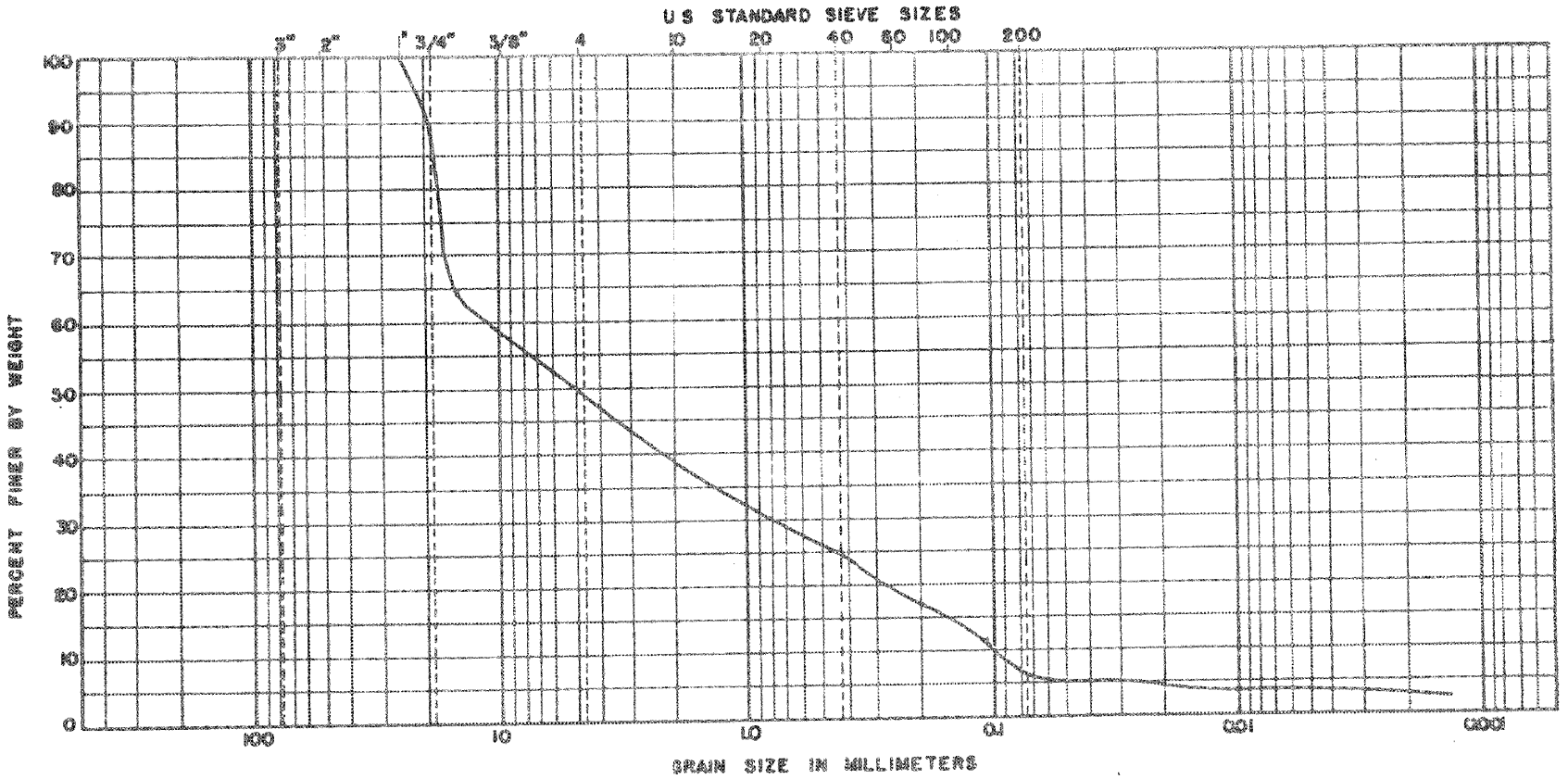
APPENDIX 2.5A

SECTION 3

INTERMEDIATE ZONE
(60-150 FT)



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-1, S-15	65'-66.5'					Light grey brown slightly clayey slightly silty coarse to fine sandy coarse to fine gravel. (Coarse to fine gravel sizes are limestone. Coarse to medium sand sizes are 60% or more shell fragments, fine sand size has a trace of shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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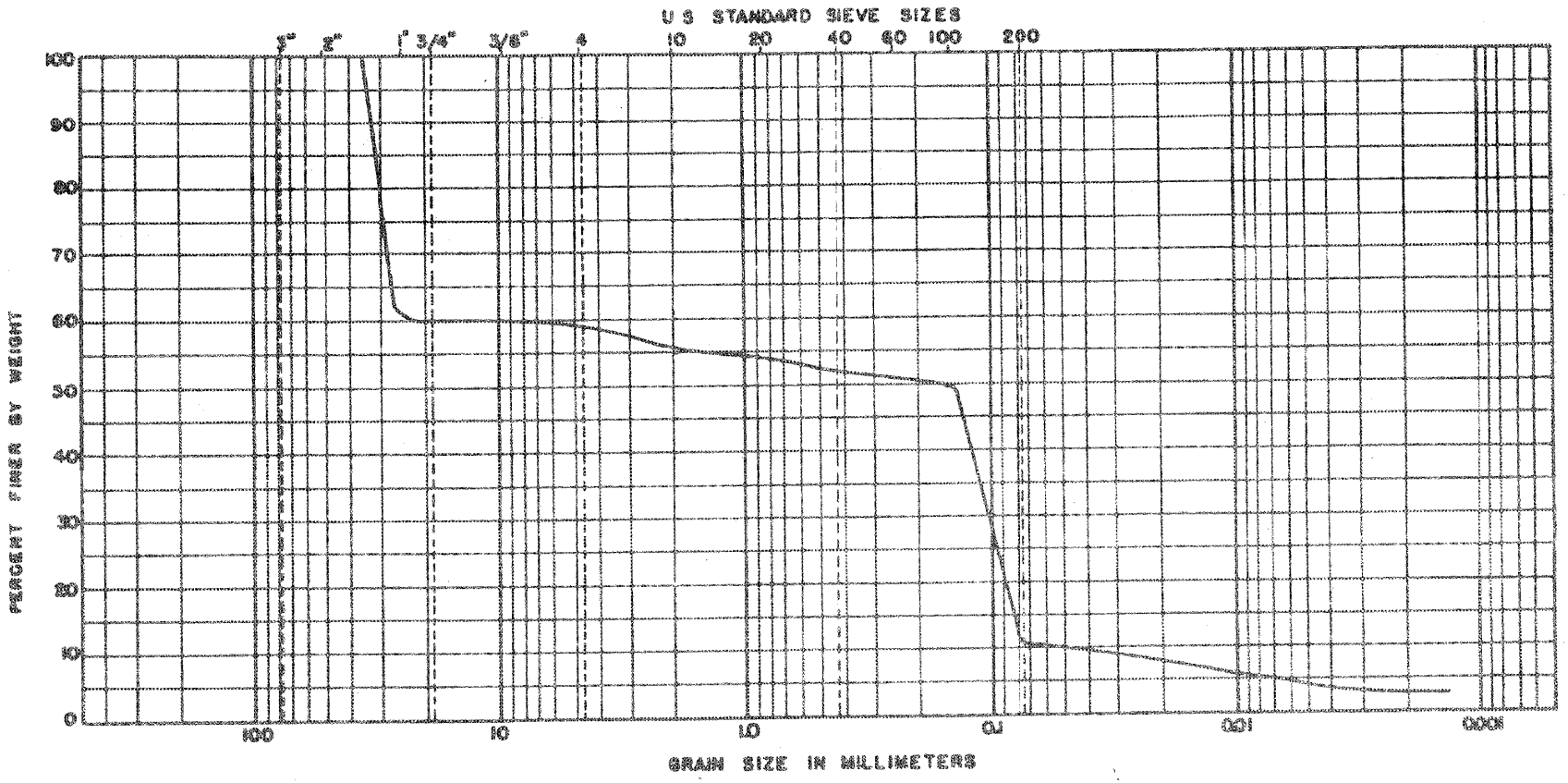

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1, S-16	70'-71.5'					Light tan slightly clayey silty coarse to fine gravelly coarse to fine sand. (Coarse to fine gravel sizes are limestone. Coarse to medium sand sizes are 50% or less sand and 50% or more limestone.

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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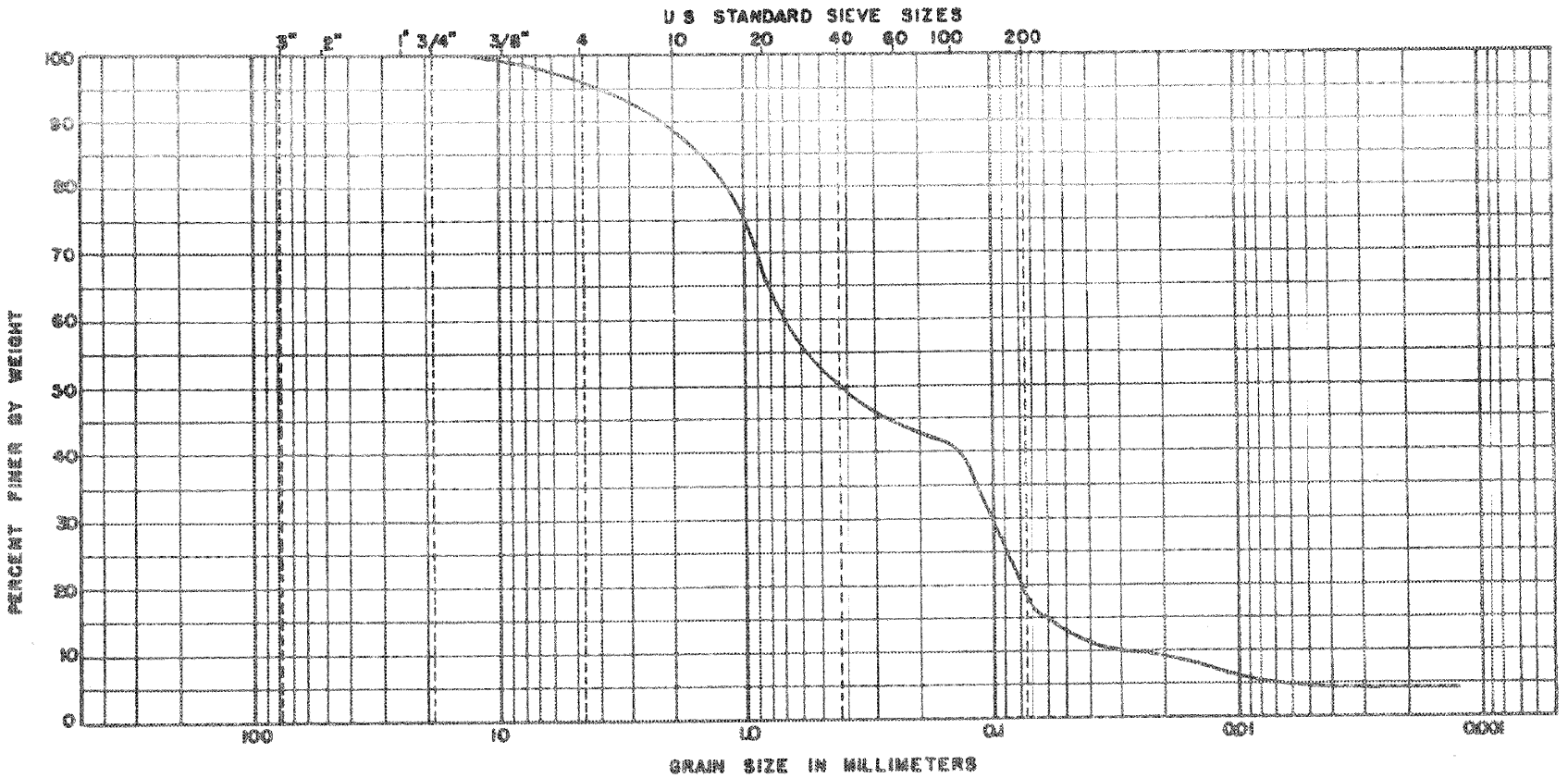


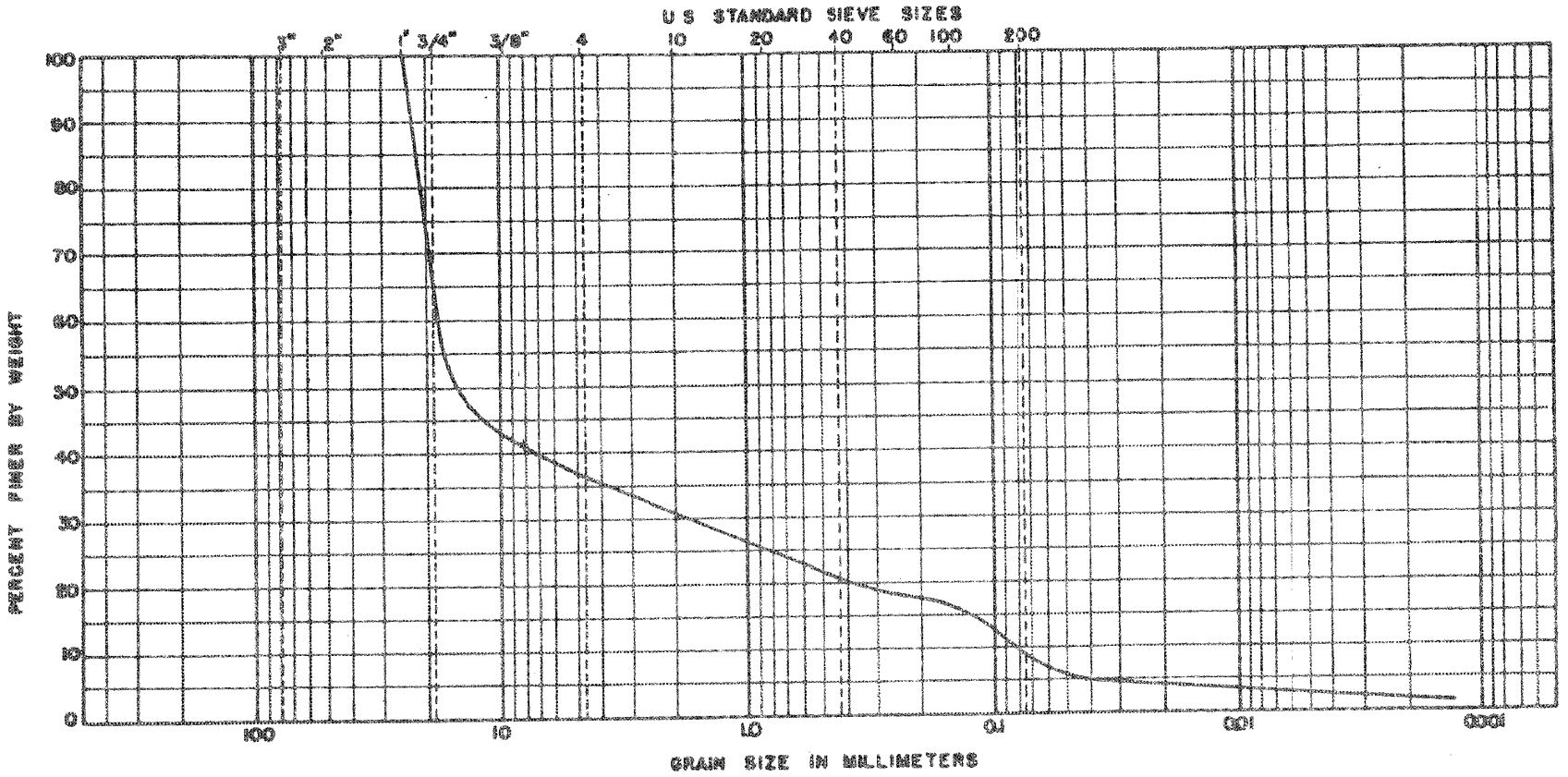
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1, S-18	80'-81.5'					Brown grey slightly clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel, coarse sand and medium sand sizes are 60% shells and 40% limestone fine sand size is 60% shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-1, S-19	85'-86.5'					Dark Grey and Tan slightly clayey silty coarse to fine sandy coarse to fine gravel. (Coarse gravel size is limestone. Fine gravel size is 20% shells and 80% limestone coarse sand is 60% limestone and 40% shells. Medium and fine sand sizes contain various proportions of sand and shell fragments)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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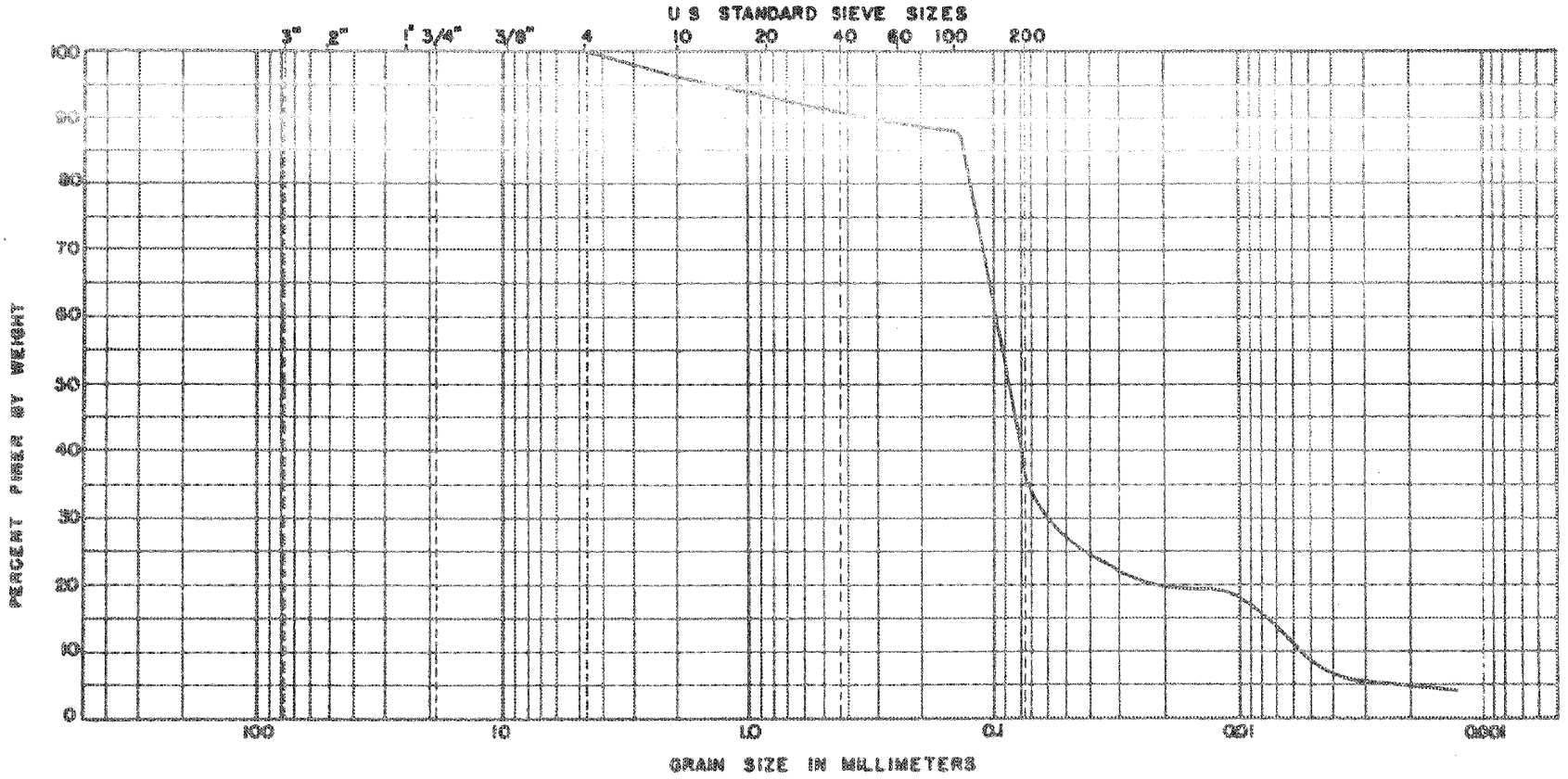


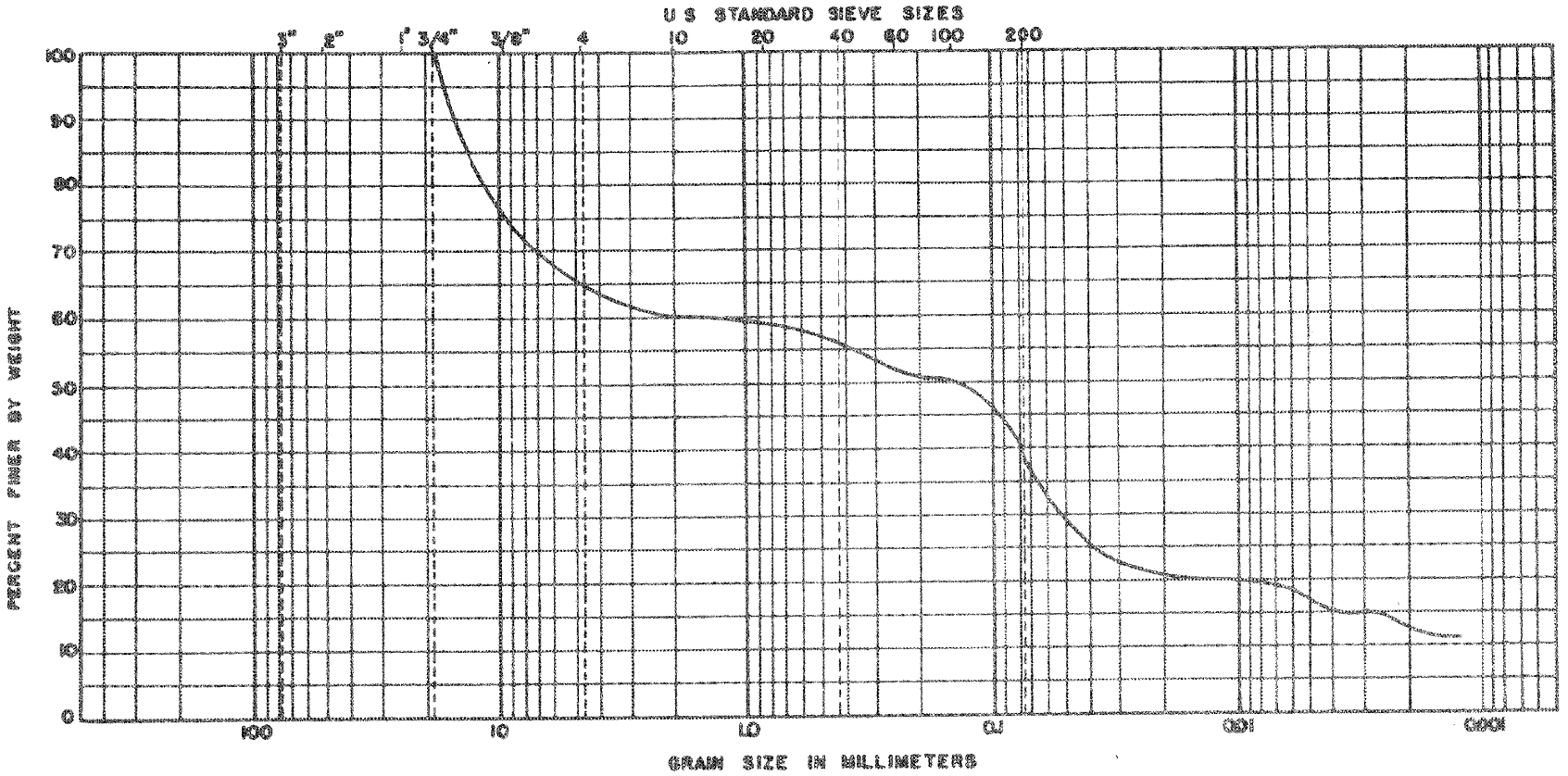
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-1, S-21	95'-96.5'					Grey brown slightly clayey silty coarse to fine sand. (Coarse to medium sand sizes are limestone and shell fragments. Fine sand size is sand and shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



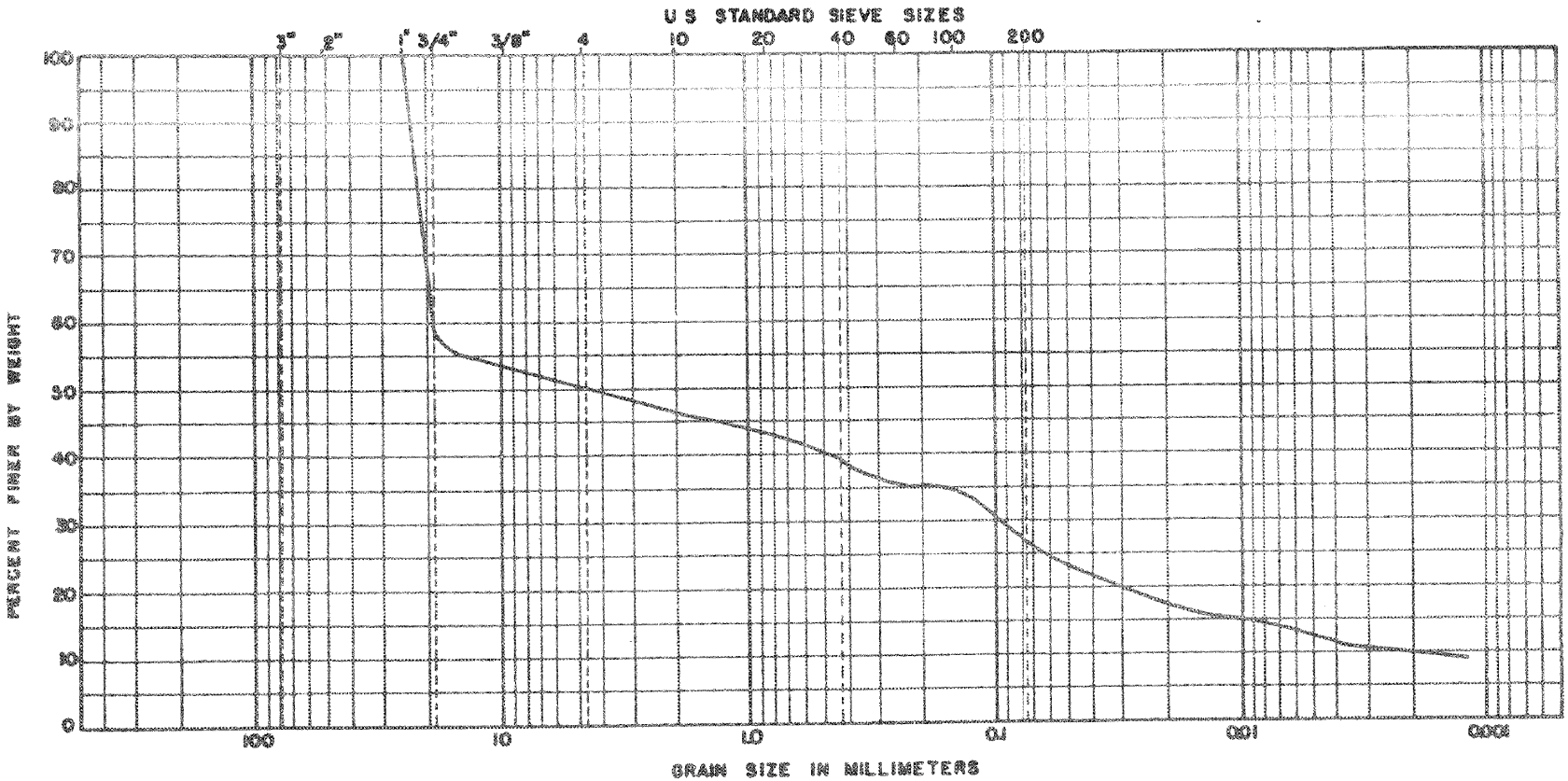
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-23	105'		32	23	9	Grey Clayey silty coarse to fine sandy fine gravel. (Fine gravel and coarse sand sizes are 80% or more limestone and 20% or less shell fragments. Medium to fine sand sizes are 30% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-24	110'					Grey clayey silty coarse to fine sandy coarse to fine gravel. (Gravel sizes are limestone. Coarse and medium sand sizes are shells and limestone. Fine sand size is 70% or more shells).

GRAIN SIZE DISTRIBUTION

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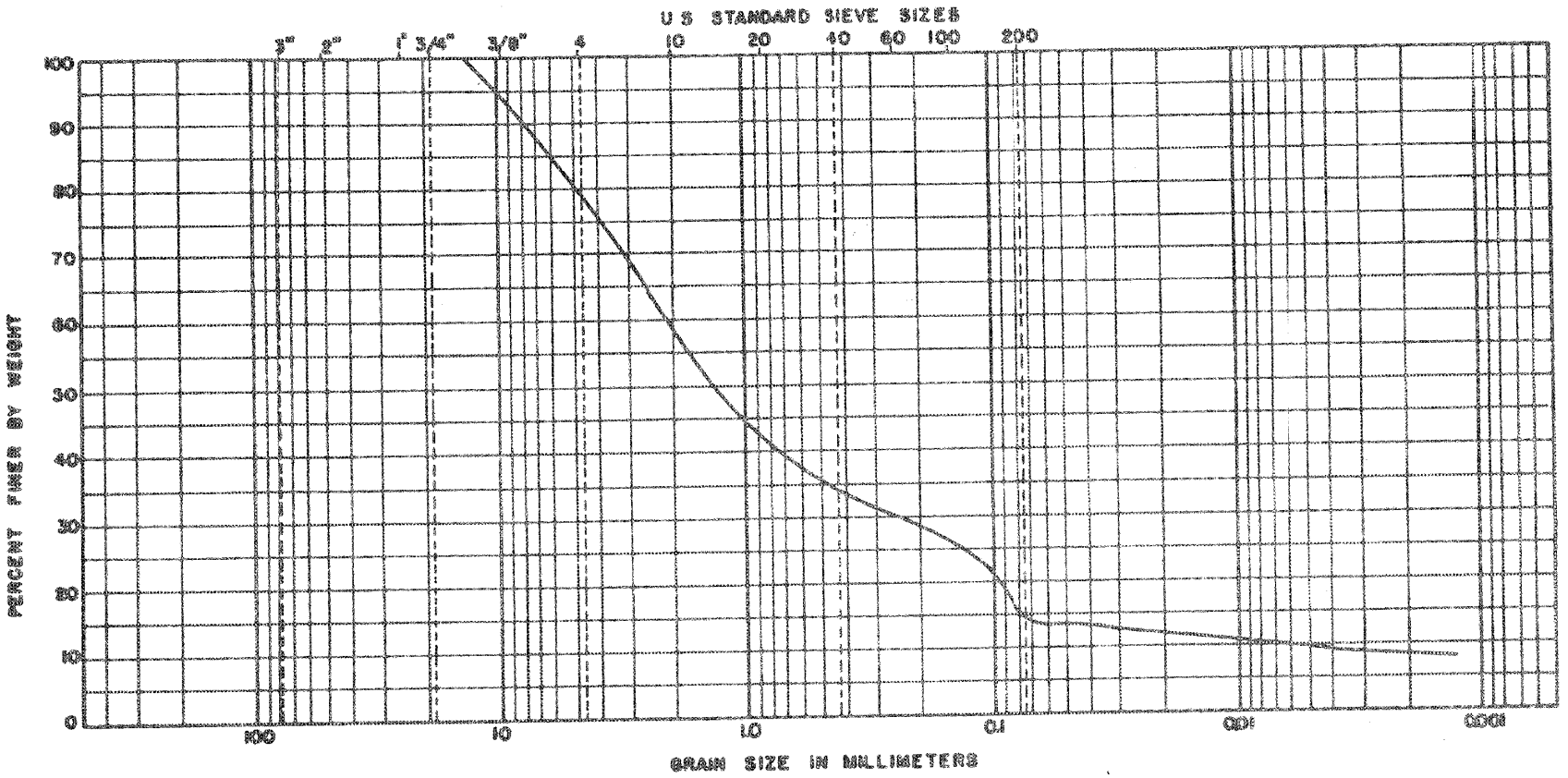

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1, S-25	115'-116.5'					Grey-brown slightly silty slightly clayey fine gravelly coarse to fine sand. Fine gravel is 60% shells and 40% limestone coarse and medium sand sizes are 50% or more shells and 30% or more limestone. Fine sand size shows a trace of shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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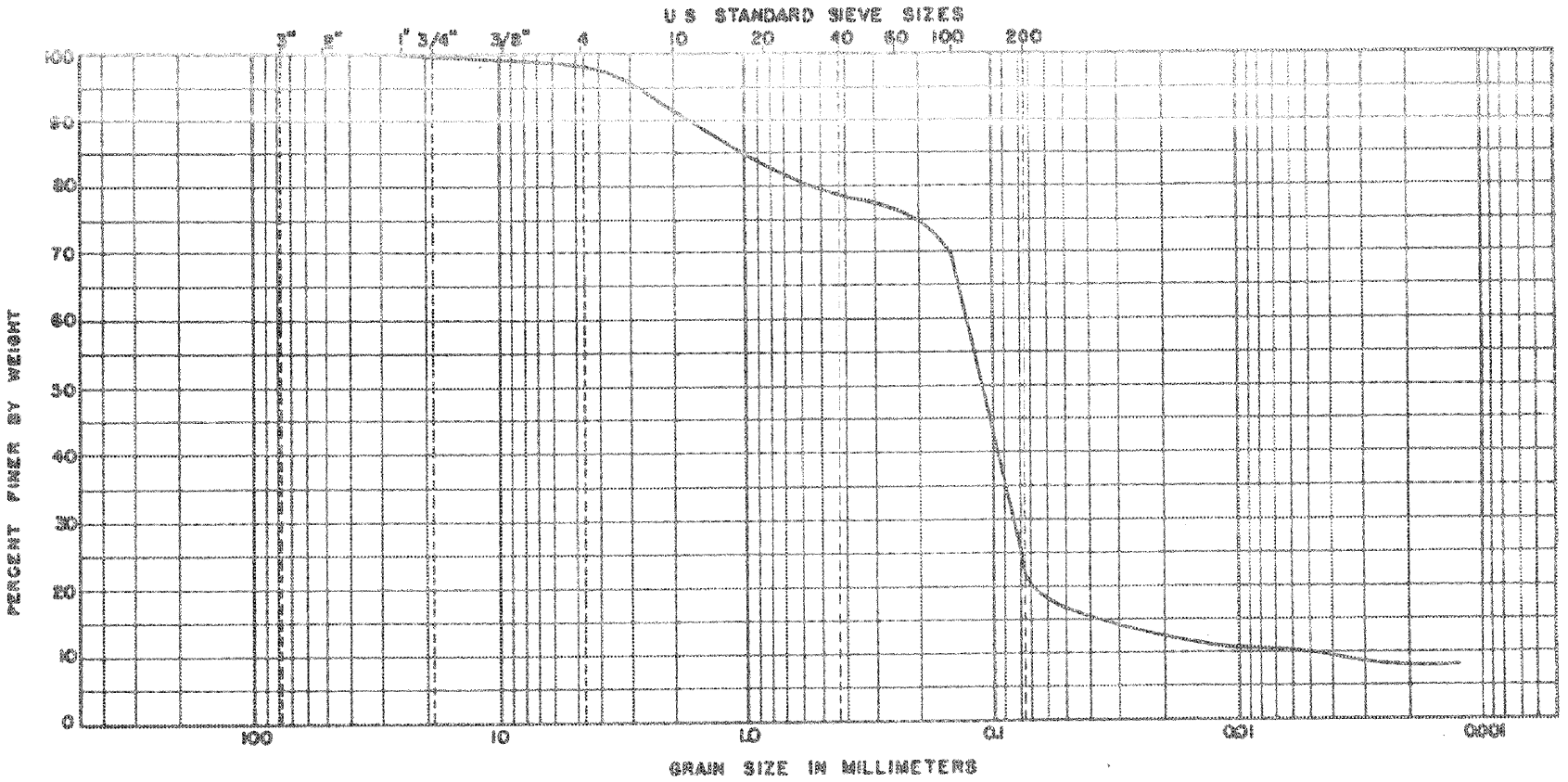

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-26	120'-121.5					Grey brown slightly clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel size is 75% limestone and 25% shells. Coarse sand size is 60% limestone and 30% shells medium sand size is 40% limestone and 40% shells. Fine

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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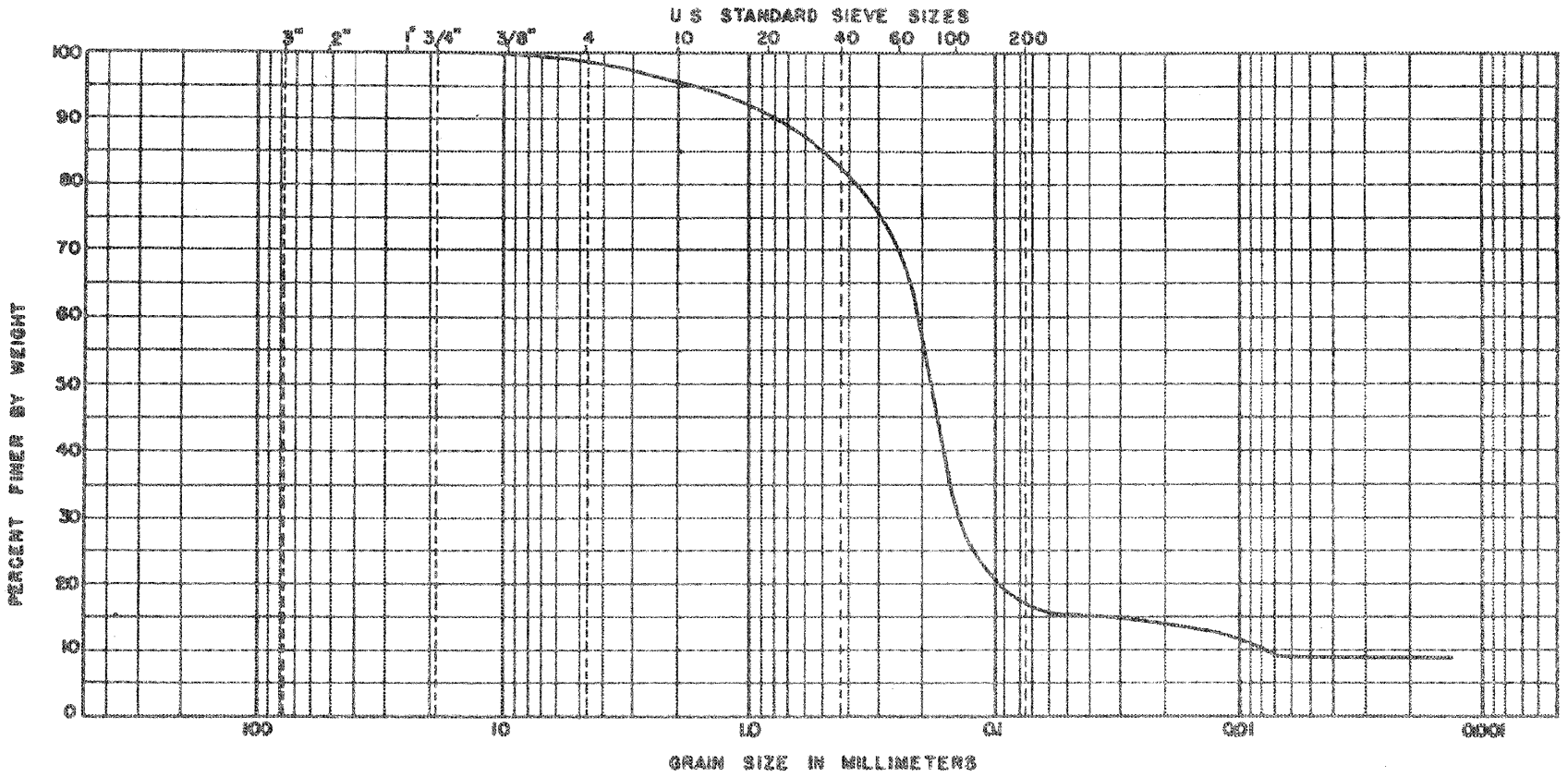

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-27	125'					Grey brown slightly clayey slightly silty slightly fine gravelly coarse to fine sand. (Fine gravel size is shell fragments. Coarse sand size is 90% shell fragements and 10% limestone. Medium sand size is 60% shell fragments and 30% limestone. Fine sand size has a trace of shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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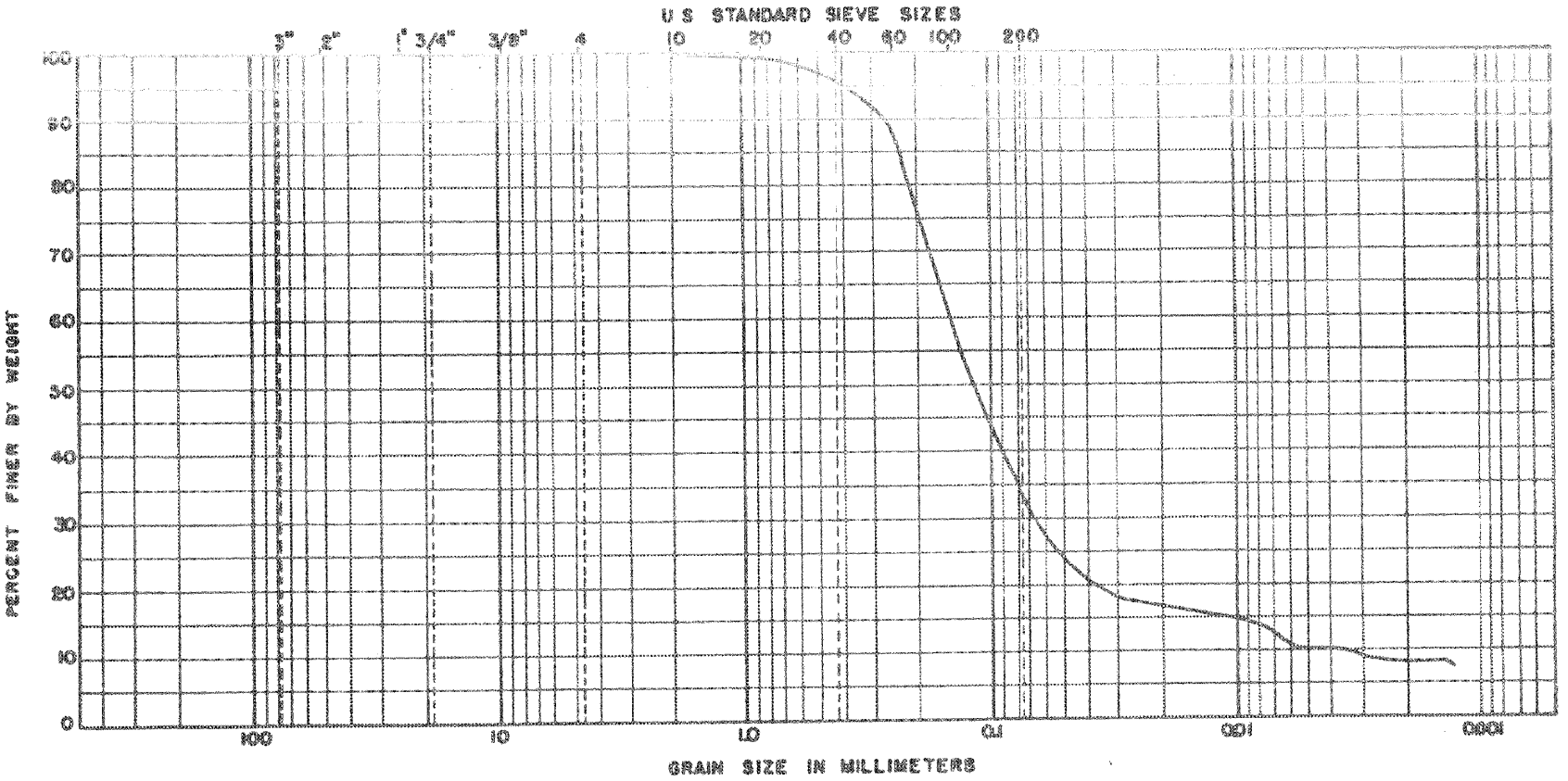

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1, S-28	130'		23	NP		Brown grey slightly clayey silty medium to fine sand. (Medium sand is 70% shells and 20% limestone).

GRAIN SIZE DISTRIBUTION

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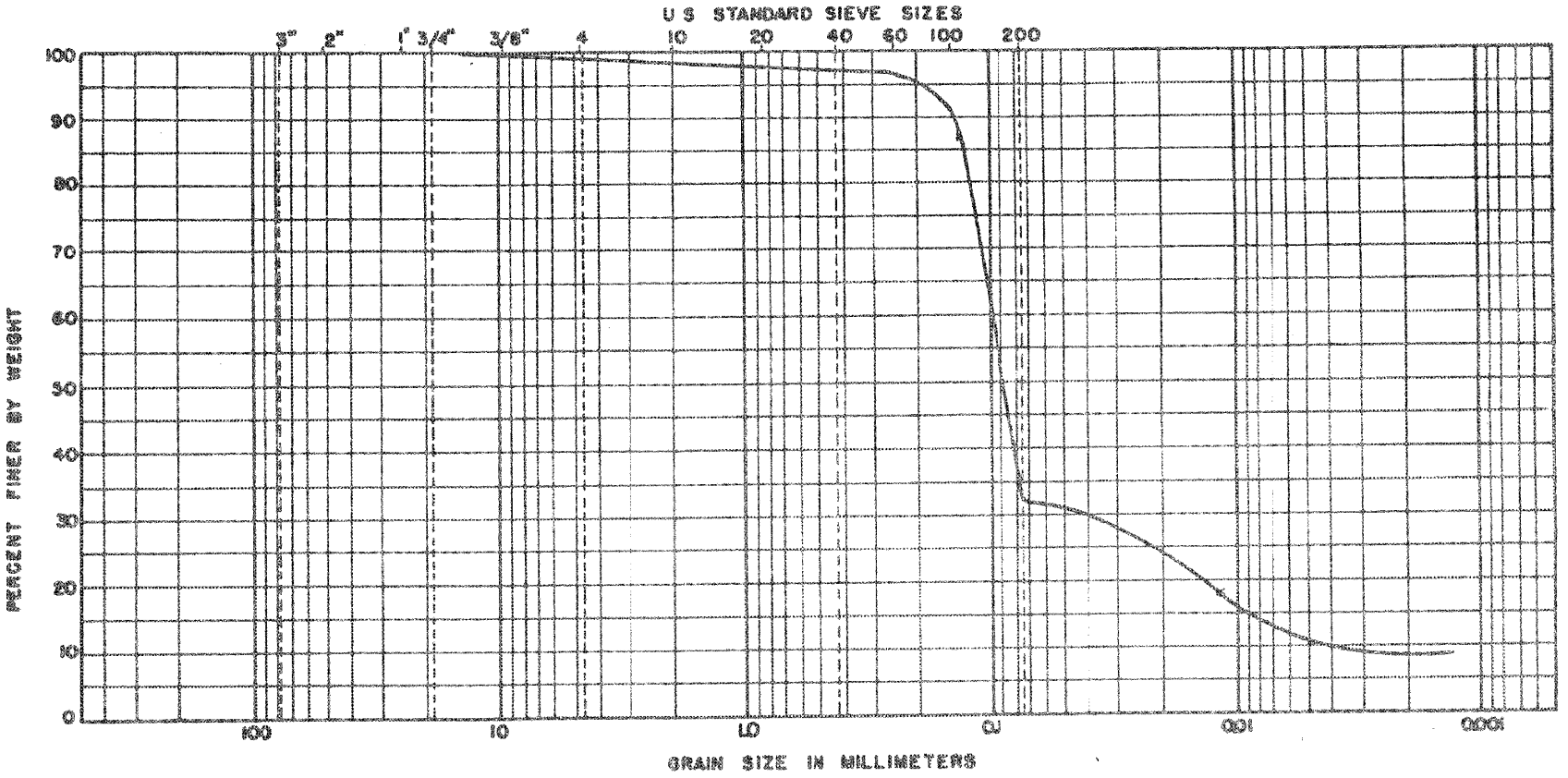

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-29	135'					Grey brown slightly clayey silty coarse to fine sand. (Coarse sand size is 50% limestone and 50% shells. Medium sand size is 90% shell fragments. Fine sand size is 40% or less shell fragments

GRAIN SIZE DISTRIBUTION

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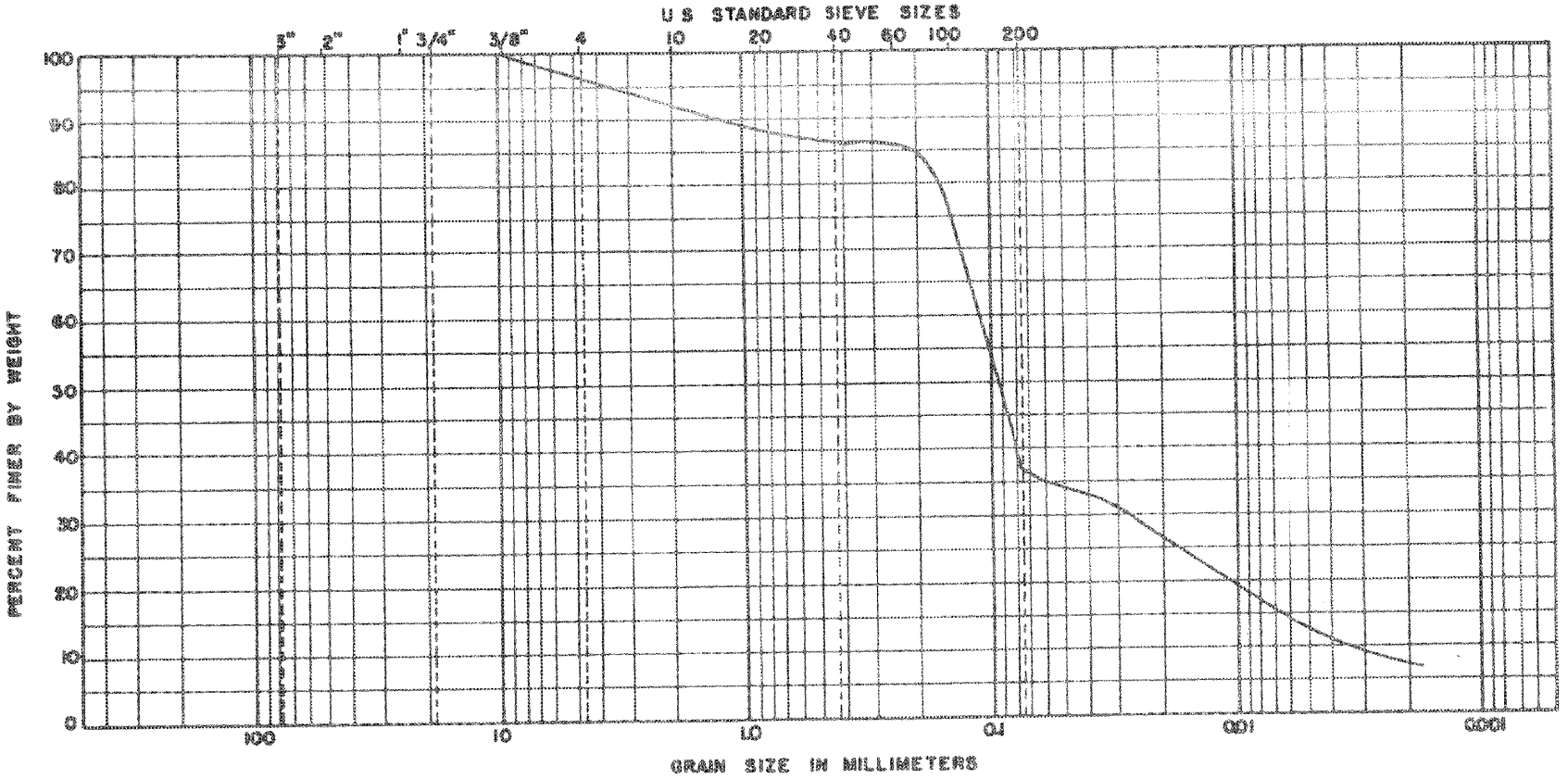

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1 UD	135'		19	NP		Grey slightly clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel, coarse sand and medium sand sizes are 70% or more shells and 30% or less limestone)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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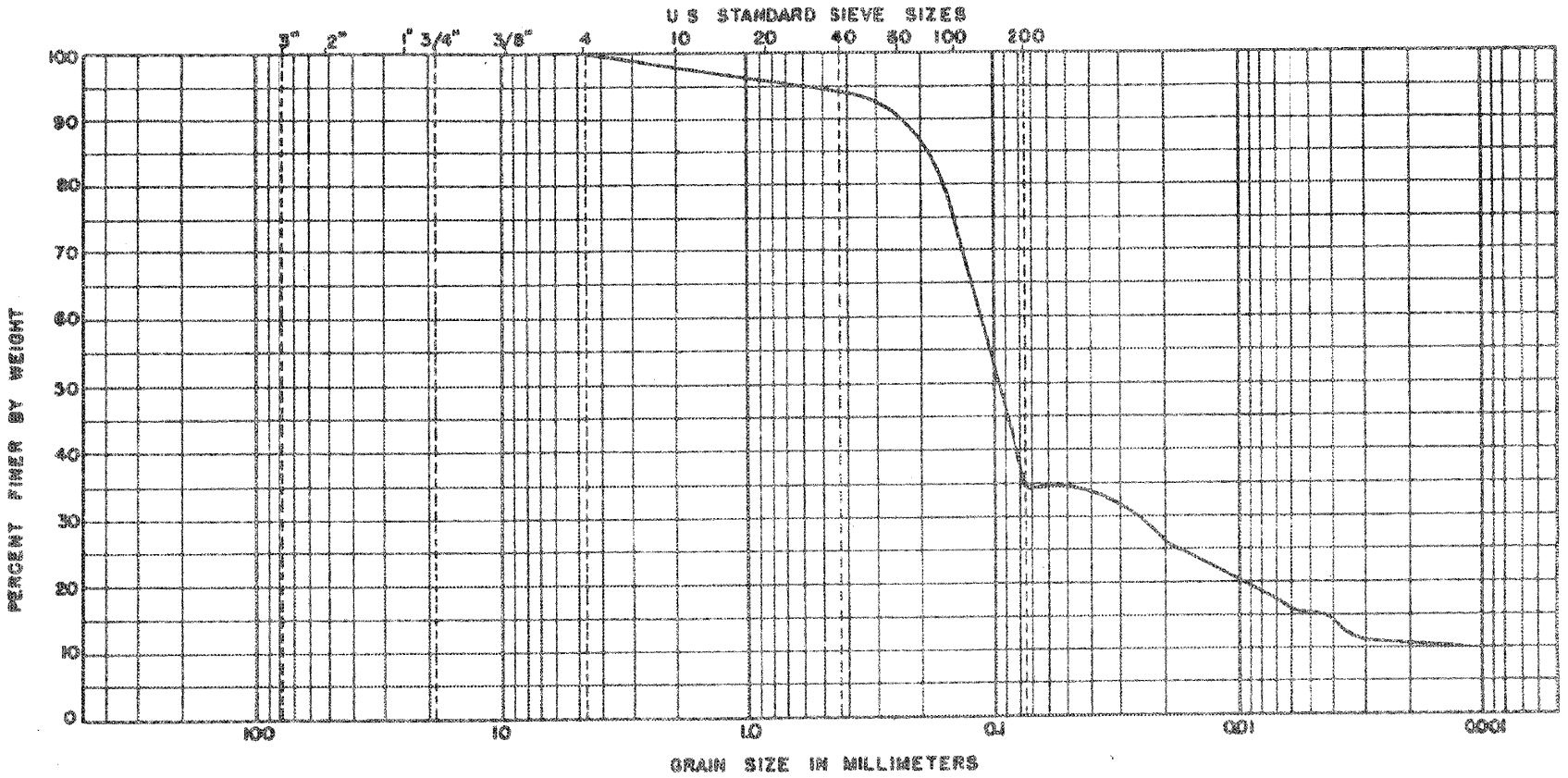

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-30	140'					Light grey brown clayey silty coarse to fine sand. (Coarse to medium sand sizes are 50% or more limestone and 50% or less shell fragments. Fine sand size is 20% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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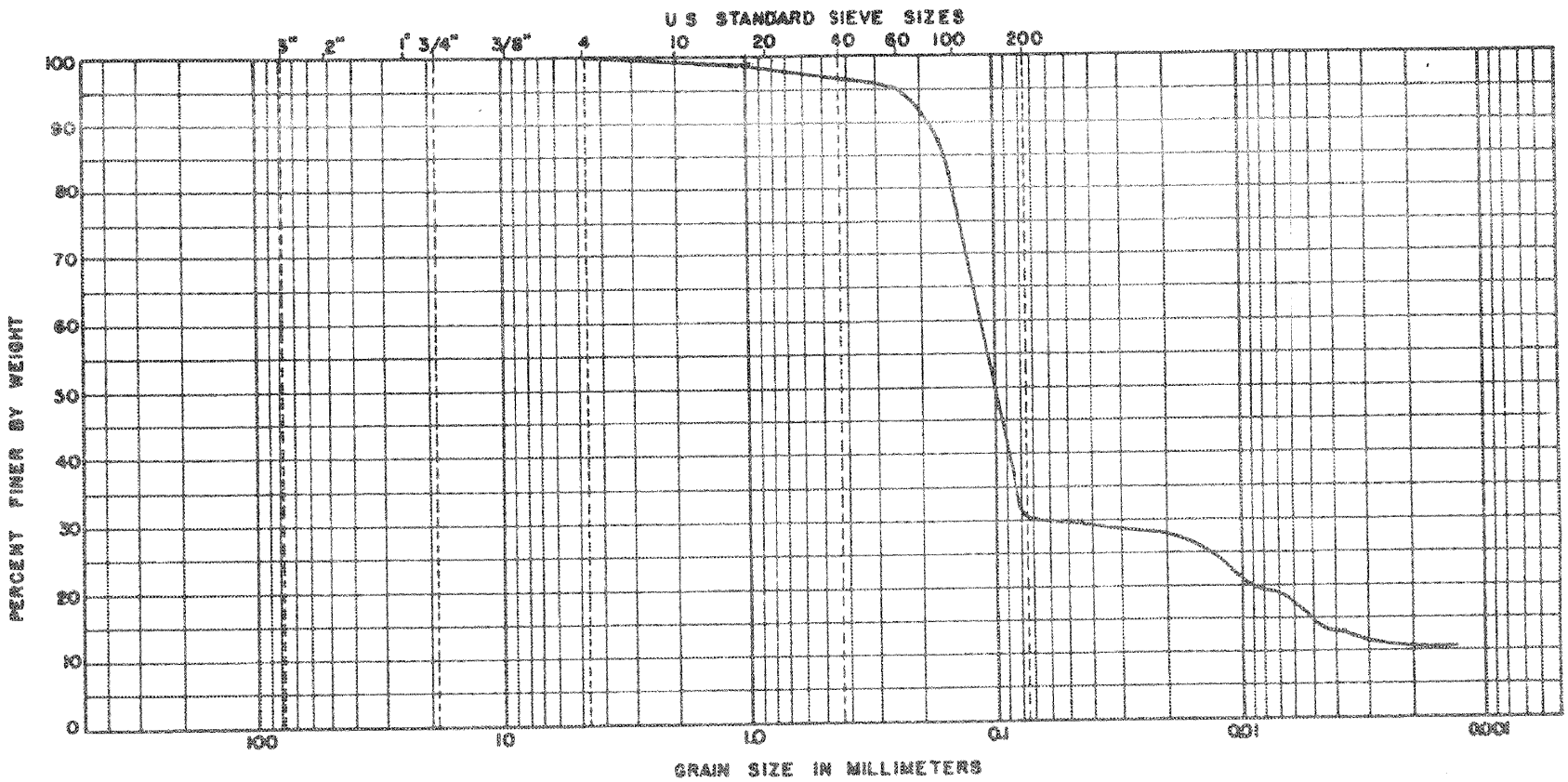

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1, S-31	145'		20	NP		Grey brown clayey silty medium to fine sand. (Medium sand size is 90% or more shells. Fine sand is 40% shells).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

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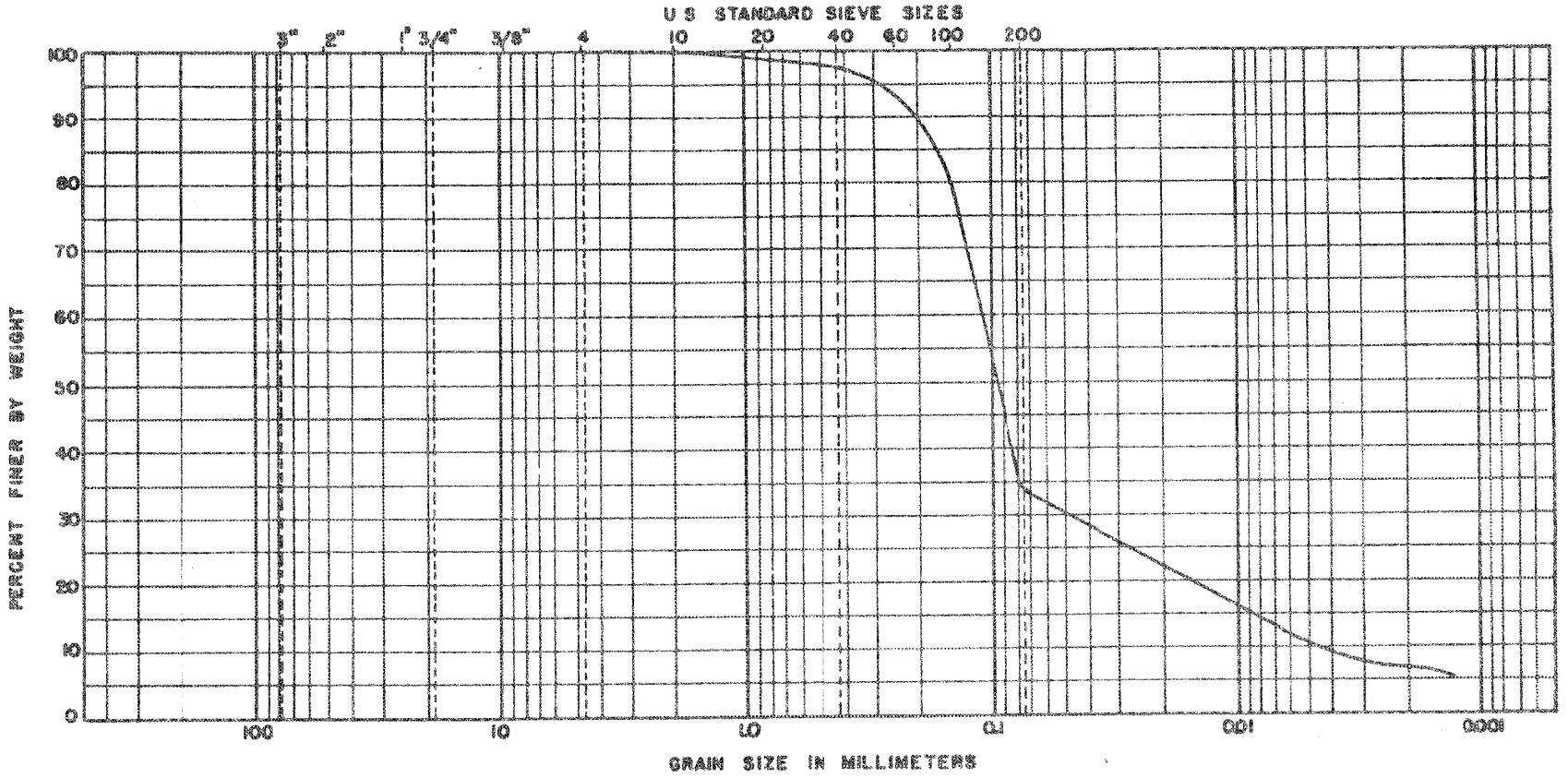


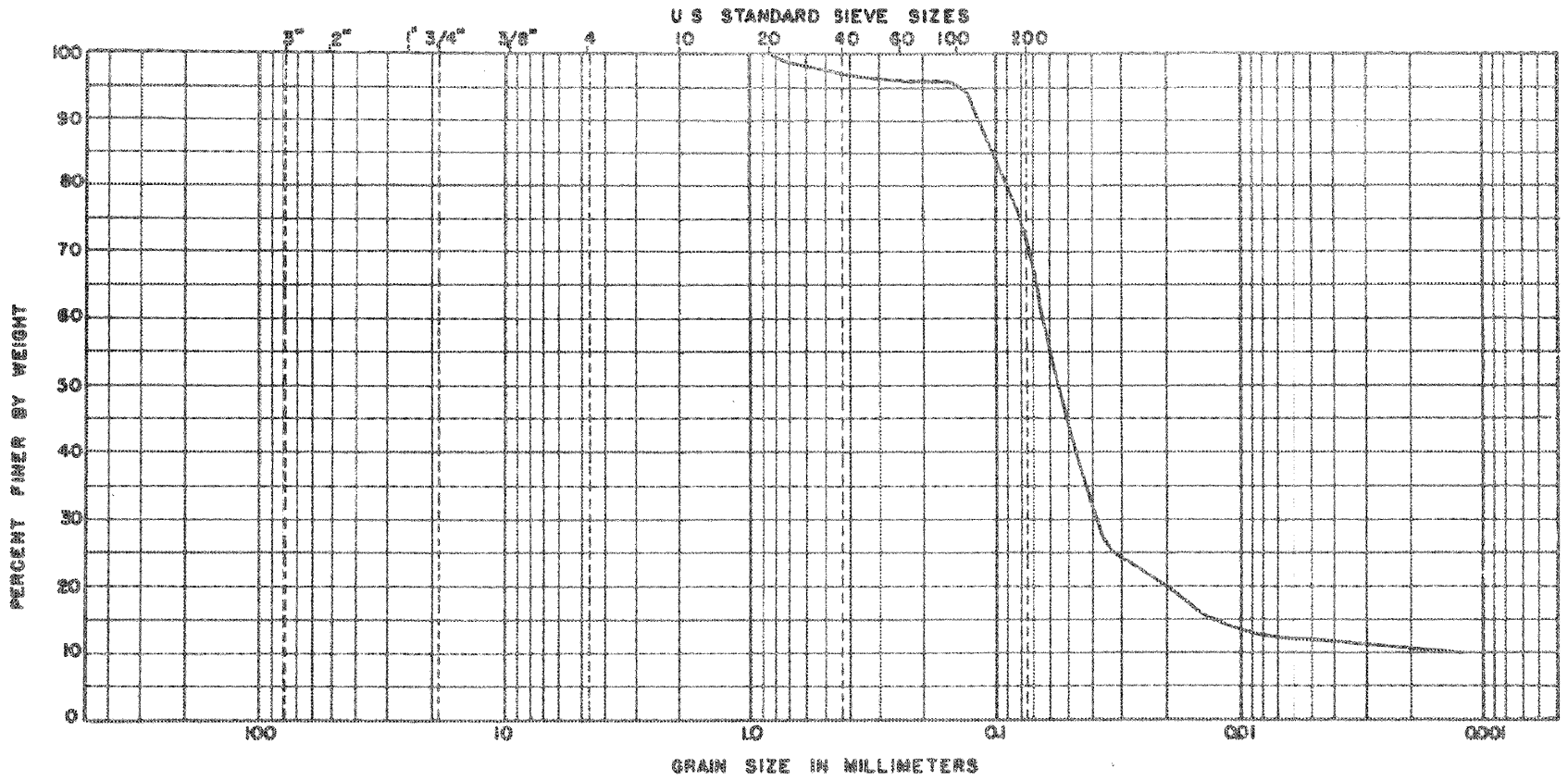
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1 UD	140'					Grey slightly clayey silty medium to fine sand. (Medium sand size is 65% shells and 35% limestone. Fine sand size is 60% shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1	150'		24	24	0	Brown grey clayey silty medium to fine sand. (Medium sand size is shell fragments and sand. Fine sand size has no shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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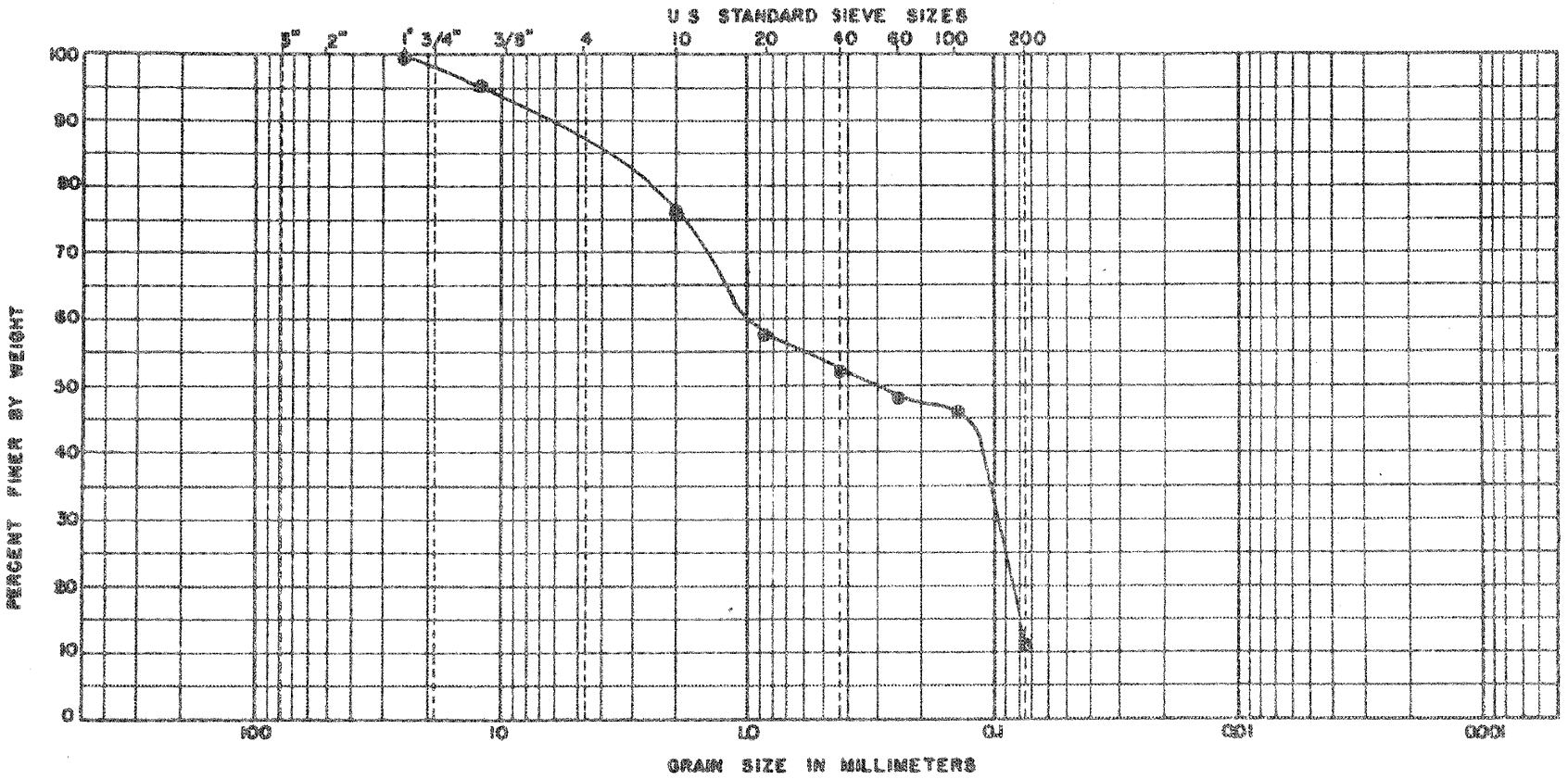

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-3	75'-76.5'					GRAY FINE GRAVELLY SILTY COARSE TO FINE SAND (SHELL FRAGMENTS RETAINED IN SIEVE NO. 40) UNIFIED SOIL CLASSIFICATION: SW-SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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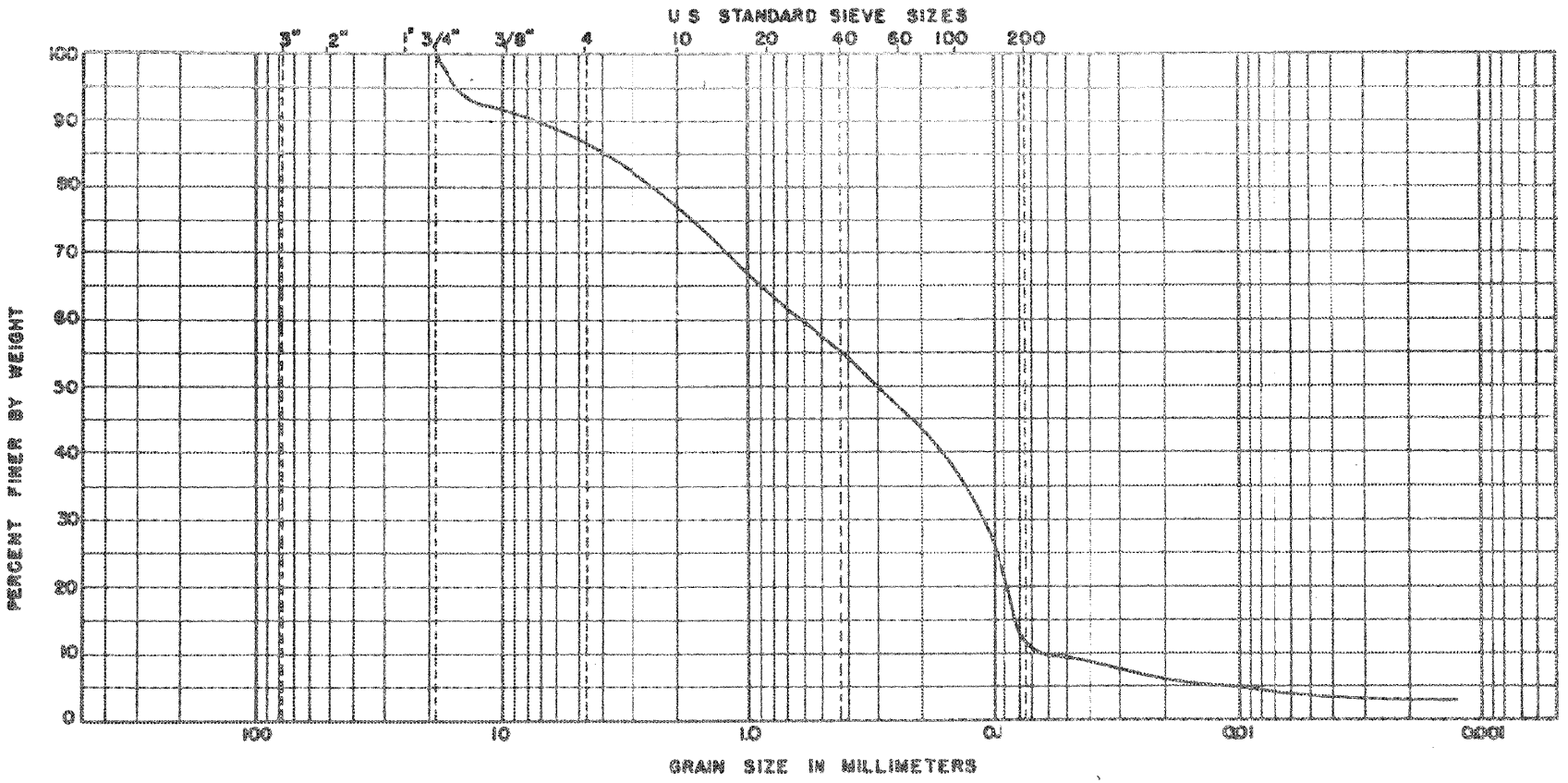


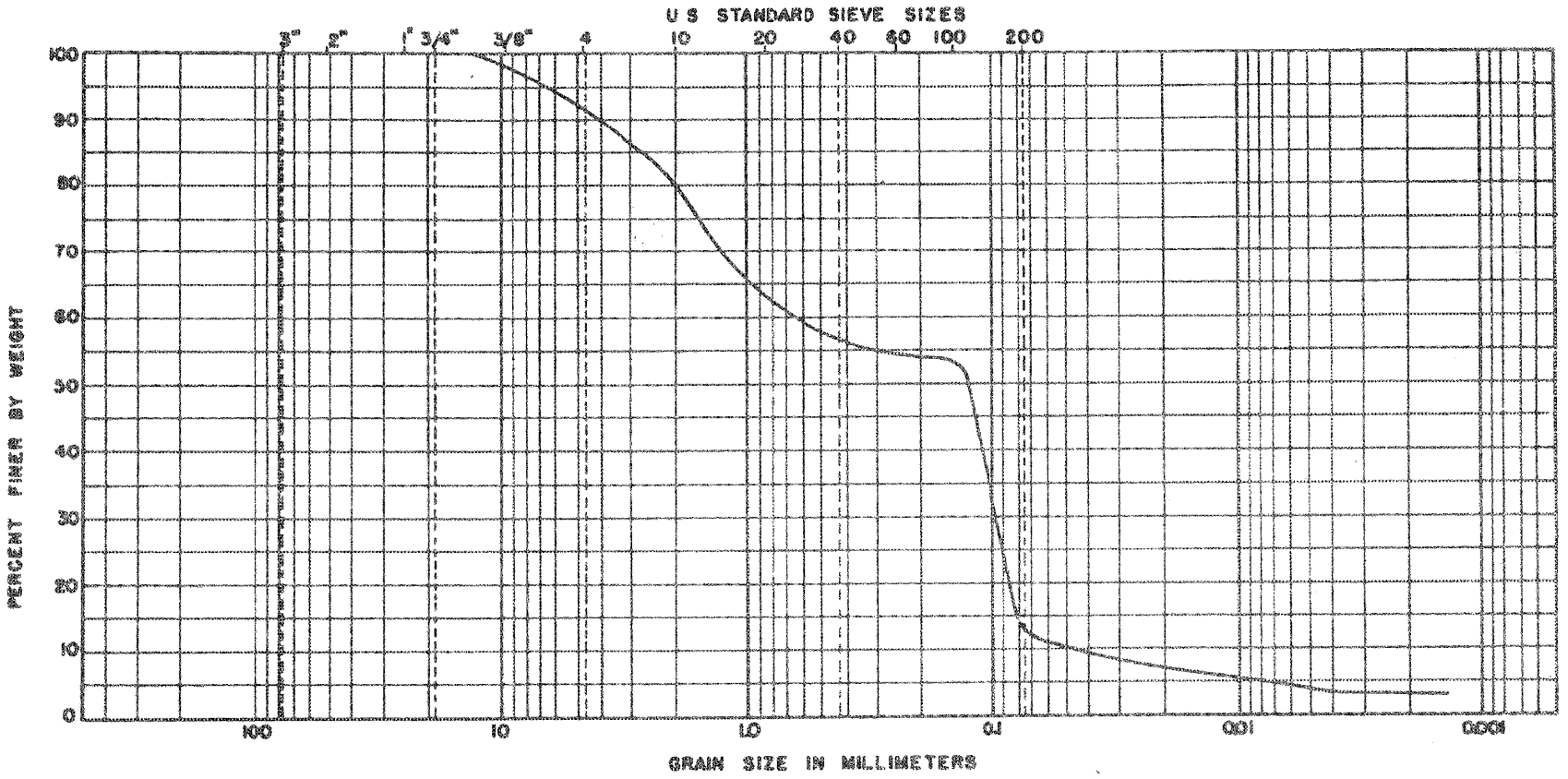
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-4	65'					Grey slightly clayey slightly silty fine gravelly coarse to fine sand. (Fine gravel and coarse sand sizes are limestone and shell fragments. Medium sand size has a trace of shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-4	70'					Brown-grey slightly clayey silty fine gravelly coarse to fine sand. (Fine gravel and coarse to medium sand sizes are shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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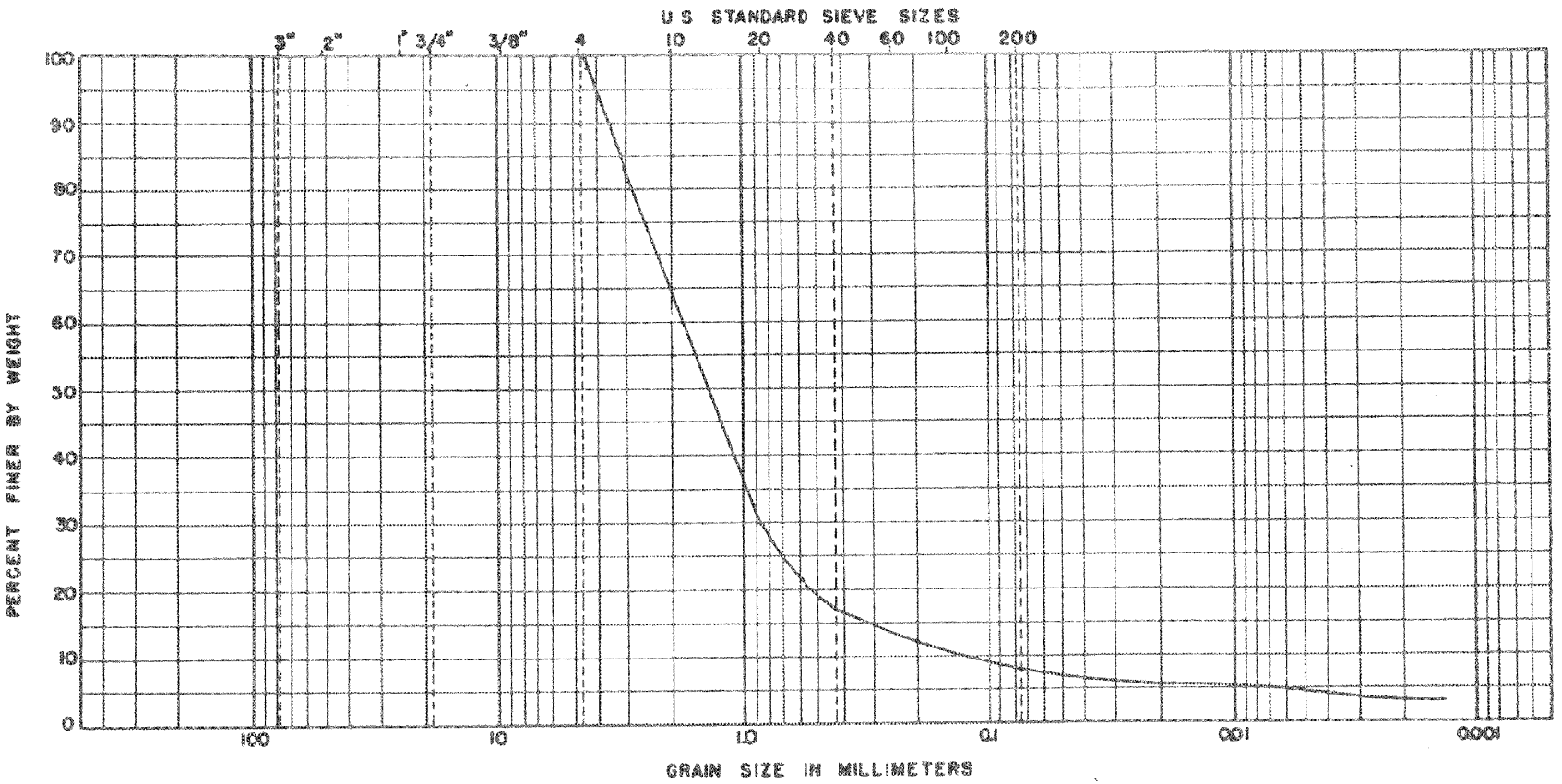

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-4	75'					Light brown slightly clayey slightly silty fine to coarse sand. (coarse to medium sand sizes are 80% shell fragments and 20% limestone).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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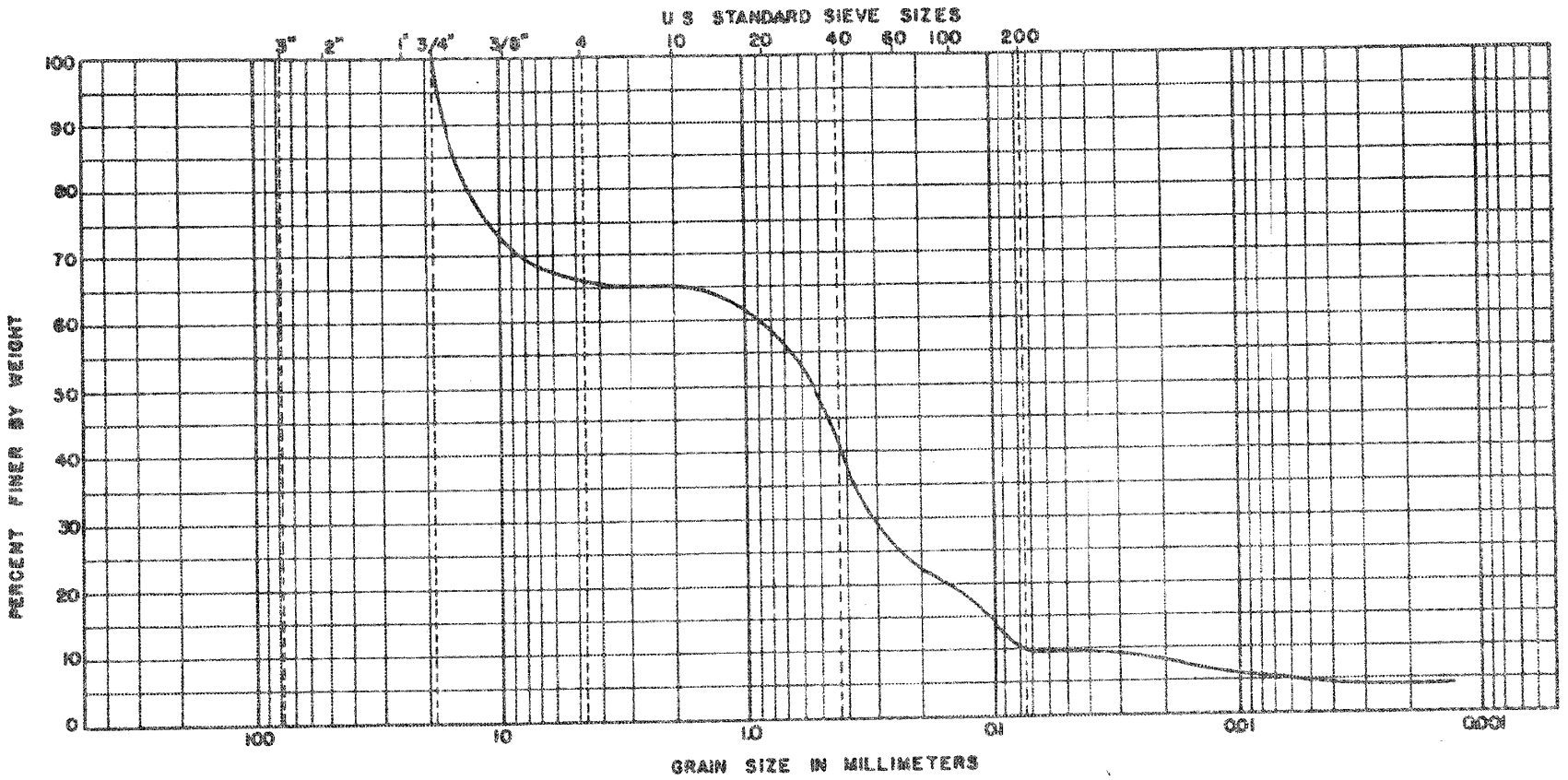


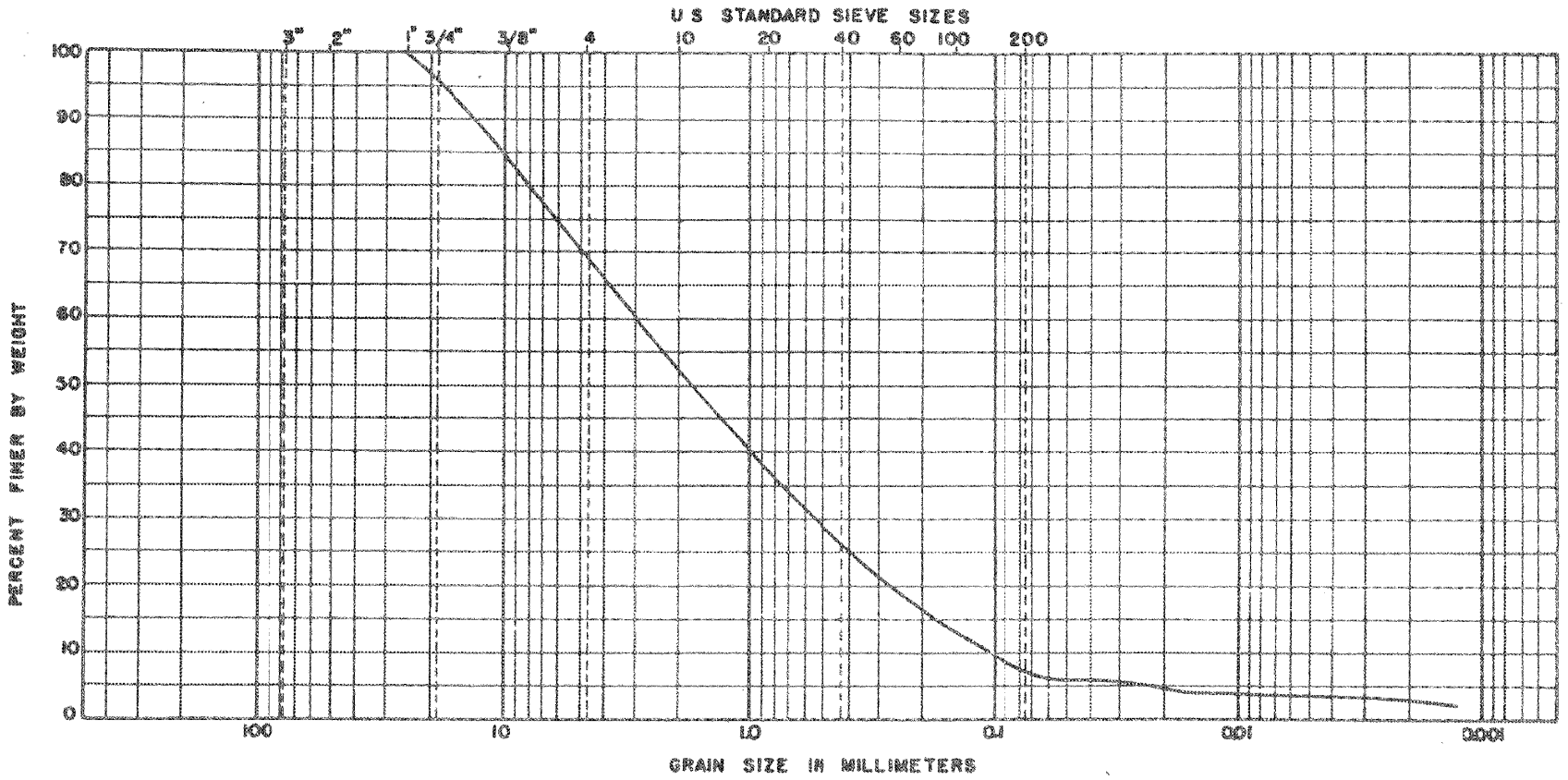
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-4	80'					Light Grey and black slightly clayey slightly silty fine gravelly coarse to fine sand. (Fine gravel and coarse sand sizes are shells with some limestone. Fine sand size is 75% shell fragements).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-4	85'					Grey slightly clayey slightly silty coarse to fine gravelly coarse to fine sand. (Coarse to fine gravel and coarse to fine sand sizes are 50% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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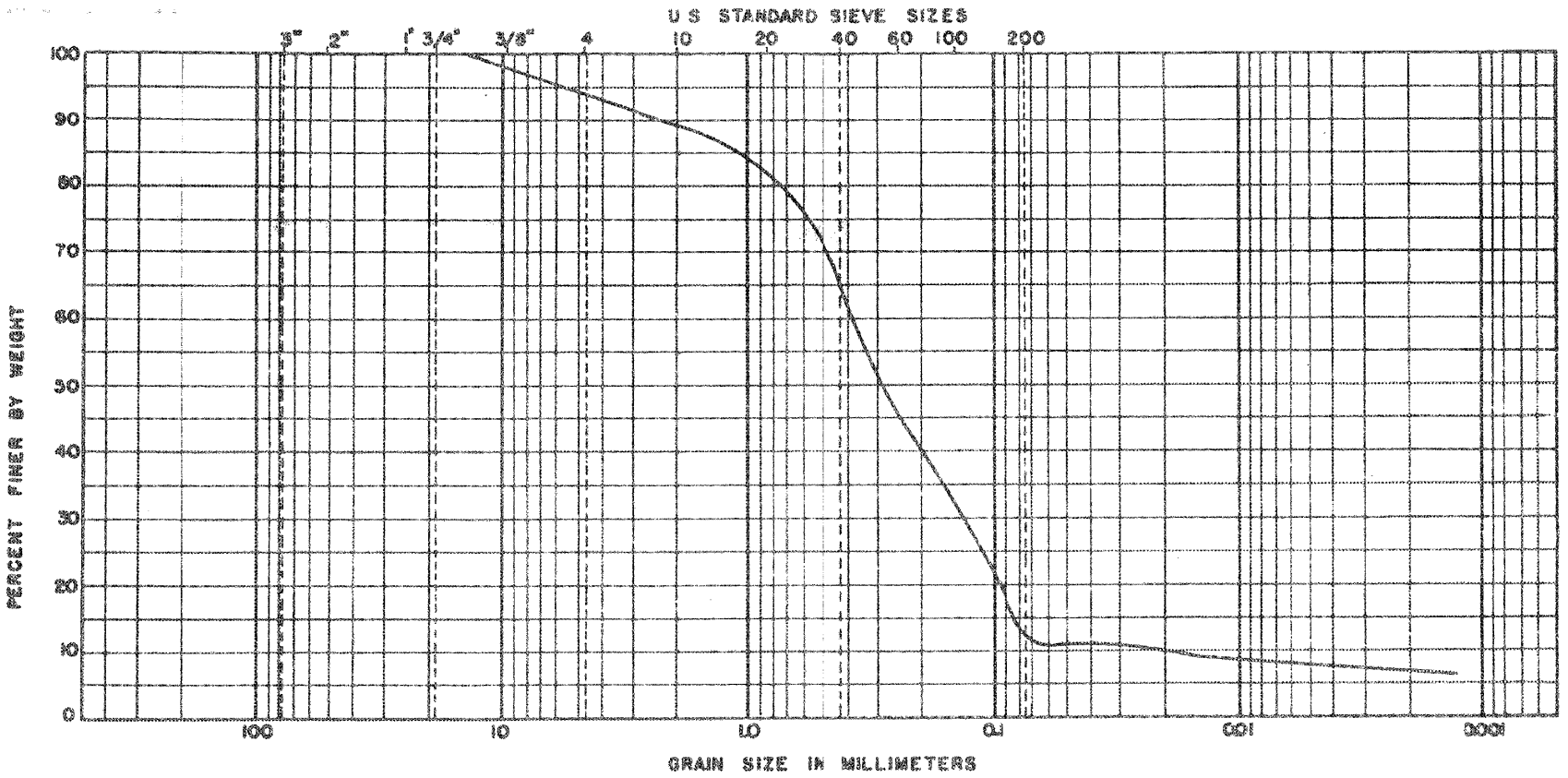

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-4	90'					Grey clayey silty fine gravelly coarse to fine sand. (Fine gravel and coarse to fine sand sizes are 50% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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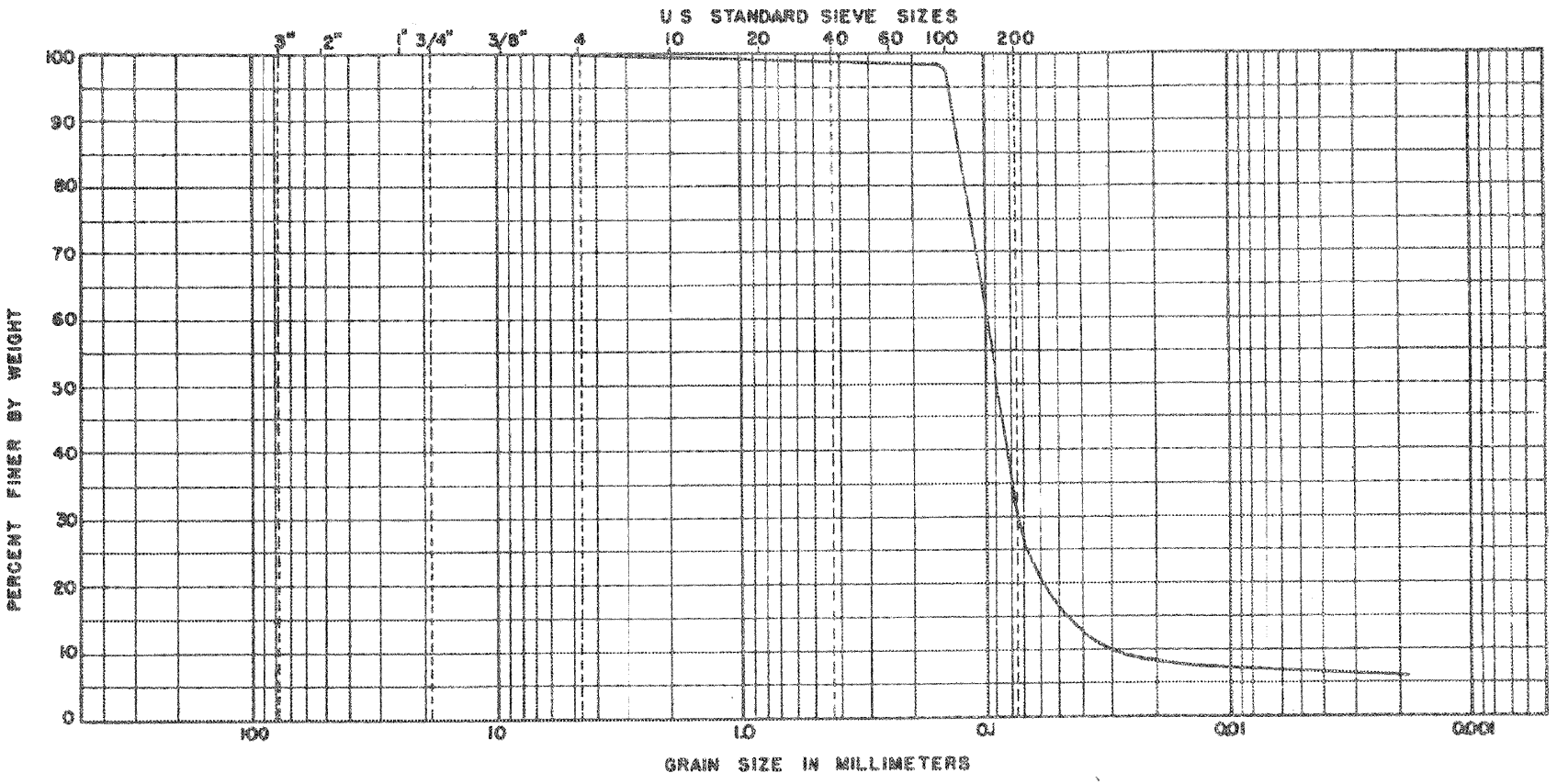


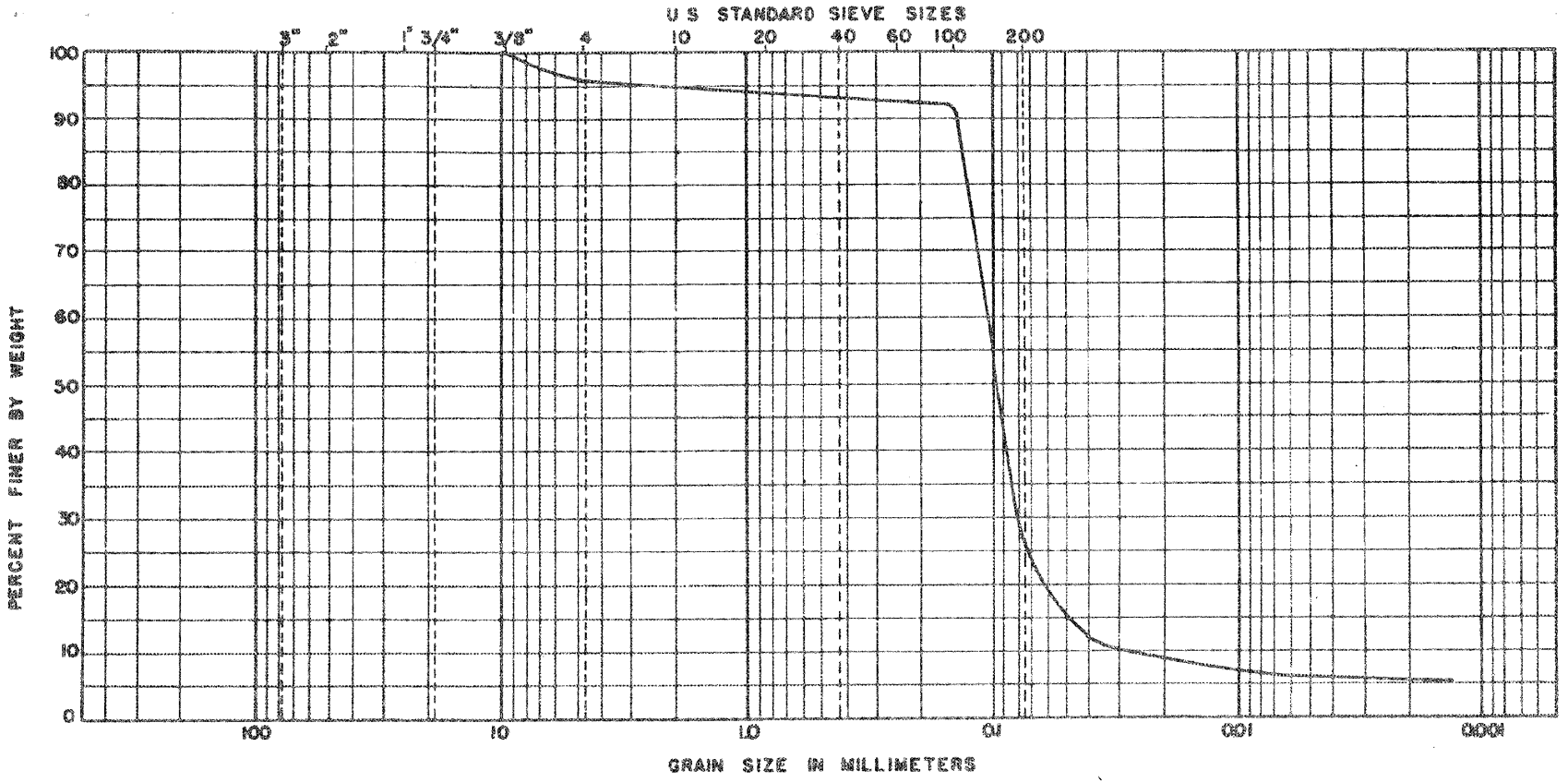
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-4, S-21	95'					Light grey brown slightly clayey silty medium to fine sand. (Medium sand size is 90% or more shell fragments. Fine sand size is 50% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-4	100'					Brown Grey slightly clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel size is 50% shells and 50% limestone. Coarse and medium sand sizes are 60% shell fragments and 40% limestone).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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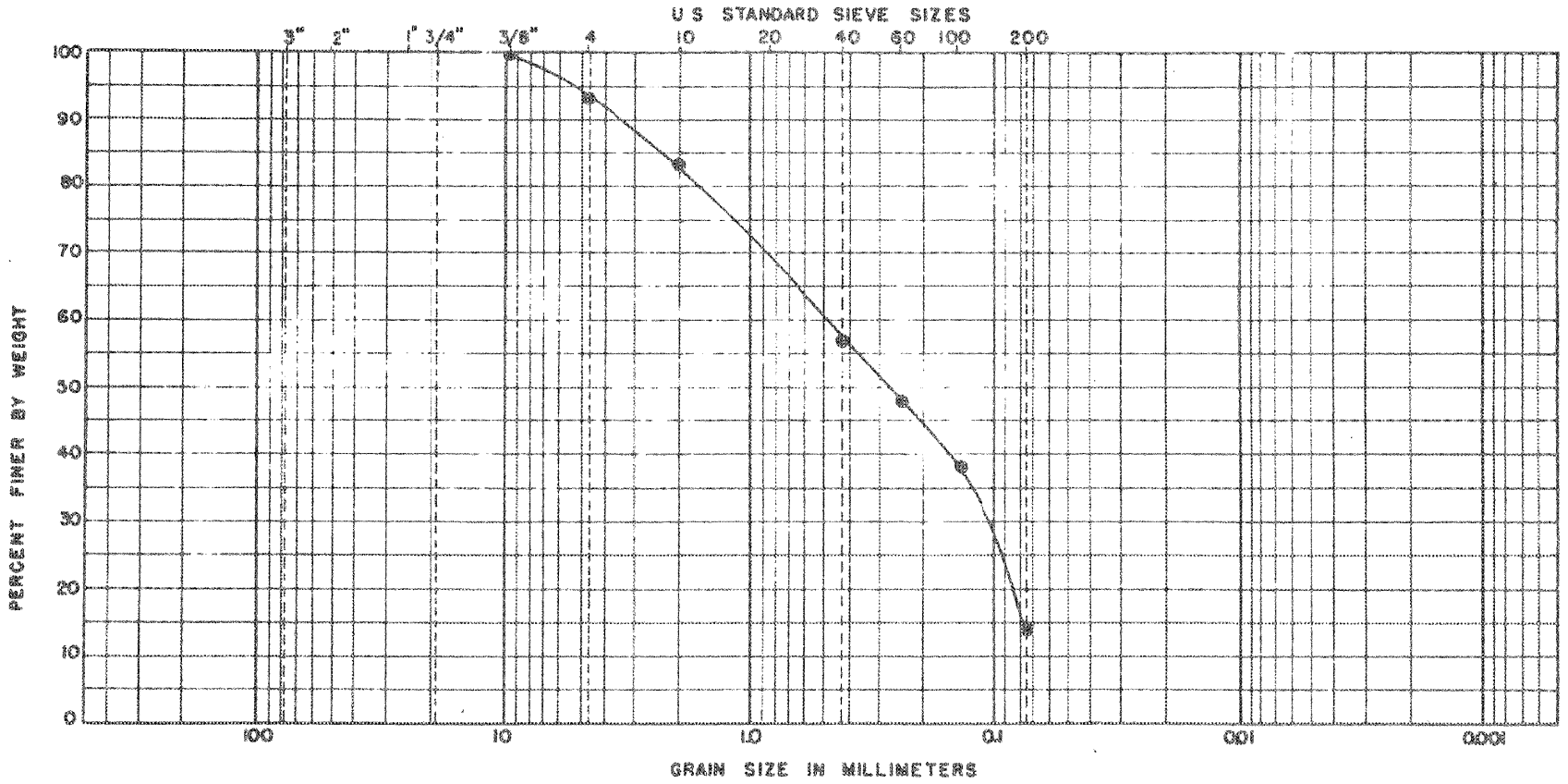


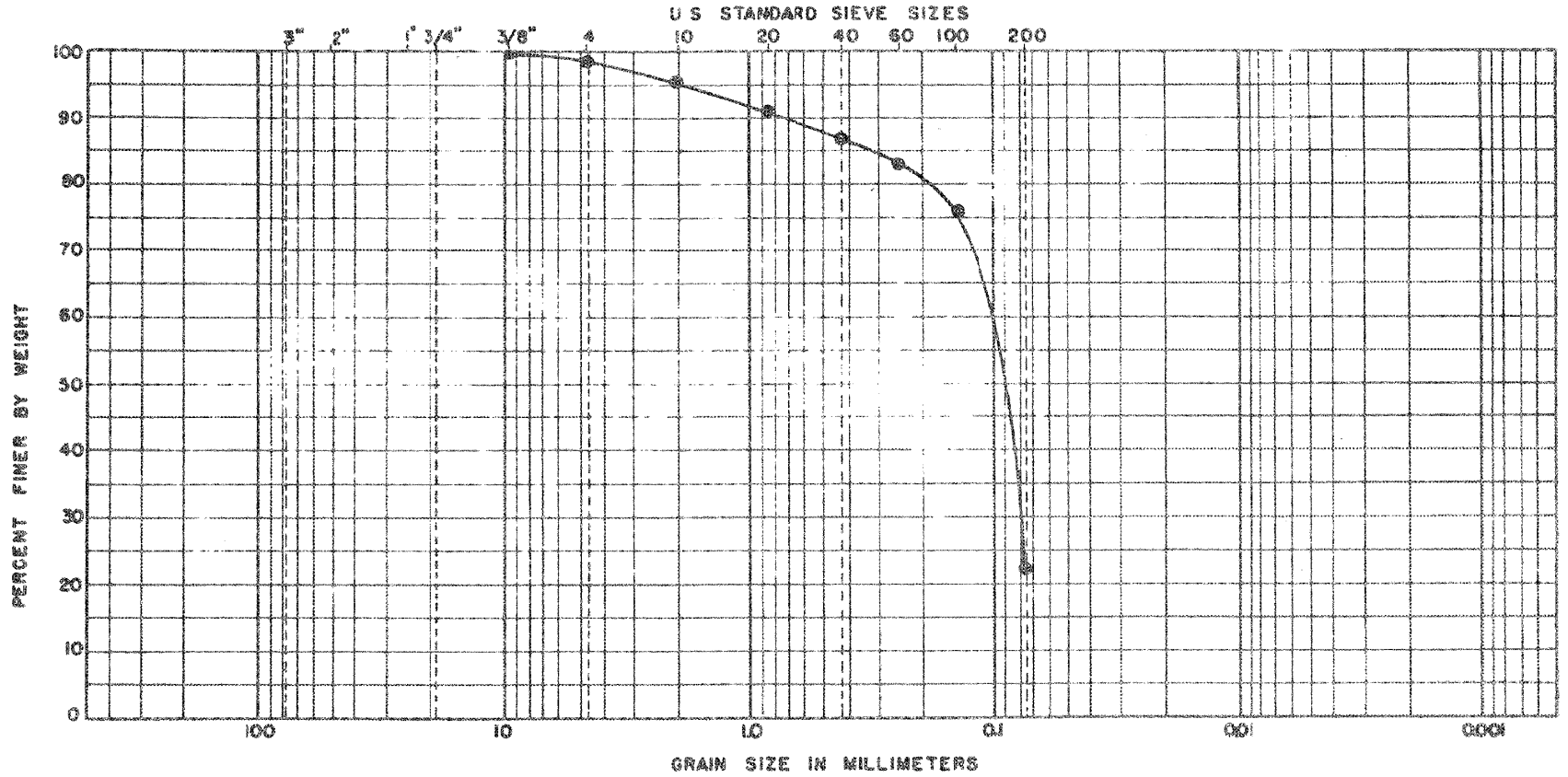
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5	61' - 62.5'					GREEN CLAYEY SILTY FINE SAND WITH SHELLS UNIFIED SOIL CLASSIFICATION: SM-SC

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



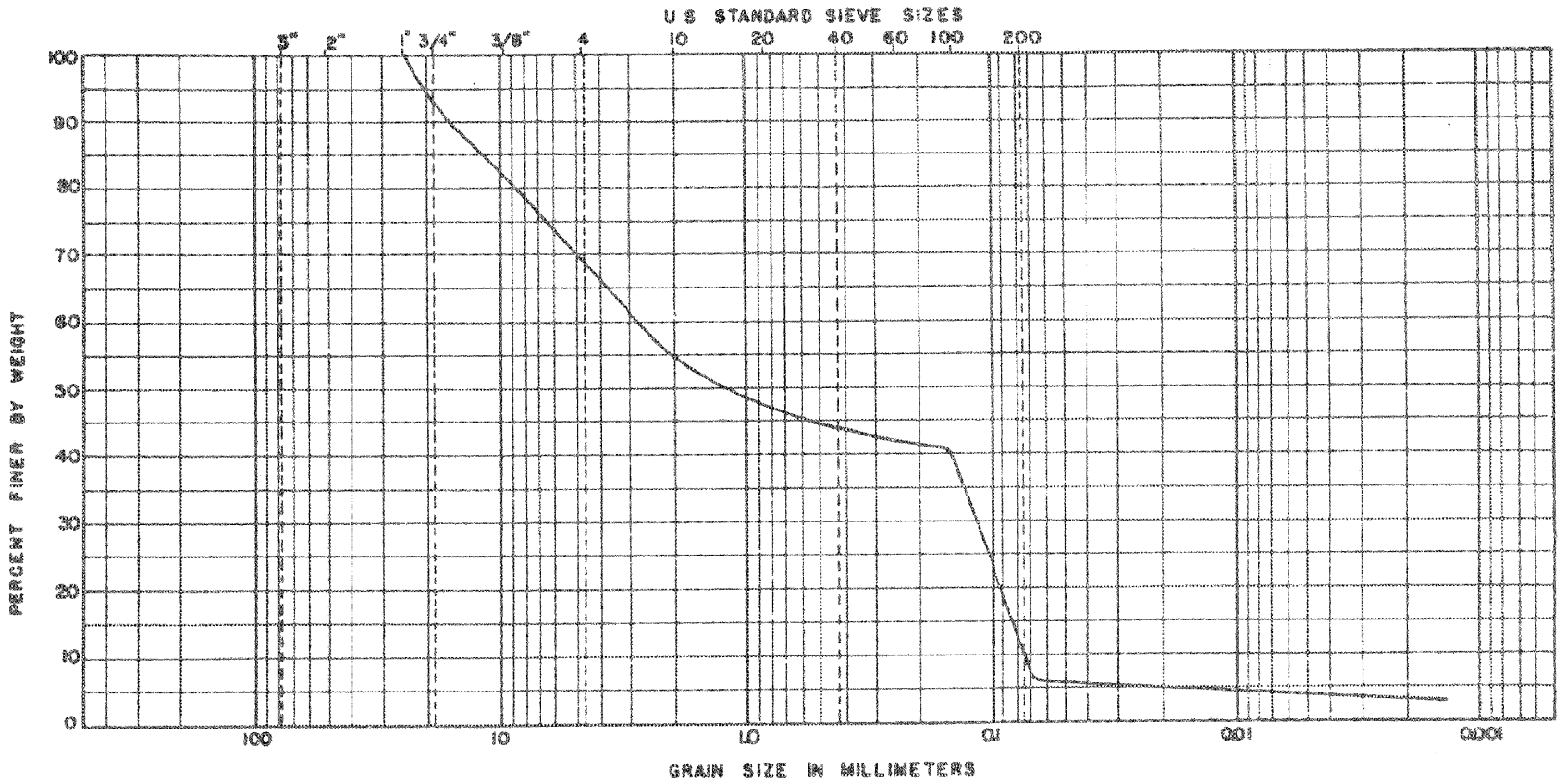
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-5	64'4"± 65'10"					GRAY SHELL FRAGMENTS WITH SILTY VERY FINE SAND UNIFIED SOIL CLASSIFICATION : SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



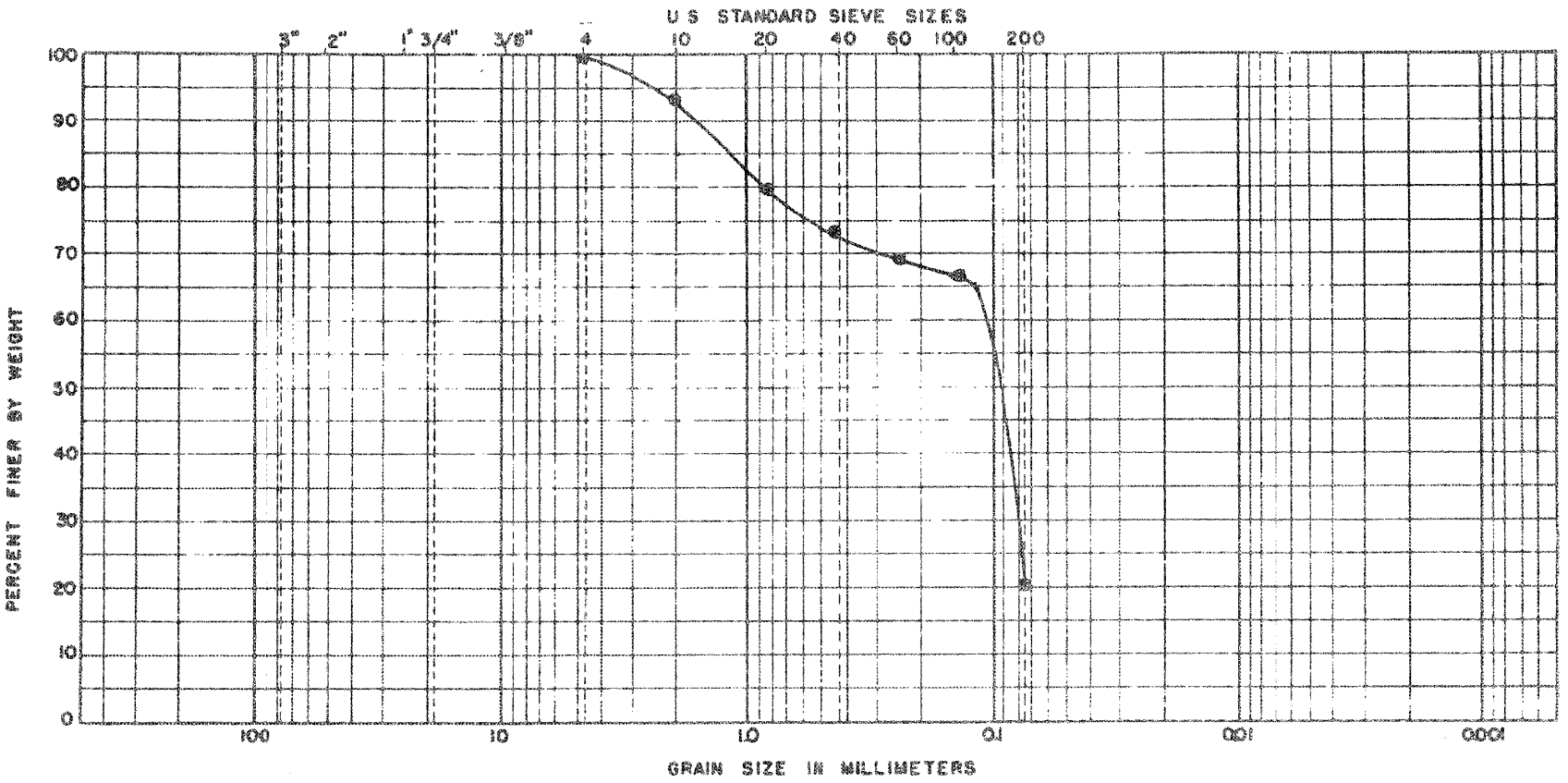
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5 UD	70-71.8'					Brown Grey slightly clayey slightly silty fine gravelly coarse to fine sand. (Fine gravel-medium sand sizes are shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



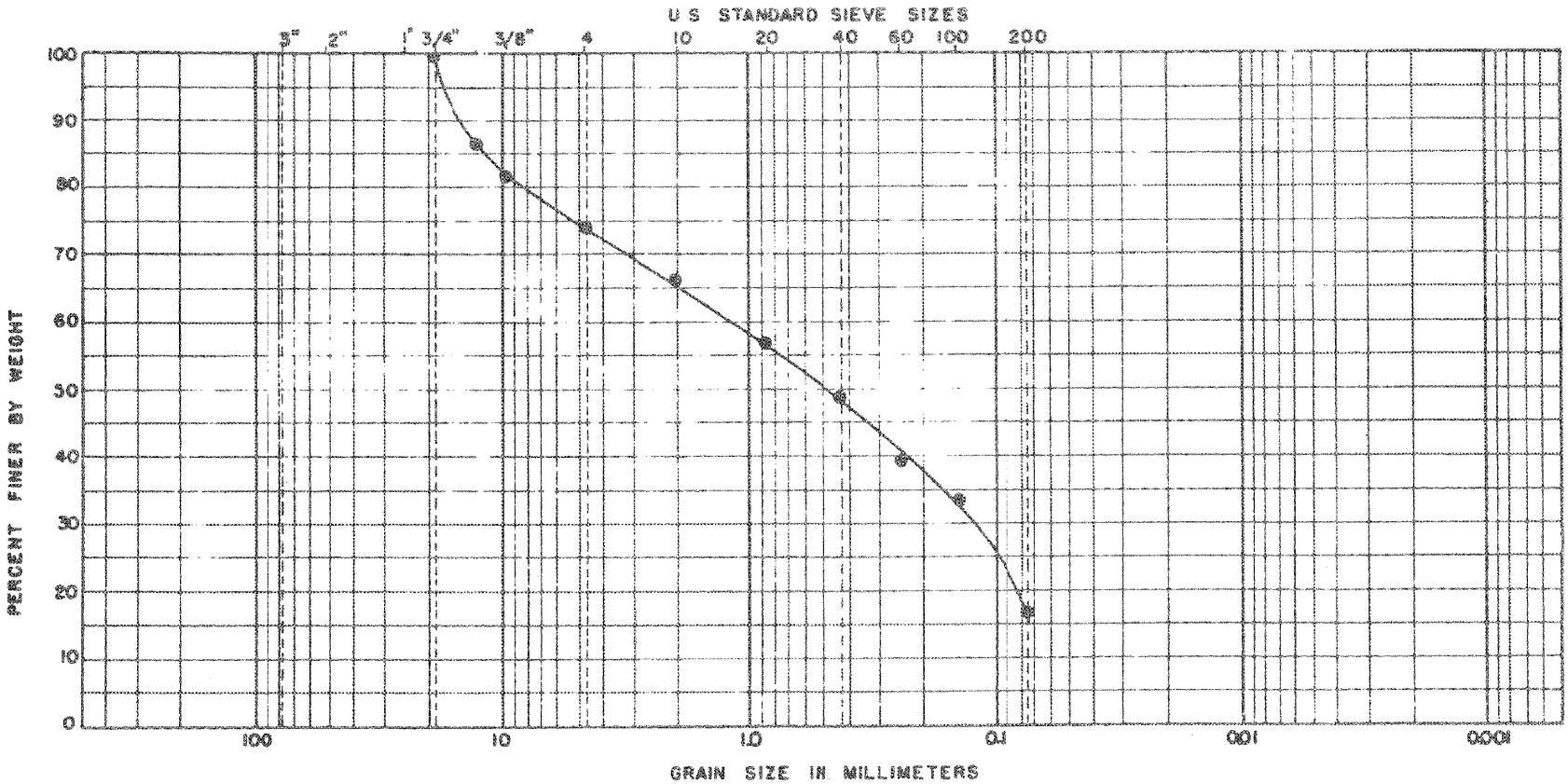
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5	[illegible] - 76.5'					GRAY SILTY FINE SAND WITH SHELL FRAGMENTS UNIFIED SOIL CLASSIFICATION: SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5	81' - 82.5'					GRAY SILTY FINE SAND WITH SHELL FRAGMENTS UNIFIED SOIL CLASSIFICATION: SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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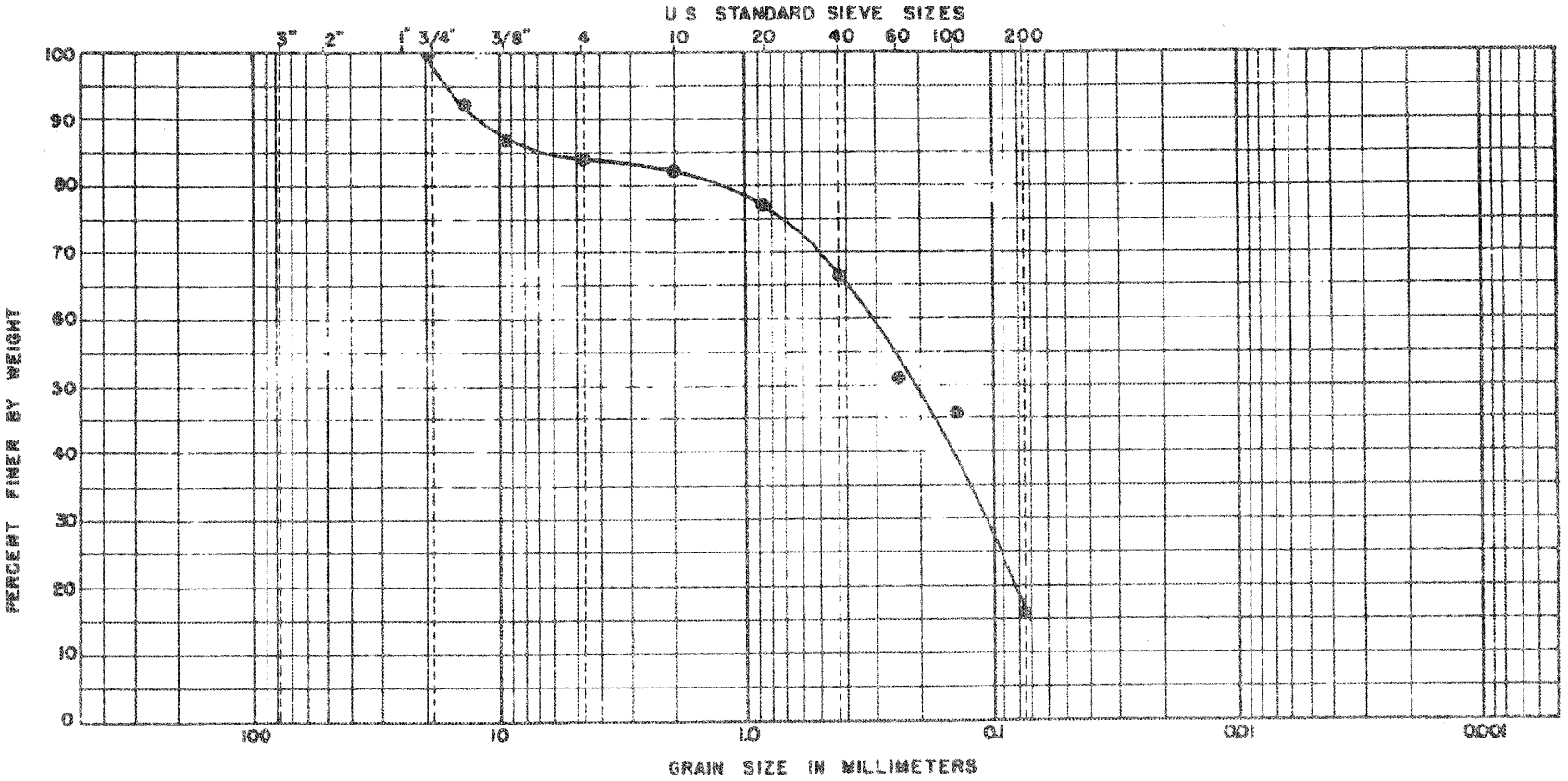


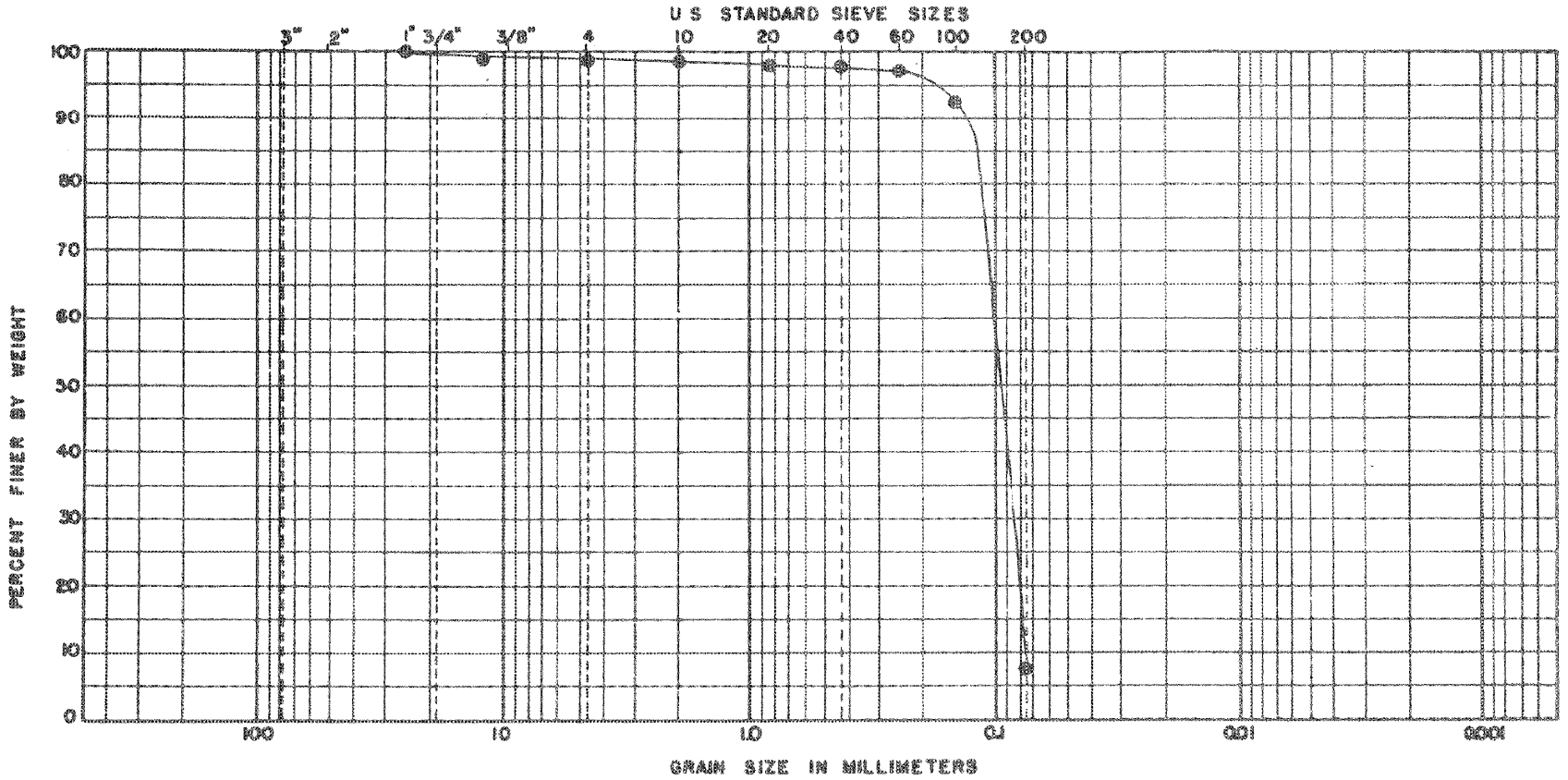
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5	83.5' - 85'					GRAY FINE SAND WITH HIGHLY FRAGMENTED SHELLS AND TRACE OF CEMENTED SAND AND SHELL NODULES UNIFIED SOIL CLASSIFICATION: SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



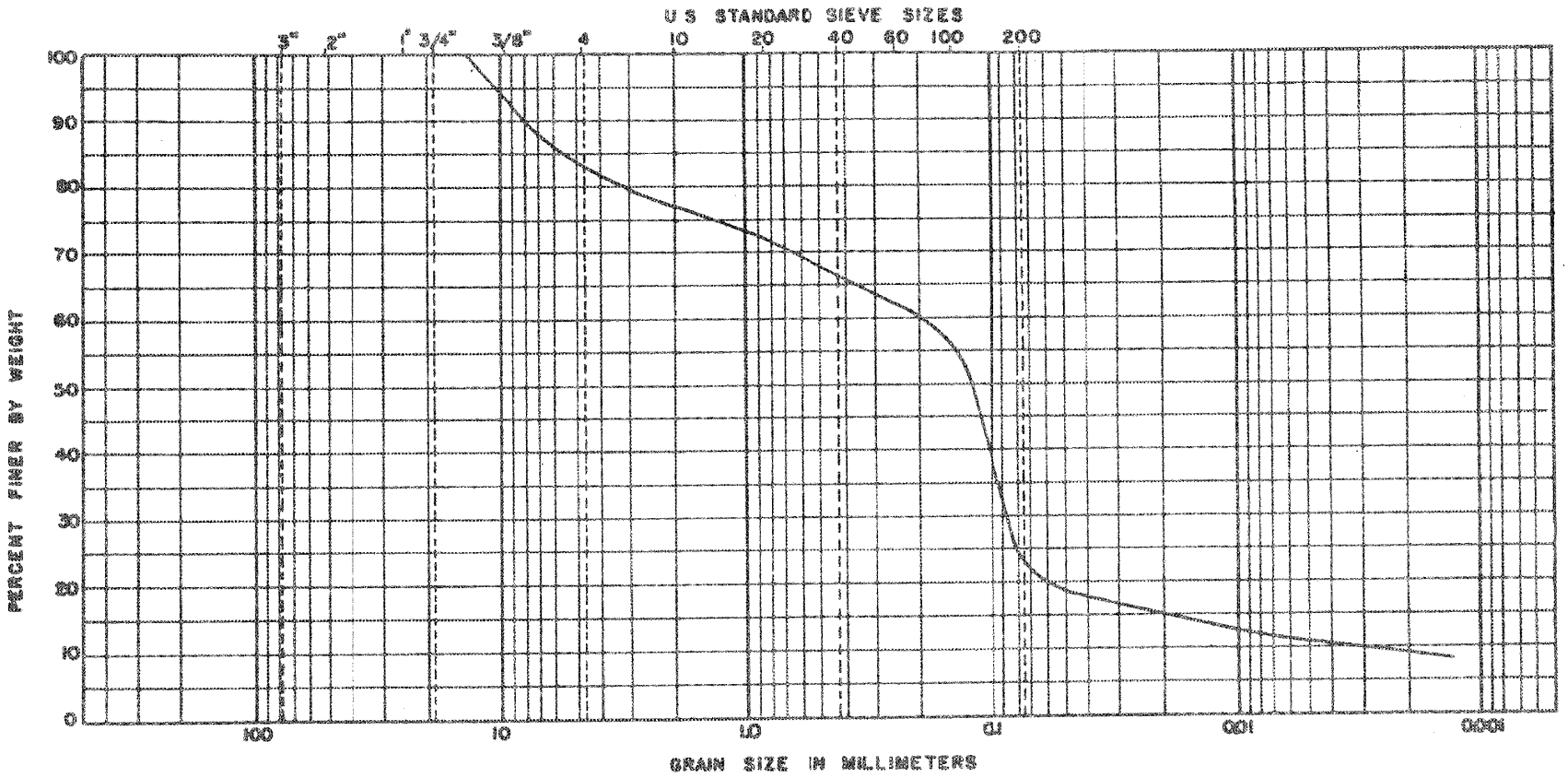
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-5	97'-99'					LIGHT GRAY SLIGHTLY SILTY FINE SAND WITH TRACE HIGHLY FRAGMENTED SHELLS UNIFIED SOIL CLASSIFICATION: SP-SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-5	125'					Grey brown slightly clayey silty fine gravelly coarse to fine sand. (Fine gravel size is 50% limestone and 50% shells coarse and medium sand sizes are 65% or more shells. Fine sand size is 35% shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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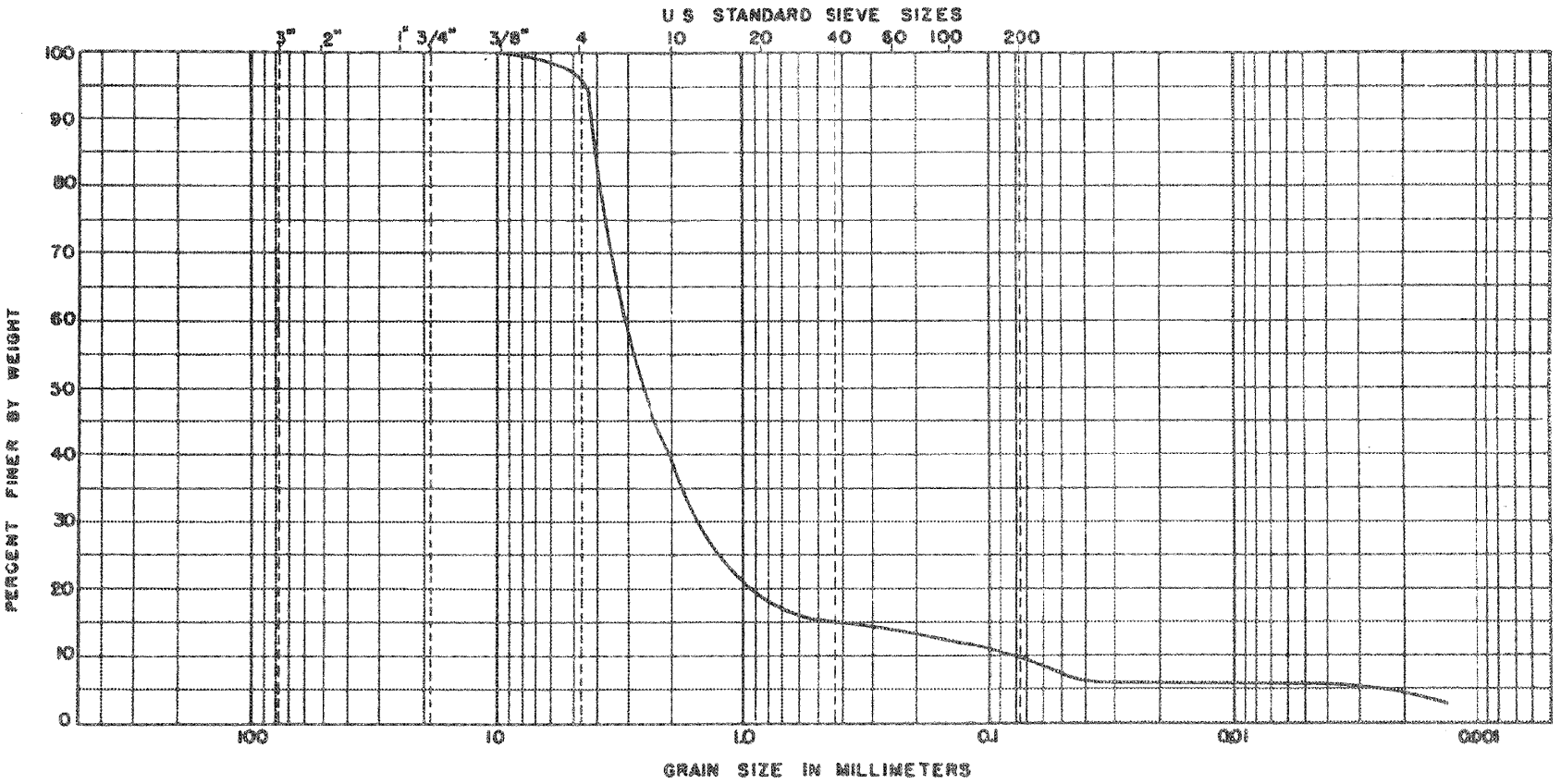


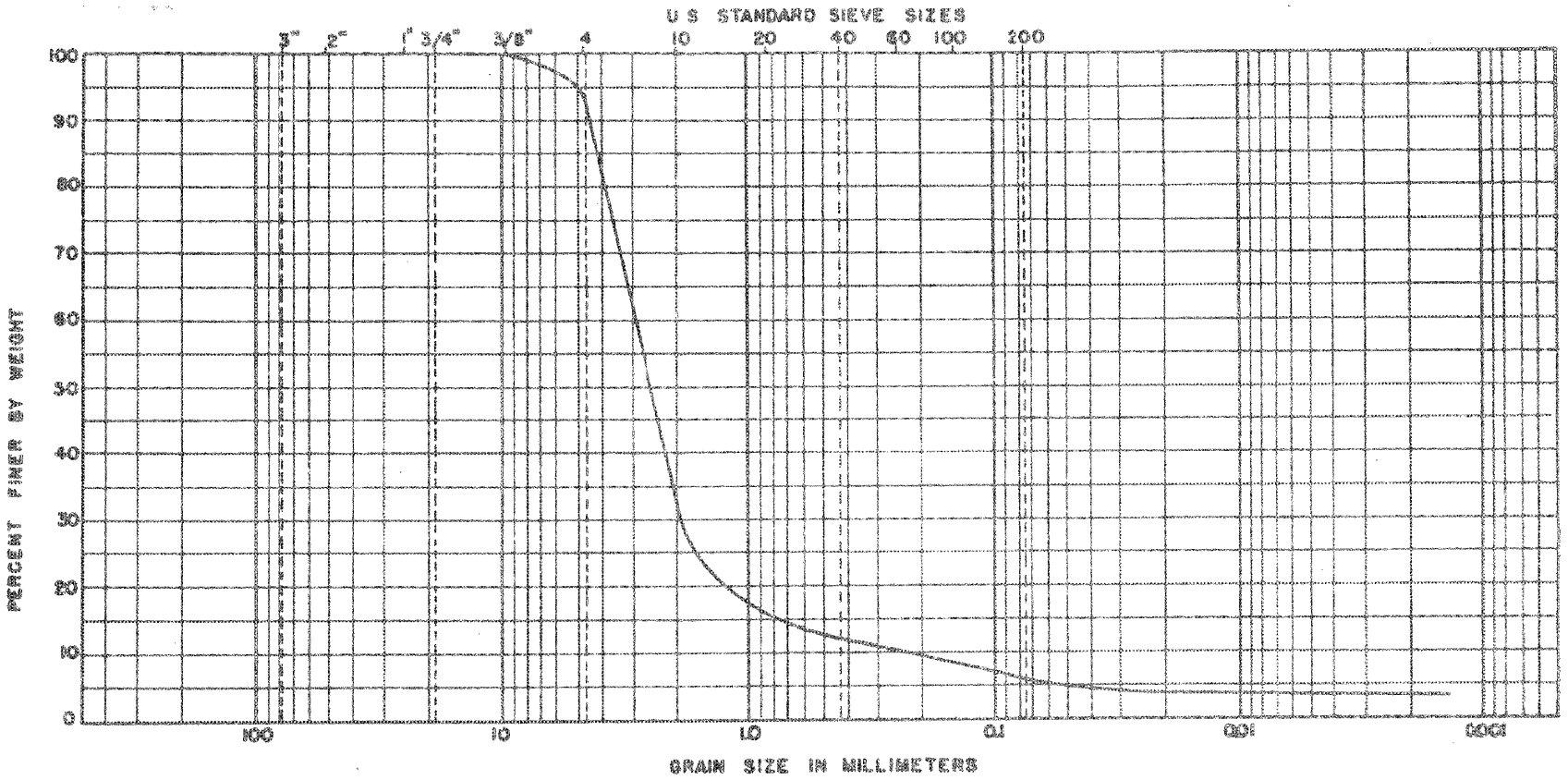
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5	128'		22	21	1	Grey-Brown slightly clayey slightly silty slightly fine gravelly coarse to fine sand. (Fine gravel size is all limestone. Coarse sand size is 75% limestone. Medium and fine sand sizes are shells and sand).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-5	130'					Grey brown slightly clayey slightly silty fine gravelly fine to coarse sand. (Fine gravel and fine to coarse sand sizes are 50% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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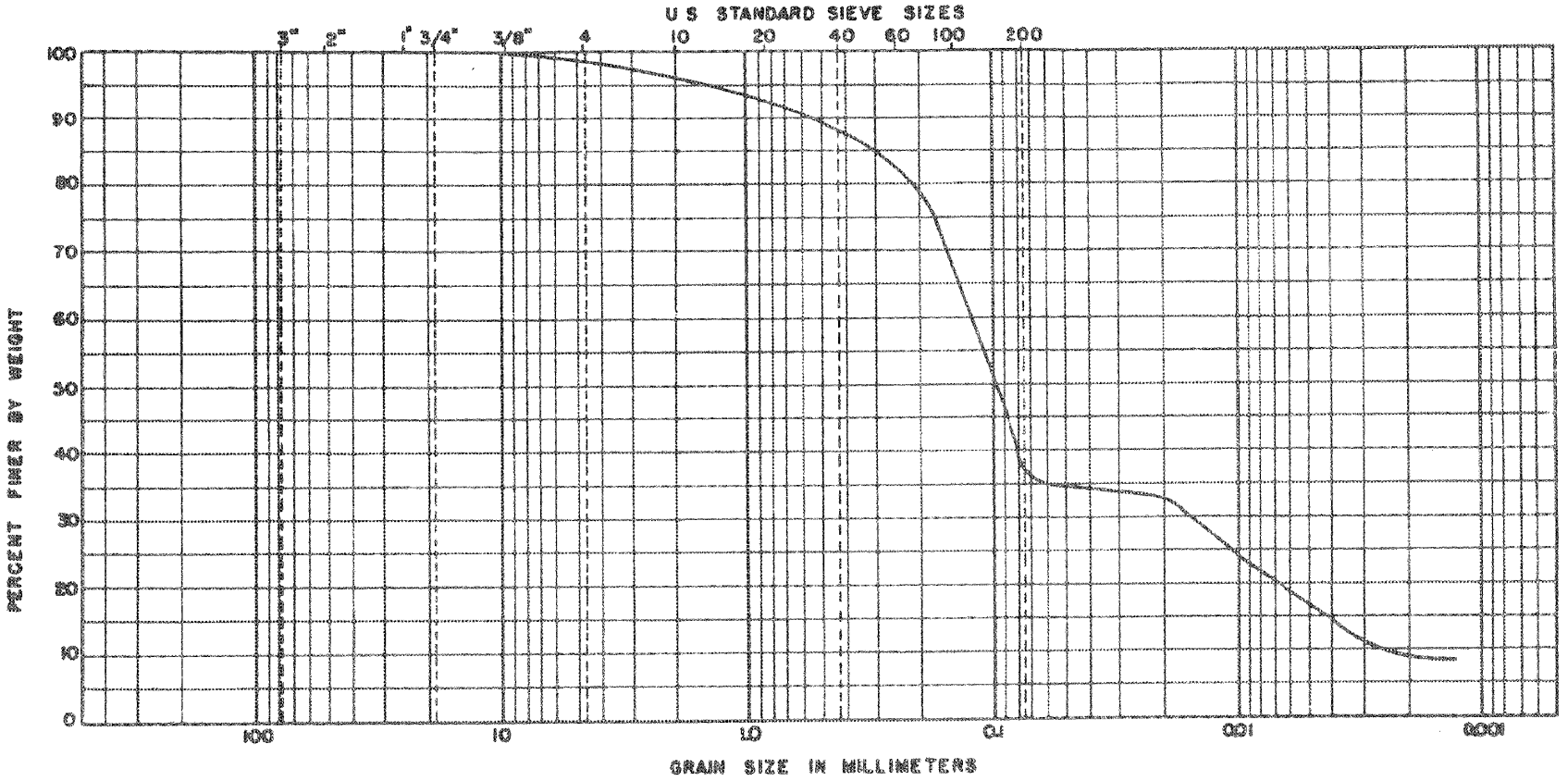


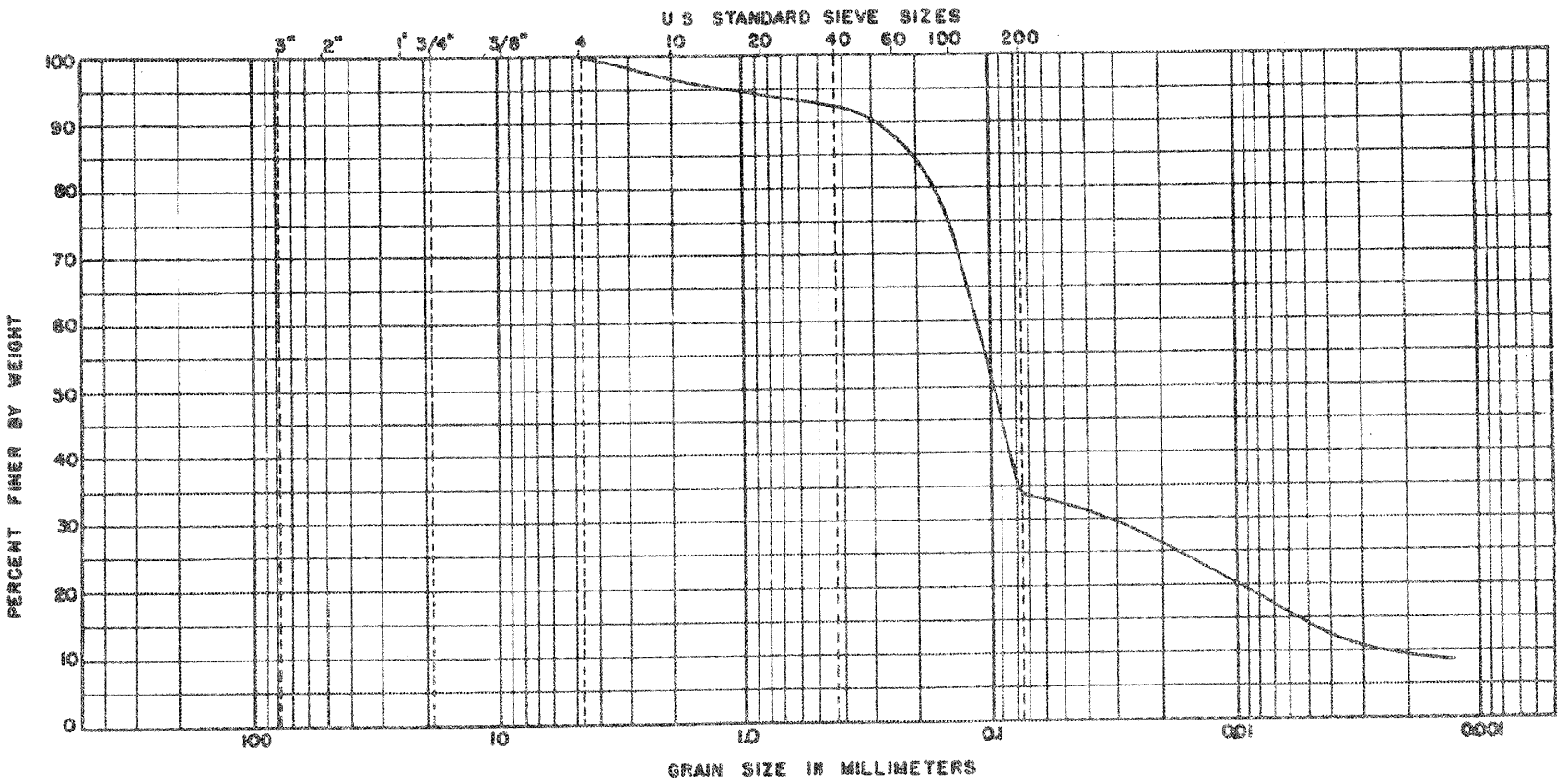
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-5	135'					Grey brown clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel and coarse to medium sand sizes are 90% or more shell fragments. Fine sand size is 50% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



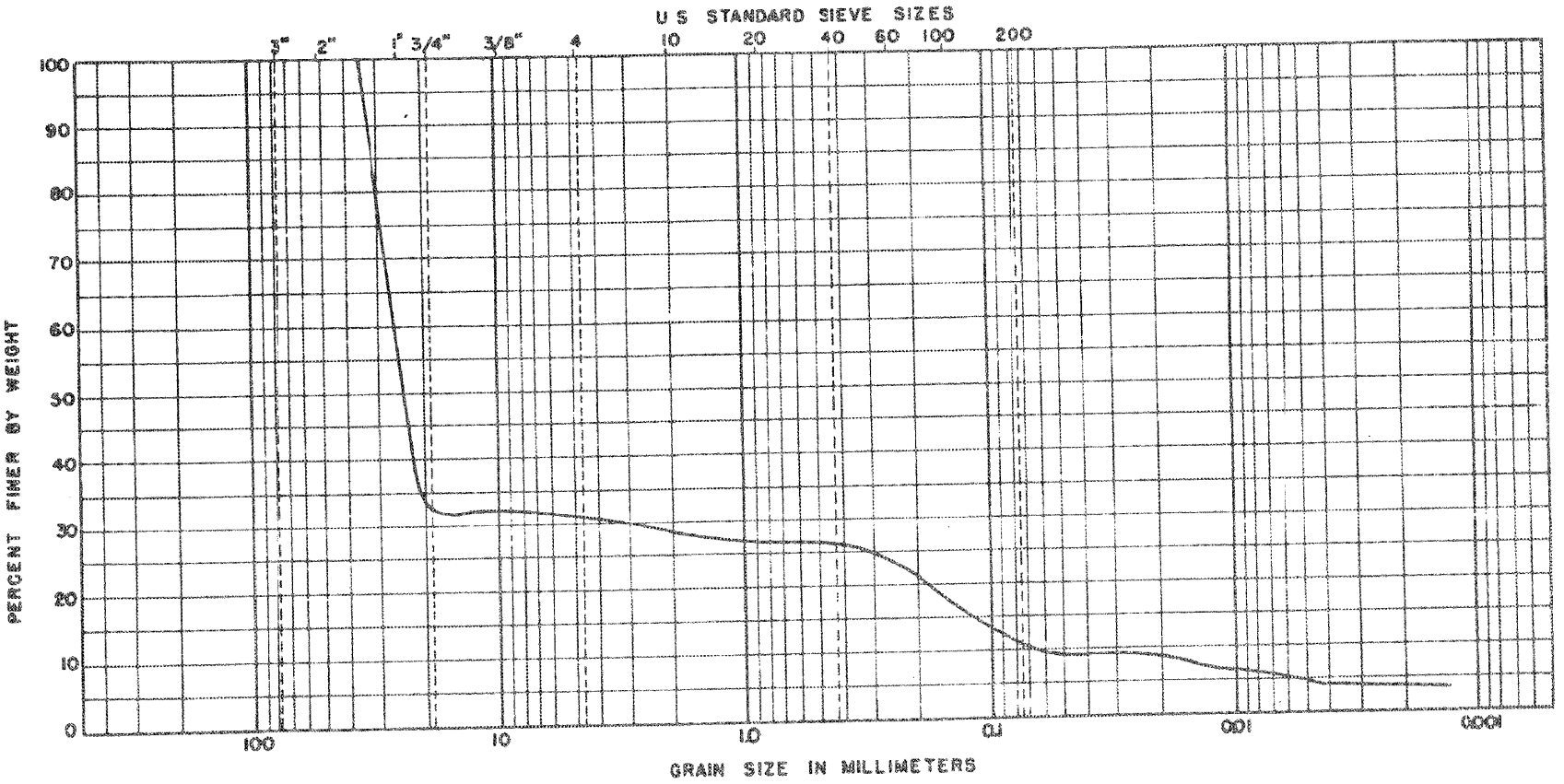
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-5	140'					Grey brown clayey silty coarse to fine sand. (Coarse to fine sand sizes are 50% or more shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



