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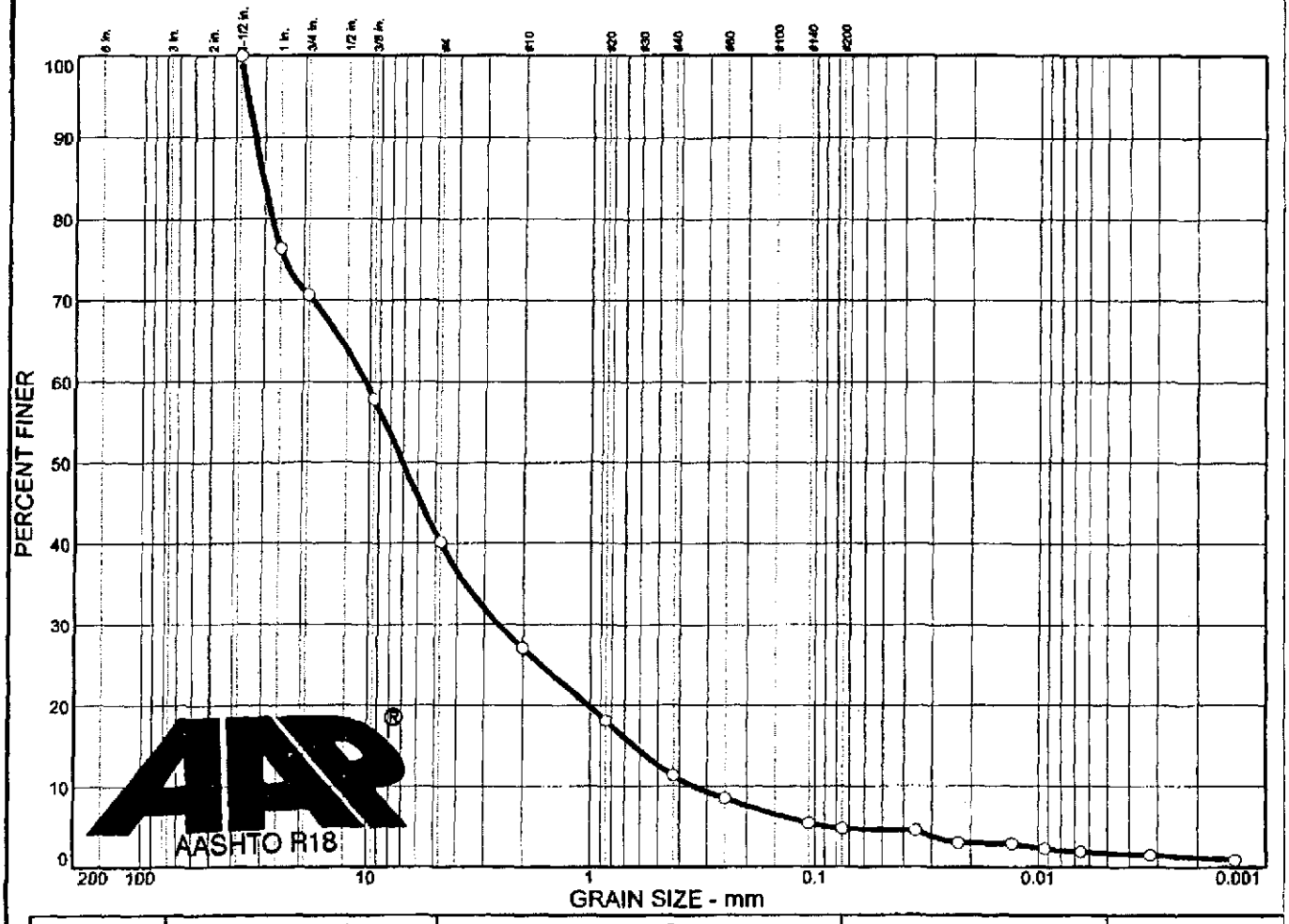
Appendix F3 Geotechnical Tests - Laboratory

Effective Porosity

Sample ID	Spt1-15-LF	SPT2-15-LF	SPT3-15-LF	SPT4-15-LF	SPT5-35-LF	SPT6-15-LF	SPT7-15-LF	SPT8-15-NP
Variables								
Specific Gravity	2.681	2.676	2.752	2.703	2.672	2.688	2.709	2.680
Percent Moisture	0.115	0.118	0.075	0.088	0.080	0.073	0.130	0.078
Dry Density of Soil	123.100	115.100	130.300	114.200	98.800	118.700	112.400	130.600
Constants								
Unit Weight of H_2O	62.4 pcf	62.4 pcf	62.4 pcf	62.4 pcf	62.4 pcf	62.4 pcf	62.4 pcf	62.4 pcf
Weight of Air	0 pcf	0 pcf	0 pcf	0 pcf	0 pcf	0 pcf	0 pcf	0 pcf
Volume of Soil	1 ft3	1 ft3	1 ft3	1 ft3	1 ft3	1 ft3	1 ft3	1 ft3
Ws (pcf)	167.294	166.982	171.725	168.667	166.733	167.731	169.042	167.232
Ww (pcf)	19.239	19.704	12.879	14.843	13.339	12.244	21.975	13.044
Vv (ft^3)	0.359	0.451	0.318	0.477	0.688	0.413	0.504	0.280
Vw (ft3)	0.308	0.316	0.206	0.238	0.214	0.196	0.352	0.209
Va (ft3)	0.051	0.135	0.112	0.239	0.474	0.217	0.152	0.071
Vtot (ft3)	1.359	1.451	1.318	1.477	1.688	1.413	1.504	1.280
Effective Porosity								
(n)	0.264	0.311	0.241	0.323	0.407	0.292	0.335	0.219

Note: The samples delivered to the laboratory were disturbed samples. Therefore the bulk density and in-situ moisture content could not be obtained. The effective porosity was calculated based on the maximum dry density and optimum moisture content obtained from the standard proctor tests ASTM D698.

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	59.8	35.5	3.0	1.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			30.4	10.5	7.03	2.58	0.636	0.346	1.84	30.25

MATERIAL DESCRIPTION	USCS	AASHTO
○ Well Graded Gravel With Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT1 **Sample No.:** SSO-SPT1-5-LF

Remarks:

○ 10/24/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT1-5-LF

Particle Size Distribution Report

	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	27.4	70.1	0.8	1.7

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			12.5	1.35	0.785	0.440	0.281	0.227	0.63	5.97

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT1 **Sample No.:** SSO-SPT1-10-LF

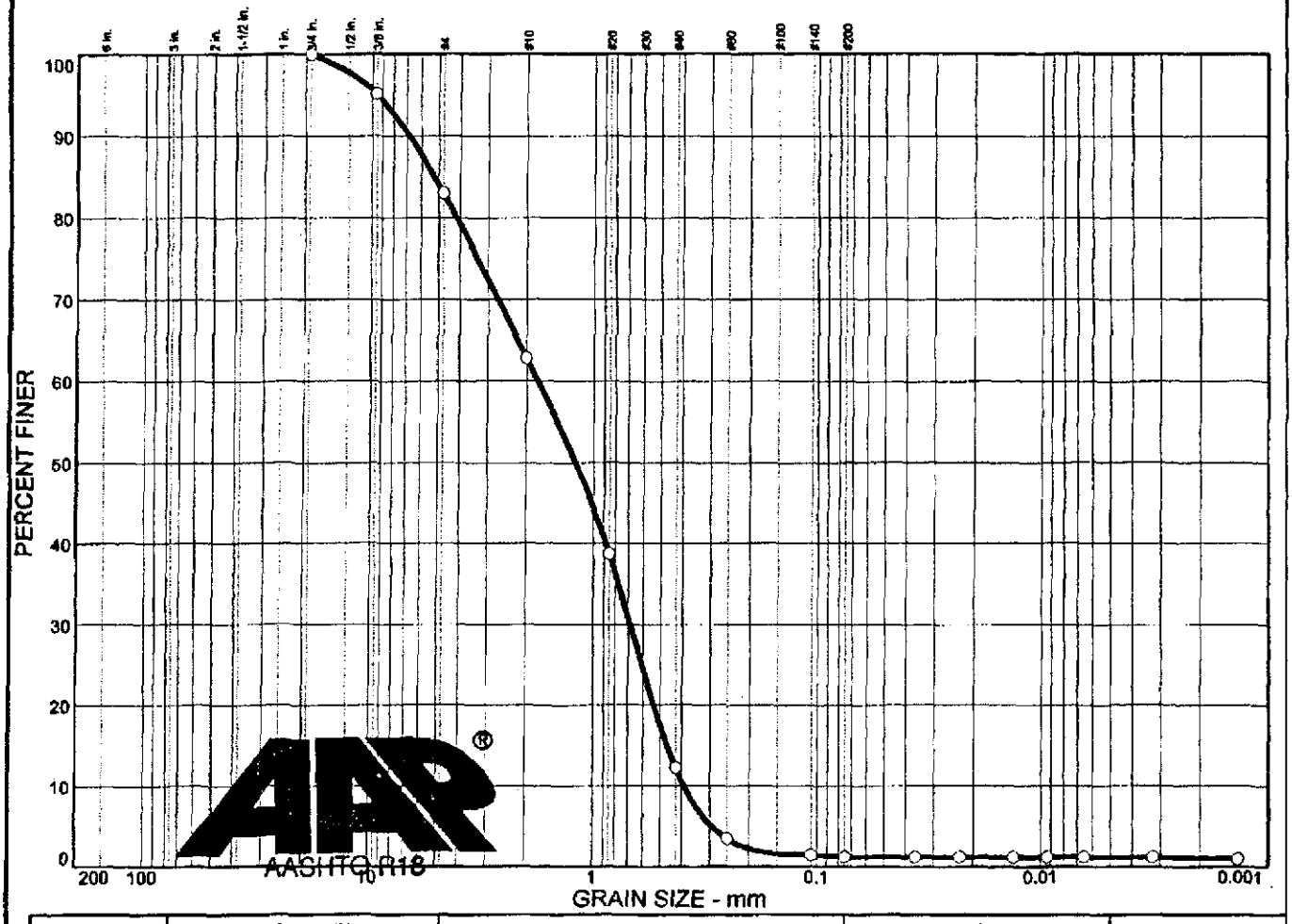
Remarks:
○ 10/24/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT1-10-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	17.0	81.8	0.0	1.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			5.22	1.78	1.20	0.683	0.465	0.391	0.67	4.55

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT1 **Sample No.:** SSO-SPT1-15-LF

Remarks:

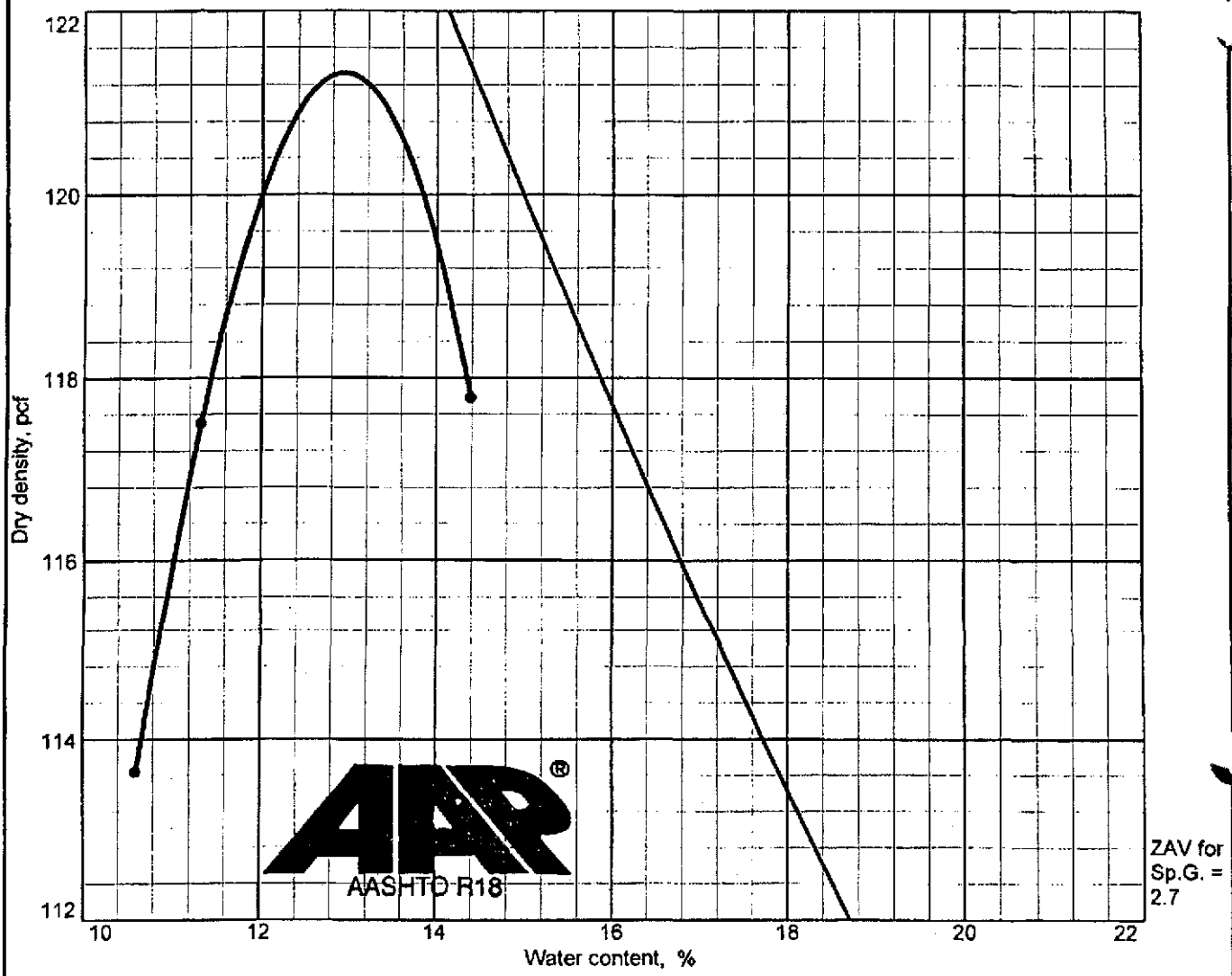
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT1-15-LF

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure B Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 In.	% < No.200
	USCS	AASHTO						
				2.681			9.4	1.2

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 123.1 pcf Optimum moisture = 11.5 %	Poorly graded sand with gravel (Visual)

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT1 **Sample No.:** SSO-SPT1-15-LF

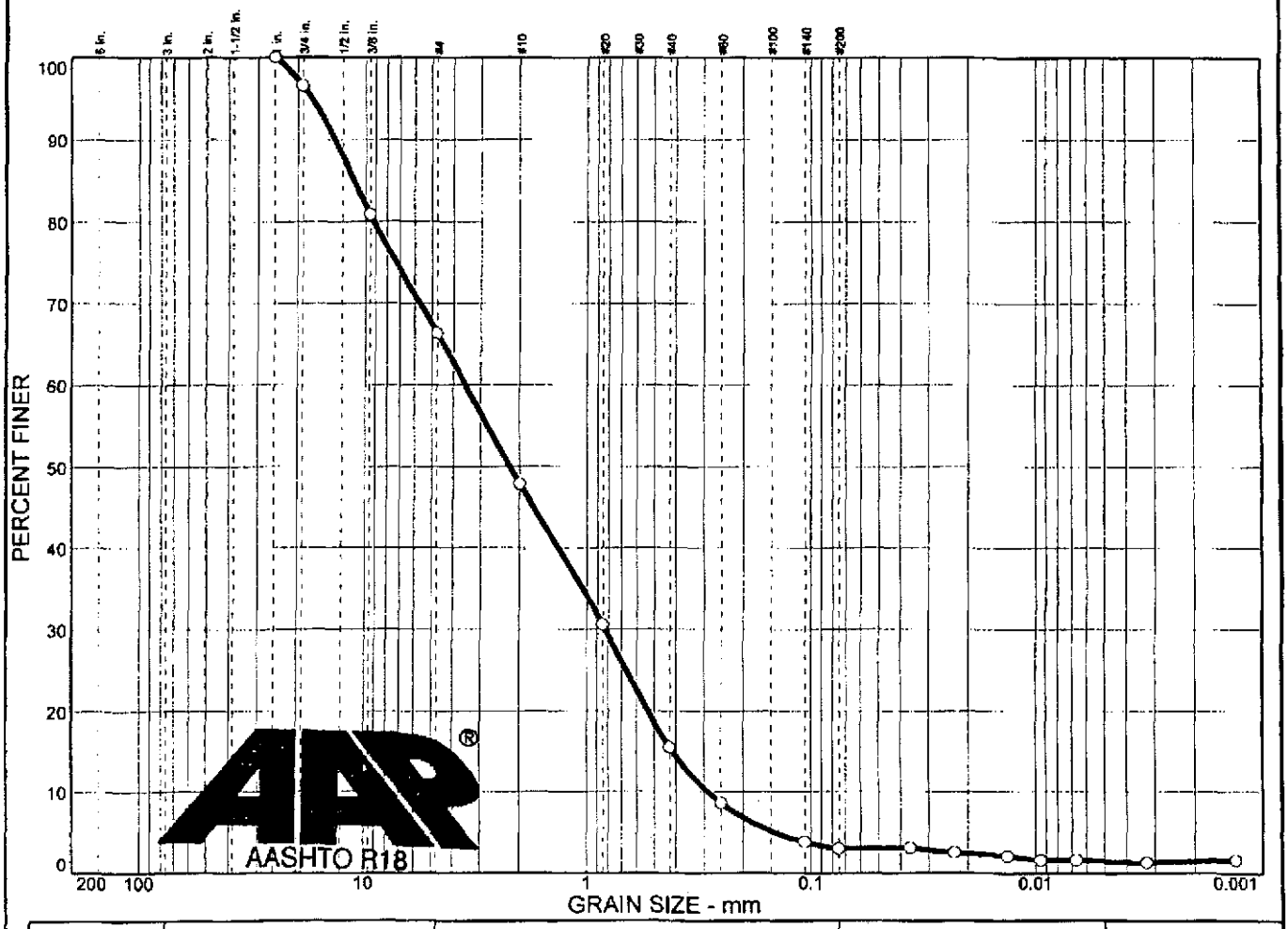
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT1-15-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	33.6	63.4	1.6	1.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			11.3	3.51	2.21	0.827	0.413	0.288	0.68	12.21

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT2 **Sample No.:** SSO-SPT2-5-LF

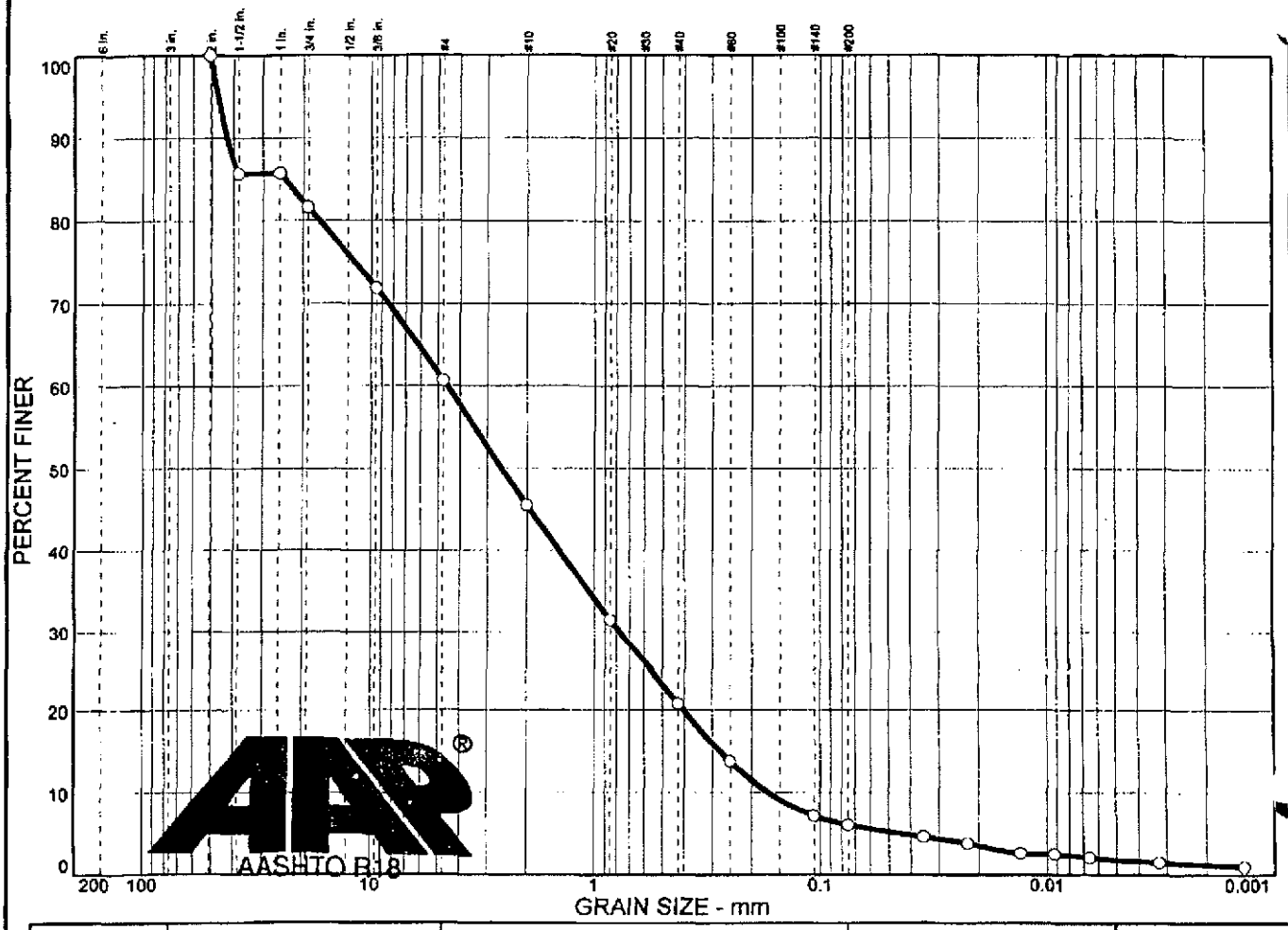
Remarks:
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT2-5-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	39.3	54.6	4.3	1.8

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			24.2	4.56	2.59	0.773	0.277	0.168	0.78	27.08

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT2 **Sample No.:** SSO-SPT2-10-LF

Remarks:

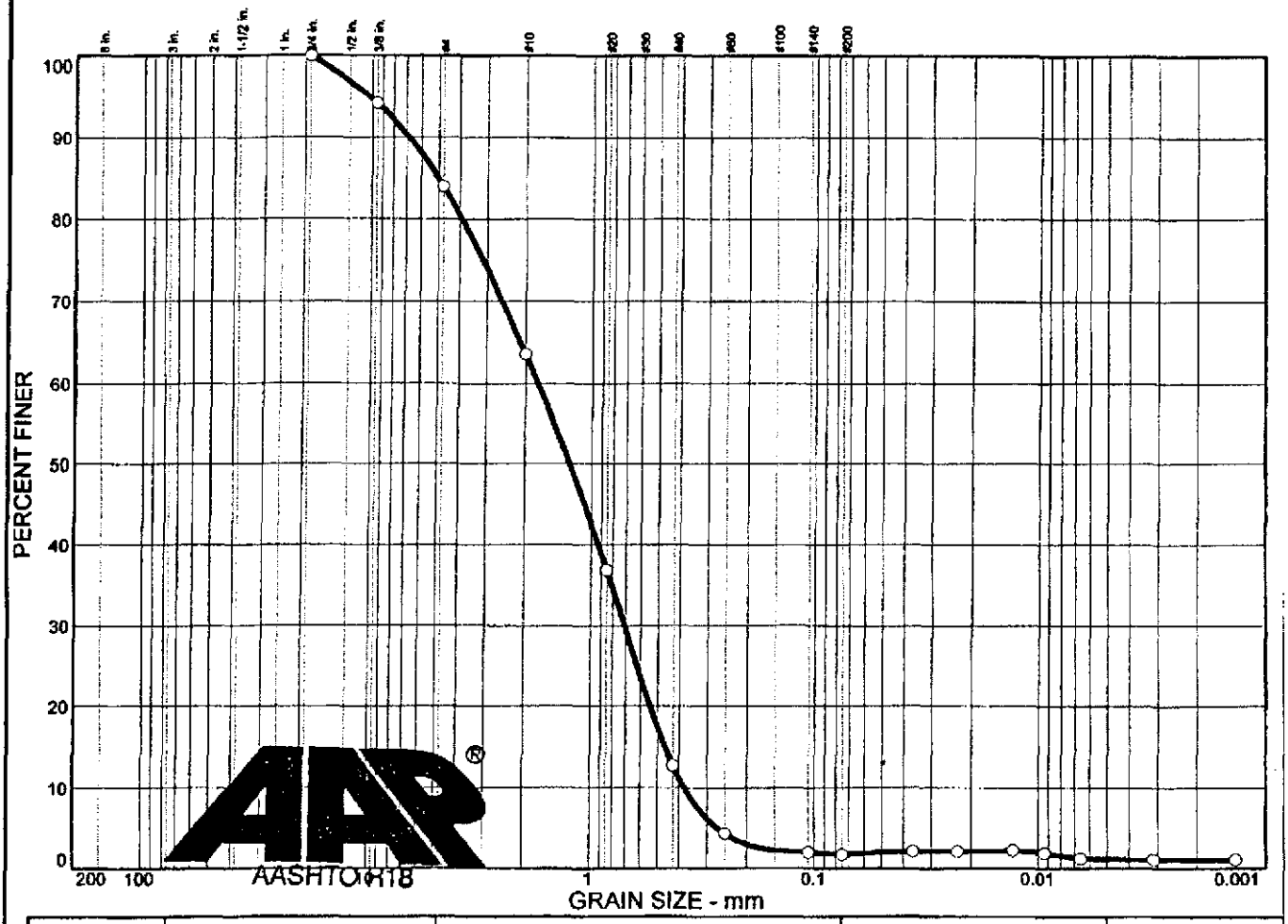
○ 10/24/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT2-10-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	16.0	82.3	0.5	1.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
○			5.01	1.76	1.25	0.707	0.462	0.379	0.75	4.65

