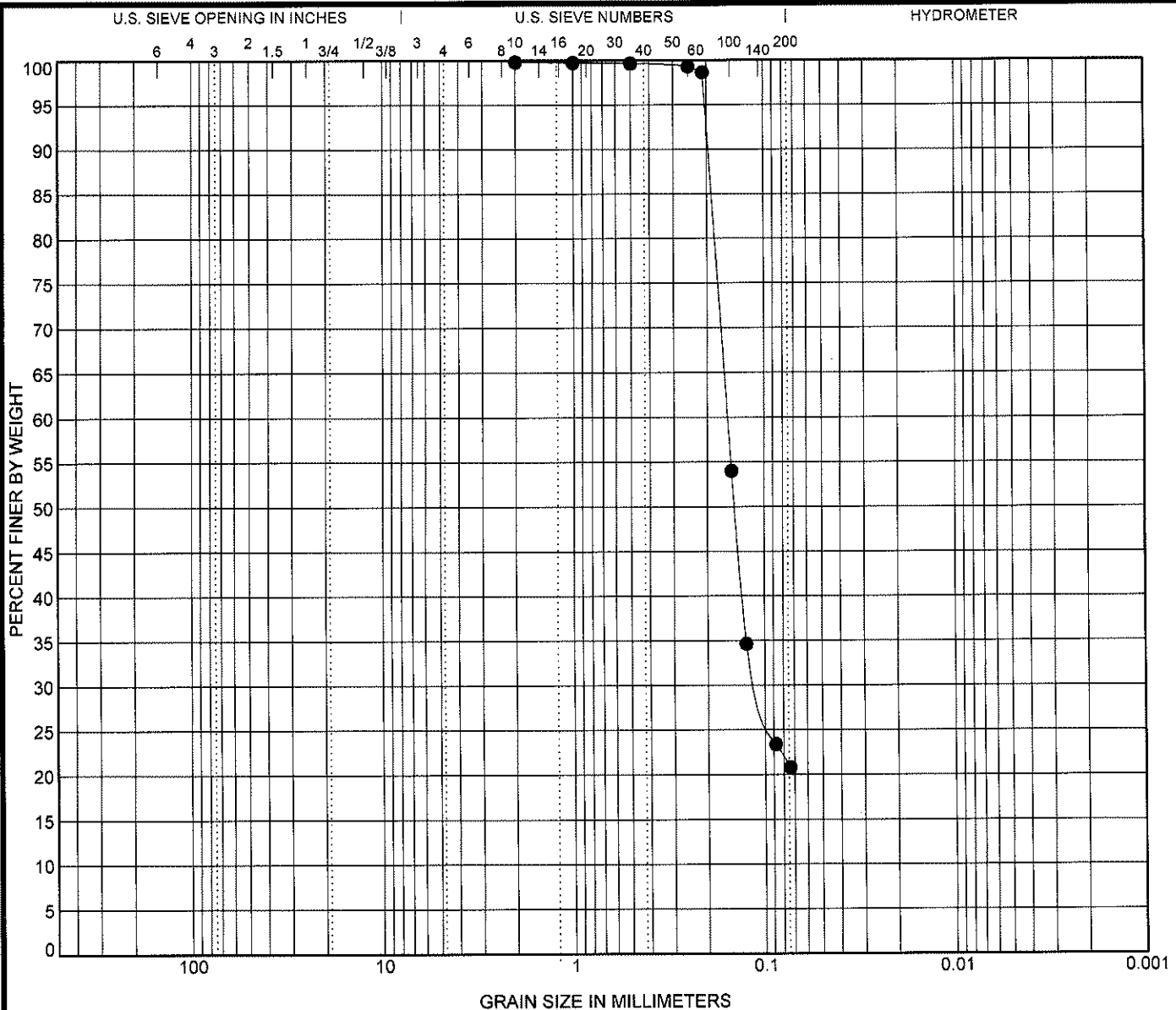
Specimen ID	Depth	Classification				LL	PL	PI	Cc	Cu
● AA-16	(-28' to -29' NAVD)	Borrow Area (-28' to -29' NAVD)								
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● AA-16	(-28' to -29' NAVD)	1	0.131	0.094		0.0				



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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-16	(-30' to -31' NAVD)	Borrow Area (-30' to -31' NAVD)									
Specimen ID		Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	AA-16	(-30' to -31' NAVD)	2	0.156	0.108		0.0					

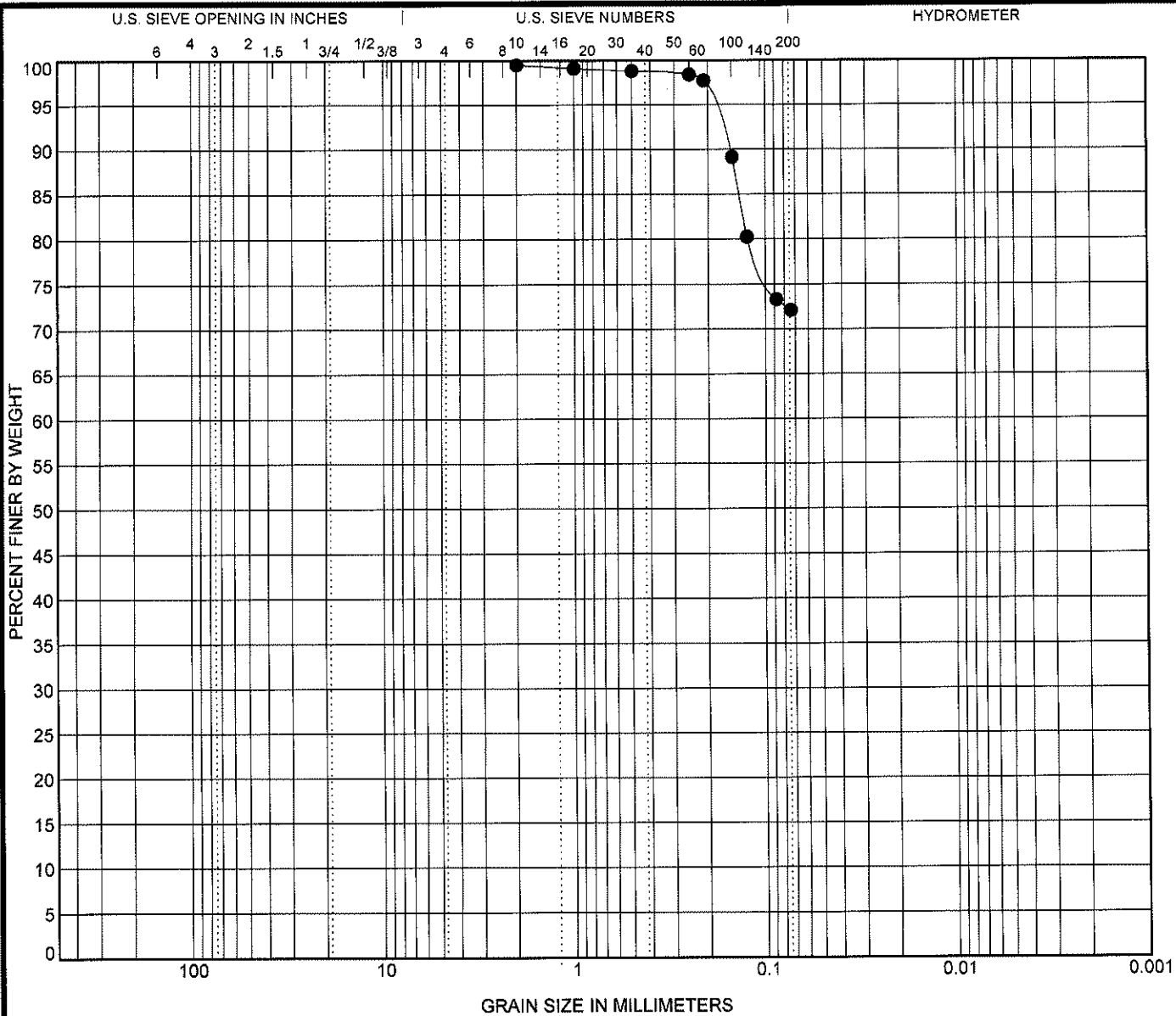


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-16	(-32' to -33' NAVD)	Borrow Area (-32' to -33' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-16	(-32' to -33' NAVD)	2				0.0			

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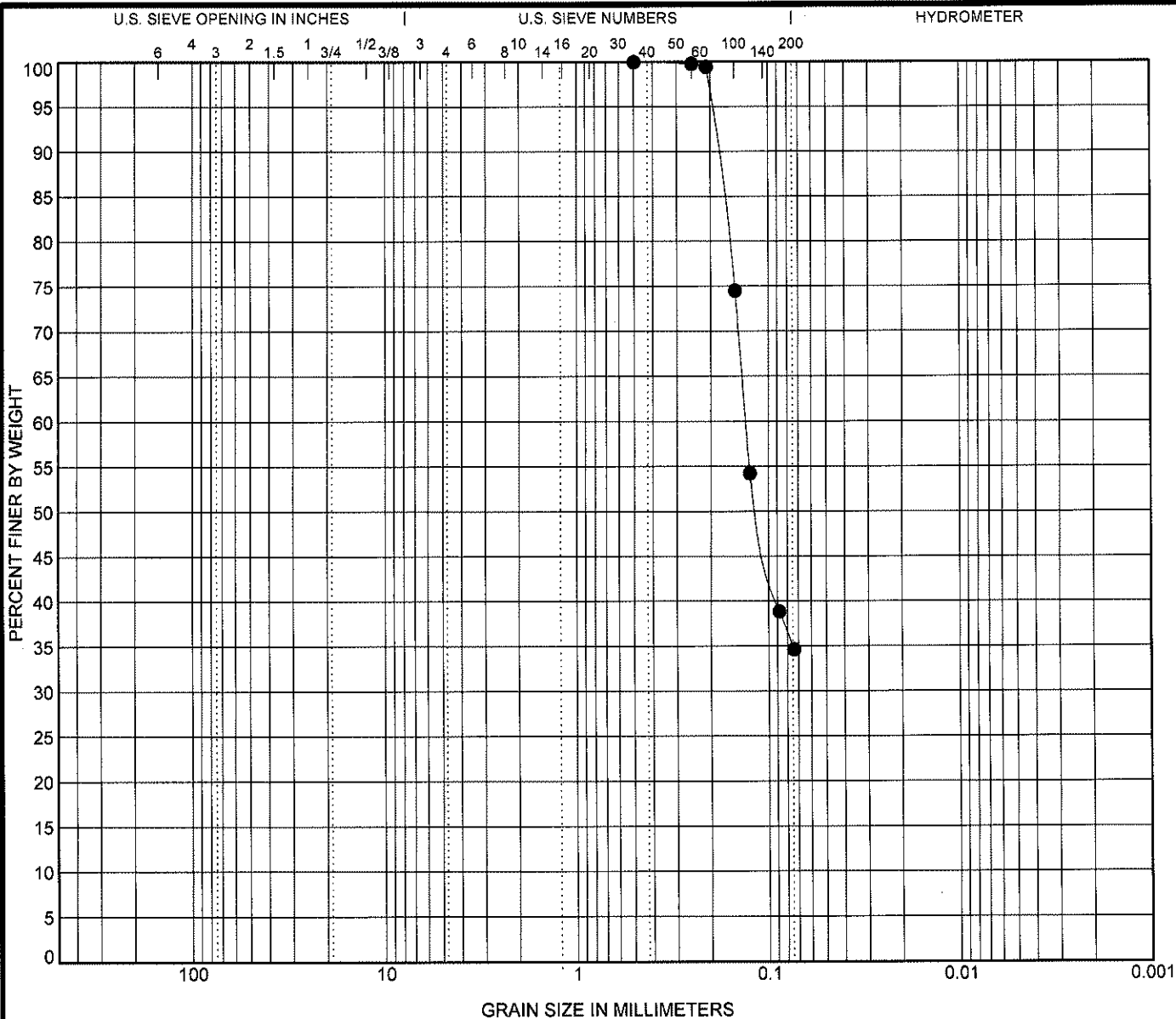


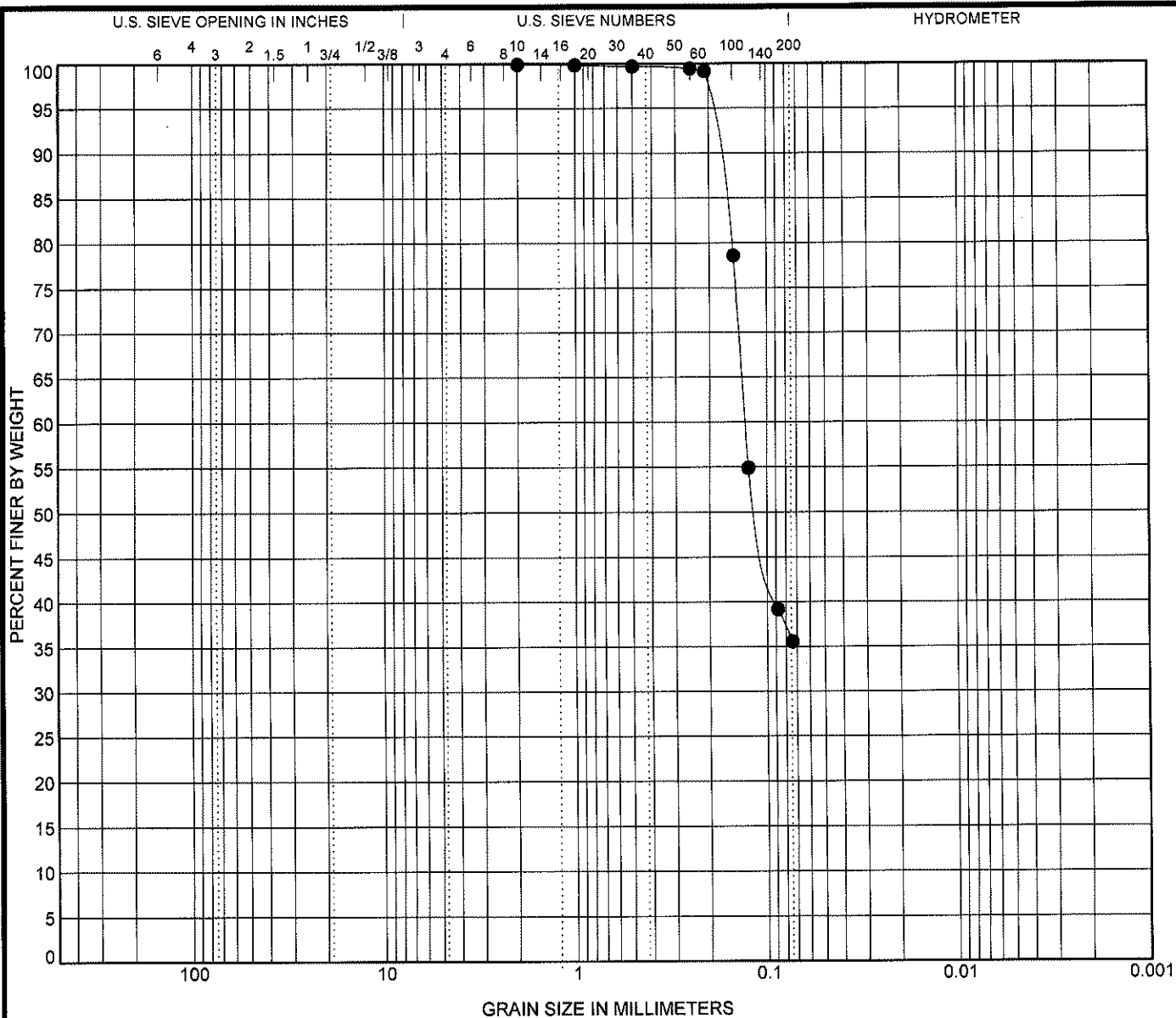
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US GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ US LAB.GDT 4/9/09





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-16	(-36' to -37' NAVD)	Borrow Area (-36' to -37' NAVD)					

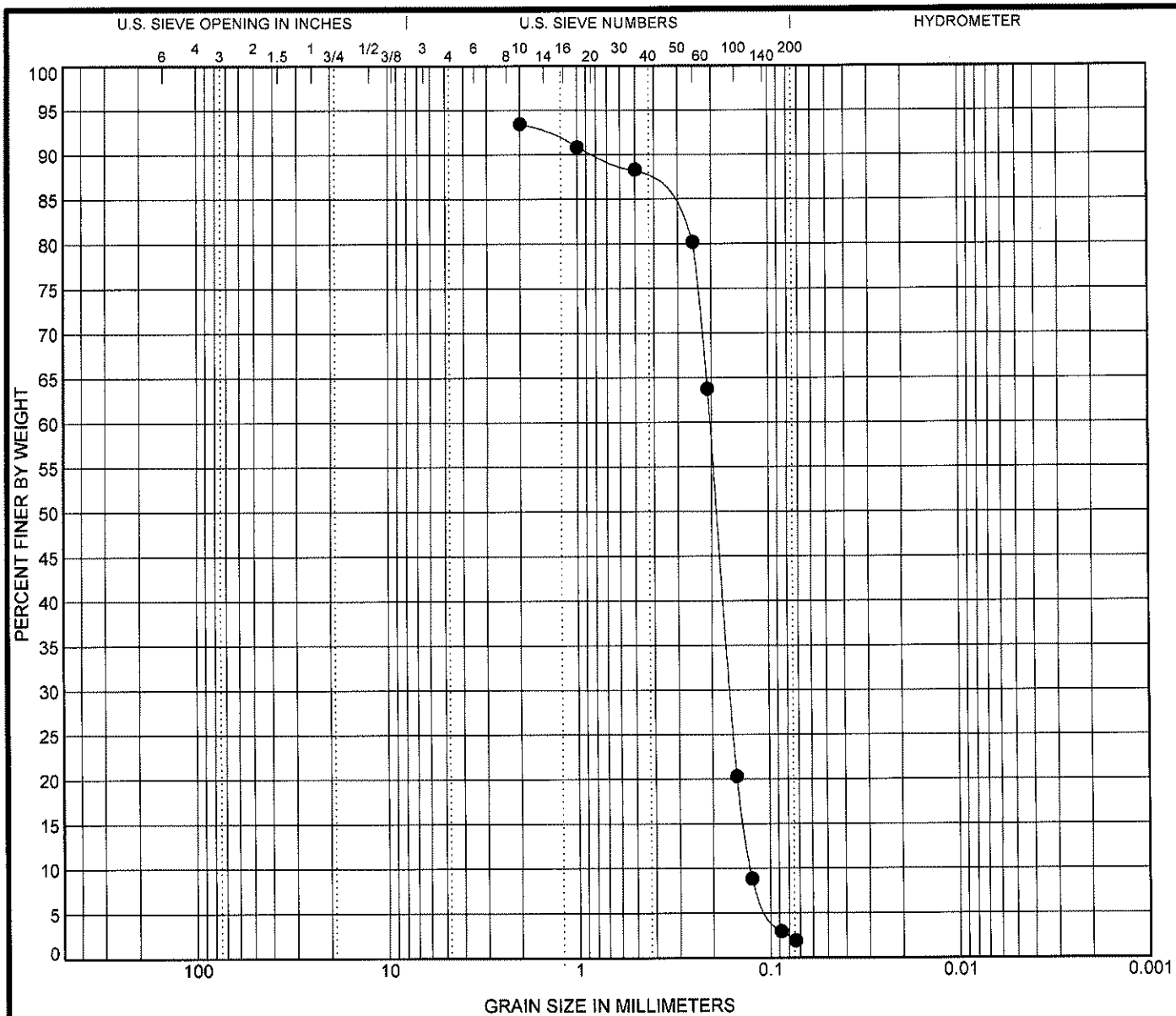
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-16	(-36' to -37' NAVD)	2	0.13			0.0			



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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-16	(-39' to -40' NAVD)	Borrow Area (-39' to -40' NAVD)				1.00	1.60

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-16	(-39' to -40' NAVD)	2	0.204	0.161	0.127	0.0			



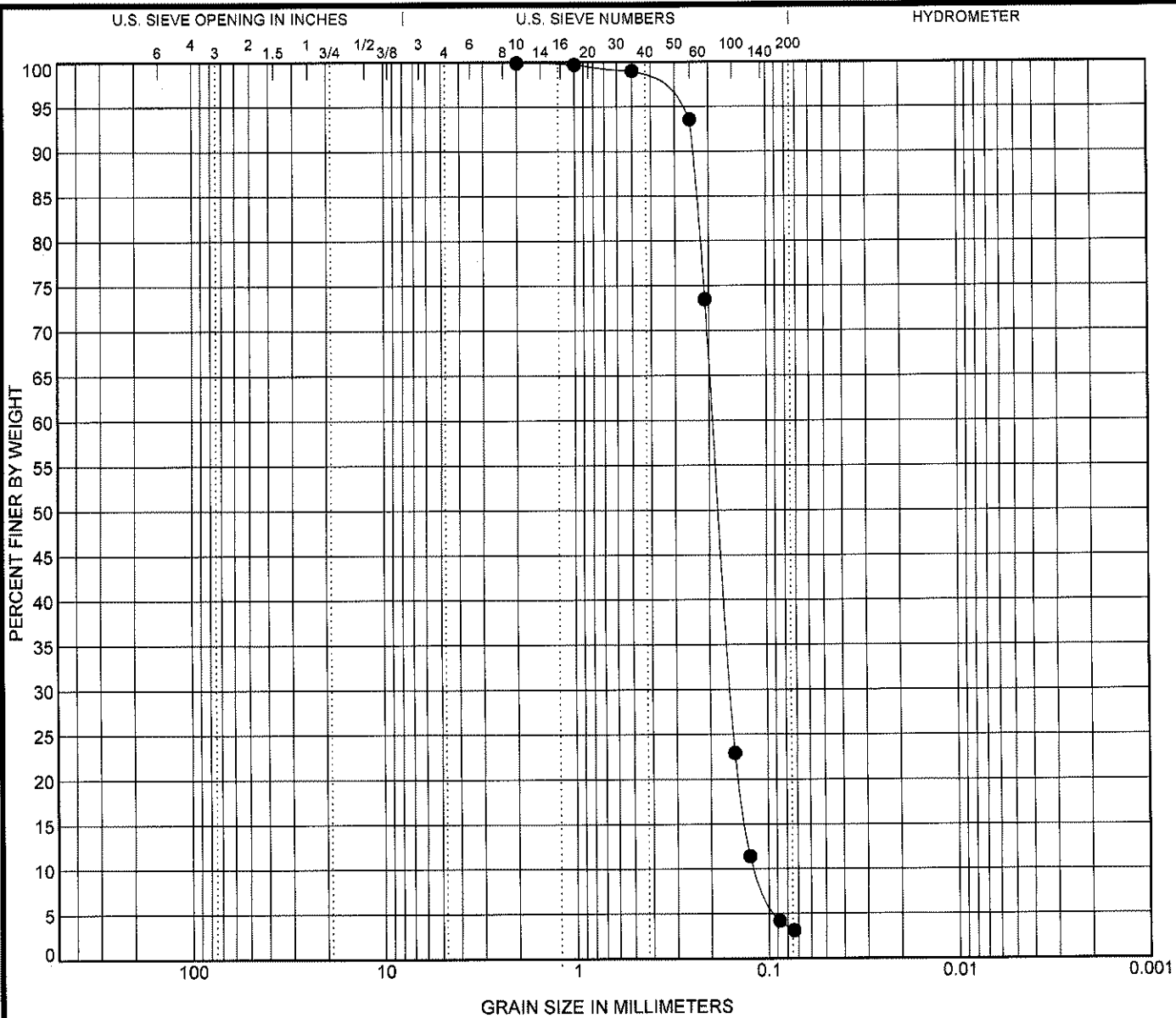
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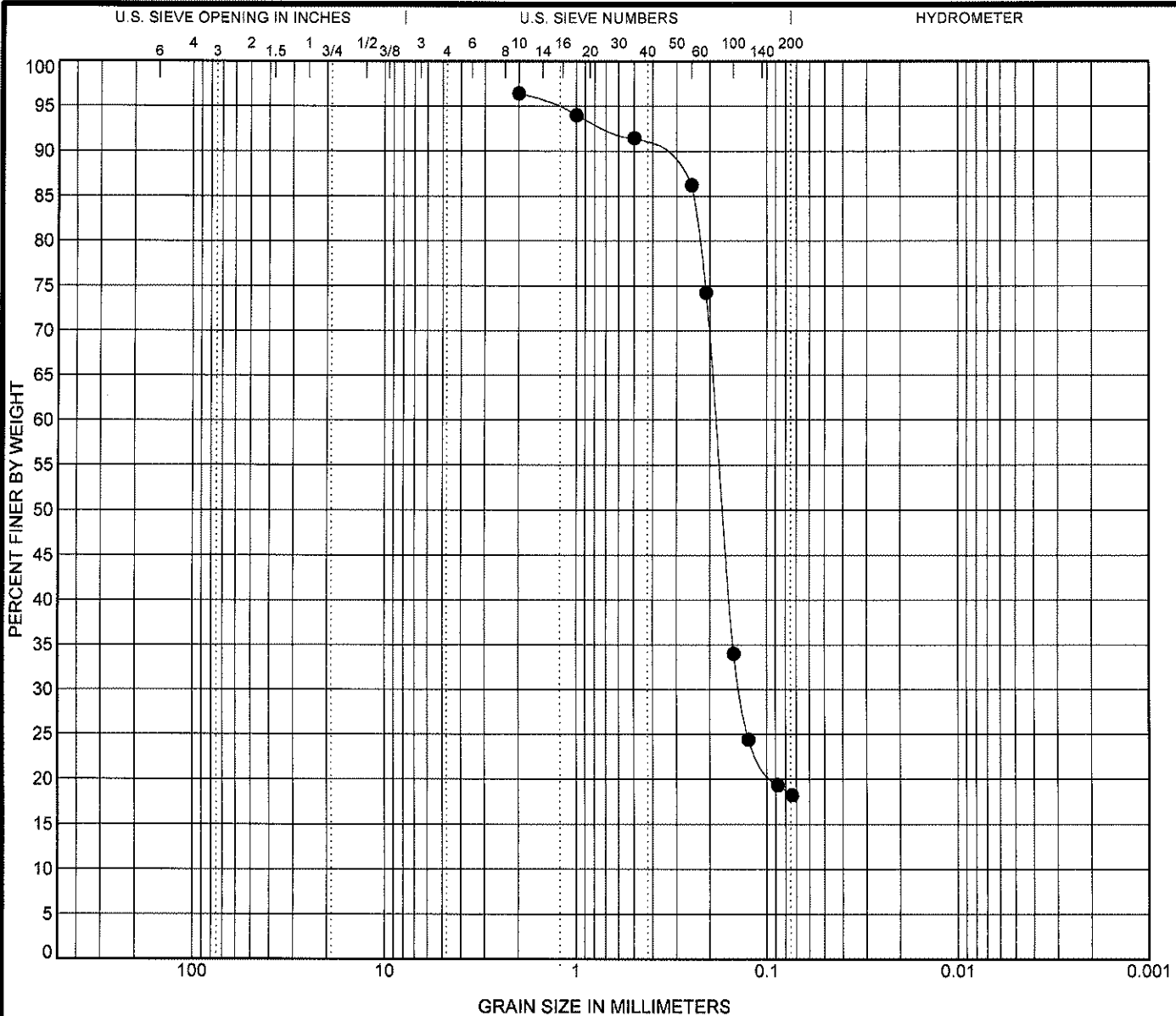
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Location: Anchorage Basin; Galveston, Texas

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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-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				

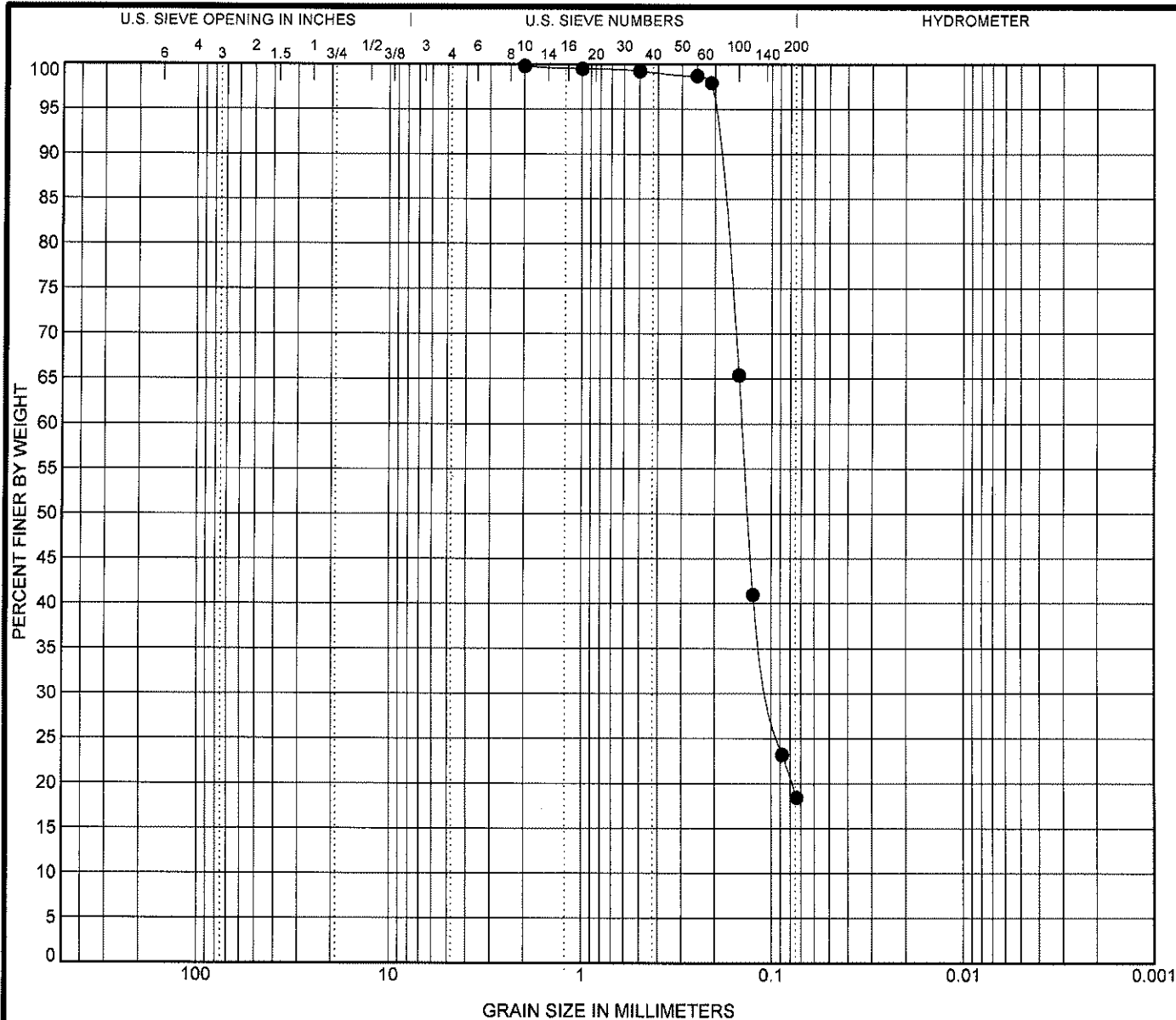


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-17	(-34' to -35' NAVD)	<b>Borrow Area (-34' to -35' NAVD)</b>					