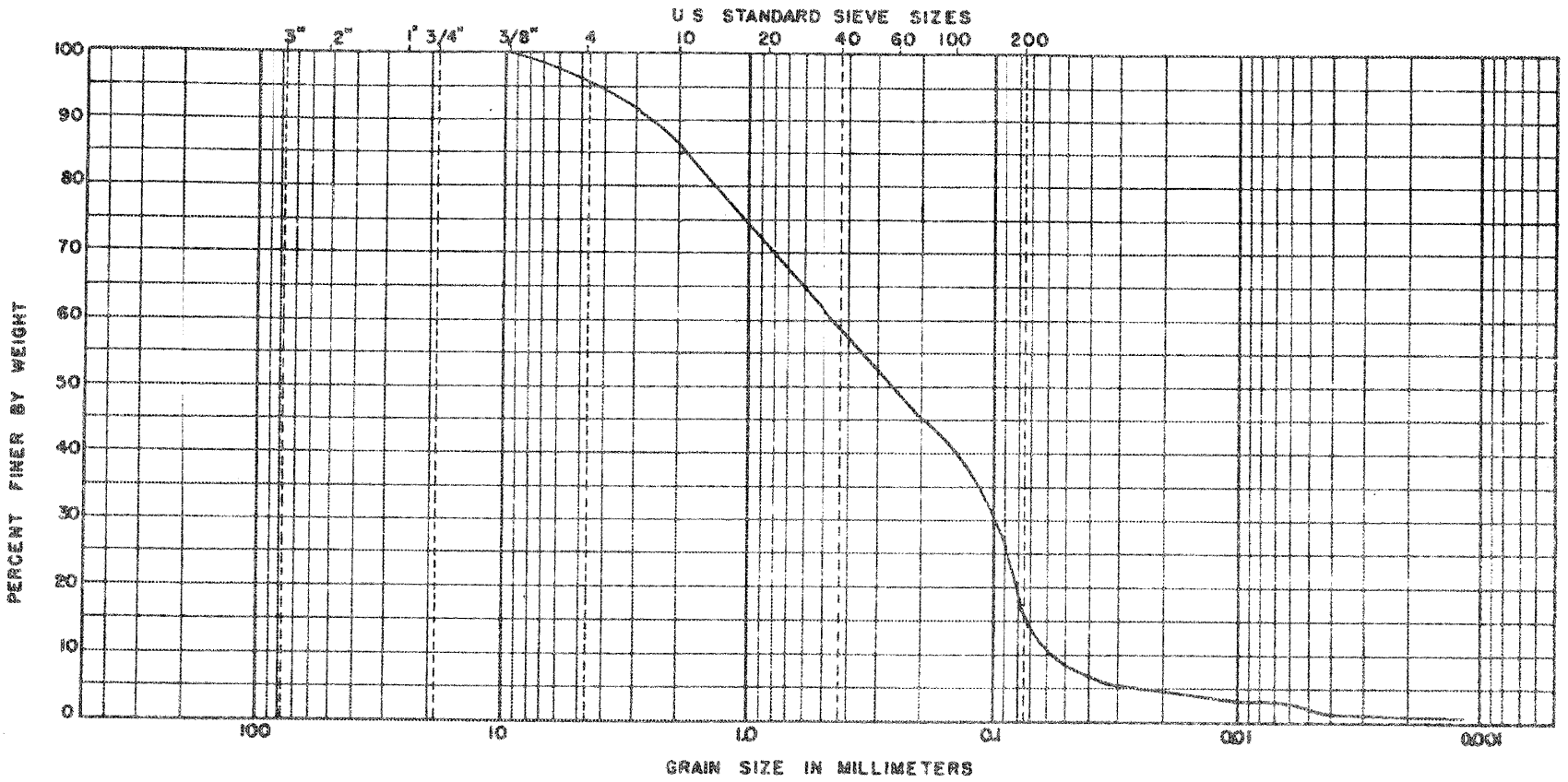
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-5	145'		NL	NP		Light brown slightly clayey slightly silty coarse to fine sandy coarse gravel (coarse gravel size is limestone. Coarse to fine sand sizes are 70% limestone and 30% shell fragments).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-6	55'	15.4				Brown-grey slightly clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel and coarse sand sizes are 70% or more shell fragments.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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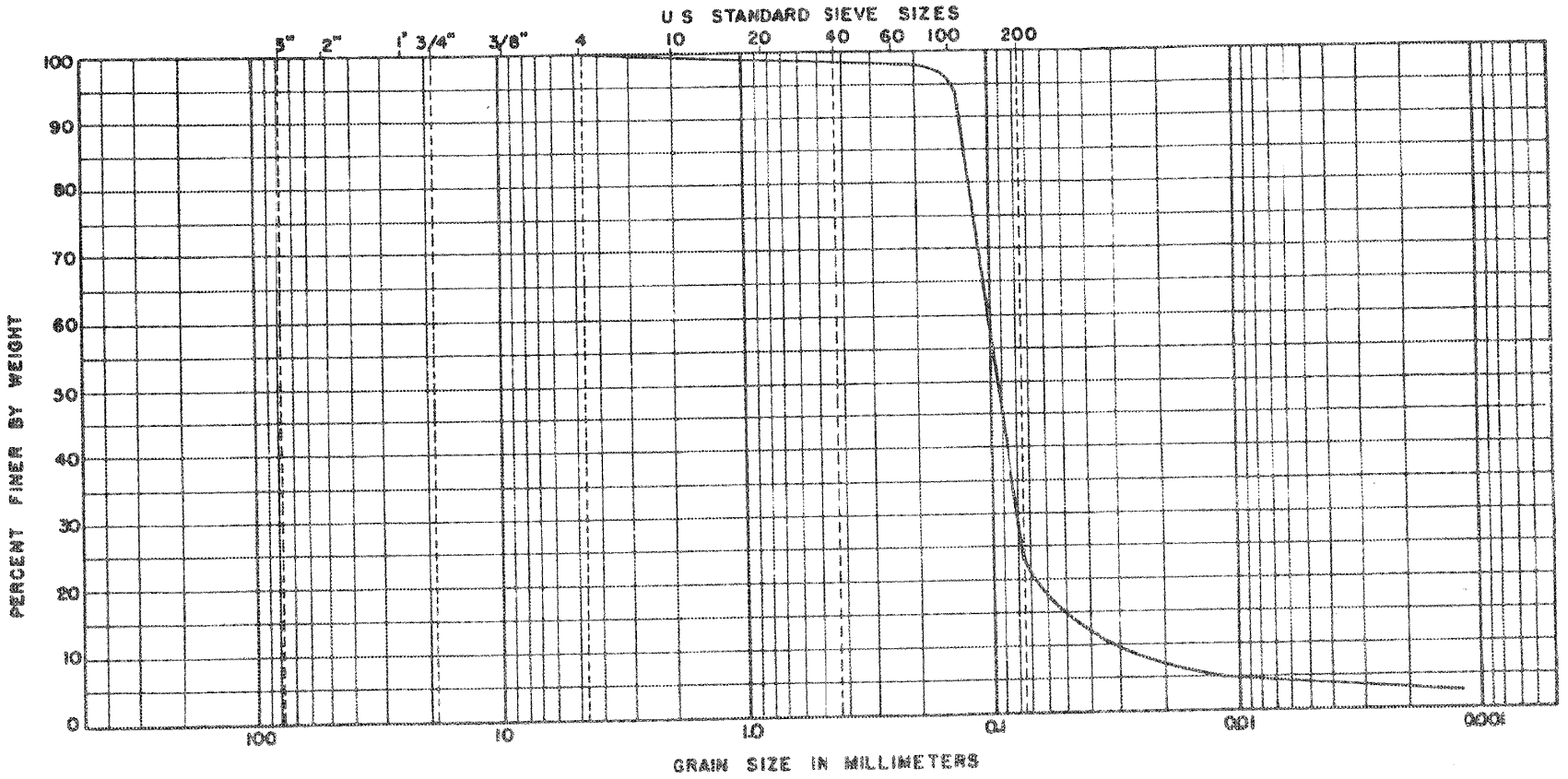


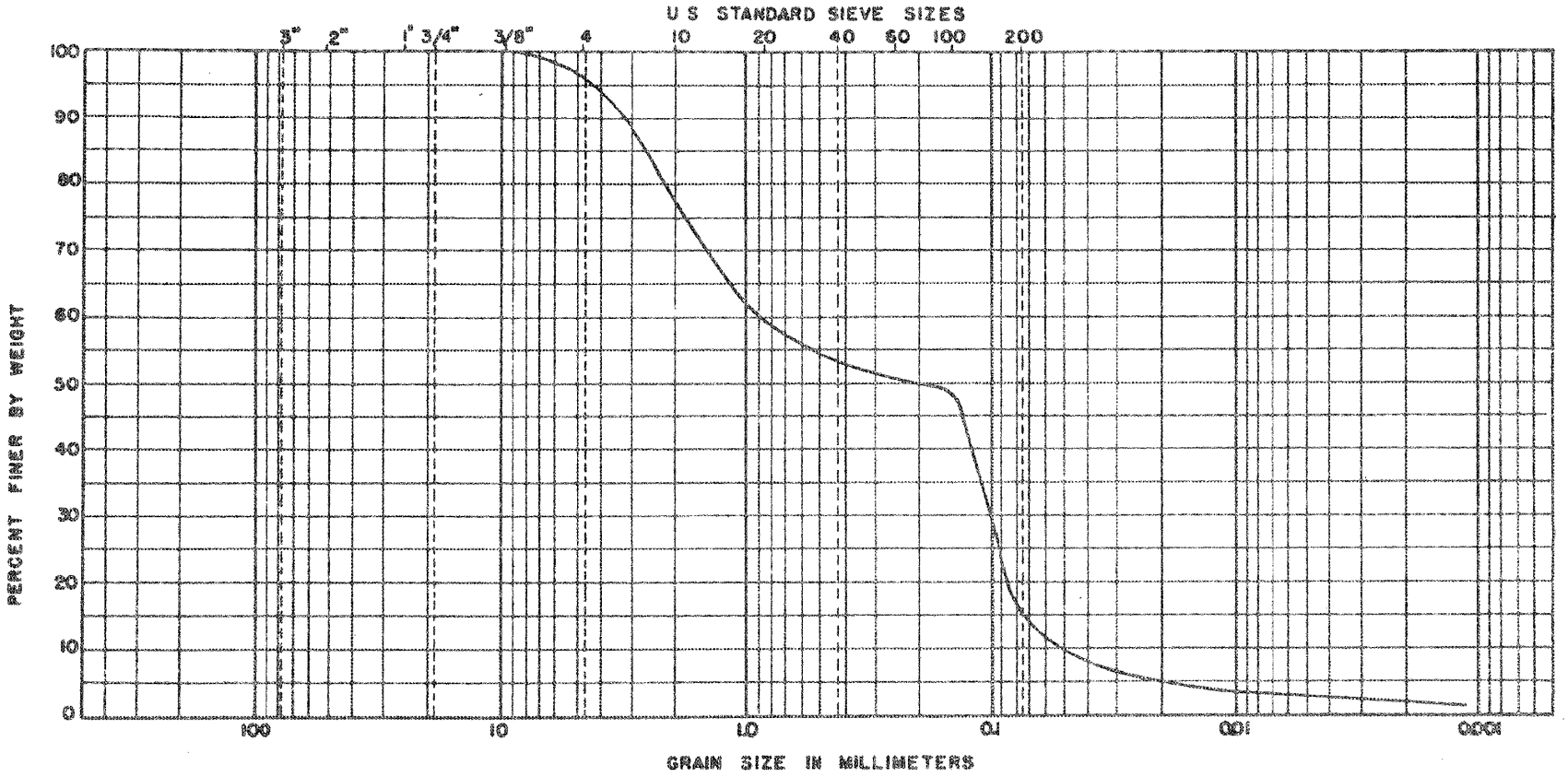
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-6	70'	28.9				Brown-grey slightly clayey silty coarse to fine sand. (Coarse sand size is 30% shell fragments and 70% limestone.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



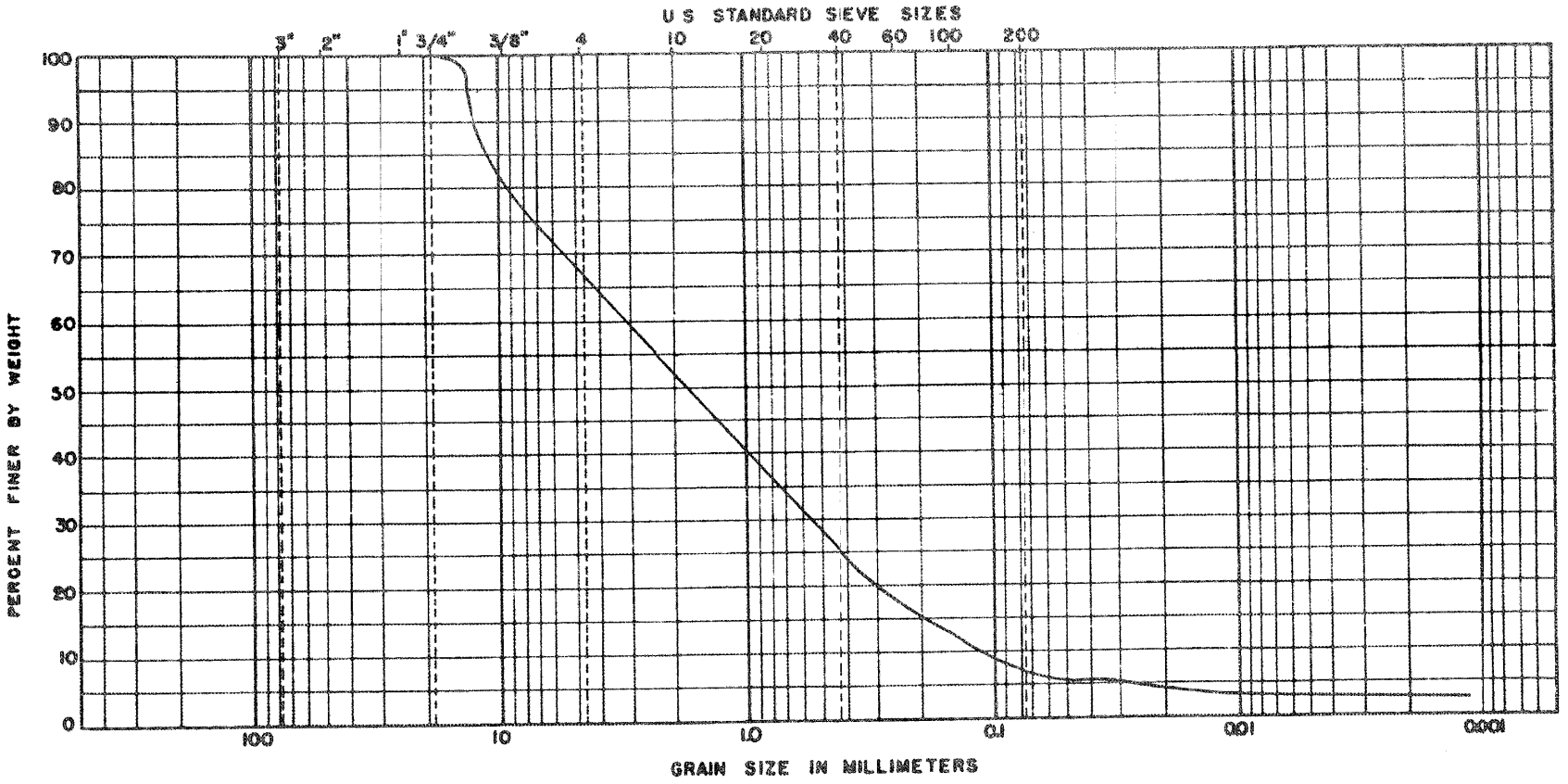
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-6	75'	17.8	NL	NP	--	Brown-grey slightly clayey silty slightly fine gravelly coarse to fine sand. (Fine gravel and coarse to medium sand sizes are 90% or more shell fragments.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-6	85'	24.6				Grey slightly clayey slightly silty fine gravelly coarse to fine sand. (Fine gravel and coarse sand sizes are cemented shell fragments.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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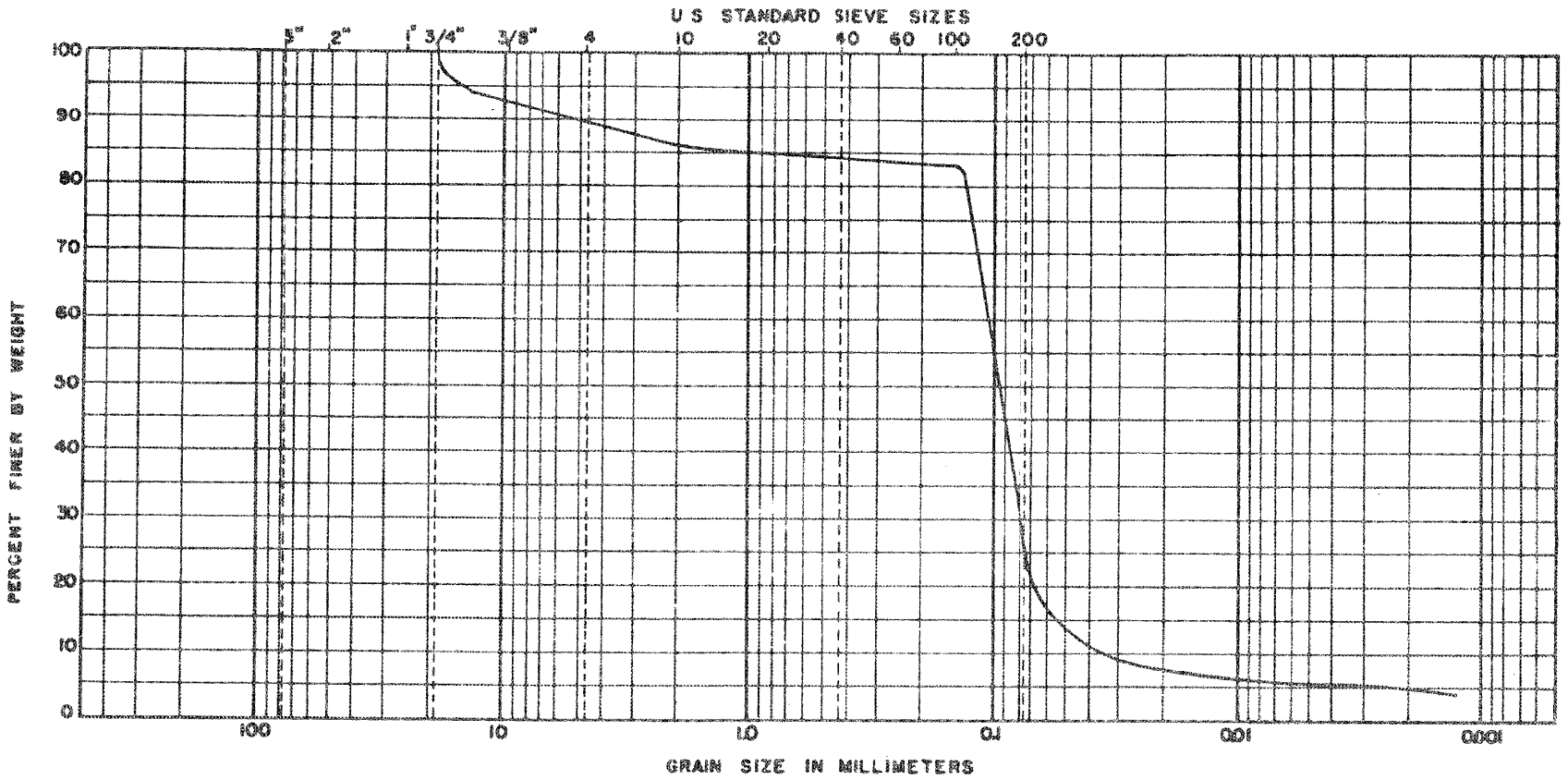

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-6	95'	25.1				Grey-brown slightly clayey silty fine gravelly coarse to fine sand. (Fine gravel size is limestone. Coarse and medium sand sizes are shell and limestone.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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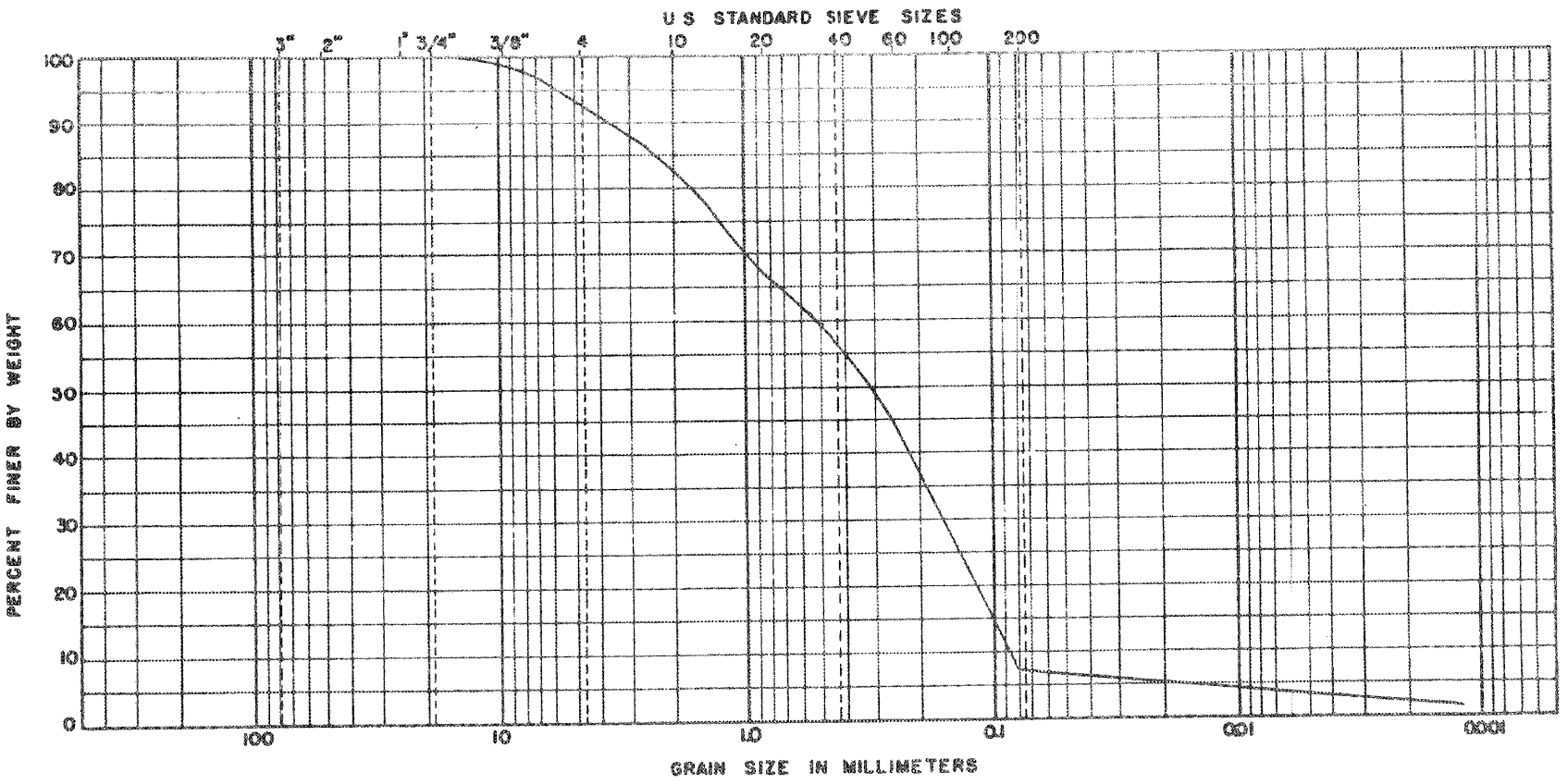

BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-6	90'	16.4				Grey-brown slightly clayey slightly silty fine gravelly coarse to fine sand. (Fine gravel and coarse sand sizes are 90% or more shell fragments.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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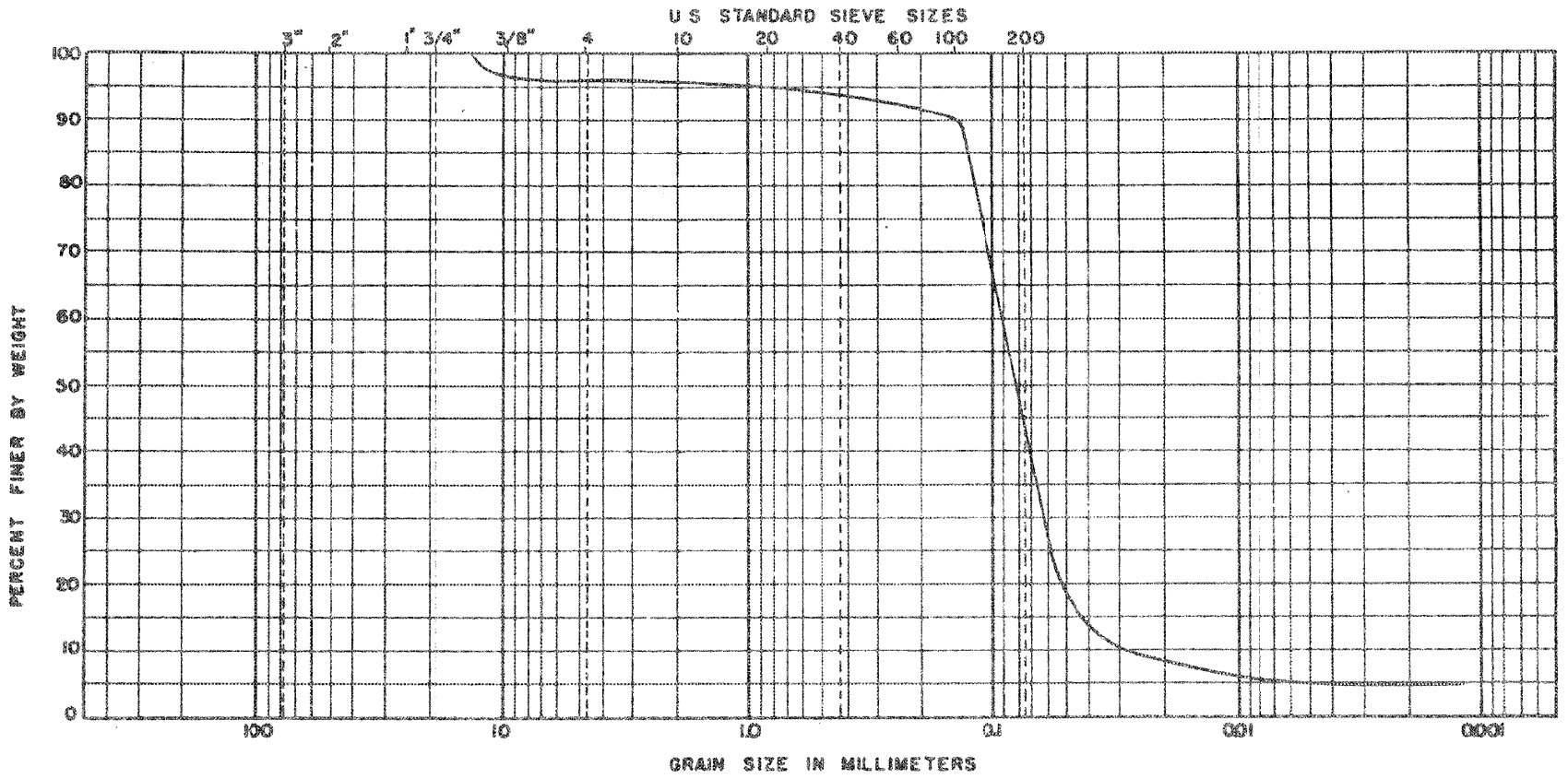


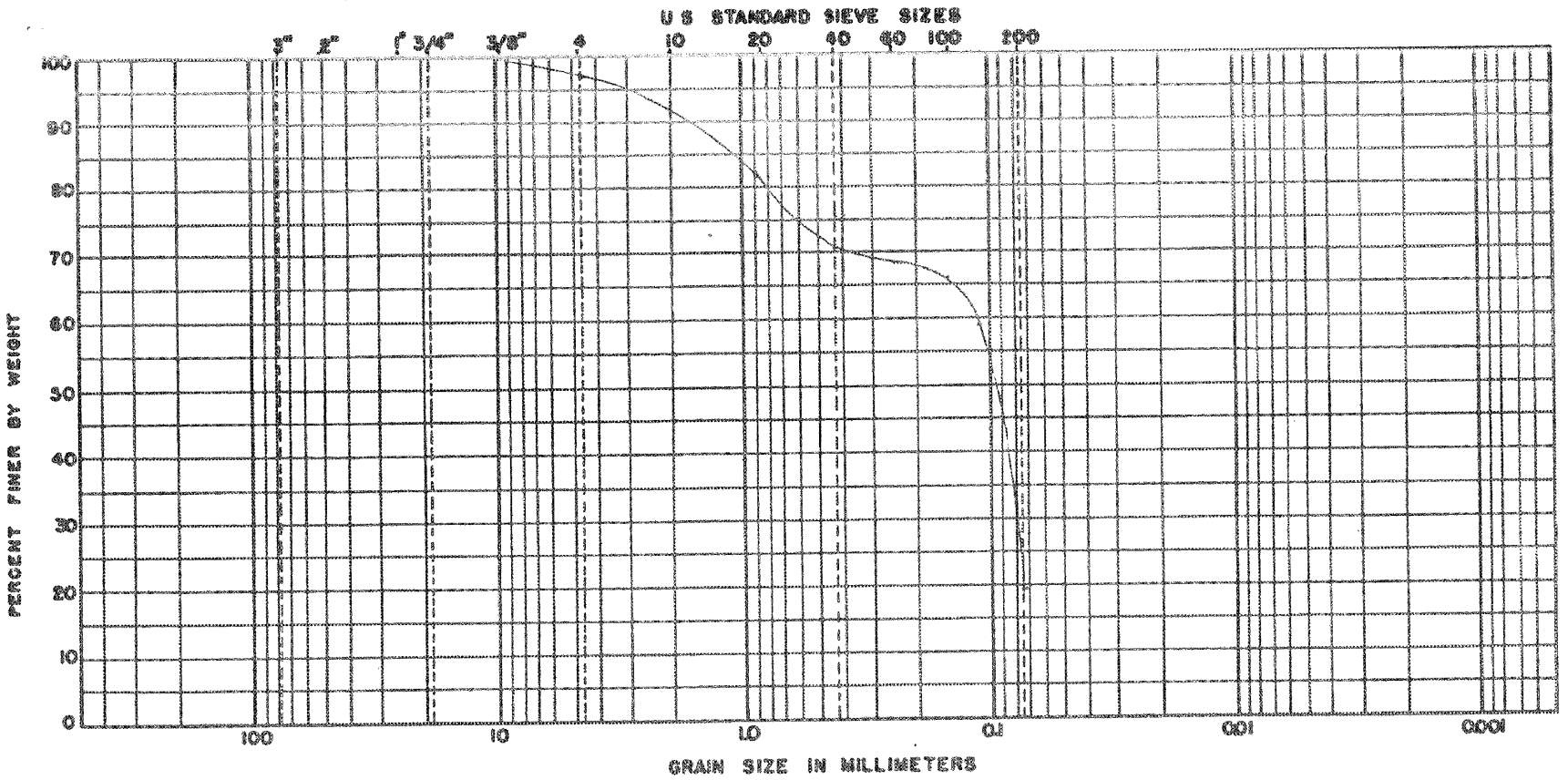
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-6	100'	25.0				Grey-brown clayey silty slightly fine gravelly coarse to fine sand.(Fine gravel size is limestone. Coarse and medium sand sizes are 50% or more shell or shell fragments.)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



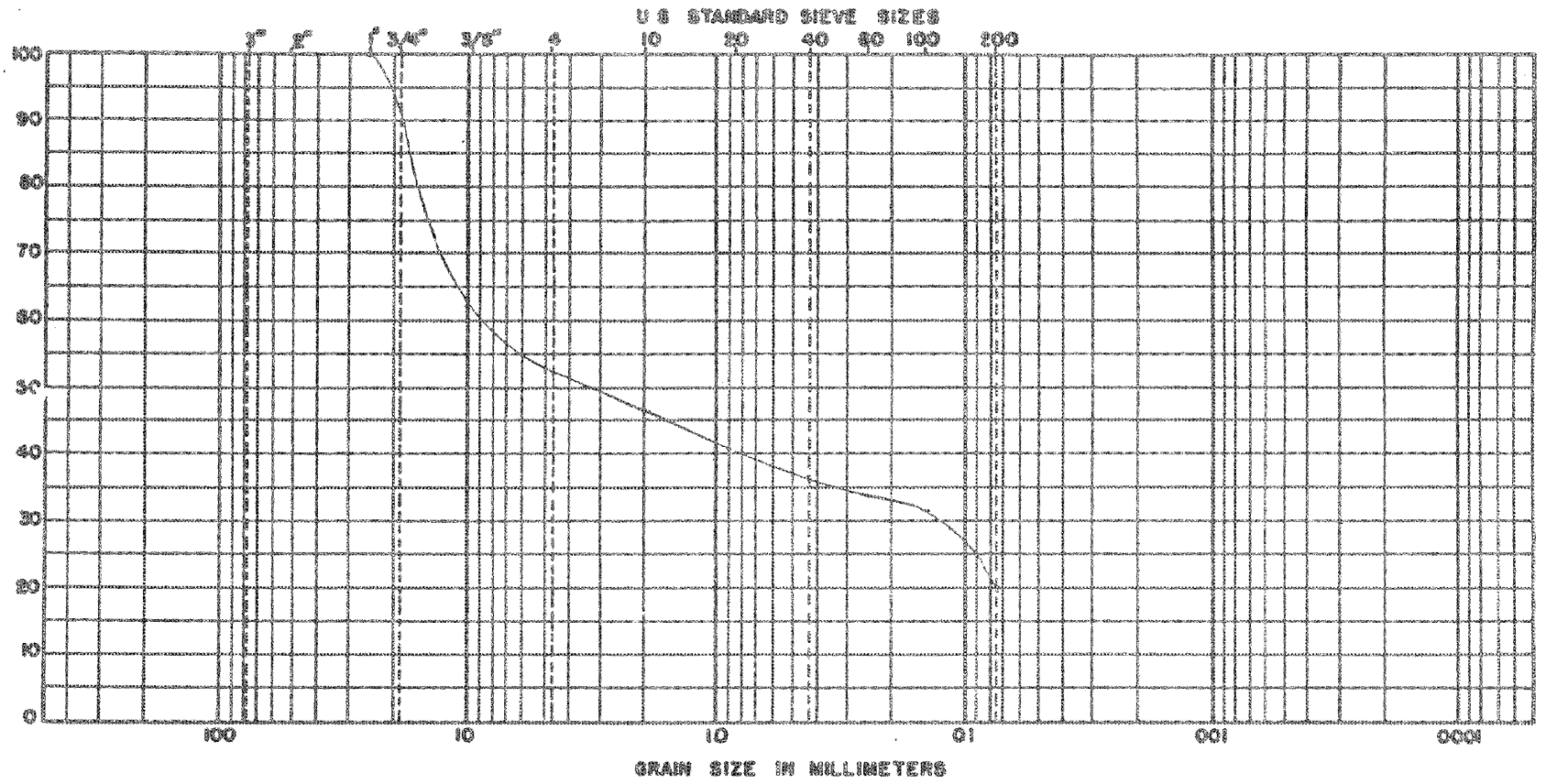
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-6A Sample #17	80.0'	-	-	-	-	-	Grey fine sand with shell Moisture Content - 24.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



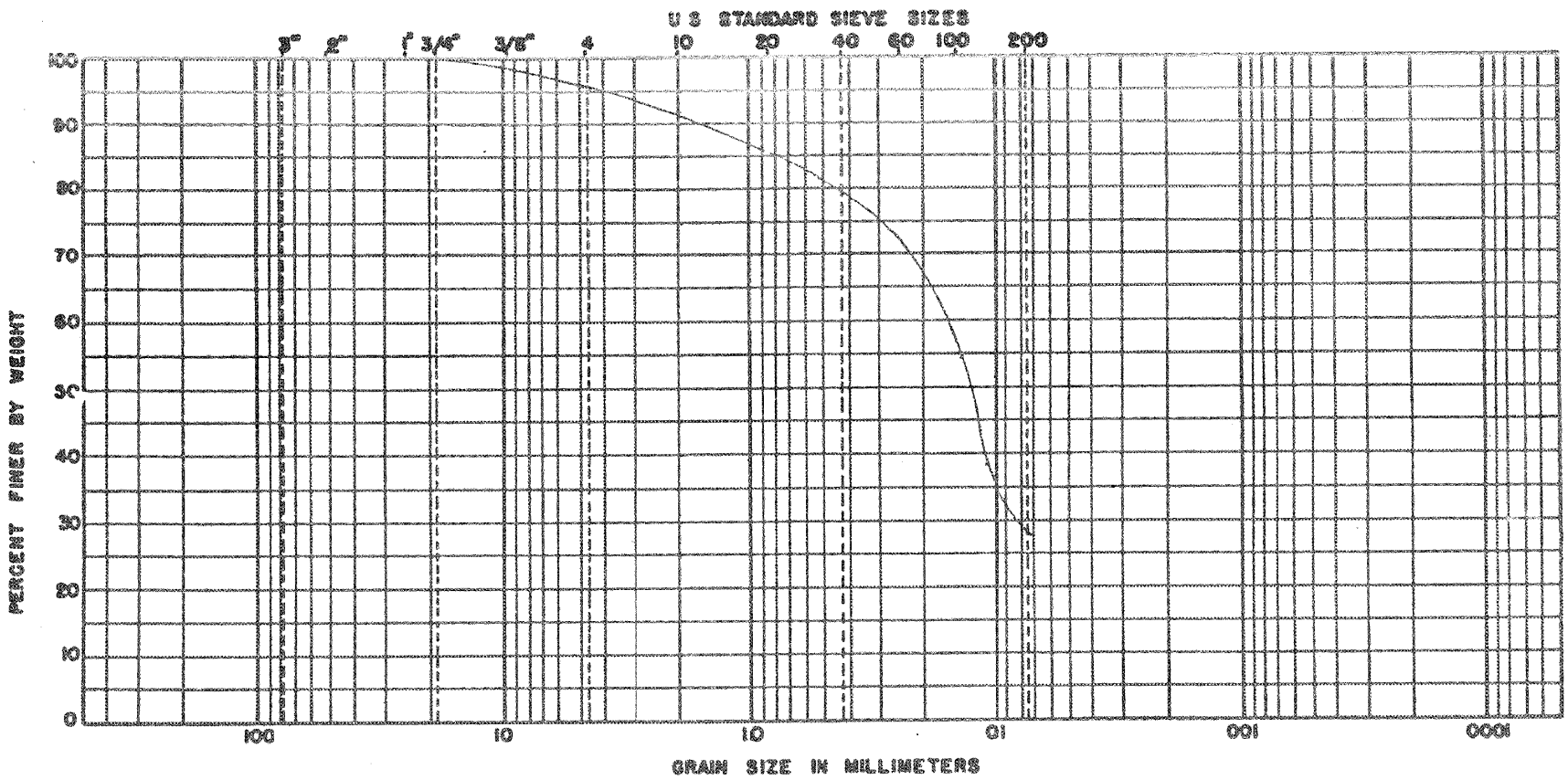
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-6A Sample #23	110.0'	- -	-	-	-	Grey fine sand with shell Moisture Content - 16.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



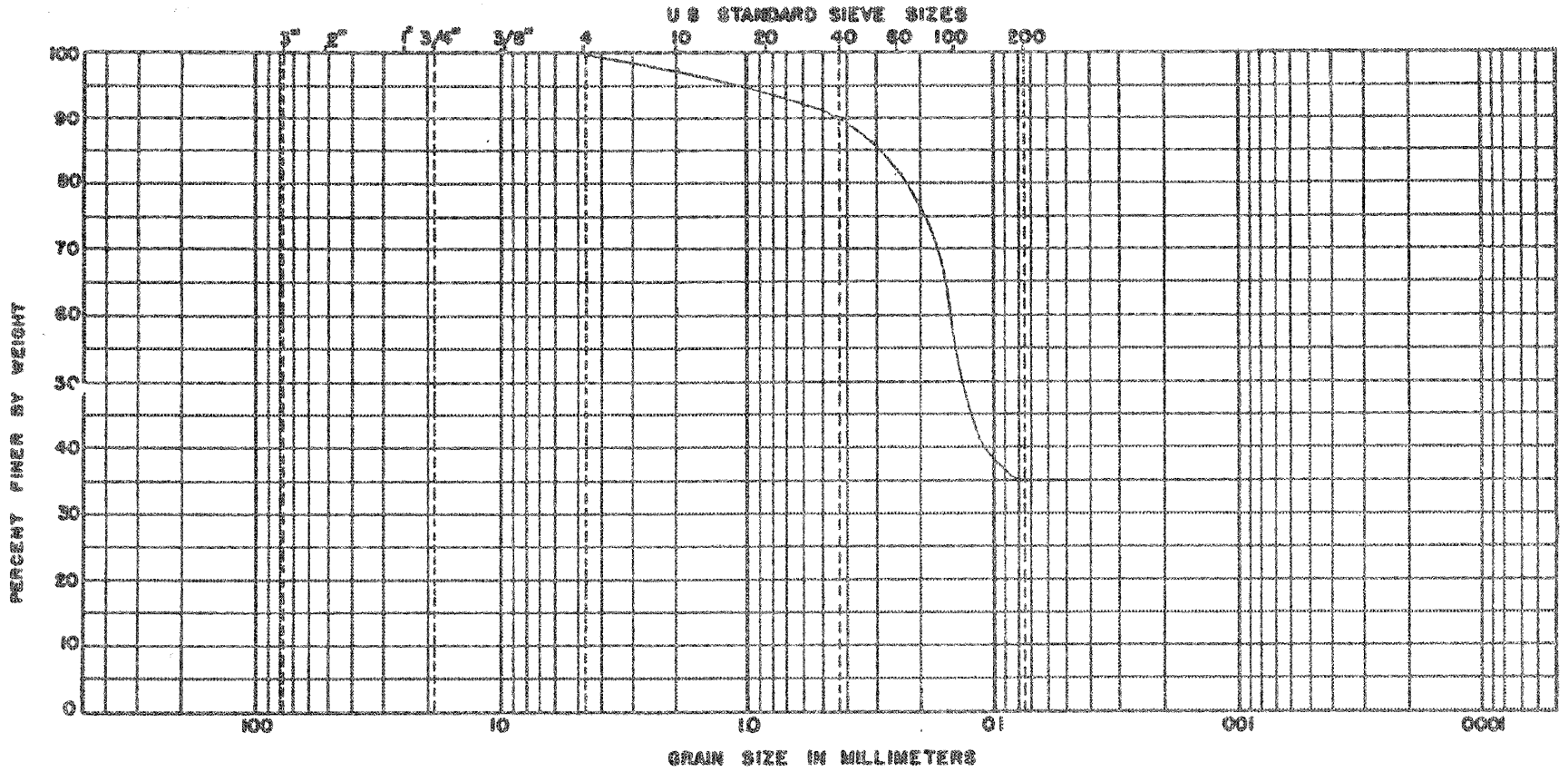
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-6A Sample #28	135.0'	- -	-	-	-	Grey slightly clayey fine sand Mositure Content 22.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



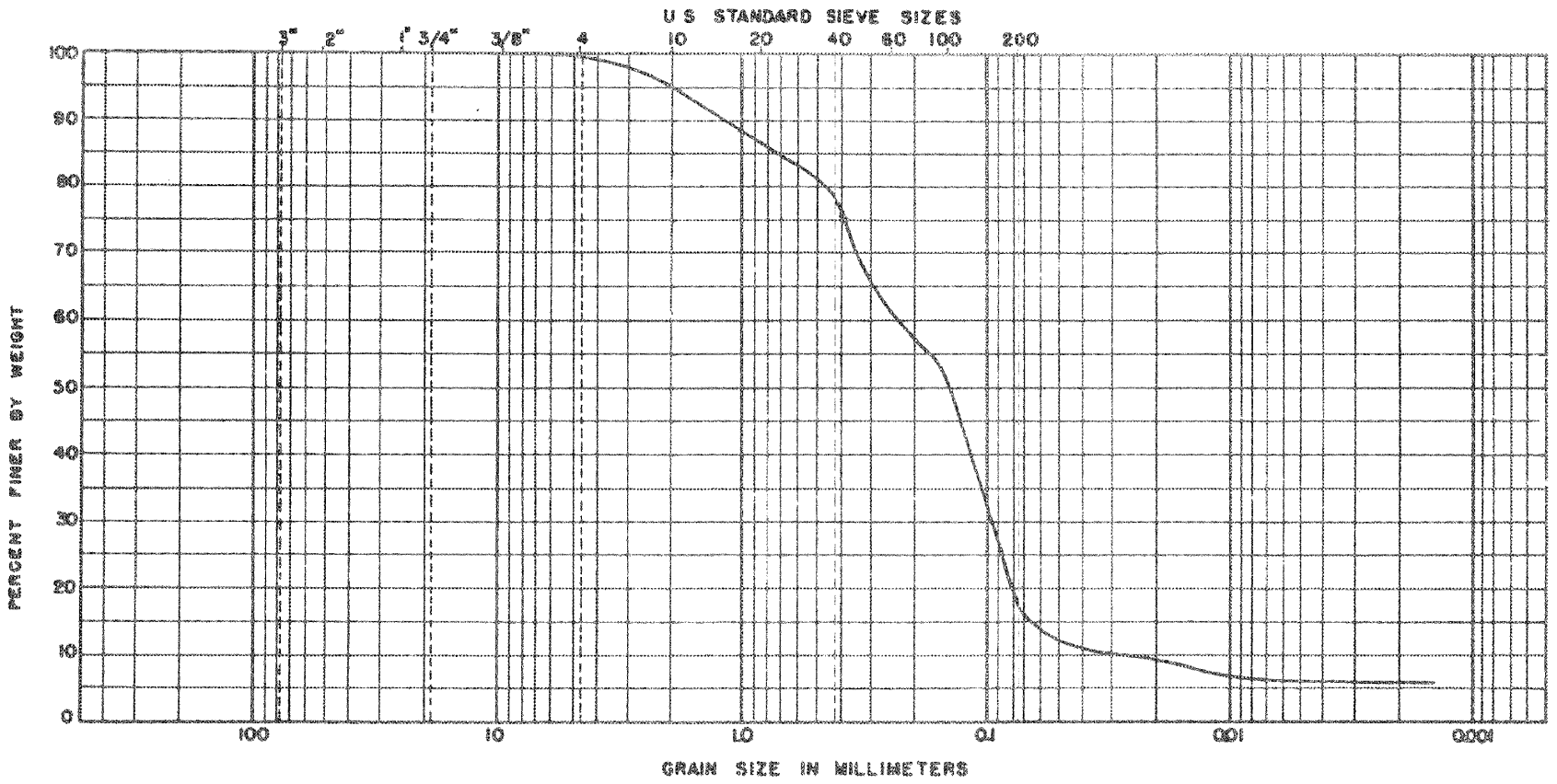
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-6A Sample #29	140.0'	- -	-	-	-	Grey slightly clayey fine sand with traces of shell Moisture Content - 24.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-15	65'					Brown and Grey slightly clayey silty coarse to fine sand. (coarse to medium sand sizes are 90% or more shell fragments)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

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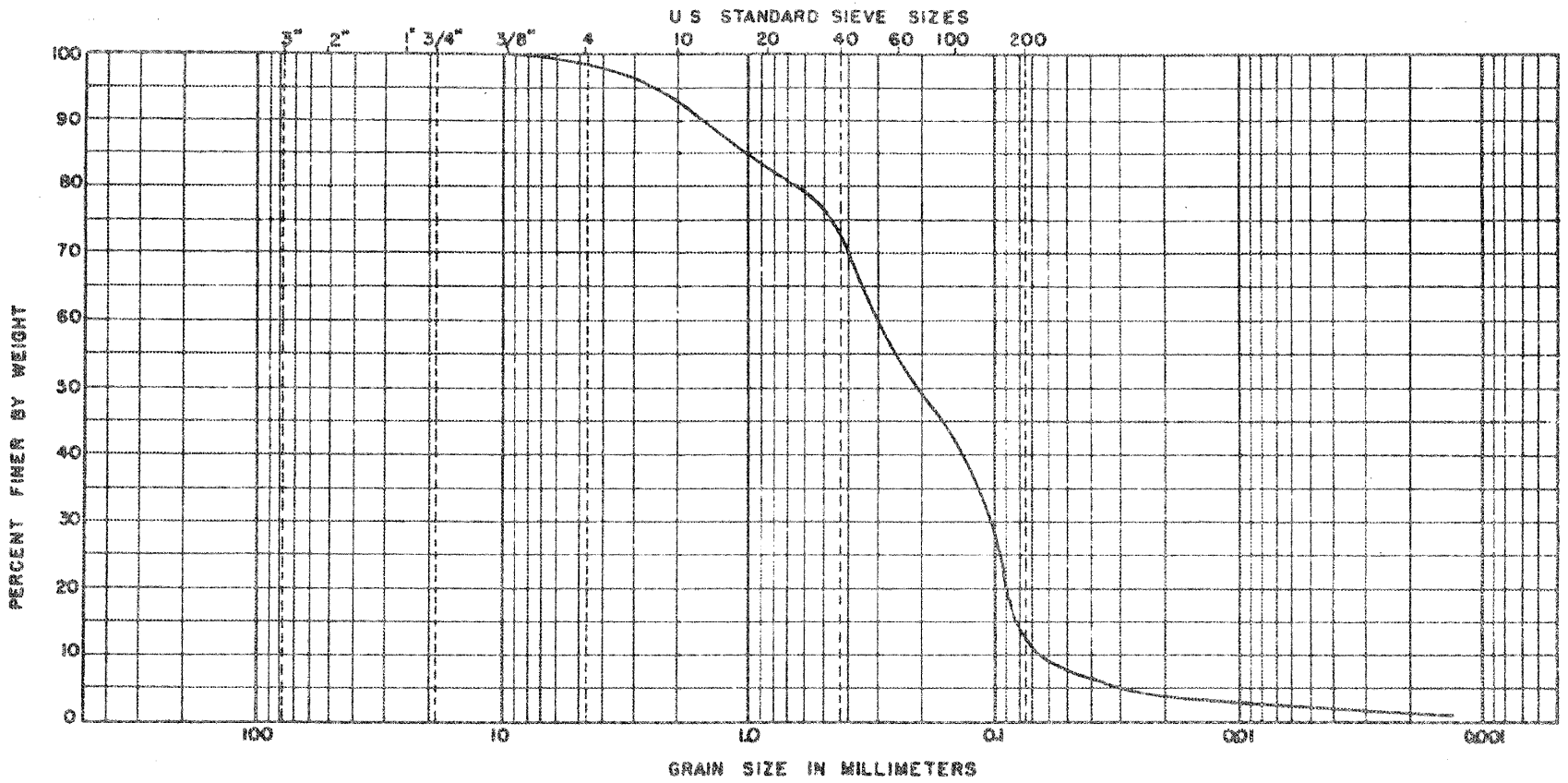


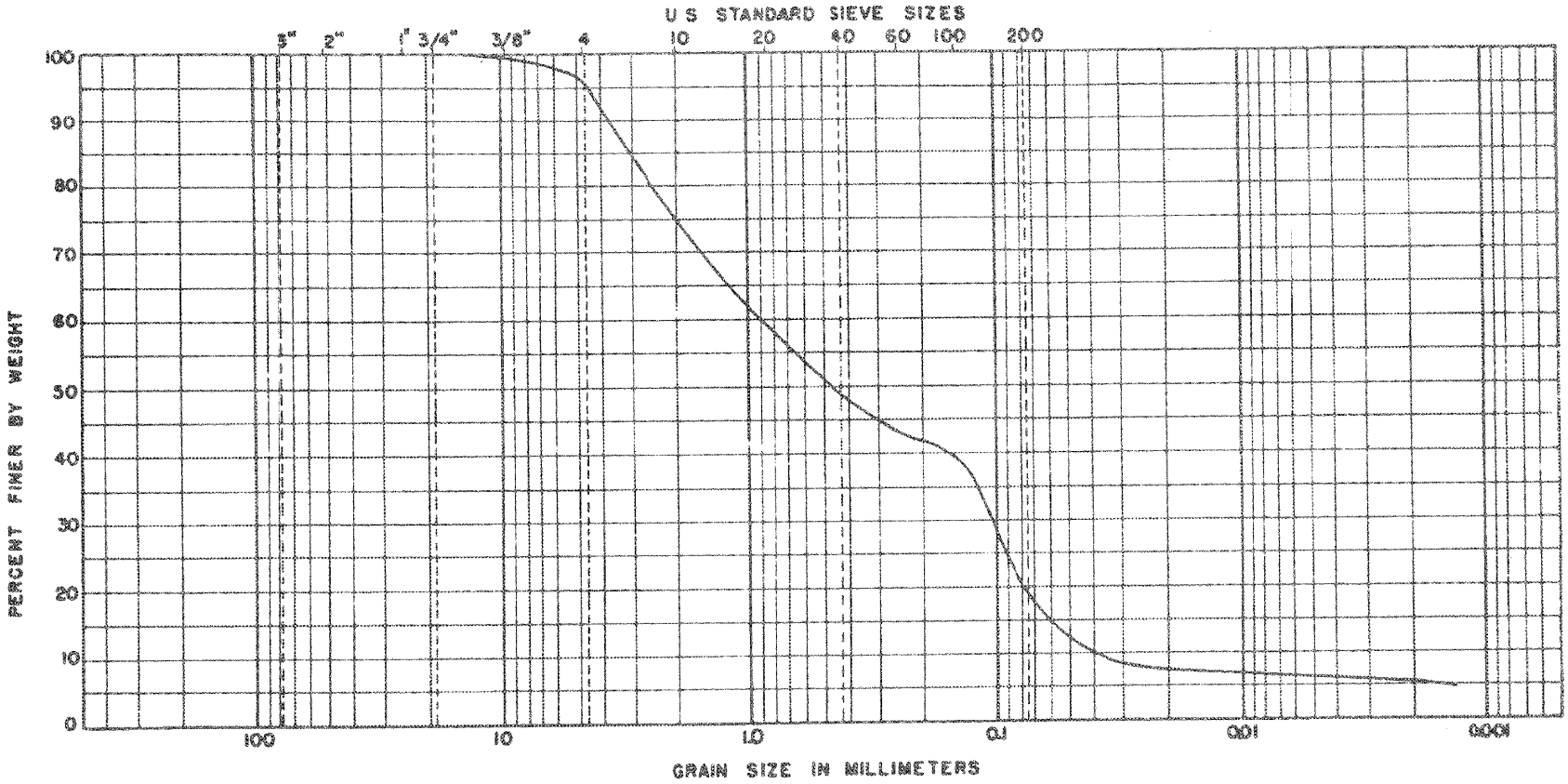
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-15	70'					Grey slightly clayey silty slightly fine gravelly coarse to fine sand. (fine gravel and coarse sand sizes are shells and shell fragments. Medium and fine sand sizes are shell fragments.

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



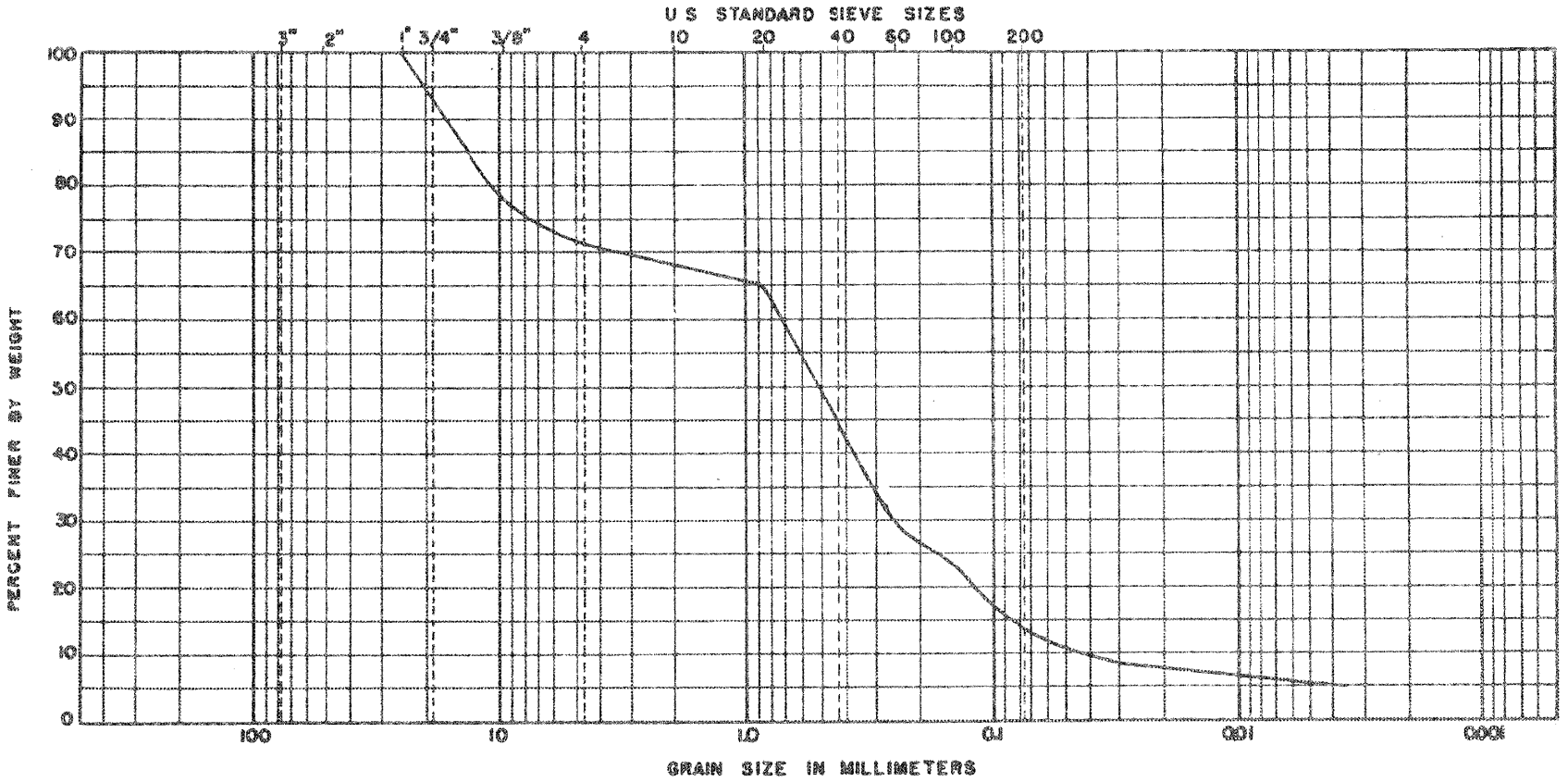
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-15	76'		26	21	5	Grey-Brown slightly clayey silty fine gravelly coarse to fine sand.

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



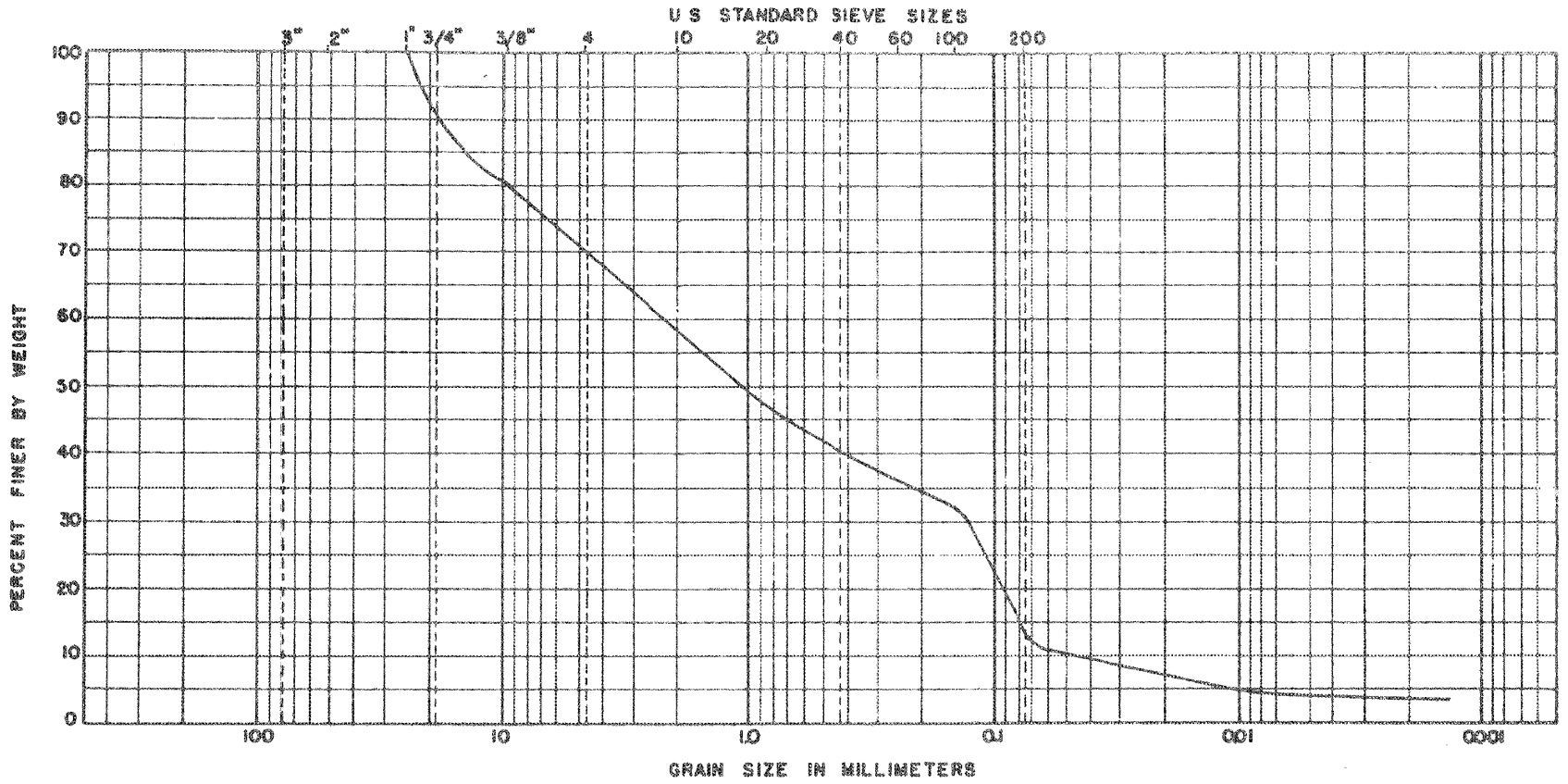
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-15	80'					Brown-Grey slightly clayey slightly silty fine gravelly coarse to fine sand (fine gravel size is limestone. Coarse to fine sand sizes are 50% or more shell fragments)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

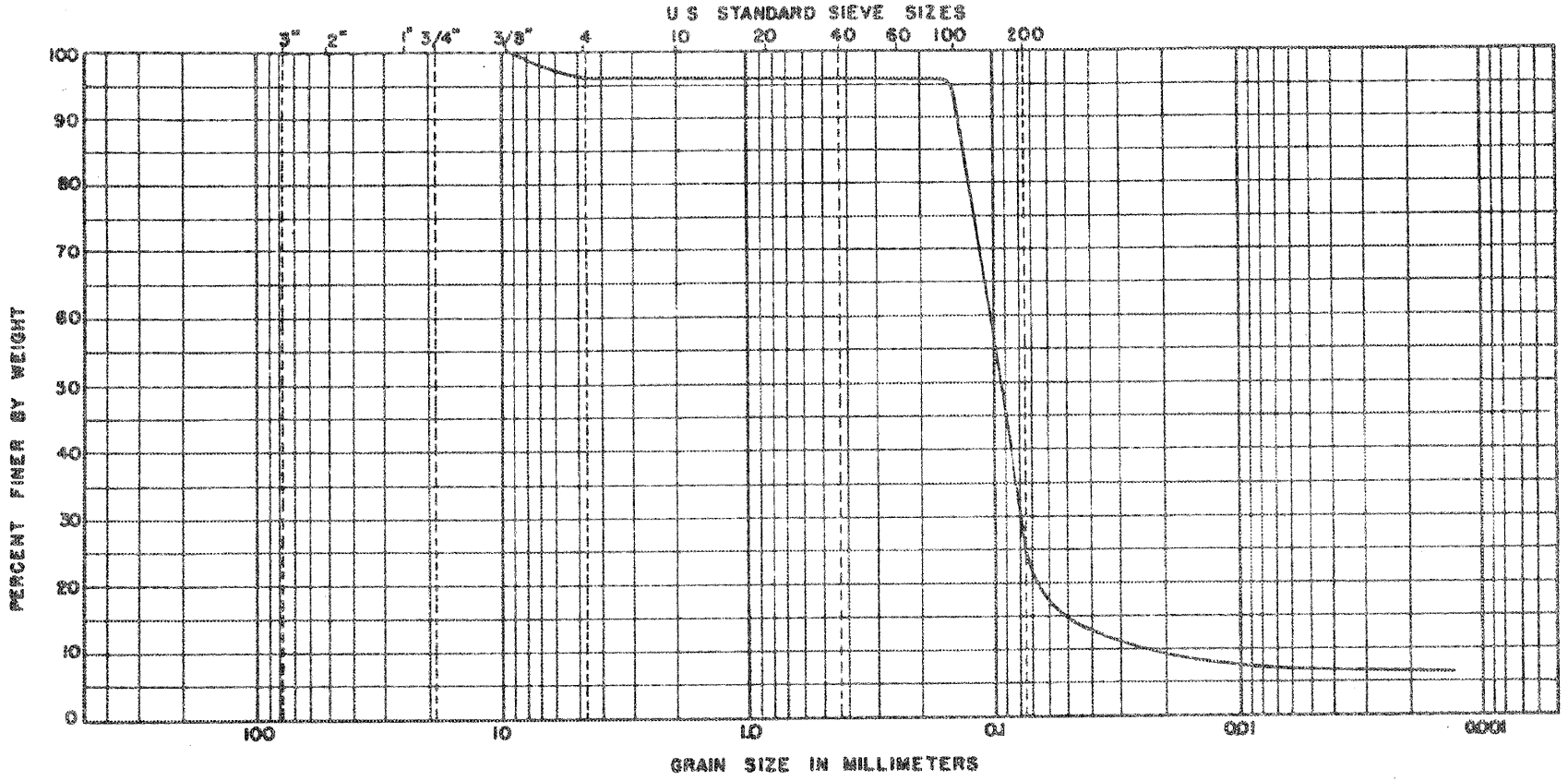
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-15	85'					Grey and brown slightly clayey silty coarse to fine gravelly coarse to fine sand (coarse to fine gravel and coarse sand sizes are 75% limestone and 25% shell fragments. Medium to fine sand sizes are 75% shell fragments and 25% sand).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

ep



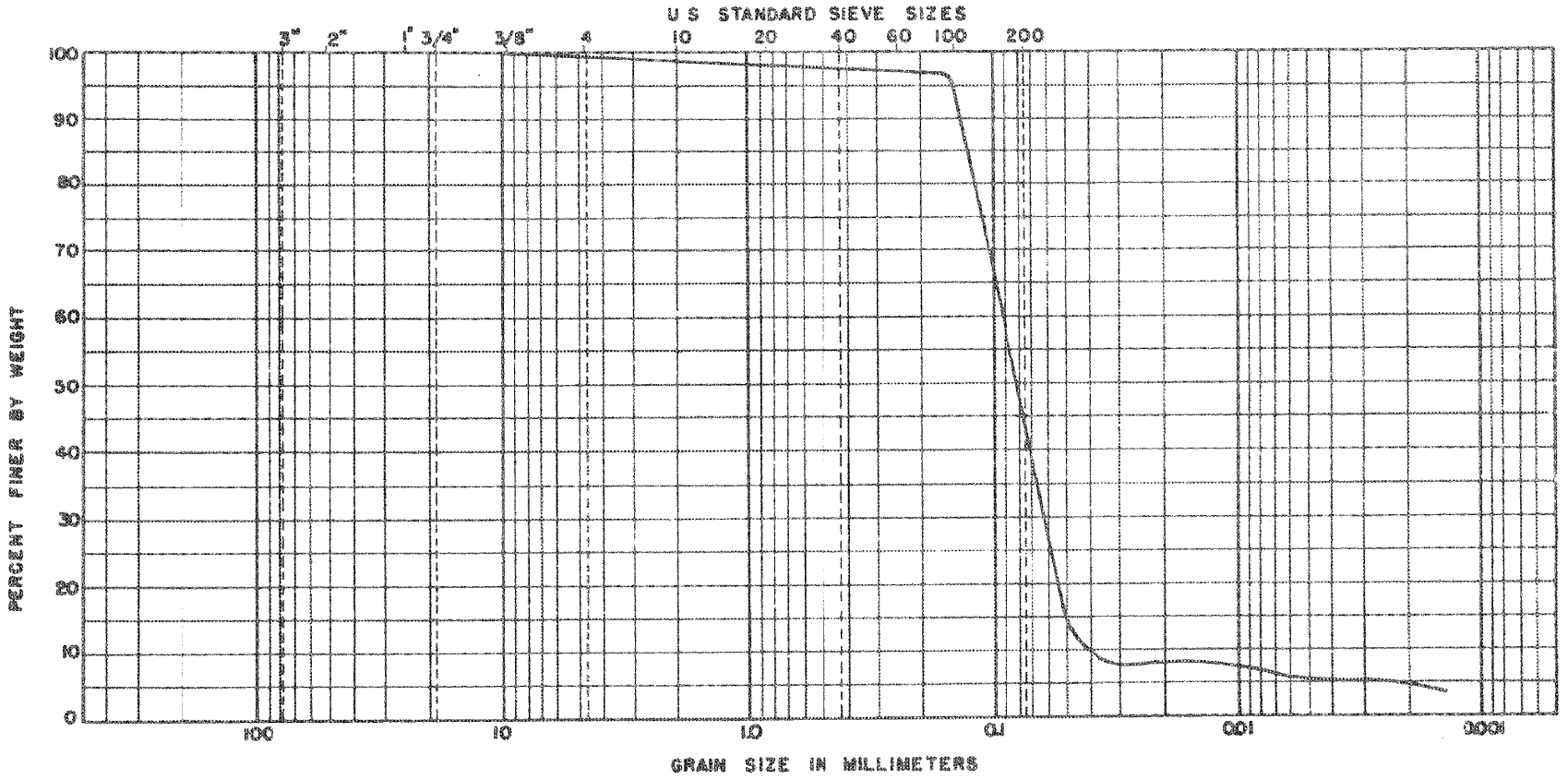
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-15	90'					Light grey brown slightly clayey silty slighty fine gravelly fine sand. (Fine gravel size is limestone. Fine sand size is 20% shells).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



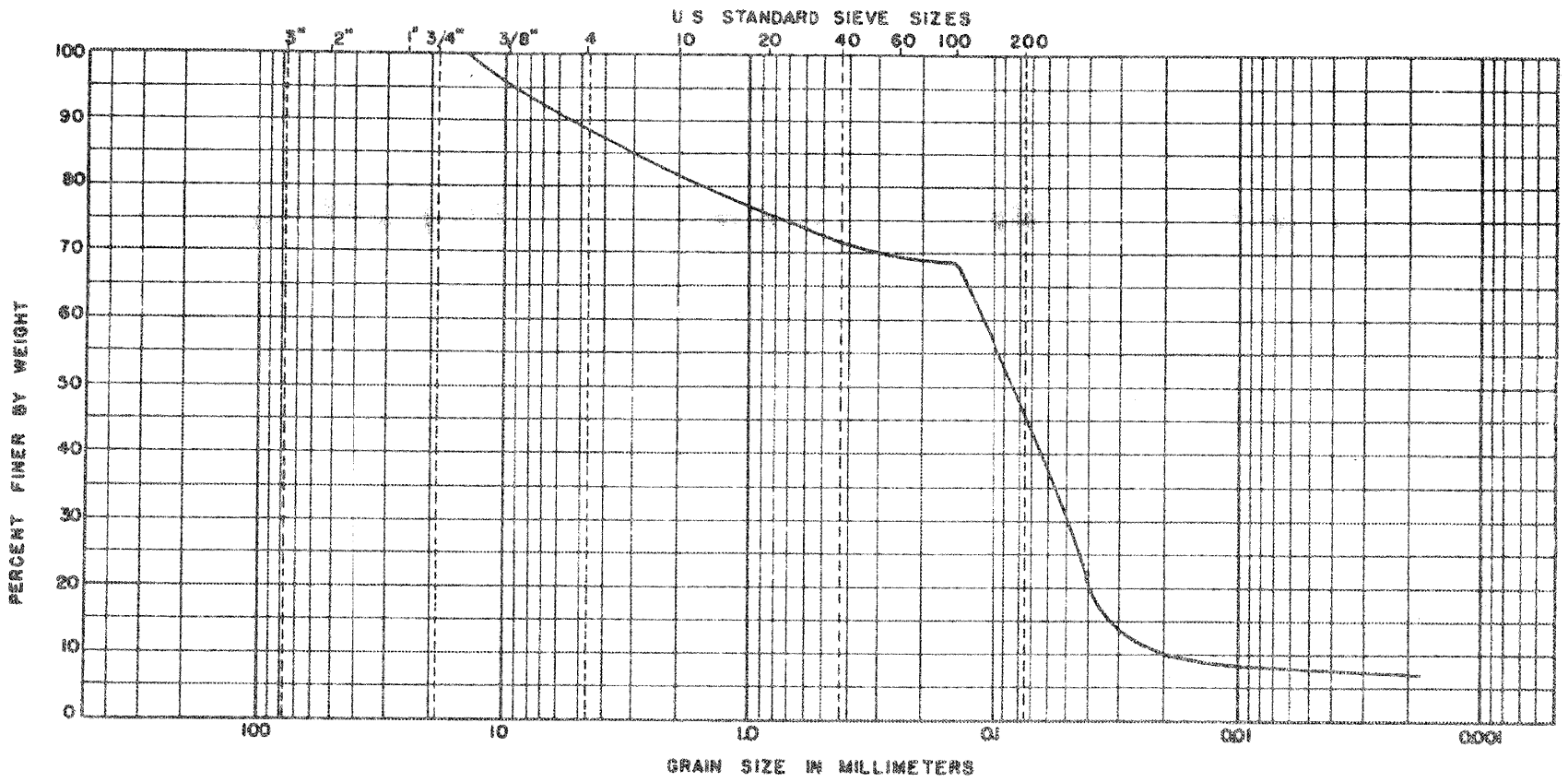
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-15	95'					Light grey brown slightly clayey silty coarse to fine sand (coarse sand size is limestone. Medium to fine sand sizes are 80% or more shell fragments)

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

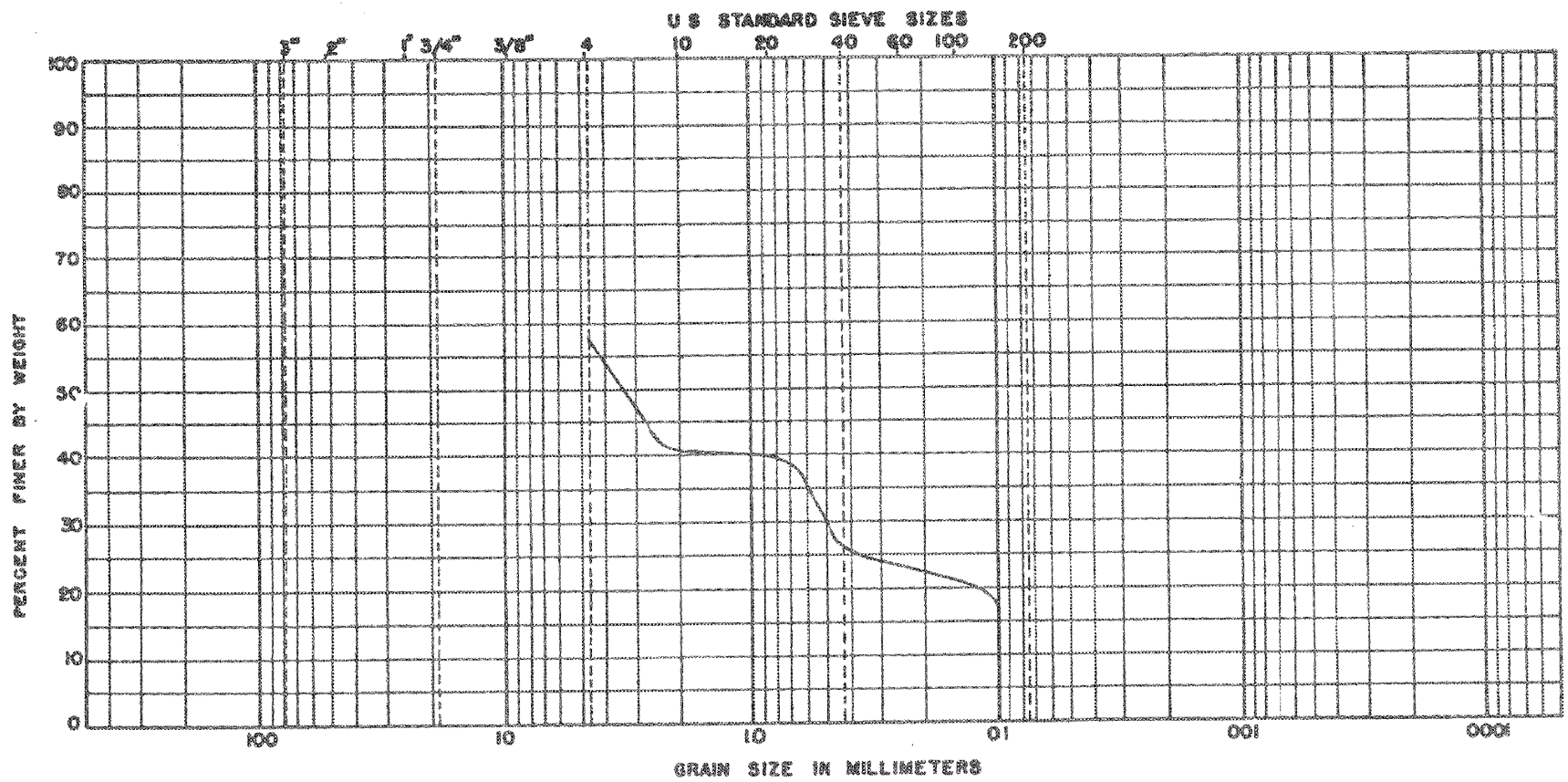
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-15	100'					Light grey brown slightly clayey fine gravelly silty coarse to fine sand. (sand sizes are 50% shell fragments and 50% limestone. Fine gravel is limestone).

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

ep



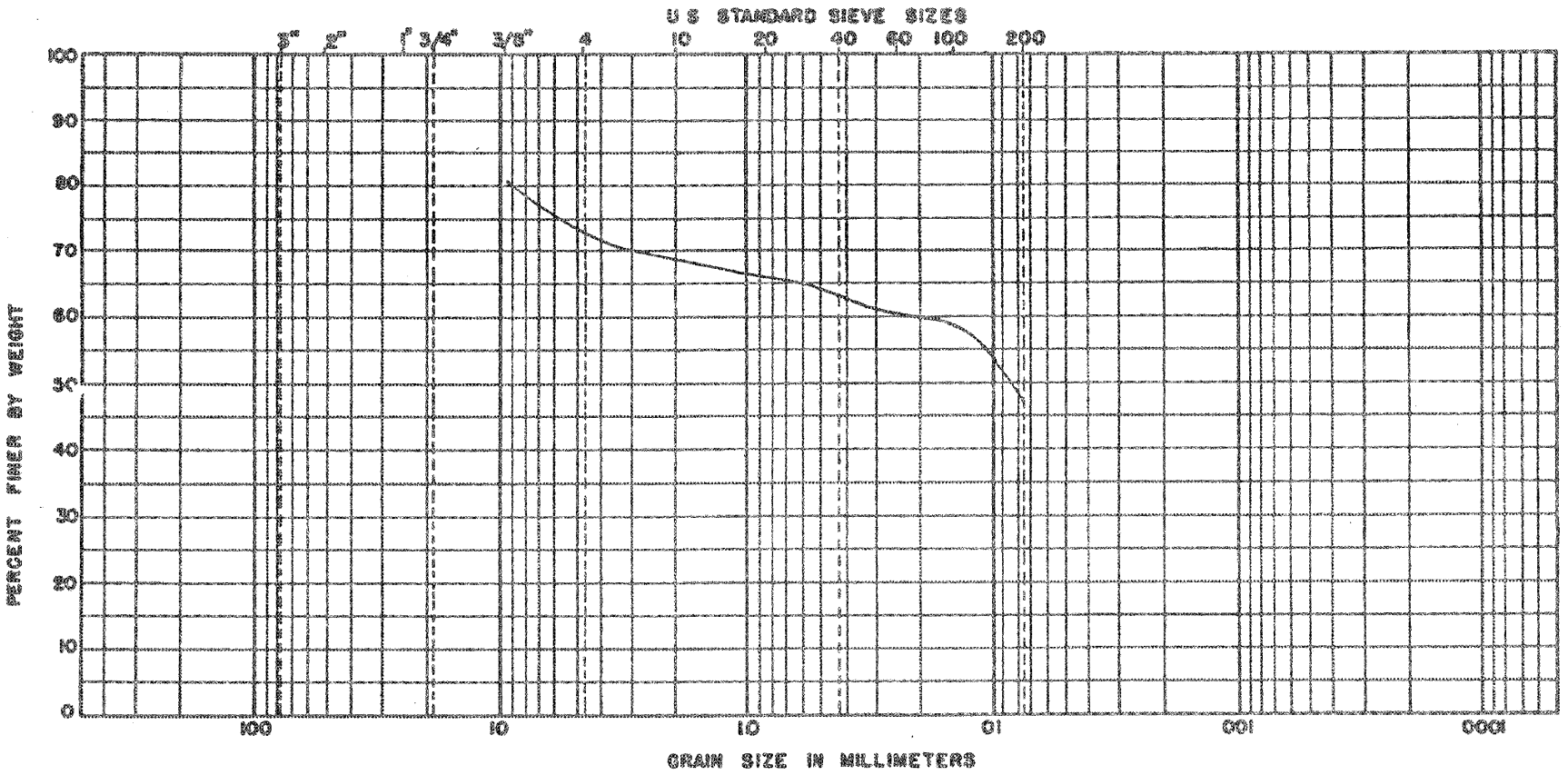
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-101 Sample #17	80.0'	- -	-	-	-	Firm fine grey sandy silt Moisture Content - 13.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



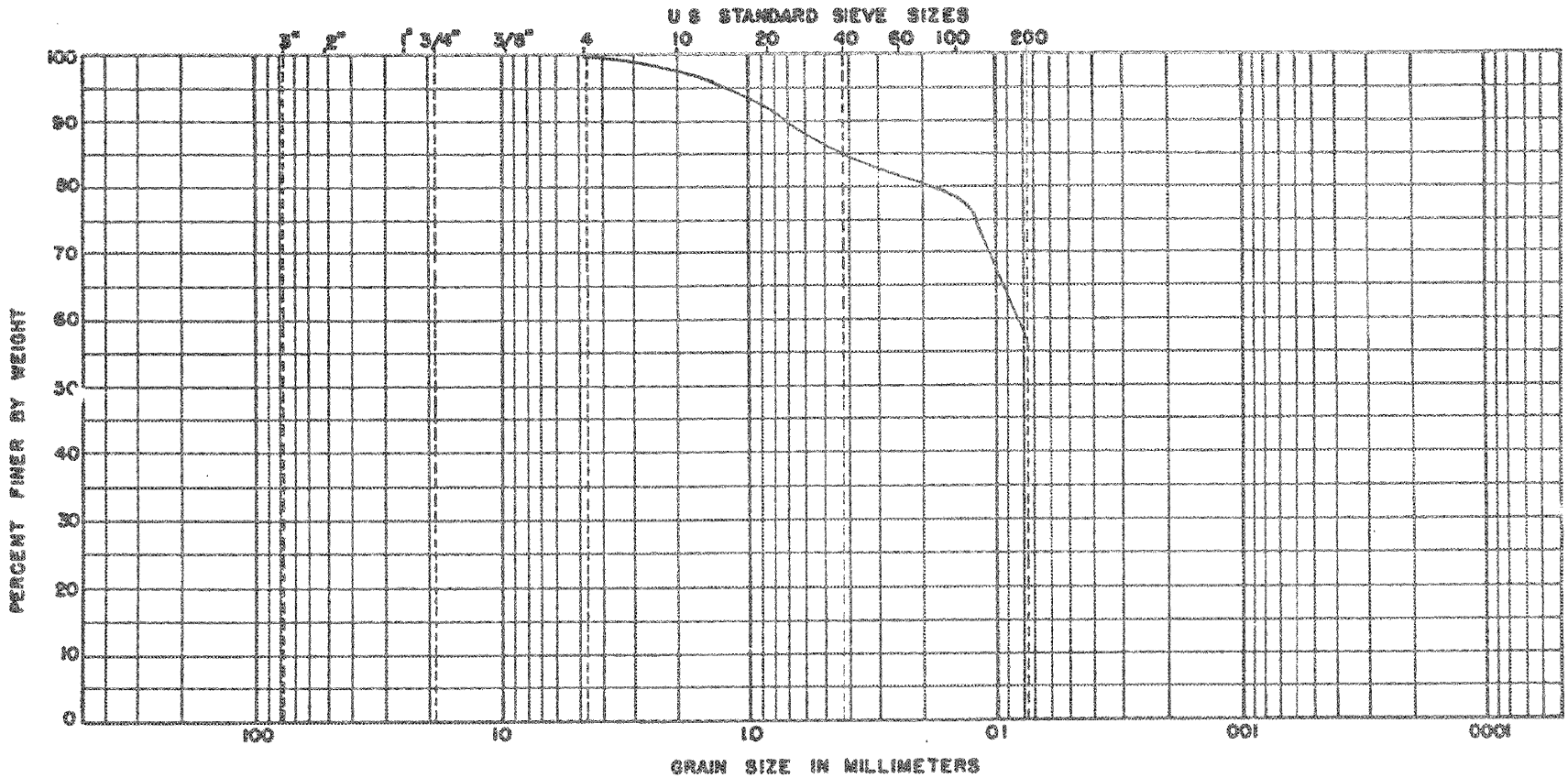
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-101 Sample #23	110.0'	- -	-	-	-	Firm grey clay with limestone Moisture Content - 17.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



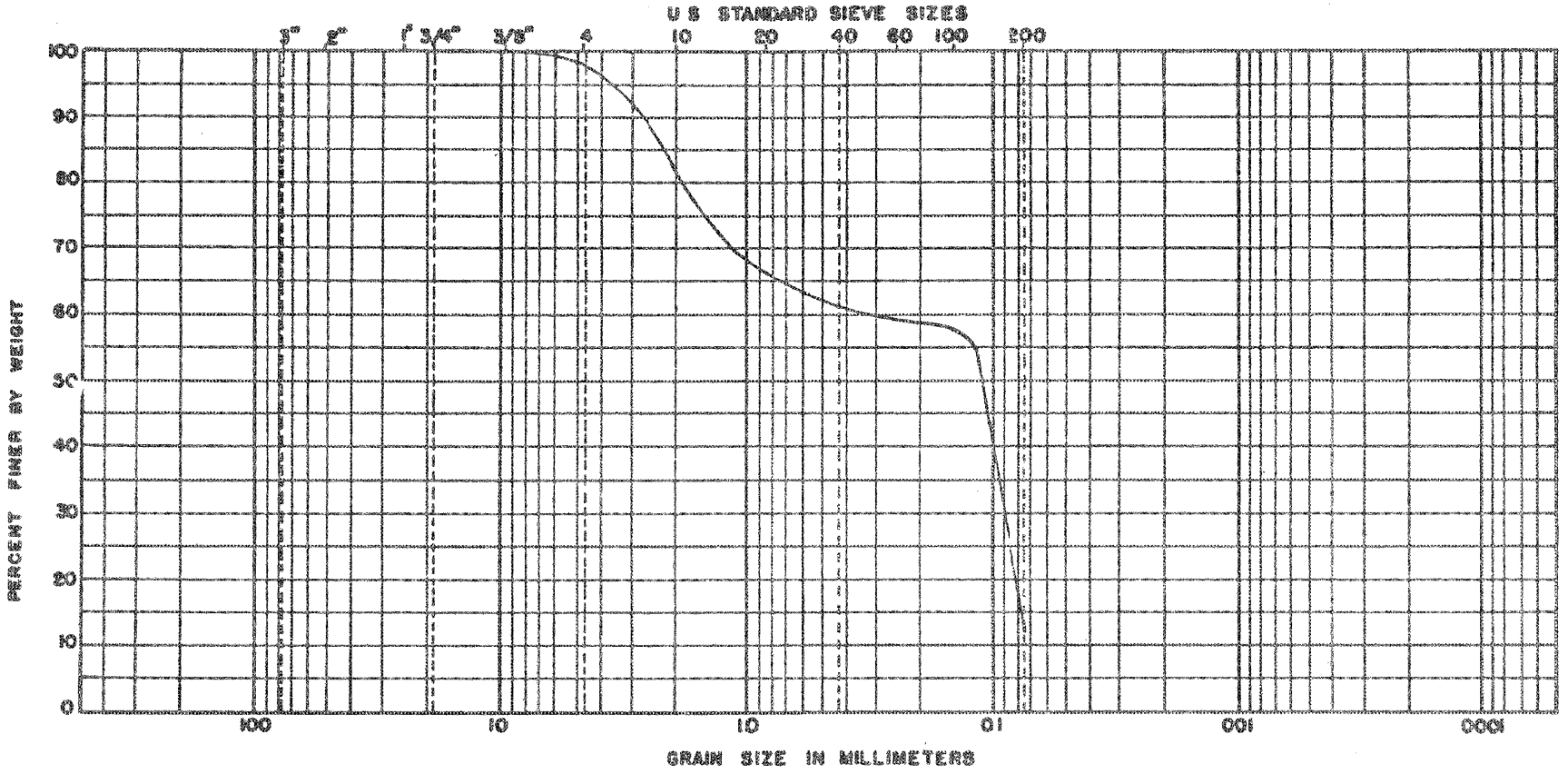
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-101 Sample #24	115.0'	- -	-	-	-	Firm grey clay with shell and marl Moisture Content - 25.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



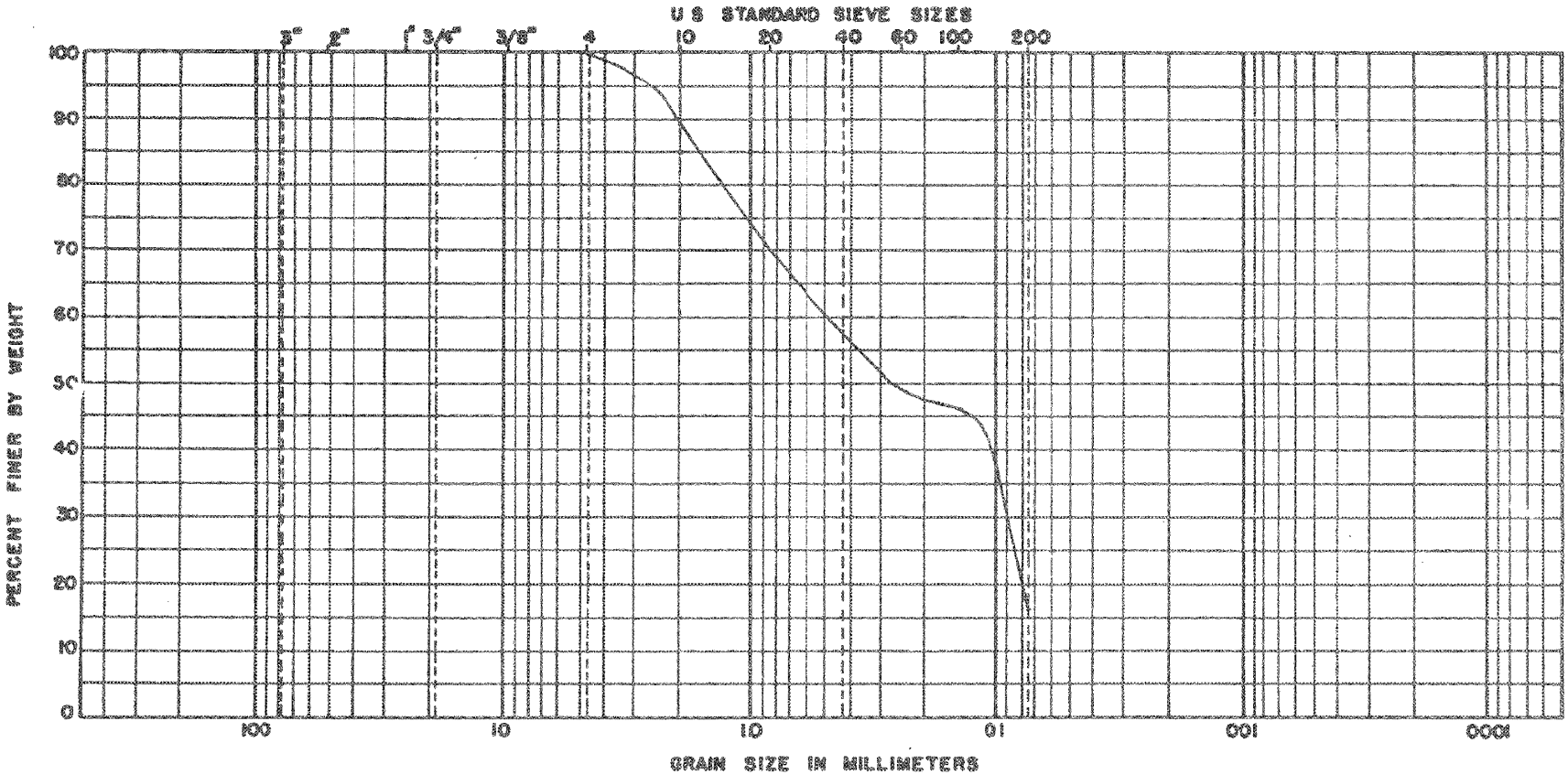
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-102 Sample #17	79.0' - 80.5'	- -	-	-	-	Firm grey fine sand and shell Moisture Content - 18.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



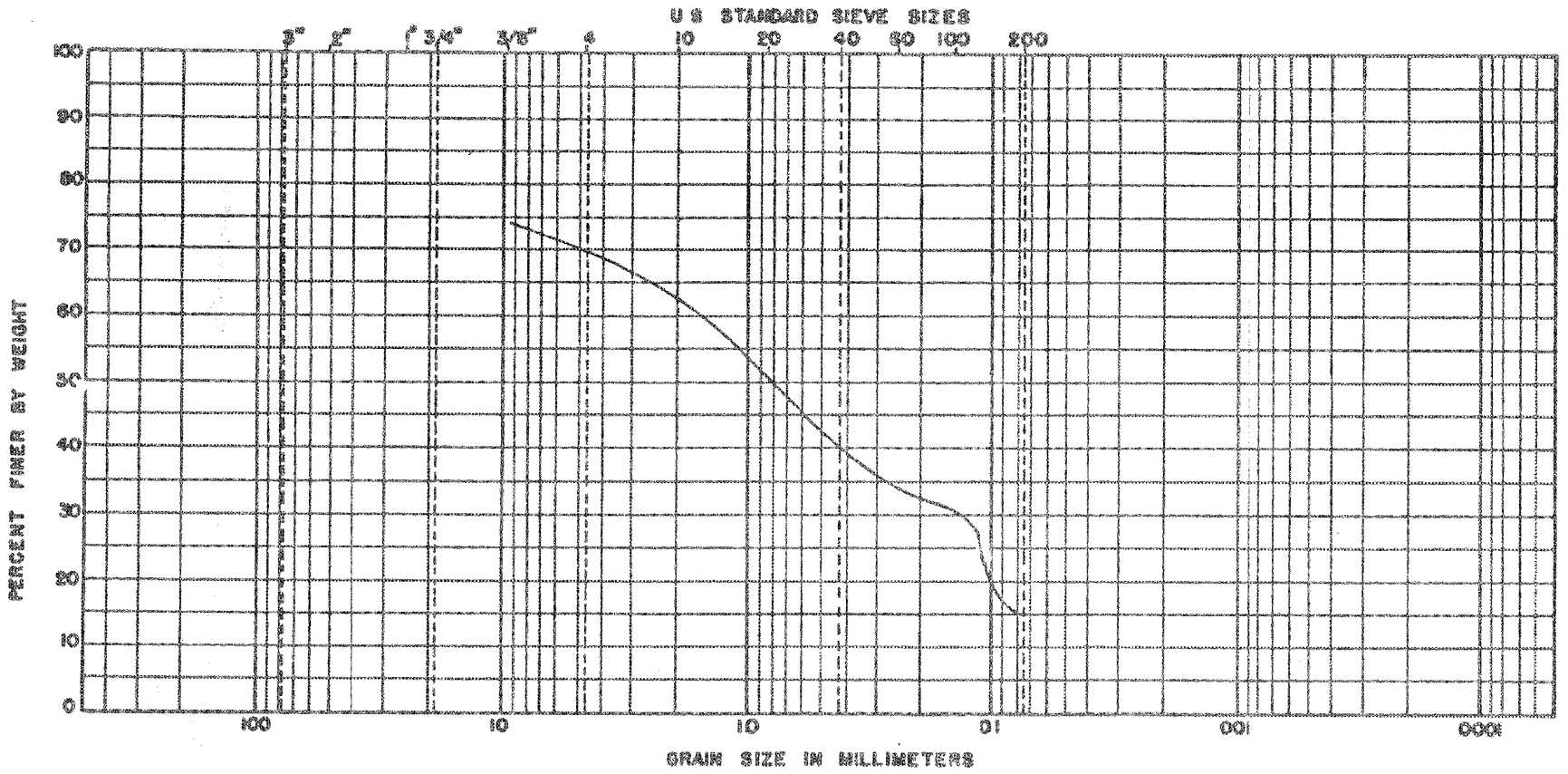
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-102 Sample #18	84.0' - 85.5'	- -	-	-	-	Firm grey fine sand and shell Moisture Content - 19.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



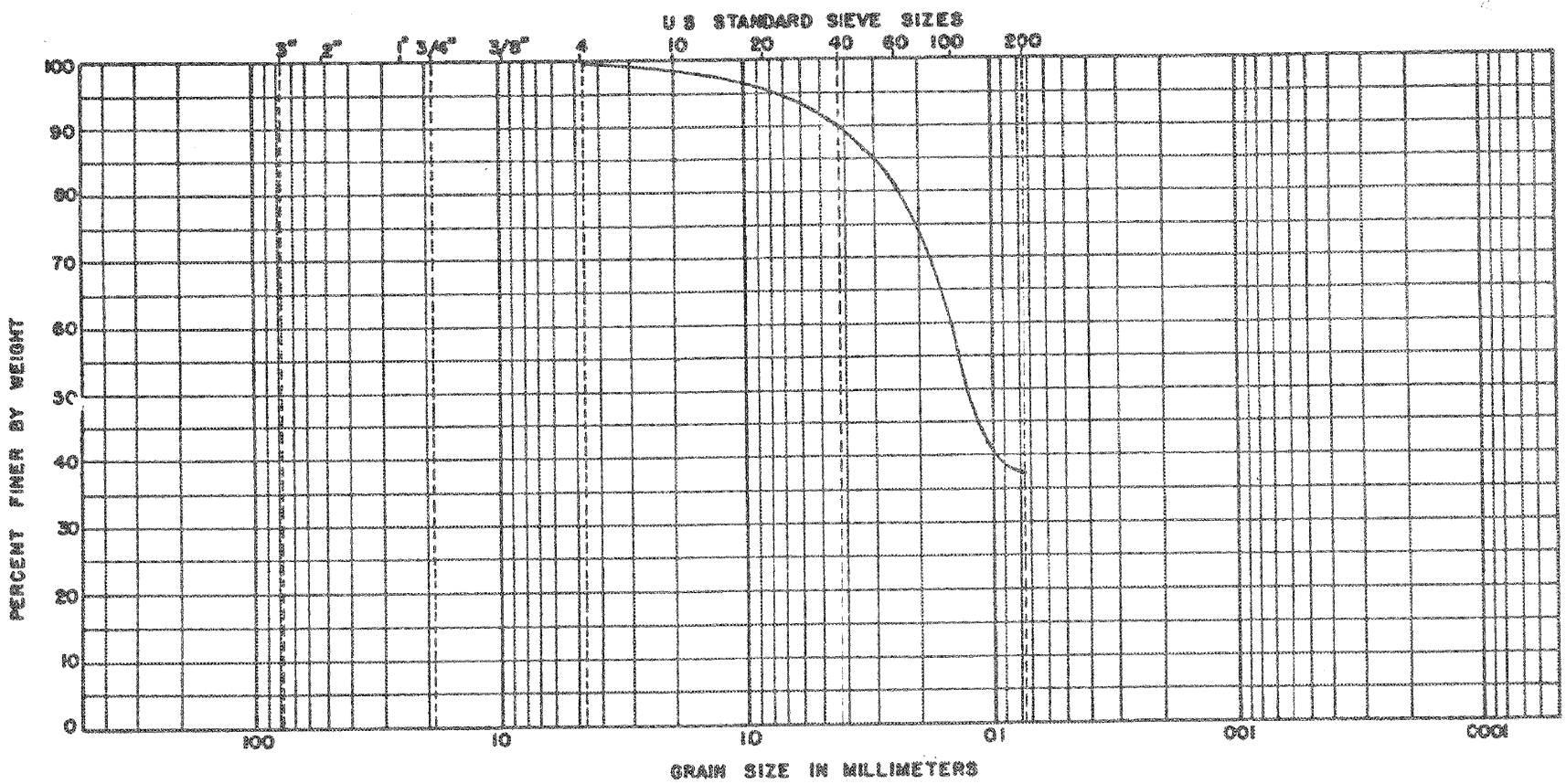
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-102 Sample #20	94.0' - 95.5'	- -	-	-	-	Very firm grey shell and fine sand Moisture Content - 18.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



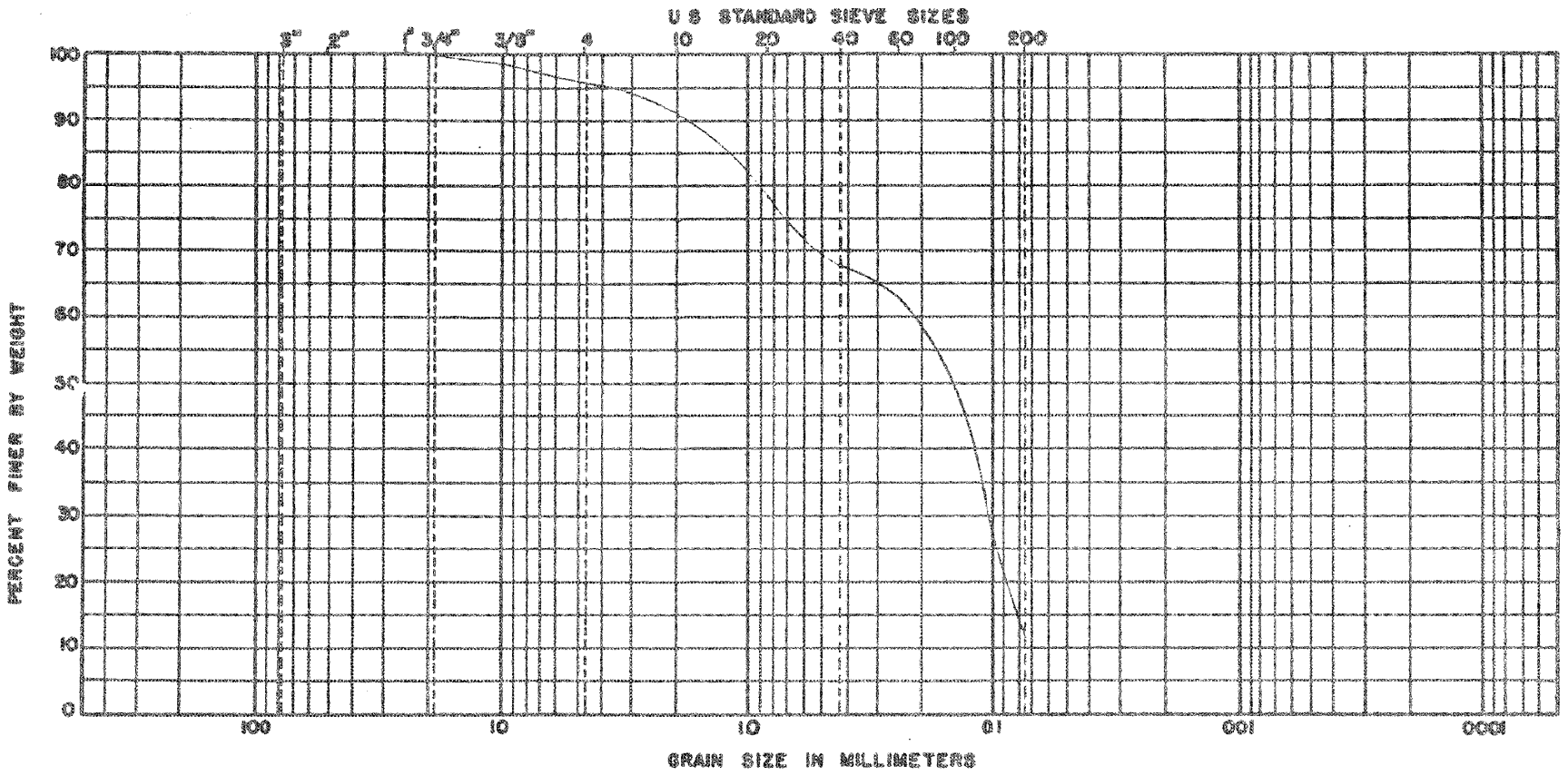
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-102 Sample #30	144.0' - 145.5'	- -	-	-	-	Firm grey silty fine sand and shell fragments Moisture Content - 19.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



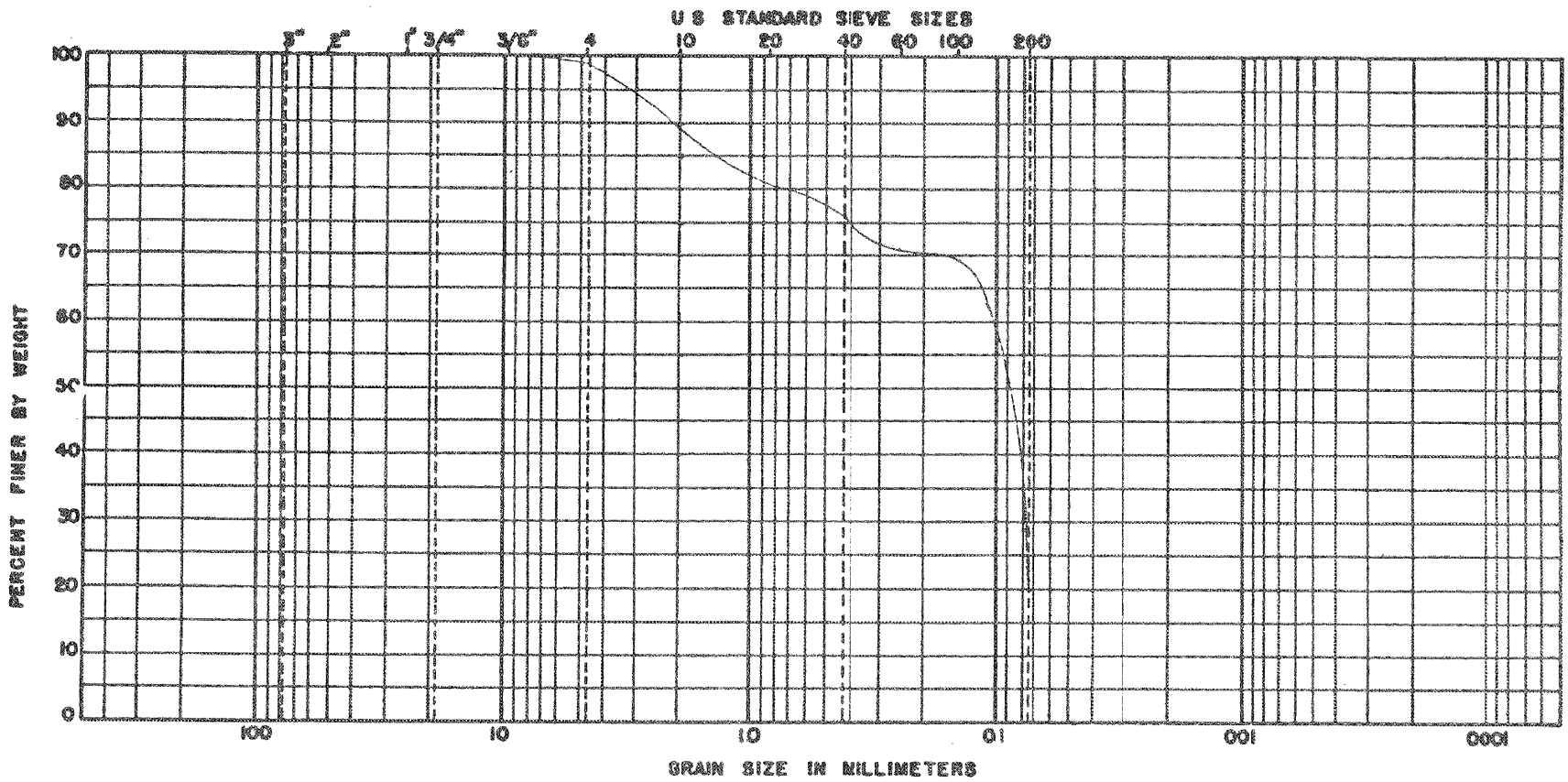
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-103 Sample #15	70.0'	- -	-	-	-	Grey fine sand with shell Moisture Content - 24.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



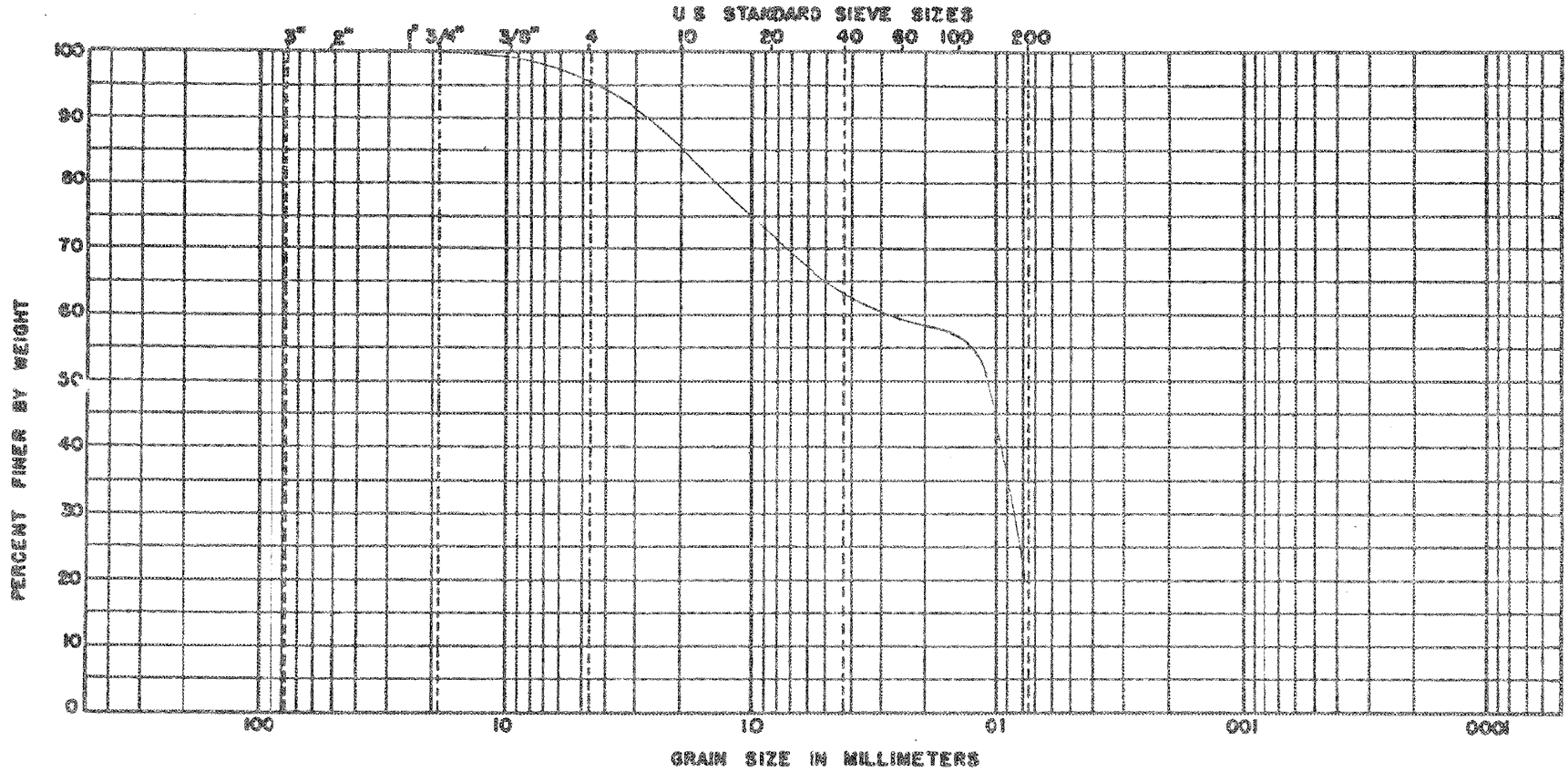
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-103 Sample #16	75.0'	- -	-	-	-	Grey fine sand with shell Moisture Content - 25.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



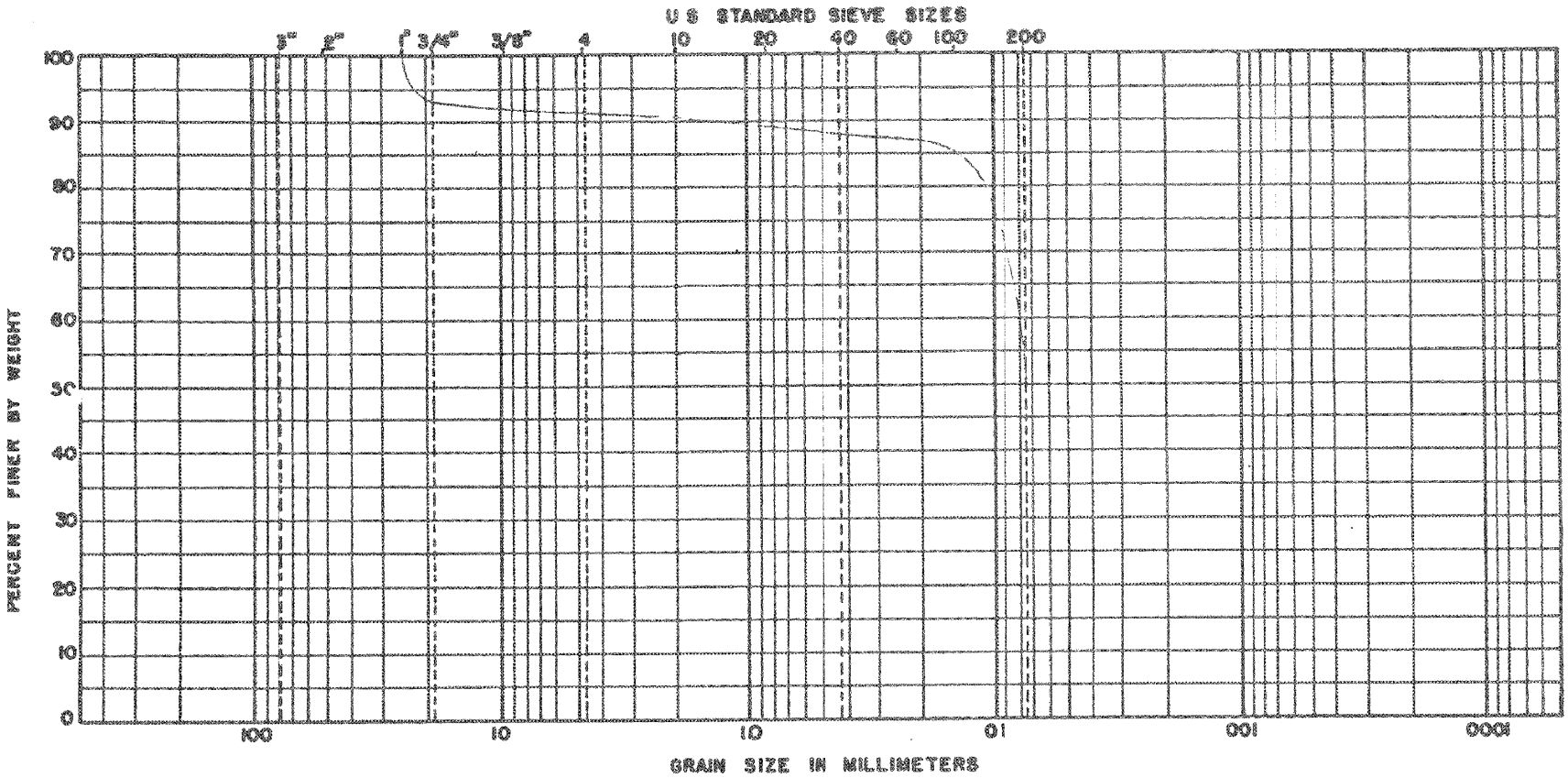
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-103 Sample #17	80'	- -	-	-	-	Grey fine sand with shell Moisture Content - 20.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



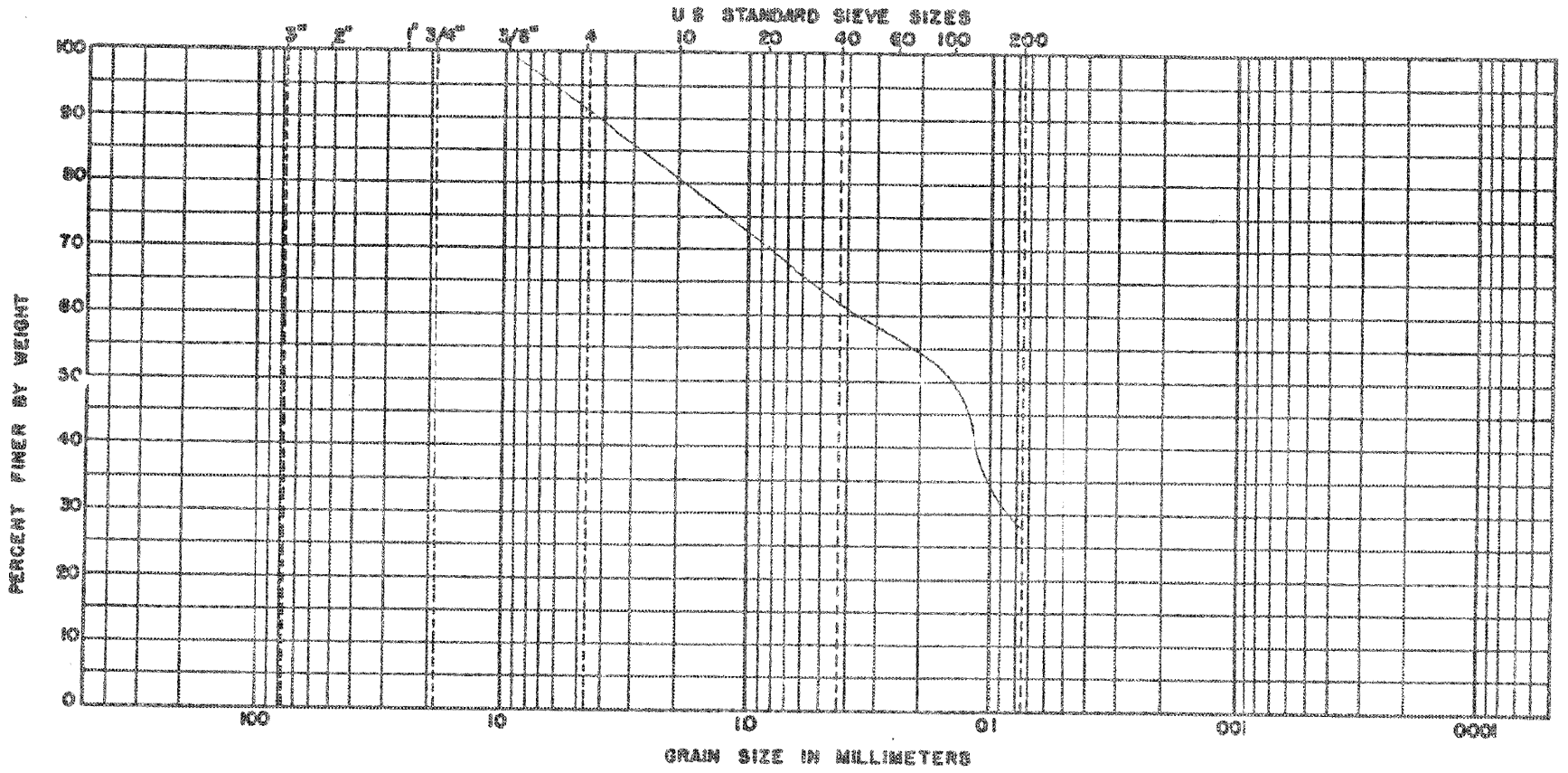
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-103 Sample #22	105.0'	- -	-	-	-	Grey clayey fine sand with limestone fragments Moisture Content - 31.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



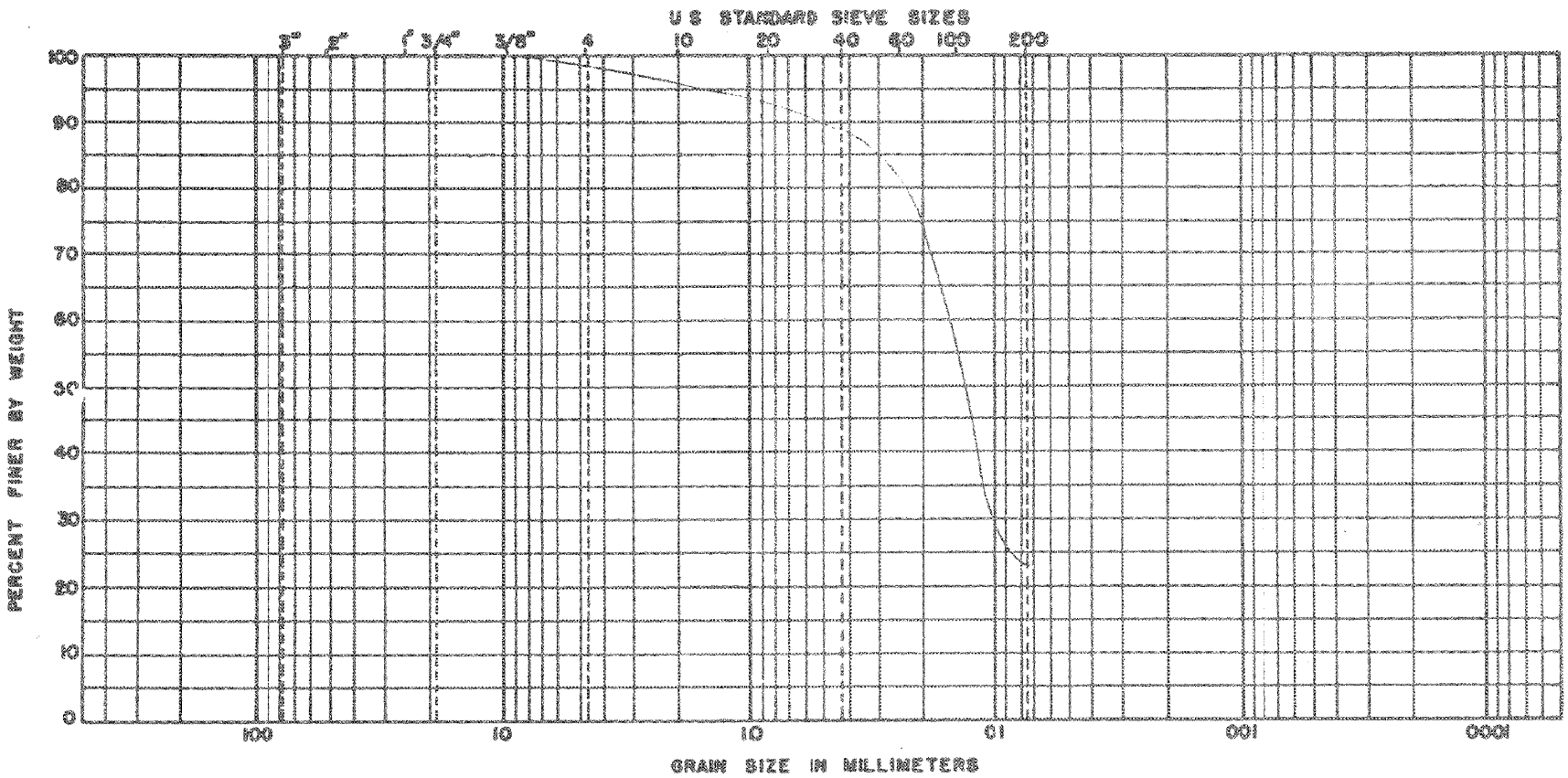
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-103 Sample #28	135.0'	- -	-	-	-	Grey slightly clayey fine sand with shell Moisture Content - 26.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



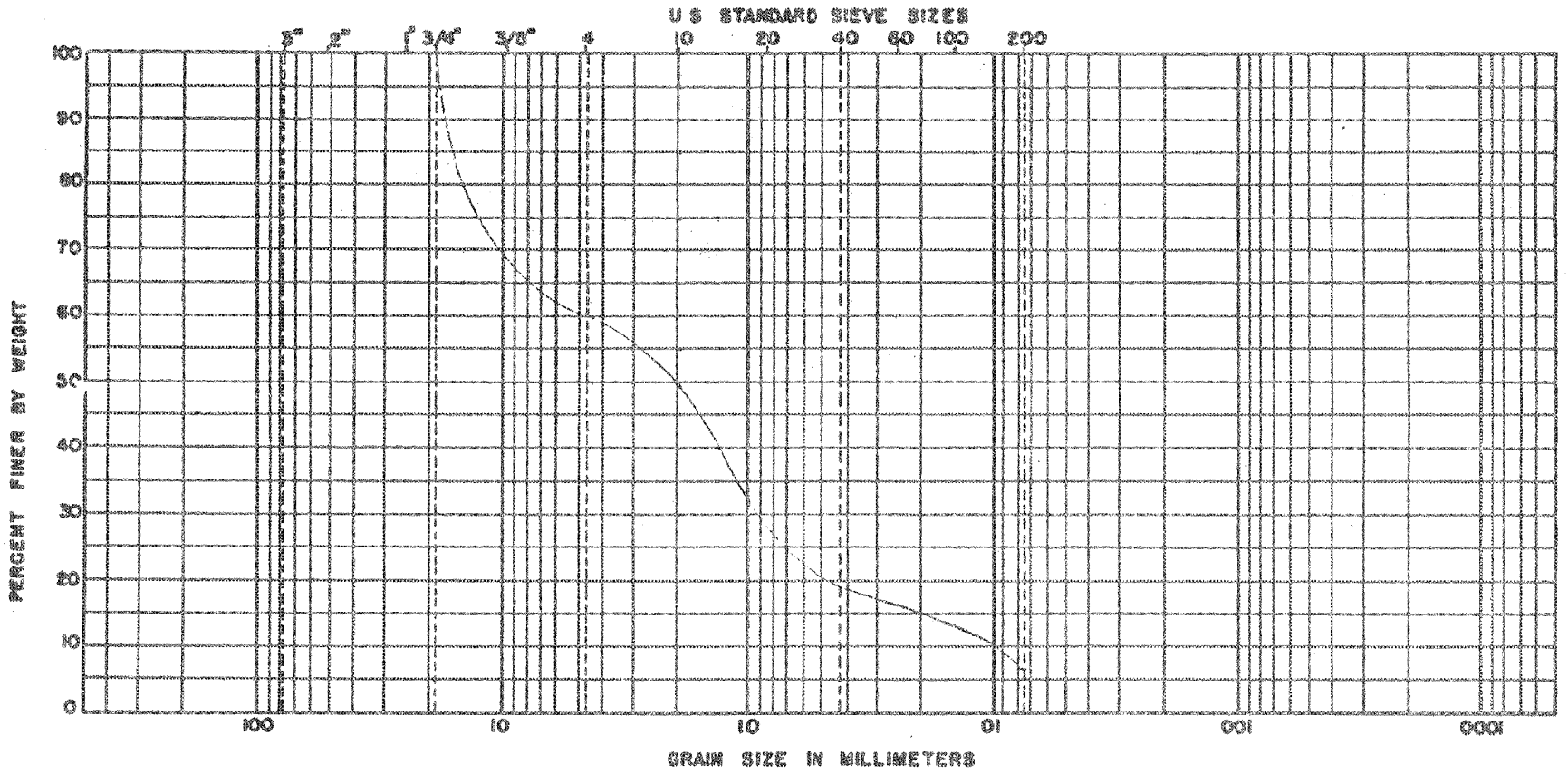
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-103 Sample #29	140.0'	- -	-	-	-	Grey medium sand Moisture Content - 28.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



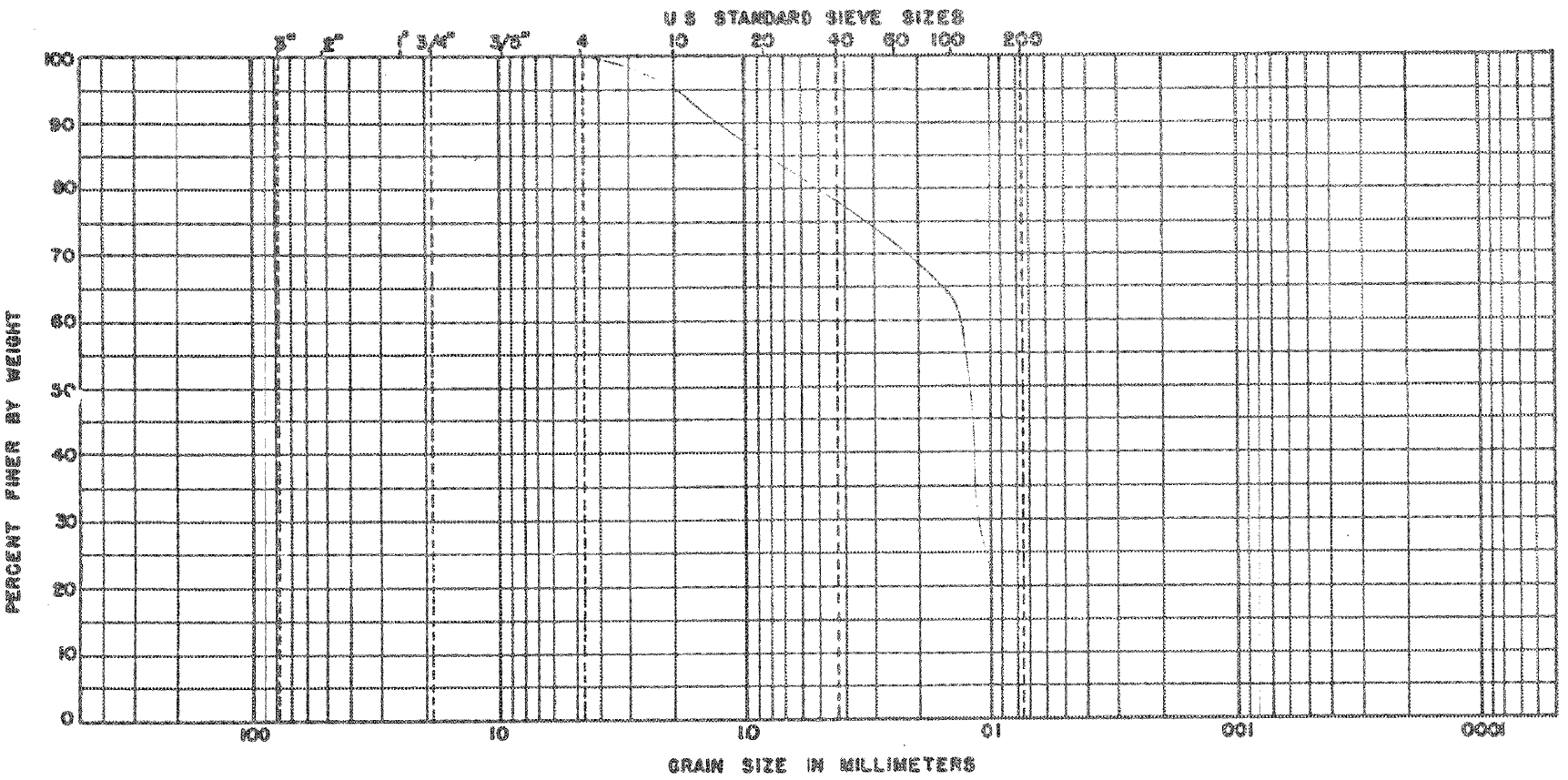
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-104 Sample #17	80.0'	- -	-	-	-	Shell with grey medium sand Moisture Content - 16.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



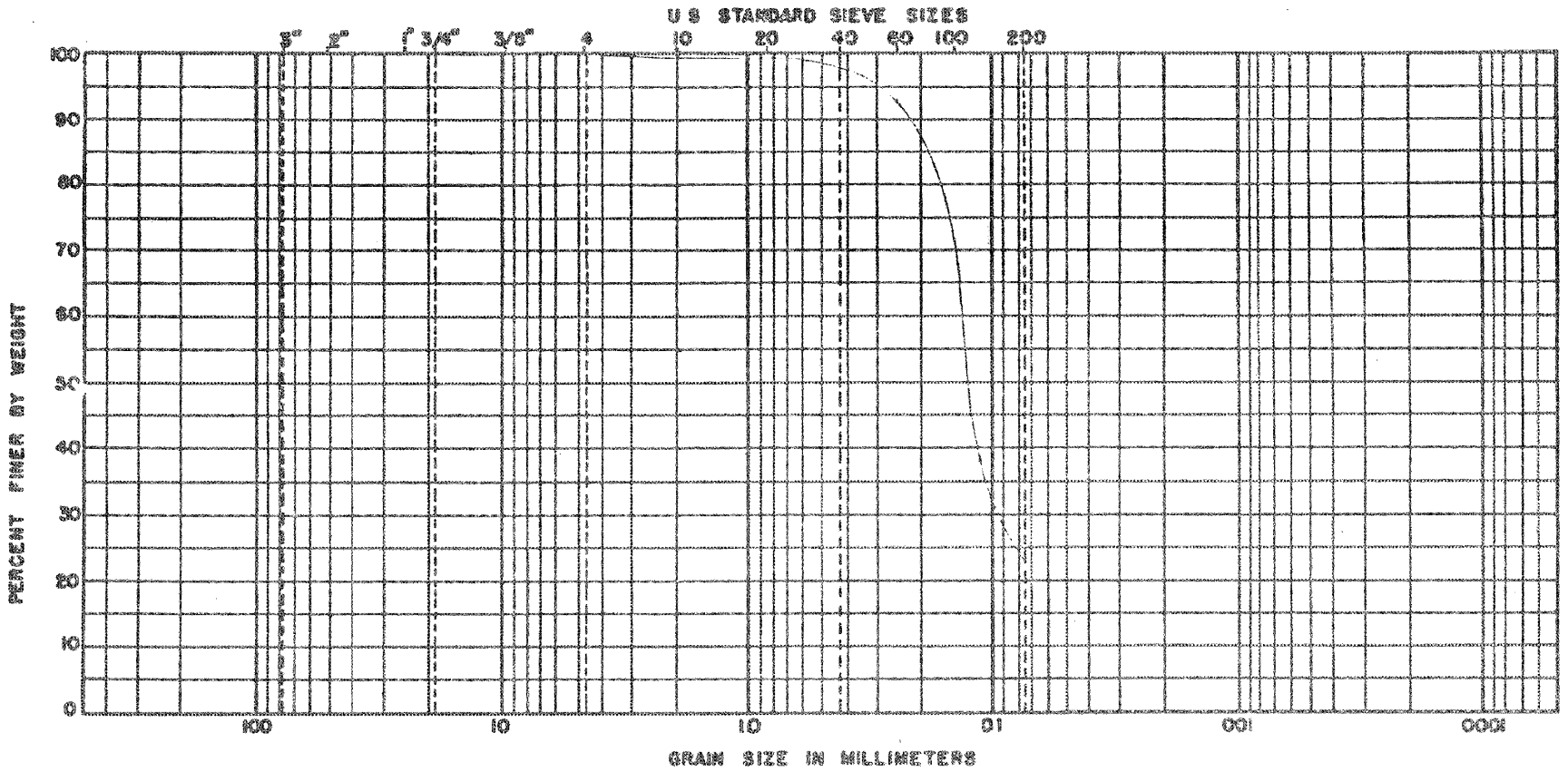
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-104 Sample #25	120.0'	- -	-	-	-	Grey medium sand with traces of shell Moisture Content - 30.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



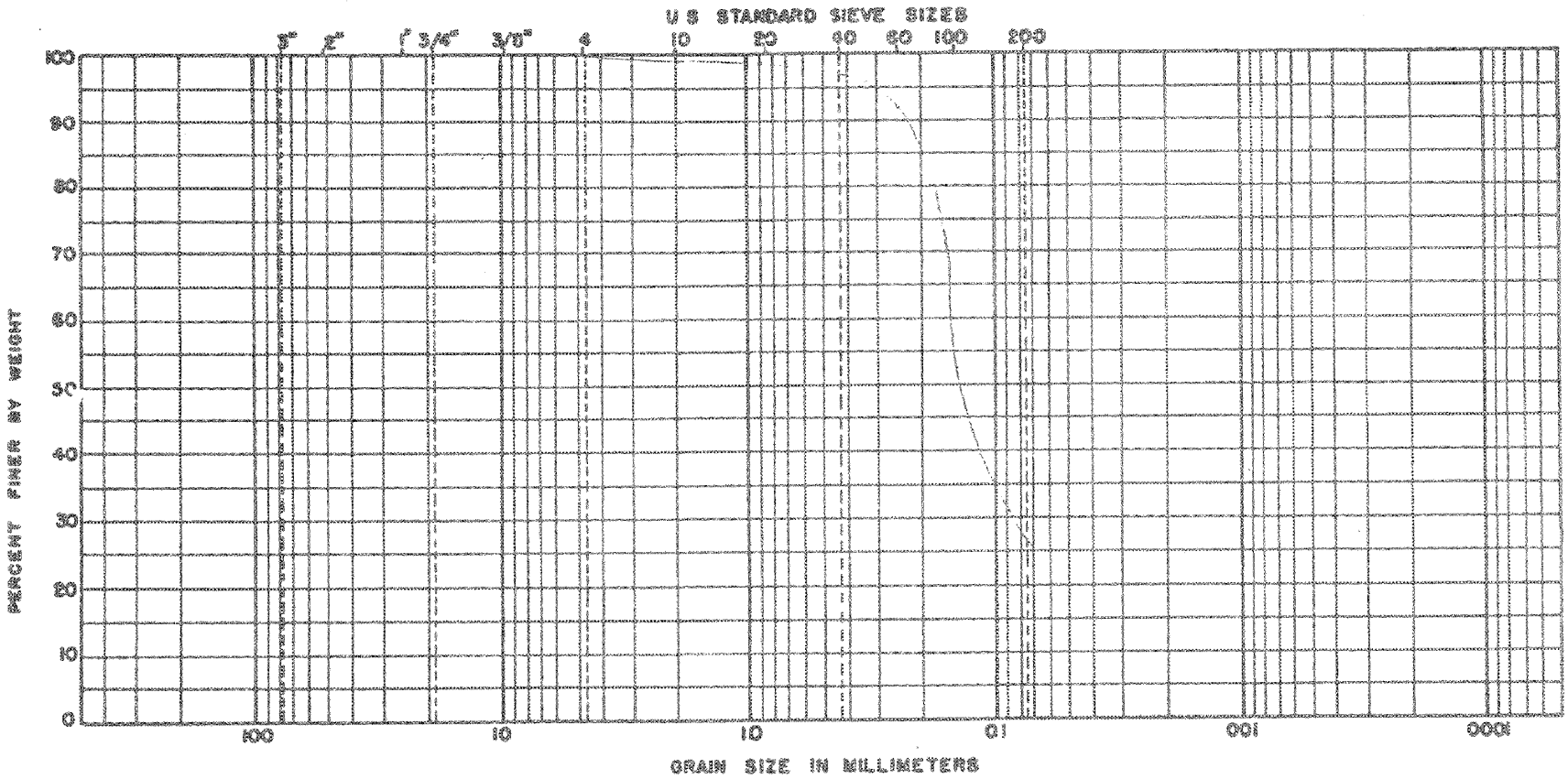
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-104 Sample #29	140.0'	- -	-	-	-	Grey fine silty sand Moisture Content - 33.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



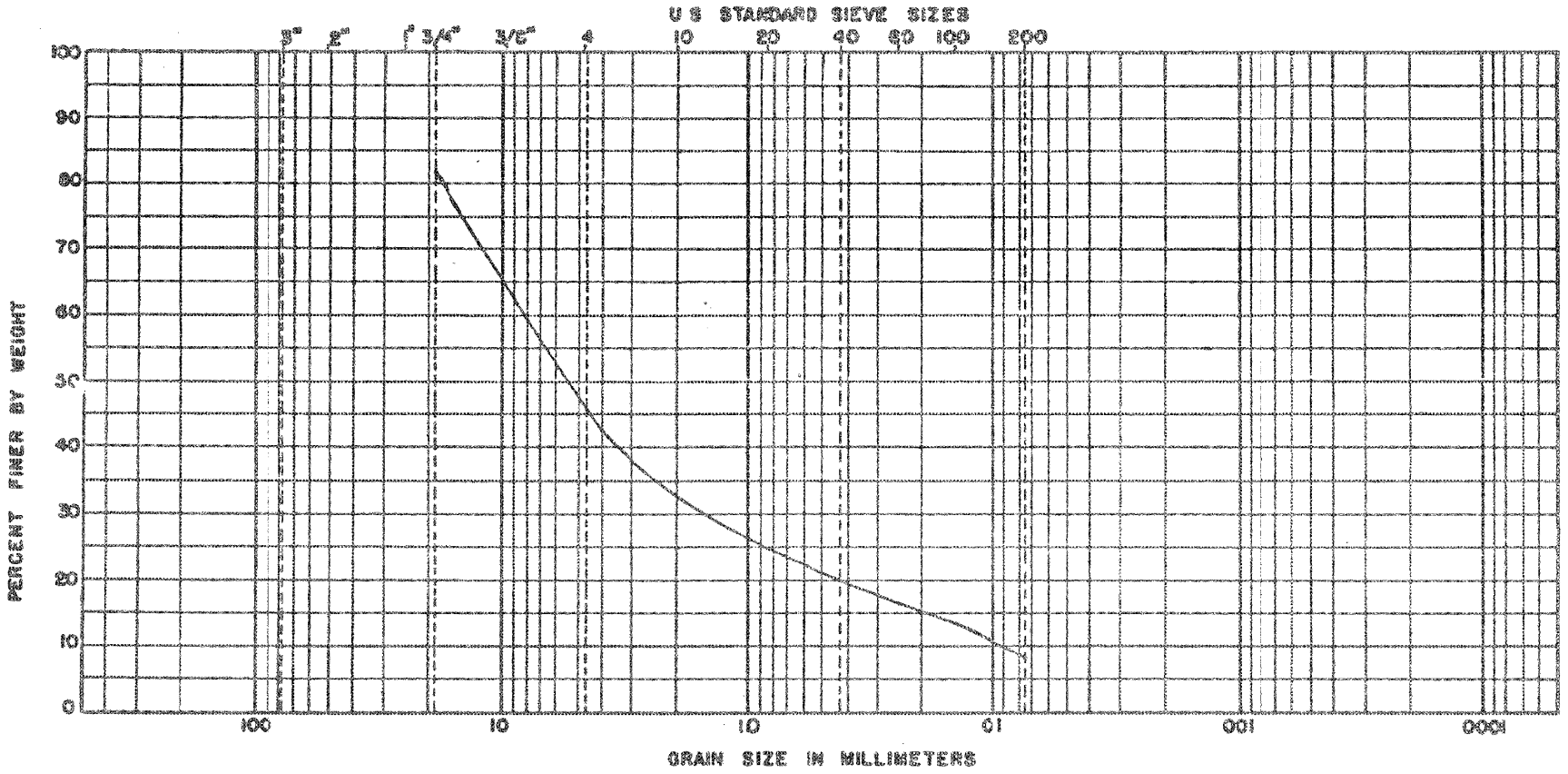
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-104 Sample #30	145.0'	- -	-	-	-	Grey fine silty sand Moisture Content - 35.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



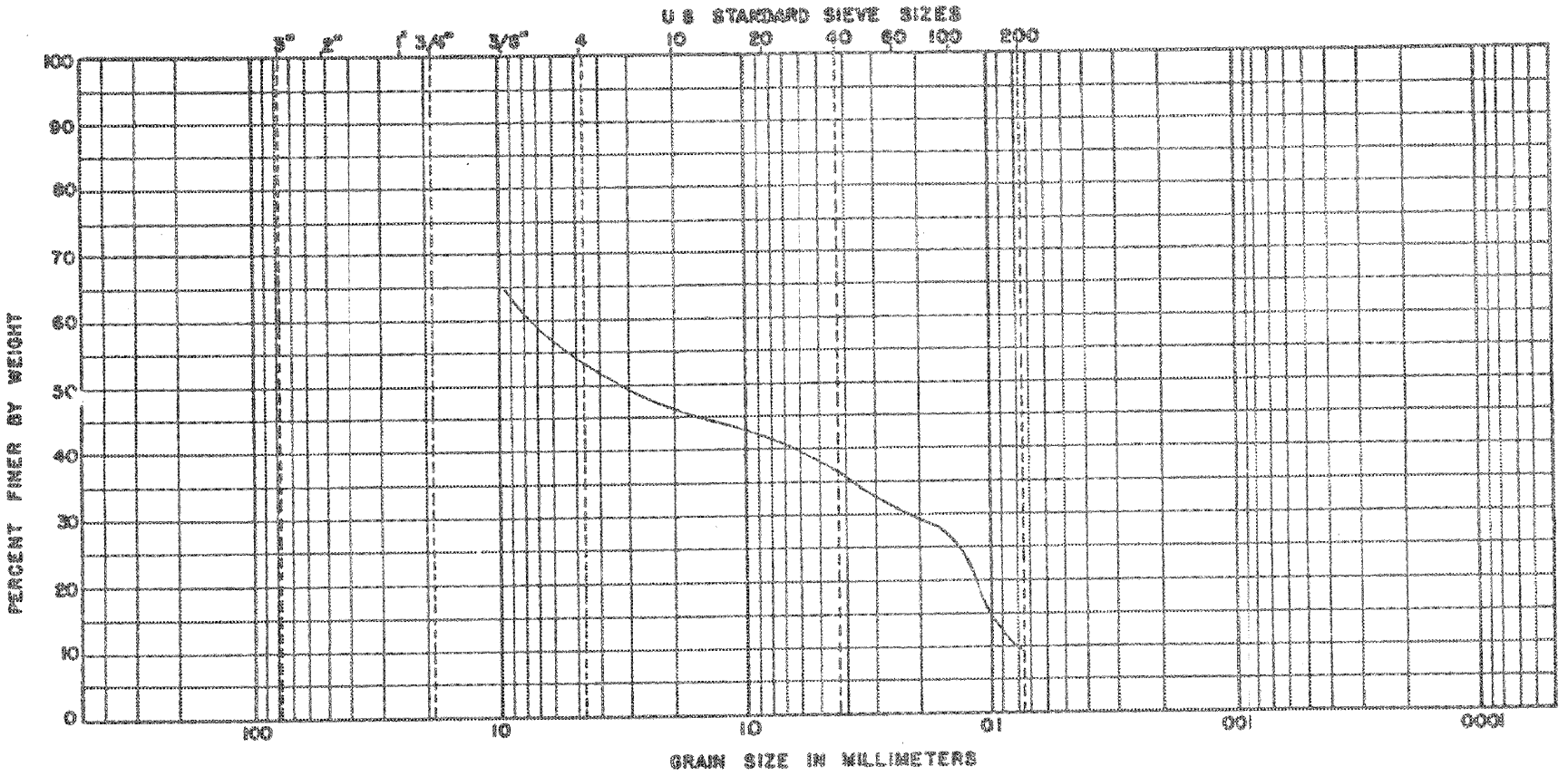
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-105 Sample #15	65.0'	- -	-	-	-	Hard grey limestone and shell Moisture Content - 11.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



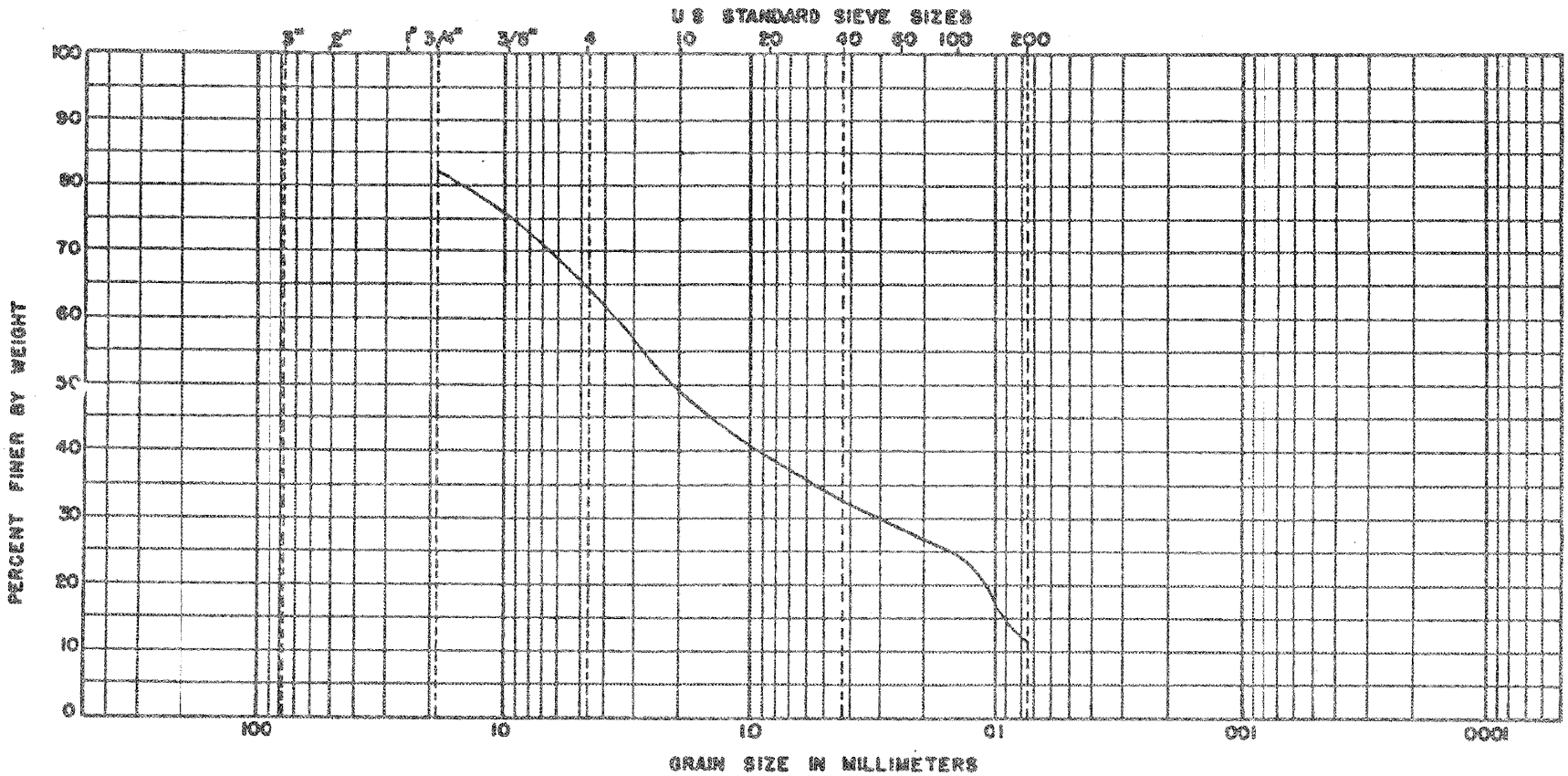
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-105 Sample #16	70.0'	- -	-	-	-	Hard grey limestone with shell fragments Moisture Content - 10.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



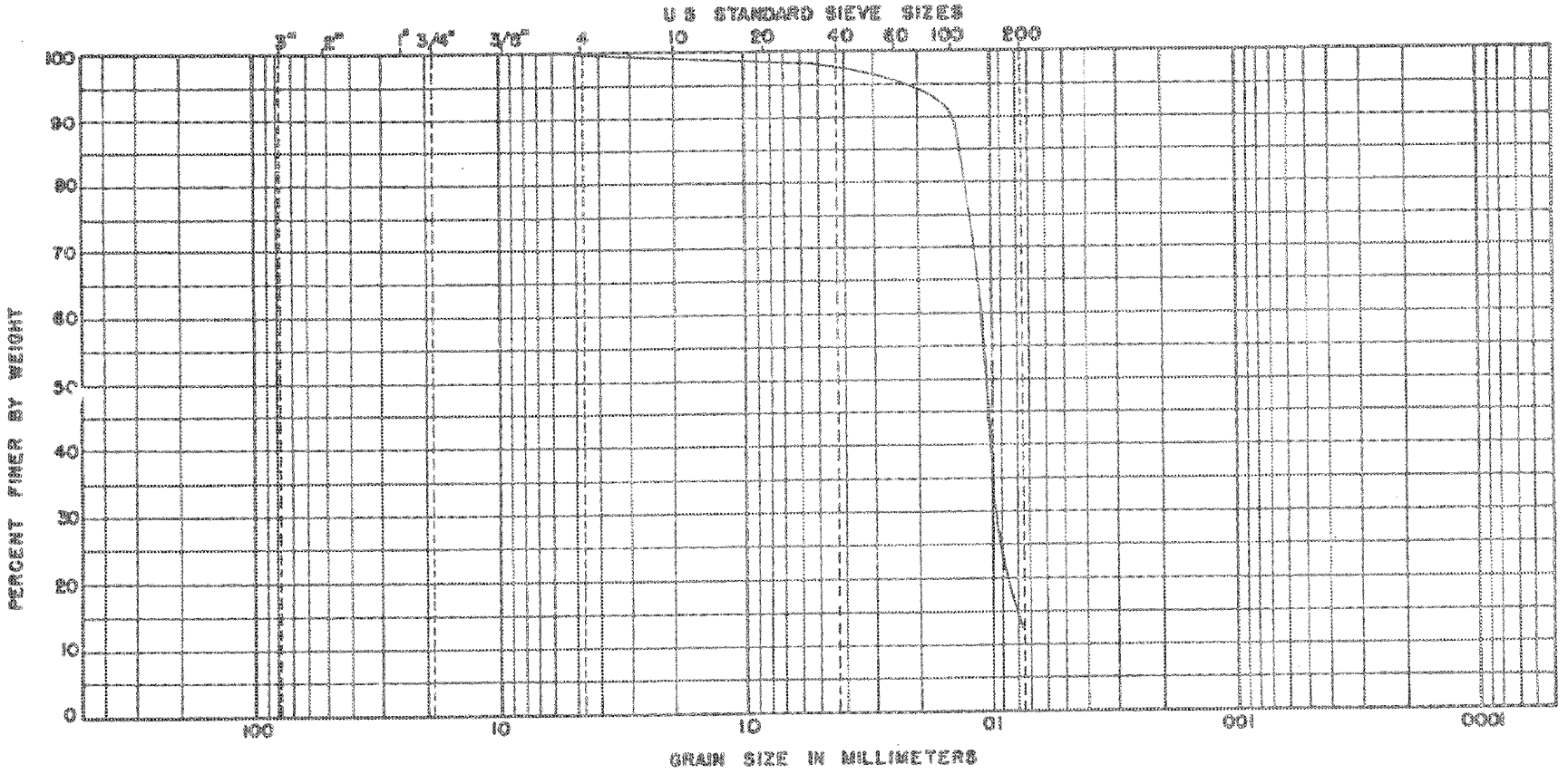
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-105 Sample #17	80.0'	- -	-	-	-	Hard grey limestone and shell Moisture Content - 11.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-105 Sample #22	100.0'	- -	-	-	-	Dense light grey sand Moisture Content - 29.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

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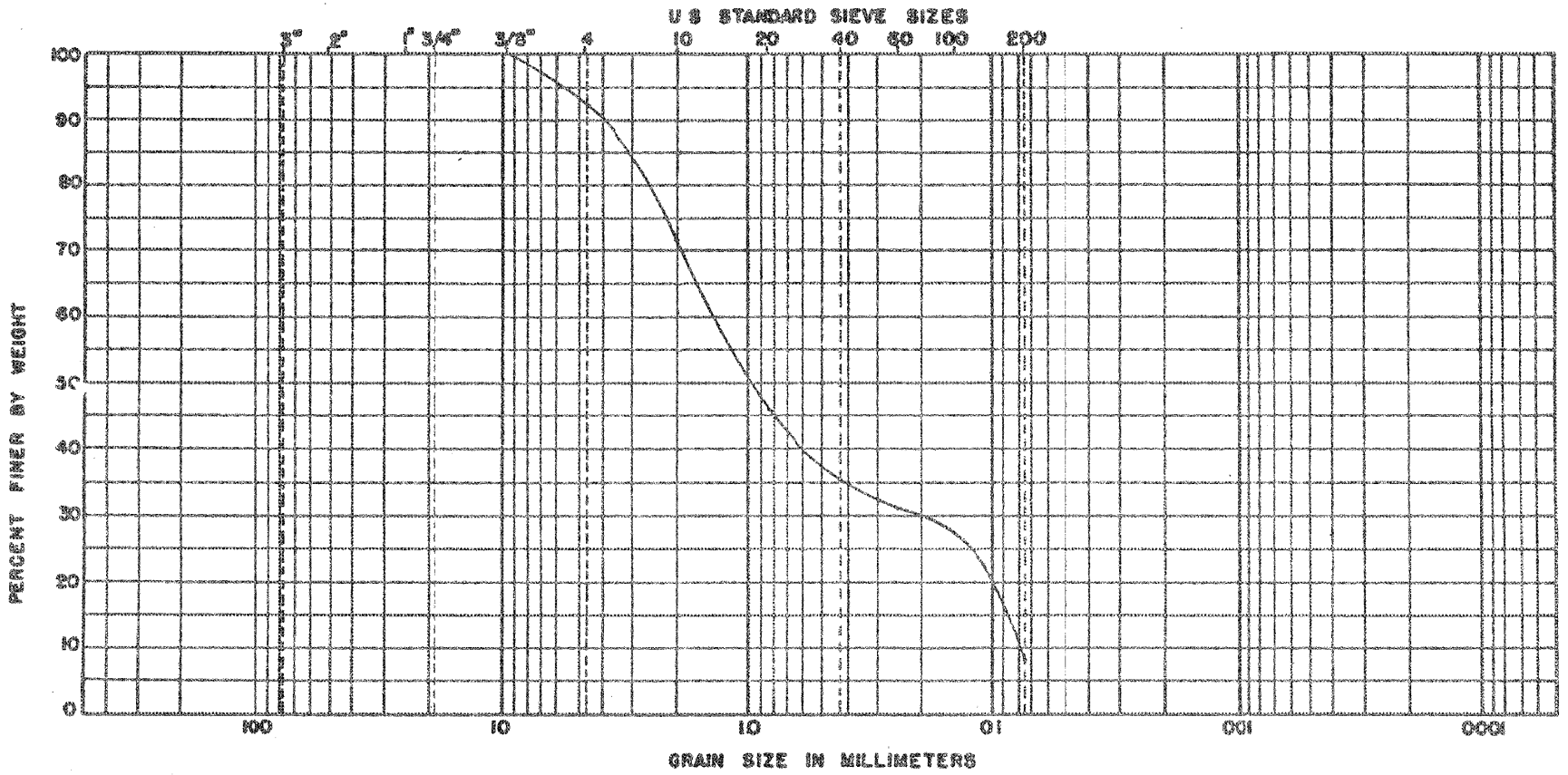