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT2 **Sample No.:** SSO-SPT2-15-LF

Remarks:

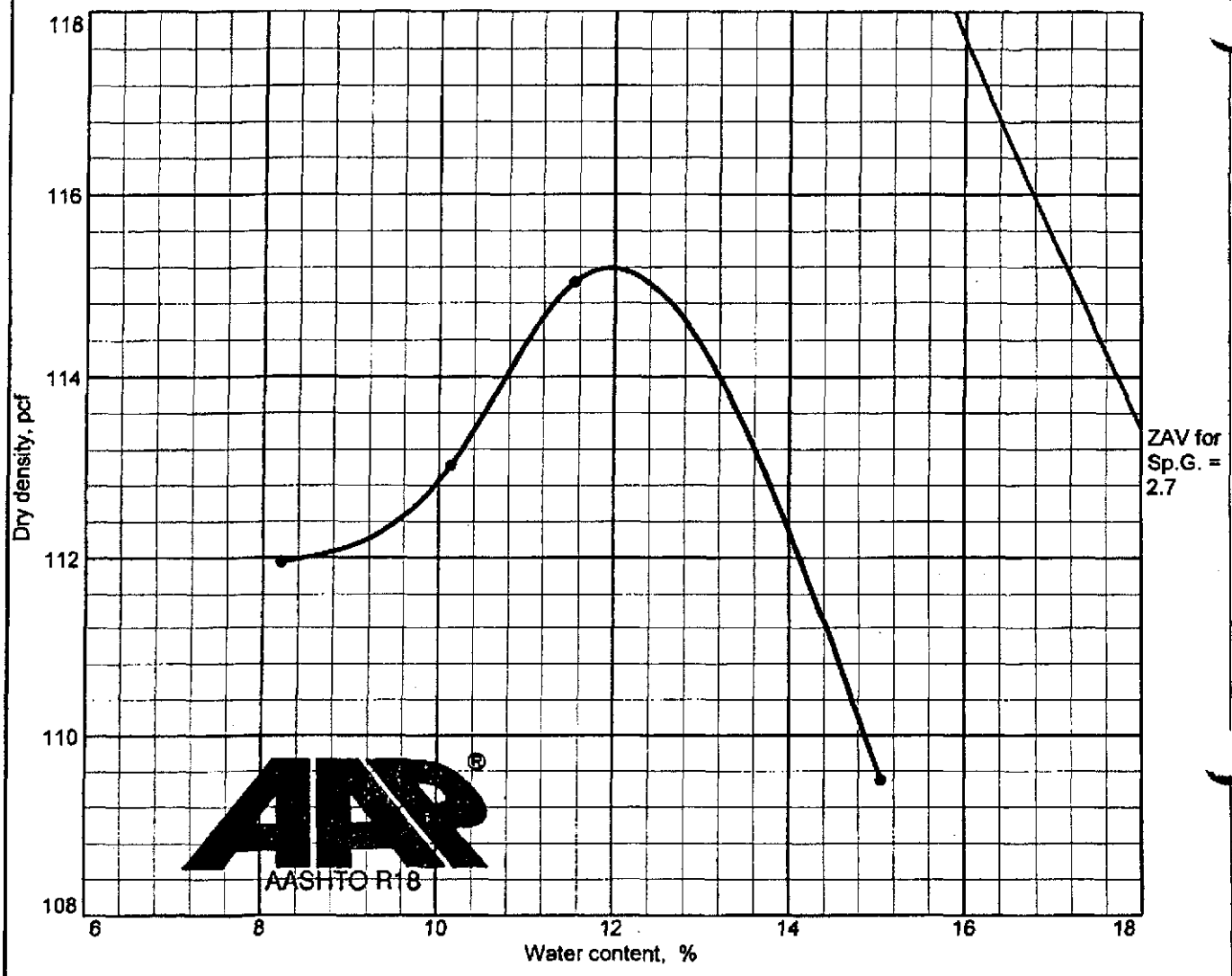
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT2-15-LF

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SP			2.676			16.0	1.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115.1 pcf Optimum moisture = 11.8 %	Poorly graded sand with gravel (Visual)

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT2 **Sample No.:** SSO-SPT2-15-LF

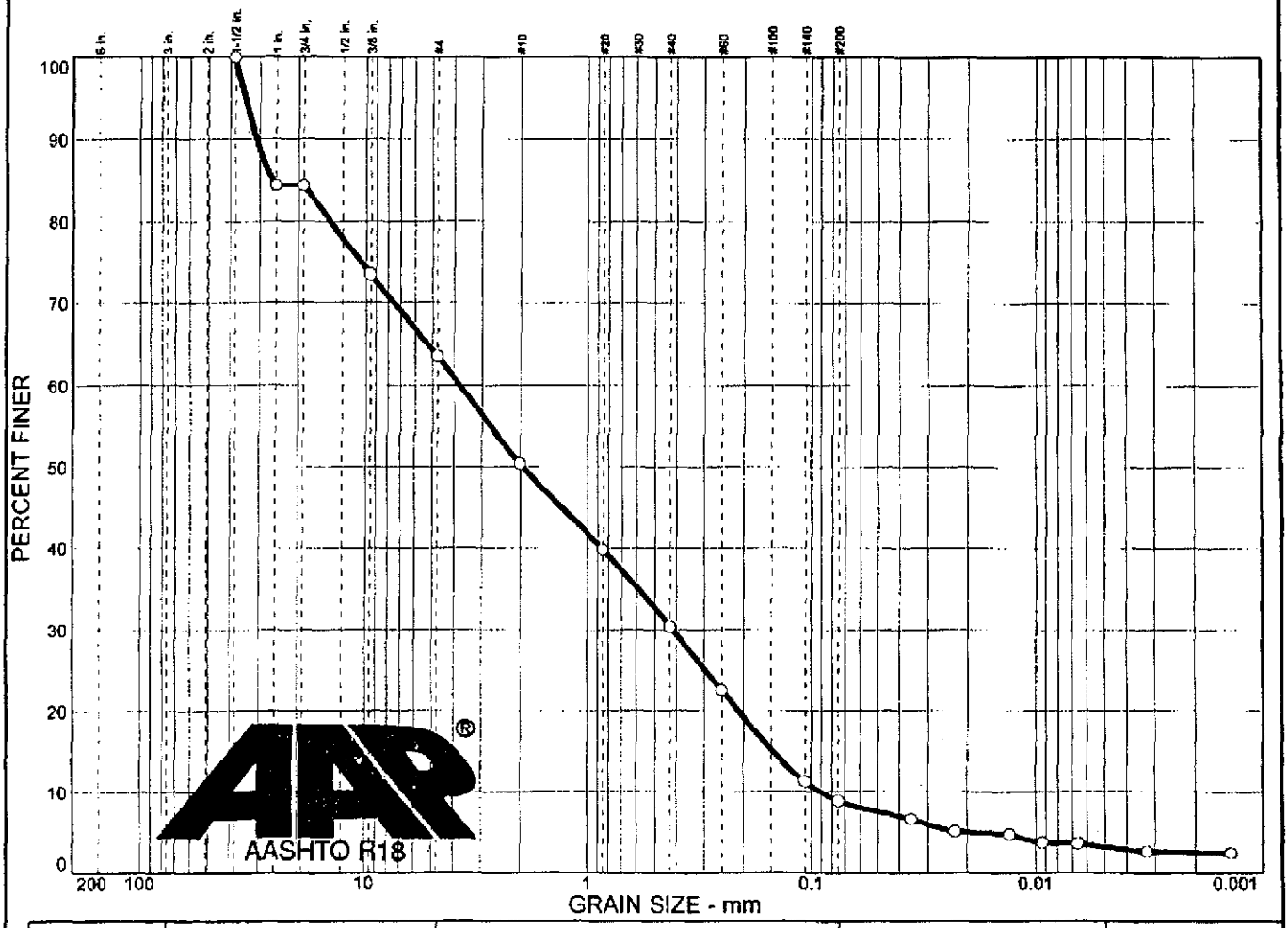
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT2-15-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	36.5	54.6	5.7	3.2

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			26.3	3.78	1.94	0.413	0.148	0.0902	0.50	41.87

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with silt and gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT3 **Sample No.:** SSO-SPT3-5-LF

Remarks:

○

Particle Size Distribution Report

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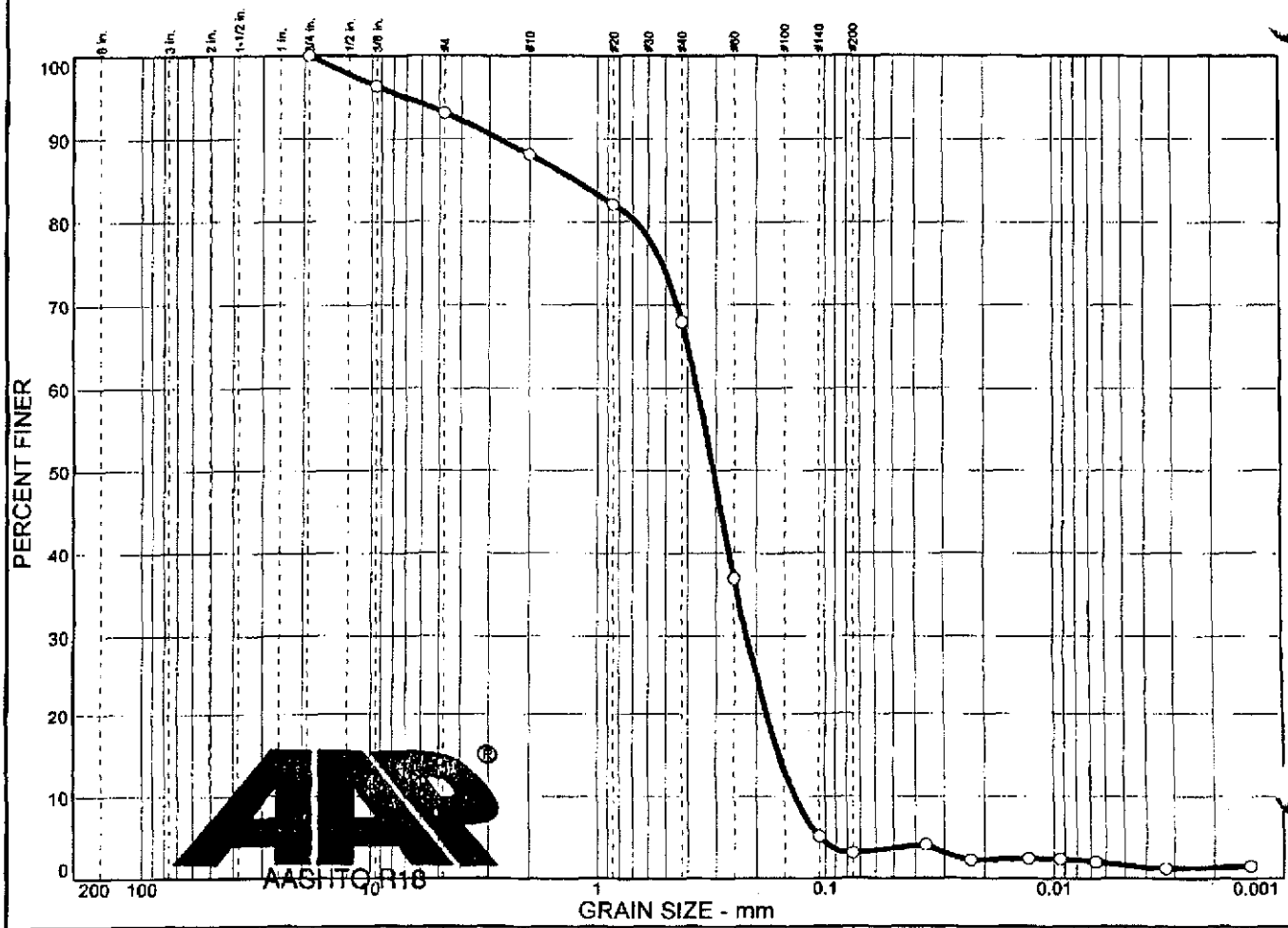
Figure SPT3-5-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	6.9	90.0	1.5	1.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.26	0.364	0.309	0.221	0.158	0.135	1.00	2.70

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT3 **Sample No.:** SSO-SPT3-10-LF

Remarks:

○

Particle Size Distribution Report

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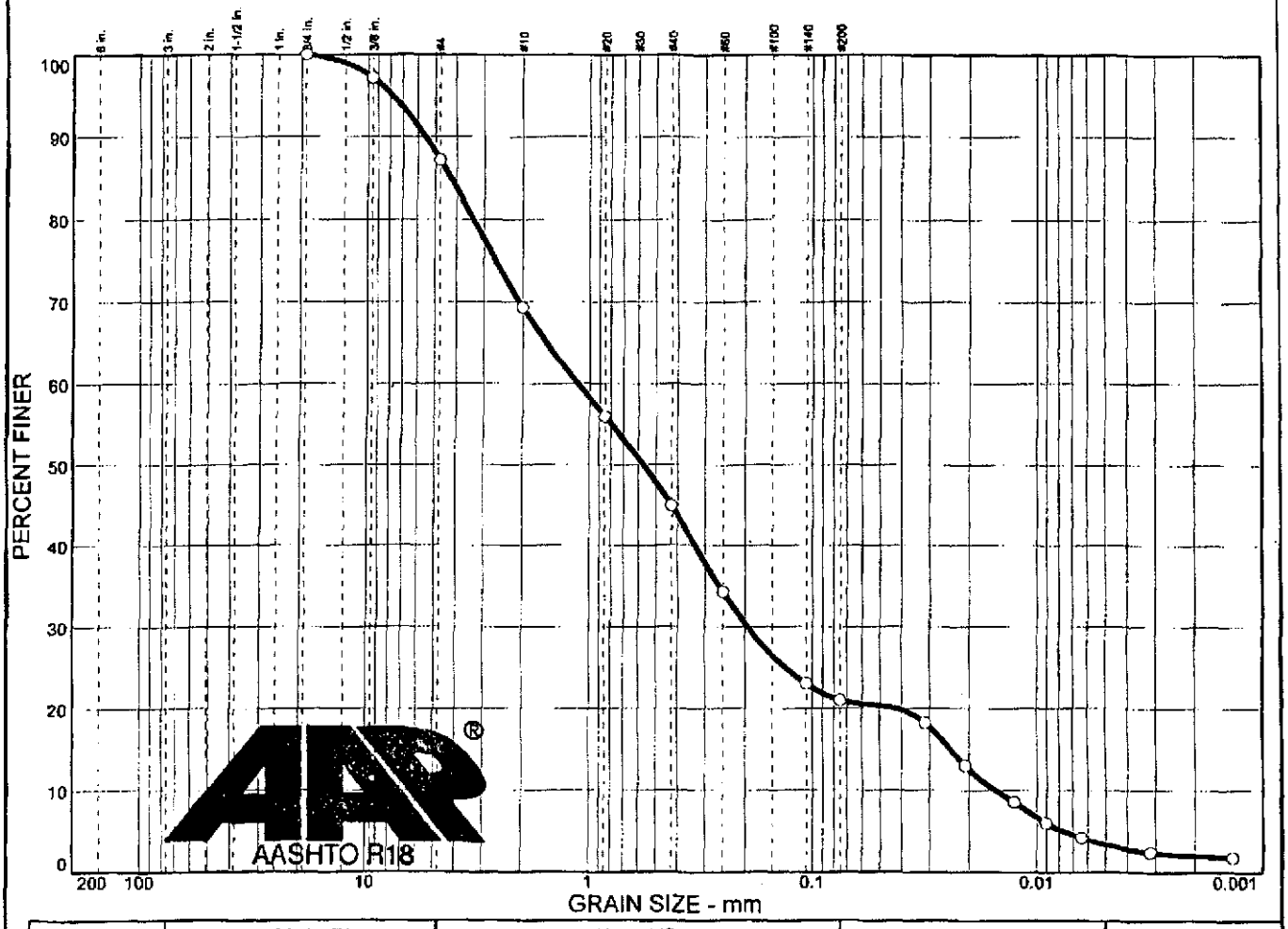
Figure SPT3-10-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	12.8	66.2	17.6	3.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			4.25	1.13	0.567	0.194	0.0242	0.0152	2.20	74.09

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT3 **Sample No.:** SSO-SPT3-15-LF

Remarks:

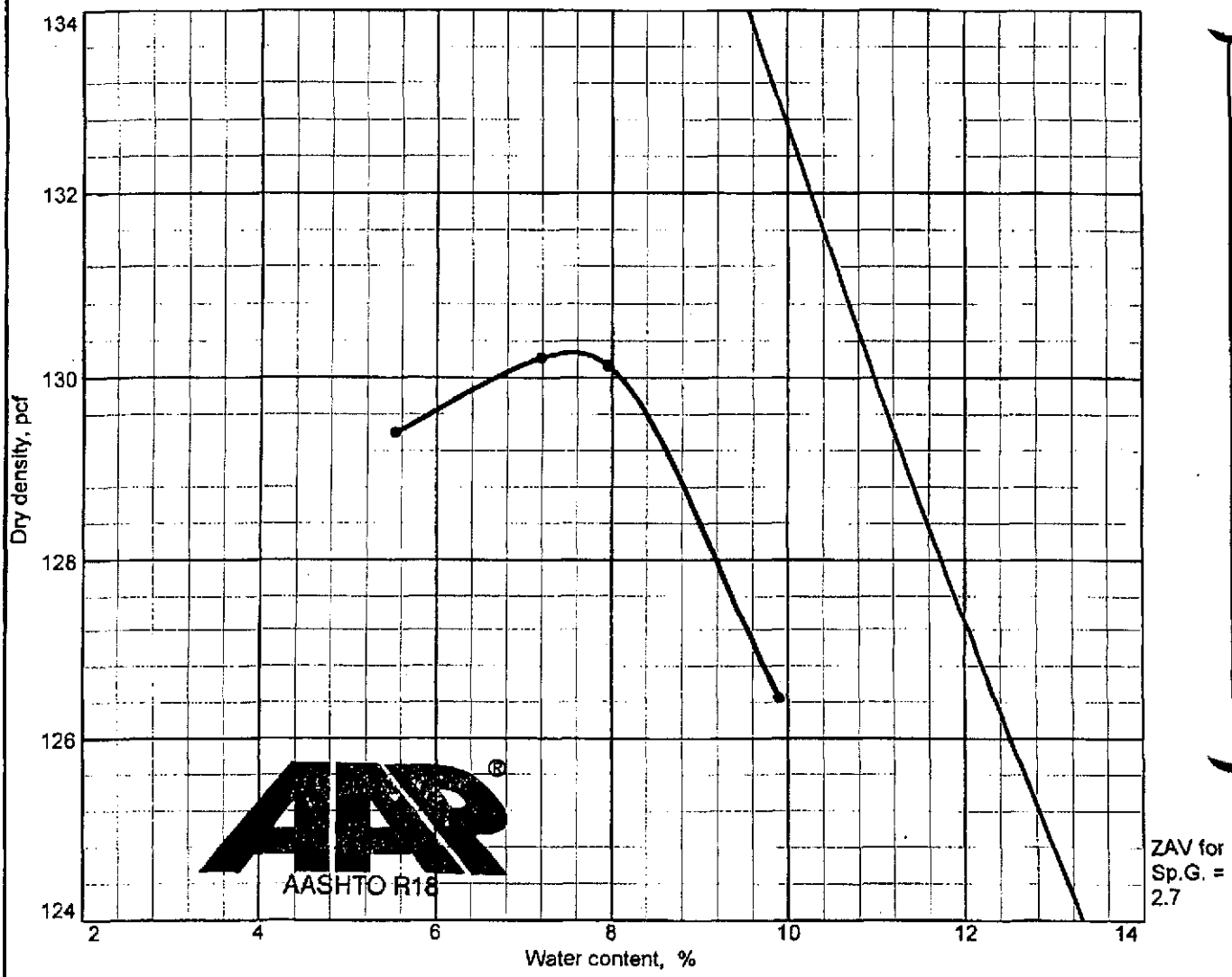
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT3-15-LF

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
				2.752			2.8	21.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 130.3 pcf Optimum moisture = 7.5 %	Silty sand (visual)

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT3 **Sample No.:** SSO-SPT3-15-LF

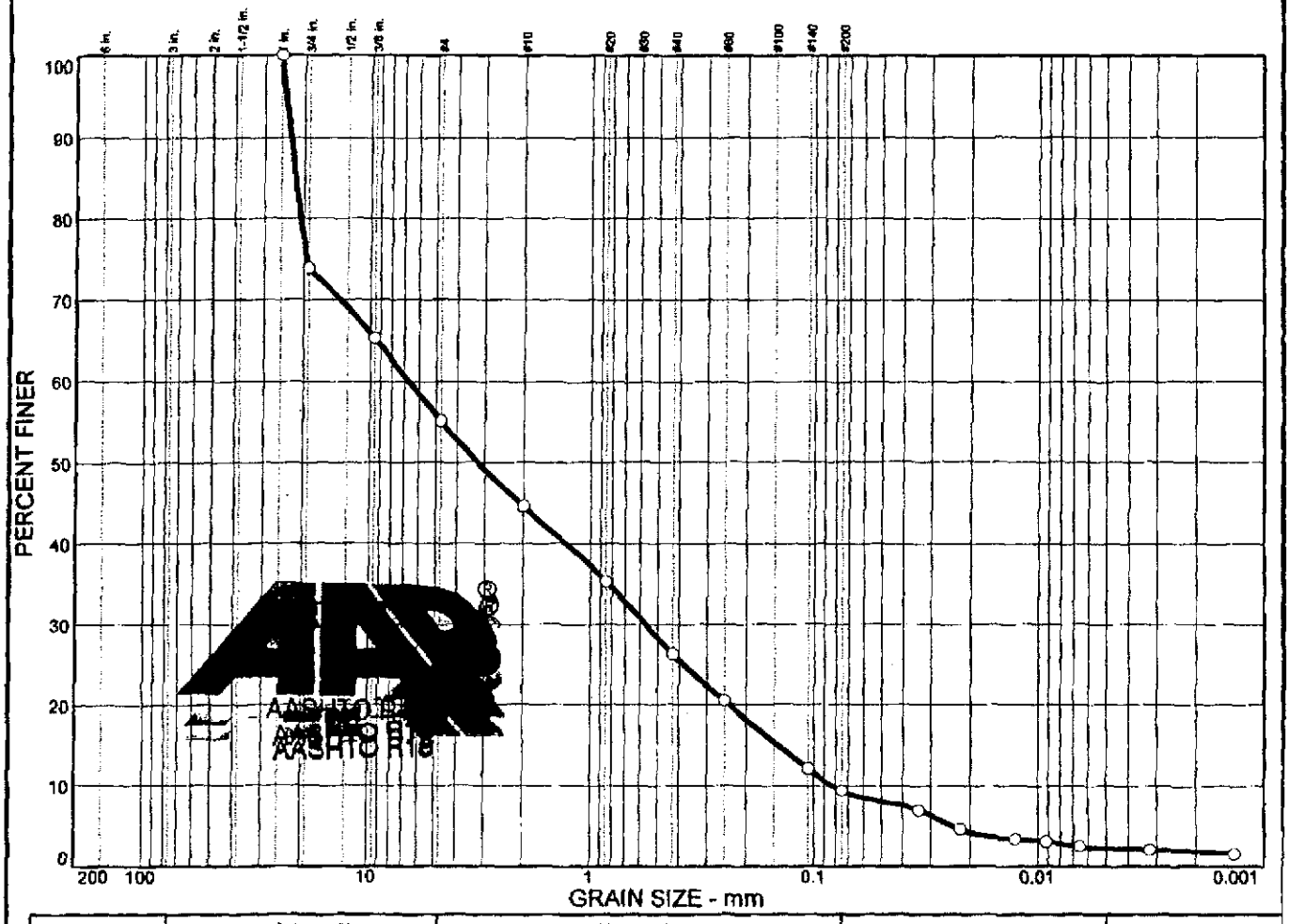
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT3-15-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	44.9	45.7	7.2	2.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			21.9	6.66	3.21	0.565	0.144	0.0823	0.58	80.90