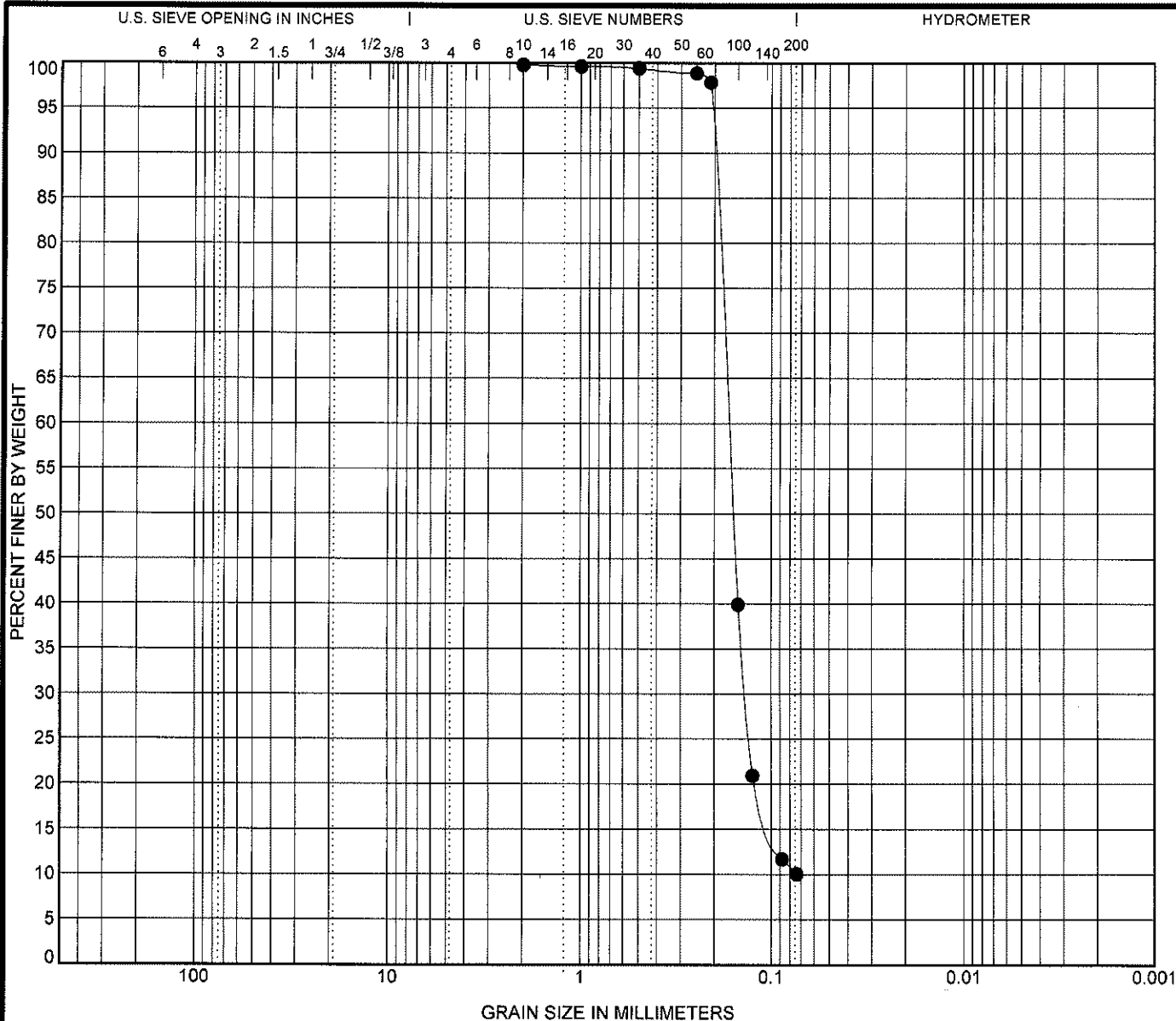
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-34' to -35' NAVD)	2	0.143	0.101		0.0			



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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-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			



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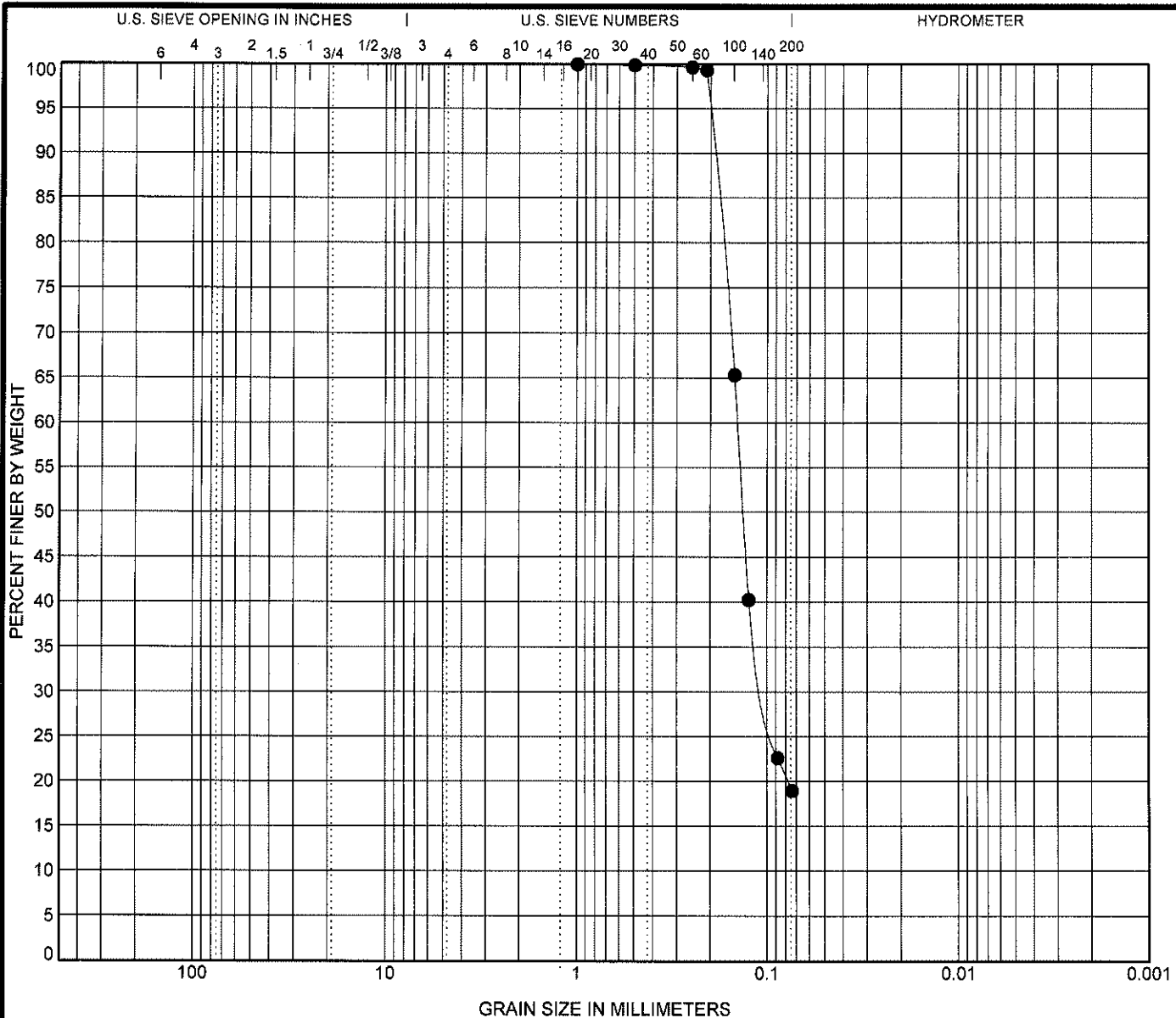
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U.S. GRAIN SIZE G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ US LAB GDT 4/9/09



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)	Borrow Area (-40' to -41' NAVD)					

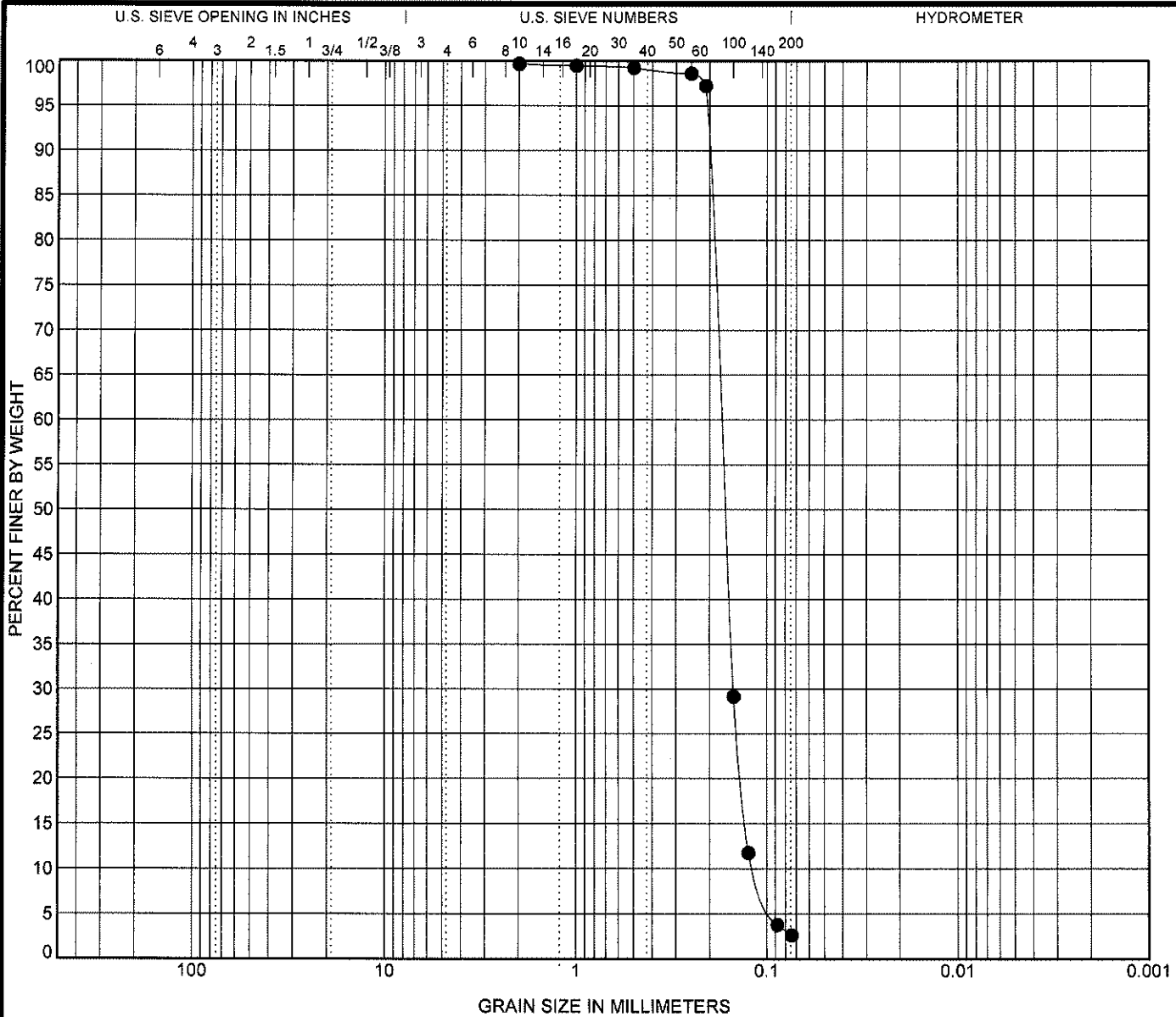
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-17	(-40' to -41' NAVD)	1	0.144	0.102		0.0			



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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-18	(-30' to -31' NAVD)	<b>Borrow Area (-30' to -31' NAVD)</b>				<b>1.11</b>	<b>1.50</b>

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-18	(-30' to -31' NAVD)	<b>2</b>	<b>0.174</b>	<b>0.15</b>	<b>0.116</b>	<b>0.0</b>			

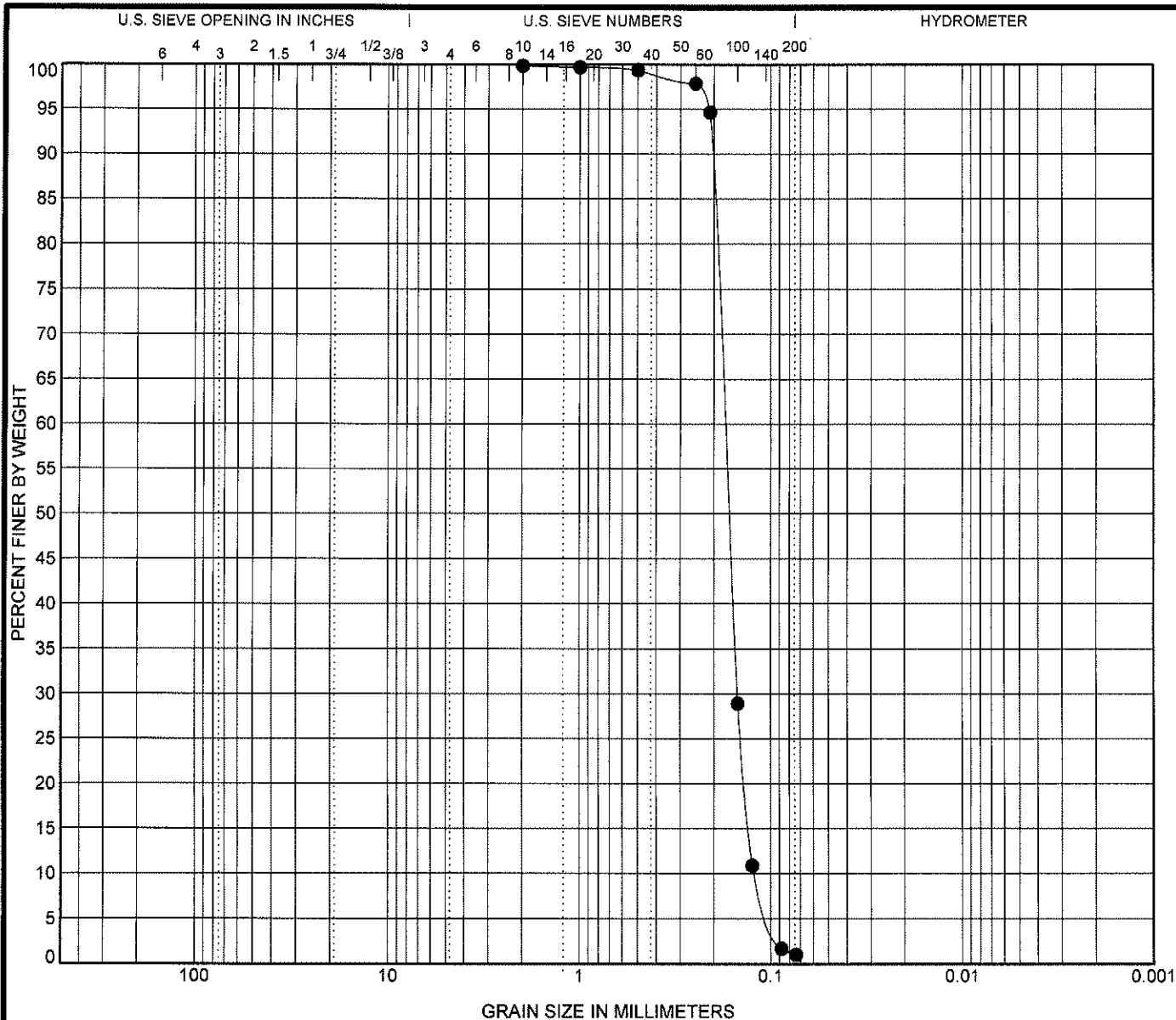


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-18	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)				1.06	1.45

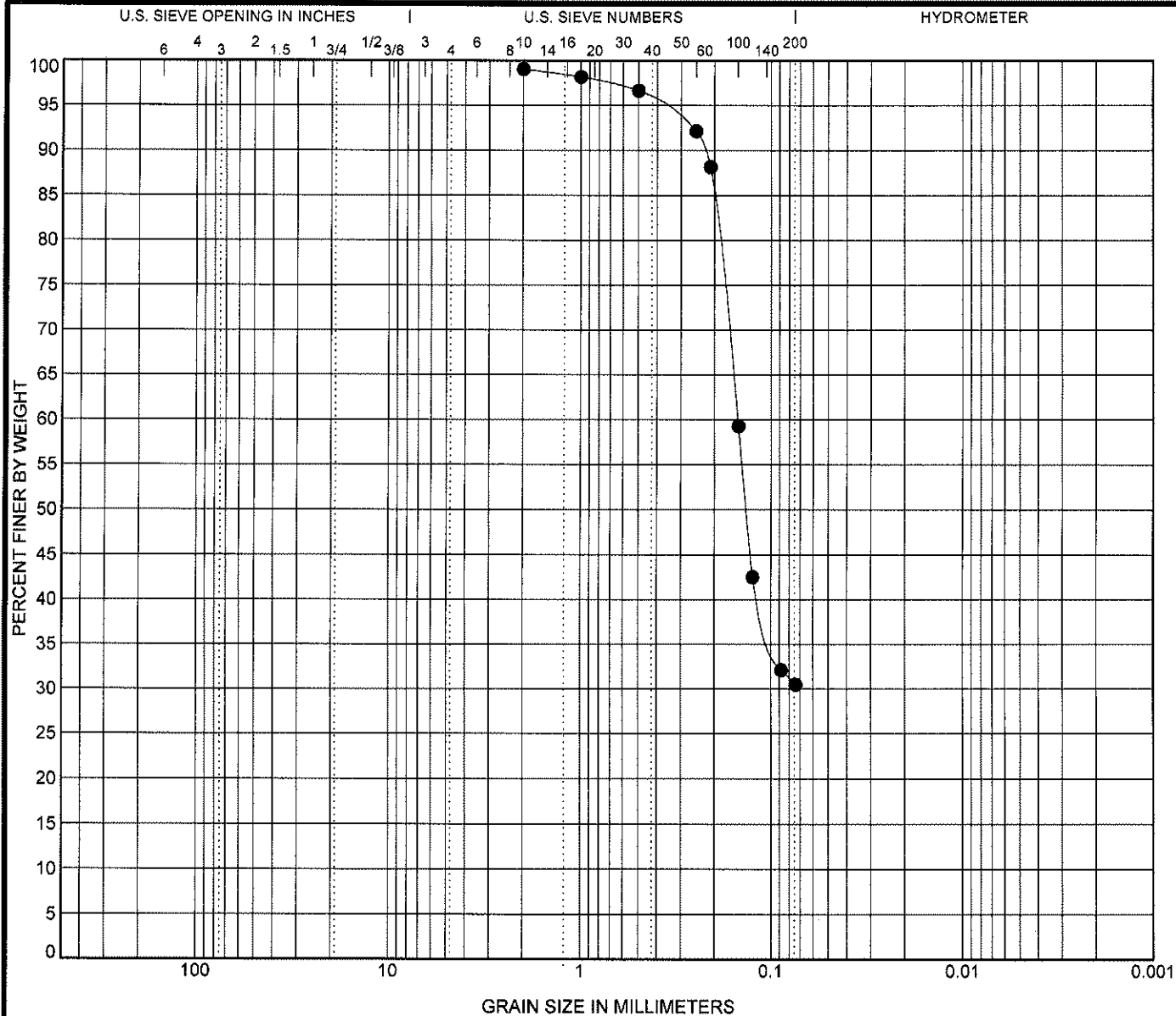
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-18	(-33' to -34' NAVD)	2	0.175	0.15	0.121	0.0			



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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

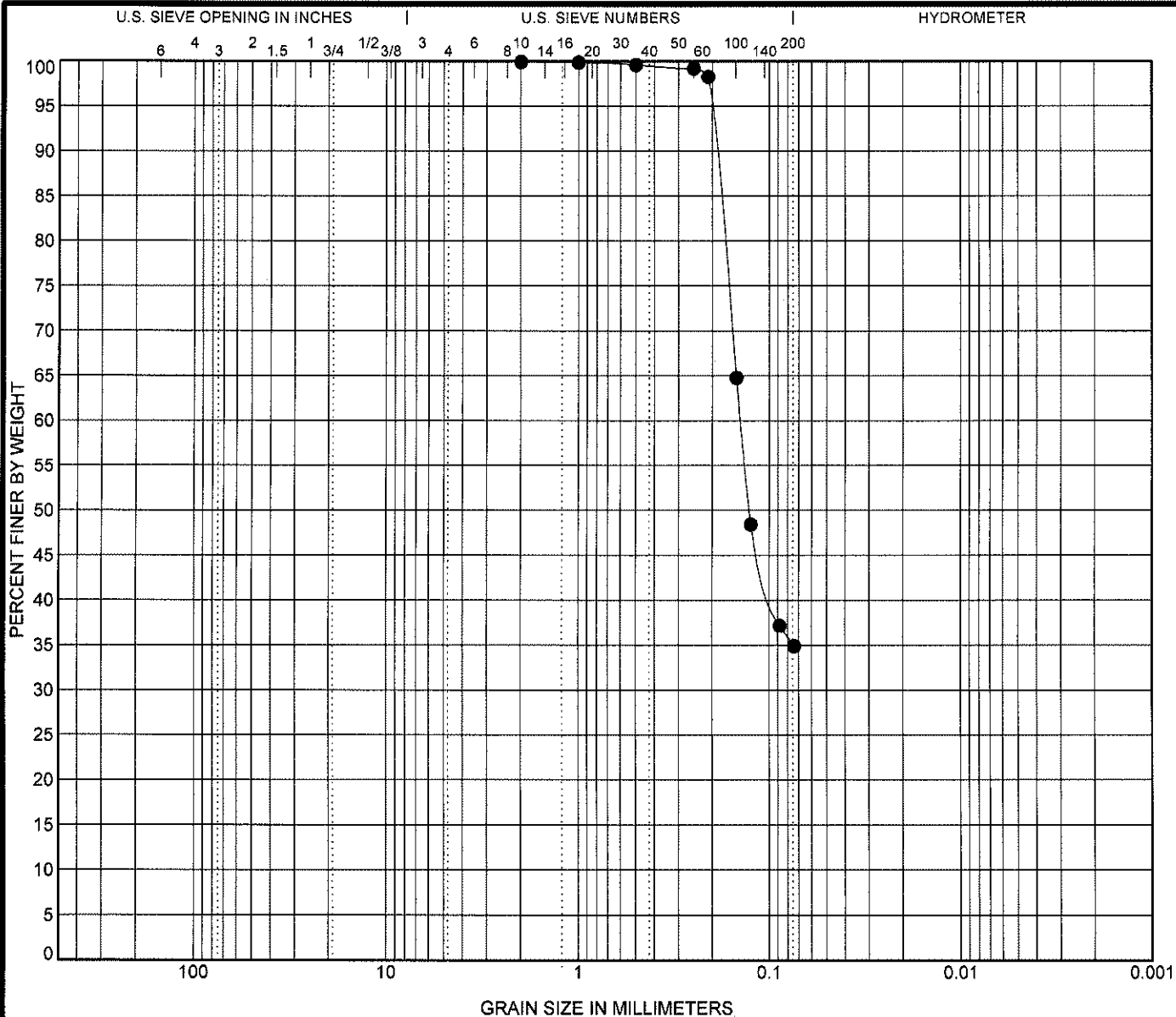
Specimen ID		Depth	Classification					LL	PL	PI	Cc	Cu
●	AA-18	(-35' to -36' NAVD)	Borrow Area (-35' to -36' NAVD)									
Specimen ID		Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	AA-18	(-35' to -36' NAVD)	2	0.15			0.0					



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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-18	(-37' to -38' NAVD)	Borrow Area (-37' to -38' NAVD)					

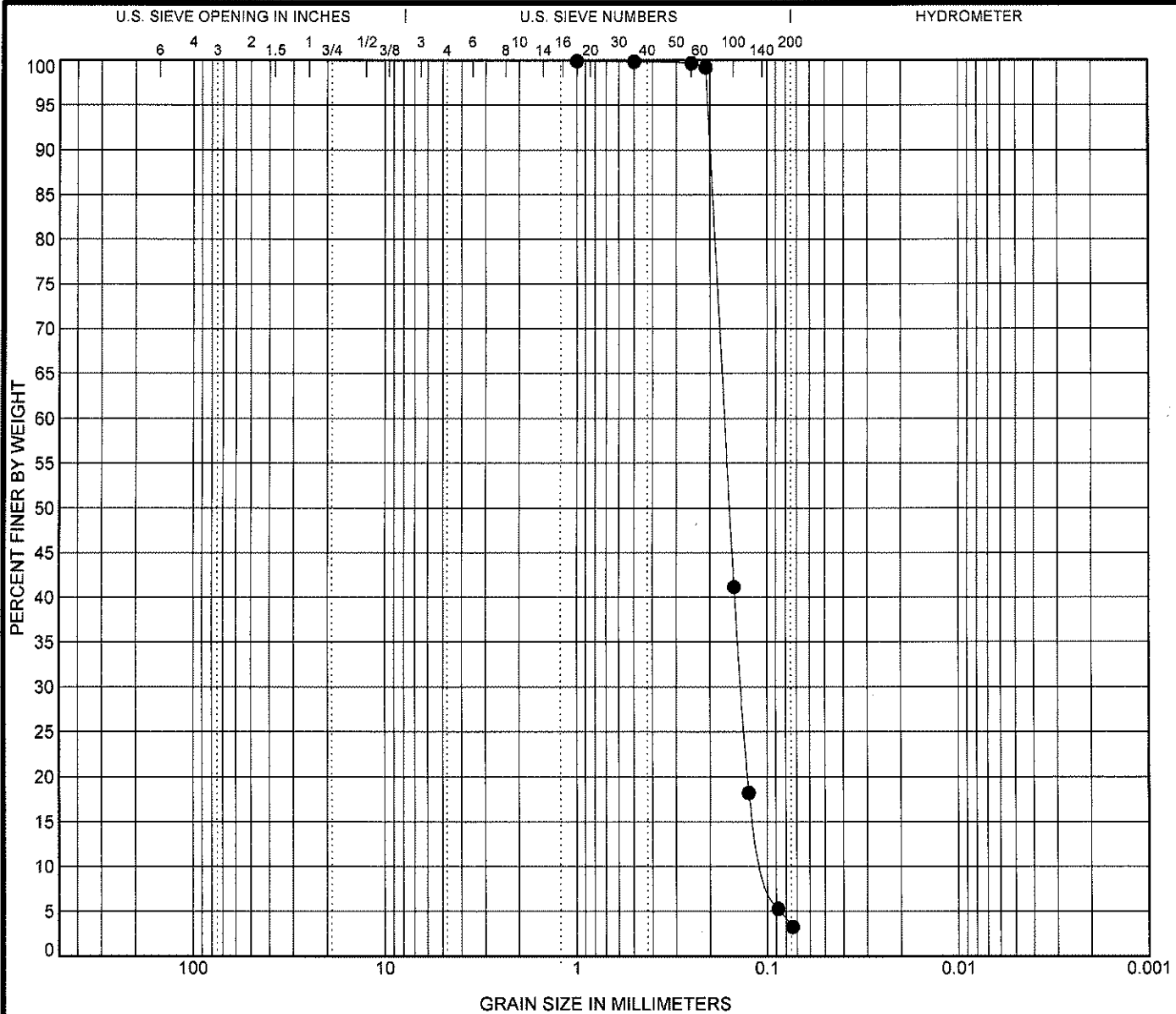
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-18	(-37' to -38' NAVD)	2	0.142			0.0			



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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-18	(-39' to -40' NAVD)	Borrow Area (-39' to -40' NAVD)				1.12	1.67

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-18	(-39' to -40' NAVD)	1	0.167	0.137	0.1	0.0			