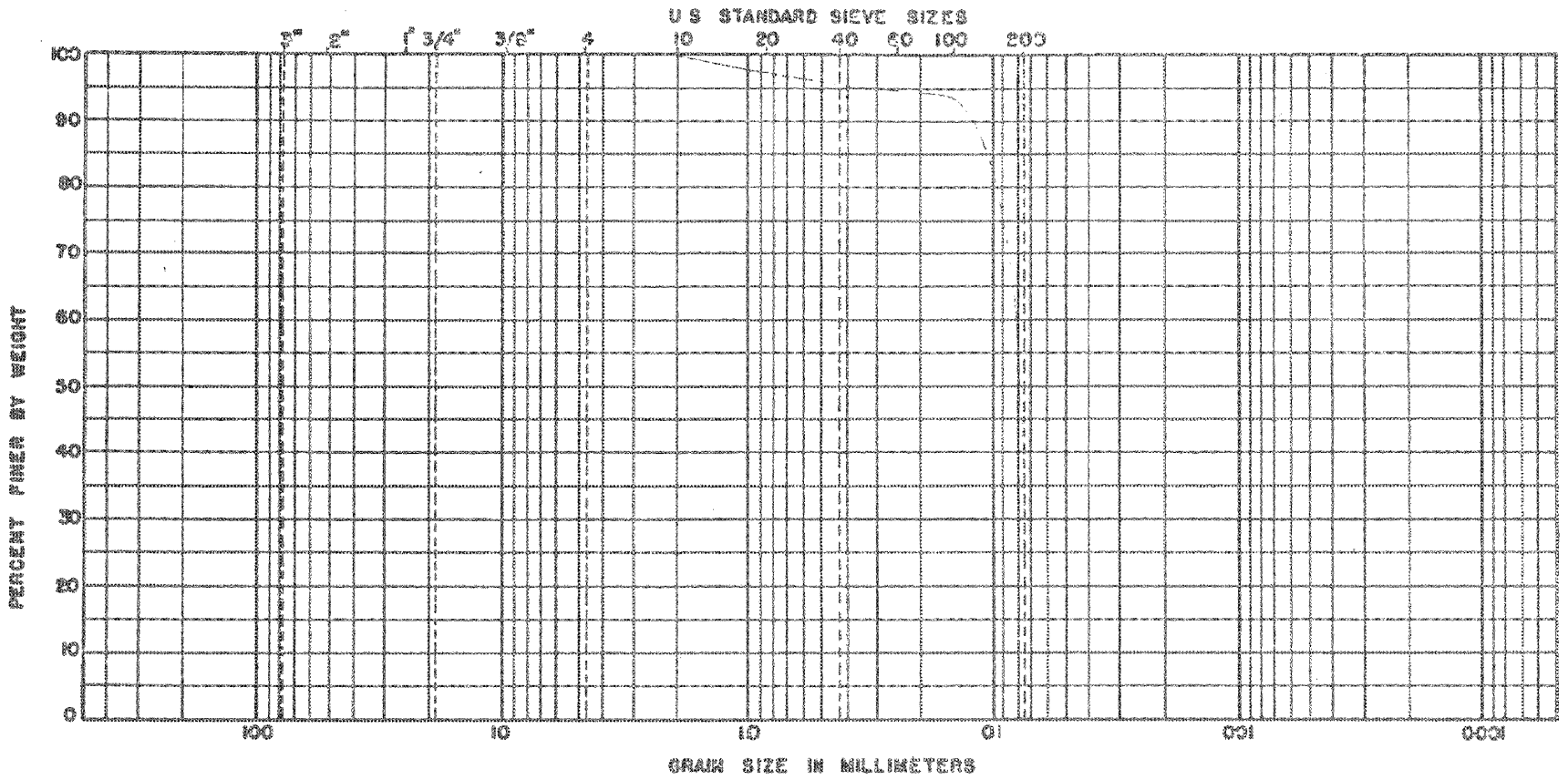
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 Sample #17	85.0'	- -	-	-	-	Dense grey fine sand and shell Moisture Content - 23.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

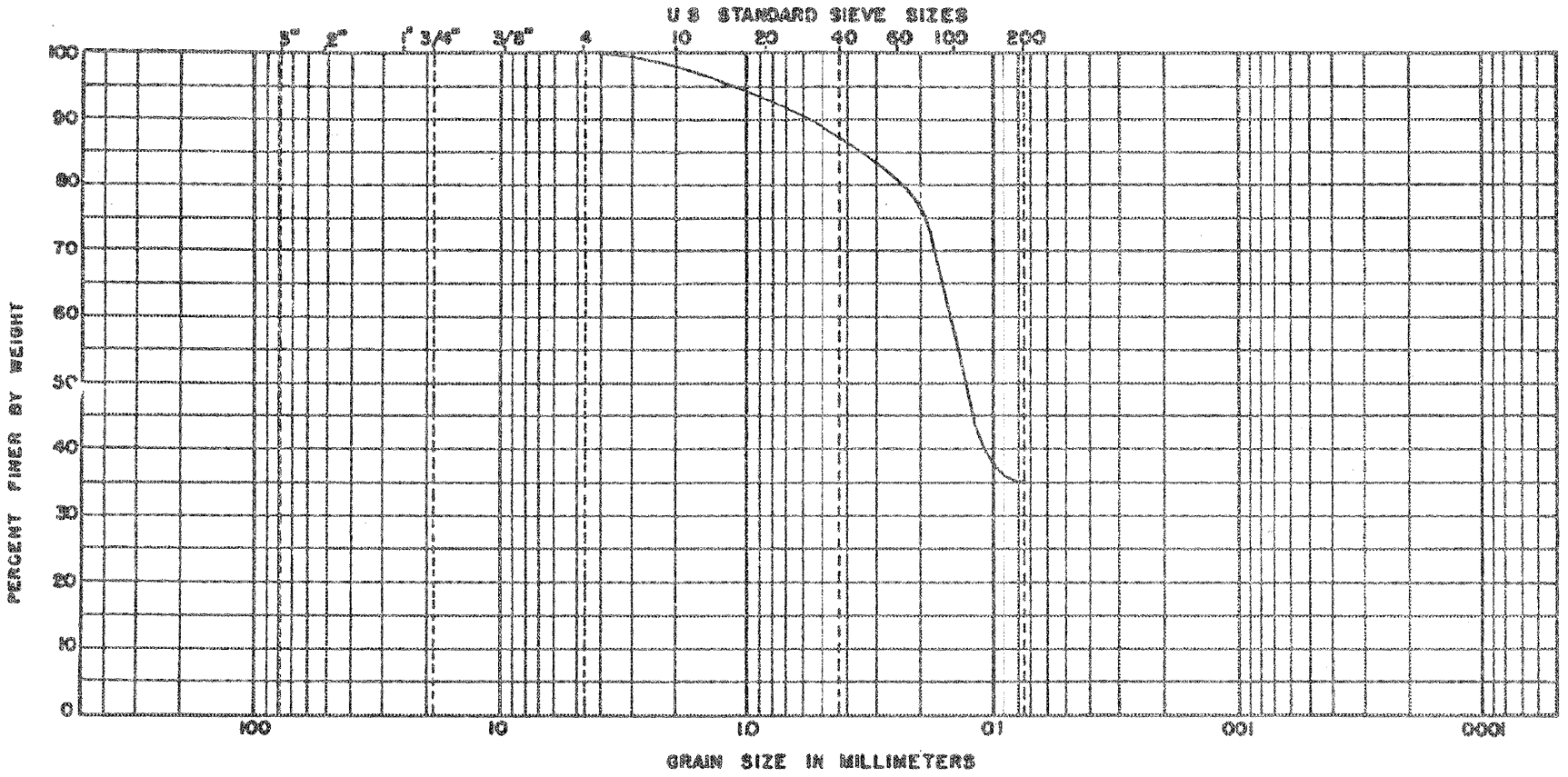
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 UD	87.5'	25.9				GRAY FINE TO MEDIUM SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



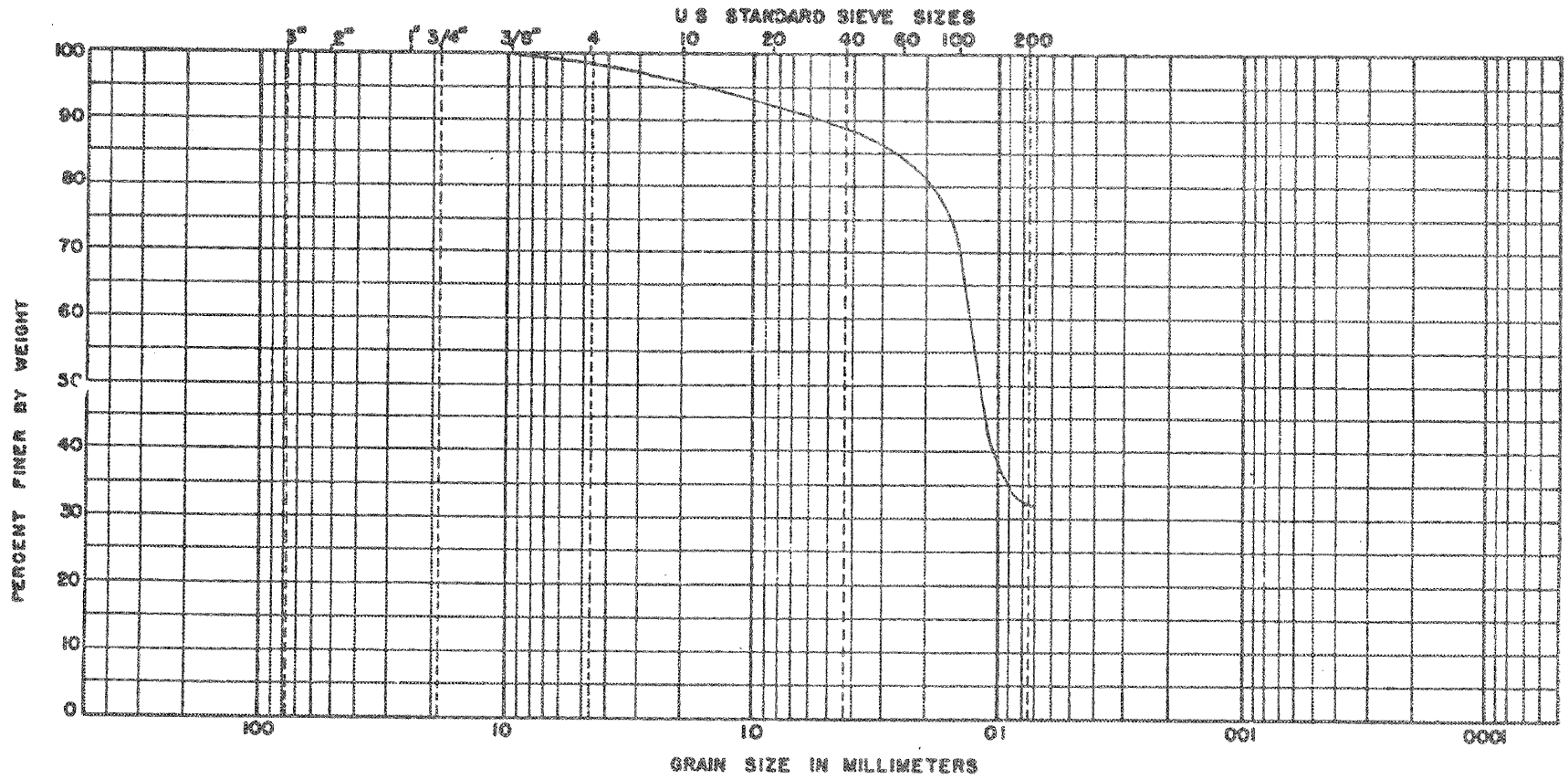
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 Sample #28	100.0'	- -	-	-	-	Firm grey clayey silty sand Moisture Content - 24.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



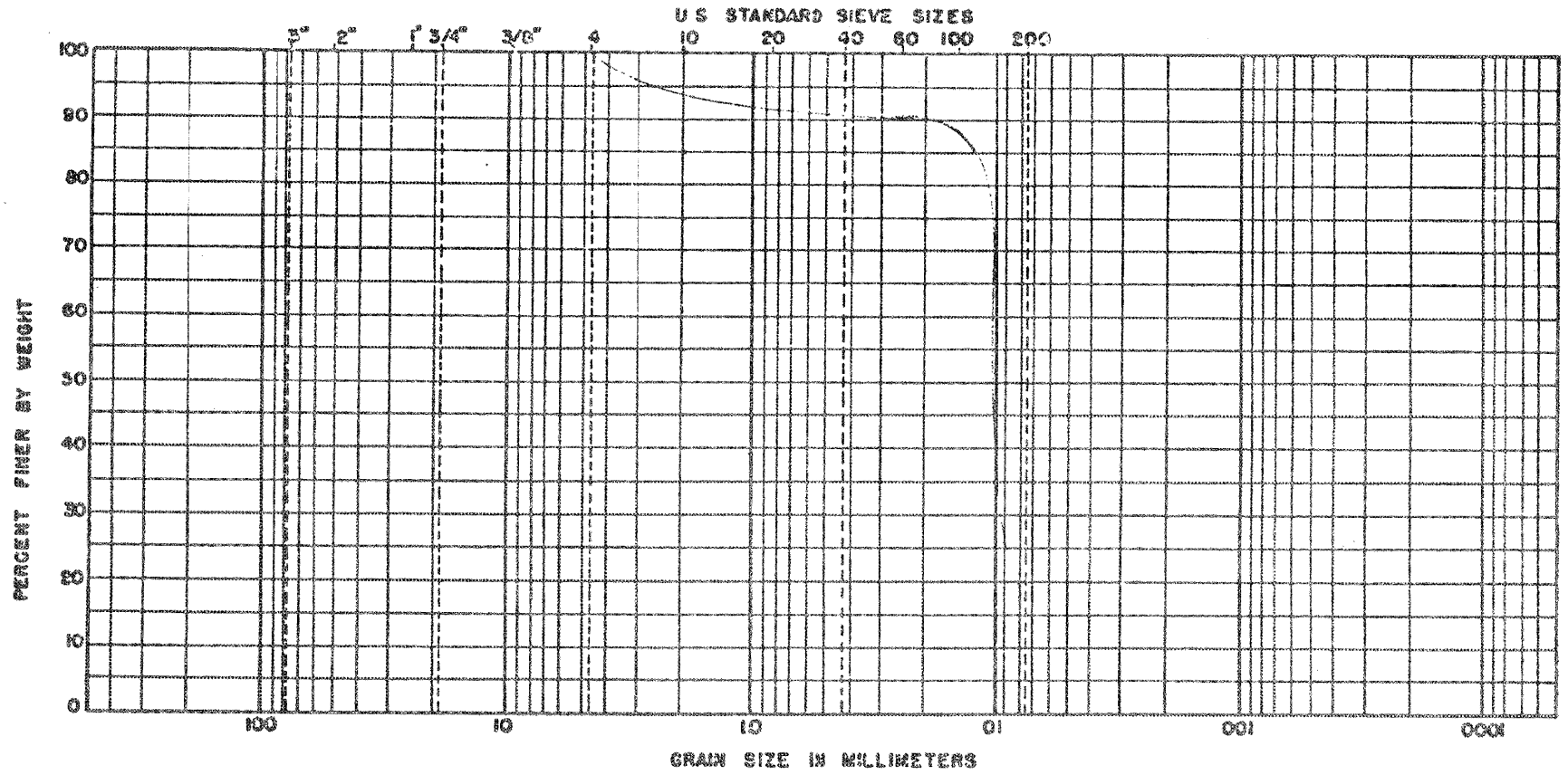
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 Sample #29	105.0'	- -	-	-	-	Fine grey clayey sandy silt with shell Moisture Content - 26.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

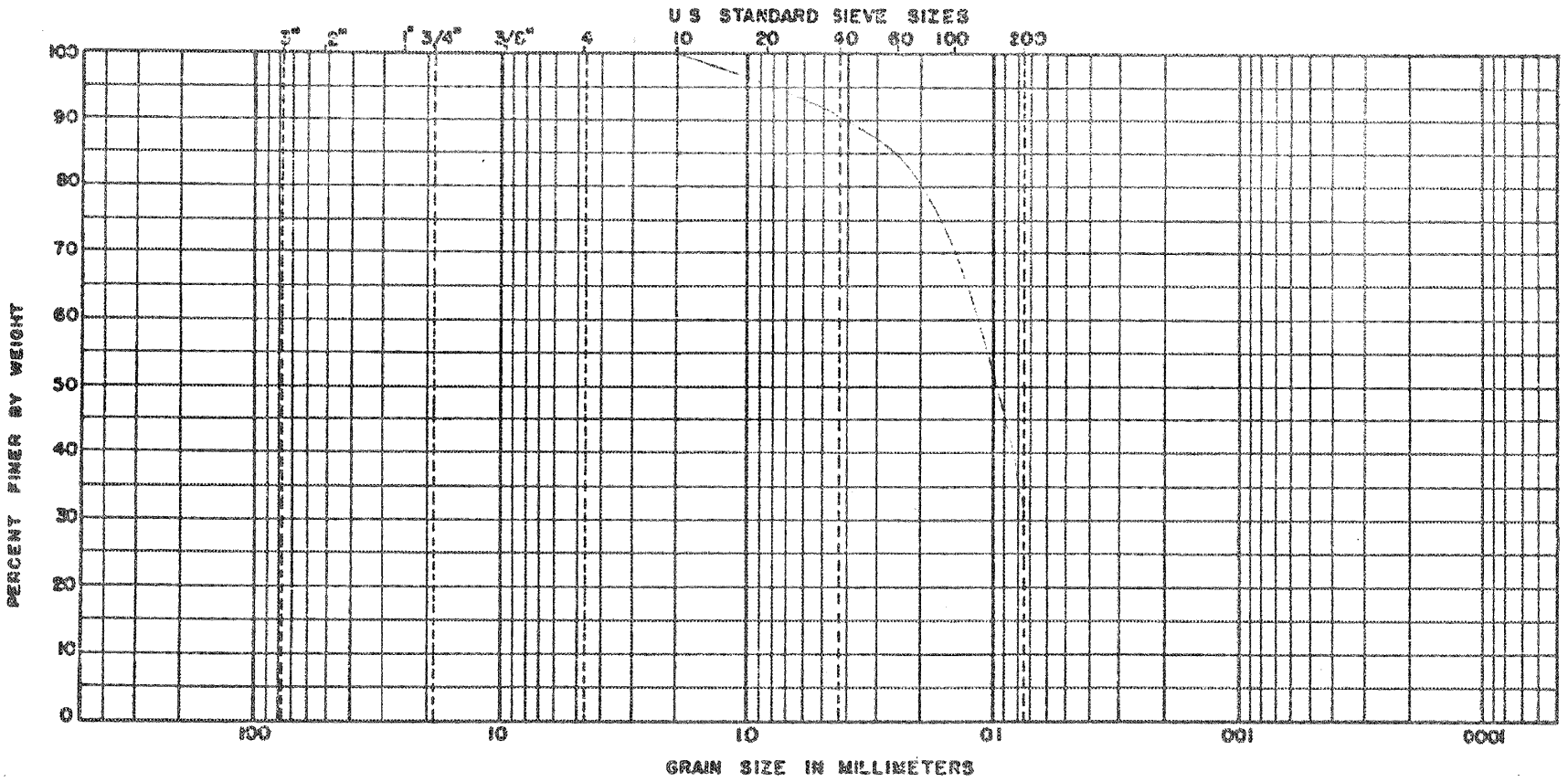
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 UD	137.5 FT.	24.1				GREEN CLAYEY FINE TO COARSE SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

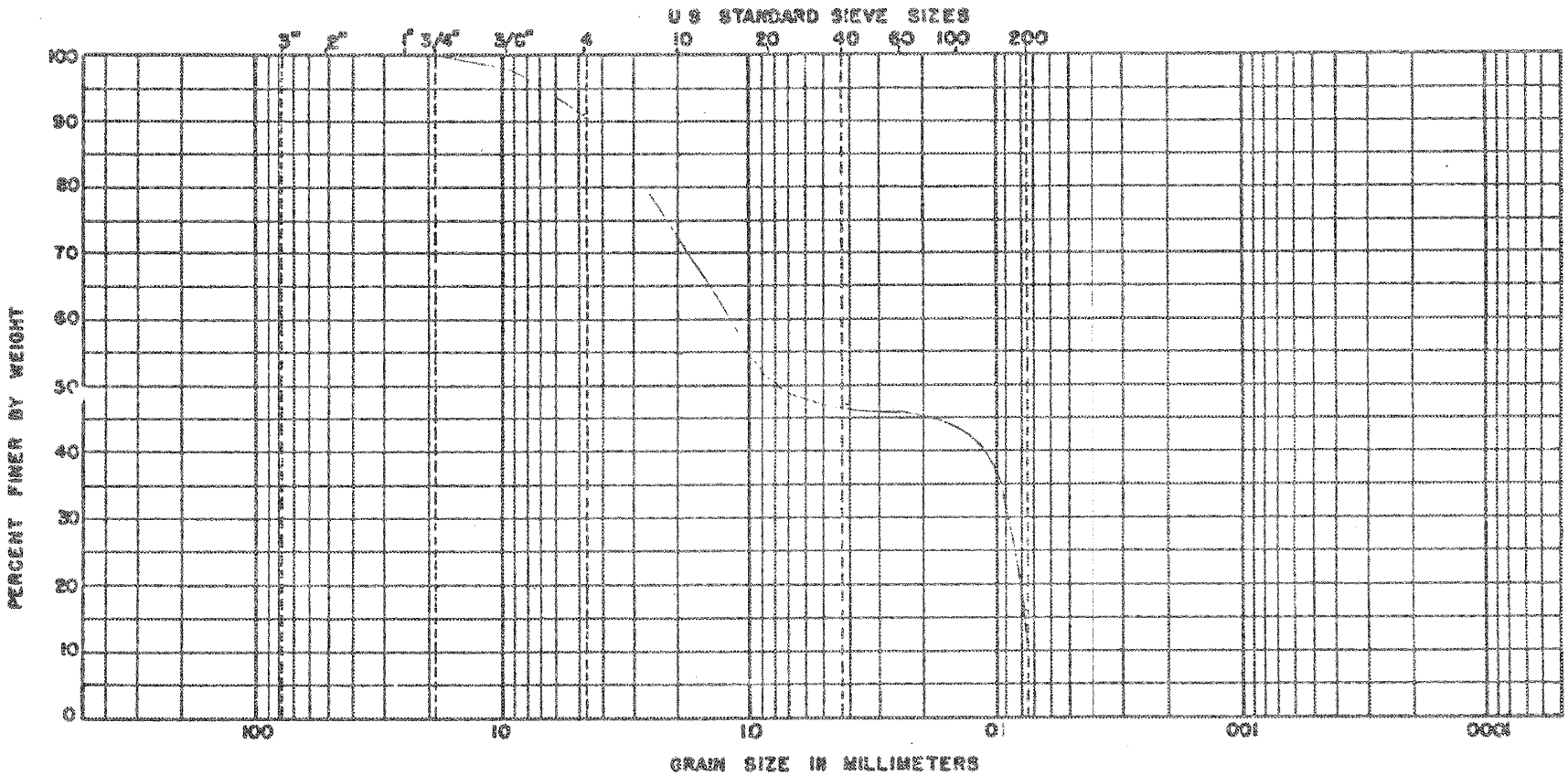
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 UD	147.5 FT	30.8				GREEN FINE TO MEDIUM CLAYEY SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



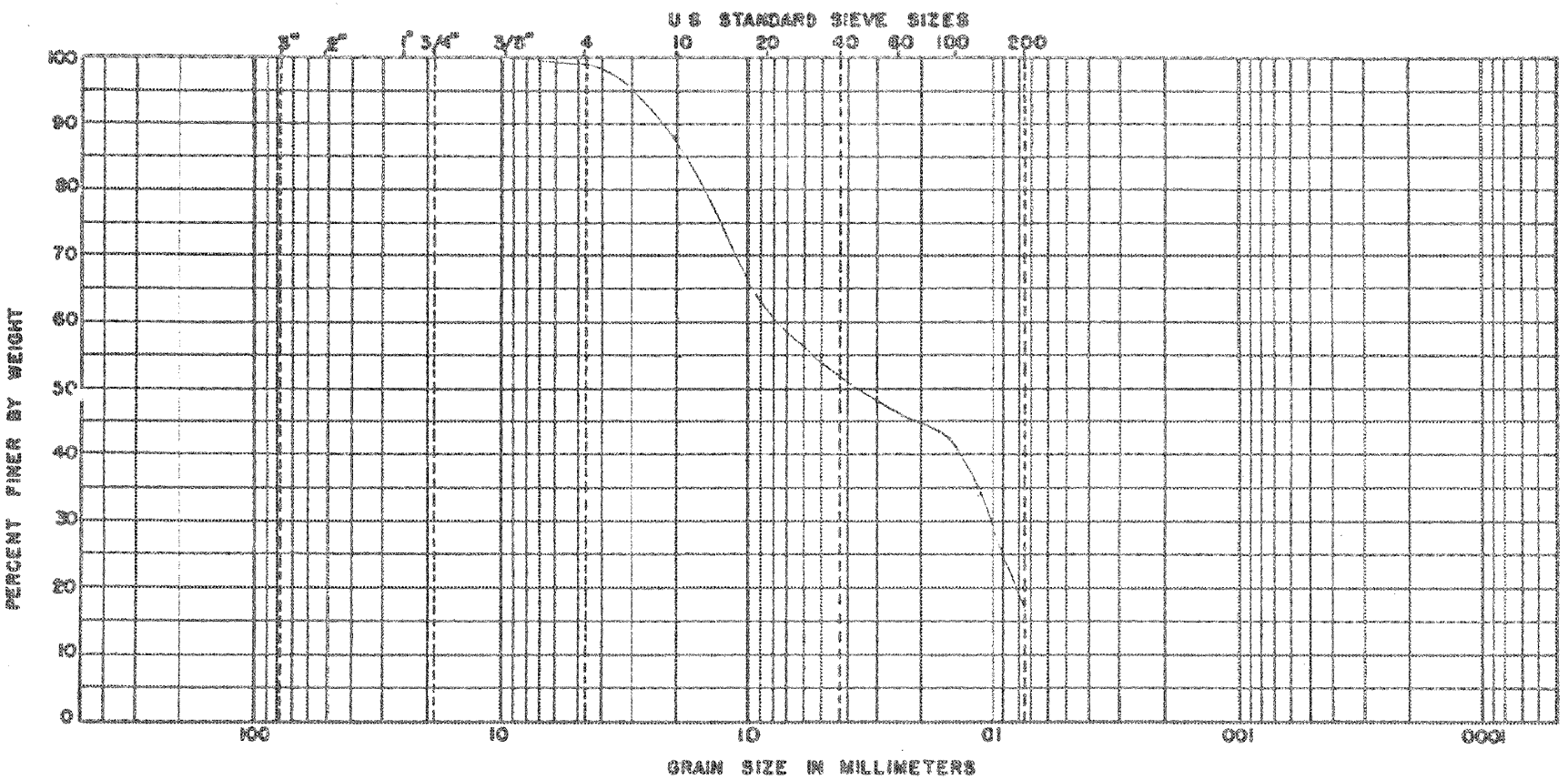
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #21	77.5'	- -	-	-	-	Grey fine sand with shell fragments Moisture Content - 17.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



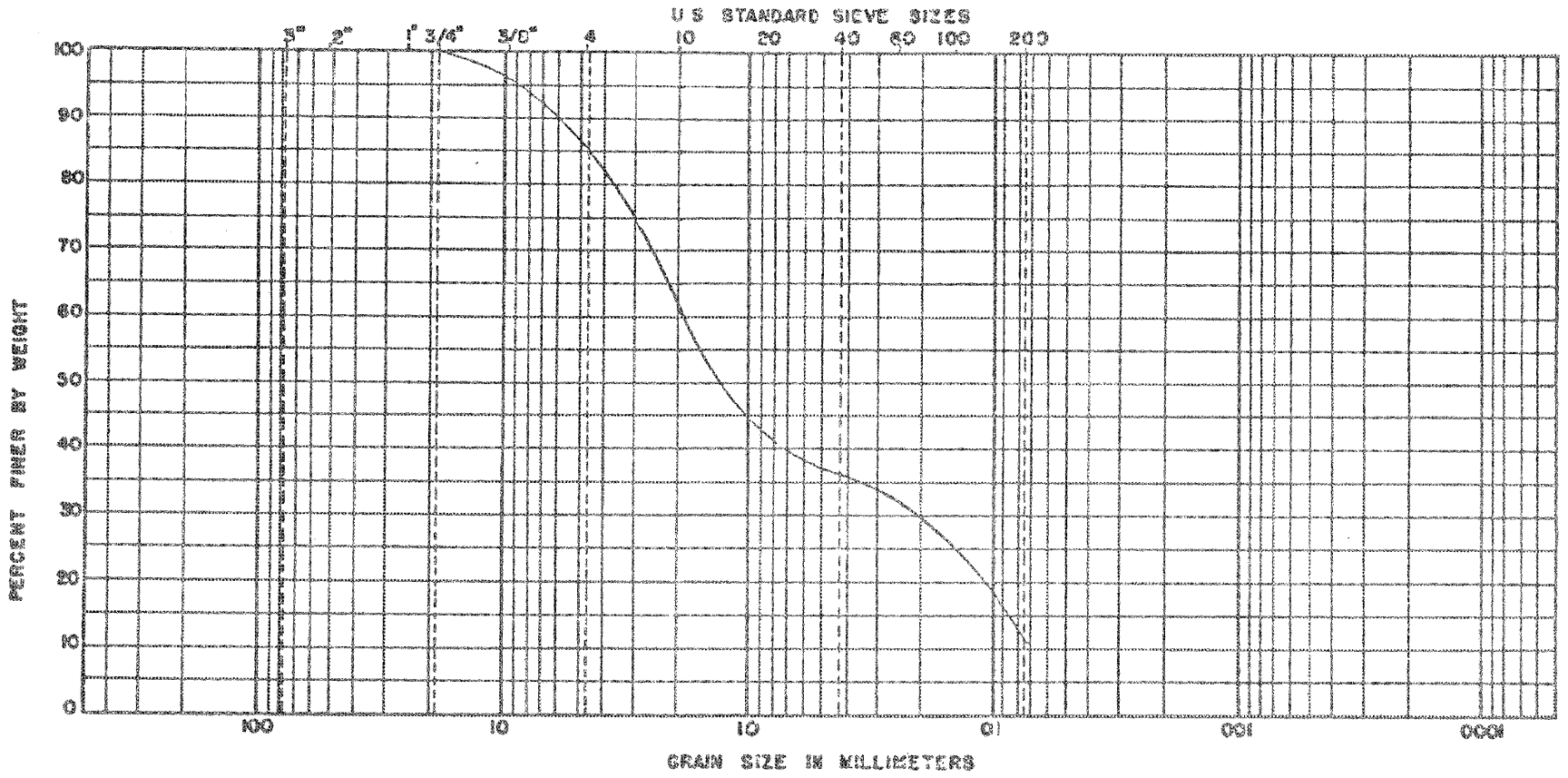
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #22	81.5'	- -	-	-	-	Grey fine sand with shell fragments Moisture Content - 21.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



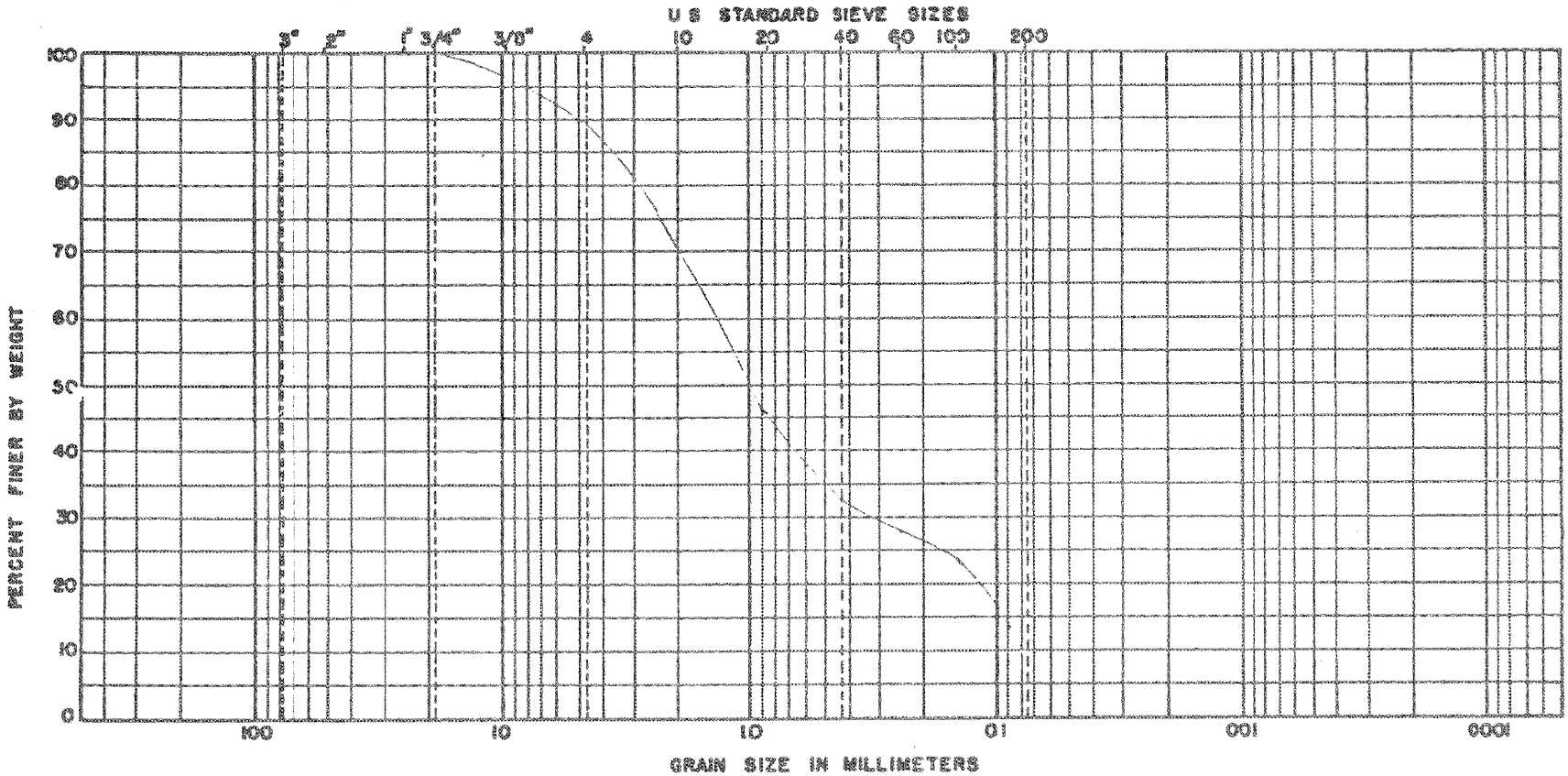
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-107 UD	84 FT.	20.4				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



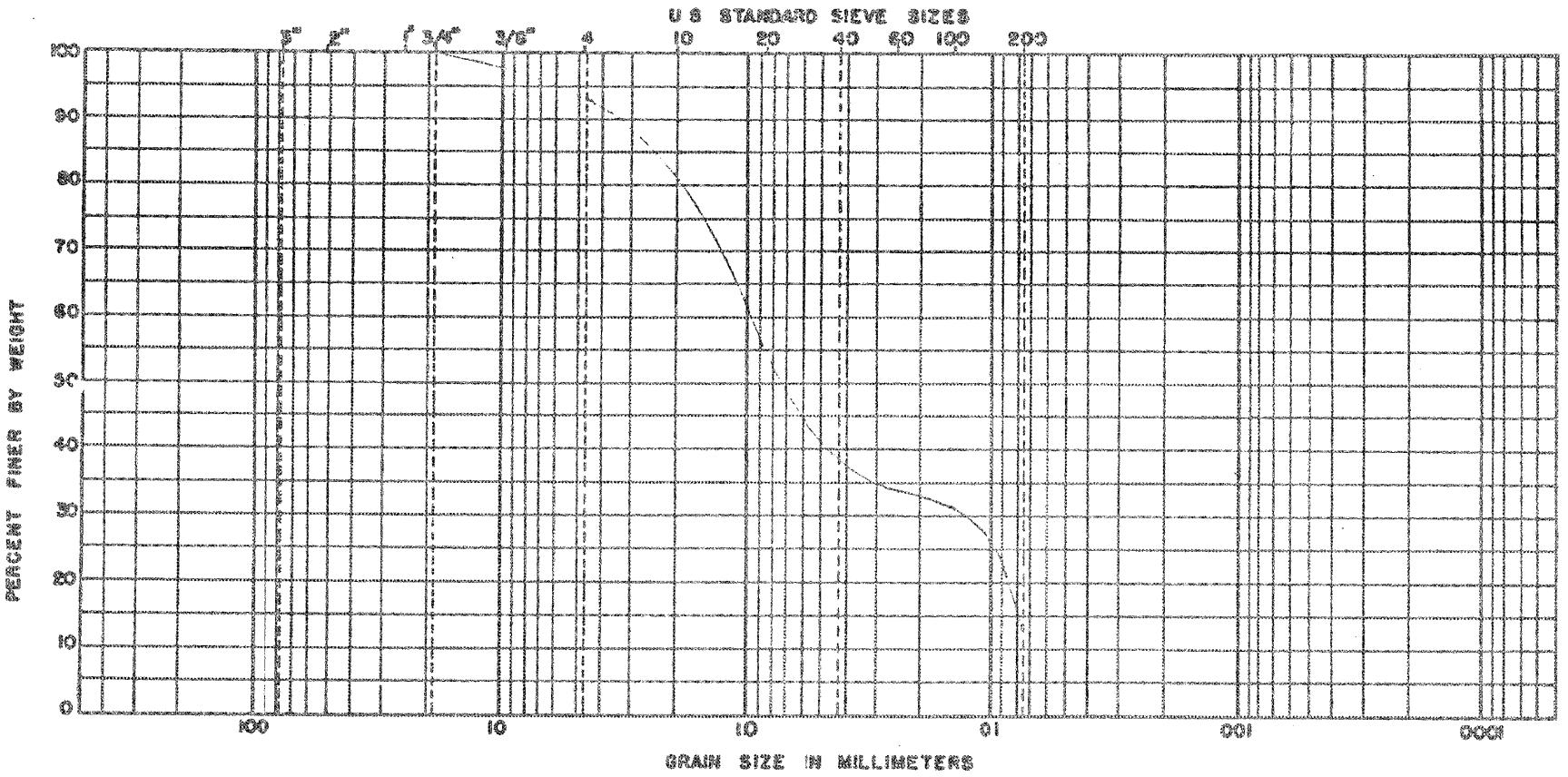
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #23	85.5	- -	-	-	-	Shell with grey fine sand Moisture Content - 23.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



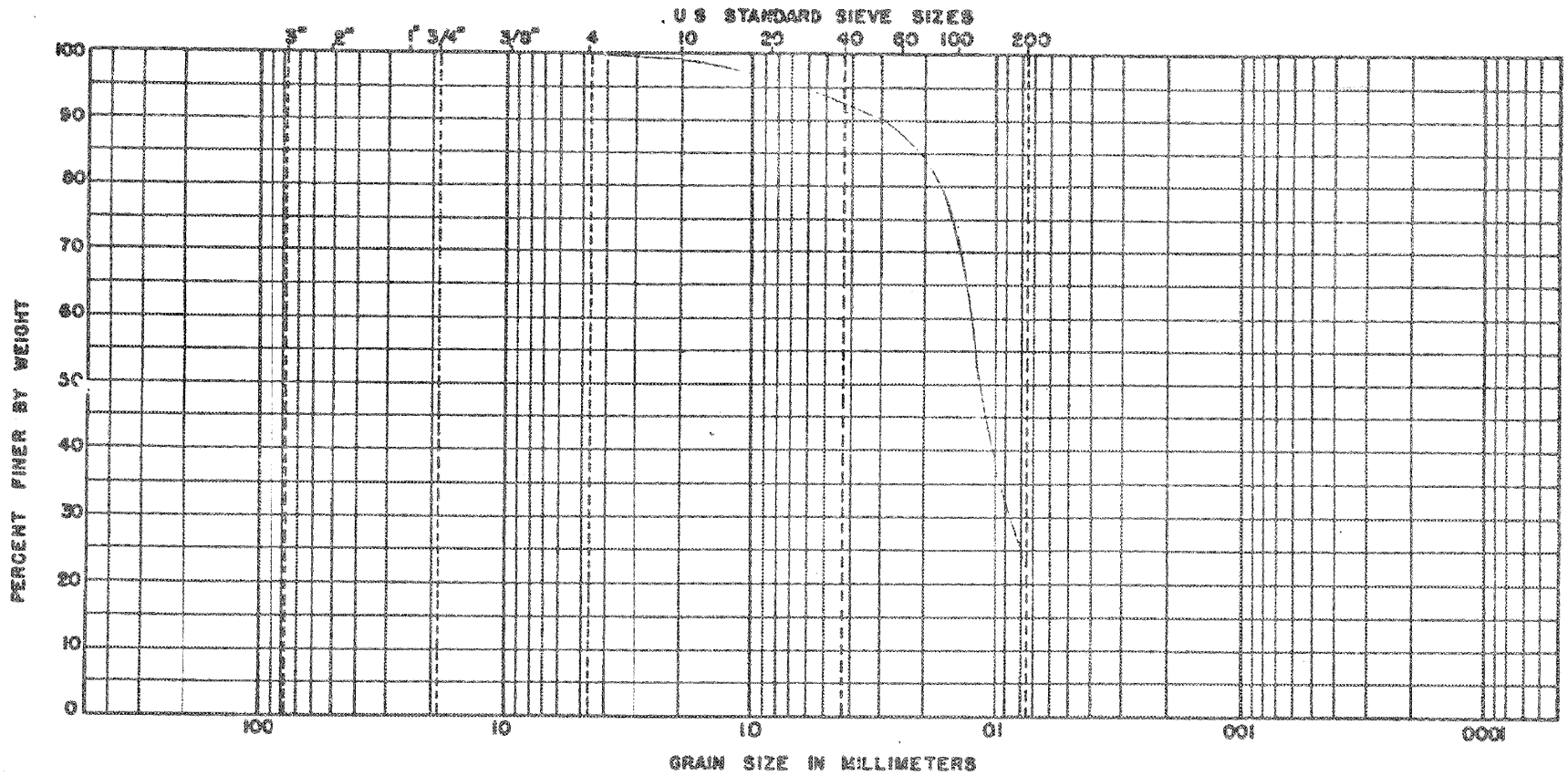
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #24	90.0'	- -	-	-	-	Grey shell with traces of fine sand Moisture Content - 16.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



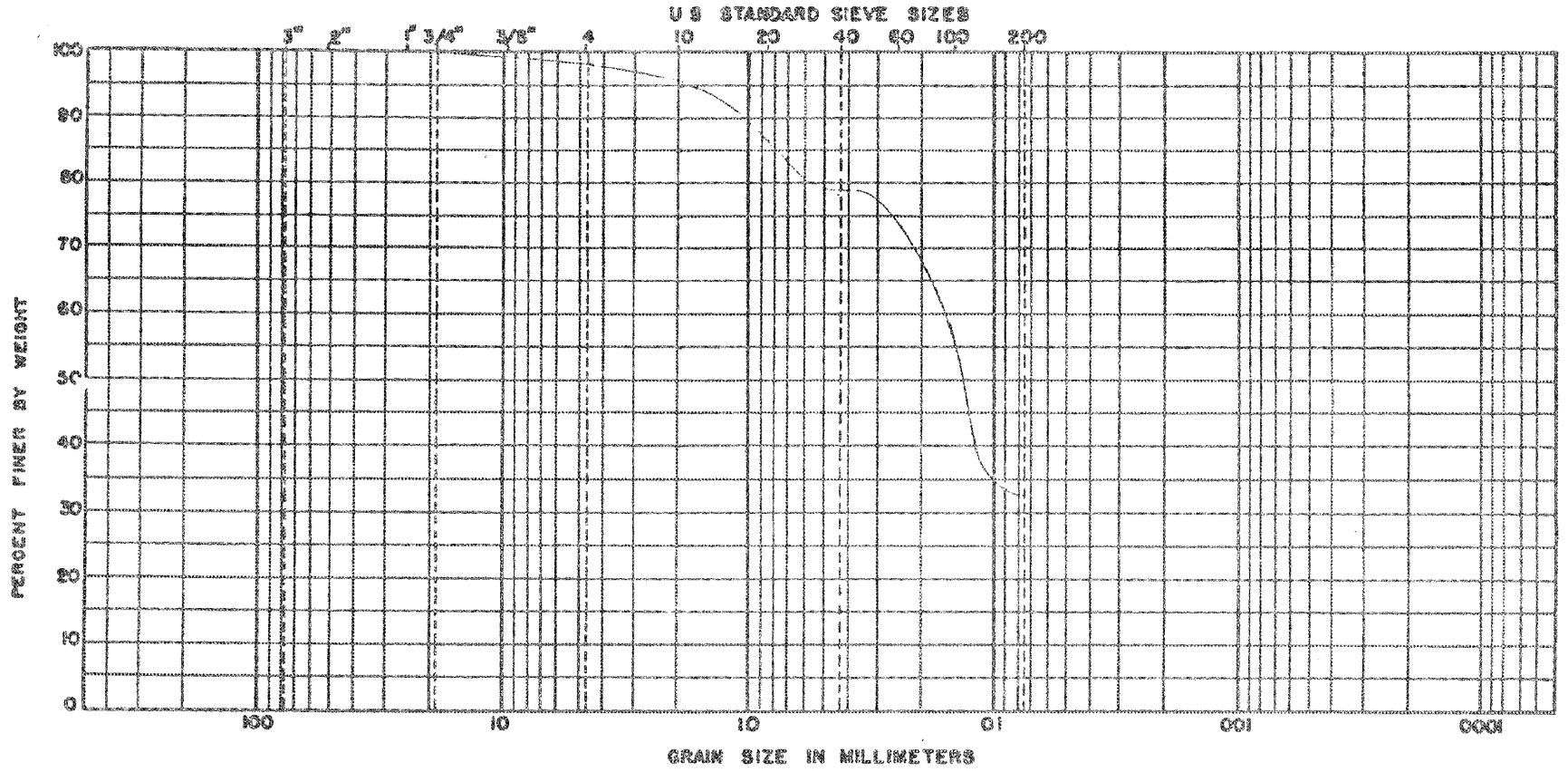
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #32	125.0'	- -	-	-	-	Grey fine silty sand with shell fragments Moisture Content - 27.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

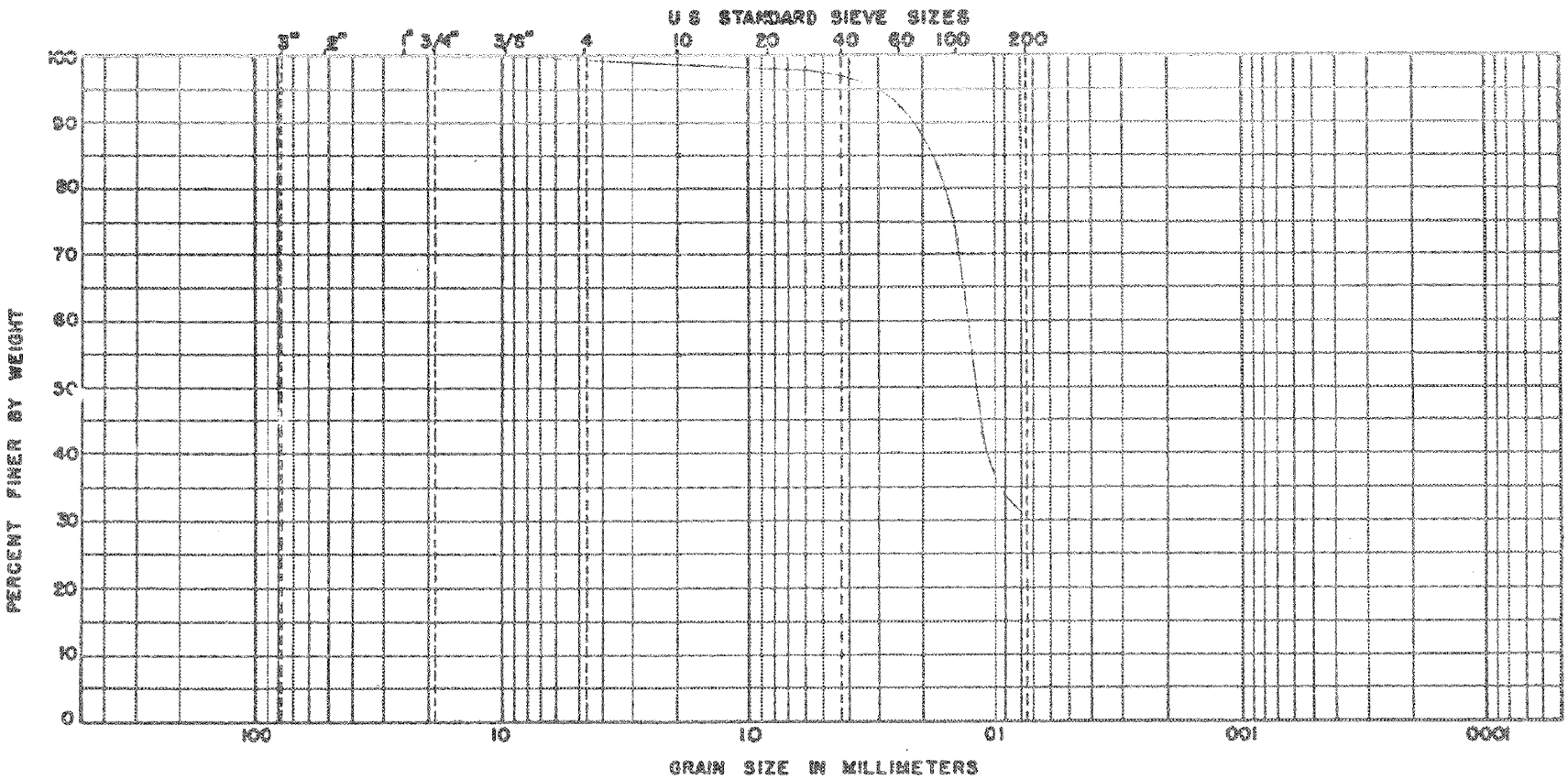
BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #34	135.0'	-	-	-	-	Fine silty sand with shell fragments Moisture Content - 26.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

2.5A-392A



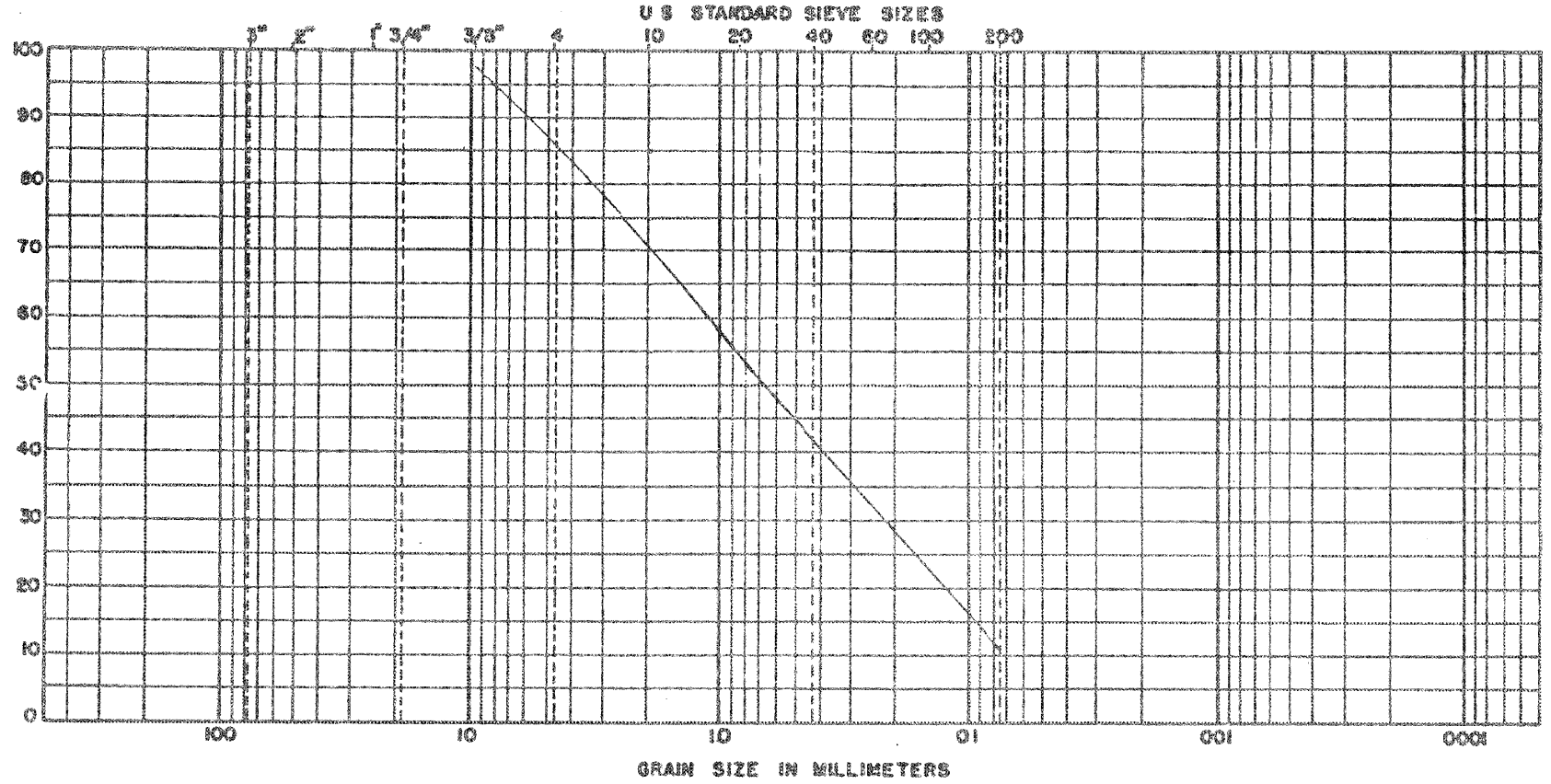
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 Sample #36	150.0'	- -	-	-	-	Grey silty fine sand Moisture Content - 29.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



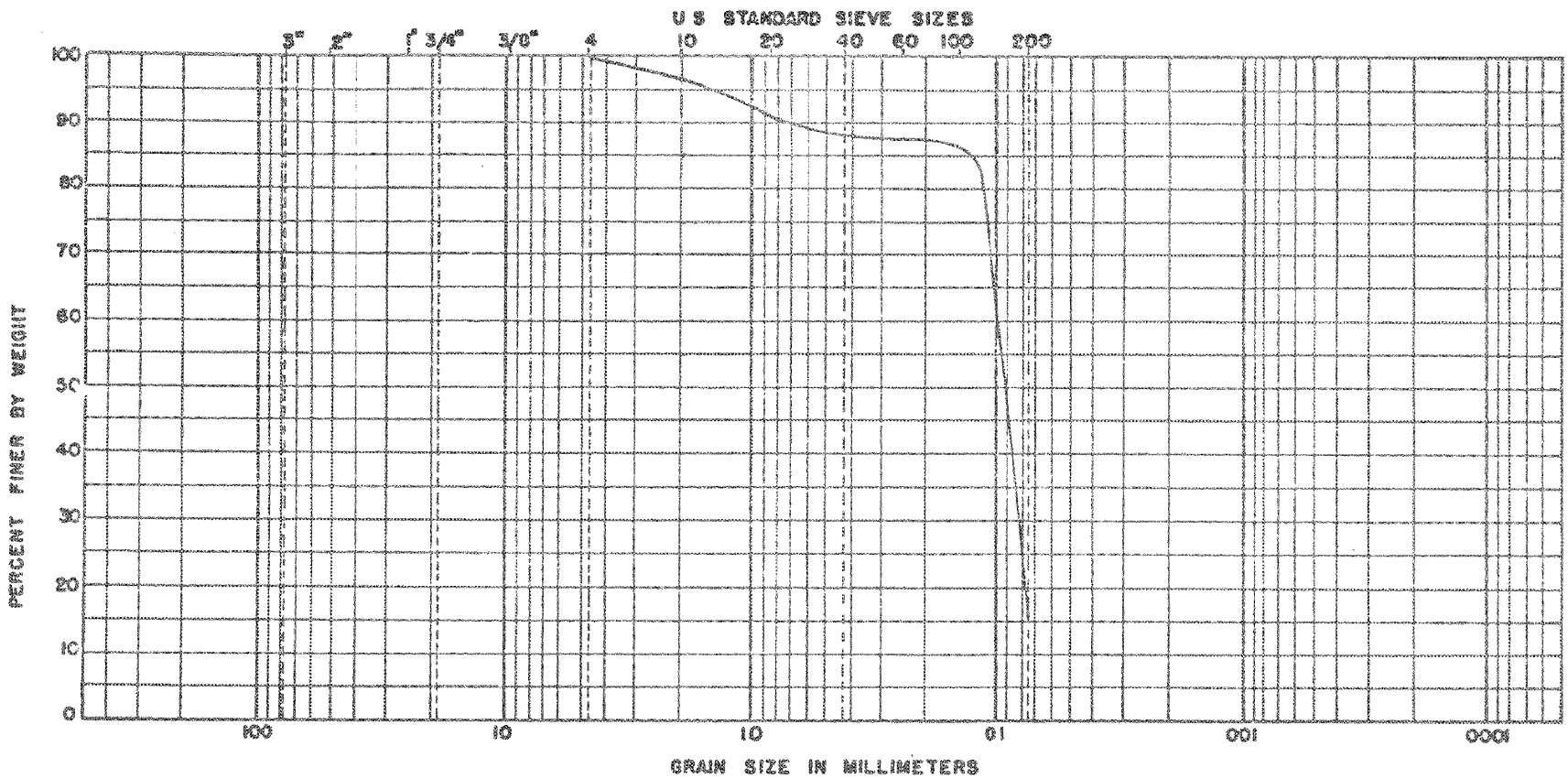
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107A Sample #18	71.5'	- -	-	-	-	Very firm grey coarse to fine sand and shell Moisture Content - 16.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



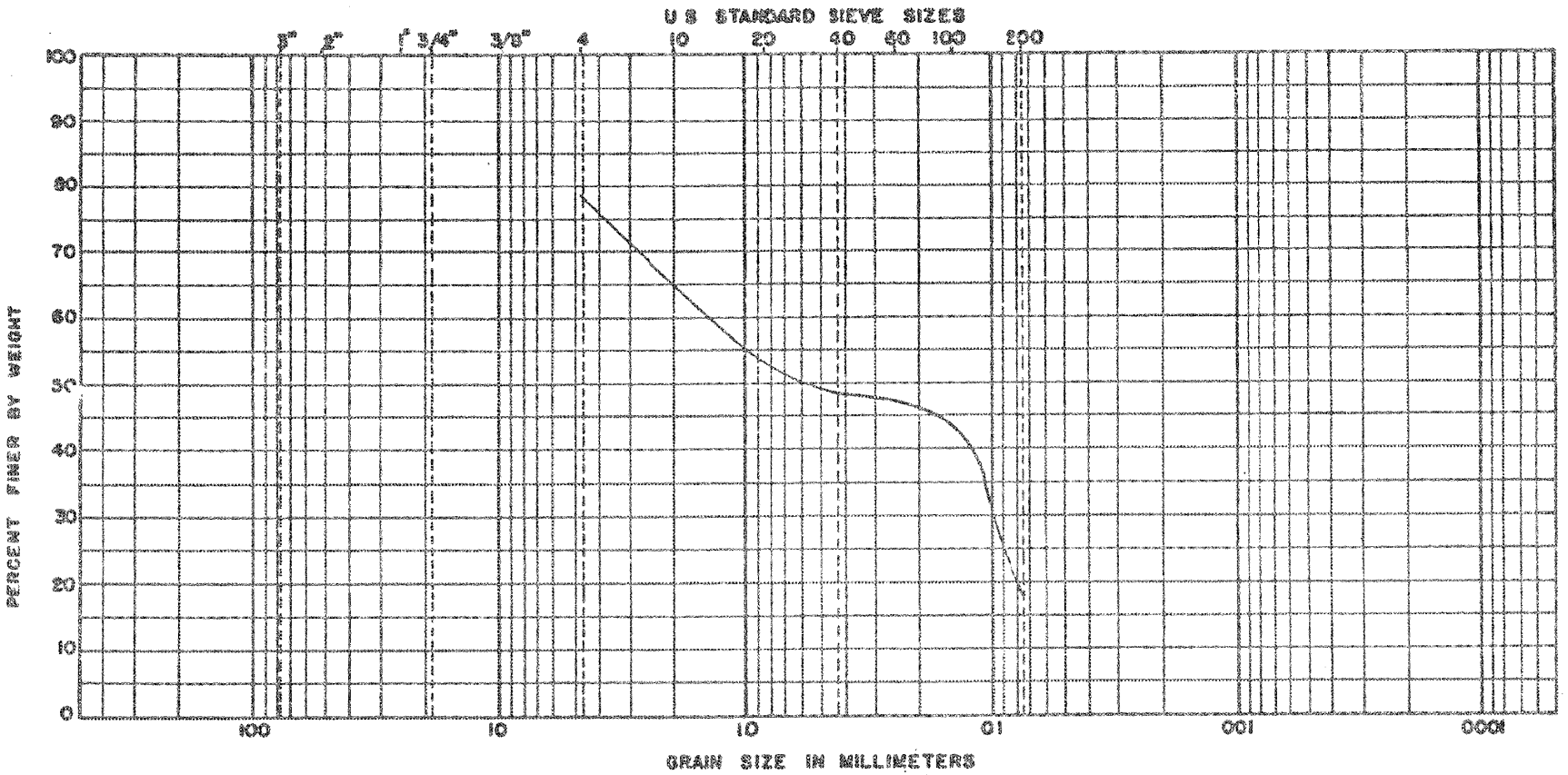
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107A Sample #19	73.5' - 75.0'	- -	-	-	-	Firm fine to very fine silty sand Moisture Content - 28.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



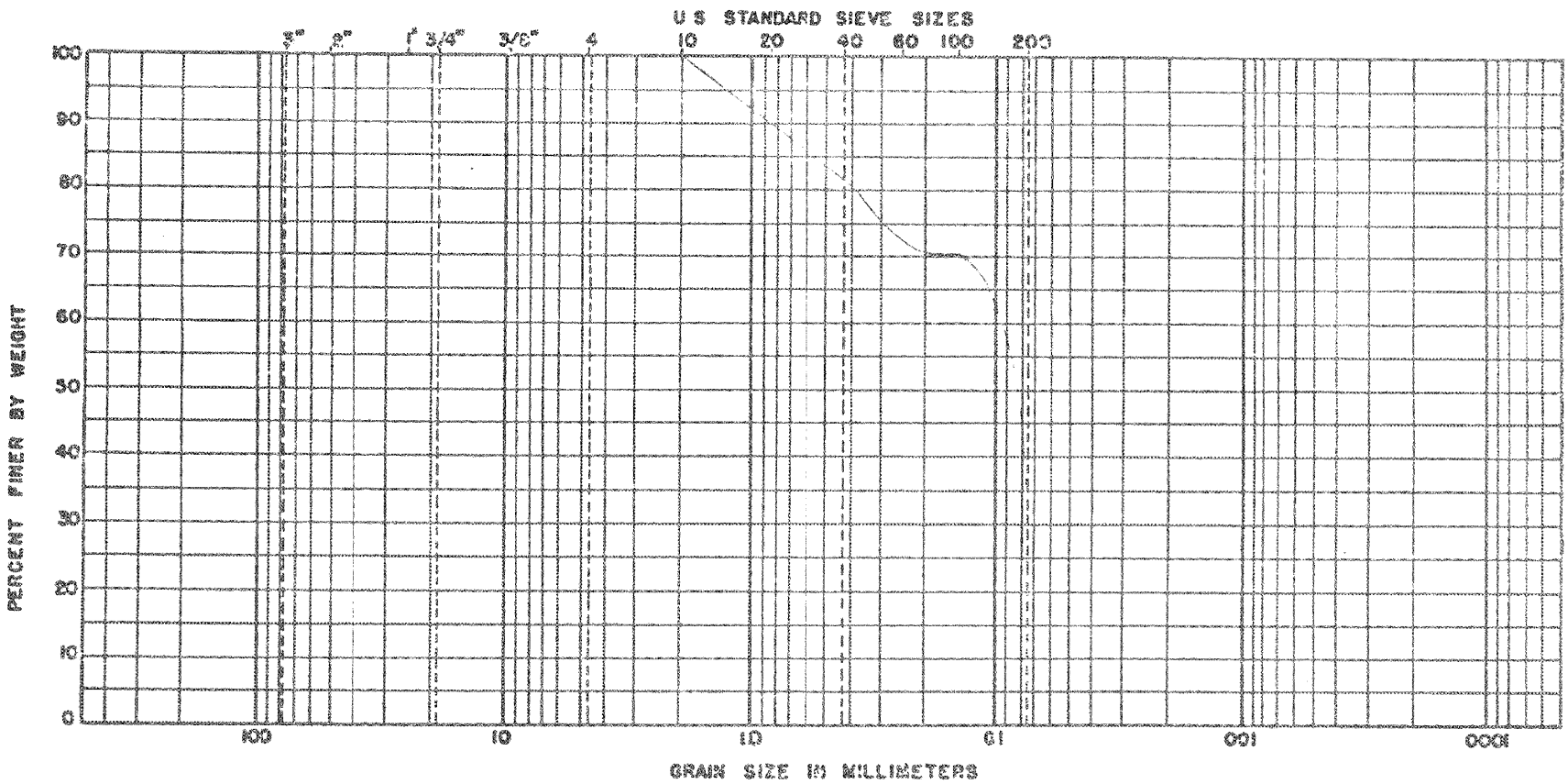
COBBLES	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107A Sample #20	75.5' - 77.0'	- -	-	-	-	Loose silty fine sand and shell Moisture Content - 22.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

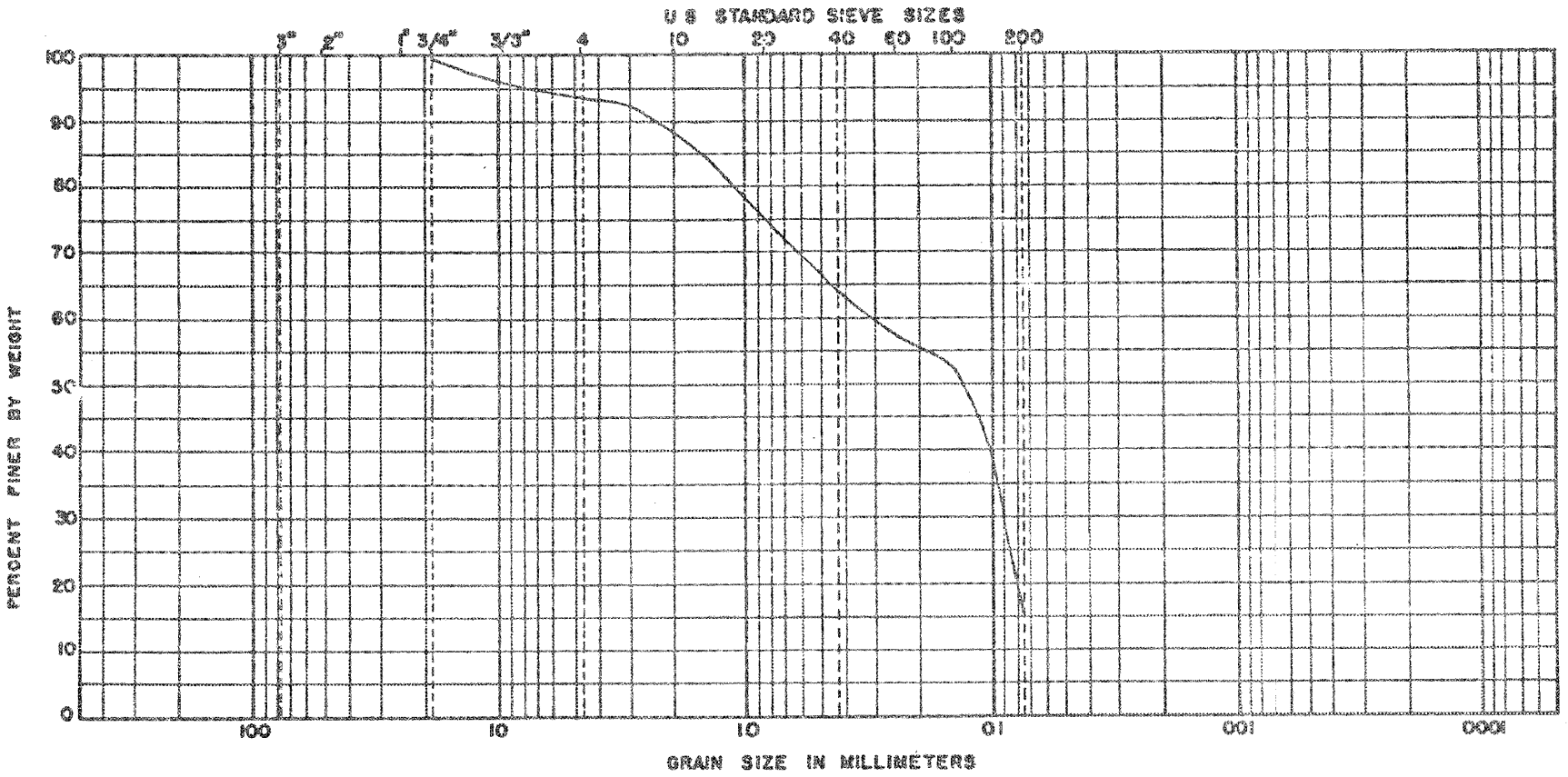
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107A UD	79.5 FEET	26.1				GRAY SHALEY SILTY FINE TO MEDIUM SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



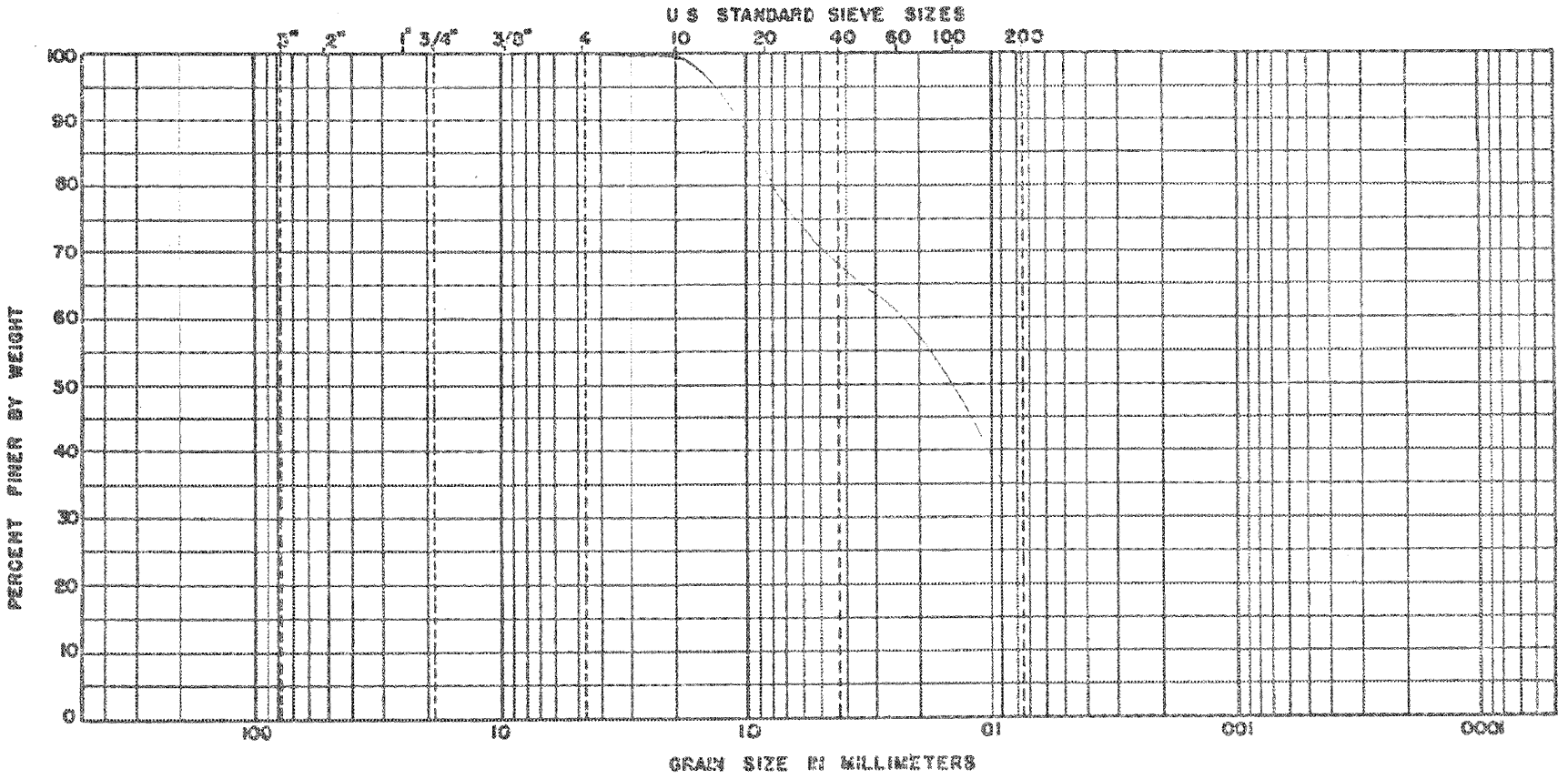
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107A Sample #22	81.5' - 83.0	- -	-	-	-	Firm fine to very fine light grey sand and shell Moisture Content - 17.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

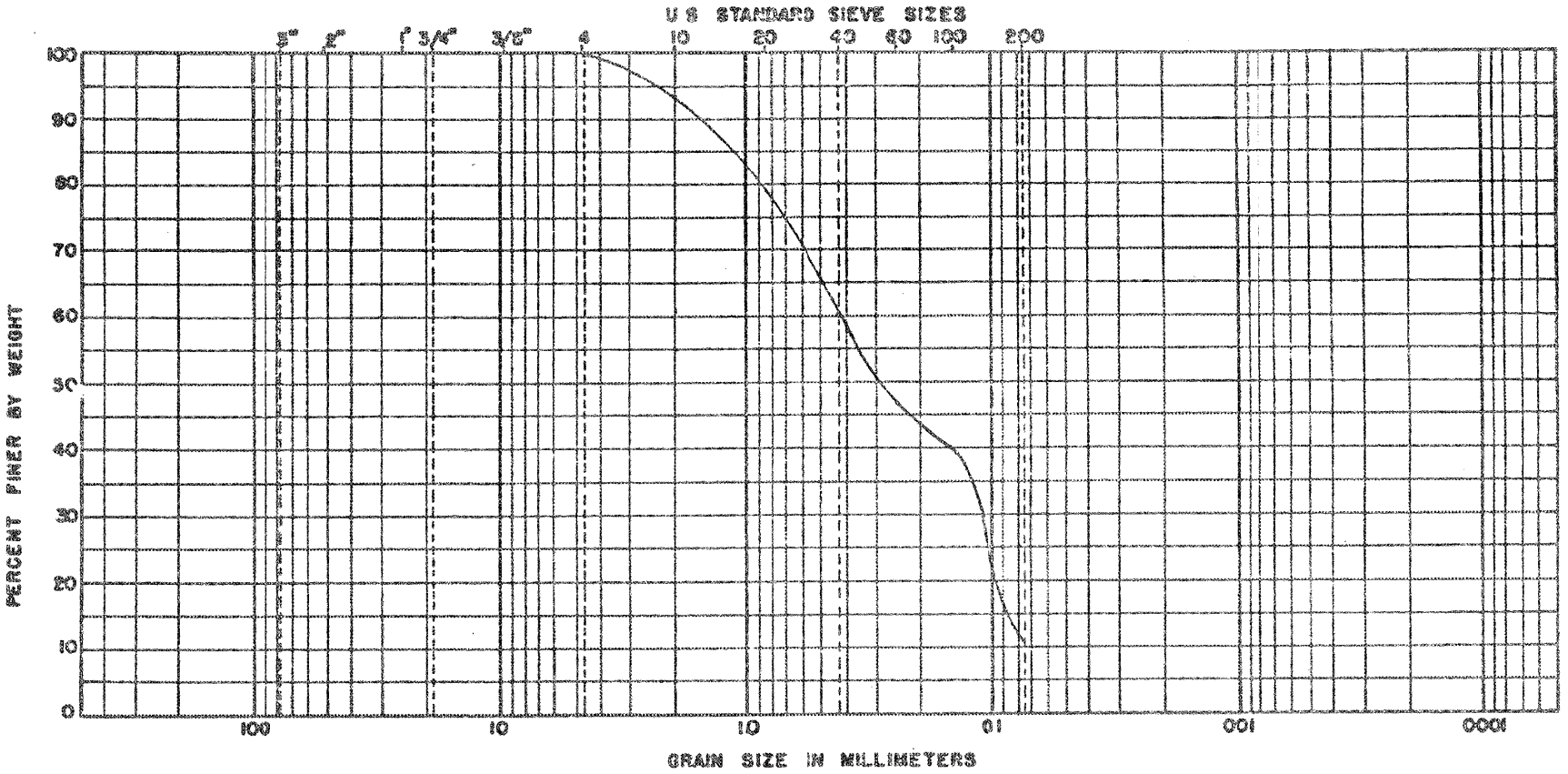
BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-108 UD	67.5'	16.2				GREEN FINE TO MEDIUM SAND WITH SHELL

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



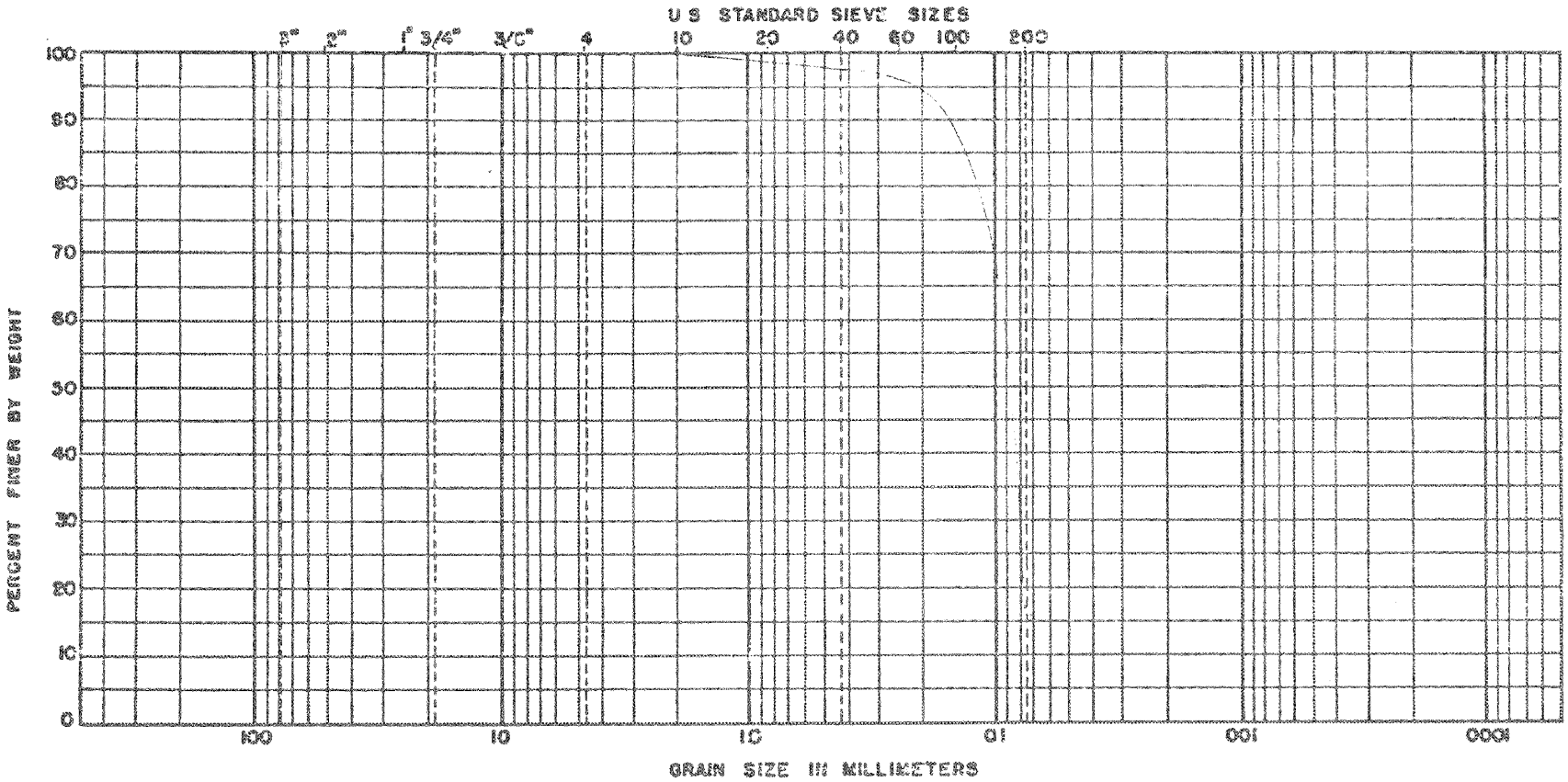
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108 Sample #17	75.0' - 75.5'	- -	-	-	-	Grey and white coarse to fine shell fragments Moisture Content - 21.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

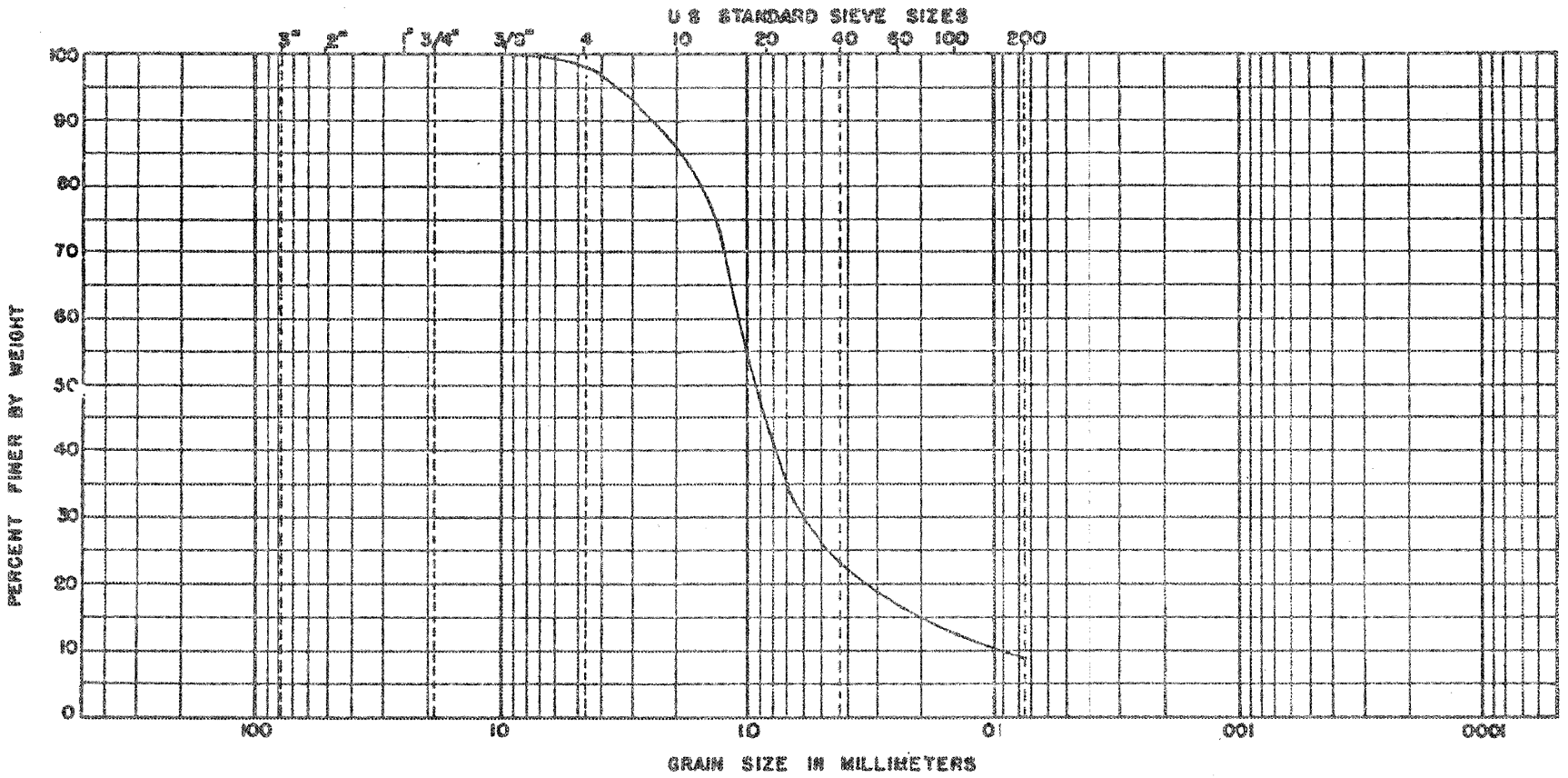
BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-108 UD	87.5'	23.6				GREEN FINE TO MEDIUM SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



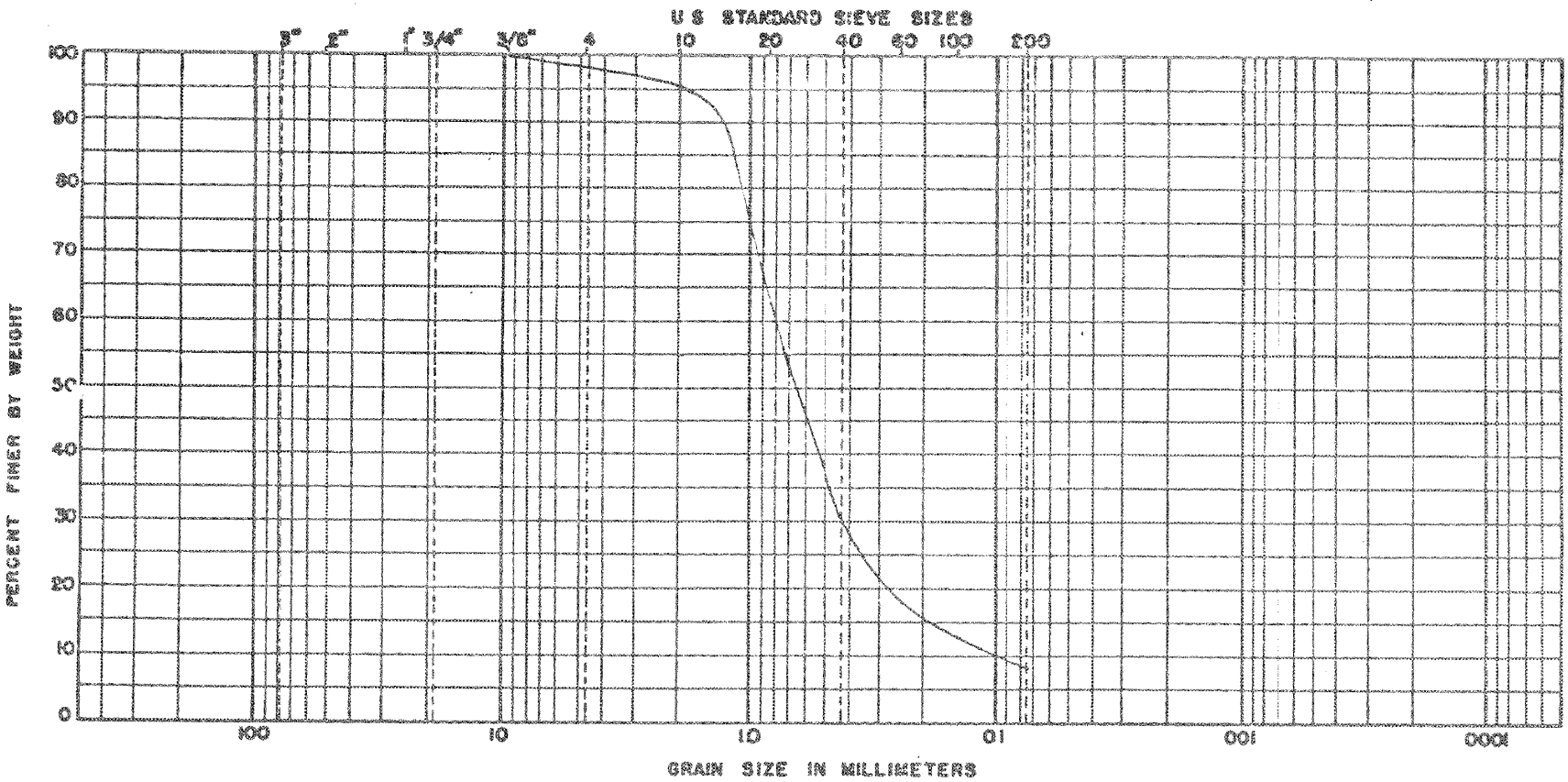
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108 Sample #20	90.0' - 91.5'	- -	-	-	-	Firm grey coarse to fine sand with shell fragments Moisture Content - 23.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



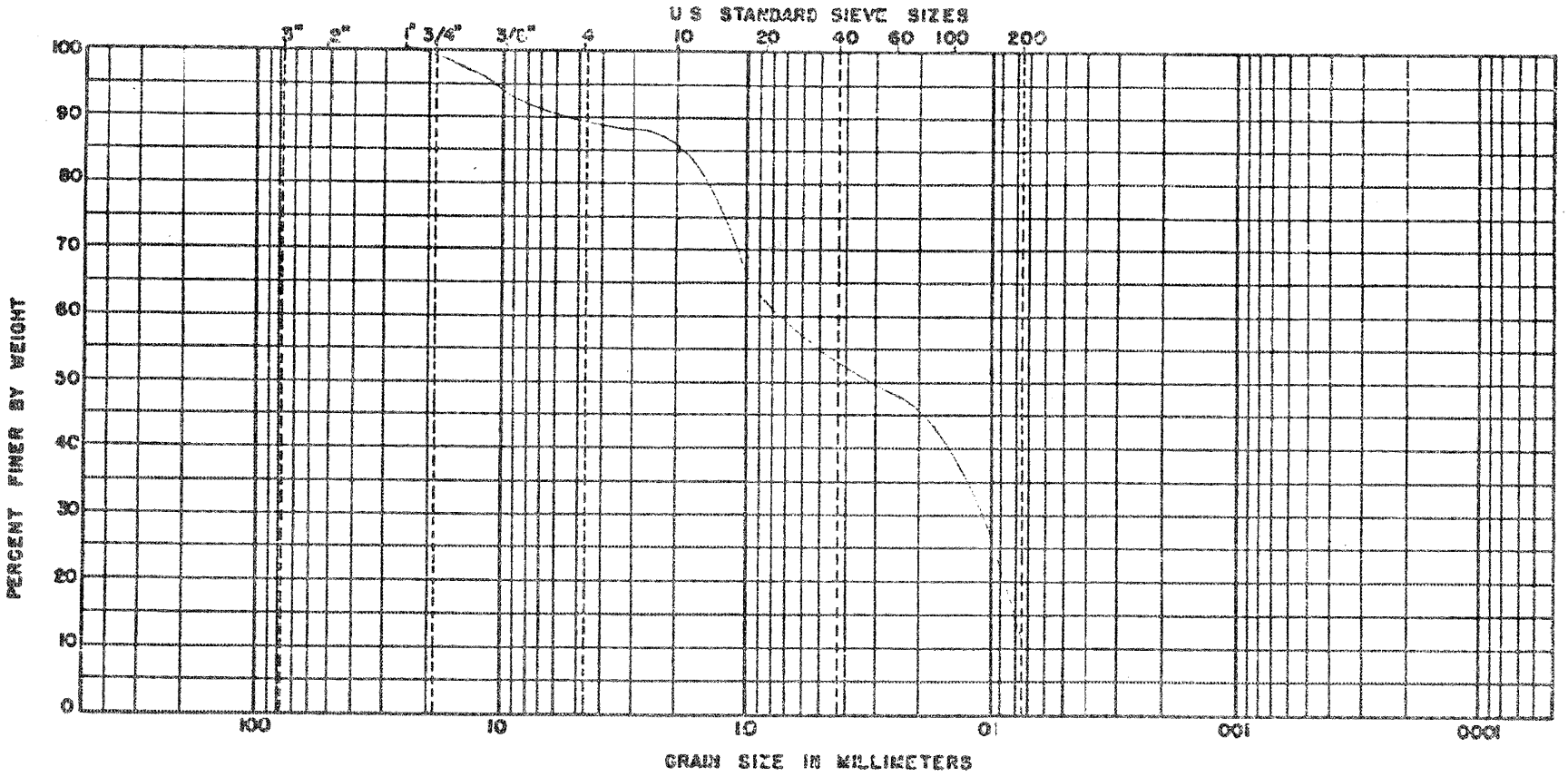
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
3-108 Sample #21	95.0' - 96.5'	- -	-	-	-	Firm grey coarse to fine sand with shell fragments Moisture Content - 23.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

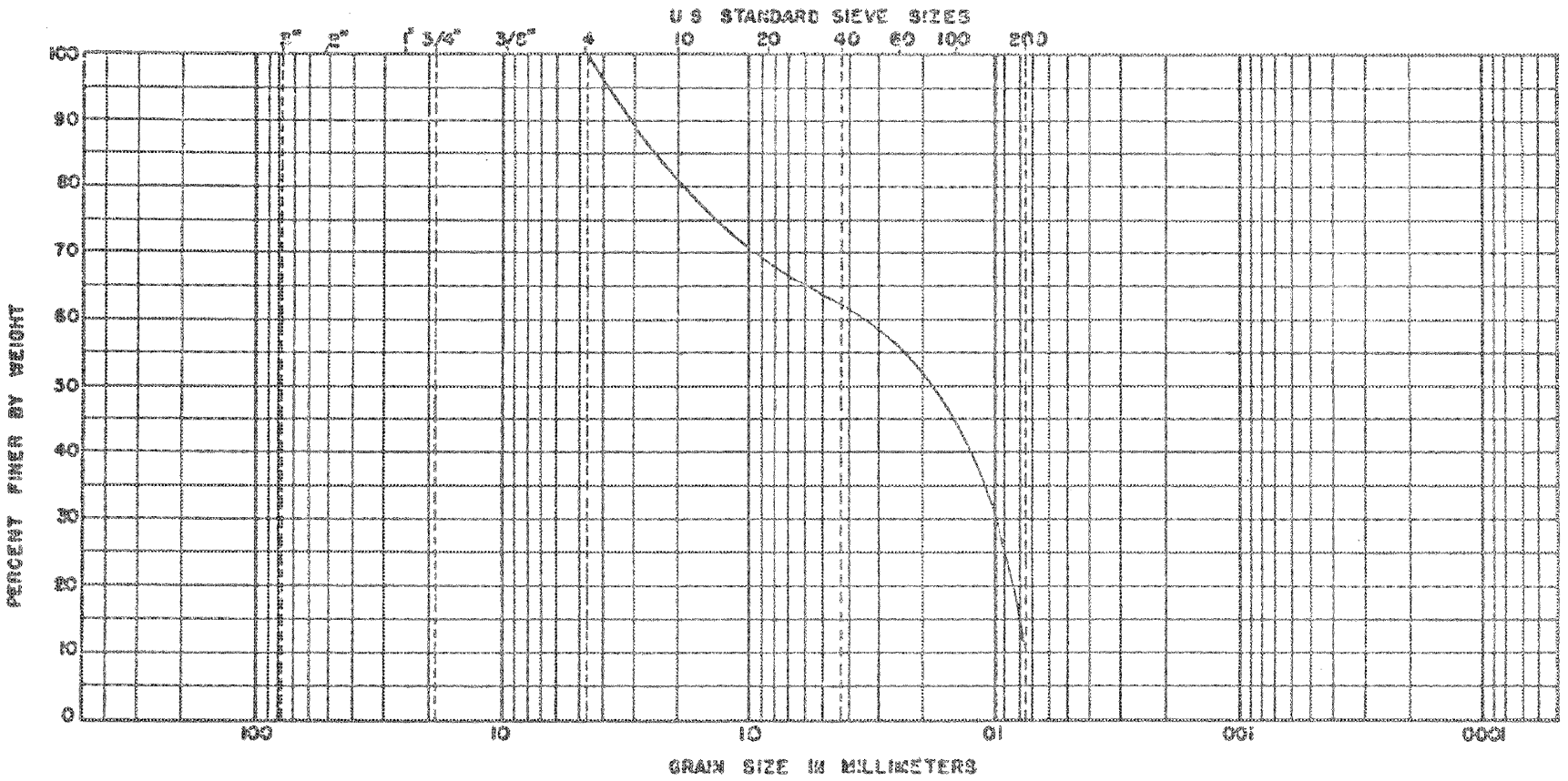
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108 UD	97.5'	18.6				GREEN FINE GRAVELLY (SHELL) FINE TO COARSE SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



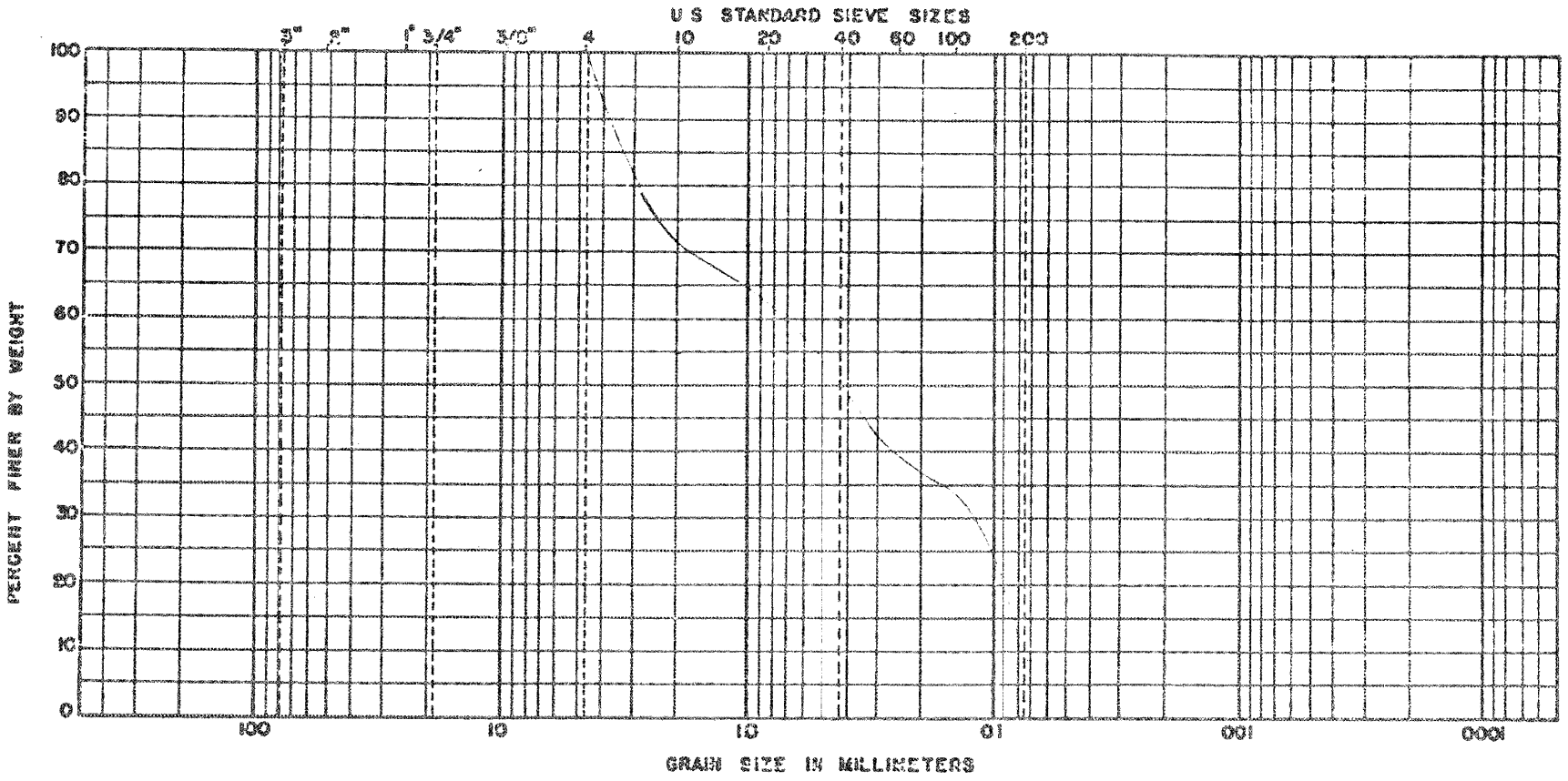
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-108A UD	64 FEET	19.6				GREEN FINE TO COARSE SAND WITH SHELL

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

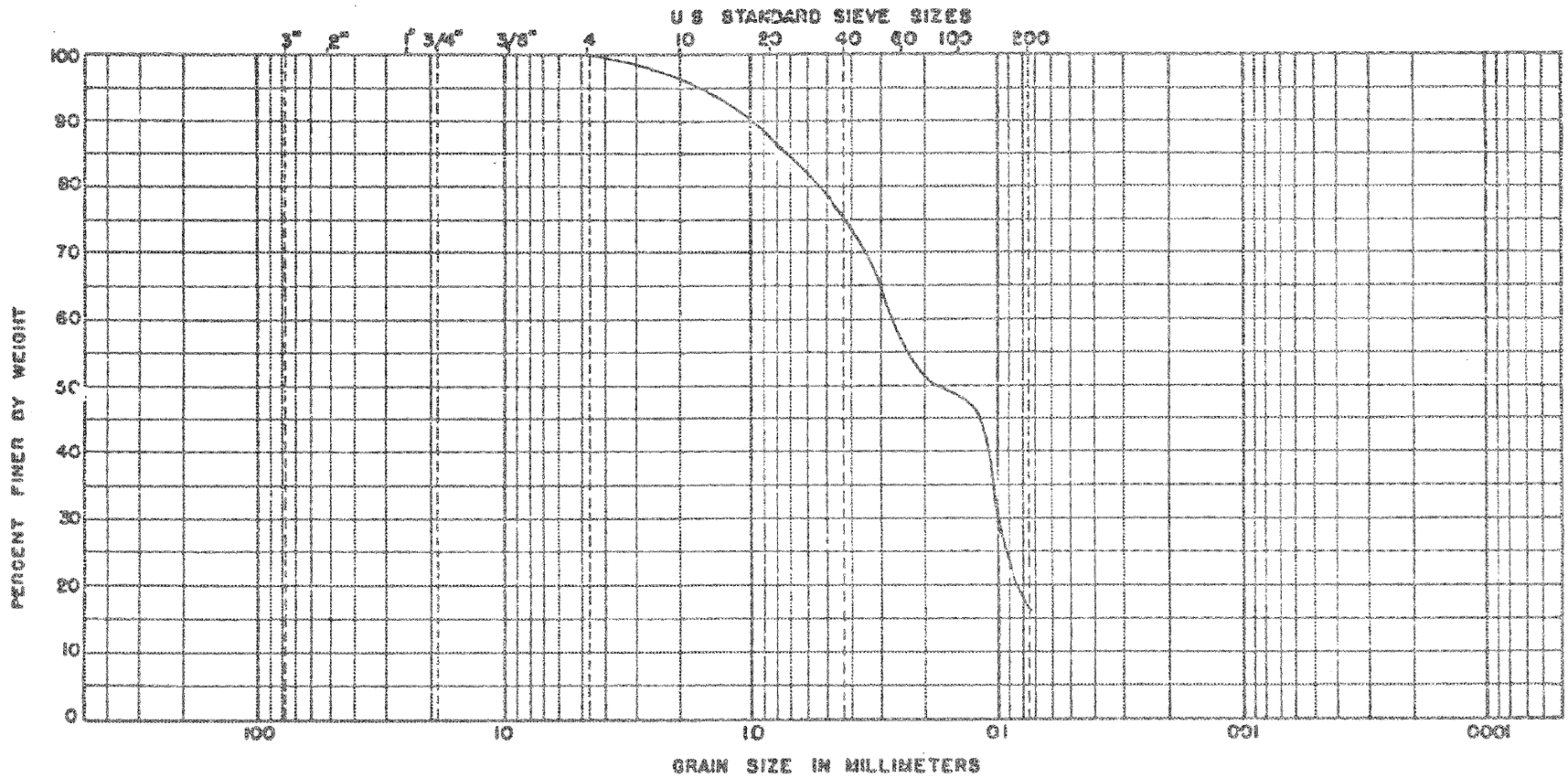
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A UD	68-69.5'	20.6				GREEN FINE TO COARSE SAND WITH SHELL

GRAIN SIZE DISTRIBUTION

JOB NO. I-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



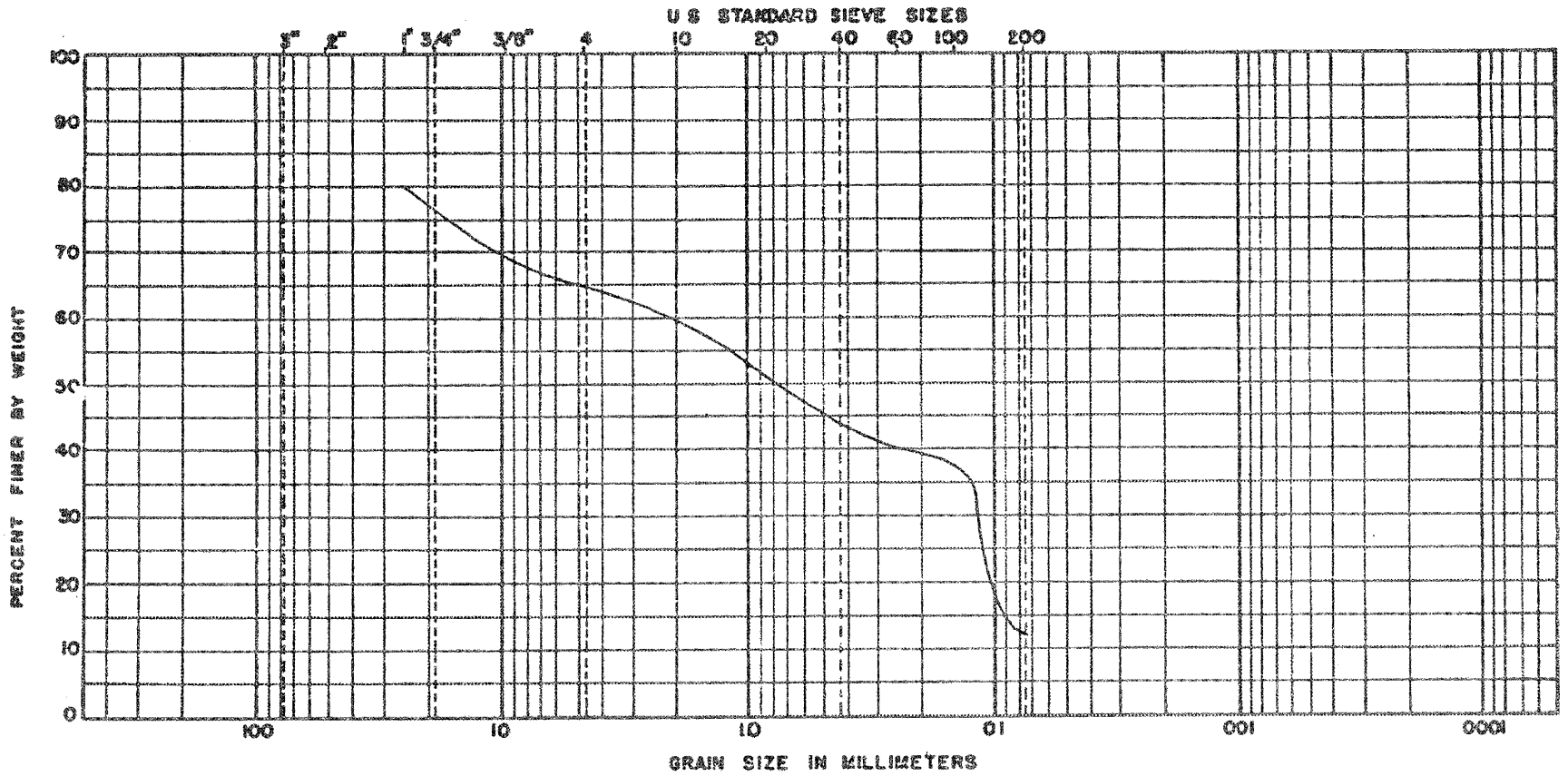
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #4	69.5' - 71.0'	-	-	-	-	-	Very dense grey silty fine sand with shell fragments Moisture Content - 16.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



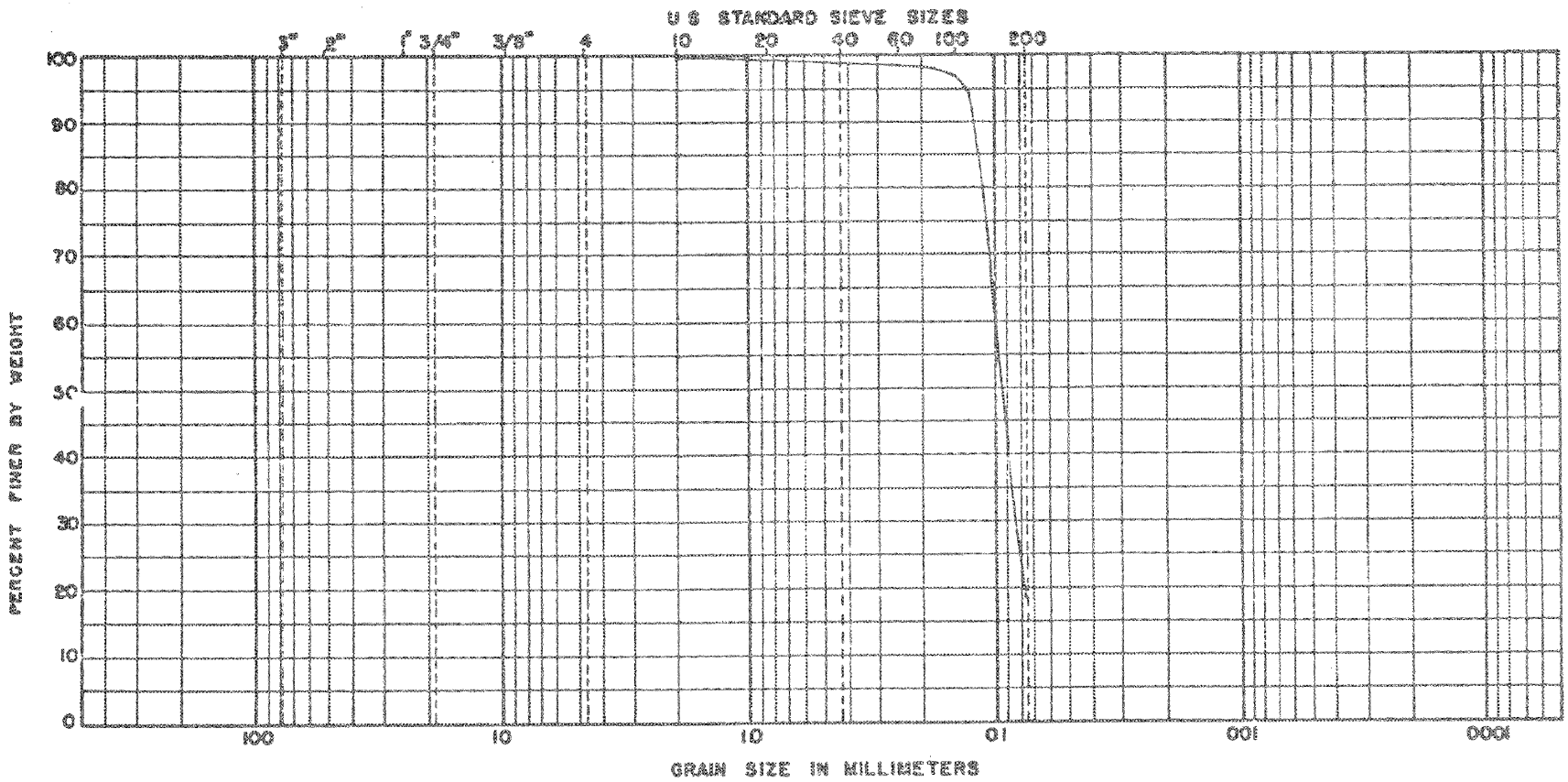
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #5	72.0' - 73.5'	- -	-	-	-	Dense grey fine sand with shell fragments Moisture Content - 12.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



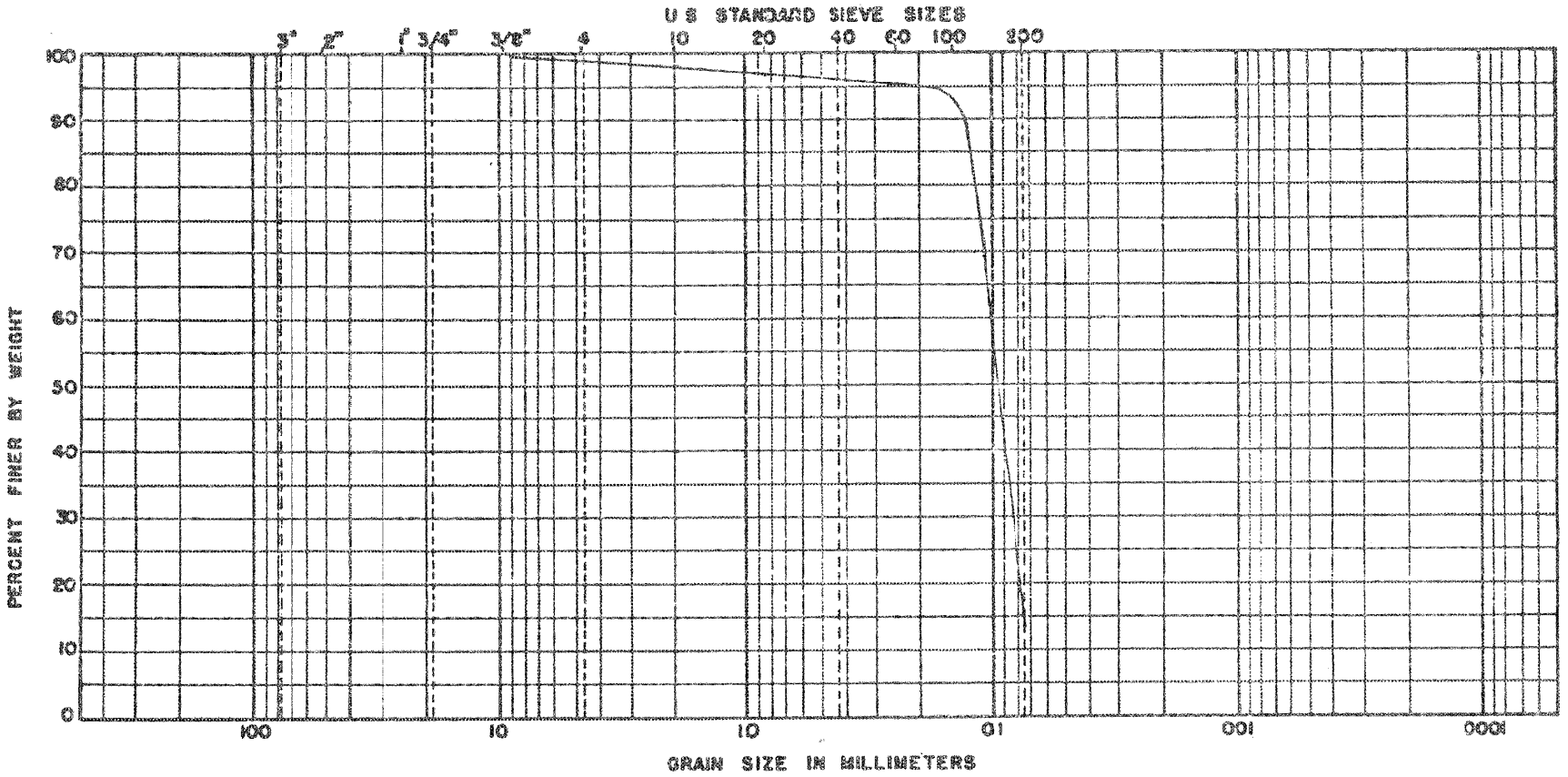
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #6	74.0' - 75.5'	- -	-	-	-	Very dense light grey silty fine sand Moisture Content - 29.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



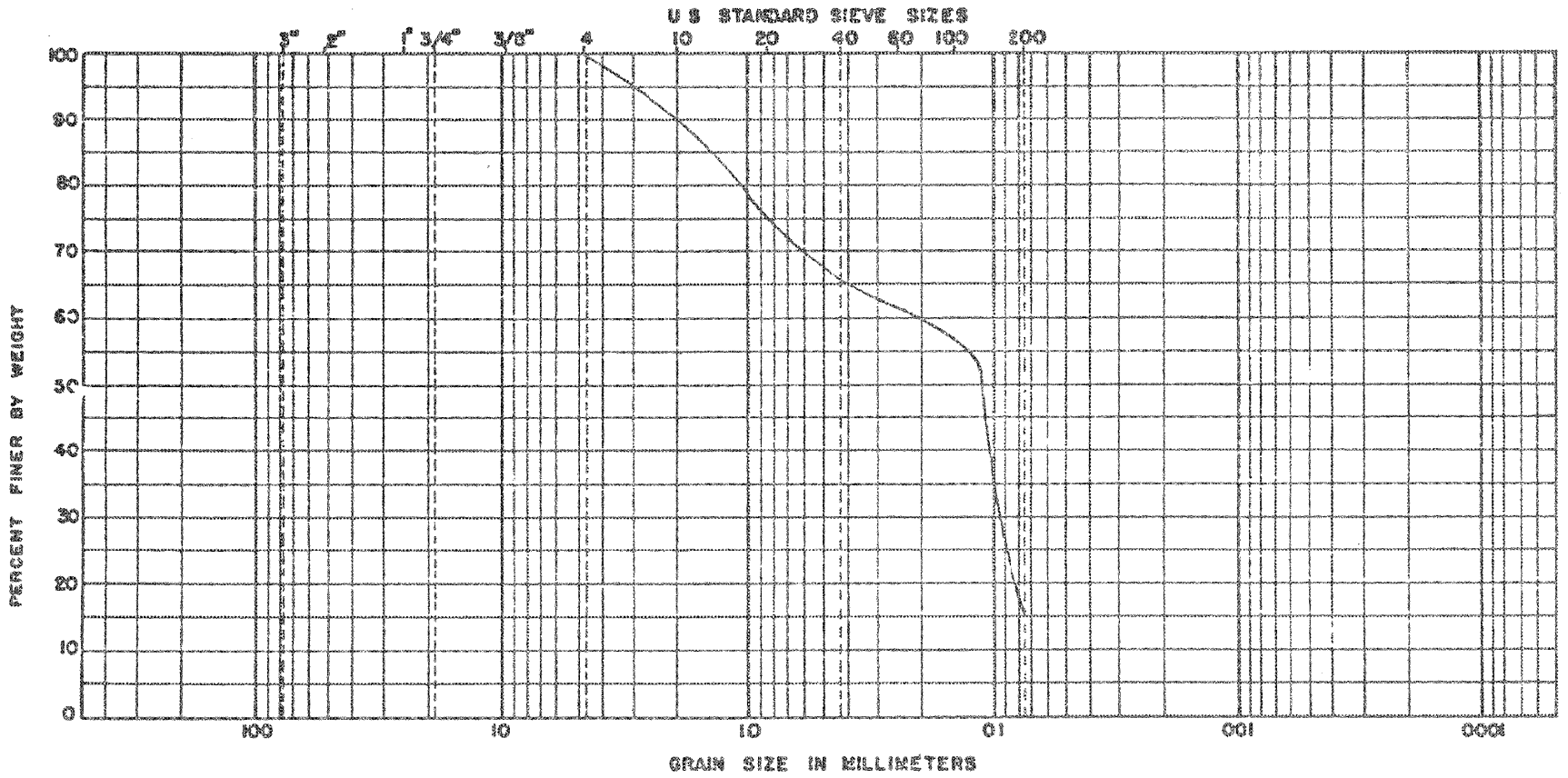
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #7	76.0' - 77.5'	-	-	-	-	Firm light grey silty fine sand with shell fragments Moisture Content - 30.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



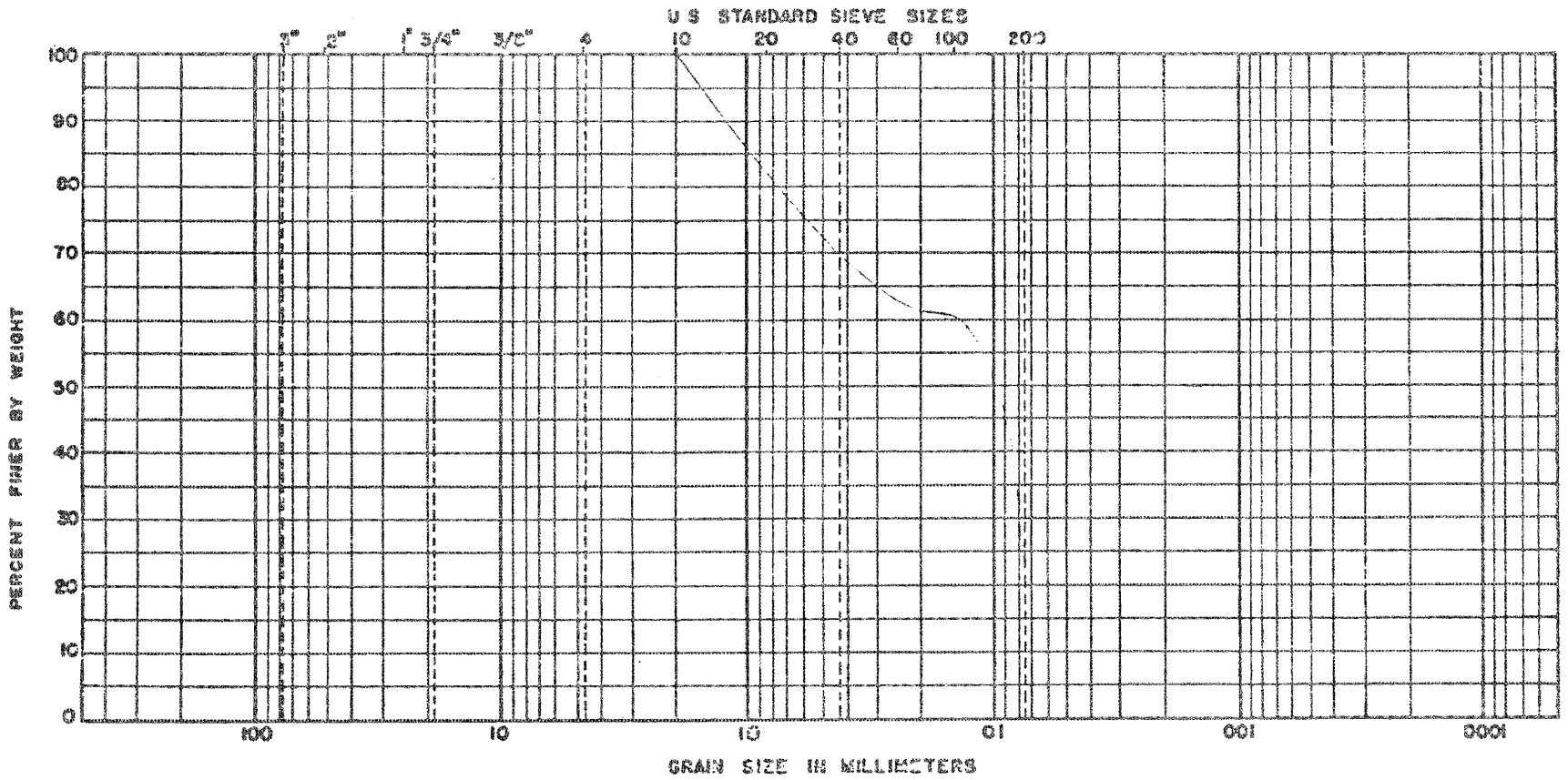
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #8	80.0' - 81.5'	- -	-	-	-	Very firm grey fine sand with shell fragments Moisture Content - 22.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

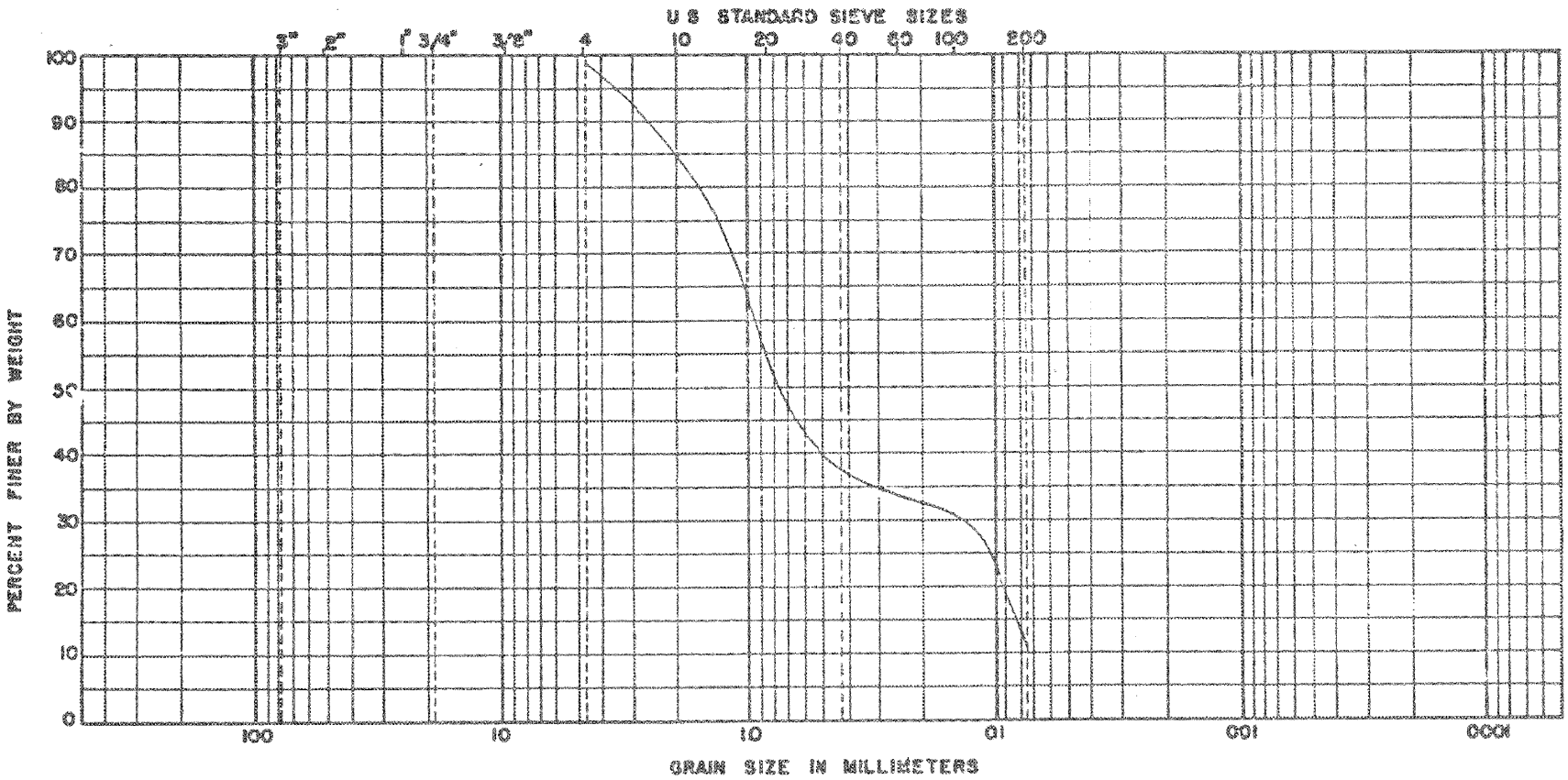
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A UD	82'	24.1				PREDOMINANTLY SHELL AND SHELL FRAGMENT WITH FINE SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



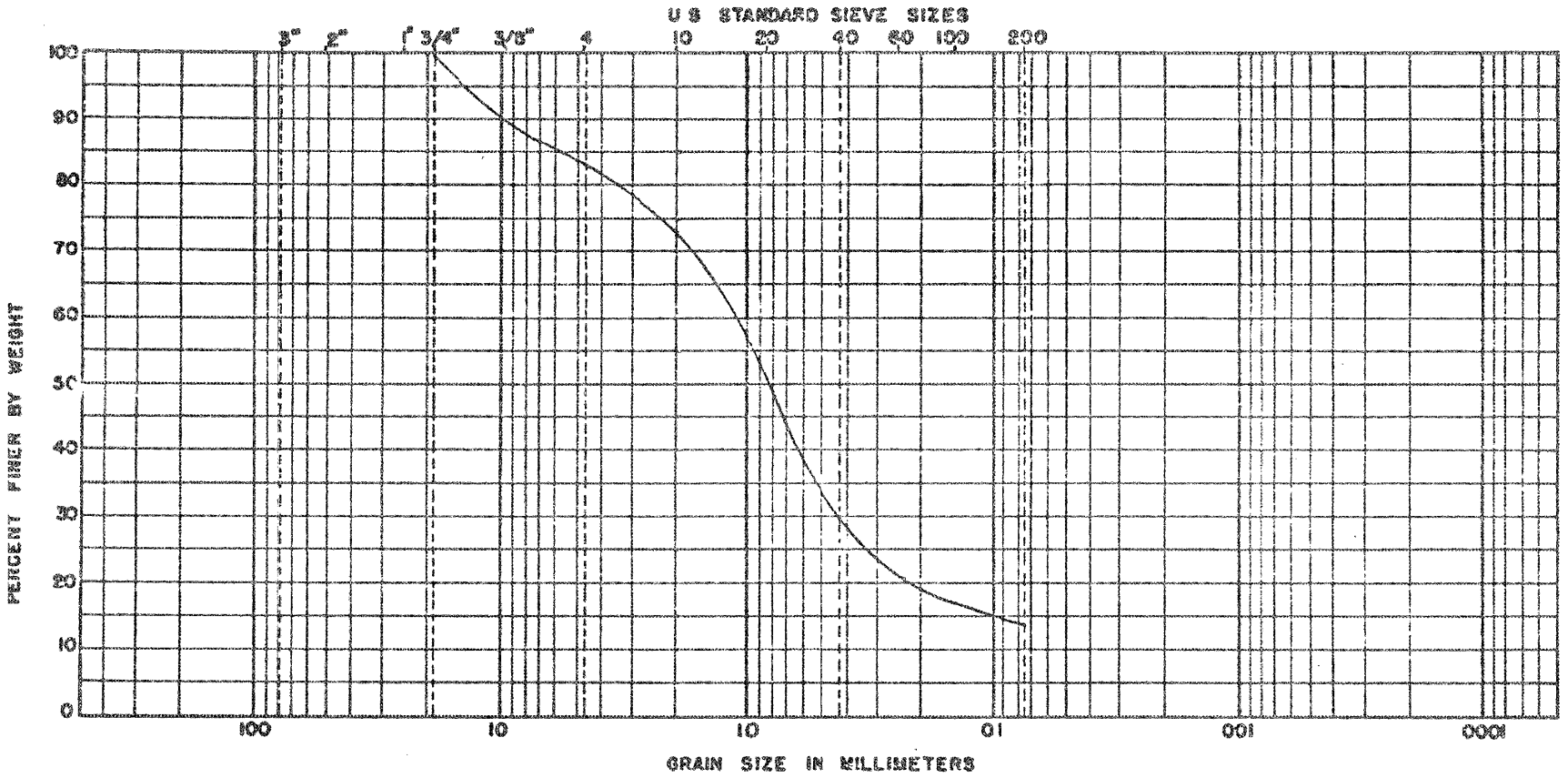
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #9	84.0' - 85.5'	- -	-	-	-	Firm grey shell with some fine sand Moisture Content - 20.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



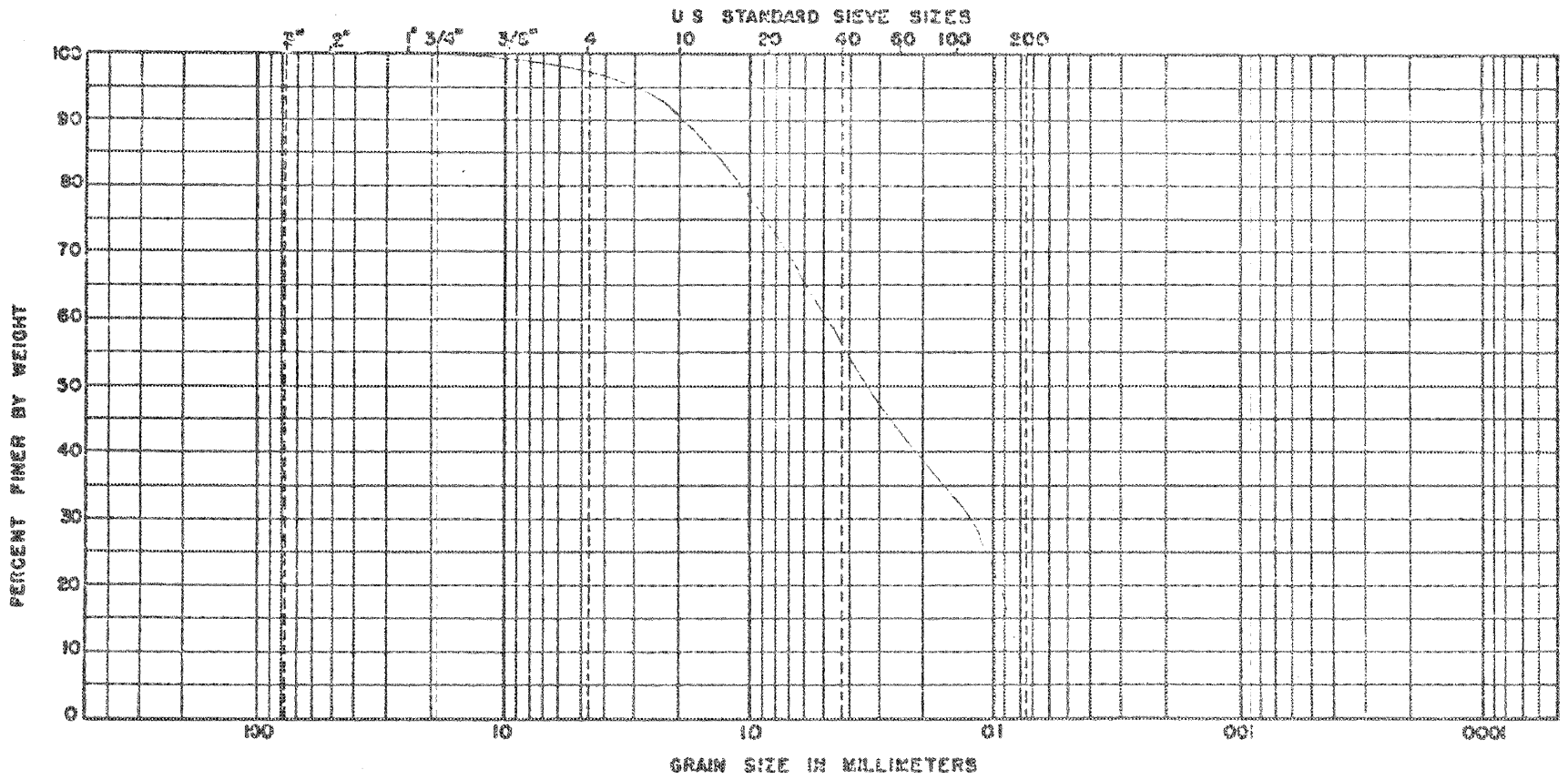
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A Sample #10	86.0' - 87.5'	- -	-	-	-	Firm grey shell with some fine sand Moisture Content - 25.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

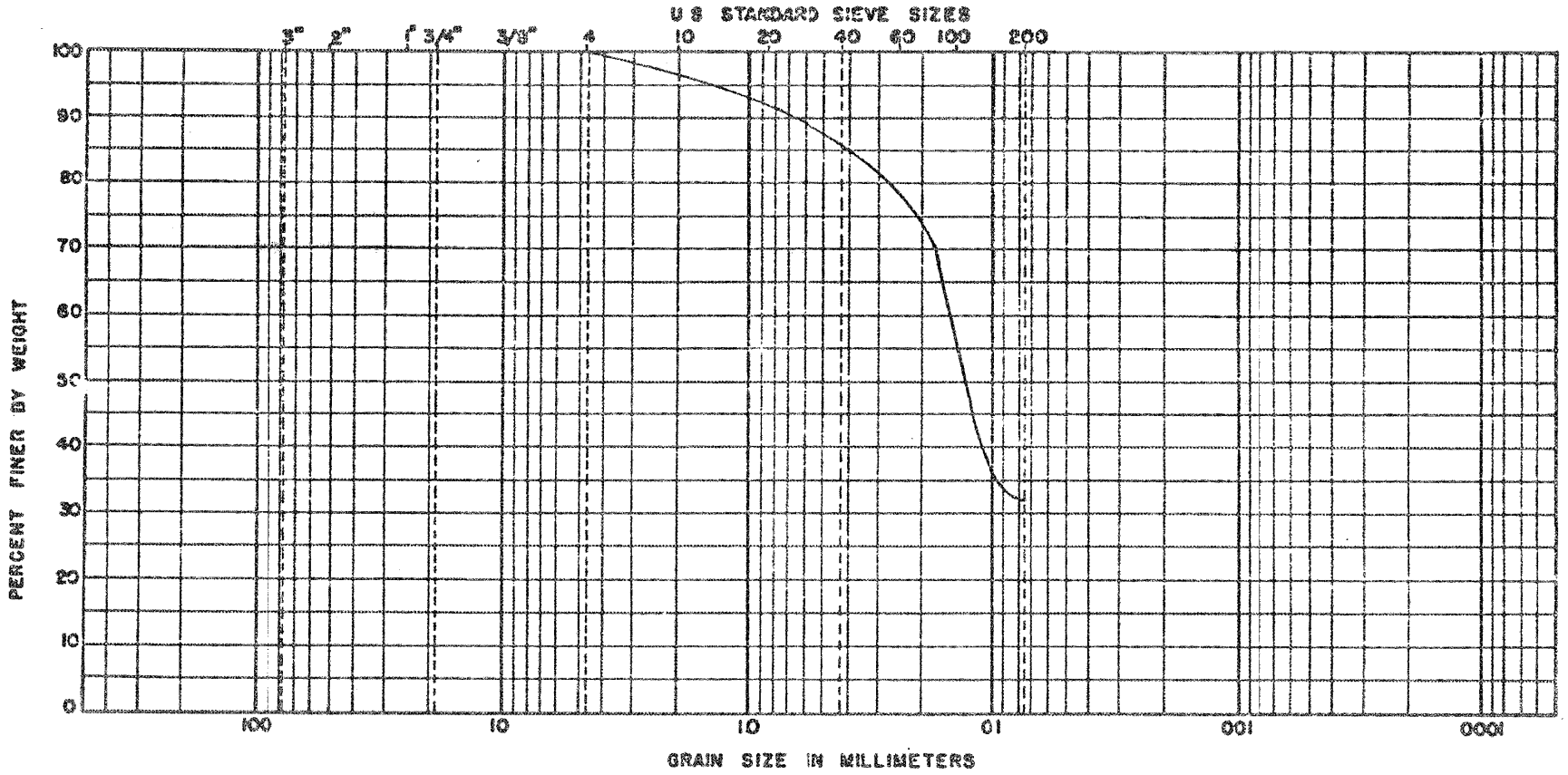
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-108A UD	88 FEET	23.6				GREEN FINE GRAVELLY (SHELL) FINE TO COARSE SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



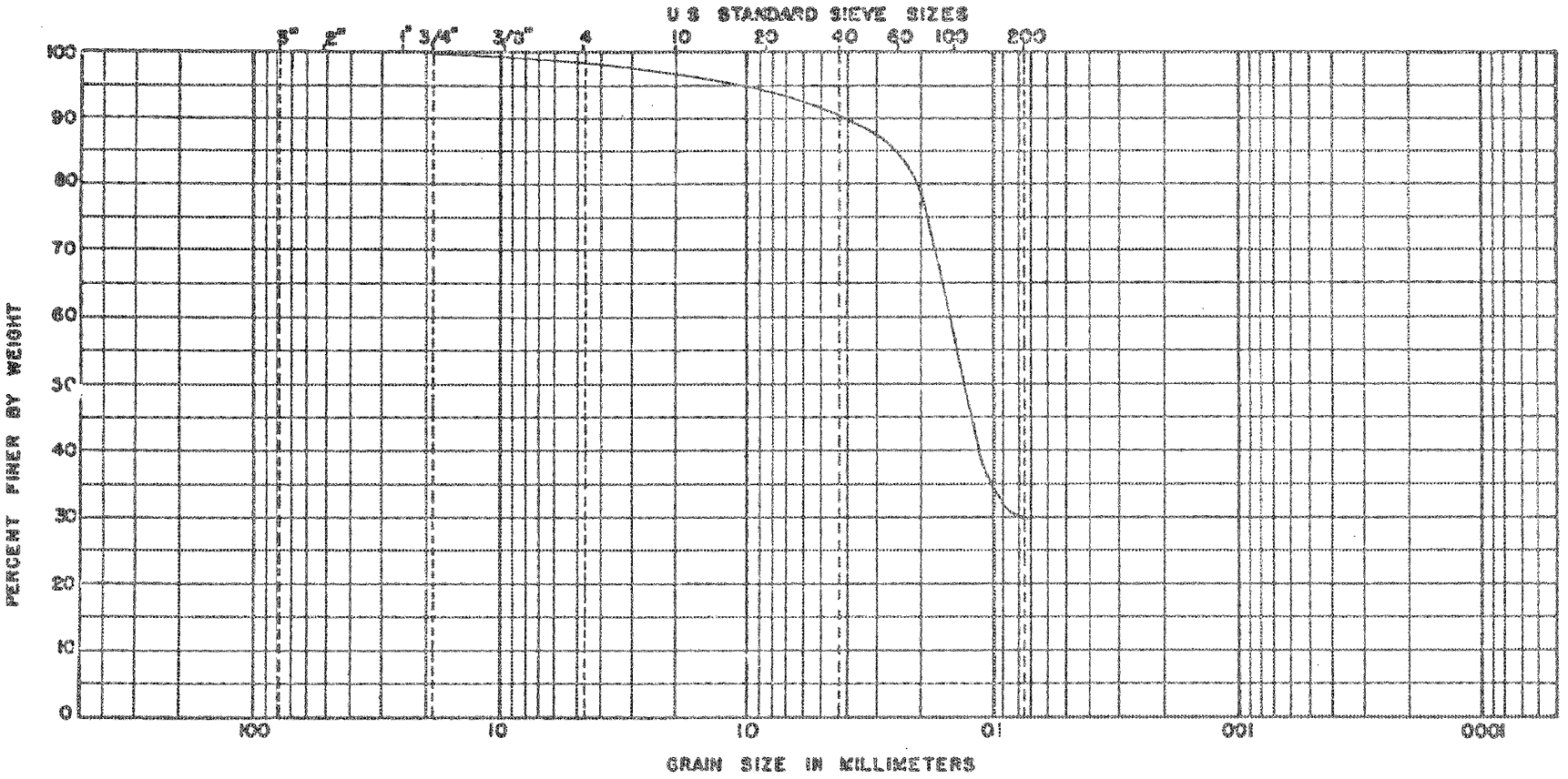
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-109 Sample #30	144.0' - 145.5'	- -	-	-	-	Loose grey silty clayey fine sand Moisture Content - 26.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



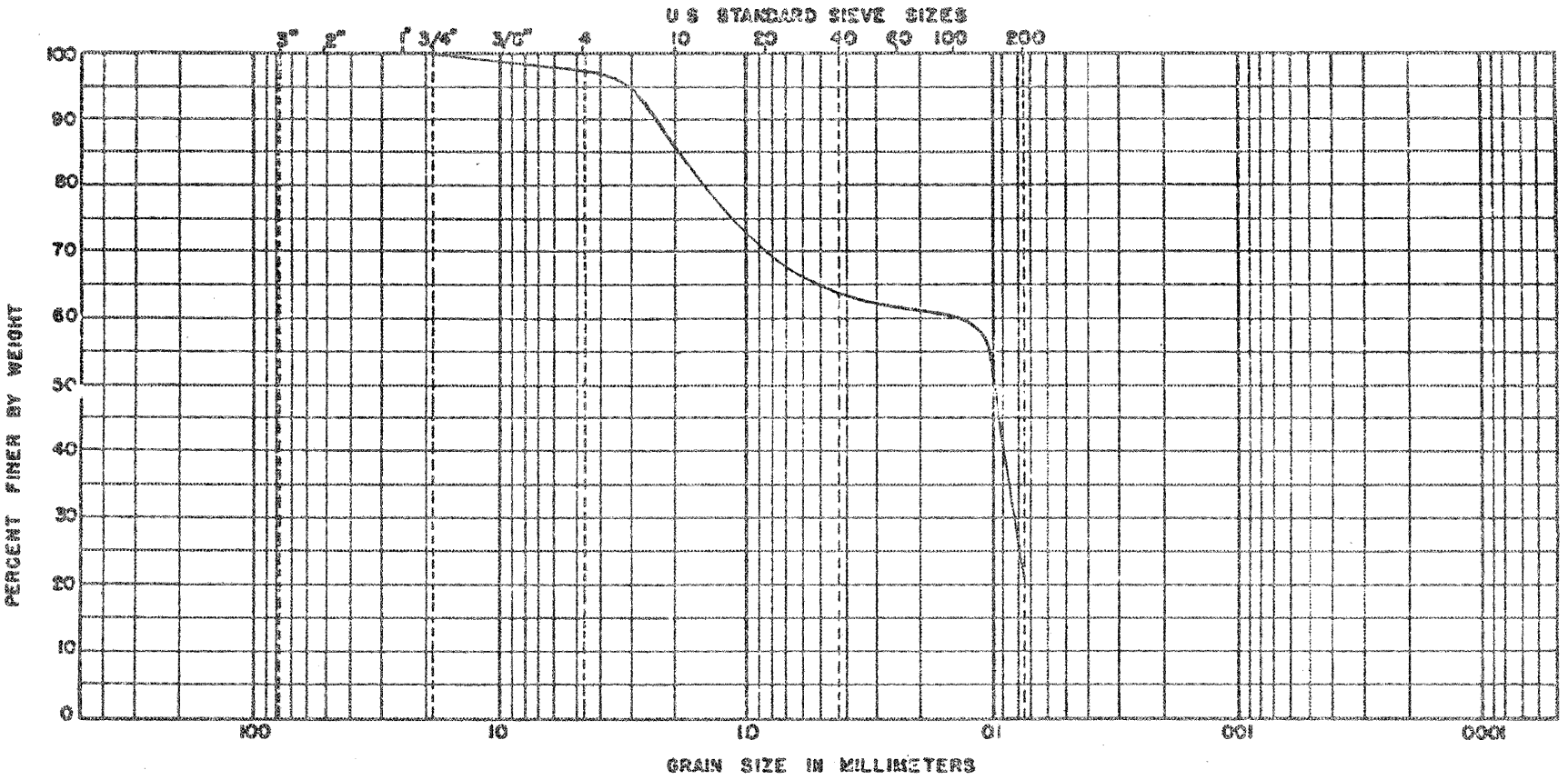
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-109 Sample #31	149.0' - 150.5'	- -				Firm light grey silty fine sand with fine shell fragments Moisture Content - 31.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



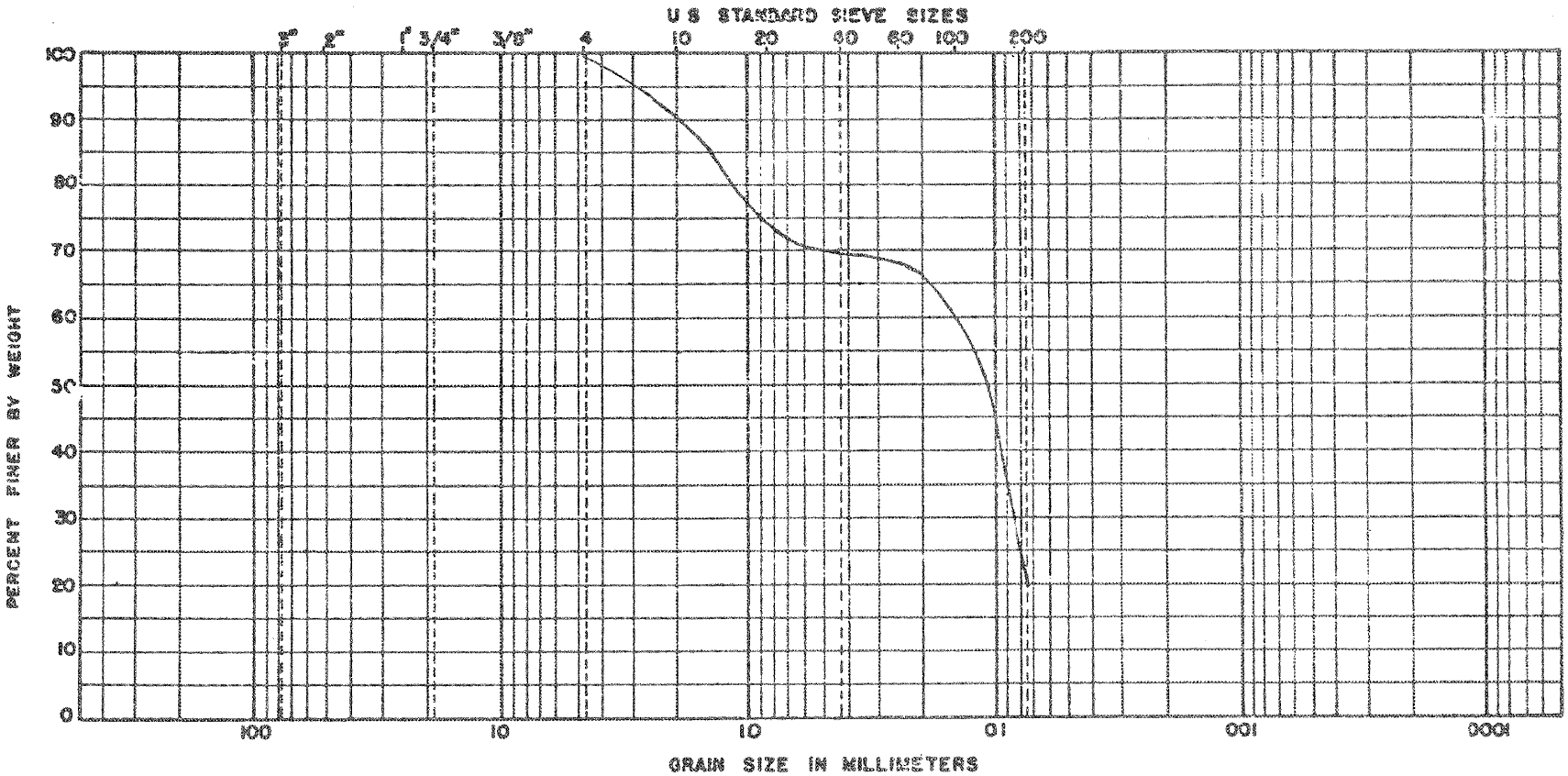
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-110 Sample #21	77.5'	- -	-	-	-	GRAY SILTY FINE SAND AND SHELL FRAGMENTS Moisture Content - 17.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



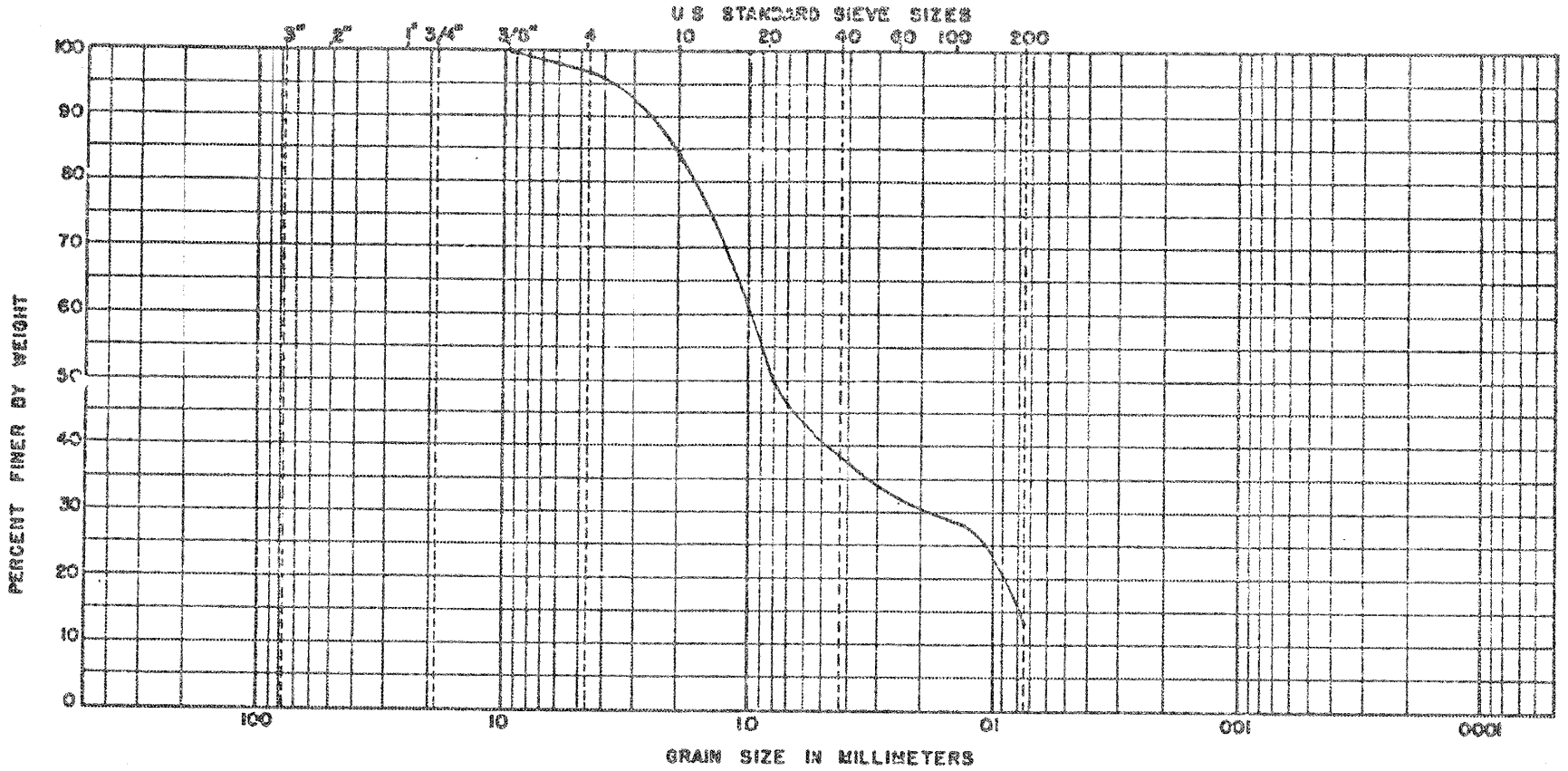
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-110 Sample #23	81.5'	- -	-	-	-	GRAY SILTY FINE SAND Moisture Content - 20.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



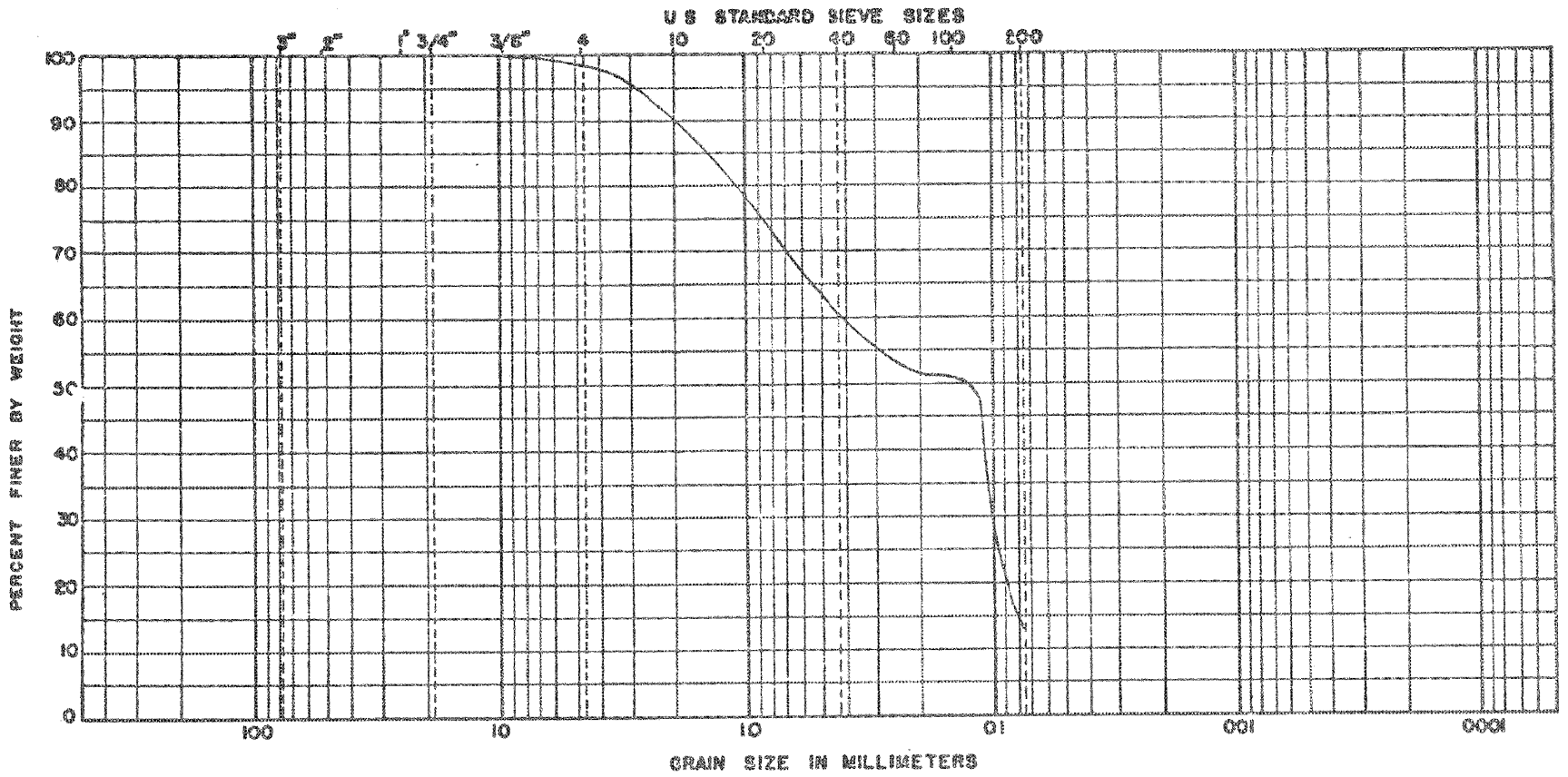
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-110 Sample #24	83.5					GRAY SILTY FINE SAND Moisture Content - 19.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