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT4 **Sample No.:** SSO-SPT4-5-LF

Remarks:

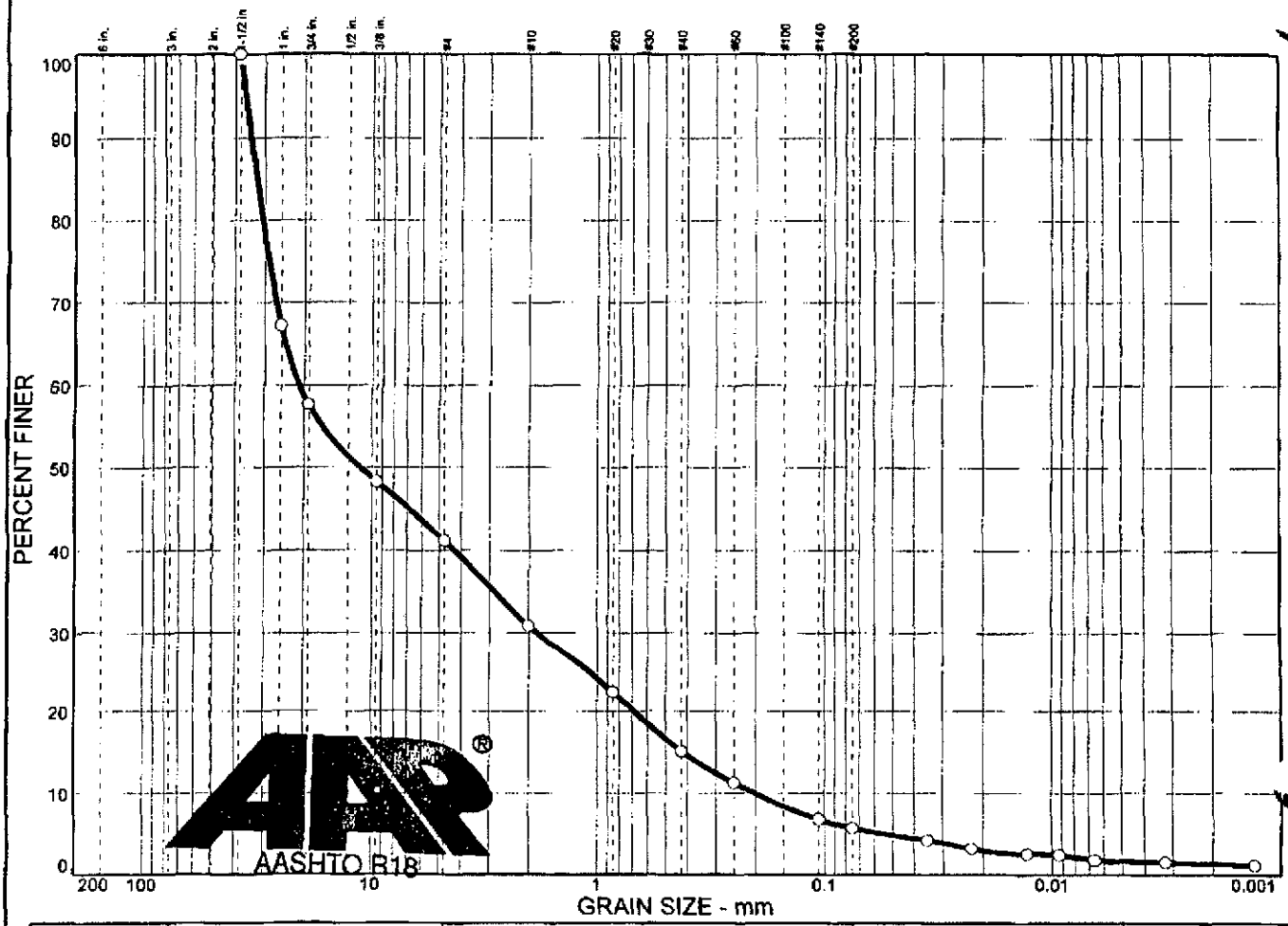
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT4-5-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	58.8	35.5	4.0	1.7

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			32.4	21.1	11.3	1.84	0.420	0.201	0.80	104.55

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Gravel With Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT4 **Sample No.:** SSO-SPT-4-10-LF

Remarks:
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT4-10-LF

Particle Size Distribution Report

	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	38.3	59.0	1.5	1.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			17.2	4.27	2.46	0.905	0.430	0.312	0.61	13.67

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT4 **Sample No.:** SSO-SPT4-15-LF

Remarks:

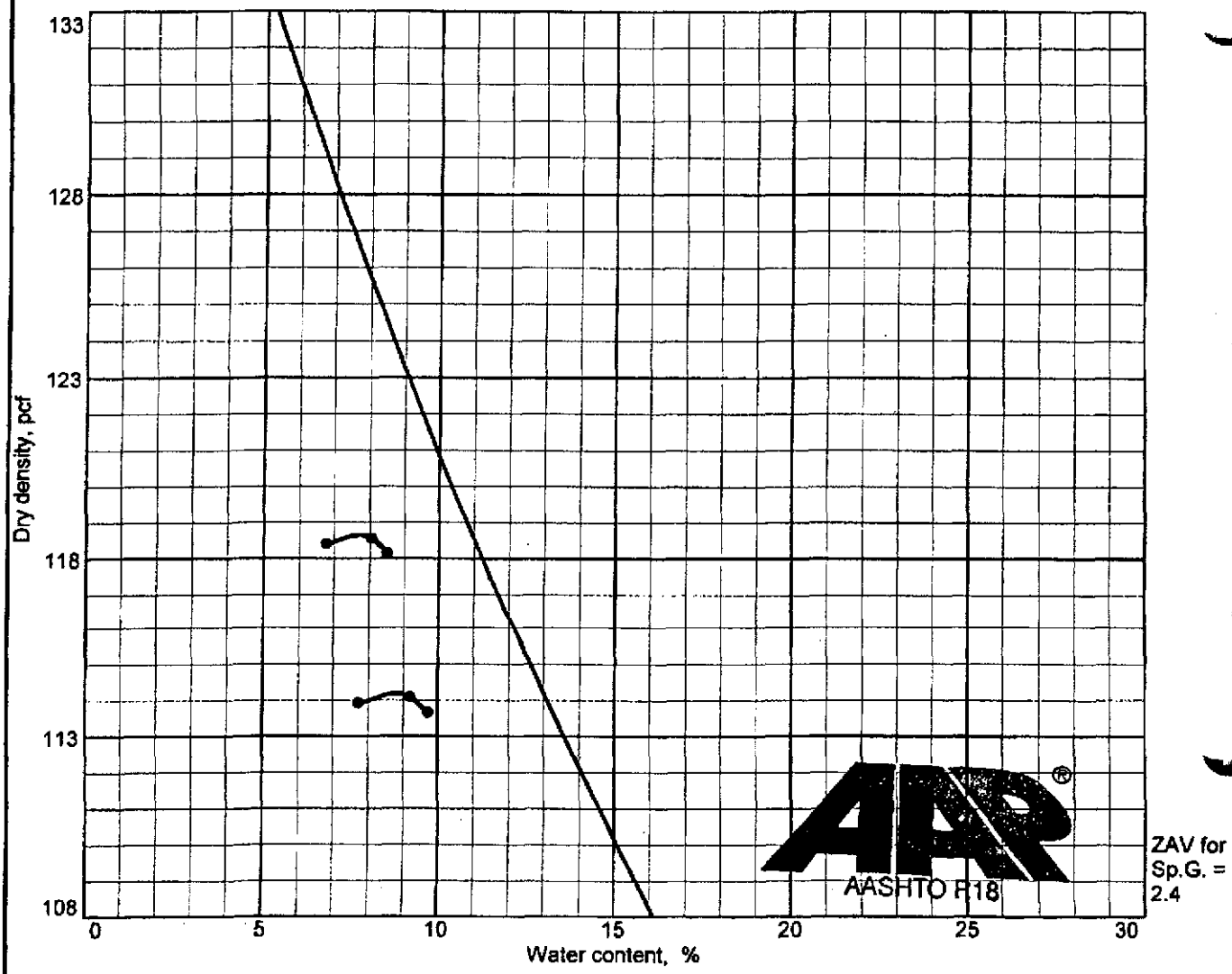
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT4-15-LF

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure C Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
				2.703			12.6	2.7

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 118.7 pcf	114.2 pcf	Poorly graded sand with gravel (Visual)
Optimum moisture = 7.7 %	8.8 %	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT4 **Sample No.:** SSO-SPT4-15-LF

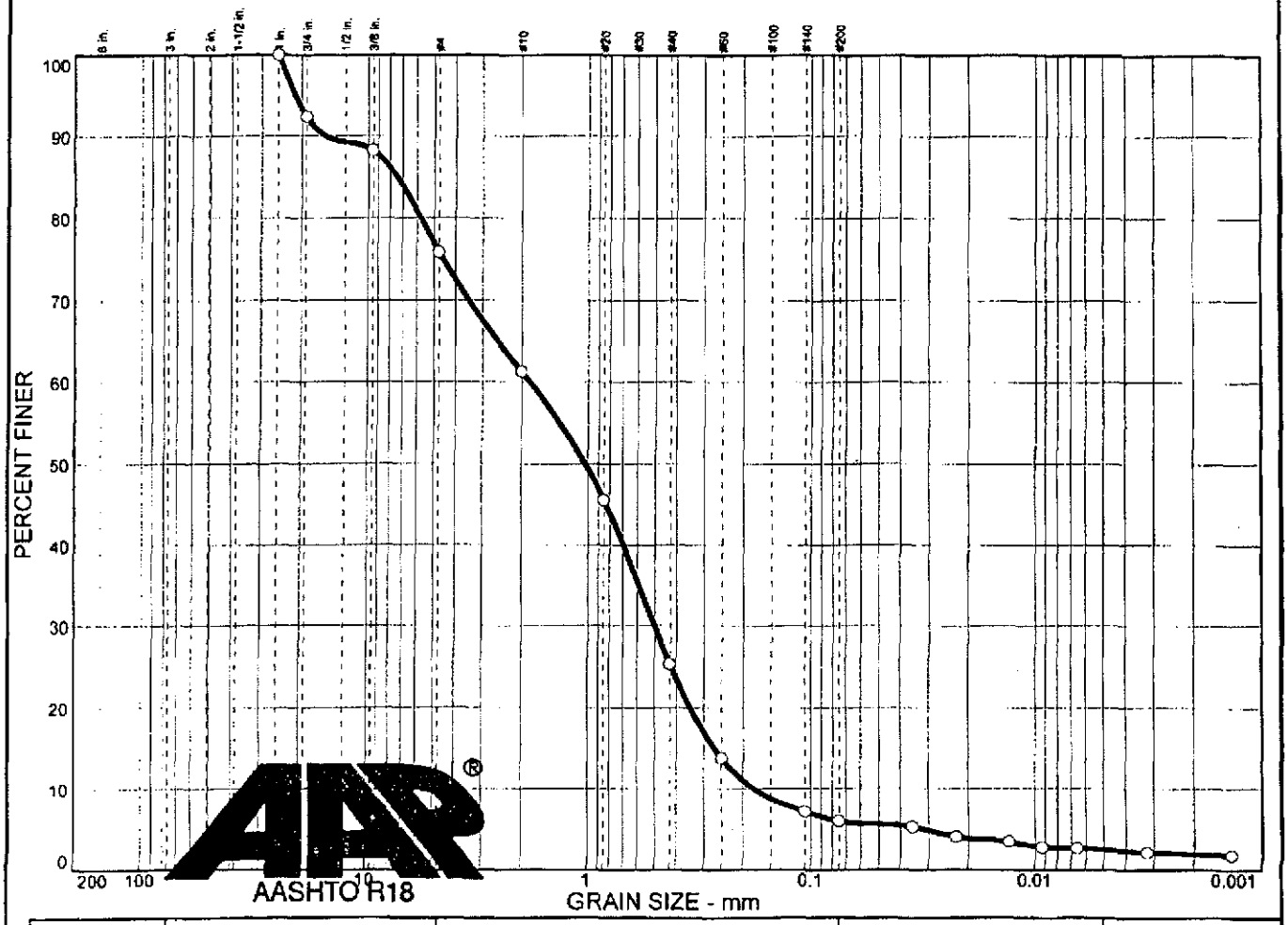
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT4-15-LF

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	24.1	69.9	3.5	2.5

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		7.41	1.83	1.03	0.500	0.269	0.179	0.76	10.24

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SSO-SPT5 **Sample No.:** SSO-SPT5-5-LF

Remarks:

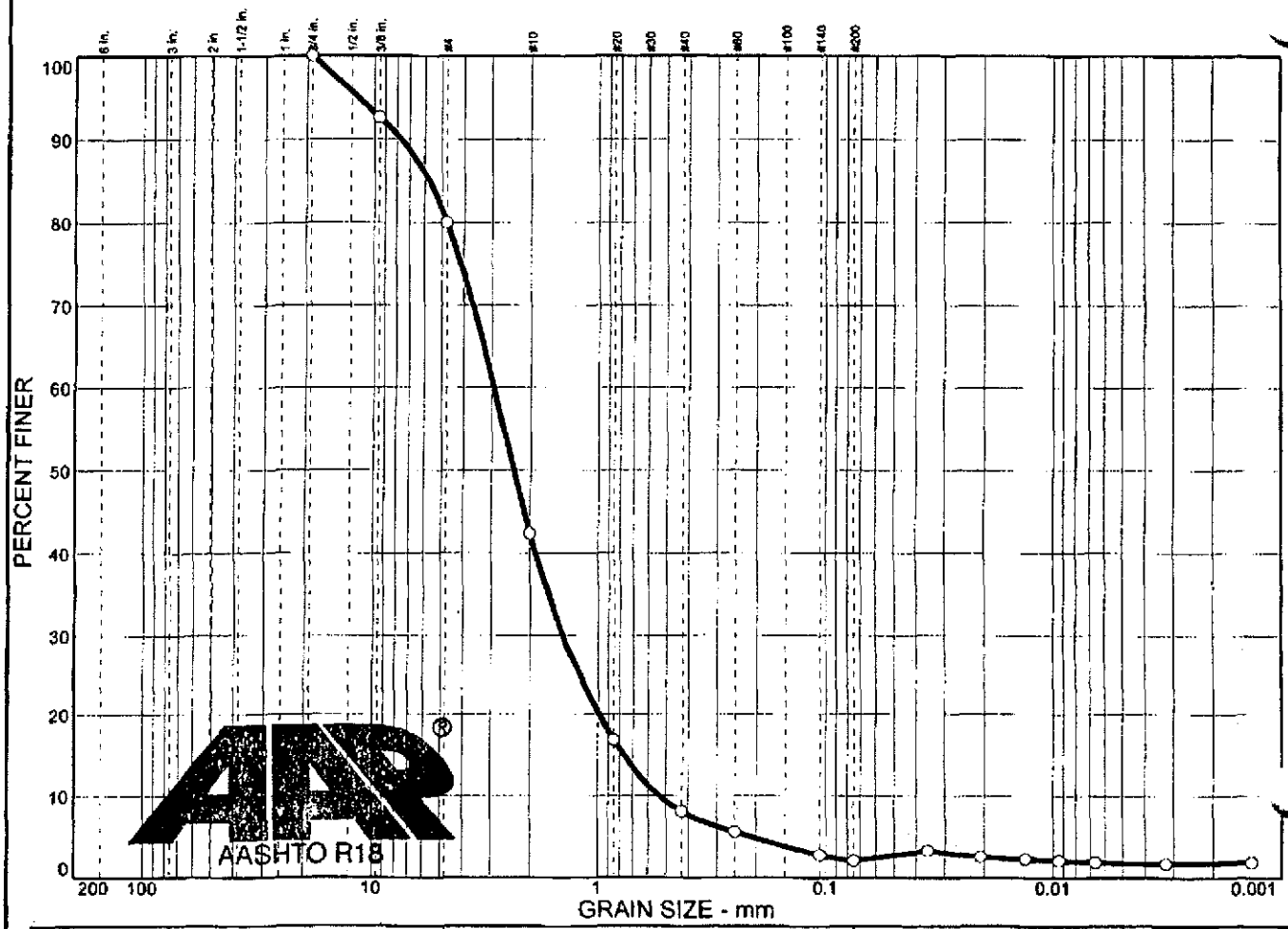
10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT5-5-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	20.0	77.9	0.3	1.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			5.72	2.93	2.37	1.43	0.765	0.529	1.32	5.55

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT5 **Sample No.:** SSO-SPT5-10-LF

Remarks:

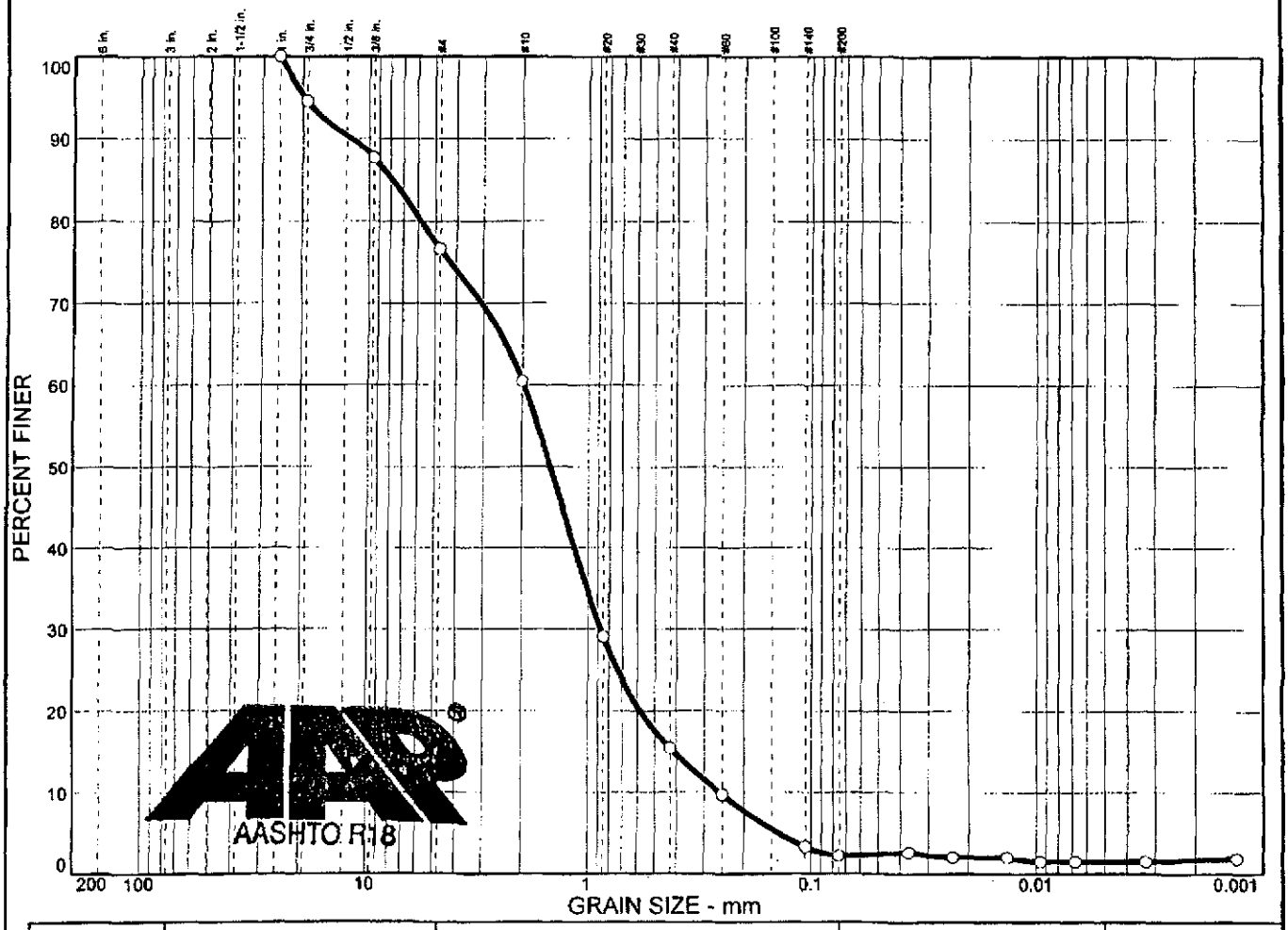
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT-5-10-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	23.4	74.4	0.7	1.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			7.83	1.97	1.48	0.875	0.411	0.255	1.52	7.70

MATERIAL DESCRIPTION	USCS	AASHTO
○ Well Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT5 **Sample No.:** SSO-SPT5-15-LF

Remarks:

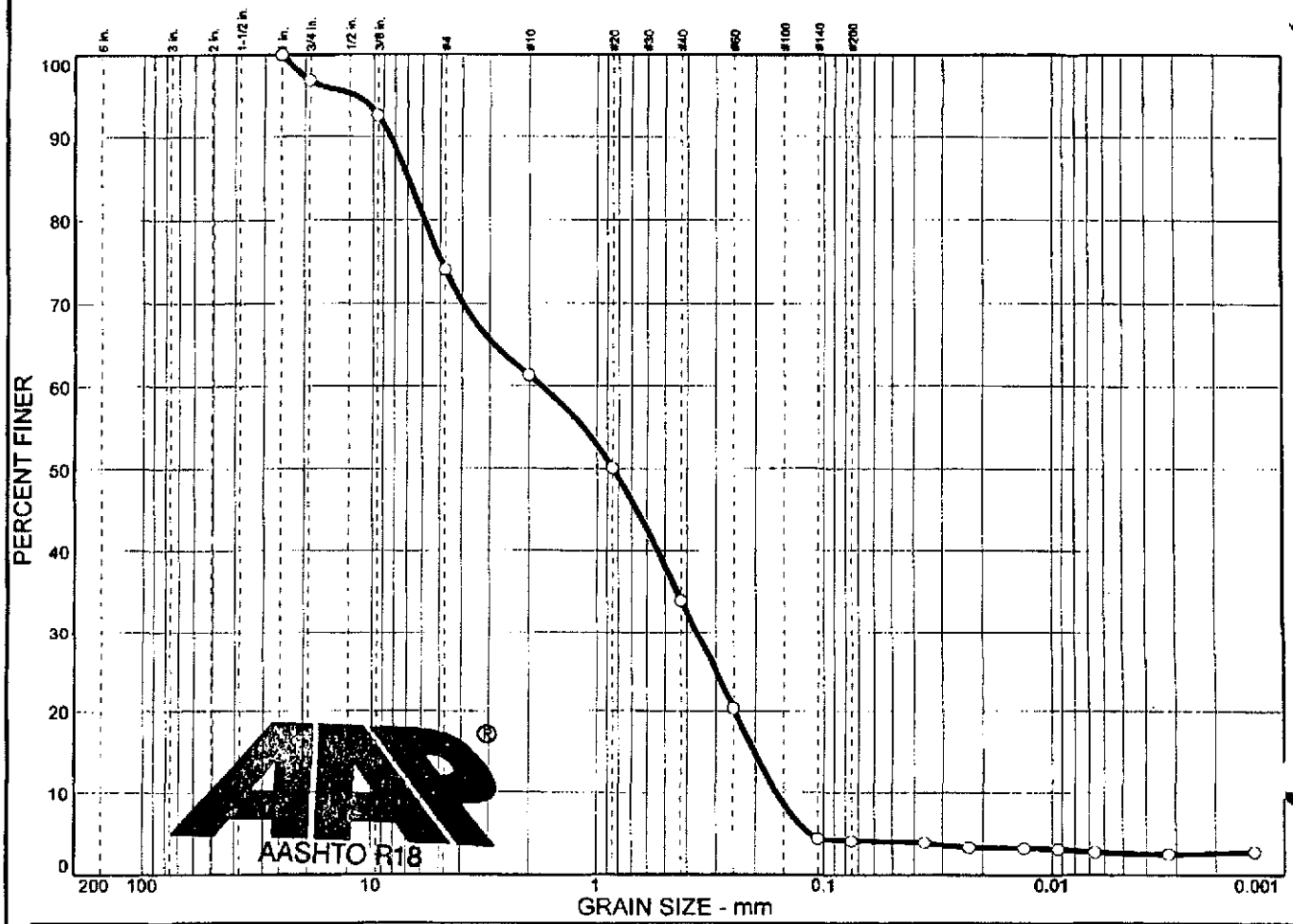
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT5-15-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	26.0	69.9	1.5	2.6