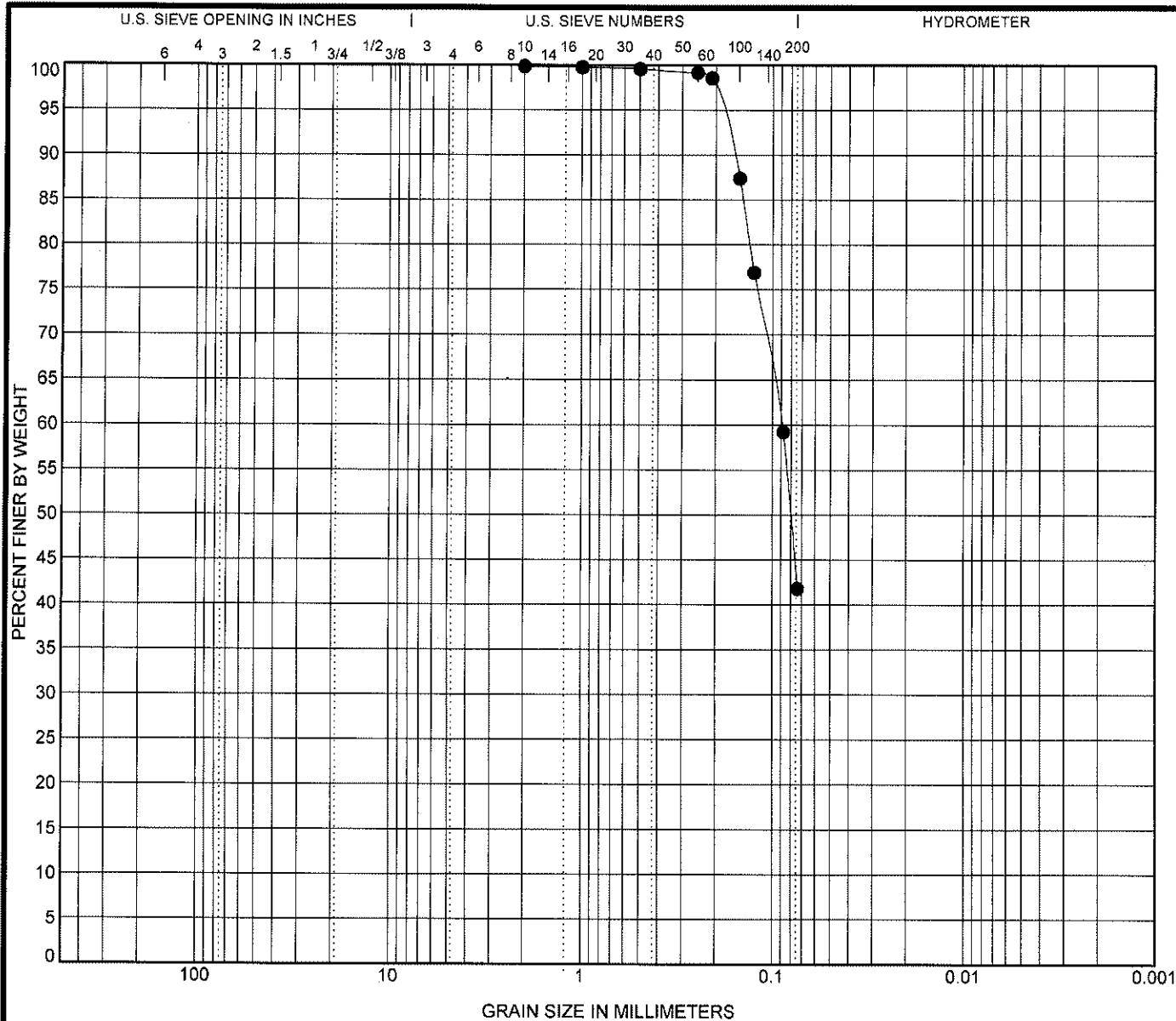


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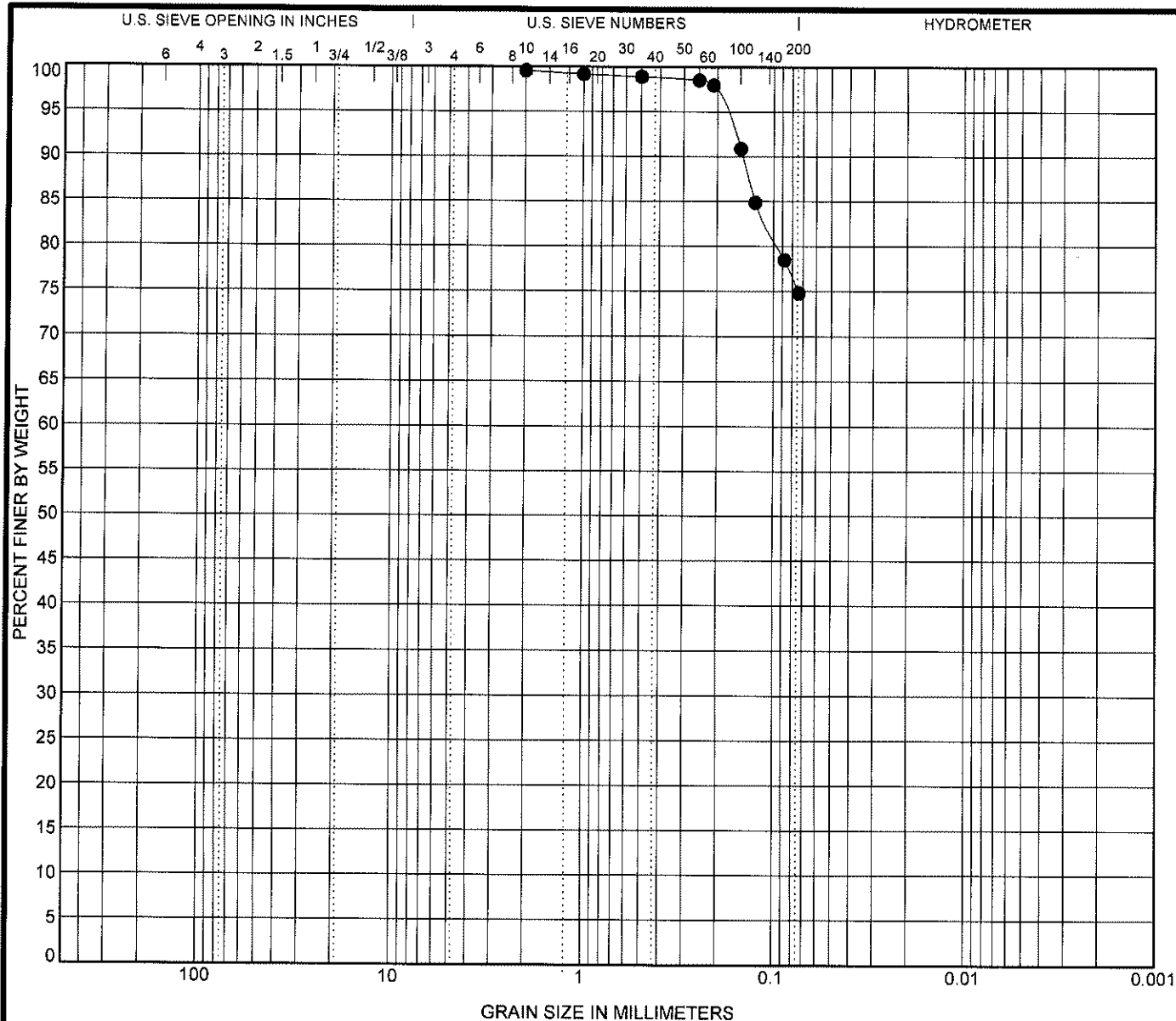
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

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

[illegible]

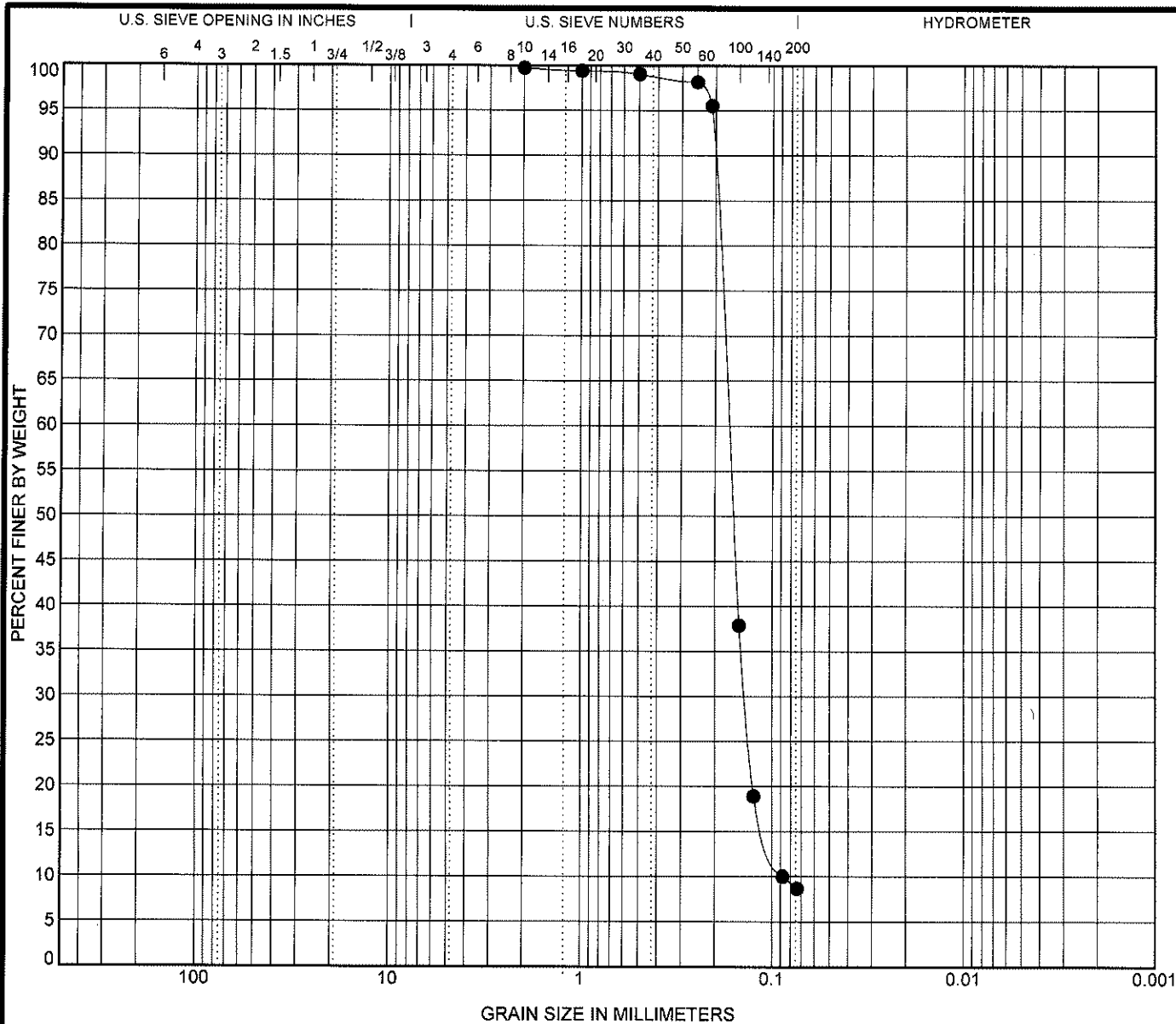
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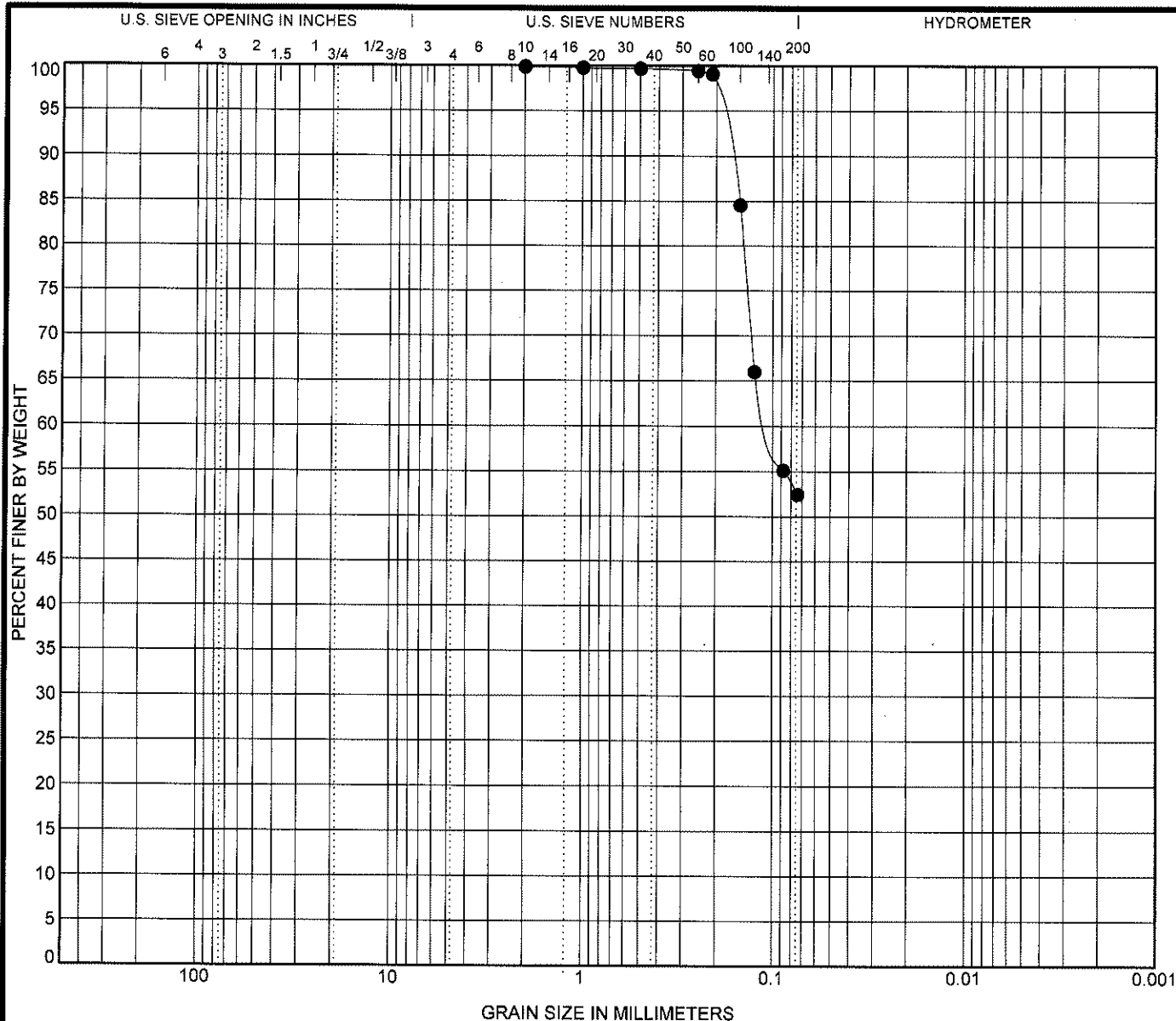
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

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

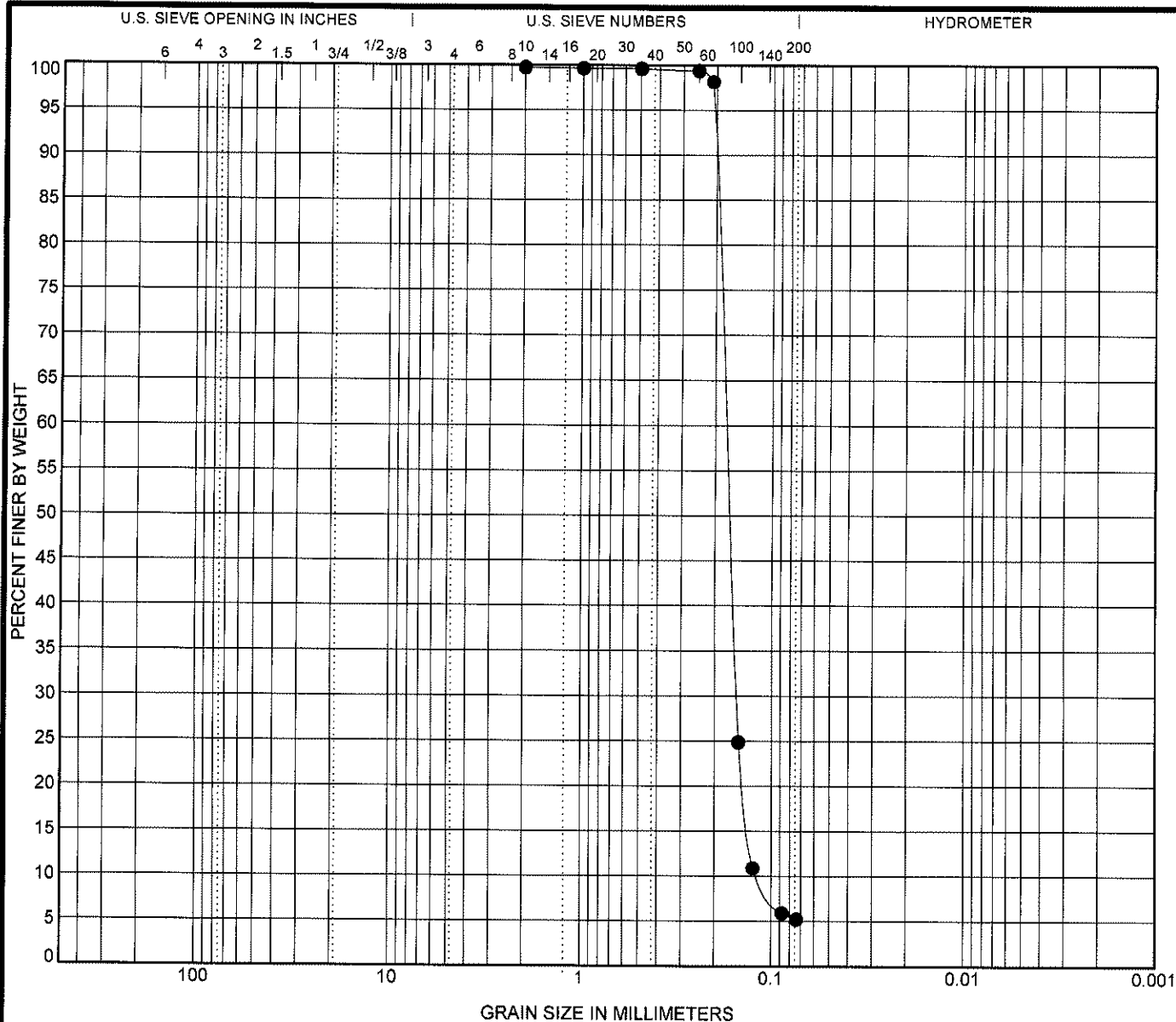
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-19	(-37' to -38' NAVD)	2	0.103			0.0			



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 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	(-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			



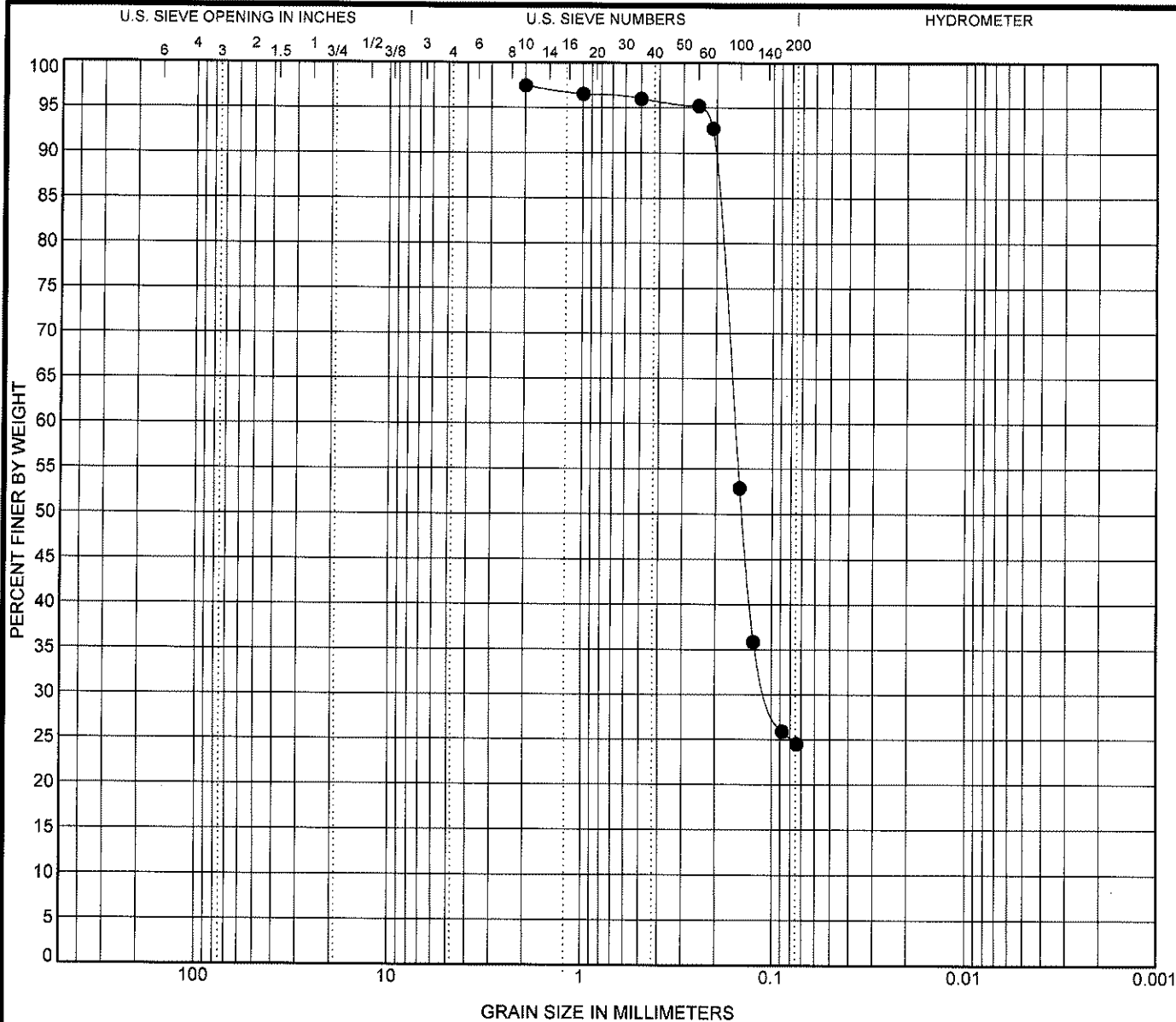
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Location: Anchorage Basin; Galveston, Texas

Number: G109112



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-19	(-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			



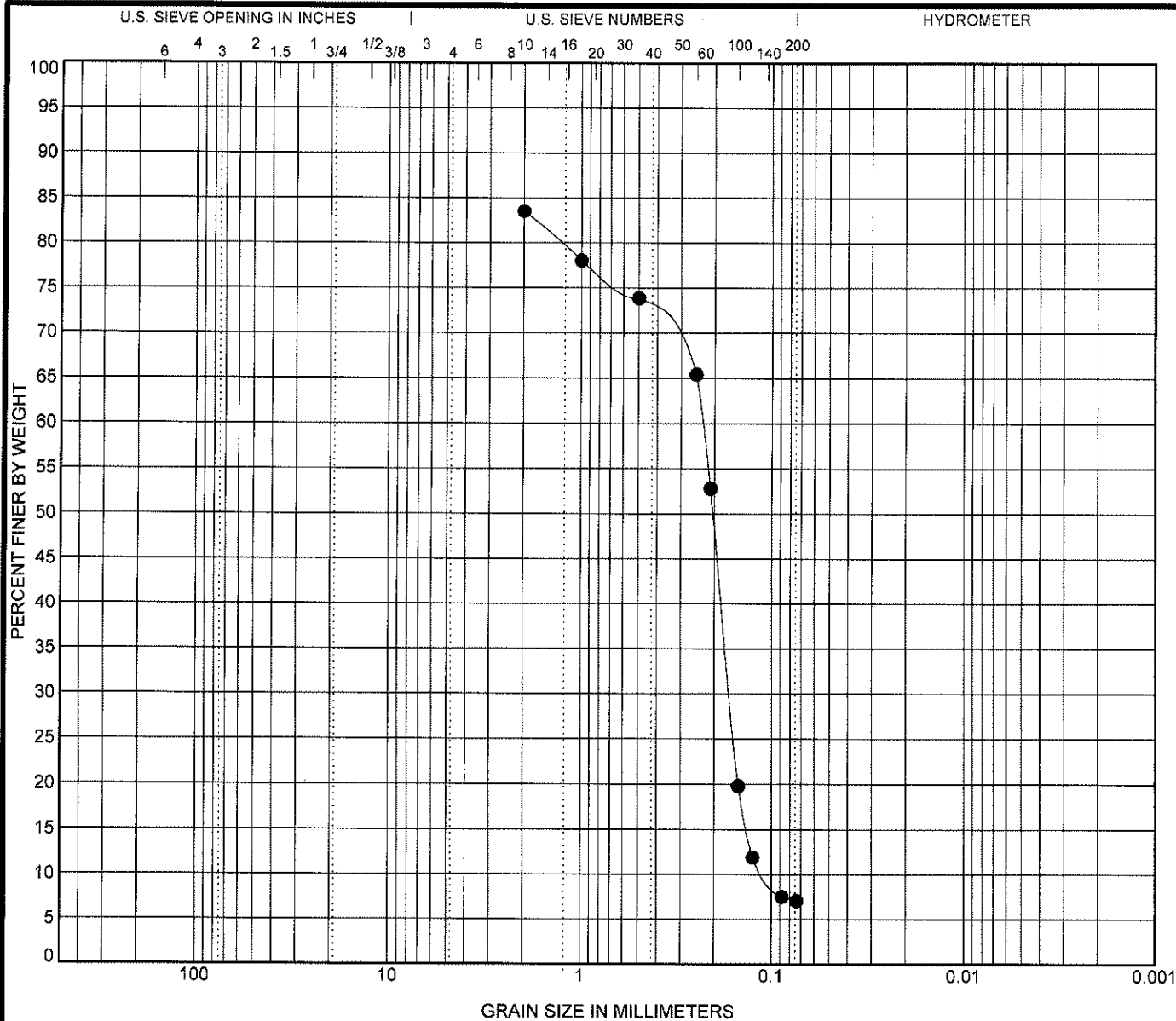
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Number: G109112



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-20	(-32' to -33' NAVD)	Borrow Area (-32' to -33' NAVD)				1.10	2.16

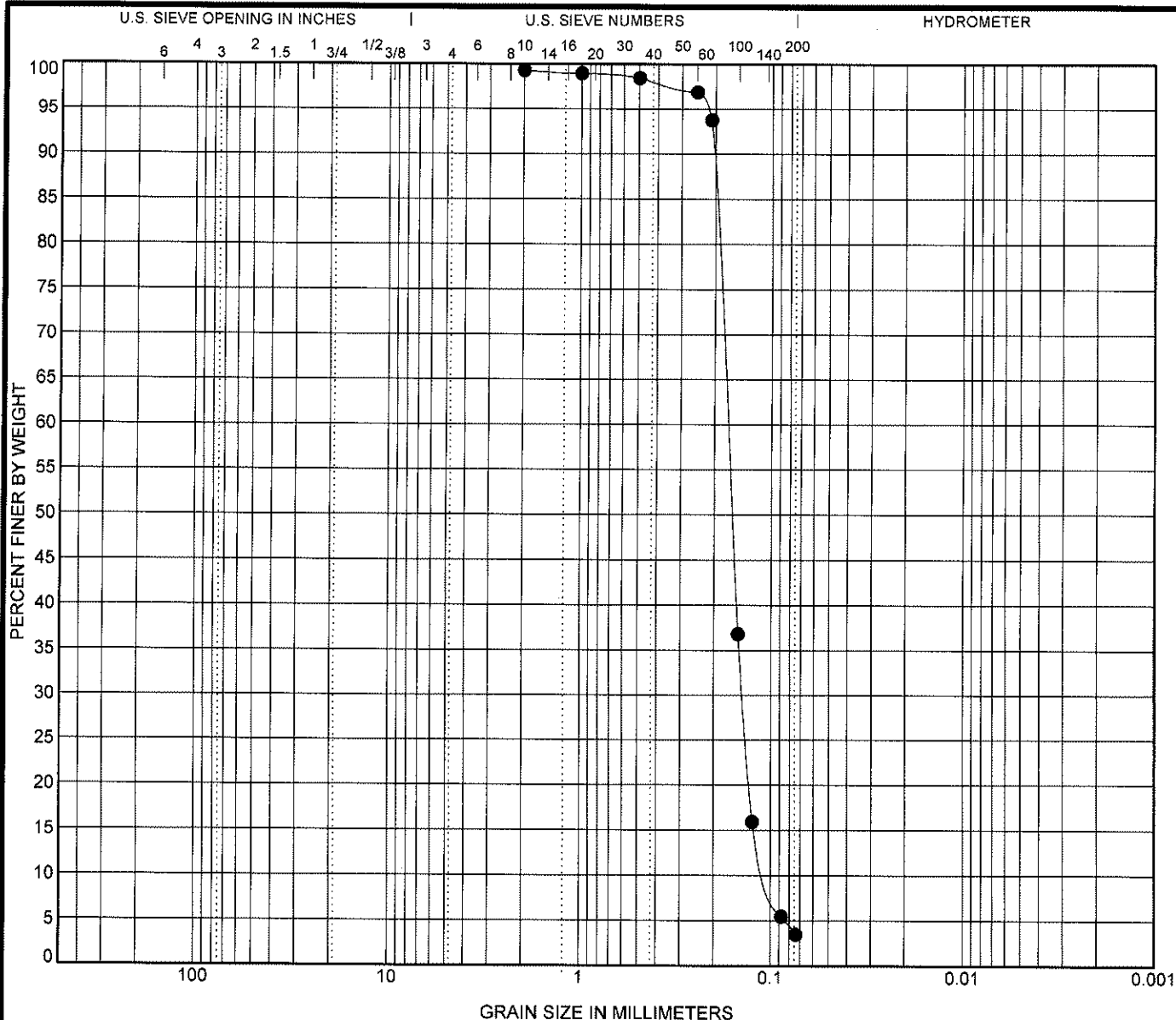
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-20	(-32' to -33' NAVD)	2	0.232	0.166	0.107	0.0			



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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-21	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)				1.13	1.67

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-21	(-33' to -34' NAVD)	2	0.171	0.141	0.102	0.0			