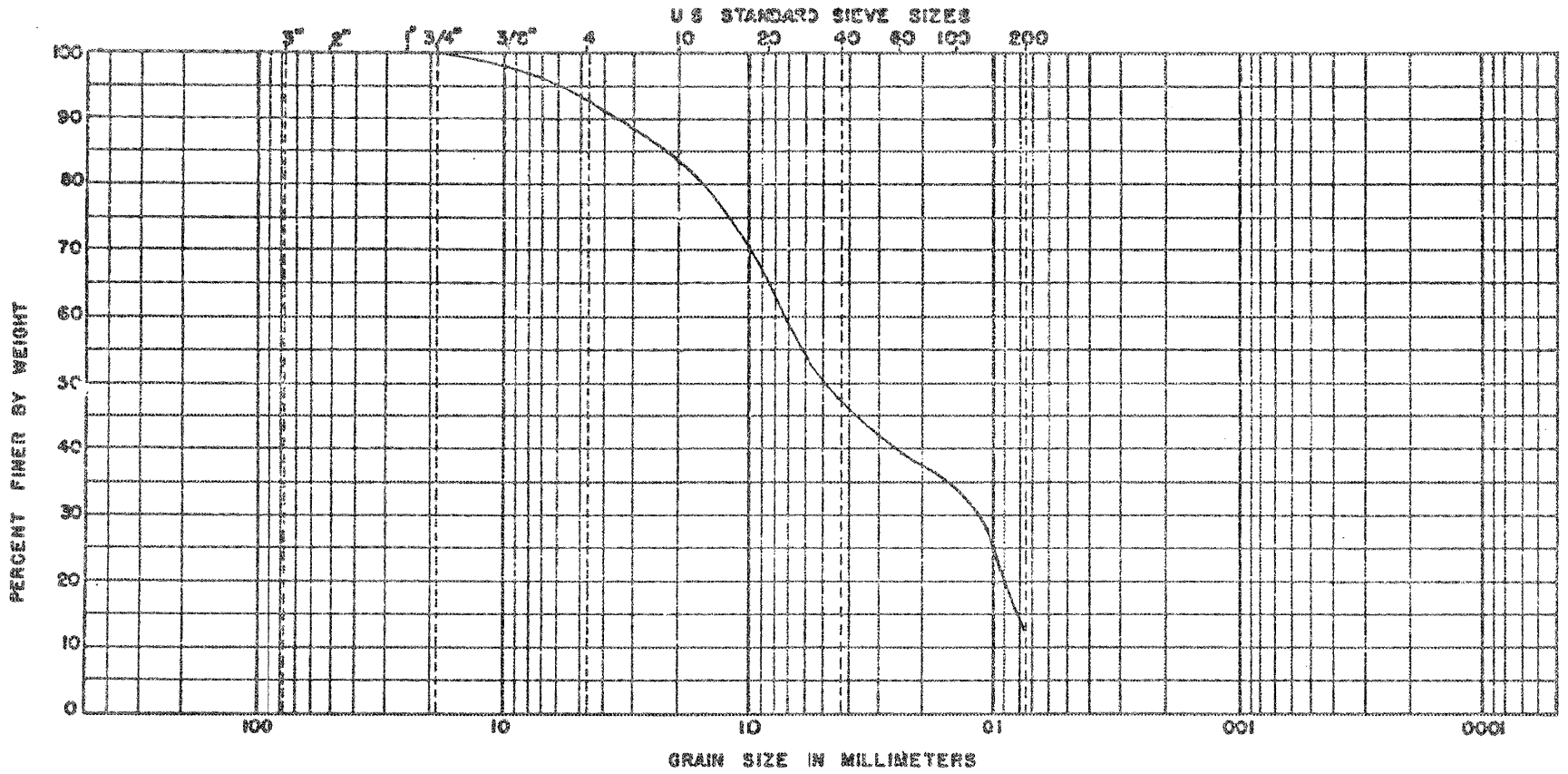
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-110 Sample #25	85.5	- -	-	-	-	GRAY TO BLUE SILTY FINE TO MEDIUM SAND WITH SHELL TRACES Moisture Content - 18.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



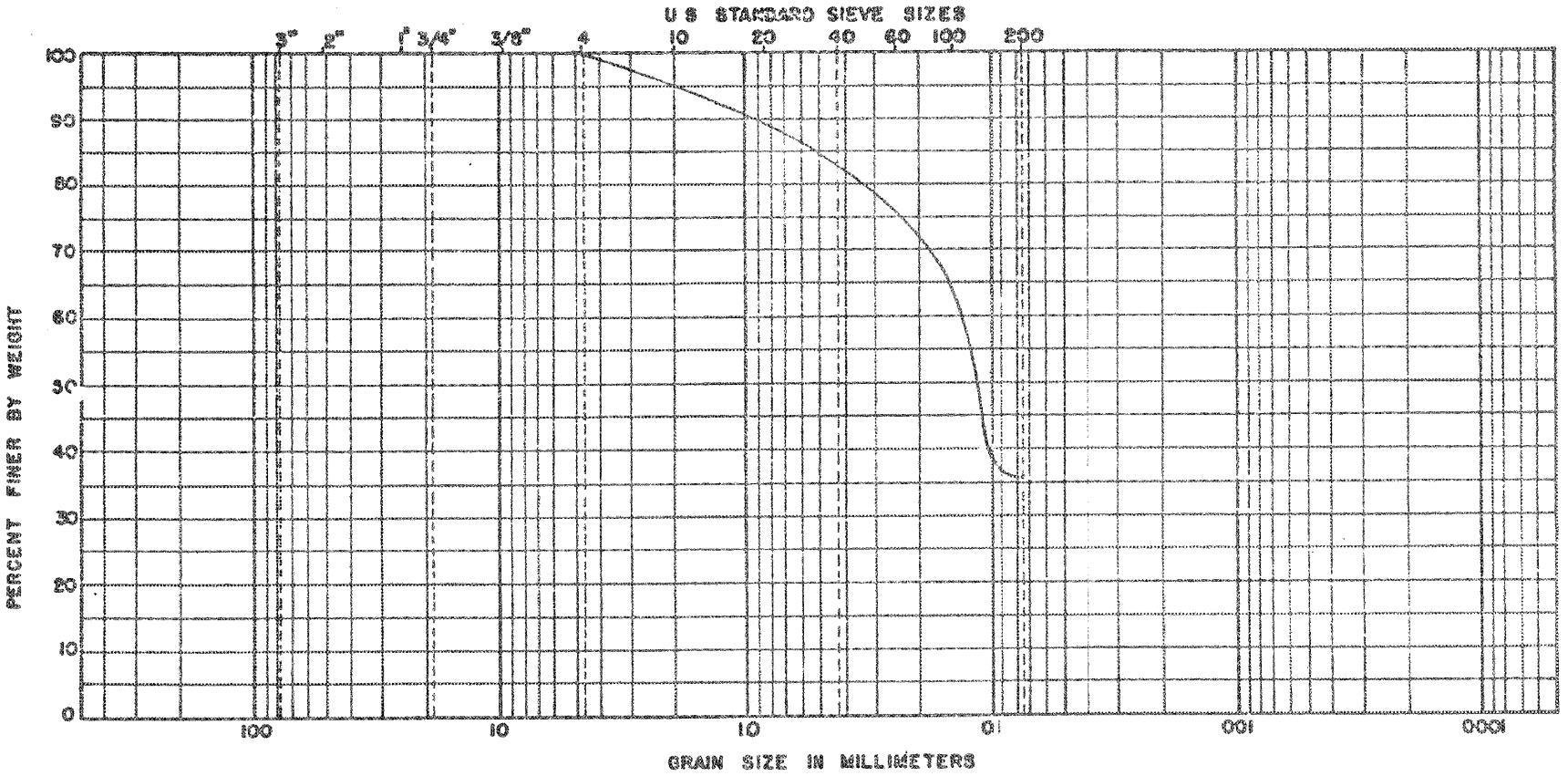
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-110 Sample #26	87.5	- -	-	-	-	GRAY TO BLUE SILTY FINE TO MEDIUM SAND WITH SHELLS Moisture Content - 15.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



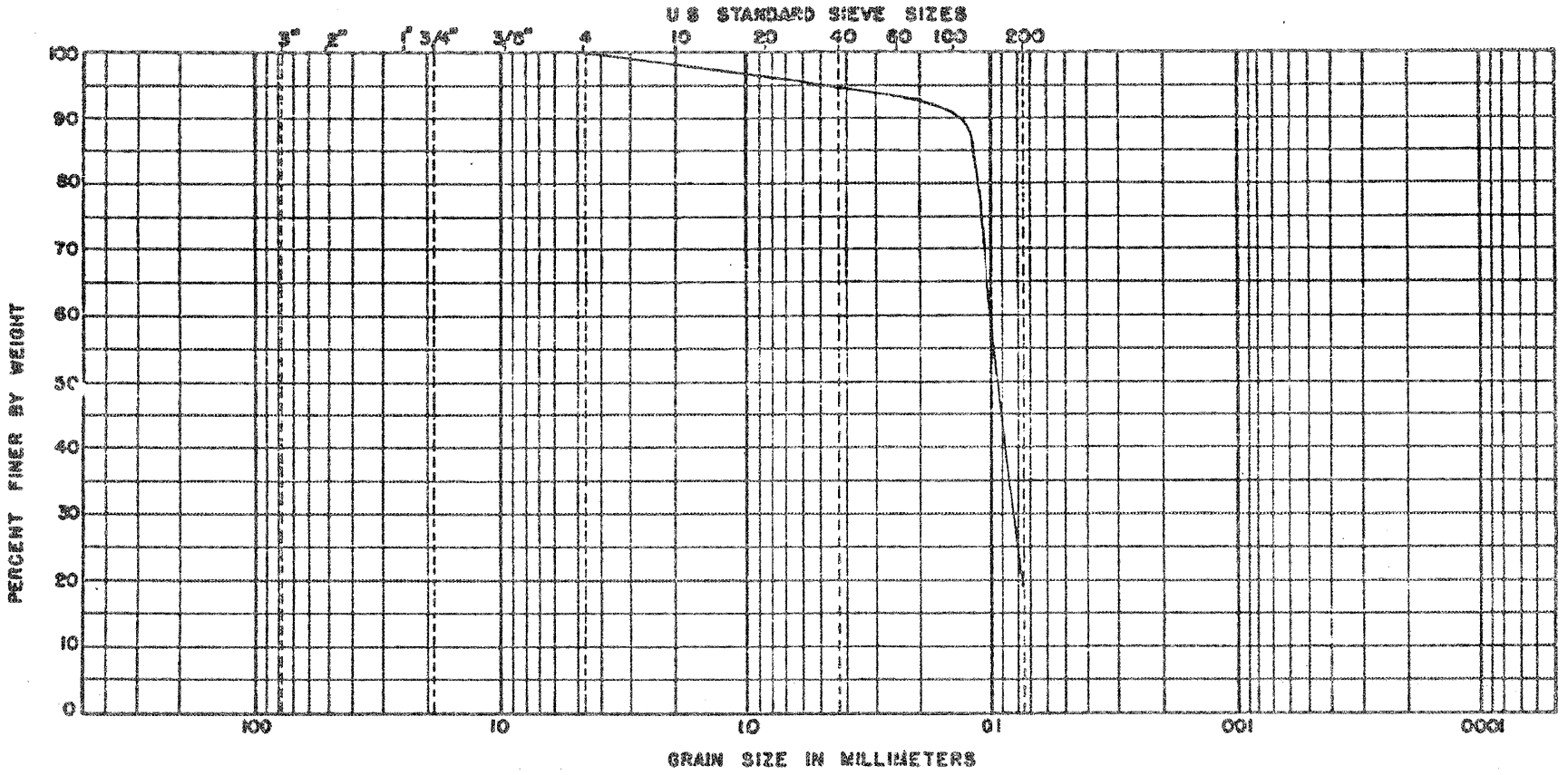
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-110 Sample #37	140'	- -	-	-	-	GRAY SILTY CLAYEY FINE SAND Moisture Content - 21.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



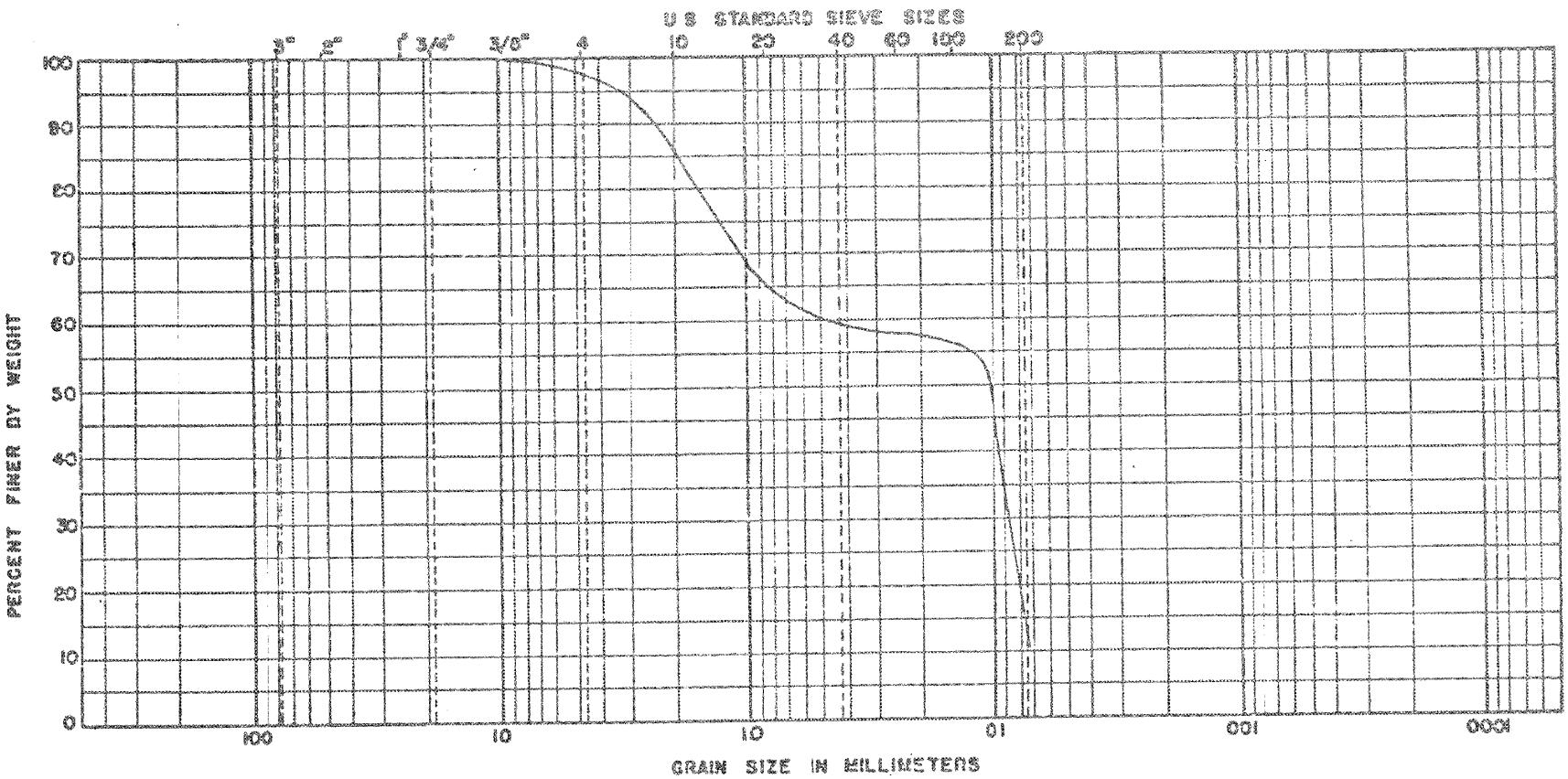
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111 Sample #20	74.0' - 75.5'	- -	-	-	-	Dense grey silty fine sand with fine shell fragments Moisture Content - 27.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



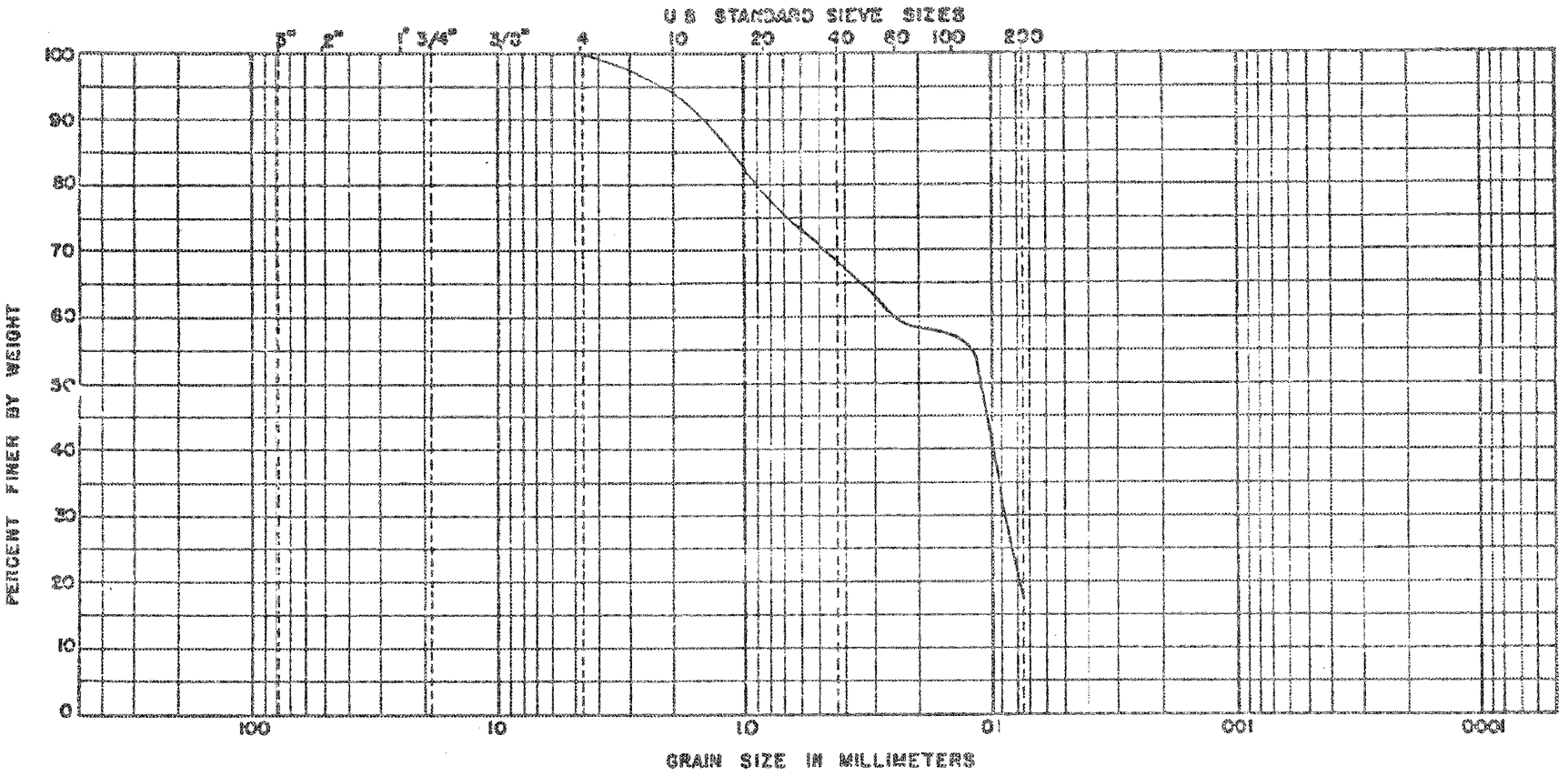
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
3-111 Sample #21	76.0' - 77.5'	- -	-	-	-	Firm grey fine sand with shell fragments Moisture Content - 22.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



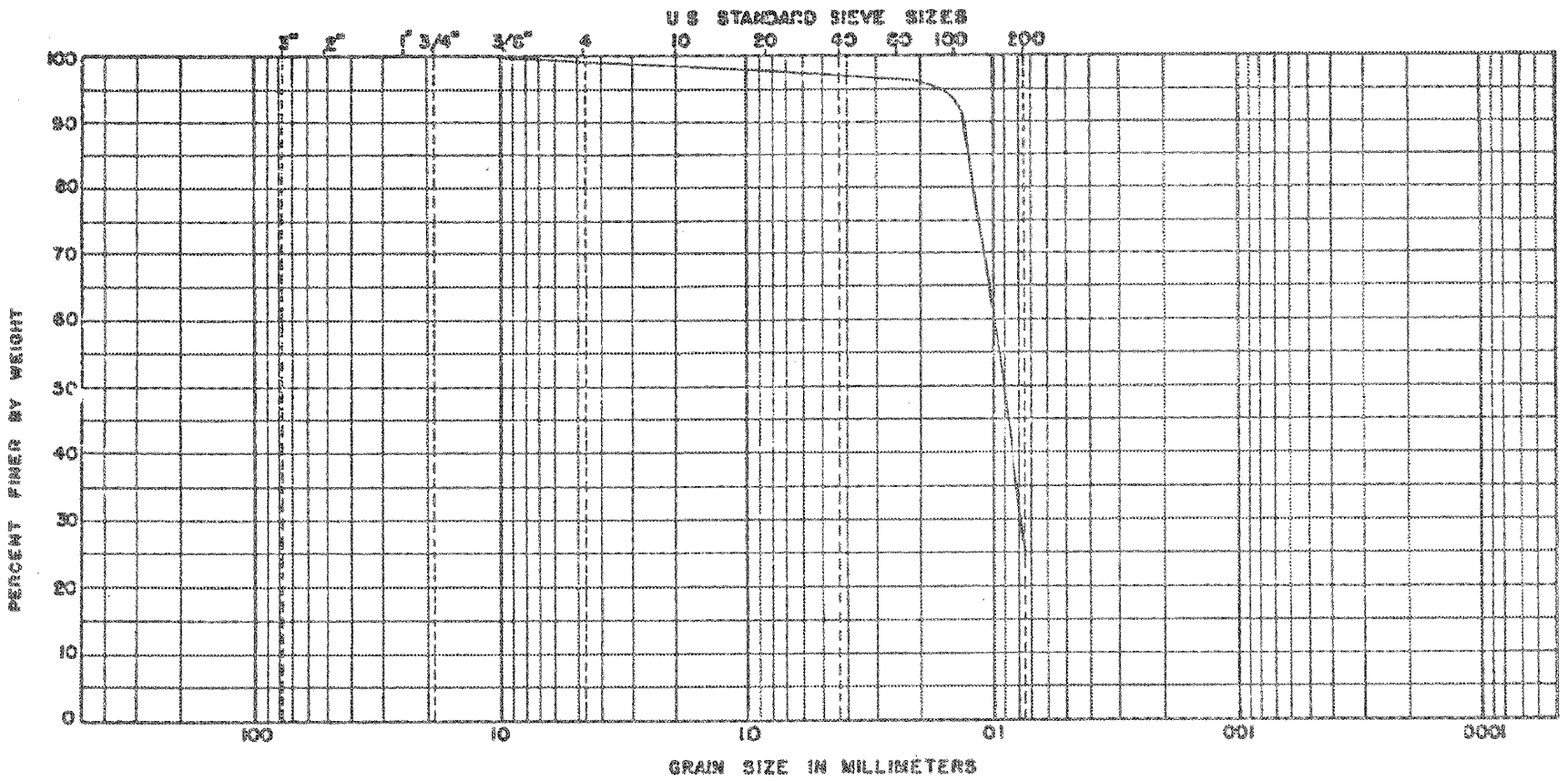
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111 Sample #23	81.5'	- -	-	-	-	Dense grey fine sand and shell fragments Moisture Content - 17.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

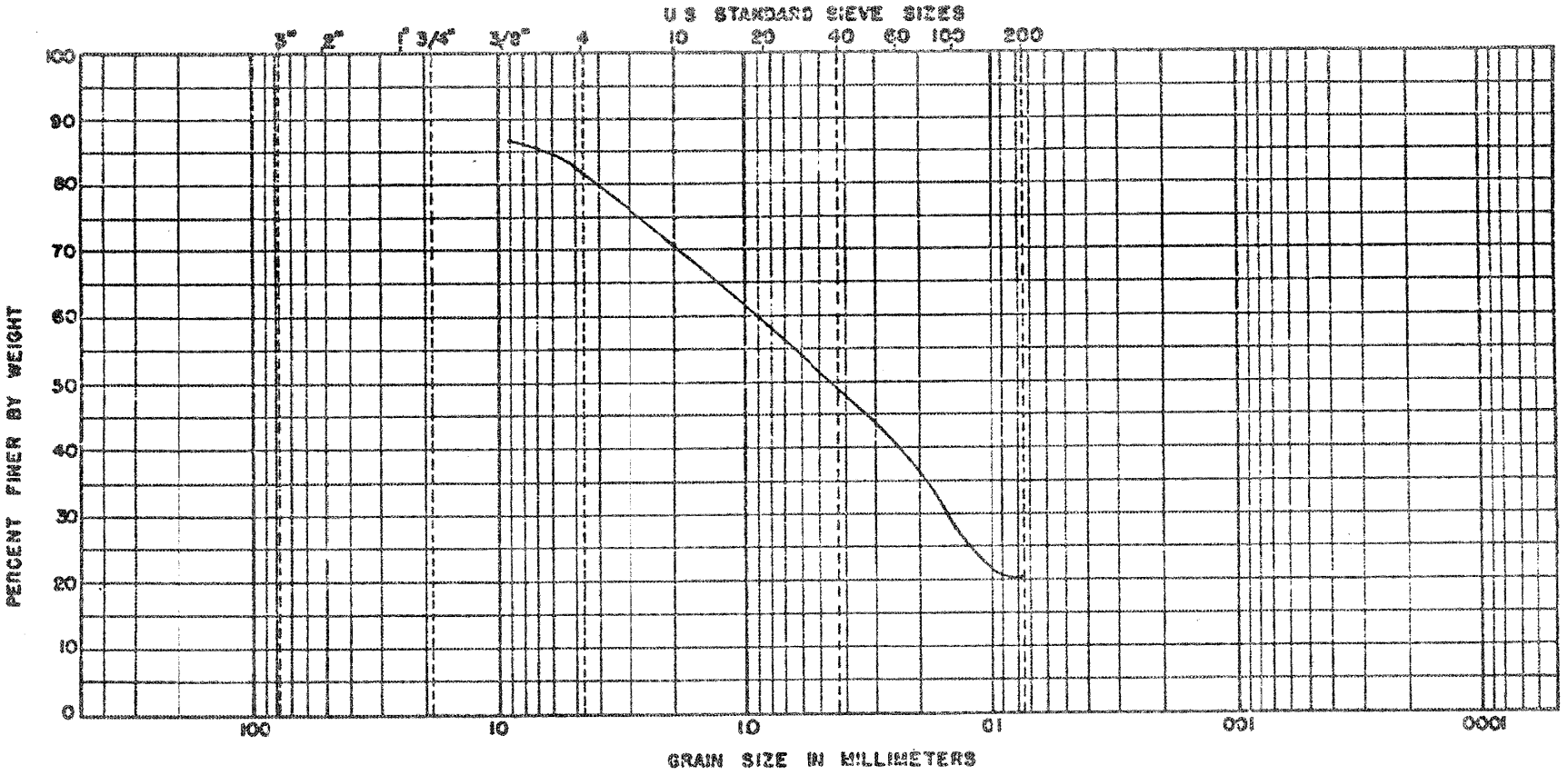
BORING NO	DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-111 Sample #30	105.5'	- -	-	-	-	Very dense light grey silty fine sand Moisture Content - 25.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

2.5A-427



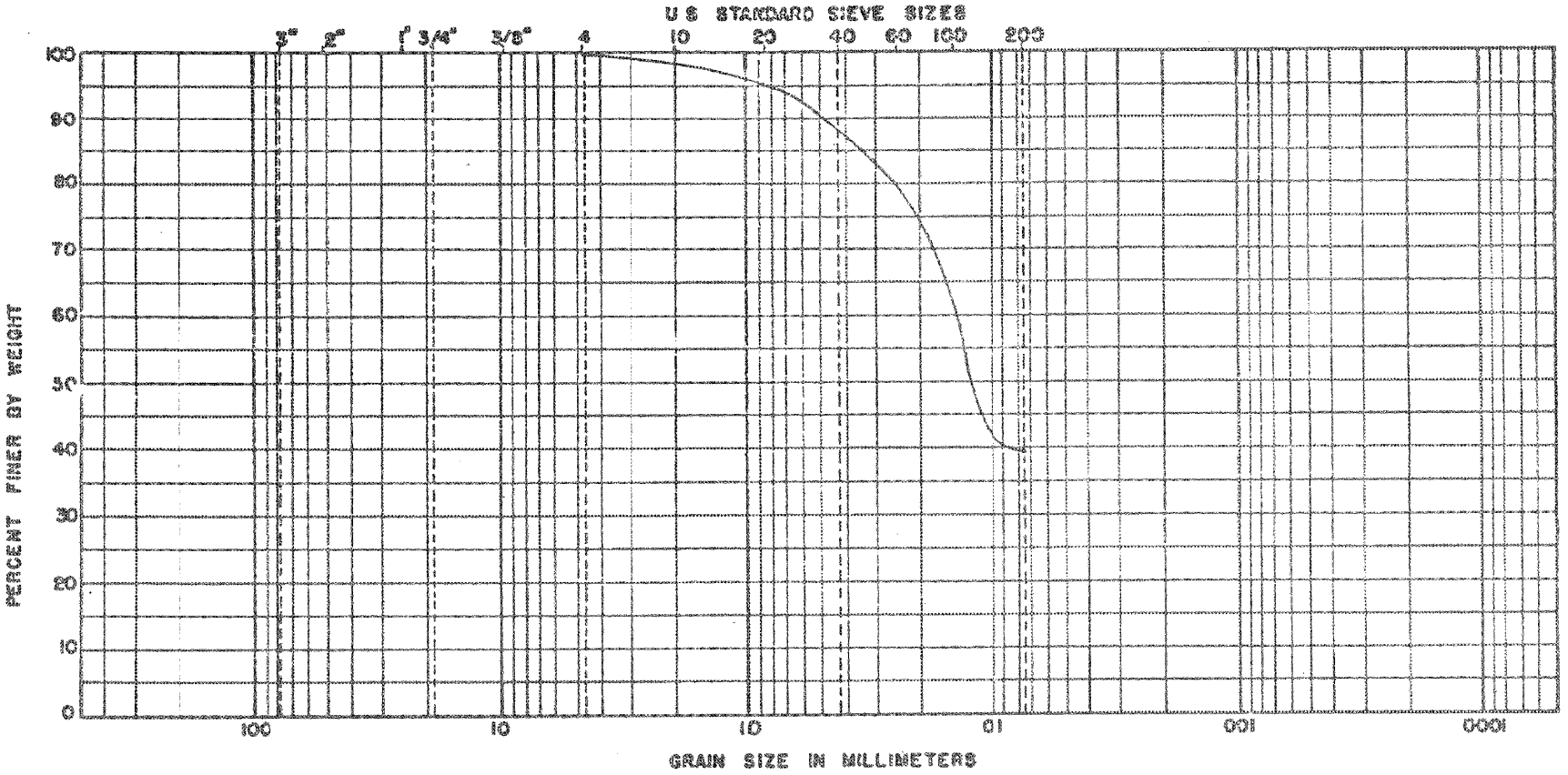
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-111 Sample #36	135.5'	- -	-	-	-	Very dense grey silty cemented fine sand Moisture Content - 11.5%

GRAIN SIZE DISTRICUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



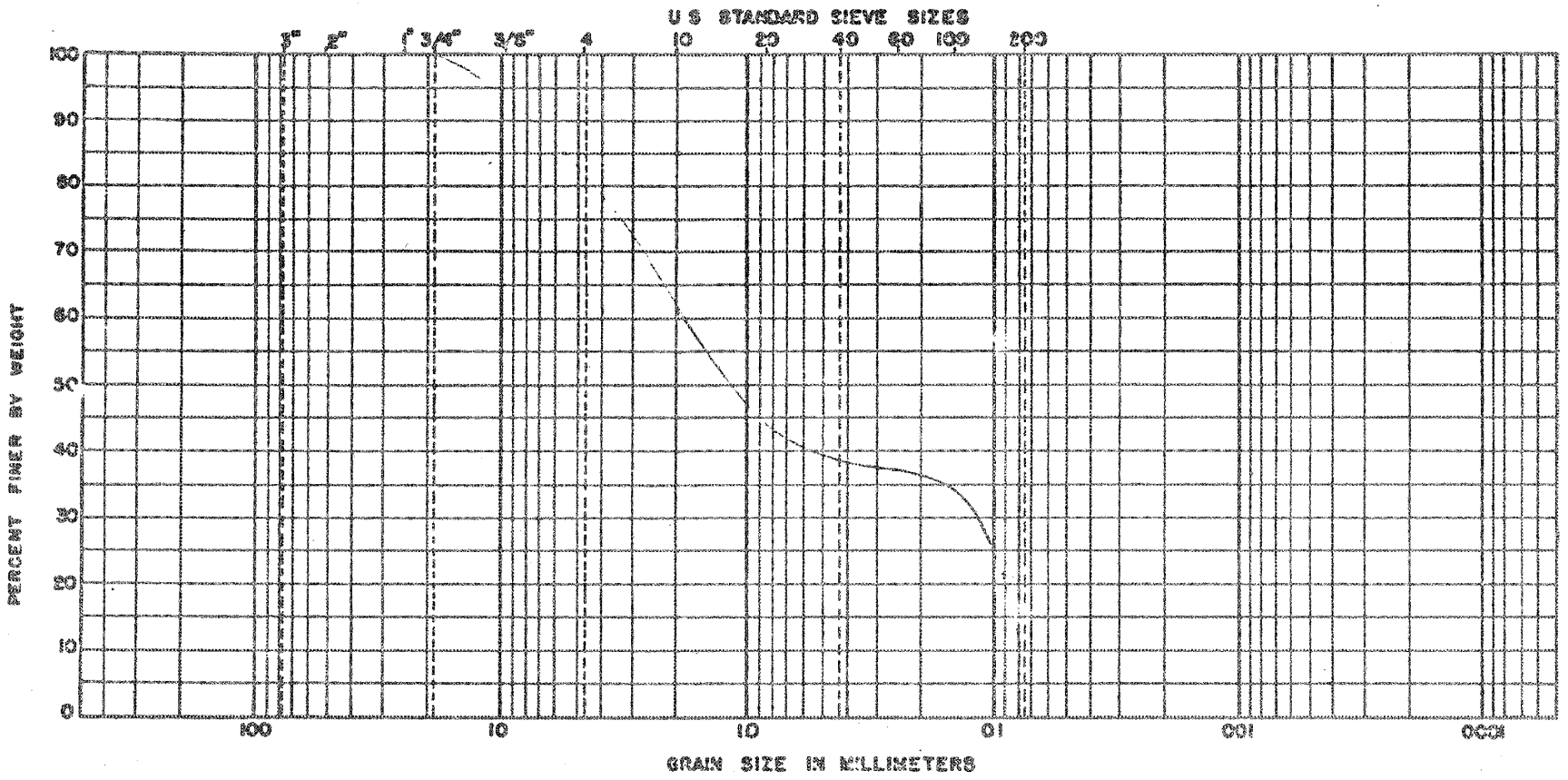
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111 Sample #37	139.0' - 140.5'	-	-	-	-	-	Stiff light grey fine sandy silt with shell fragments Moisture Content - 23.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



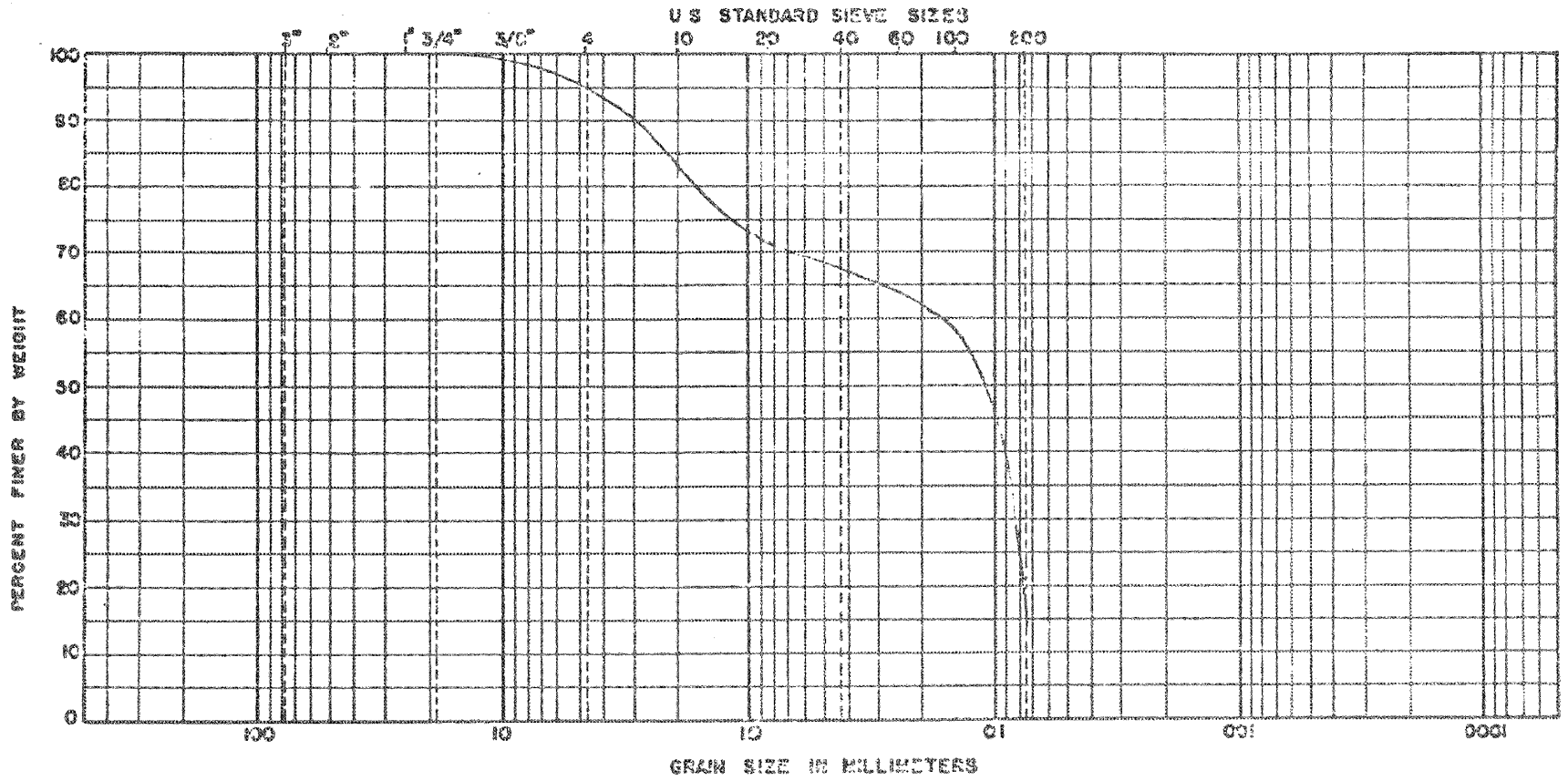
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A Sample #7	77.5	- -	-	-	-	Grey fine sand with shell Moisture Content - 20.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



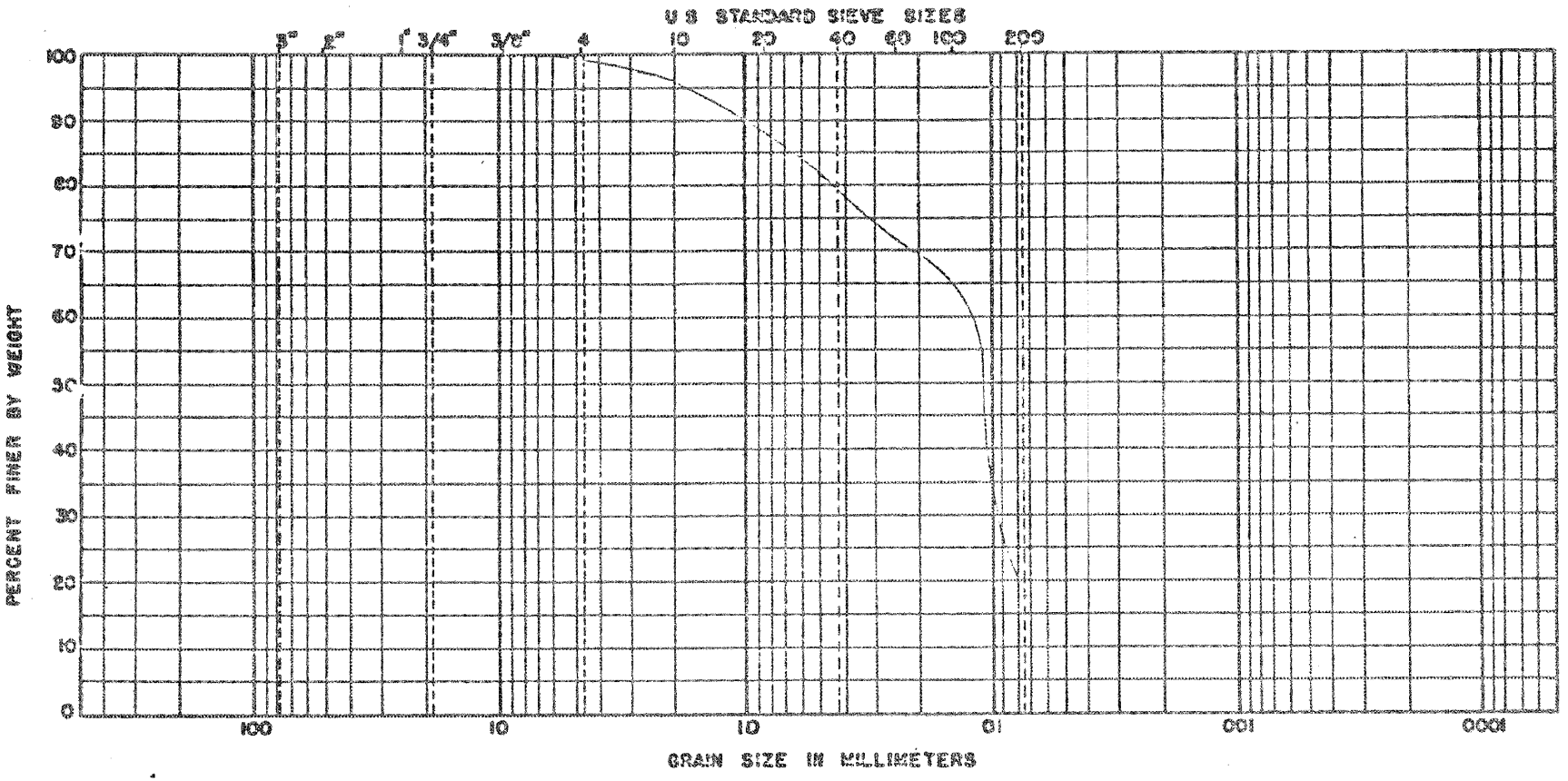
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A LD	78 FT.	19.9				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



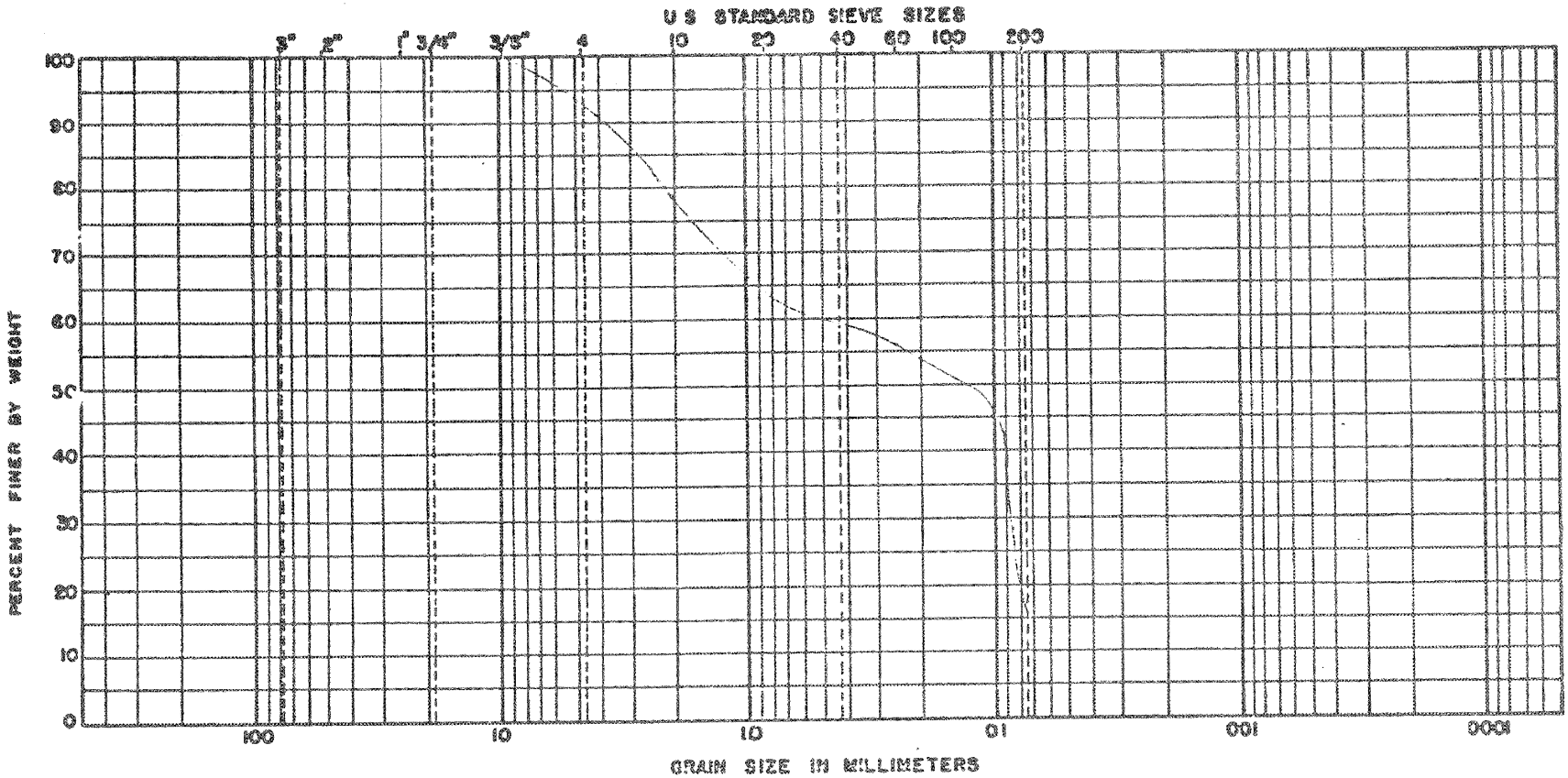
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A Sample #8	80.0' - 81.5'	- -	-	-	-	Grey silty sand and shell fragments Moisture Content - 25.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



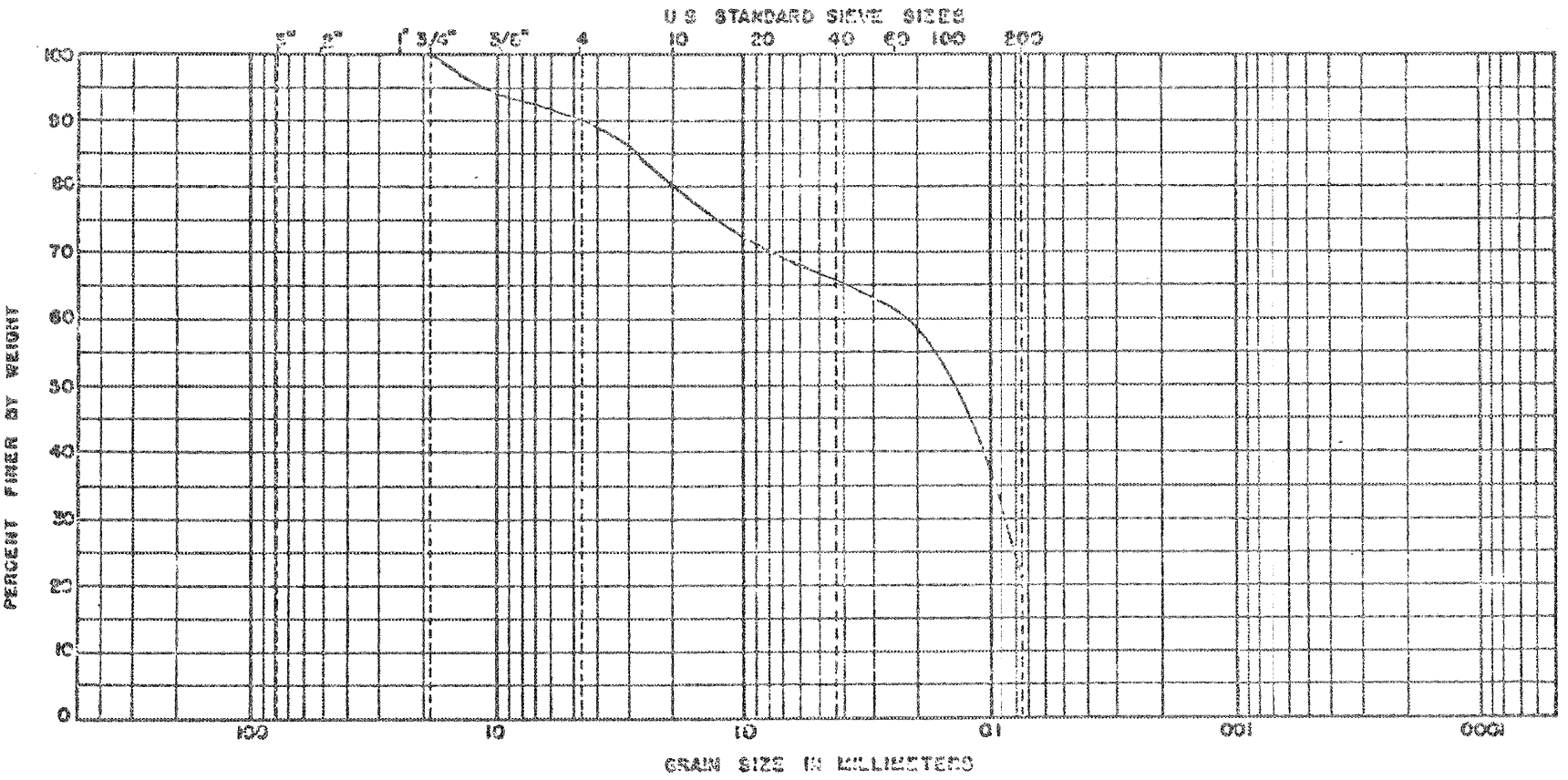
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A Sample #9	82.0' - 83.5'	- -	-	-	-	Grey fine sand with shell fragments Moisture Content - 20.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



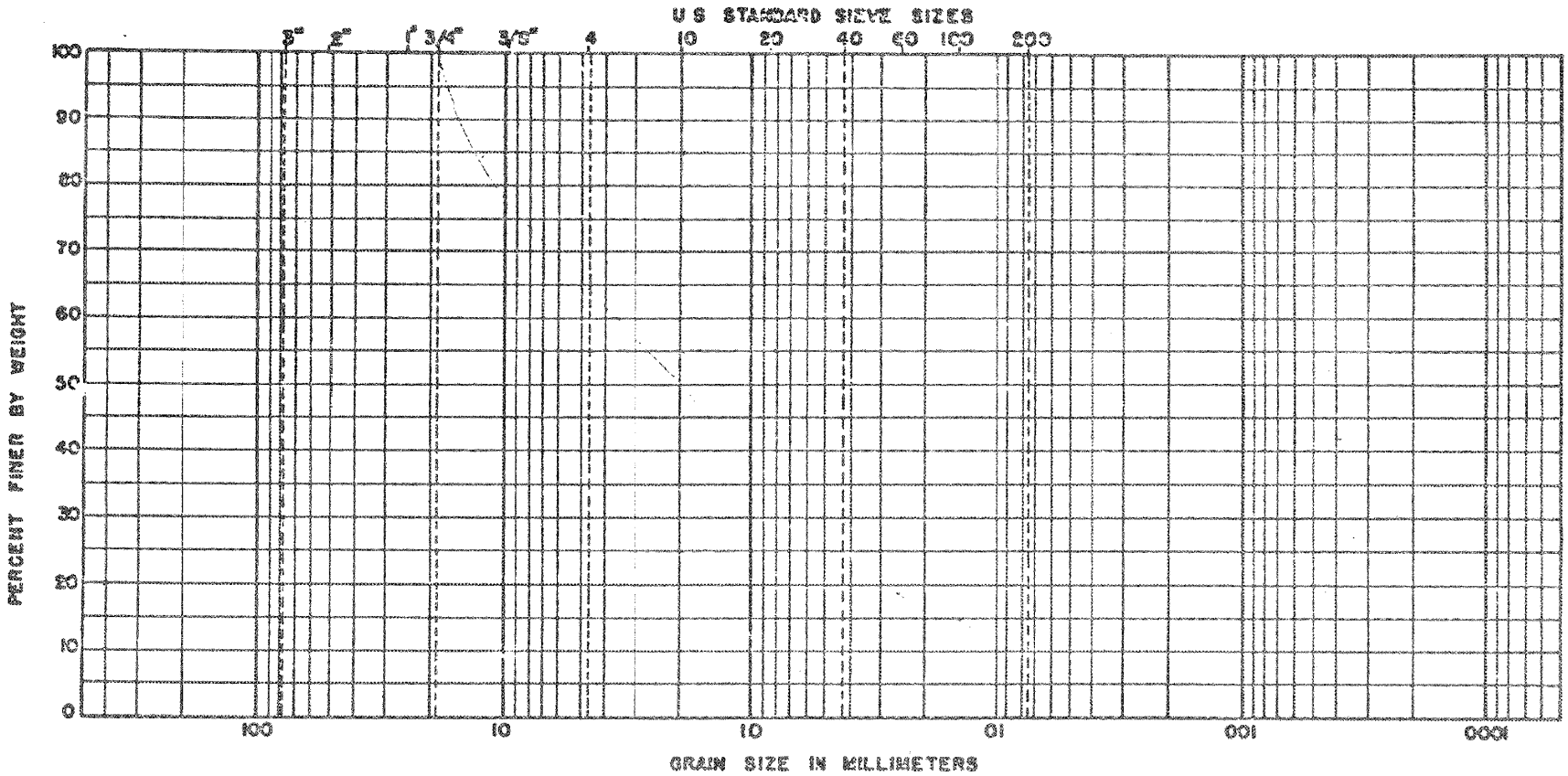
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A UD	84 FT	20.7				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



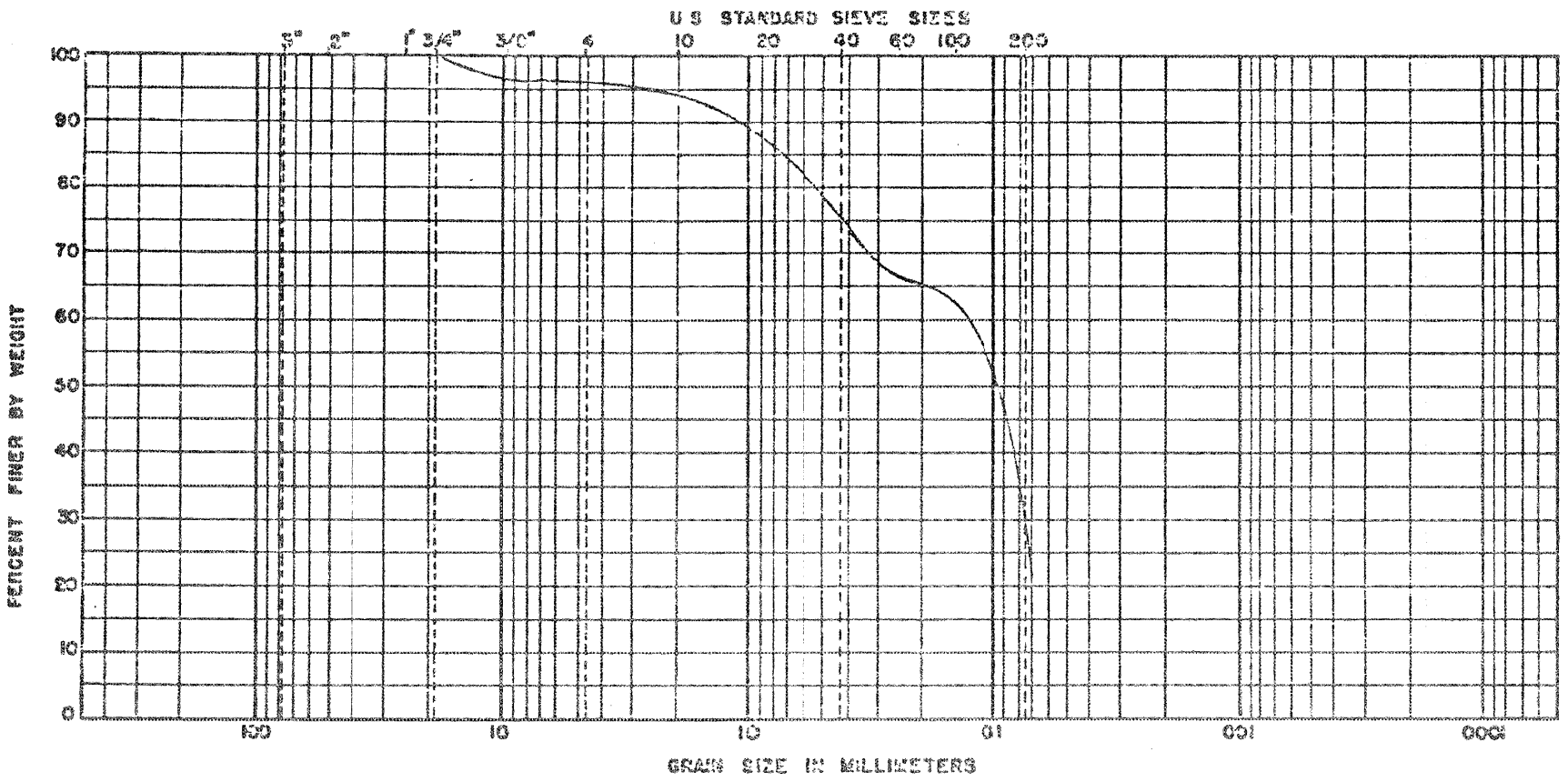
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A Sample #10	86.0'-87.5'	- -	-	-	-	Grey shell with cemented fine sand and shell Moisture Content - 13.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



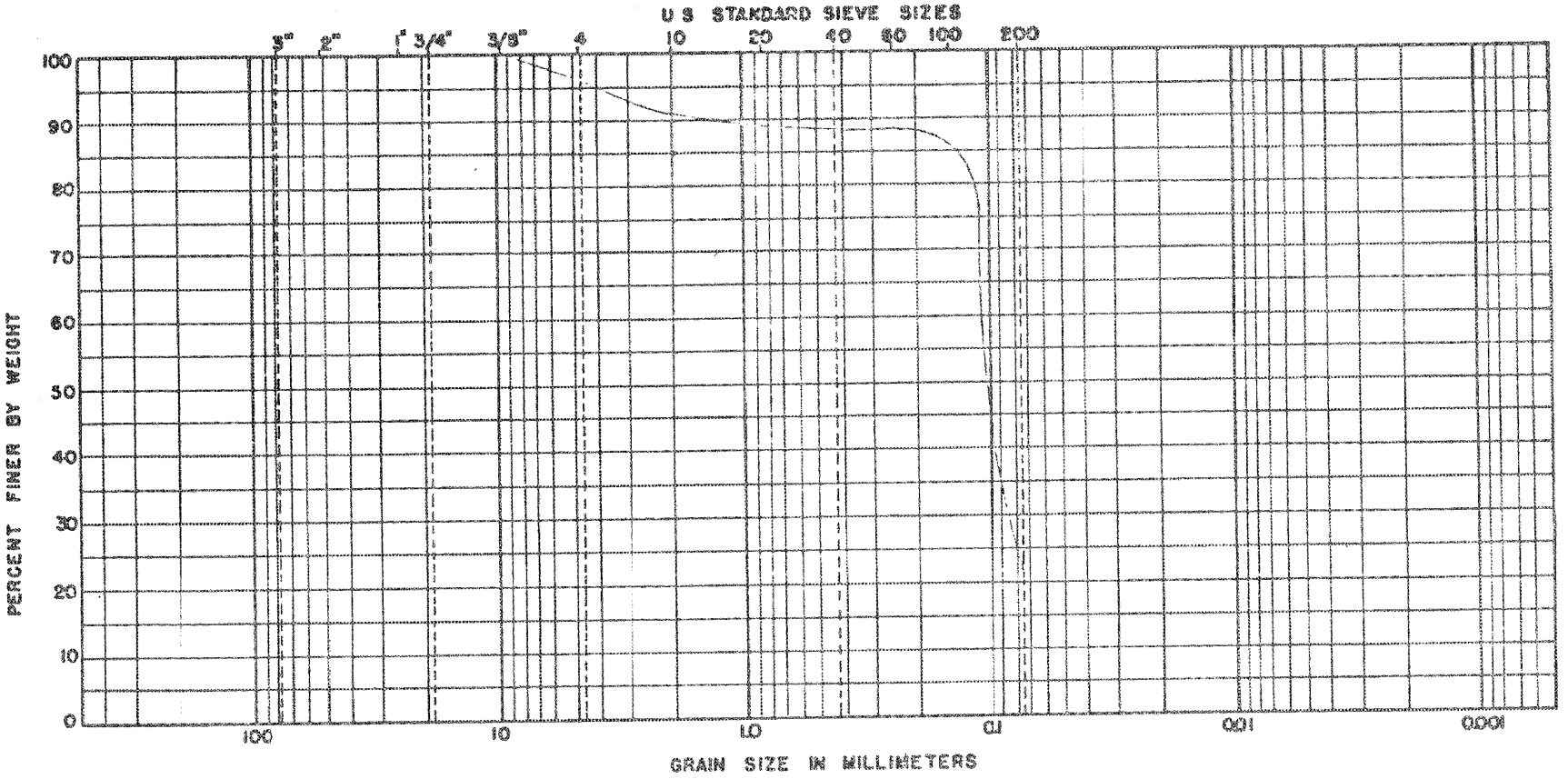
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

CORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-111A UD	88 FT.	21.2				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



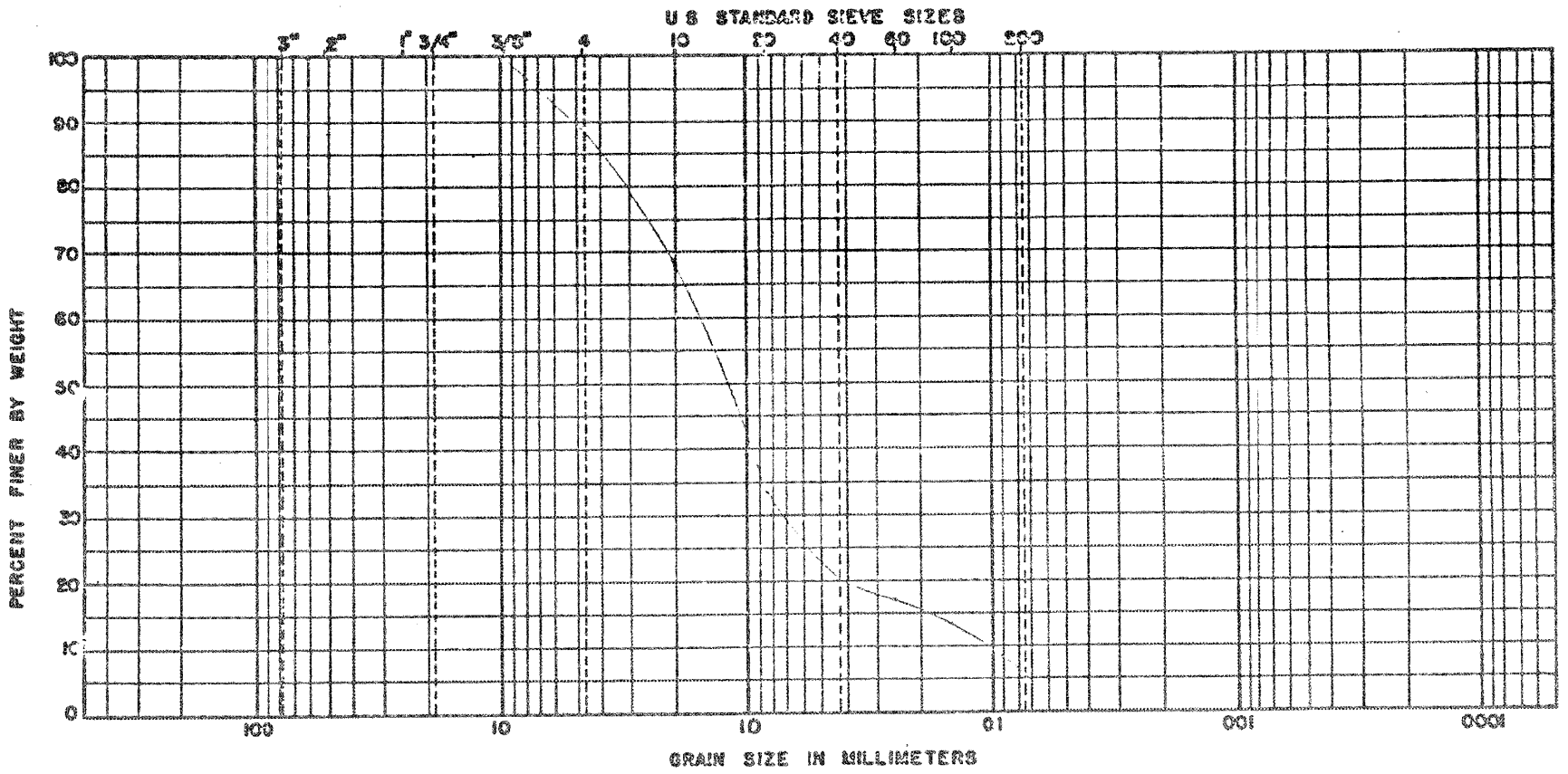
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-112 Sample #14	74.0' - 75.5'	- -	-	-	-	Light grey silty fine sand Moisture Content - 32.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



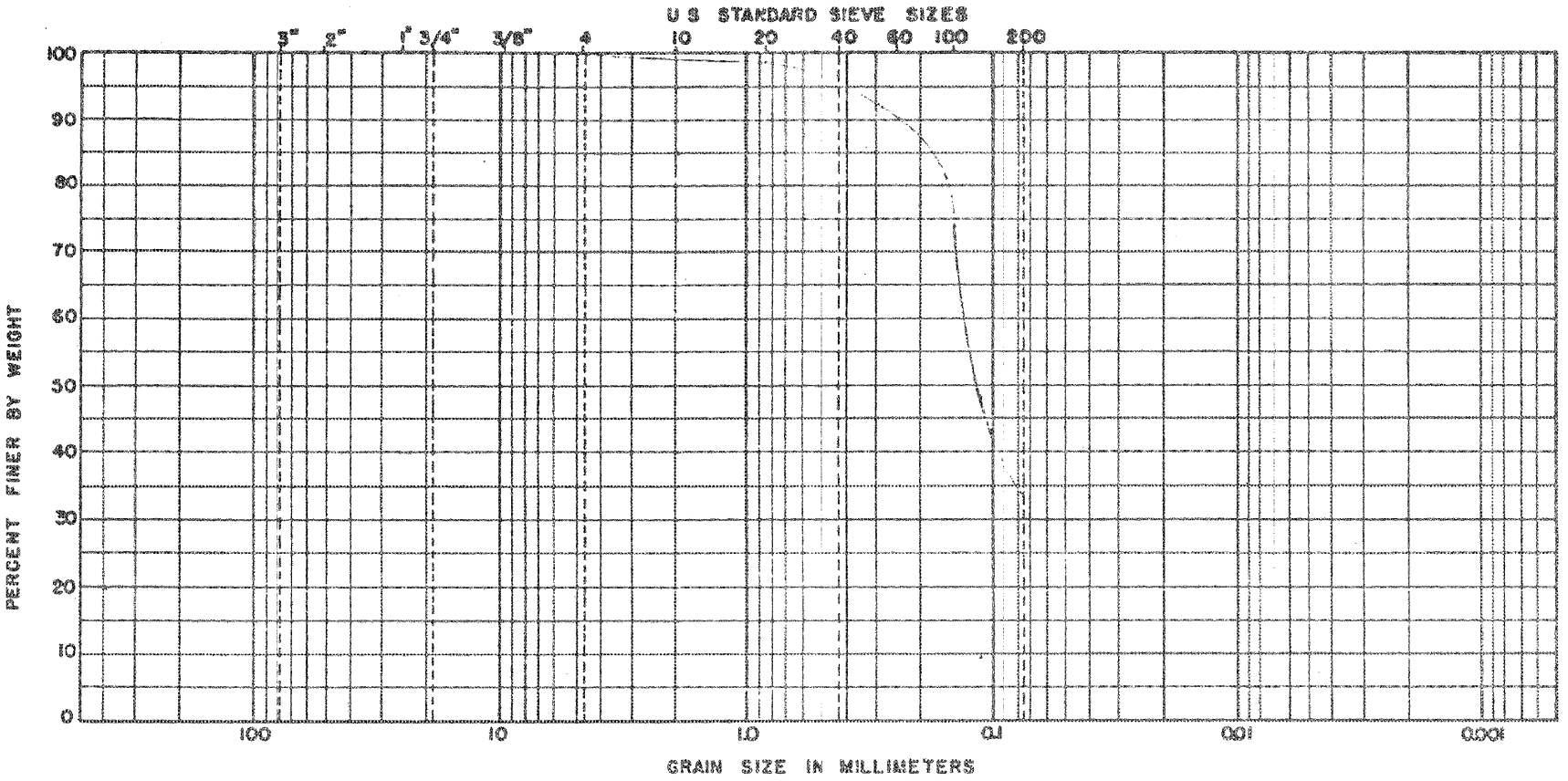
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-112 Sample #15	79.0' - 80.5'	- -	-	-	-	Grey shell with fine sand Moisture Content - 27.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



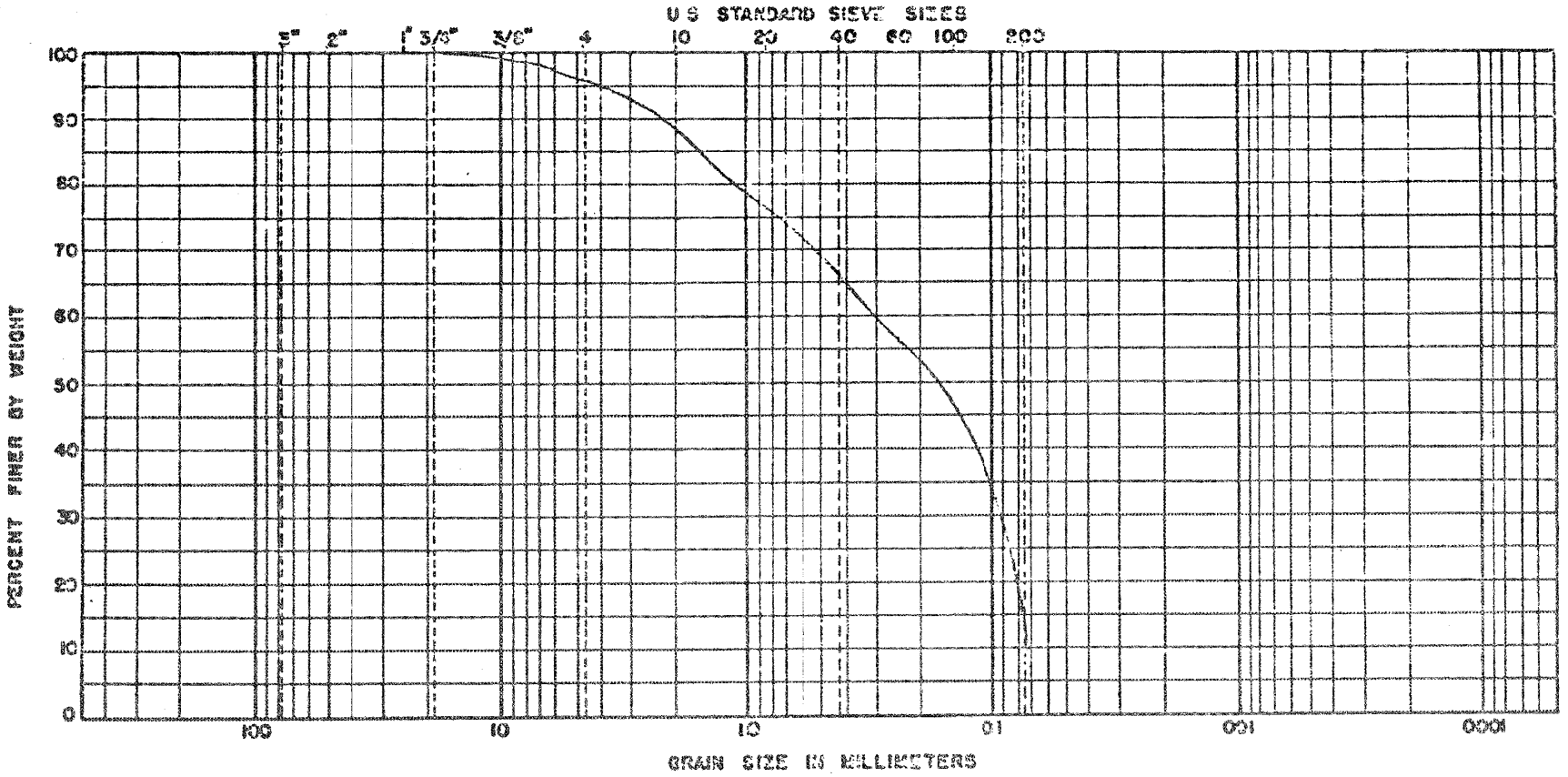
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-112 Sample #27	139.0'-140.5'	- -	-	-	-	Grey silty fine sand Moisture Content - 36.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



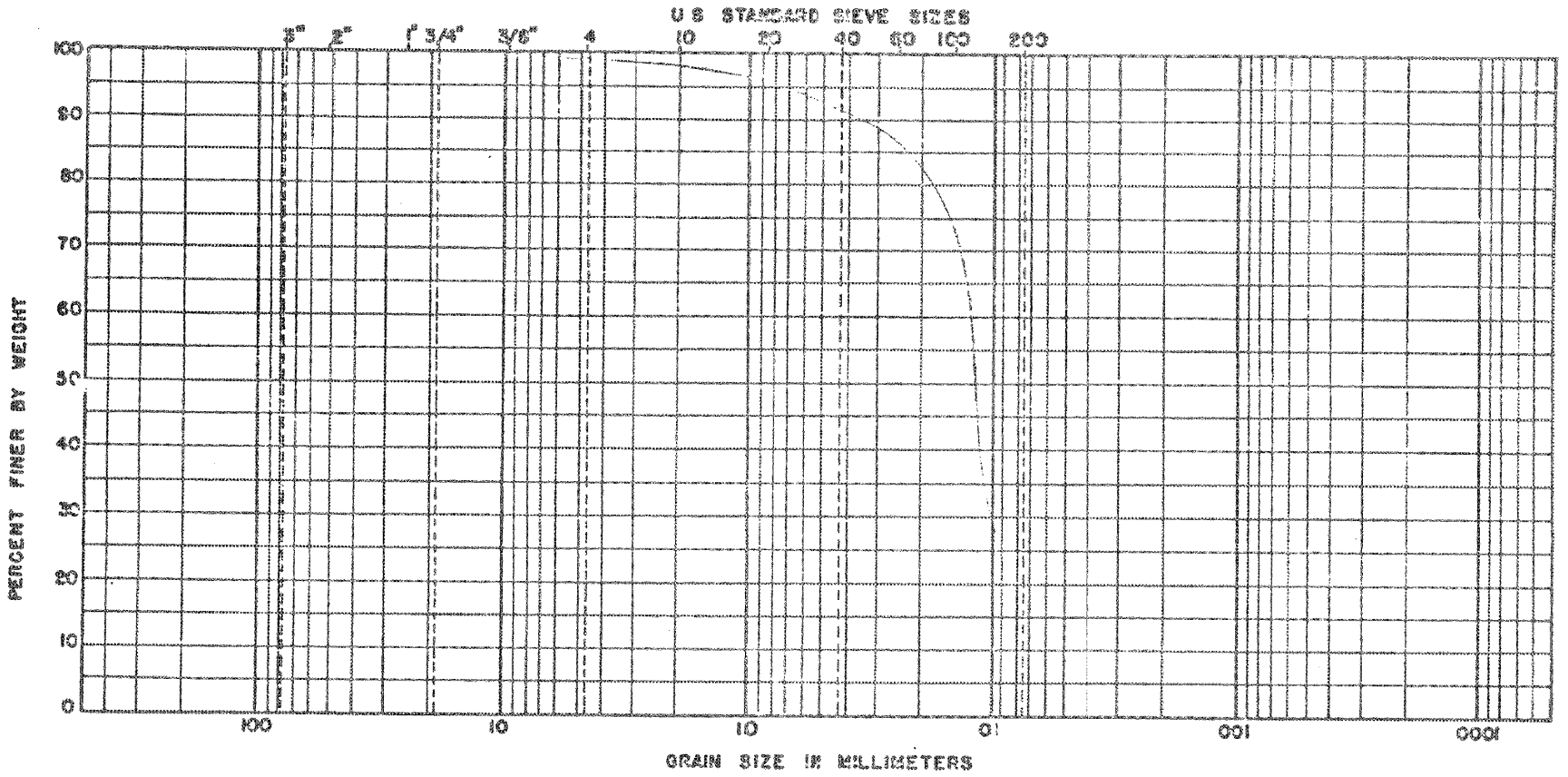
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-113 UD	67 FT.	17.8				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



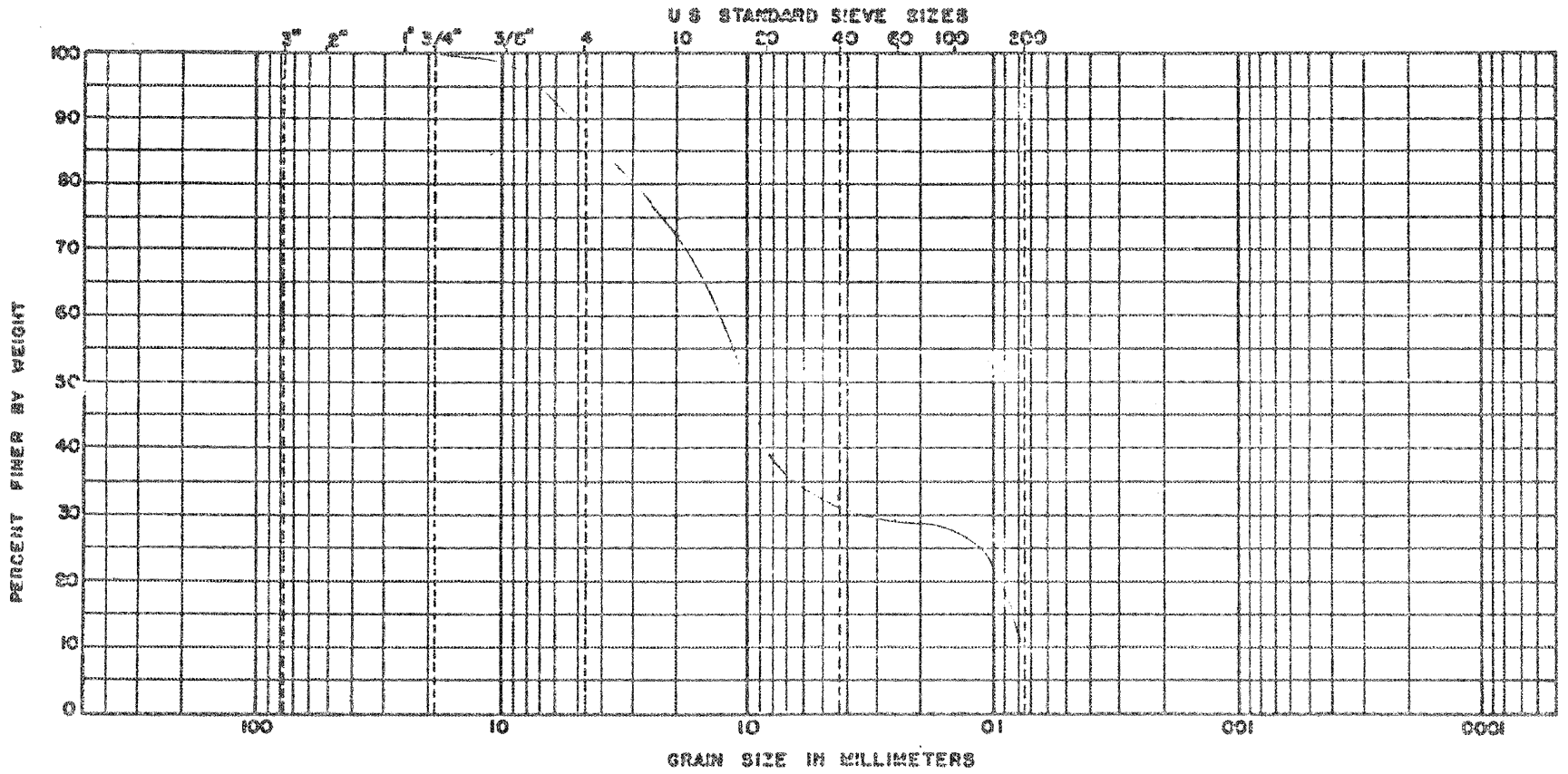
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-113 Sample #14	69.0' - 70.5'	- -	-	-	-	Grey silty fine sand with shell fragments Moisture Content - 25.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



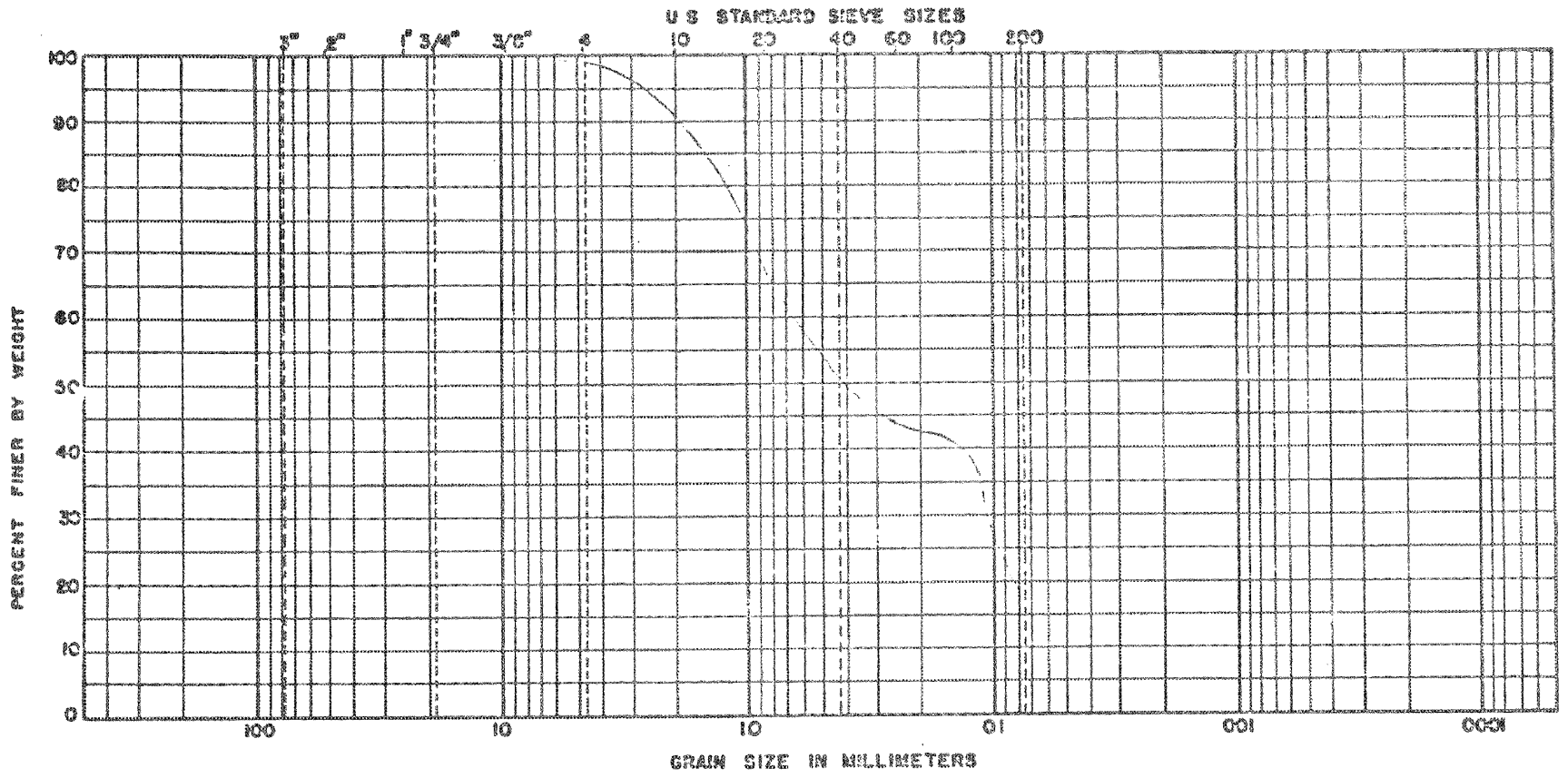
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-113 Sample #15	74.0' - 75.5'	- -	-	-	-	Grey shell with some fine sand Moisture Content - 19.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



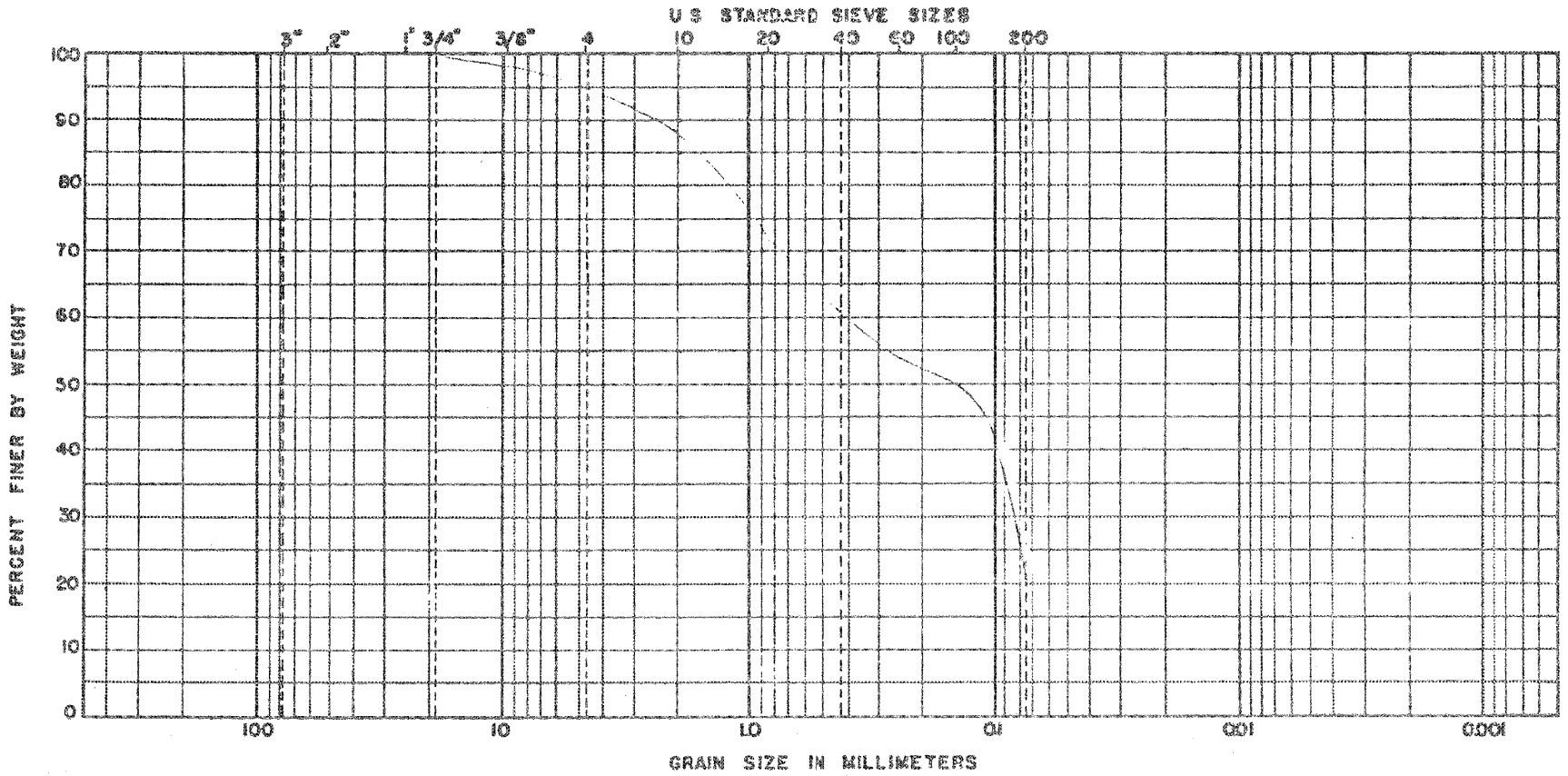
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-113 Sample #16	79.0' - 80.5'	- -	-	-	-	Grey shell fragments with some fine sand Moisture Content - 20.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



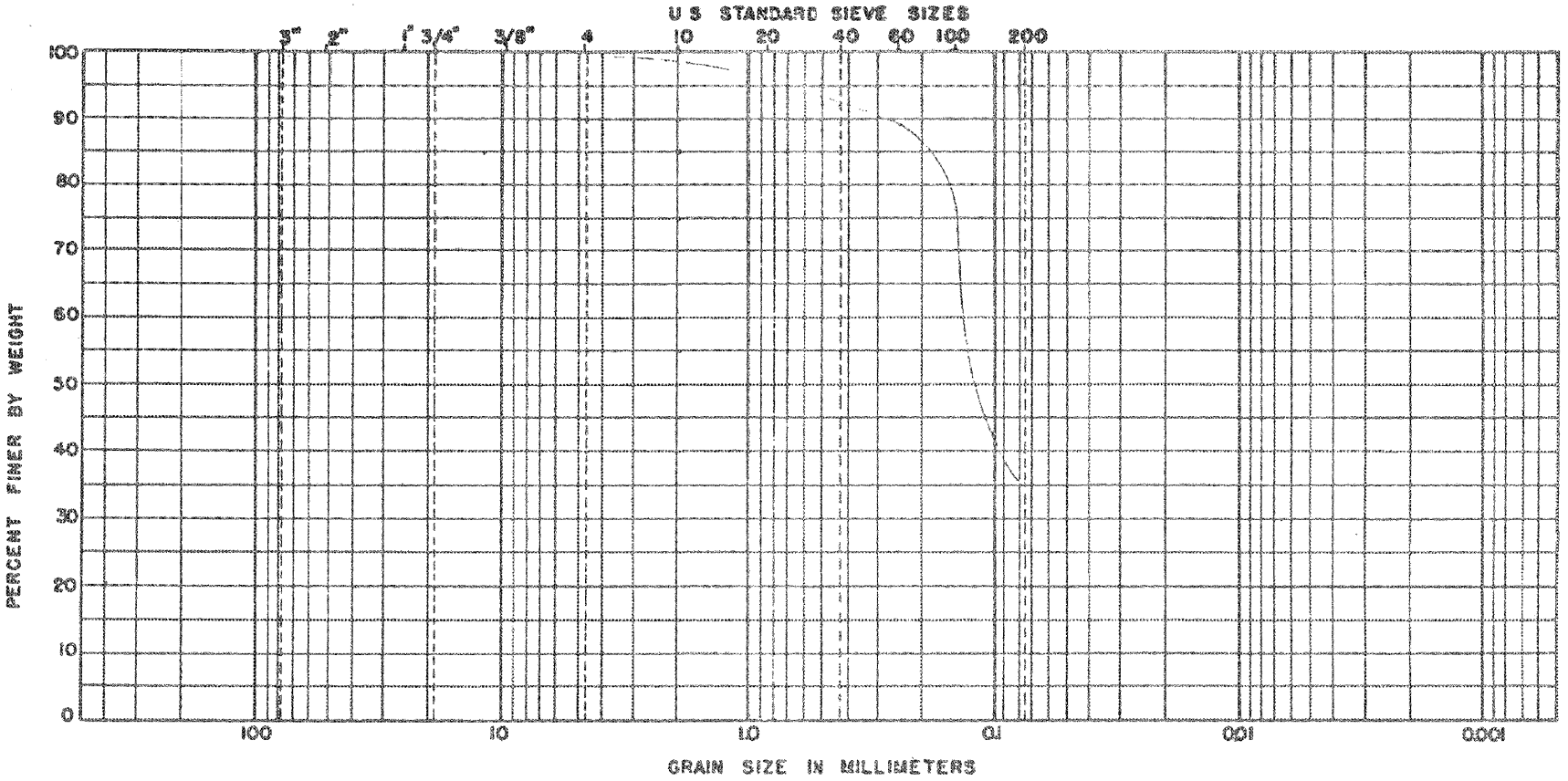
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114 Sample #20	82.5'	- -	-	-	-	Grey fine sand with shell fragments Moisture Content - 19.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



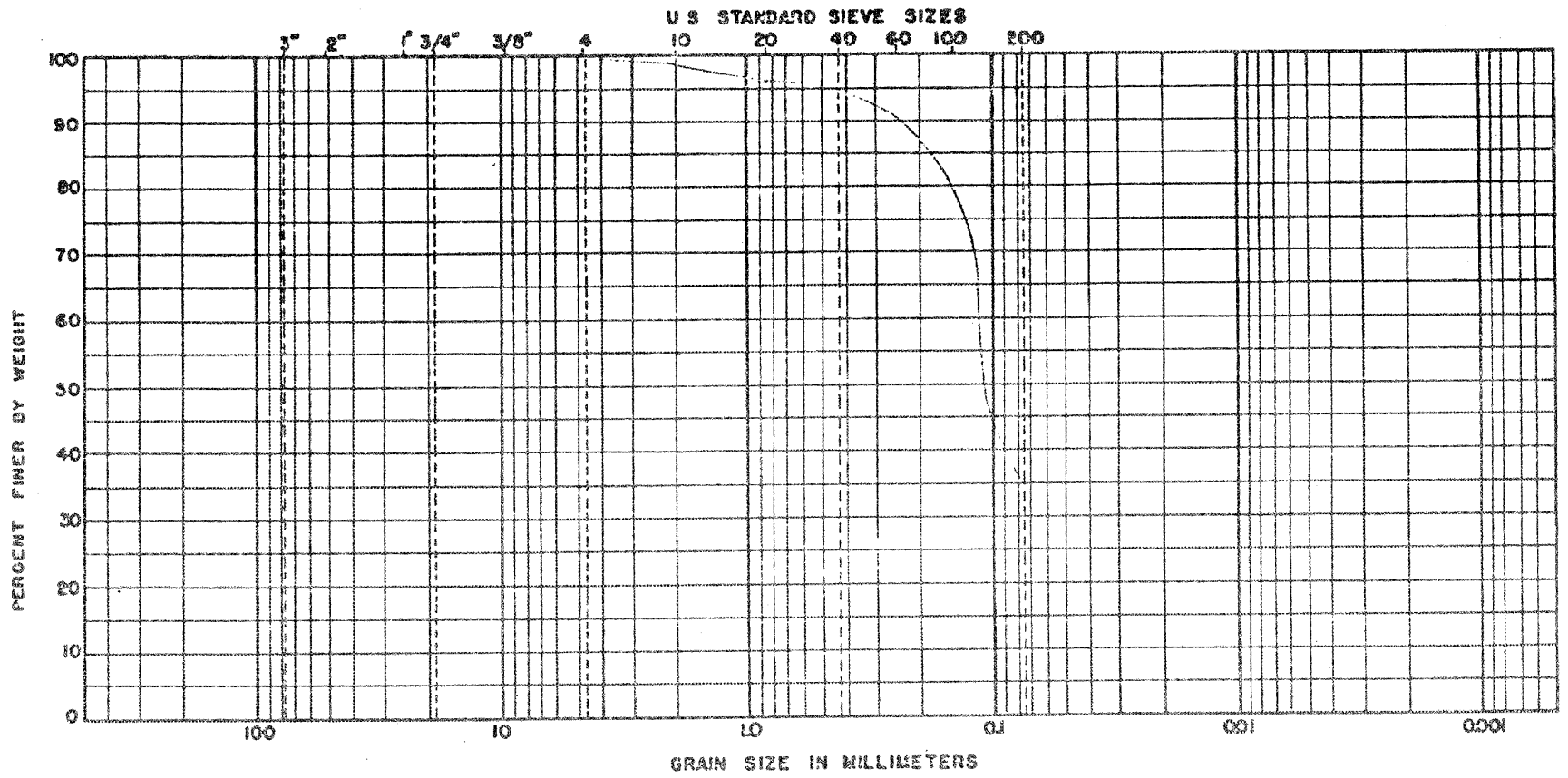
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114 Sample #33	140.0'	- -	-	-	-	Grey silty clayey fine sand with shell fragments Moisture Content - 23.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



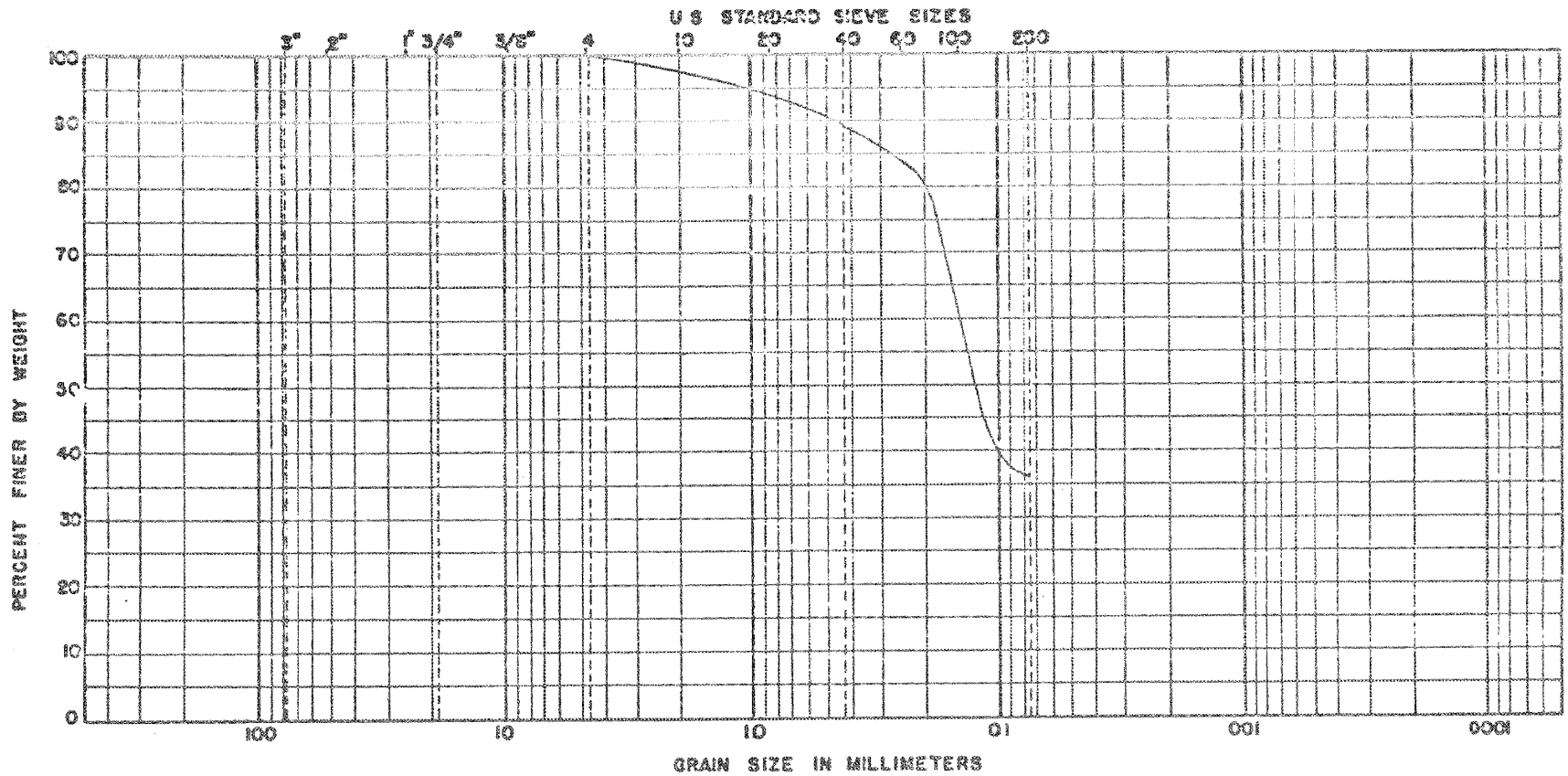
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-114 Sample #34	145.0'	- -	-	-	-	Grey slightly clayey fine sand with shell fragments Moisture Content - 27.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

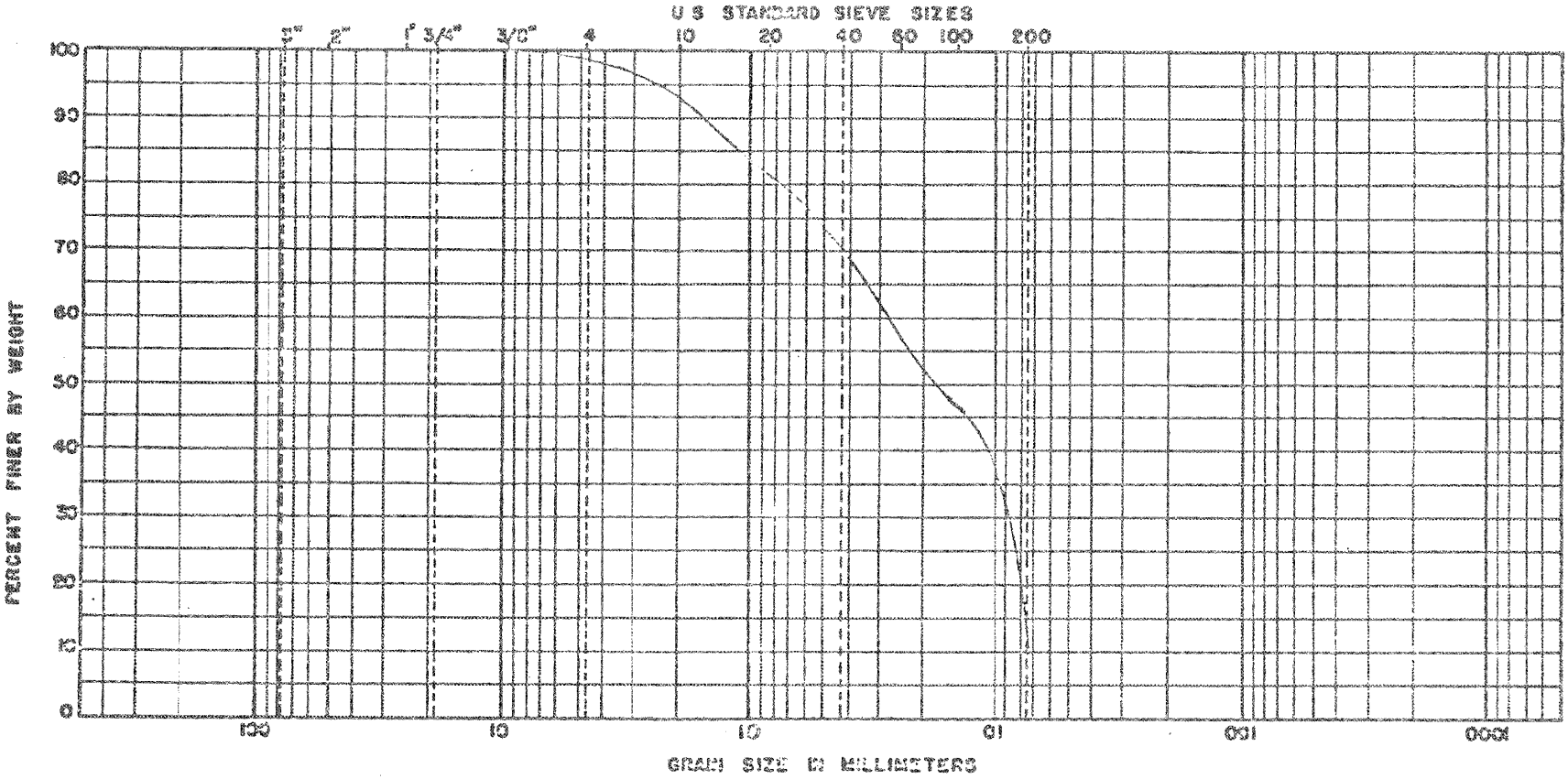
BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114A Sample #33	140'					GRAY SILTY CLAYEY FINE SAND AND SHELLS Moisture Content - 24.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

2.5A-447



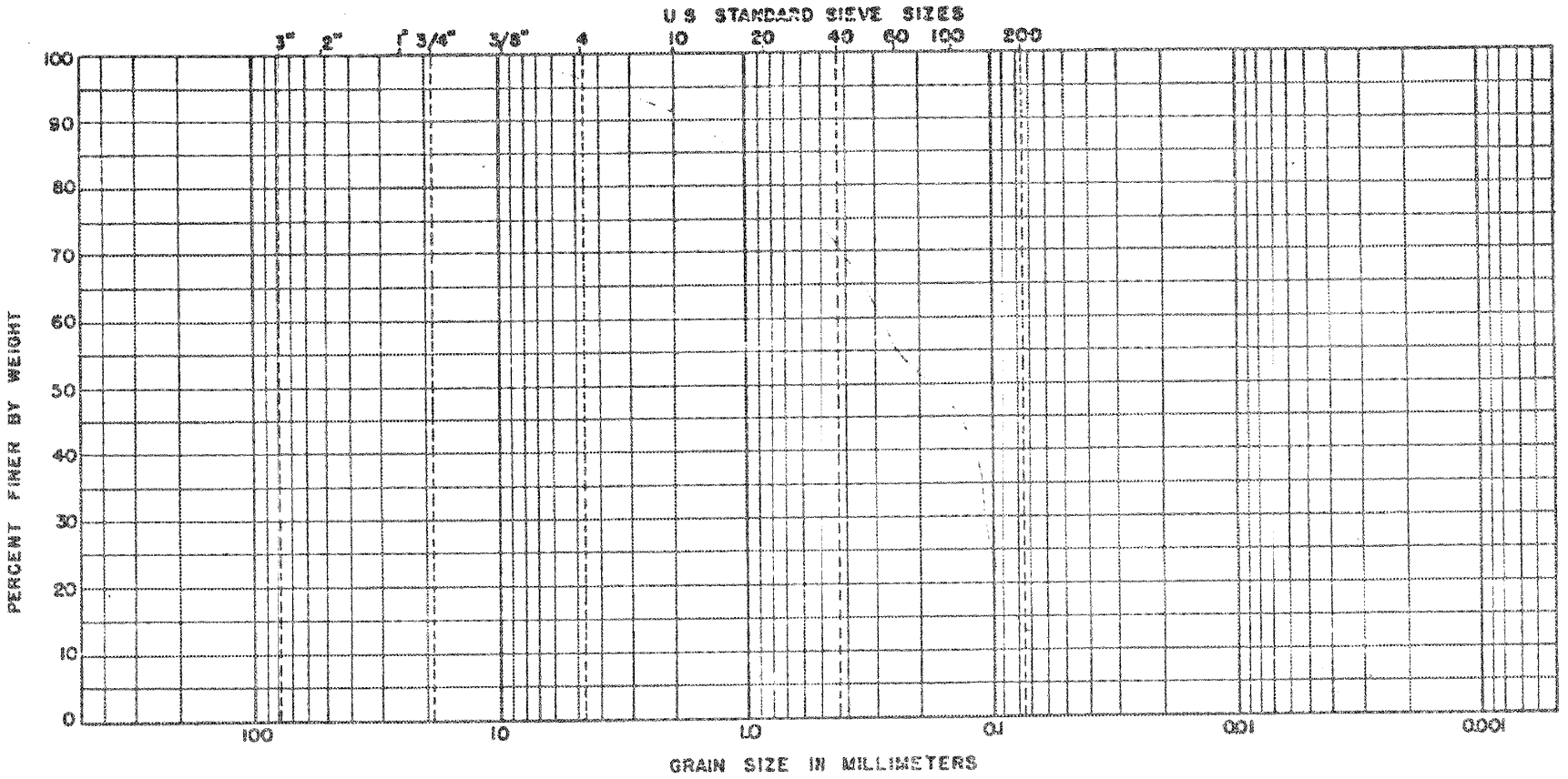
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 UD	67.5	18.0				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



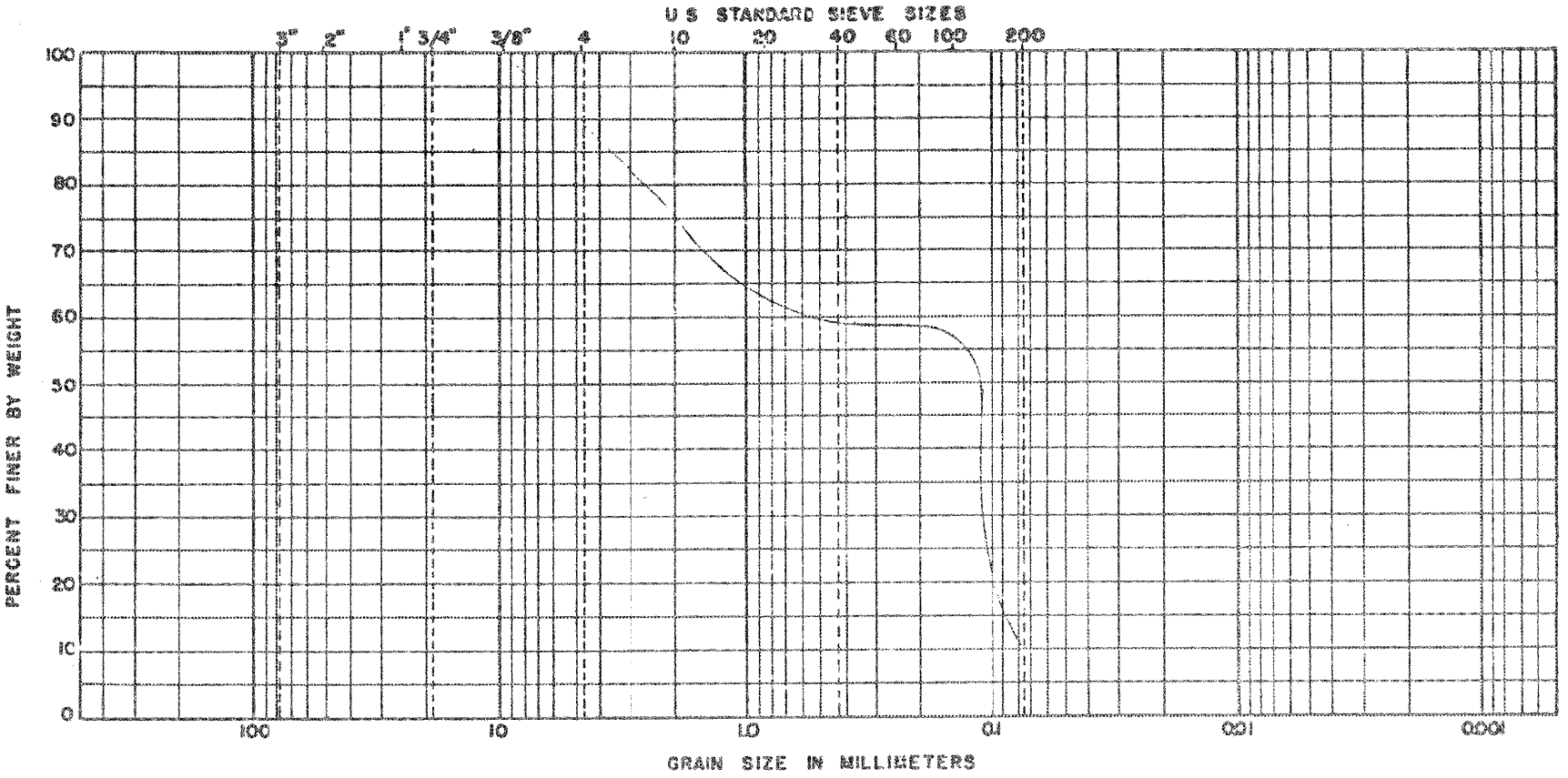
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 Sample #17	70.0	- -	-	-	-	Grey medium sand with shell fragments Moisture Content - 17.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



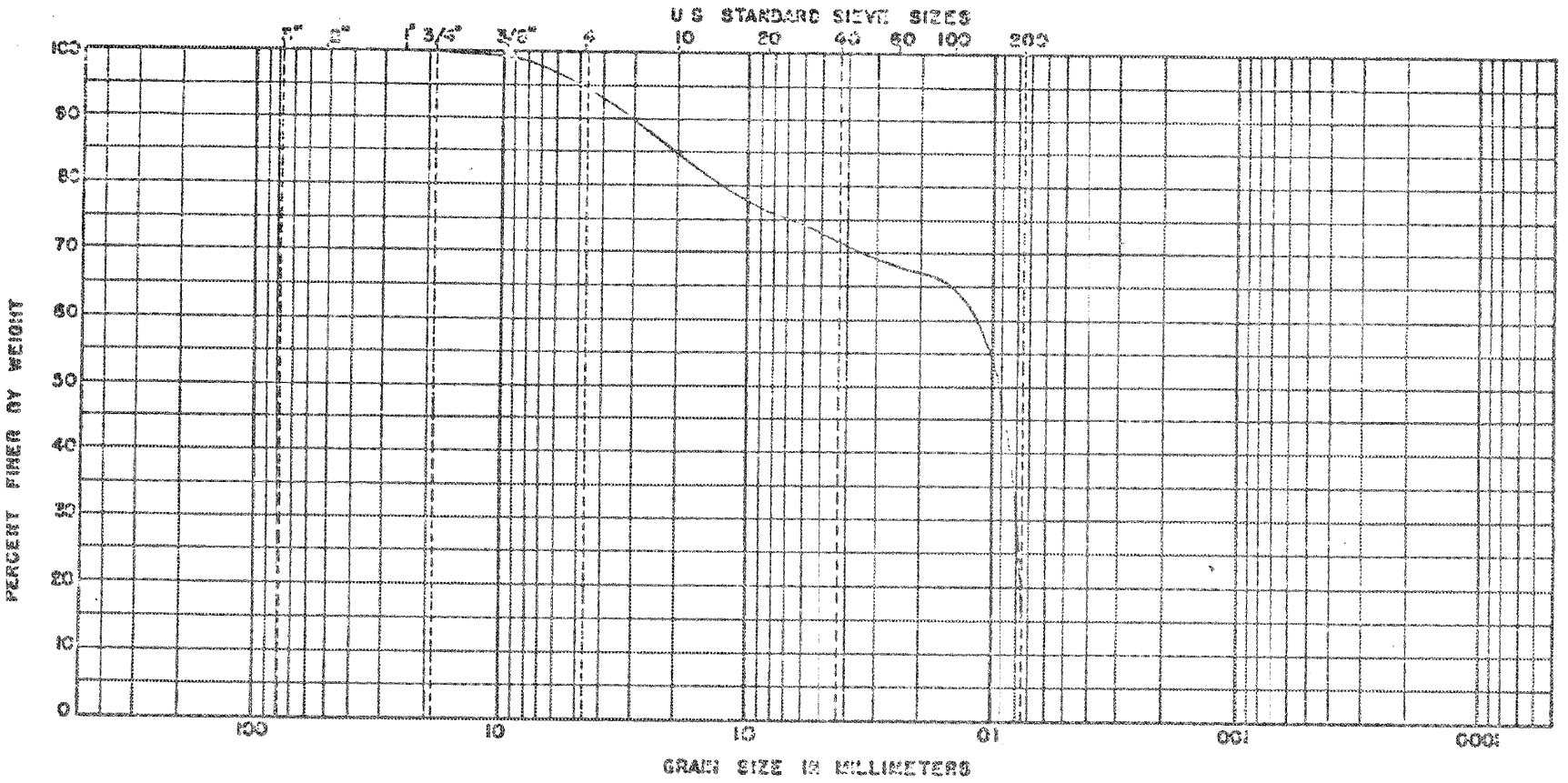
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 Sample #18	75.0	- -	-	-	-	Grey fine sand with shell fragments Moisture Content - 18.3%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



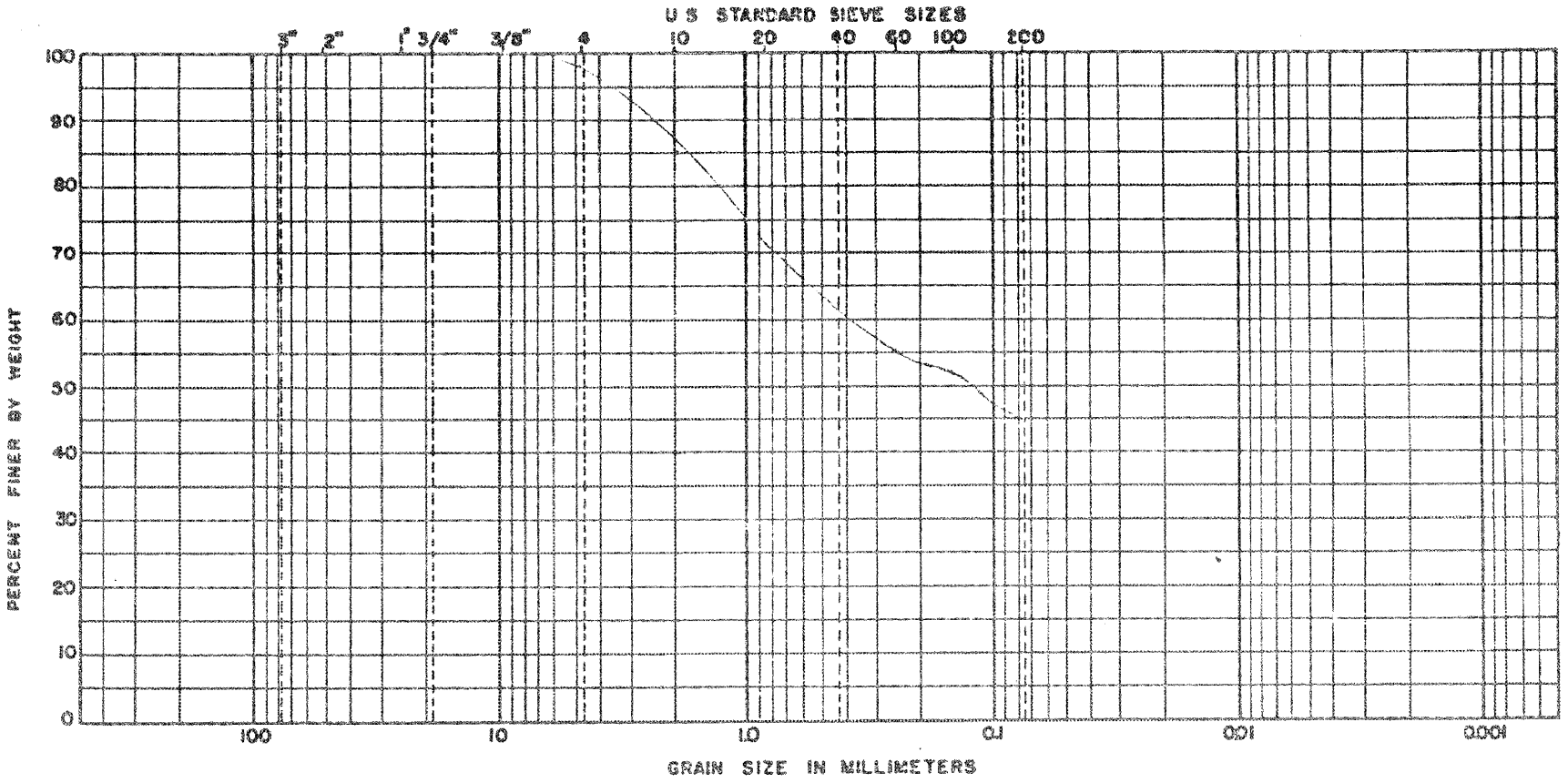
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 UD	77.5 FT.	20.6				GRAY, FINE GRAVELLY FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



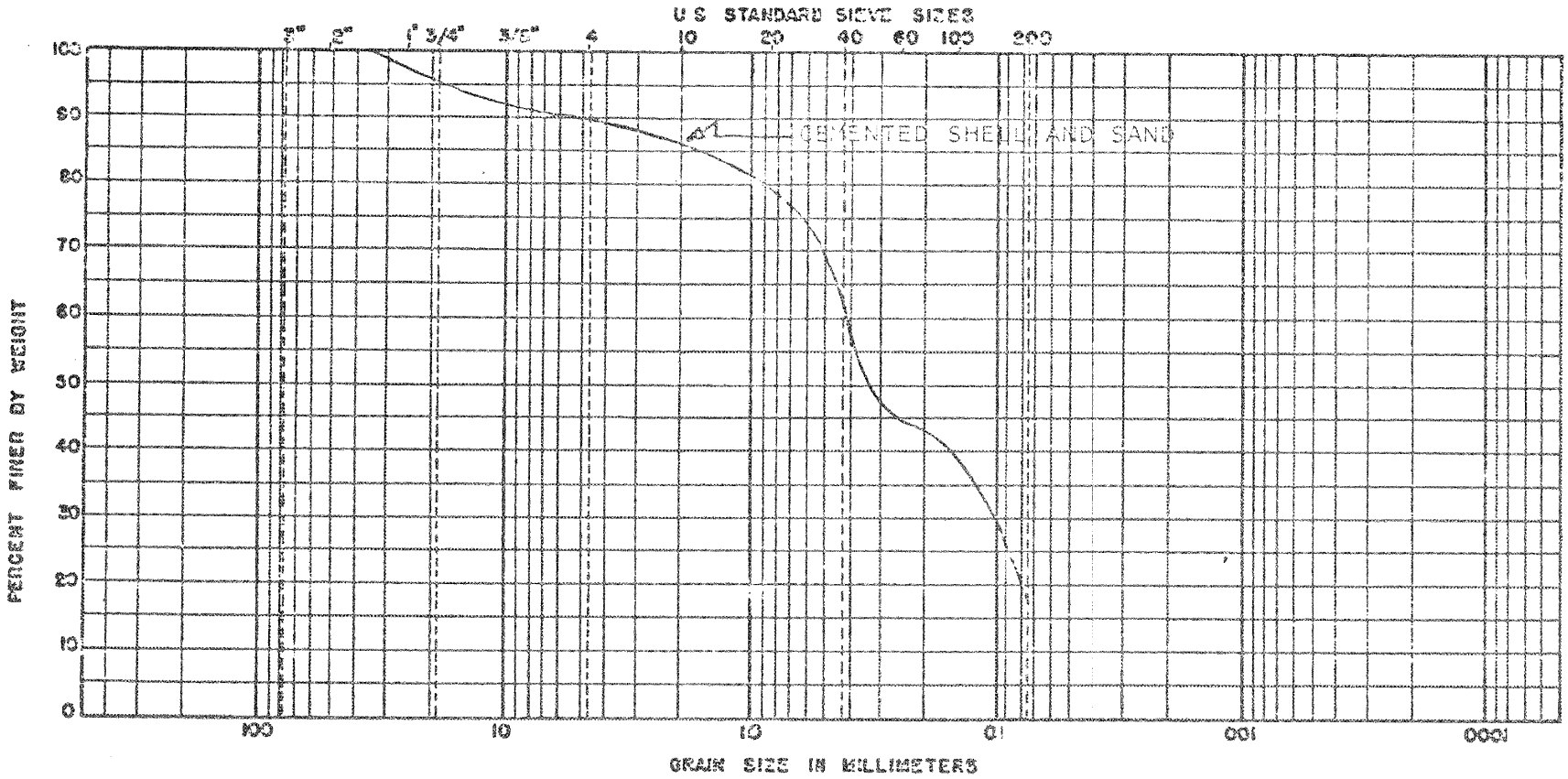
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 Sample #19	80.0	-	-	-	-	-	Grey fine sand with shell fragments Moisture Content - 19.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



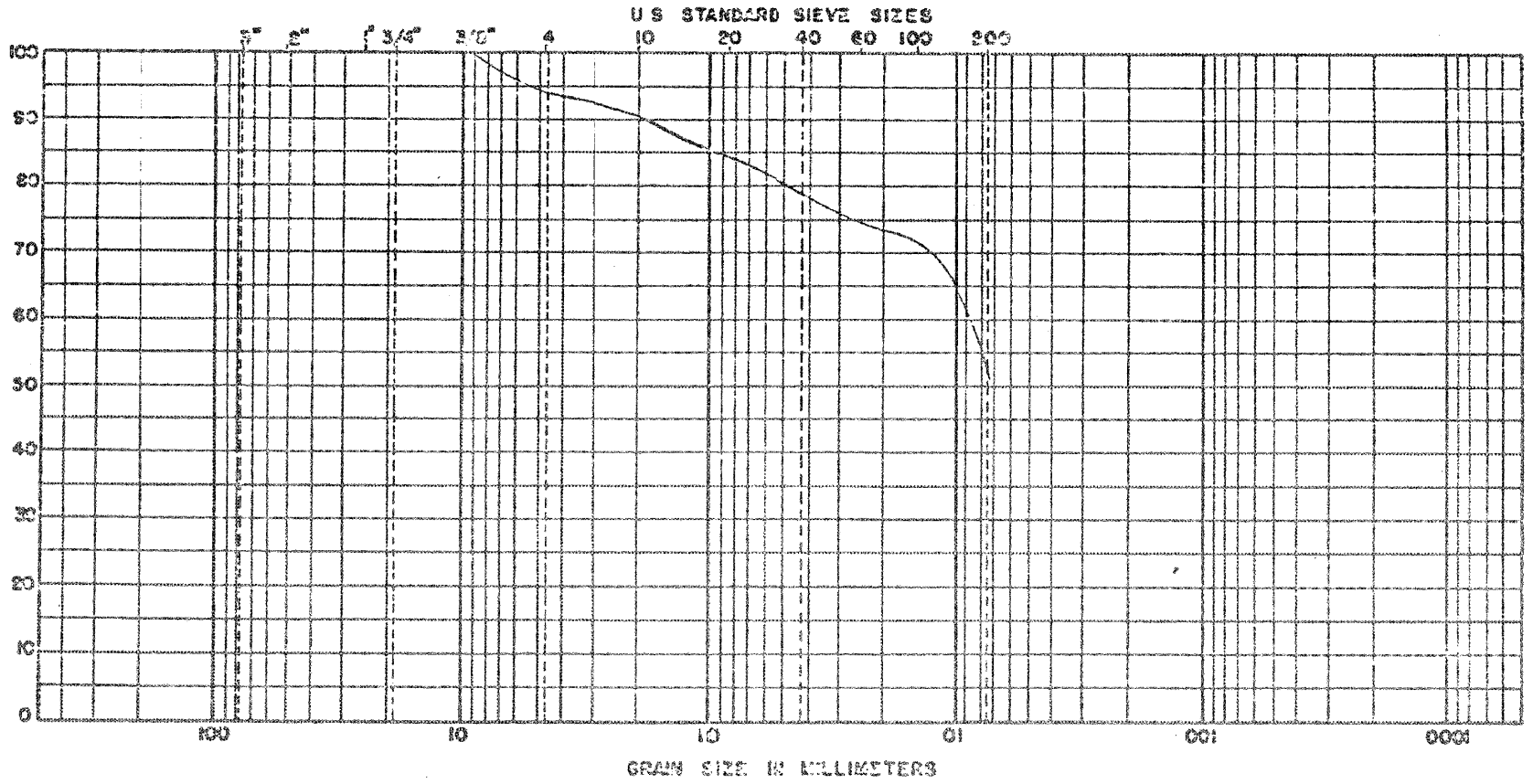
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 UD	87.5 FT.	16.1				GRAY, COARSE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



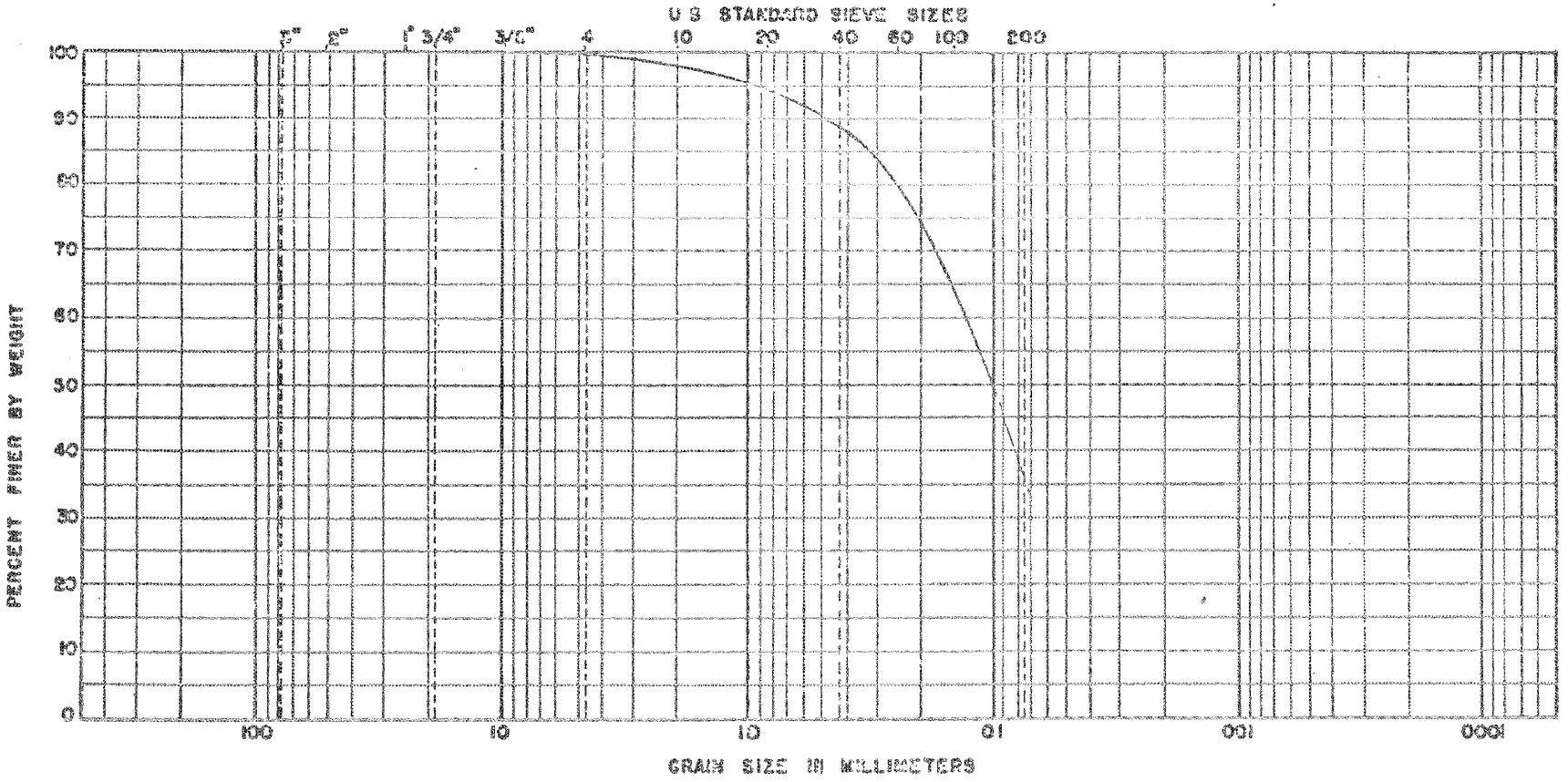
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 UD	107.5 FT.	24.7				GRAY, FINE GRAVELLY, FINE TO COARSE SANDY, SILT (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



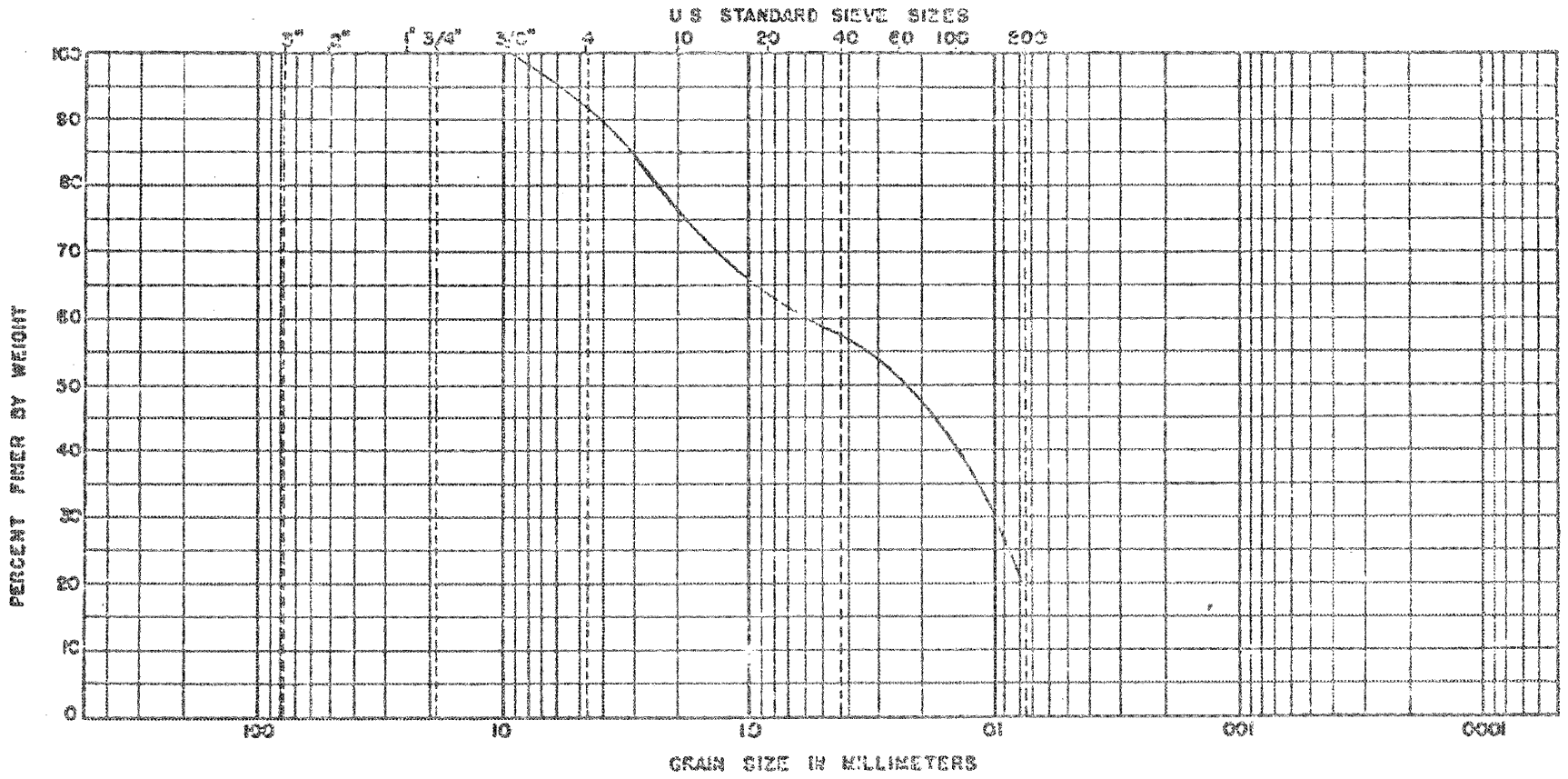
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 UD	137.5 FT	27.2				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



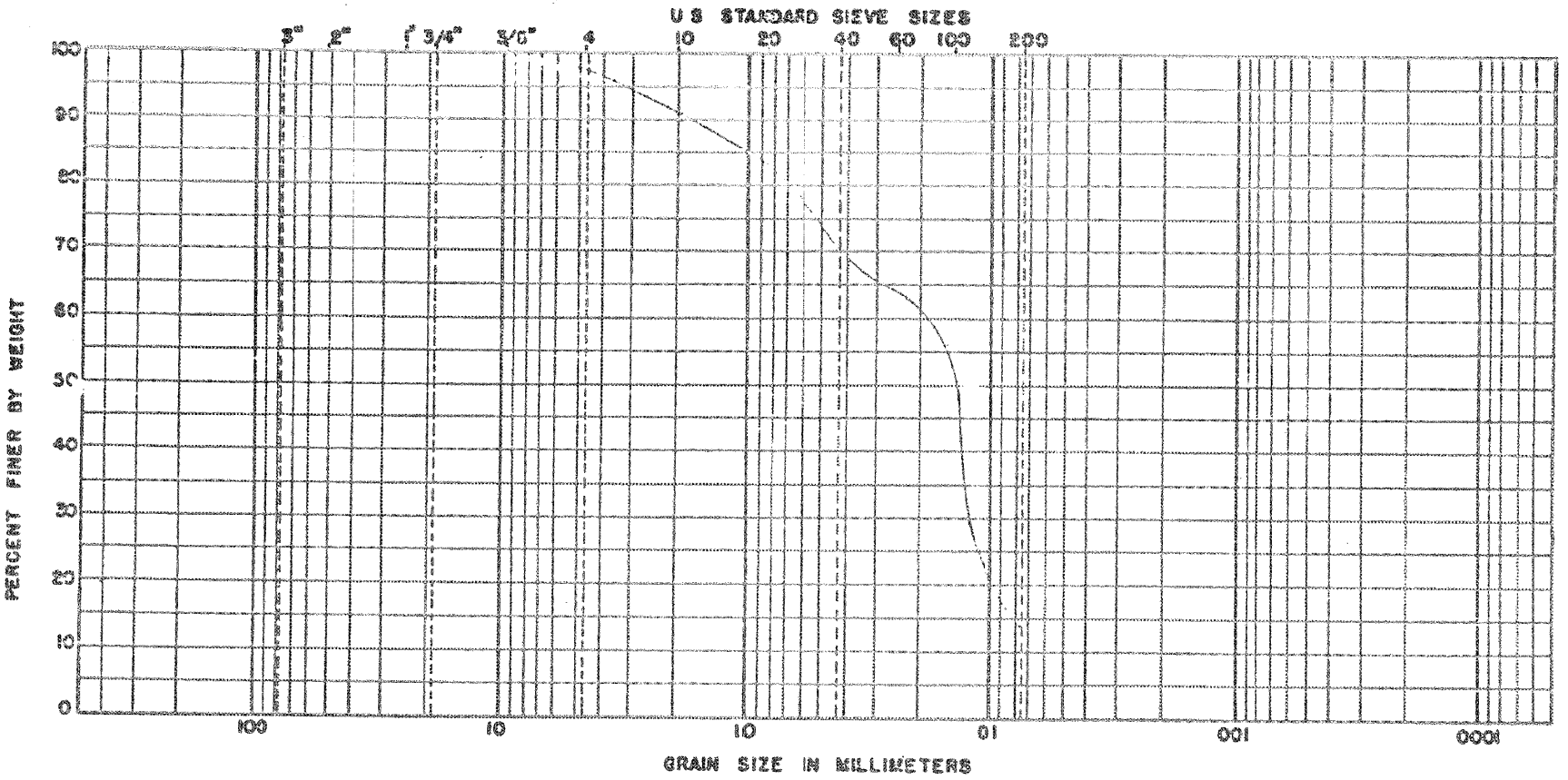
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-115 UD	147.5 FT	26.0				GRAY, FINE GRAVELLY, FINE TO COARSE SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



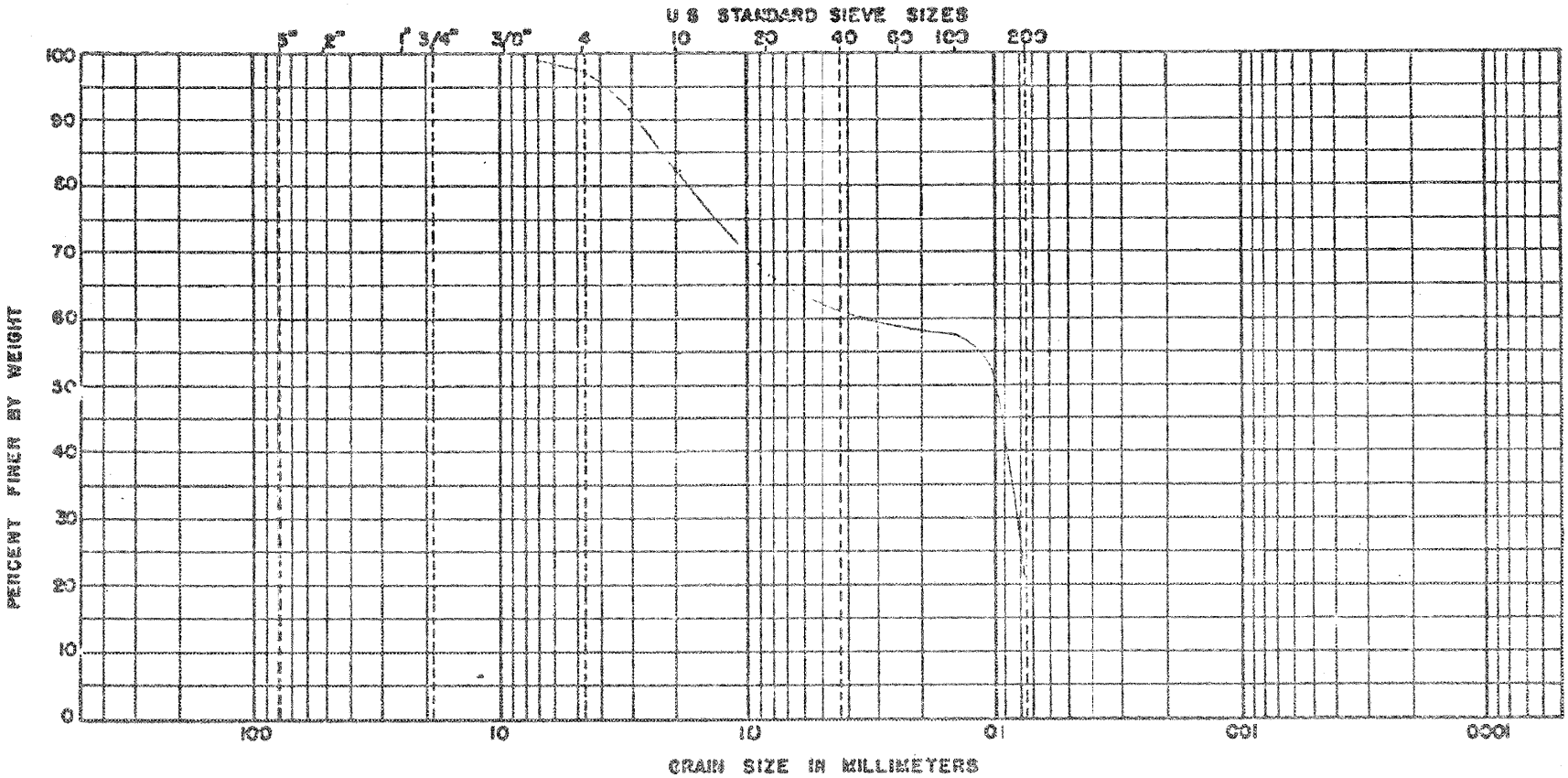
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-116 Sample #14	69.0' - 70.5'	- -	-	-	-	Fine to medium sand with shell fragments Moisture Content - 21.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



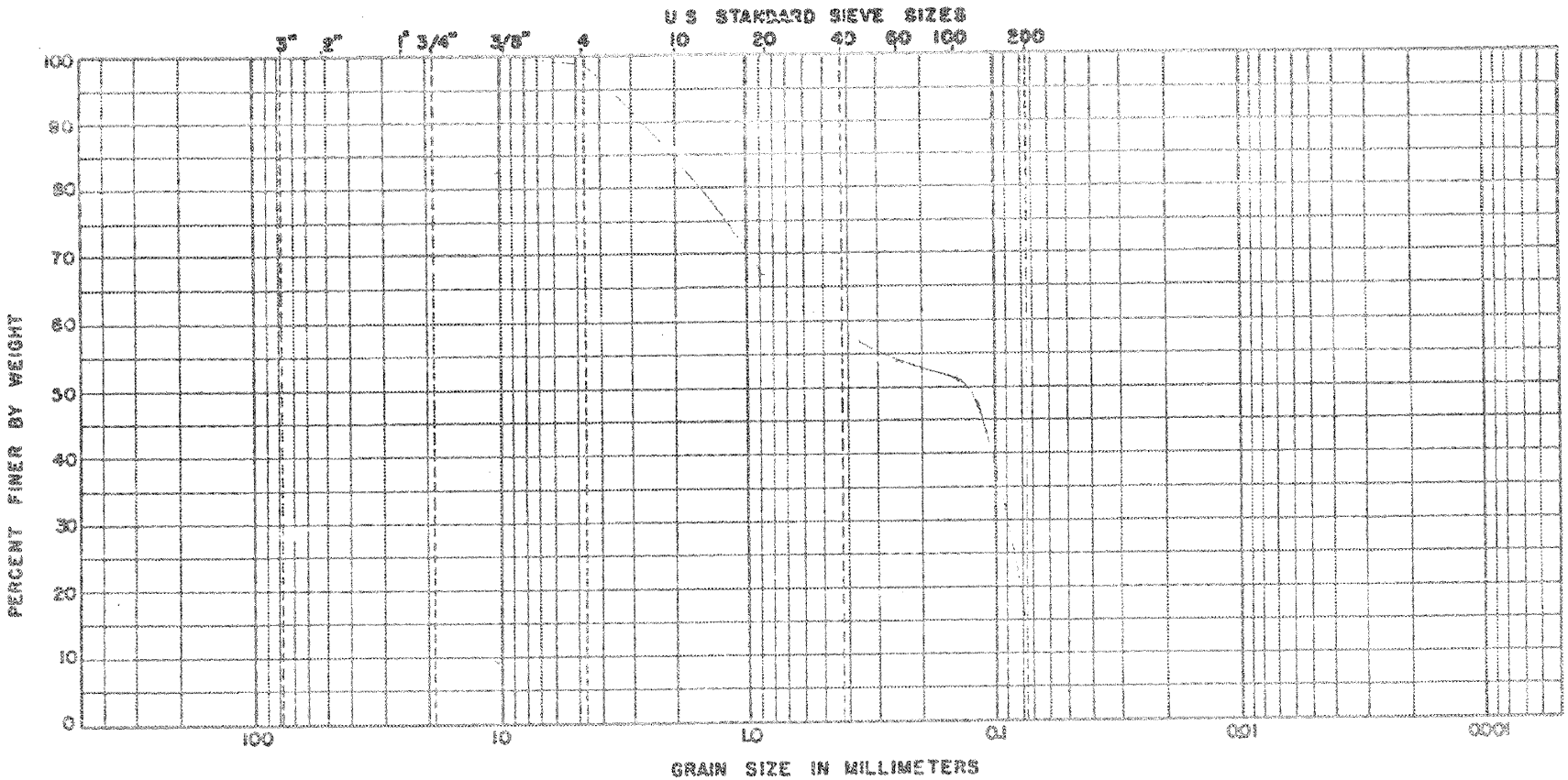
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-116 Sample #15	74.0' - 75.5'	-	-	-	-	Grey fine sand with shell fragments Moisture Content - 30.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



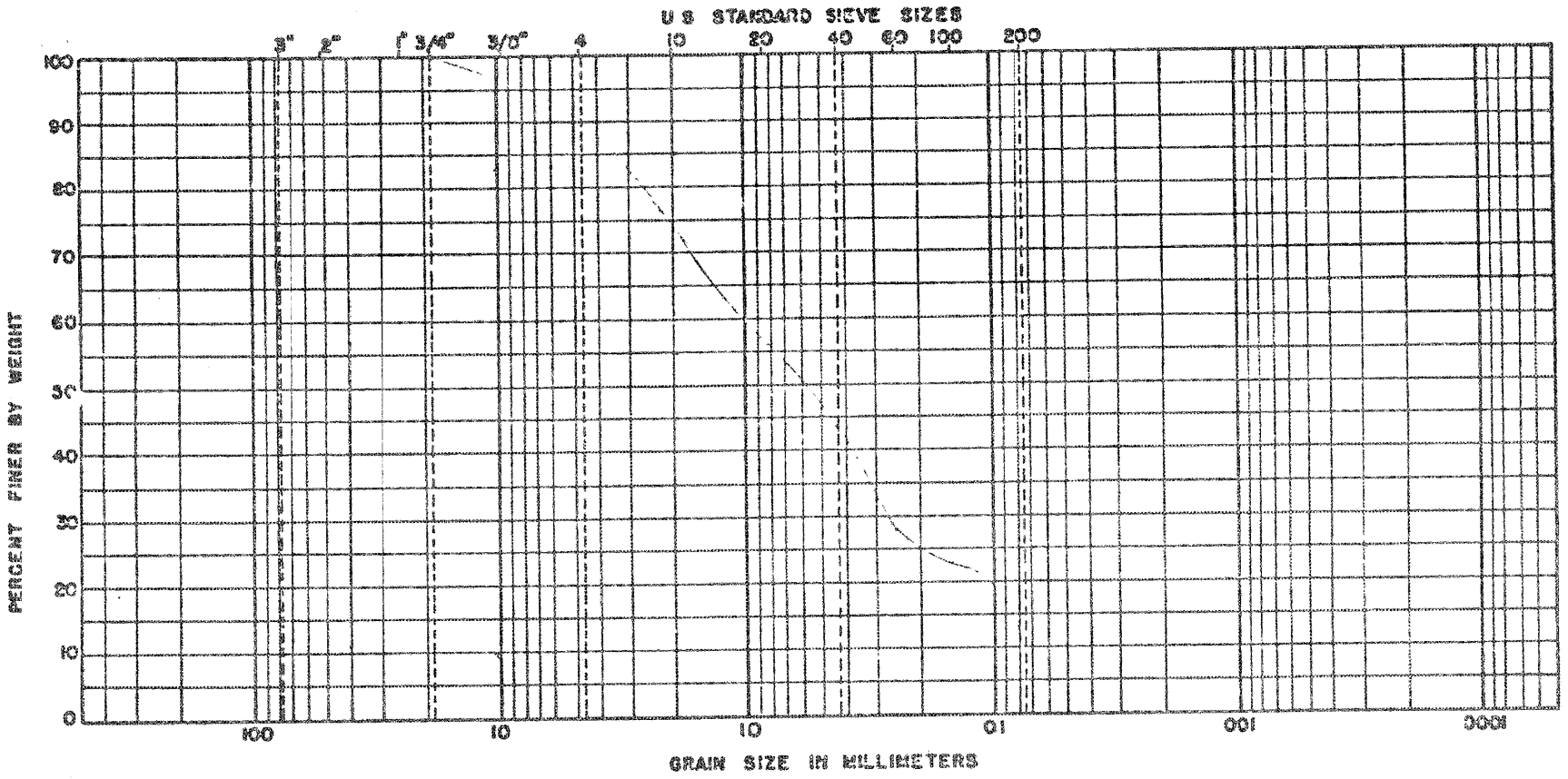
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-116 Sample #16	79.0' - 80.5'	- -	-	-	-	Grey fine sand with shell fragments Moisture Content - 21.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



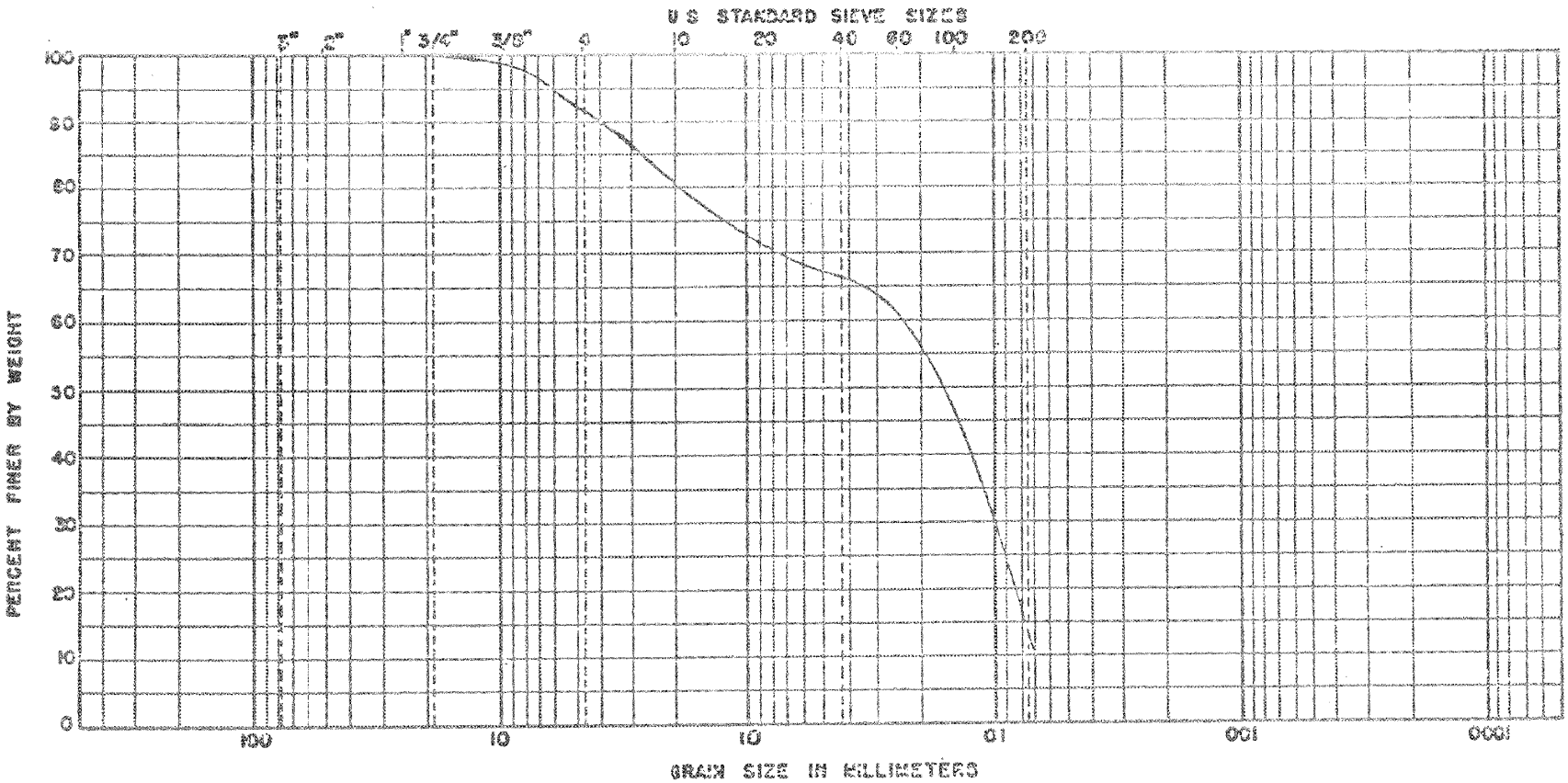
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-117 Sample #15	74.0' - 75.5'	- -	-	-	-	Grey shell fragments with some fine sand Moisture Content - 23.8%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



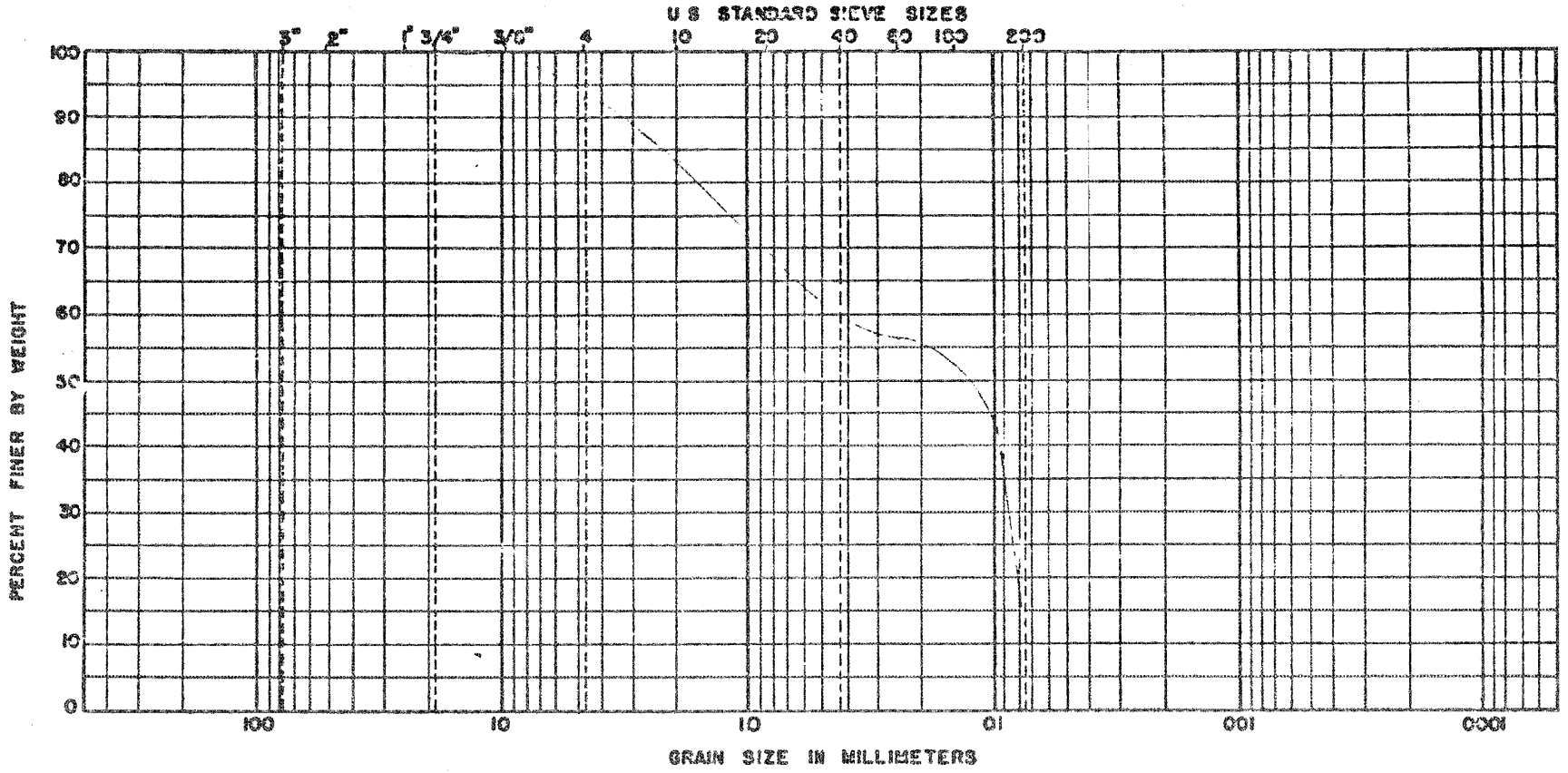
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	MAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-117 UD	77 FT.	19.9				GRAY, FINE GRAVELLY, FINE TO COARSE SAND (SHELL)