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			6.94	1.76	0.845	0.364	0.202	0.161	0.47	10.91

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT5 **Sample No.:** SSO-SPT5-20-LF

Remarks:

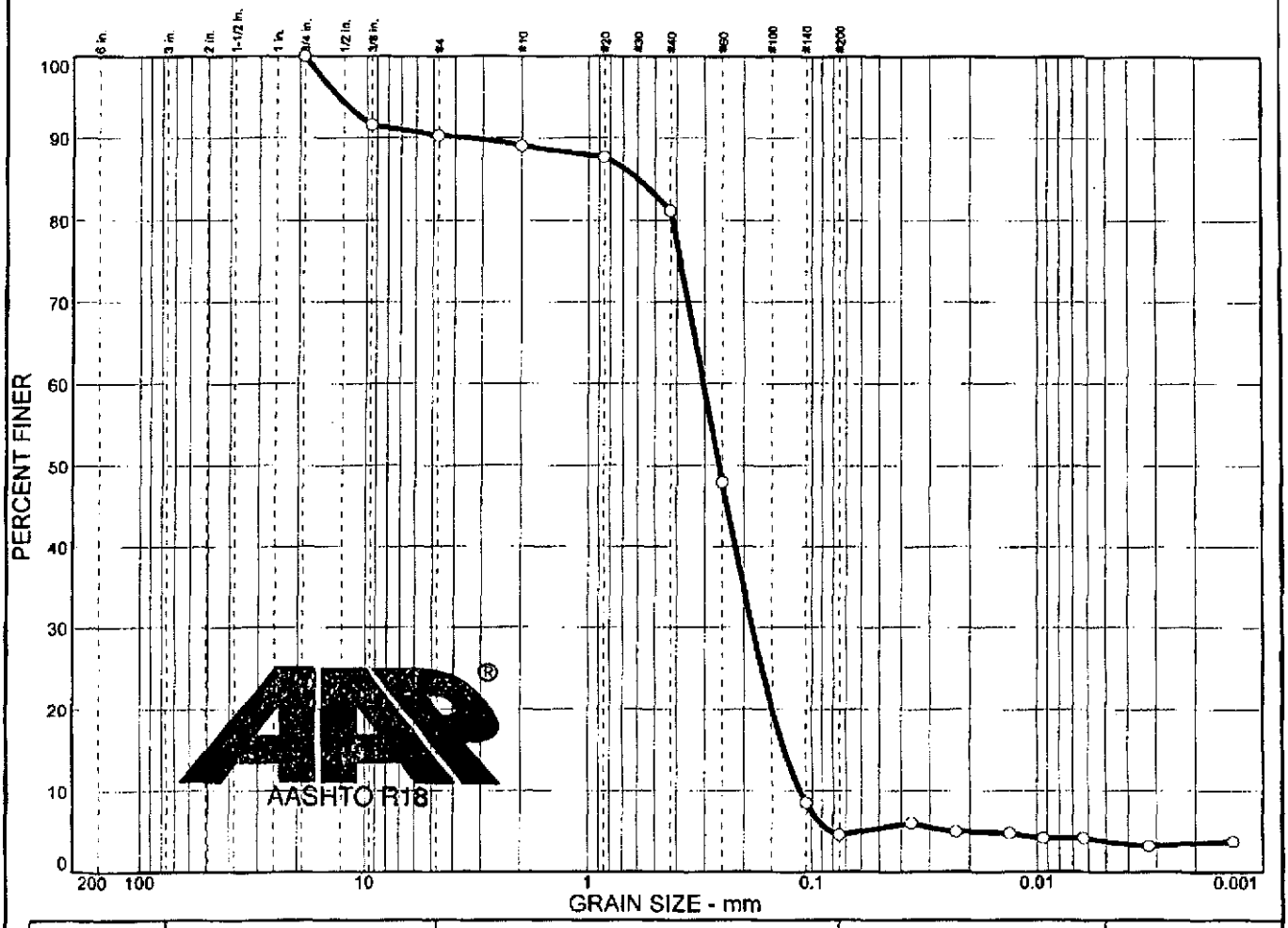
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT5-20-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	9.7	85.7	0.8	3.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.597	0.304	0.259	0.183	0.132	0.113	0.98	2.69

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT5 **Sample No.:** SSO-SPT5-25-LF

Remarks:

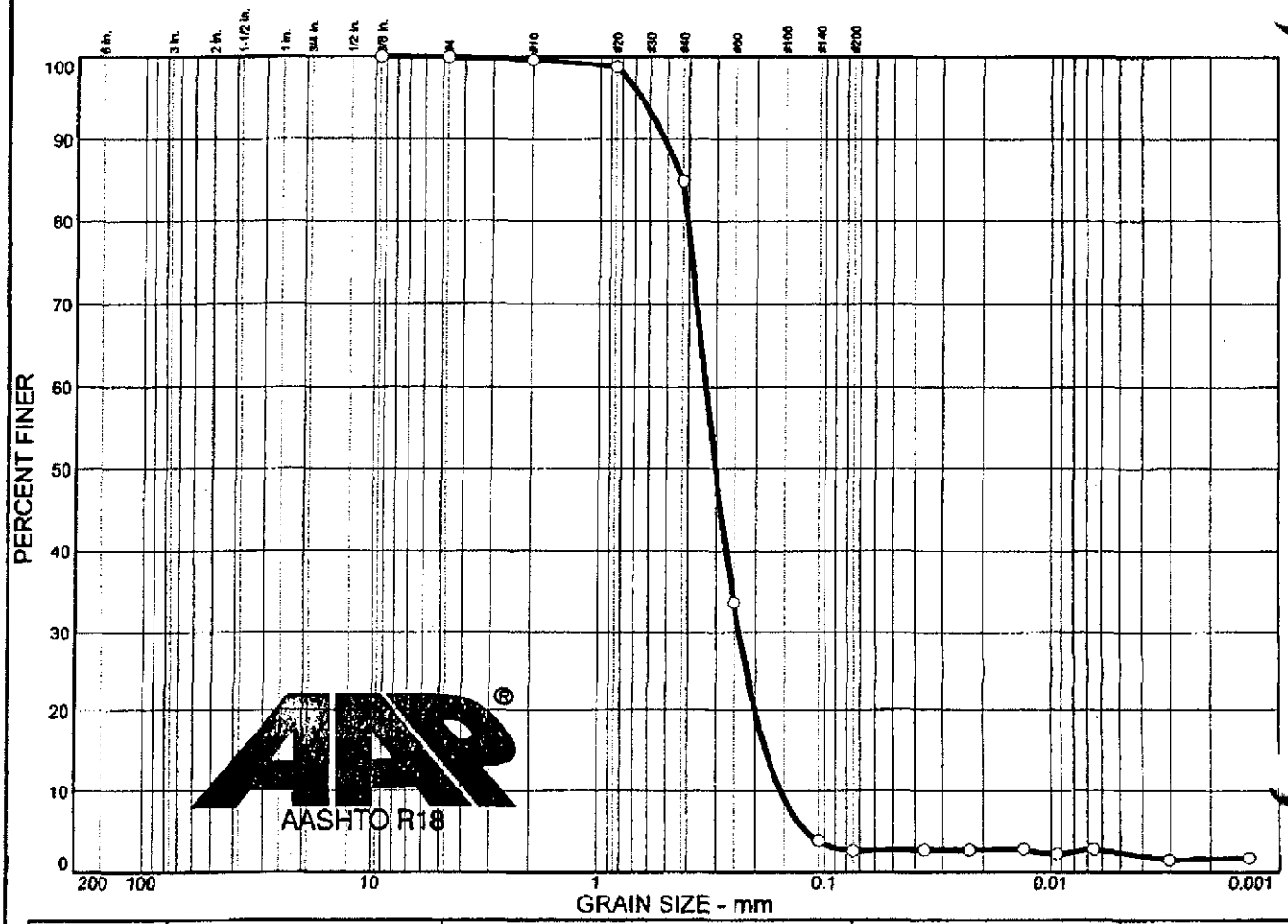
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT5-25-LF

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.1	97.3	0.3	2.3

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		0.426	0.334	0.302	0.238	0.180	0.155	1.09	2.15

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SSO-SPT5 **Sample No.:** SSO-SPT5-35-LF

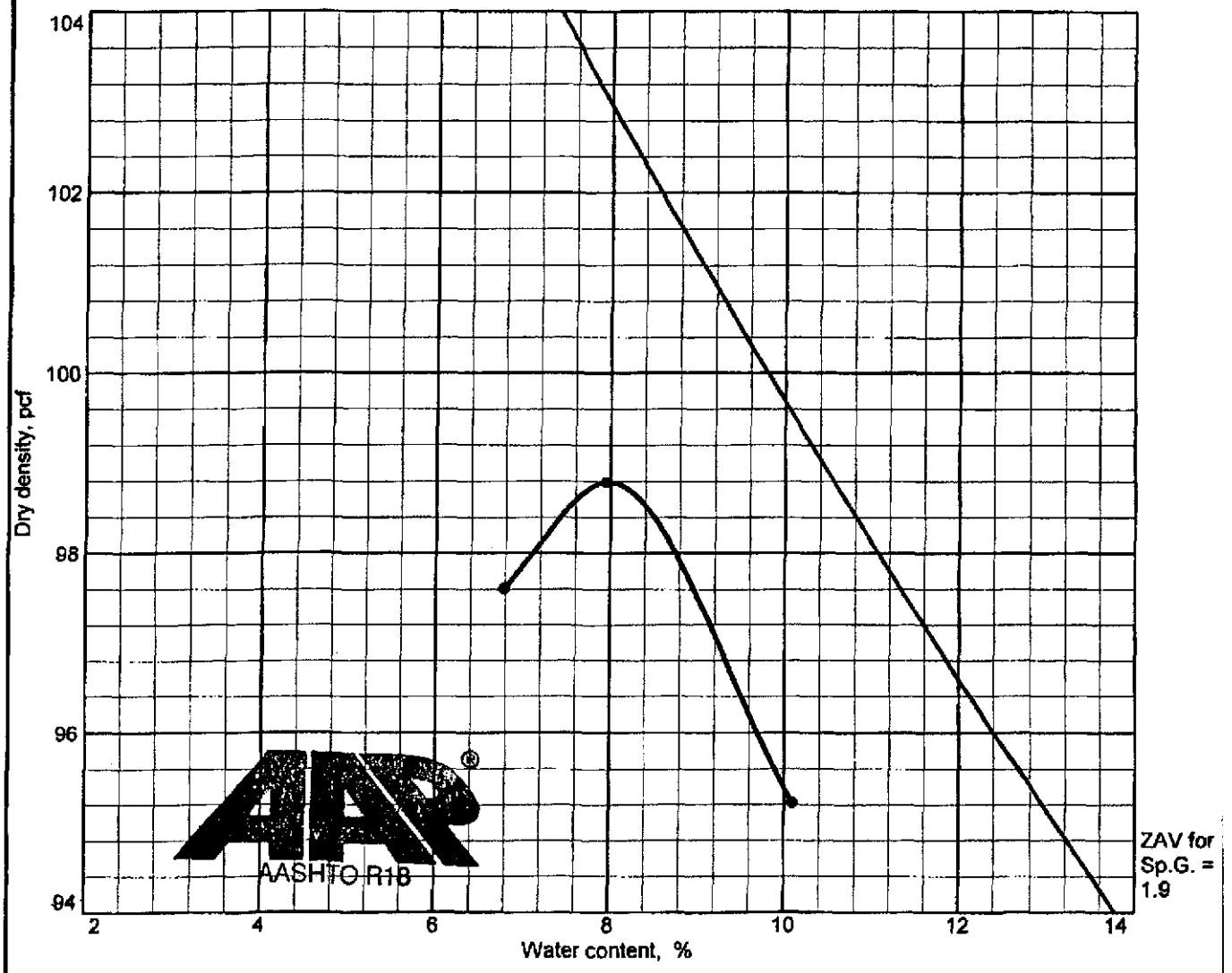
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT5-35-LF

COMPACTION TEST REPORT



Test specification: *ASTM D 698-91 Procedure A Standard*

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
				2.672			0.1	2.6

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 98.8 pcf Optimum moisture = 8.0 %	Poorly graded sand (Visual)

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT5 **Sample No.:** SSO-SPT5-35-LF

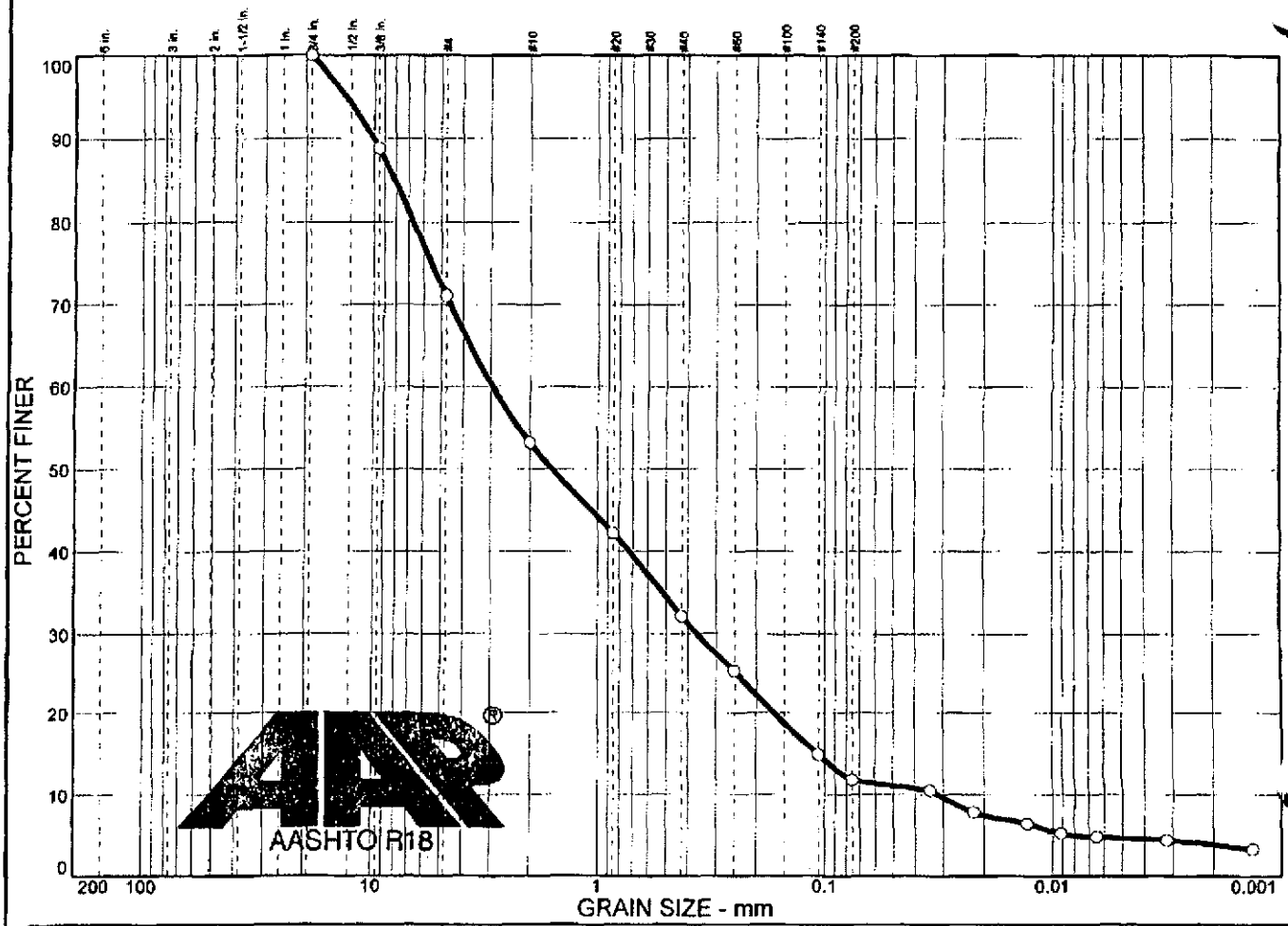
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT5-35-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	29.0	59.2	7.1	4.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			8.09	2.94	1.60	0.364	0.107	0.0319	1.41	91.97

MATERIAL DESCRIPTION	USCS	AASHTO
○ Well-graded sand with silt and gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT6 **Sample No.:** SSO-SPT6-5-UI

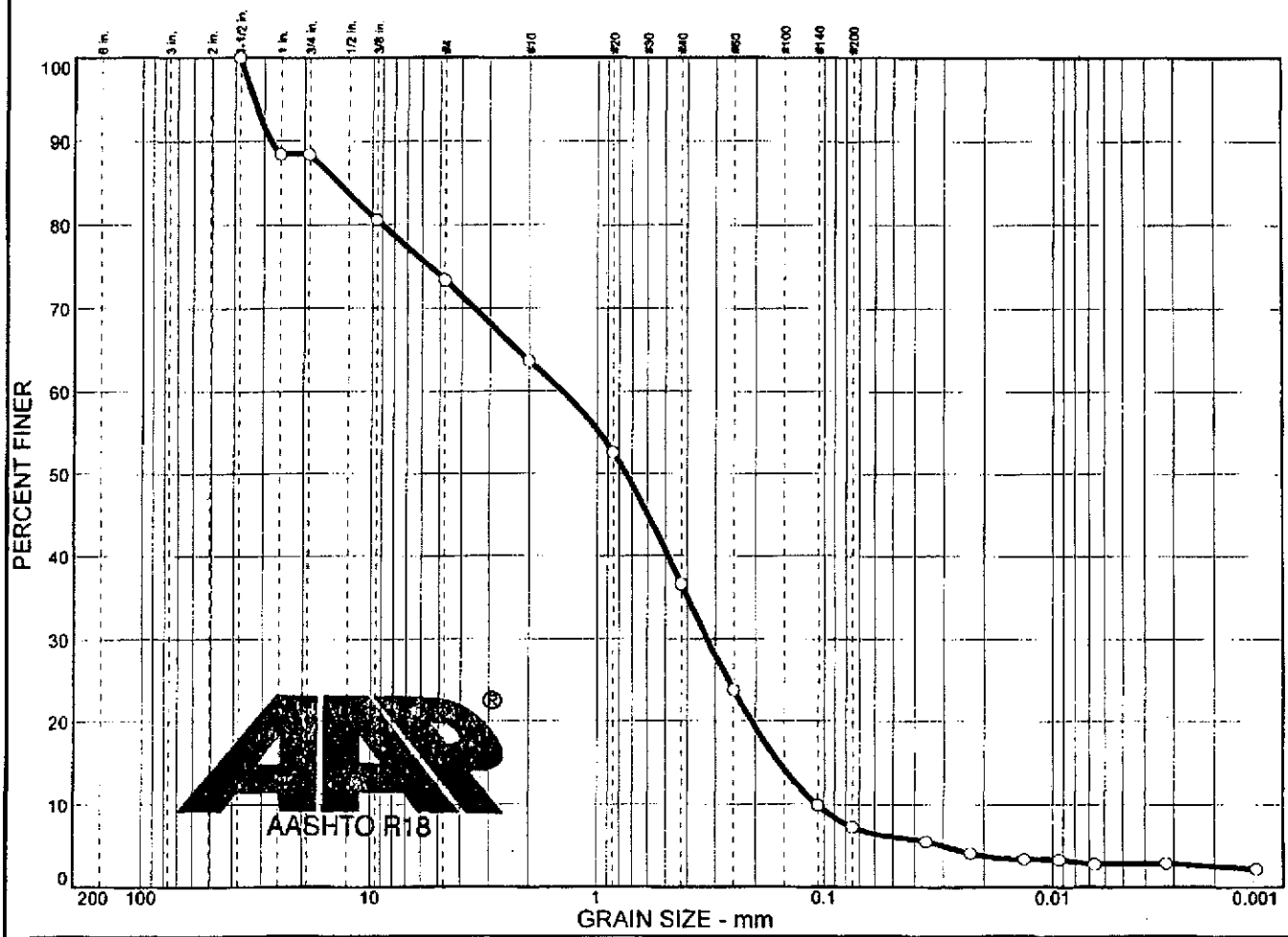
Remarks:
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT6-5-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	26.6	66.1	4.5	2.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			14.1	1.42	0.745	0.326	0.157	0.107	0.70	13.30

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand With Gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT6 **Sample No.:** SSO-SPT6-10-UI

Remarks:

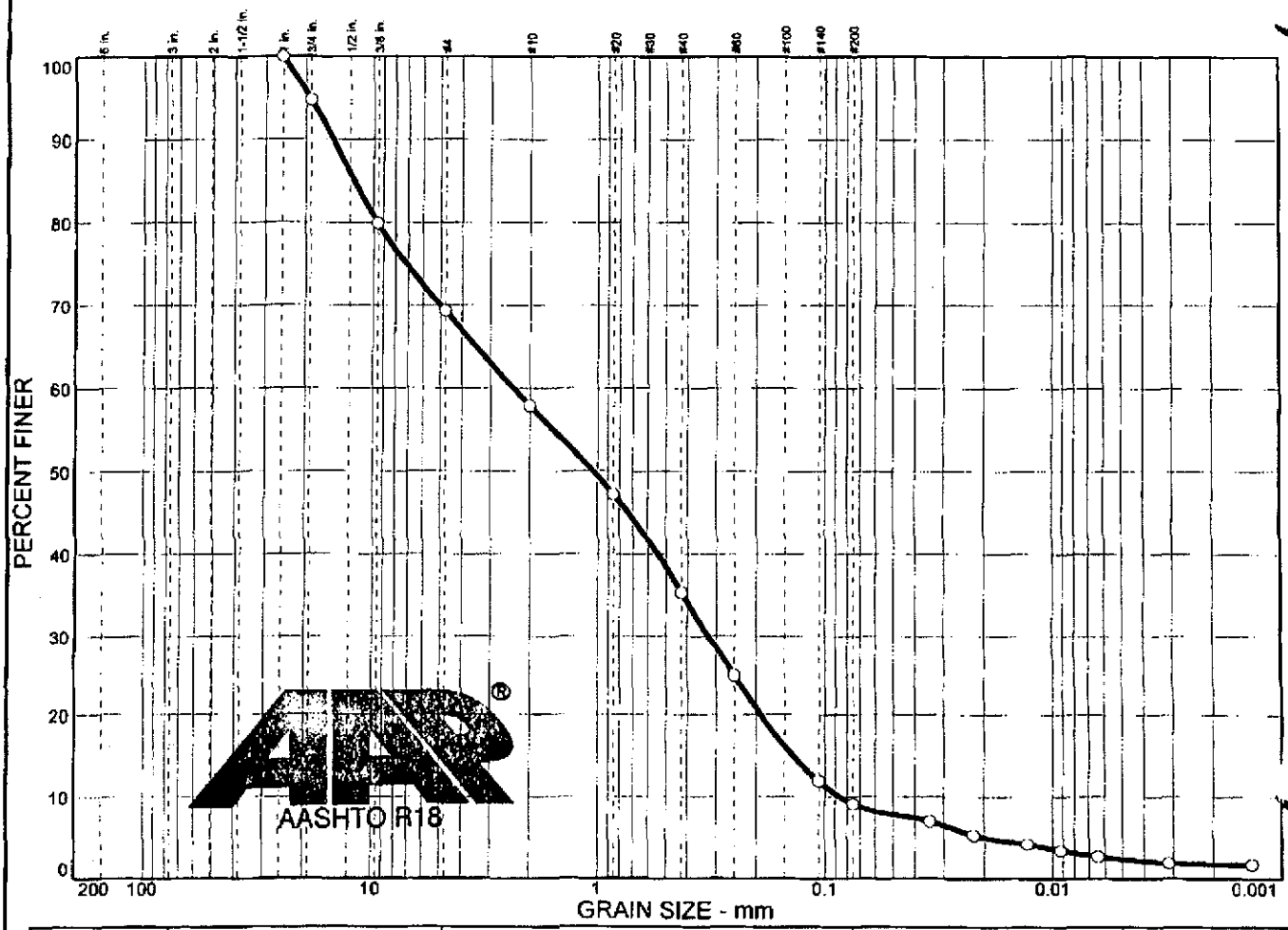
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT6-10-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	30.7	60.2	6.8	2.3