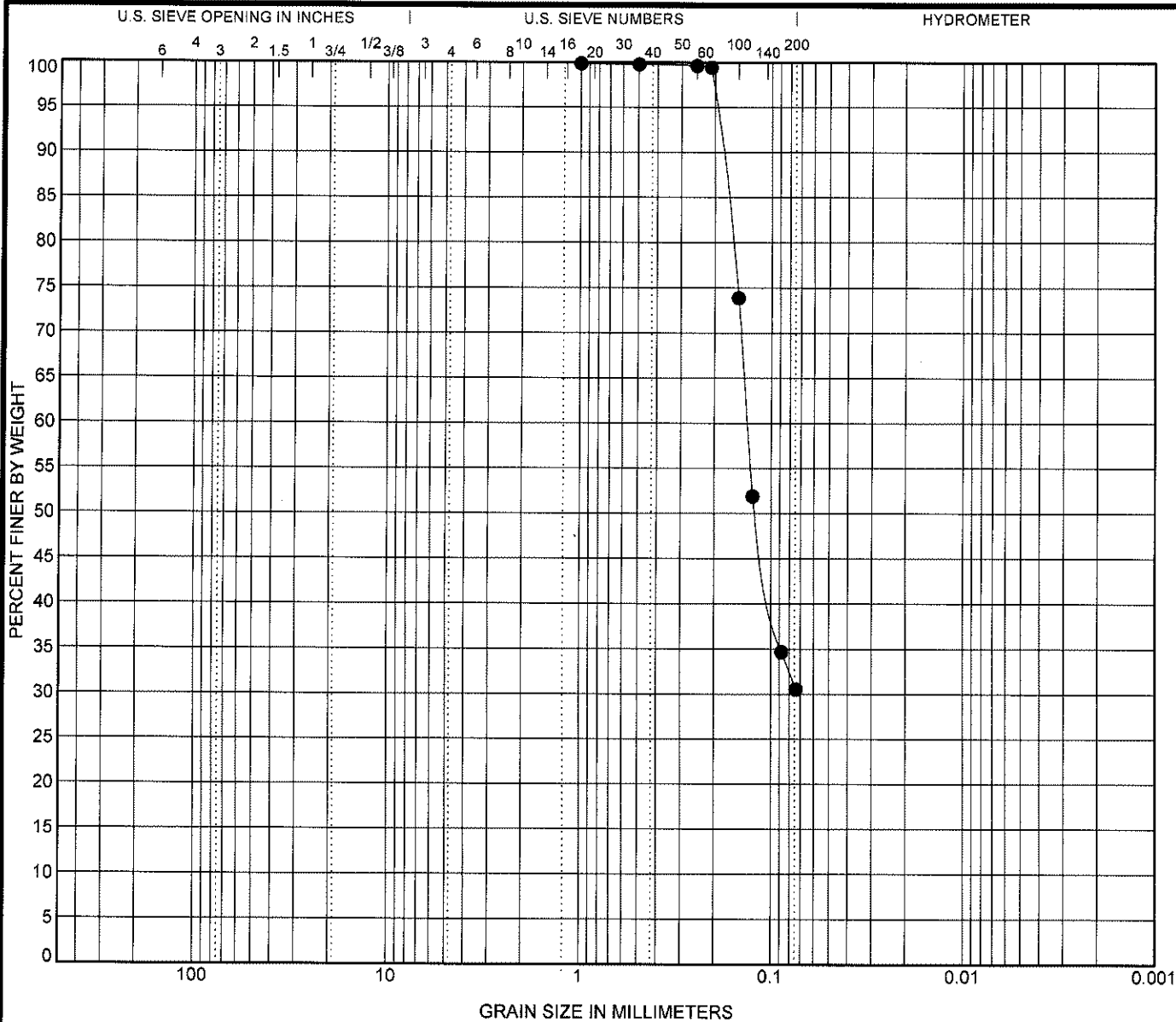


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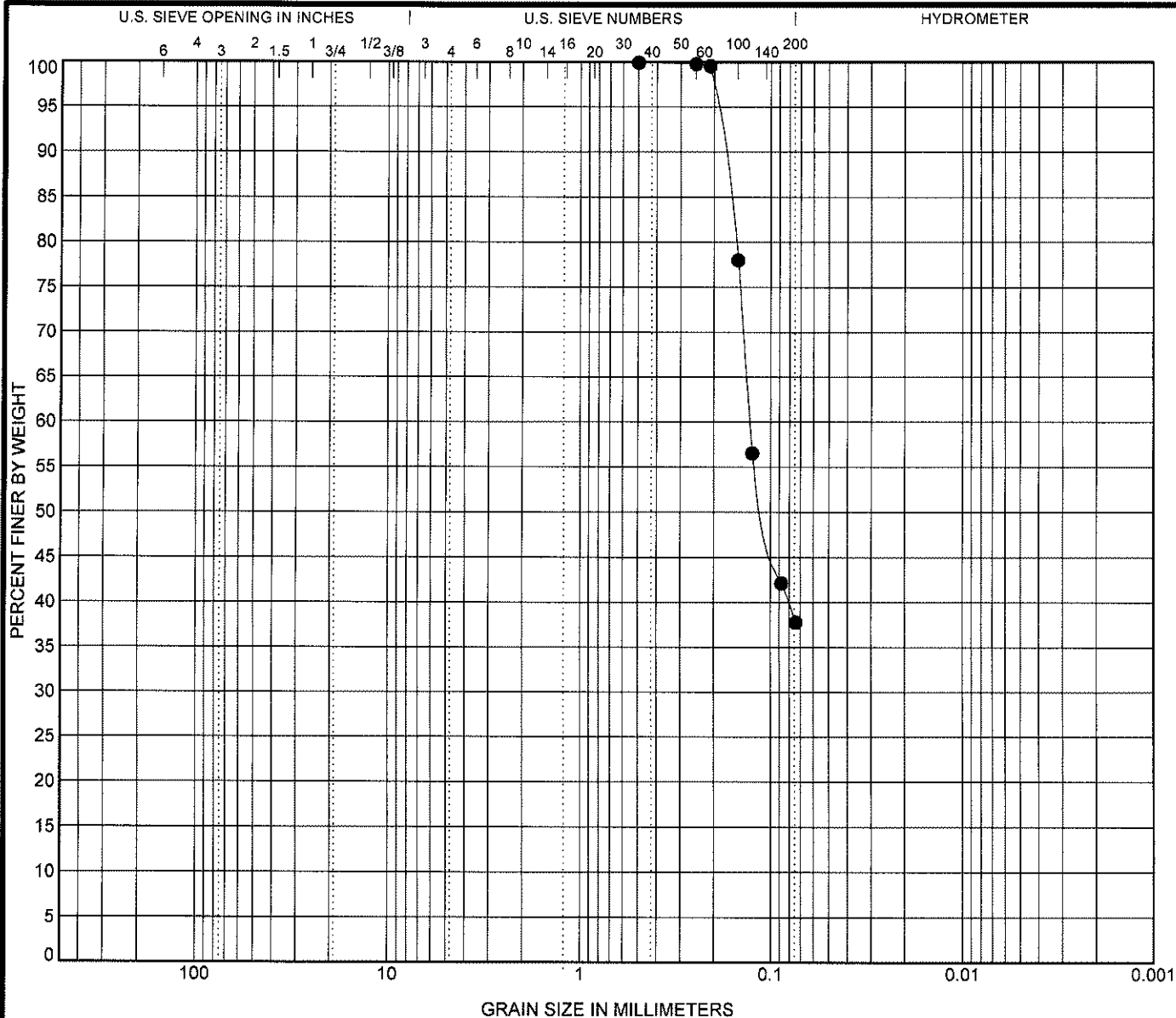
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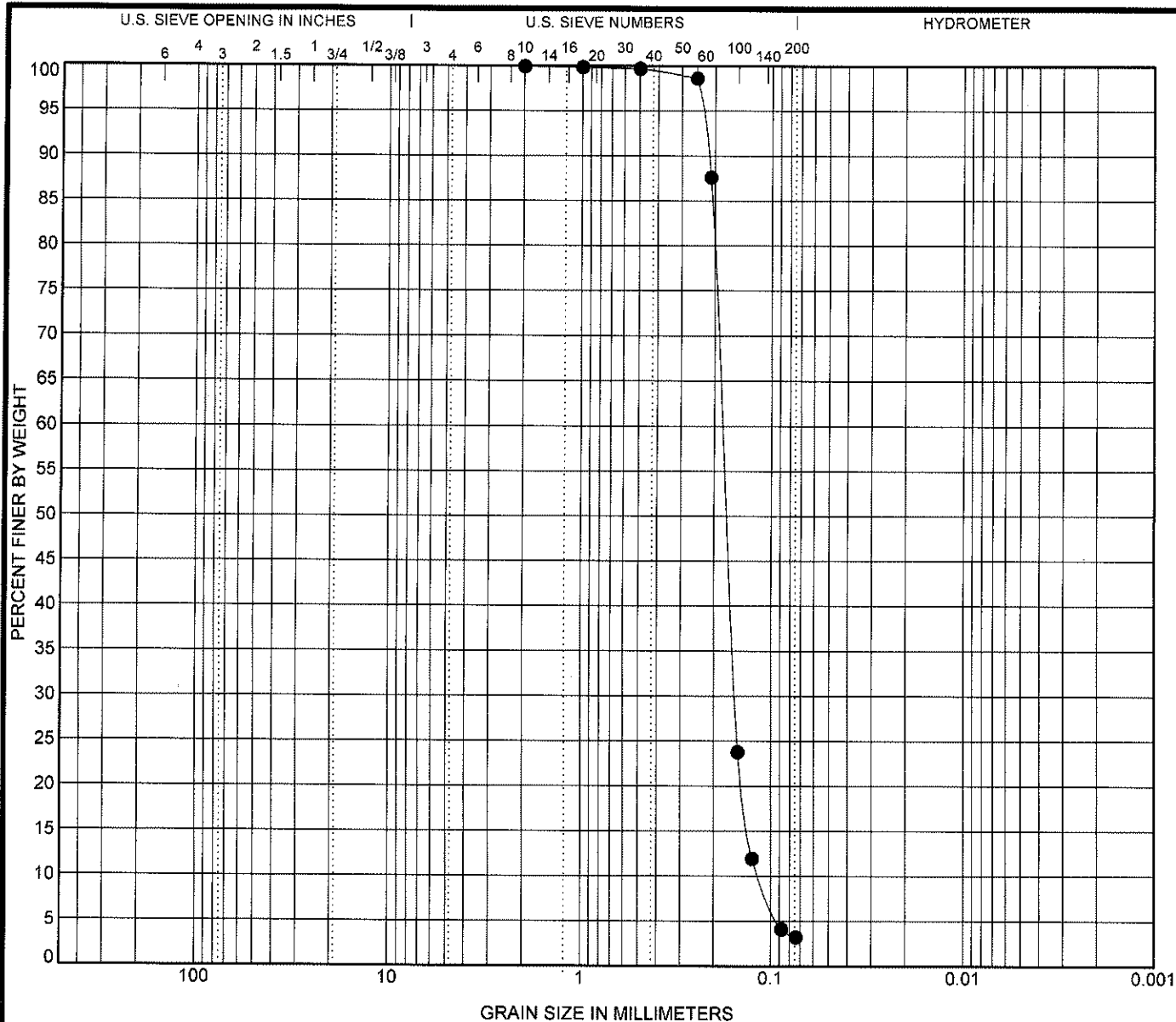
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-20	(-40' to -41' NAVD)	Borrow Area (-40' to -41' NAVD)				1.14	1.58

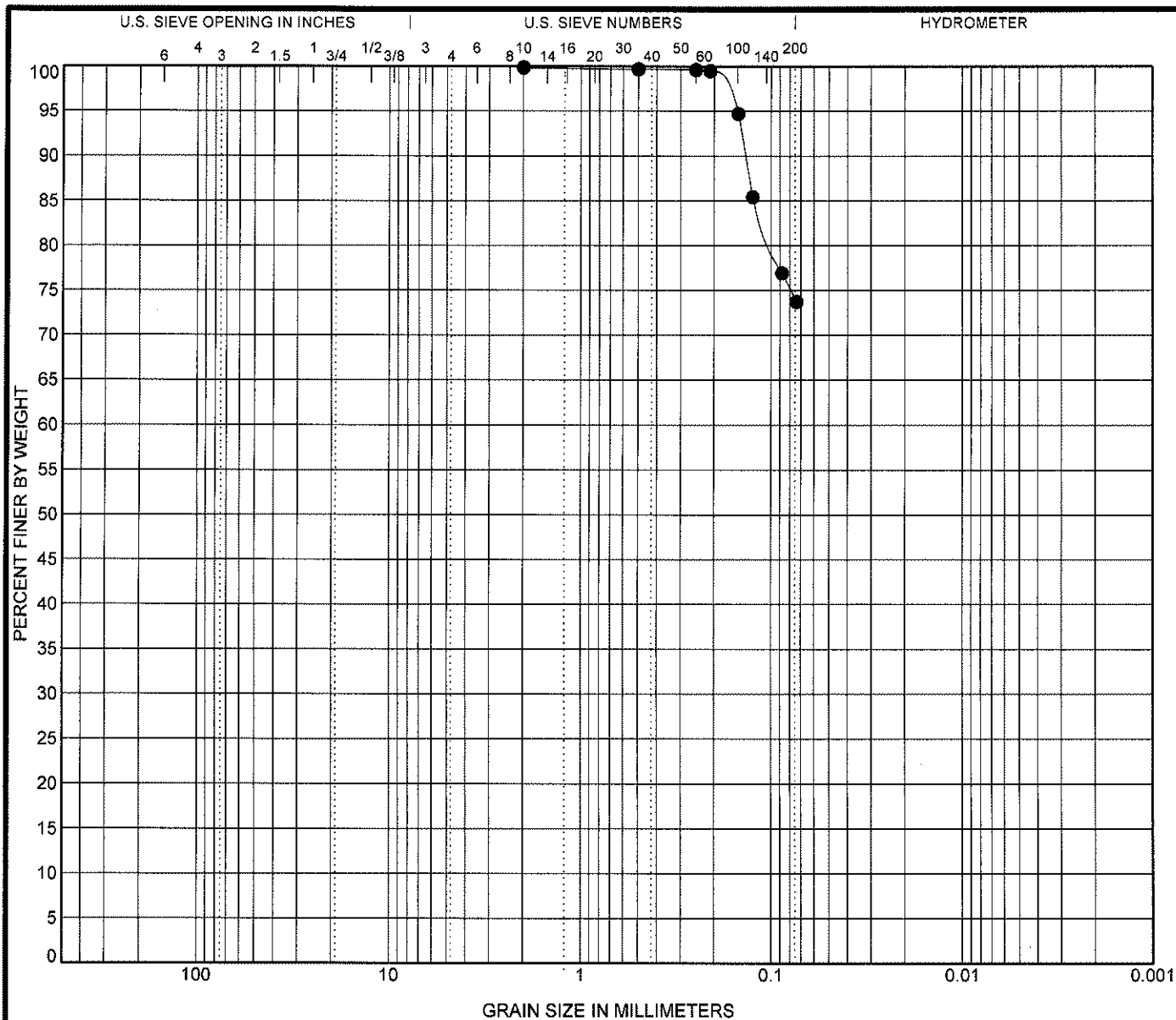
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-20	(-40' to -41' NAVD)	2	0.181	0.154	0.115	0.0			



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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-21 (-35' to -36' NAVD)		Borrow Area (-35' to -36' NAVD)					

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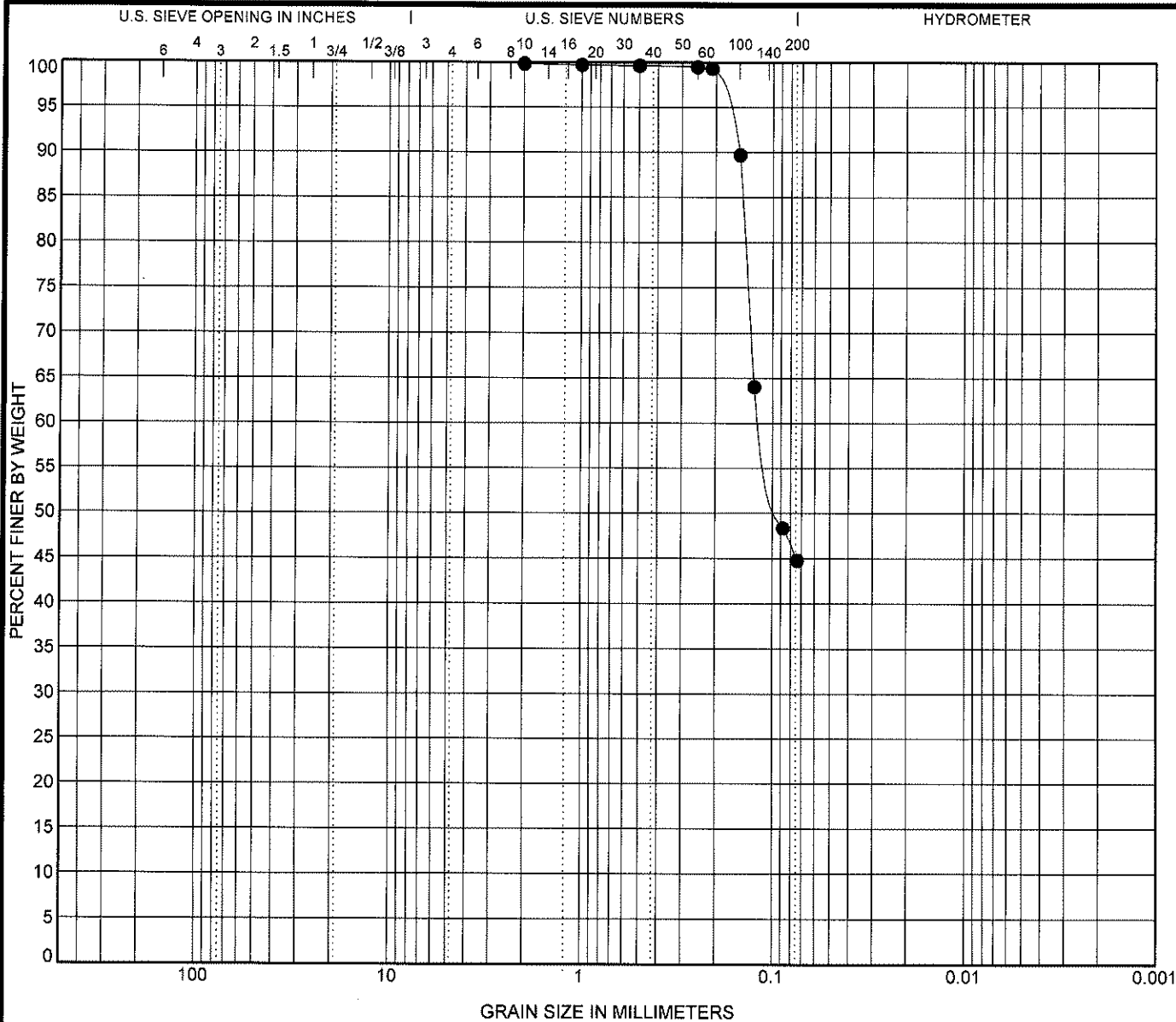
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-21	(-37' to -38' NAVD)	Borrow Area (-37' to -38' NAVD)					

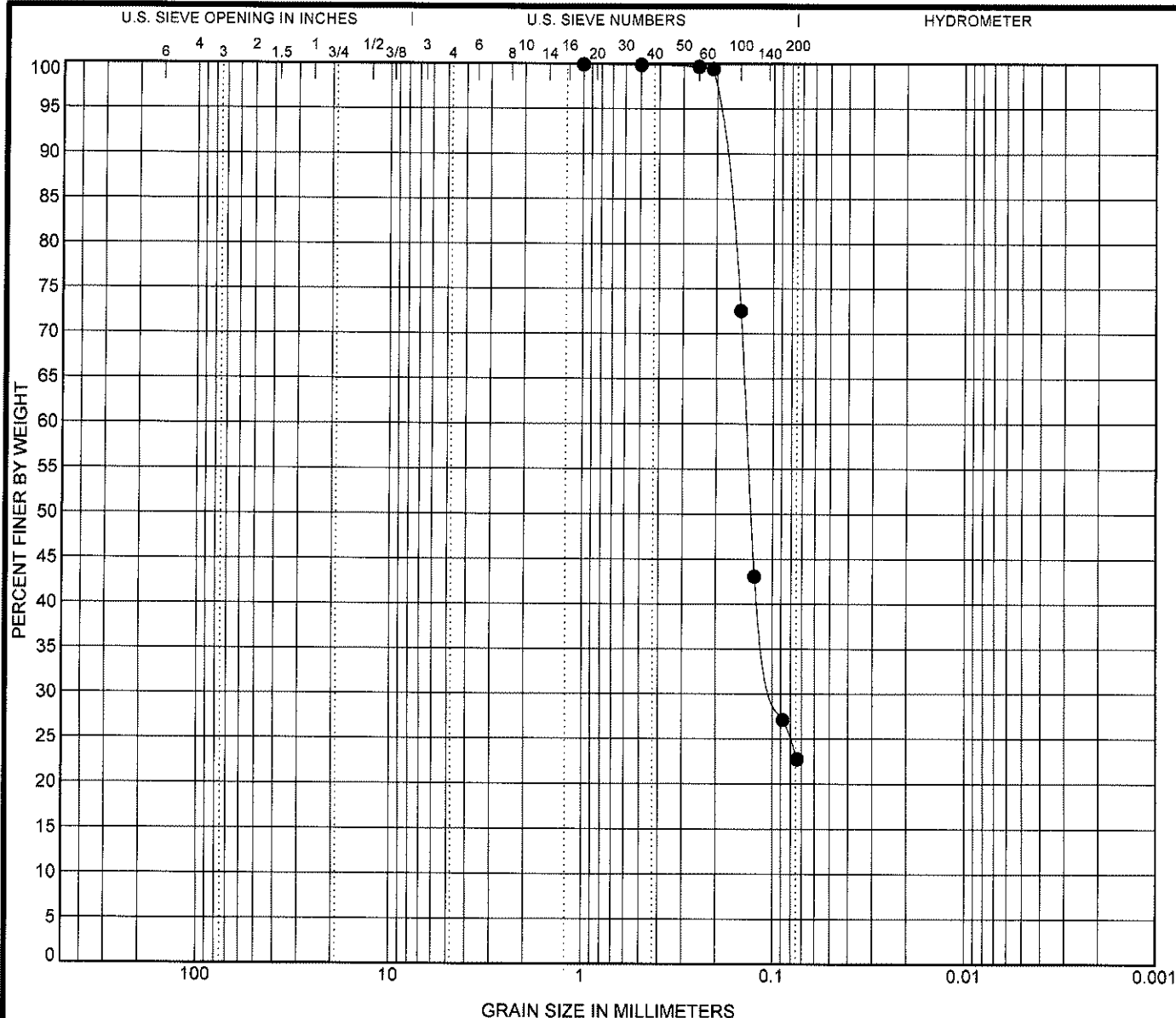
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-21	(-37' to -38' NAVD)	2	0.114			0.0			



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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-21	(-40' to -41' NAVD)	Borrow Area (-40' to -41' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-21	(-40' to -41' NAVD)	1	0.138	0.094		0.0			

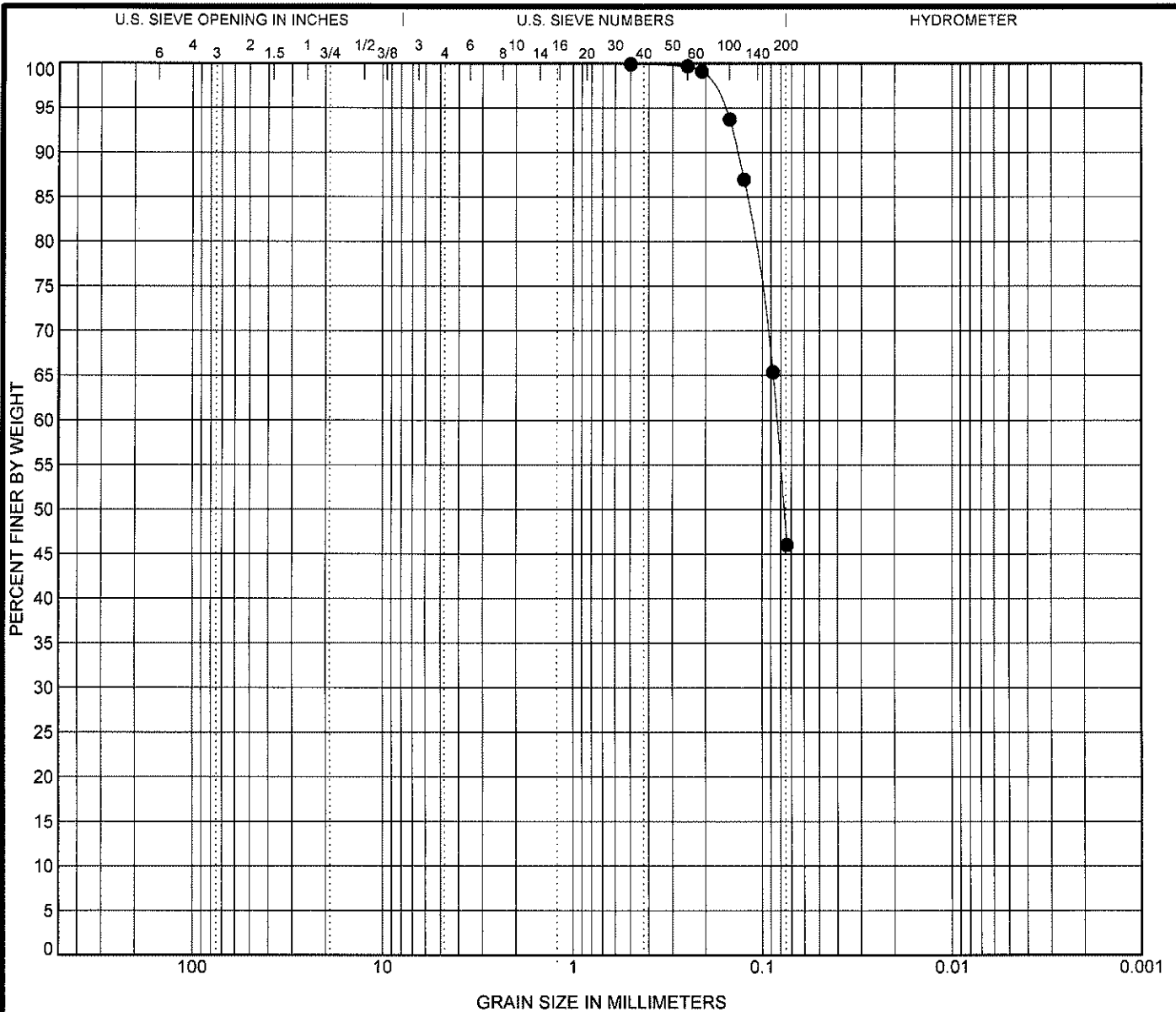


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

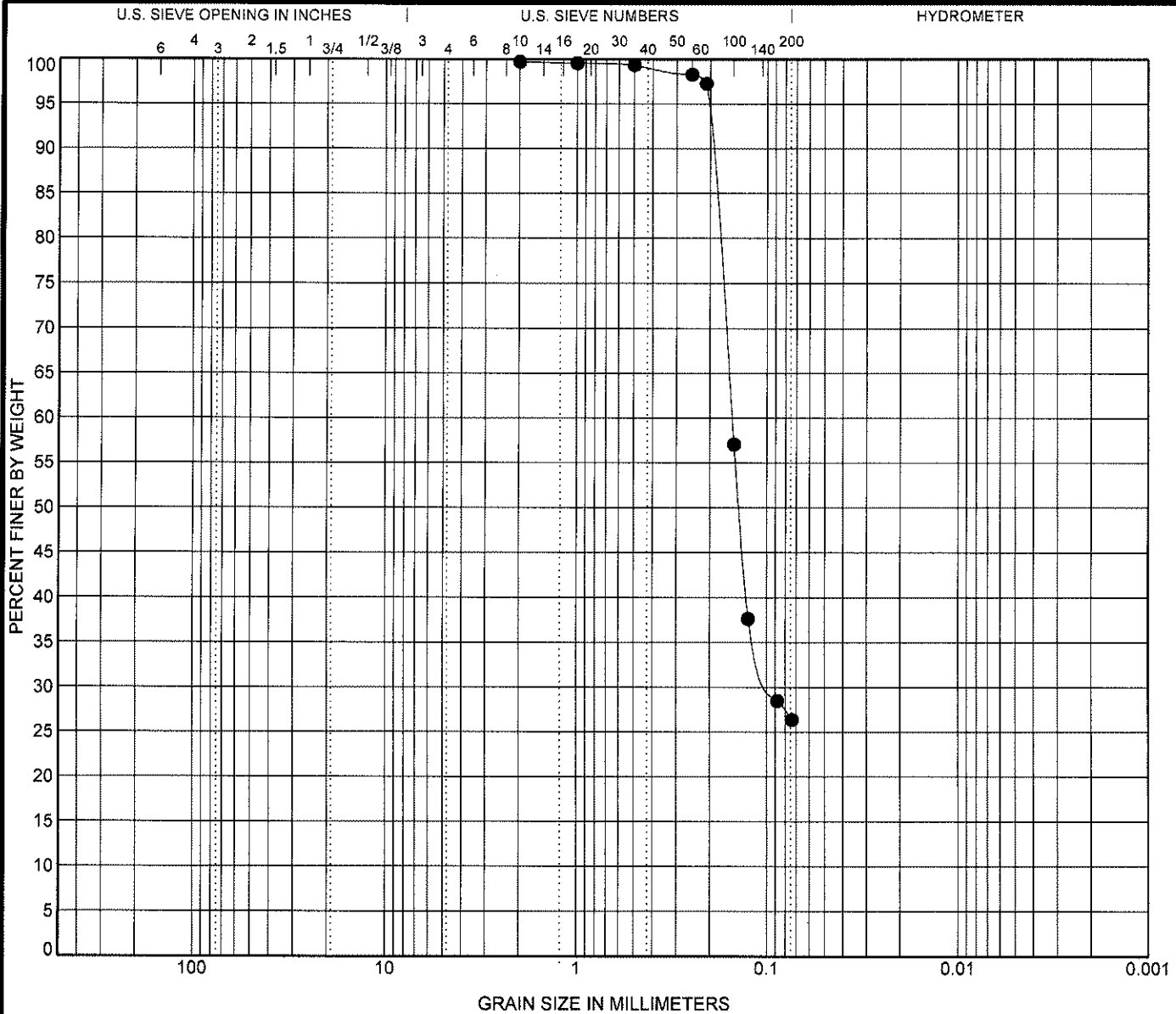
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-22	(-31' to -32' NAVD)	Borrow Area (-31' to -32' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-22	(-31' to -32' NAVD)	0.5	0.084			0.0			



