Materials Testing & Consulting, Inc.
Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project:	LDW ENR/AC Pilot Study	**Date Received:**	October 16, 2020
Project #:	19S135	**Sampled By:**	Others
Client :	Wood	**Date Reported:**	November 18, 2020
Source:	Multiple	**Tested By:**	B. Goble
MTC Sample#:	Multiple		

CASE NARRATIVE

1. Six samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology.
2. The samples were run in a single batch and one sample from this job was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. Two samples did not yield the required amount of fines for the pipette portion of the analysis. The samples have been qualified on the QA summary.
4. The data is provided in summary tables and plots.
5. There were no other noted anomalies during this testing..

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Sampled by: Others
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Apparent Grain Size Distribution Summary

Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4 (4750)	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)	31.0	15.6	7.8	3.9	2.0	1.0
LDW-Y3-SC-ENR+AC-CB-ULM	100.0	100.0	61.1	38.2	16.2	5.6	3.9	3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4
	100.0	100.0	58.4	34.8	14.8	5.5	3.7	3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2
	100.0	100.0	57.7	36.3	15.6	5.5	3.8	3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
LDW-YS-SC-ENR-CA-ULM	100.0	100.0	67.2	42.8	19.4	6.0	3.3	2.7	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7
LDW-Y3-SC-ENR-CC-ULM	100.0	100.0	56.0	33.1	15.0	6.5	4.9	4.2	2.8	2.0	1.3	0.9	0.5	0.3
LDW-Y3-SC-ENR-CD-ULM	100.0	100.0	50.3	28.3	13.4	6.7	4.7	4.0	2.5	1.8	1.1	0.8	0.6	0.3
LDW-Y3-SC-ENR+AC-CA-ULM	100.0	100.0	57.1	39.1	21.0	10.4	8.1	7.0	4.9	3.2	1.9	1.3	0.9	0.4
LDW-Y3-SC-ENR+AC-CC-ULM	100.0	100.0	62.8	41.4	21.6	9.9	7.0	6.0	4.1	3.0	1.9	1.3	0.9	0.7

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Apparent Grain Size Distribution Summary

Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay			Total Fines
Phi Size	< -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	> 10	> 4
Sieve Size (microns)	> #10 (2000)	10-18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0	<230 (<62)
LDW-Y3-SC-ENR+AC-CB-ULM	38.9	22.9	22.0	10.6	1.7	0.5	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	3.4
	41.6	23.6	20.0	9.3	1.8	0.5	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	3.2
	42.3	21.4	20.6	10.1	1.7	0.5	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	3.3
LDW-YS-SC-ENR-CA-ULM	32.8	24.4	23.3	13.5	2.7	0.5	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7	<2.7	2.7
LDW-Y3-SC-ENR-CC-ULM	44.0	22.9	18.2	8.5	1.6	0.7	1.4	0.8	0.7	0.3	0.4	0.2	0.3	4.2
LDW-Y3-SC-ENR-CD-ULM	49.7	22.0	14.9	6.7	2.0	0.7	1.5	0.7	0.7	0.3	0.2	0.3	0.3	4.0
LDW-Y3-SC-ENR+AC-CA-ULM	42.9	18.0	18.1	10.6	2.3	1.1	2.1	1.7	1.3	0.7	0.4	0.5	0.4	7.0
LDW-Y3-SC-ENR+AC-CC-ULM	37.2	21.4	19.8	11.7	2.9	1.0	1.9	1.1	1.1	0.6	0.5	0.2	0.7	6.0

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Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
LDW-Y3-SC-ENR+AC-CB-ULM	100.0	100.0	61.1	38.2	16.2	5.6	3.9	3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4
	100.0	100.0	58.4	34.8	14.8	5.5	3.7	3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2
	100.0	100.0	57.7	36.3	15.6	5.5	3.8	3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
AVE	100.0	100.0	59.1	36.4	15.6	5.5	3.8	3.3	N/A	N/A	N/A	N/A	N/A	N/A
STDEV	0.0	0.0	1.5	1.4	0.6	0.0	0.1	0.1	N/A	N/A	N/A	N/A	N/A	N/A
%RSD	0.0	0.0	2.5	3.8	3.6	0.7	2.2	2.6	N/A	N/A	N/A	N/A	N/A	N/A