☒	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			12.1	2.36	1.04	0.325	0.137	0.0859	0.52	27.50

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with silt and gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT6 **Sample No.:** SSO-SPT6-15-LF

Remarks:

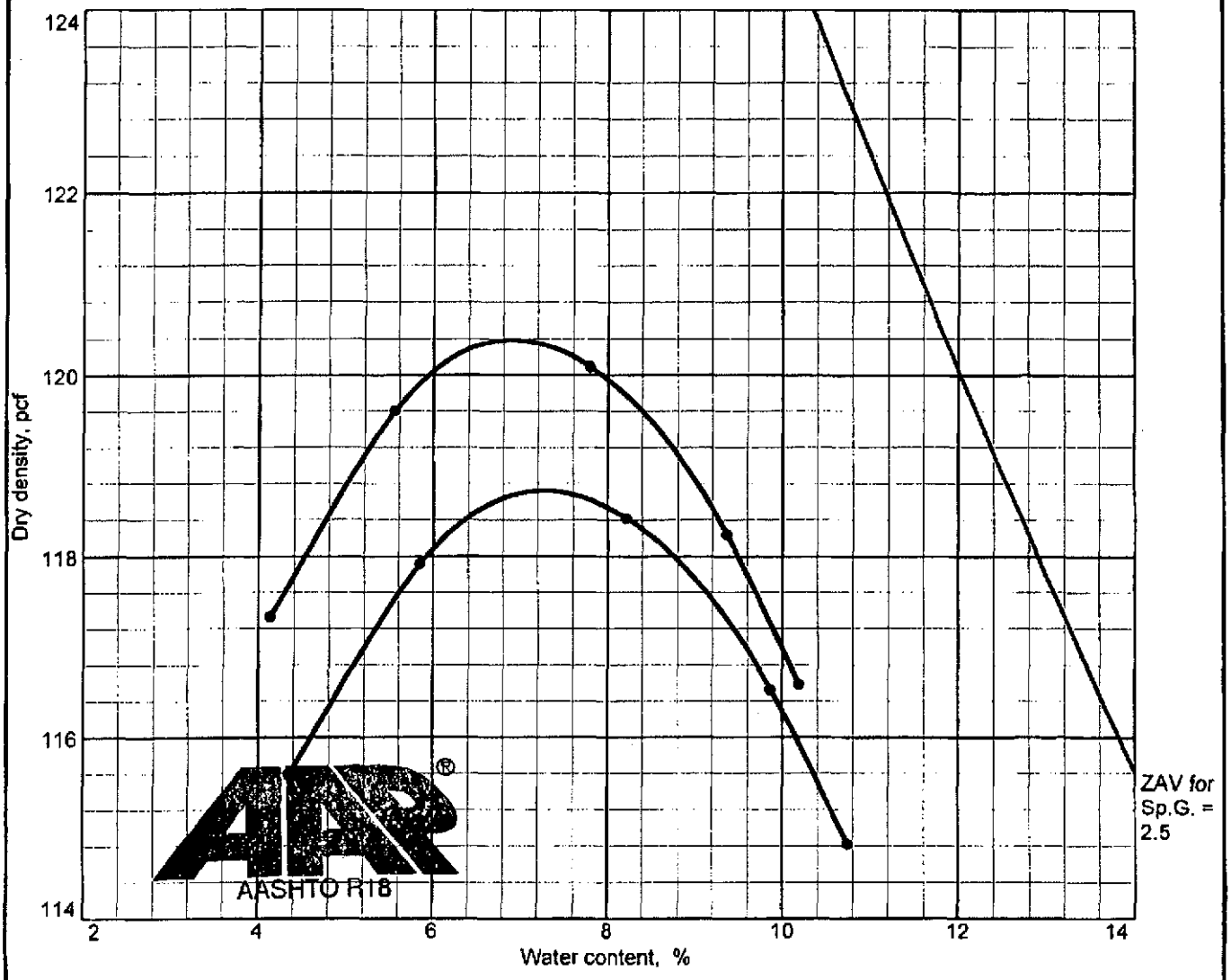
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT6-15-LF

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure C Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 In.	% < No.200
	USCS	AASHTO						
				2.688			5.2	9.1

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 120.4 pcf	118.7 pcf	Poorly graded sand with silt and gravel (visual)
Optimum moisture = 6.9 %	7.3 %	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT6 **Sample No.:** SSO-SPT6-15-LF

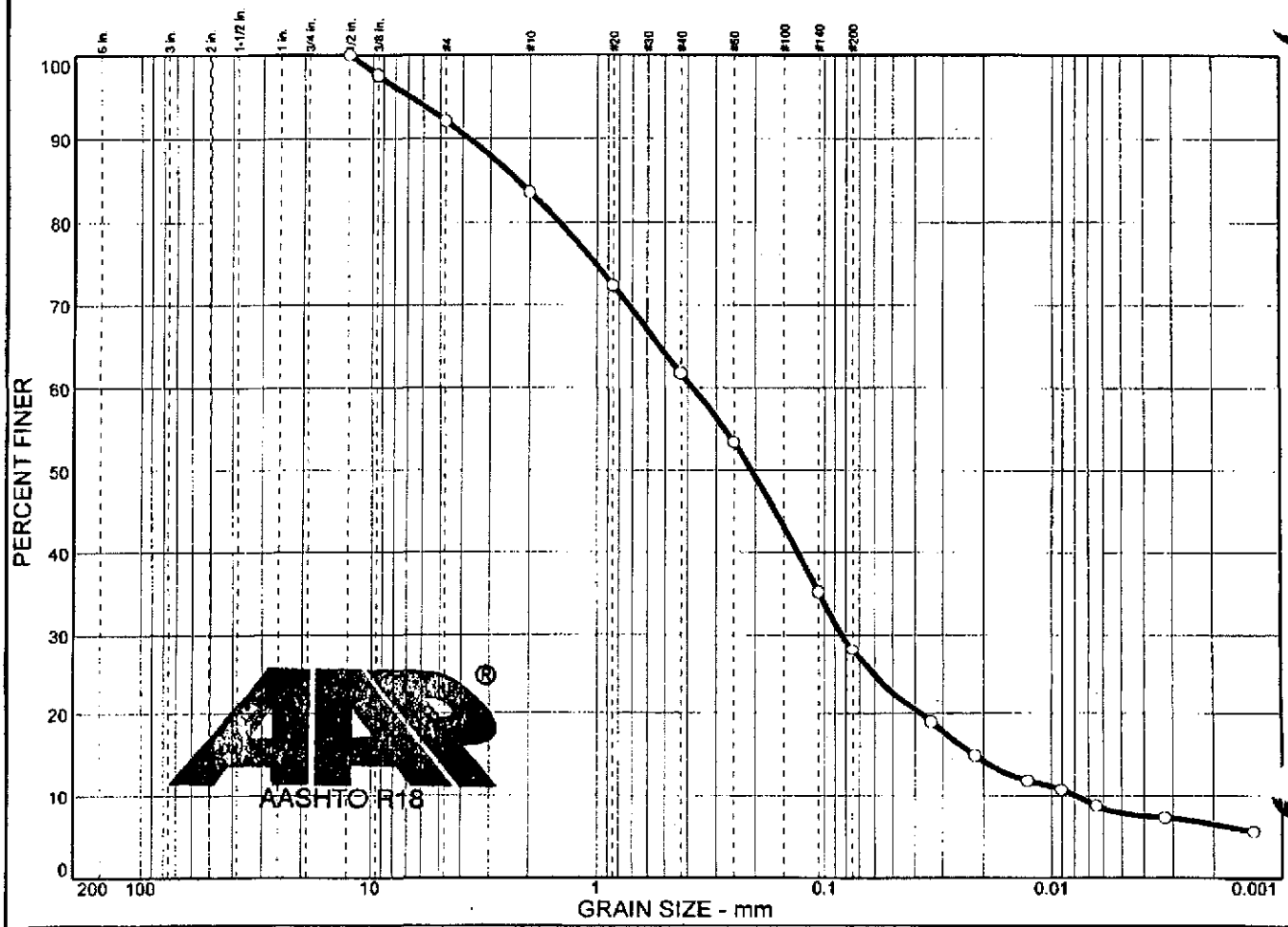
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT6-15-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	7.9	64.1	20.1	7.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.27	0.379	0.209	0.0834	0.0220	0.0079	2.33	48.22

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT7 **Sample No.:** SSO-SPT7-5-UI

Remarks:

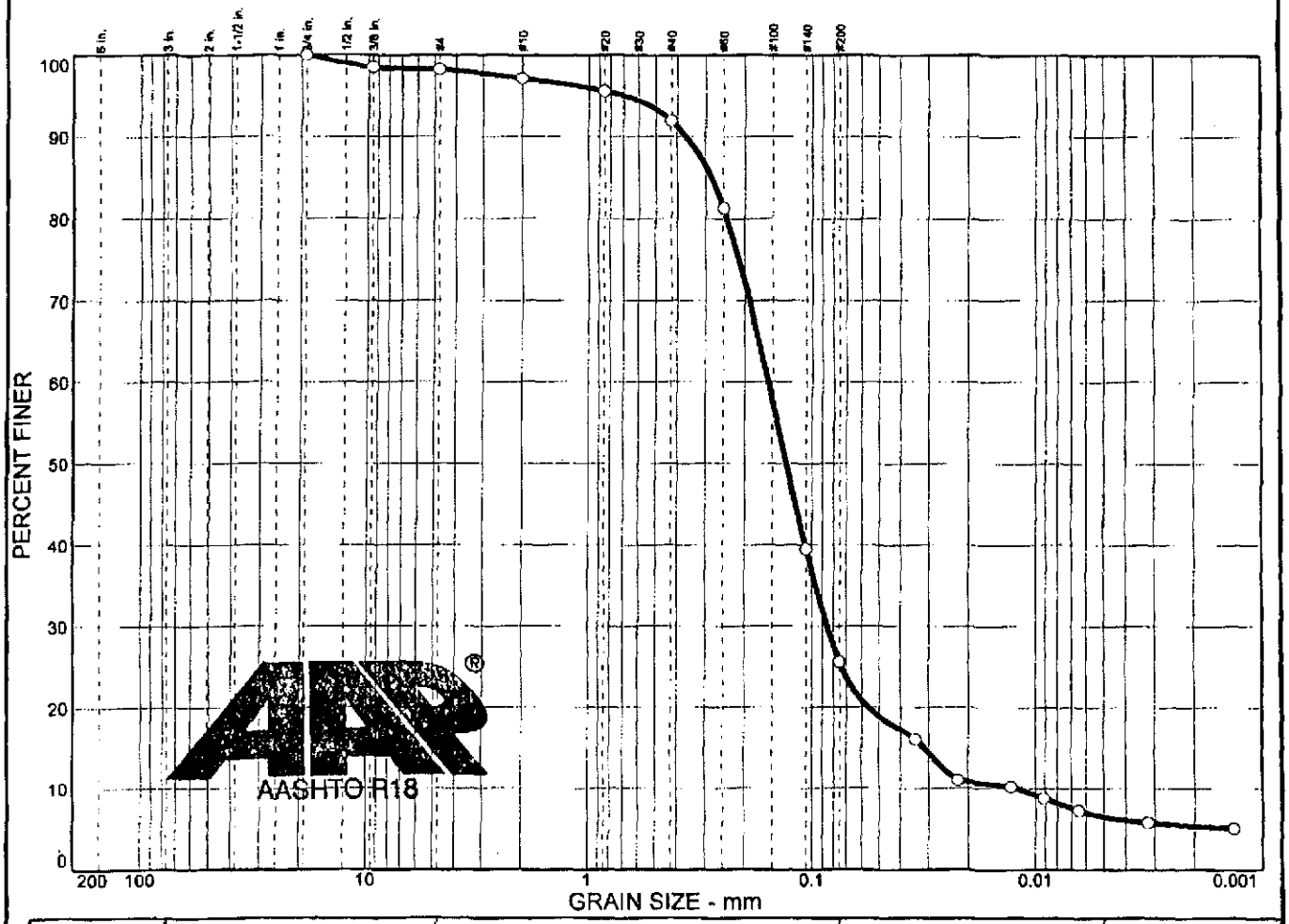
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT7-5-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	1.8	72.6	19.1	6.5

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.283	0.157	0.130	0.0854	0.0312	0.0122	3.81	12.83

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT7 **Sample No.:** SSO-SPT7-10-UI

Remarks:

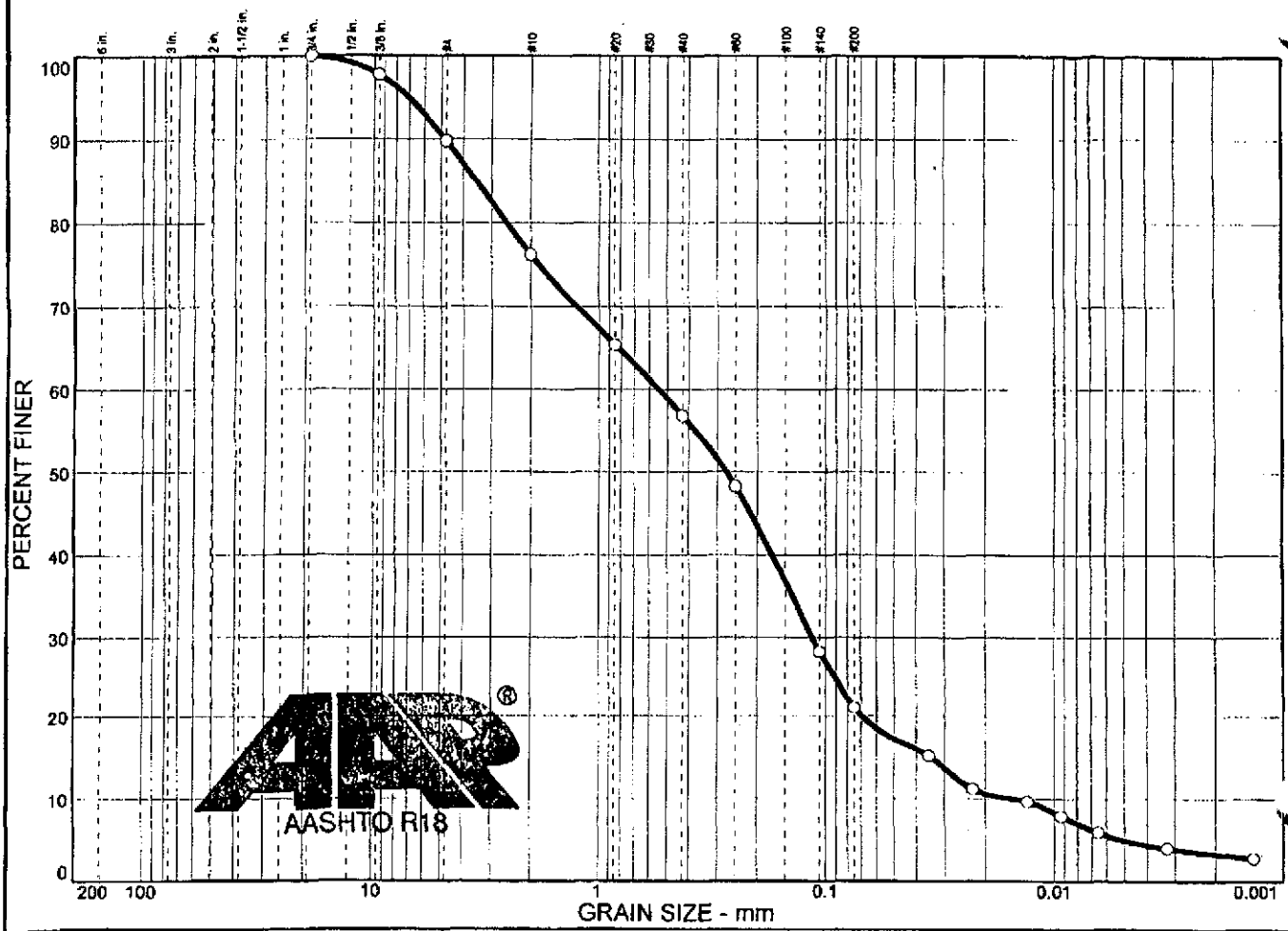
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT7-10-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	10.2	68.7	16.2	4.9

X	LL	PI	D_{85}	D_{60}	D_{60}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.49	0.543	0.274	0.114	0.0342	0.0147	1.63	36.89

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT7 **Sample No.:** SSO-SPT7-15-LF

Remarks:

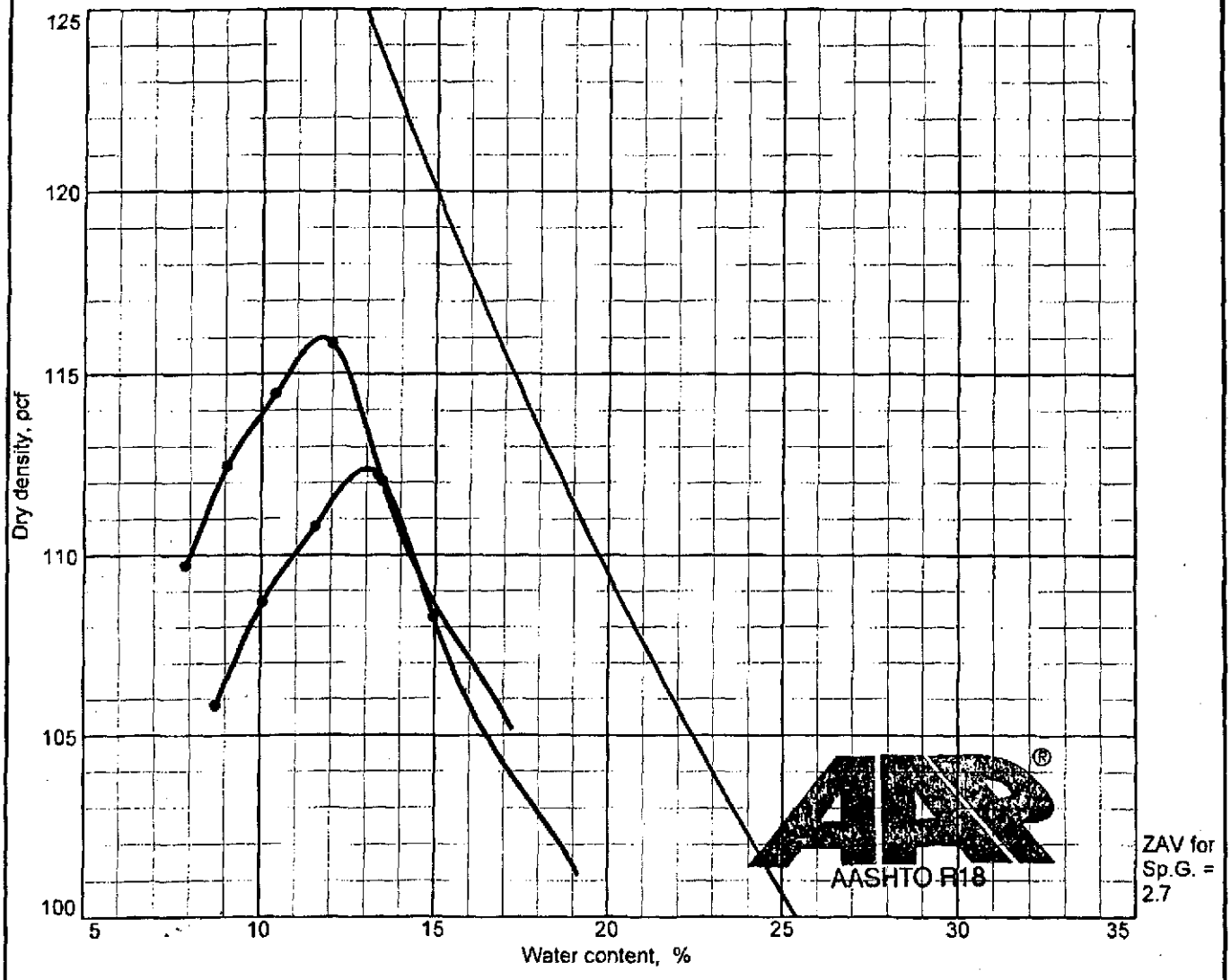
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT7-15-LF

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure A Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
				2.709			10.2	21.1

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 116.0 pcf	112.4 pcf	Silty sand (visual)
Optimum moisture = 11.7 %	13.0 %	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT7 **Sample No.:** SSO-SPT7-15-LF

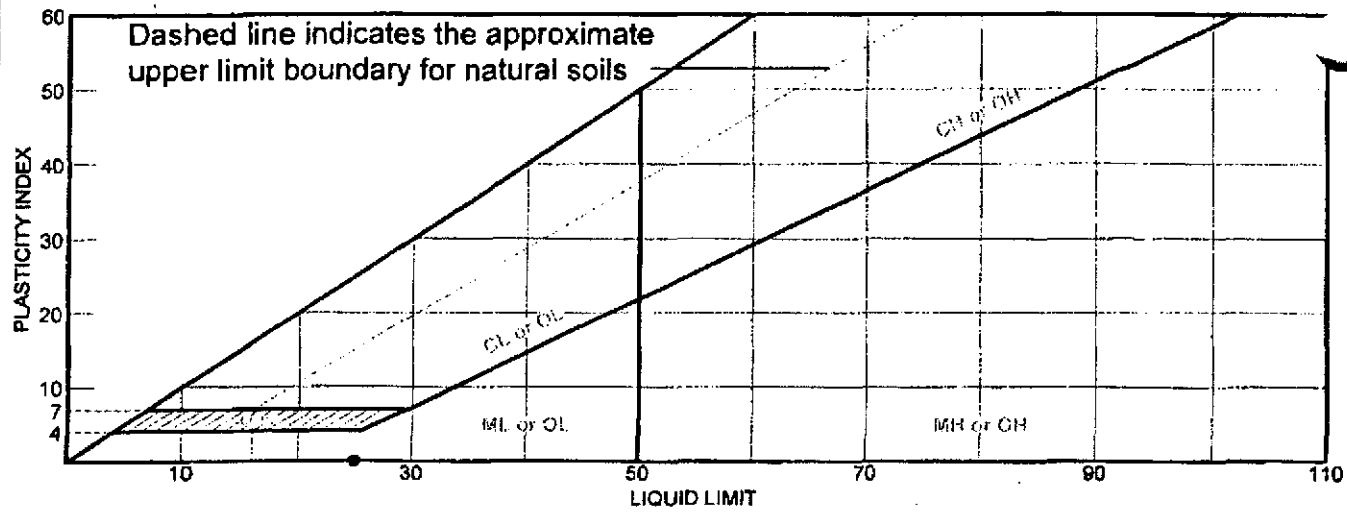
Remarks:

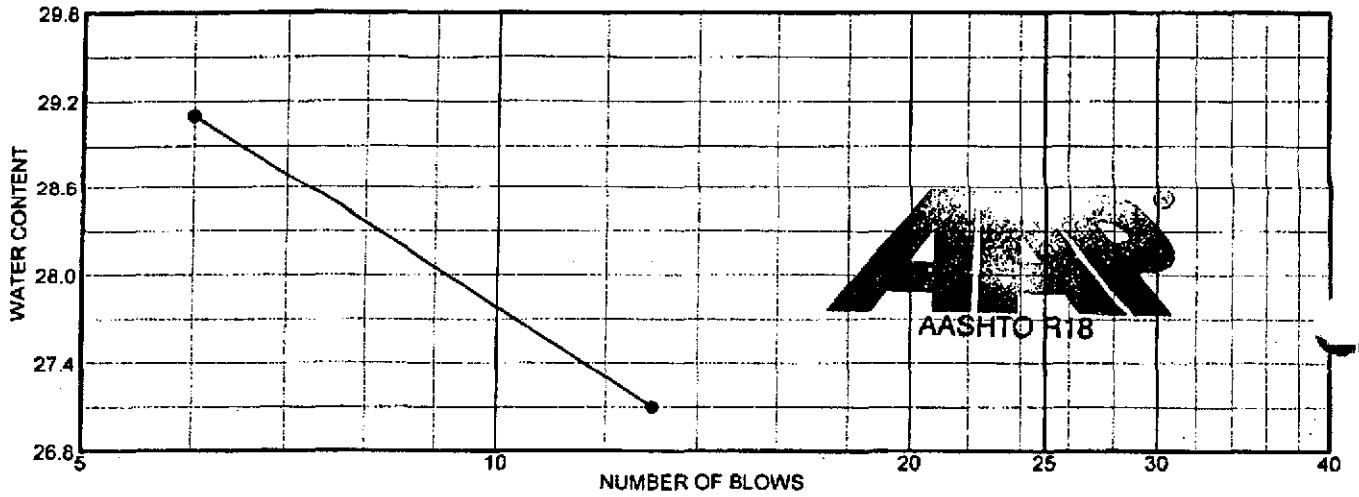
COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT7-15-LF