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



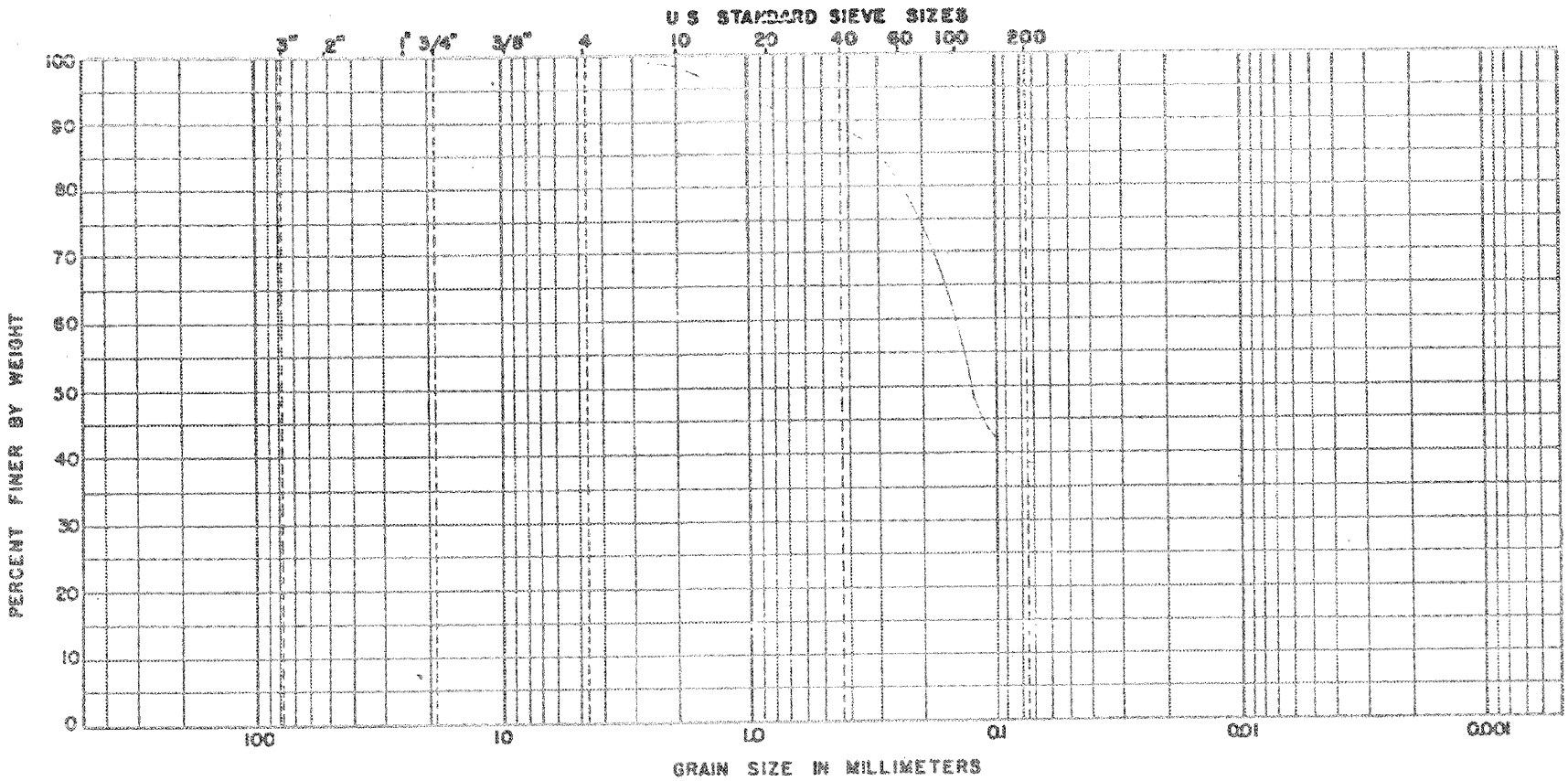
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-117 Sample #16	79.0' - 80.5'	- -	-	-	-	Grey fine sand with shell Moisture Content - 21.7%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



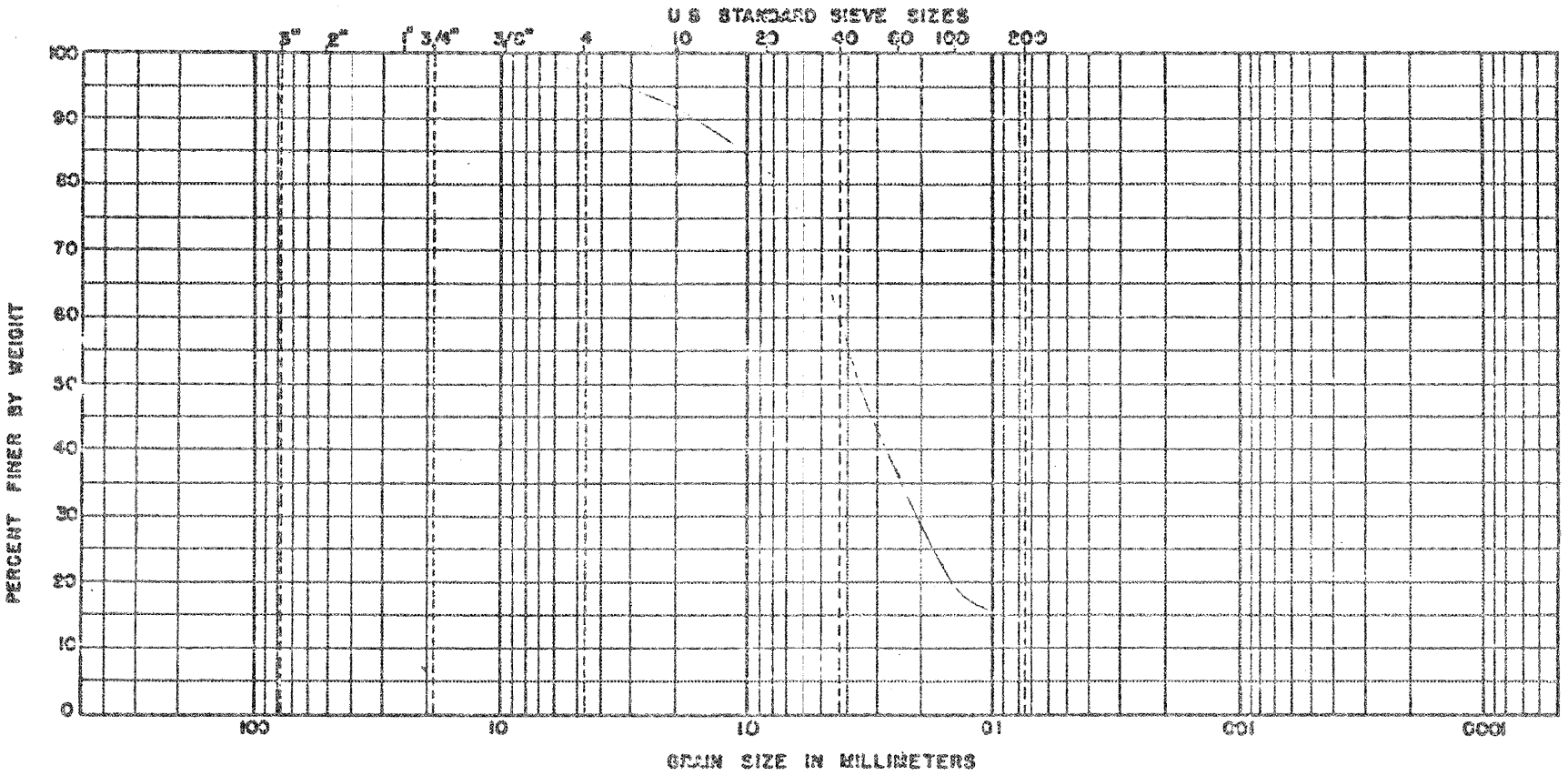
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-117 Sample #27	134.0' - 135.5'	- -	-	-	-	Light grey very silty fine sand Moisture Content - 24.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



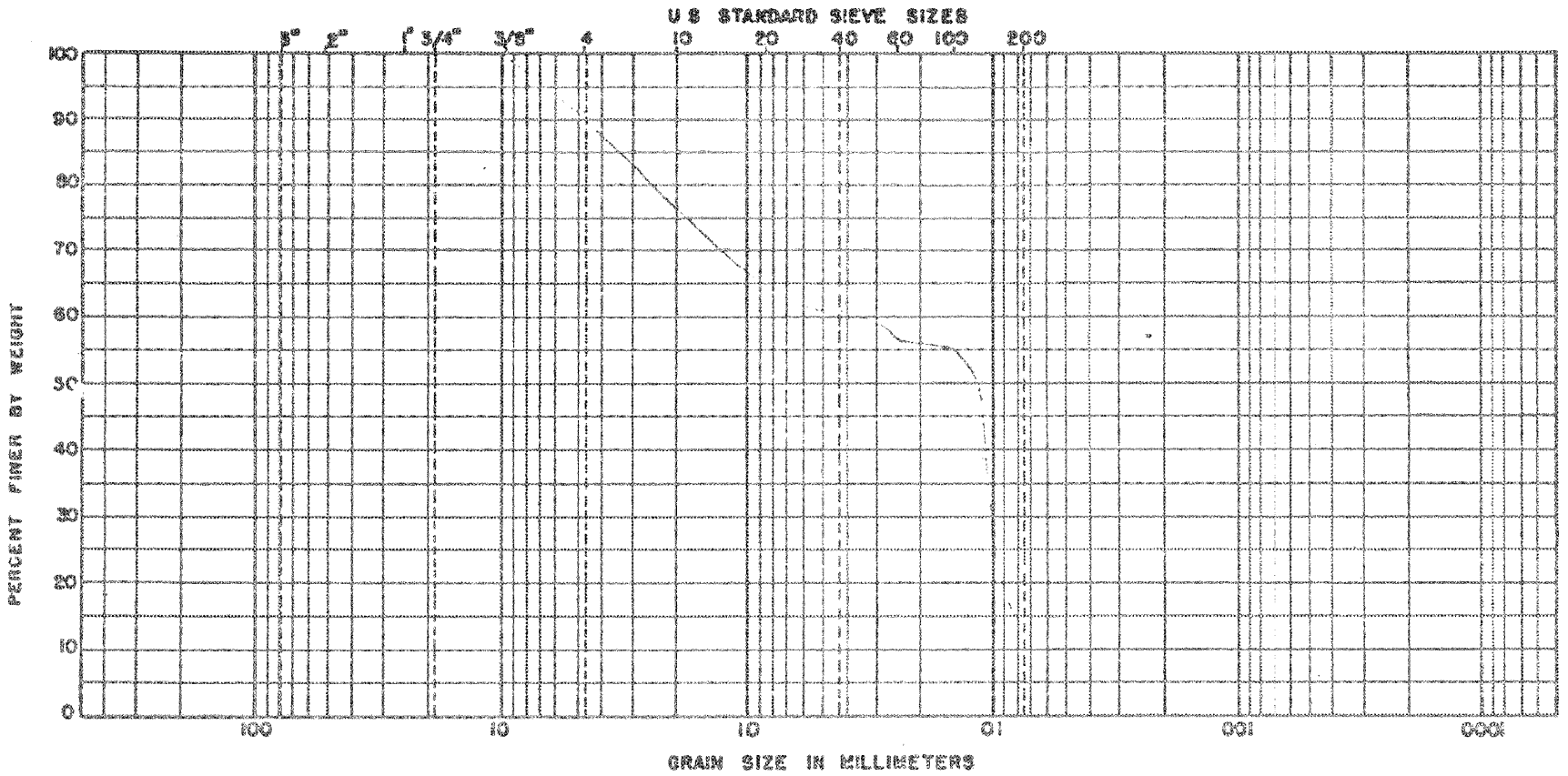
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-117 Sample #28	139.0' - 140.5'	- -	-	-	-	Grey silty fine sand with shell fragments Moisture Content - 33.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

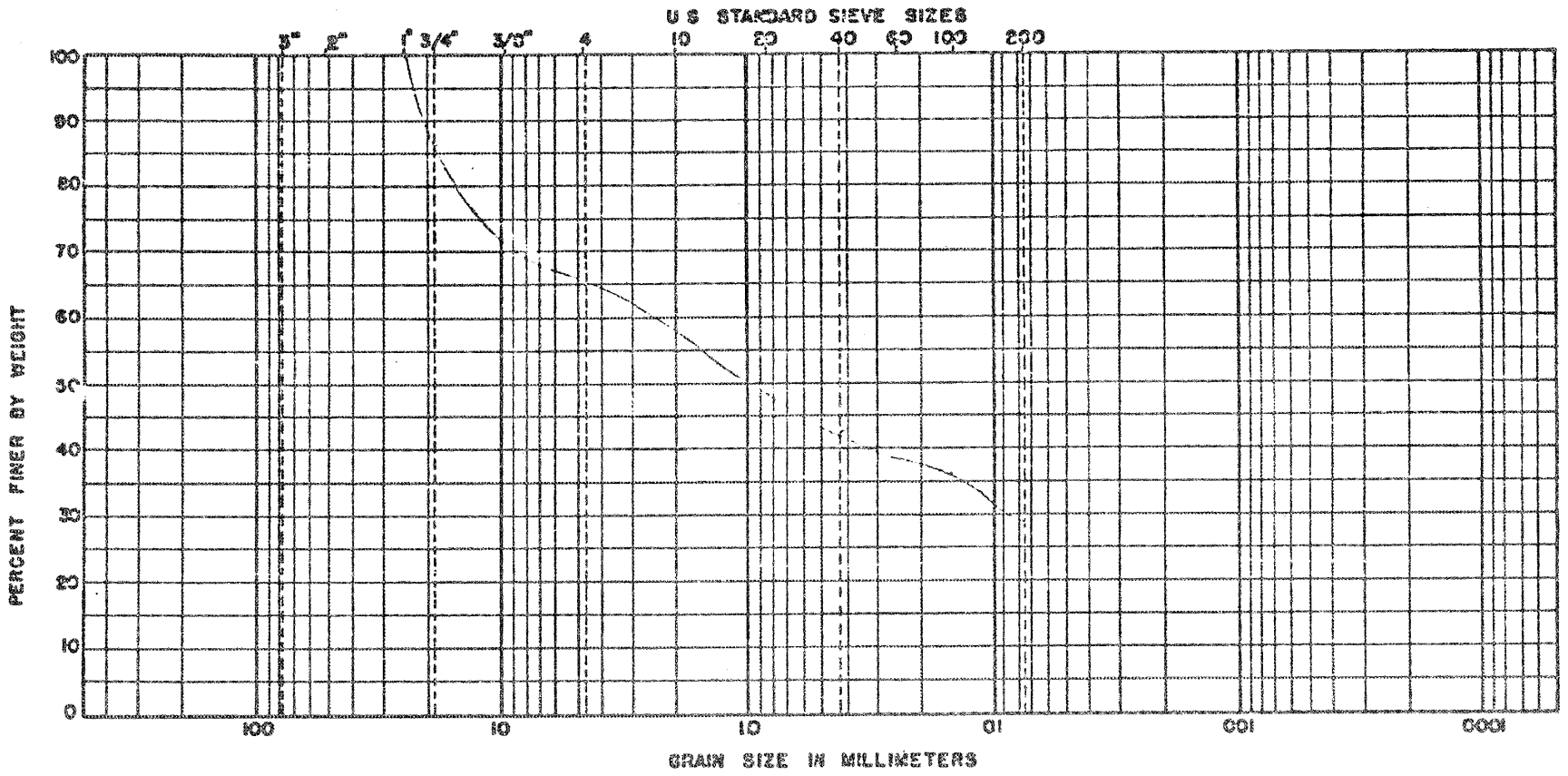
BORING NO	DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-118 Sample #14	69.0' - 70.5'	- -	-	-	-	Grey fine sand with shell Moisture Content - 18.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

2.5A-465



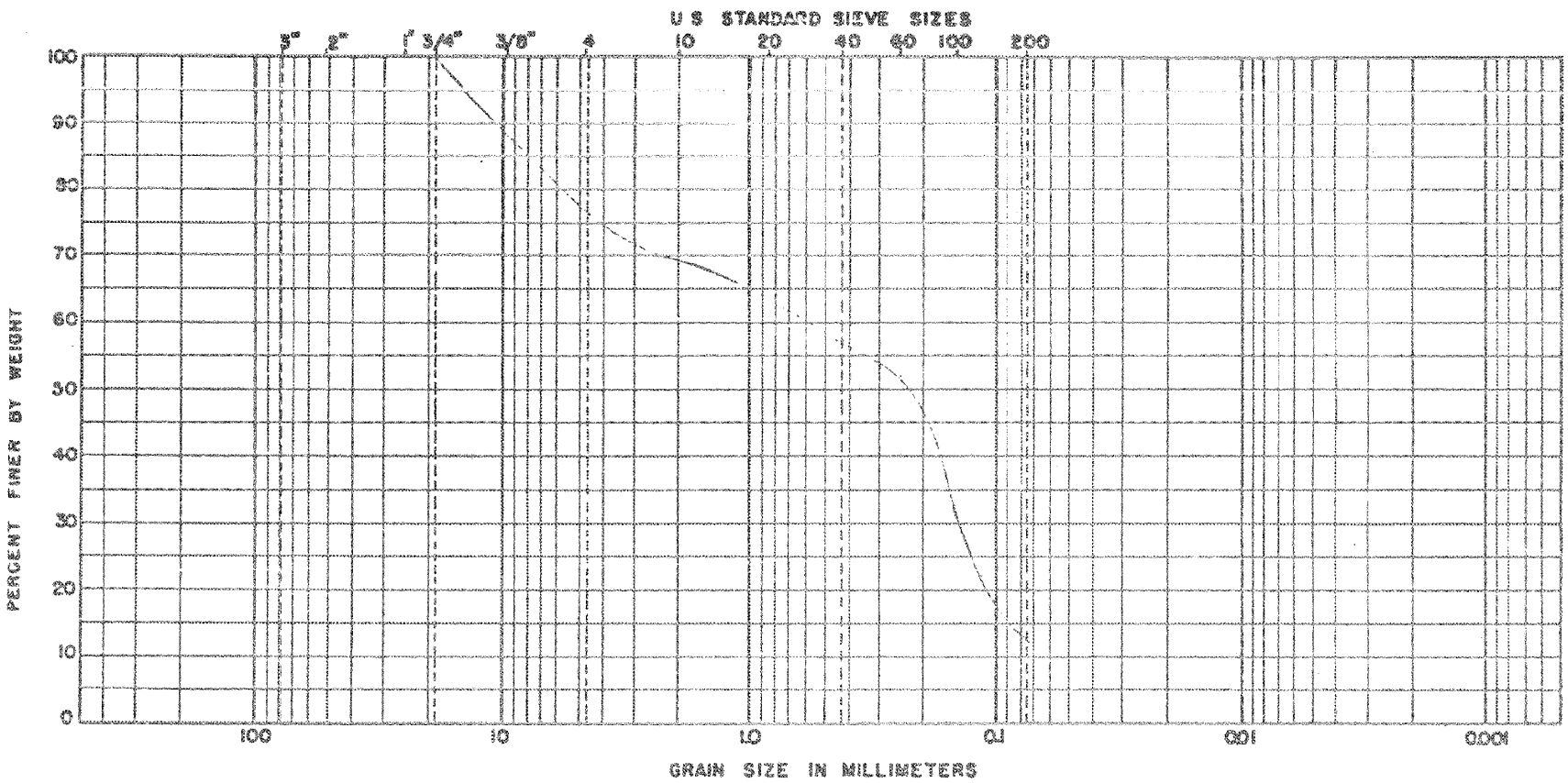
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-118 Sample #21	104.0' - 105.5'	- -	-	-	-	Grey silty fine sand with shell and rock fragments Moisture Content - 20.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



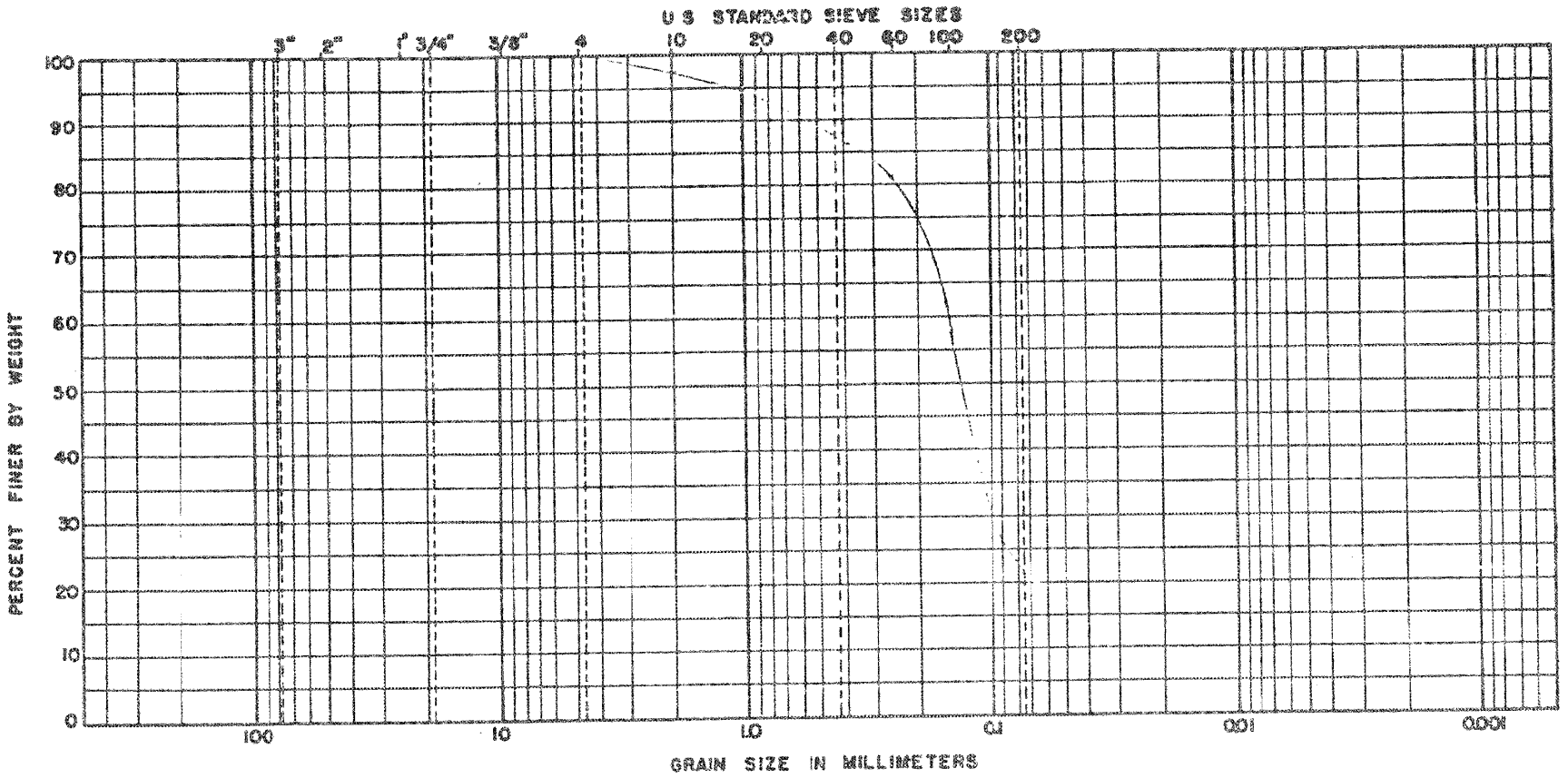
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-118 Sample #24	119.0' - 120.5'	- -	-	-	-	Grey slightly silty fine sand with shell fragments Moisture Content - 24.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



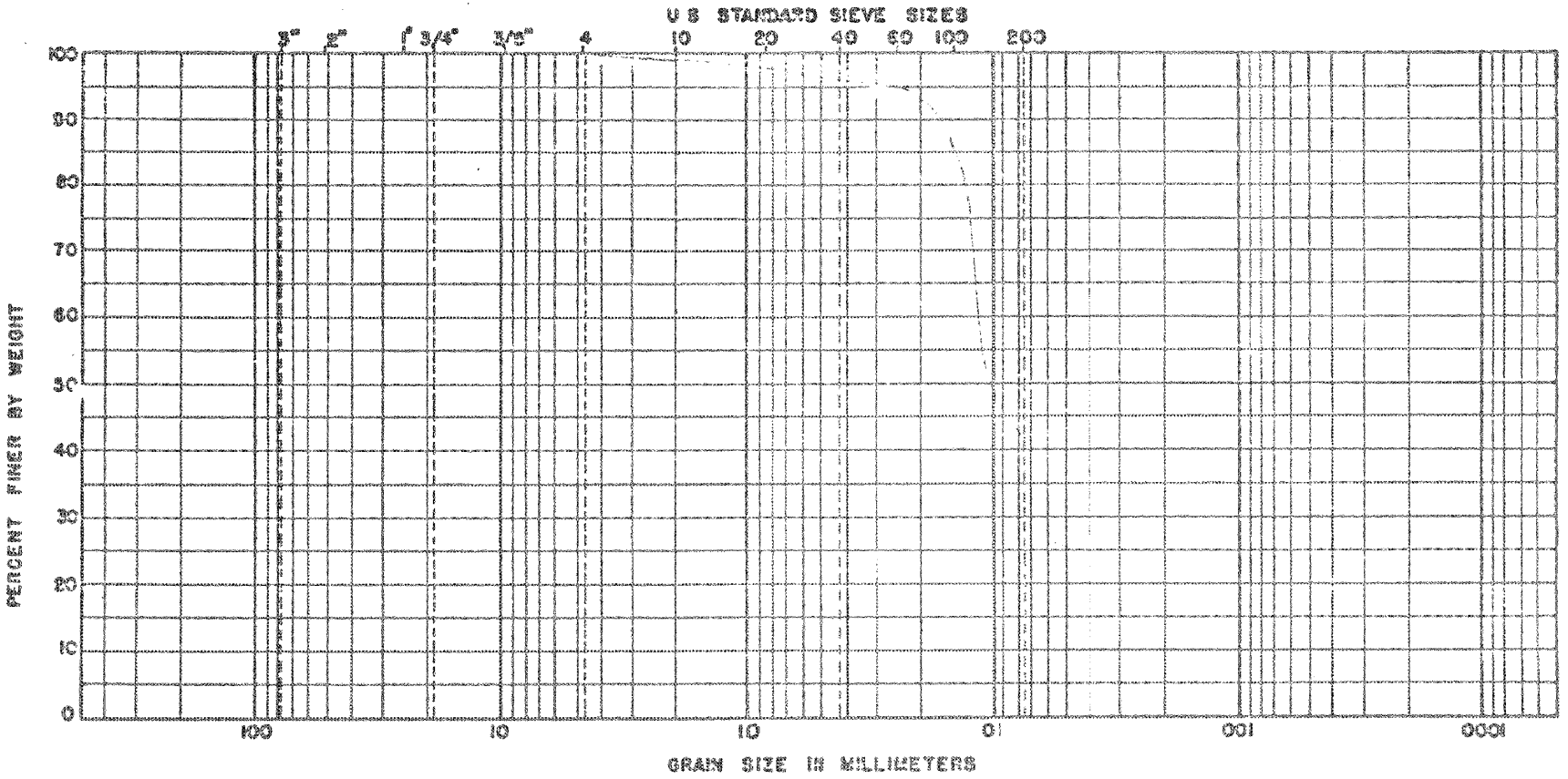
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-118 Sample #26	129.0' - 130.5'	- -	-	-	-	Grey silty fine sand Moisture Content - 33.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



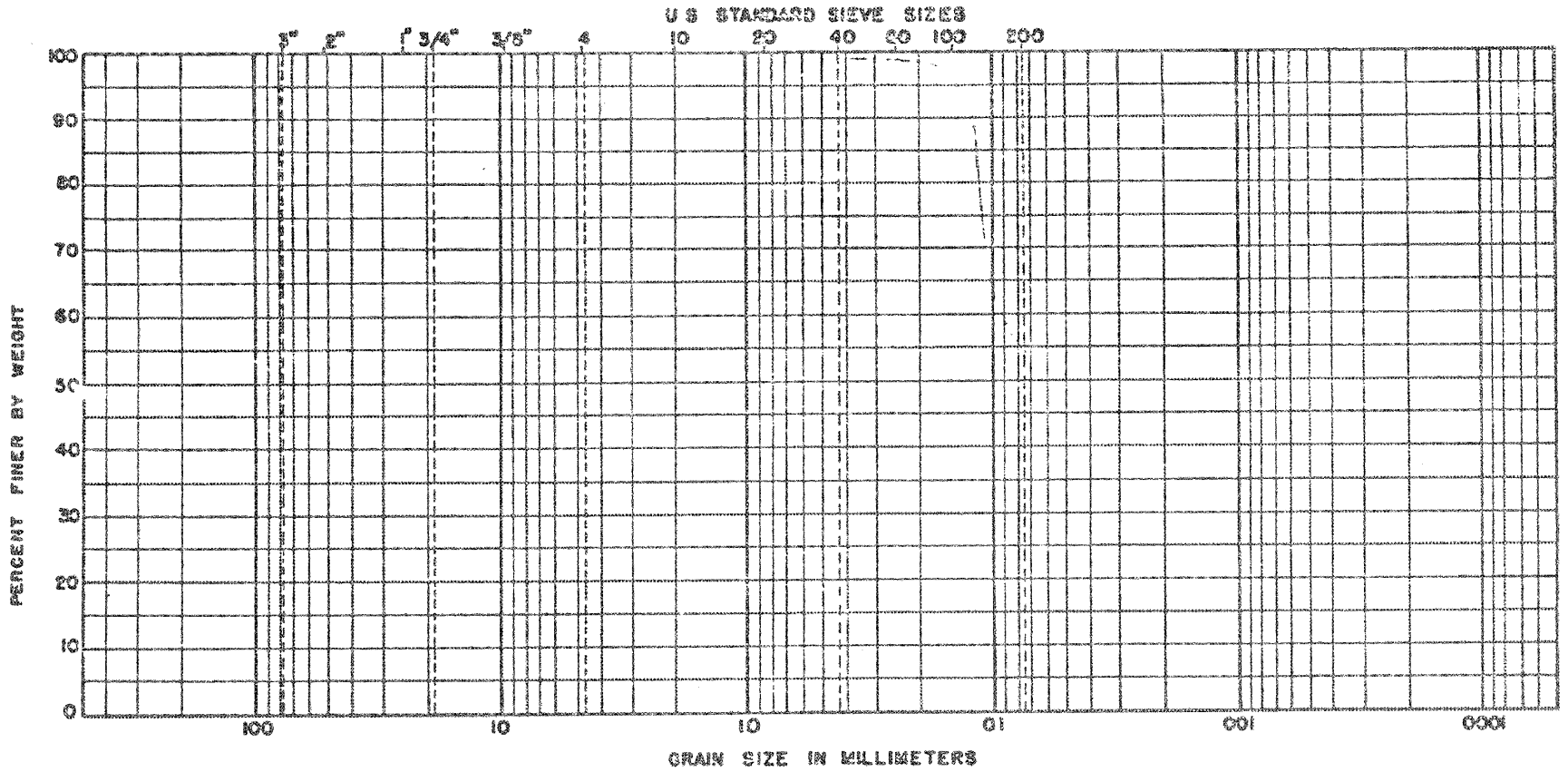
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-118 Sample #28	139.0' - 140.5'	- -	-	-	-	Grey-green silty fine sand Moisture Content - 19.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



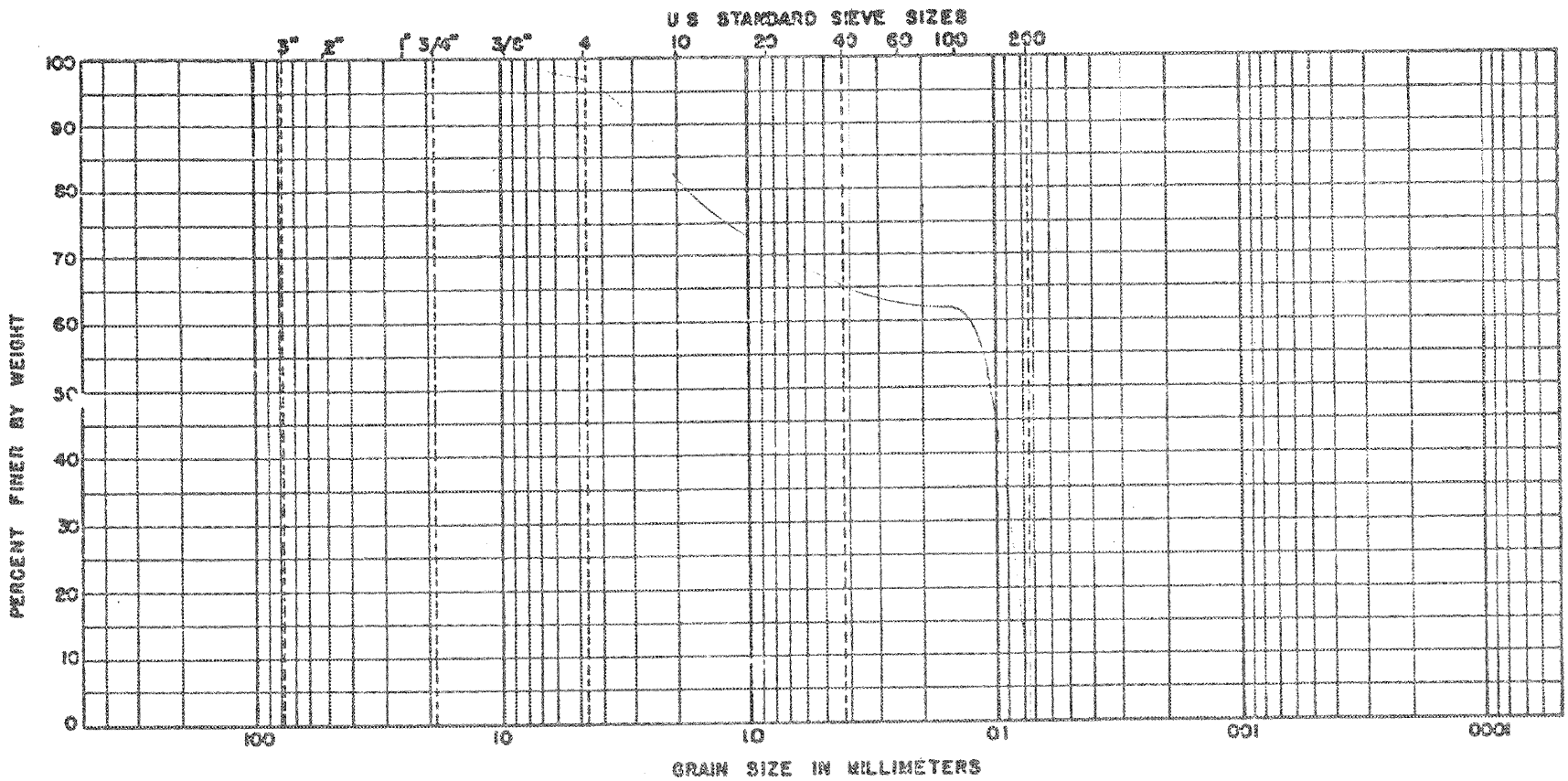
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-118 Sample #29	144.0' - 145.5'	- -	-	-	-	Grey-green silty, clayey fine sand Moisture Content - 31.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



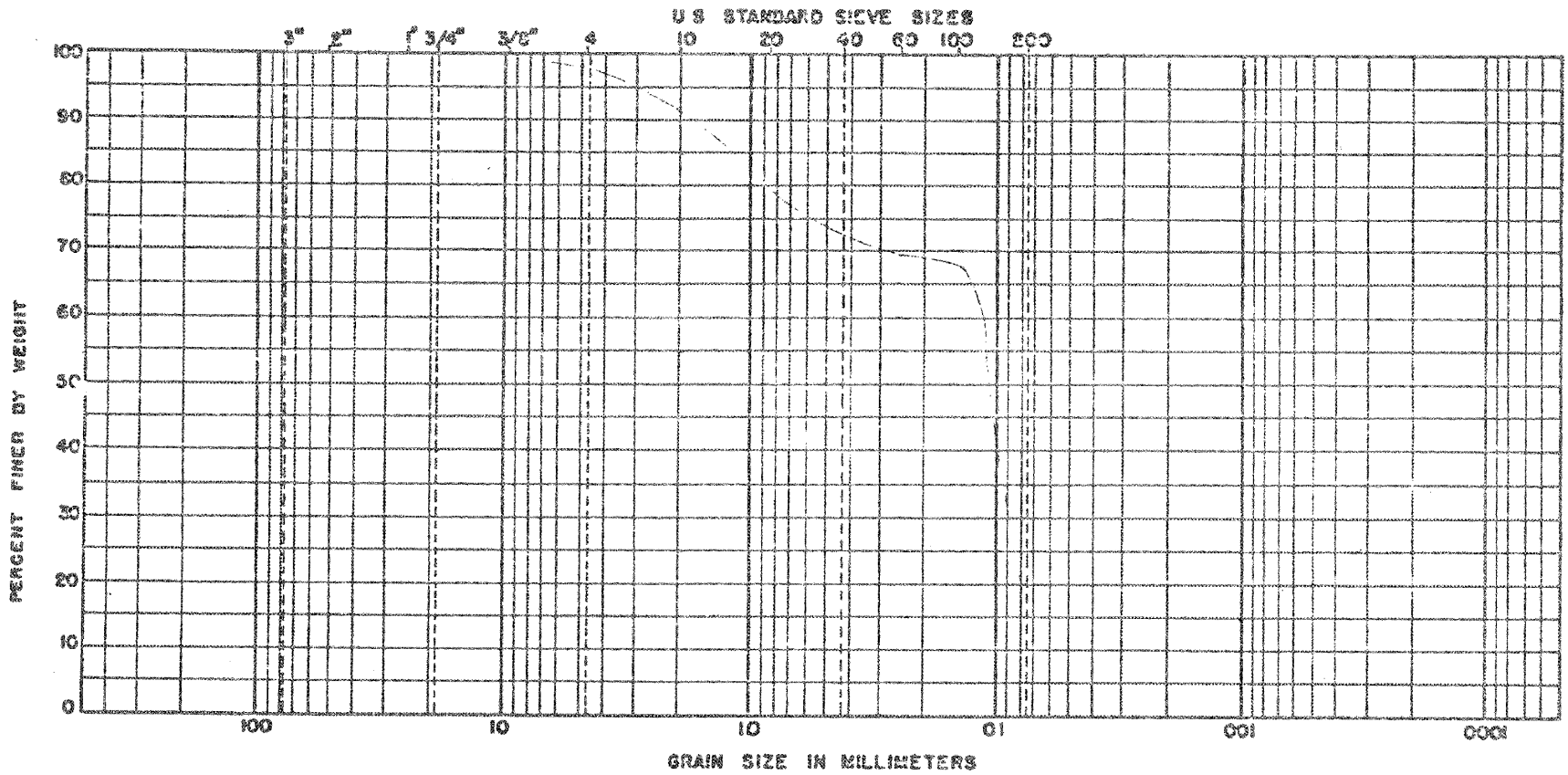
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-119 Sample #15	70.0'	- -	-	-	-	Grey silty sand with some shell fragments Moisture Content - 19.9%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



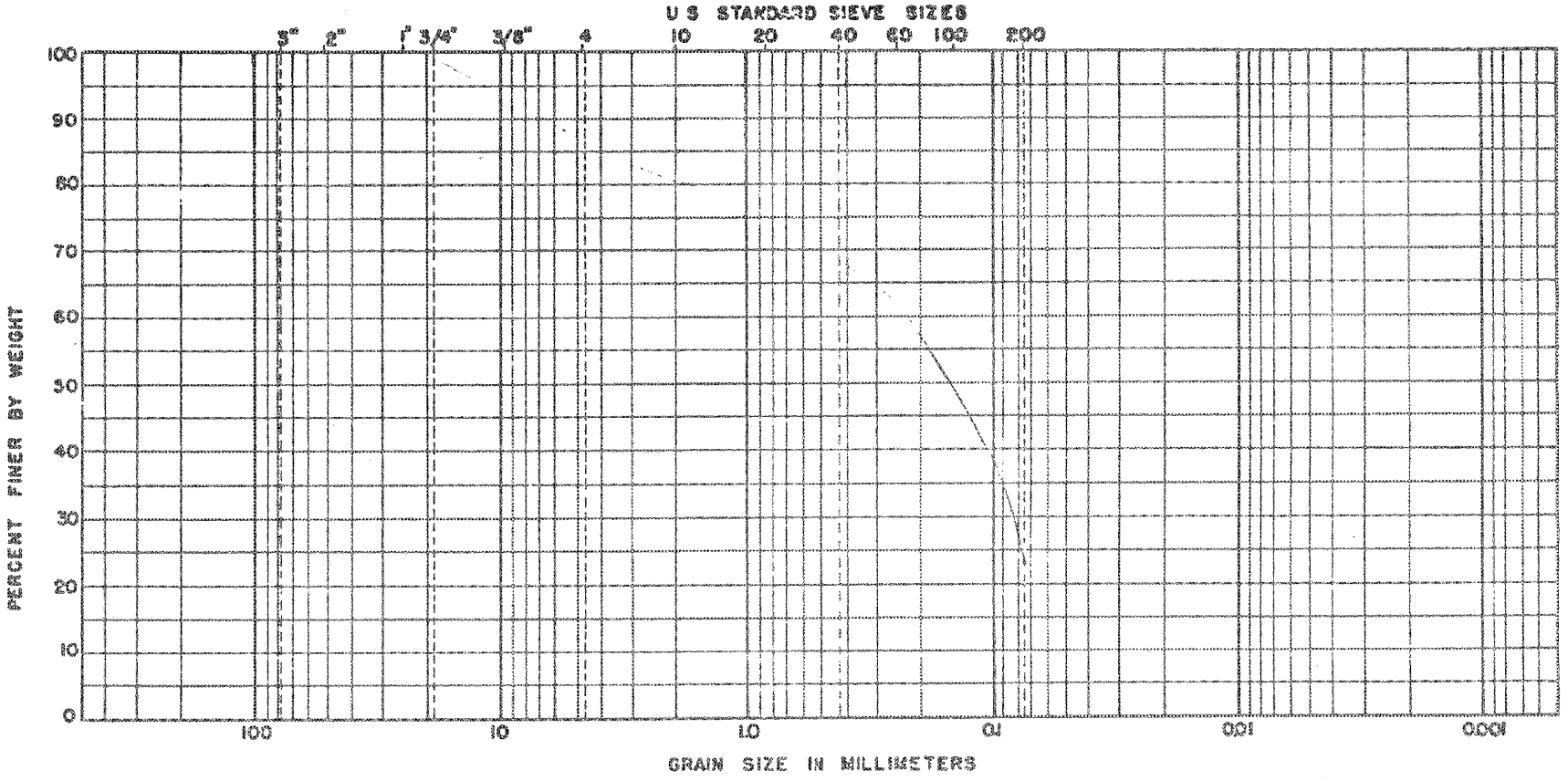
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

CORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-119 Sample #16	75.0'	- -	-	-	-	Grey silty sand with some shell fragments Moisture Content - 21.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



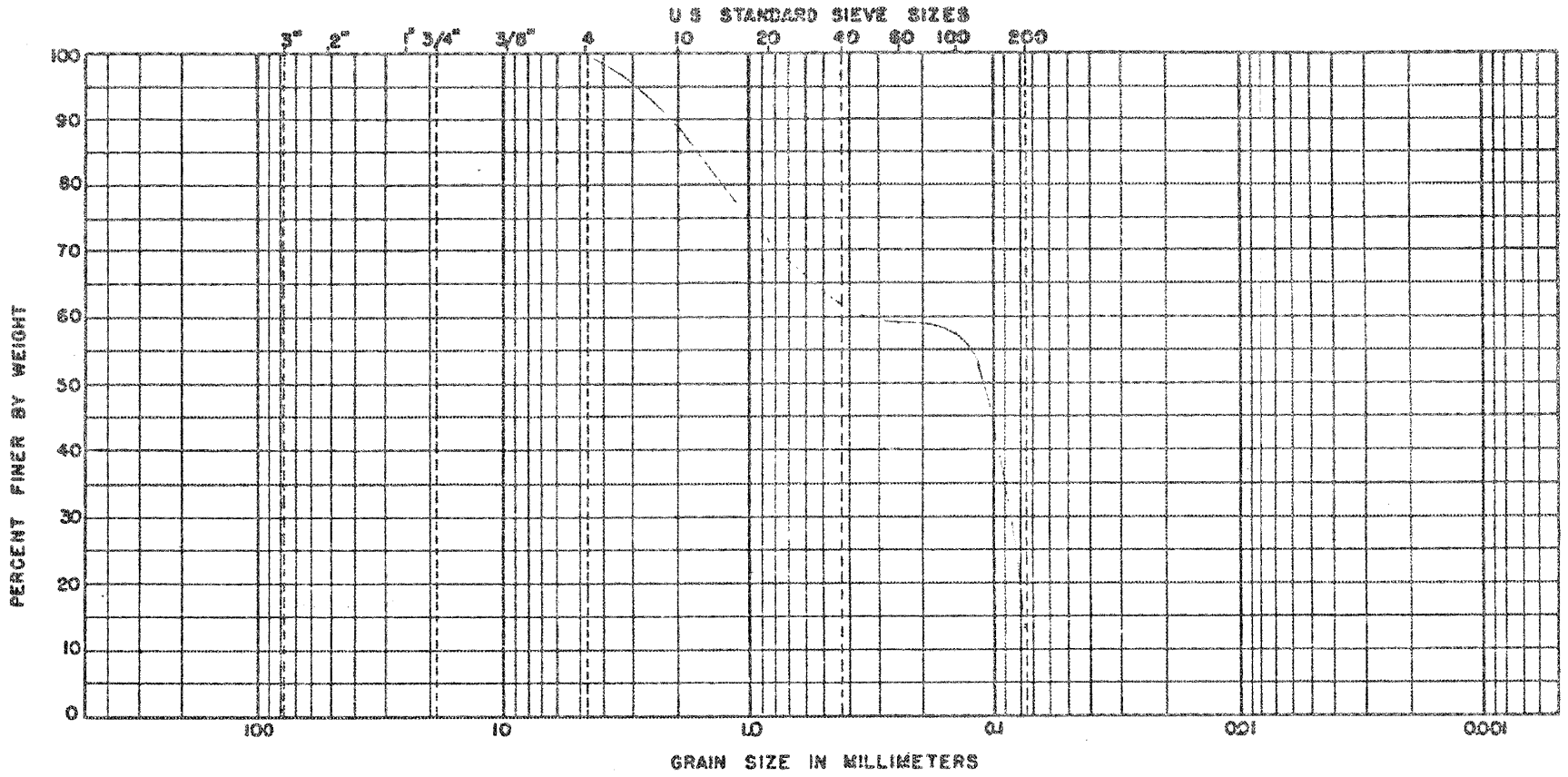
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-119 Sample #27	130.0'	- -	-	-	-	Grey silty fine sand with shell fragments Moisture Content - 24.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



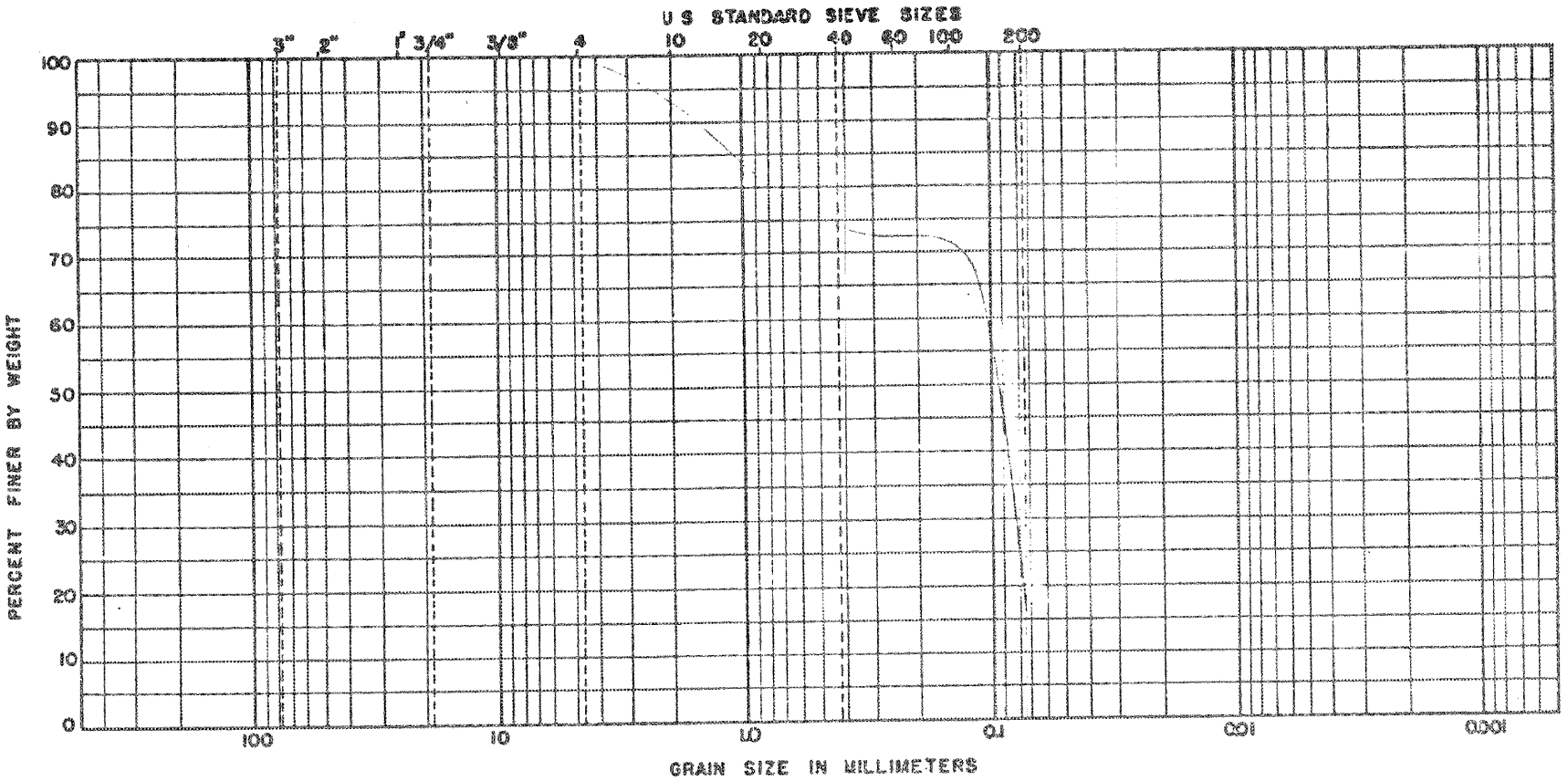
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-121 Sample #15	70.0'	- -	-	-	-	Silty, very fine sand with shell fragments Moisture Content - 20.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

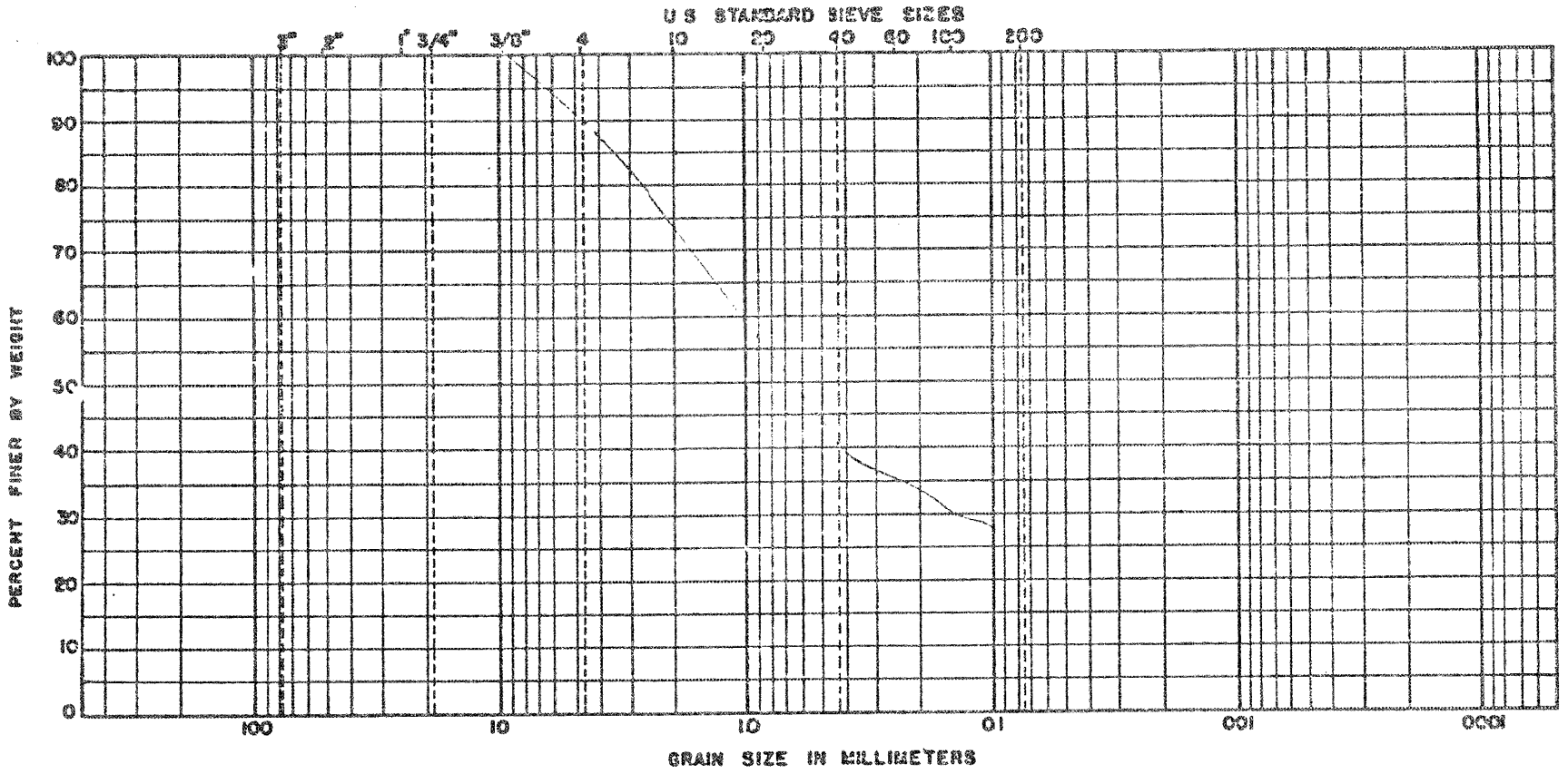
BORING NO	DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-121 Sample #16	75.0'	- -	-	-	-	Grey silty fine sand with shell fragments Moisture Content - 23.5%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

2 SA-475



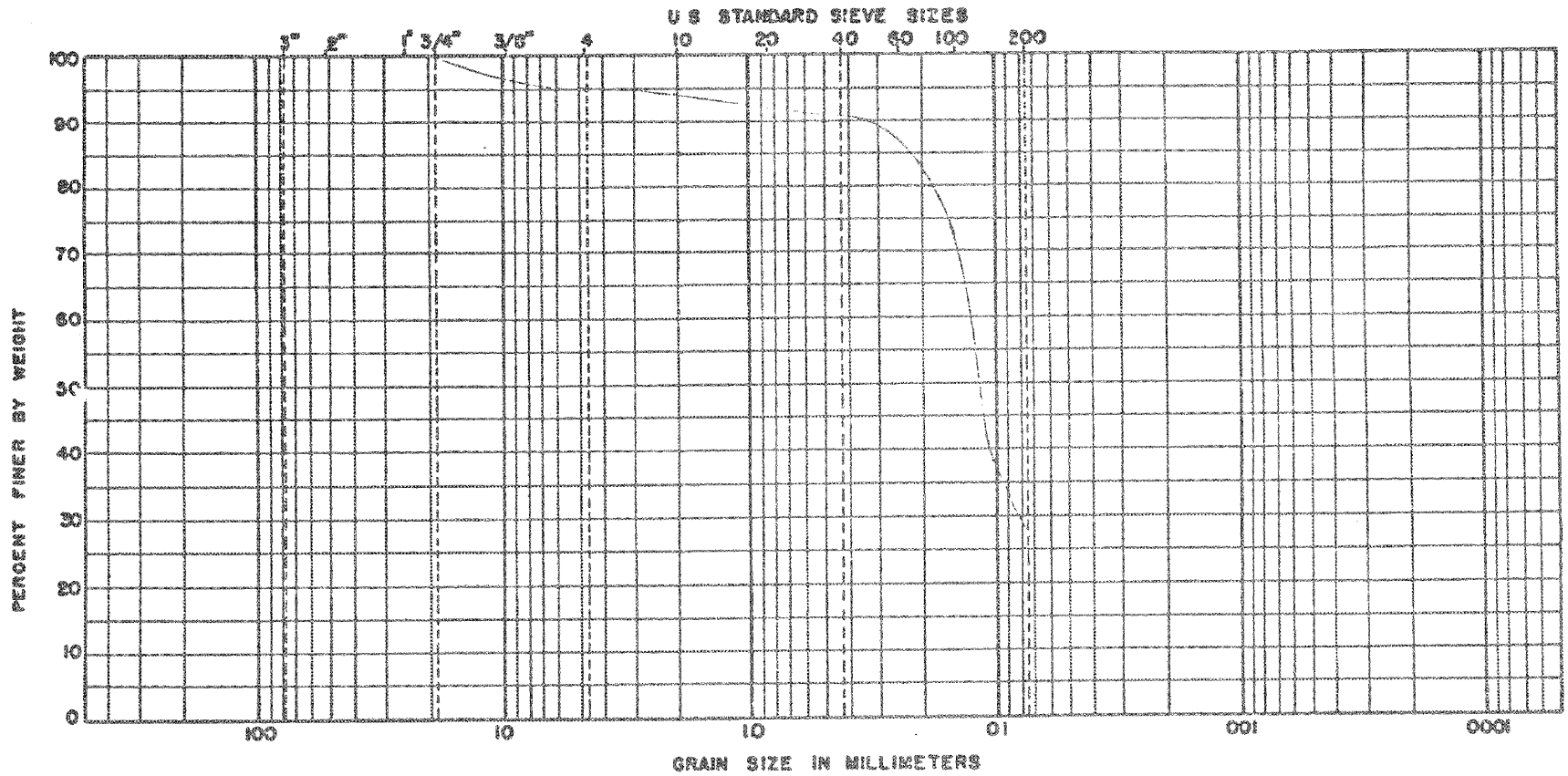
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-121 Sample #17	80.0'	- -	-	-	-	Grey very fine silty sand with shell fragments Moisture Content - 15.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



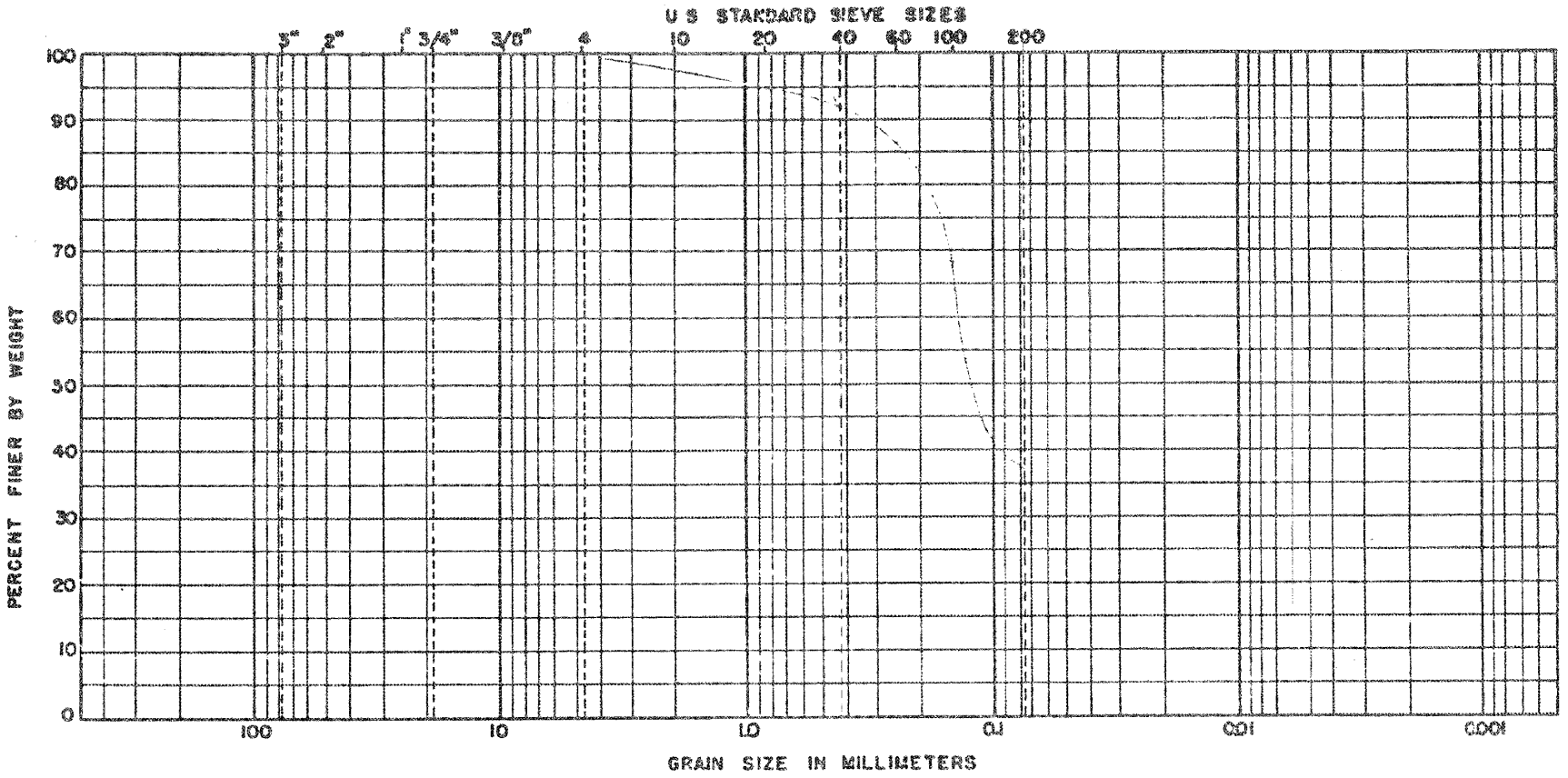
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-121 Sample #27	130.0'	- -	-	-	-	Light grey fine to very fine silty sand with shell fragments Moisture Content - 30.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



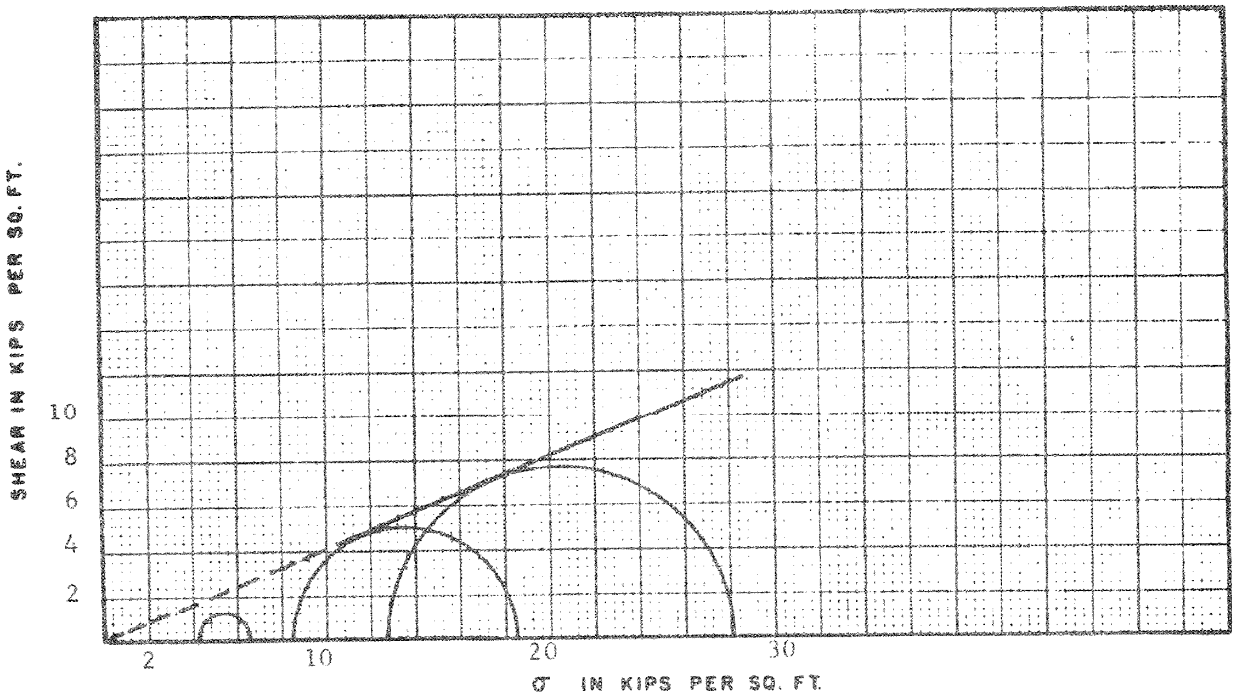
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	[redacted] DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-121 Sample #28	135.0'	- -	-	-	-	Light grey slightly silty fine to very fine sand with shell fragments Moisture Content - 27.5%

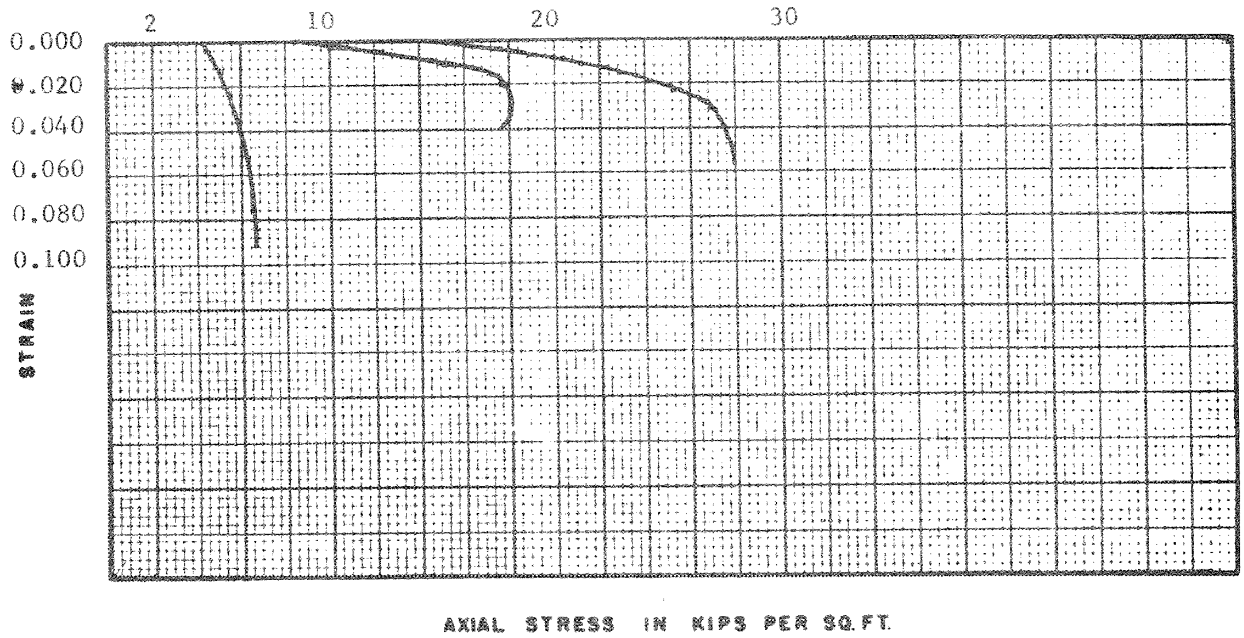
GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

LIGHT GRAY SLIGHTLY CLAYEY SILTY FINE SAND

"COHESION", C 0.0 KSF

ANGLE OF SHEAR RESISTANCE, ϕ 22.5°

UNIT WEIGHT, γ 90 PCF (AVG)

WATER CONTENT, W 33% (AVG)

VOID RATIO, e 0.922 (AVG)

SATURATION, S 95% (AVG)

SEE ATTACHED

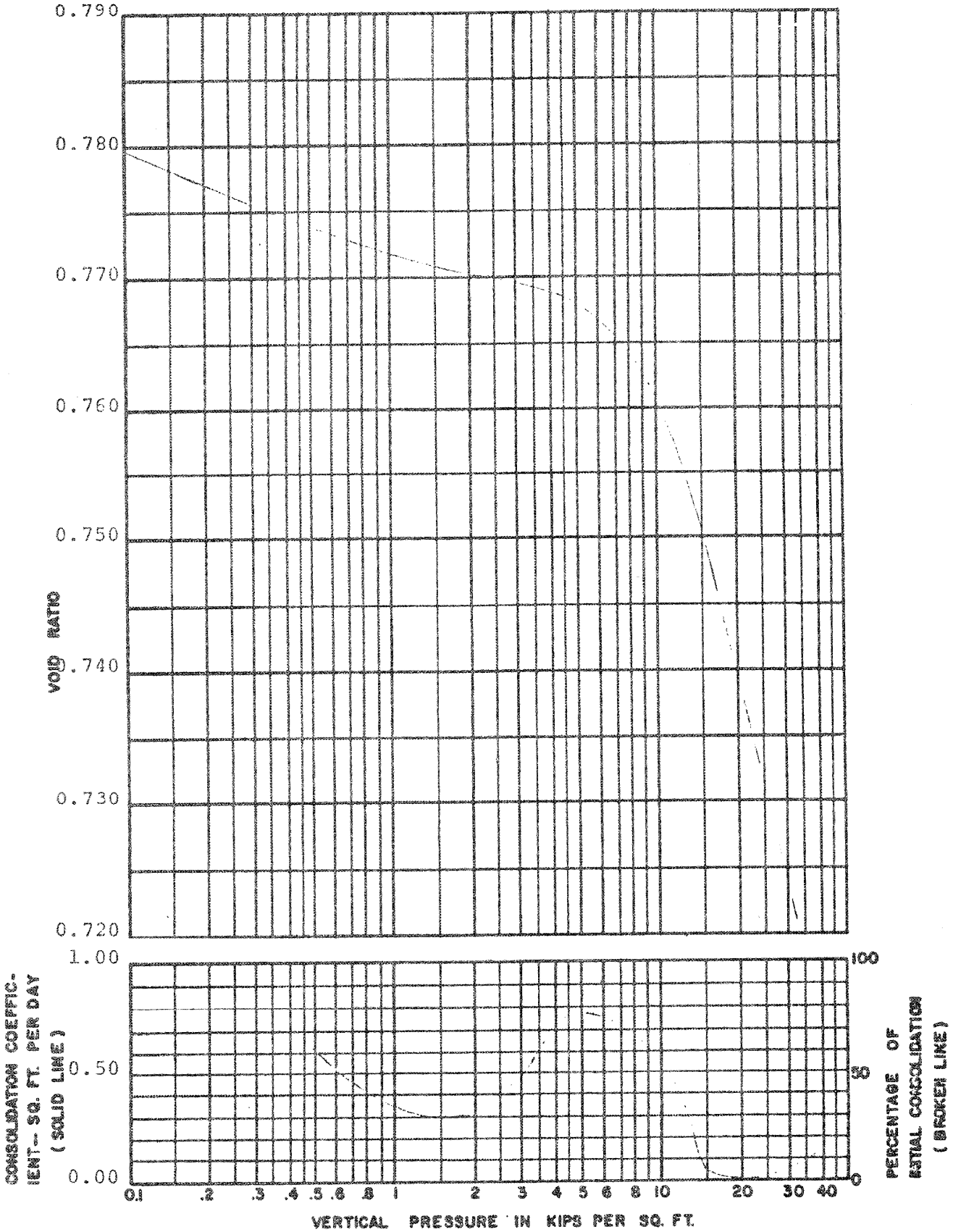
CONSOLIDATED-UNDRAINED

TRIAXIAL SHEAR TEST

BORING NO. B1N SAMPLE NO. UD

ELEV. OR DEPTH 141' JOB NO. EC-163

LAW ENGINEERING TESTING CO



PECIFIC GRAVITY 2.71

COMPRESSION INDEX 0.0820

UNIT WEIGHT 114.4 PCF (WET)

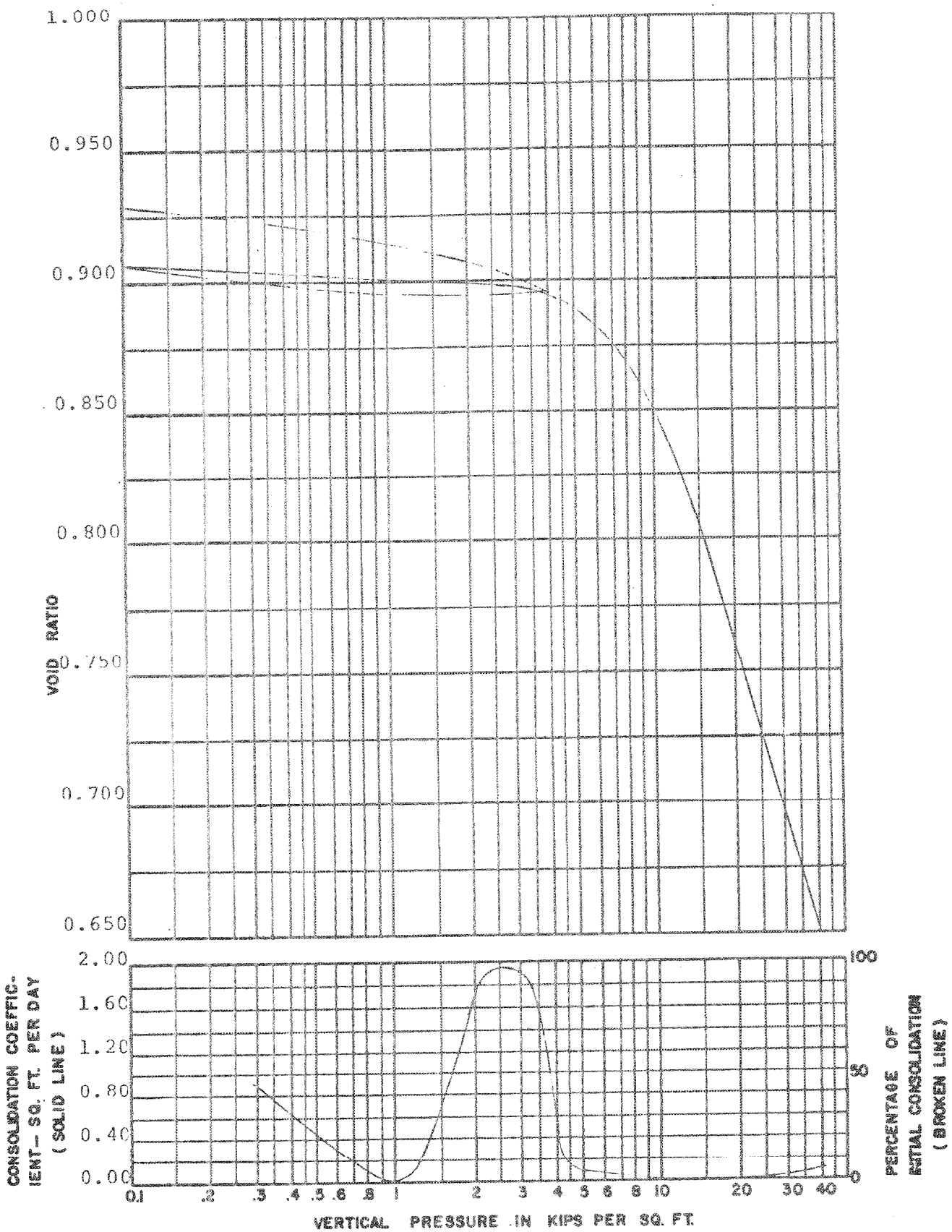
WATER CONTENT 20.6%

SATURATION 71.5%

CONSOLIDATION TEST

BORING NO. B-108A SAMPLE NO. UD

ELEV. OR DEPTH 68' JOB NO. J-1147



SPECIFIC GRAVITY 2.77

COMPRESSION INDEX 0.349

UNIT WEIGHT 112.33 PCF (WET)

WATER CONTENT 24.1%

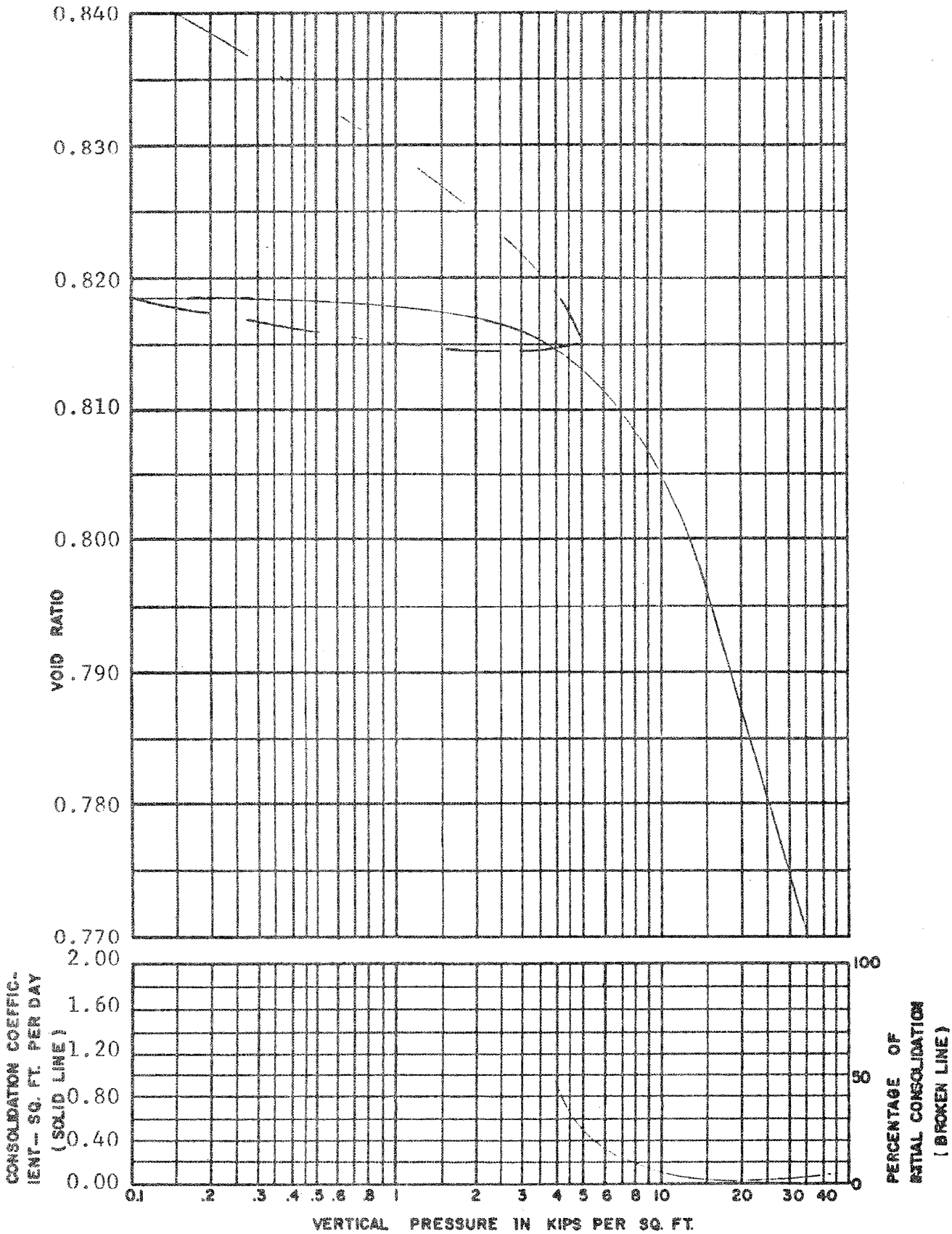
SATURATION 73.6%

CONSOLIDATION TEST

BORING NO. B-108A SAMPLE NO. UD

ELEV. OR DEPTH 82ft. JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



SPECIFIC GRAVITY 2.73

COMPRESSION INDEX 0.073

UNIT WEIGHT 121.86 PCF (WET)

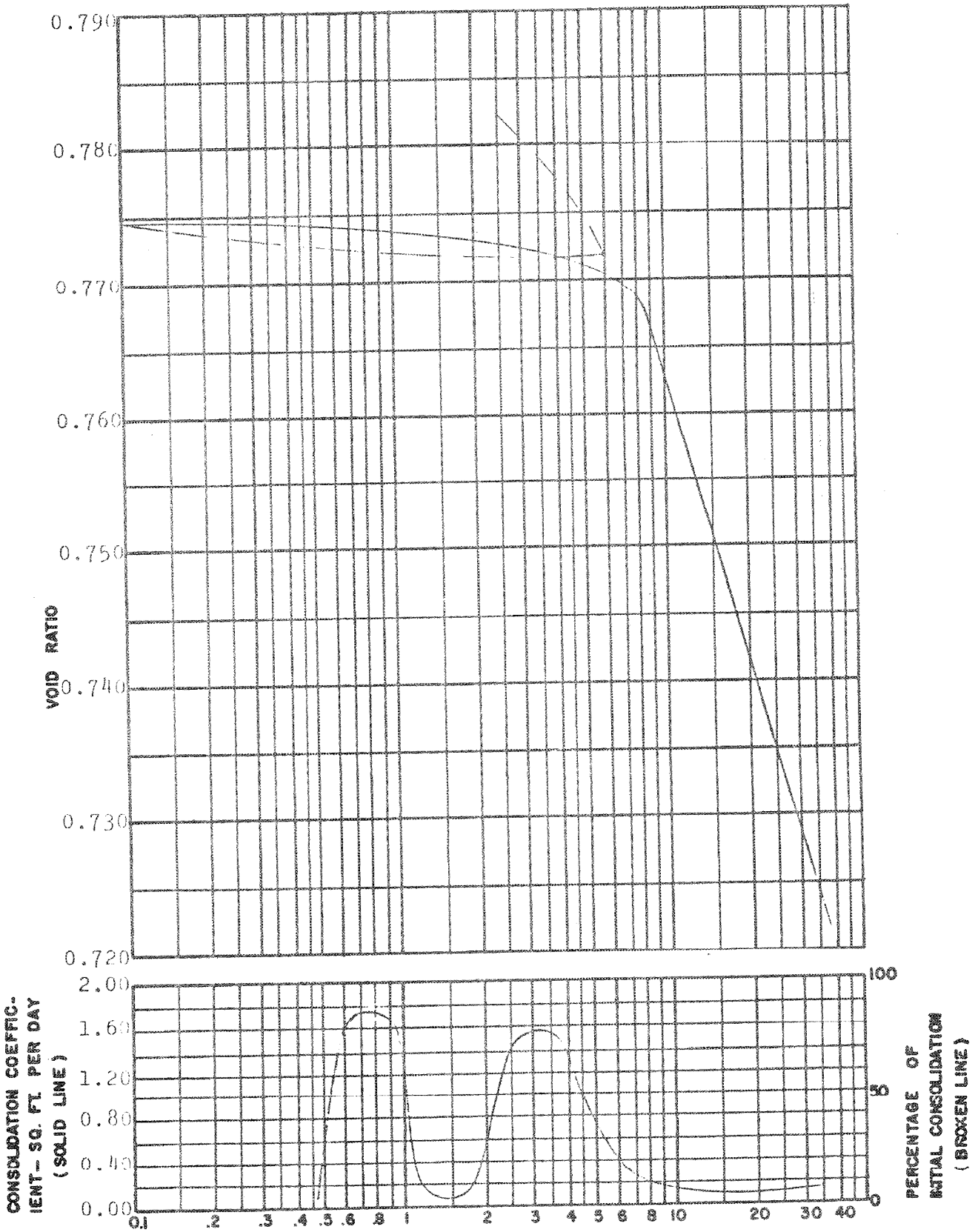
WATER CONTENT 30.3%

SATURATION 101.05%

CONSOLIDATION TEST

BORING NO. B-108A SAMPLE NO. UD

ELEV. OR DEPTH 88Ft. JOB NO. J-1127



SPECIFIC GRAVITY 2.69

COMPRESSION INDEX 0.0689

UNIT WEIGHT 119.01 PCF (WET)

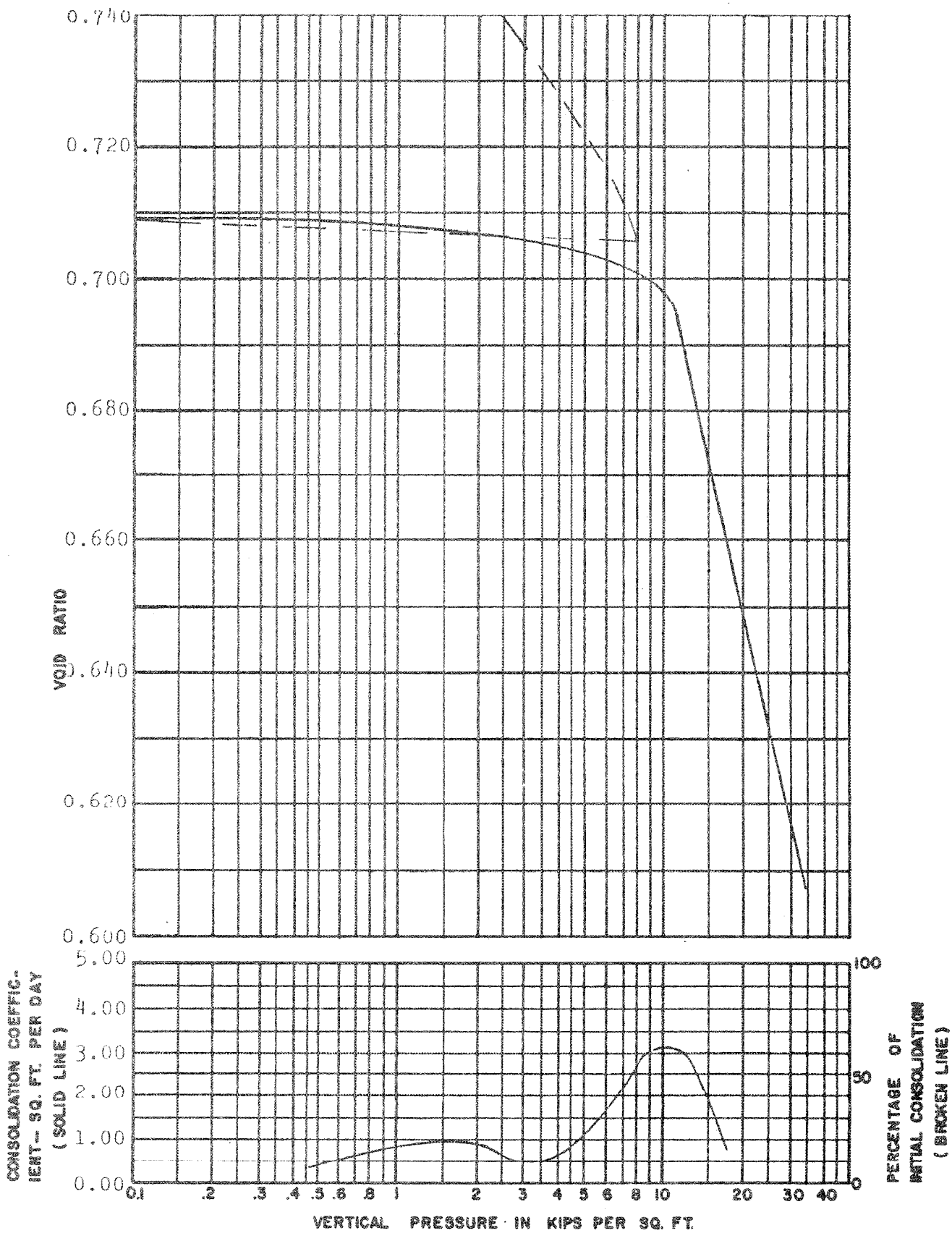
WATER CONTENT 26.0%

SATURATION 90.3%

CONSOLIDATION TEST

BORING NO. B-115 SAMPLE NO. UD

ELEV. OR DEPTH 107.5 FT. JOB NO. J-1127



COMPRESSION INDEX 0.175
UNIT WEIGHT 124.73 PCF (WET)
WATER CONTENT 26.4%
SATURATION 100.0%

2.5A-484

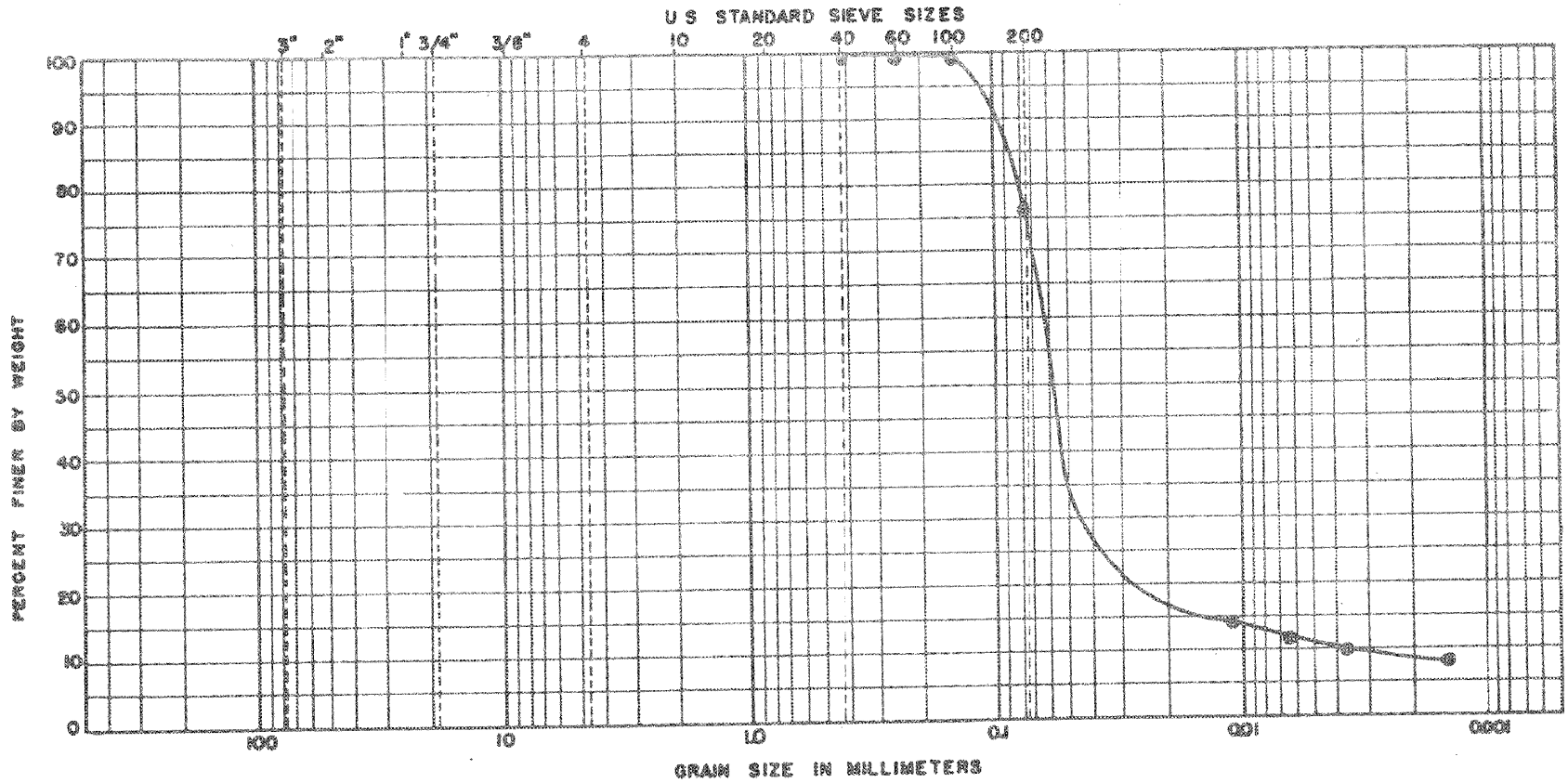
CONSOLIDATION TEST

BORING NO. B-115 SAMPLE NO. UD
ELEV. OR DEPTH 137.5 FT JOB NO. J-1117
LAW ENGINEERING TESTING COMPANY

APPENDIX 2.5A

SECTION 4

DEEP ZONE
(150-400 FT)



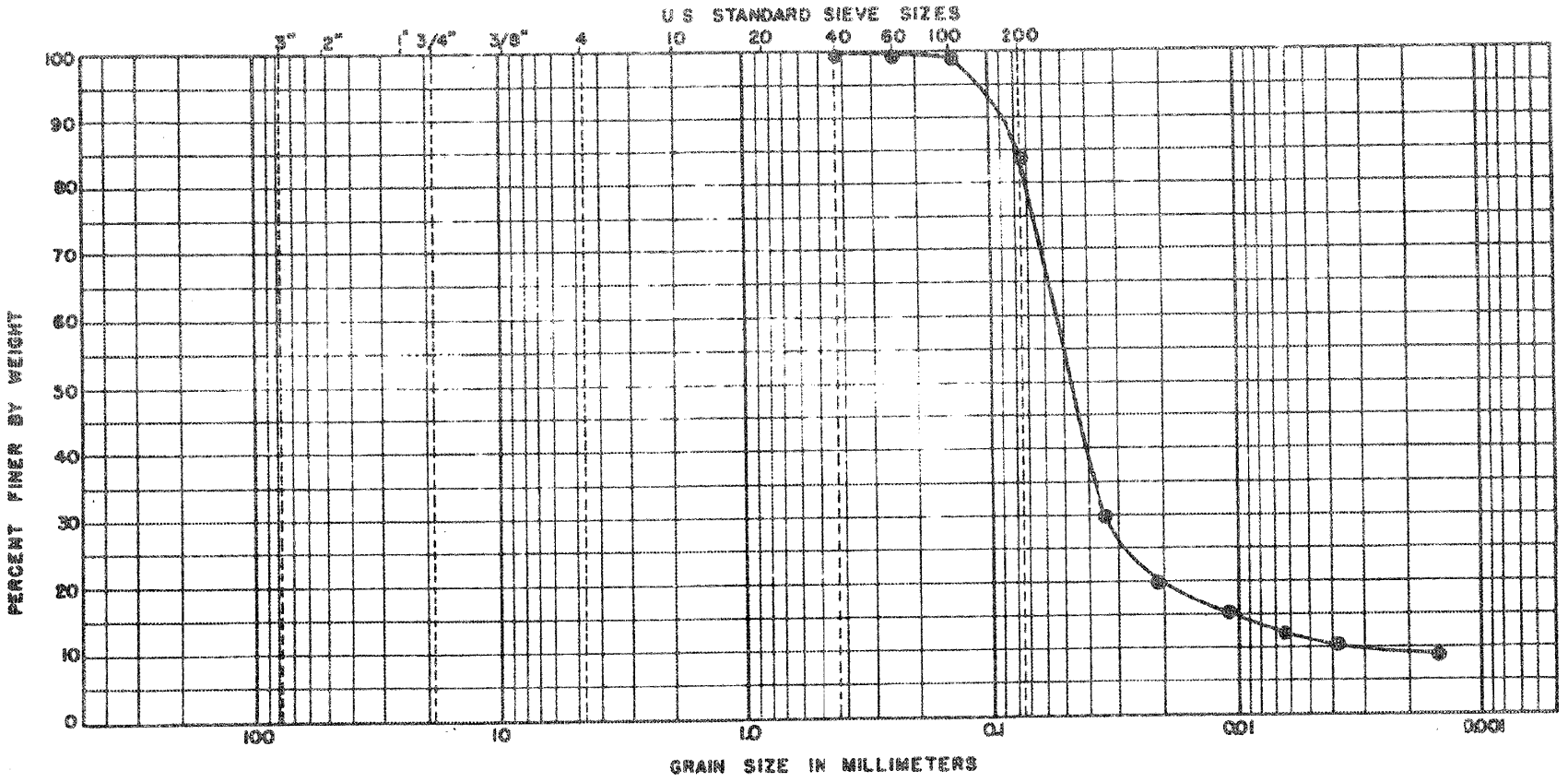
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-1	250.1 - 252.1					Green Clayey, very fine sandy silt with mica.

GRAIN SIZE DISTRIBUTION

JOB NO. EC 163

LAW ENGINEERING TESTING COMPANY



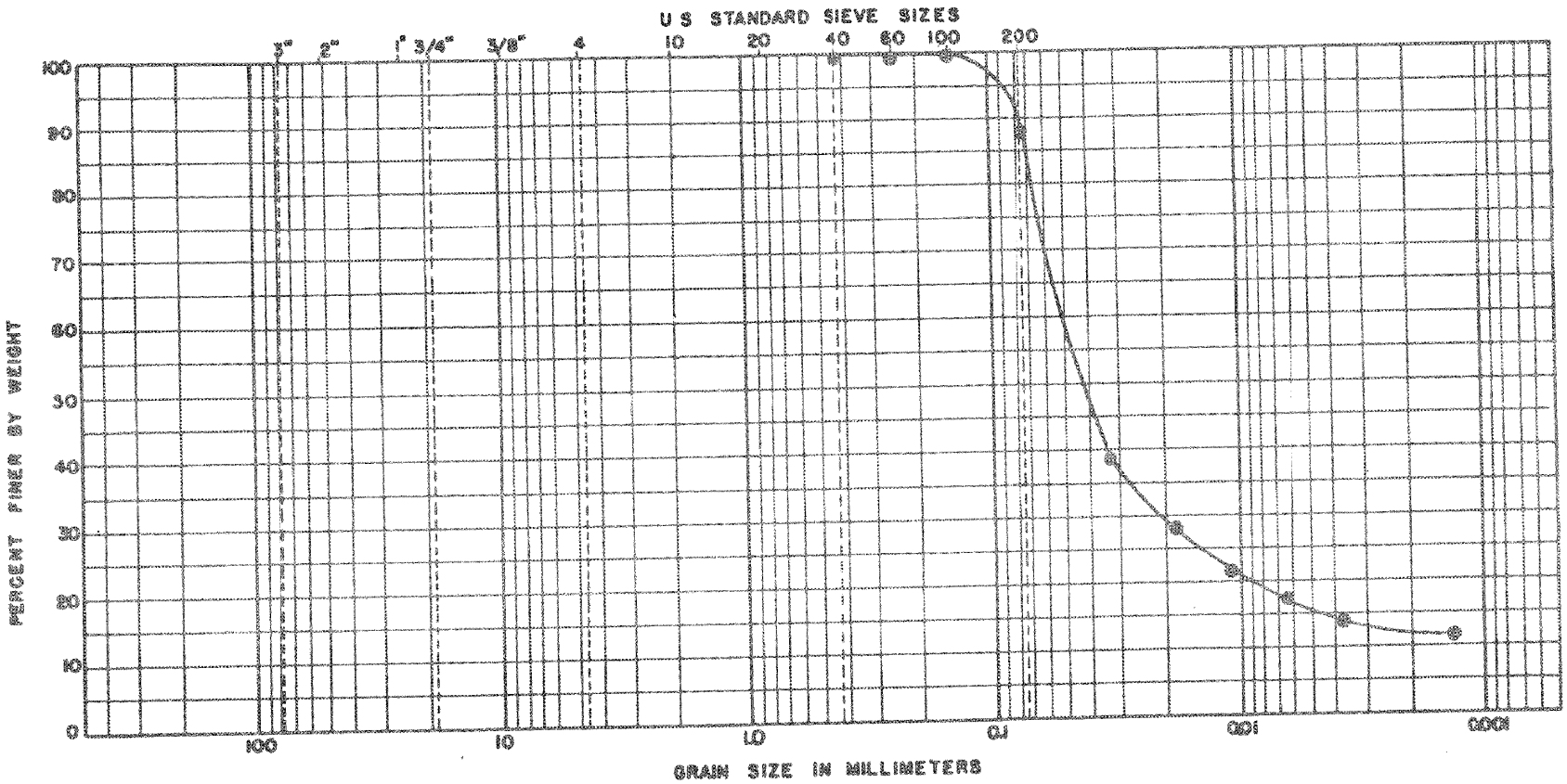
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1	260.2 - 262.2					Green Clayey, very fine sandy silt with mica

GRAIN SIZE DISTRIBUTION

JOB NO. CCEC163

LAW ENGINEERING TESTING COMPANY



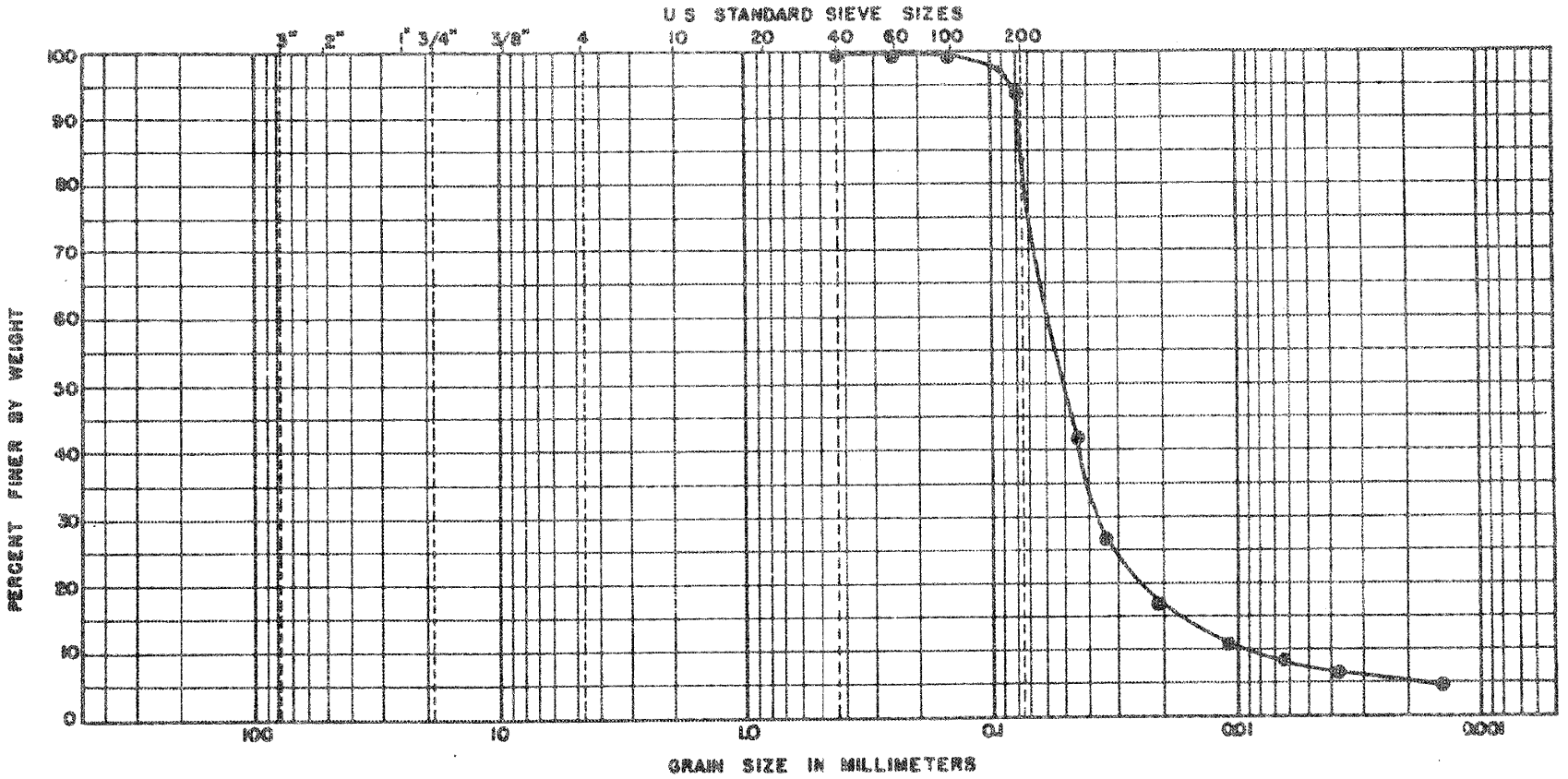
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-1	275.7 - 277.7					Green Clayey very fine sandy silt with mica.

GRAIN SIZE DISTRIBUTION

JOB NO. EC 163

LAW ENGINEERING TESTING COMPANY



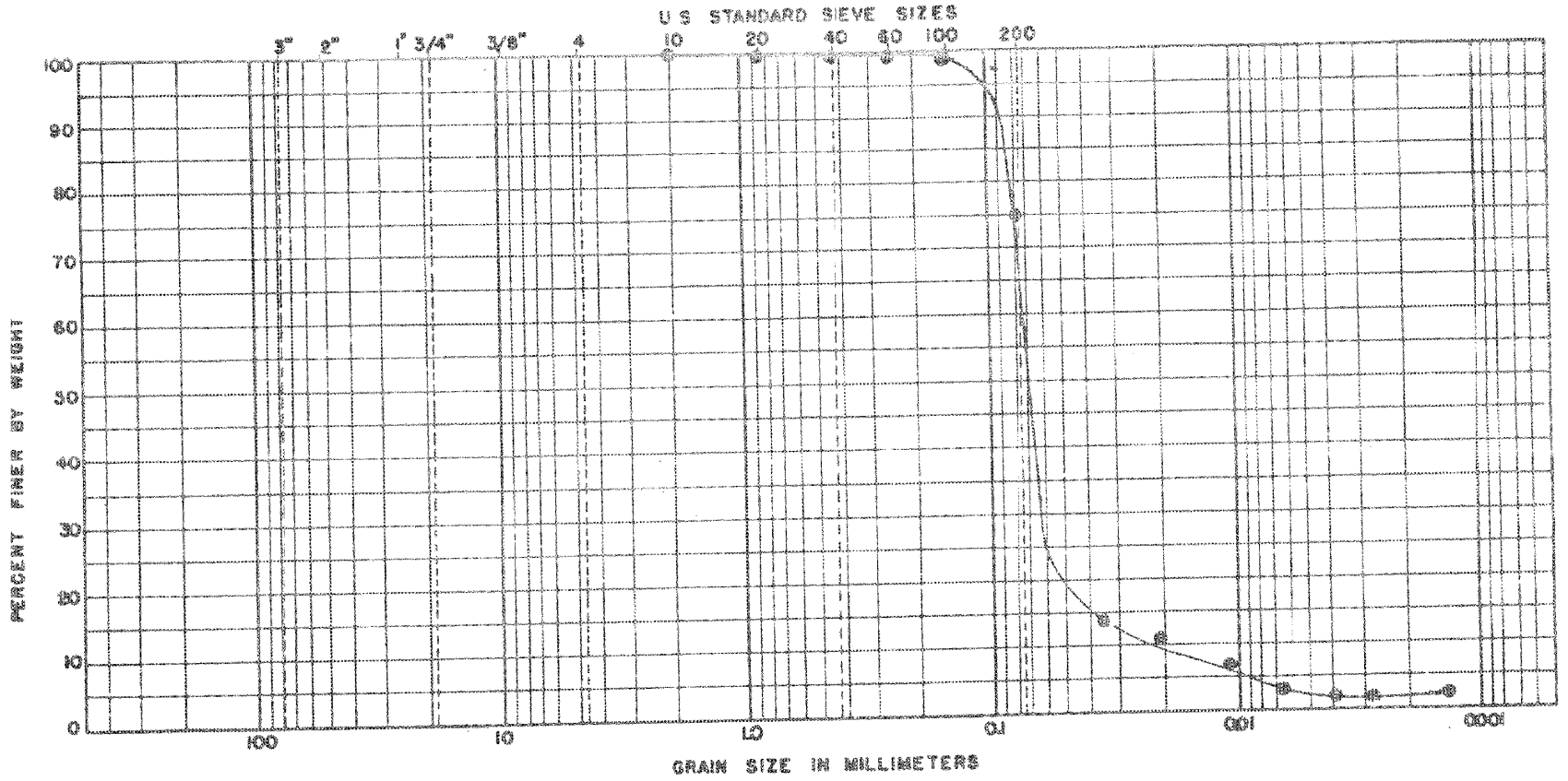
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-1	290.7 - 292.7					Green Clayey, very fine sandy silt with mica.

GRAIN SIZE DISTRIBUTION

JOB NO. EC 163

LAW ENGINEERING TESTING COMPANY



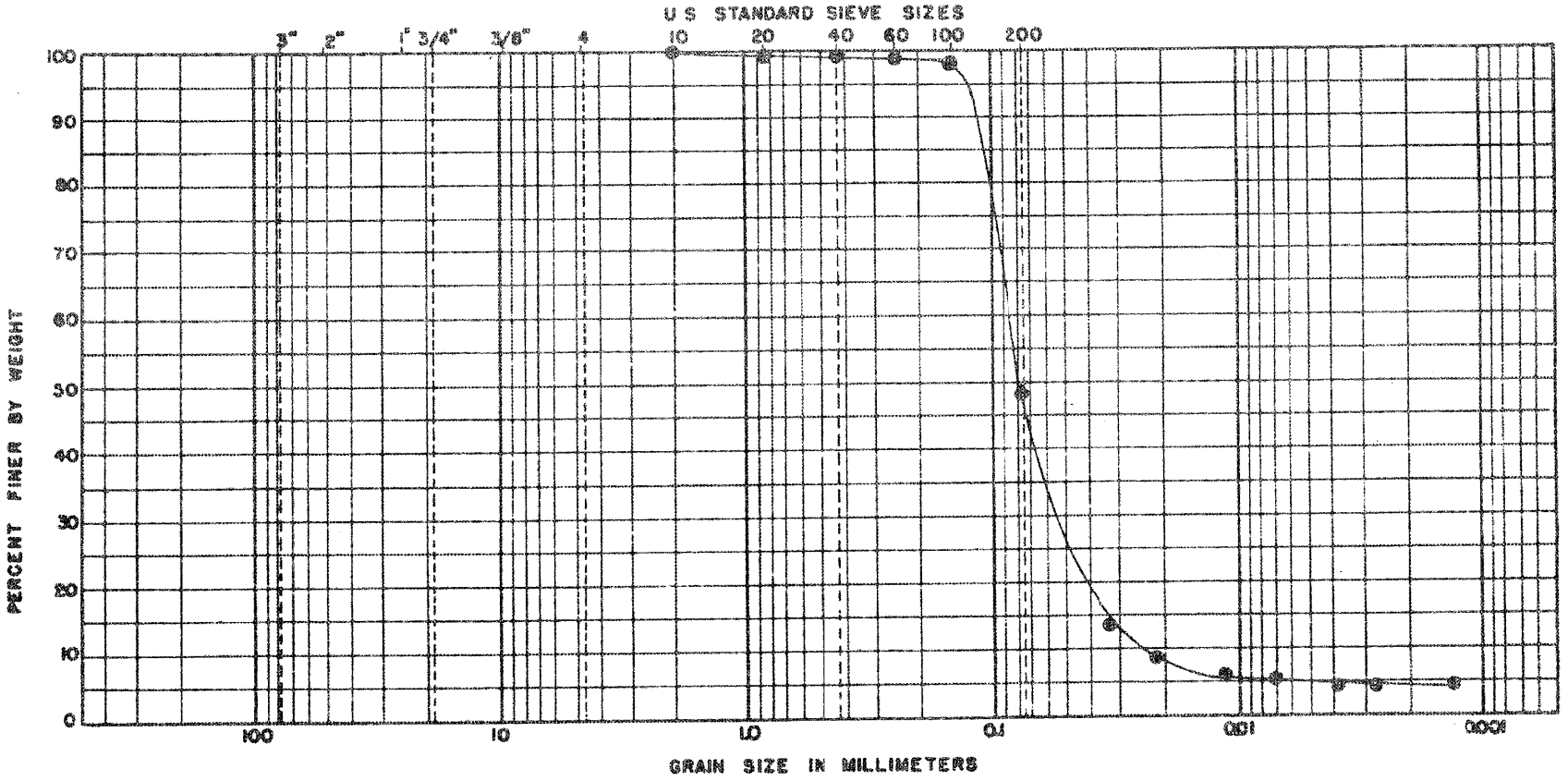
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	~~ELEV~~ OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
B-5	156'-157.5'					GREEN SLIGHTLY CLAYEY VERY FINE SANDY SILT WITH TRACE OF MICA

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



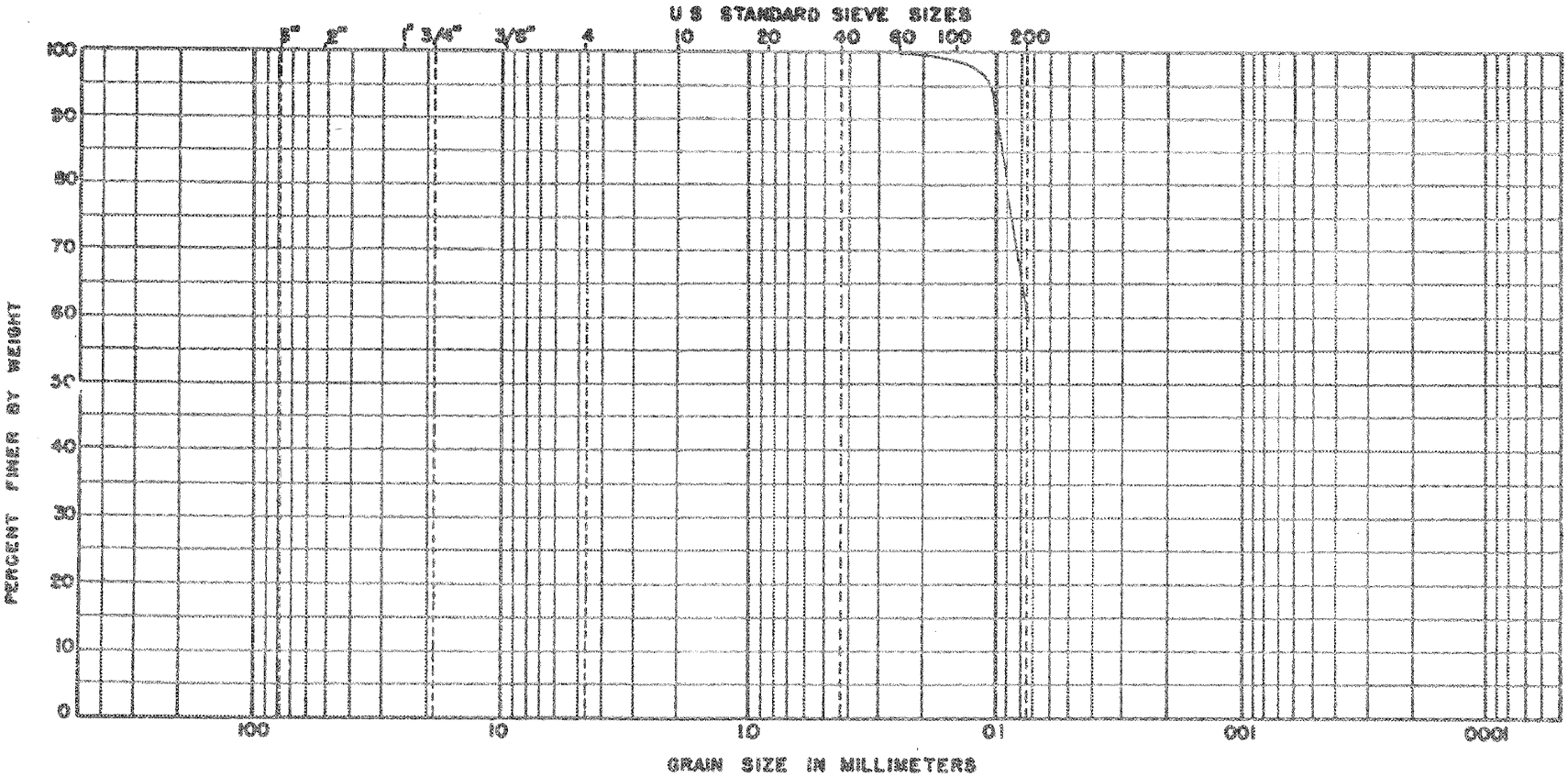
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
B-5	231'-232.5'					GREEN SLIGHTLY CLAYEY SILTY VERY FINE SAND WITH TRACE OF MICA UNIFIED SOIL CLASSIFICATION = SM

GRAIN SIZE DISTRIBUTION

JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



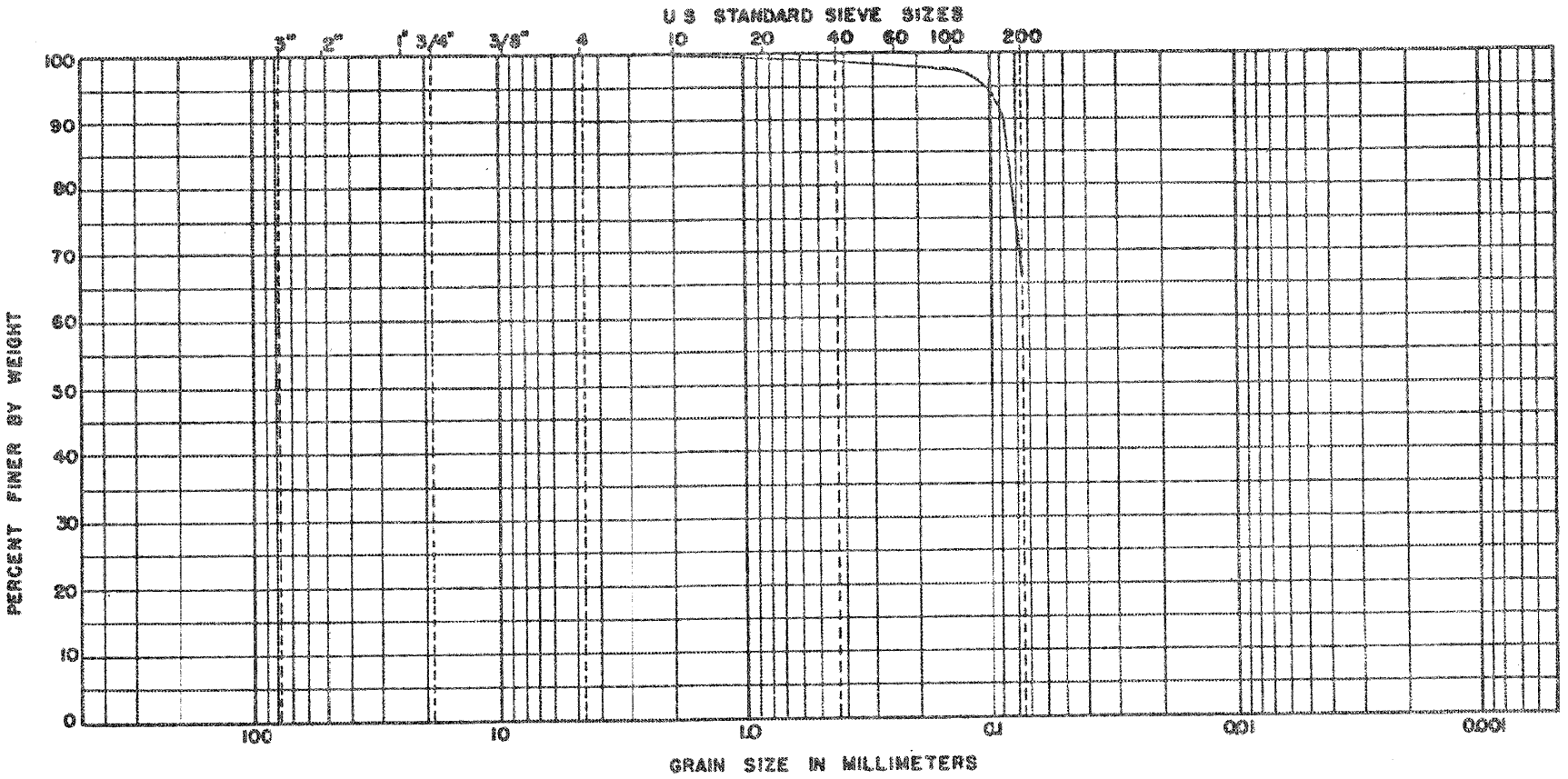
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-101 Sample #34	165.0'	- -	-	-	-	Firm green silty sand Moisture Content - 29.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



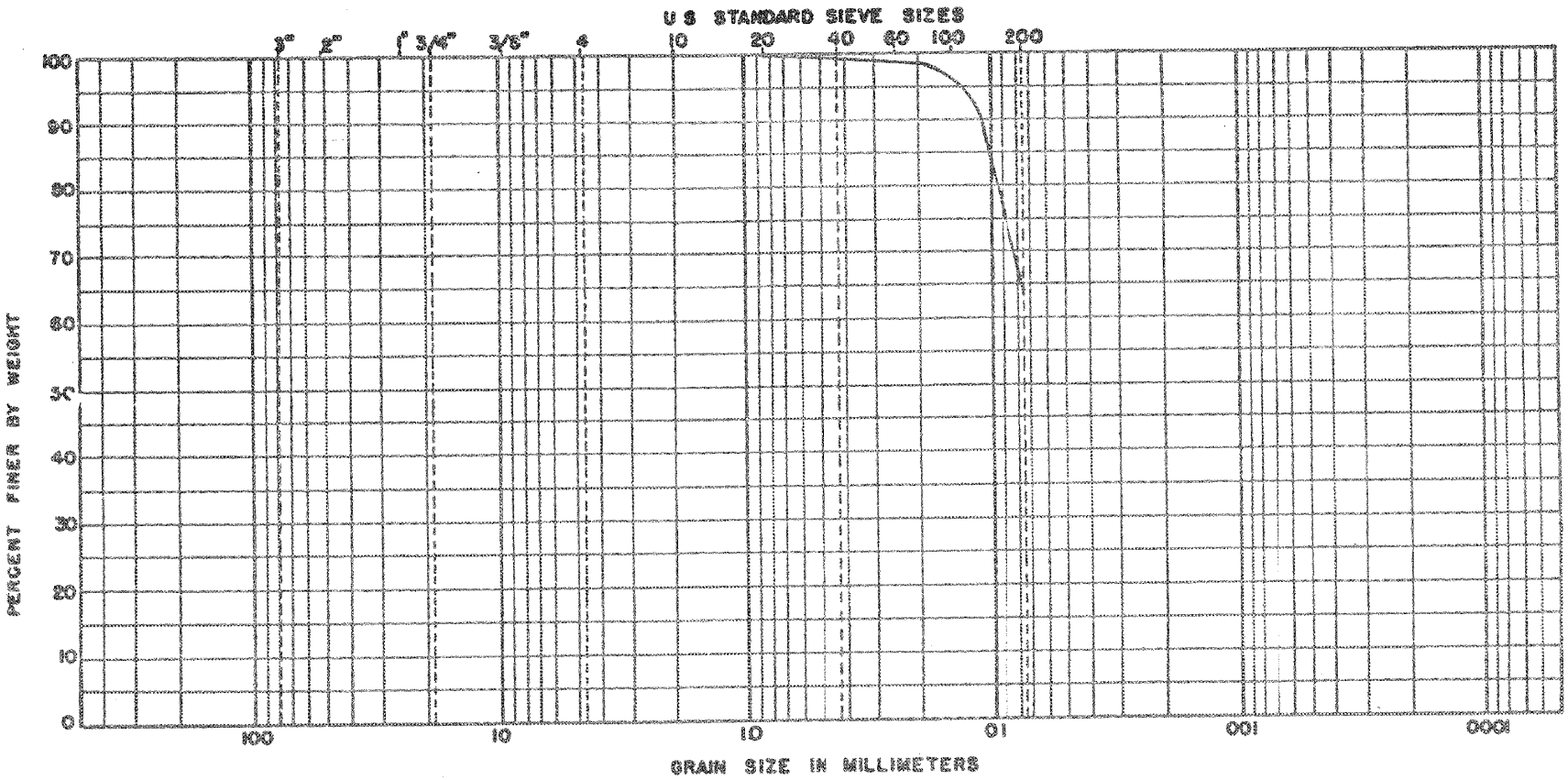
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-102 Sample #36	174.0' - 175.5'	- -	-	-	-	Very stiff green fine sandy silt Moisture Content - 30.2%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



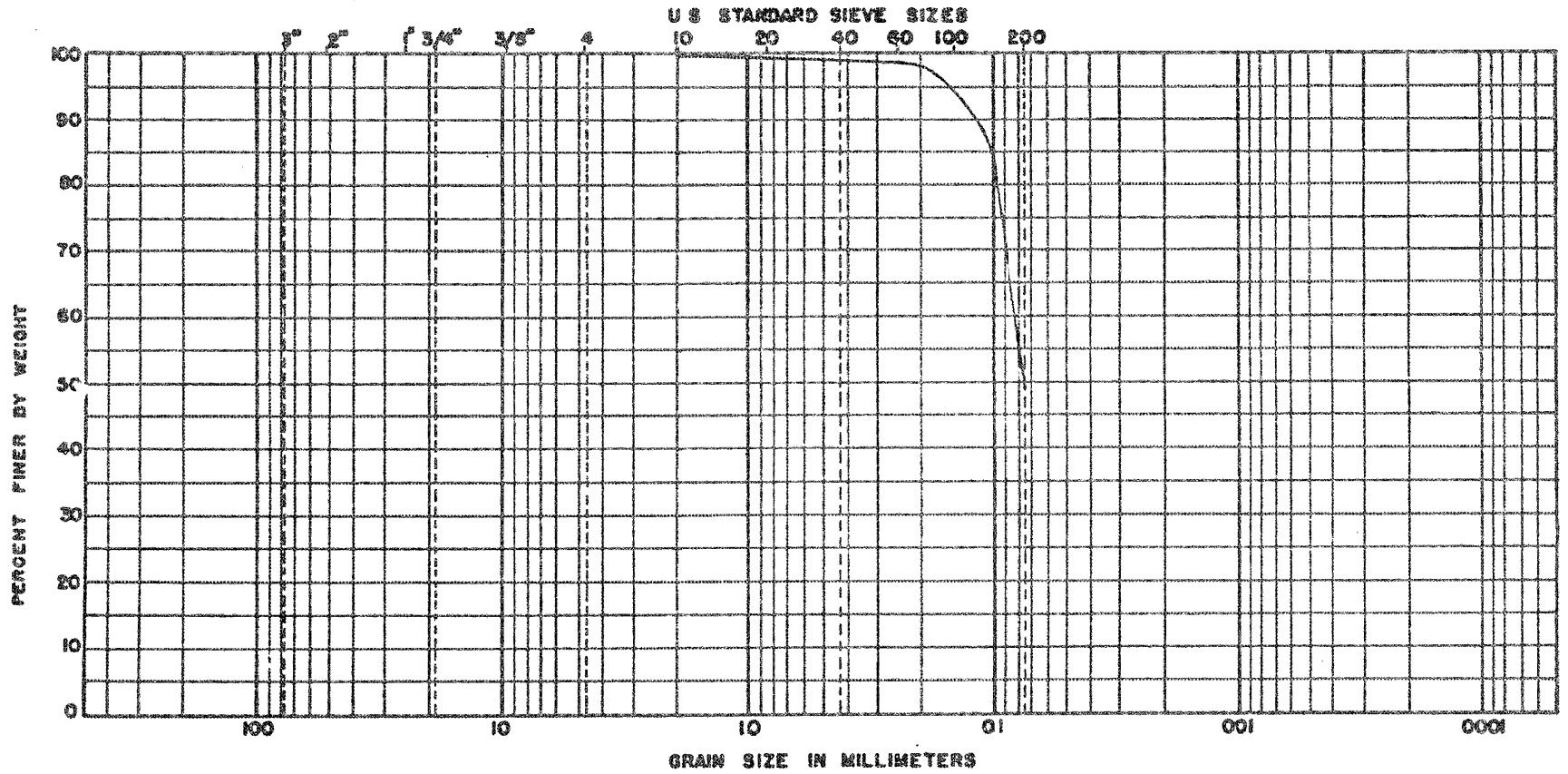
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-102 Sample #37	179.0'-180.5'	- -	-	-	-	Stiff grey-green fine sandy silt Moisture Content - 34.4%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



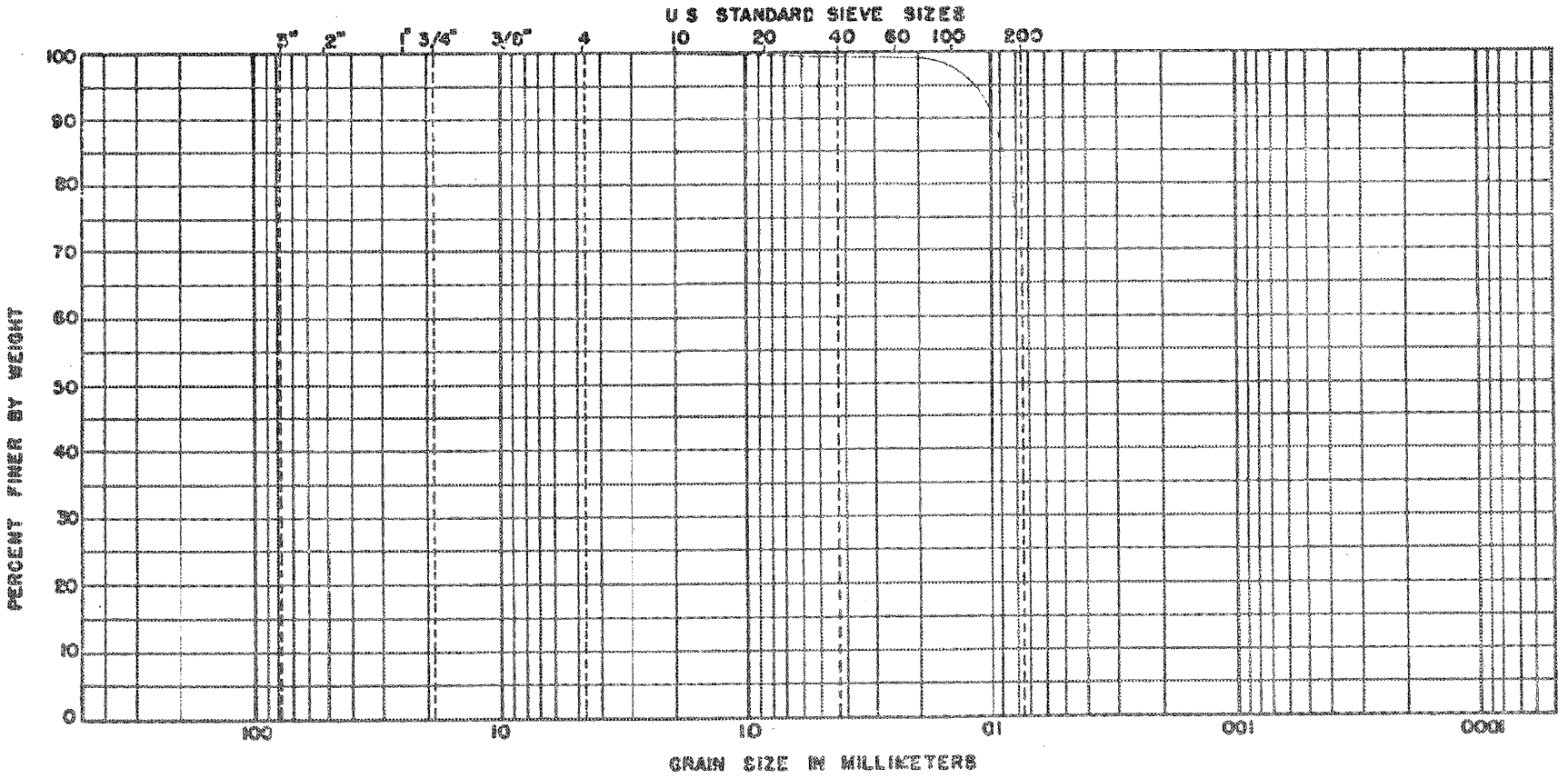
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-105 Sample #33	165'	- -	-	-	-	GREEN SILTY CLAYEY FINE SAND Moisture Content - 27.1%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

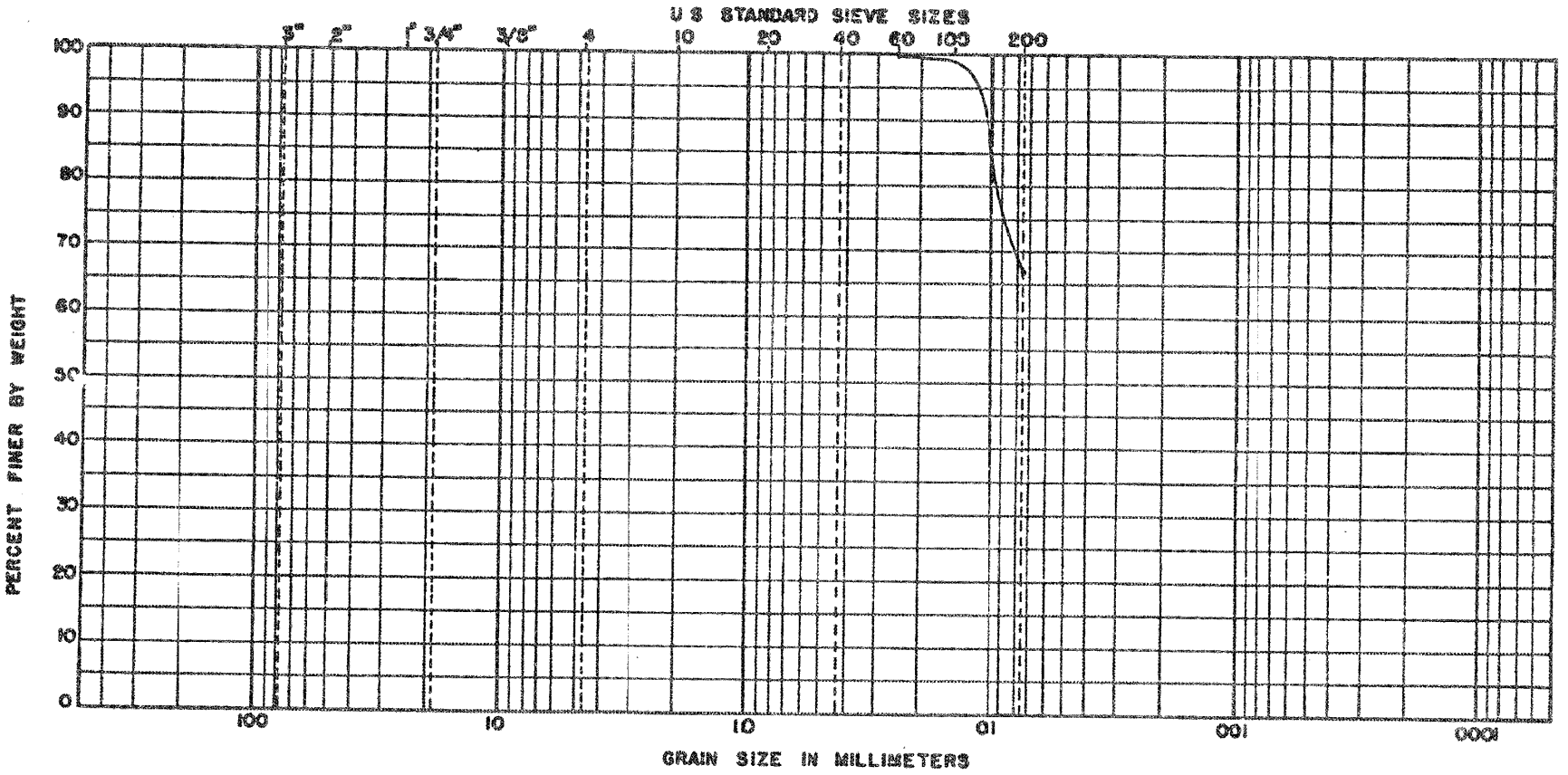
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-106 UD	157.5'	28.5				GREEN SILTY FINE TO MEDIUM SAND WITH SHELL

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

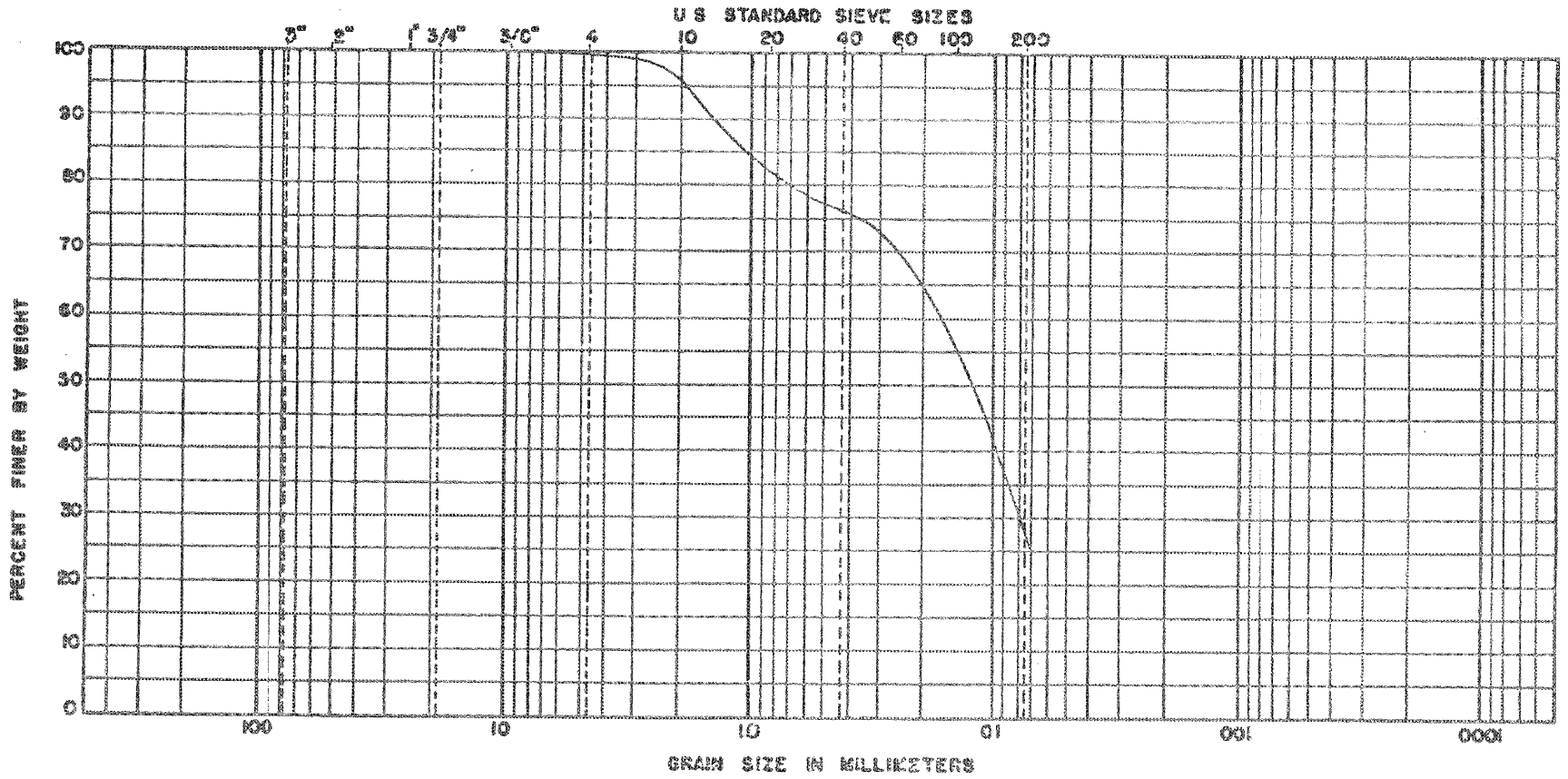
BORING NO	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
3-106 Sample #34	170.0'	- -	-	-	-	Fine green sandy silt Moisture Content - 31.6%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

2.5A-497



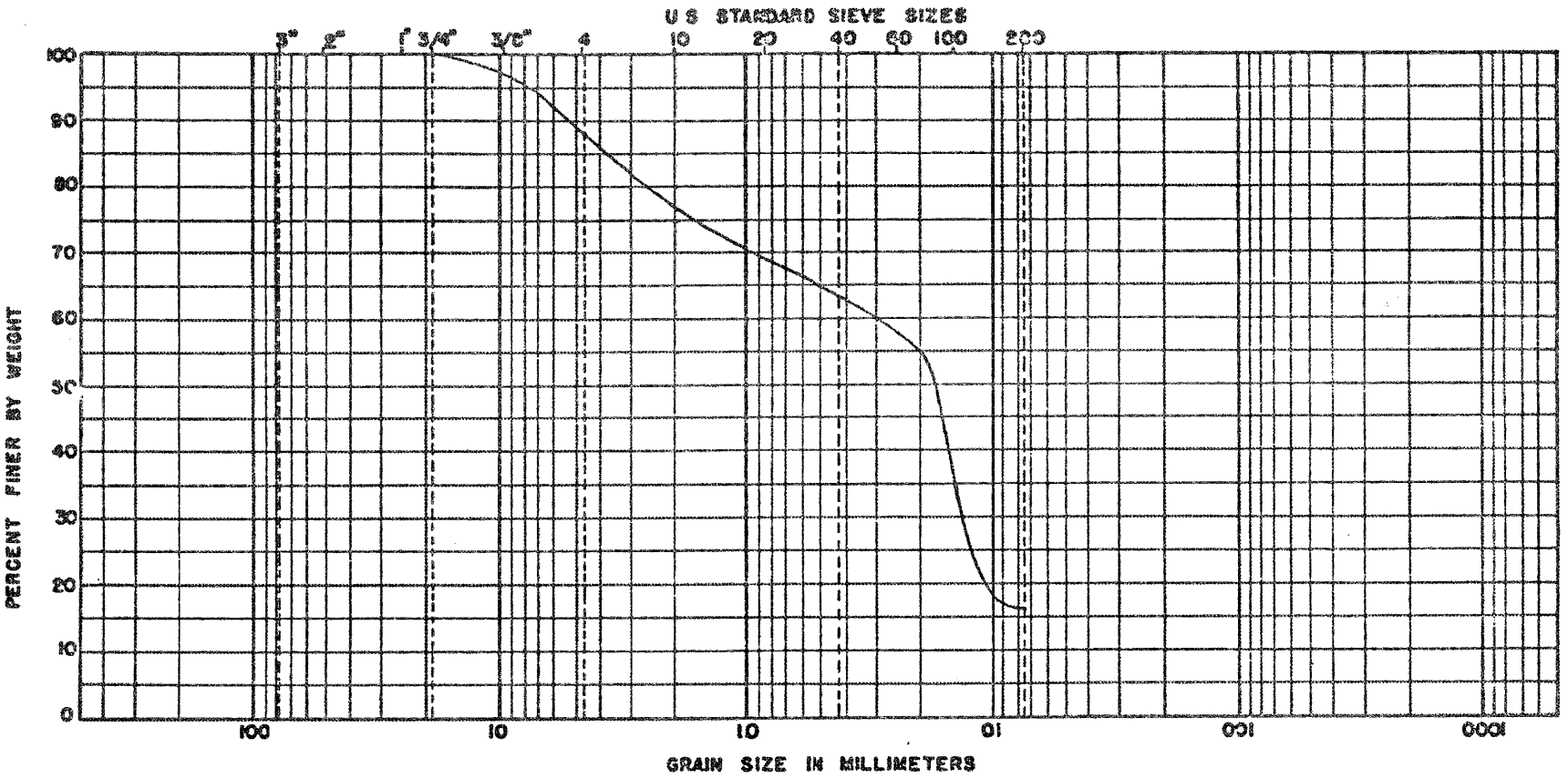
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-107 UD	152.5 FT	18.8				GRAY, FINE GRAVELLY, FINE TO COARSE SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



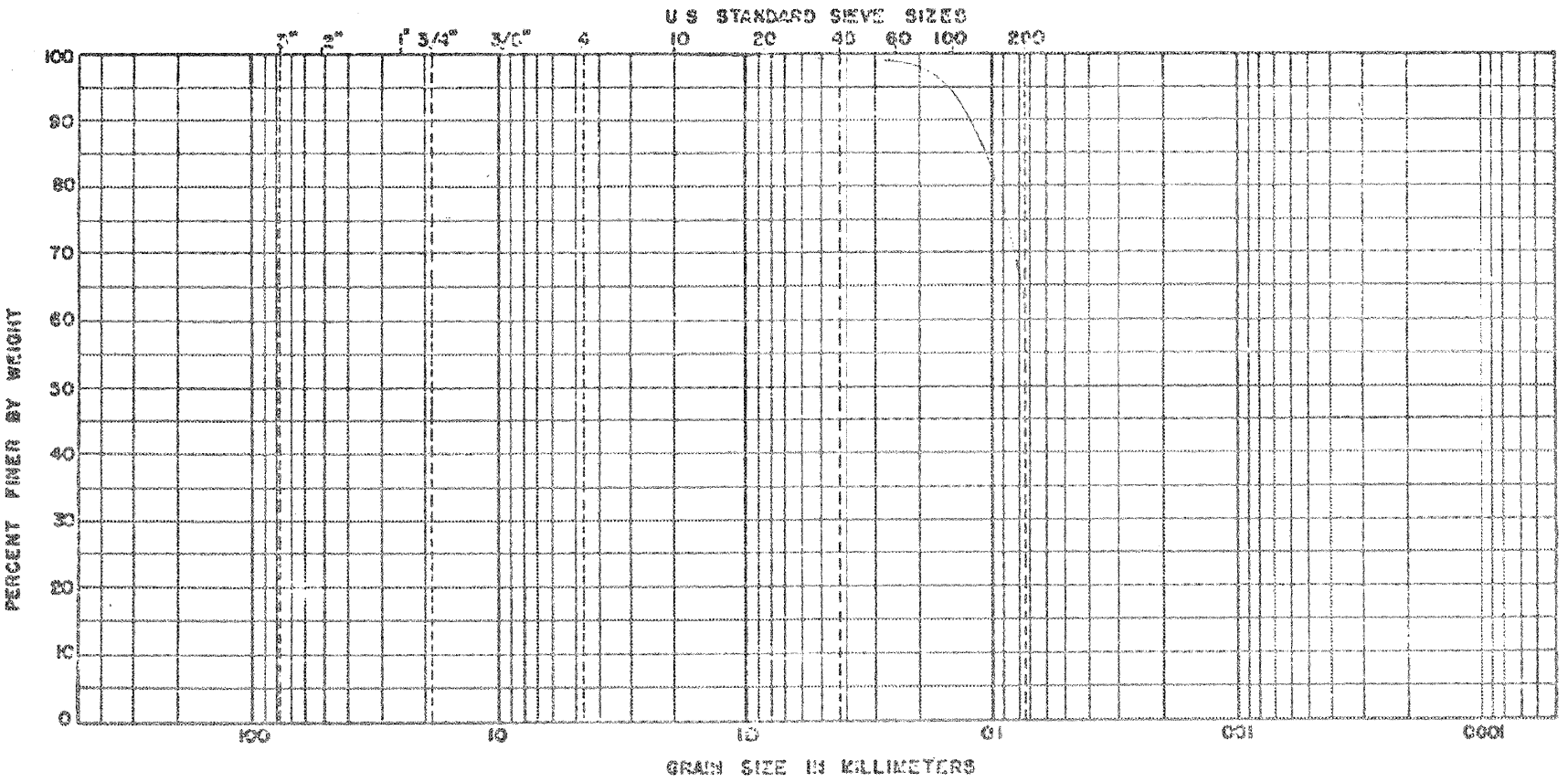
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	DEPTH	NAT WC	L.L.	P.L.	P.I.	DESCRIPTION OR CLASSIFICATION
B-109 Sample #32	154.0'-155.5	- -				Loose grey silty fine sand and shell and limestone fragments Moisture Content - 22.0%

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

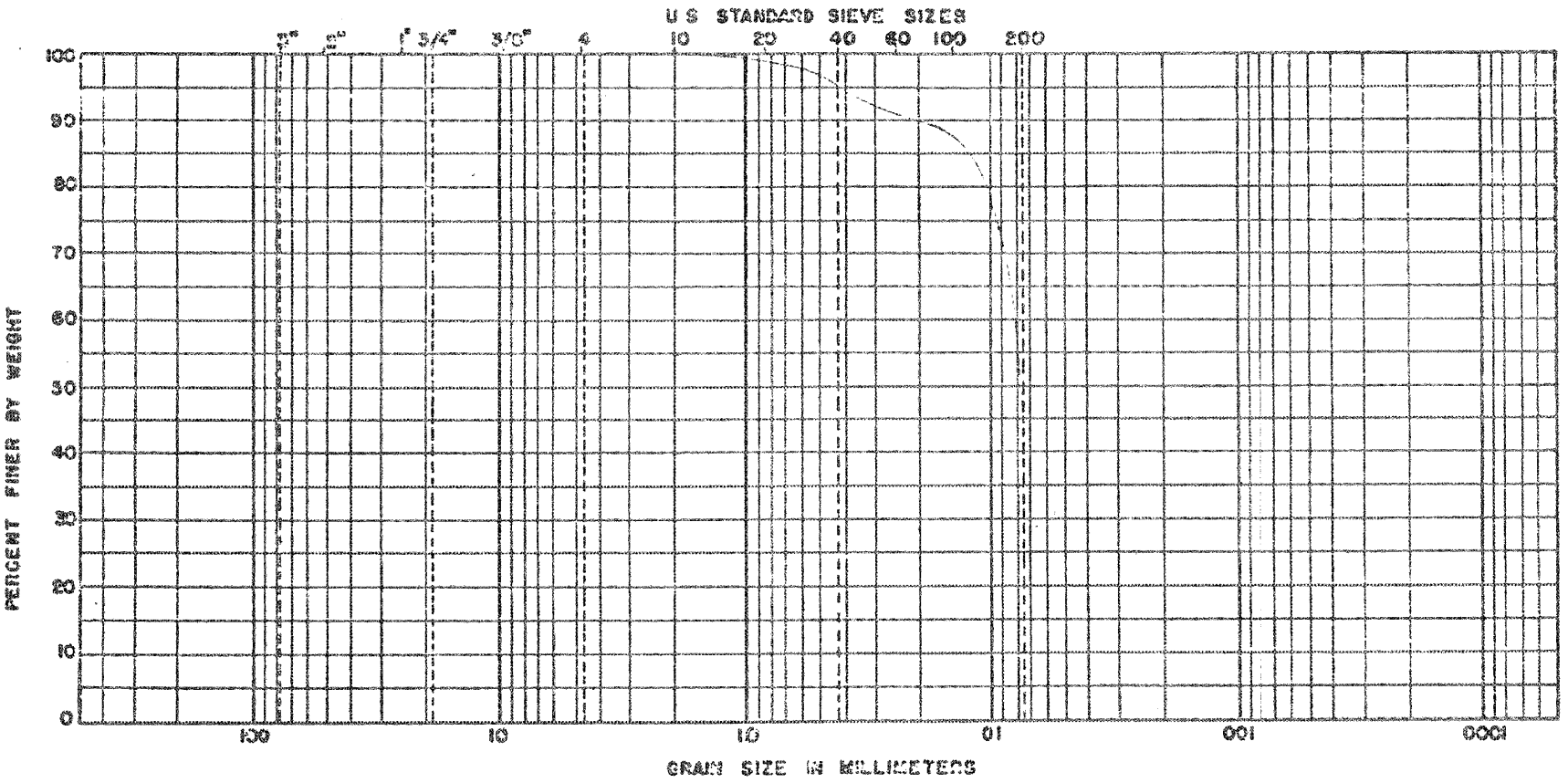
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114A UD	207.5'	26.1				DARK GRAY CLAYEY FINE SANDY SILT

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

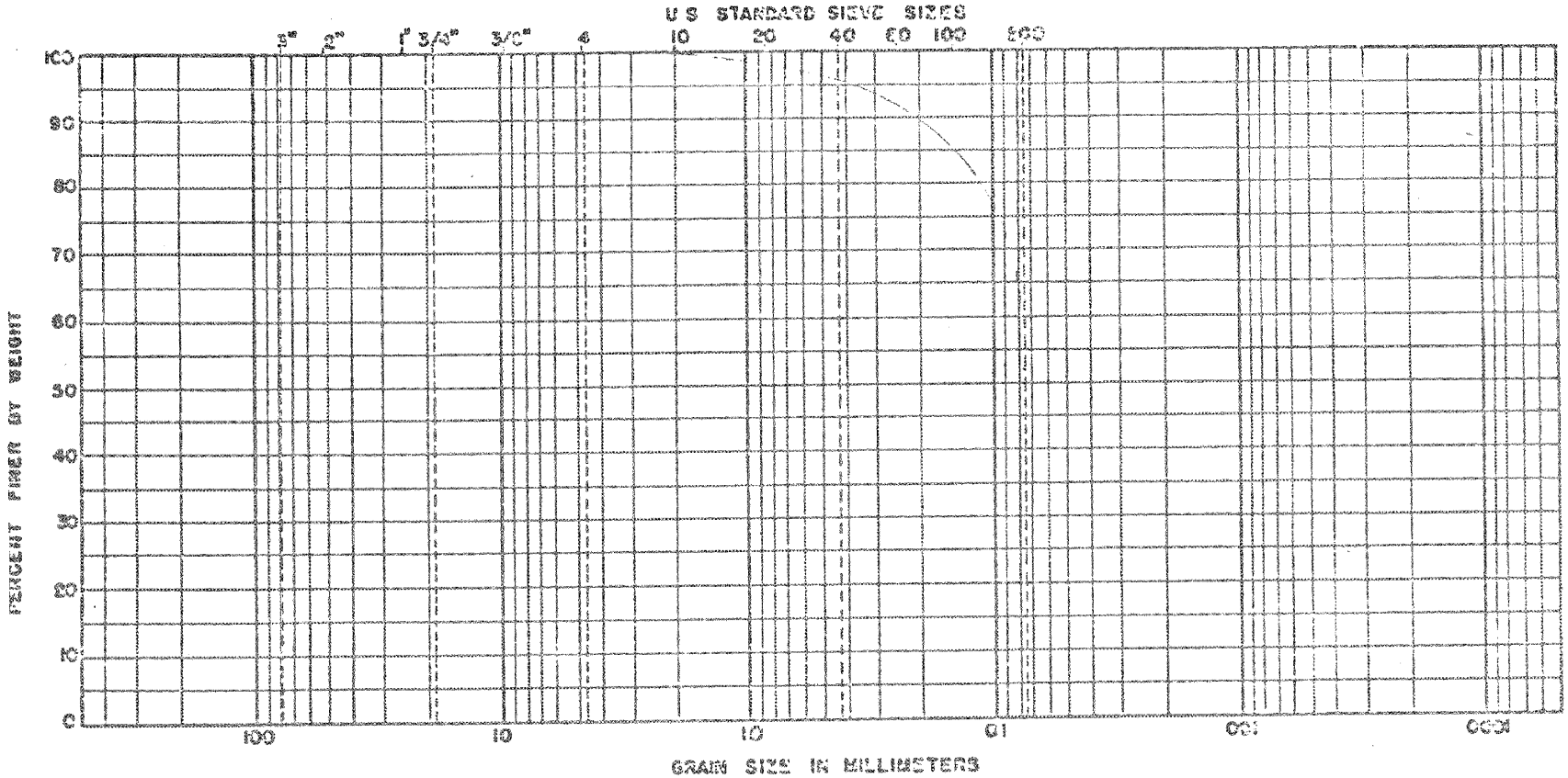
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114A UD	257.5'	41.0				GREEN CLAYEY SILTY FINE TO MEDIUM SAND

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



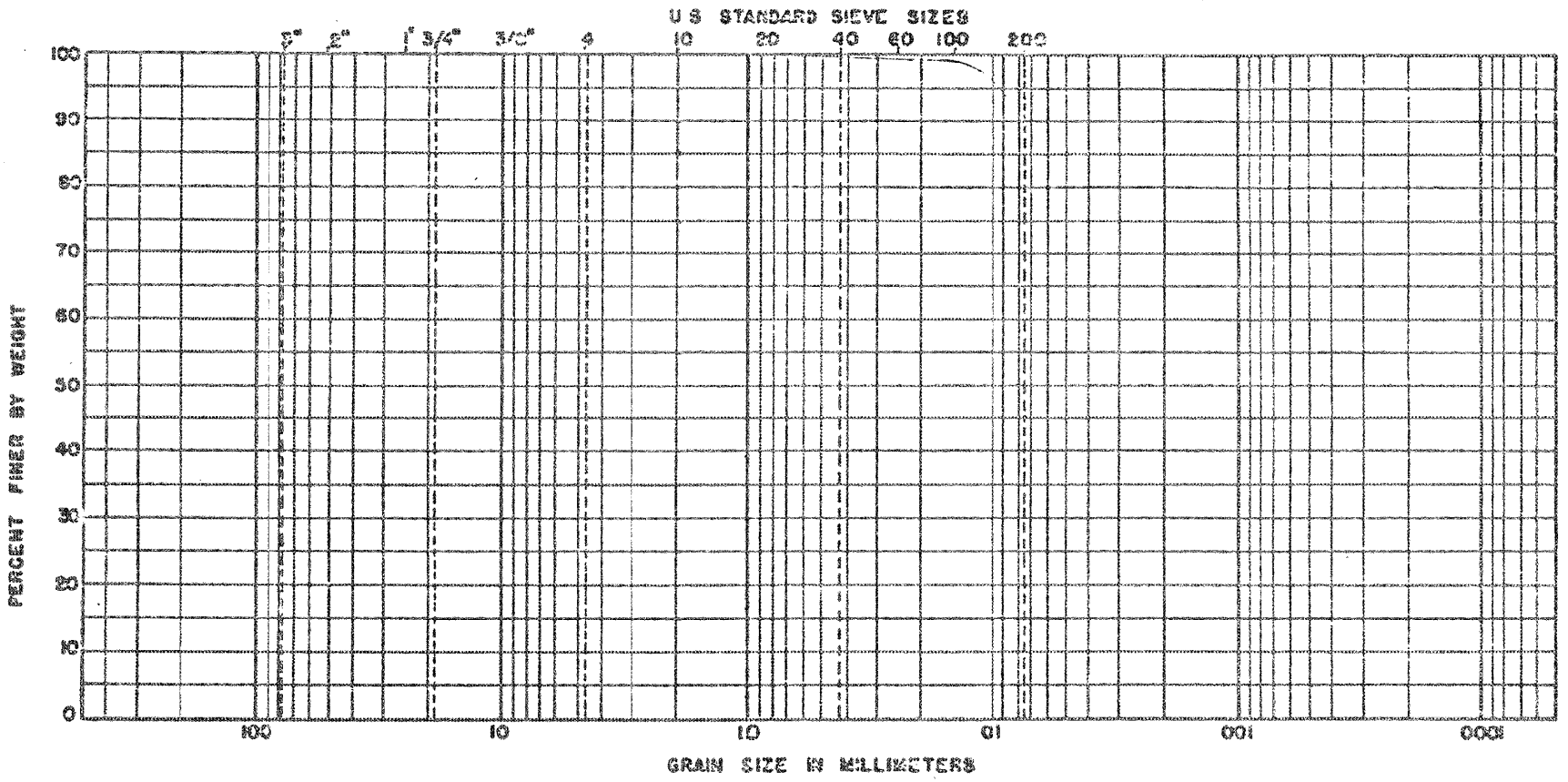
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114A UD	282.5'	23.8				GREEN CLAYEY FINE TO MEDIUM SANDY SILT

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

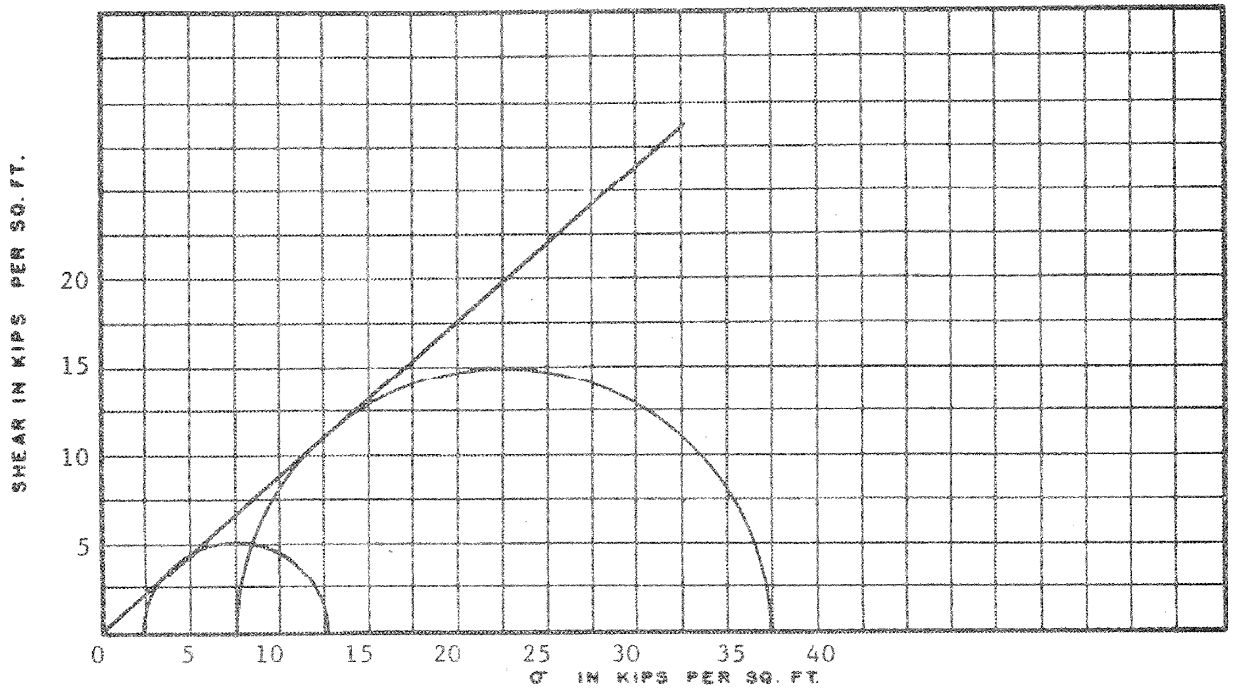
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
B-114A UD	307'	35.4				GREEN FINE SANDY SILTY CLAY

GRAIN SIZE DISTRIBUTION

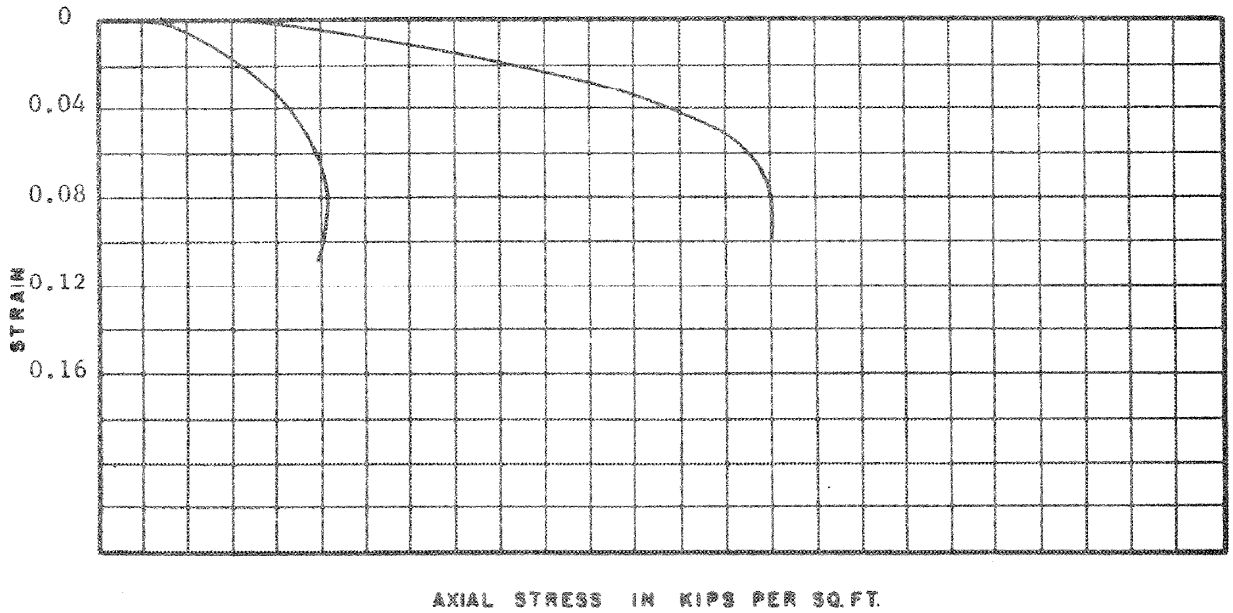
JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

gjh/2



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

VERY DENSE GREEN SLIGHTLY SILTY
FINE SAND WITH TRACE OF MICA

"COHESION", C _____

ANGLE OF SHEAR RESISTANCE, ϕ 41.0°

UNIT WEIGHT, γ_m 124.2 PCF

WATER CONTENT, W 21.1 %

VOID RATIO, e 0.630

CONSOLIDATED UNDRAINED

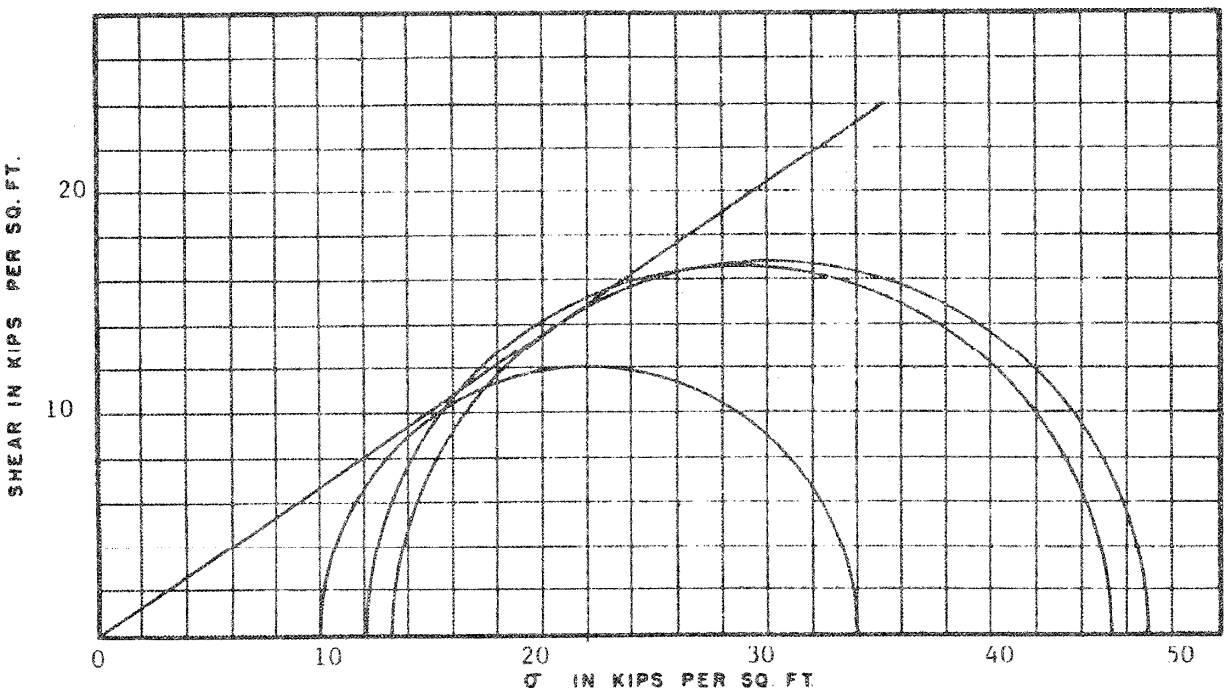
TRIAXIAL SHEAR TEST

BORING NO. B-3 SAMPLE NO. UD-4

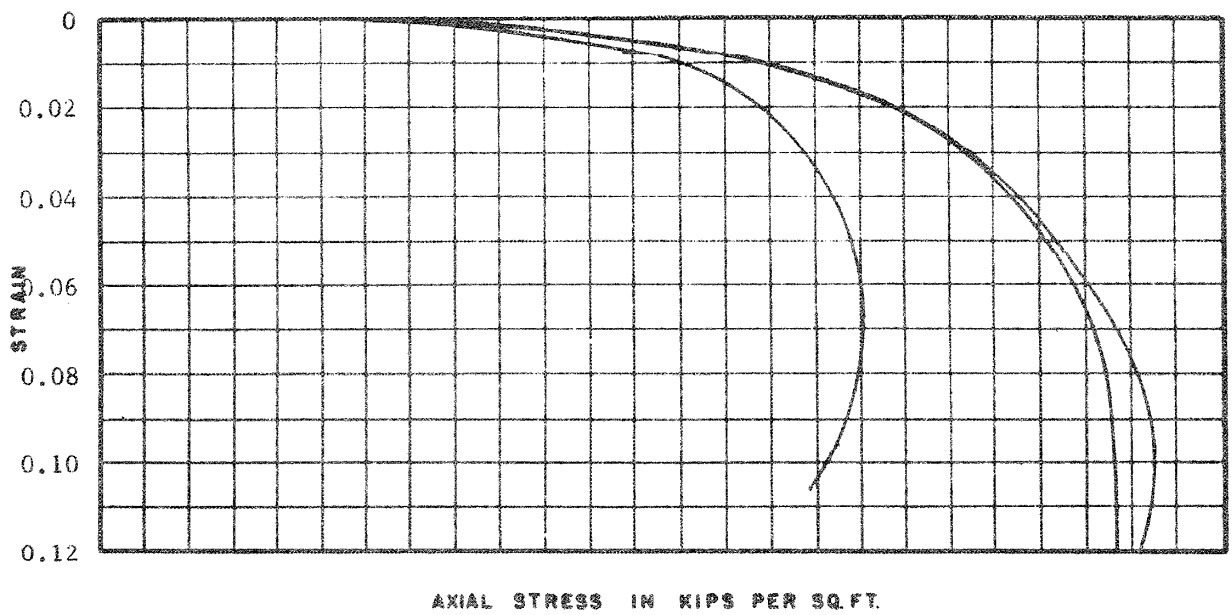
~~ELEV.~~ OR DEPTH 157.5-158.5' JOB NO. EC-163

LAW ENGINEERING TESTING CO.