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Number: G109112



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-22	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-22	(-33' to -34' NAVD)	2	0.153	0.093		0.0			

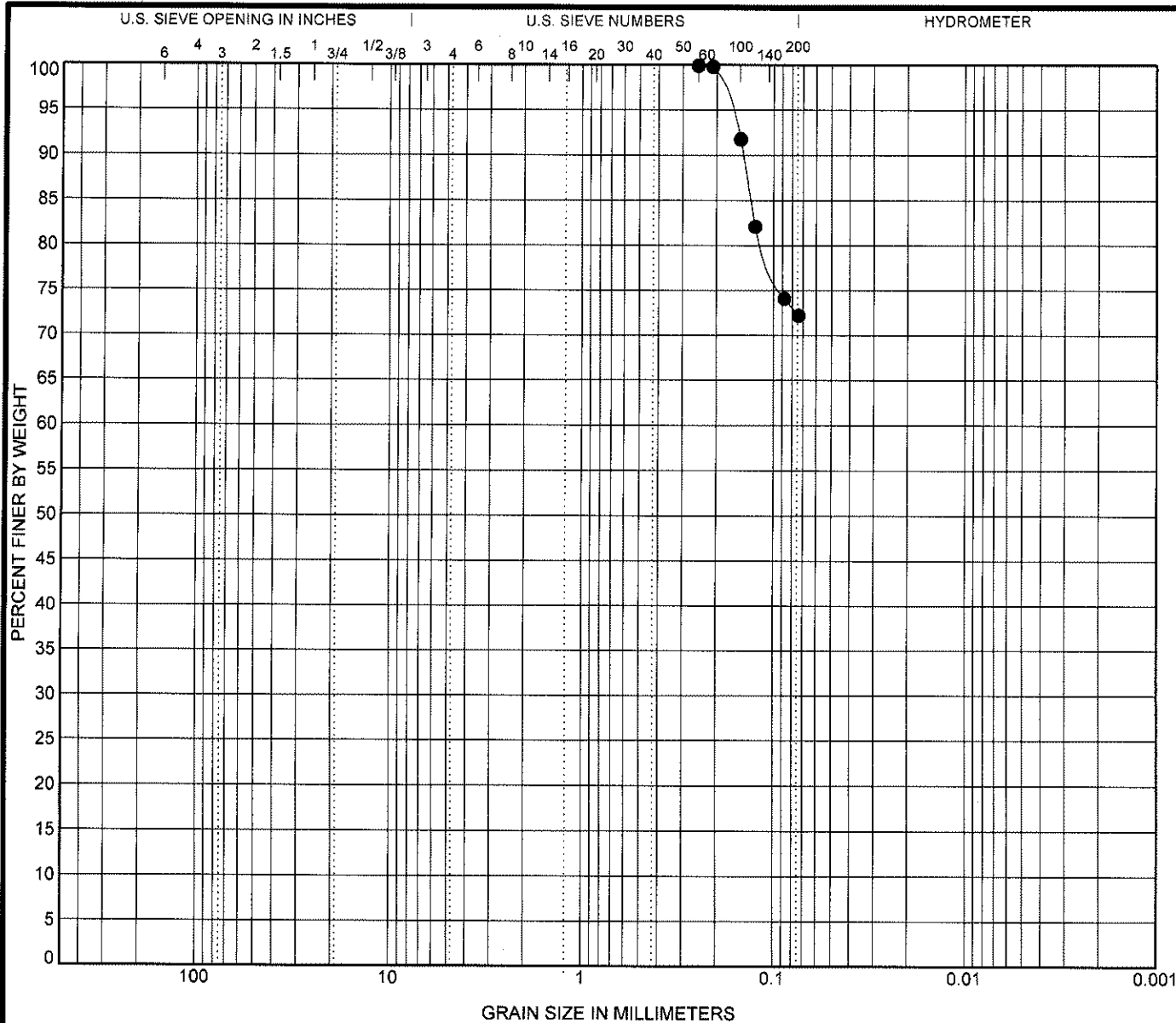


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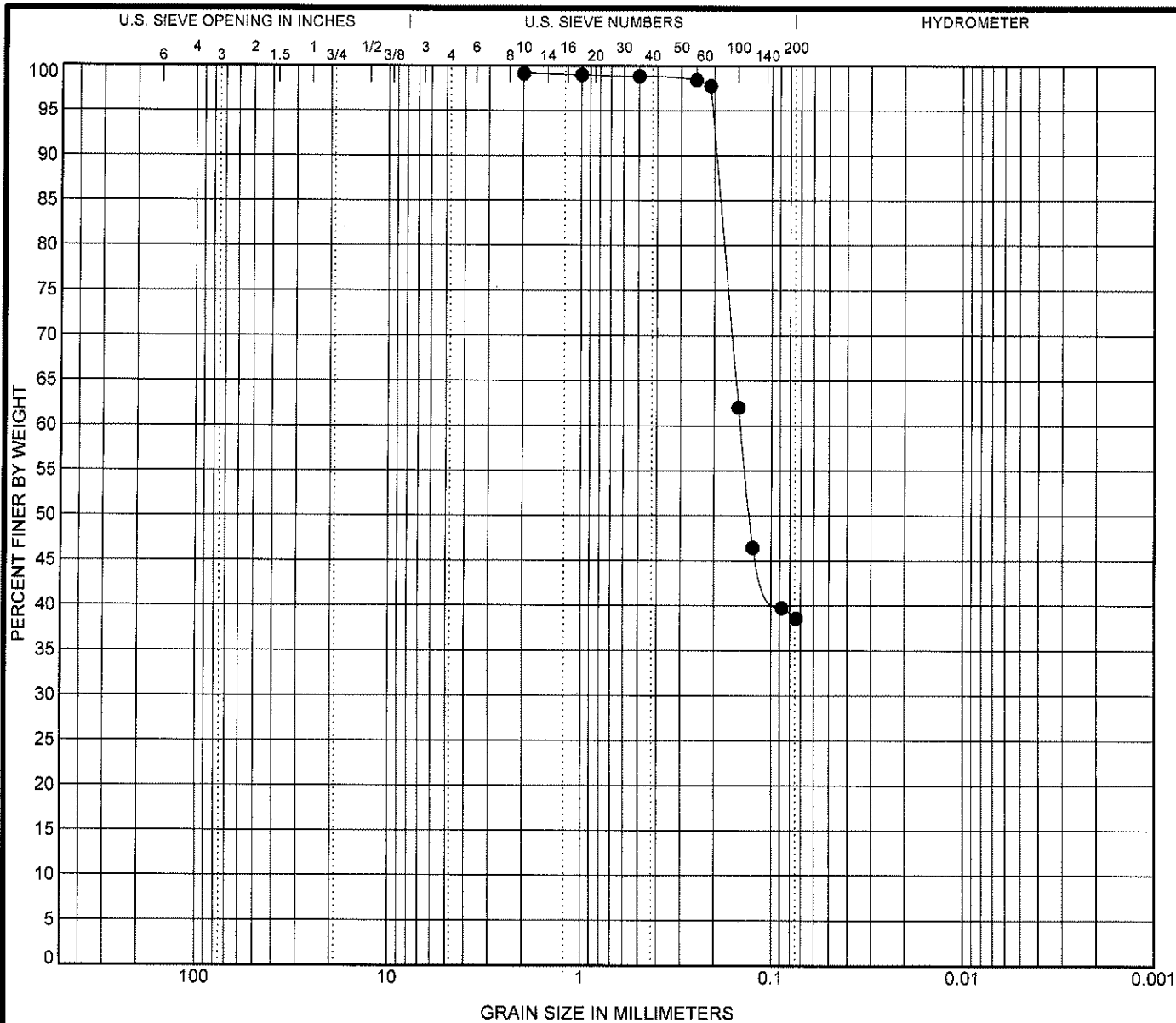
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-22	(-38' to -39' NAVD)	Borrow Area (-38' to -39' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-22	(-38' to -39' NAVD)	2	0.146			0.0			

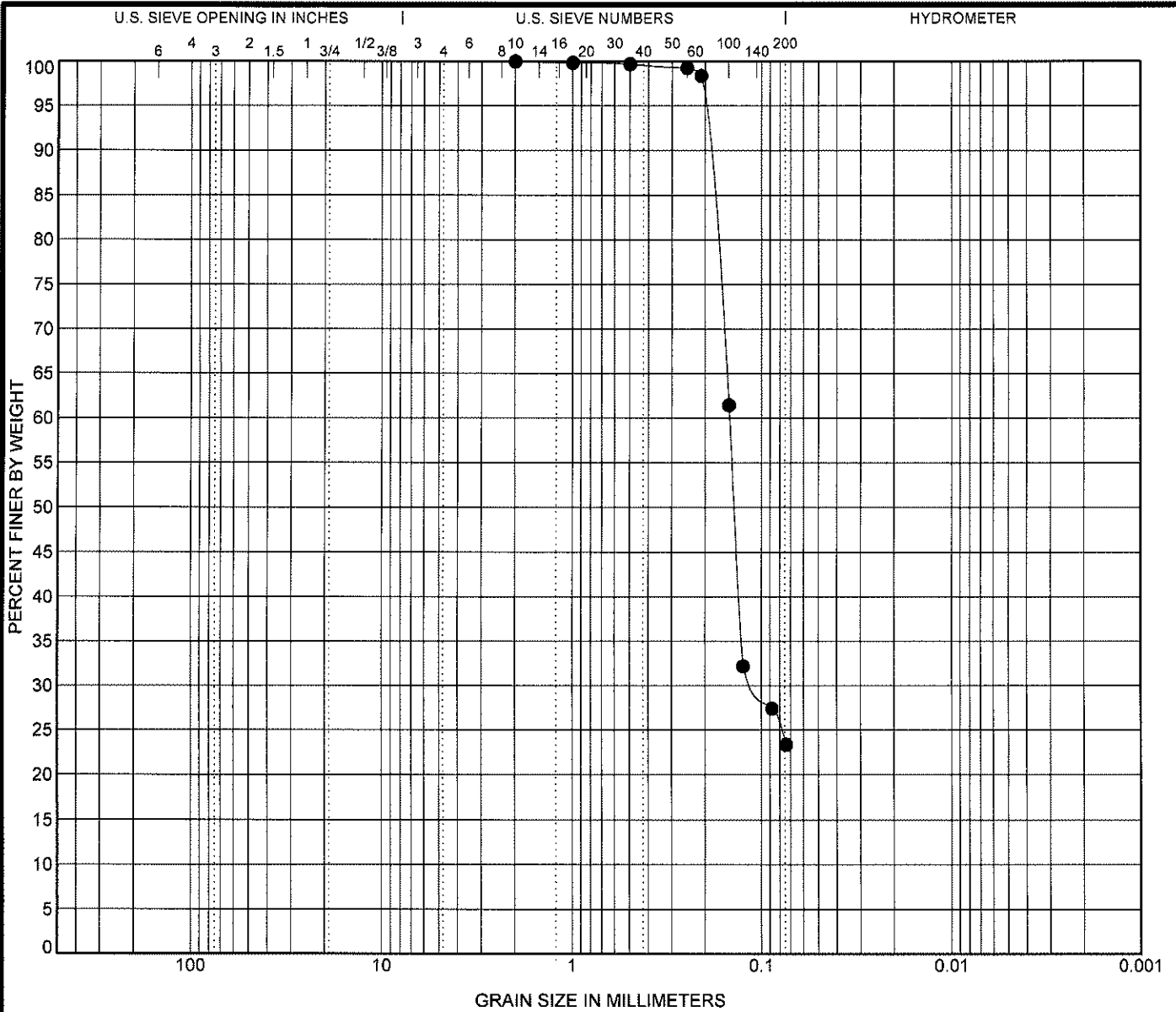


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

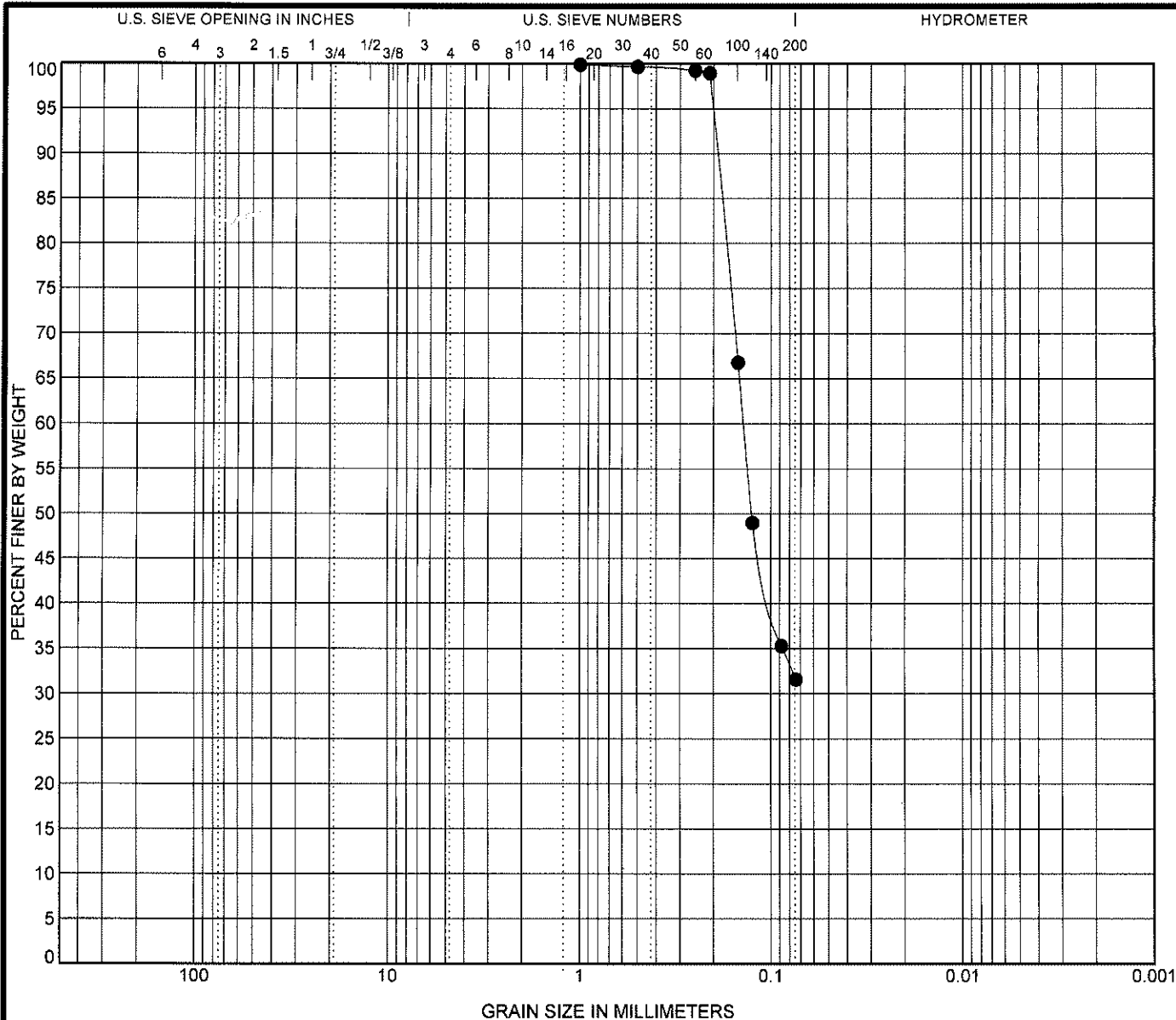
Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-23	(-32' to -33' NAVD)	Borrow Area (-32' to -33' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-23	(-32' to -33' NAVD)	2	0.148	0.106		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-23	(-34' to -35' NAVD)	Borrow Area (-34' to -35' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-23	(-34' to -35' NAVD)	1	0.139			0.0			



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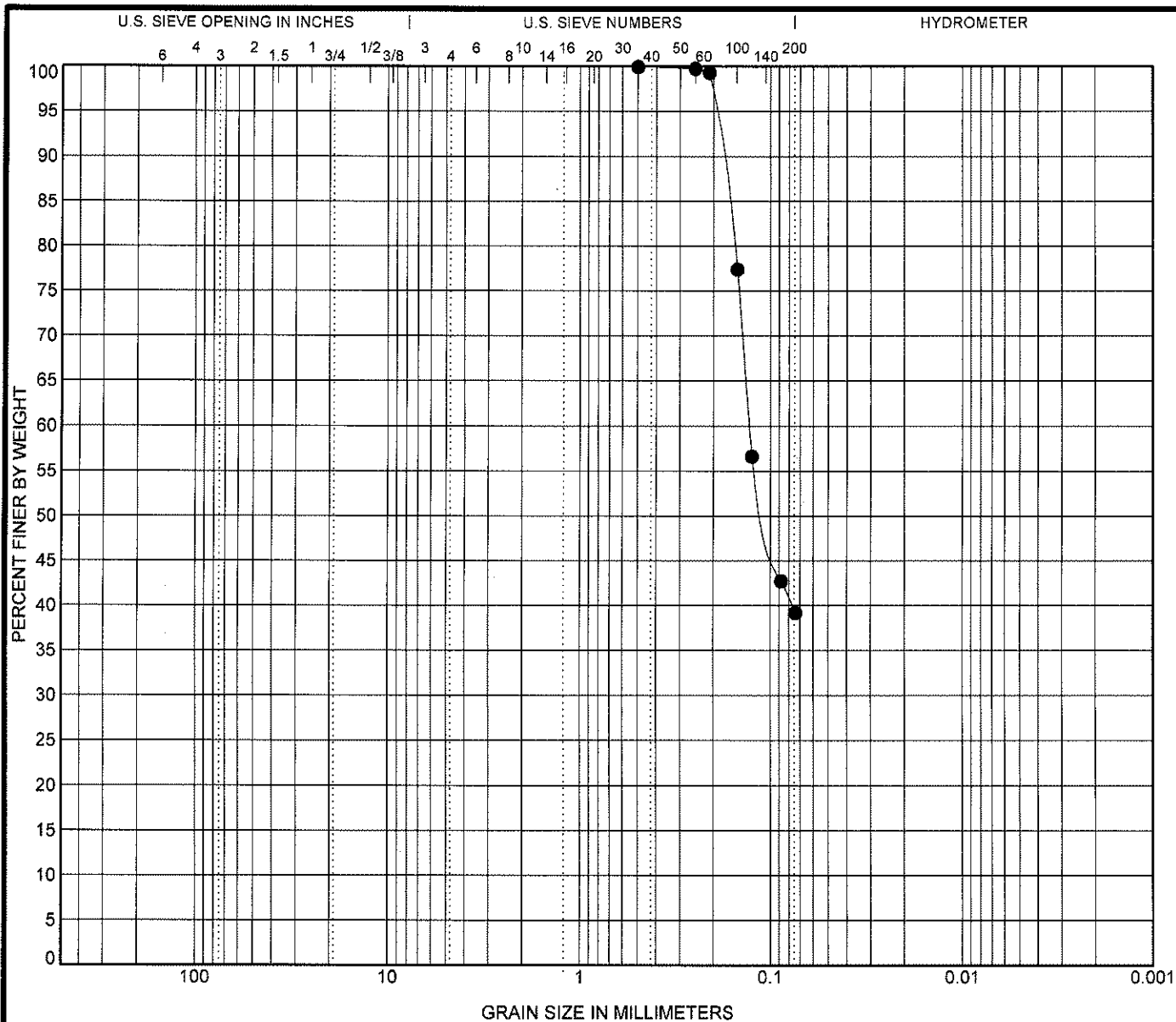
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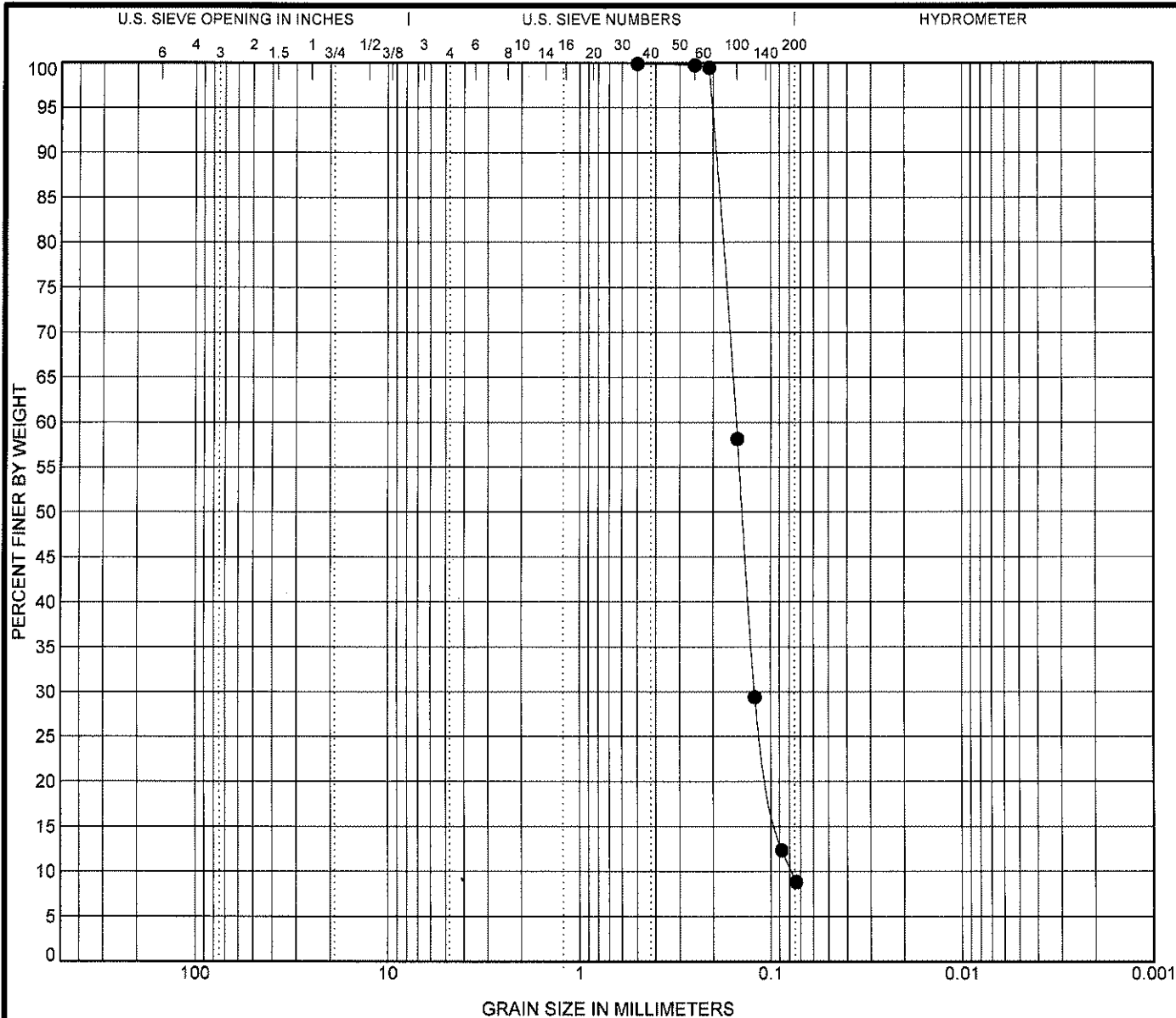
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Location: Anchorage Basin; Galveston, Texas

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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-23	(-41' to -42' NAVD)	Borrow Area (-41' to -42' NAVD)							1.25	1.93
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● AA-23	(-41' to -42' NAVD)	0.5	0.151	0.122	0.078	0.0				



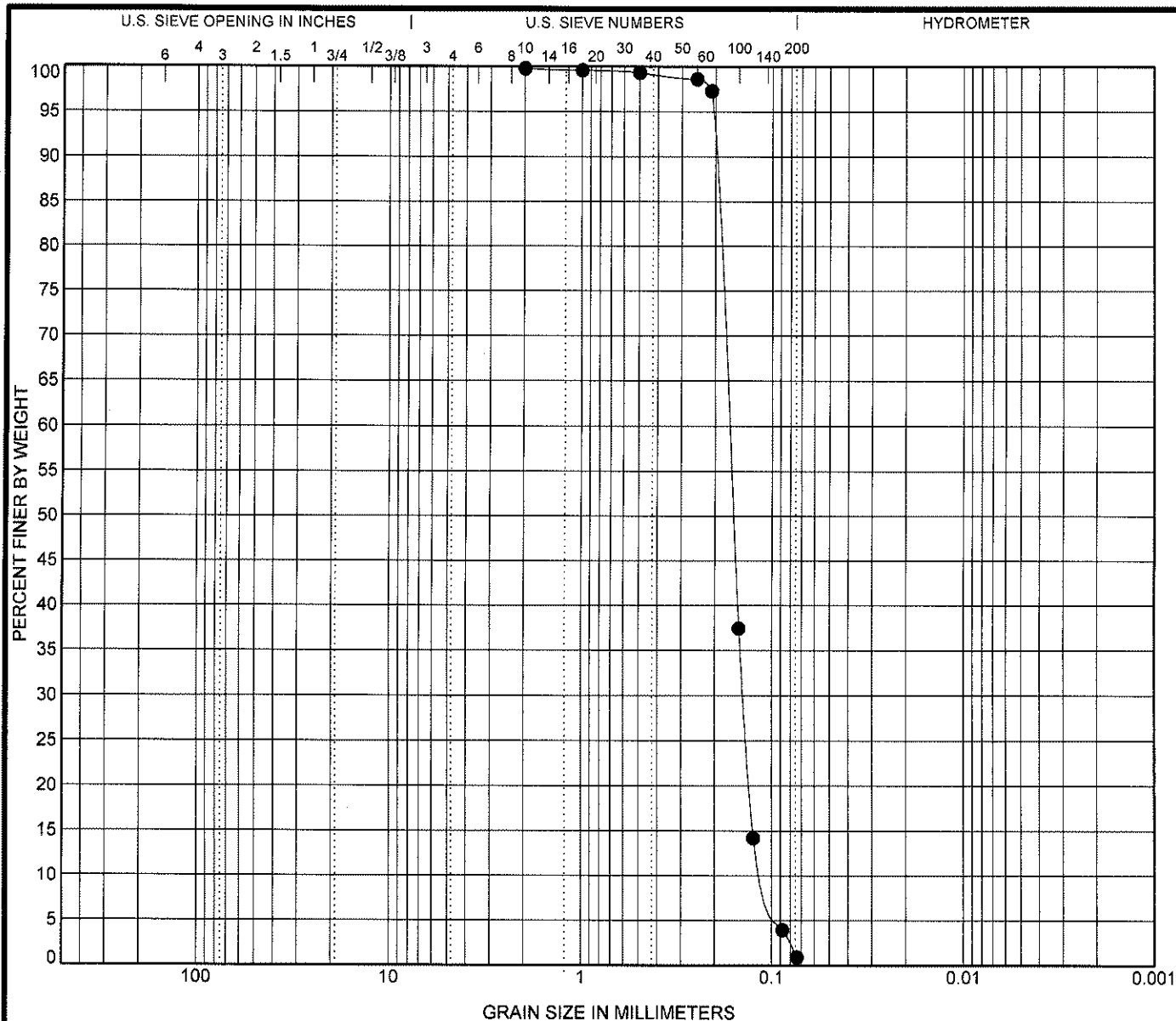
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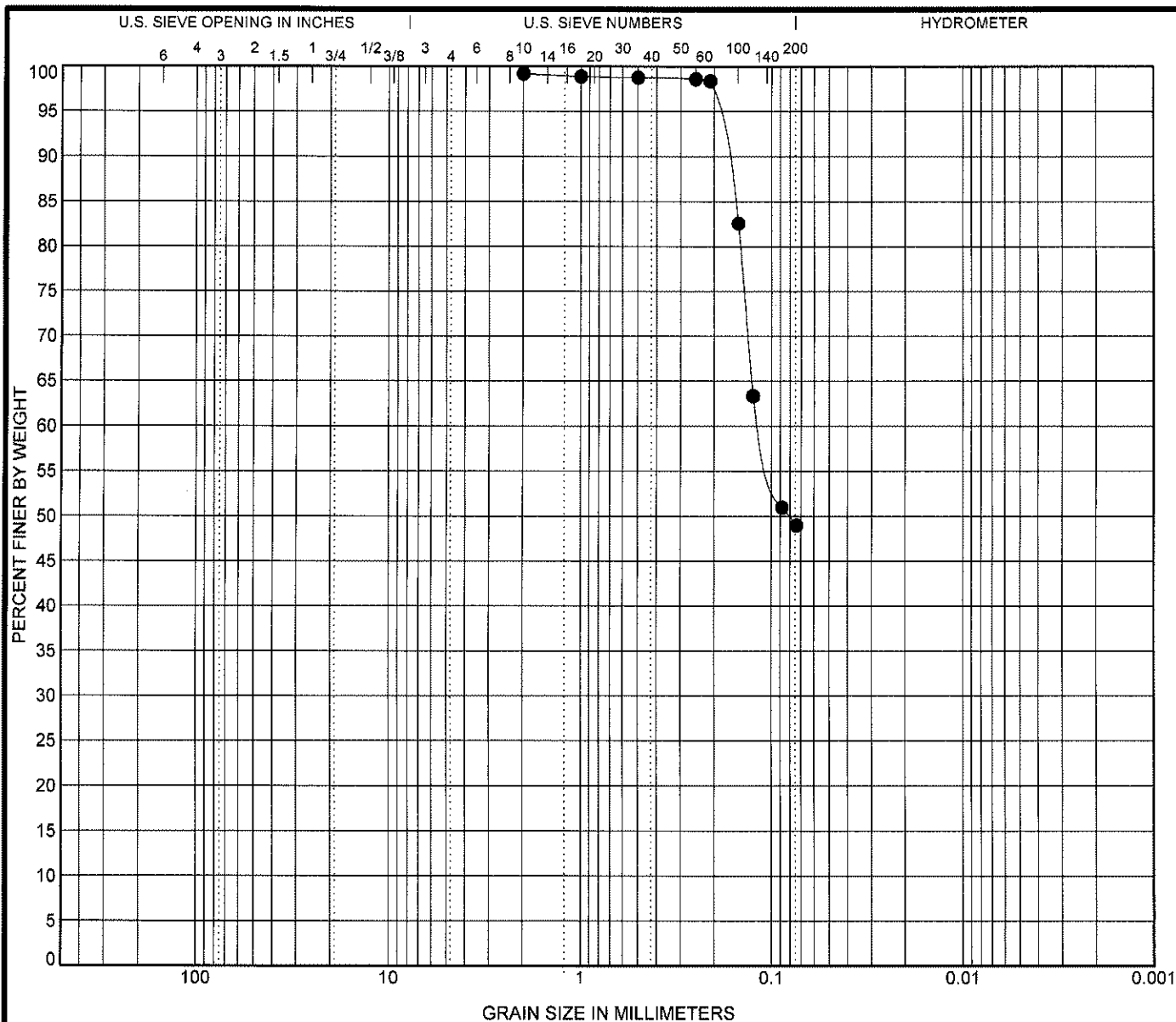