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty sand (visual)	25	25	0	56.8	21.1	SM

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT7 **Sample No.:** SSO-SPT7-15-LF

Remarks:

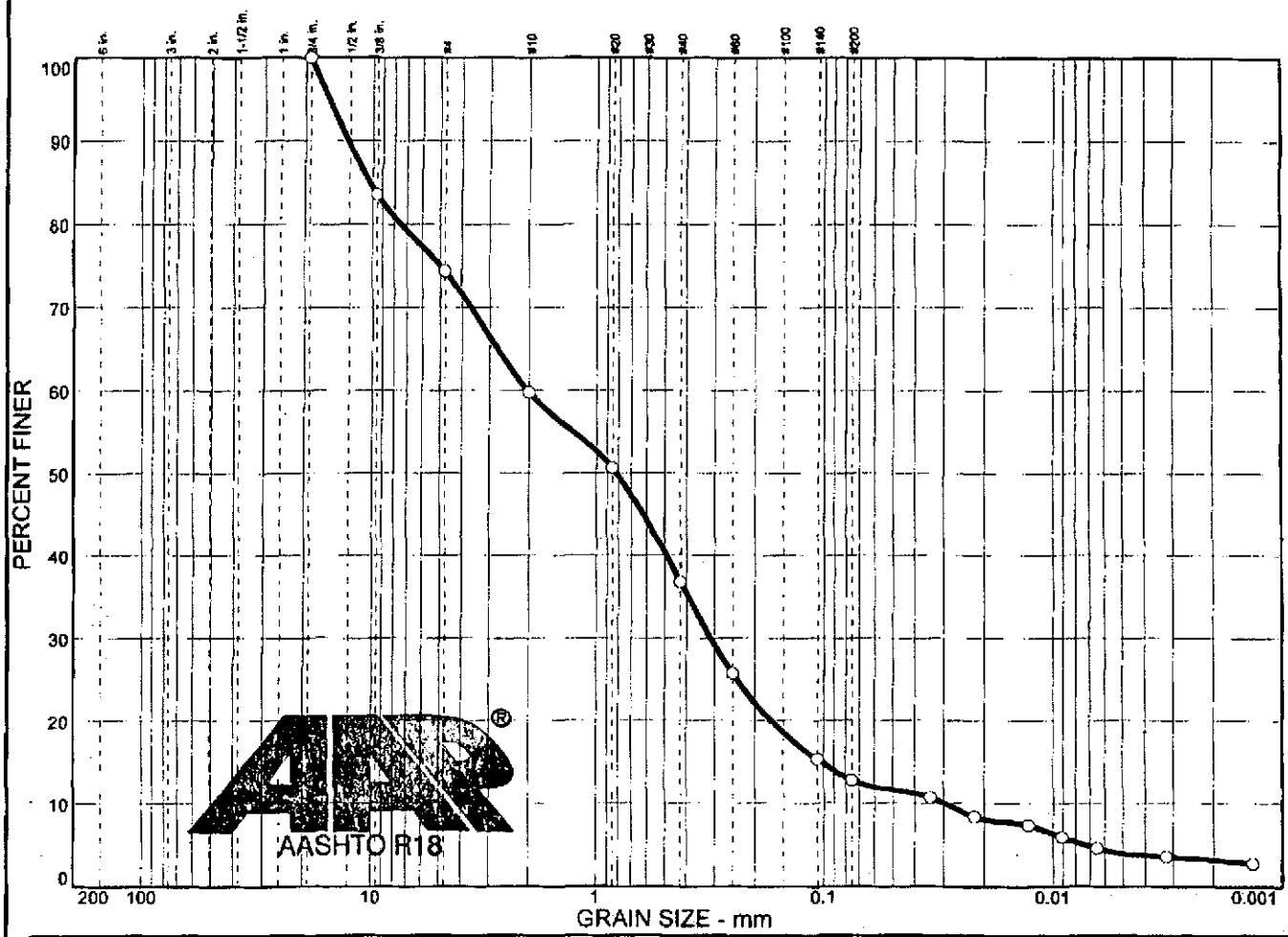
●

LIQUID AND PLASTIC LIMITS TEST REPORT

SHIELD ENGINEERING

Figure SPT7-15-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	25.6	61.6	8.8	4.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			10.3	2.03	0.817	0.312	0.102	0.0299	1.61	67.96

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand with gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT8 **Sample No.:** SSO-SPT8-5-NP

Remarks:

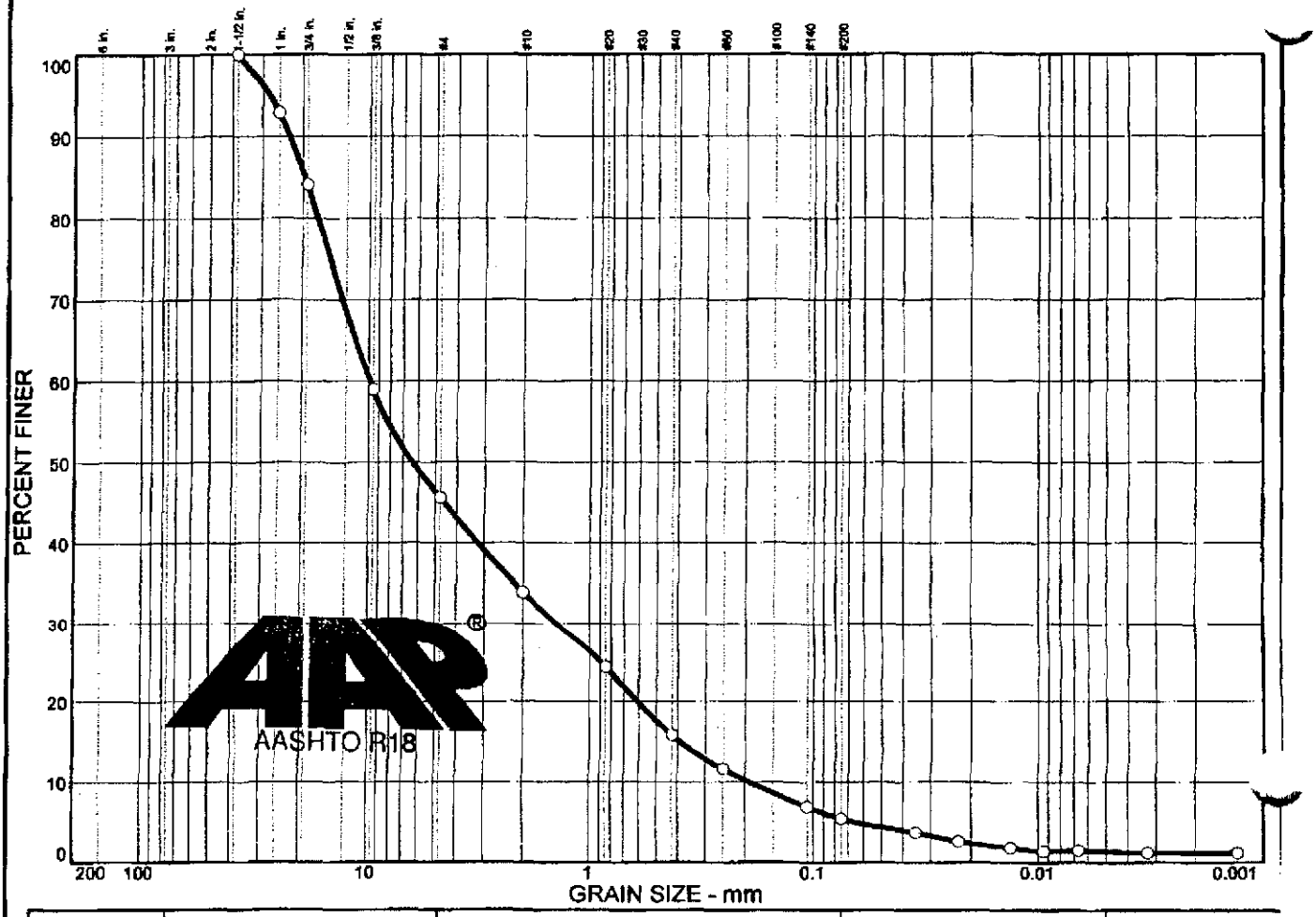
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT8-5-NP

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	54.4	40.2	4.0	1.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			19.5	9.85	6.35	1.41	0.392	0.192	1.06	51.32

MATERIAL DESCRIPTION	USCS	AASHTO
○ Well Graded Gravel With Silt and Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT8 **Sample No.:** SSO-SPT8-10-NP

Remarks:

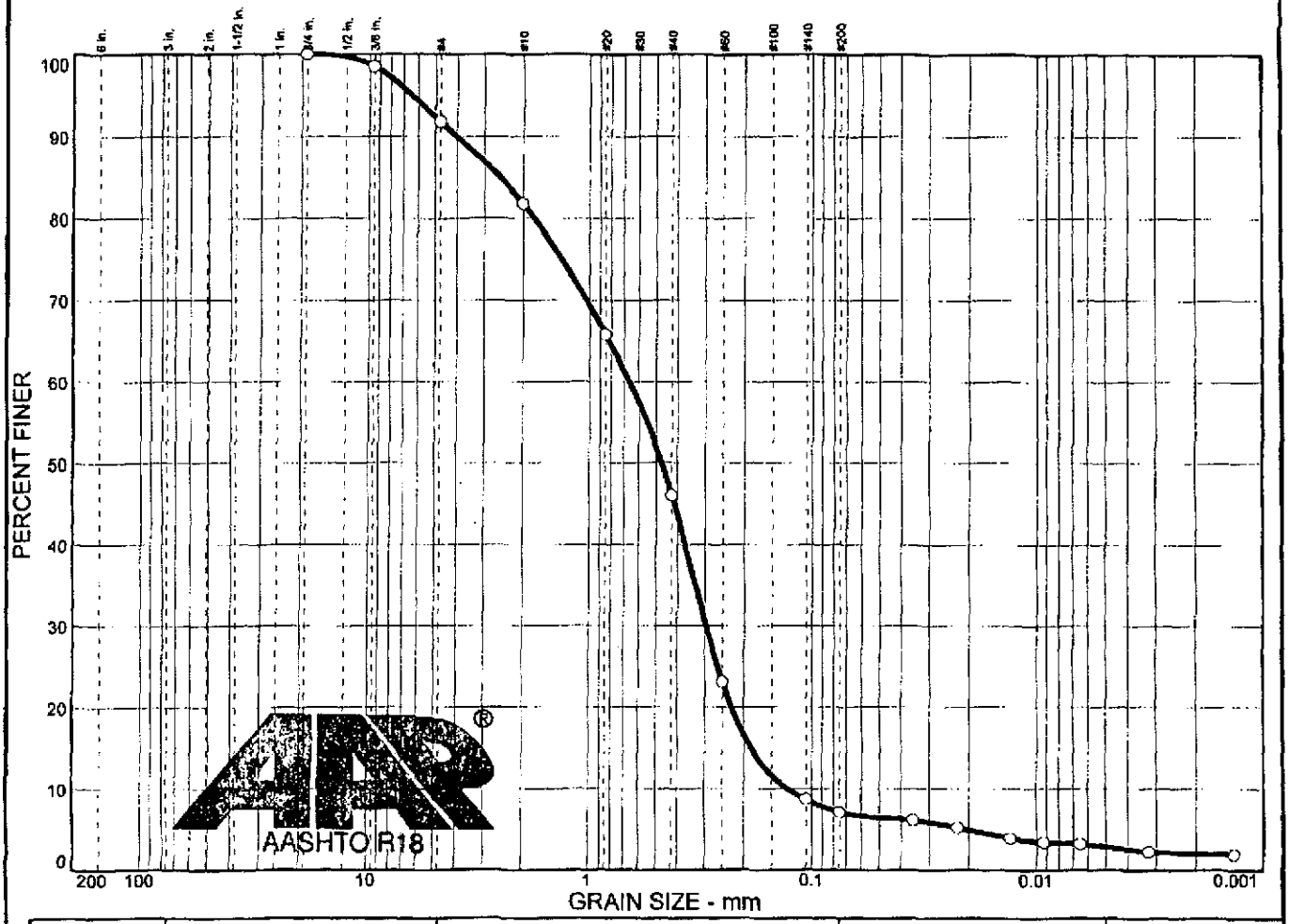
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT8-10-NP

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	8.2	84.7	4.2	2.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.54	0.660	0.471	0.296	0.186	0.128	1.03	5.16

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with silt (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-SPT8 **Sample No.:** SSO-SPT8-15-NP

Remarks:

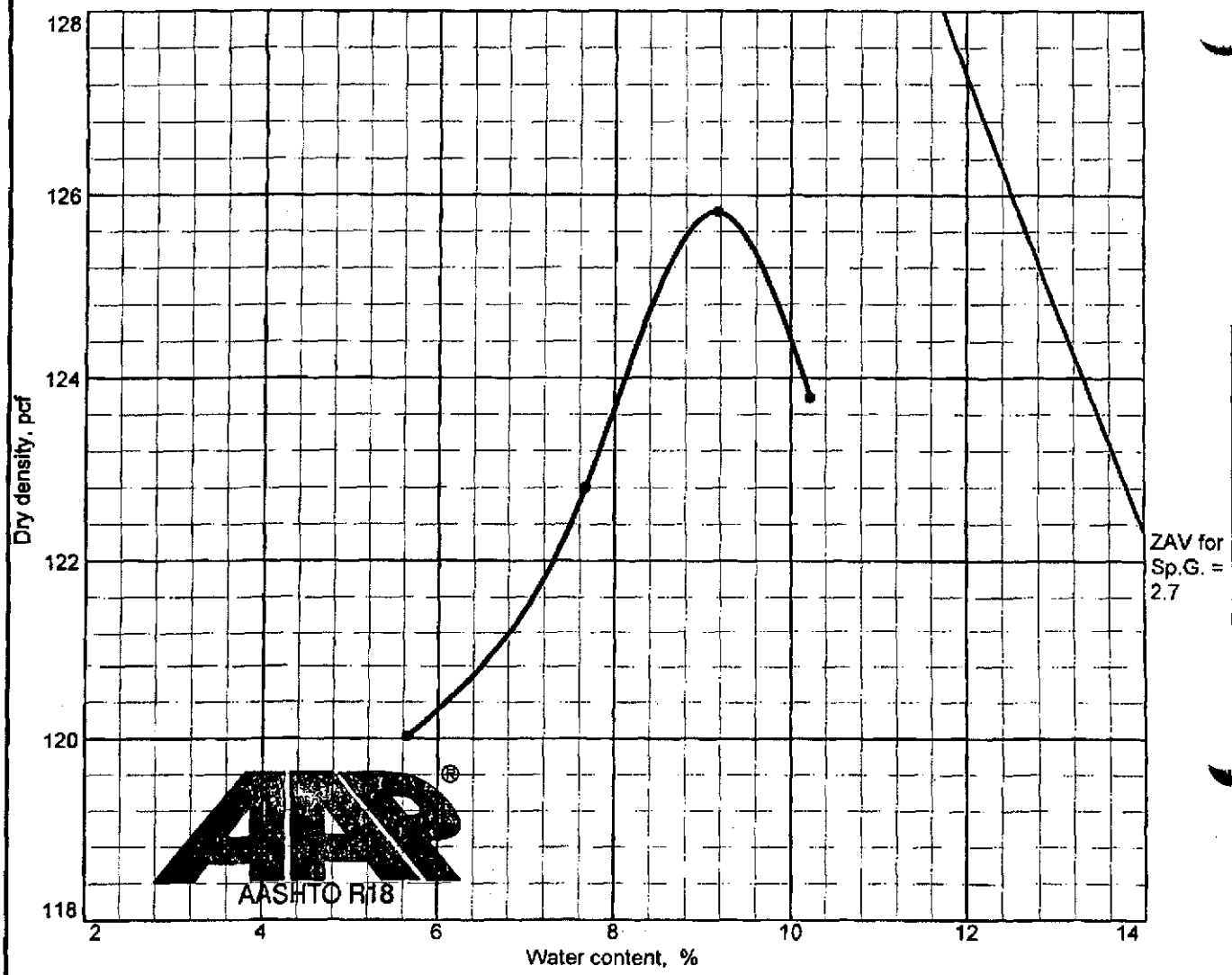
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SPT8-15-NP

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Procedure B Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
				2.680			15.2	7.1

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 130.6 pcf Optimum moisture = 7.8 %	Poorly graded sand with silt (visual)

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

● **Source:** SSO-SPT8 **Sample No.:** SSO-SPT8-15-NP

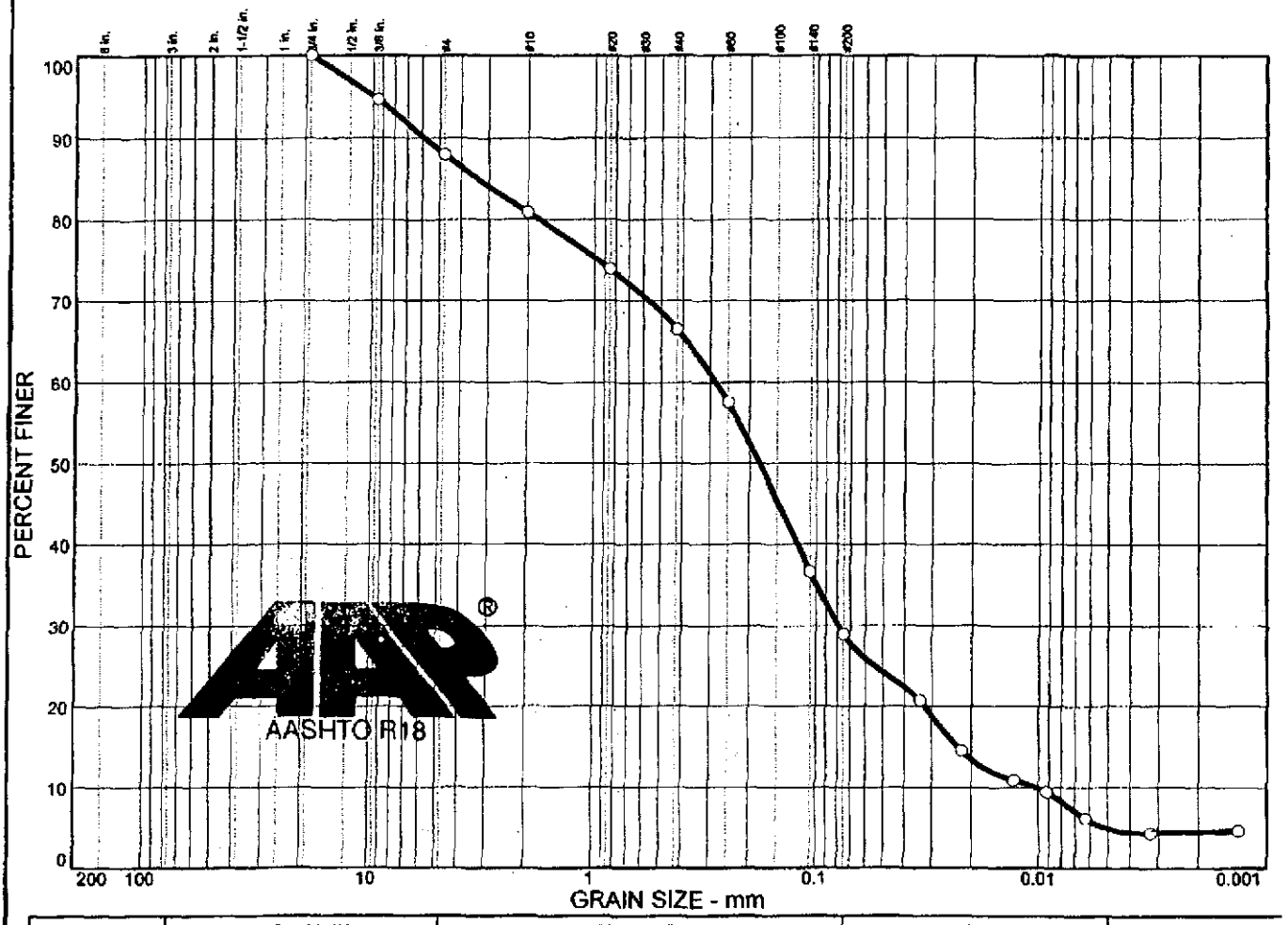
Remarks:

COMPACTION TEST REPORT

SHIELD ENGINEERING

Figure SPT8-15-NP

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	12.0	59.0	24.1	4.9

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		3.37	0.284	0.180	0.0792	0.0230	0.0101	2.18	27.98

MATERIAL DESCRIPTION	USCS	AASHTO
Silty Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SSO-01-NP **Sample No.:** SSO-01-NP

Remarks:

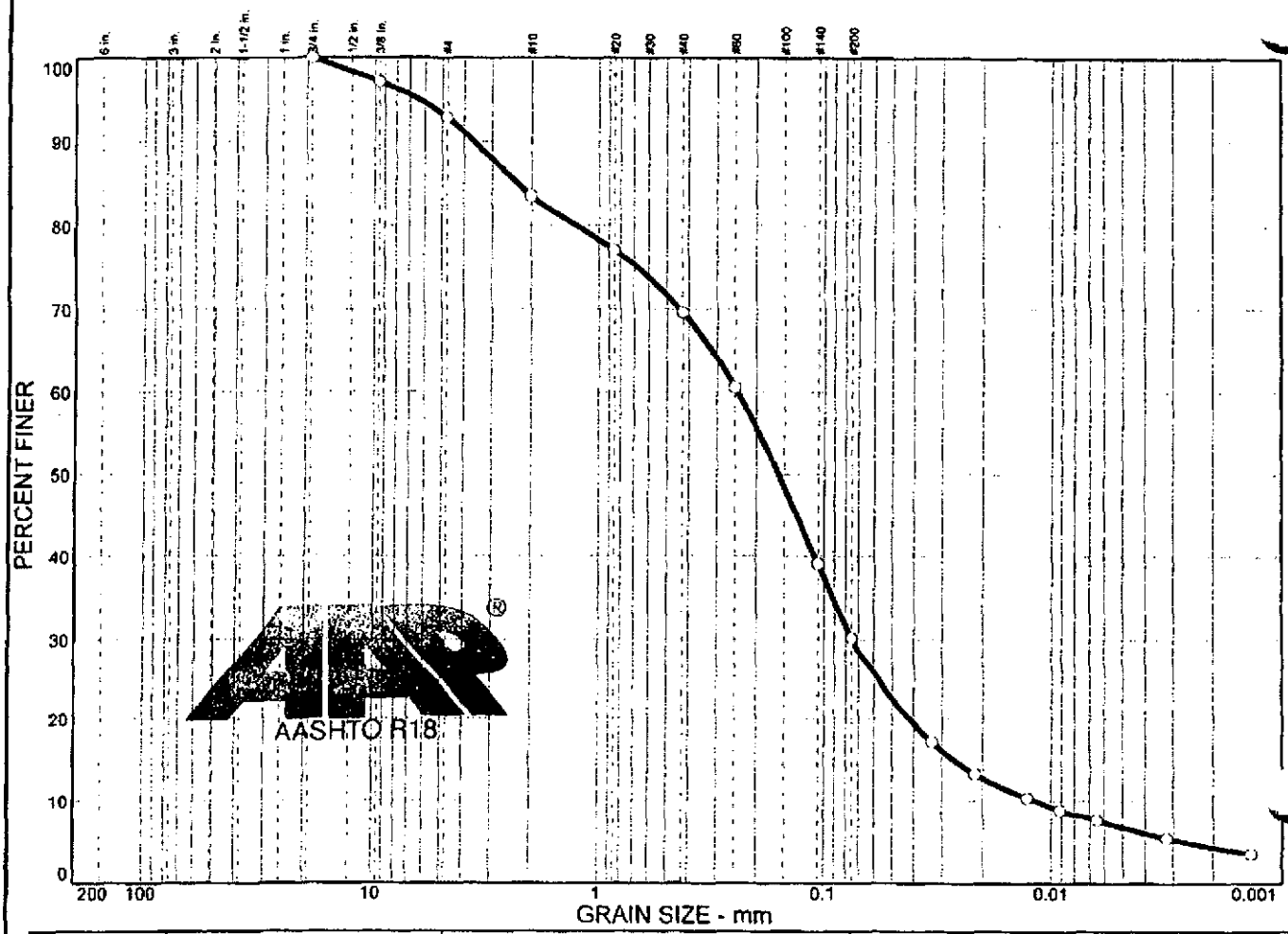
10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SSO-01-NP