SS



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

DARK GRAY SILTY FINE SAND, TRACE MICA -

CONSOLIDATED UNDRAINED

"COHESION", C _____

ANGLE OF SHEAR RESISTANCE, ϕ 33.9

UNIT WEIGHT, γ_m 121.0 PCF

WATER CONTENT, W 30.3%

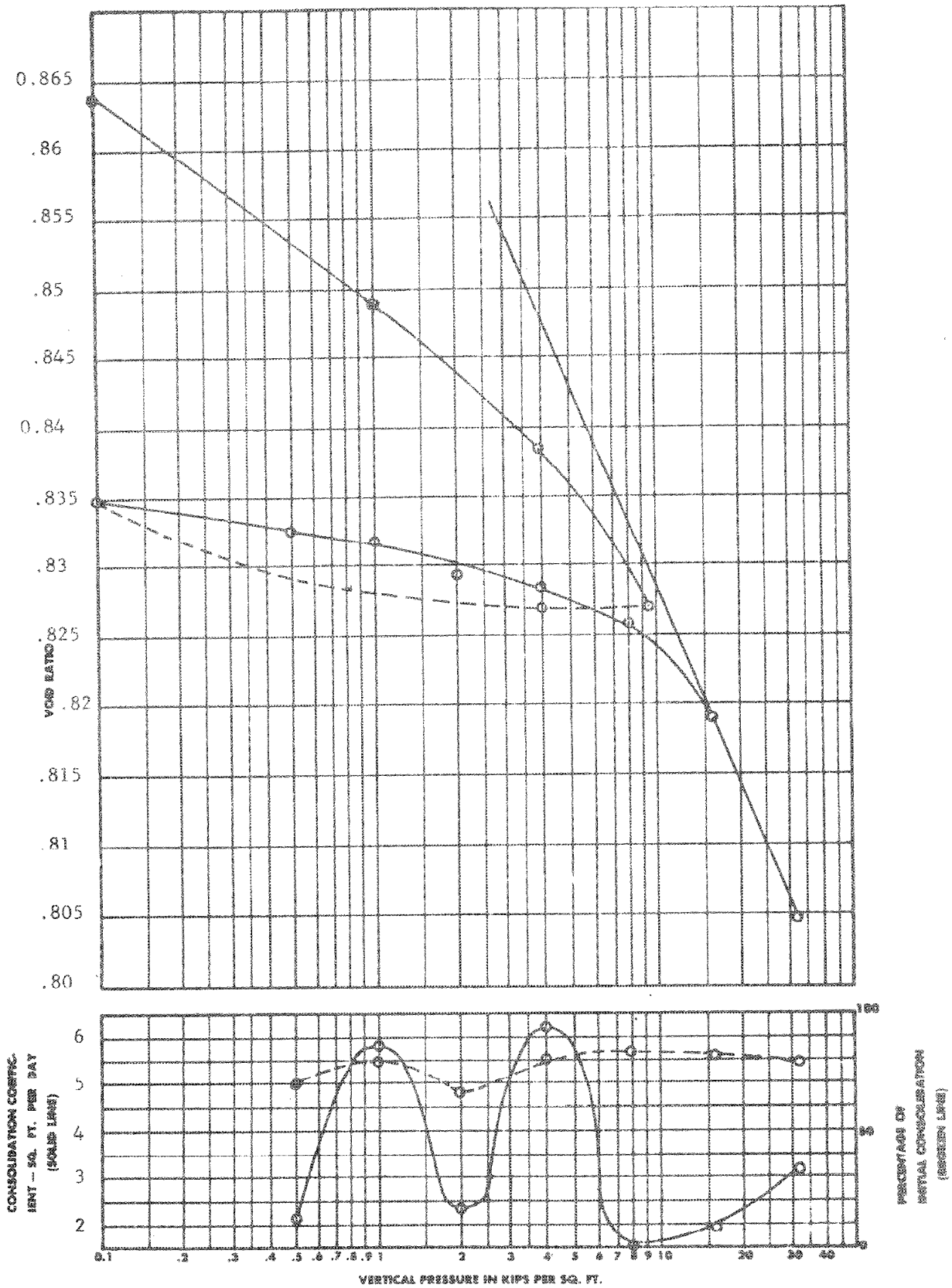
VOID RATIO, e 0.766

TRIAXIAL SHEAR TEST

BORING NO. B-8 SAMPLE NO. UD-4

~~ELEV.~~ OR DEPTH 175-176.3' JOB NO. LC-163

LAW ENGINEERING TESTING CO



GREEN CLAYEY SILTY VERY
FINE SAND WITH MICA

COMPRESSION INDEX 0.033

UNIT WEIGHT γ_{dry} 120 PCF

WATER CONTENT 30.0%

SATURATION 97%

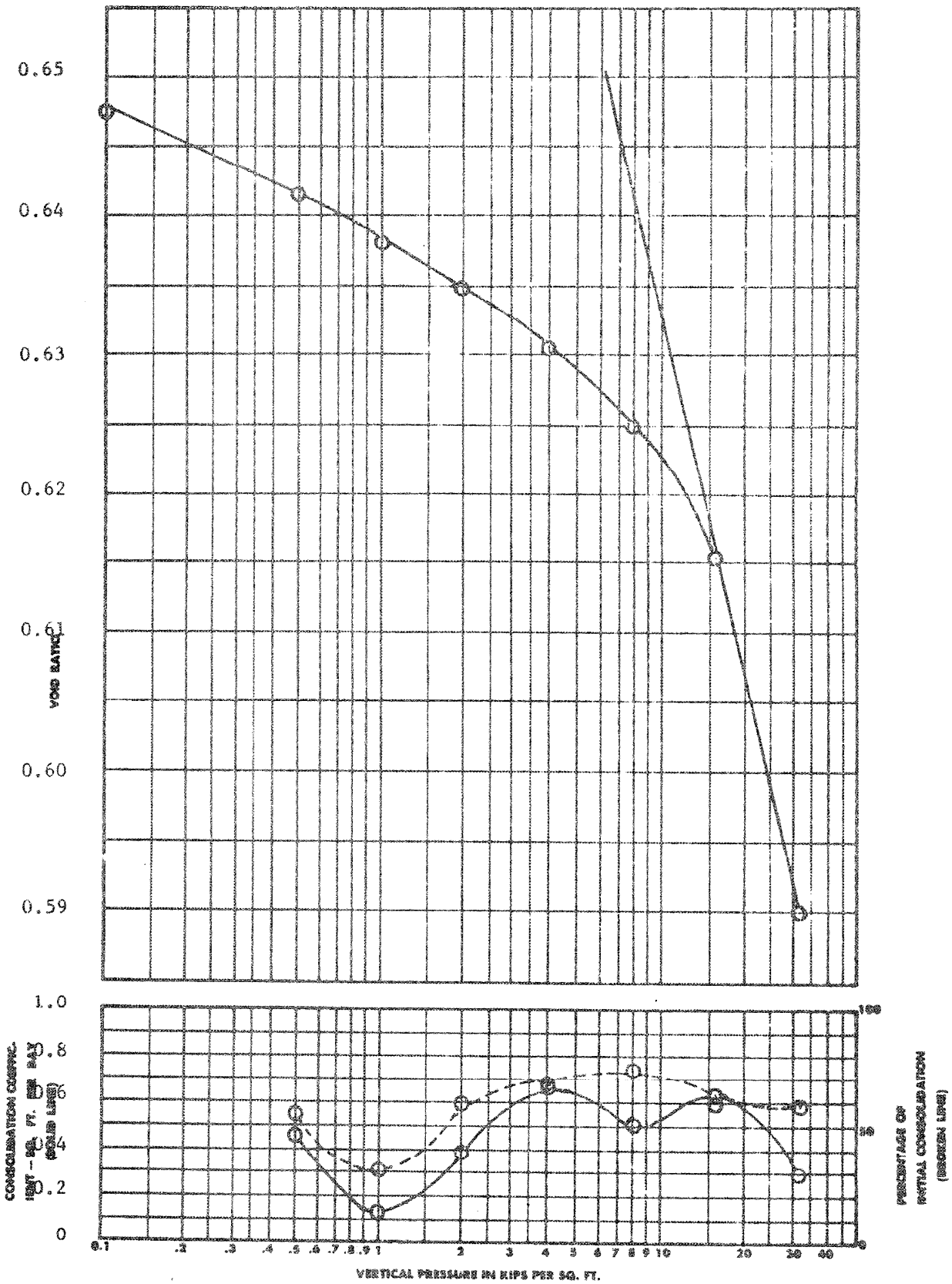
CONSOLIDATION TEST

BORING NO. B-1 SAMPLE NO. HD-5

ELEV. OR DEPTH 168.5-170.5 JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

SS



Green clayey fine sand with mica and trace of shells

COMPRESSION INDEX 0.09

UNIT WEIGHT γ_{dry} 126 PCF

WATER CONTENT 24.1%

SATURATION 100%

CONSOLIDATION TEST

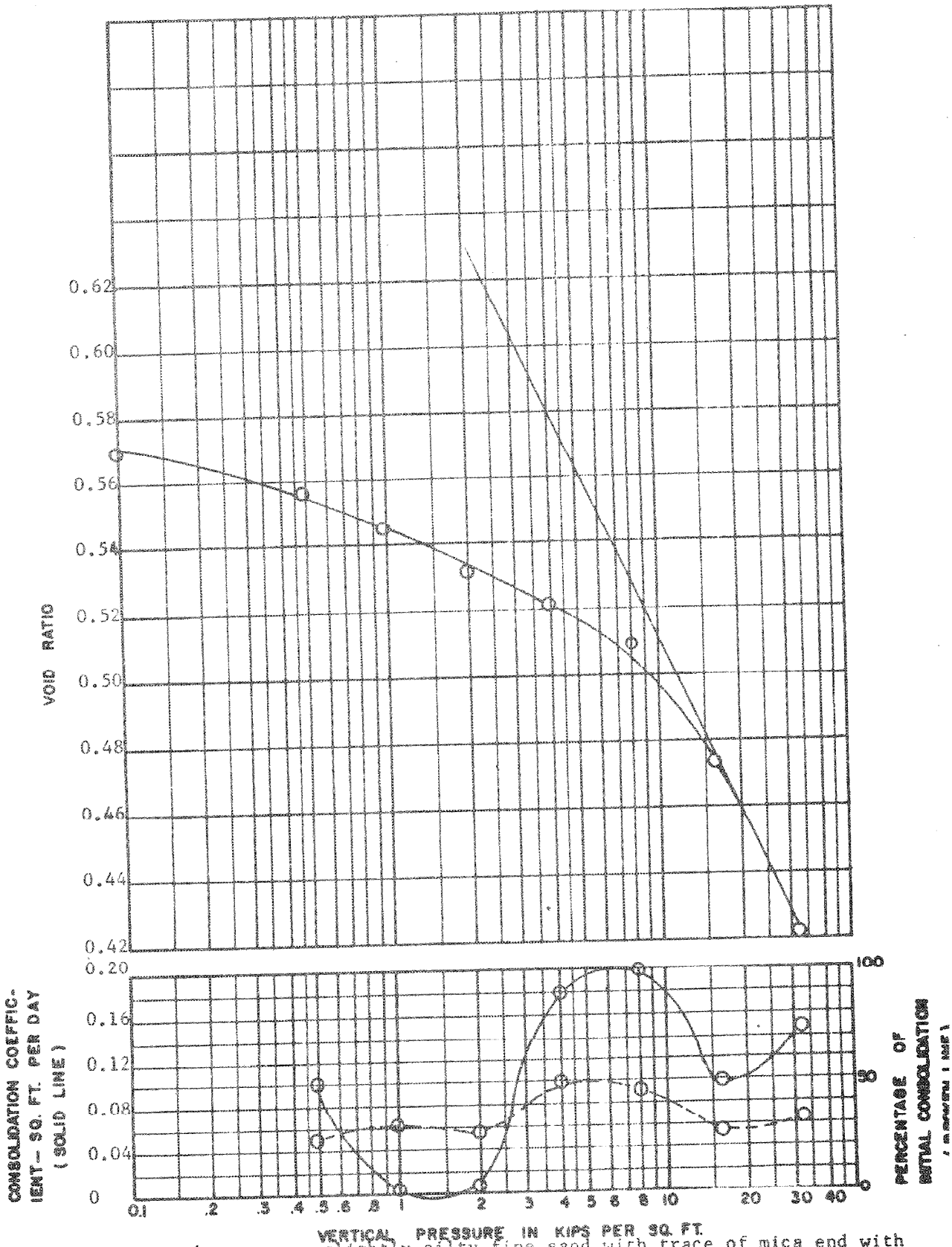
BORING NO. B-1 SAMPLE NO. UD-6

DEPTH 247.5-249.1 JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY

2.5A-507

NOTE: From visual examination of sample after test - One stratum of sand (1/3 of sample) a one of sand and shells (2/3 of sample) vertical stratification.



Very dense green slightly silty fine sand with trace of mica end with small shell fragments

COMPRESSION INDEX 0.175

UNIT WEIGHT, γ 129 PCF

WATER CONTENT 21.2%

SATURATION 100 %

NOTE: The sampler was driven.

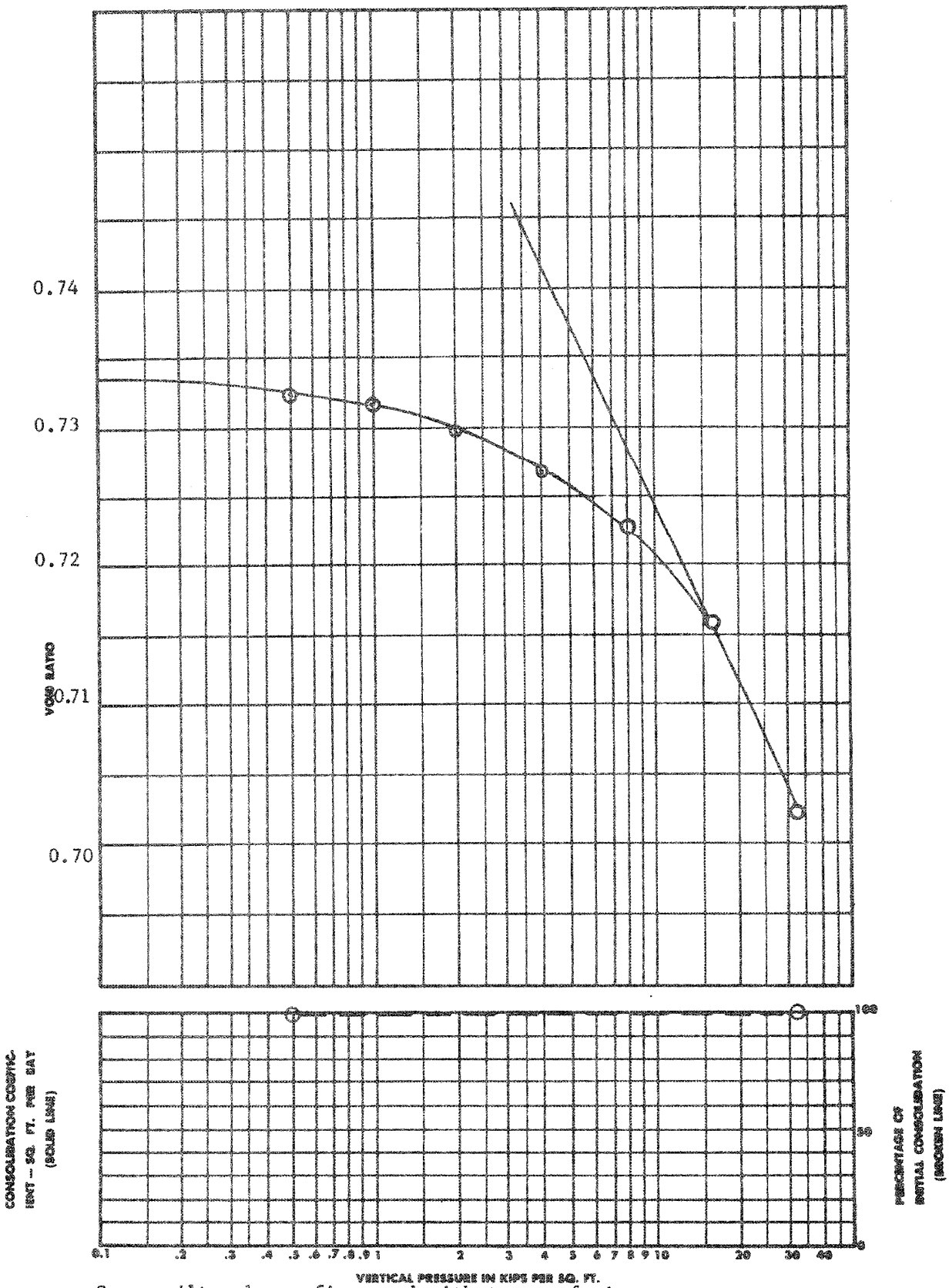
2.5A-508

CONSOLIDATION TEST

BORING NO. B-3 SAMPLE NO. UD-4

ELEV. OR DEPTH 157'-158.5' JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



Green silty clayey fine sand with trace of mica.

COMPRESSION INDEX 0.044

UNIT WEIGHT γ_{pcf} 121 PCF

WATER CONTENT 24.2

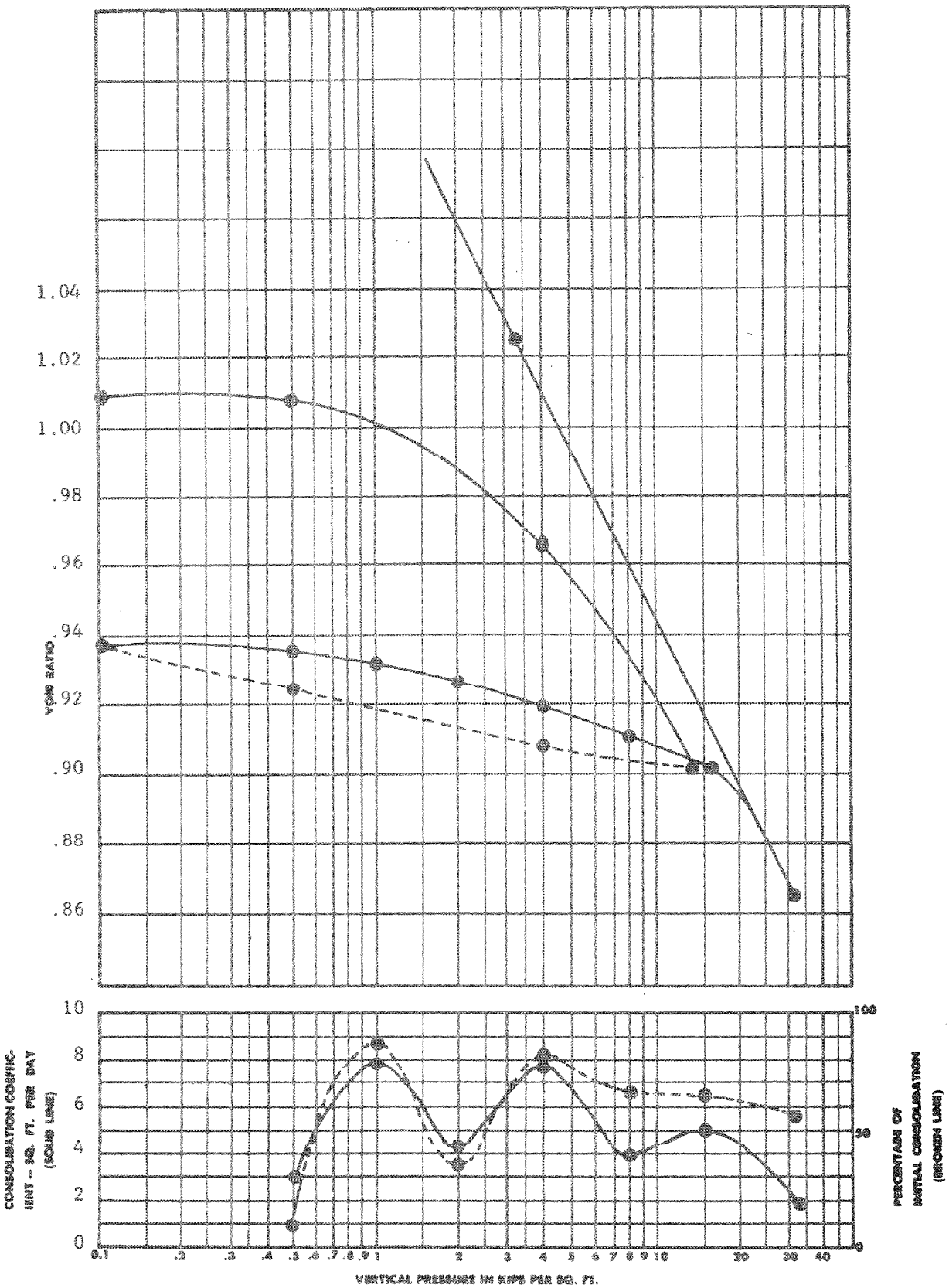
SATURATION 89%

CONSOLIDATION TEST

BORING NO. B-8 SAMPLE NO. UD-4

ELEV. OR DEPTH 175-176.3 JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



VERY FIRM GREEN-GRAY CLAYEY SILT

COMPRESSION INDEX 0.16

UNIT WEIGHT 113 PCF (wet)

WATER CONTENT 35.9%

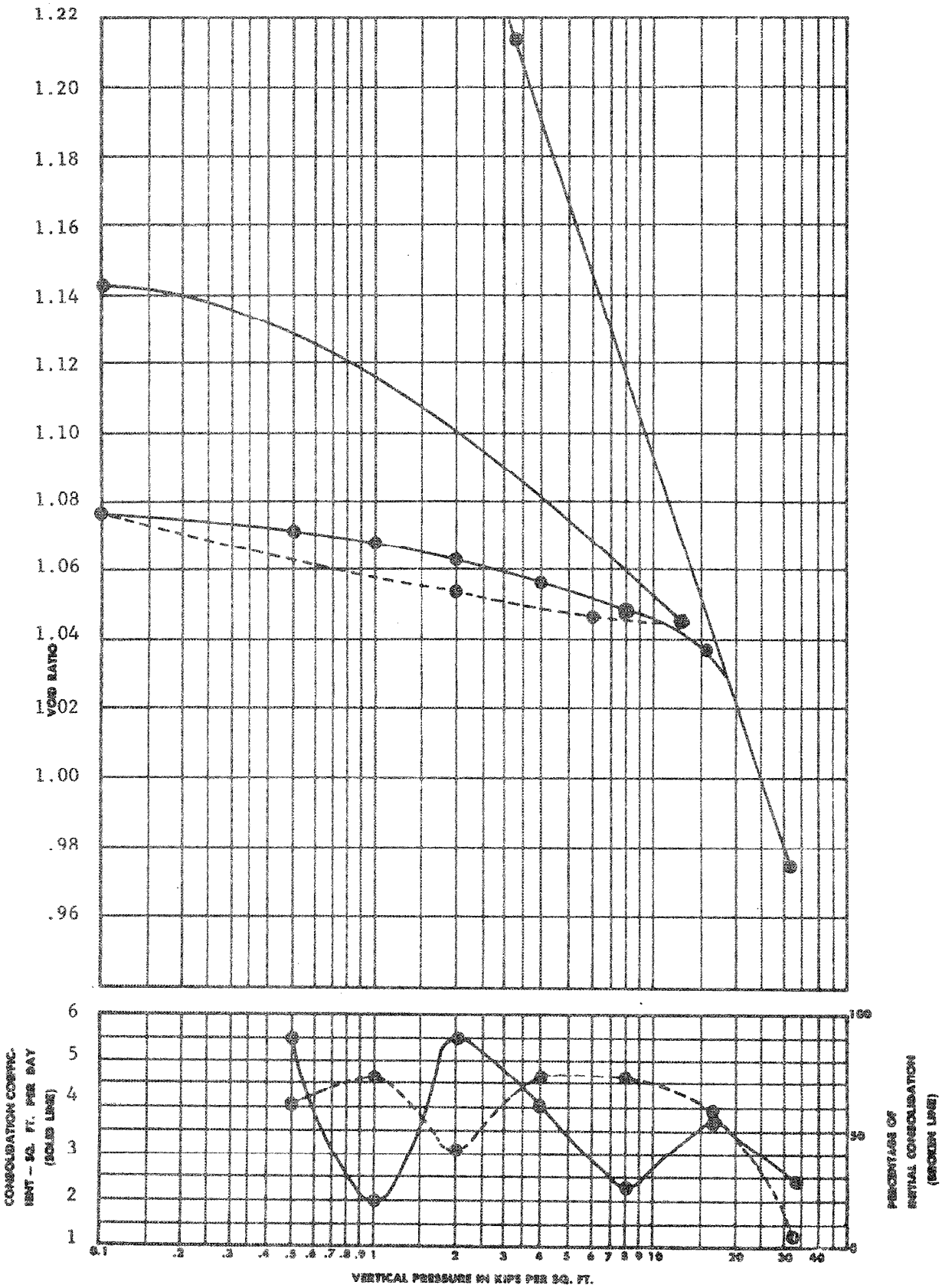
SATURATION 95%

CONSOLIDATION TEST

BORING NO. IN SAMPLE NO. UD-28

ELEV. OR DEPTH 290.7'-292.7' JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



VERY FIRM GRAY-GREEN VERY CLAYEY SILT WITH FINE SAND INCLUSIONS

CONSOLIDATION TEST

COMPRESSION INDEX 0.24

UNIT WEIGHT 110 PCF (wet)

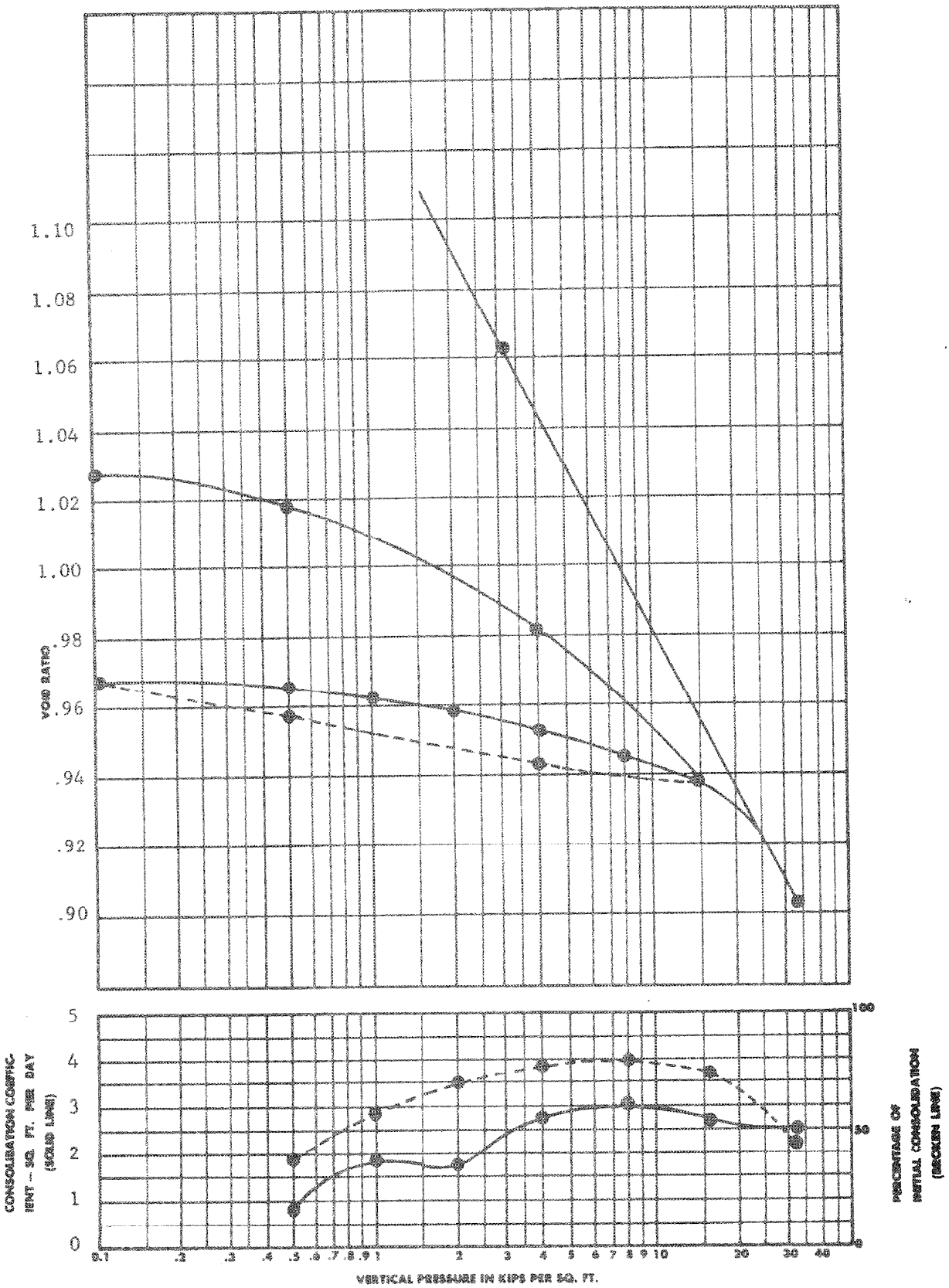
WATER CONTENT 41.1%

SATURATION 96%

BORING NO. 1 N SAMPLE NO. UD-24

ELEV. OR DEPTH 270.7'-272.7' JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



VERY FIRM GREEN-GRAY VERY CLAYEY SILT WITH FINE SAND INCLUSIONS

COMPRESSION INDEX 0.16

UNIT WEIGHT 113 PCF (wet)

WATER CONTENT 38.2 %

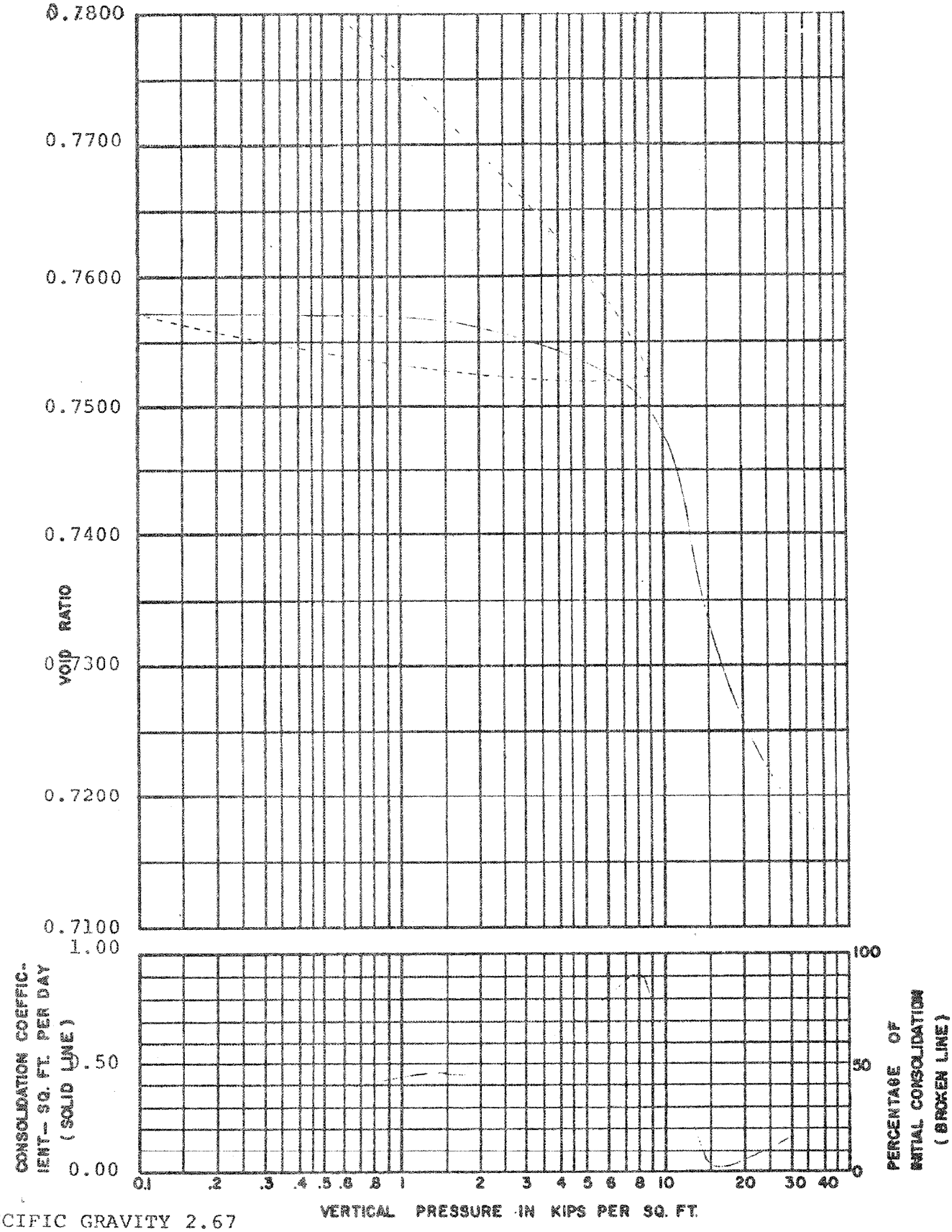
SATURATION 99%

CONSOLIDATION TEST

BORING NO. IN SAMPLE NO. UD-26

ELEV. OR DEPTH 279.9' - 281.9' JOB NO. EC-163

LAW ENGINEERING TESTING COMPANY



ECIFIC GRAVITY 2.67

COMPRESSION INDEX 0.0408

UNIT WEIGHT 121.65 PCF (WET)

WATER CONTENT 28.5

SATURATION 100.52%

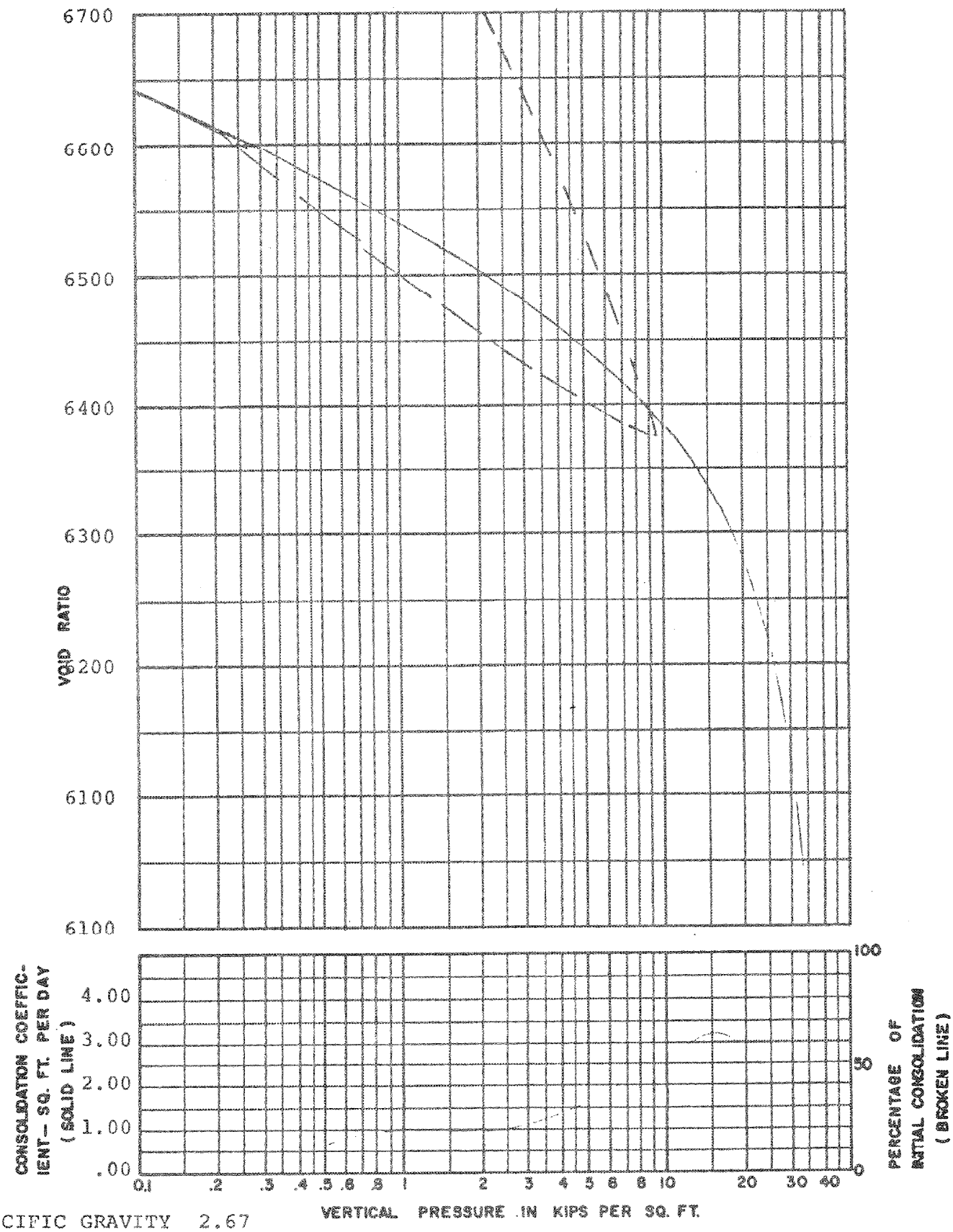
2.5A-513

CONSOLIDATION TEST

BORING NO. B-106 SAMPLE NO. UD

ELEV. OR DEPTH 157.5' JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



SPECIFIC GRAVITY 2.67

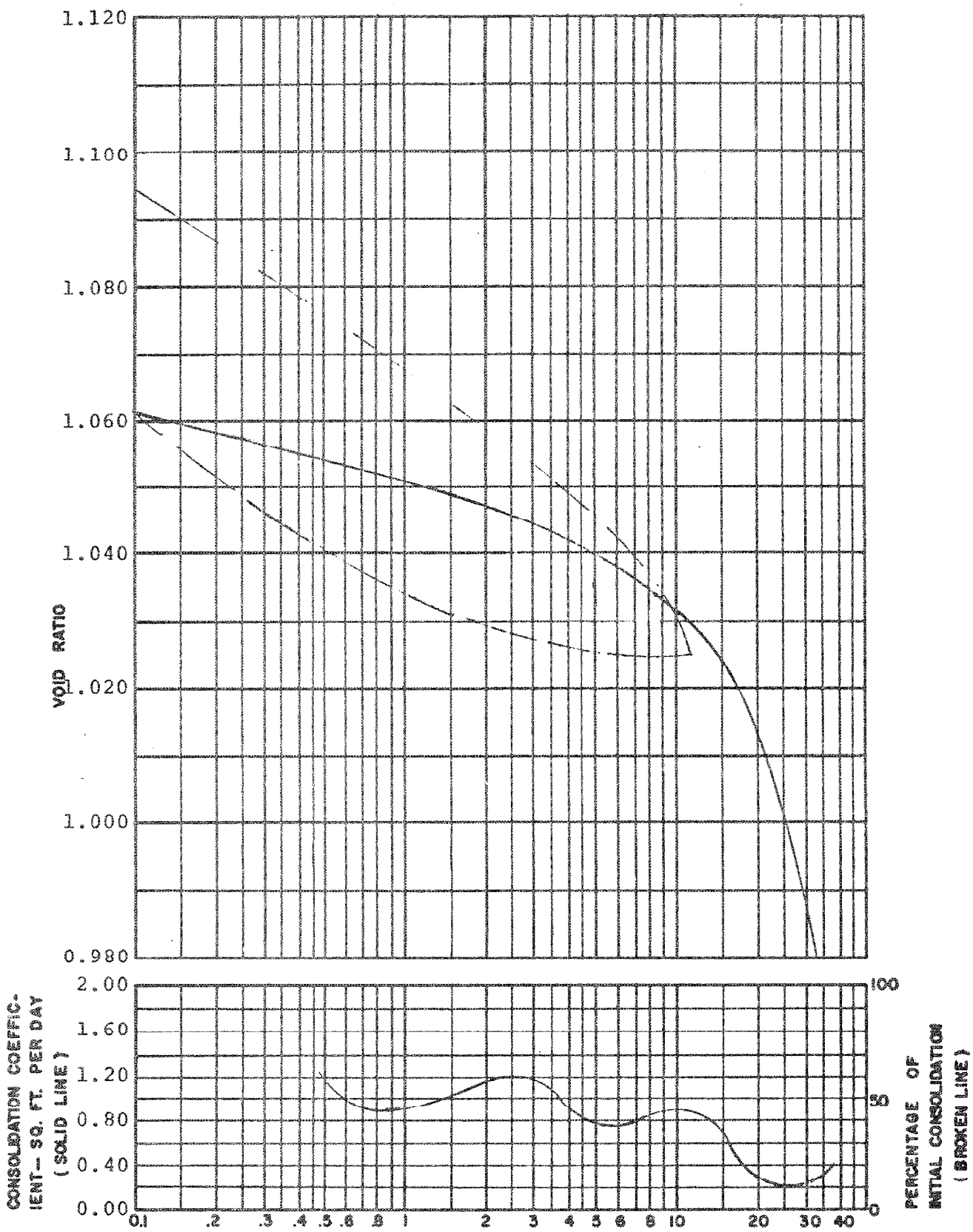
COMPRESSION INDEX 0.0938
UNIT WEIGHT 126.02 (WET)
WATER CONTENT 26.1%
SATURATION 104.88%

2.5A-514

CONSOLIDATION TEST

BORING NO. 114A SAMPLE NO. UD
ELEV. OR DEPTH 207.5' JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



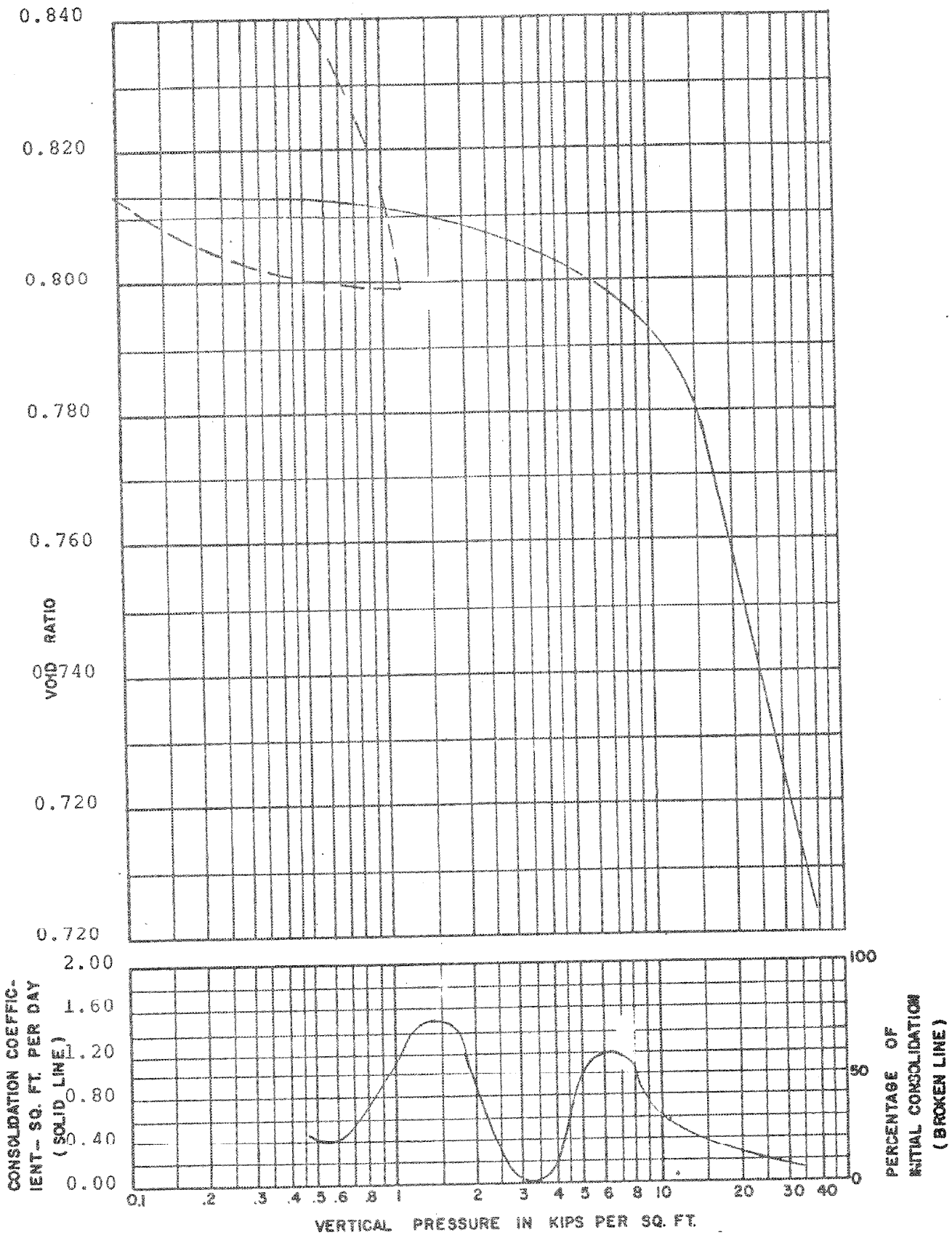
SPECIFIC GRAVITY 2.64

COMPRESSION INDEX 0.175
UNIT WEIGHT 112.40 pcf (WET)
WATER CONTENT 41%
SATURATION 101.96%

2.5A-515

CONSOLIDATION TEST

BORING NO. B-114 SAMPLE NO. UD
ELEV. OR DEPTH 257.5' JOB NO. J-1127



SPECIFIC GRAVITY 2.63

COMPRESSION INDEX 0.179

UNT WEIGHT 111.88 PCF (WET)

WATER CONTENT 23.8%

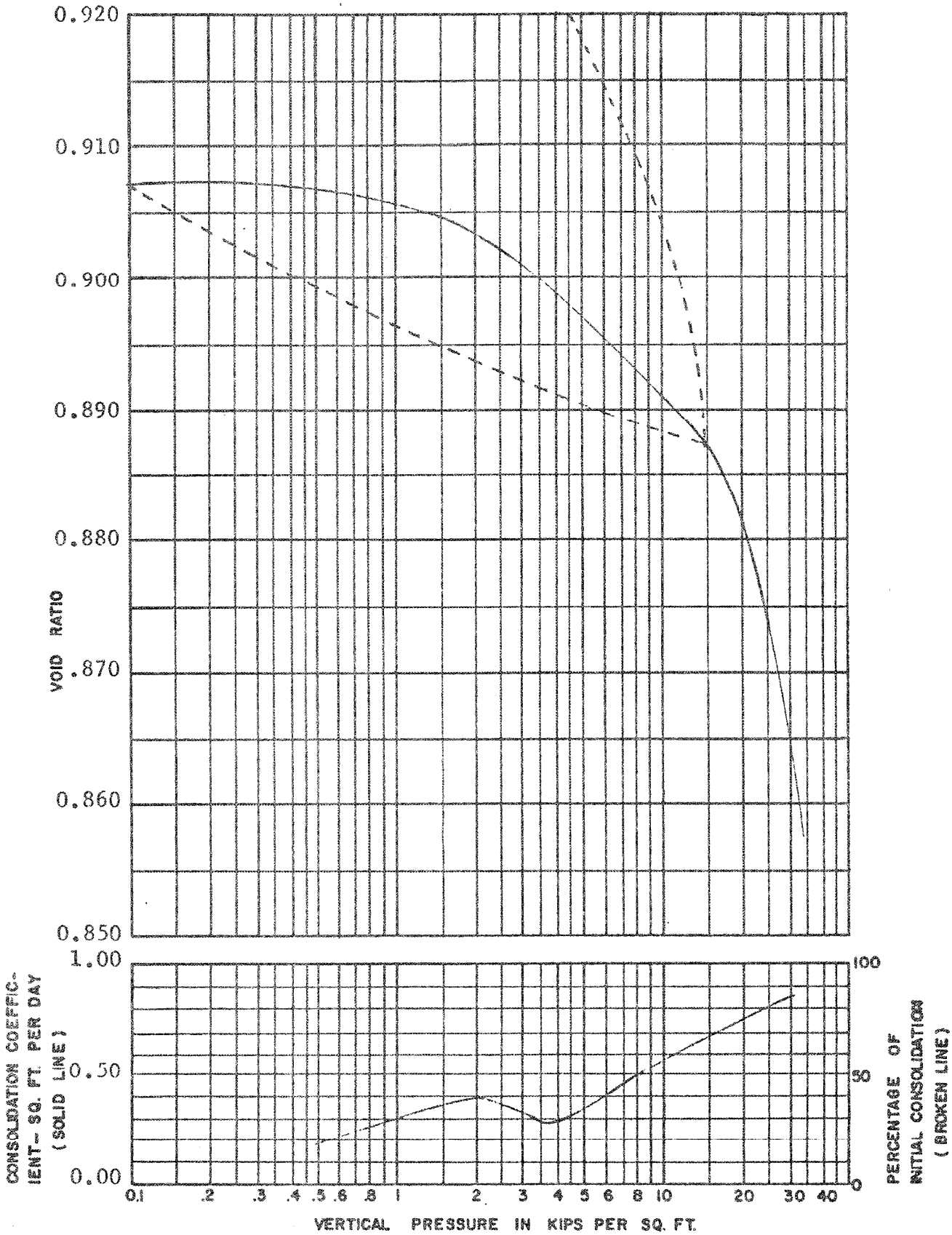
76 988

2 5A-516

CONSOLIDATION TEST

BORING NO. B-114A SAMPLE NO. UD

ELEV. OR DEPTH 282.5' JOB NO. J-1127



SPECIFIC GRAVITY 2.62

COMPRESSION INDEX 0.0823

UNIT WEIGHT 115.85PCF (WET)

WATER CONTENT 35.4%

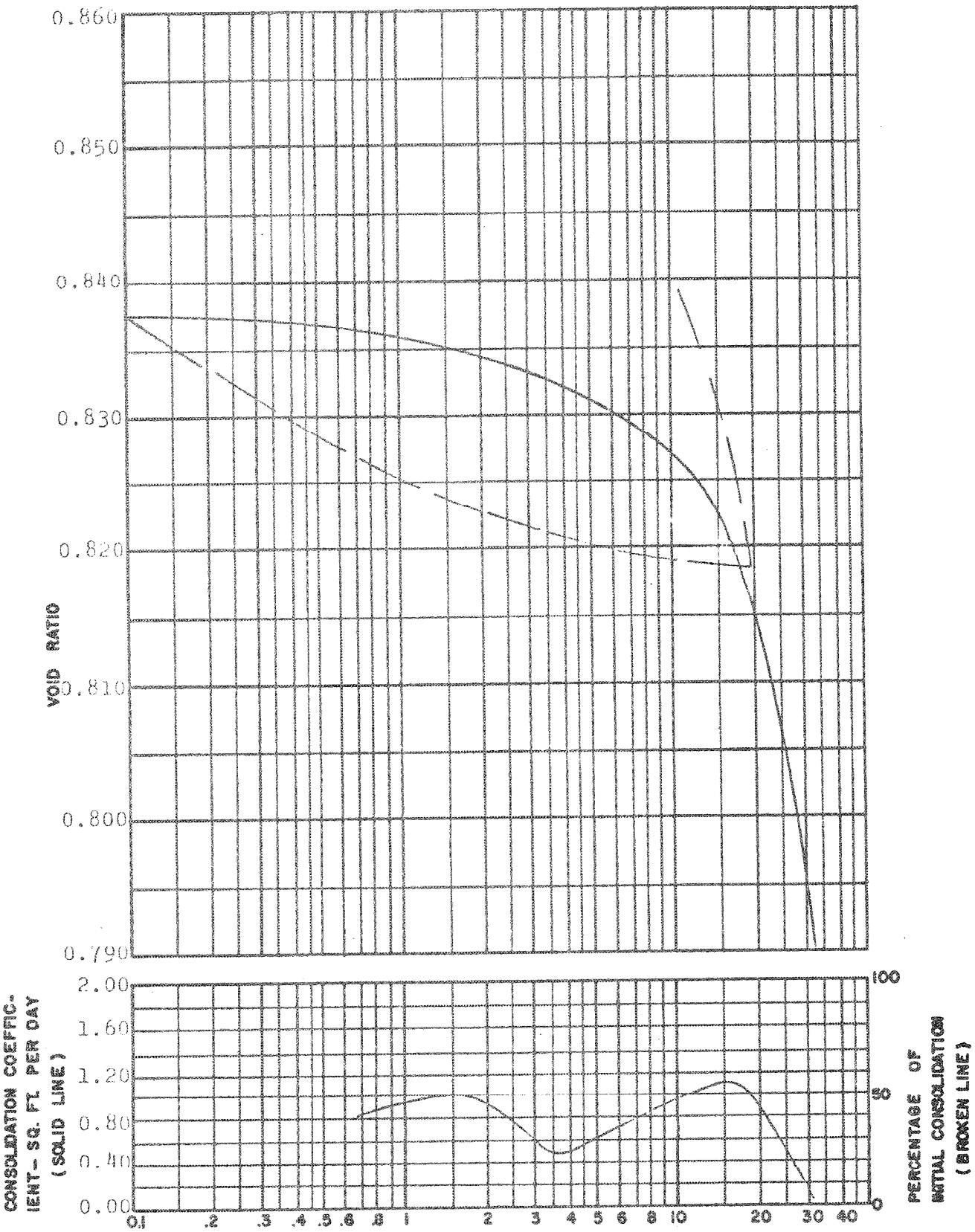
102.18%

2.5A-517

CONSOLIDATION TEST

BORING NO. B-114A SAMPLE NO. UD

ELEV. OR DEPTH 307Ft. JOB NO. J-1127



SPECIFIC GRAVITY 2.62

COMPRESSION INDEX 0.0951

UNIT WEIGHT 120.54 PCF (WET)

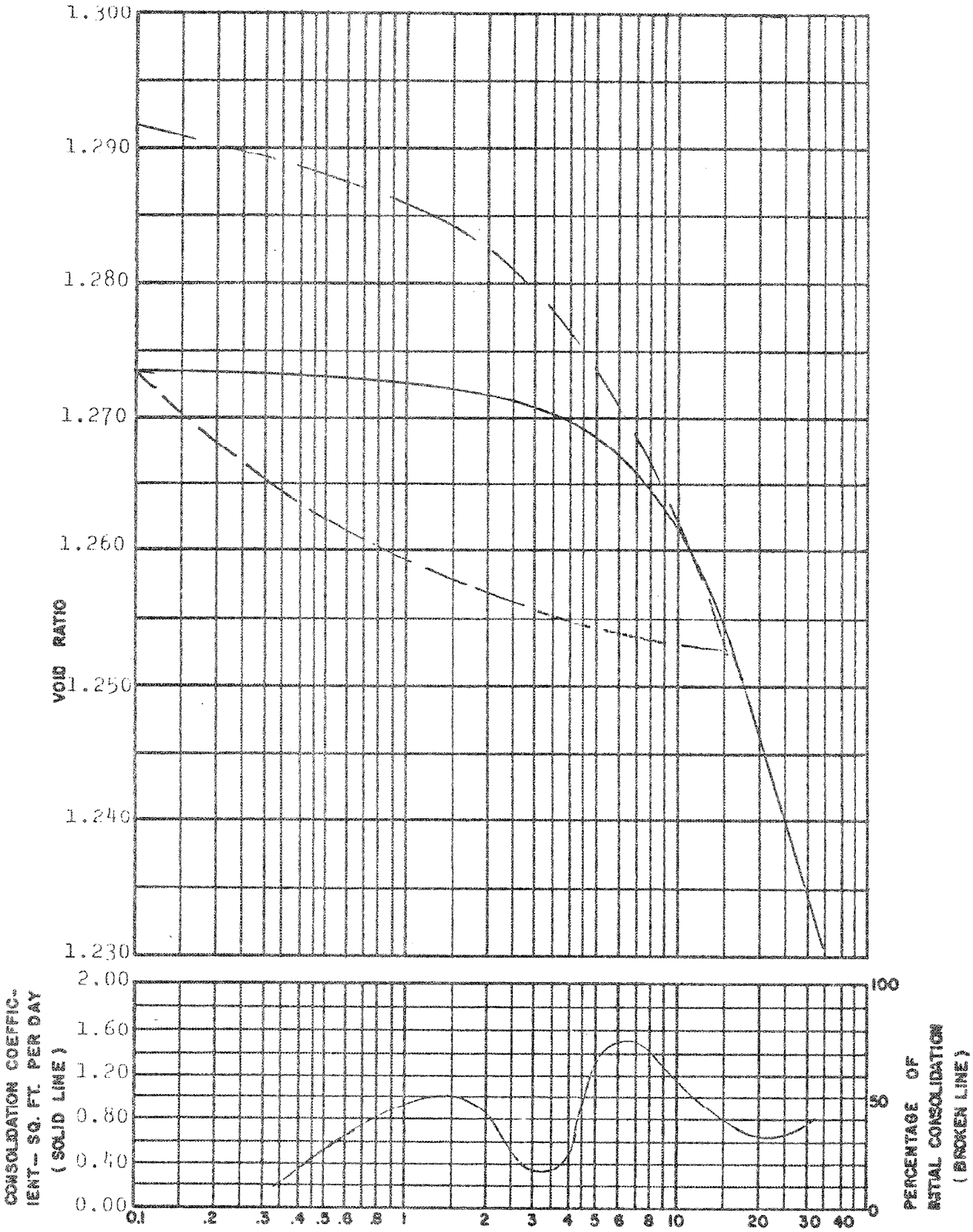
WATER CONTENT 35.7%

SATURATION 100.0

CONSOLIDATION TEST

BORING NO. B-114A SAMPLE NO. UD

ELEV. OR DEPTH 357.5 FT JOB NO. J-1127



SPECIFIC GRAVITY 2.60

COMPRESSION INDEX 0.0656

UNIT WEIGHT 102.39 PCF (WET)

WATER CONTENT 43.7%

SATURATION 89.2%

CONSOLIDATION TEST

BORING NO. B-134A SAMPLE NO. UD

ELEV. OR DEPTH 407.5 FT JOB NO. J-1127

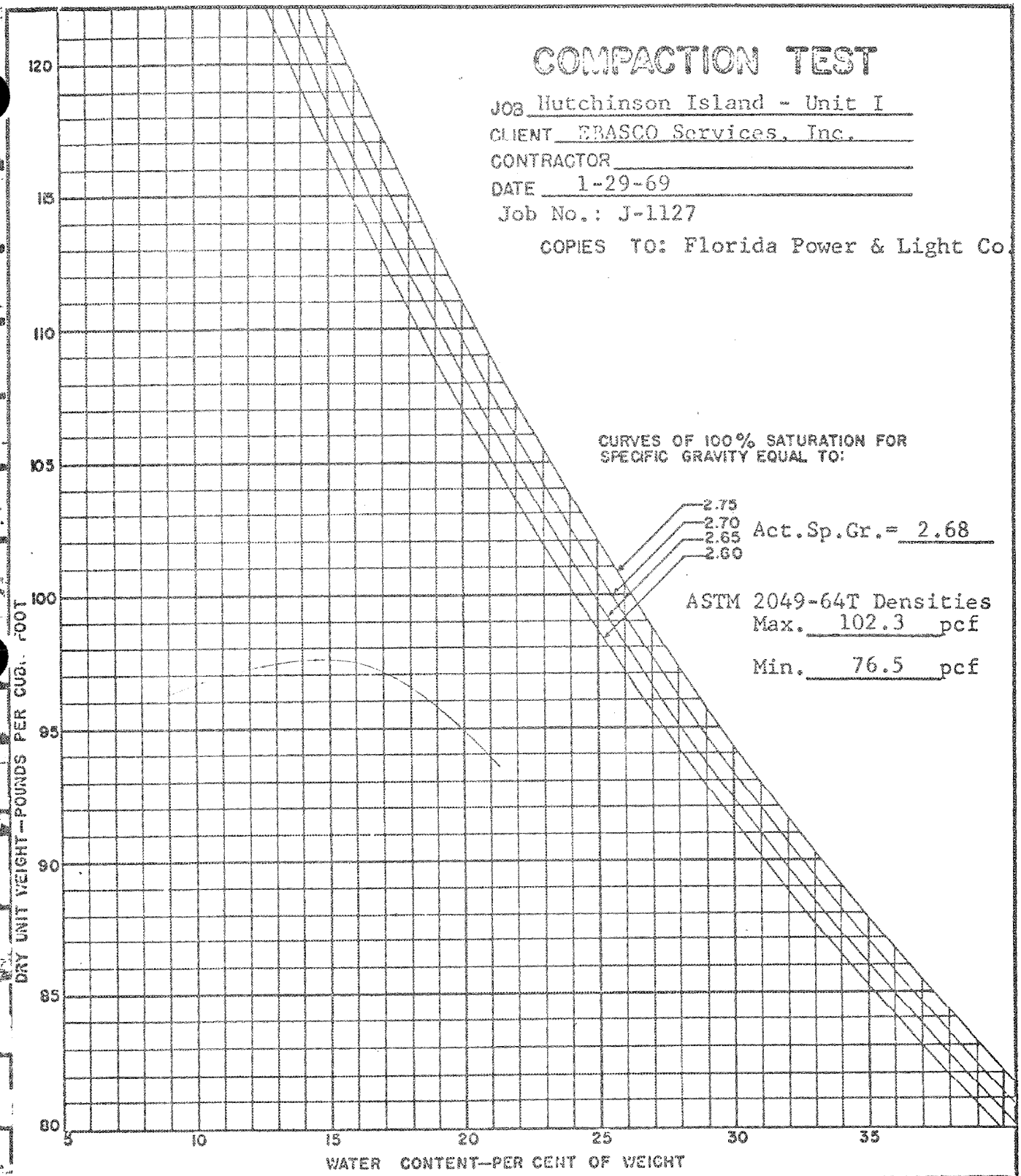
APPENDIX 2.5A

SECTION 5

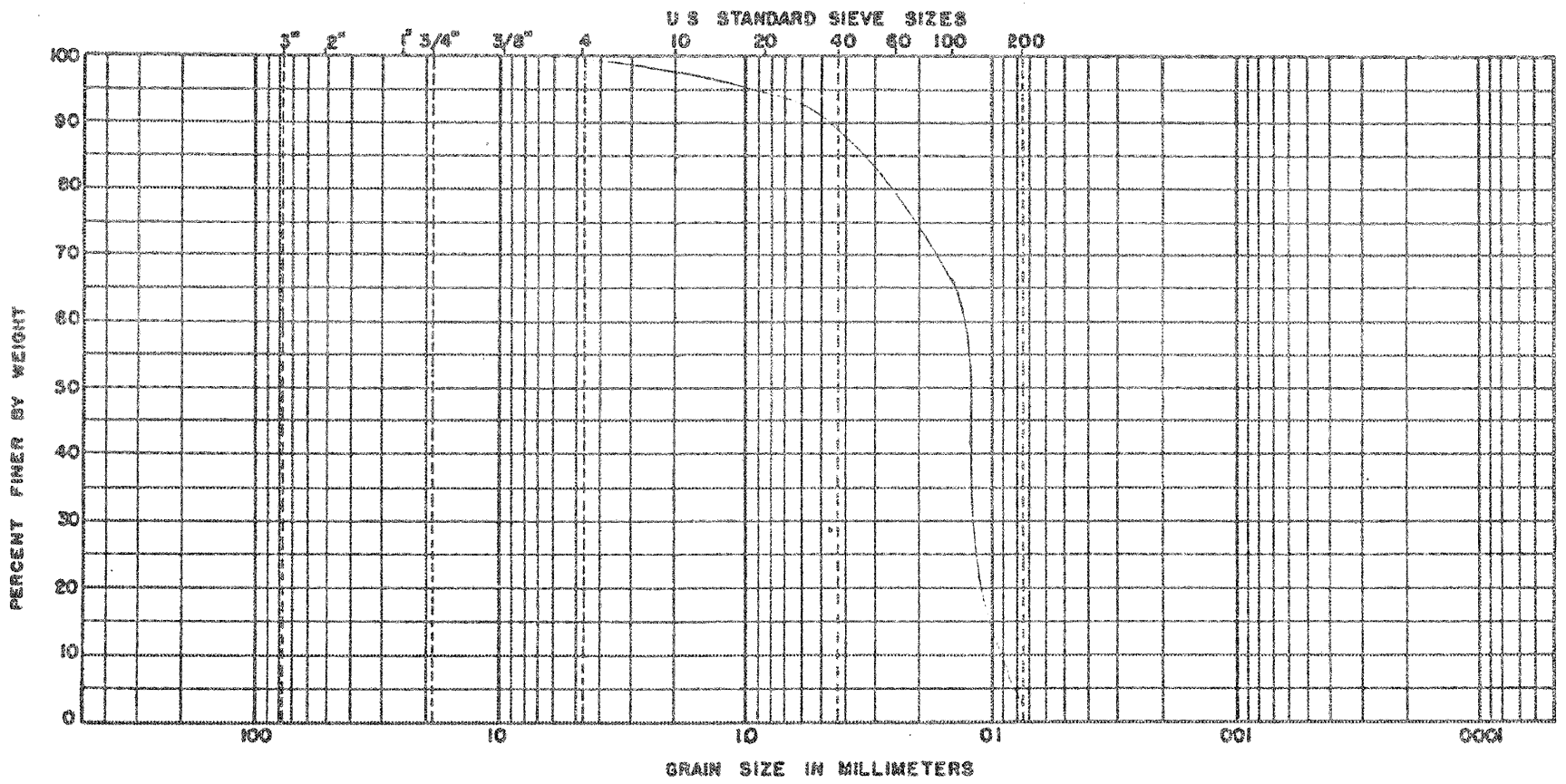
FILL MATERIAL
(0-60 FT)

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT ERASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
COPIES TO: Florida Power & Light Co.



MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 1	AASHO T-180 Method D	97.6	14.5	Grey medium to fine SAND A-1, 12' - 27'



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

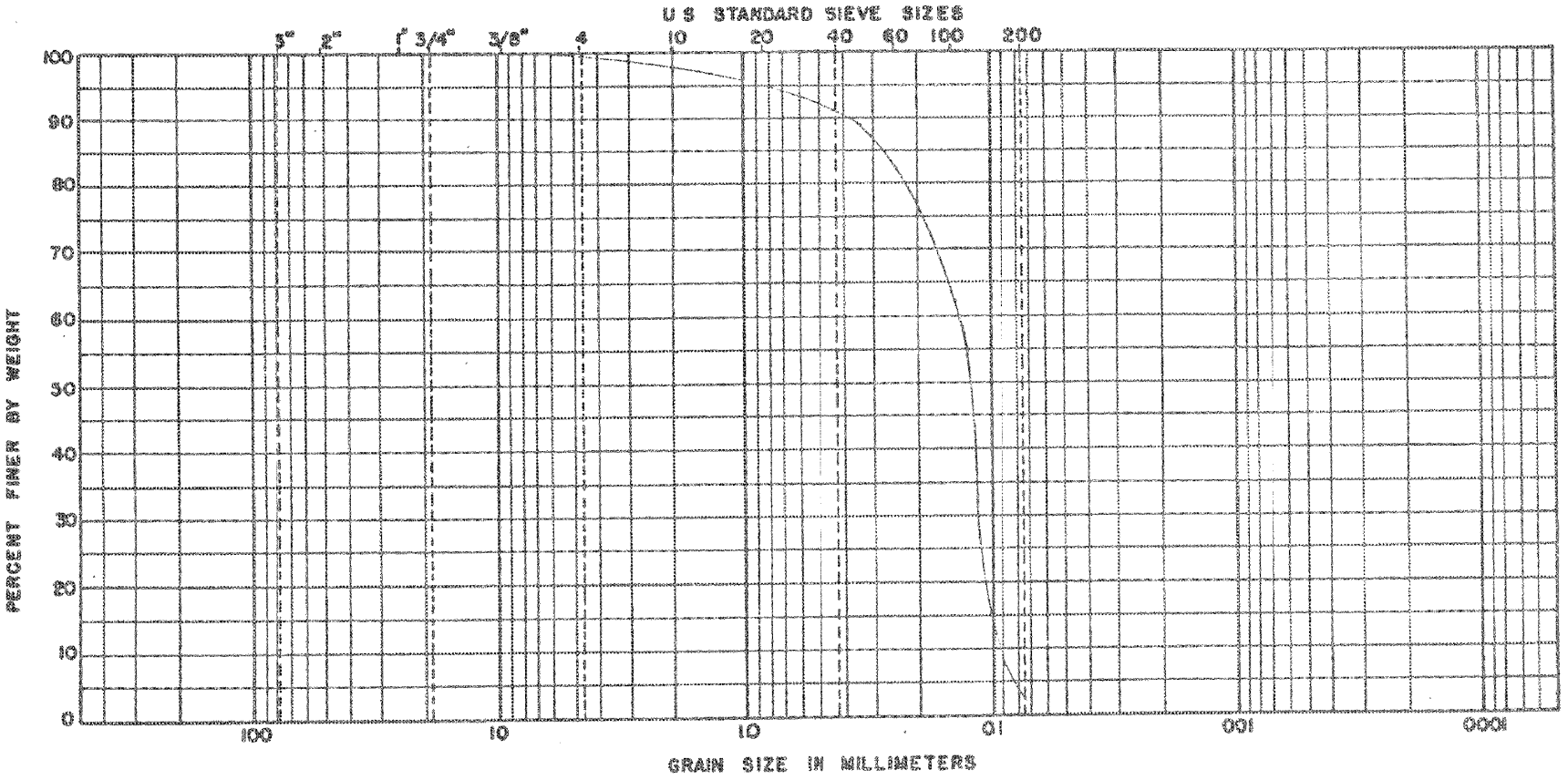
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-1	12' - 27'	24.9				Before Test Grey medium to fine SAND

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-1	12' - 27'					After Test Grey medium to fine SAND

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT EBASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
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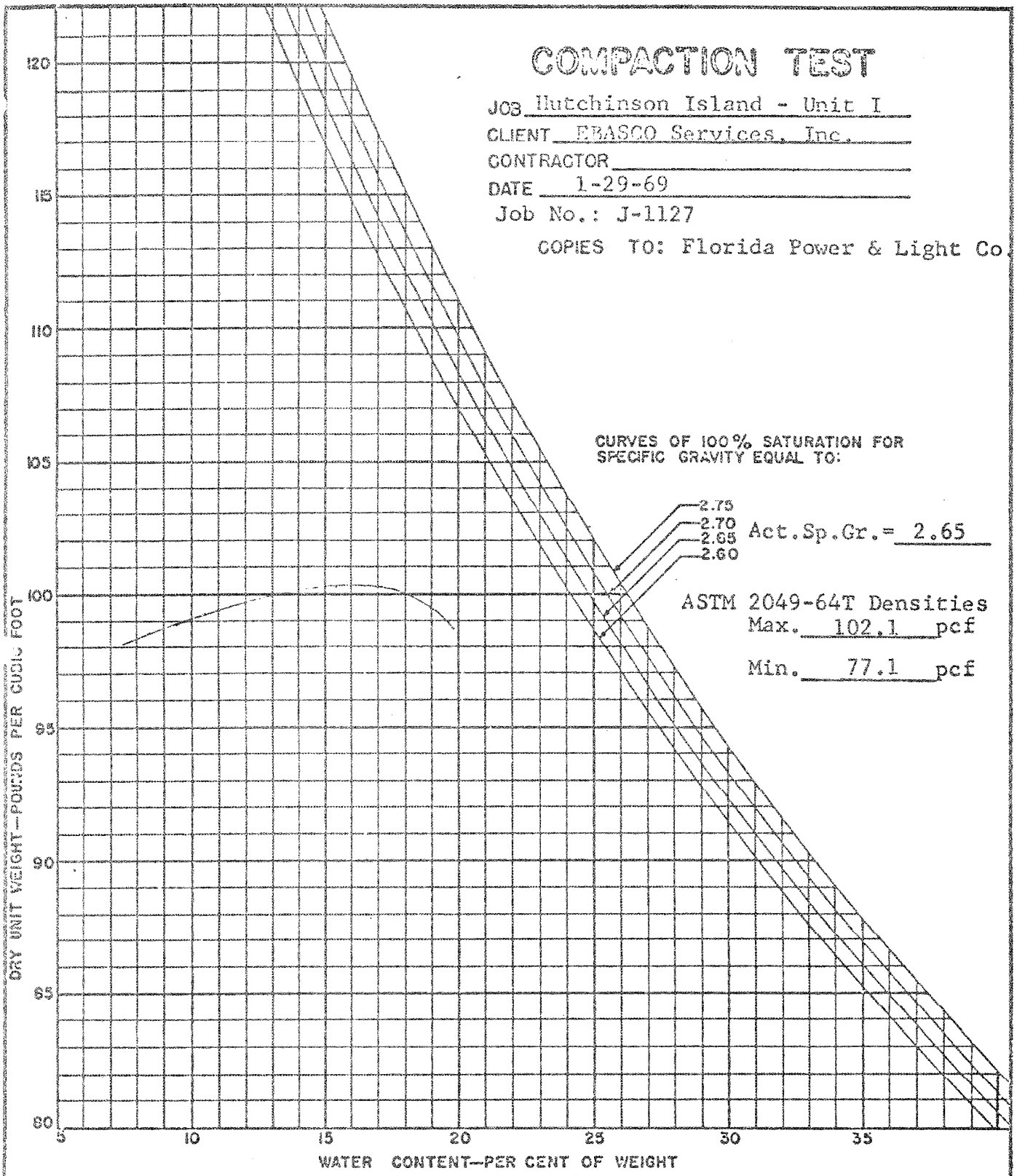
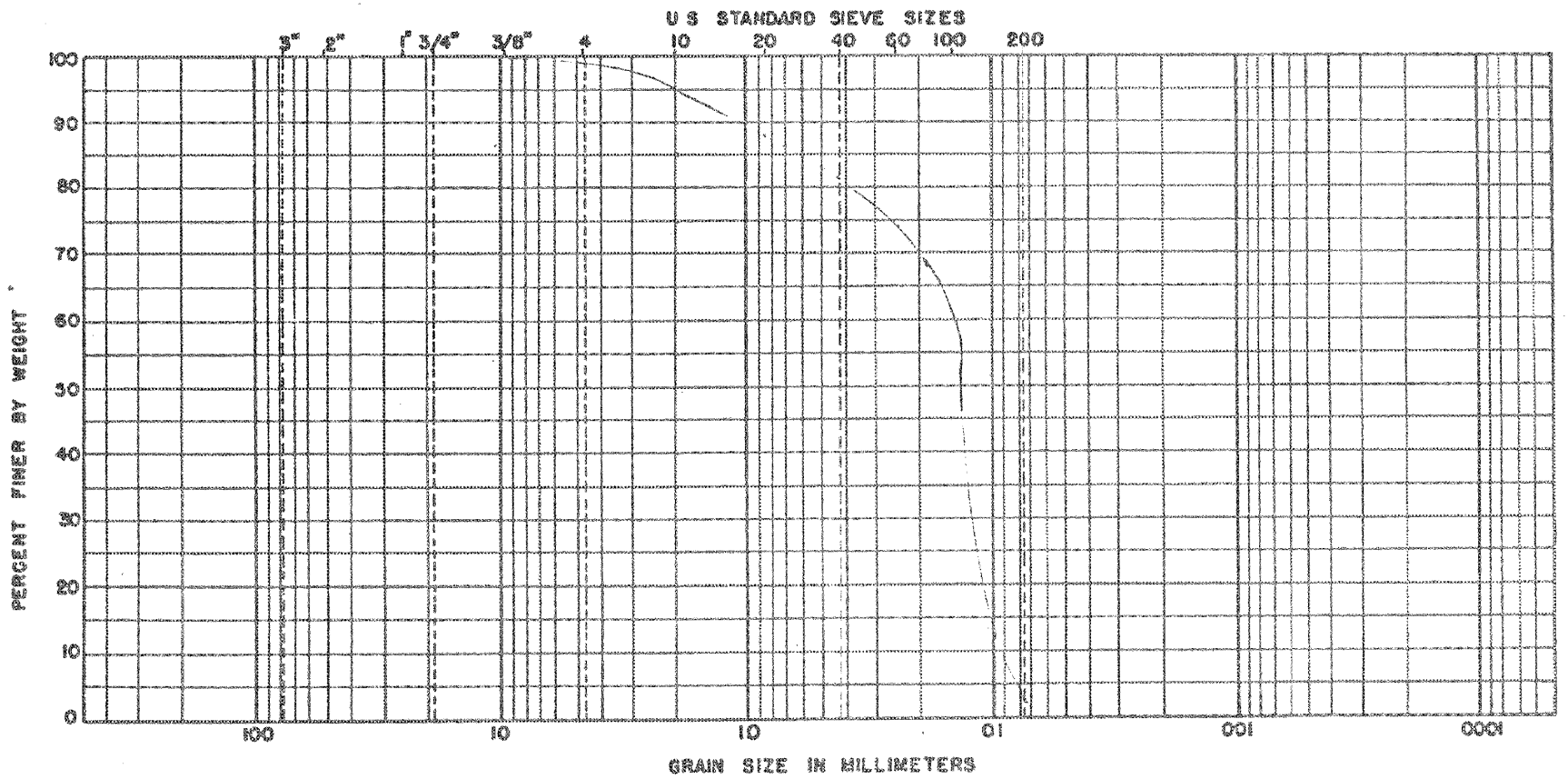


MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 4	AASHO T-180 Method D	100.3	14.6	Grey fine SAND with shells A-3, 12' - 27'



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

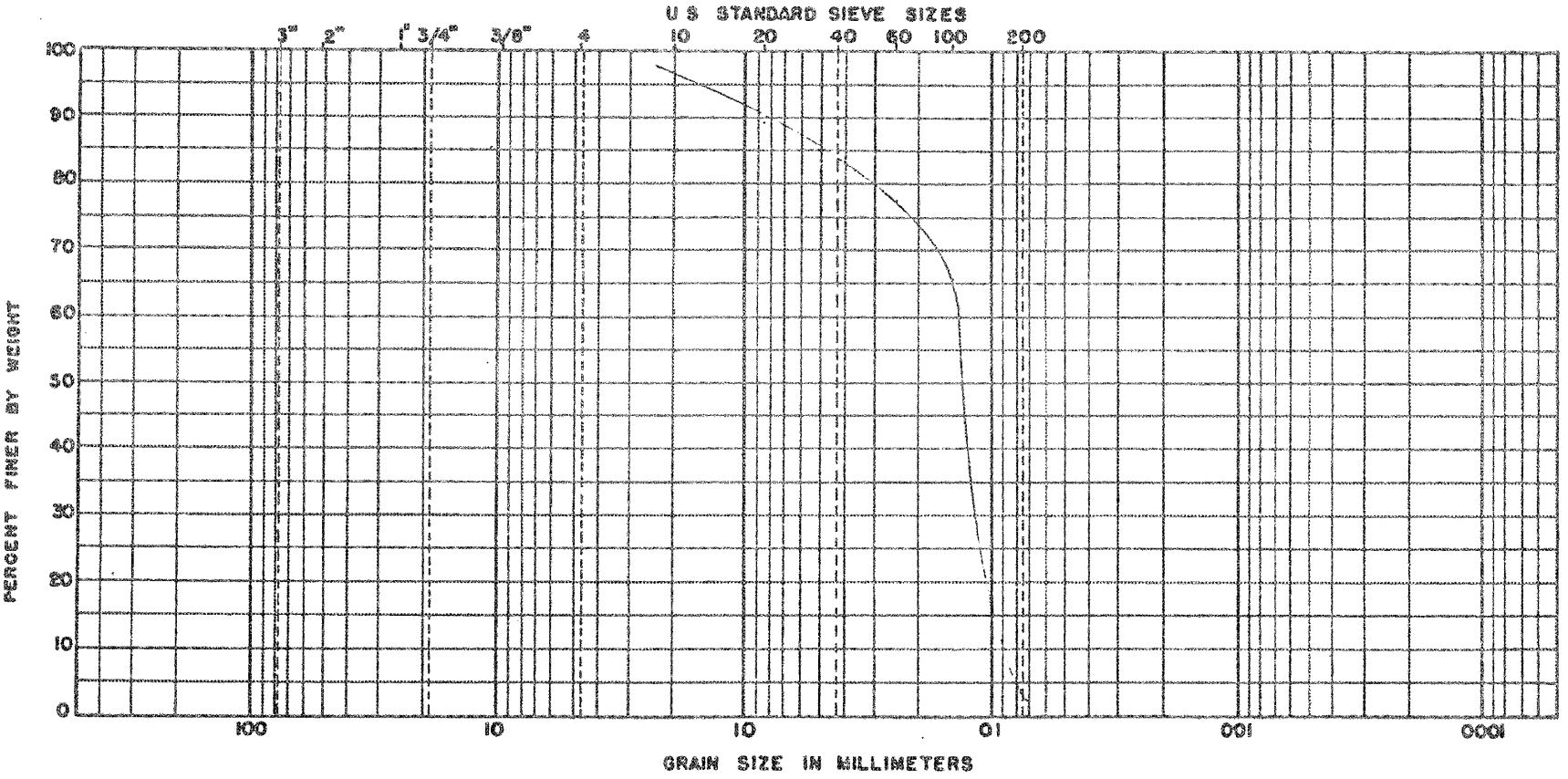
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-3	12' - 27'	28.0				Before Test Grey fine SAND with shells

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-3	12' - 27'					After Test Grey fine SAND with shells

GRAIN SIZE DISTRIBUTION

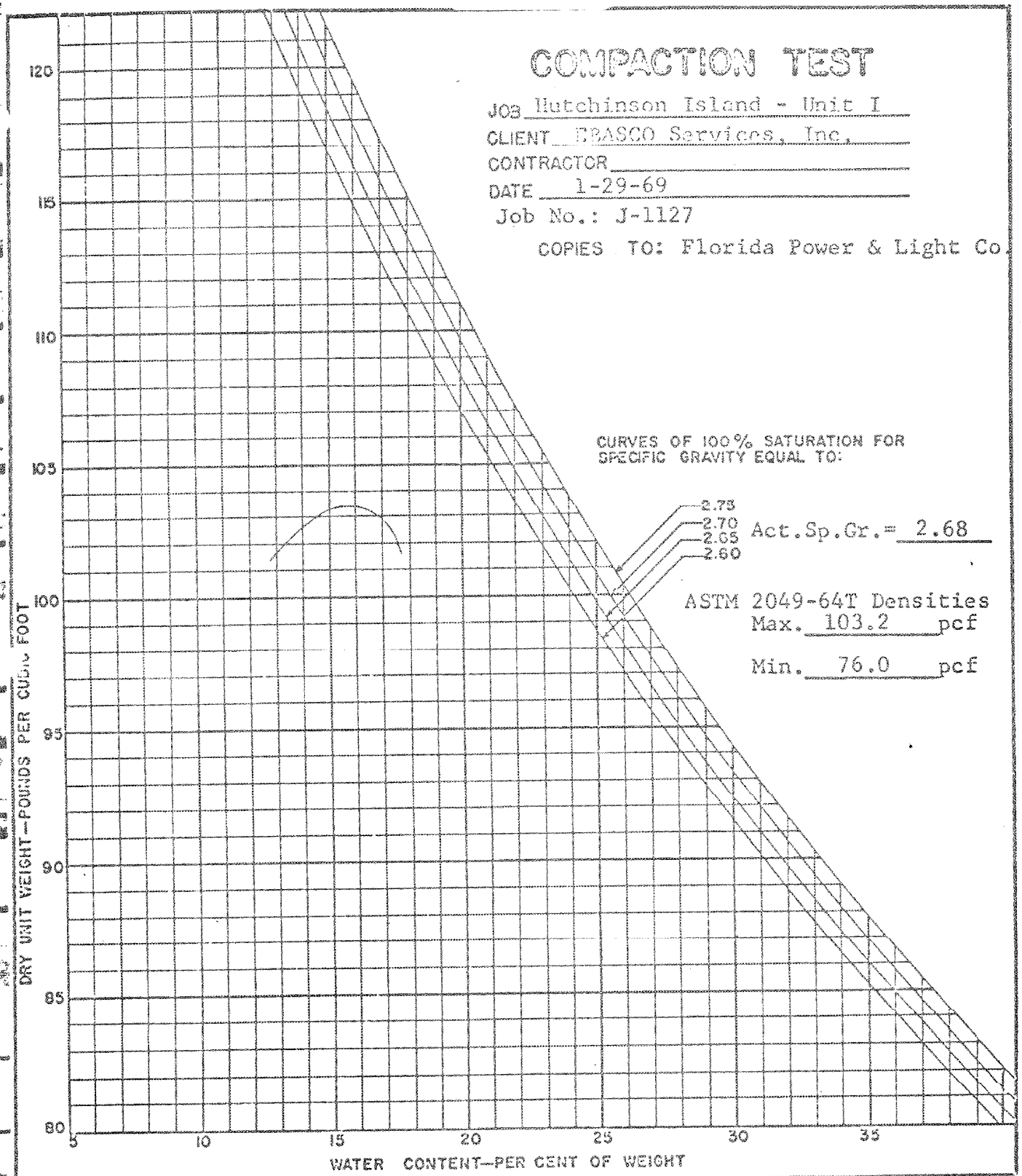
Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

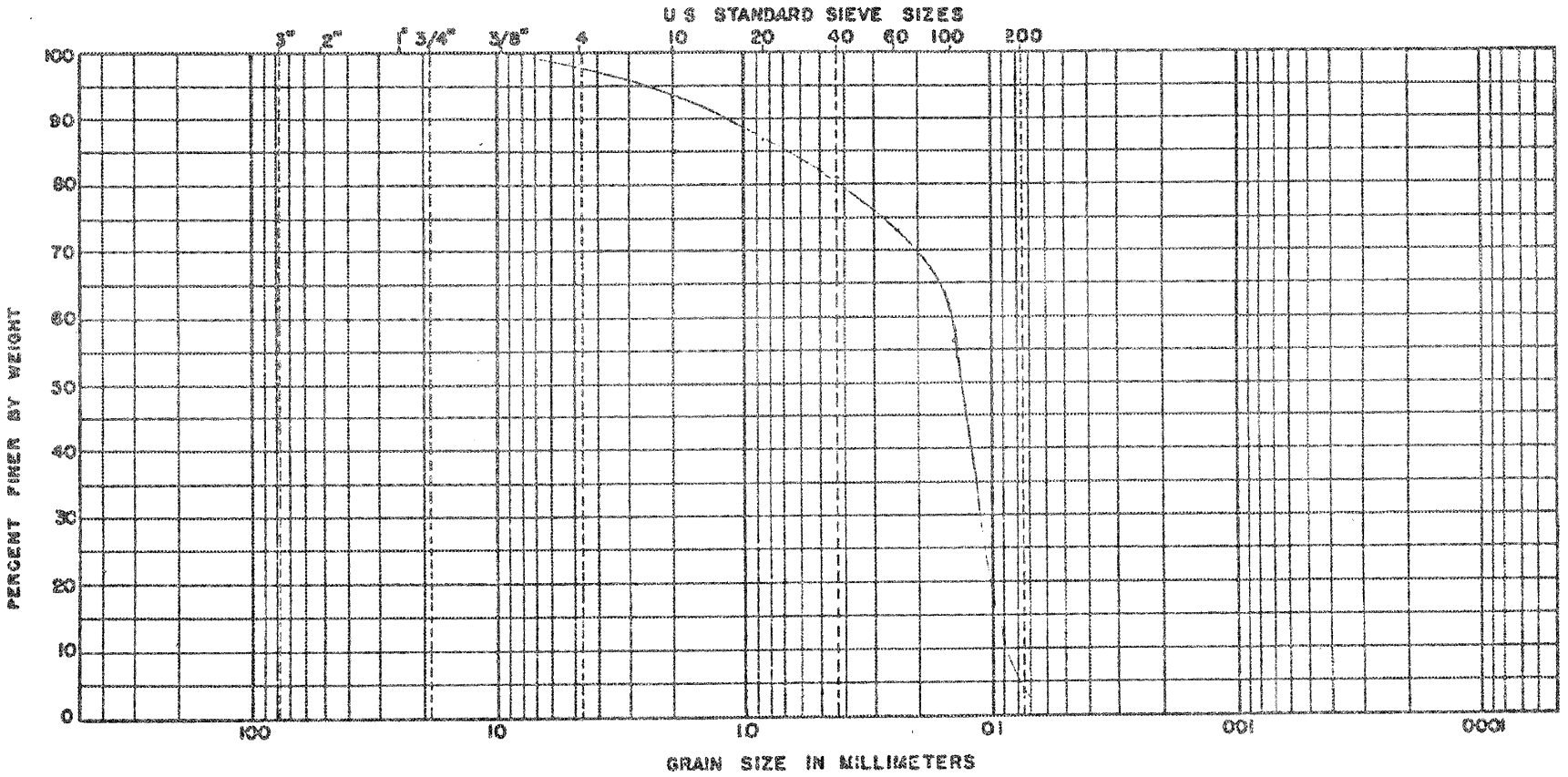
JOB Hutchinson Island - Unit I
CLIENT CRASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
COPIES TO: Florida Power & Light Co.



Act.Sp.Gr.= 2.68

ASTM 2049-64T Densities
Max. 103.2 pcf
Min. 76.0 pcf

MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 7	AASHO T-180 Method D	103.4	15.9	Grey fine SAND with shells A-4, 12' - 27'



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

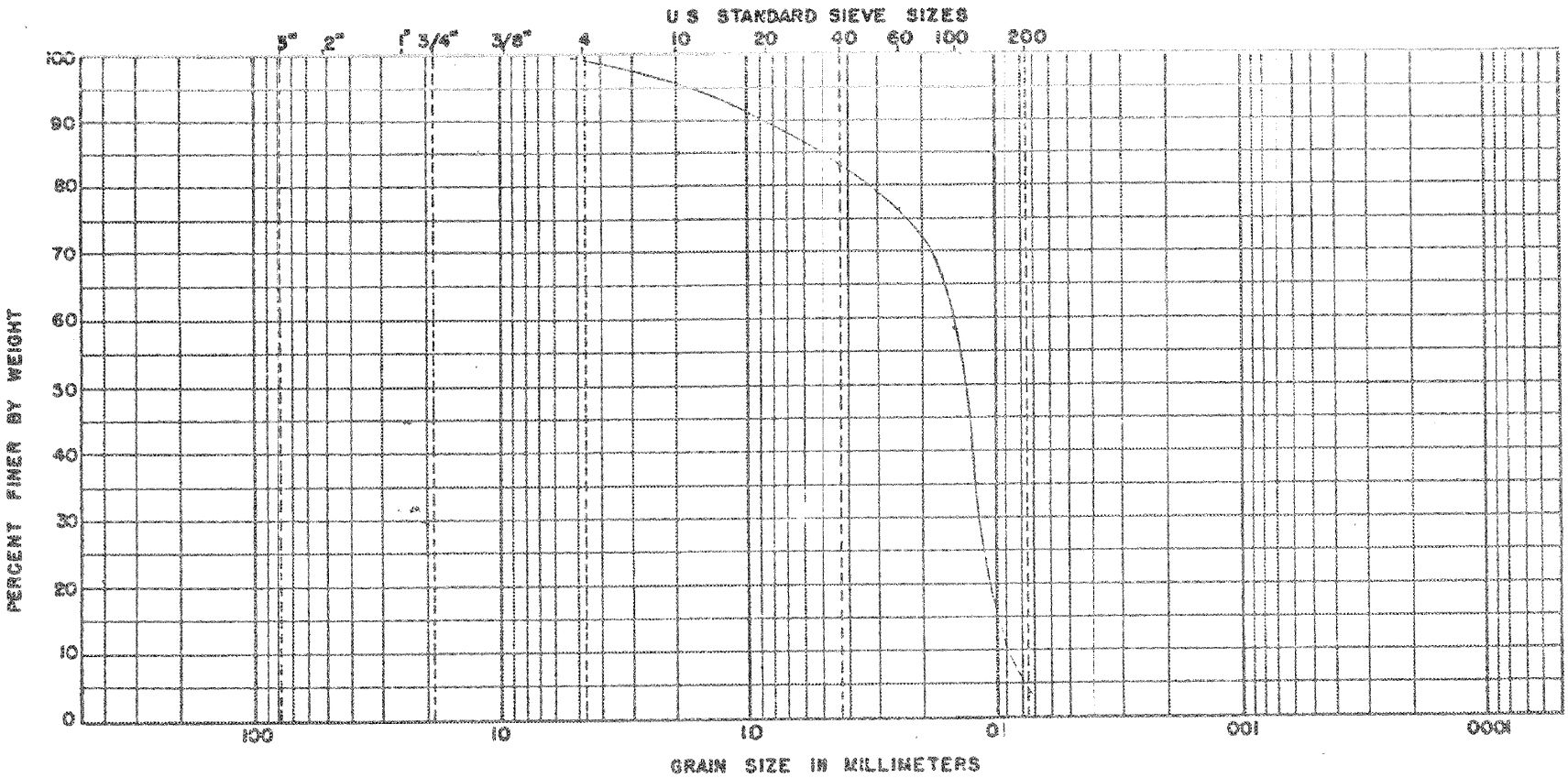
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-4	12' - 27'	12.9				Before Test Grey fine SAND with shells

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-4	12' - 27'					After Test Grey fine SAND with shells

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT [illegible] Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
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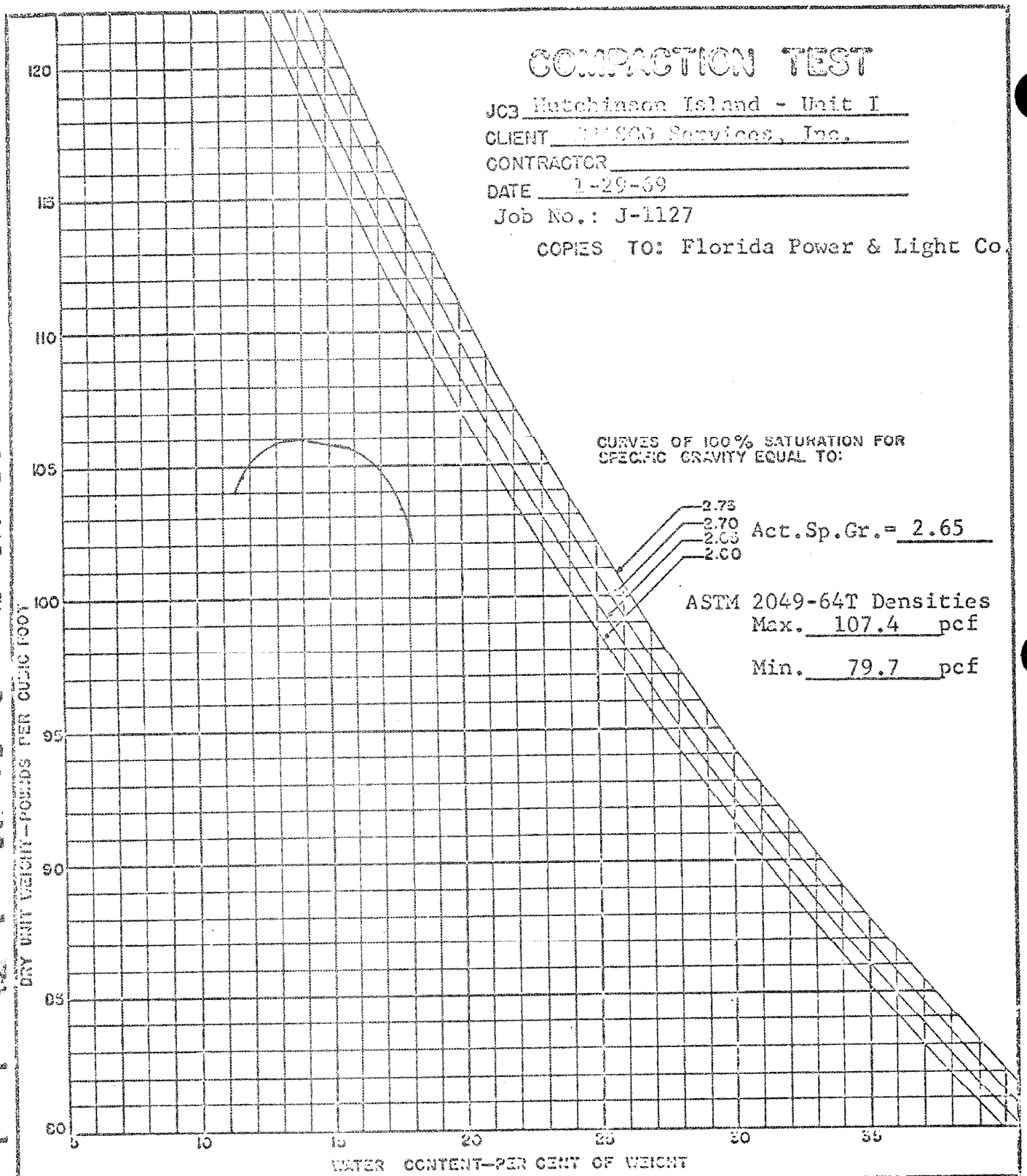
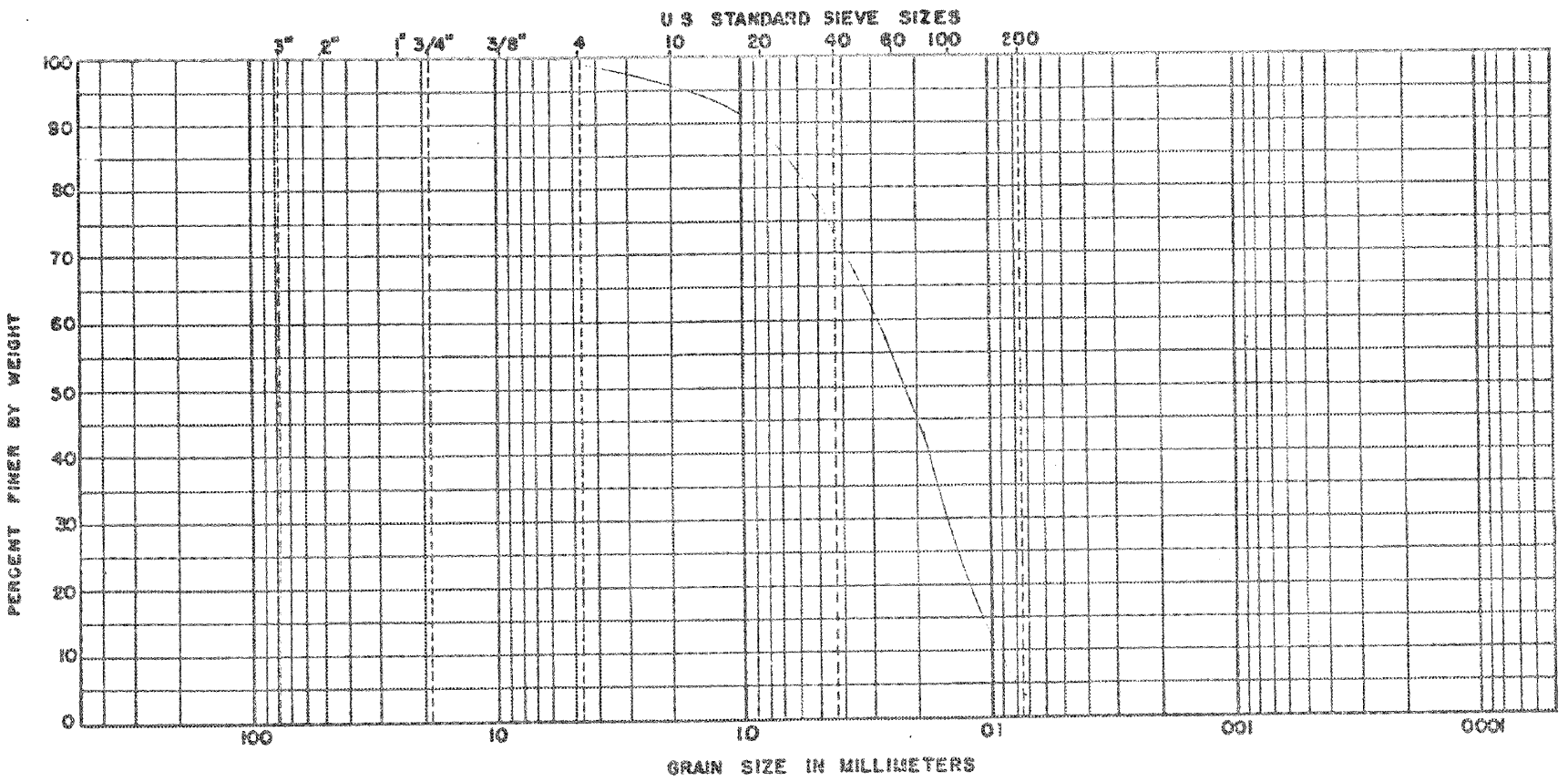


MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 10	AASHO T-180 Method D	106.0	13.7	Dark grey medium to coarse SAND Boring A-2, 12' - 27'

2.5A-530

D [illegible]



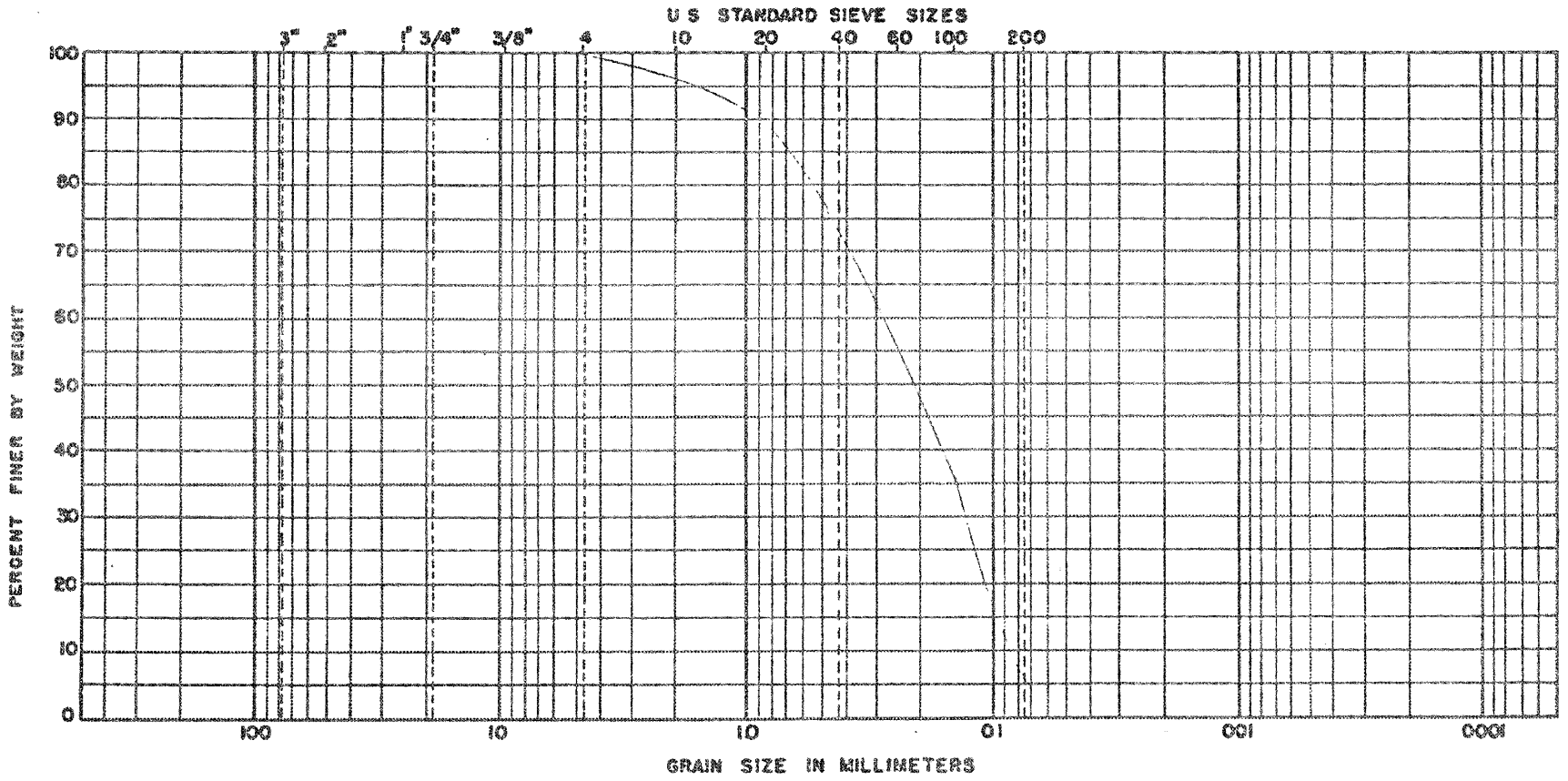
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-2	12'-27'	20.2%				Dark grey slightly silty medium to fine SAND with some shells Before Test

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
A-2	12'-27'					Dark grey slightly silty medium to fine SAND with some shells After Test

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT EBASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
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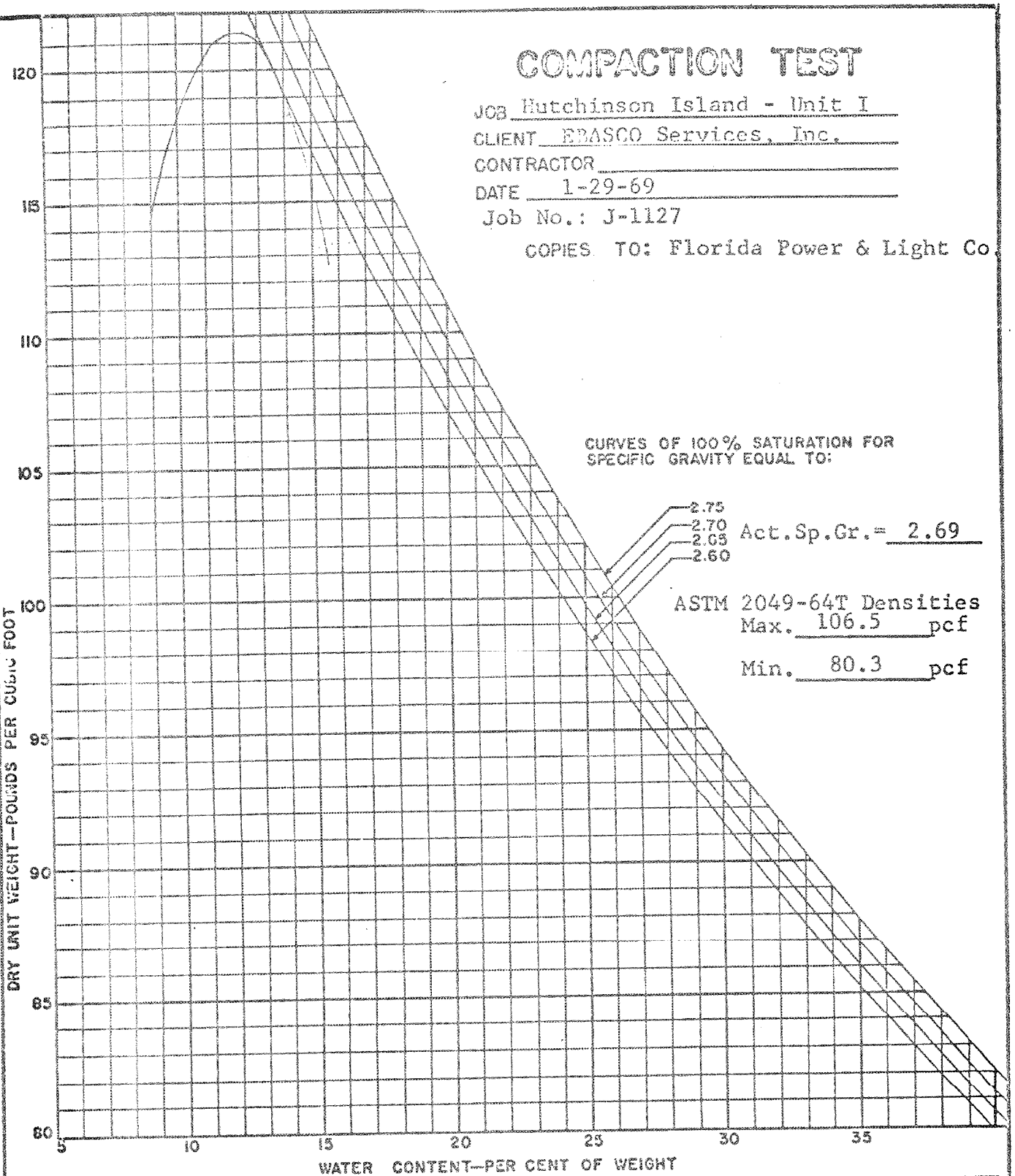
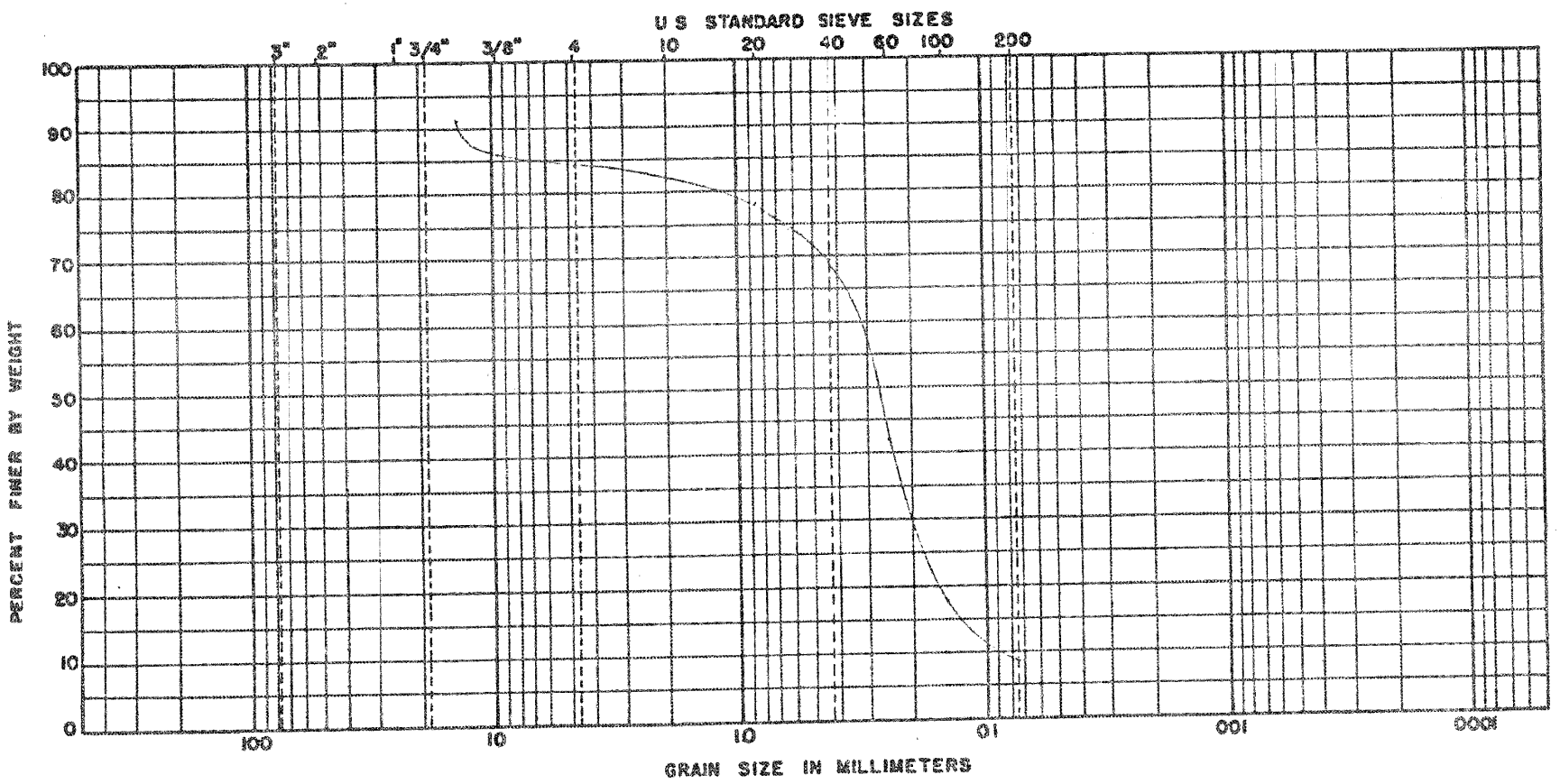


Act.Sp.Gr.= 2.69

ASTM 2049-64T Densities
Max. 106.5 pcf
Min. 80.3 pcf

MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 2	AASHO T-180 Method	118.3	14.1	Grey and tan silty medium to fine SAND with shells A-1, 27' - 47'

Donald H. Eaton



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

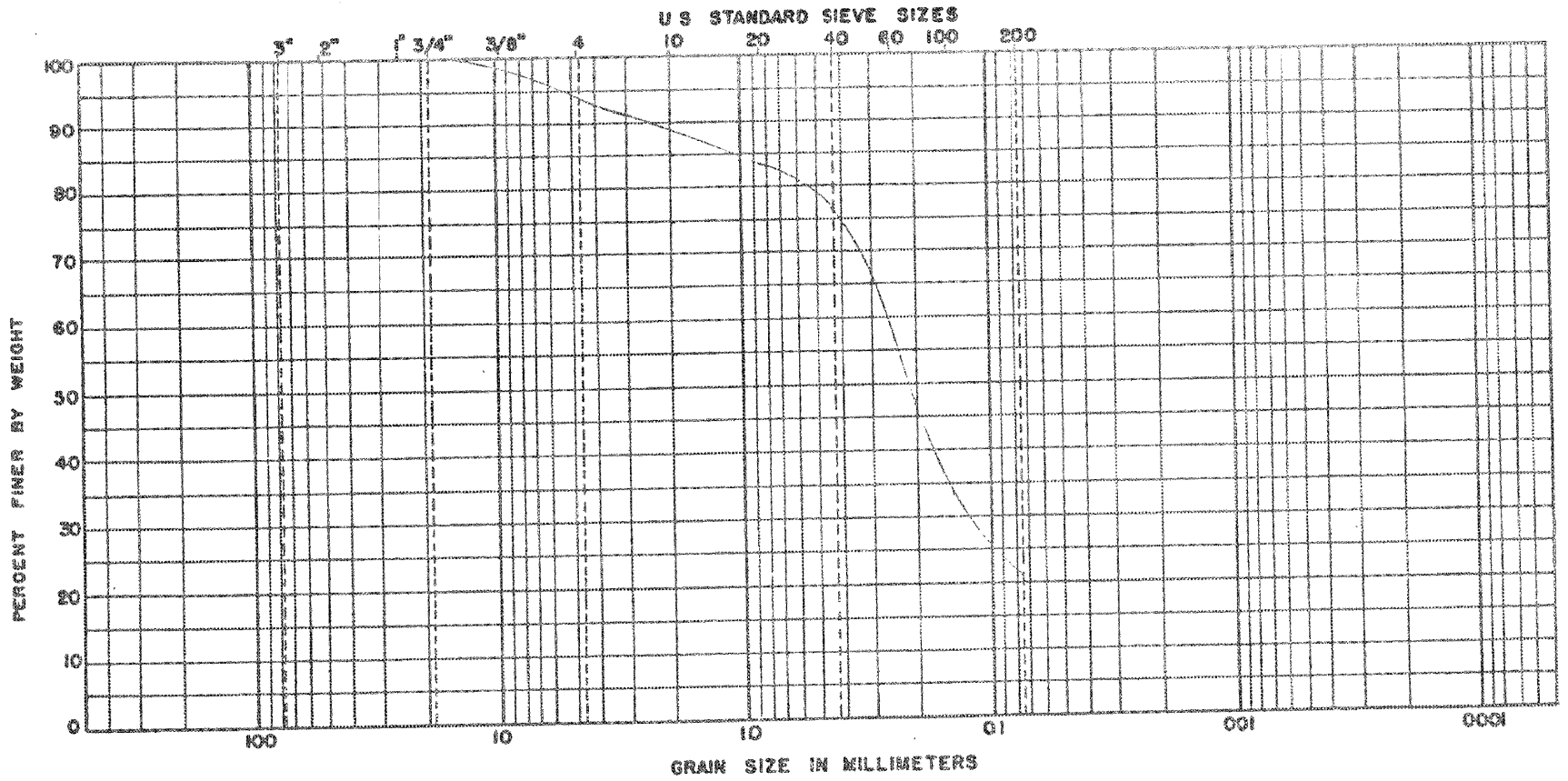
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-1	27' - 47'	22.1				Before Test Grey and tan silty medium to fine SAND with shells

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	PL	P I	DESCRIPTION OR CLASSIFICATION
A-1	27'- 47'					After Test Grey and tan silty medium to fine SAND with shells

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT EBASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
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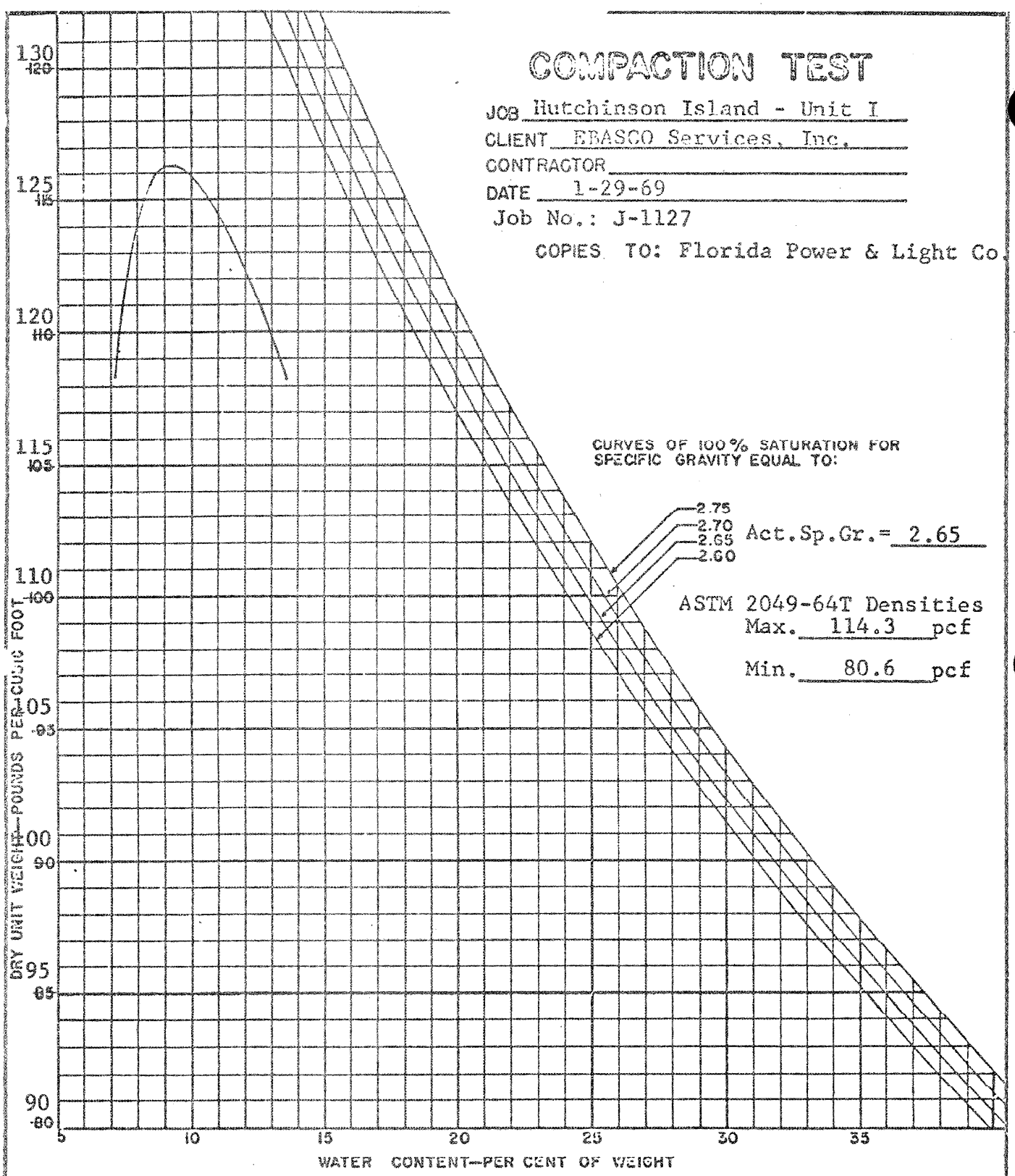
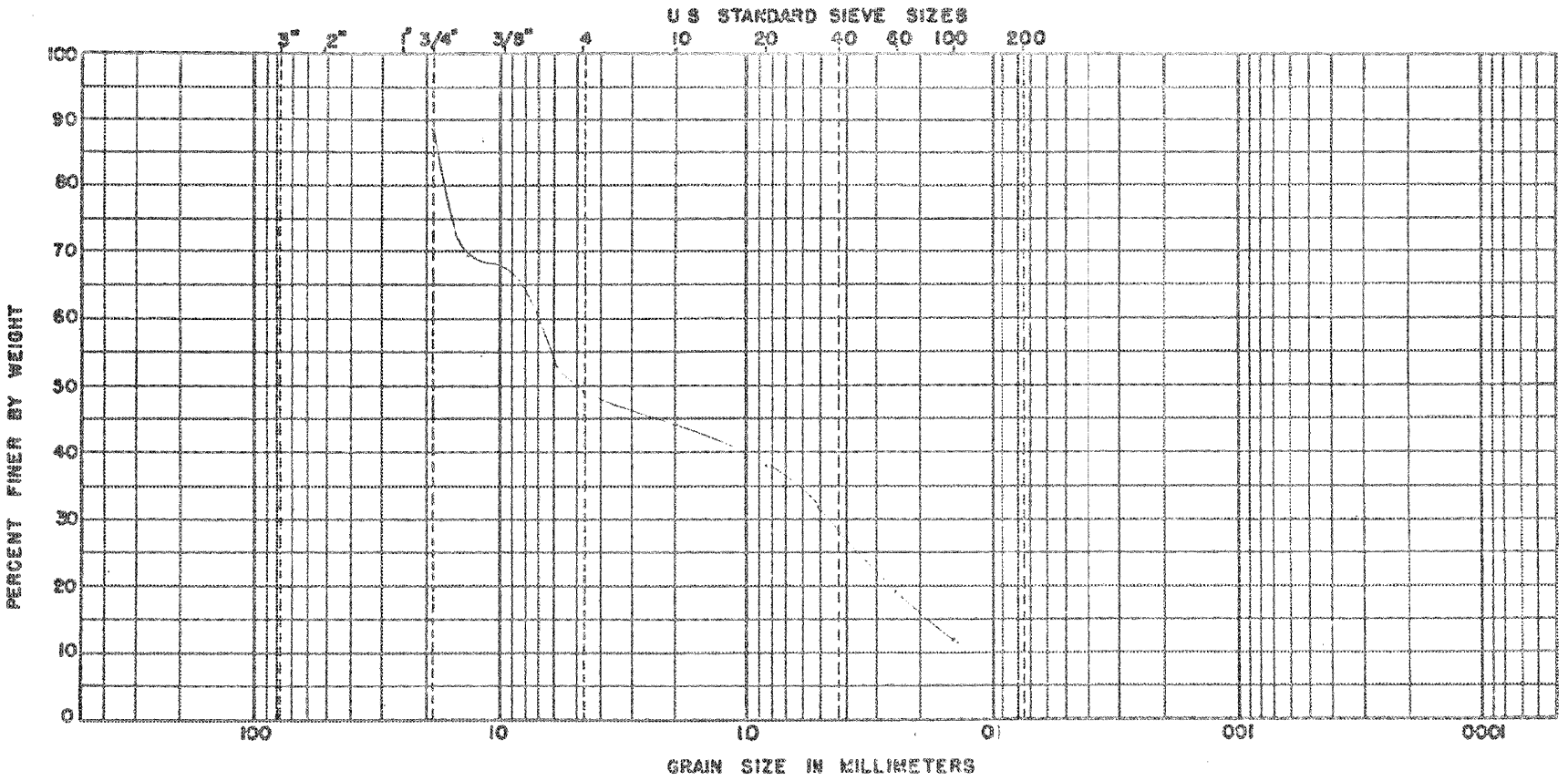


MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 5	AASHO T-180 Method D	126.3	9.6	Tan clayey silty fine SAND with shells and limestone A-3, 27' - 47'



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

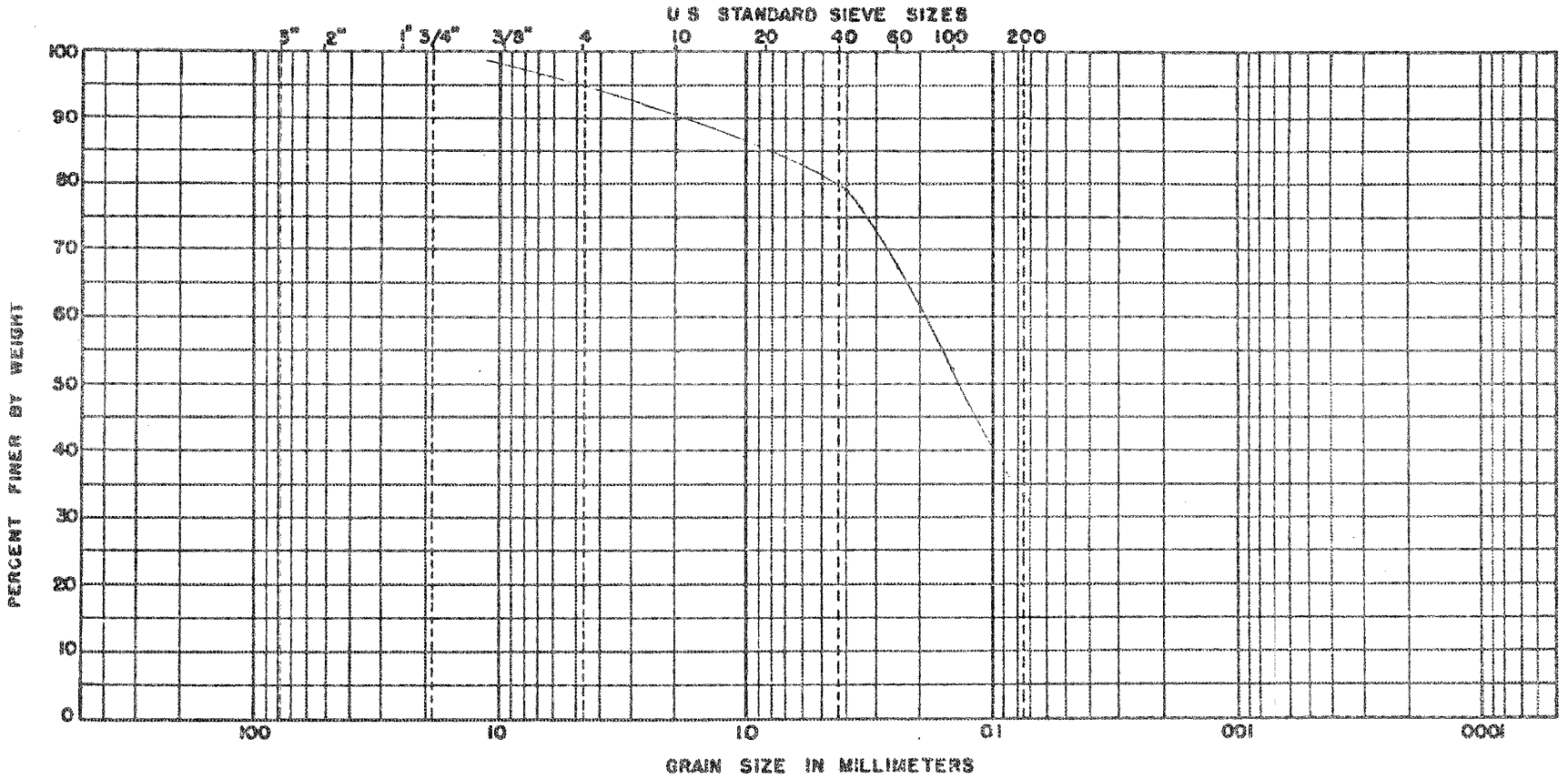
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-3	27' - 47'	16.9				Before Test Tan clayey silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	MAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
A-3	27' - 47'					After Test Tan clayey silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

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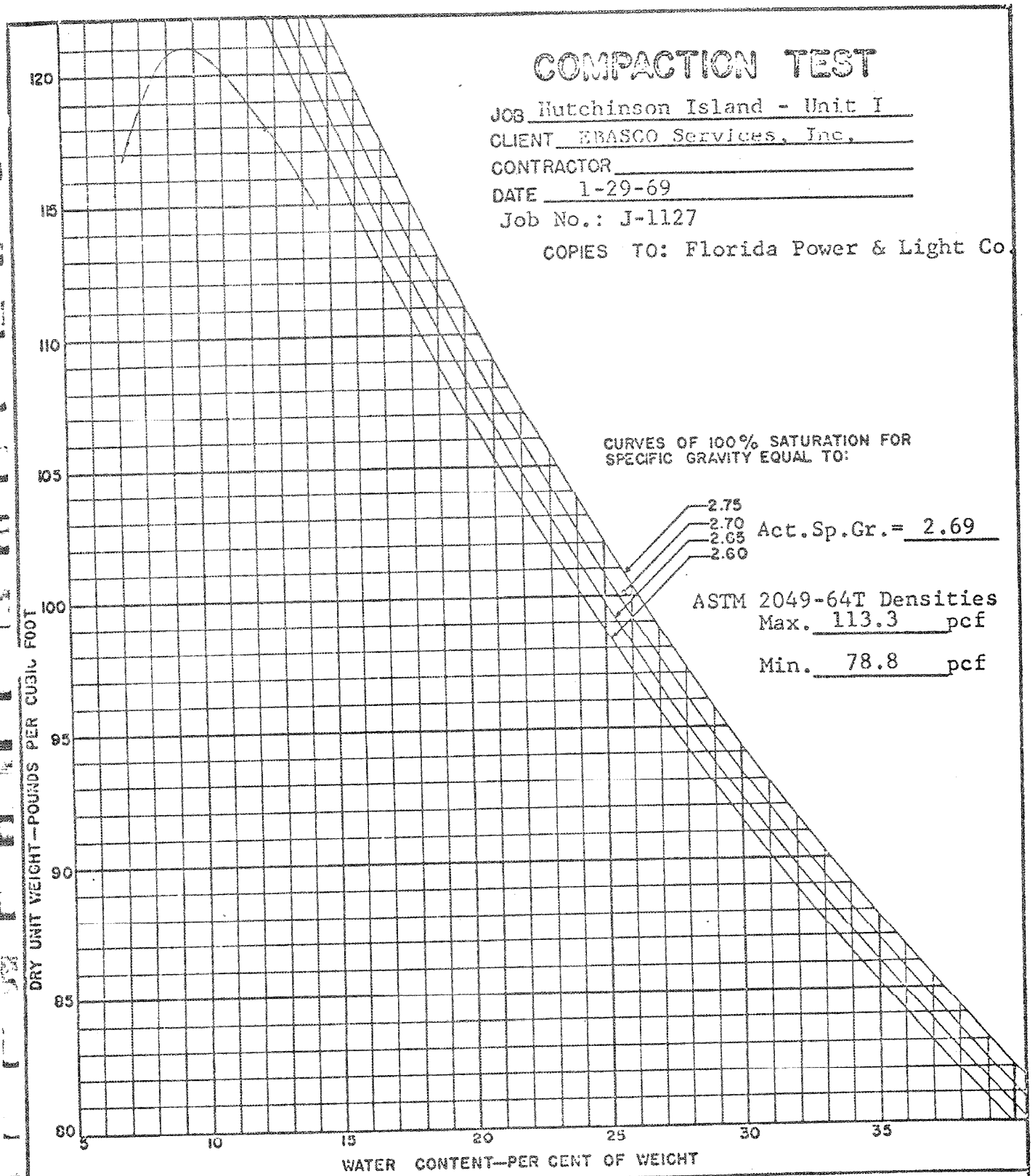
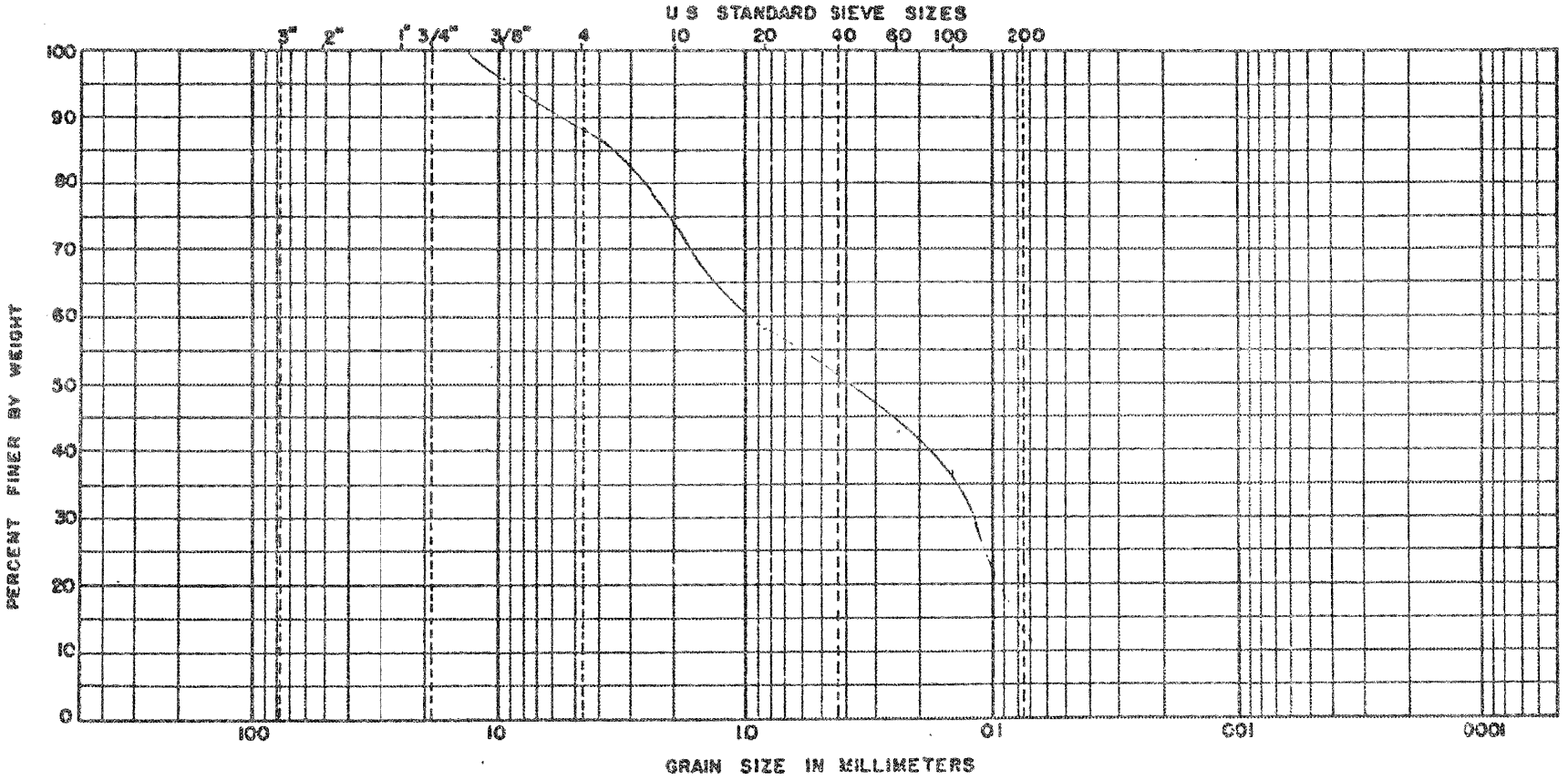


Act.Sp.Gr.= 2.69

ASTM 2049-64T Densities
Max. 113.3 pcf
Min. 78.8 pcf

MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 8	AASHO T-180 Method D	121.0	10.0	Grey and tan silty fine SAND with shells and limestone A-4, 27' - 47'

2-5A-539



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

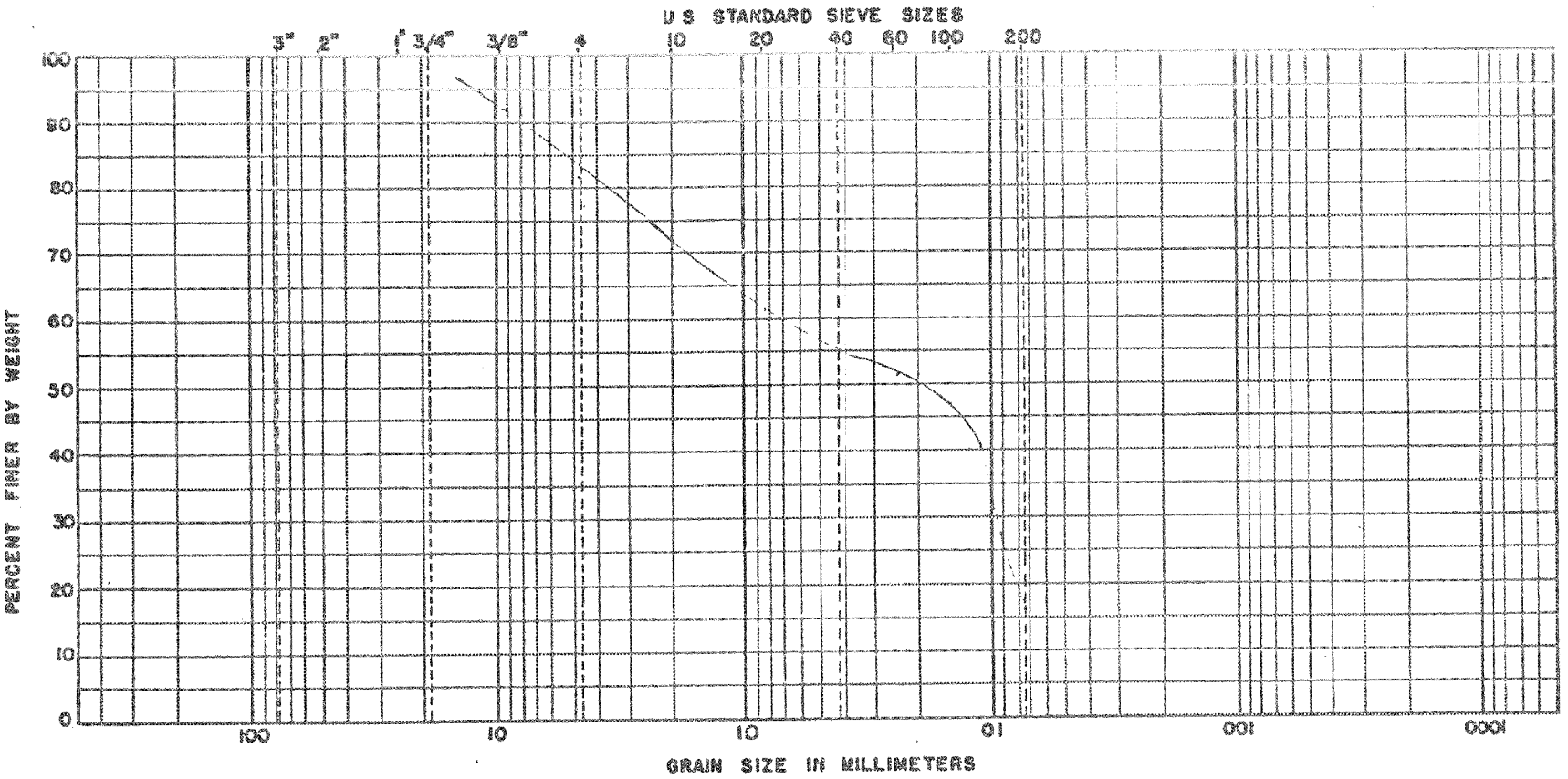
BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
A-4	27' - 47'	16.3				Before Test Grey and tan silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
A-4	27' - 47'					After Test Grey and tan silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT BRASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
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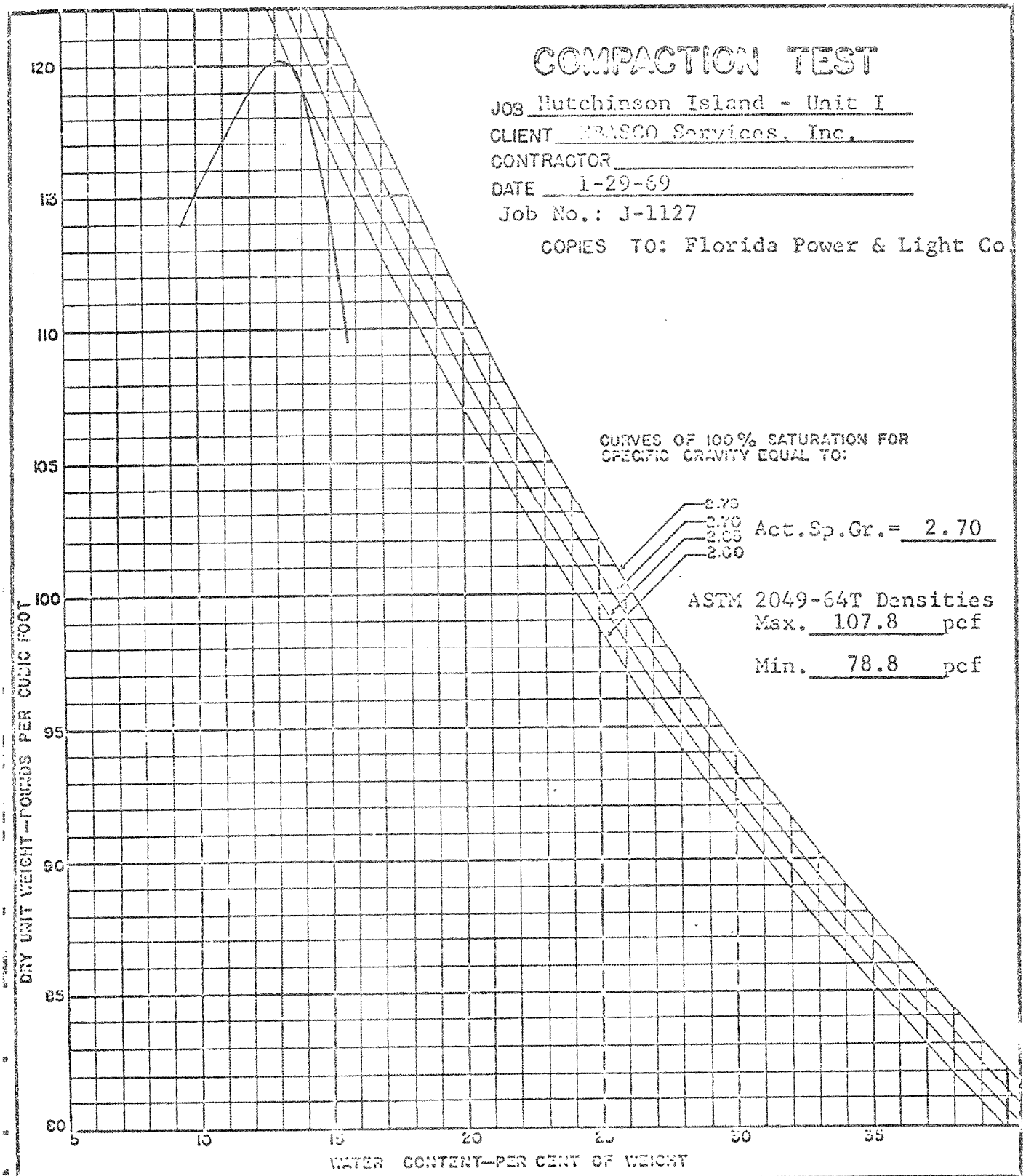
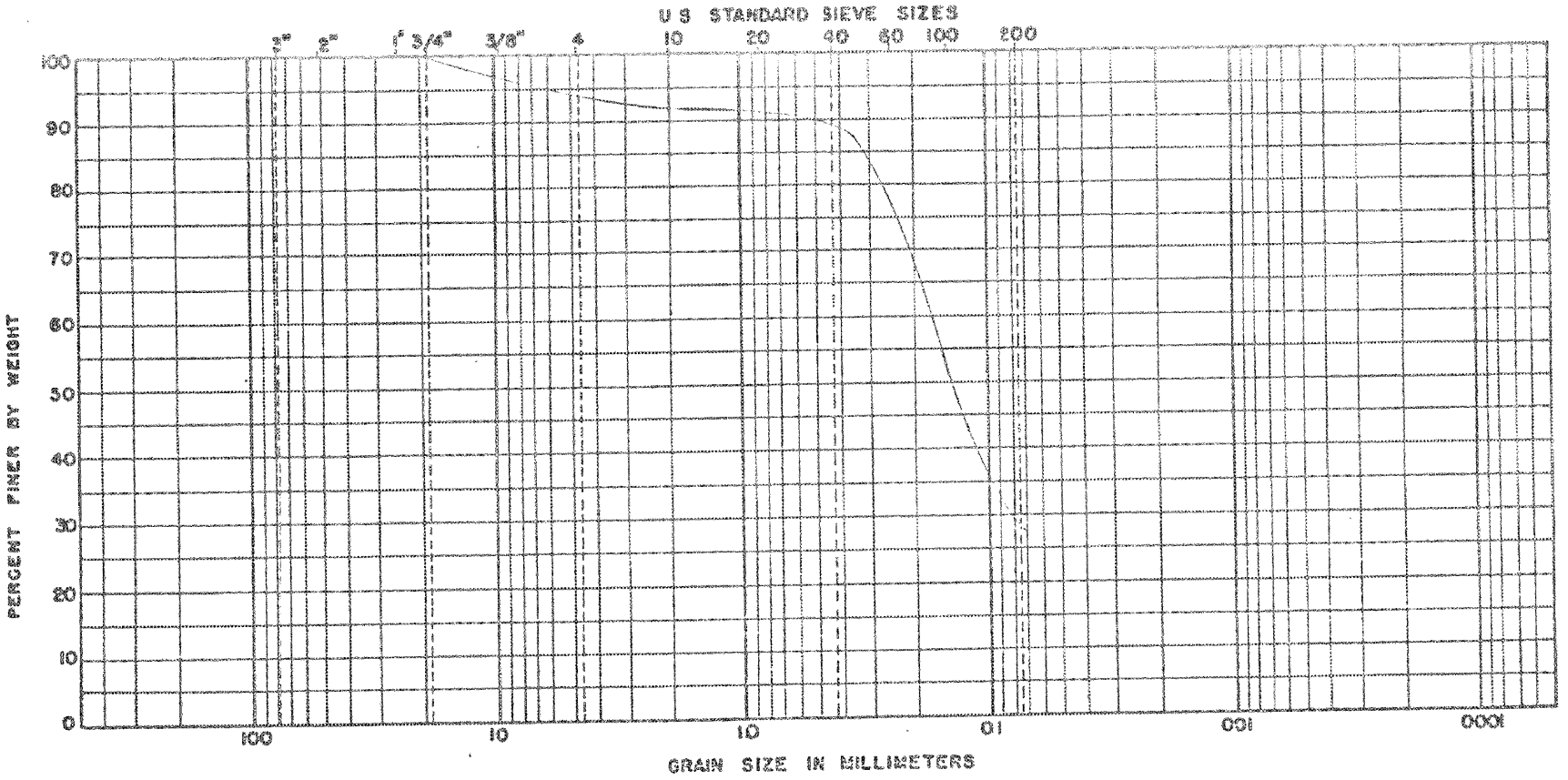


MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No.11	AASHO T-180 Method A	120.1	13.4	Brown and tan slightly clayey silty SAND with limerock and shell mixed Boring A-2, 27' to 47'



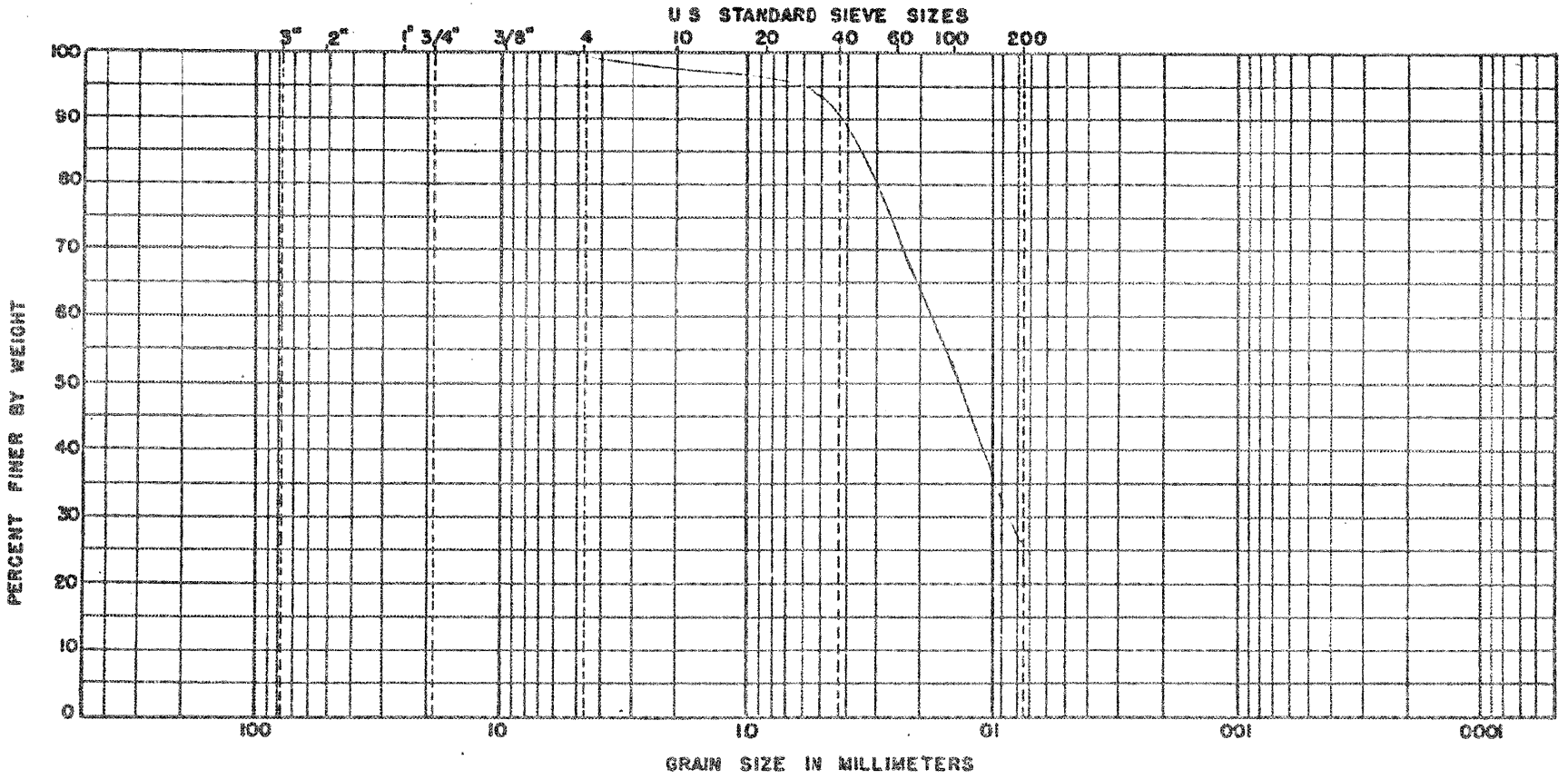
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-2	27'-47'	25.4%				Brown and tan clayey silty fine SAND with some shell and limestone Before Test

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L.L	PL	PI	DESCRIPTION OR CLASSIFICATION
A-2	27'- 47'					Brown and tan clayey silty fine SAND with some shell and limestone After Test

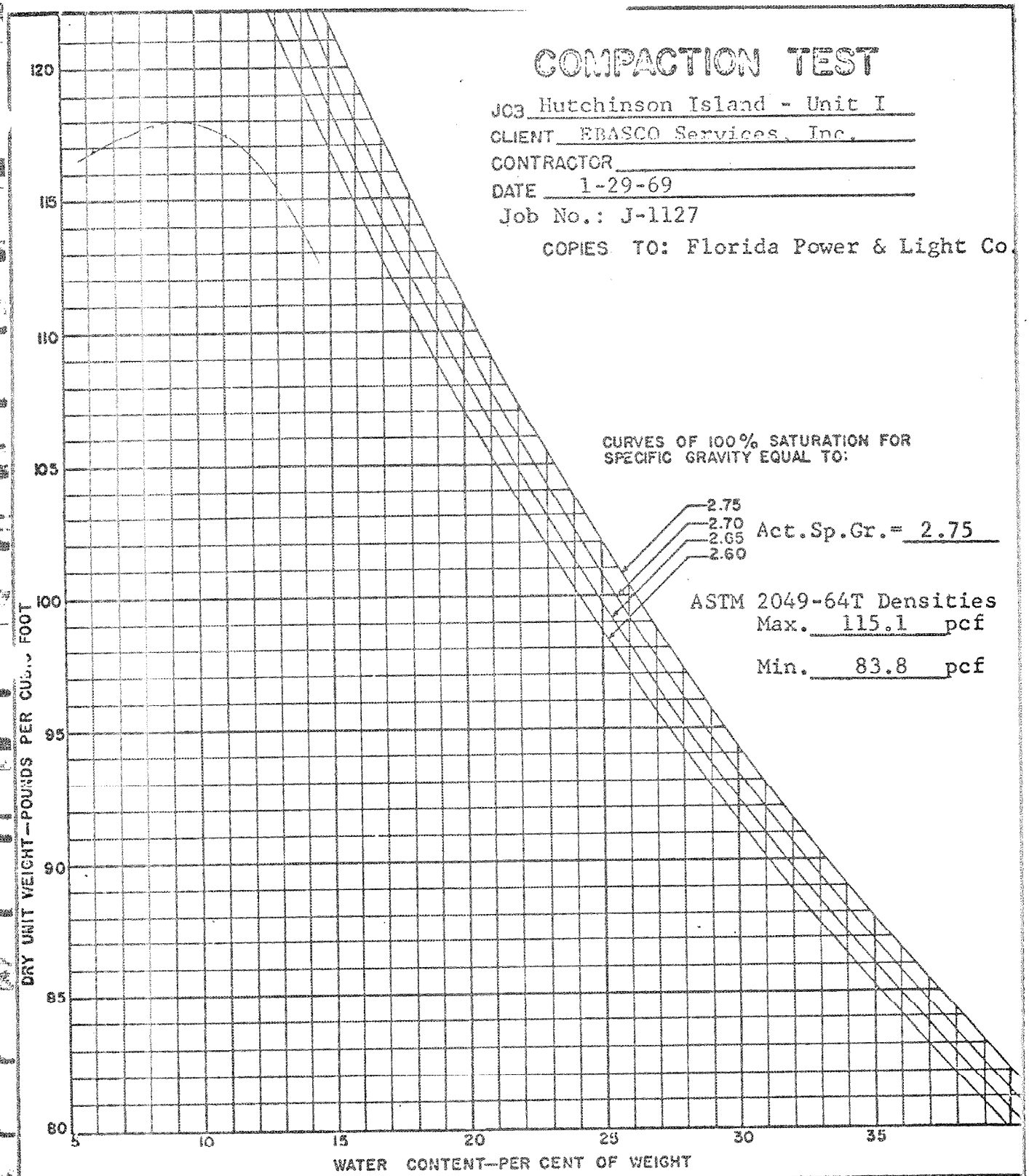
GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

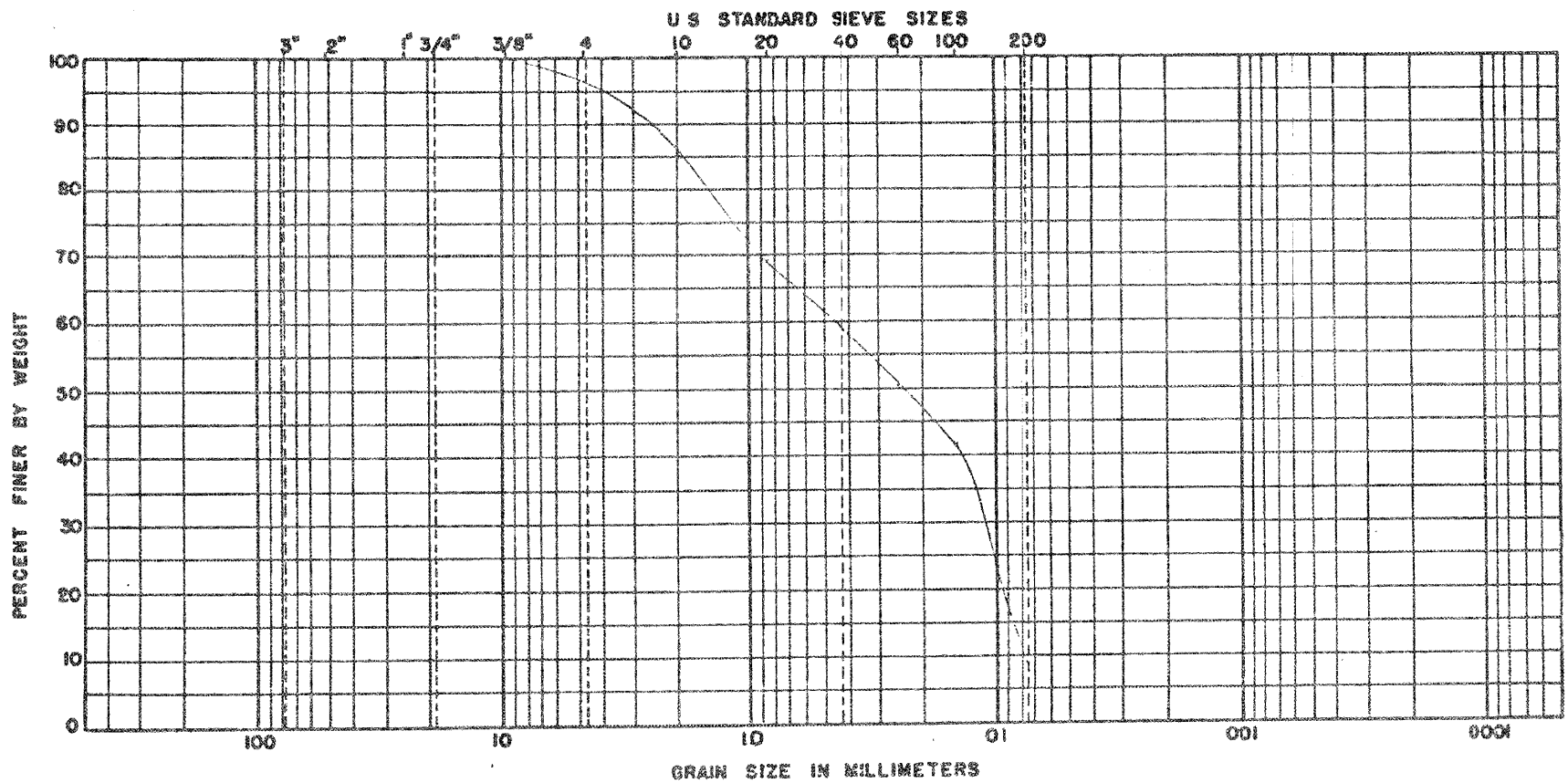
COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT EBASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
COPIES TO: Florida Power & Light Co.



MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 3	AASHO T-180 Method D	118.0	14.2	Grey and tan silty fine SAND with shells and limestone A-1, 47' - 67'

2.5A-545



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

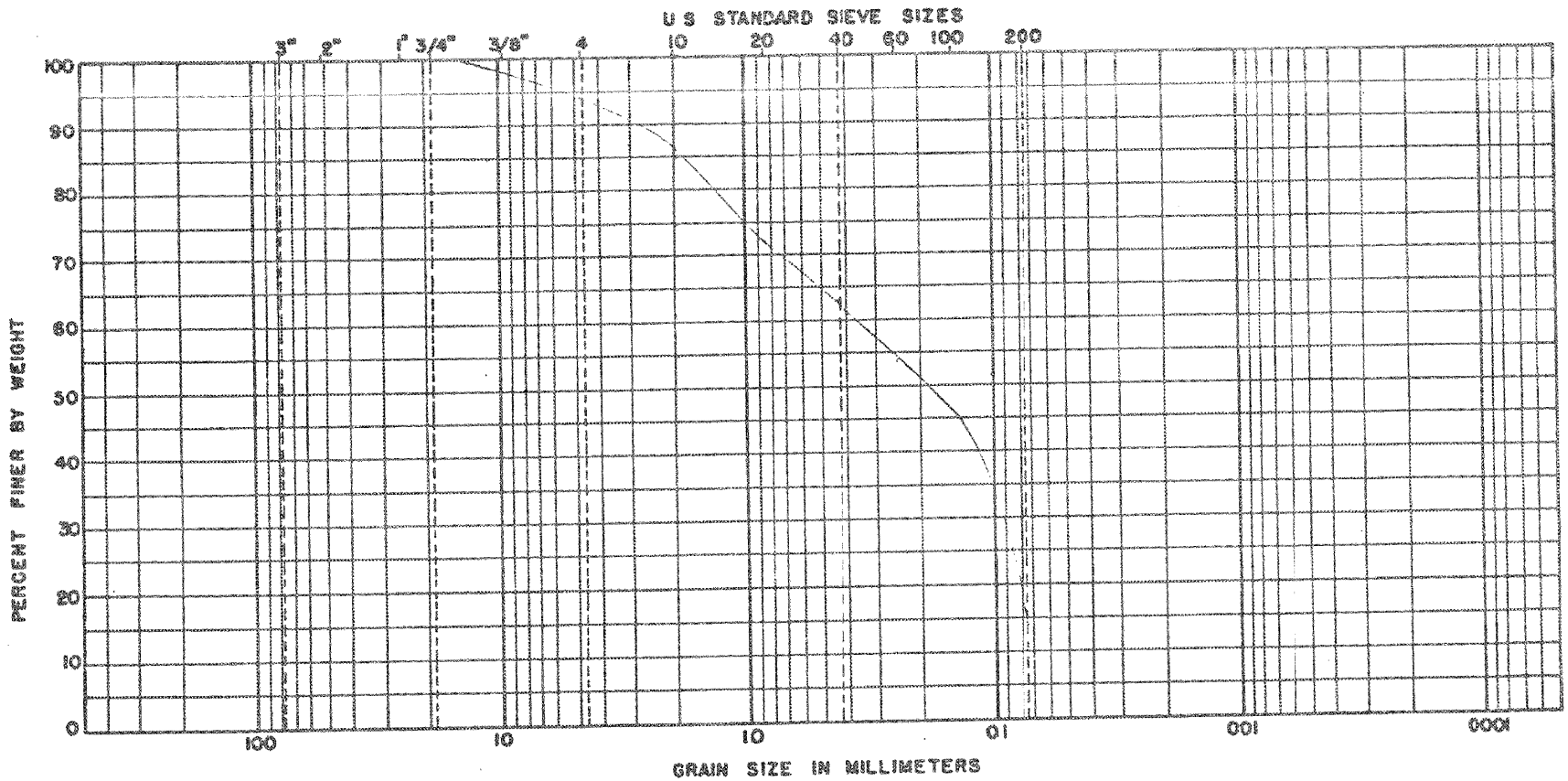
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-1	47' - 67'	24.2				Before Test Grey and tan silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-1	47' - 67'					After Test Grey and tan silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT EBASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
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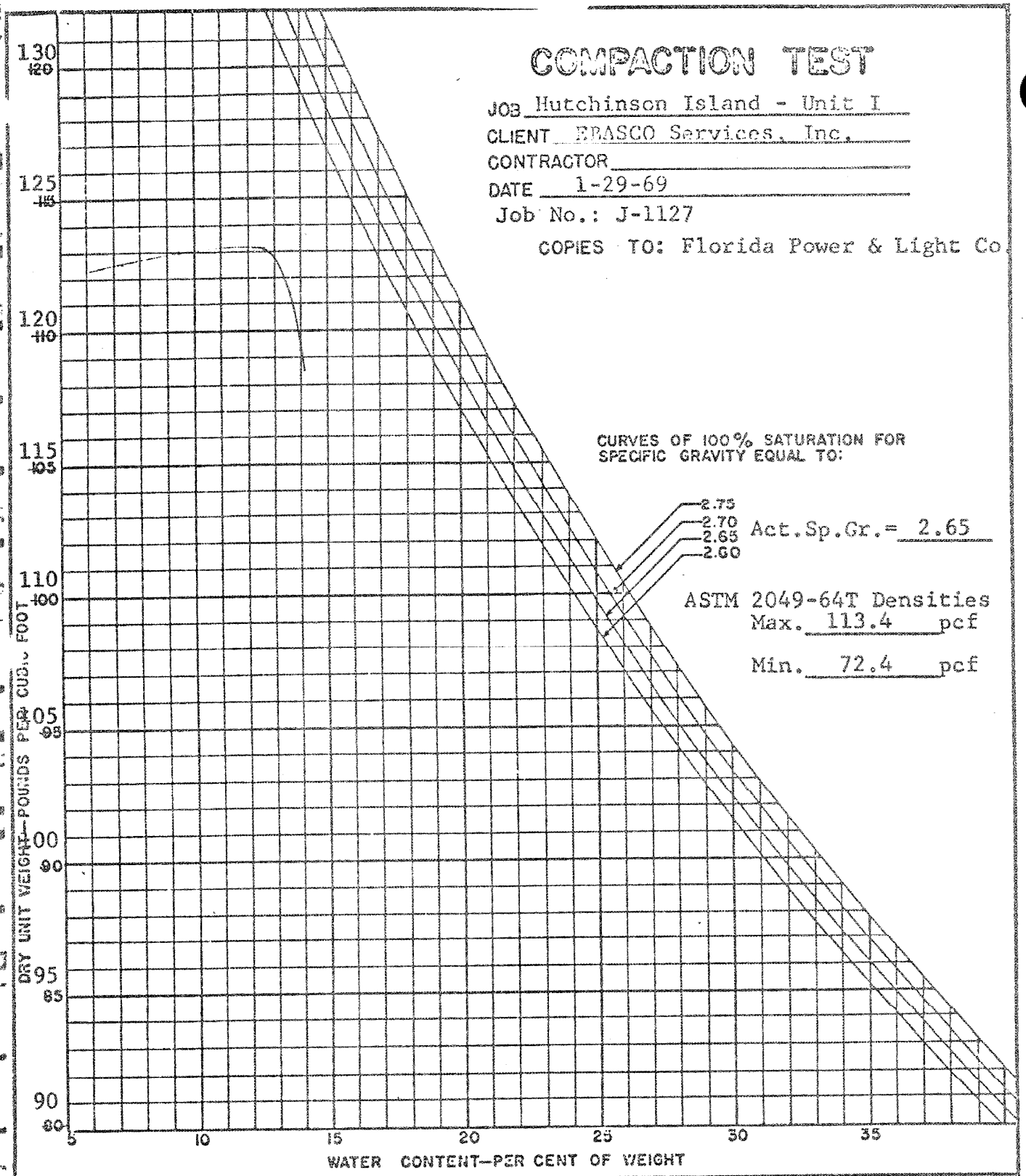
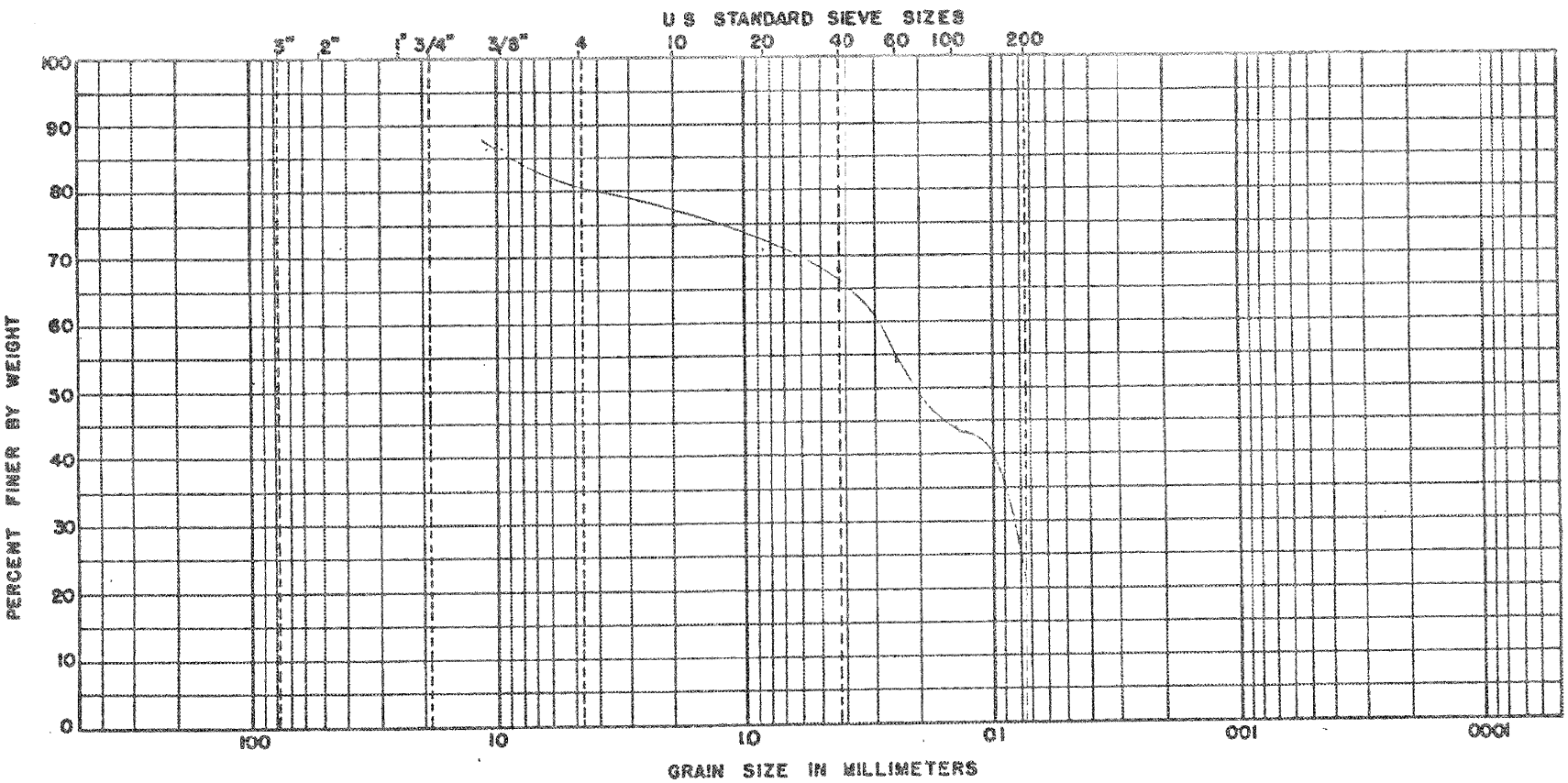


MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 6	AASHO T-180 Method D	123.3	11.0	Tan clayey silty fine SAND with shells and limestone A-3, 47' - 67'

Bondx H. Ray



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

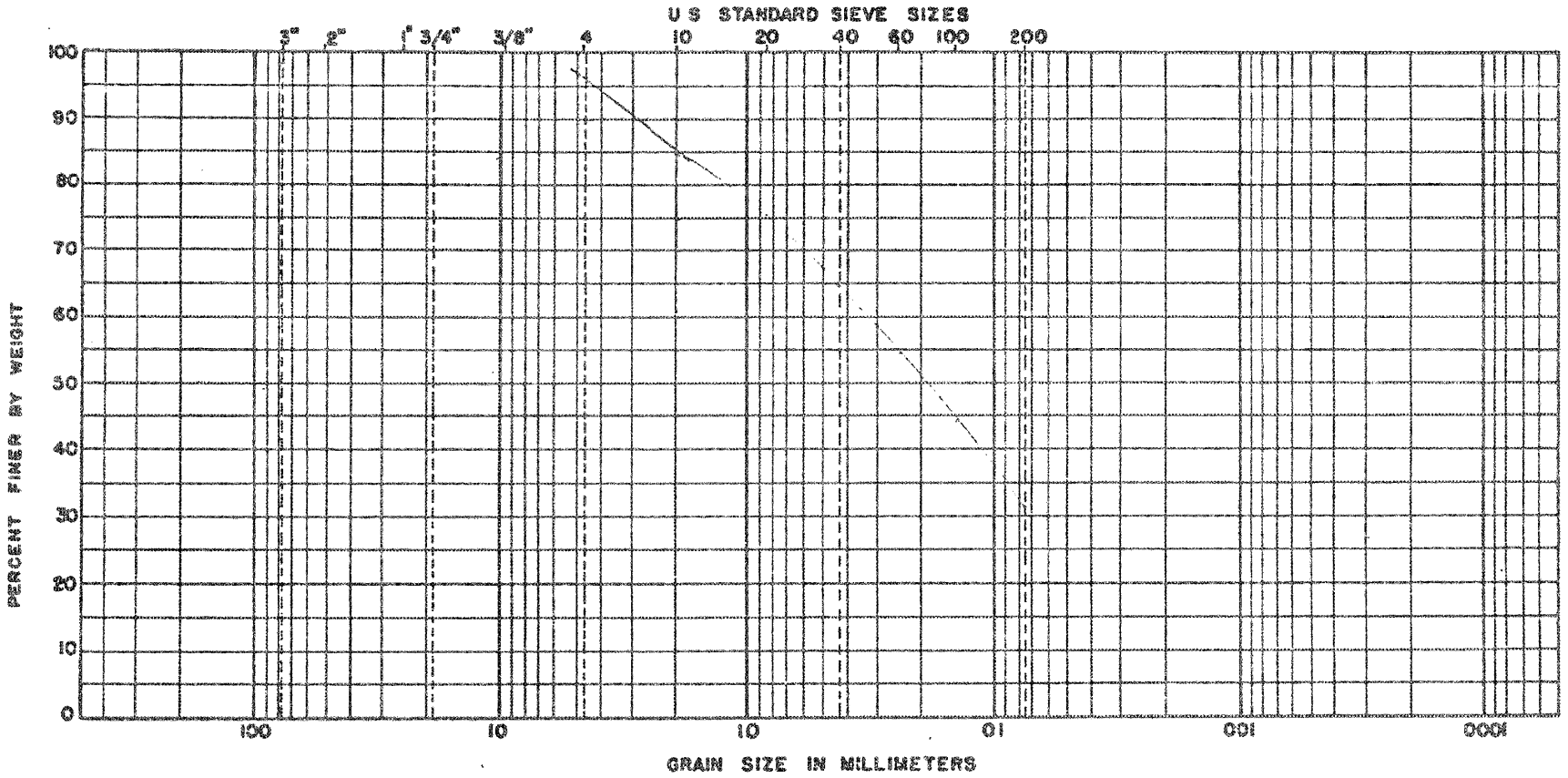
BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-3	47' - 67'	9.6				Tan clayey silty fine SAND with shells and limestone Before Test

GRAIN SIZE DISTRIBUTION

Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
A-3	47' - 67'					After Test Tan clayey silty fine SAND with shalls and limestone

GRAIN SIZE DISTRIBUTION

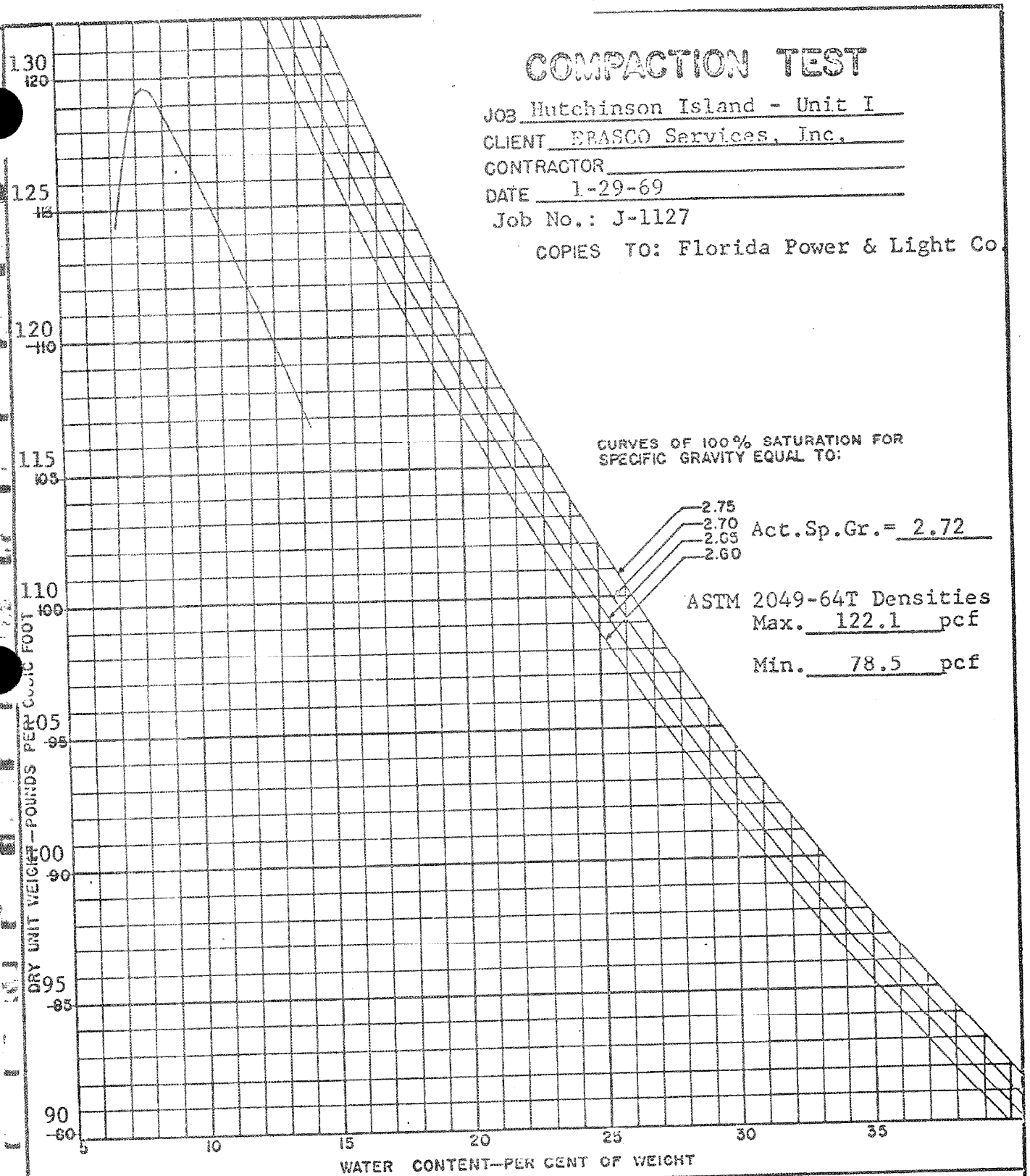
Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

COMPACTION TEST

JOB Hutchinson Island - Unit I
CLIENT ERASCO Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
COPIES TO: Florida Power & Light Co.

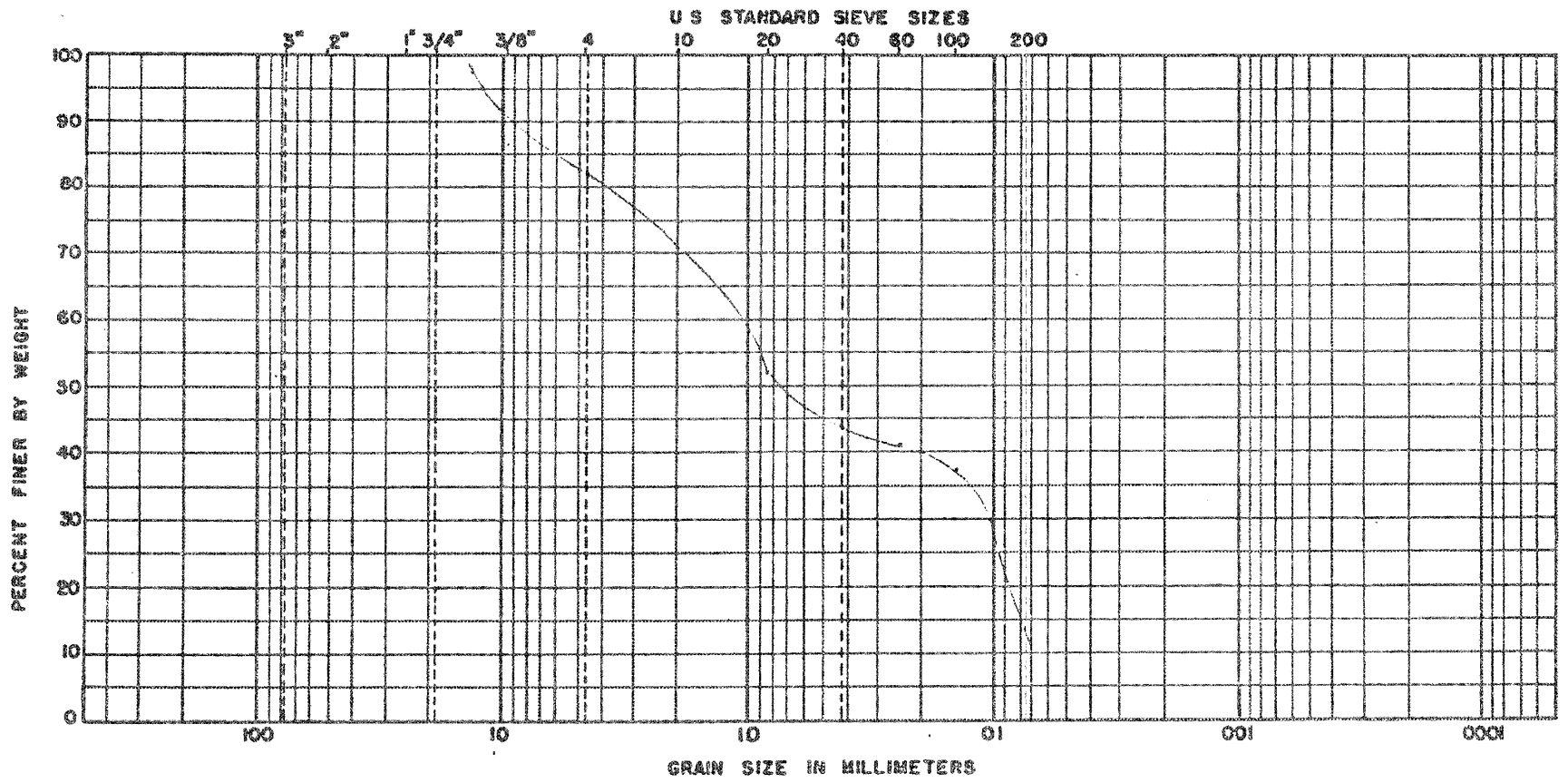


Act.Sp.Gr.= 2.72

ASTM 2049-64T Densities
Max. 122.1 pcf
Min. 78.5 pcf

MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT%	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 9	AASHO T-180 Method D	129.7	8.2	Grey and tan silty fine SAND with shells and limestone A-4, 47' - 67'

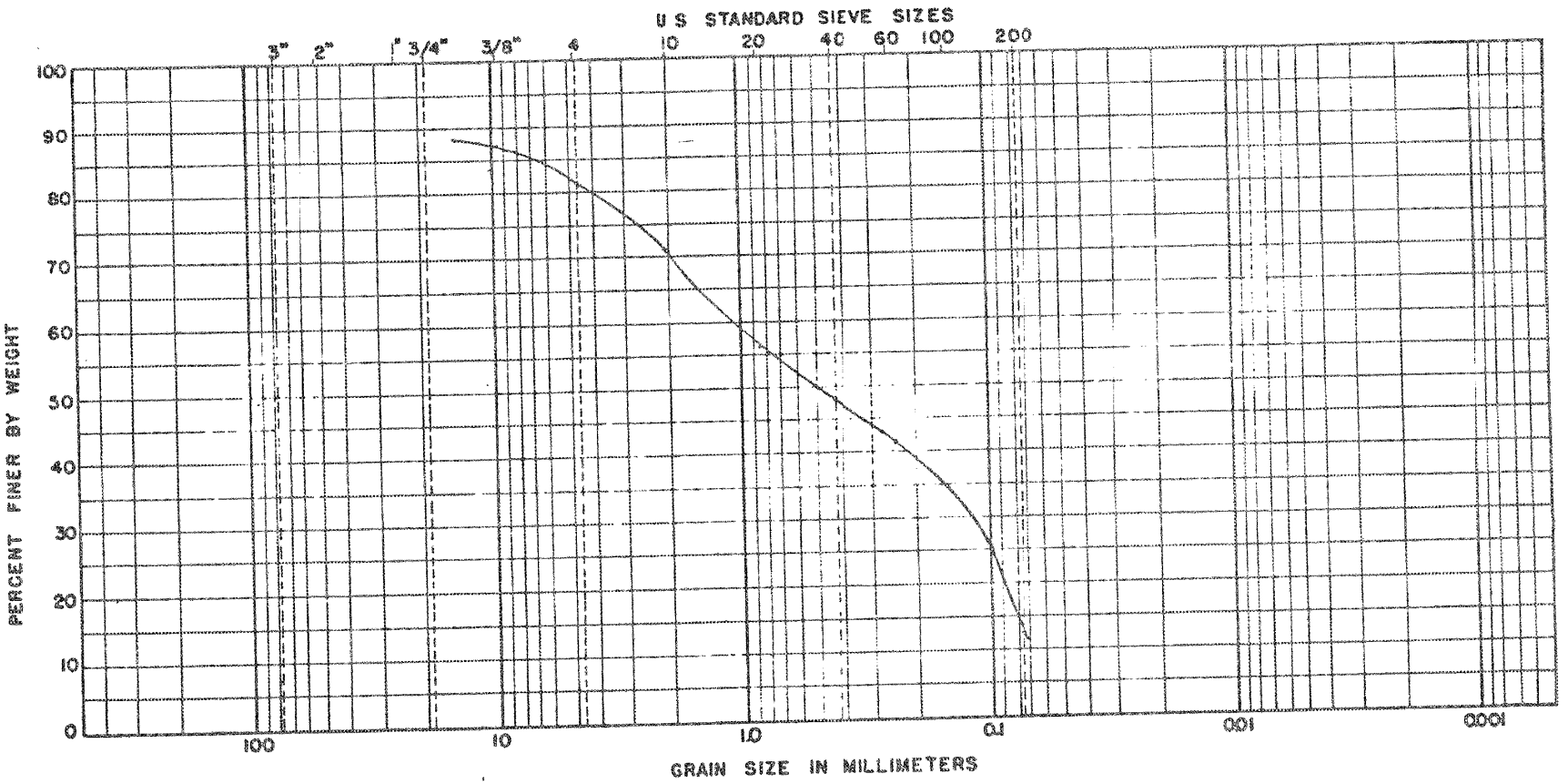
Donald H. Esry
Donald H. Esry, P.E.



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-4	47' - 67'	13.6				Before Test Grey and tan silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION
Hutchinson Island
JOB NO. J-1127
LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-4	47' - 67'					After Test Grey and tan silty fine SAND with shells and limestone

GRAIN SIZE DISTRIBUTION

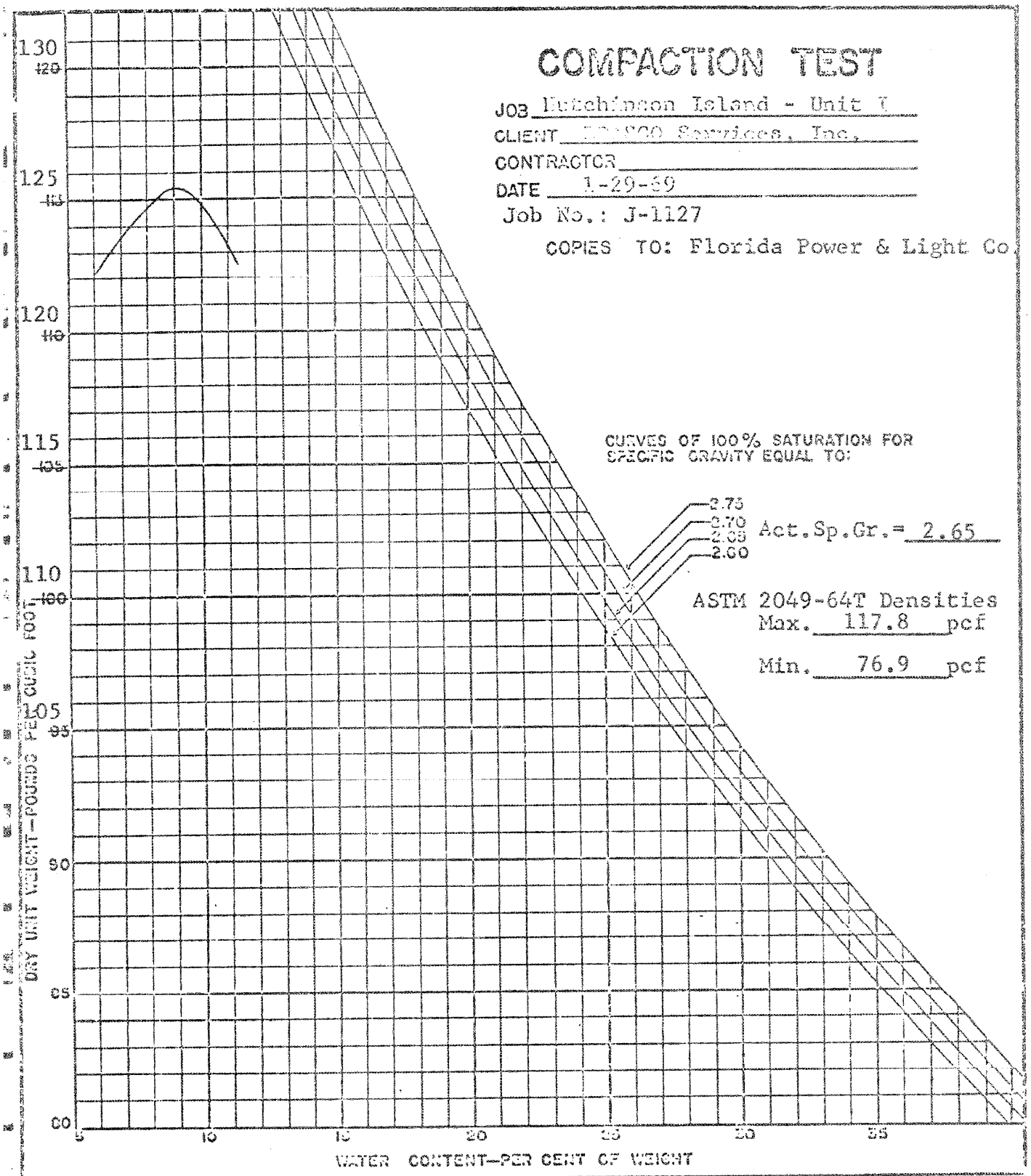
Hutchinson Island

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

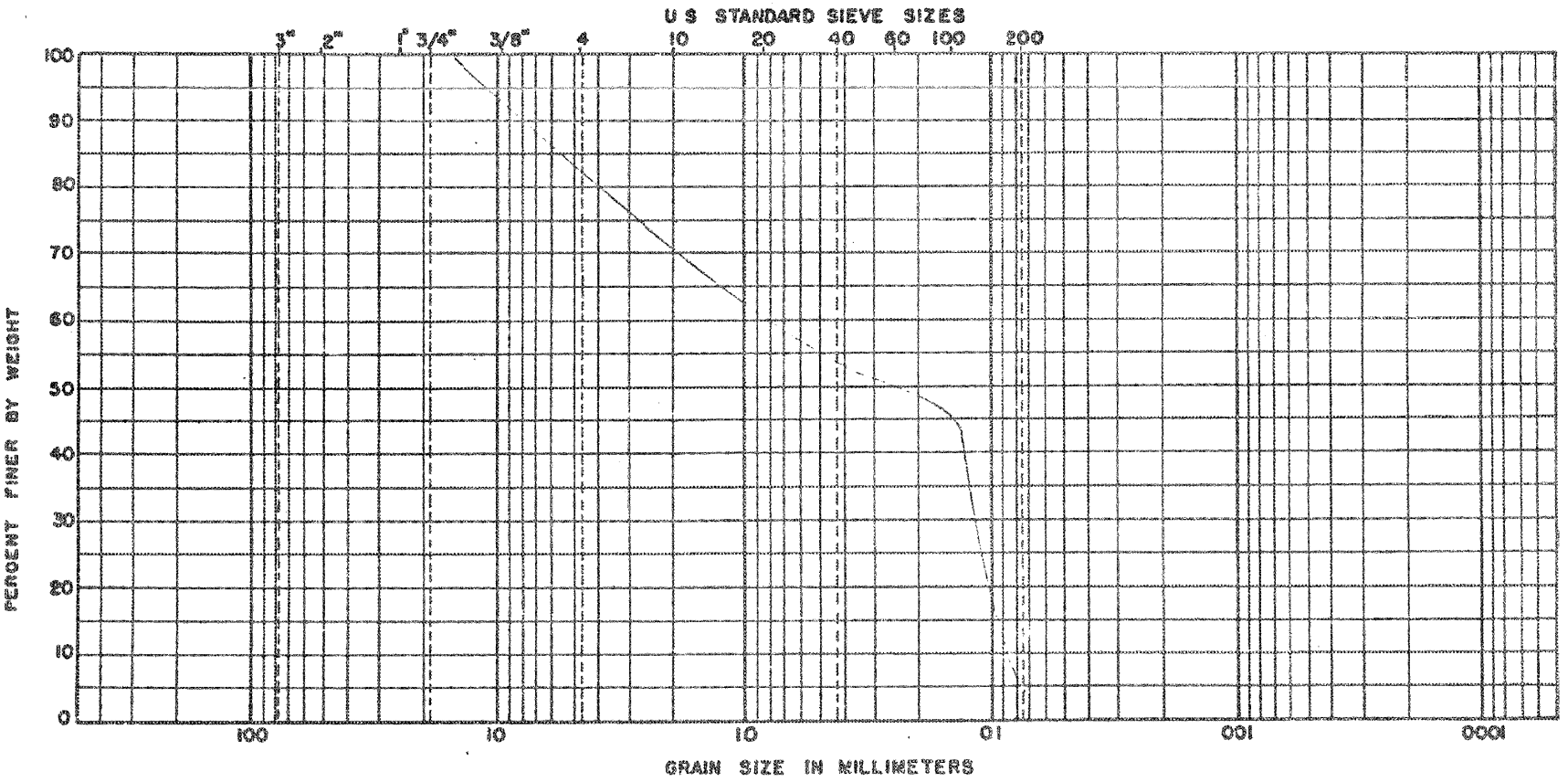
COMPACTION TEST

JOB Hutchinson Island - Unit 1
CLIENT [illegible] Services, Inc.
CONTRACTOR
DATE 1-29-69
Job No.: J-1127
COPIES TO: Florida Power & Light Co.



MOISTURE DENSITY RELATION	METHOD OF TEST	MAX. DRY DENSITY PCF	OPTIMUM MOISTURE CONTENT %	SOIL DESCRIPTION OR CLASSIFICATION AND SAMPLE LOCATION
No. 12	AASHO T-180 Method D	125.4	9.0	Grey and tan silty clayey SAND with shell and limestone Boring A-2, 47' to 67'

2 5A-55A



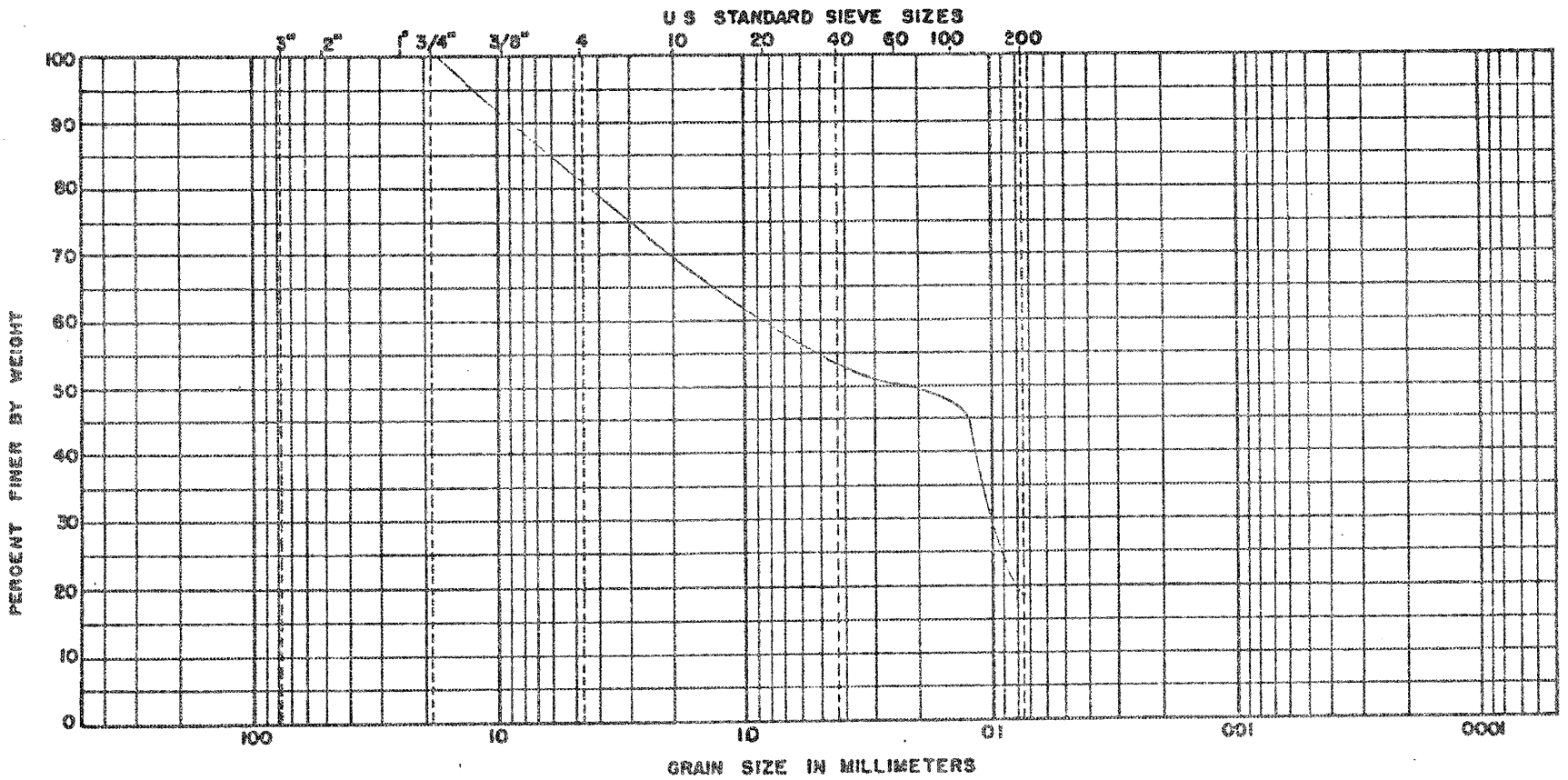
BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
A-2	47'-67'	20.9%				Grey and tan fine SAND with some shells and limestone Before Test

GRAIN SIZE DISTRIBUTION

JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

BORING NO	ELEV OR DEPTH	NAT WC	L L	P L	P I	DESCRIPTION OR CLASSIFICATION
A-2	47'-67'					Grey and tan slightly clayey silty fine SAND with some shells and limestone After Test

GRAIN SIZE DISTRIBUTION

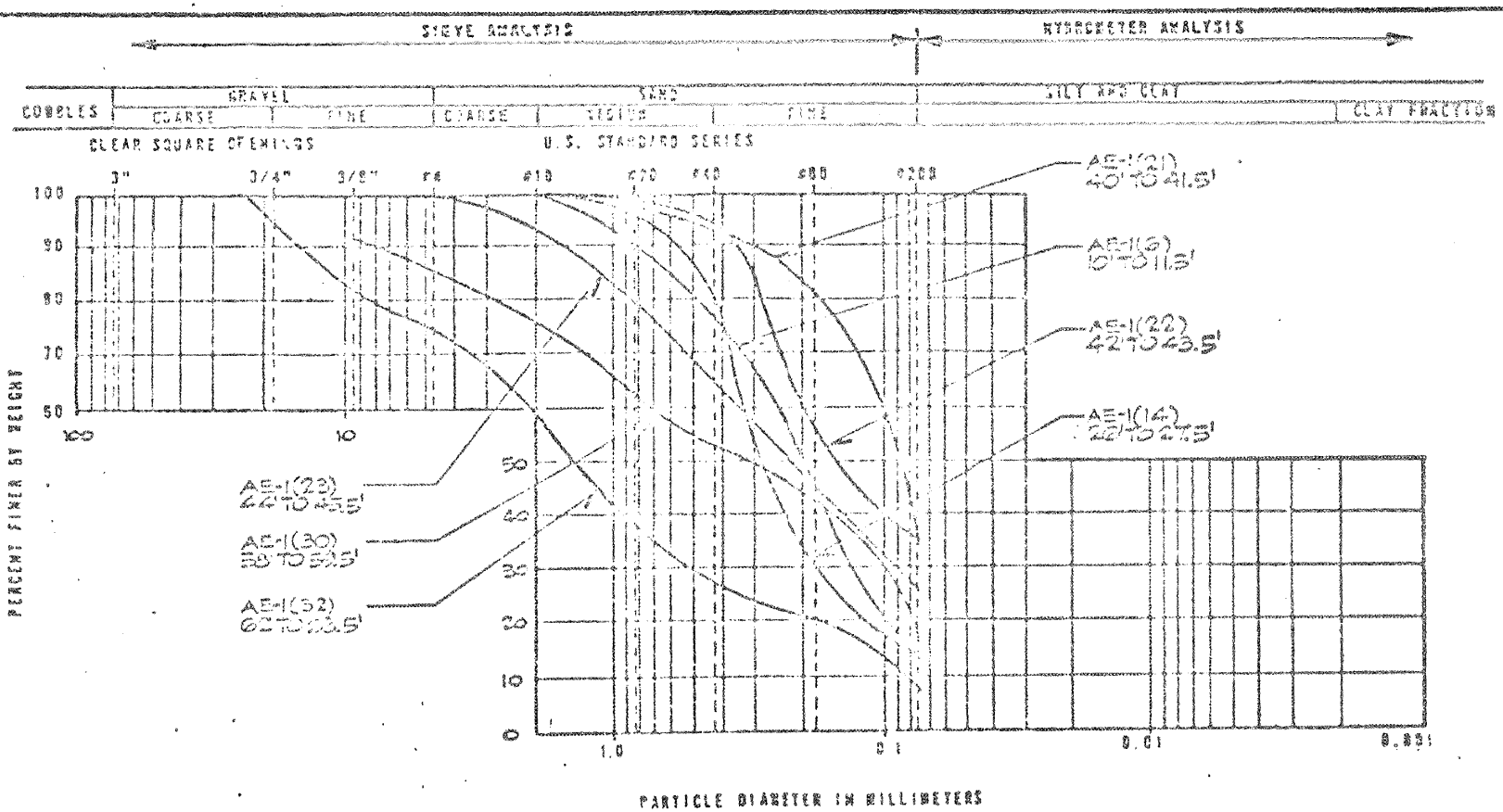
JOB NO. J-1127

LAW ENGINEERING TESTING COMPANY

APPENDIX 2.5A

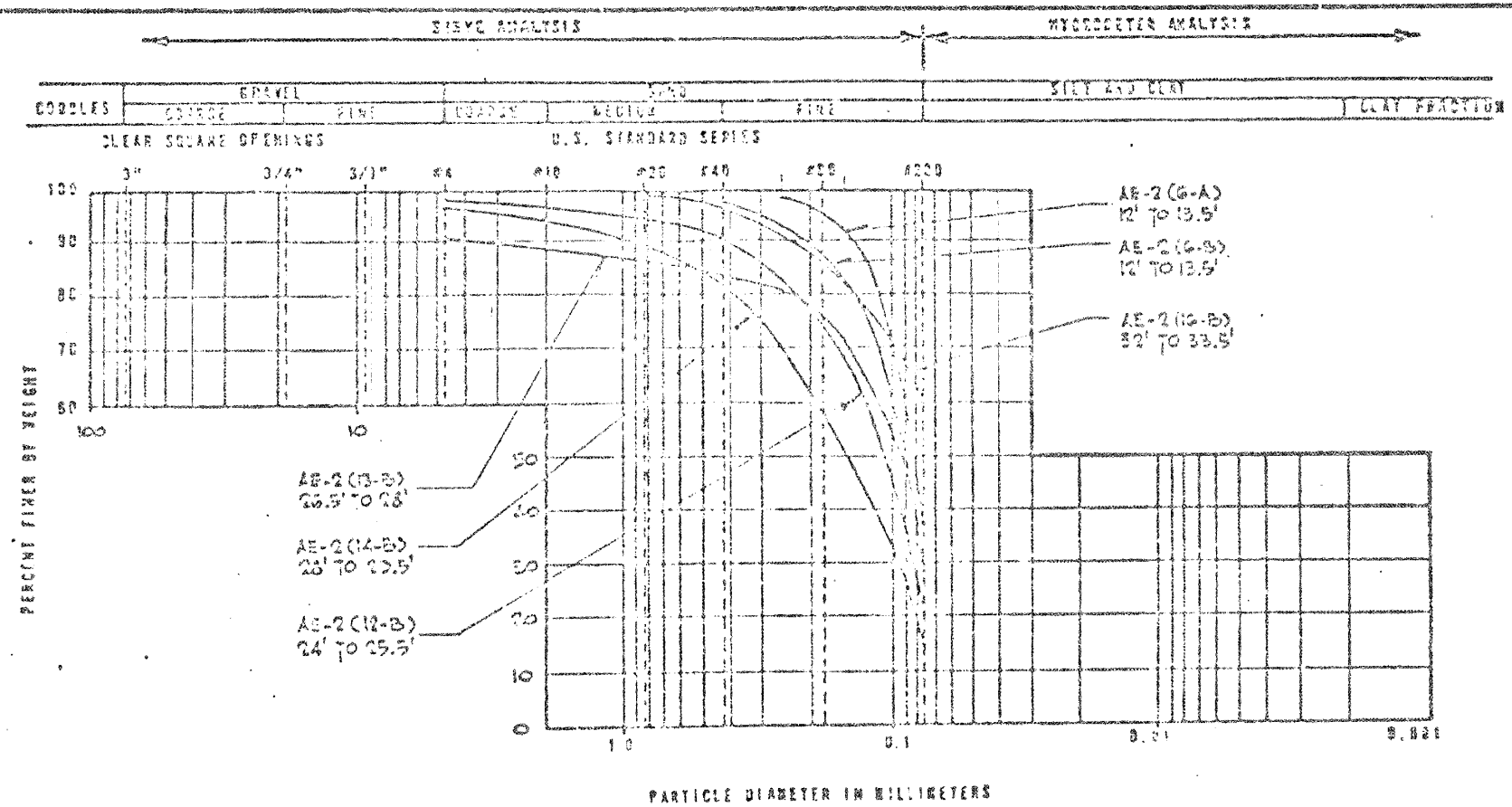
SECTION 6

SWITCHYARD/INTAKE CANAL/EMERGENCY COOLING CANAL AREA
(1974 INVESTIGATION)



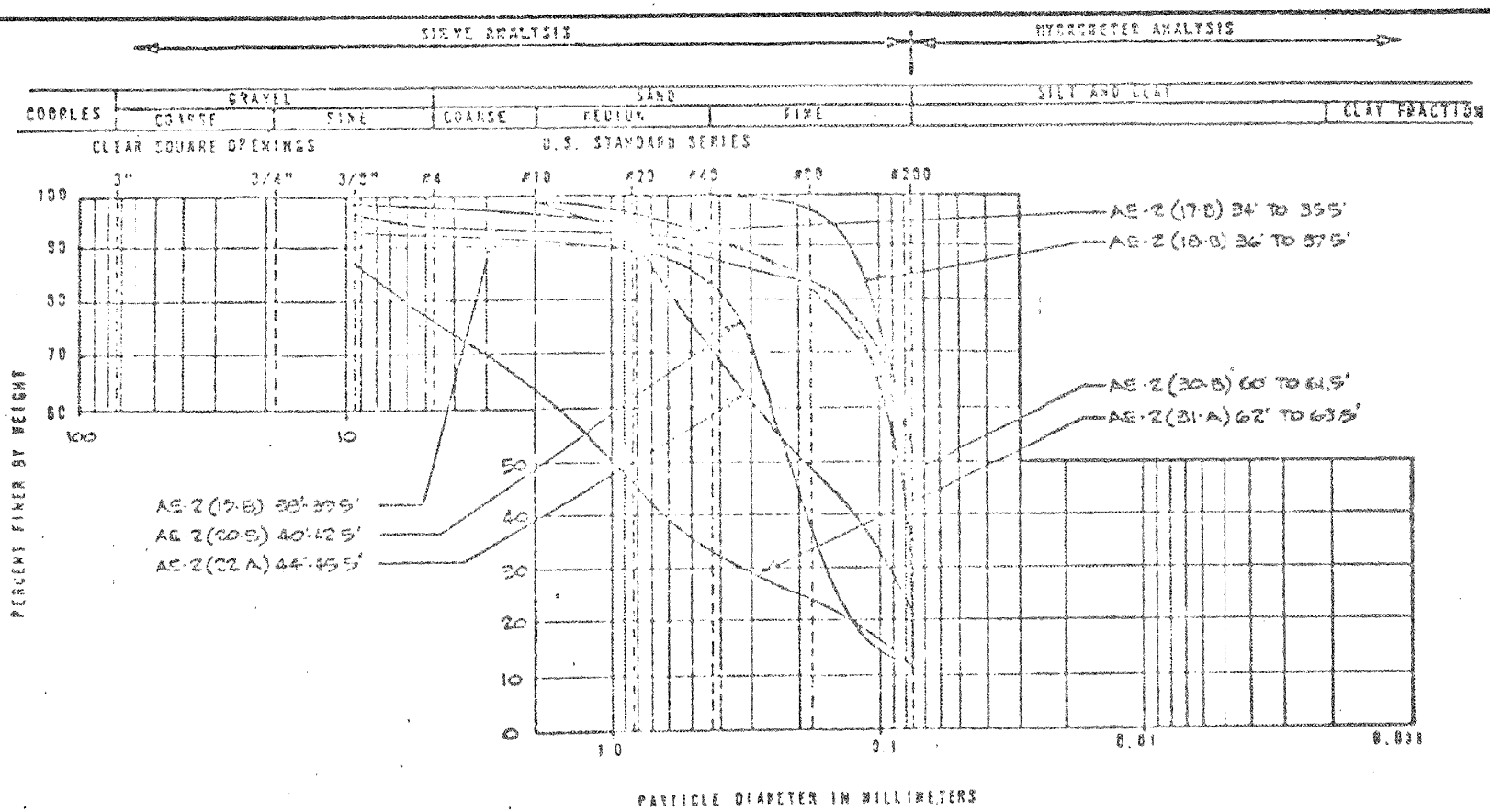
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-1
FIGURE 2G-C1



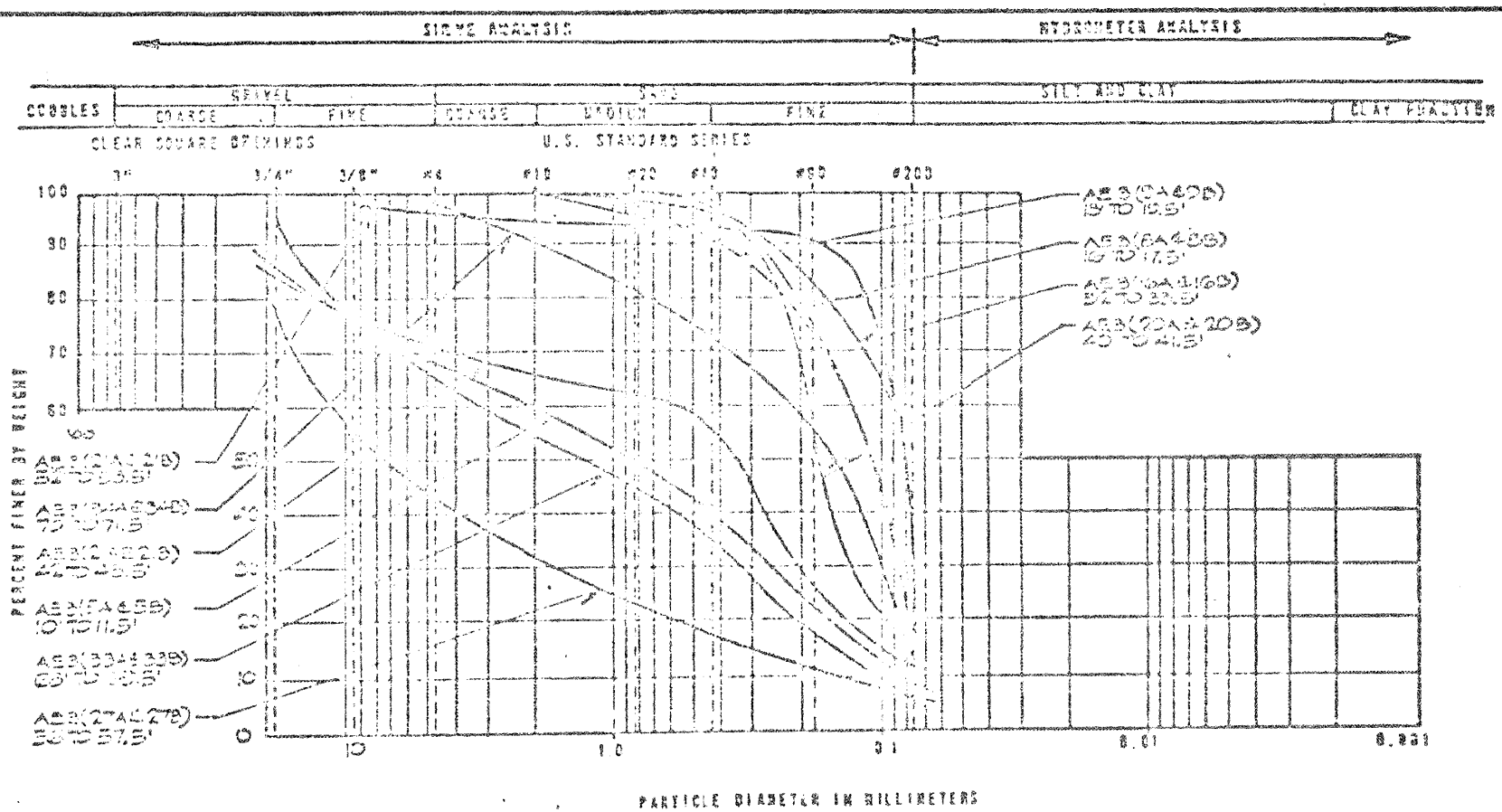
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-2
FIGURE 2G-C2



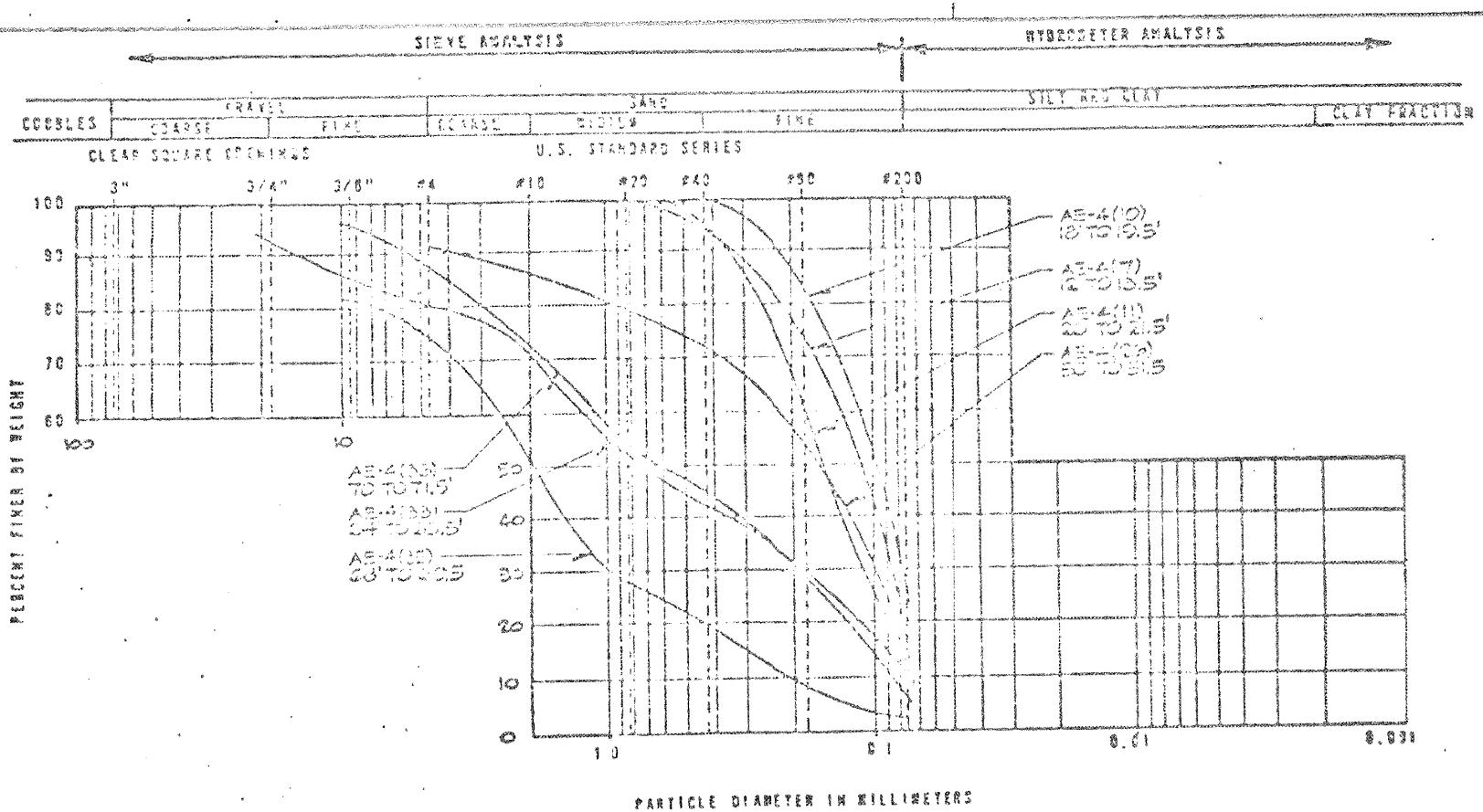
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-2
FIGURE 2G-C2 (CON'T)



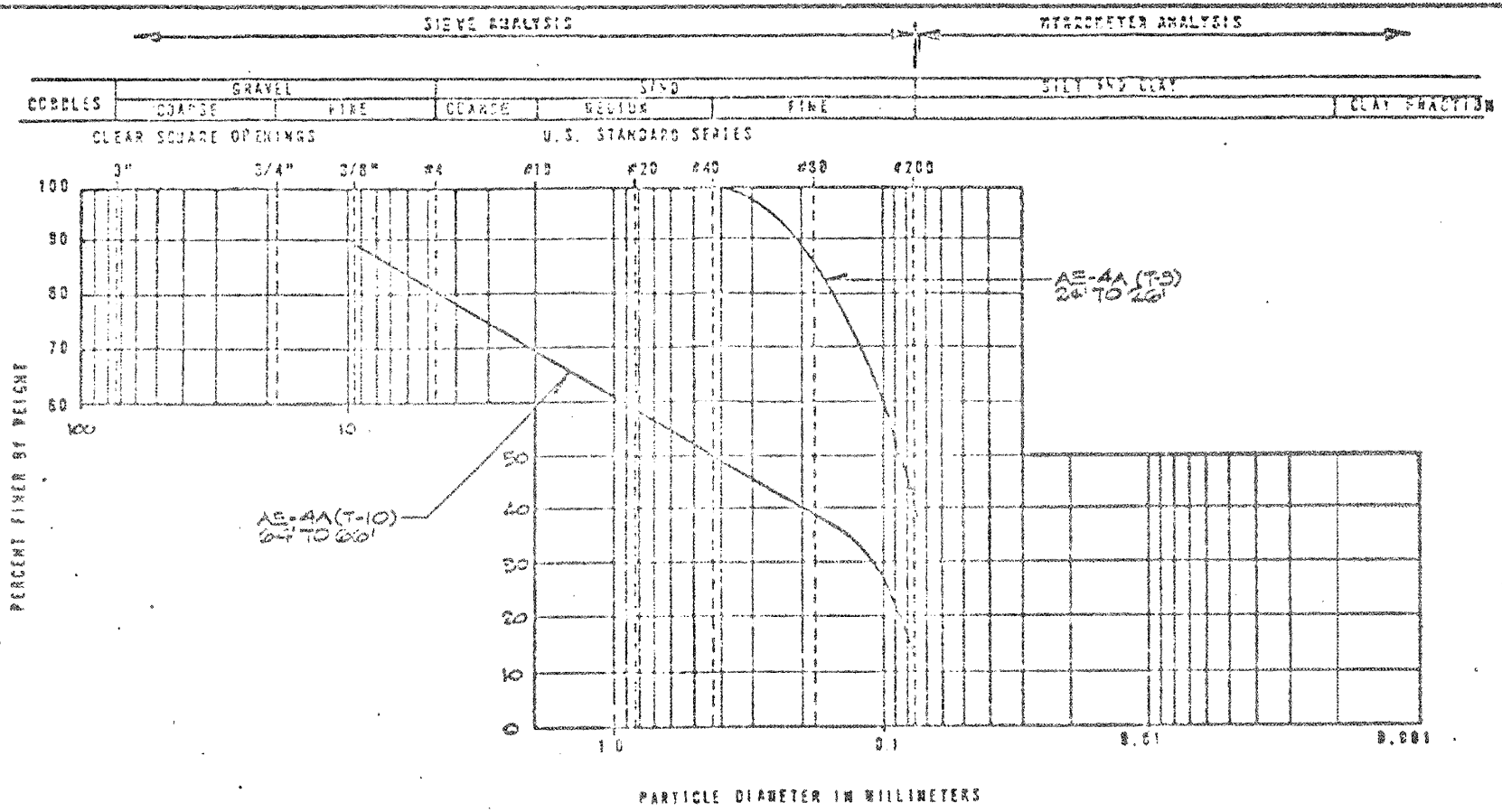
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AB-3
FIGURE 2G-C3



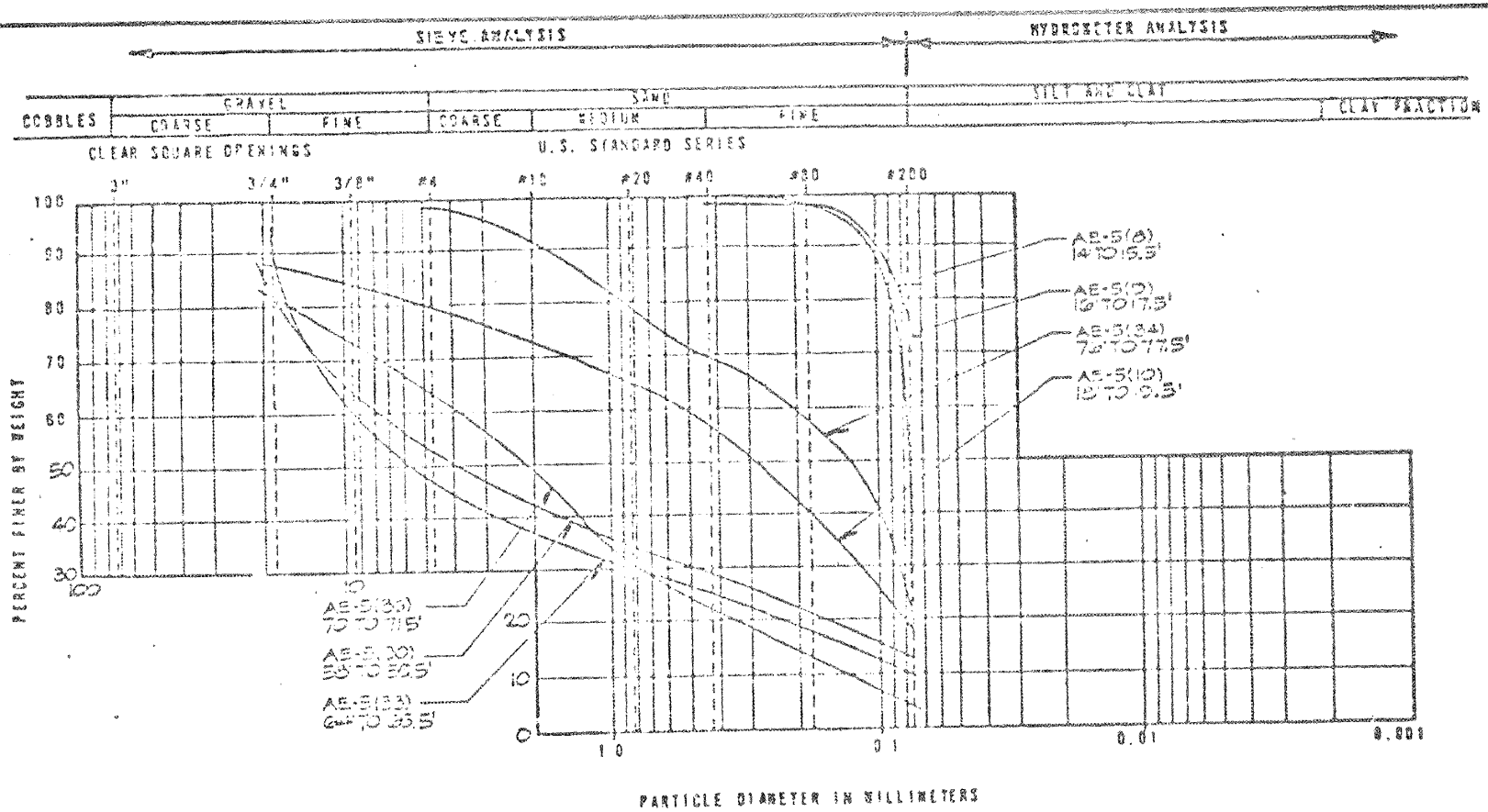
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AB-4
FIGURE 2G-C4



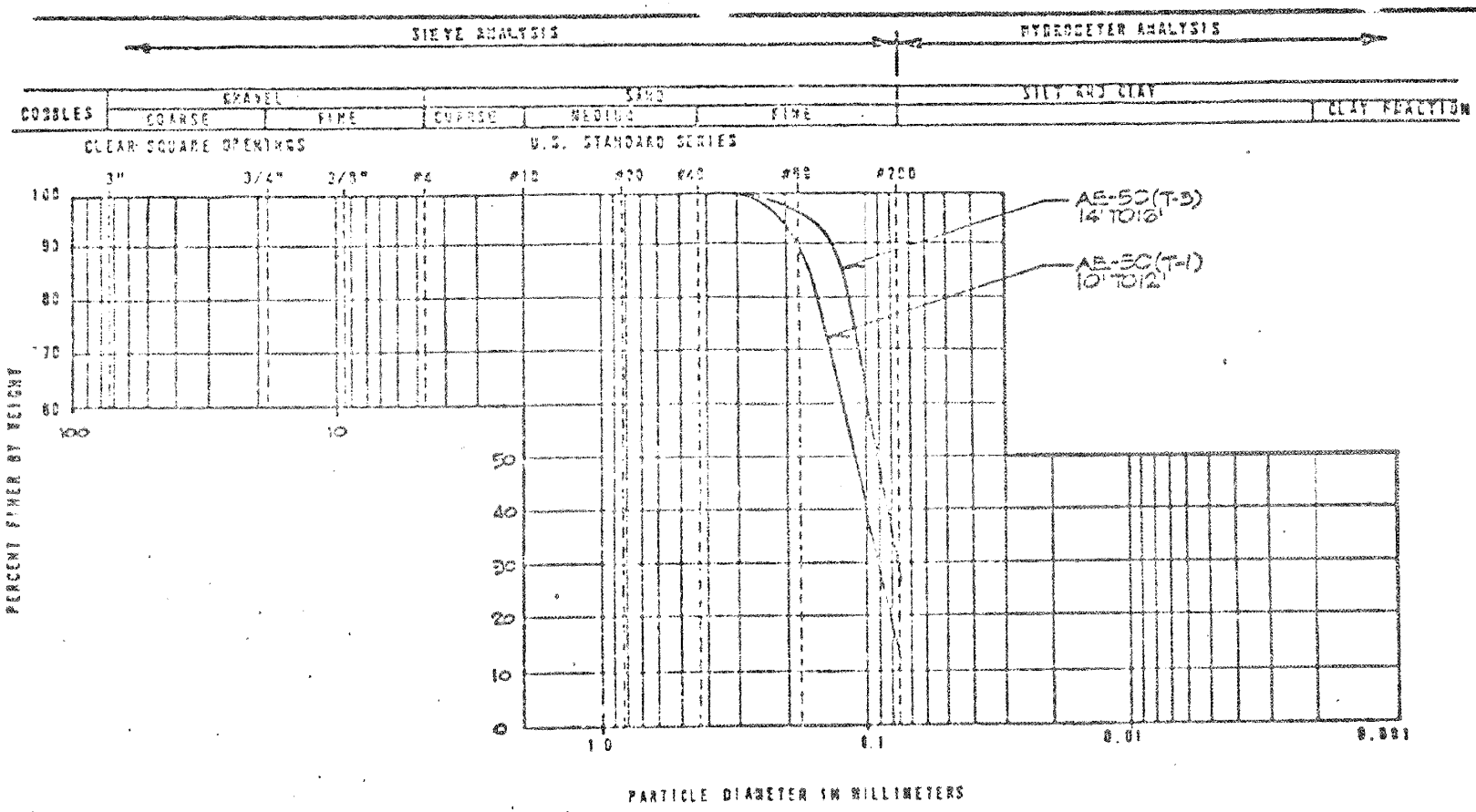
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AS-4A
FIGURE 2G-C5



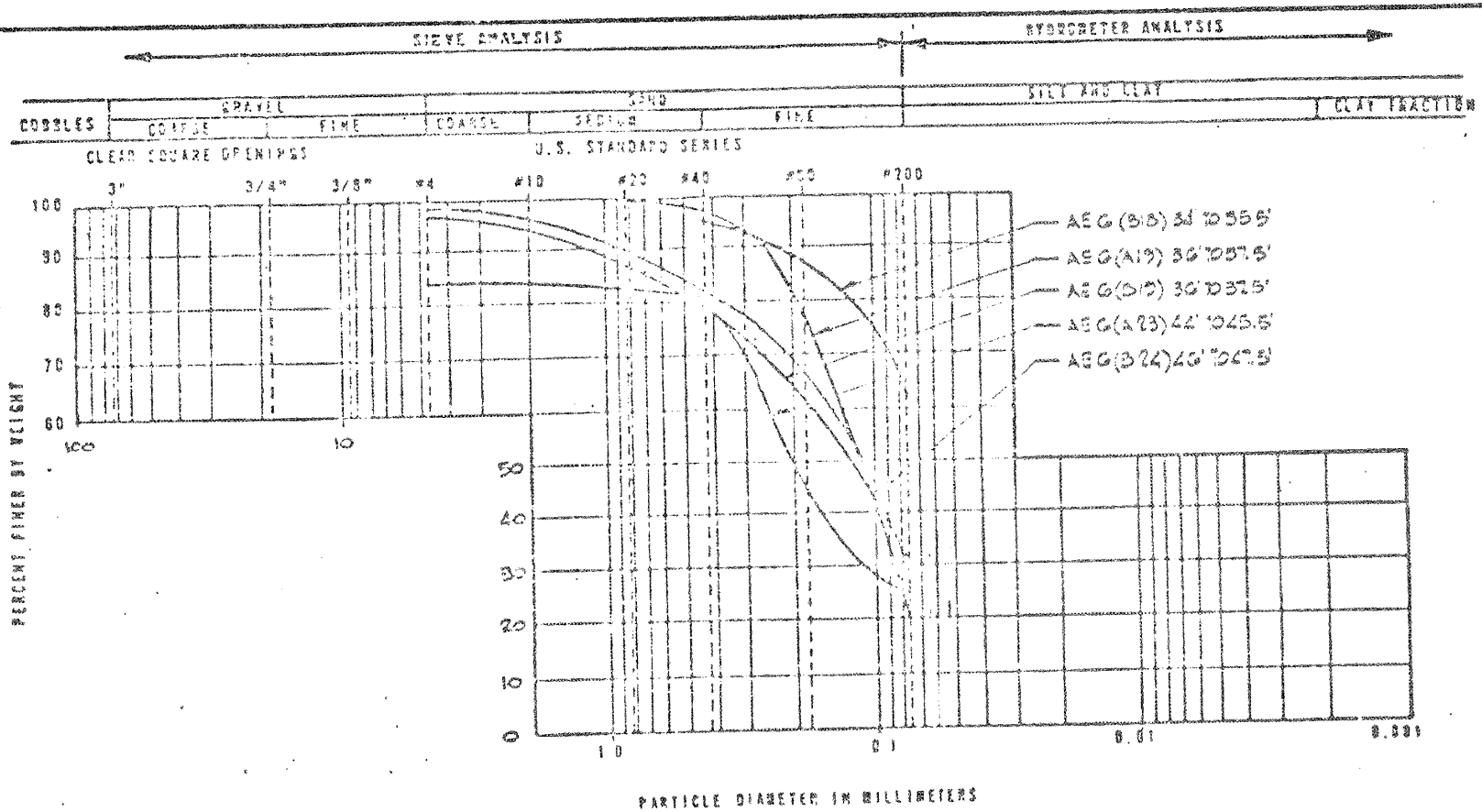
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-5
FIGURE 2G-CG



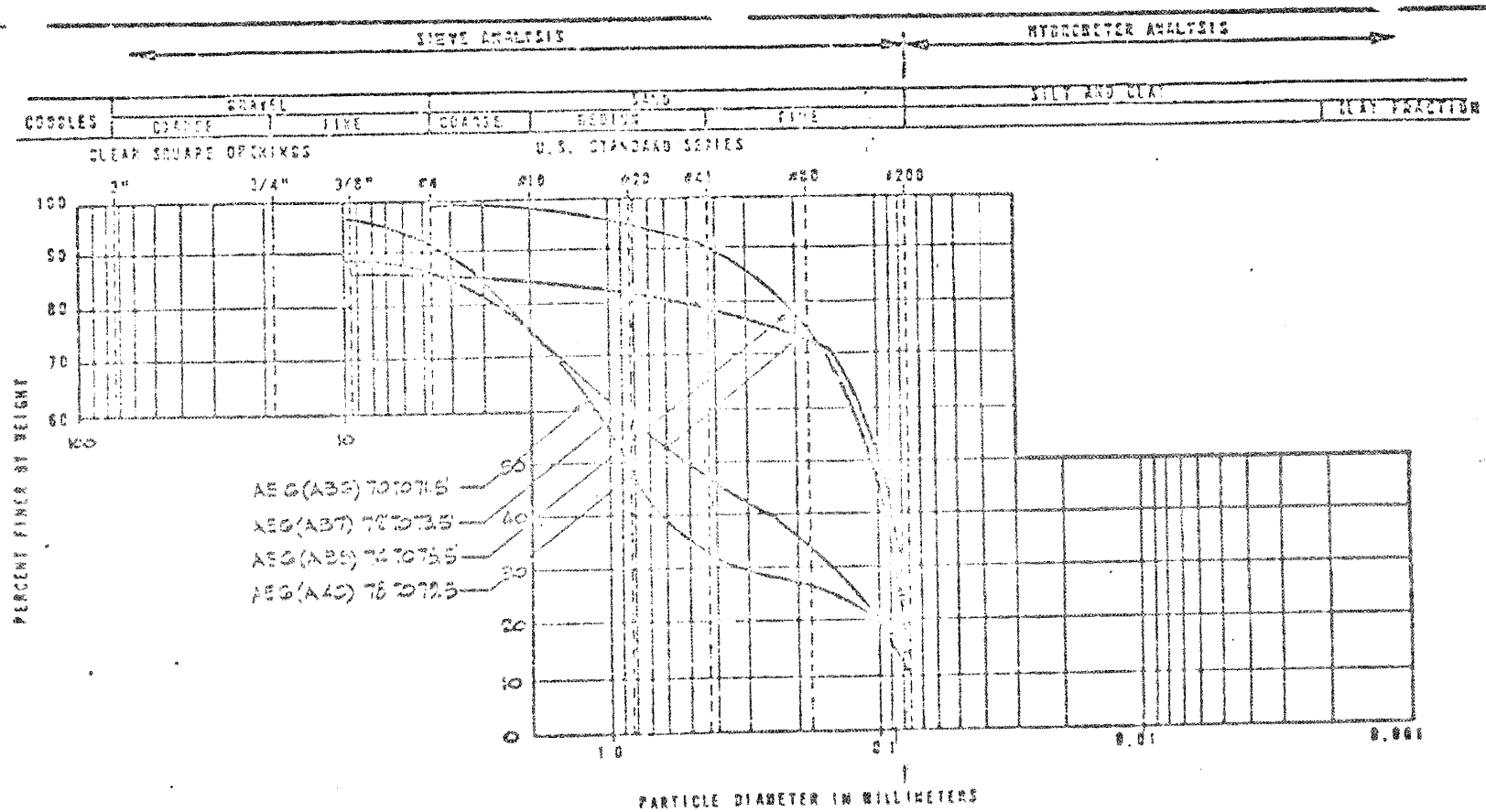
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-5C
FIGURE 2G-C7



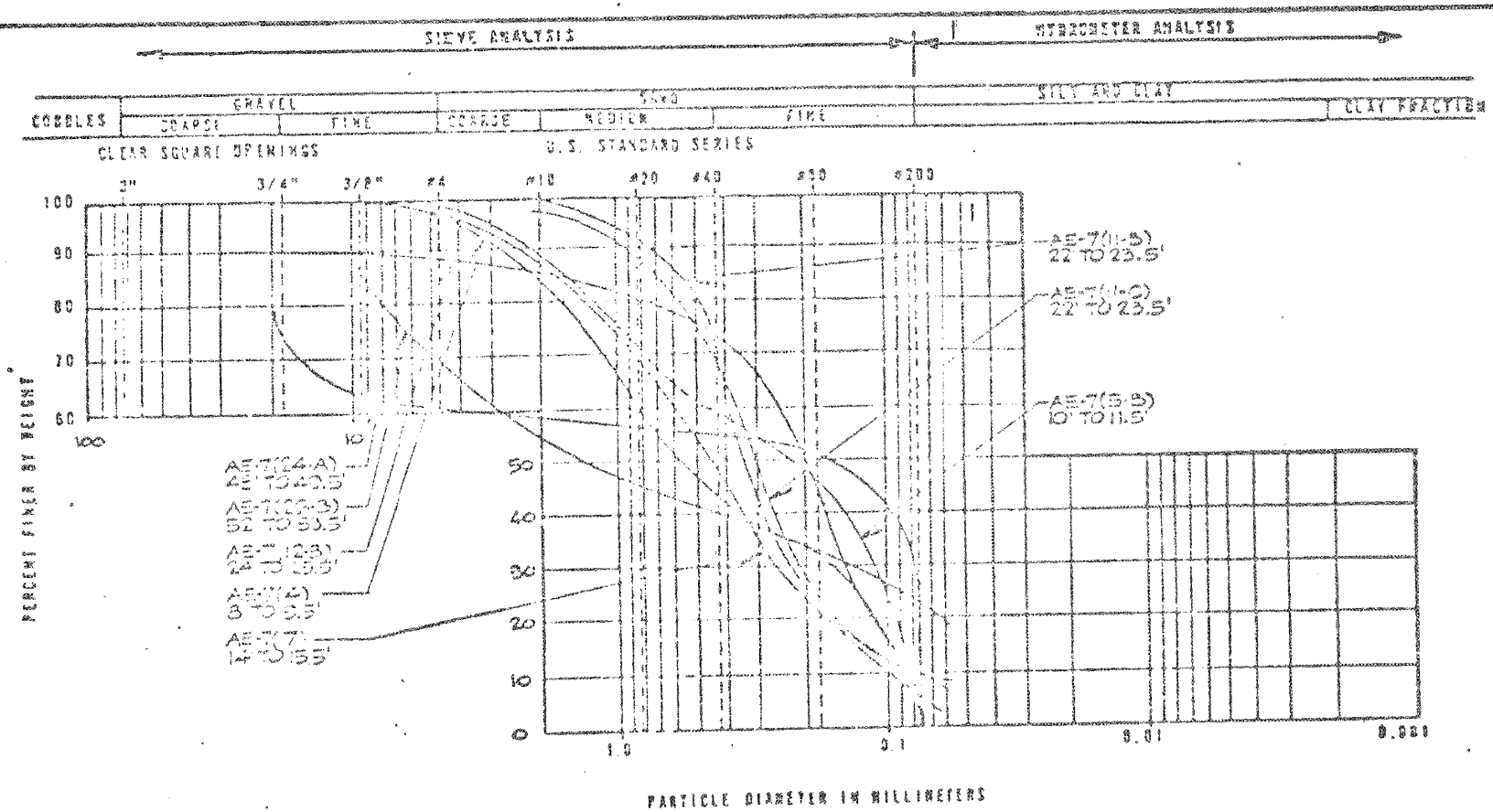
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-G
FIGURE 2G-C8



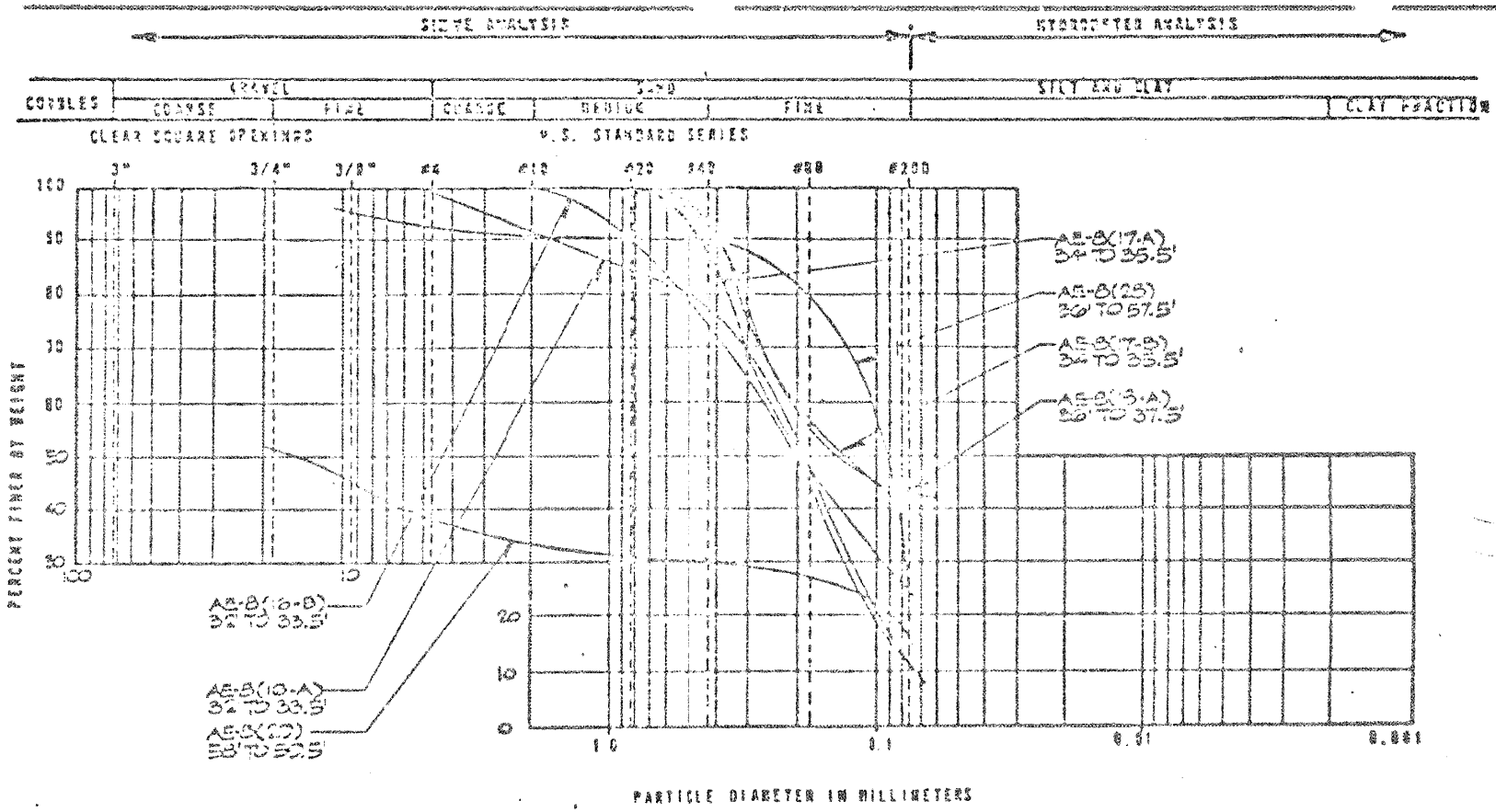
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-3
FIGURE 2.G-C8 (CONT)



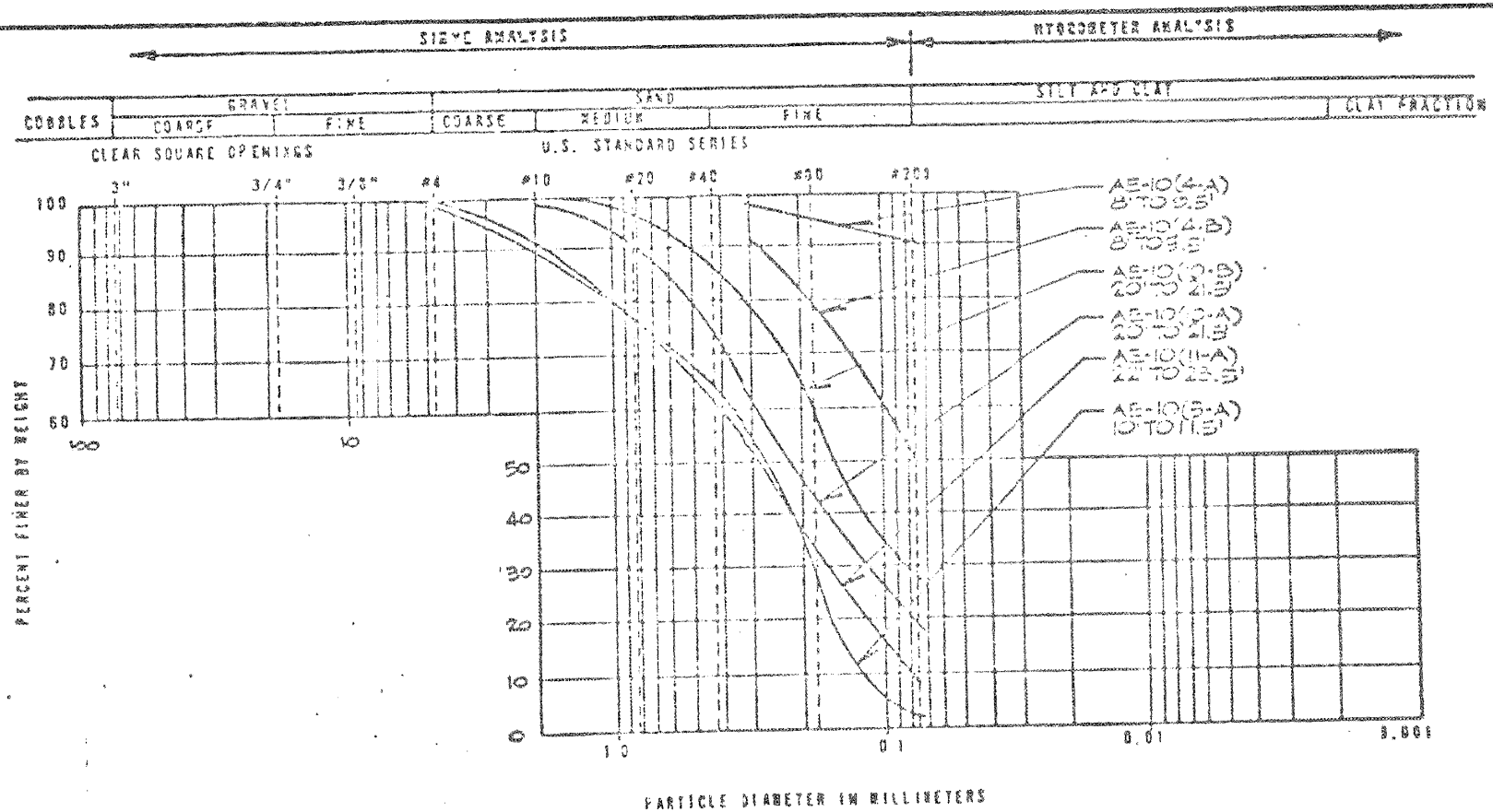
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-7
FIGURE 2G-C9



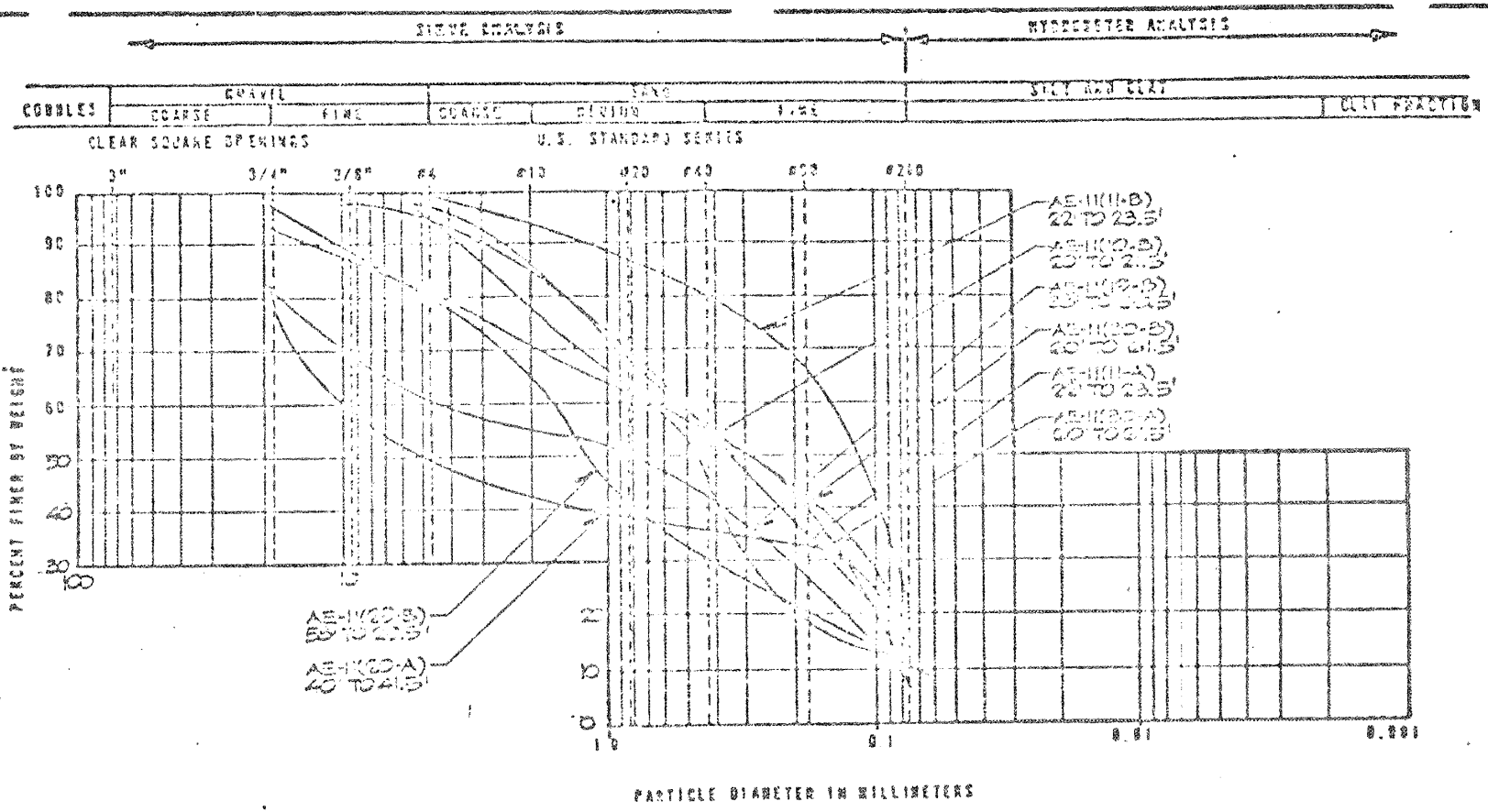
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-8
FIGURE 2G-C10



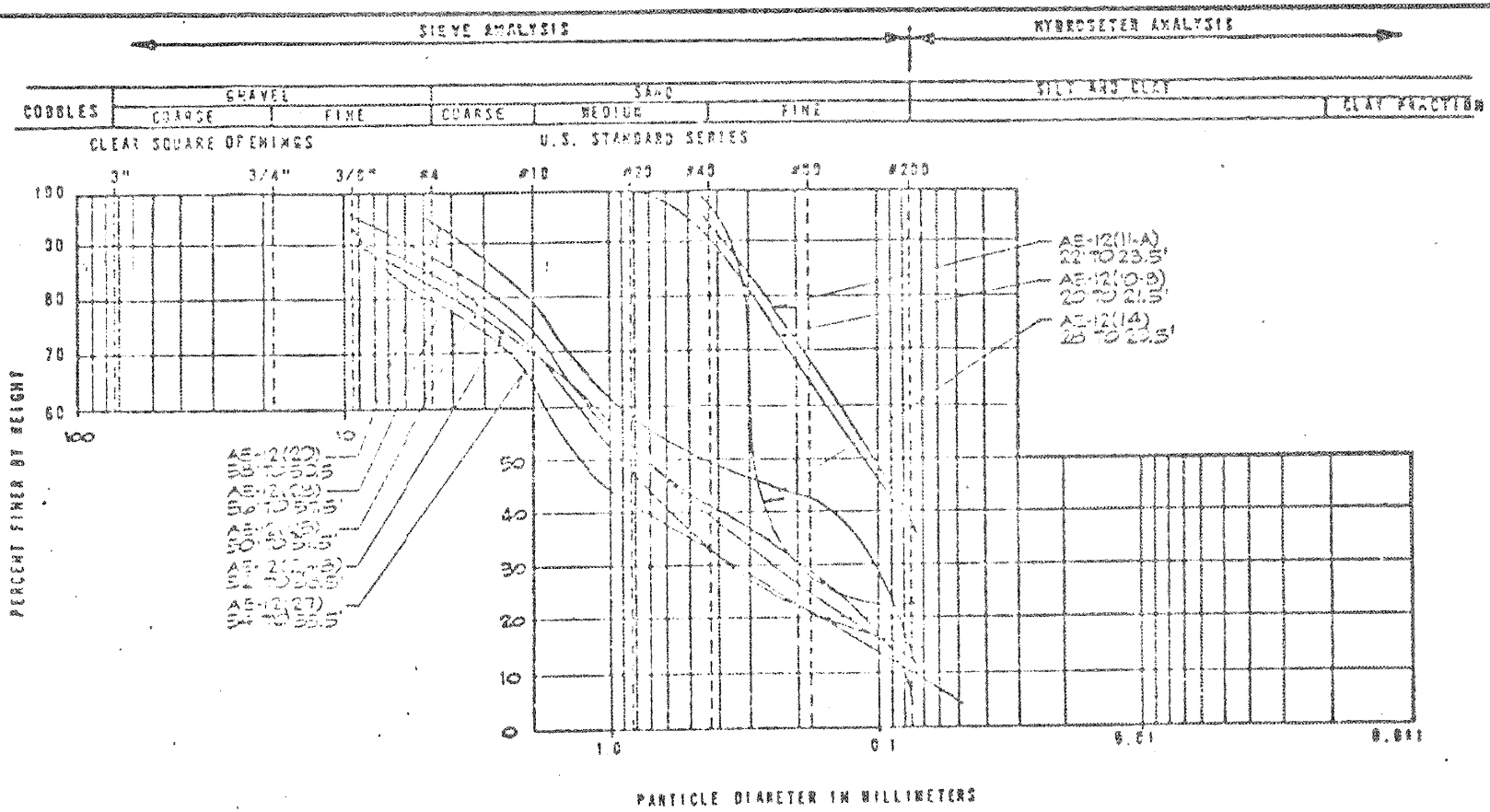
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AS-10
FIGURE 2G-C11



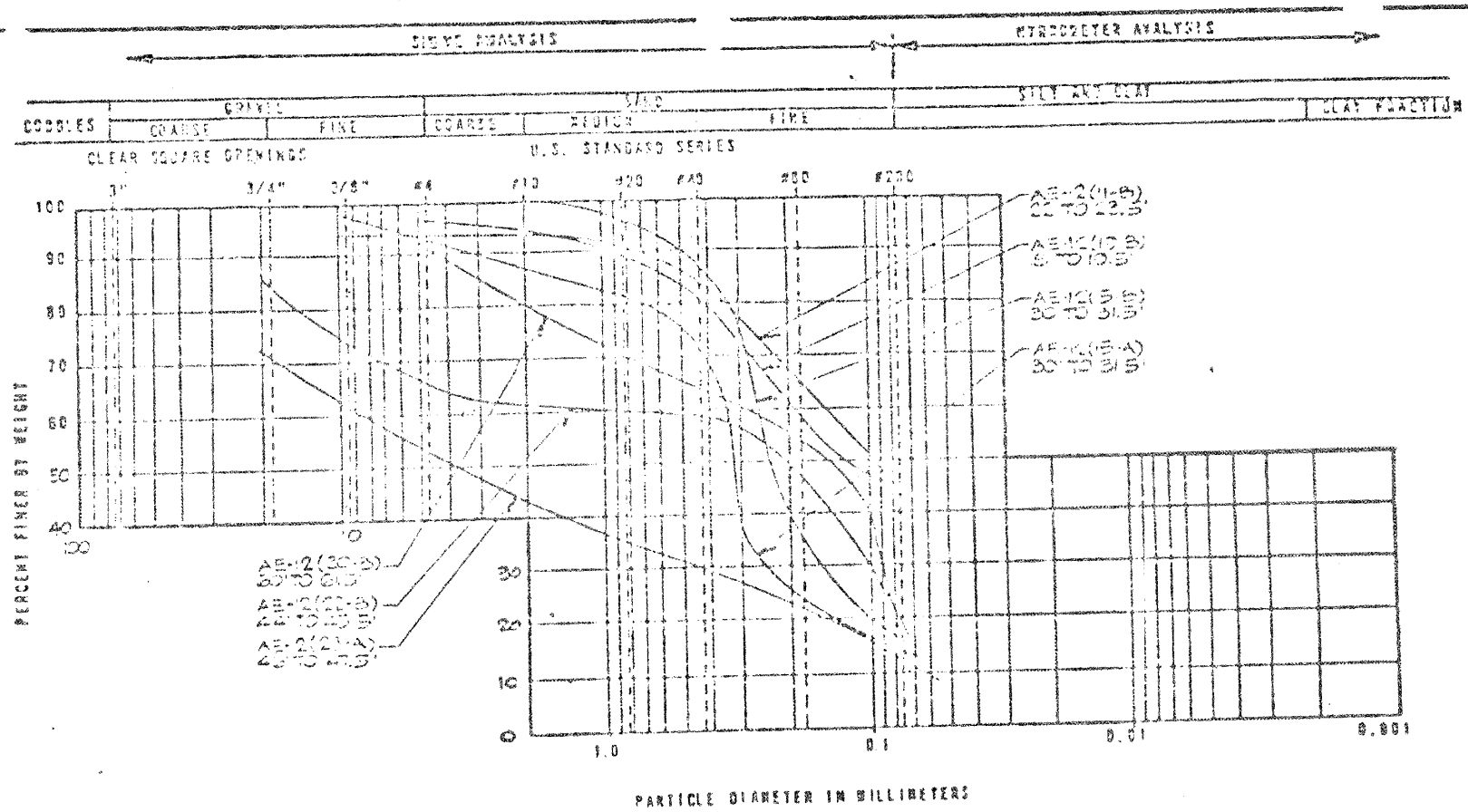
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-11
FIGURES 2G-C12



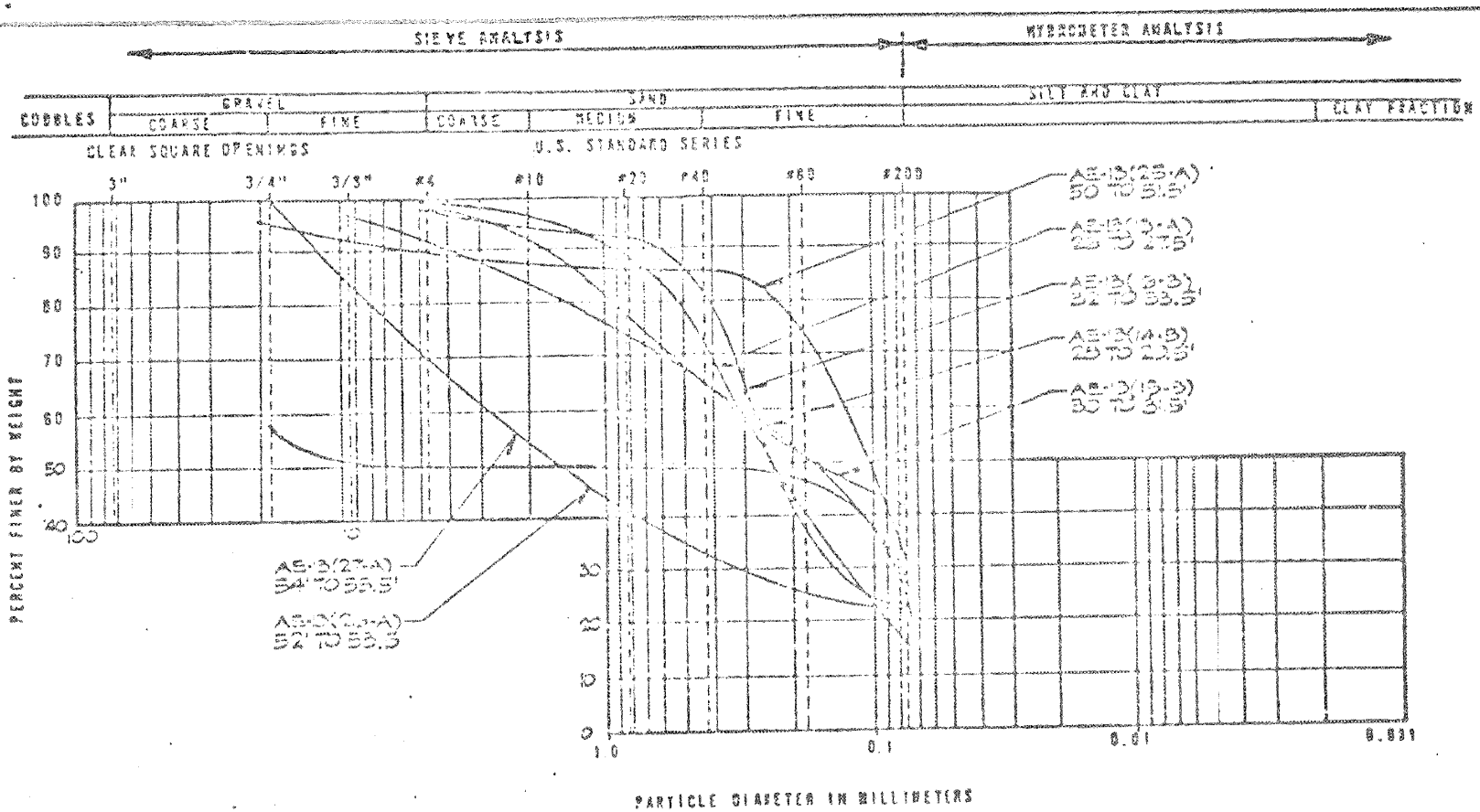
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-12
FIGURE 2.G-C13



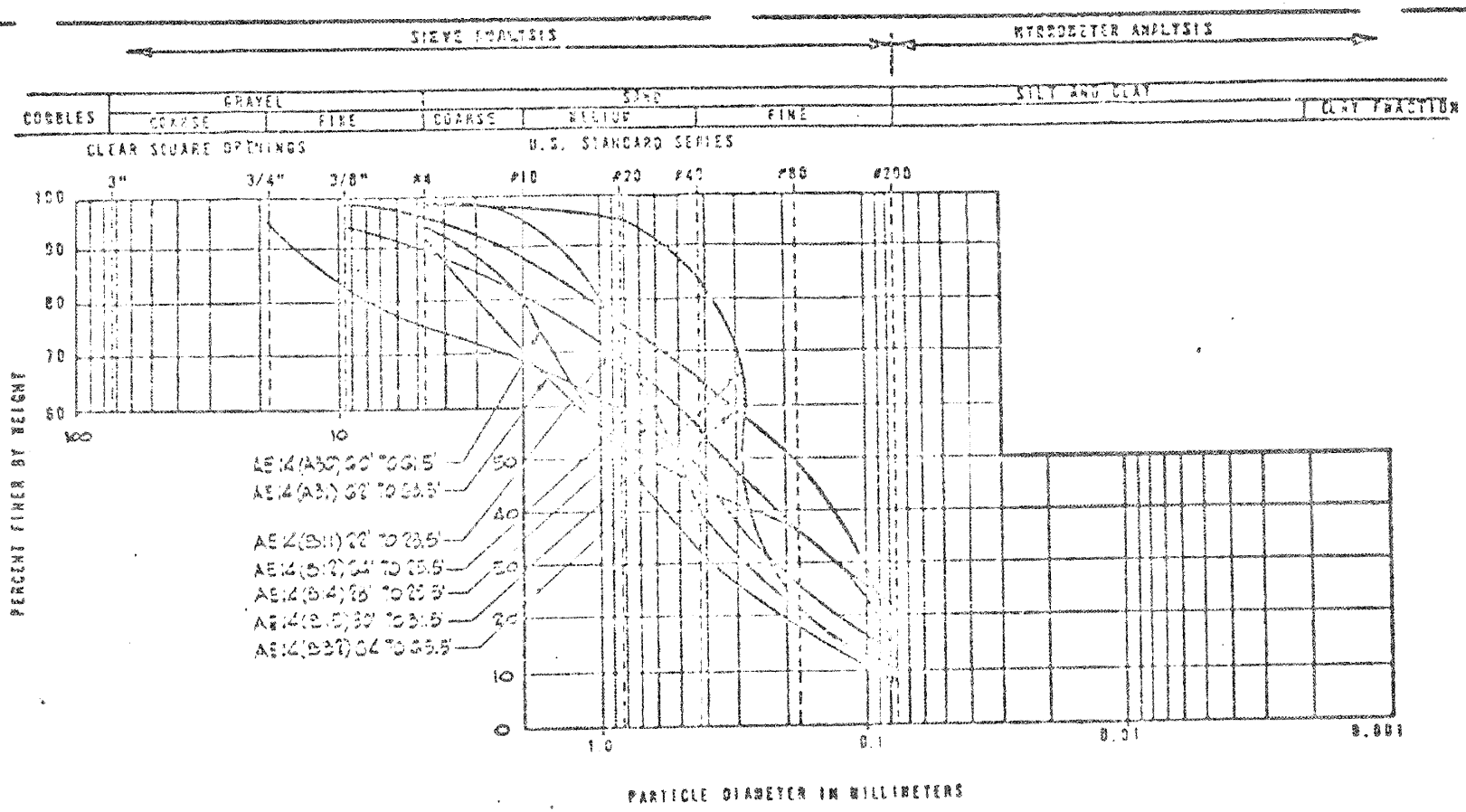
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-12
FIGURE 2.5A-C13 (CONT'D)



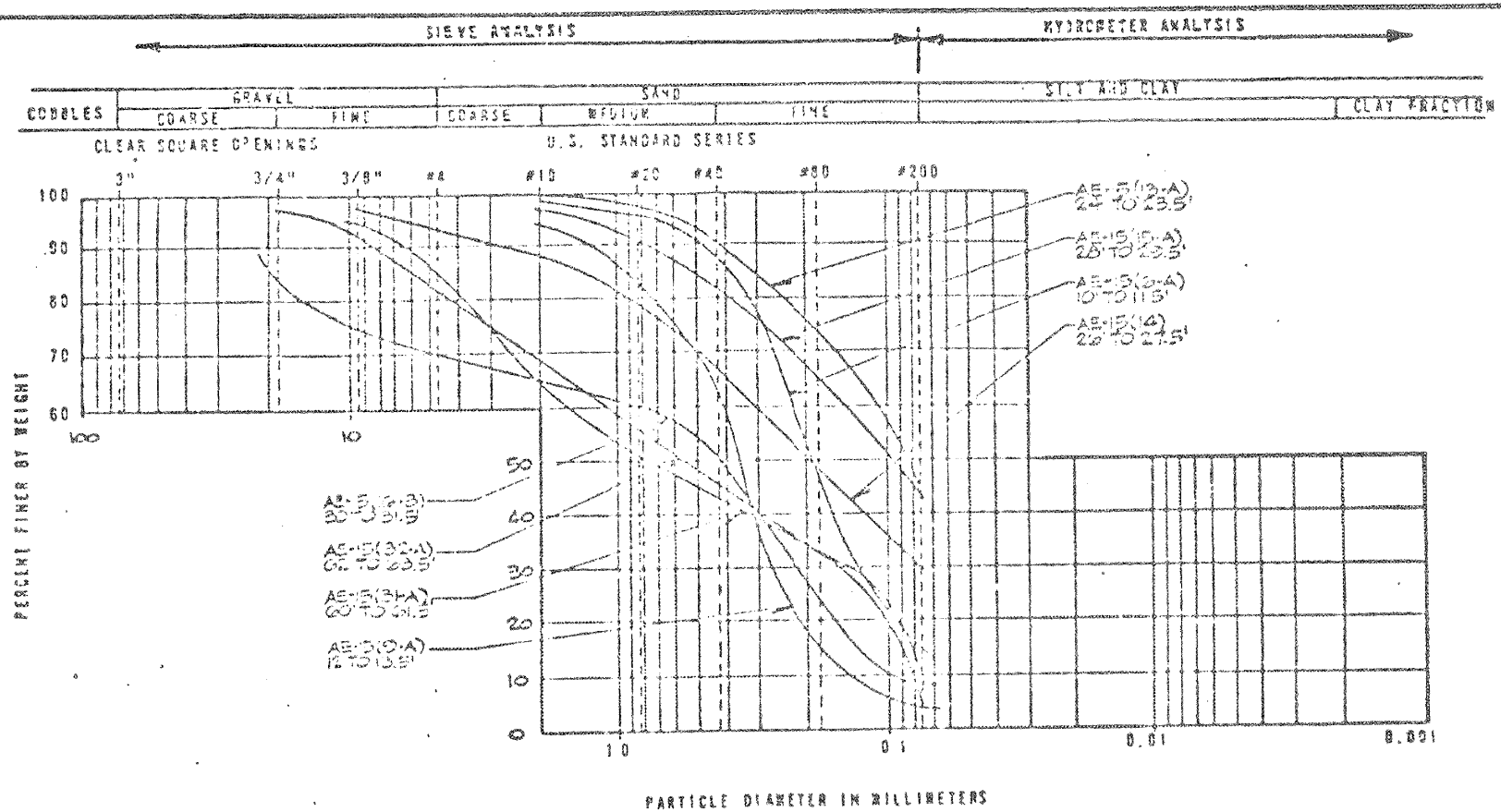
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AB-13
FIGURE 2G-C14



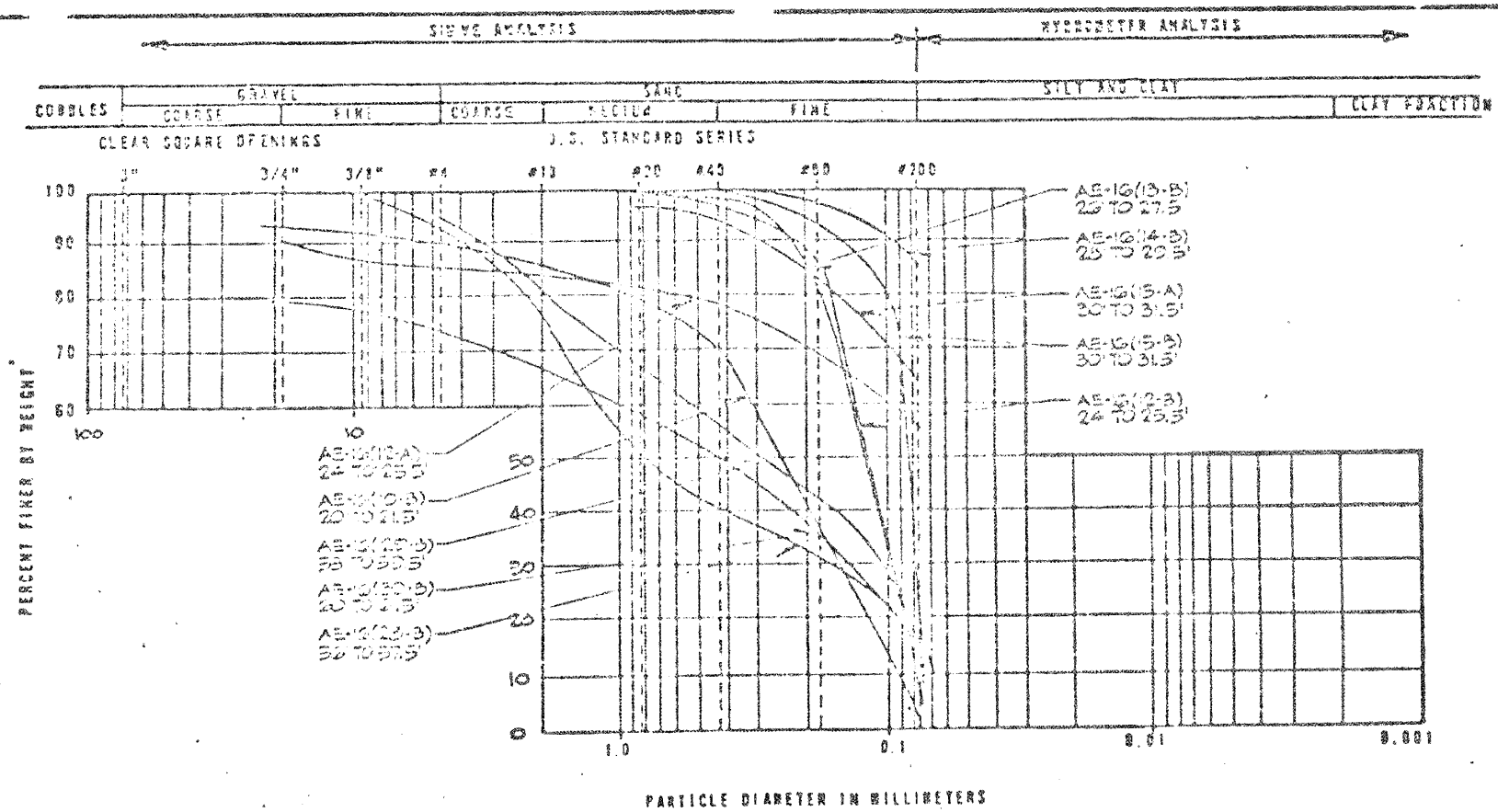
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-14
FIGURE 2G-C15



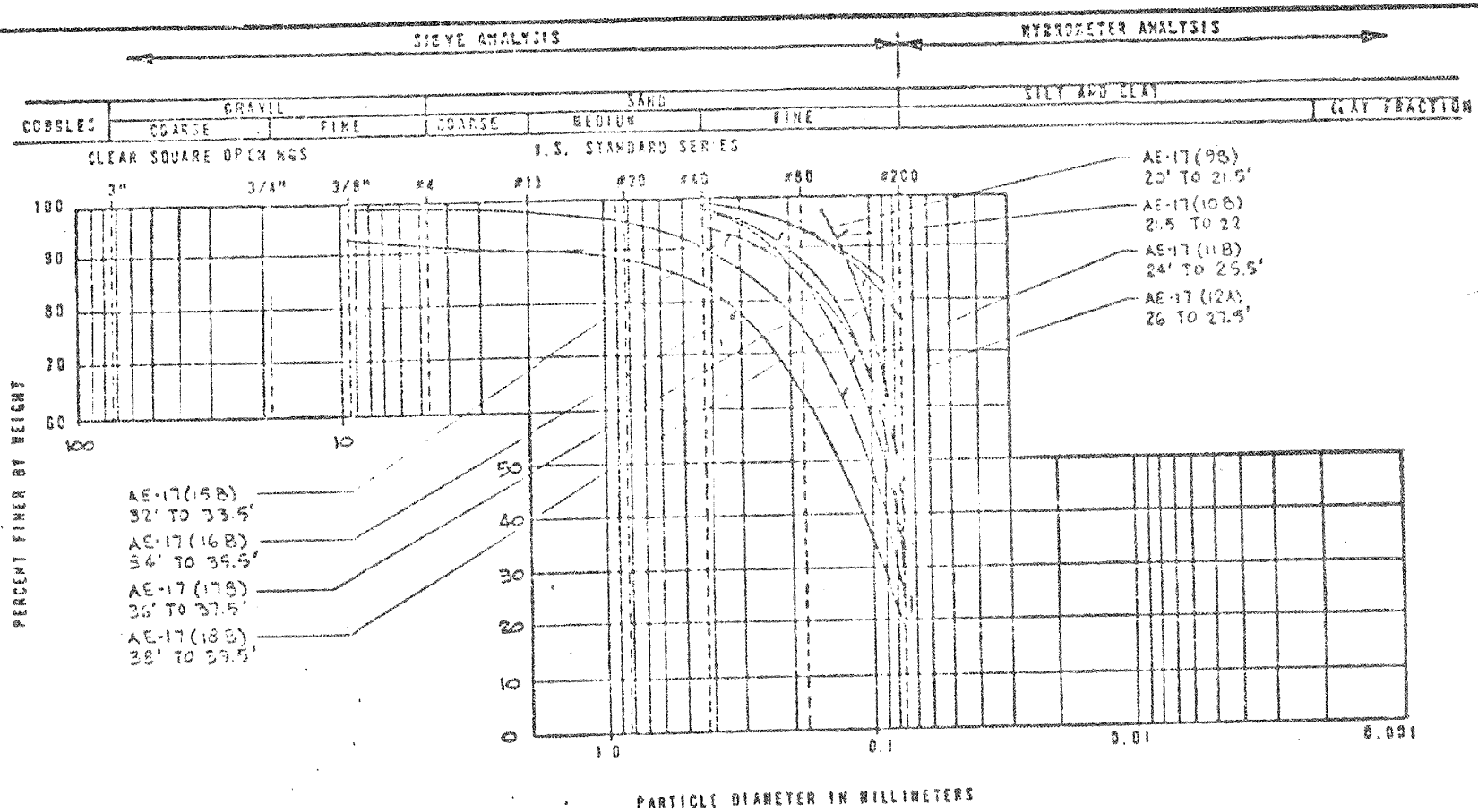
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-15
FIGURE 2G-C16



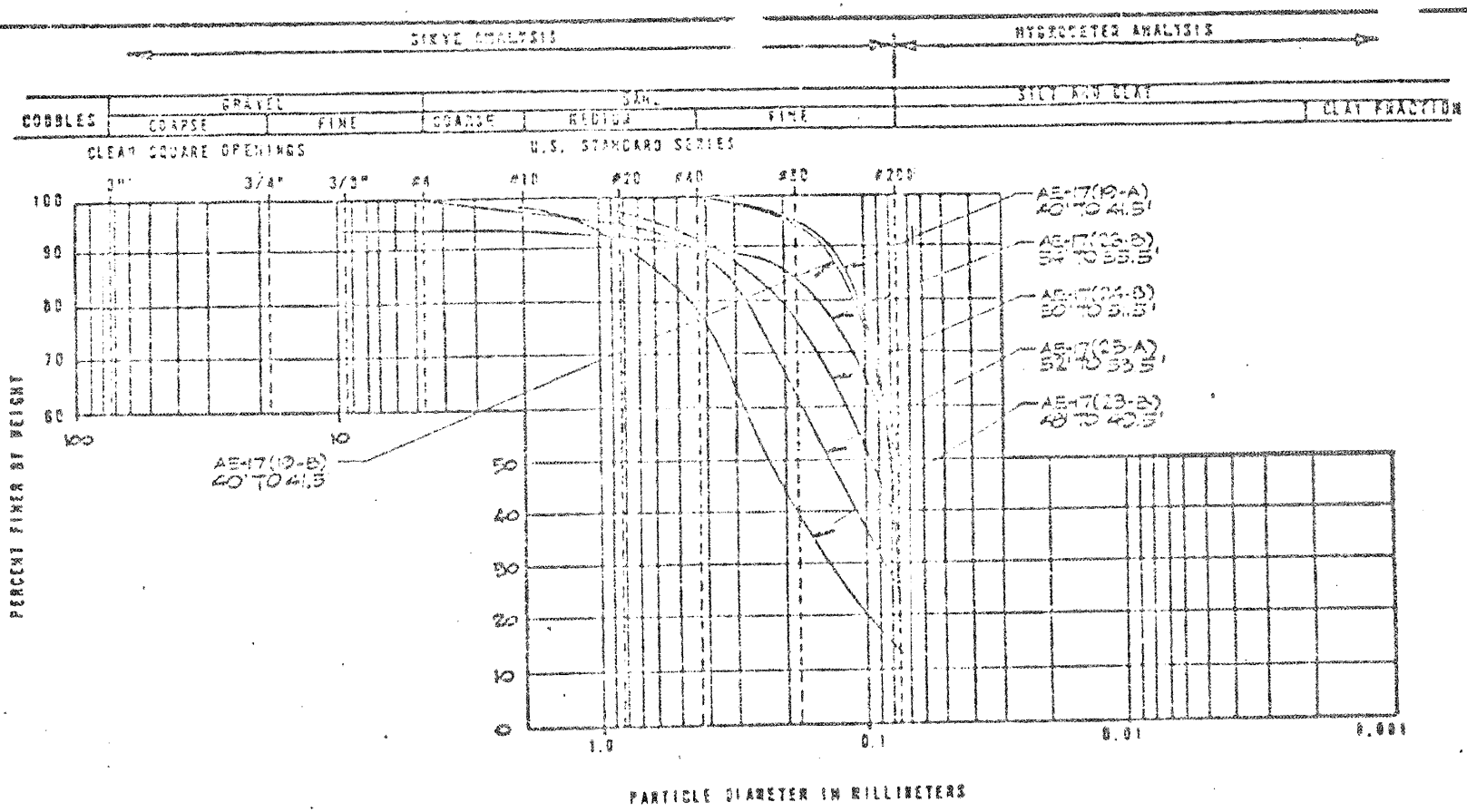
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AB-16
FIGURE 2G-C17



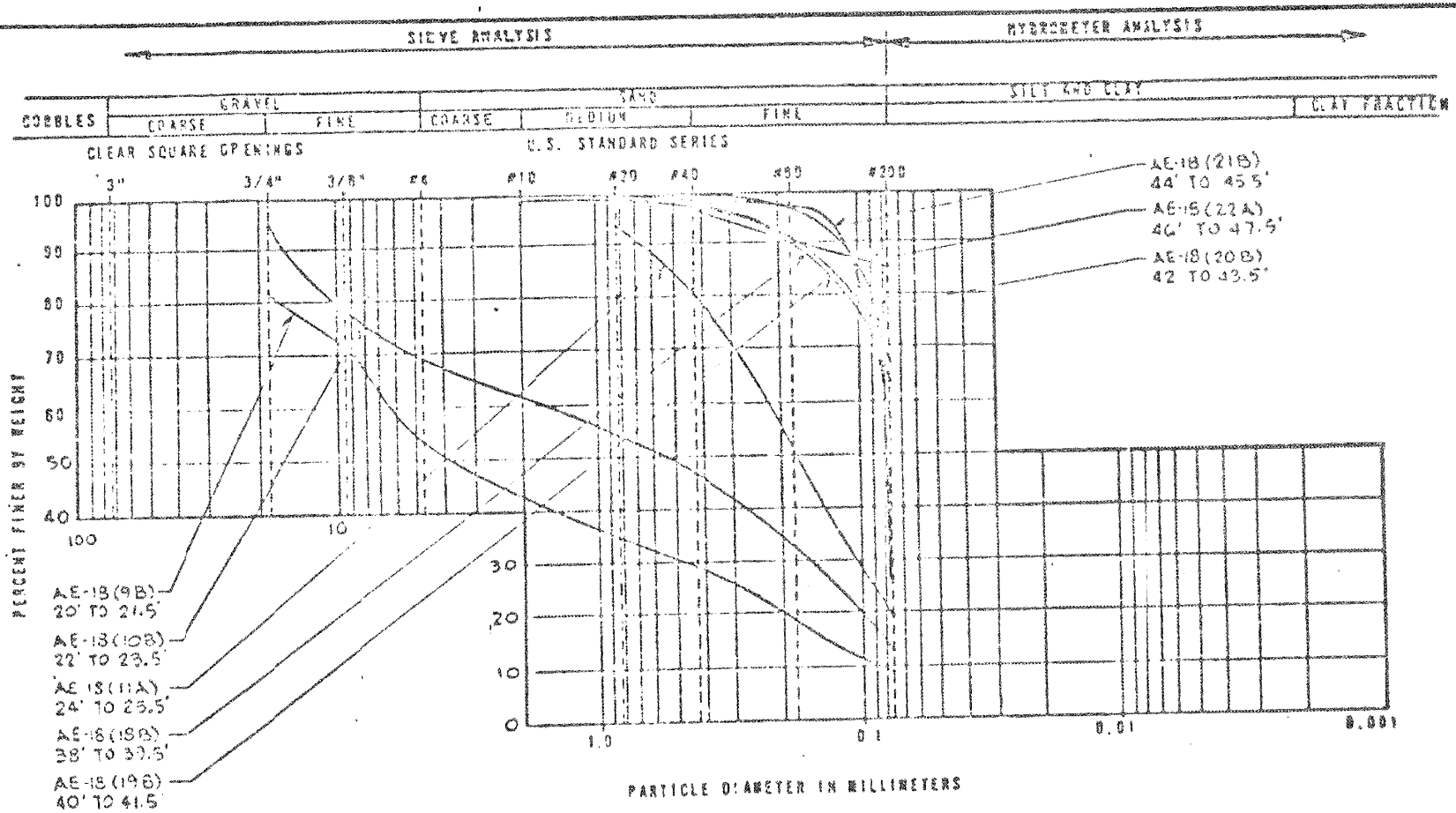
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-17
FIGURE 2.G-C15



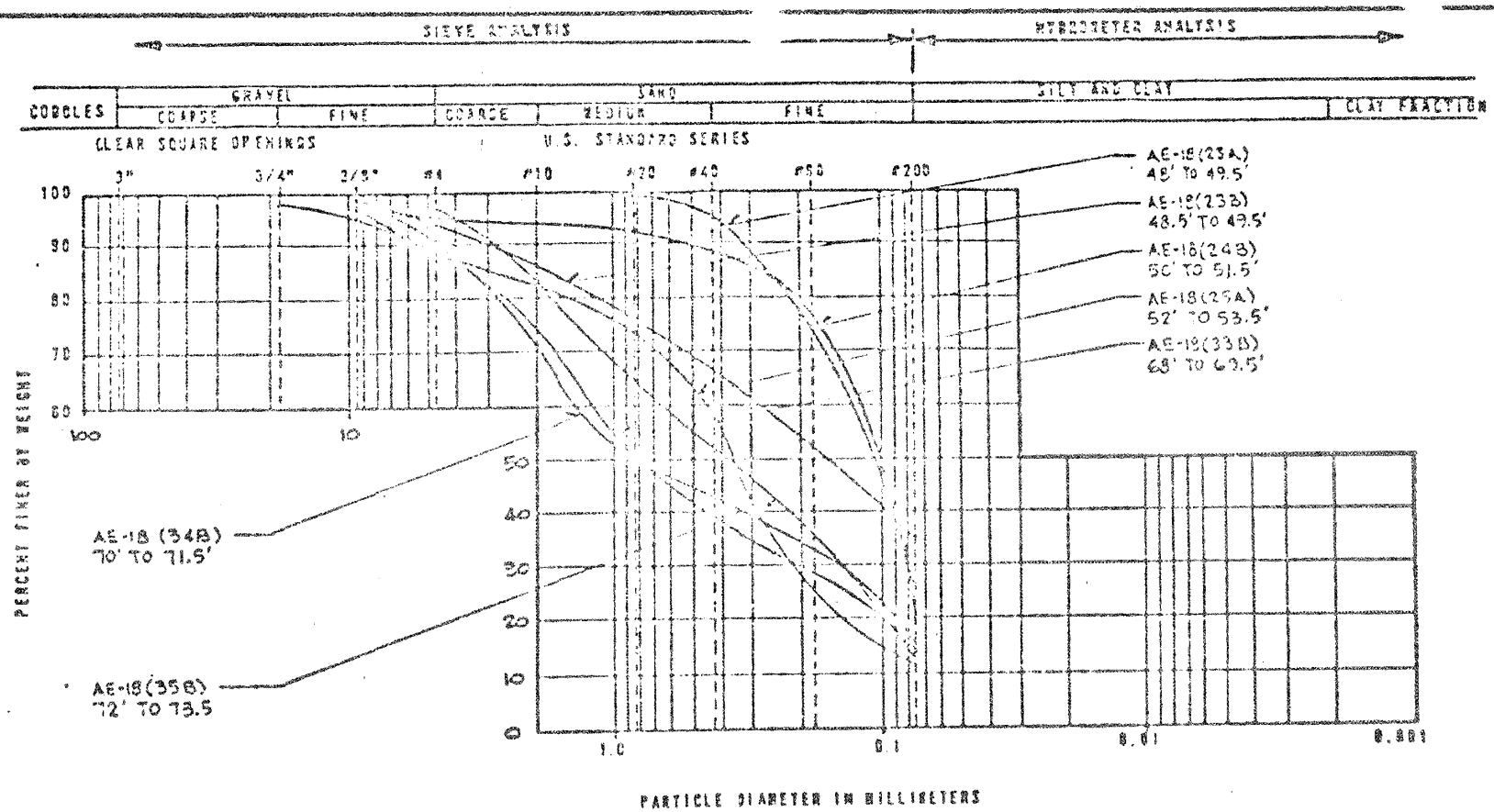
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-17
FIGURE 2.G-C18 (CON'T)



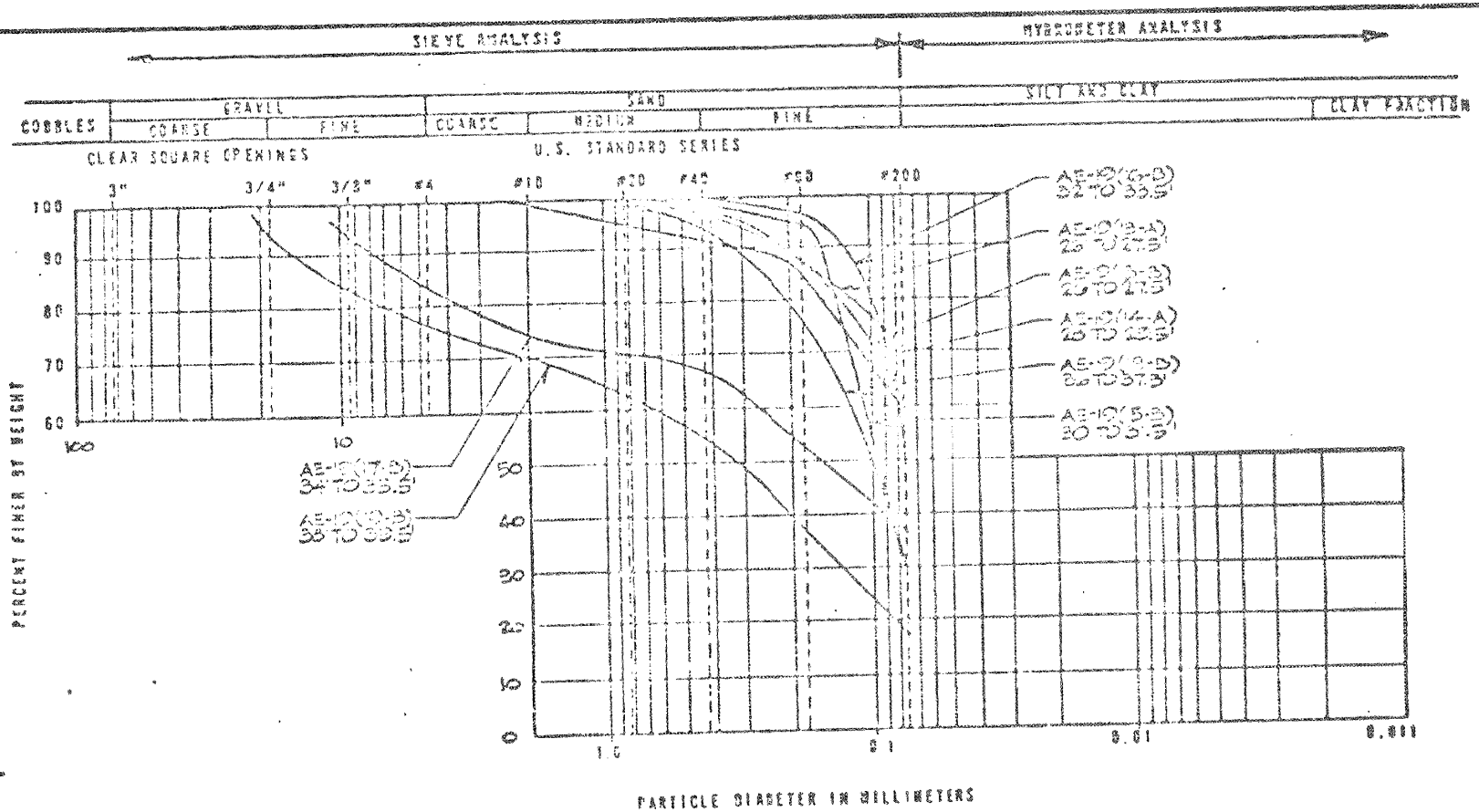
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-18
FIGURE 2GC19



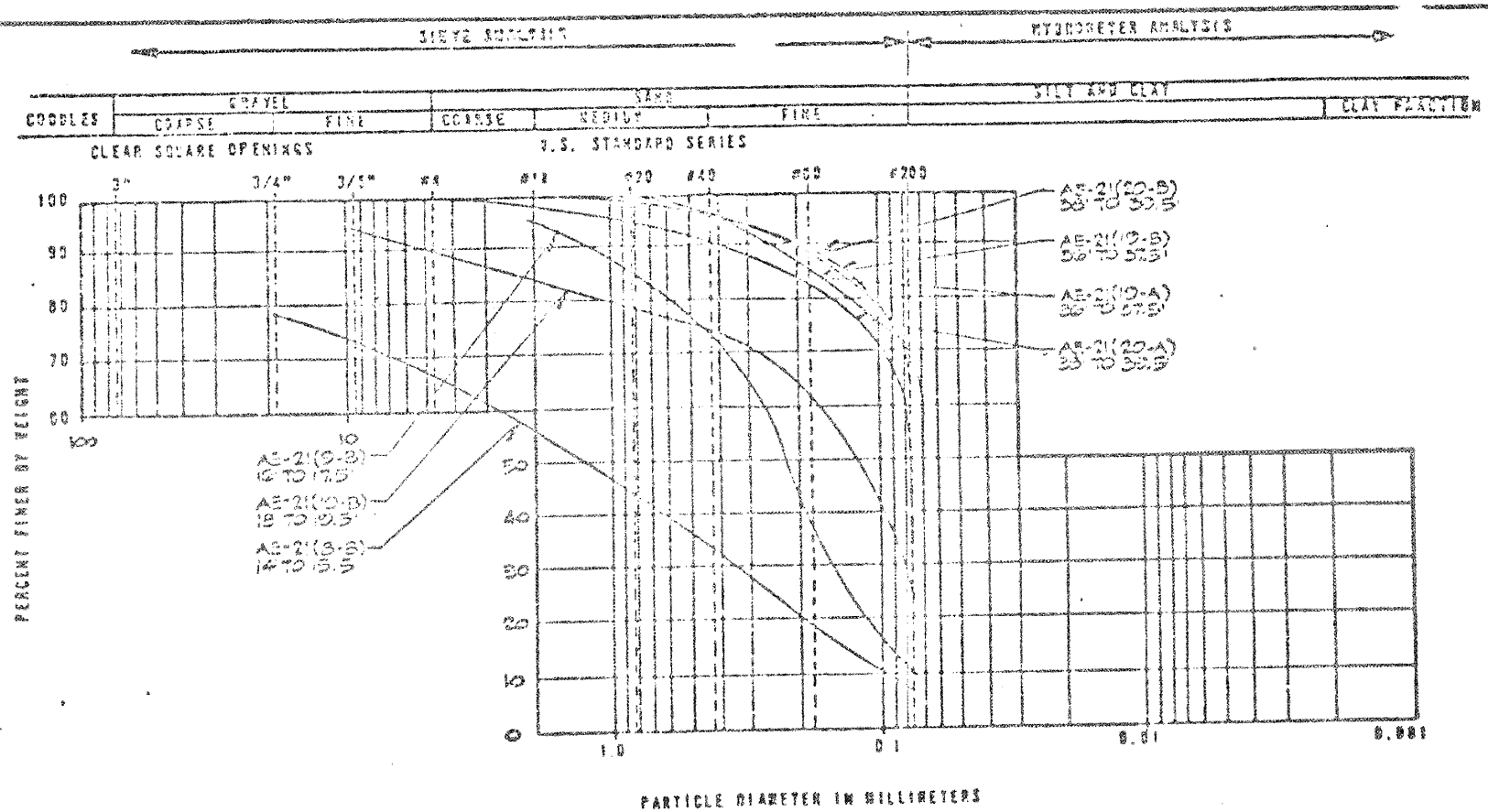
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-18
FIGURE 2.G-C19 (CONT)



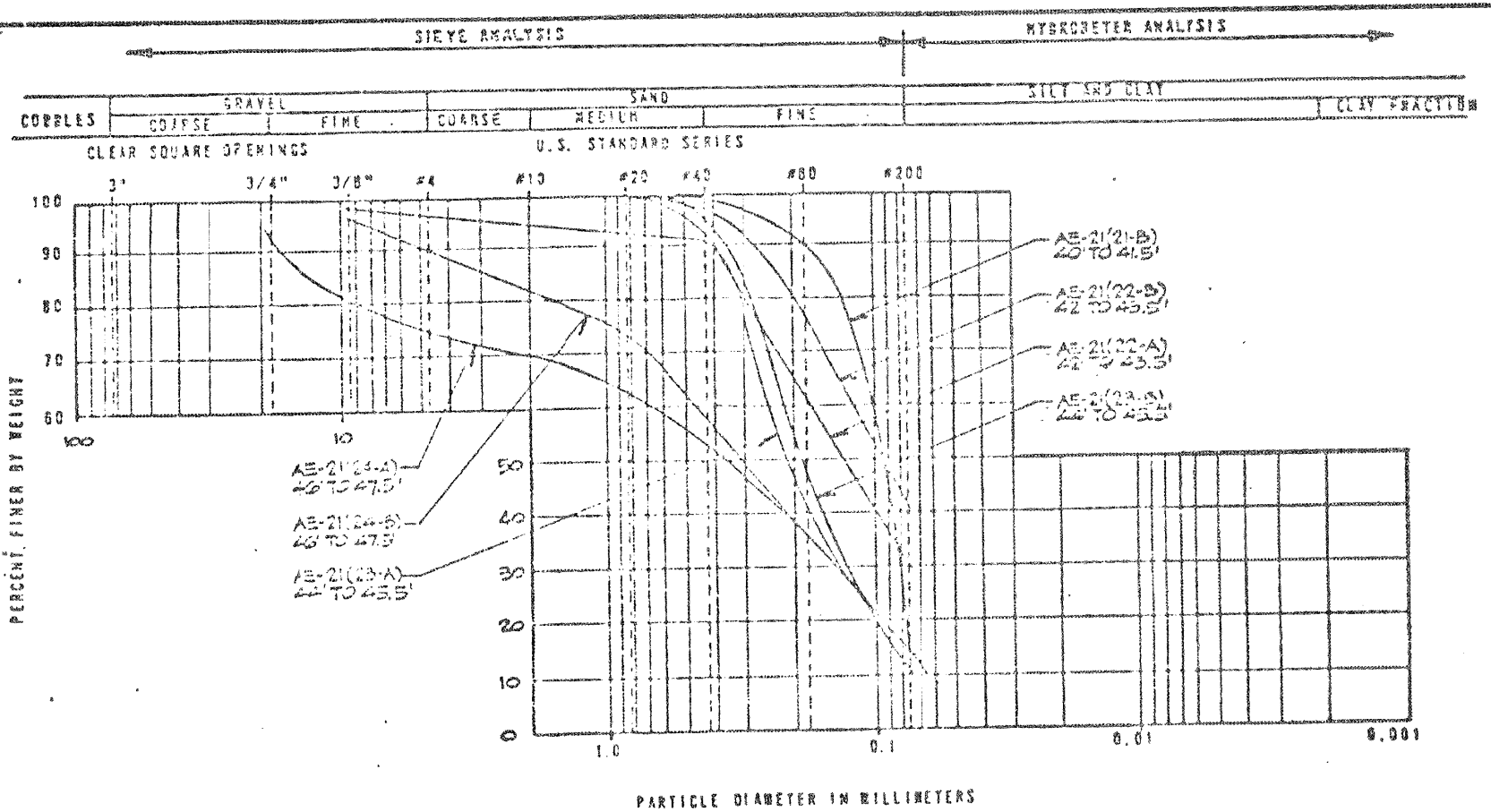
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-10
FIGURE 2G-C20



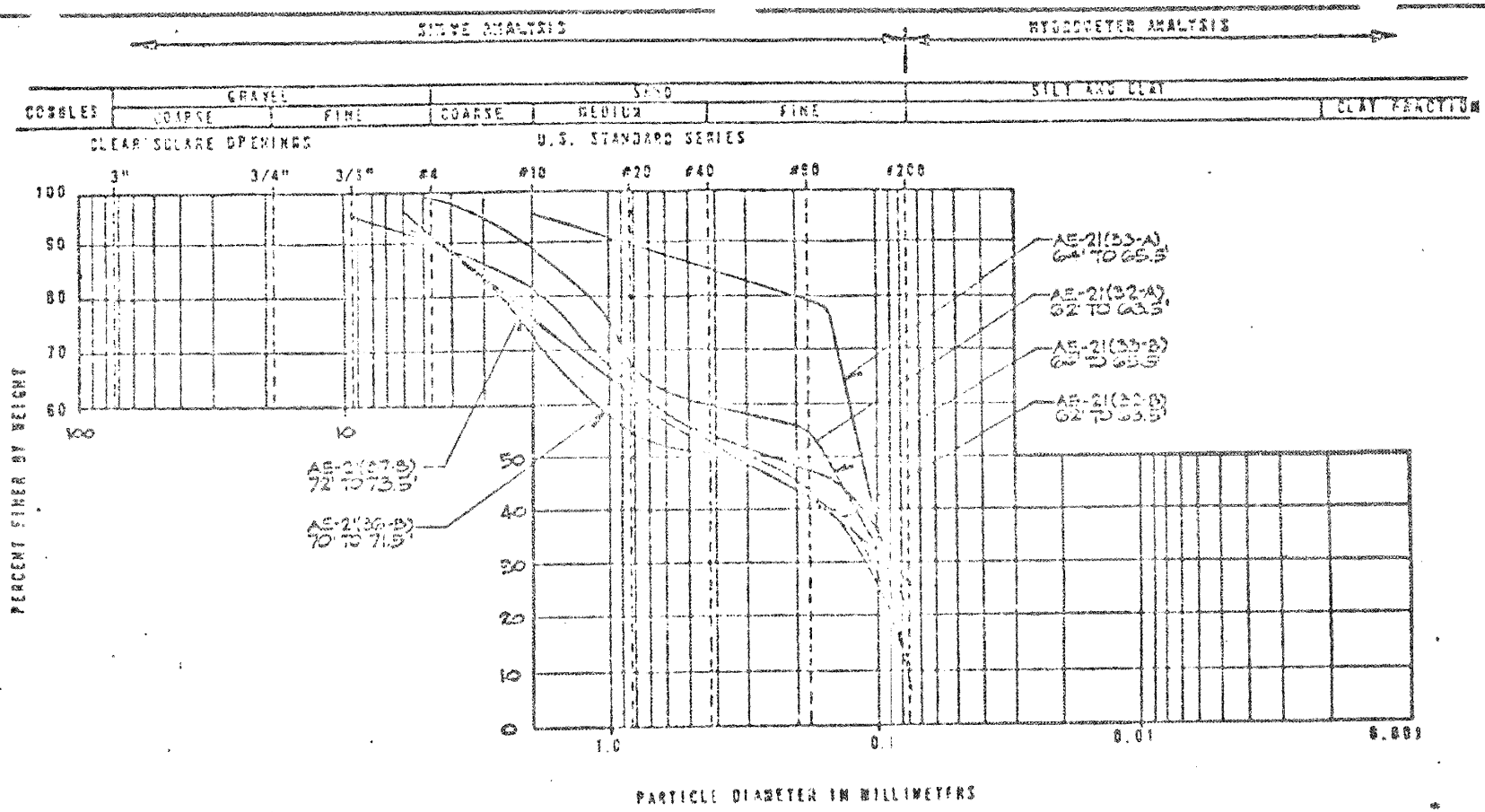
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-21
FIGURE 2G-C21