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
LDW-Y3-SC-ENR+AC-CB-ULM	10/16/2020	11/2/2020	11/17/2020	100.9	SS	4.1
	10/16/2020	11/2/2020	11/17/2020	100.8	SS	3.9
	10/16/2020	11/2/2020	11/17/2020	100.8	SS	3.9
LDW-YS-SC-ENR-CA-ULM	10/16/2020	11/2/2020	11/17/2020	100.6	SS	4.2
LDW-Y3-SC-ENR-CC-ULM	10/16/2020	11/2/2020	11/17/2020	101.1		6.4
LDW-Y3-SC-ENR-CD-ULM	10/16/2020	11/2/2020	11/17/2020	101.2		5.9
LDW-Y3-SC-ENR+AC-CA-ULM	10/16/2020	11/2/2020	11/17/2020	101.5		10.7
LDW-Y3-SC-ENR+AC-CC-ULM	10/16/2020	11/2/2020	11/17/2020	101.4		8.7

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MTC Sample#:	Multiple		

Data Qualifiers

PSEP Grain Size Analysis

SM - The sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations.

SS - The sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis.

W - The weight of the sample in some pipette aliquots was below the level required for accurate weighing.

F - The samples were frozen prior to particle size determination.

LV - Due to low sample volume provided, the samples could not be rerun to meet QA requirements.

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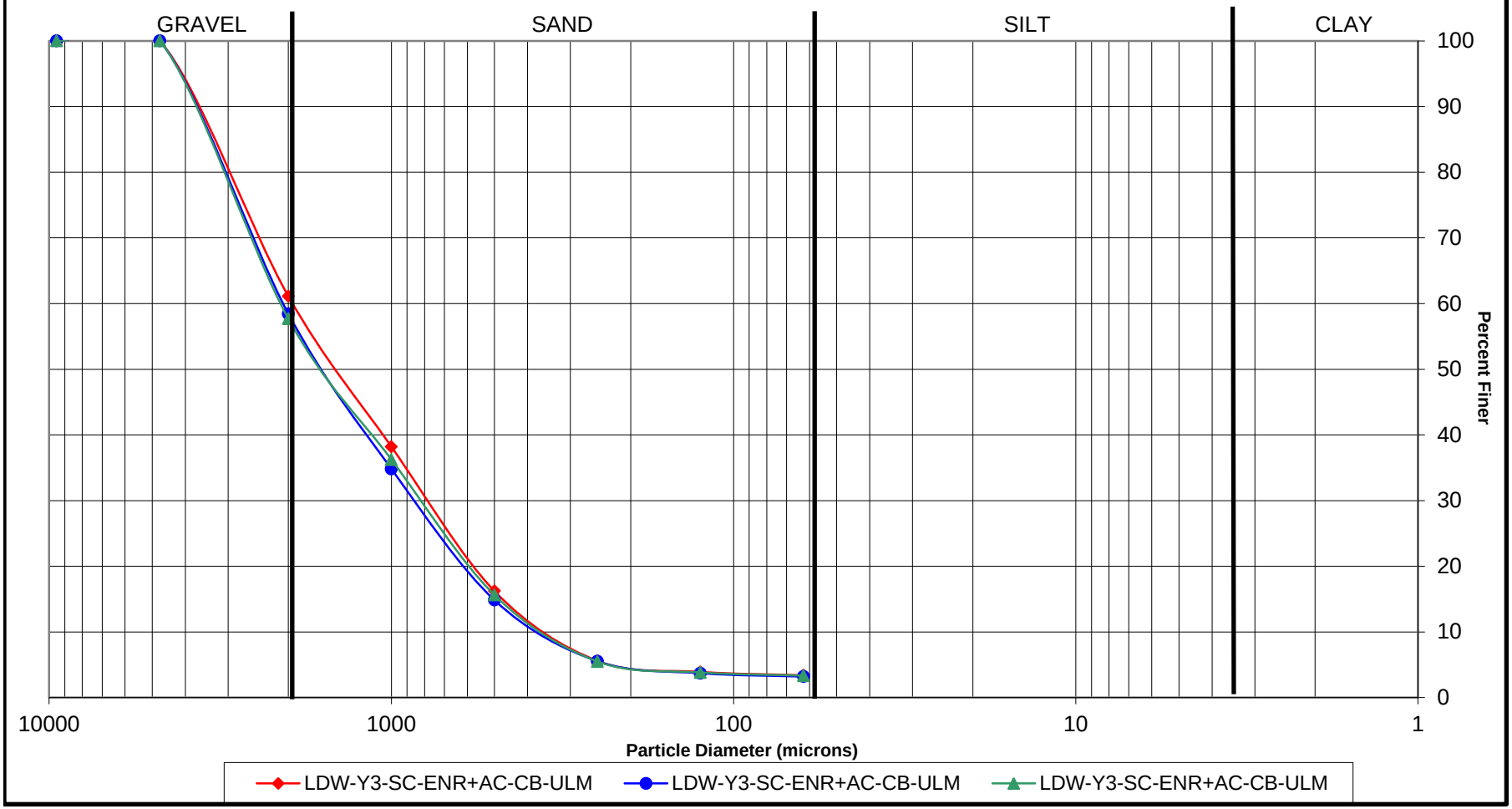
PSEP Grain Size Distribution