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	7.2	62.6	23.4	6.8

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
○			2.30	0.243	0.159	0.0743	0.0265	0.0117	1.95	20.82

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SSO-FD01 **Sample No.:** SSO-FD01

Remarks:

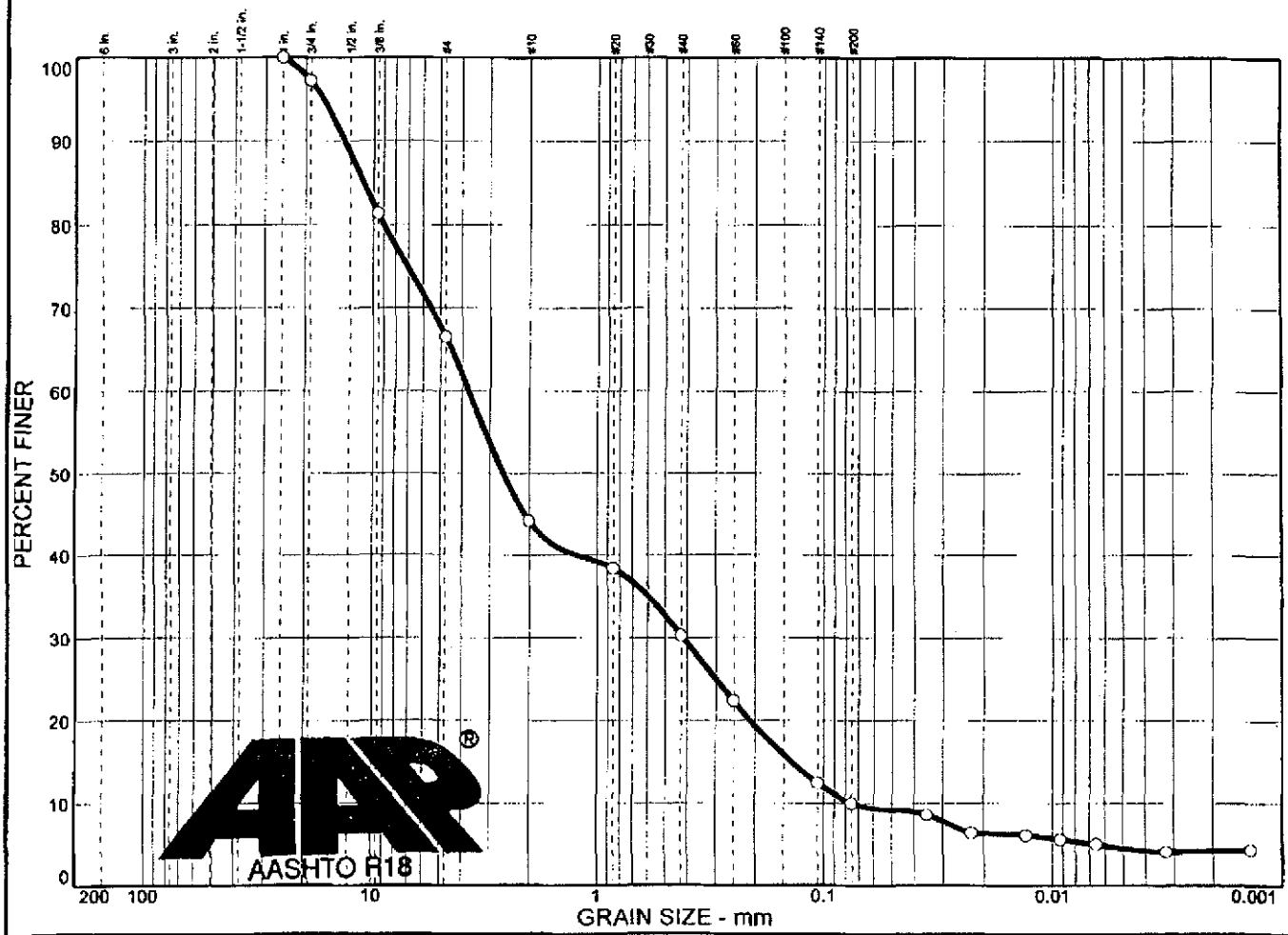
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SSO-FD-01

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	33.4	56.6	5.4	4.6

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			11.1	3.72	2.61	0.417	0.139	0.0750	0.62	49.65

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with silt and gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SO-W13-NP **Sample No.:** SO-W13-NP

Remarks:

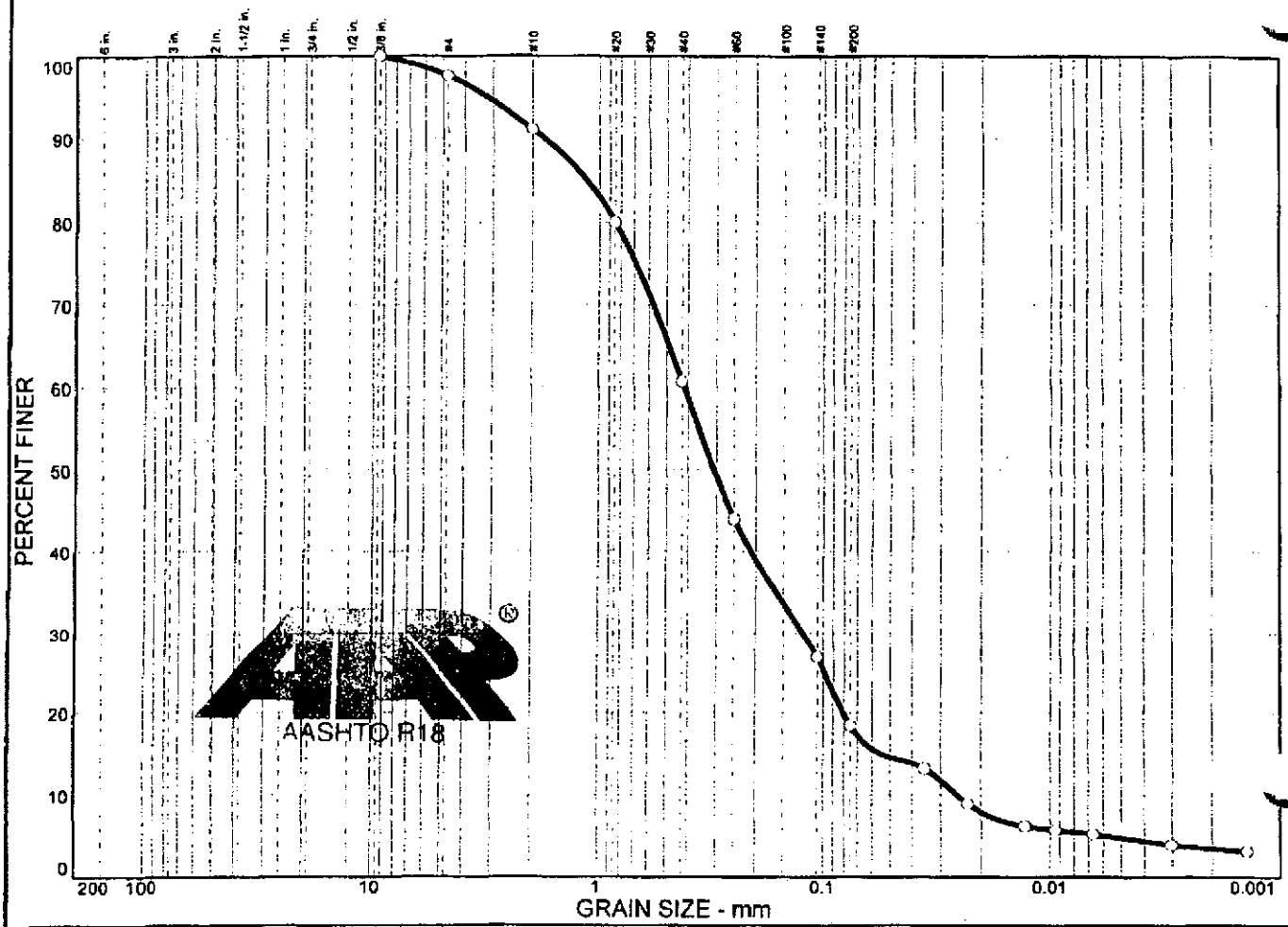
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SO-W13-NP

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	2.4	79.2	13.7	4.7

☒	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.14	0.416	0.307	0.123	0.0553	0.0254	1.42	16.37

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)	SM	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SO-W16-NA **Sample No.:** SO-W16-NA

Remarks:
○

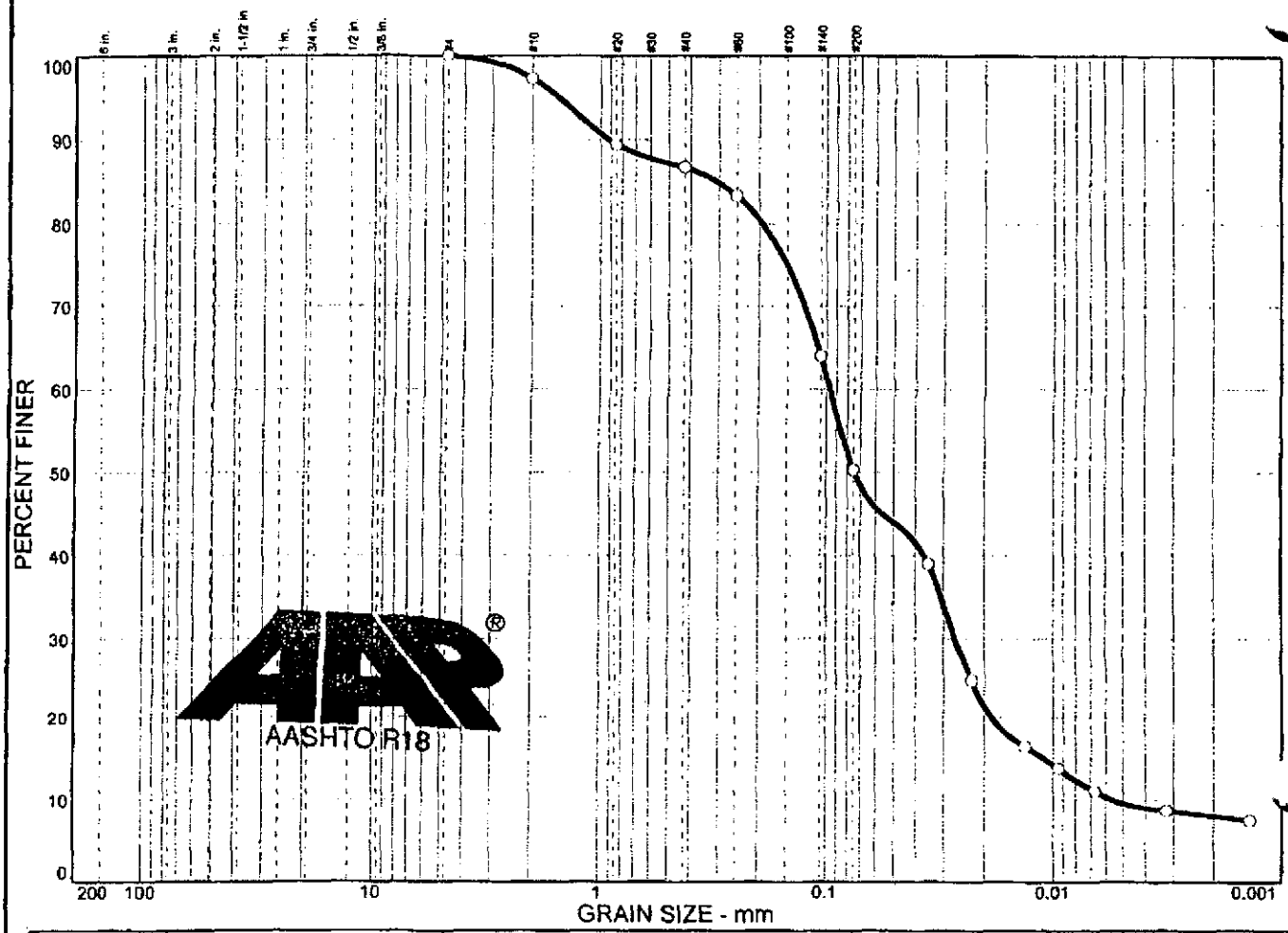
Particle Size Distribution Report

SHIELD ENGINEERING

Figure SO-W16-NA

Sample SO-W15-NP was not viable for testing. It consisted mainly of plant fibers, glass fragments and metal hardware.

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	49.7	40.7	9.6

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.306	0.0963	0.0742	0.0267	0.0109	0.0056	1.33	17.24

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy silt (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-001-UI **Sample No.:** SE-001-UI redone

Remarks:

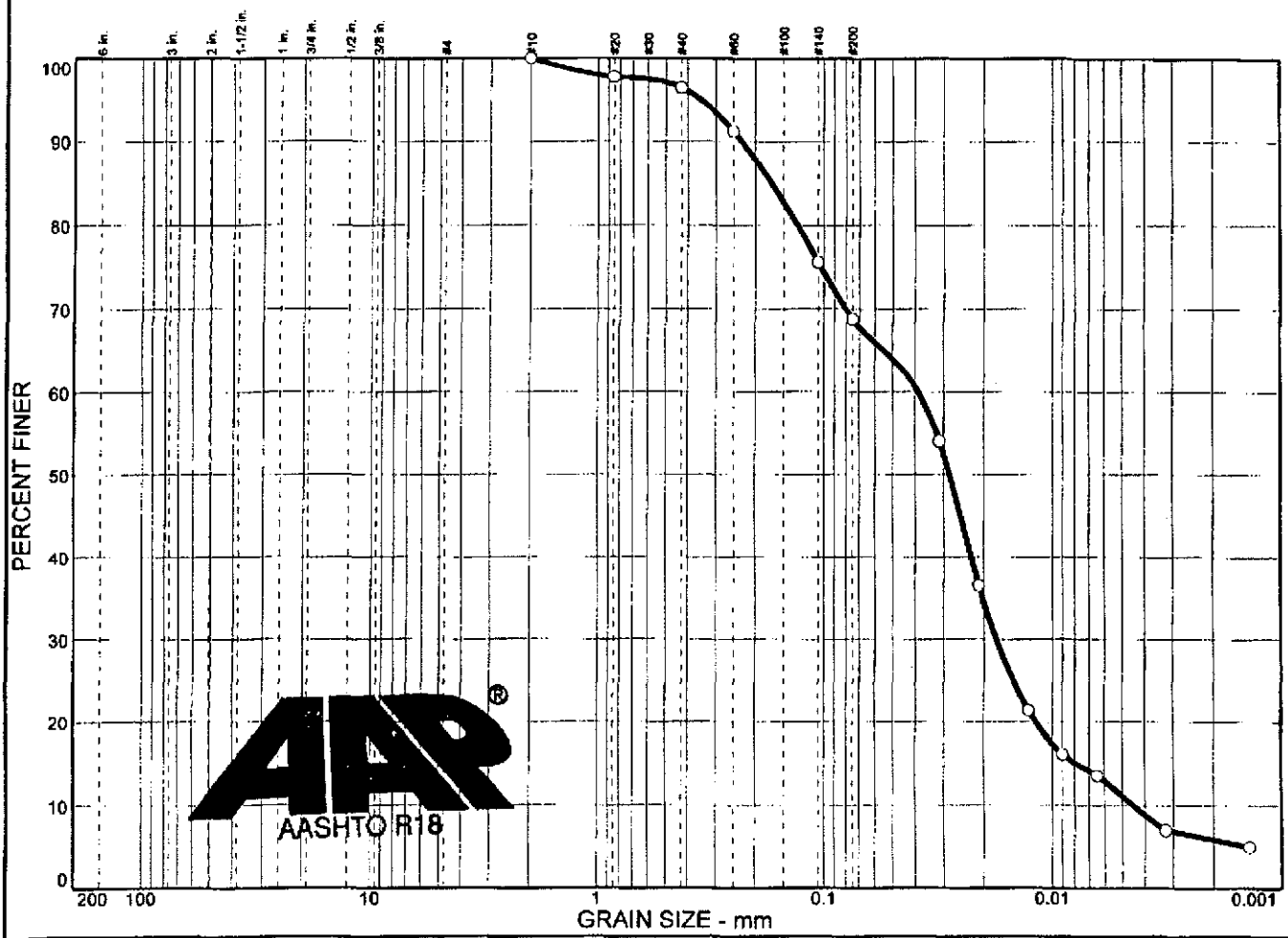
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-001-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	31.2	57.7	11.1

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.169	0.0386	0.0283	0.0176	0.0079	0.0045	1.79	8.62

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy silt (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-002-UI **Sample No.:** SE-002-UI

Remarks:

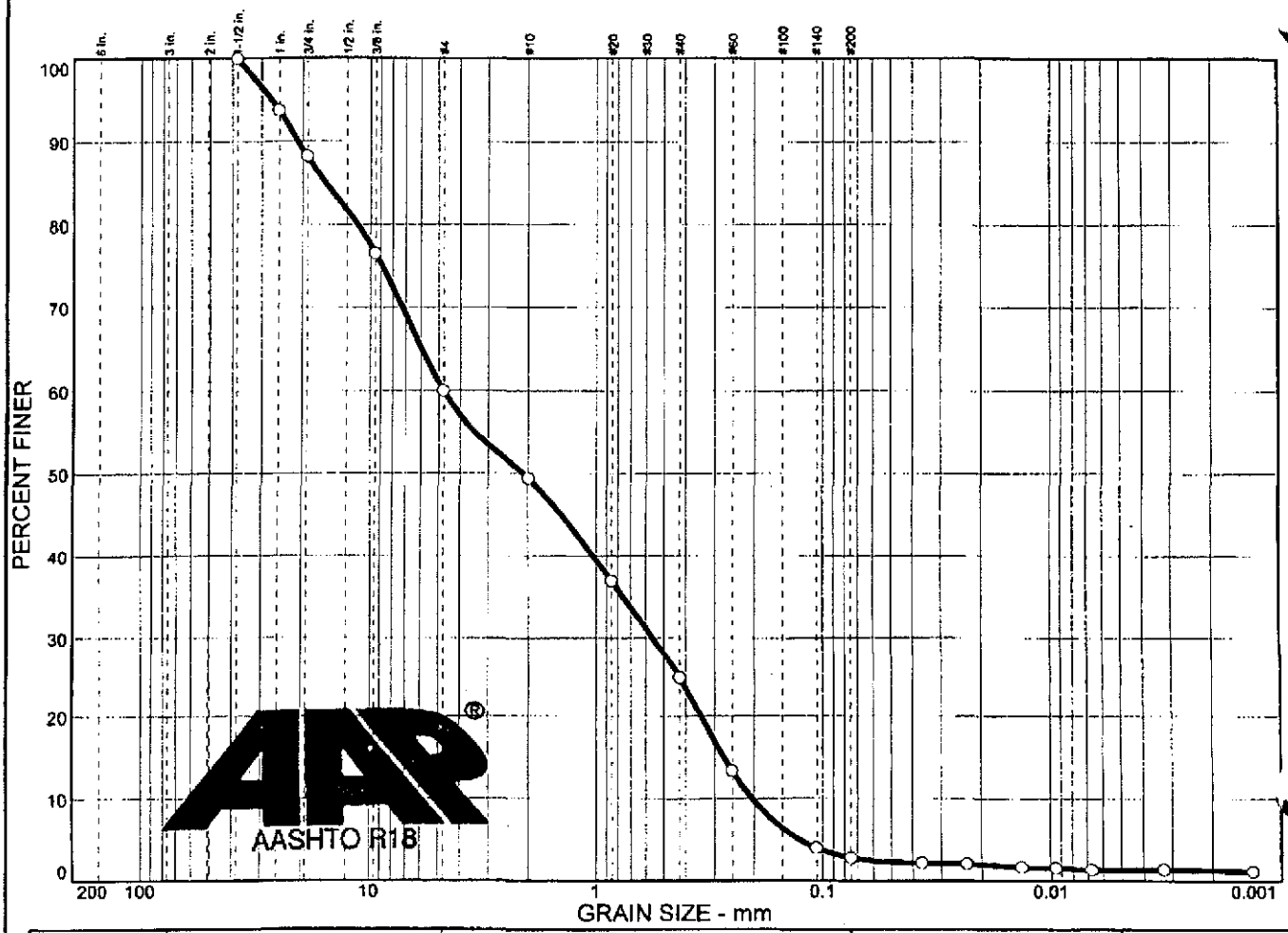
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-002-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	40.0	57.2	1.4	1.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			15.7	4.75	2.11	0.561	0.271	0.203	0.33	23.35

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-003-UI **Sample No.:** SE-003-UI

Remarks:

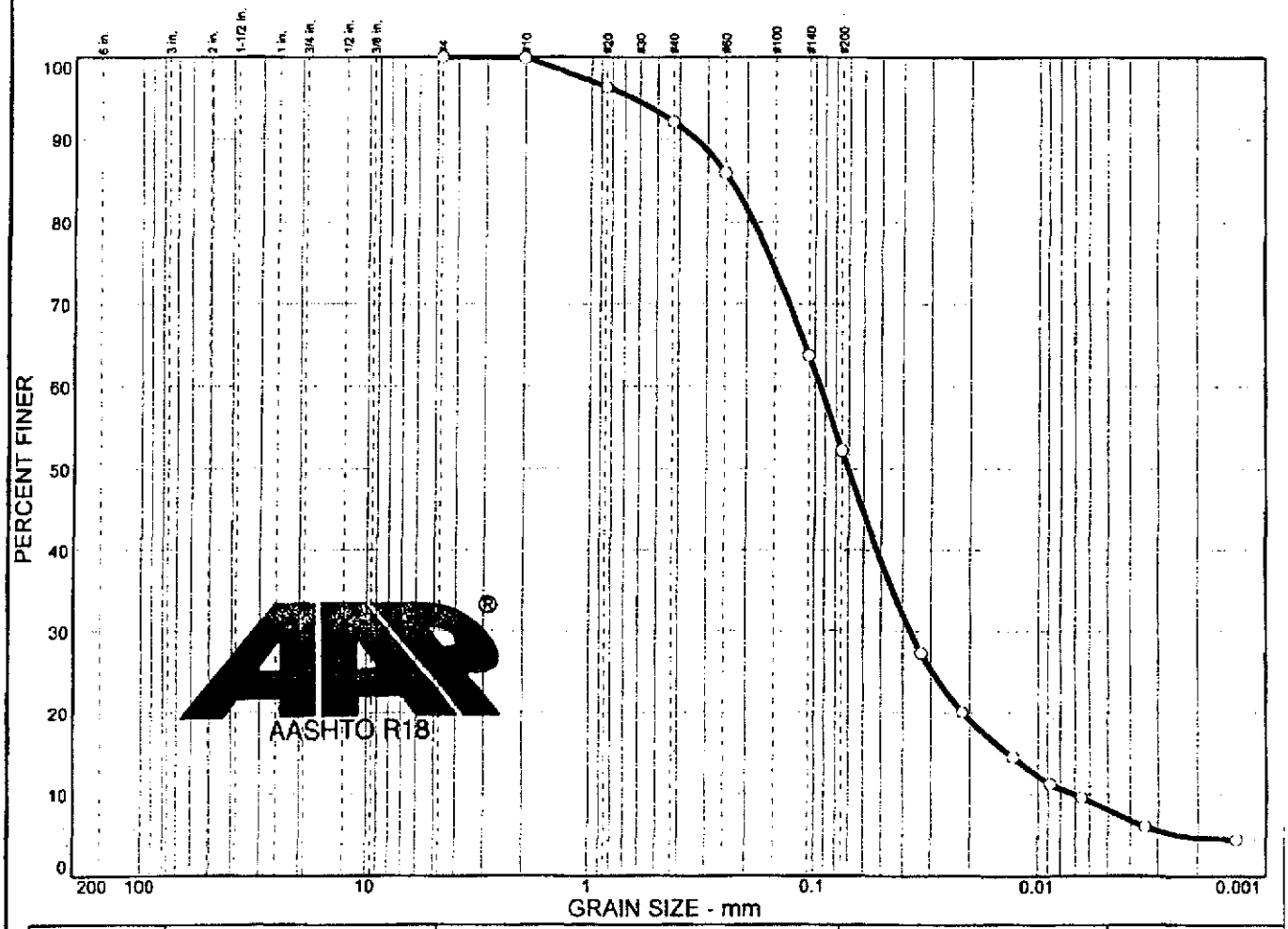
○ 10/16/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-003-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	47.8	44.1	8.1