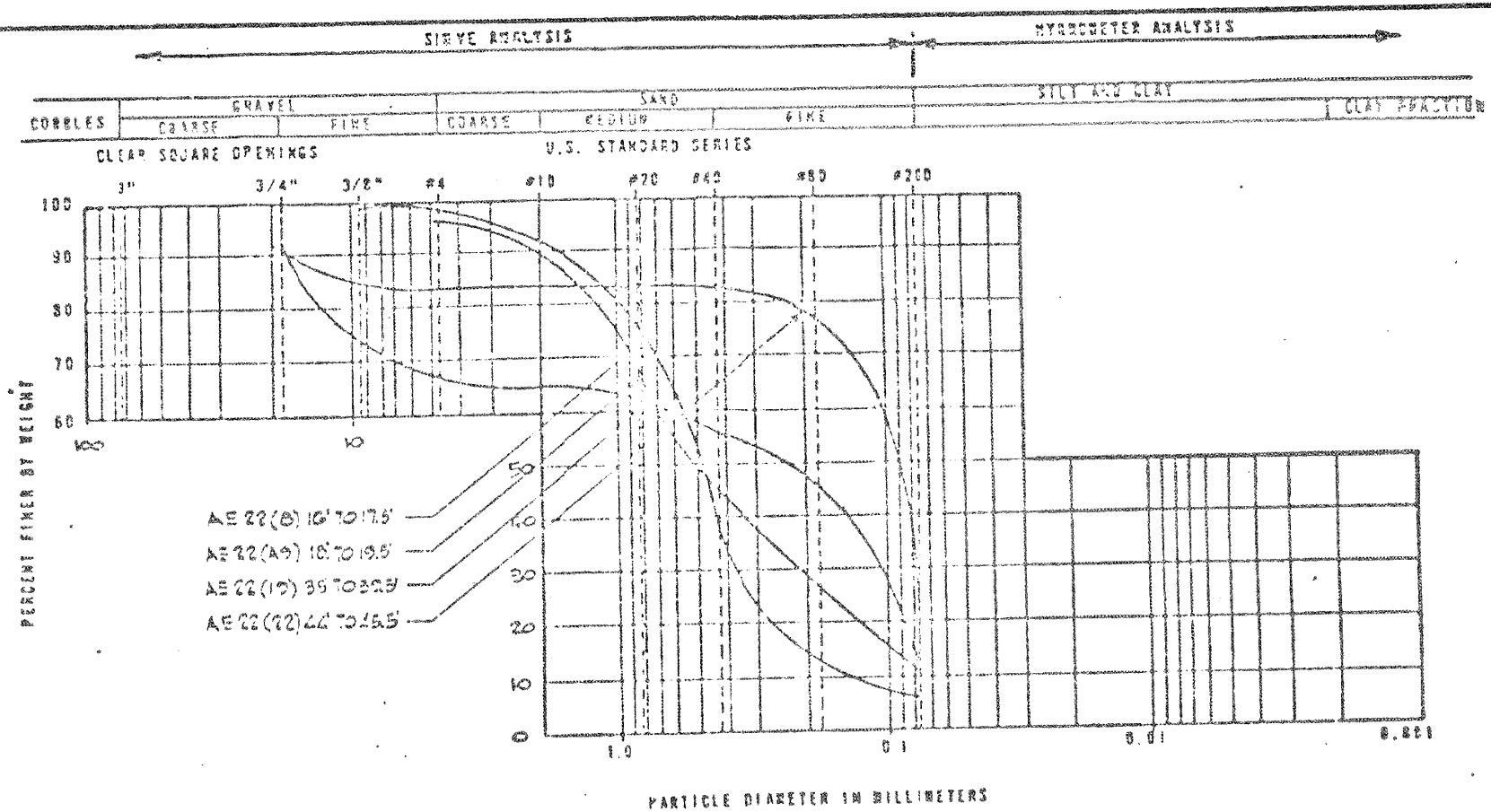
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-21
FIGURE 2.G-C21 (CON'T)



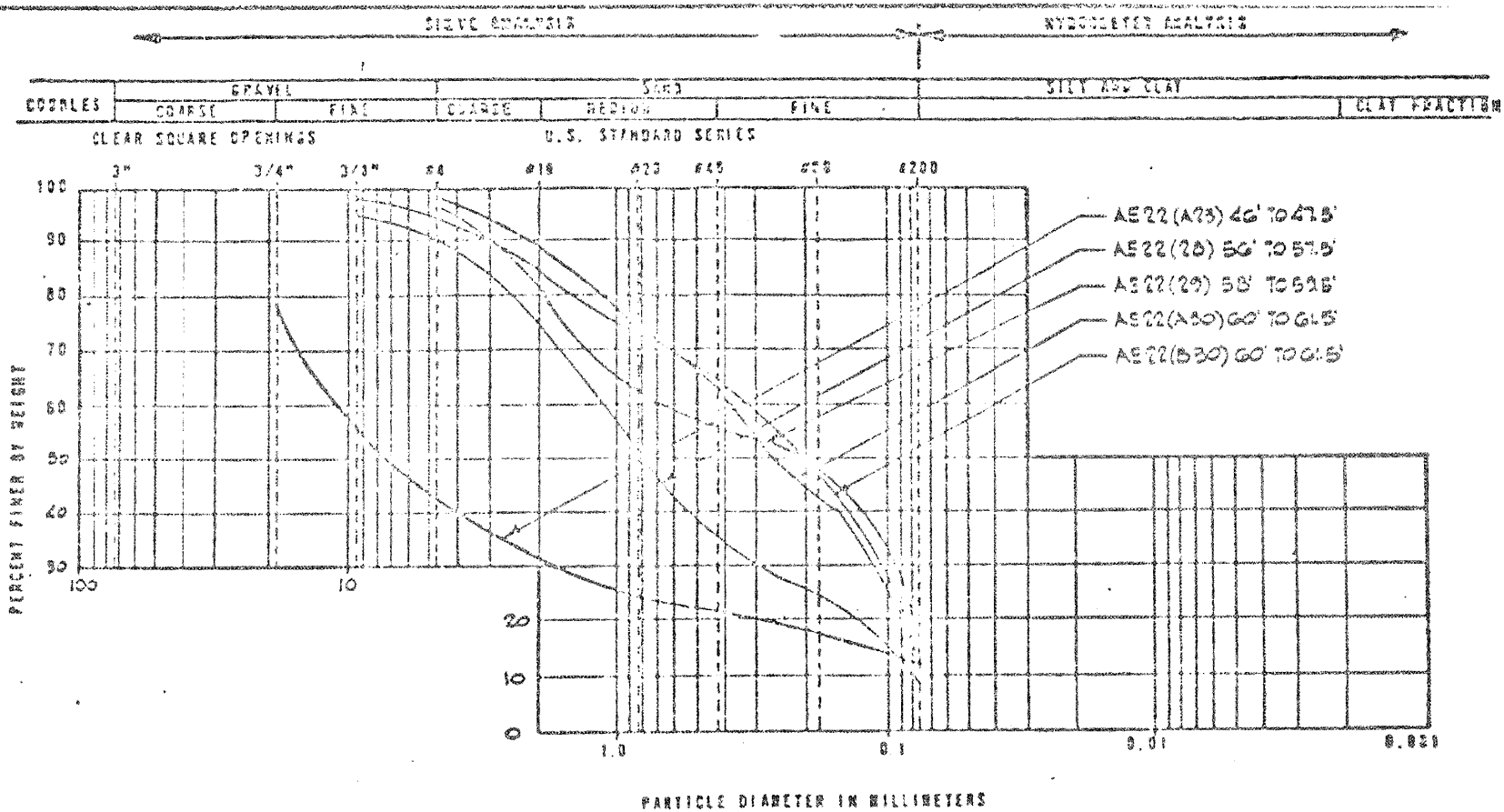
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-21
FIGURE 2.G-C21(CON'T)



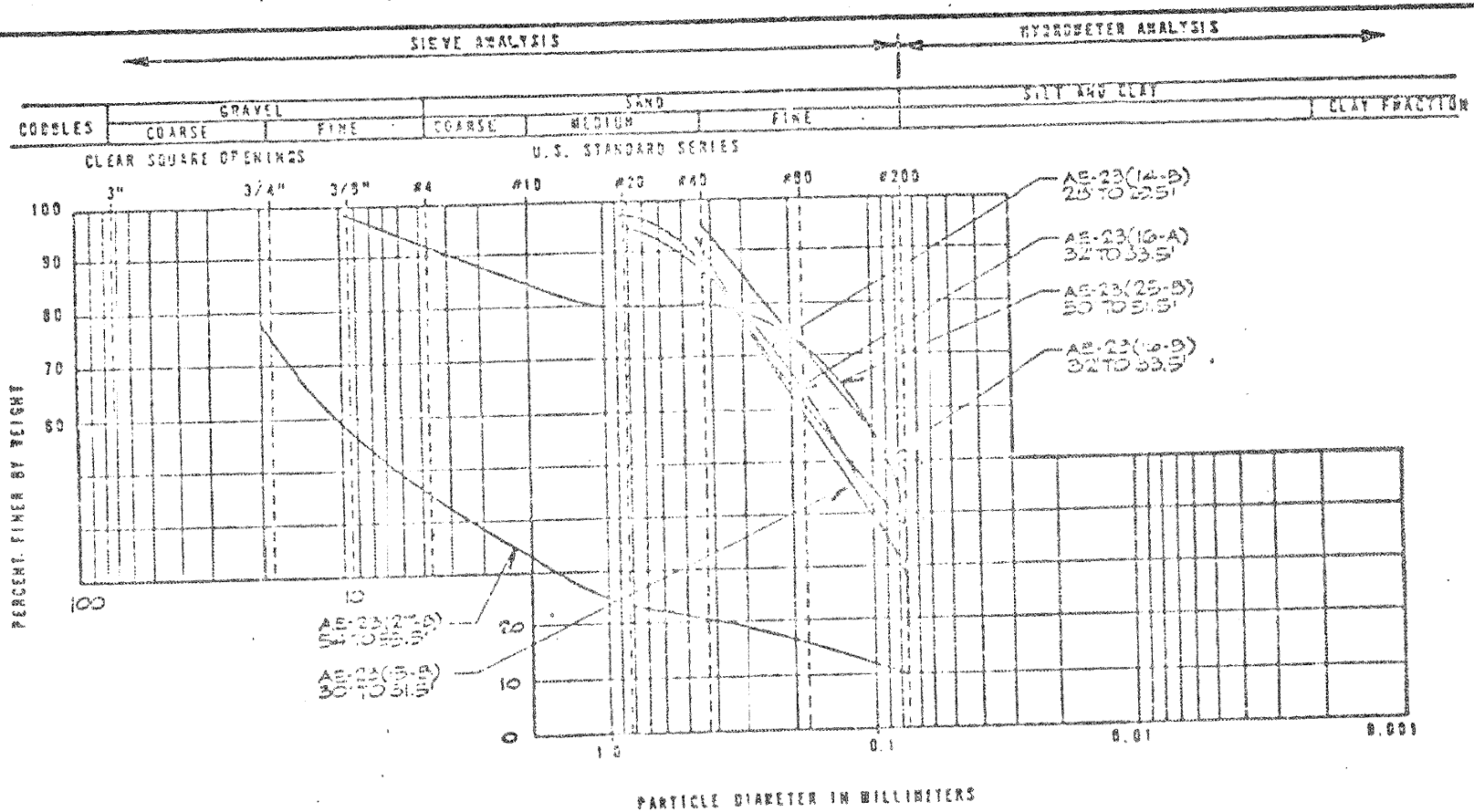
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-22
FIGURE 2G-C22



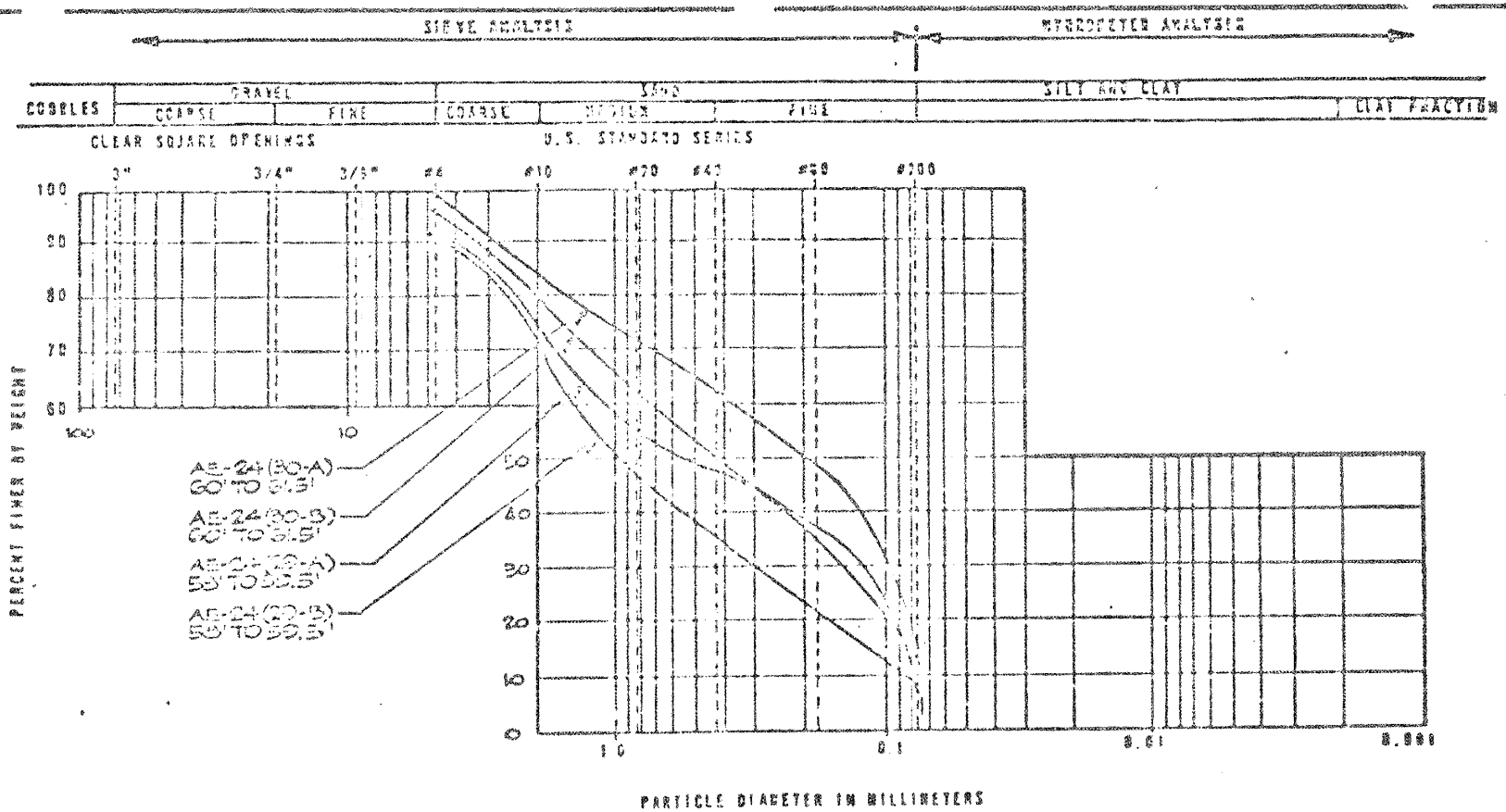
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-22
FIGURE 2.G-C22 (CONT)



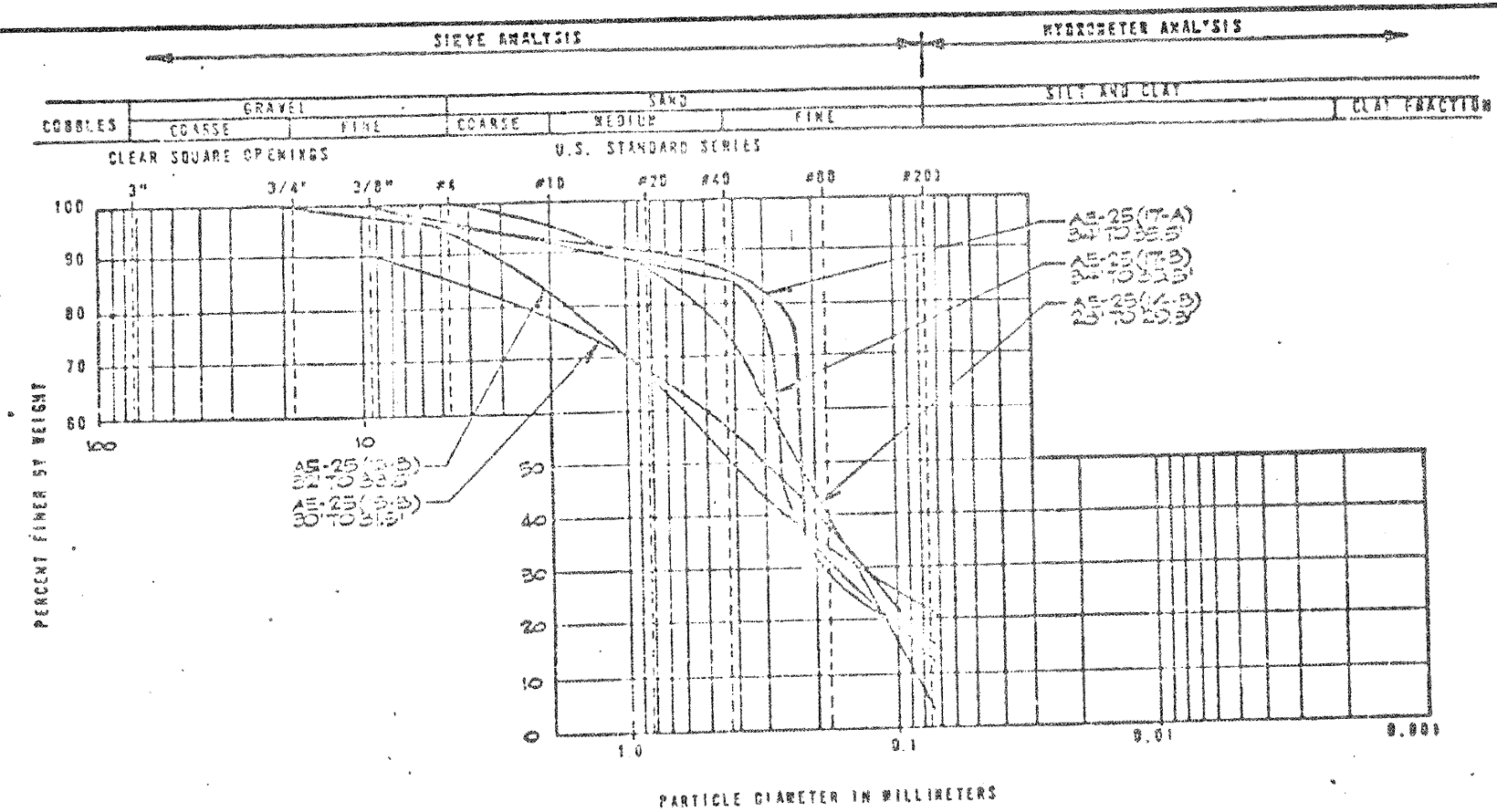
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-23
FIGURE 2G-C23



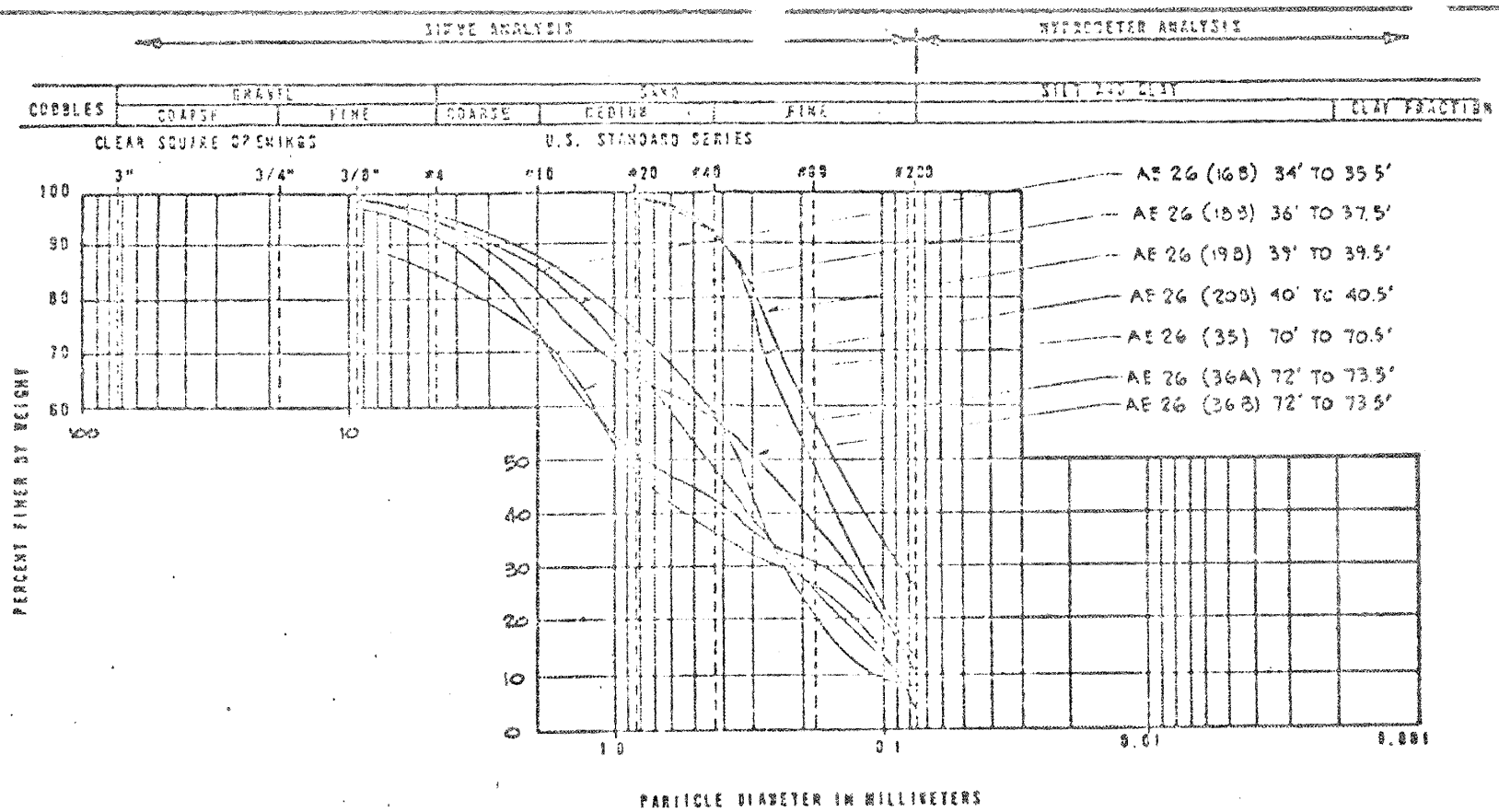
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-24
FIGURE 2C-C24



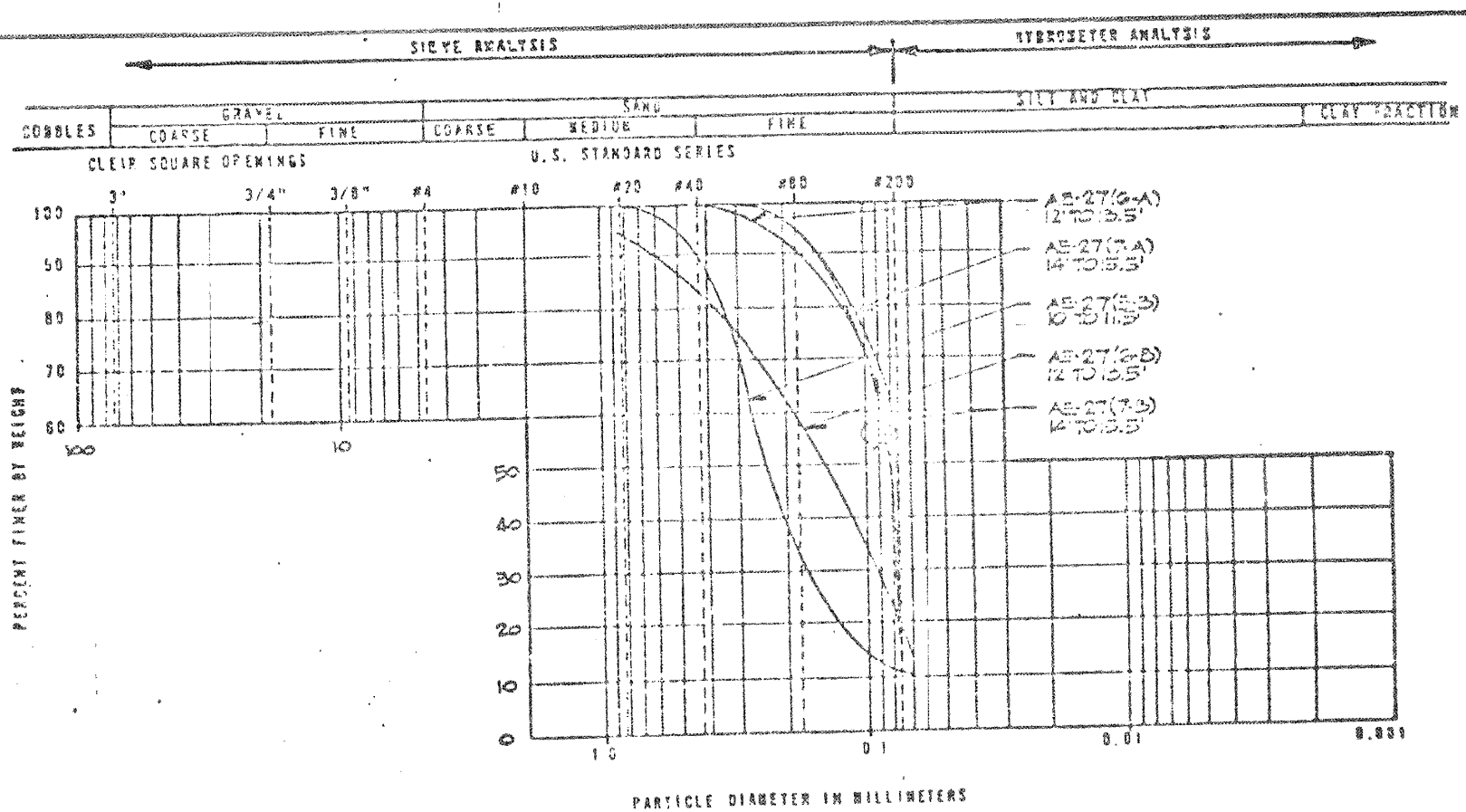
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AS-25
FIGURE 2G-C23



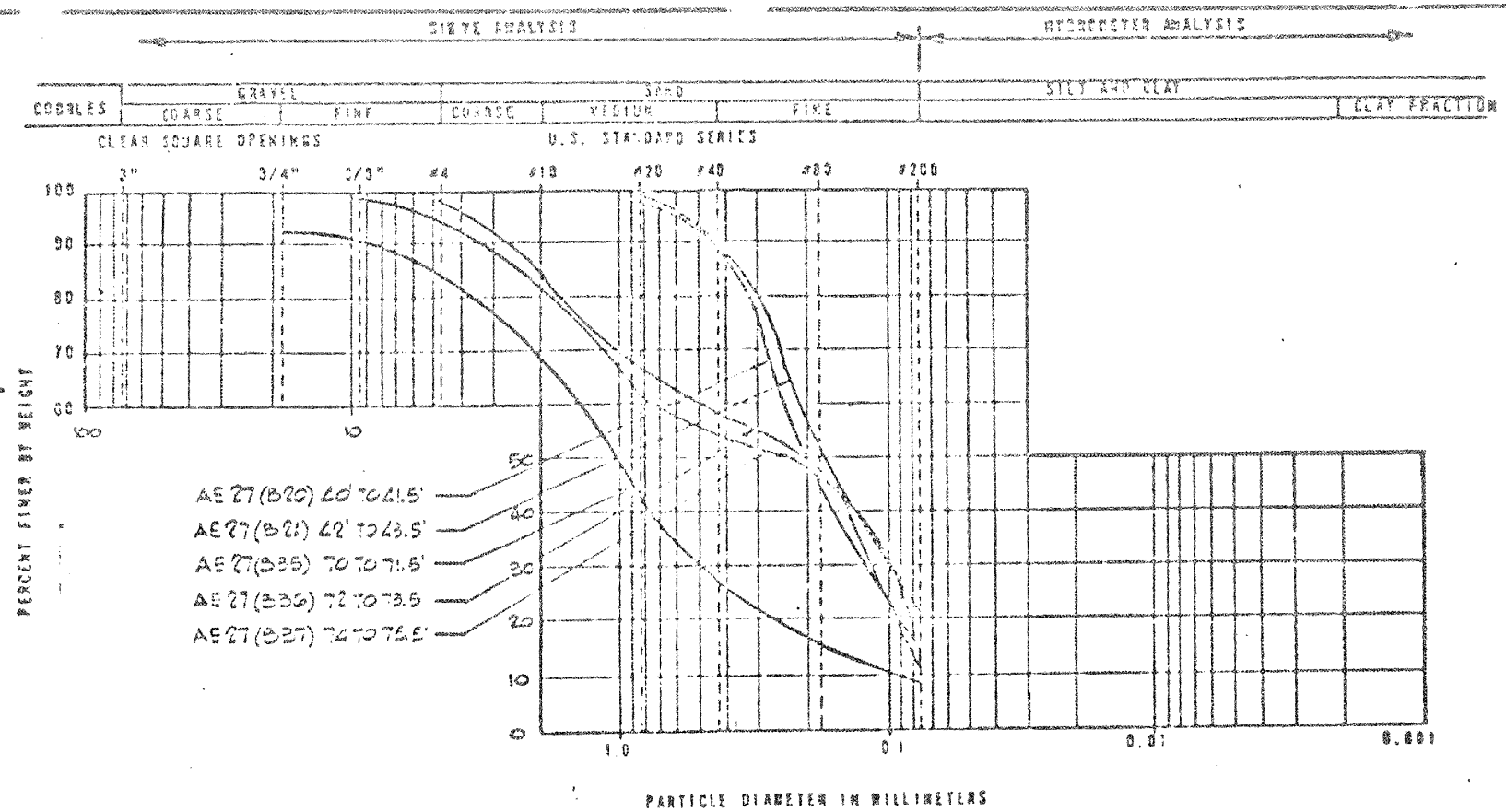
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-26
FIGURE 2G-C26



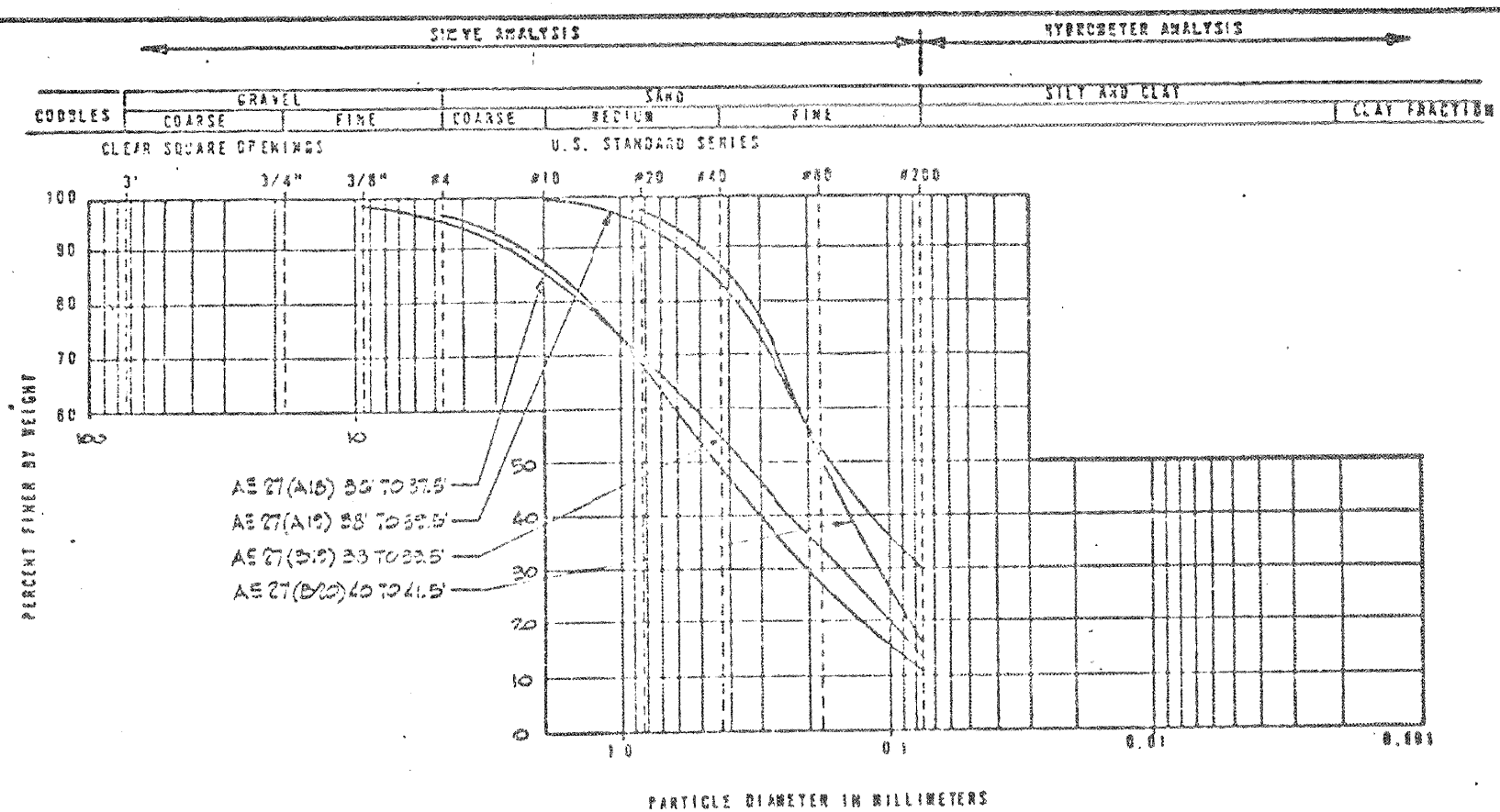
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AB-27
FIGURE 2G-C27



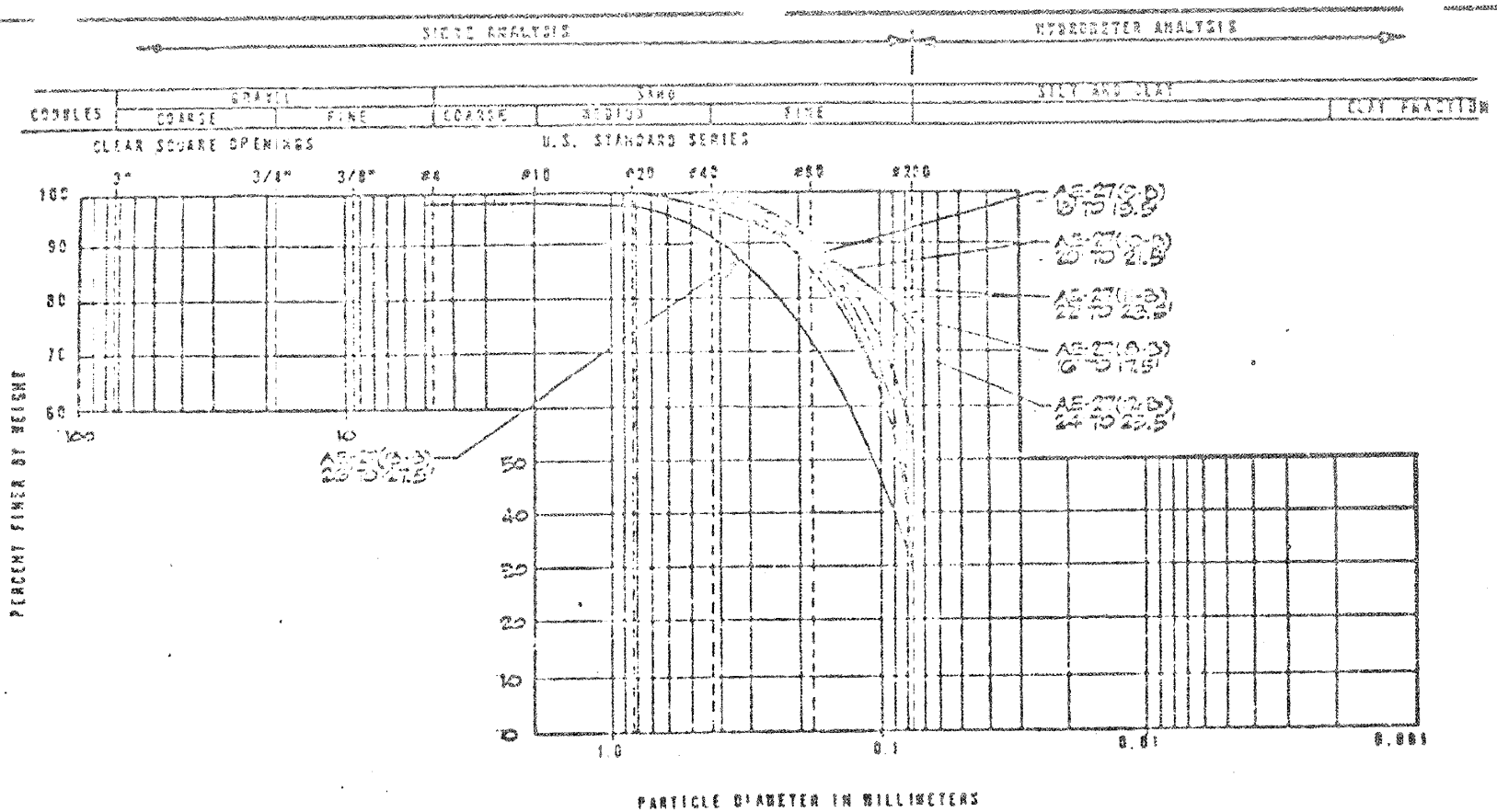
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-27
FIGURE 2G-C27 (CONT'D)-X



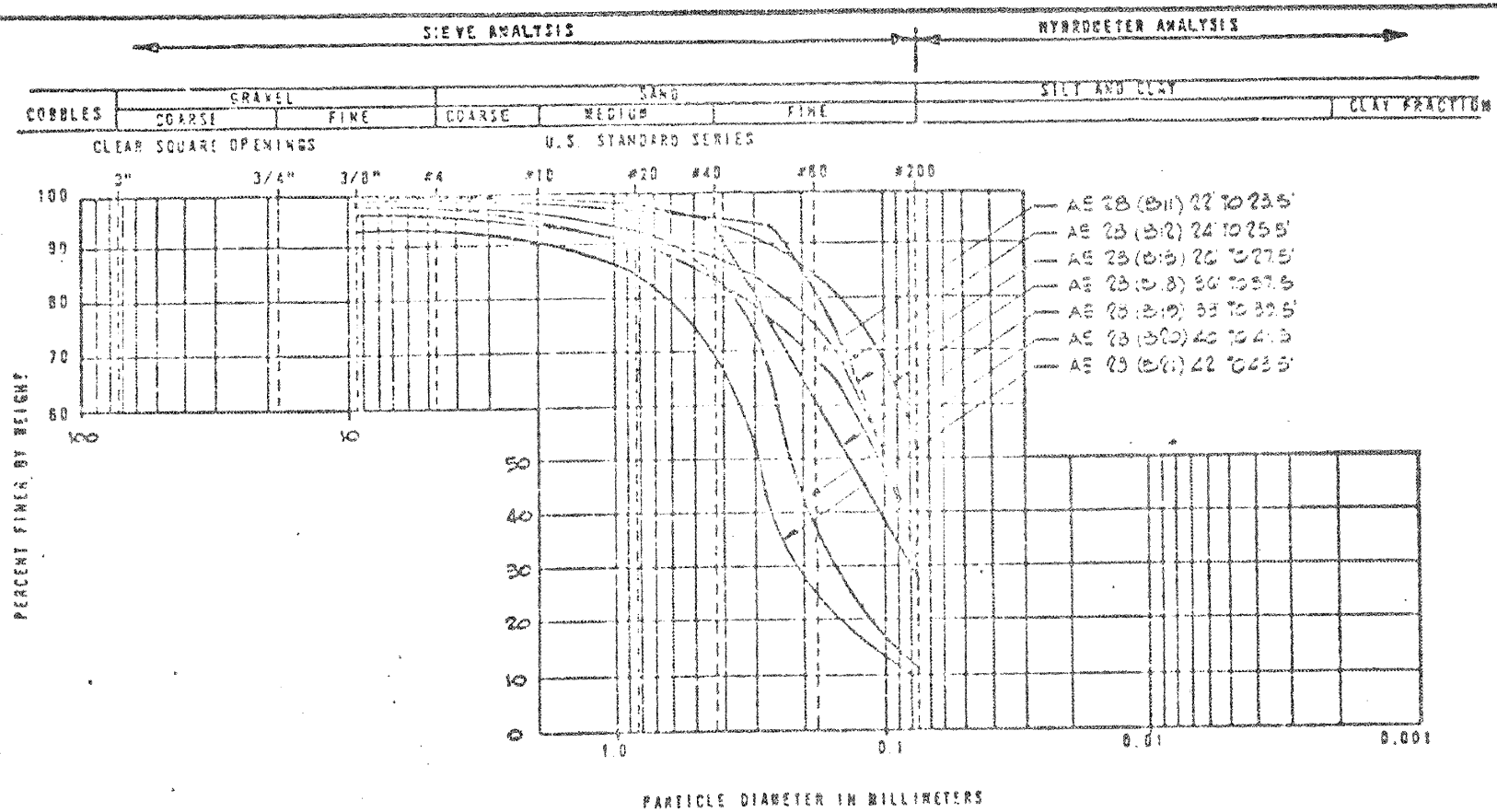
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-27
FIGURE 2G-C27(CONT)-2



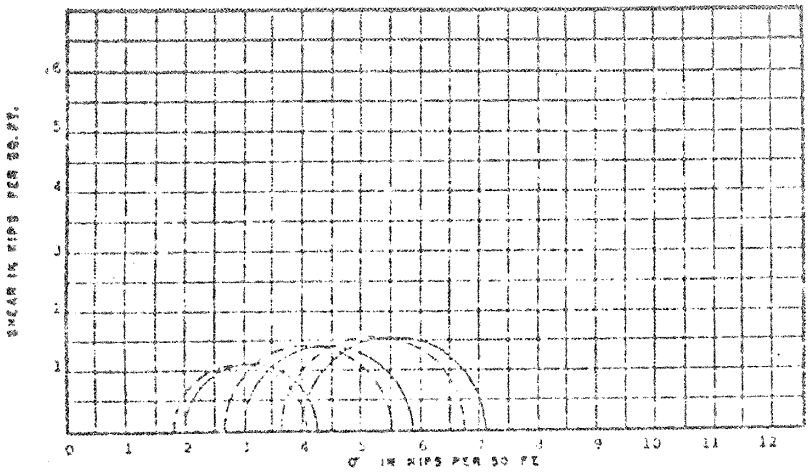
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-27
FIGURE 2 G-C27 (CONT)-3

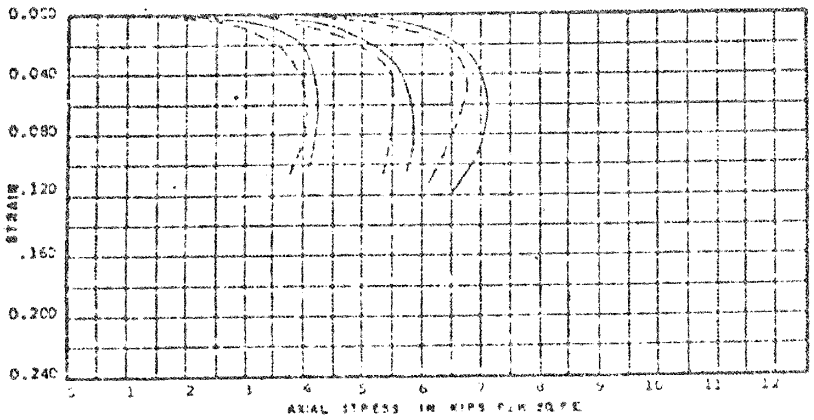


FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

GRAIN SIZE DISTRIBUTIONS
BORING AE-28
FIGURE 2G-C28



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ 65.4, 74.5, 82.5

WATER CONTENT, w 41.0, 31.6, 25.74

VOID RATIO, e 1.53, 1.23, 1.11

CONSOLIDATED UNDRAINED

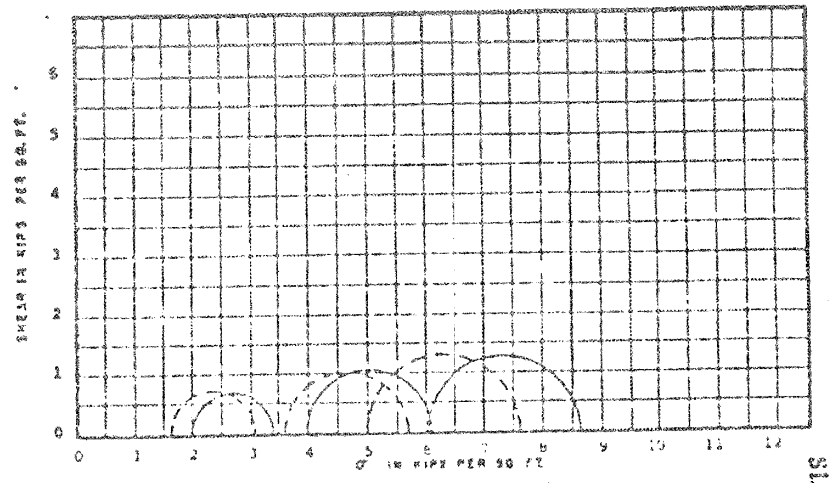
TRIAXIAL SHEAR TEST

BORING NO. AM-1A SAMPLE NO. UD-2

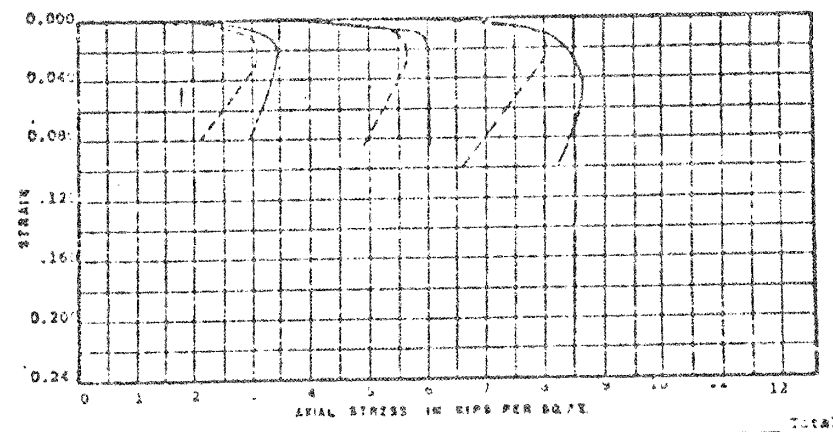
ELEV. OR DEPTH 34.0'-36.0' JOB NO. SA-737

LAW ENGINEERING TESTING CO.

MERIDIANVILLE, FLORIDA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

Total σ_1
Effective σ_1

SATURATED, CONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST WITH PORE PRESSURE MEASUREMENTS

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ 62.1, 71.2, 79.6 PCF

WATER CONTENT, w 46.0, 41.6, 36.16

VOID RATIO, e 1.32, 1.22, 1.10

TRIAXIAL SHEAR TEST

BORING NO. AL-2A SAMPLE NO. UD-2

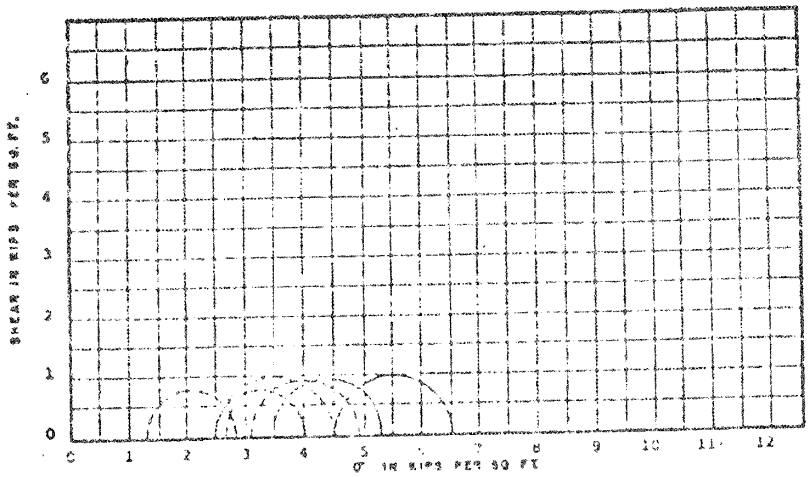
ELEV. OR DEPTH 32.0'-34.0' JOB NO. SA-719

LAW ENGINEERING TESTING CO.

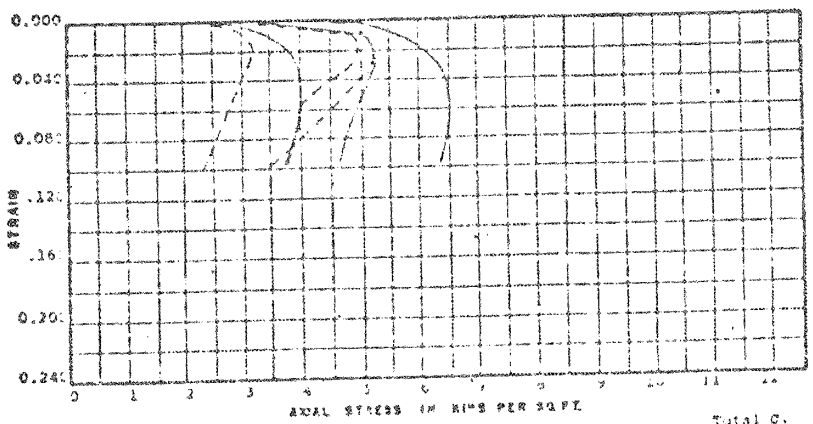
BIRMINGHAM, ALABAMA

2.5A-597

S12



MOHR DIAGRAMS – ϕ



STRESS-STRAIN CURVES

Total σ_1
Effective σ_1

SATURATED, CONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST WITH PORE PRESSURE MEASUREMENTS

"COHESION", C

ANGLE OF SHEAR RESISTANCE, ϕ

UNIT WEIGHT, γ_d 62.4, 62.7, 71.4 PCF

WATER CONTENT, W

VOID RATIO, e 1.20, 1.09, 1.0

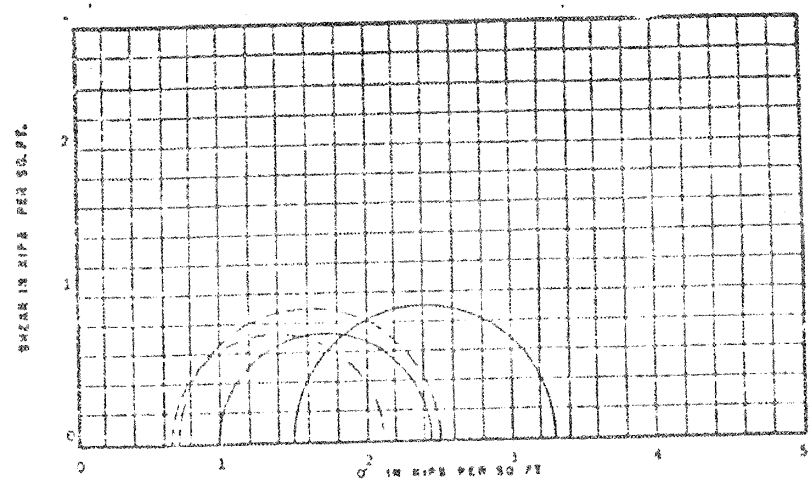
TRIAXIAL SHEAR TEST

BORING NO. AE-2C SAMPLE NO. CD-4

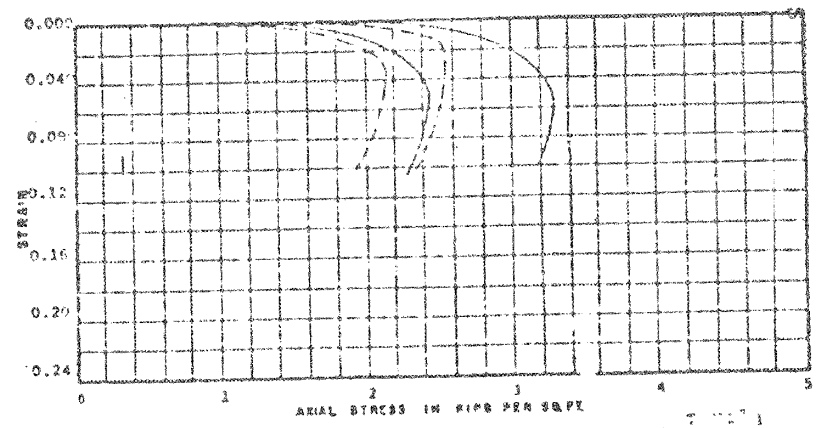
ELEV. OR DEPTH 14'-16' JOB NO. 5A-737

LAW ENGINEERING TESTING CO.

BIRMINGHAM, ALABAMA



MOHR DIAGRAMS – ϕ



STRESS-STRAIN CURVES

Total σ_1
Effective σ_1

SATURATED, CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENTS

"COHESION", C

ANGLE OF SHEAR RESISTANCE, ϕ

UNIT WEIGHT, γ_d 70.3, 75.7 PCF

WATER CONTENT, W 41.7, 41.0 %

VOID RATIO, e 1.11, 1.11

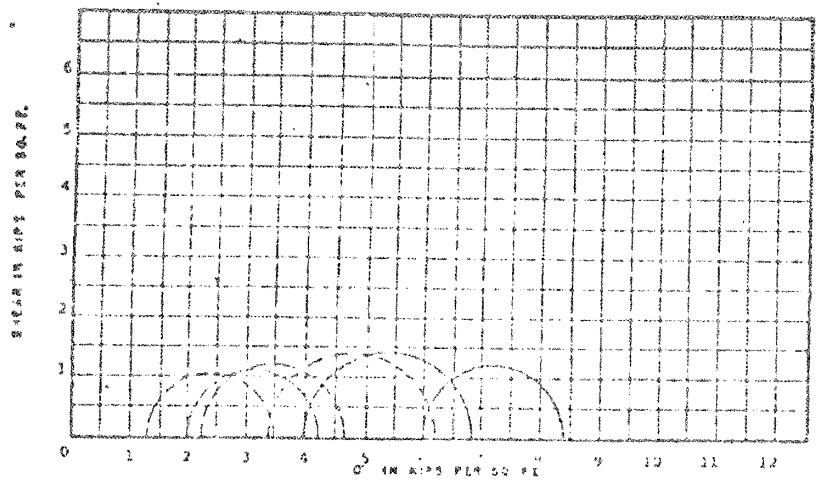
TRIAXIAL SHEAR TEST

BORING NO. AE-2C SAMPLE NO. CD-5

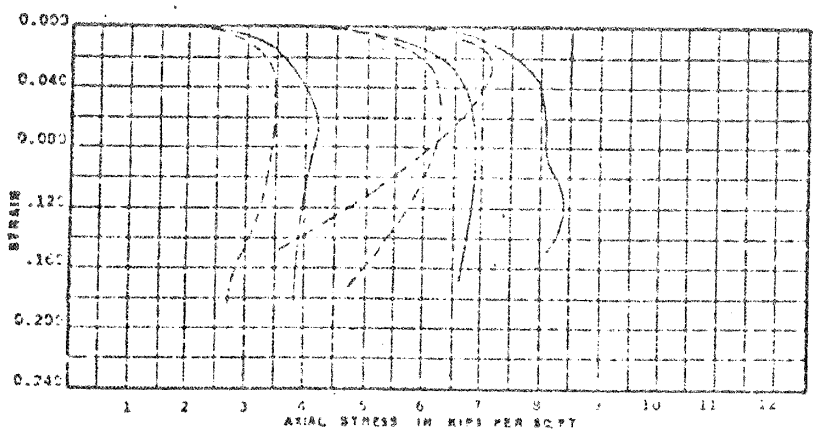
ELEV. OR DEPTH 14'-16' JOB NO.

LAW ENGINEERING TESTING CO.

BIRMINGHAM, ALABAMA



MOHR DIAGRAMS – ϕ



STRESS-STRAIN CURVES

——— TOTAL σ_1
— — — EFFECTIVE σ_1

SATURATED CONSOLIDATED
UNDRAINED WITH PORE
PRESSURE MEASUREMENT

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d 71.9, 63.9, 72.4

WATER CONTENT, w [illegible]

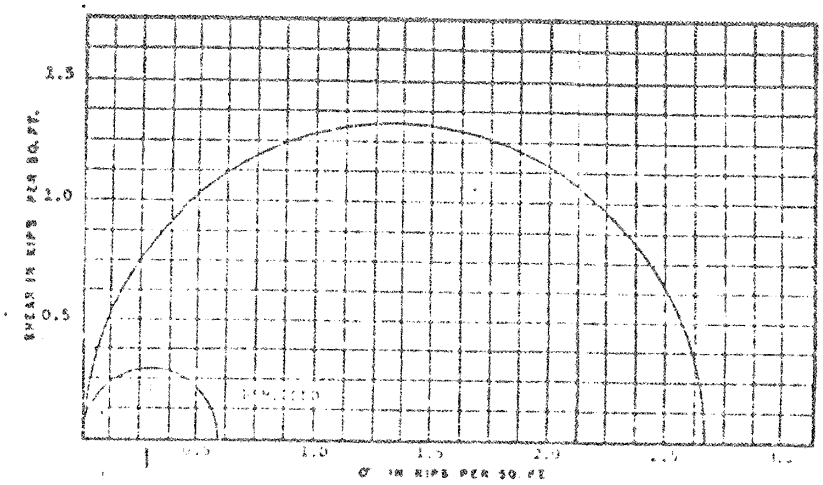
VOID RATIO, e 1.33, 1.63, 1.36

TRIAXIAL SHEAR TEST

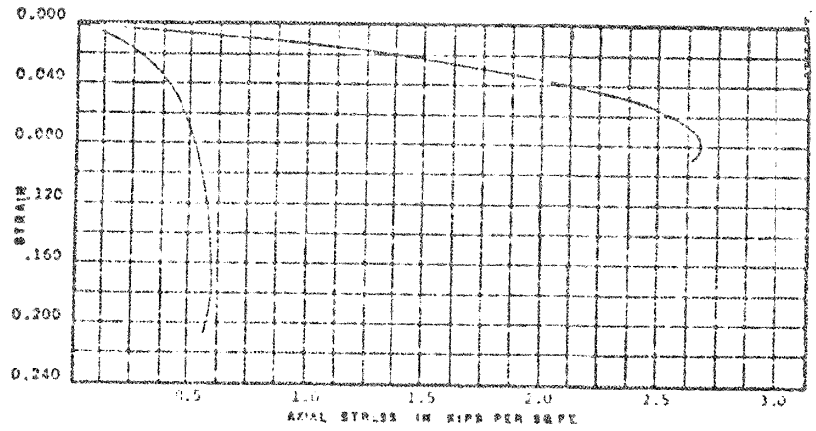
BORING NO. AE-6A SAMPLE NO. T-6

ELEV. OR DEPTH [illegible] JOB NO. SA-237

LAW ENGINEERING TESTING CO.
JACKSONVILLE, FLORIDA



MOHR DIAGRAMS – ϕ



STRESS-STRAIN CURVES

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d 61.3, 63.0 [illegible]

WATER CONTENT, w 6[illegible].7, 5[illegible].3[illegible]

VOID RATIO, e 1.6, 1.5

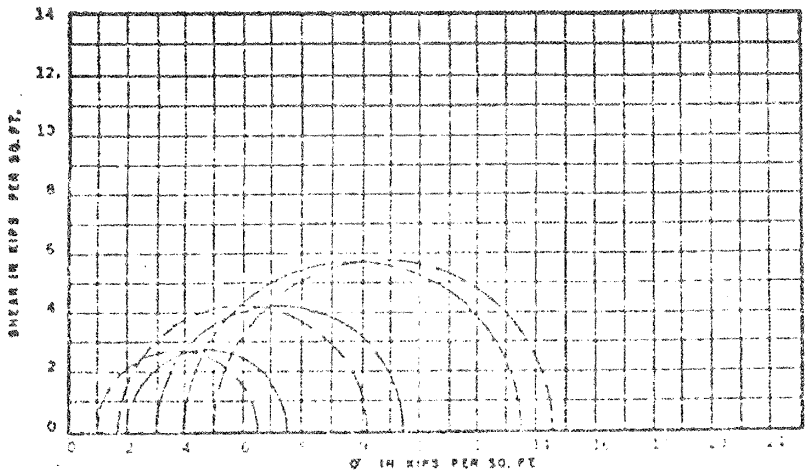
UNCONFINED COMPRESSION

TRIAXIAL SHEAR TEST

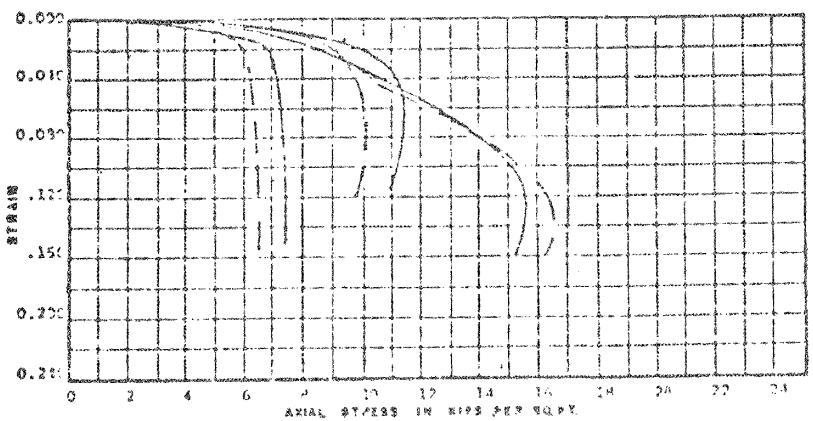
BORING NO. AE-3A SAMPLE NO. T-[illegible]

ELEV. OR DEPTH 39 [illegible] JOB NO. [illegible]

LAW ENGINEERING TESTING CO.
JACKSONVILLE, FLORIDA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

TOTAL σ_1
EFFECTIVE σ_1

"COHESION", C _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d [illegible] PCF

WATER CONTENT, W [illegible]

VOID RATIO, e [illegible]

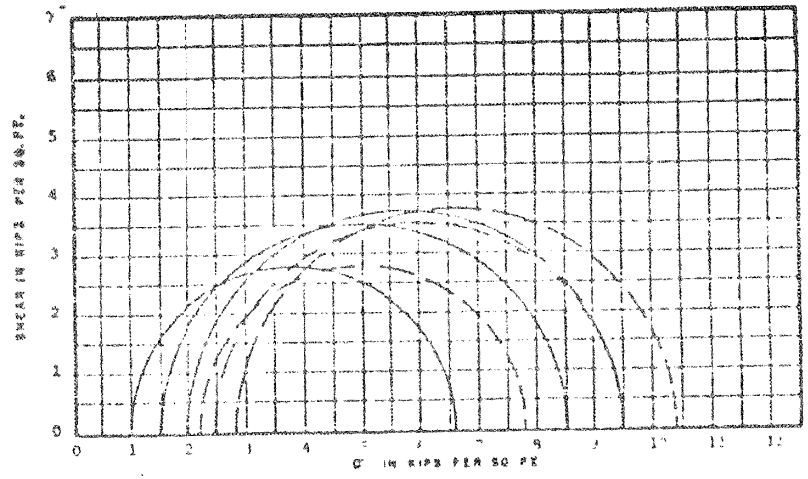
SATURATED, CONSOLIDATION UNDRAINED
WITH PORE PRESSURE MEASUREMENTS

TRIAXIAL SHEAR TEST

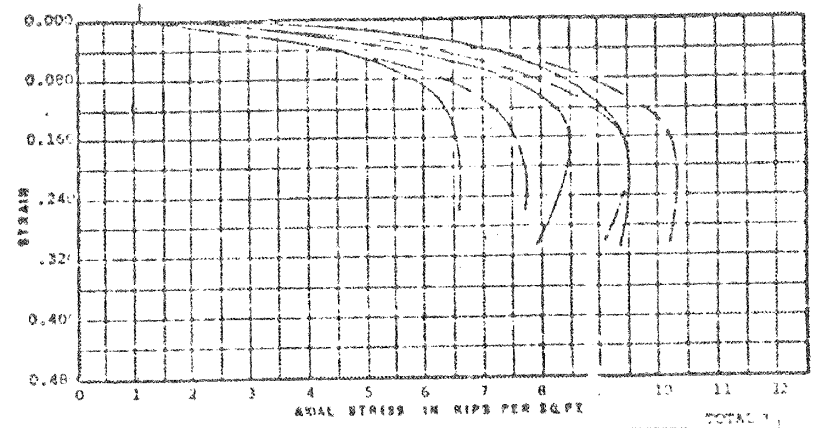
BORING NO. [illegible] SAMPLE NO. [illegible]

ELEV. OR DEPTH [illegible] JOB NO. [illegible]

LAW ENGINEERING TESTING CO.
BIRMINGHAM, ALABAMA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

TOTAL σ_1
EFFECTIVE σ_1

"COHESION", C _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d [illegible] PCF

WATER CONTENT, W [illegible]

VOID RATIO, e [illegible]

SATURATED, CONSOLIDATED UNDRAINED
WITH PORE PRESSURE MEASUREMENTS

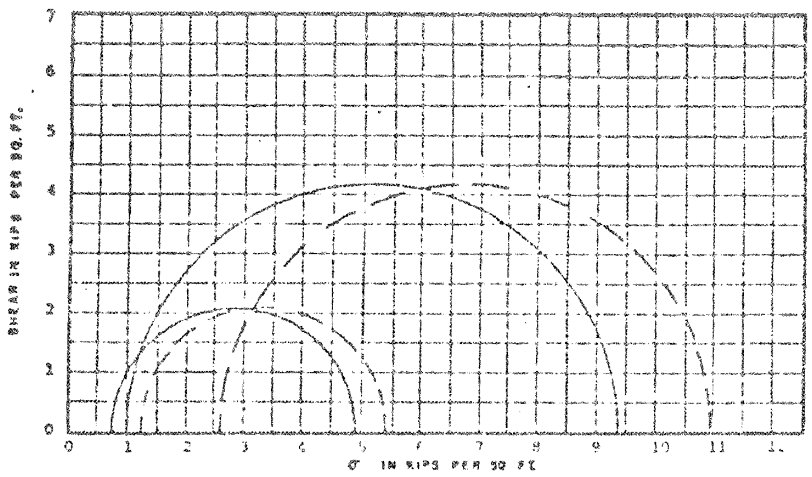
TRIAXIAL SHEAR TEST

BORING NO. [illegible] SAMPLE NO. [illegible]

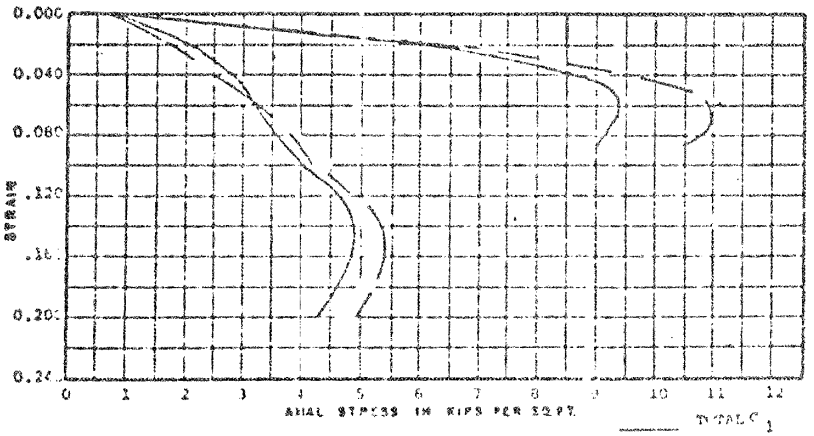
ELEV. OR DEPTH [illegible] JOB NO. [illegible]

LAW ENGINEERING TESTING CO.
BIRMINGHAM, ALABAMA

2.5A-600



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

——— TOTAL σ_1
— — EFFECTIVE σ_1

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d [illegible]

WATER CONTENT, w [illegible]

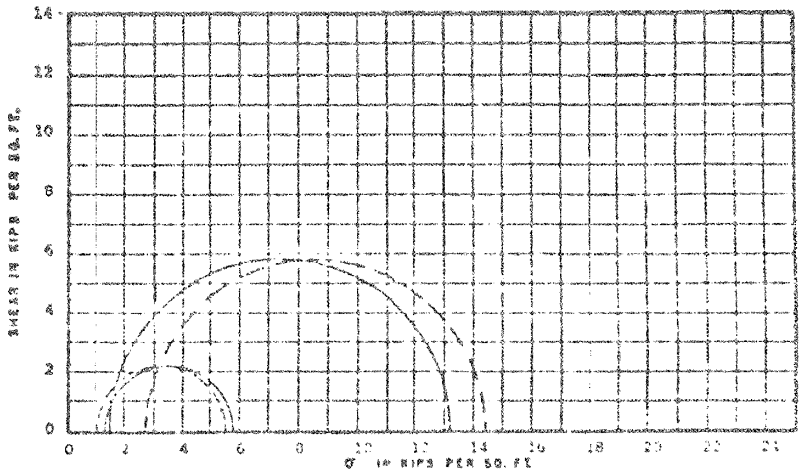
VOID RATIO, e [illegible]

SATURATED, CONSOLIDATED UNDRAINED
WITH POR. PRESSURE MEASUREMENTS

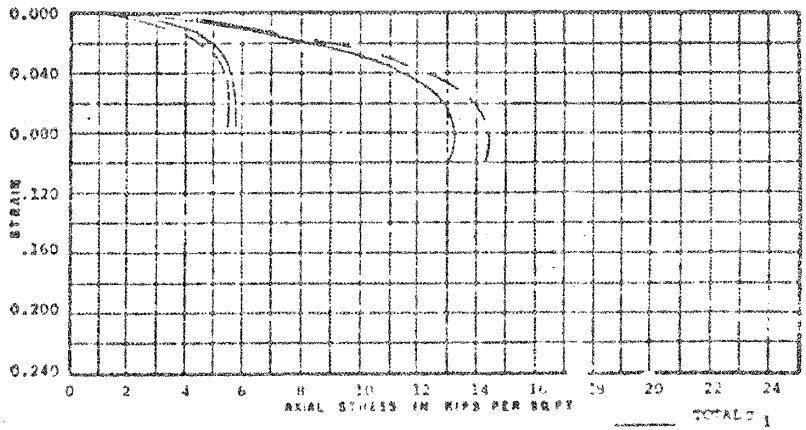
TRIAXIAL SHEAR TEST

BORING NO. AE-50 SAMPLE NO. T-1
ELEV. OR DEPTH [illegible] JOB NO. [illegible]

LAW ENGINEERING TESTING CO.
BIRMINGHAM, ALABAMA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

——— TOTAL σ_1
— — EFFECTIVE σ_1

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d 85.7, 82.8, [illegible]

WATER CONTENT, w [illegible]

VOID RATIO, e 0.[illegible], 1.[illegible]

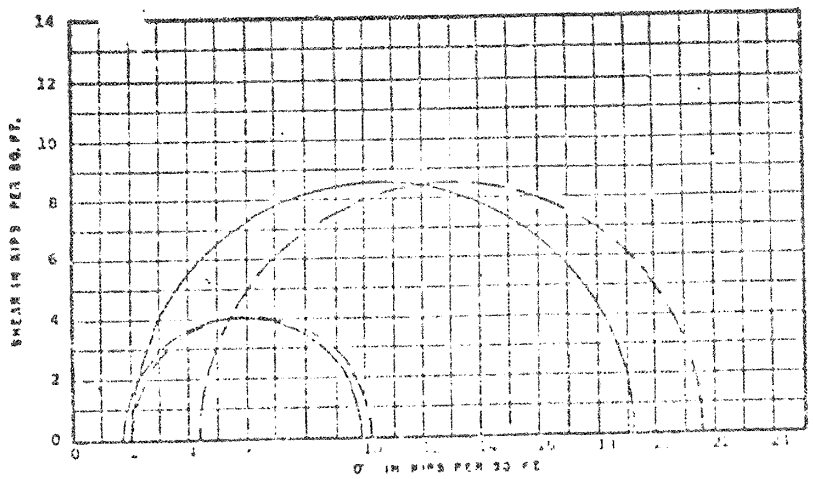
SATURATED, CONSOLIDATED UNDRAINED
WITH POR. PRESSURE MEASUREMENTS

TRIAXIAL SHEAR TEST

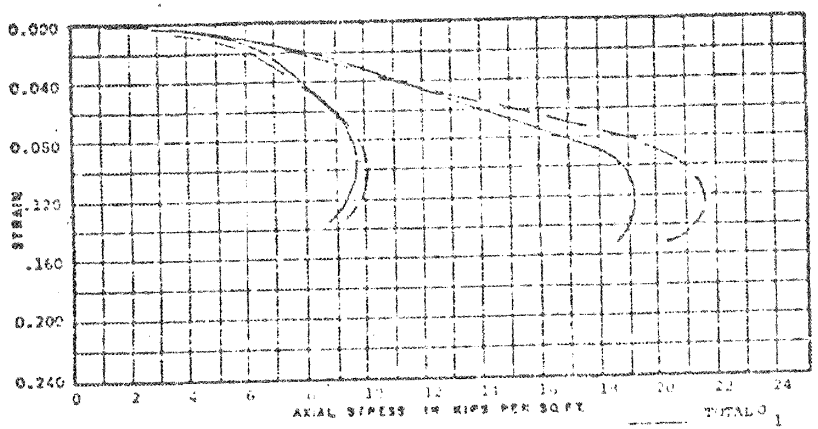
BORING NO. AE-48 SAMPLE NO. T-2
ELEV. OR DEPTH [illegible] JOB NO. [illegible]

LAW ENGINEERING TESTING CO.
BIRMINGHAM, ALABAMA

2.5A-601



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES — TOTAL σ_1 — — EFFECTIVE σ_1

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d [illegible]

WATER CONTENT, w [illegible]

VOID RATIO, e 1.03, 0.94

SATURATED, CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENTS

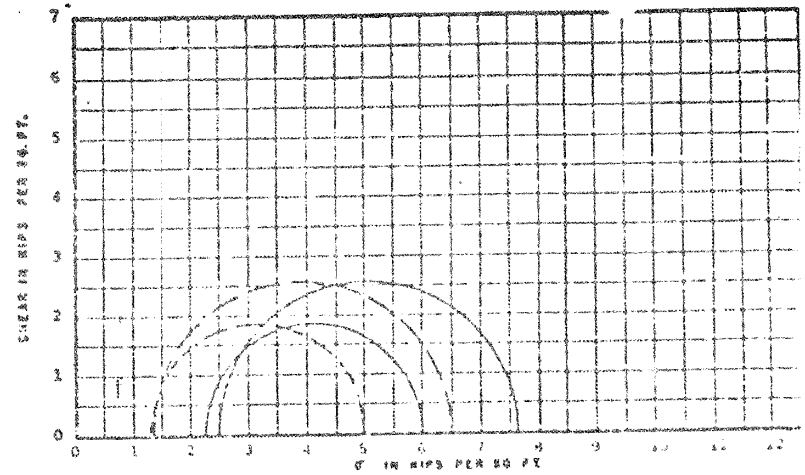
TRIAXIAL SHEAR TEST

BORING NO [illegible] SAMPLE NO [illegible]

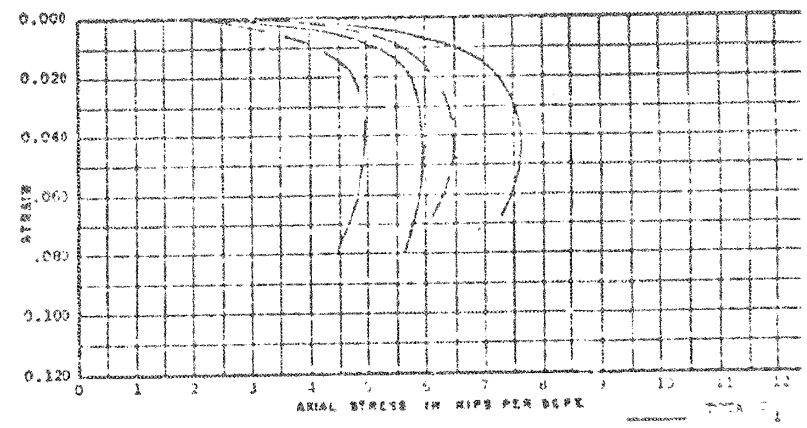
ELEV. OR DEPTH 14.0-16.0 JOB NO. [illegible]

LAW ENGINEERING TESTING CO.

BIRMINGHAM, ALABAMA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES — TOTAL σ_1 — — EFFECTIVE

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d [illegible]

WATER CONTENT, w 37.3, 37.03

VOID RATIO, e 1.05, 1.03

SATURATED, CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENTS

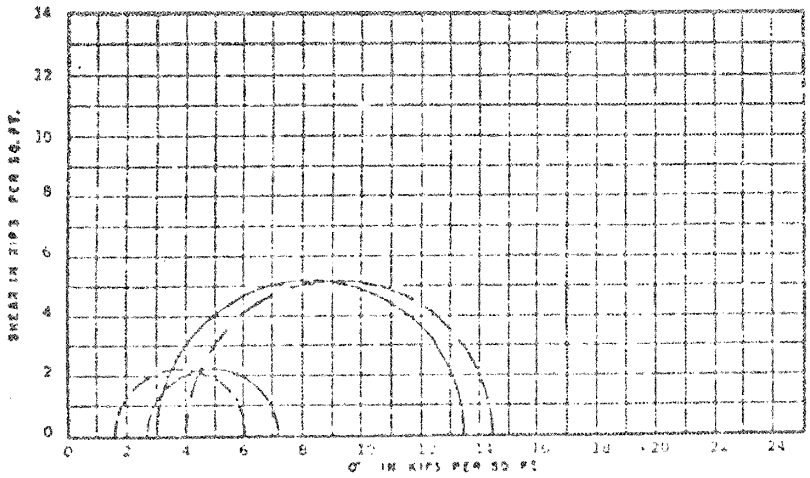
TRIAXIAL SHEAR TEST

BORING NO [illegible] SAMPLE NO [illegible]

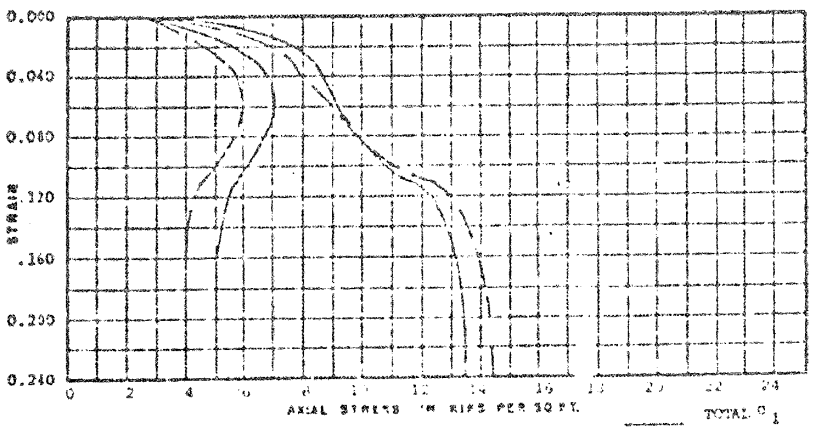
ELEV. OR DEPTH 16 [illegible] JOB NO [illegible]

LAW ENGINEERING TESTING CO.

BIRMINGHAM, ALABAMA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d 80.9, 87.8 PCF

WATER CONTENT, w 29.5, 29.04

VOID RATIO, e 1.05, 1.11

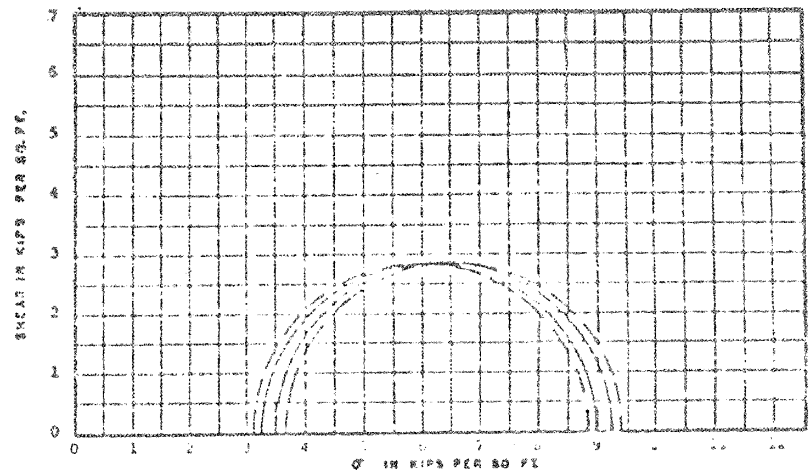
SATURATED, CONSOLIDATED UNDRAINED
WITH PORE PRESSURE MEASUREMENTS

TRIAXIAL SHEAR TEST

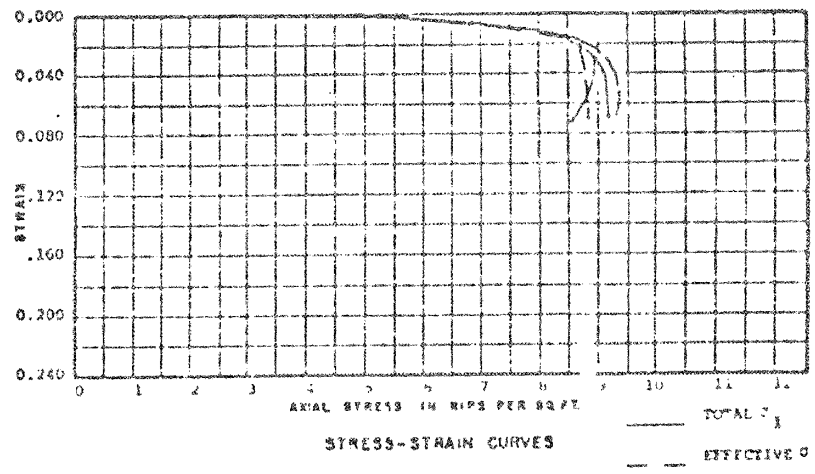
BORING NO AE-58 SAMPLE NO 7-5

ELEV. OR DEPTH 28.0 - 30.0 JOB NO. 15-717

LAW ENG. TESTING CO.
BIRMINGHAM, ALABAMA



MOHR DIAGRAMS — ϕ



STRESS-STRAIN CURVES

"COHESION", c _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d 74.9, 77.4 PCF

WATER CONTENT, w 35.1, 29.74

VOID RATIO, e 1.24, 1.13

SATURATED, CONSOLIDATED UNDRAINED
WITH PORE PRESSURE MEASUREMENTS

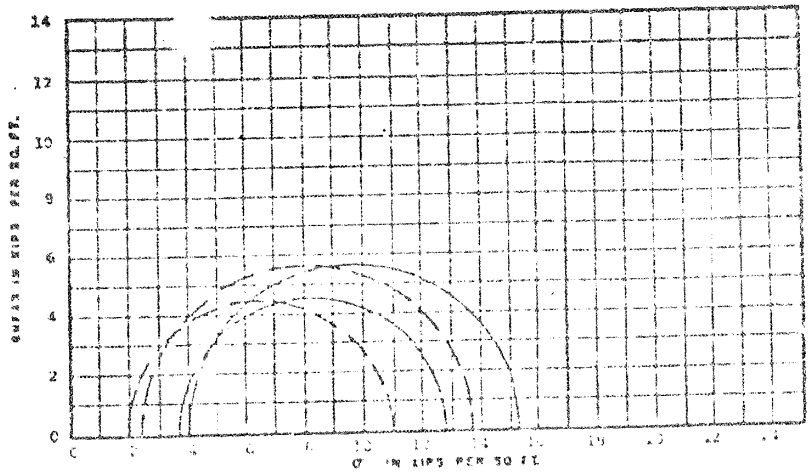
TRIAXIAL SHEAR TEST

BORING NO AE-58 SAMPLE NO 7-6

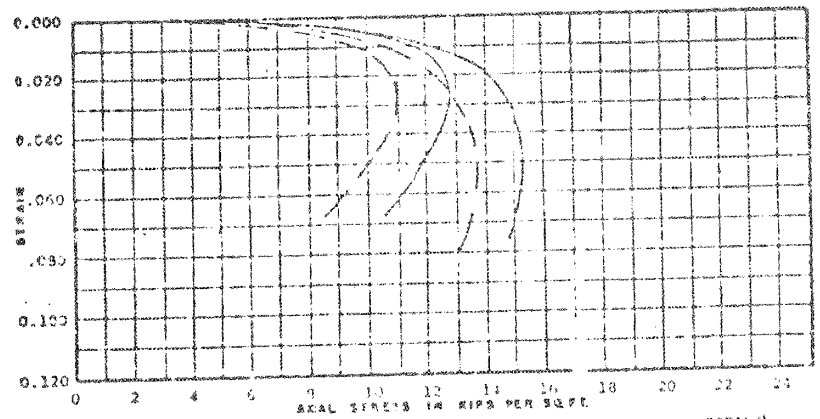
ELEV. OR DEPTH 30.0 - 32.0 JOB NO. 15-717

LAW ENG. TESTING CO.
BIRMINGHAM, ALABAMA

2.5A-603



MOHR DIAGRAMS – ϕ



STRESS-STRAIN CURVES

——— TOTAL σ_1

— — EFFECTIVE σ_1

"COHESION", C _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d 87.5, 93.0 PCF

WATER CONTENT, W 19.4, 24.5%

VOID RATIO, e 0.61, 0.82

SATURATED, CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENTS

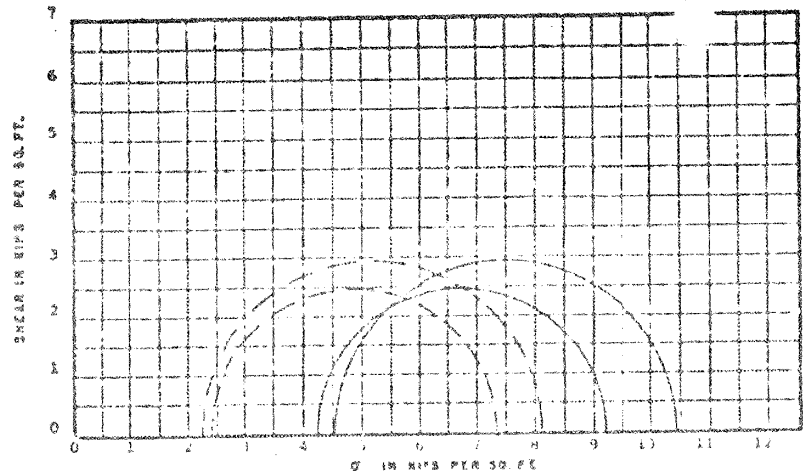
TRIAXIAL SHEAR TEST

BORING NO. AE-5B SAMPLE NO. T-2

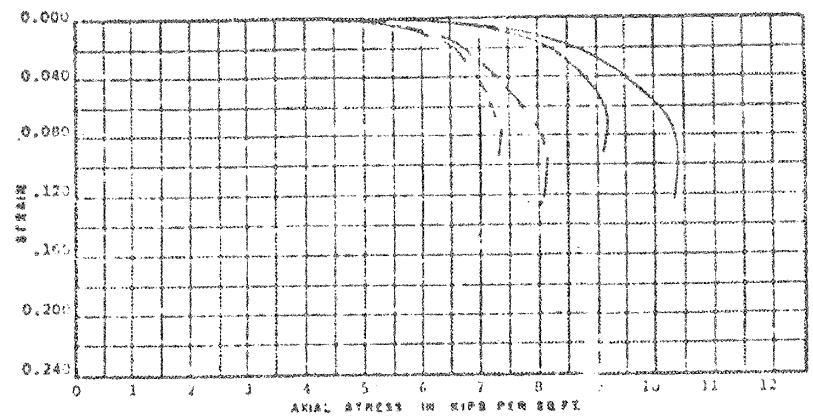
ELEV. OR DEPTH 27.0-31.0 JOB NO. [illegible]

LAW ENGINEERING TESTING CO.

BIRMINGHAM, ALABAMA



MOHR DIAGRAMS – ϕ



STRESS-STRAIN CURVES

——— TOTAL σ_1

— — EFFECTIVE σ_1

"COHESION", C _____

ANGLE OF SHEAR RESISTANCE, ϕ _____

UNIT WEIGHT, γ_d [illegible] PCF

WATER CONTENT, W [illegible]

VOID RATIO, e 0.59, 0.69

SATURATED, CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENTS

TRIAXIAL SHEAR TEST

BORING NO. [illegible] SAMPLE NO. [illegible]

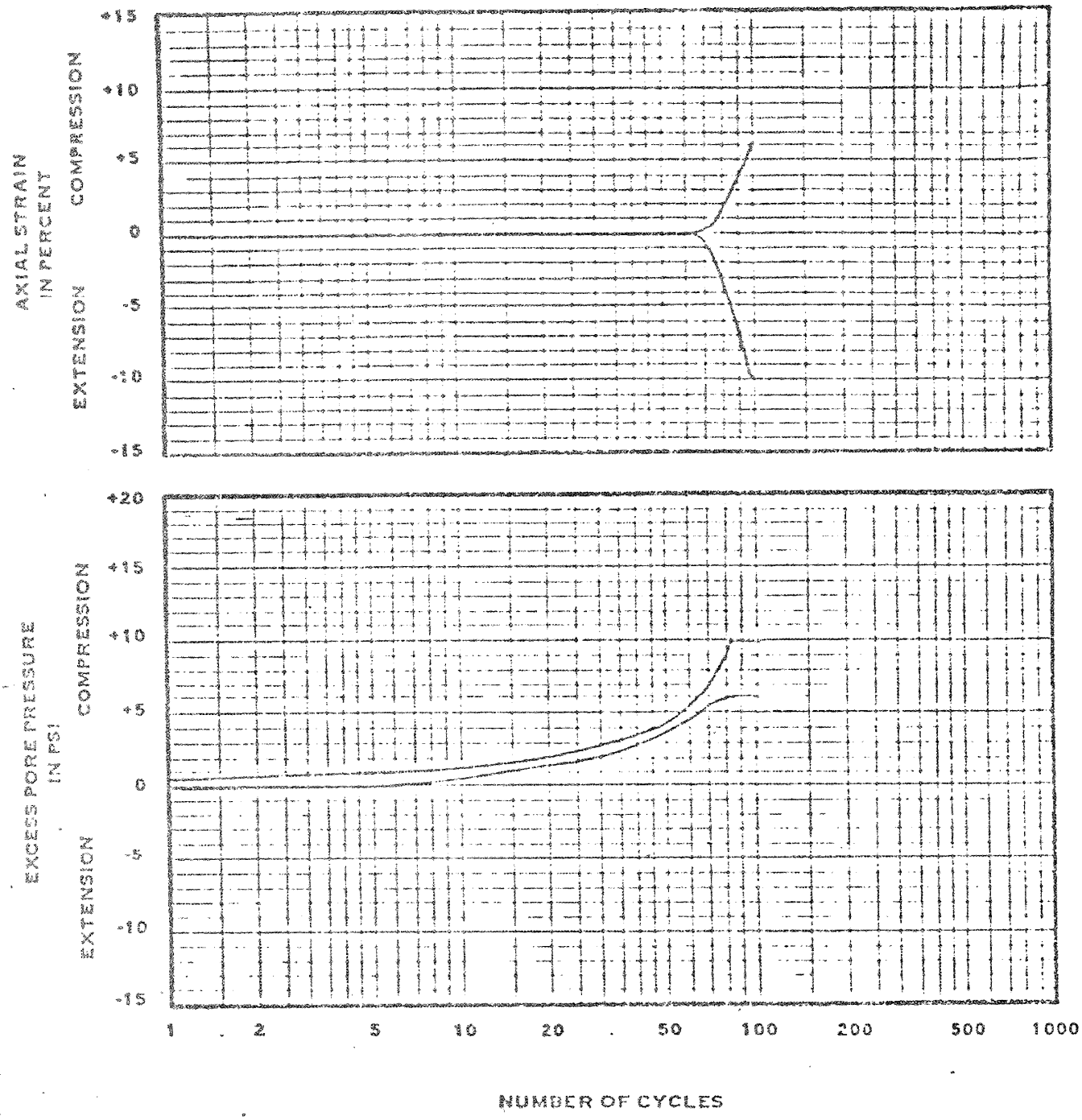
ELEV. OR DEPTH [illegible] JOB NO. [illegible]

LAW ENGINEERING TESTING CO.

BIRMINGHAM, ALABAMA

NO ORIGINAL

2.5A-604



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE _____ PSI

CYCLIC DEVIATOR STRESS 1078 PSF. 'B' VALUE _____

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	75
5	80
10	88
15	96

*DOUBLE AMPLITUDE STRAIN

2.5A-605

CYCLIC TRIAXIAL TEST NO. 1

PROJECT: ST. LUCIE PLANT SA-737

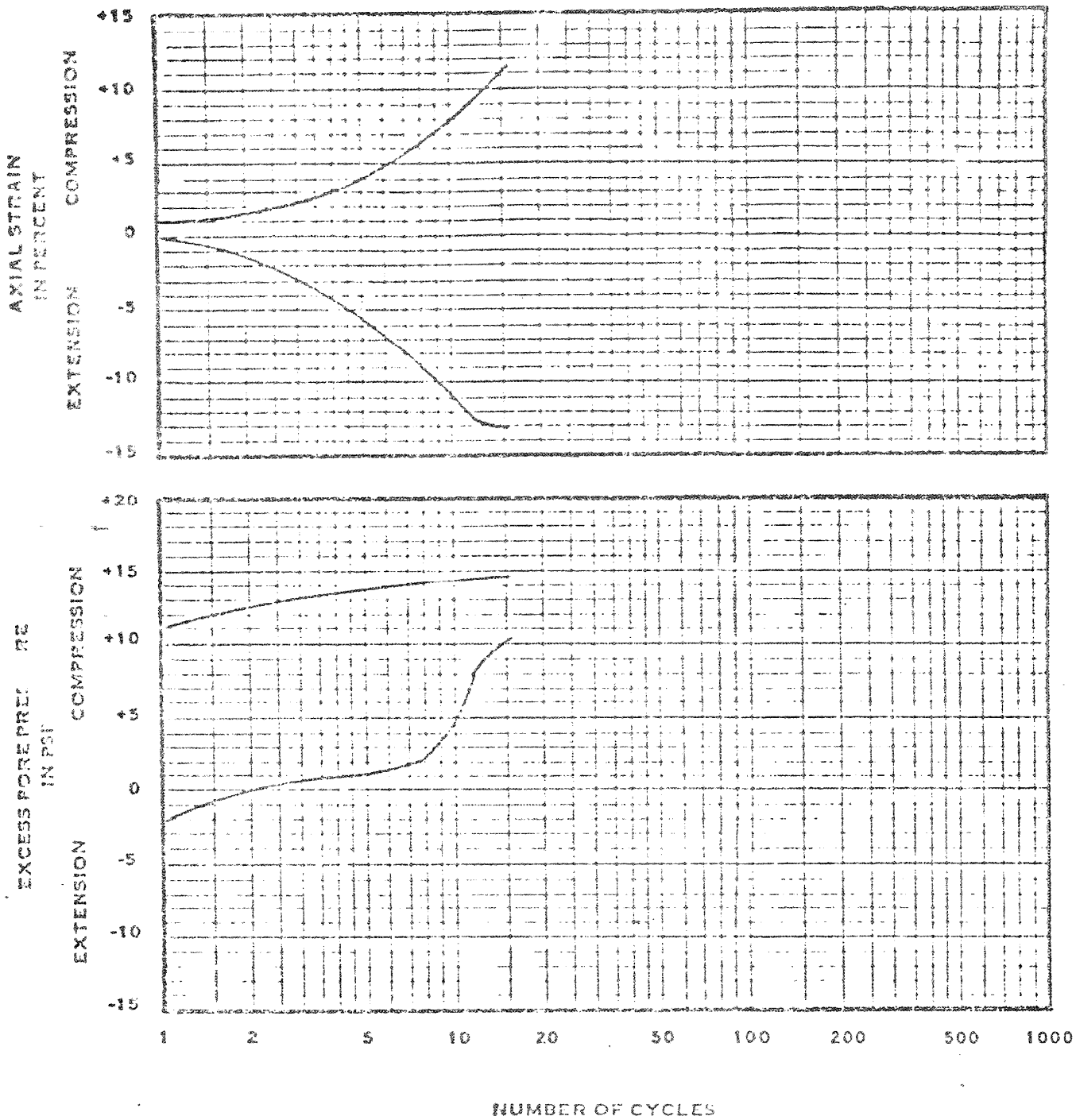
BORING NO. AE-27A SAMPLE NO. T-2 A

DEPTH 12-14 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN CHALLY SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 60 PSI

CYCLIC DEVIATOR STRESS 1548 PSF "B" VALUE .99

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	2
5	3
10	5
15	8

*DOUBLE AMPLITUDE STRAIN

2.5A-606

CYCLIC TRIAXIAL TEST NO. 2

PROJECT. ST. LUCIE PLANT SA-737

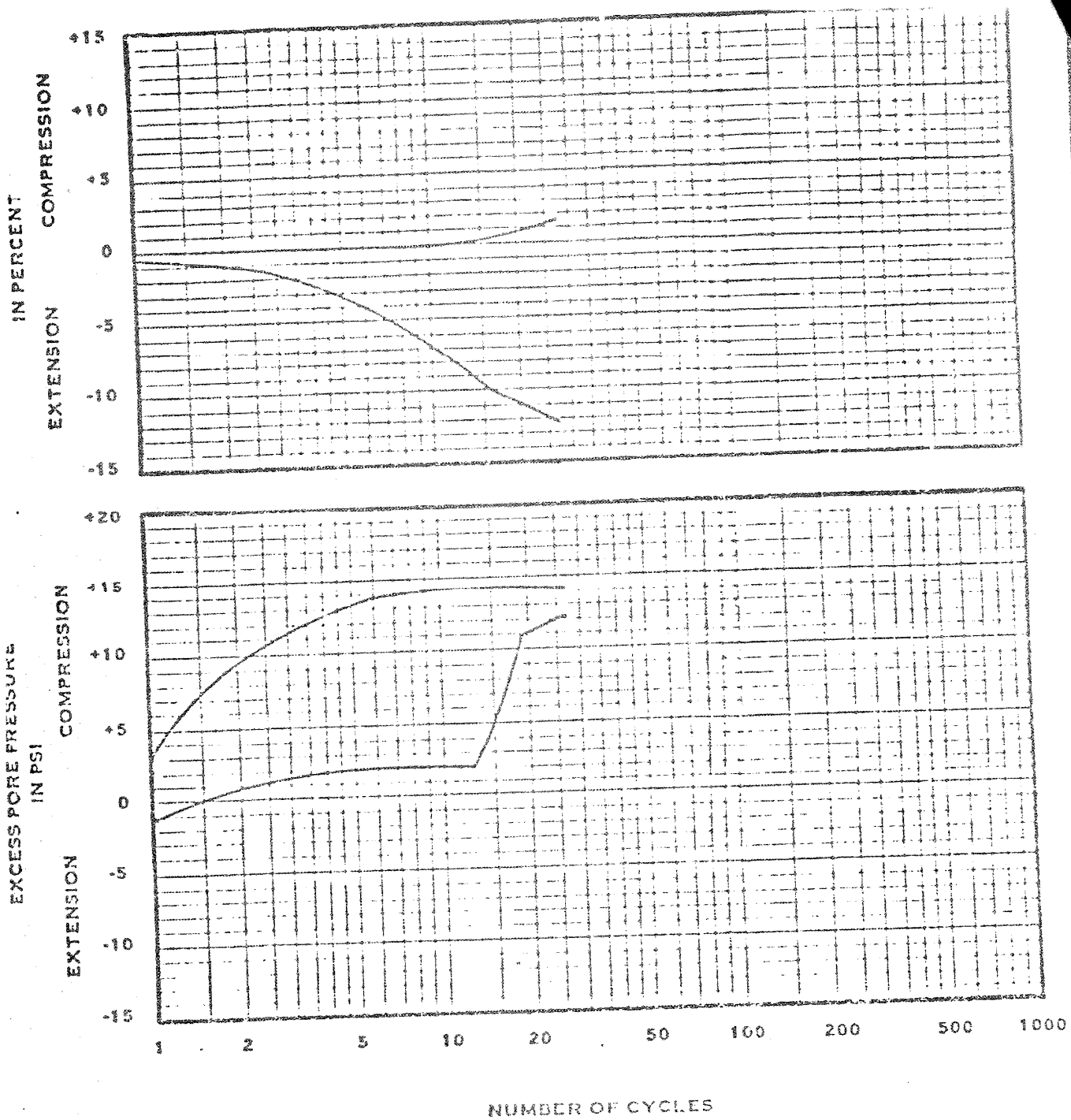
BORING NO. AE-27A SAMPLE NO. T-2 B

DEPTH 12-14 FT.

BORING LOCATION. UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN SHELLY SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 60 PSI

CYCLIC DEVIATOR STRESS 1520 PSF "B" VALUE .95

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	4
5	7
10	16
15	—

*DOUBLE AMPLITUDE STRAIN

2.5A-607

CYCLIC TRIAXIAL TEST NO. 3

PROJECT: ST. LUCIE PLANT SA-737

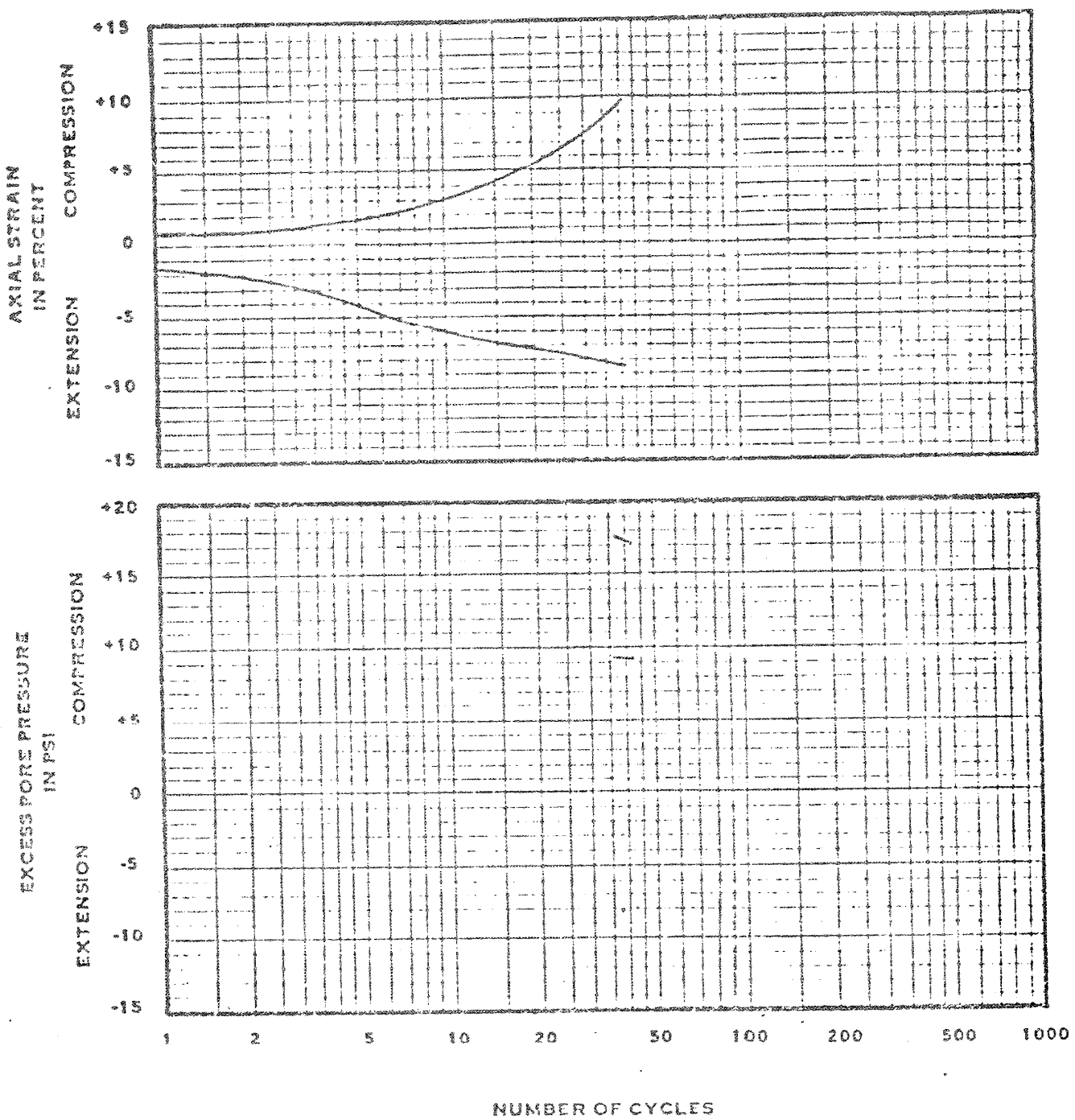
BORING NO. AE-27A SAMPLE NO. T-8 A

DEPTH 20-22 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN SHELLY SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 60 PSI

CYCLIC DEVIATOR STRESS 1.248 PSI. "B" VALUE .99

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	1
5	4
10	12
15	28

*DOUBLE AMPLITUDE STRAIN

2.5A-608

CYCLIC TRIAXIAL TEST NO. 4

PROJECT: ST. LUCIE PLANT SA-737

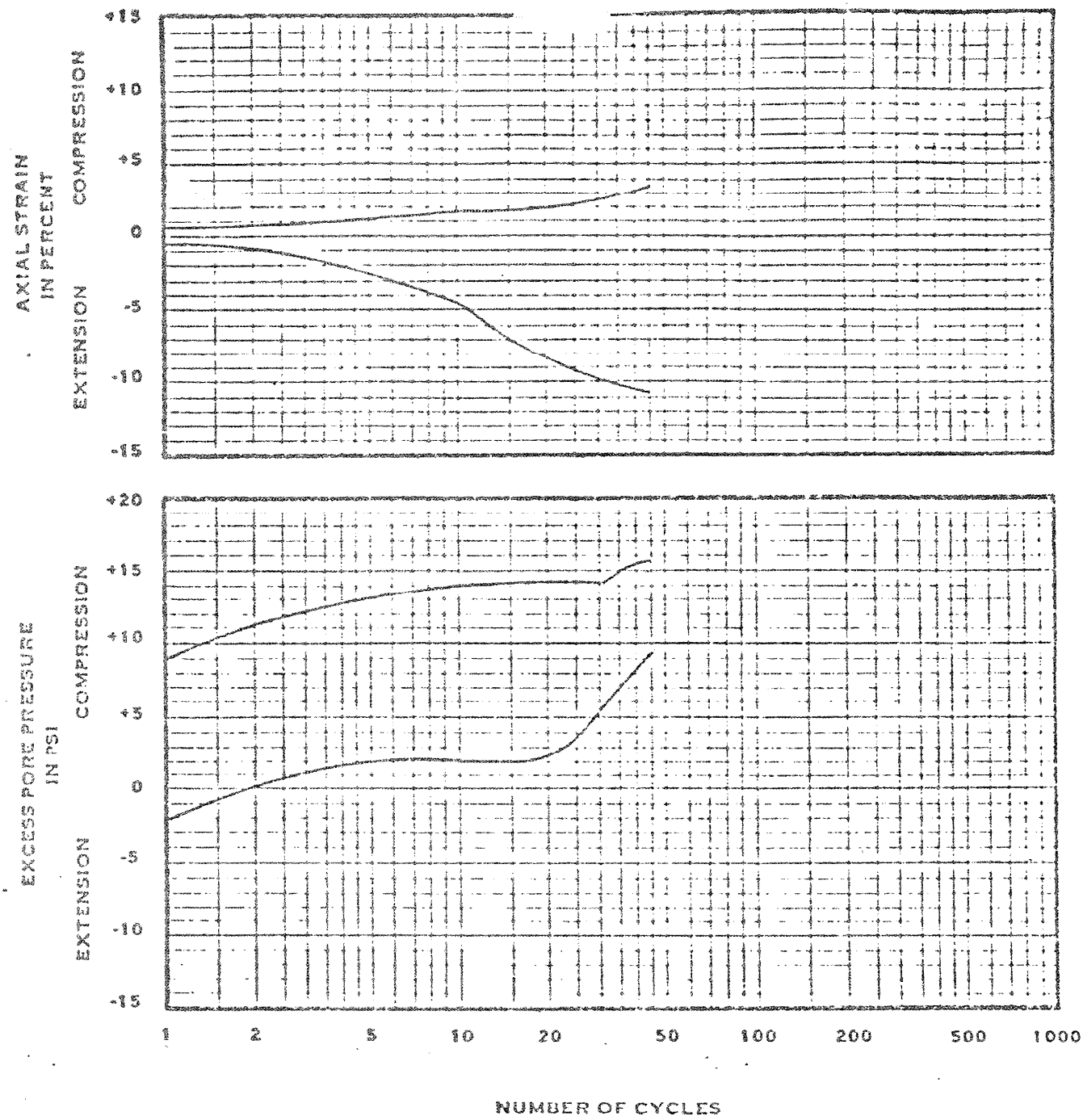
BORING NO. AE-27A SAMPLE NO. T-11A

DEPTH 24-26 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.8 PSI. BACK PRESSURE 65 PSI
CYCLIC DEVIATOR STRESS 1714 PSF. "B" VALUE .99

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	3
5	8
10	18
15	—

*DOUBLE AMPLITUDE STRAIN

CYCLIC TRIAXIAL TEST NO. 5

PROJECT: ST. LUCIE PLANT SA-737

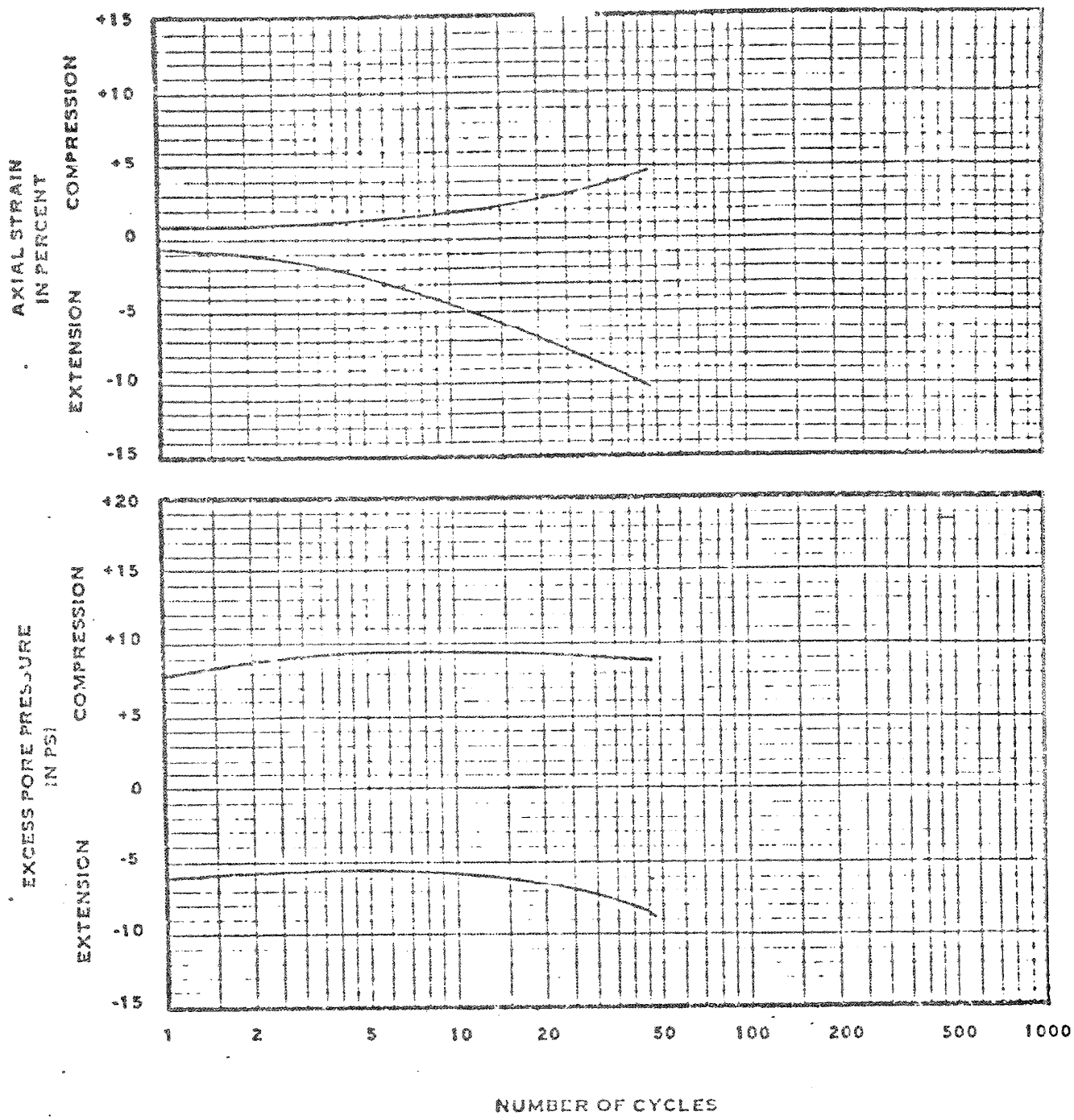
BORING NO. AE 27A SAMPLE NO. T-09

DEPTH 20-22 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA GEORGIA



REMARKS: SPECIFIC GRAVITY = 1.76

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 40 PSI

CYCLIC DEVIATOR STRESS 2086 PSF. "B" VALUE 98

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	2
5	7
10	20
15	--

*DOUBLE AMPLITUDE STRAIN

2.5A-610

CYCLIC TRIAXIAL TEST NO. 6

PROJECT. ST. LUCIE PLANT SA-737

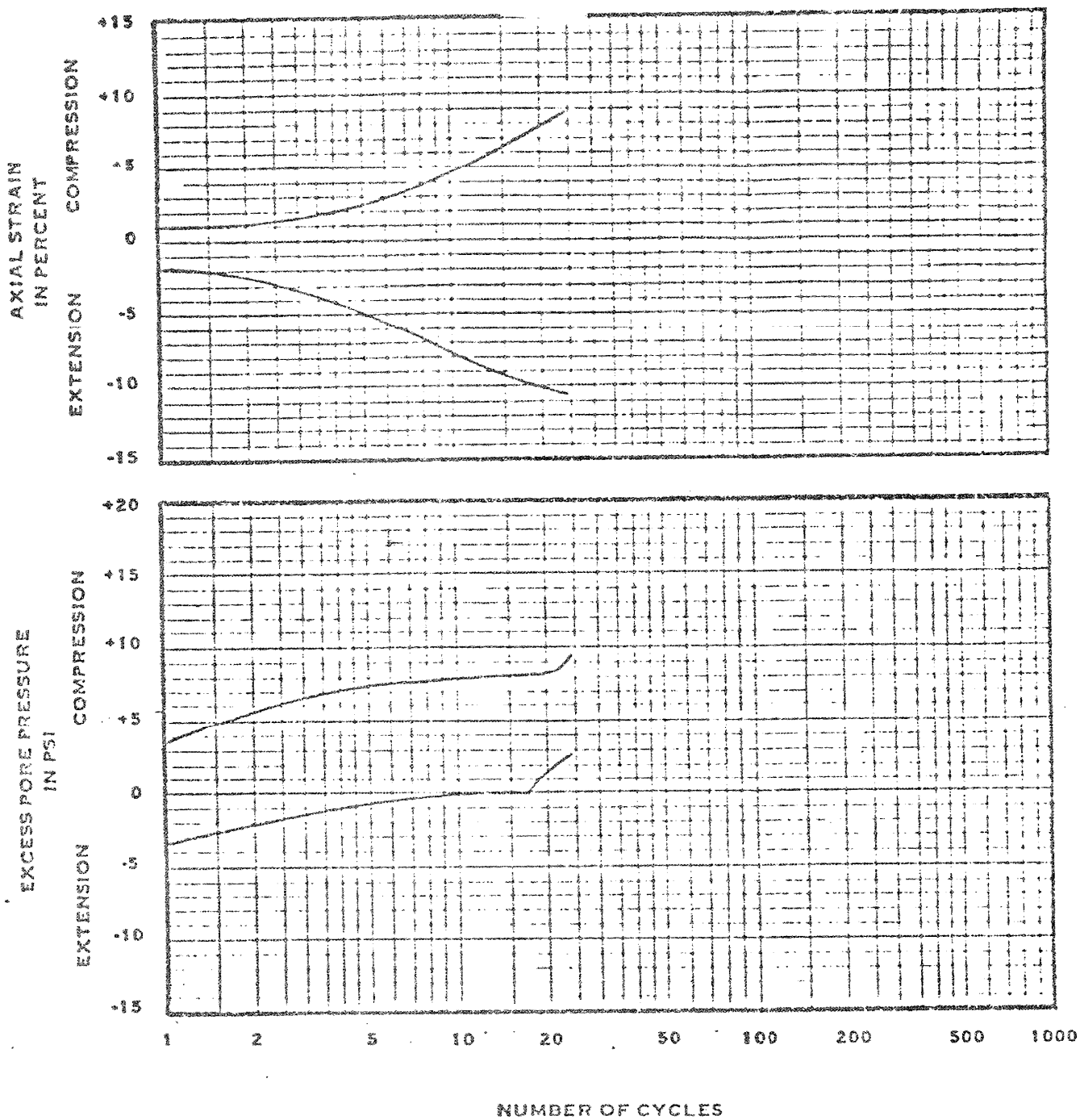
BORING NO. AE-27B SAMPLE NO. T-5A

DEPTH 19-21 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 40 PSI

CYCLIC DEVIATOR STRESS 1273 PSF "B" VALUE .98

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	1
5	3
10	8
15	14

*DOUBLE AMPLITUDE STRAIN

2.5A-611

CYCLIC TRIAXIAL TEST NO. 7

PROJECT: ST. LUCIE PLANT SA-737

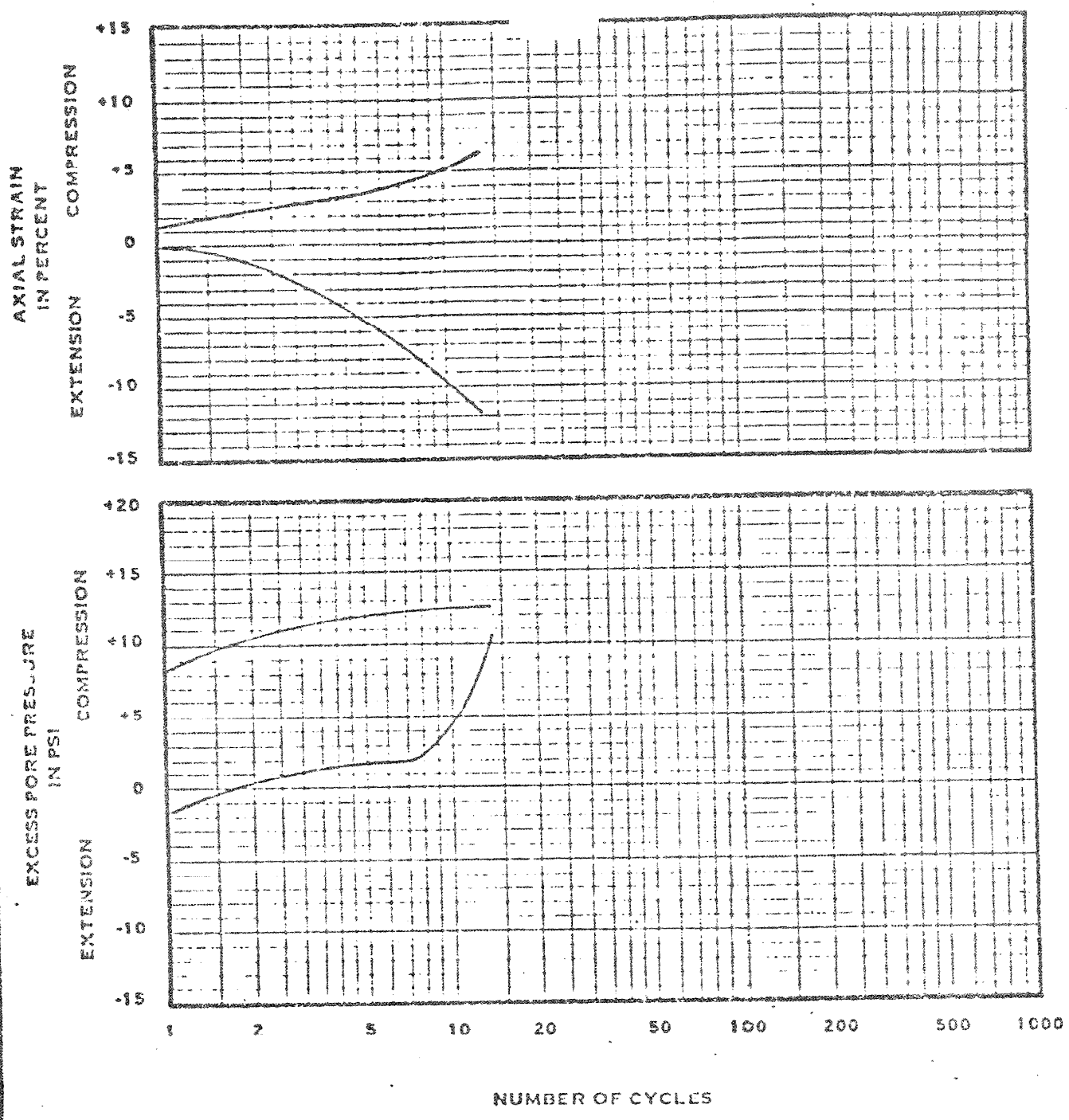
BORING NO. AE-27B SAMPLE NO. T-7

DEPTH 23-25 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: TAN SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA



REMARKS: SPECIFIC GRAVITY = 2.60

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 60 PSI

CYCLIC DEVIATOR STRESS 1133 PSF. "B" VALUE 98

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	1
5	3
10	6
15	10

*DOUBLE AMPLITUDE STRAIN

2.5A-612

CYCLIC TRIAXIAL TEST NO. 8

PROJECT: ST. LUCIE PLANT SA-737

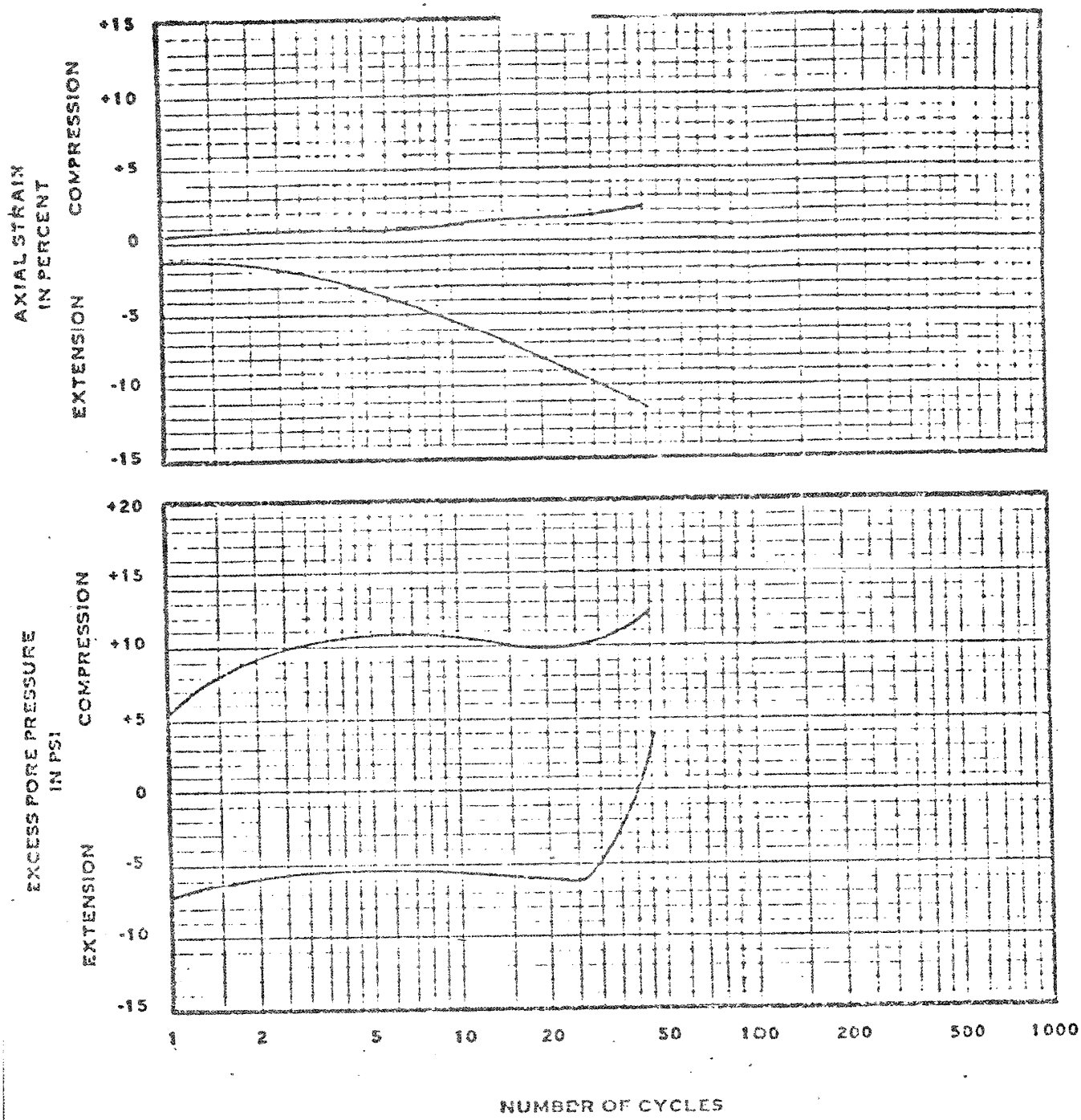
BORING NO. AE-28 SAMPLE NO. UD-3

DEPTH 14.5-15.5 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: LIGHT GREY SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA



REMARKS. SPECIFIC GRAVITY = 2.71

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 30 PSI

CYCLIC DEVIATOR STRESS 5.15 PSI. "B" VALUE .97

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	2
5	7
10	22
15	—

*DOUBLE AMPLITUDE STRAIN

CYCLIC TRIAXIAL TEST NO. 9

PROJECT: ST. LUCIE PLANT SA-737

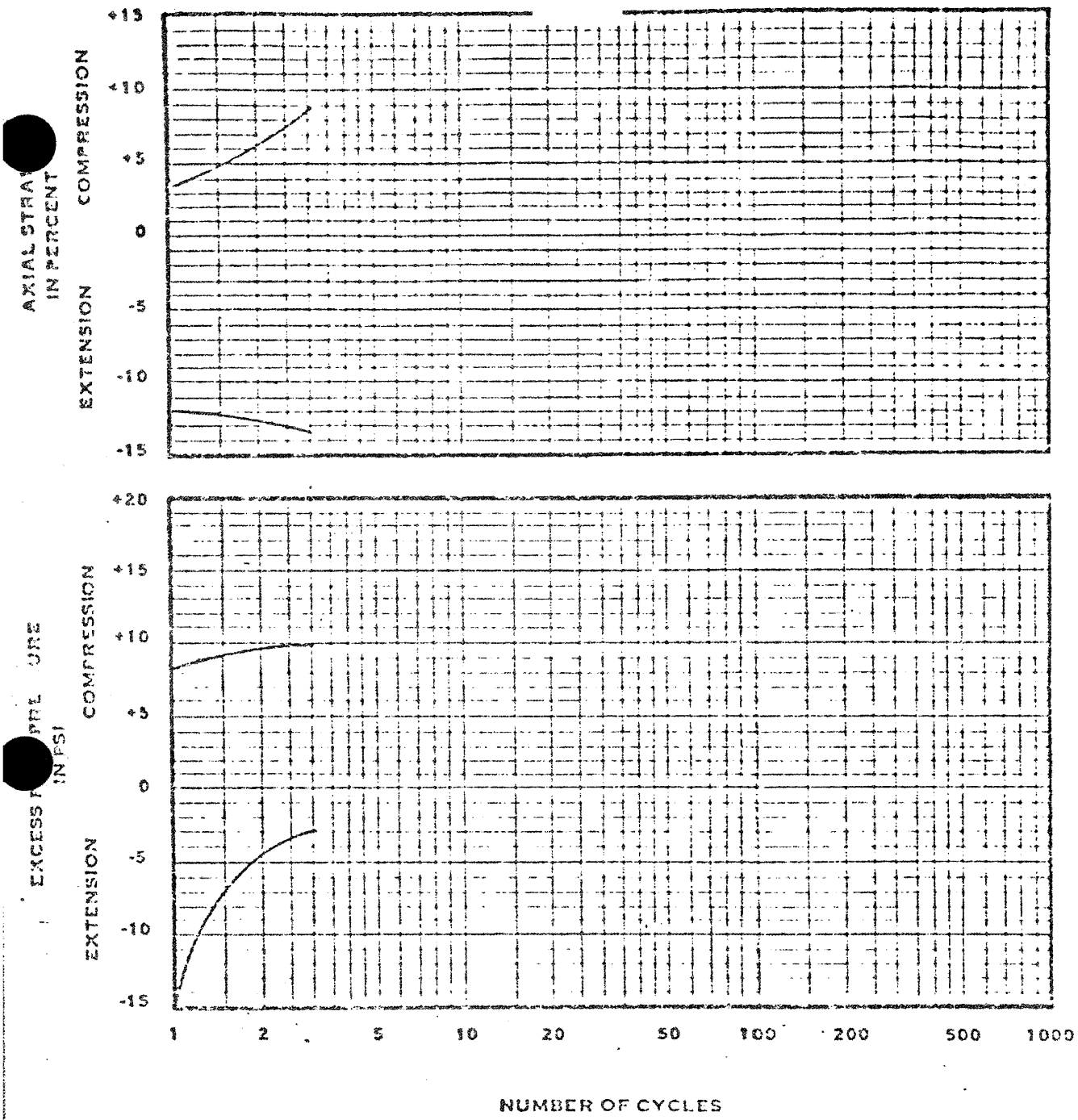
BORING NO. 7-2C SAMPLE NO. UD-1

DEPTH 9.5-11.5 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: LIGHT GREY SHELLY SILTY FINE SAND

LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA



REMARKS: SPECIFIC GRAVITY = 2.73

CONFINING PRESSURE 17.4 PSI. BACK PRESSURE 61 PSI

CYCLIC DEVIATOR STRESS 22.5 PSI. "B" VALUE .88

AXIAL STRAIN* (%)	NUMBER OF CYCLES
2	
5	
10	
15	

*DOUBLE AMPLITUDE STRAIN

2.5A-614

CYCLIC TRIAXIAL TEST NO. 10

PROJECT: ST. LUCIE PLANT SA-737

BORING NO. A-22C SAMPLE NO. T-8

DEPTH 24-26 FT.

BORING LOCATION: UNIT 1 INTAKE

SAMPLE DESCRIPTION: LIGHT TAN SILTY FINE SAND

LAWRENCE ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA

APPENDIX 2.5B

FLORIDA EARTHQUAKE OF OCTOBER 27, 1973

FLORIDA EARTHQUAKE OF OCTOBER 27, 1973

INTRODUCTION

On October 27, 1973, at 2:21 A.M., E.S.T., about 9,000 square miles of central and eastern Florida experienced an earthquake. The epicenter of this earthquake is estimated to have been between Titusville and Geneva, Florida. Approximately 4,000 square miles was subjected to an intensity of V MM to V/VIMM. No historical earthquake epicenters have been recorded within about 75 miles of this epicenter.

LOCATION

The National Earthquake Information Center (NEIC) (U.S. Geological Survey) lists the earthquake epicenter at 28.7° N, 81.0° W (the edge of Lake Puzzle on the Volusia-Seminole County boundary.) The location was estimated based on responses to questionnaires submitted to postmasters of cities and towns within a 100 mile radius of the epicentral area. Data from seismic recording stations were insufficient to permit a more exact location of the epicenter.

The listed NEIC epicenter is located near the northern edge of the region of higher intensity. Based on our independent study of intensity responses, the earthquake epicenter could possibly be moved to the south, along the St. Johns River Valley.

Law Engineering learned of the earthquake on the morning of October 27, 1973. A portable, smoke-paper micro-earthquake recorder was installed on property in the boundary of Brevard, Orange, and Osceola Counties by 10:00 p.m. that same date. The recorder was maintained in operation for a period of one week. During this period no identifiable aftershocks were recorded.

MAGNITUDE

The National Earthquake Information Center lists the earthquake as having a magnitude of about 3. Based on preliminary analyses of records from the Atlanta Seismic Station, the earthquake magnitude was estimated as 3.9 ± 0.2.

MICROSEISMIC DATA

Intensity data was collected by Law Engineering from several sources. Most data was obtained by distribution of a modification of the standard questionnaire as presented in Richter (1958). Sources of data include:

1) Responses (260) to questionnaires distributed to employees of Florida Power and Light Company and Florida Power Corporation in central and eastern Florida.

2) Responses (126) to the questionnaire published in the CocoaToday on October 19, 1973.

3) Responses (150) to the CocoaToday questionnaire collected as a class assignment by physics students at Melbourne High School.

4) Responses collected by Dr. G.A. Bollinger, Virginia Polytechnic Institute, from postcard questionnaires distributed to 36 postmasters in Florida and ten letters in response to an article in the LakelandLedger.

Attached to this appendix is a tabulation of all usable responses by location and intensity.

Figure 1 is an Intensity map of the October 27, 1973 earthquake. All sources noted above were used in compiling this map. The boundary between the area not felt and the area felt is approximate. The earthquake occurred at a time period when most responders to the questionnaire were asleep. It is difficult to determine in some cases if the not felt responses were due to low magnitude intensity which did not awake sleepers or, if the intensity of the quake at these locations was minor and not felt by persons awake at that time. The boundary between intensity less than V MM and intensity V MM and greater is more definitive since V MM is severe enough to waken most sleepers.

Twelve persons were interviewed where their questionnaire responses indicated an intensity of V MM or greater. The interviews and observations of earthquake effects at those locations substantiated the general validity of the questionnaire responses.

In the higher intensity region (V MM and greater) many people were awakened and a number frightened by the tremor. Small objects were displaced or upset. Hanging objects moved or in some cases fell to the floor. Some pendulum clocks stopped. There were scattered reports of cracks forming or being extended in weak masonry or glass. In inspections made by Law Engineering of several of these reports, the new cracks often occurred along construction joints or previously patched masonry cracks.

Persons responding to questionnaires and/or interviewed who had previously experienced earthquake shocks at other locations almost unanimously agreed that they "knew" immediately that they had felt an earthquake. Some reported a "rolling" sensation similar to that they had previously experienced in earlier earthquakes. Many others accustomed to the sounds and vibrations associated with rocket launches from Cape Canaveral, assumed that an unannounced launch had occurred, and perhaps the launch vehicle had exploded.

APPENDIX 2.5B: REFERENCES

Applin, P.L.
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Table 2.5B-1

QUESTIONNAIRE RESPONSE

LOCATION	NUMBER OF RESPONSES	INTENSITY (MM) IV/V	<V	V	V/VI	VI
Apopka	1		1			
Christmas	1					1
Cocoa – Rockledge	54	25	18	11		
Daytona Beach – Ormond Beach	12		12			
DeLand	28		28			
DeLeon Springs	1		1			
Deltona	12		11	1		
Geneva	2		2			
Grant	1				1	
Indialantic	38	13	9	11	5	
Indian Harbor Beach	12	5	1	6		
Jacksonville	2		2			
Kissimmee	8			2	6	
Lake Helen	2	1	1			
Lake Mary	5	2	3			
Lake Wales	3		2	1		
Longwood – Altamonte Springs	5	1	4			
Maitland – Fern Park	5	2	2	1		
Melbourne	95	49	3	37	6	
Melbourne Beach	29	13	1	13	2	
Merritt Island – Cocoa Beach	25	13	1	10	1	
Miami	3		3			
Micco	2		1	1		
New Smyrna Beach	2		2			
Orange City – DeBary	34	6	28			
Orlando – Winter Park	11	2	7	2		
Paisley	3		3			
Palatka	3		3			
Palm Bay	15		5	10		
Sanford – Lake Monroe	42		38	4		
Satellite Beach	8	3	1	2	1	1
Sebastian	1	1				
Titusville	70	36	15	17	2	
Winter Gardens	1		1			

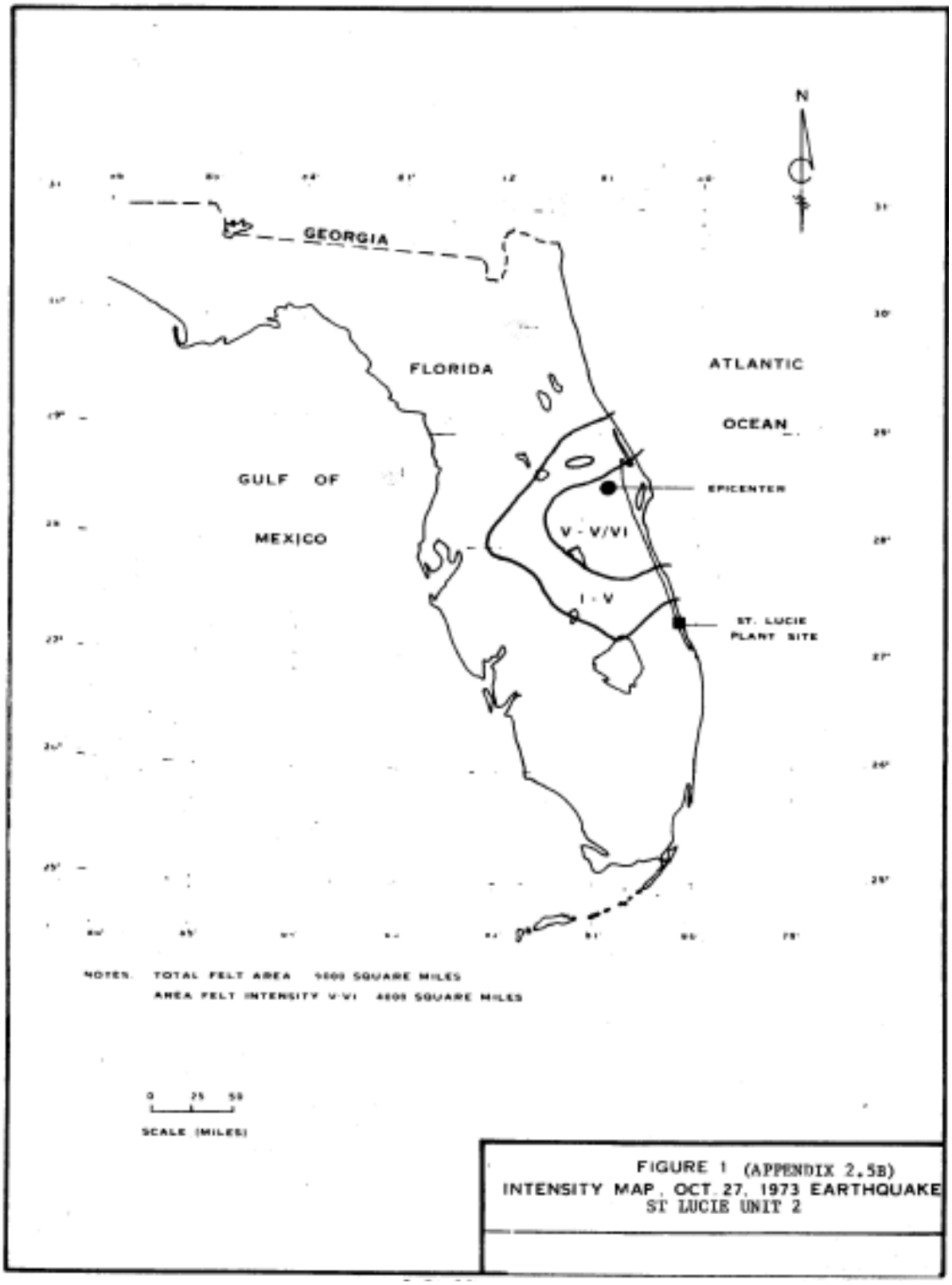

FIGURE 1 (APPENDIX 2.5B)
INTENSITY MAP, OCT. 27, 1973 EARTHQUAKE
ST LUCIE UNIT 2

APPENDIX 2.5C

EAB AND LPZ SHORT-TEM (ACCIDENT) DIFFUSION ESTIMATES FOR AST

EAB AND LPZ SHORT TERM (ACCIDENT) DIFFUSION ESTIMATES FOR AST

OBJECTIVE

Conservative values of atmospheric diffusion at the site boundary (EAB) and the low population zone (LPZ) were calculated for appropriate time periods using meteorological data collected onsite during the time period including the years 1997, 1998, 1999, 2002 and 2003 which were deemed to represent the most reliable data sets.

METHODOLOGY

The methodology used for this calculation is consistent with Regulatory Guide 1.145 as implemented by the PAVAN computer code (Reference 2). Using joint frequency distributions of wind direction and wind speed by atmospheric stability, the PAVAN computer code provides relative air concentration (χ/Q) values as functions of direction for various time periods at the EAB and LPZ. Three procedures for calculation of χ/Qs are utilized for the site boundary and LPZ; a direction-dependent approach, a direction-independent approach, and an overall site χ/Q approach. The χ/Q calculations are based on the theory that material released to the atmosphere will be normally distributed (Gaussian) about the plume centerline. A straight-line trajectory is assumed between the point of release and all distances for which χ/Q values are calculated.

The theory and implementing equations employed by the PAVAN computer code are documented in Reference 2.

CALCULATIONS/PAVAN COMPUTER CODE INPUT DATA

The minimum EAB distance assumed for all directions is 1,442 meters from the center of the Unit 2 containment building. The LPZ distance is taken as 1,490 meters from the center of the Unit 1 containment building in all directions.

All of the releases were considered ground level releases because the highest possible release elevation is from the plant stack at 184 feet. From Section 1.3.2 of Reference 1, a release is only considered a stack release if the release point is at a level higher than two and one-half times the height of adjacent solid structures. For the St. Lucie plant, the elevation of the top of the Unit 2 containment is 225.5 feet. Therefore, the highest possible release point is not 2.5 times higher than the adjacent containment buildings, and thus all releases were considered ground level releases. As such, the release height was set equal to 10.0 meters as required by Table 3.1 of Reference 2. The building area used for the building wake term was 1,565 m^2. This area was calculated to be conservatively small in that the height used in the area calculated was from the highest roof elevation of a nearby building to the elevation of the bottom of the containment dome.

The tower height at which the wind speeds were measured is 10 meters and 57.9 meters above plant grade. The windspeed units are given in miles per hour, therefore the PAVAN variable UCOR was set equal to 101 to convert the windspeeds to meters per second as described in Table 3.1 of Reference 2. The maximum windspeed in each windspeed category was chosen to match the raw joint frequency of distribution data, which conforms to the windspeed bins in Table 1 of Reference 3. The maximum windspeed values are 1, 3, 7, 12, 18, 24, and 30 mph. The maximum windspeed in each windspeed category was chosen to match the recommendation of RIS-2006-4 (Reference 4).

RESULTS

PAVAN computer runs for the EAB and LPZ boundary distances were performed using the data discussed previously. Per Section 4 of Reference 1, the maximum χ/Q for each distance was determined and compared to the 5% overall site value for the boundary under consideration. The maximum EAB and LPZ χ/Qs that resulted from this comparison are provided in the table below:

Offsite Boundary χ/Q Factors for Analysis Events

Time Period	EAB χ/Q (sec/m^3)	LPZ χ/Q (sec/m^3)
0-2 hours	1.05E-4	1.01E-4
0-8 hours	5.98E-5	5.74E-5
8-24 hours	4.52E-5	4.32E-5
1-4 days	2.46E-5	2.33E-5
4-30 days	1.02E-5	9.62E-6

References

1. USNRC Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants", Revision 1, November 1982, (Reissued February 1983 to correct page 1.145-7).

2. NUREG/CR-2858, "PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations", November 1982.

3. Safety Guide 23, "Onside Meteorological Programs", February 17, 1972.

4. US NRC Regulatory Issue Summary RIS-2006-4, “Experience with Implementation of Alternative Source Terms,” March 7, 2006.

APPENDIX 2.5D

CONTROL ROOM SHORT-TERM (ACCIDENT) DIFFUSION ESTIMATES FOR AST

SHORT-TERM (ACCIDENT) DIFFUSION FOR THE CONTROL ROOM

OBJECTIVE

Conservative values of atmospheric diffusion to the Control Room were calculated for appropriate time periods using meteorological data collected onsite during the time period including the years 1997, 1998, 1999, 2002 and 2003 which were deemed to represent the most reliable data sets.

METHODOLOGY

The ARCON96 computer code is used by the USNRC staff to review licensee submittals relating to control room habitability (Reference 1). Therefore, the ARCON96 computer code was used to determine the relative concentrations (χ/Qs) for the control room air intakes and inleakage locations.

The ARCON96 computer code uses hourly meteorological data for estimating dispersion in the vicinity of buildings to calculate relative concentrations at control room air intakes that would be exceeded no more than five percent of the time. These concentrations are calculated for averaging periods ranging from one hour to 30 days in duration.

The theory and implementing equations employed by the ARCON96 computer code are documented in Reference 1.

CALCULATIONS/ARCON COMPUTER CODE INPUT DATA

Five years of meteorological data were used for the ARCON96 computer code runs.

A number of various release-receptor combinations were considered for the control room χ/Qs. These different cases were considered to determine the limiting release-receptor combinations for the various events. The case matrix for these combinations is provided in Table 2D-2.

The distance and direction inputs for the ARCON96 runs may be found in Table 2D-1. The distances were converted from feet to meters with a factor of 0.3048 meters/feet. The distances in meters were then rounded down to the nearest tenth for conservatism. The elevation difference term was set equal to zero for each case since all elevation points are taken with respect to the same datum. The intake heights were determined as the intake elevations less the plant grade elevation of 19 feet.

The lower and upper measurements heights for the meteorological data were entered as 10 meters and 57.9 meters, respectively, for each case. The mph option was selected for the windspeed units.

A ground level release was chosen for each scenario since none of the release points are 2.5 times taller than the closest solid structure as called out in Section 3.2.2 of Reference 3 for stack releases. The top of the containment structures is at an elevation of 225.5 feet. The highest release point is from the top of the plant stack at an elevation of 184 feet, which is not 2.5 times higher than the nearby containment structure. The vertical velocity, stack flow, and stack radius terms were all set equal to zero since each case is a grounded level release. The vent release option was not selected for any of the scenarios.

The actual release height was used in the cases. No credit was taken for effective release height due to plume rise; therefore, for the releases from the stacks, the release elevations were set equal to the stack top elevation. The release heights were taken as the release elevations less the plant grade elevation of 19 feet.

The only cases in this analysis that take credit for the building wake effect are the scenarios where the release is from the containment building. Some of the other scenarios have buildings between the release and receptor points, but for these cases the building wake was not credited for the sake of conservatism. Not crediting wakes was accomplished by setting the building area term equal to 0.01 m^2 as stated in Table A-2 of Reference 3. The building area used is a conservatively determined containment cross sectional area. The width used is equal to the inside diameter of the containment building plus the thickness of the wall, while the height is taken as the distance between the top of the cylinder portion of the containment structure and the highest auxiliary building roof elevation. This building area is equal to 1,565 m^2.

All of the default values in the ARCON96 code were unchanged from the code default values with the following exceptions. Table A-2 of Reference 3 suggests use of a value of 0.2 for the Surface Roughness Length, and use of a value of 4.3 for the Averaging Sector Width Constant. These two changes were made for each case. The minimum wind speed was left at 0.5 m/s per the guidance instruction in Table A-2 of Reference 3.

RESULTS

ARCON96 computer runs for the various release points and control room intake locations were performed using the data discussed previously. Per Reference 3, the 95th percentile χ/Q values were determined. The resulting χ/Qs are listed in Table 2D-2.

References

1. NUREG/CR-6331 PNL-10521, "Atmospheric Relative Concentrations in Building Wakes," May 1995, with Errata dated July 1997.

2. Safety Guide 23, "Onside Meteorological Programs," February 17, 1972.

3. USNRC Regulatory Guide 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Plants", June 2003.

TABLE 2D-1
Direction and Distance Data
(Page 1 of 2)

Release Point	Receptor Point	Release Height (ft)	Release Height (m)	Receptor Height (ft)	Receptor Height (m)	Distance (ft)	Distance (m)	Direction with Respect to True North
Stack/Plant Vent	N CR Intake	184	56.1	59.67	18.2	48.07	14.6	58
Stack/Plant Vent	S CR Intake	184	56.1	57.58	17.6	126.7	38.6	1
RWT	N CR Intake	48.22	14.6	59.67	18.2	245.3	74.7	65
RWT	S CR Intake	48.22	14.6	57.58	17.5	275.6	84.0	42
FHB Closest Point	N CR Intake	43	13.1	59.67	18.2	121.3	36.9	48
FHB Closest Point	S CR Intake	43	13.1	57.58	17.6	189.8	57.8	16
Aux. Bldg. Louver L-7B	N CR Intake	38	11.5	59.67	18.2	123.81	37.7	72
Aux. Bldg. Louver L-7A	S CR Intake	38	11.5	57.58	17.6	147.85	45.0	40
Condenser	N CR Intake	5.25	1.6	59.67	18.2	153.23	46.7	244
Closest MSSV/ADV	N CR Intake	47	14.3	59.67	18.2	100.66	30.6	298
Closes MSSV/ADV	S CR Intake	47	14.3	57.58	17.6	195.55	59.6	320
Closest Feedwater Line Point	N CR Intake	17	5.2	59.67	18.2	83.06	25.3	306

TABLE 2D-1
Direction and Distance Data
(Page 2 of 2)

Release Point	Receptor Point	Release Height (ft)	Release Height (m)	Receptor Height (ft)	Receptor Height (m)	Distance (ft)	Distance (m)	Direction with Respect to True North
Closest Feedwater Line Point	S CR Intake	17	5.2	57.58	17.6	183.25	55.8	325
Stack/Plant Vent	Midpoint between Intakes	184	56.1	58.625	17.9	72.02	21.9	10
RWT	Midpoint between Intakes	48.22	14.6	58.625	17.9	244.78	74.6	53
Aux. Bldg. Louver L-7A	Midpoint between Intakes	38	11.4	58.625	17.9	119	36.2	61
Closest MSSV/ADV	Midpoint between Intakes	47	14.3	58.625	17.9	149.54	45.5	309
Closest Feedwater Line Point	Midpoint between Intakes	17	5.2	58.625	17.9	134.2	40.9	315

Notes:

1. Release heights are calculated as 19 feet less than the reference elevations to account for the plant grade elevation.
2. The FHB closest point release elevation is taken as the roof elevation since the SW corner of the roof is the closest building point to the intakes.
3. Release and receptor points are considered to be at the centerpoint or centerline of all openings.
4. The only release/receptor combination that does not have the intakes in the same wind direction window from the release point is for the releases from the plant stack. All other release points analyzed result in both control room intakes being in the same wind direction window. Therefore, credit may be taken for intake dilution only for releases from the plant stack.
5. The receptor point for the "midpoint between intakes" is taken as being on the outside of the control room (and H&V room) east wall. The receptor elevation is taken as the average of the receptor elevations for the two outside air intakes.
6. Atmospheric dispersion factors for the releases to the midpoint between the control room intakes are required for the limiting cases to be used during the time period when the control room intakes are isolated. This midpoint receptor location is used to calculate the χ/Q value to be used for the unfiltered control room inleakage dose.
7. The containment/shield building penetrations at the 228° and 240° azimuths empty into the covered walkway that leads to the RAB; therefore, the closest containment/shield building penetration to the intakes that is directly exposed to the atmosphere is the closest feedwater line penetration.

TABLE 2D-2
Control Room χ/Qs

This table summarizes the results for χ/Q factors for the control room intakes for the various accident scenarios. Values are presented for the unfavorable (North) intake prior to intake isolation, the midpoint between the intakes for during isolation, as well as values for the favorable (South) intake due to the manual selection of the favorable control room intake after unisolation and initiation of filtered air make-up. These values are not corrected for Control Room Occupancy Factors but do include taking credit for dilution where allowed. Section 3.3.2.3 of Regulatory Guide 1.194 provides the following guidance for dual intake ventilation systems which allow the operator to manually select the least contaminated outside air intake as a source of outside air makeup and close the other intake:

> The χ/Q value for the limiting intake should be used for the time interval prior to intake isolation. This χ/Q value may be reduced by a factor of 2 to account for dilution by the flow from the other intake. The χ/Q values for the favorable intake are used for the subsequent time intervals. The χ/Q values for the favorable intake may be reduced by a factor of 4 to account for the duel inlet and the expectation that the operator will make the proper intake selection. This protocol should be used only if the dual intakes are in different wind direction windows."

Based on the layout of the site, the only cases that may take credit for dilution are when the releases are from the plant vent stack. Therefore, the plant stack values shown below include a reduction by a factor of 2 prior to isolation and a reduction by a factor of 4 after the control room is aligned to the favorable intake for filtered make-up. However, dilution is not credited during the time period when the control room intakes are isolated for these cases.

* Indicates credit for dilution taken for this case.

The atmospheric dispersion factors corresponding to ADVs were determined to be more limiting than those from the MSSVs for all time periods. Therefore, the more limiting ADV values have been used throughout the analyses for all secondary releases. No distinction is made between automatic steam relief from the MSSVs and controlled releases from the ADVs for radiological purposes.

Release – Receptor Pair	Release Location	Receptor Location	0-2 hour χ/Q (sec/m^3)	2-8 hour χ/Q (sec/m^3)	8-24 hour χ/Q (sec/m^3)	1-4 days χ/Q (sec/m^3)	4-30 days χ/Q (sec/m^3)
A*	Stack/Plant Vent*	N CR Intake	2.39E-03				
B*	Stack/Plant Vent*	S CR Intake	6.70E-04	4.58E-04	2.02E-04	1.40E-04	1.13E-04
C	RWT	N CR Intake	1.37E-03				
D	RWT	S CR Intake	1.04E-03	8.49E-04	3.64E-04	2.73E-04	2.32E-04
E	FHB Closest Point	N CR Intake	4.92E-03				
F	FHB Closest Point	S CR Intake	1.87E-03	1.36E-03	5.88E-04	4.00E-04	3.06E-04
G	Louver 2L-7B	N CR Intake	4.80E-03				
H	Louver 2L-7A	S CR Intake	3.22E-03	2.67E-03	1.14E-03	8.62E-03	7.04E-04
I	Steam Jet Air Ejector	N CR Intake	3.02E-03				
J	Closest ADV	N CR Intake	6.71E-03				
K	Closest ADV	S CR Intake	1.89E-03	1.53E-03	6.02E-04	4.55E-04	3.89E-04
L	Closest Feedwater Line Point	N CR Intake	7.29E-03				
M	Closest Feedwater Line Point	S CR Intake	1.95E-03	1.57E-03	6.56E-04	4.75E-04	3.99E-04
N	Stack/Plant Vent	Midpoint between Intakes	3.96E-03				
O	RWT	Midpoint between Intakes	1.34E-03				
P	Louver 2L-7A	Midpoint between Intakes	5.06E-03				
Q	Closest ADV	Midpoint between Intakes	3.13E-03				
R	Closest Feedwater Line Point	Midpoint between Intakes	3.33E-03				
S	Containment Maintenance Hatch	N CR Intake	1.90E-03				
T	Containment Maintenance Hatch	S CR Intake	8.28E-04	6.57E-04	2.92E-04	1.93E-04	1.76E-04
U	Containment Maintenance Hatch	Midpoint between Intakes	1.27E-03				
V	FHB Closest Point	Midpoint between Intakes	3.29E-03				