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-24	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)				1.08	1.57

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-24	(-33' to -34' NAVD)	2	0.17	0.141	0.108	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-24	(-35' to -36' NAVD)	Borrow Area (-35' to -36' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-24	(-35' to 36' NAVD)	2	0.114			0.0			



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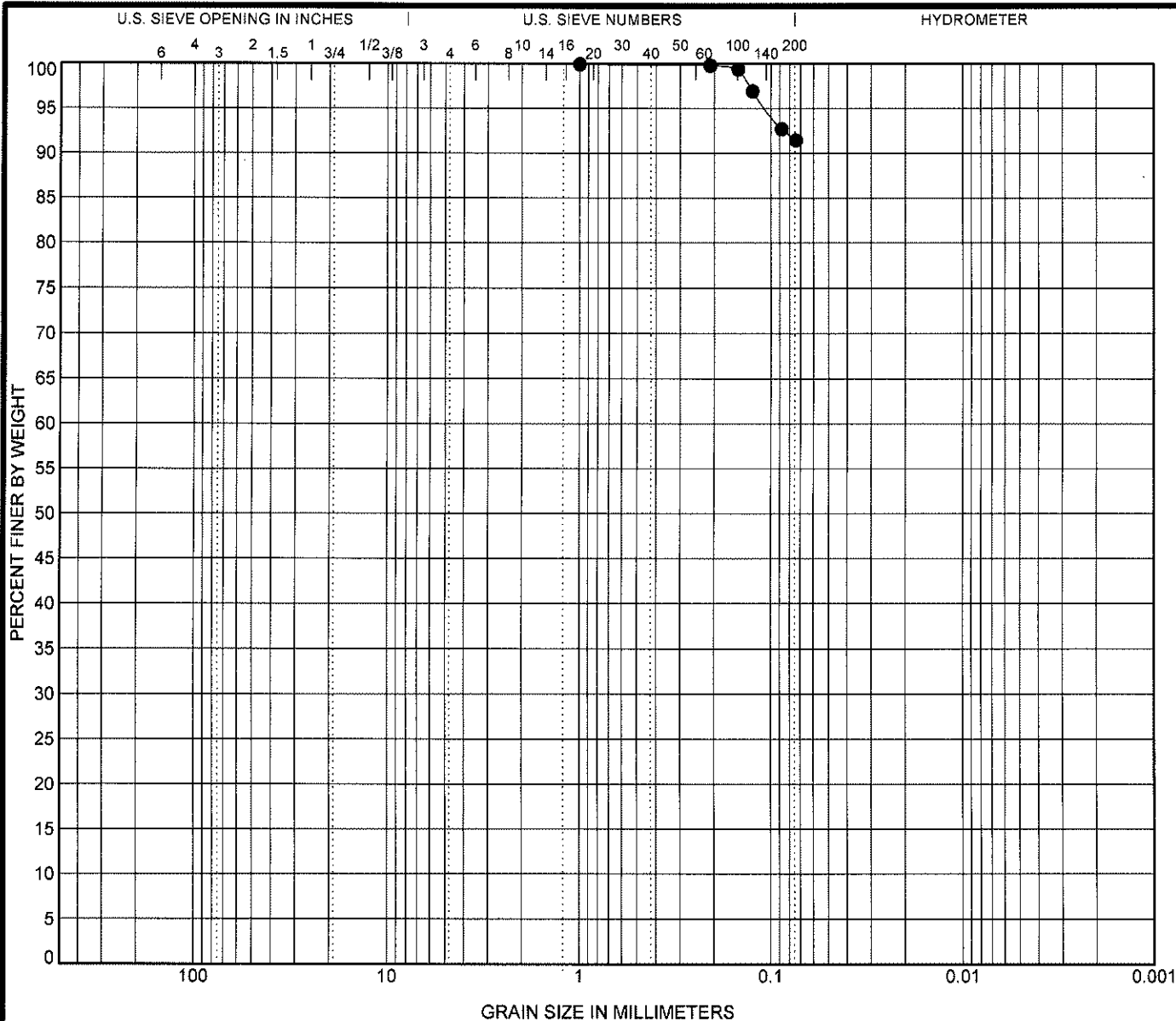
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-24 (-38' to -39' NAVD)		Borrow Area (-38' to -39' NAVD)					

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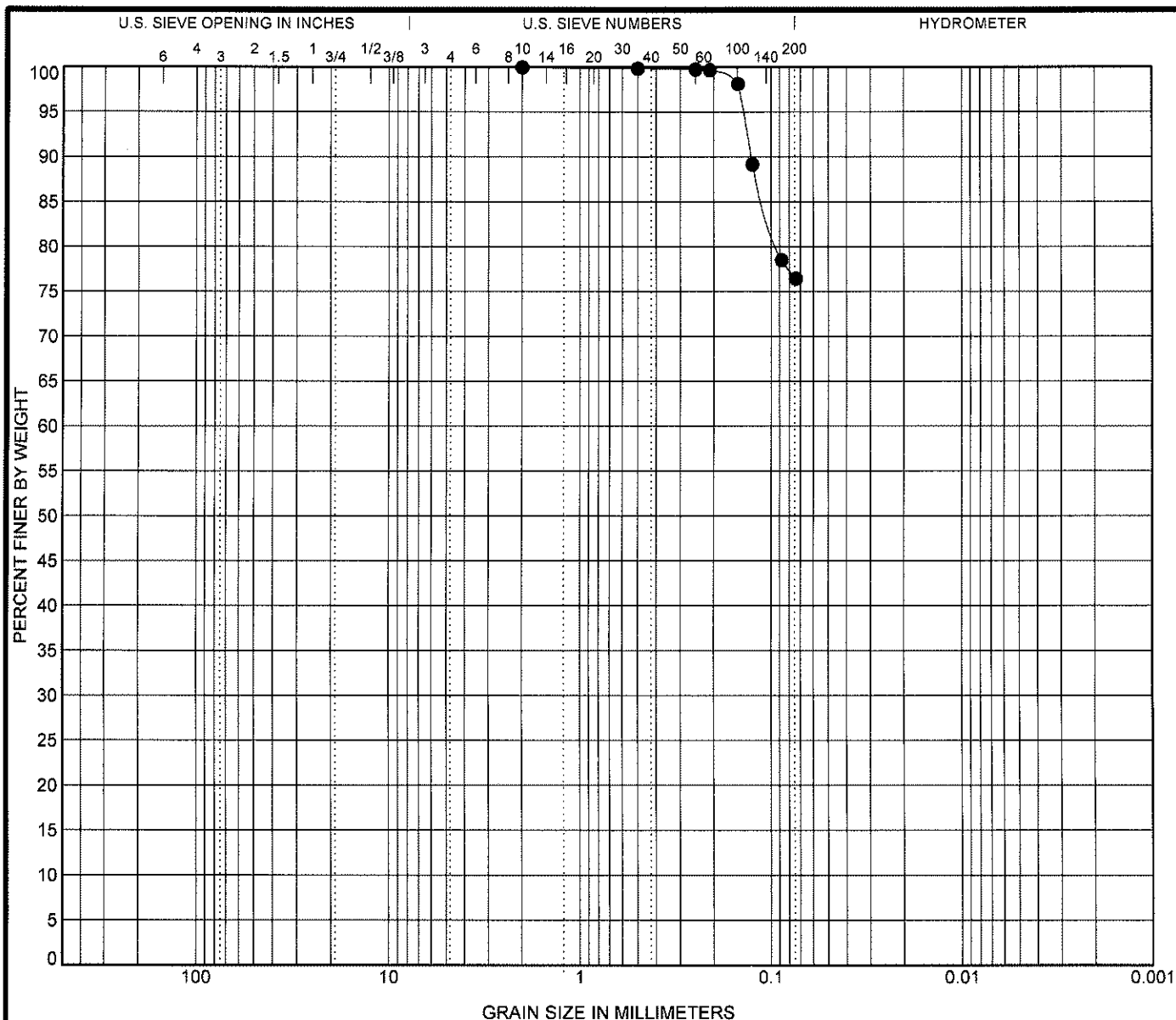
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-24 (-40' to -41' NAVD)		Borrow Area (-40' to -41' NAVD)					

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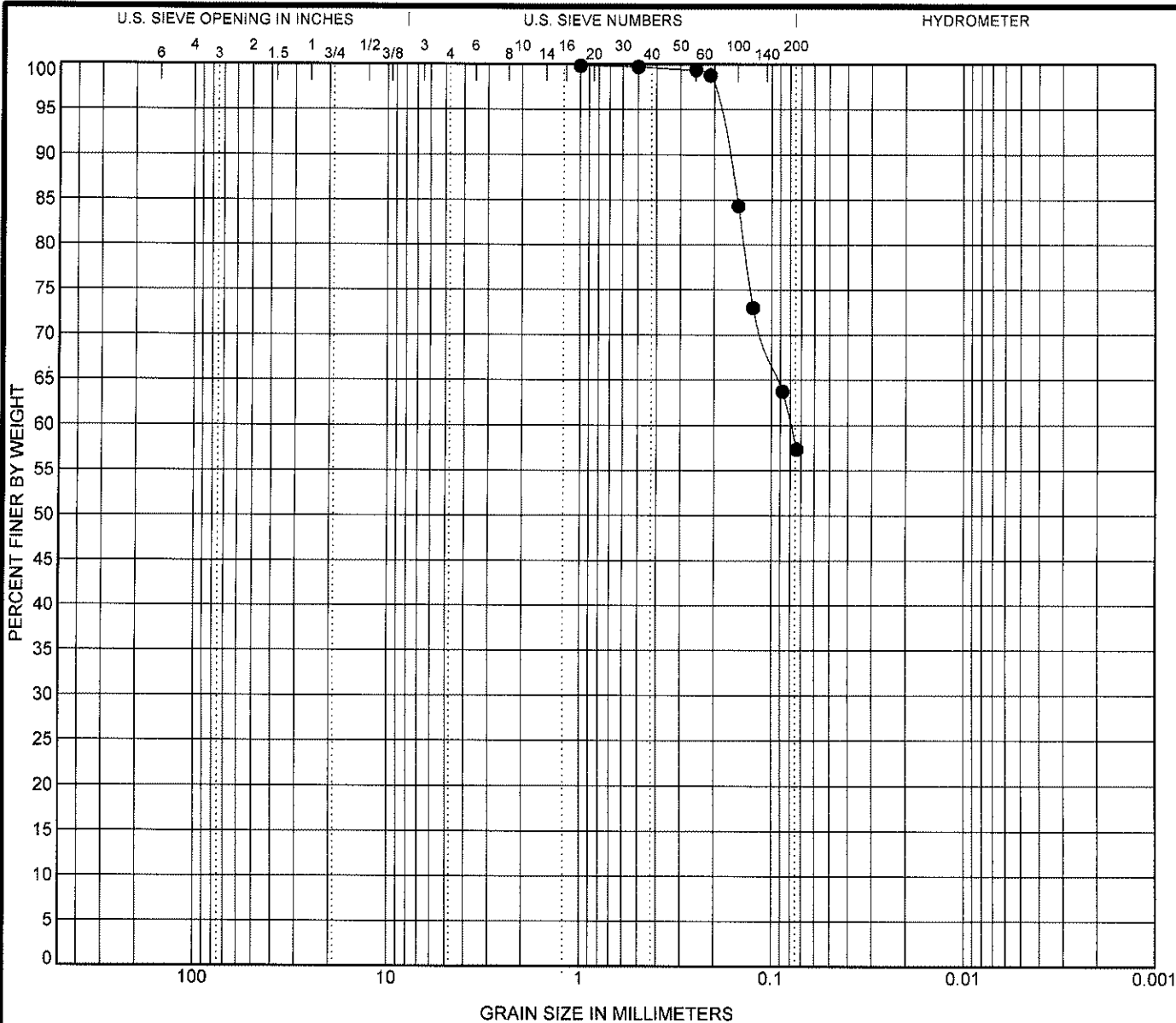
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-25	(-34' to -35' NAVD)	Borrow Area (-34' to -35' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-25	(-34' to -35' NAVD)	1	0.079			0.0			

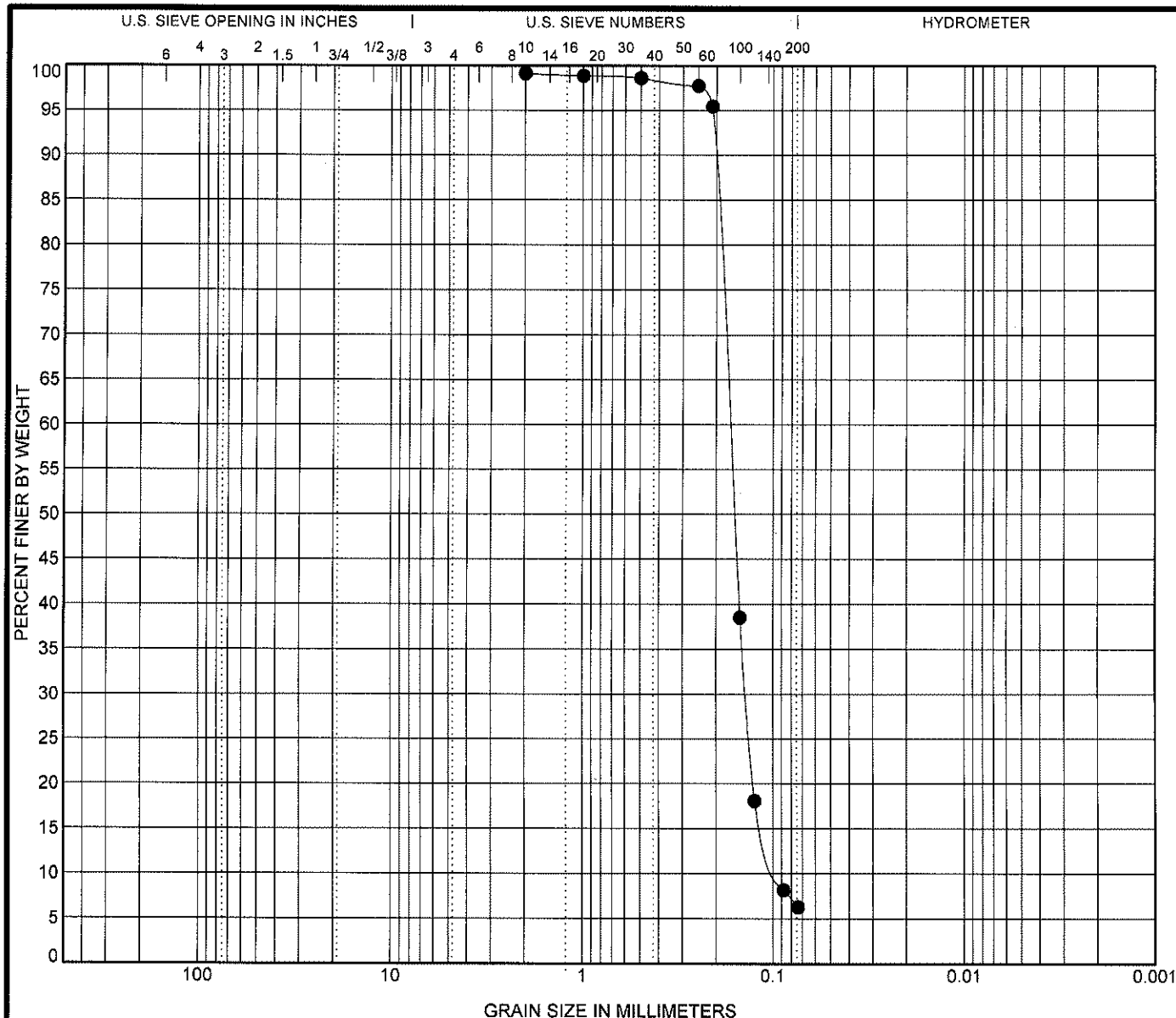


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-25	(-35' to -36' NAVD)	Borrow Area (-35' to -36' NAVD)				1.20	1.81

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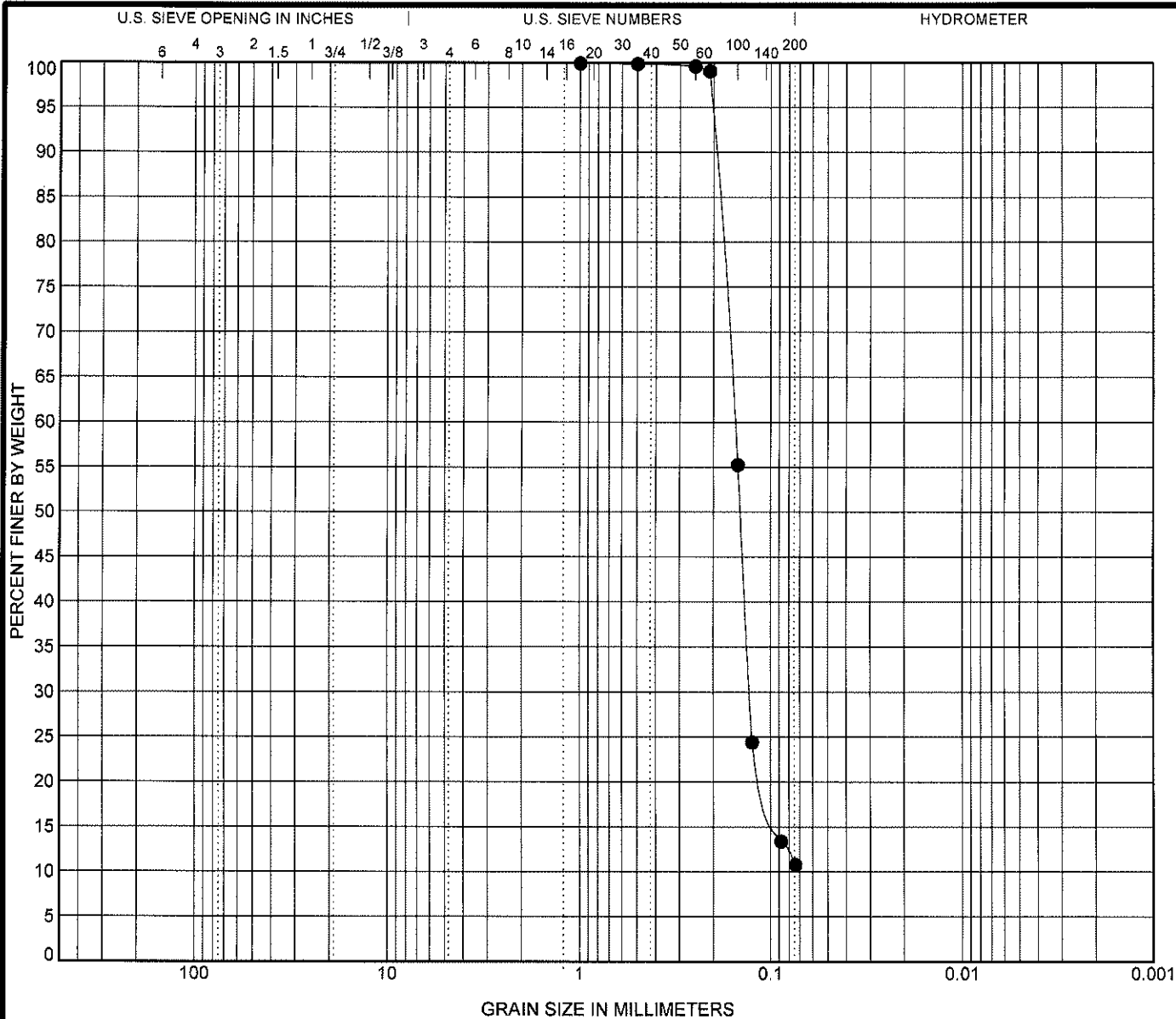
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-25	(-37' to -38' NAVD)	Borrow Area (-37' to -38' NAVD)				1.53	2.20

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-25	(-37' to -38' NAVD)	1	0.155	0.129		0.0			



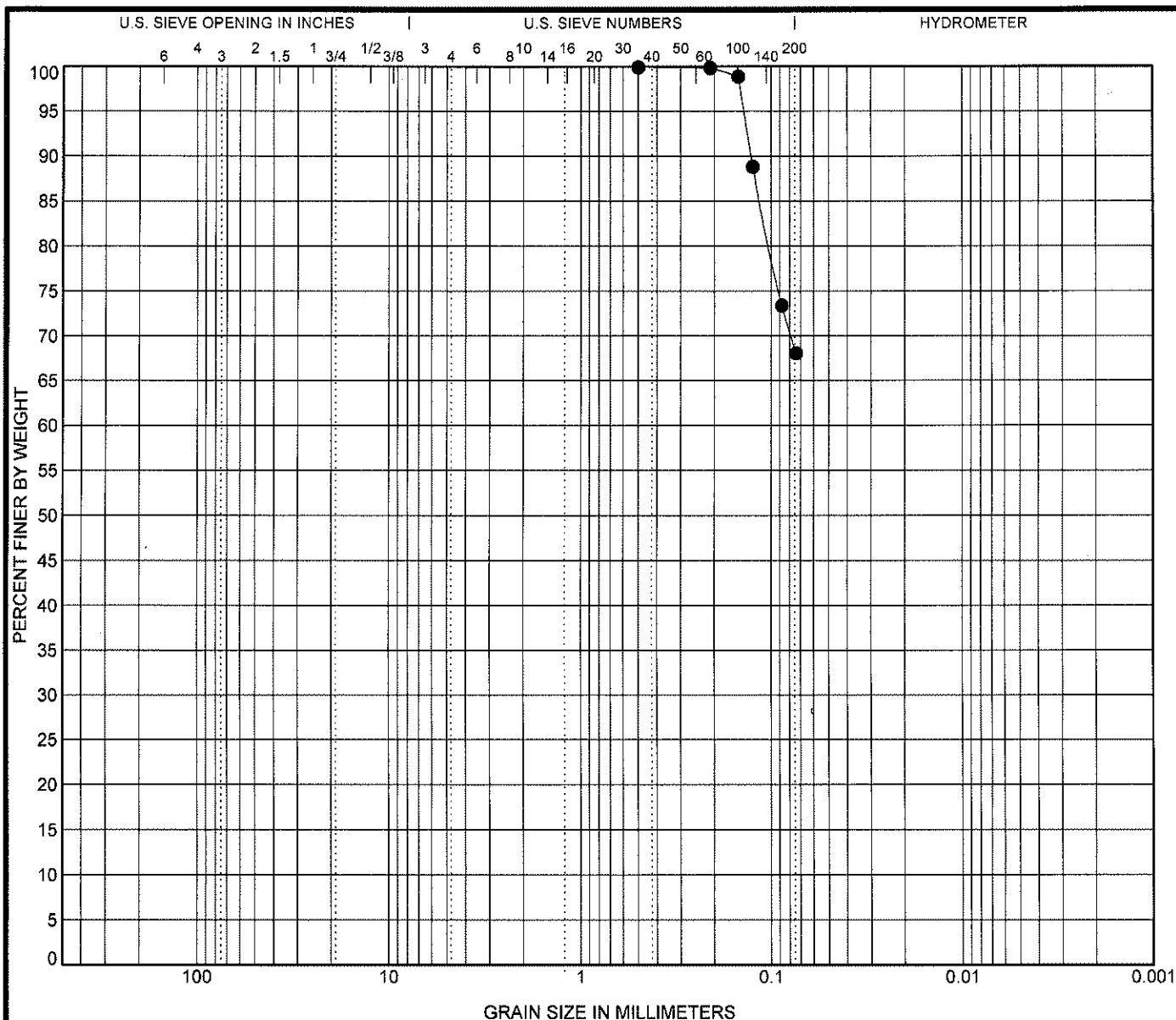
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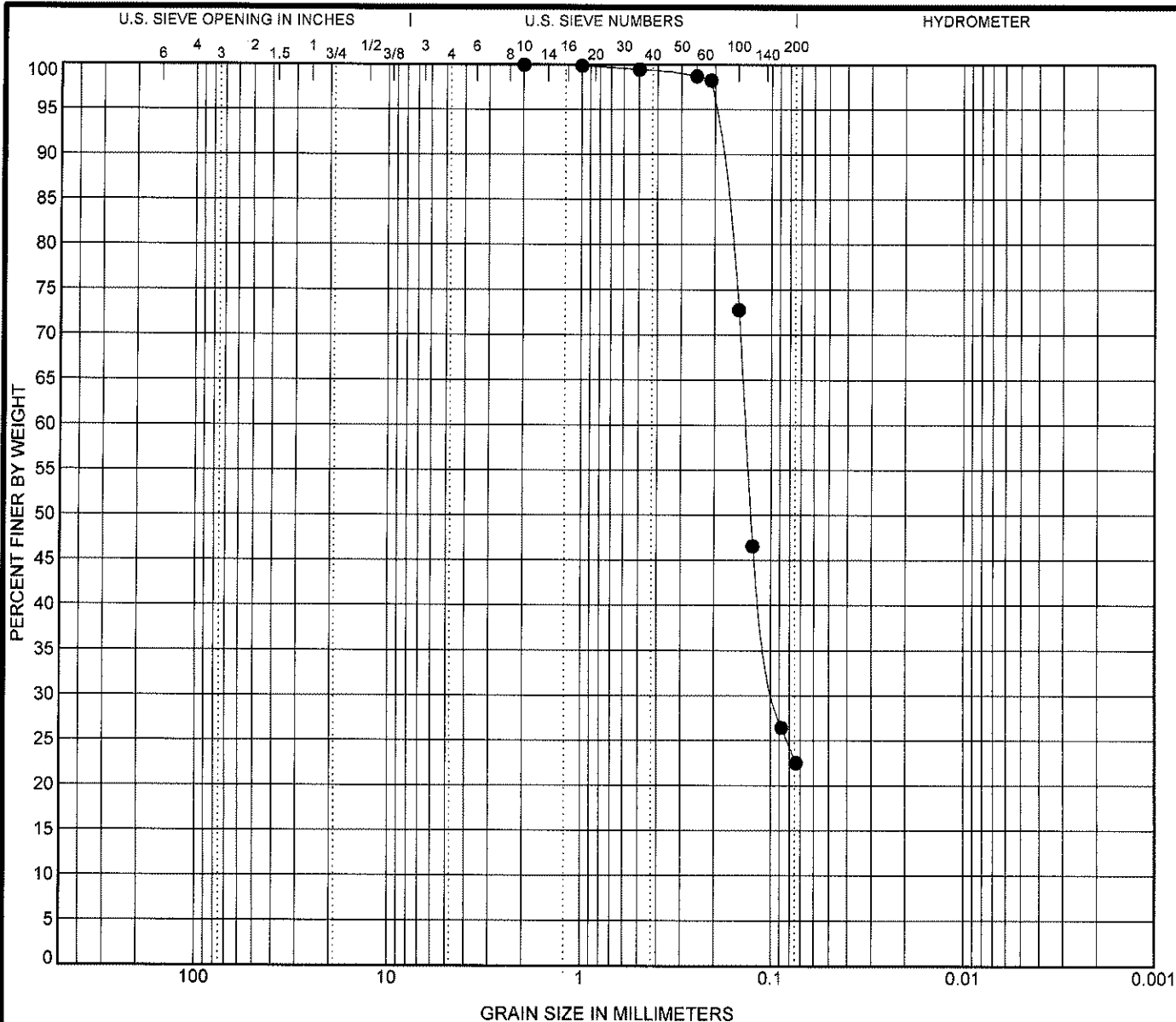
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-26	(-33' to -34' NAVD)	Borrow Area (-33' to -34' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-26	(-33' to -34' NAVD)	2	0.137	0.094		0.0			