Triplicate Sample Plot



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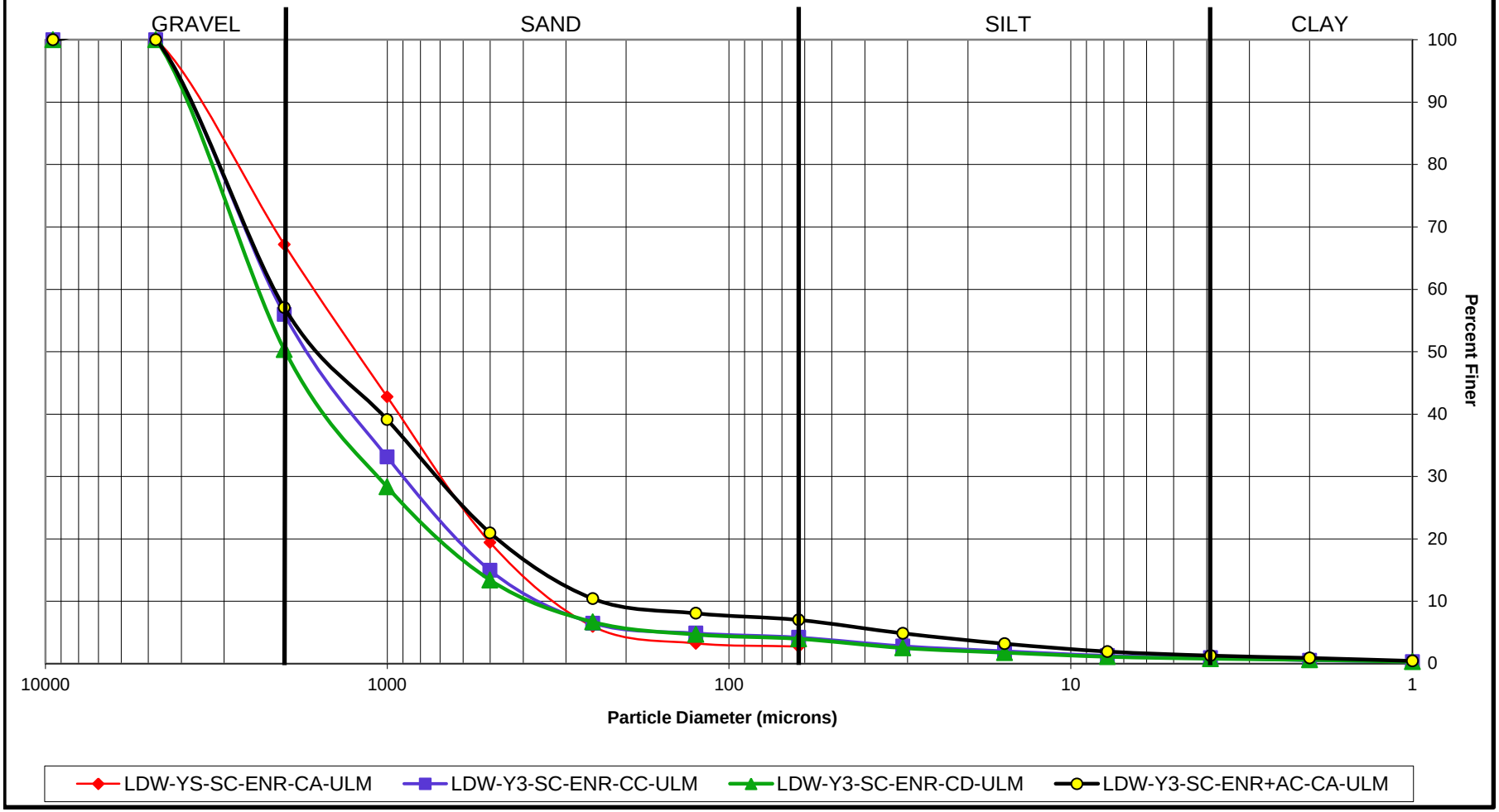
PSEP Grain Size Distribution



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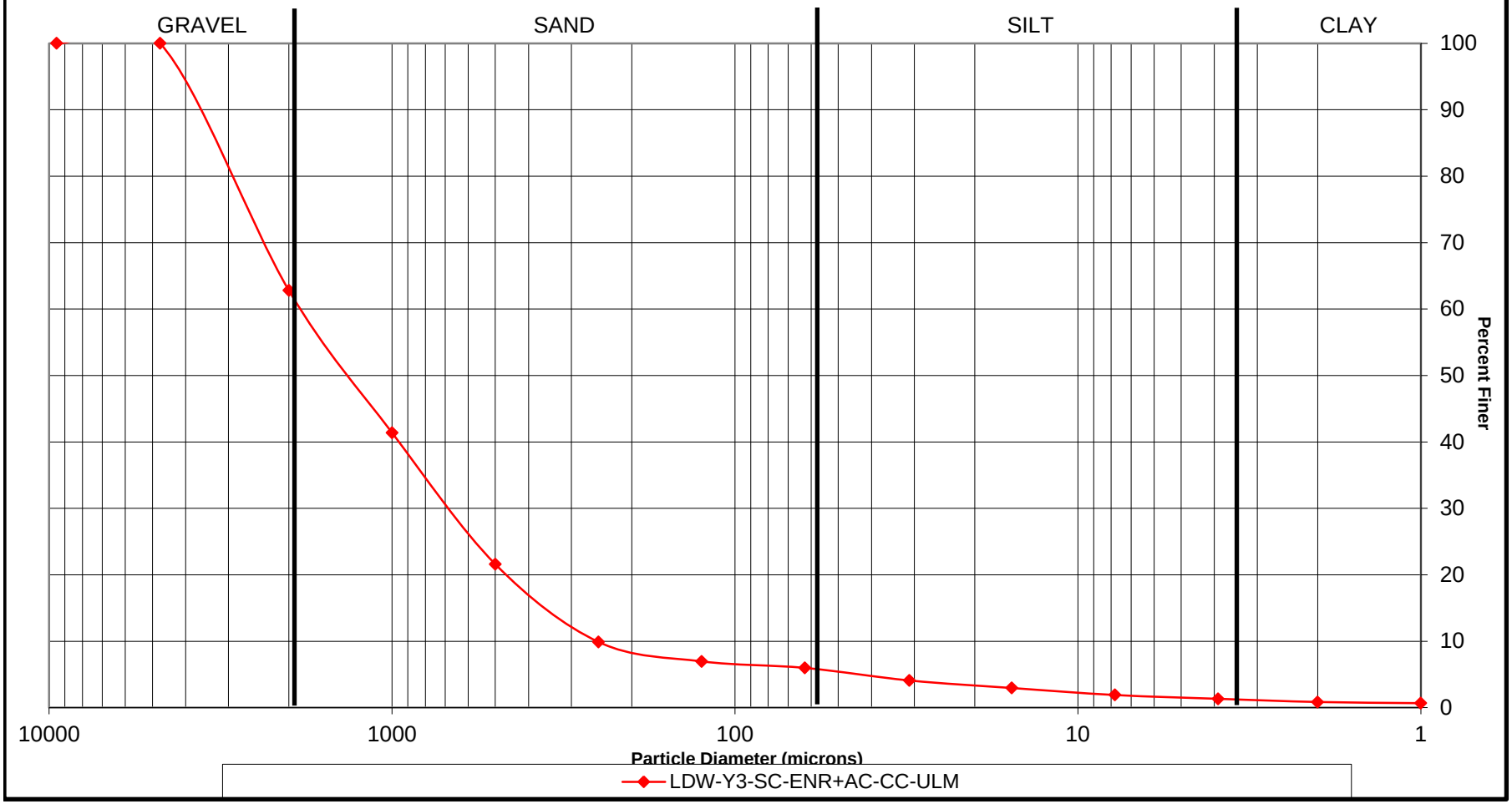
PSEP Grain Size Distribution