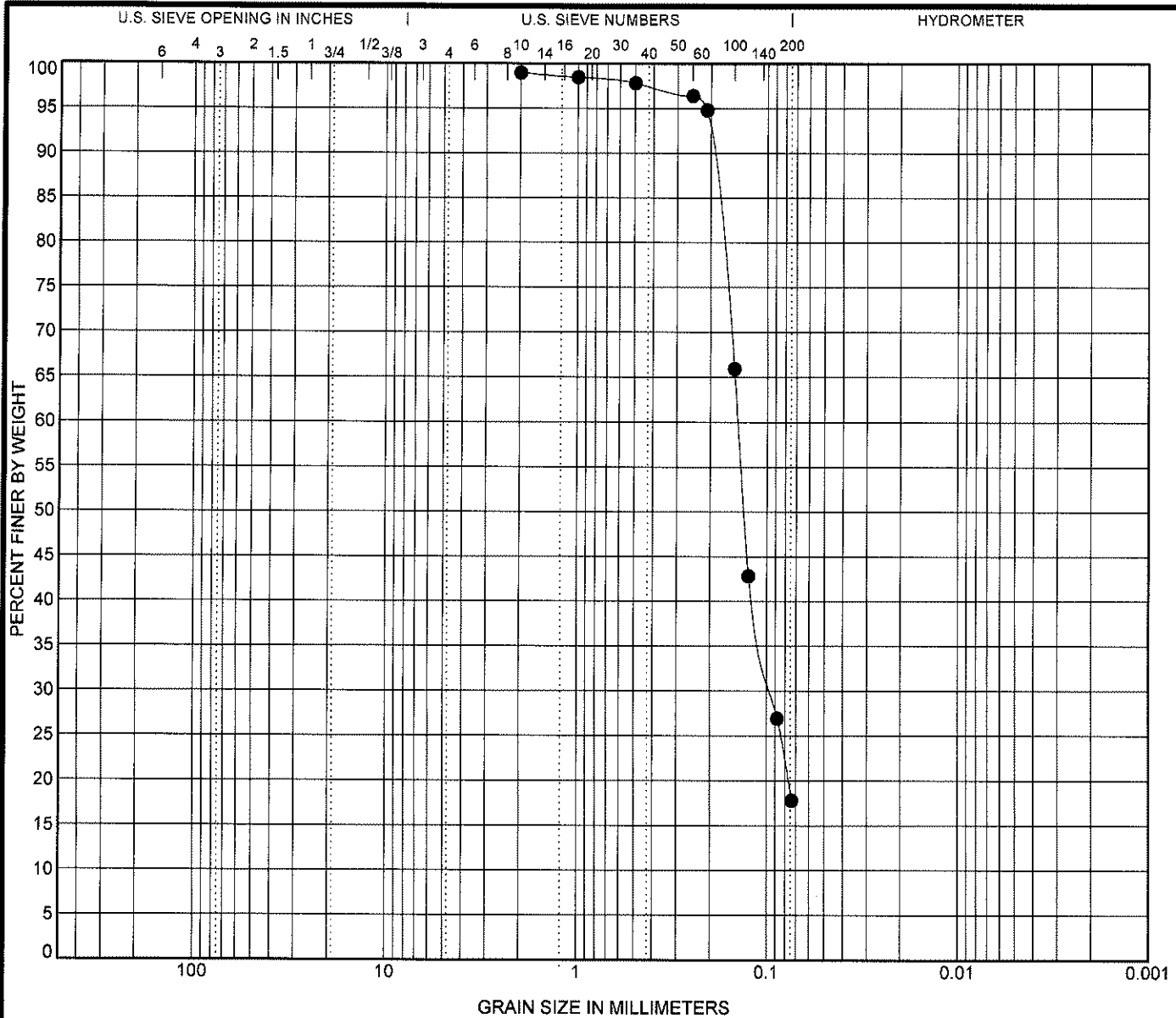
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## GRAIN SIZE DISTRIBUTION

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-26 (-35' to -36' NAVD)		Borrow Area (-35' to -36' NAVD)					

[illegible]

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

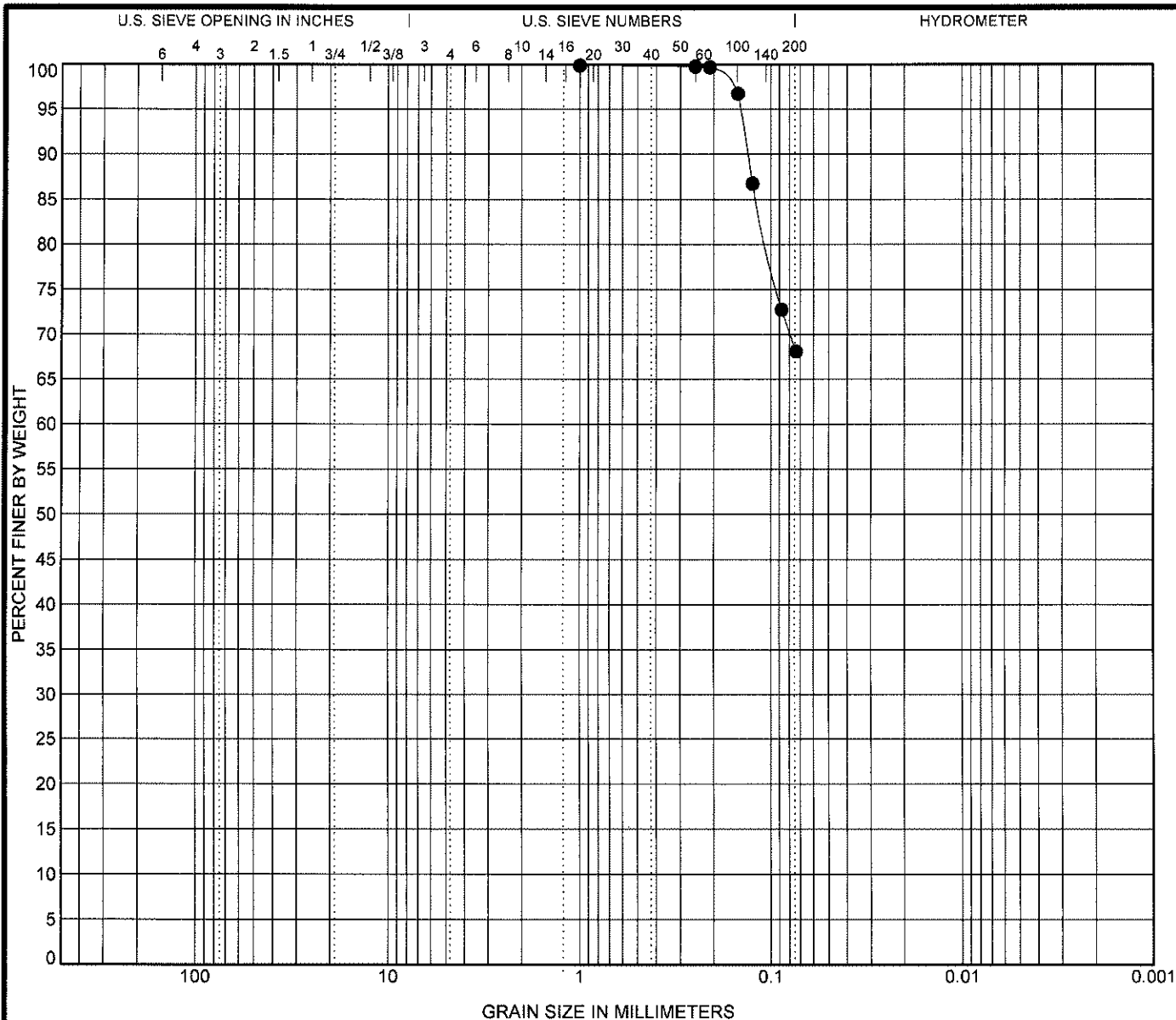
## GRAIN SIZE DISTRIBUTION

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-26	(-38' to -39' NAVD)	Borrow Area (-38' to -39' NAVD)					

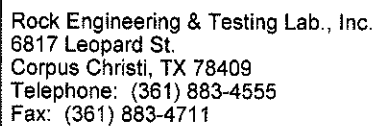
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-26	(-38' to -39' NAVD)	1				0.0			



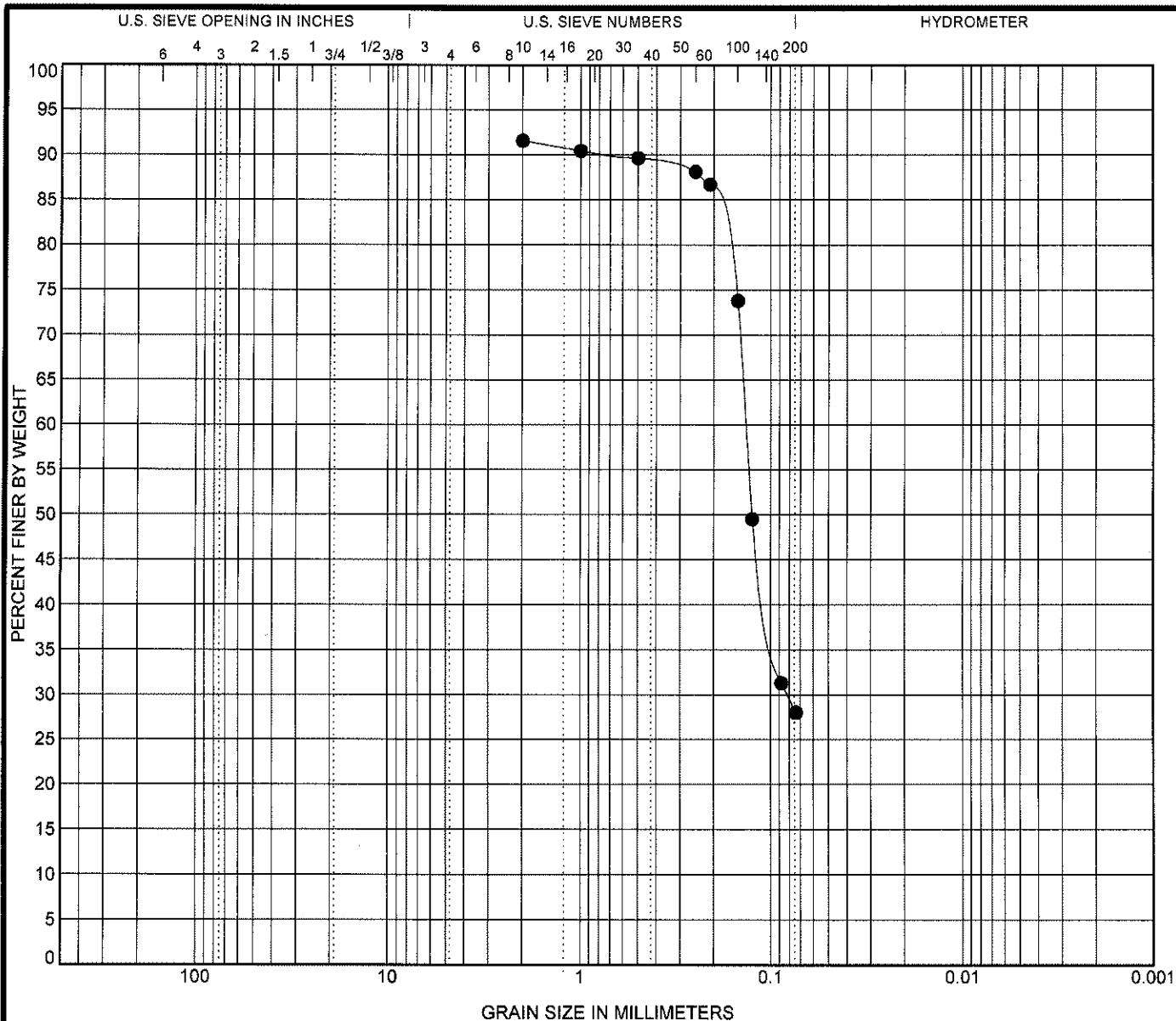
Rock Engineering & Testing Lab., Inc.  
 6817 Leopard St.  
 Corpus Christi, TX 78409  
 Telephone: (361) 883-4555  
 Fax: (361) 883-4711

### GRAIN SIZE DISTRIBUTION

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

[illegible]

## Number: G109112



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen ID	Depth	Classification	LL	PL	PI	Cc	Cu
● AA-27	(-36' to -37' NAVD)	Borrow Area (-36' to -37' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-27	(-36' to -37' NAVD)	2	0.135	0.082		0.0			



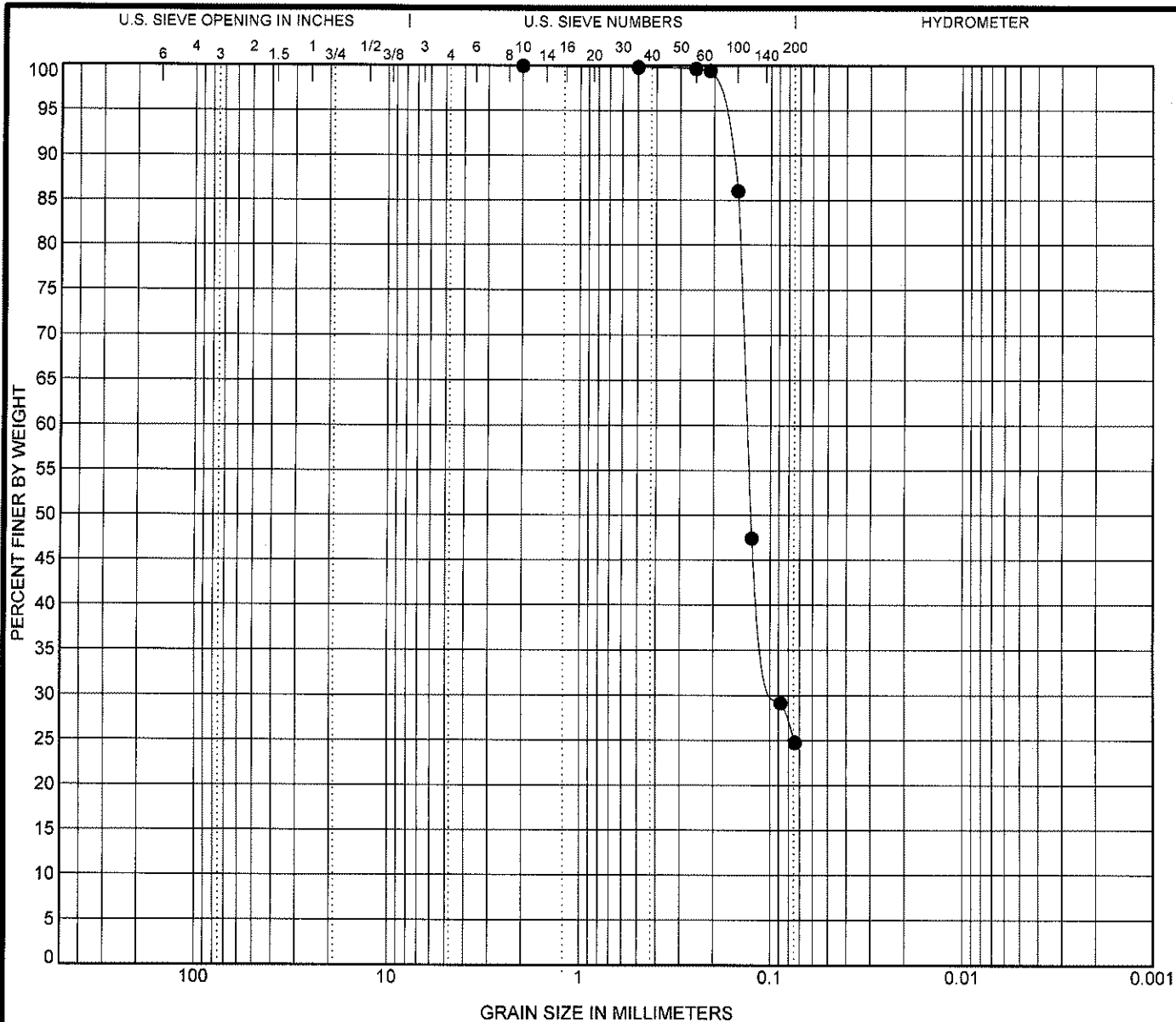
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6817 Leopard St.  
Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
Fax: (361) 883-4711

## 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-27	(-38' to -39' NAVD)	Borrow Area (-38' to -39' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-27	(-38' to -39' NAVD)	2	0.132	0.089		0.0			



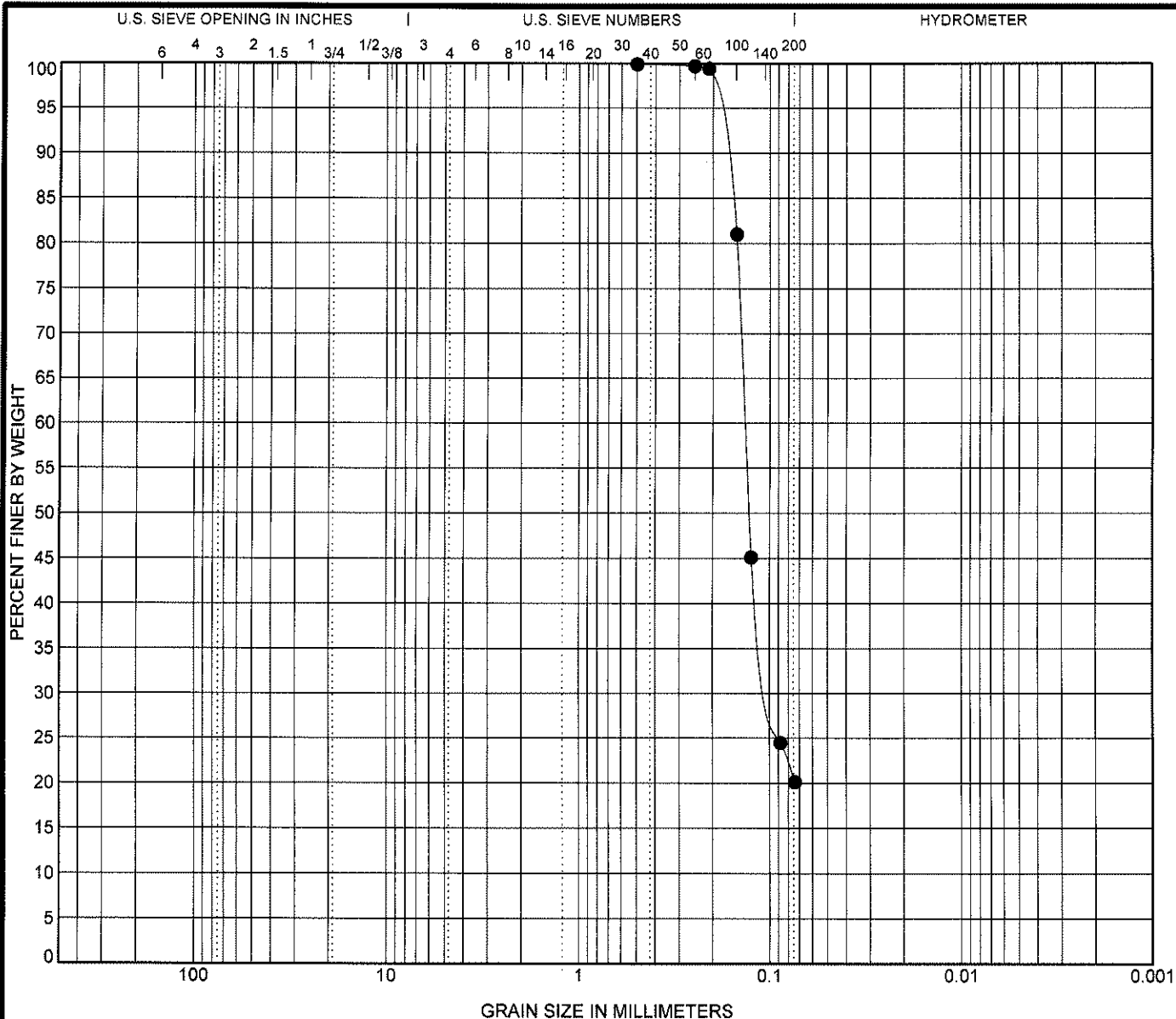
Rock Engineering & Testing Lab., Inc.  
6817 Leopard St.  
Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
Fax: (361) 883-4711

## 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-27 (-40' to -41' NAVD)		<b>Borrow Area (-40' to -41' NAVD)</b>					

[illegible]

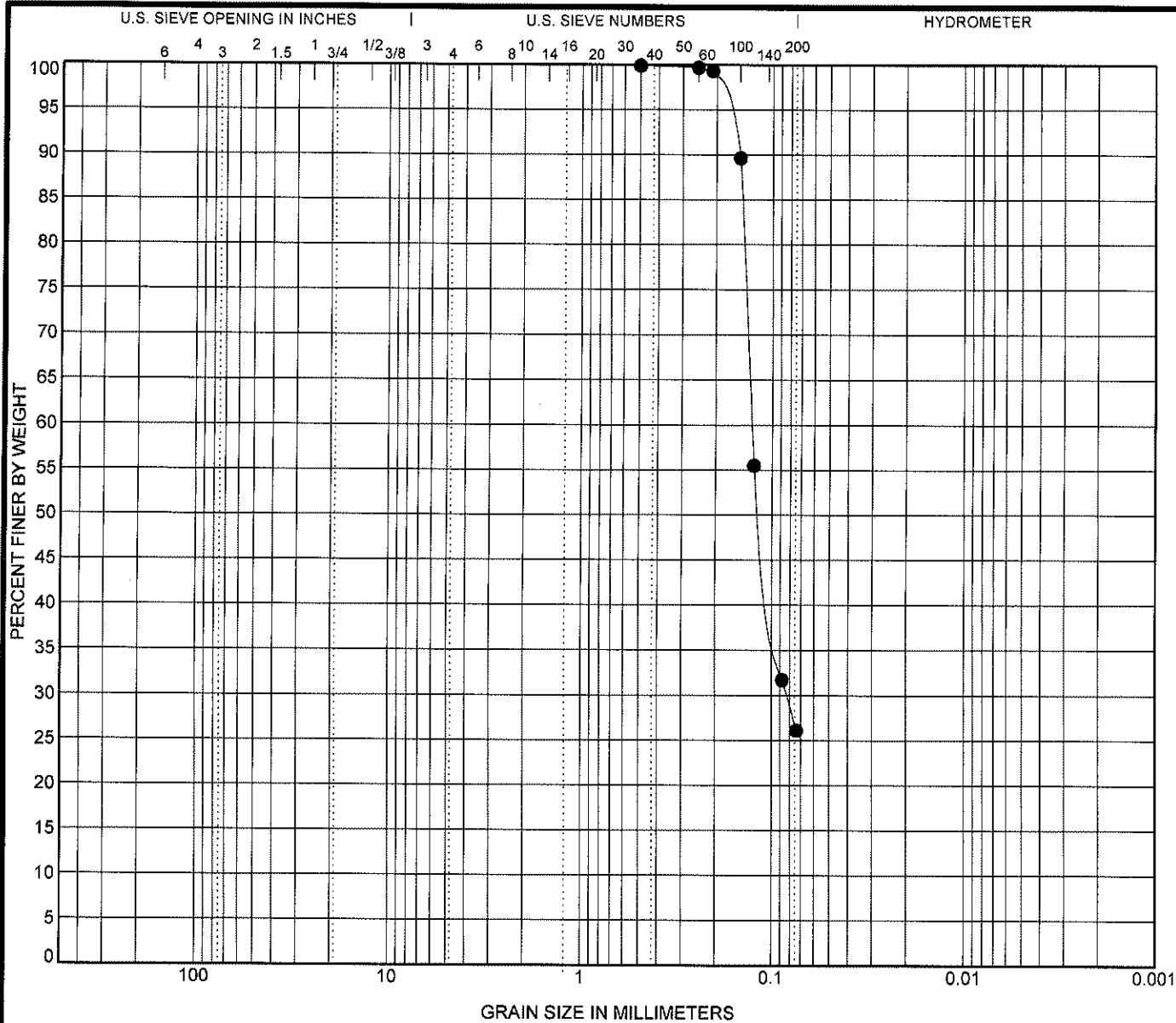
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Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
Fax: (361) 883-4711

## 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-29	(-31' to -32' NAVD)	Borrow Area (-31' to -32' NAVD)					

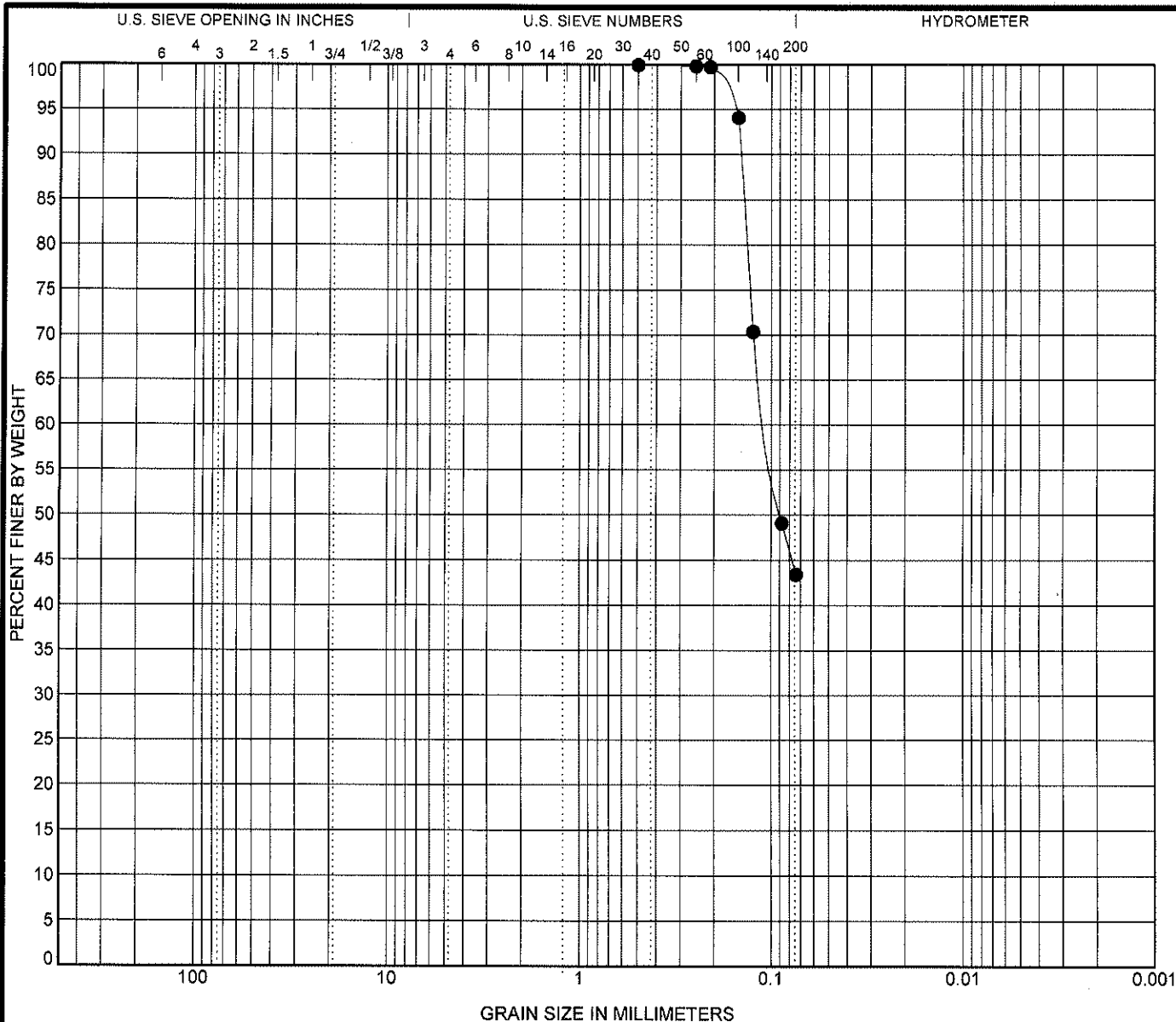
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-29	(-31' to -32' NAVD)	0.5	0.128	0.083		0.0			



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### 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-29	(-34' to -35' NAVD)	<b>Borrow Area (-34' to -35' NAVD)</b>					

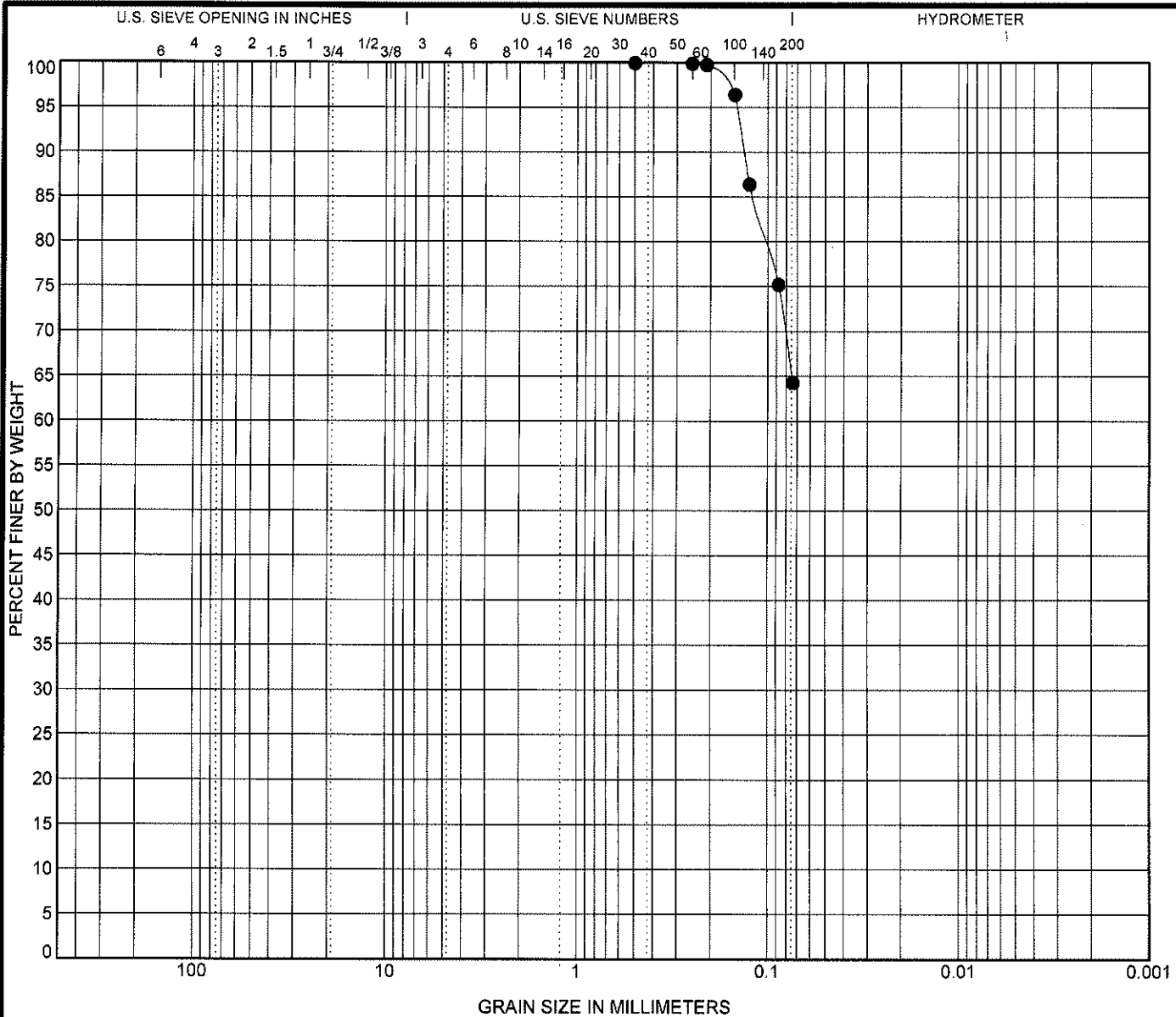
Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-29	(-34' to -35' NAVD)	<b>0.5</b>	<b>0.105</b>			<b>0.0</b>			



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 Telephone: (361) 883-4555  
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### 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-30	(-34' to -35' NAVD)	Borrow Area (-34' to -35' NAVD)					

Specimen ID	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AA-30	(-34' to -35' NAVD)	0.5				0.0			



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 Fax: (361) 883-4711

### GRAIN SIZE DISTRIBUTION

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



# LOG OF BORING AA-01

SHEET 1 OF 2



Rock Engineering & Testing Lab., Inc.  
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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: -36' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	
						LL	PL	PI				
NO. GUSTITZ PROF. ANCHORAGE DRILL SHARD CORRELATION LOGS TO BE FILED WITH THIS	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31											
	32											
	33											
	34											
	35											
	36											
		S-1										
		S-2										
		S-3										1
		S-4										
	40											

**POORLY GRADED SAND**, with shell fragments, brown and gray.

Same as above.

Same as above.

**POORLY GRADED SAND**, with shell fragments, brown and gray.

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. 13,697,653' E. 3,316,595'

## LOG OF BORING AA-01

SHEET 2 OF 2



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):  
Vibrocure

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -36' NAVD

DESCRIPTION OF STRATUM

Same as above.

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

## FIELD DATA

## LABORATORY DATA

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 (%)
						LL	PL	PI			
	41	S-5									

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. 13,697,653' E. 3,316,595'

## SHEET 1 OF 1



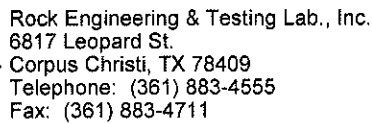
Rock Engineering & Testing Lab., Inc.  
6817 Leopard St.  
Corpus Christi, TX 78409  
Telephone: (361) 883-4555  
Fax: (361) 883-4711

CLIENT: HDR Engineering, Inc.  
PROJECT: Anchorage Basin Sand Source Investigation  
LOCATION: Anchorage Basin; Galveston, Texas  
NUMBER: G109112

DATE(S) DRILLED: 03/13/09 - 03/13/09

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:
						LL	PL	PI				
	21											
	22	S-1									2	<b>POORLY GRADED SAND</b> with shell fragments, brown and gray. Same as above.  Same as above.
	23											
	24		S-2									
	25		S-3									
	26		S-4									
	27	S-5									38	<b>CLAYEY SAND</b> with shell fragments, brown and gray. Same as above.
	28	S-6										
	29	S-7										
	30	S-8									9	<b>POORLY GRADED SAND</b> with clay and shell fragments, gray. Same as above.
	31	S-9										
												Boring was extended to an elevation of -31-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. 13,698,267' E. 3,316,725'

## SHEET 1 OF 2



CLIENT: HDR Engineering, Inc.  
PROJECT: Anchorage Basin Sand Source Investigation  
LOCATION: Anchorage Basin; Galveston, Texas  
NUMBER: G109112

DATE(S) DRILLED: 03/13/09 - 03/13/09

**DRILLING METHOD(S):**  
Vibrocure

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -28' NAVD

### DESCRIPTION OF STRATUM

<b><u>POORLY GRADED SAND</u></b> , with shell fragments, gray.
Same as above.
<b><u>SANDY CLAY</u></b> , gray.
Same as above.
Same as above.
<b><u>CLAYEY SAND</u></b> , gray.
Same as above.
Same as above.
<b><u>SILTY CLAYEY SAND</u></b> , gray.
<b><u>CLAYEY SAND</u></b> , gray.
Same as above.
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. 13,698,824' E. 3,316,993'

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

## LOG OF BORING AA-03

SHEET 2 OF 2



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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: 03/13/09 - 03/13/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -28' NAVD

DESCRIPTION OF STRATUM

SANDY CLAY, gray.

Same as above.

Same as above.

SANDY CLAY, gray.POORLY GRADED SAND, gray.

Same as above.

Boring was extended to an elevation of -46-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. 13,698,824' E. 3,316,993'

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

## LOG OF BORING AA-04

SHEET 1 OF 2



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 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: 03/12/09 - 03/12/09

DRILLING METHOD(S):  
 Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

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

	FIELD DATA				LABORATORY DATA							DRILLING METHOD(S):
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 (%)	Vibracore
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				GROUNDWATER INFORMATION:
												SURFACE ELEVATION: -26' NAVD
												DESCRIPTION OF STRATUM
	21											
	22											
	23											
	24											
	25											
	26											
	27	S-1									82	<u>SANDY CLAY</u> , gray.
	28	S-2										Same as above.
	29	S-3										Same as above.
	30	S-4										<u>SANDY CLAY</u> , gray.
	31	S-5										Same as above.
	32	S-6										Same as above.
	33	S-7									2	<u>POORLY GRADED SAND</u> , gray.
	34	S-8										Same as above.
	35	S-9										Same as above.
	36	S-10									4	<u>POORLY GRADED SAND</u> , gray.
	37	S-11										Same as above.
	38	S-12										Same as above.
	39	S-13									1	<u>POORLY GRADED SAND</u> , gray.
	40	S-14										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. 13,699,436' E. 3,317,401'

## LOG OF BORING AA-04

SHEET 2 OF 2



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CLIENT: HDR Engineering, Inc.  
 PROJECT: Anchorage Basin Sand Source Investigation  
 LOCATION: Anchorage Basin; Galveston, Texas  
 NUMBER: G109112

DATE(S) DRILLED: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

**SANDY CLAY**, 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. 13,699,436' E. 3,317,401'

## LOG OF BORING AA-05

SHEET 1 OF 2



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Fax: (361) 883-4711

CLIENT: HDR Engineering, Inc.  
PROJECT: Anchorage Basin Sand Source Investigation  
LOCATION: Anchorage Basin; Galveston, Texas  
NUMBER: G109112

DATE(S) DRILLED: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27	S-1									78
	28	S-2									
	29	S-3									
	30	S-4									69
	31	S-5									
	32	S-6									21
	33	S-7									
	34	S-8									34
	35	S-9									
	36	S-10									
	37	S-11									46
	38	S-12									
	39	S-13									
	40	S-14									14

SANDY CLAY, gray.

Same as above.

Same as above.

SANDY CLAY, gray.

Same as above.

SILTY CLAYEY SAND, with shell fragments, gray.

CLAYEY SAND, gray.

Same as above.

Same as above.

CLAYEY SAND, gray.

Same as above.

SILTY CLAYEY SAND, gray.

Same as above.

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. 13,700,293' E. 3,317,717'

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



## LOG OF BORING AA-05

SHEET 2 OF 2



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 Fax: (361) 883-4711

CLIENT: HDR Engineering, Inc.

PROJECT: Anchorage Basin Sand Source Investigation

LOCATION: Anchorage Basin; Galveston, Texas

NUMBER: G109112

DATE(S) DRILLED: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

SILTY CLAYEY SAND, gray.

Same as above.

Same as above.

Boring was extended to an elevation of -46-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. 13,700,293' E. 3,317,717'

LOG\_OF\_BORING\_G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ ROCK ETL GDT 4/28/09

## LOG OF BORING AA-06

SHEET 1 OF 1



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: 03/13/09 - 03/13/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI			
	21										
	22										
	23										
	24										
	25										
	26	S-1									
	27	S-2									
	28	S-3									
	29	S-4									4
	30	S-5									
	31	S-6									26
	32	S-7									
	33	S-8									12
	34										

**POORLY GRADED SAND**, with shell fragments, gray and brown.

Same as above.

Same as above.

**POORLY GRADED SAND**, with shell fragments, gray.

Same as above.

**SILTY CLAYEY SAND**, gray.

Same as above.

**POORLY GRADED SAND**, with clay, gray.

Boring was extended to an elevation of -34-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. 13,697,692' E. 3,317,372'

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

## LOG OF BORING AA-07

SHEET 1 OF 1



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: 03/13/09 - 03/13/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

**POORLY GRADED SAND** with shell fragments, brown and gray.

Same as above.

Same as above.

**POORLY GRADED SAND** with clay and shell fragments, gray.

Same as above.

Same as above.

**POORLY GRADED SAND** with shell fragments, gray.

Same as above.

Same as above, with clay.

**POORLY GRADED SAND** with clay and shell fragments, gray.

Boring was extended to an elevation of -36-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. 13,697,972' E. 3,317,029'

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

## LOG OF BORING AA-08

SHEET 1 OF 2



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: 03/13/09 - 03/13/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29										
	30										
	31	S-1									
	32	S-2									
	33	S-3									
	34	S-4									3
	35	S-5									
	36	S-6									22
	37	S-7									
	38	S-8									
	39	S-9									
	40	S-10									19

**POORLY GRADED SAND**, with shell fragments, gray.

Same as above.

Same as above.

**POORLY GRADED SAND**, gray.

**SILTY CLAYEY SAND**, gray.

Same as above.

Same as above.

**SILTY CLAYEY SAND**, gray.

Same as above.

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. 13,698,396' E. 3,317,267'

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

# LOG OF BORING AA-08

SHEET 2 OF 2



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: 03/13/09 - 03/13/09

DRILLING METHOD(S):  
Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

SILTY CLAYEY SAND, gray.

CLAYEY SAND, gray.

SANDY CLAY, gray.

Same as above.

Boring was extended to an elevation of -44-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. 13,698,396' E. 3,317,267'

## LOG OF BORING AA-09

SHEET 1 OF 1



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):

Vibrocure

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -32' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31											
	32											
	33	S-1										
	34	S-2									37	
	35	S-3									28	
	36	S-4										
	37	S-5									18	
	38	S-6										
	39	S-7									4	

**POORLY GRADED SAND**, with shell fragments, gray.**CLAYEY SAND**, with shell fragments, gray.**SILTY CLAYEY SAND**, dark gray.

Same as above, gray.

Same as above.

**SILTY CLAYEY SAND**, gray.**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'

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

## LOG OF BORING AA-10

SHEET 1 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				
	19											
	20											
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31	S-1									38	
	32	S-2									11	
	33	S-3									36	
	34	S-4										
	35	S-5									36	
	36	S-6										

CLAYEY SAND, with shell fragments, gray.

POORLY GRADED SAND, with clay and shell fragments, gray.

CLAYEY SAND, gray.

Same as above.

Same as above.

POORLY GRADED SAND, gray.

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. 13,698,835' E. 3,317,844'

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

## LOG OF BORING AA-10

SHEET 2 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

Same as above.

Same as above.

**SANDY CLAY**, gray.

Same as above.

Boring was extended to an elevation of -40-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. 13,698,835' E. 3,317,844'



## LOG OF BORING AA-11

SHEET 1 OF 1



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -28' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29	S-1									62	
	30	S-2										
	31	S-3									47	
	32	S-4									21	
	33	S-5										
	34	S-6									15	
	35	S-7										
	36	S-8										
	37	S-9									2	
	38	S-10										

**SANDY CLAY**, with shell fragments, gray.**SILTY CLAYEY SAND**, with shell fragments, gray.**CLAYEY SAND**, gray.**SILTY CLAYEY SAND**, gray.

Same as above.

Same as above.

**POORLY GRADED SAND**, gray.

Same as above.

Same as above.

**POORLY GRADED SAND**, gray.

Boring was extended to an elevation of -38-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. 13,699,483' E. 3,318,163'

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

# LOG OF BORING AA-12

SHEET 1 OF 1



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):  
Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -26' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27	S-1									2
	28	S-2									73
	29	S-3									
	30	S-4									83
	31	S-5									
	32	S-6									
	33	S-7									8
	34	S-8									

**POORLY GRADED SAND**, with shell fragments, gray.

**SANDY CLAY**, gray.

Same as above.

Same as above.

**SANDY CLAY**, gray.

Same as above.

**POORLY GRADED SAND**, with clay, gray.

Same as above.

Boring was extended to an elevation of -34-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. 13,700,304' E. 3,318,392'

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

## LOG OF BORING AA-13

SHEET 1 OF 2



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: -32' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LL	PL	PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29										
	30										
	31										
	32										
	33	S-1									2
	34	S-2									
	35	S-3									11
	36	S-4									19
	37	S-5									
	38	S-6									9
	39	S-7									
	40	S-8									

**POORLY GRADED SAND**, with shell fragments, gray.

Same as above.

Same as above, with clay.

**SILTY CLAYEY SAND**, gray.**POORLY GRADED SAND**, with clay, gray.

Same as above.

Same as above.

**POORLY GRADED SAND**, with clay, gray.

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. 13,698,028' E. 3,318,672'

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

## LOG OF BORING AA-13

SHEET 2 OF 2



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: -32' NAVD

DESCRIPTION OF STRATUM

Same as above.

Same as above.

Boring was extended to an elevation of -42-feet NAVD during the drilling operations.

## FIELD DATA

## LABORATORY DATA

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 (%)
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI			
	41	S-9									5
	42	S-10									

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. 13,698,028' E. 3,318,672'

## LOG OF BORING AA-14

SHEET 1 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LL	PL	PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29										
	30										
	31	S-1									39
	32	S-2									8
	33	S-3									
	34	S-4									26
	35	S-5									
	36	S-6									6
	37	S-7									
	38	S-8									
	39	S-9									15
	40	S-10									

CLAYEY SAND, gray.

POORLY GRADED SAND, with clay and shell fragments, gray.  
 Same as above.

SILTY CLAYEY SAND, with shell fragments, gray.  
 Same as above.

POORLY GRADED SAND, with clay, gray.  
 Same as above.

SILTY CLAYEY SAND, gray.  
 Same as above.  
 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. 13,698,747' E. 3,318,773'

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

## LOG OF BORING AA-14

SHEET 2 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

**SILTY CLAYEY SAND**, gray.

Same as above.

Same as above.

**SILTY CLAYEY SAND**, gray.

Boring was extended to an elevation of -44-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. 13,698,747' E. 3,318,773'

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

## LOG OF BORING AA-15

SHEET 1 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LL	PL	PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29										
	30										
	31	S-1									6
	32	S-2									41
	33	S-3									
	34	S-4									22
	35	S-5									
	36	S-6									
	37	S-7									33
	38	S-8									
	39	S-9									
	40	S-10									7

POORLY GRADED SAND, with clay, gray.

CLAYEY SAND, with shell fragments, gray.

SILTY CLAYEY SAND, with shell fragments, gray.

Same as above.

CLAYEY SAND, gray.

Same as above.

Same as above.

POORLY GRADED SAND, with clay, gray.

Same as above.

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. 13,699,240' E. 3,318,962'

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

## LOG OF BORING AA-15

SHEET 2 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

**POORLY GRADED SAND**, with clay, gray.

Same as above.

Same as above.

Boring was extended to an elevation of -43-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. 13,699,240' E. 3,318,962'



# LOG OF BORING AA-16

SHEET 1 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -28' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSION STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)
						LL	PL	PI			
	19										
	20										
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29	S-1									19
	30	S-2									
	31	S-3									21
	32	S-4									
	33	S-5									72
	34	S-6									
	35	S-7									35
	36	S-8									

SILTY CLAYEY SAND, gray.

Same as above.

Same as above.

SANDY CLAY, with shell fragments, gray.

Same as above.

Same as above.

CLAYEY SAND, gray.

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. 13,699,918' E. 3,319,141'

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

## LOG OF BORING AA-16

SHEET 2 OF 2



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: 03/12/09 - 03/12/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -28' NAVD

DESCRIPTION OF STRATUM

Same as above.

POORLY GRADED SAND, gray.

Same as above.

Same as above.

Boring was extended to an elevation of -40-feet NAVD during the drilling operations.

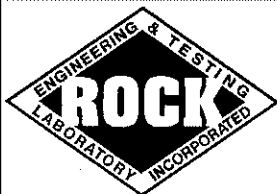
N - STANDARD PENETRATION TEST RESISTANCE  
P - POCKET PENETROMETER RESISTANCE  
T - POCKET TORVANE SHEAR STRENGTH

REMARKS:

Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by Ocean Surveys, Inc.  
GPS Coord. N. 13,699,918' E. 3,319,141'

## LOG OF BORING AA-17

SHEET 1 OF 2



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

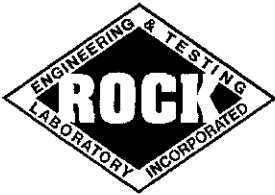
DESCRIPTION OF STRATUM

SOIL SYMBOL	FIELD DATA					LABORATORY DATA						
	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 (%)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX 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									18	<b>SILTY CLAYEY SAND</b> , with shell fragments, gray. Same as above.
	34	S-3									19	
	35	S-4										<b>POORLY GRADED SAND</b> , with clay, gray. Same as above.
	36	S-5										Same as above.
	37	S-6										Same as above.
	38	S-7									10	<b>SILTY CLAYEY SAND</b> , gray. Same as above.
	39	S-8										
	40	S-9										
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 G109112 PROP. ANCHORAGE BASIN SAND SOURCE GPJ ROCK ETL GDT 4/28/09

## LOG OF BORING AA-17

SHEET 2 OF 2



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.

## FIELD DATA

## LABORATORY DATA

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 (%)
						LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX			
						LL	PL	PI			
	41	S-10									19

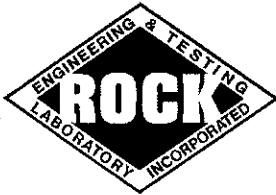
N - STANDARD PENETRATION TEST RESISTANCE  
 P - POCKET PENETROMETER RESISTANCE  
 T - POCKET TORVANE SHEAR STRENGTH

## 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-18

SHEET 1 OF 2



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: 03/13/09 - 03/13/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				
	19											
	20											
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31	S-1									3	
	32	S-2										
	33	S-3										
	34	S-4									1	
	35	S-5										
	36	S-6									31	

**POORLY GRADED SAND**, with shell fragments, gray.

Same as above.

Same as above.

**POORLY GRADED SAND**, gray.

Same as above.

**CLAYEY SAND**, gray.

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. 13,699,496' E. 3,319,957'

## LOG OF BORING AA-18

SHEET 2 OF 2



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: 03/13/09 - 03/13/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -30' NAVD

DESCRIPTION OF STRATUM

Same as above.

Same as above.

**POORLY GRADED SAND**, gray.

Same as above.

Boring was extended to an elevation of -40-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. 13,699,496' E. 3,319,957'

## LOG OF BORING AA-19

SHEET 1 OF 2



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: -28' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28	S-1									42	<u>CLAYEY SAND</u> , gray.
	29											Same as above.
	30	S-2										<u>SANDY CLAY</u> , dark gray.
	31	S-3									75	Same as above.
	32	S-4										Same as above.
	33	S-5										<u>POORLY GRADED SAND</u> , with clay, gray.
	34	S-6									9	
	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



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: -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.

## FIELD DATA

## LABORATORY DATA

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 (%)
								LL	PL	PI			
		41	S-13										
		42	S-14										25

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 AA-20

SHEET 1 OF 2



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: -32' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)
						LL	PL	PI			
	21										
	22										
	23										
	24										
	25										
	26										
	27										
	28										
	29										
	30										
	31										
	32										
	33	S-1									7
	34	S-2									
	35	S-3									
	36	S-4									31
	37	S-5									
	38	S-6									
	39	S-7									38
	40	S-8									

**POORLY GRADED SAND**, with clay, gray.

Same as above.

Same as above.

**CLAYEY SAND**, with shell fragments, gray.

Same as above.

Same as above.

**CLAYEY SAND**, gray.**POORLY GRADED SAND**, gray.

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. 13,698,014' E. 3,320,905'

## LOG OF BORING AA-20

SHEET 2 OF 2



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: -32' NAVD

DESCRIPTION OF STRATUM

Same as above.

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

## FIELD DATA

## LABORATORY DATA

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 (%)
						LL	PL	PI			
	41	S-9									3

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. 13,698,014' E. 3,320,905'

## LOG OF BORING AA-21

SHEET 1 OF 2



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

	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:	
						LL	PL	PI				SURFACE ELEVATION: -33' NAVD	
												DESCRIPTION OF STRATUM	
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												
	32												
	33												
	34	S-1									4	<u>POORLY GRADED SAND</u> , gray.	
	35	S-2										<u>SANDY CLAY</u> , gray.	
	36	S-3									74	Same as above, dark gray.	
	37	S-4										Same as above.	
	38	S-5									45	<u>CLAYEY SAND</u> , dark gray.	
	39	S-6										Same as above.	
	40	S-7										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. 13,698,958' E. 3,321,049'	

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

## LOG OF BORING AA-21

SHEET 2 OF 2



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: -33' NAVD

DESCRIPTION OF STRATUM

**SILTY CLAYEY SAND**, dark gray.

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

## FIELD DATA

## LABORATORY DATA

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 (%)
						LL	PL	PI			
41		S-8									23

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. 13,698,958' E. 3,321,049'

## LOG OF BORING AA-22

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

	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:	
						LL	PL	PI				SURFACE ELEVATION: -31' NAVD	
												DESCRIPTION OF STRATUM	
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												
	32	S-1									46		CLAYEY SAND, gray.
	33	S-2									93		SANDY CLAY, gray.
	34	S-3									26		SILTY CLAYEY SAND, gray.
	35	S-4											Same as above.
	36	S-5									72		SANDY CLAY, gray.
	37	S-6											Same as above.
	38	S-7											Same as above.
	39	S-8									39		CLAYEY SAND, gray.
	40	S-9											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. 13,700,020' E. 3,321,179'	

LOG OF BORING G109112 PROP ANCHORAGE BASIN SAND SOURCE GPJ ROCK ETL GDT 42809

## LOG OF BORING AA-22

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

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. 13,700,020' E. 3,321,179'

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

## LOG OF BORING AA-23

SHEET 1 OF 2



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

	FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Vibrocure	
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: -32' NAVD	
						LL	PL	PI				DESCRIPTION OF STRATUM	
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												
	32												
	33	S-1									23	<u>SILTY CLAYEY SAND</u> , gray.	
	34	S-2										Same as above.	
	35	S-3									32	<u>CLAYEY SAND</u> , gray.	
	36	S-4										Same as above.	
	37	S-5									20	<u>SILTY CLAYEY SAND</u> , gray.	
	38	S-6										Same as above.	
	39	S-7										<u>CLAYEY SAND</u> , gray.	
	40	S-8									39	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. 13,698,522' E. 3,321,488'	

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

## LOG OF BORING AA-23

SHEET 2 OF 2



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: -32' NAVD

DESCRIPTION OF STRATUM

Same as above.

**POORLY GRADED SAND**, with clay, gray.

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. 13,698,522' E. 3,321,488'



## LOG OF BORING AA-24

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

	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:	
						LL	PL	PI				SURFACE ELEVATION: -33' NAVD	
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												
	32												
	33												
	34	S-1									1	<u>POORLY GRADED SAND</u> , gray.	
	35	S-2										Same as above, with shell fragments.	
	36	S-3									49	<u>CLAYEY SAND</u> , gray.	
	37	S-4										<u>SANDY CLAY</u> , gray.	
	38	S-5										Same as above.	
	39	S-6									92	Same as above.	
	40	S-7										<u>SANDY CLAY</u> , gray.	
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. 13,698,450' E. 3,322,163'	

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

## LOG OF BORING AA-24

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -33' 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. 13,698,450' E. 3,322,163'

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

## LOG OF BORING AA-25

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

FIELD DATA				LABORATORY DATA							GROUNDWATER INFORMATION:	
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 (%)	SURFACE ELEVATION: -34' NAVD
						LL	PL	PI				
	19											
	20											
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31											
	32											
	33											
	34	S-1									57	<u>SANDY CLAY</u> , gray.
	35	S-2									6	<u>POORLY GRADED SAND</u> , with clay, gray.
	36											

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. 13,699,095' E. 3,322,545'

## LOG OF BORING AA-25

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

FIELD DATA										LABORATORY DATA					DRILLING METHOD(S):
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:			
						LL	PL	PI							
	37	S-3										11	Same as above.		
	38	S-4													
	39	S-5										68	<b>SANDY CLAY</b> , gray.  Same as above.		
	40	S-6													
												Boring was extended to an elevation of -40-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. 13,699,095' E. 3,322,545'			

## LOG OF BORING AA-26

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

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:				
						LL	PL	PI								
												SURFACE ELEVATION: -33' NAVD				
												DESCRIPTION OF STRATUM				
	21															
	22															
	23															
	24															
	25															
	26															
	27															
	28															
	29															
	30															
	31															
	32															
	33															
	34	S-1									23	<b>SILTY CLAYEY SAND</b> gray.				
	35	S-2										Same as above.				
	36	S-3									18	Same as above.				
	37	S-4										<b>SANDY CLAY</b> dark gray.				
	38	S-5										Same as above.				
	39	S-6										Same as above.				
	40	S-7									68	<b>SANDY CLAY</b> dark gray.				
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH												<b>REMARKS:</b> Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by Ocean Surveys, Inc. GPS Coord. N. 13,699,510' E. 3,322,110'				

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

## LOG OF BORING AA-26

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -33' NAVD

DESCRIPTION OF STRATUM

Same as above.

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

## FIELD DATA

## LABORATORY DATA

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 (%)
						LL	PL	PI			
	41	2-8									

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. 13,699,510' E. 3,322,110'

## LOG OF BORING AA-27

SHEET 1 OF 2



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

	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:	
						LL	PL	PI				SURFACE ELEVATION: -35' NAVD	
						DESCRIPTION OF STRATUM							
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												
	32												
	33												
	34												
	35												
	36	S-1									37	CLAYEY SAND, with shell fragments, gray.	
	37	S-2									28	SILTY CLAYEY SAND, gray.	
	38	S-3										Same as above.	
	39	S-4										Same as above.	
	40	S-5									25	SILTY CLAYEY SAND, gray.	
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. 13,699,532' E. 3,323,082'	

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

## LOG OF BORING AA-27

SHEET 2 OF 2



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: -35' 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. 13,699,532' E. 3,323,082'

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



## LOG OF BORING AA-28

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

FIELD DATA		LABORATORY DATA								GROUNDWATER INFORMATION:		
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 (%)	
						LL	PL	PI				
	19											
	20											
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31											
	32	S-1										<b>POORLY GRADED SAND</b> , with shell fragments, light brown.
	33	S-2										<b>SANDY CLAY</b> , dark gray.
	34	S-3										Same as above.
	35	S-4										Same as above.
	36											
<b>REMARKS:</b> Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by Ocean Surveys, Inc. GPS Coord. N. 13,700,599' E. 3,324,100'												

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

## LOG OF BORING AA-28

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -32' NAVD

## DESCRIPTION OF STRATUM

**SANDY CLAY**, dark gray.

Same as above.

Same as above.

**SANDY CLAY**, dark gray.

Boring was extended to an elevation of -40-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. 13,700,599' E. 3,324,100'

## LOG OF BORING AA-29

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

FIELD DATA										LABORATORY DATA					DRILLING METHOD(S):
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	COMPRESSION STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION:			
						LL	PL	PI							
												SURFACE ELEVATION: -30' NAVD			
DESCRIPTION OF STRATUM															
	19														
	20														
	21														
	22														
	23														
	24														
	25														
	26														
	27														
	28														
	29														
	30														
	30	S-1									47	<u>CLAYEY SAND</u> , dark gray.			
	31														
	31	S-2									26	<u>SILTY CLAYEY SAND</u> , dark gray.			
	32														
	32	S-3										<u>CLAYEY SAND</u> , dark gray.			
	33											Same as above.			
	34	S-4										Same as above.			
	35	S-5									43	<u>CLAYEY SAND</u> , dark gray.			
	36	S-6													
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. 13,700,790' E. 3,322,827'			

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

## LOG OF BORING AA-29

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

FIELD DATA										LABORATORY DATA					DRILLING METHOD(S):
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:		
						LL	PL	PI							
													SURFACE ELEVATION: -30' NAVD		
													DESCRIPTION OF STRATUM		
													Same as above.		
	37	S-7										24	<u>SILTY CLAYEY SAND</u> , dark gray.		
	38	S-8											Same as above.		
	39	S-9											Same as above.		
	40	S-10											Boring was extended to an elevation of -40-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. 13,700,790' E. 3,322,827'

## LOG OF BORING AA-30

SHEET 1 OF 2



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: 03/10/09 - 03/10/09

DRILLING METHOD(S):

Vibracore

GROUNDWATER INFORMATION:

SURFACE ELEVATION: -34' NAVD

DESCRIPTION OF STRATUM

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	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	
						LL	PL	PI				
	19											
	20											
	21											
	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											
	31											
	32											
	33											
	34											
	35	S-1									64	
	36	S-2									84	

**SANDY CLAY**, gray.

Same as above, dark gray.

REMARKS:

Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by Ocean Surveys, Inc.  
 GPS Coord. N. 13,700,597' E. 3,325,148'

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

## LOG OF BORING AA-30

SHEET 2 OF 2



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: 03/10/09 - 03/10/09

FIELD DATA		LABORATORY DATA								GROUNDWATER INFORMATION:	
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 (%)
						LL LIQUID LIMIT	PL PLASTIC LIMIT	PI PLASTICITY INDEX			
	37	S-3									
	38	S-4									
	39	S-5									
	40	S-6									
<p>Same as above.</p> <p><b>SANDY CLAY</b>, dark gray.</p> <p>Same as above.</p> <p>Same as above, dark gray and gray.</p>											
<p>Boring was extended to an elevation of -40-feet NAVD during the drilling operations.</p>											
<p>REMARKS:            Boring depth and location was determined by HDR Engineering, Inc. Boring operations were performed by Ocean Surveys, Inc.            GPS Coord. N. 13,700,597' E. 3,325,148'</p>											

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