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.238	0.0944	0.0703	0.0369	0.0135	0.0071	2.04	13.37

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy silt (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-004-UI **Sample No.:** SE-004-UI

Remarks:

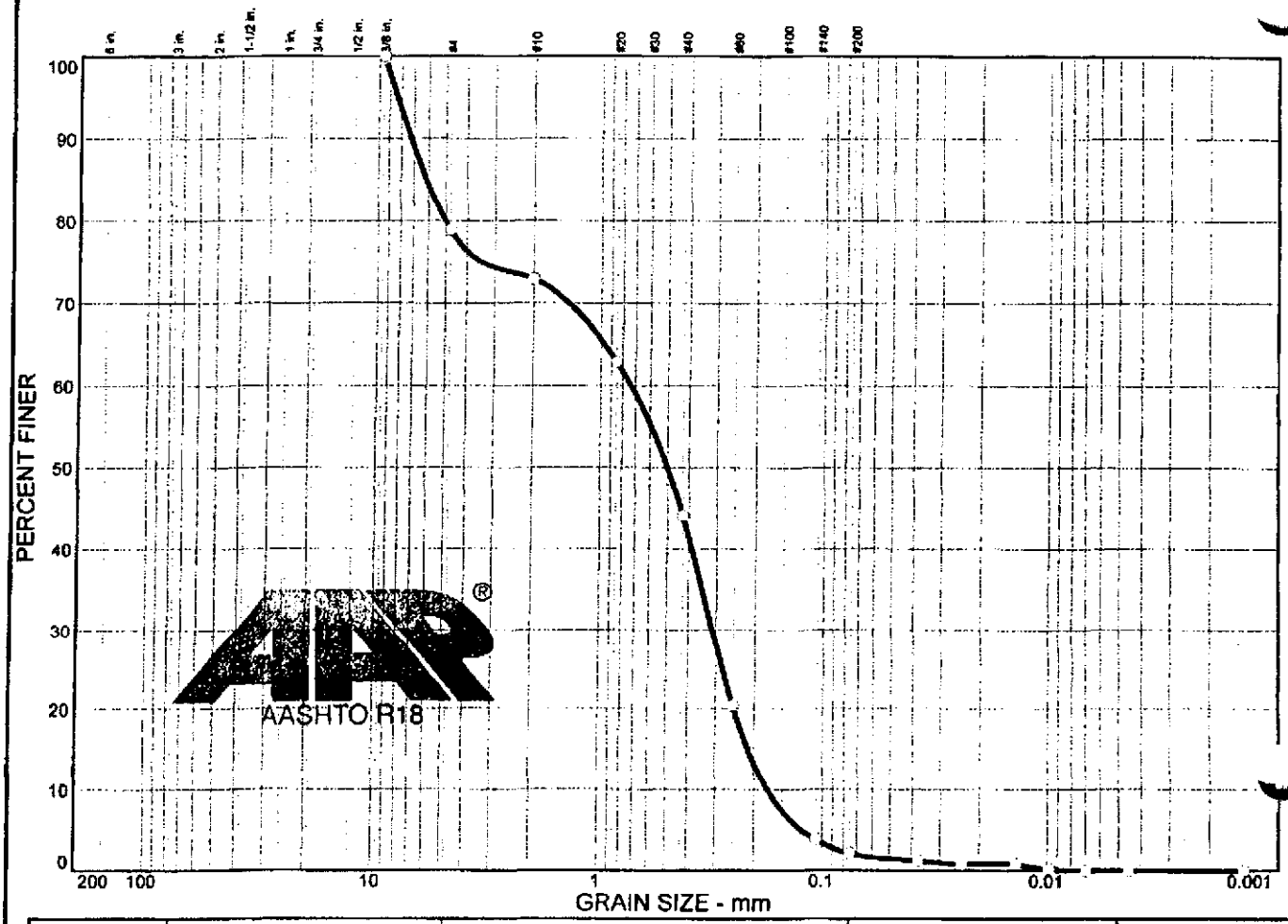
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-004-UI

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	21.1	76.8	2.1	0.0

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		6.11	0.734	0.499	0.312	0.213	0.174	0.76	4.21

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

Source: SE-005-UI **Sample No.:** SE-005-UI

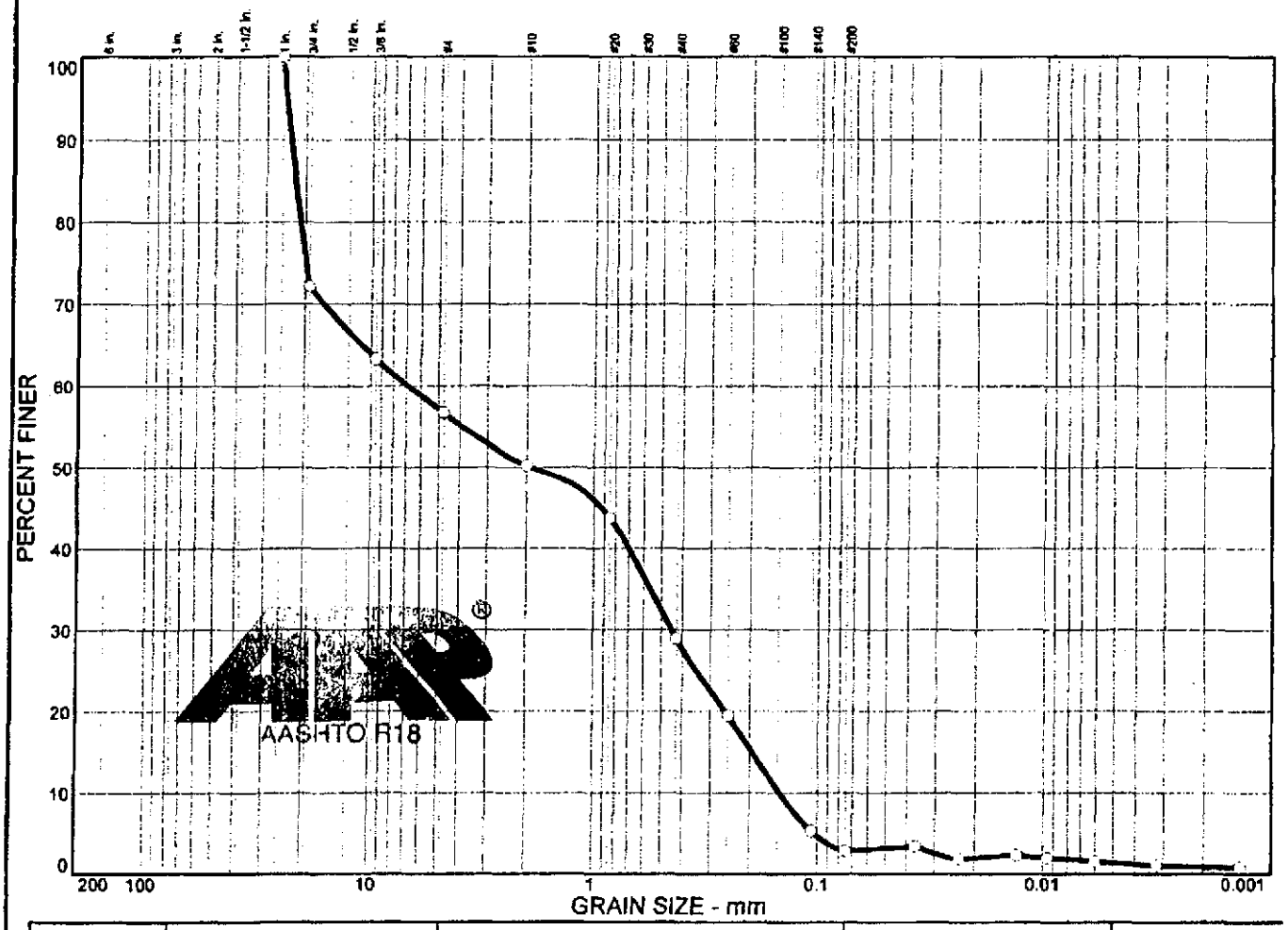
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-005-UI

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	43.3	53.9	1.5	1.3

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		22.1	6.84	1.92	0.448	0.195	0.147	0.20	46.53

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-006-UI **Sample No.:** SE-006-UI

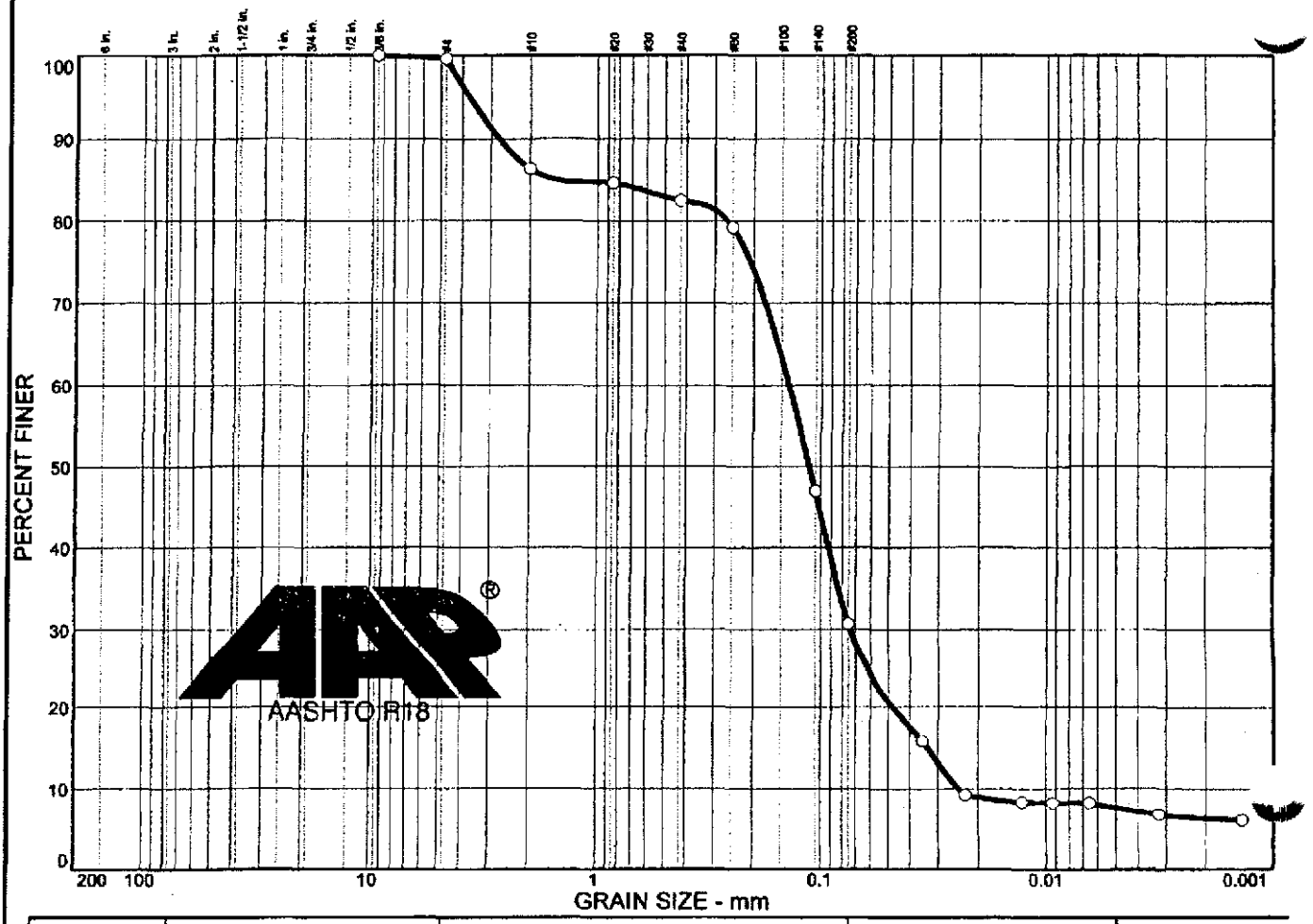
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-006-UI

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.4	68.9	23.1	7.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.53	0.139	0.113	0.0736	0.0333	0.0244	1.60	5.70

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-007-UI **Sample No.:** SE-007-UI

Remarks:

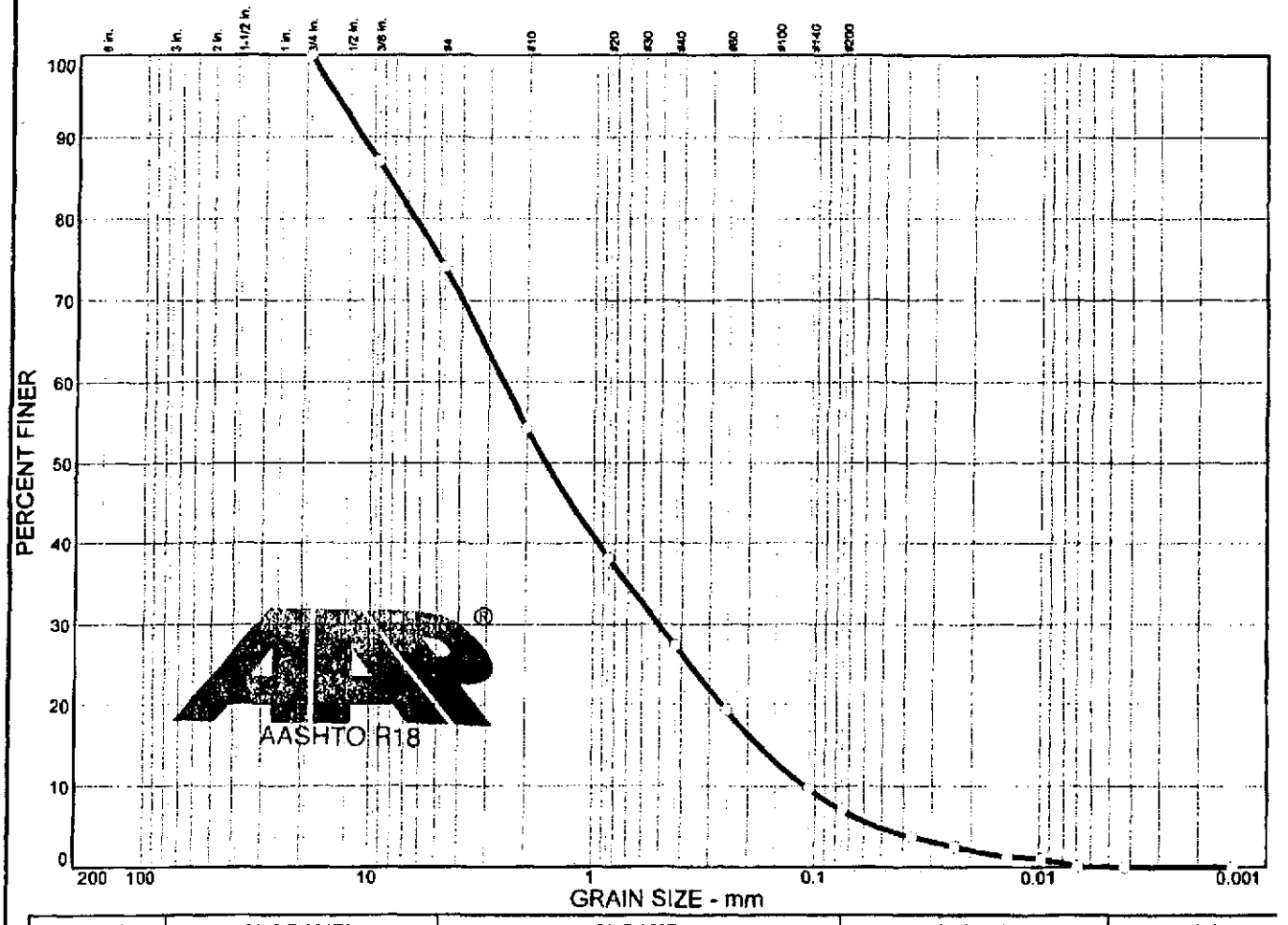
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-007-UI

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	25.9	67.2	6.9	0.0

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		8.47	2.57	1.63	0.507	0.179	0.111	0.90	23.16

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with silt and gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-008-BR **Sample No.:** SE-008-BR

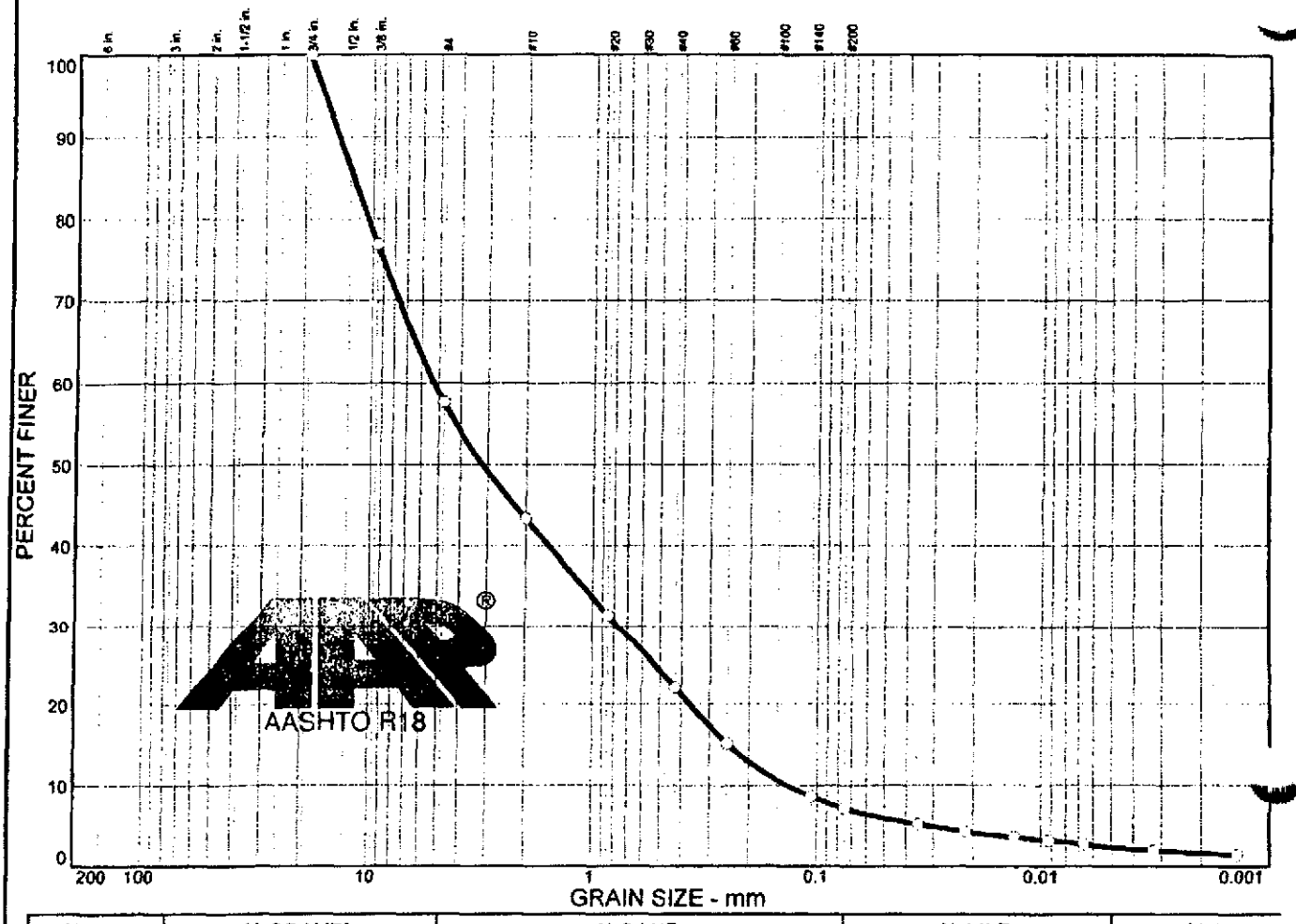
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-008-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	42.4	50.5	4.8	2.3

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		12.2	5.27	3.17	0.766	0.246	0.136	0.82	38.73

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with silt and gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-009-WT **Sample No.:** SE-009-WT

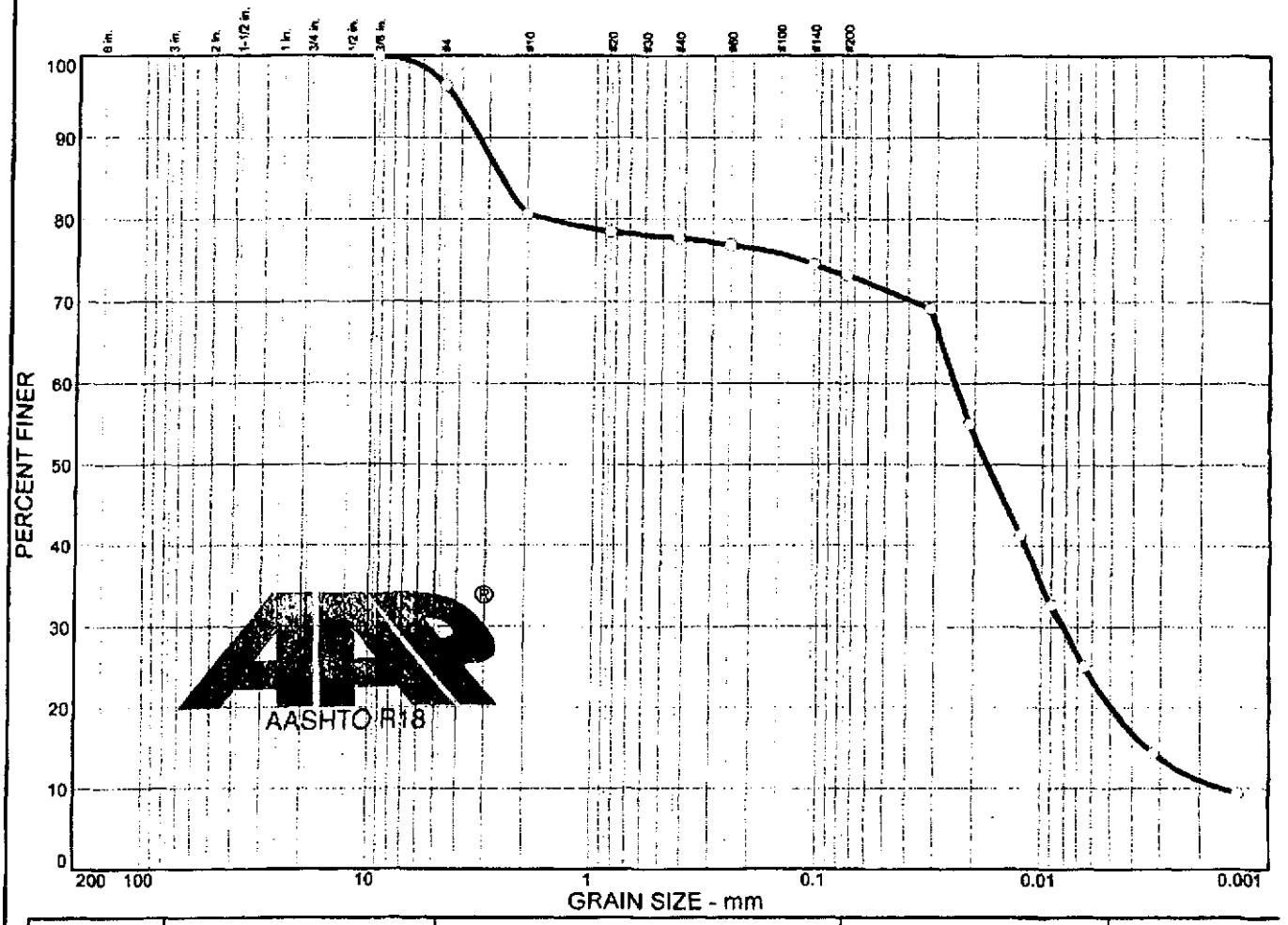
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-009-WT

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.6	23.2	53.0	20.2

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		2.60	0.0245	0.0176	0.0081	0.0034	0.0016	1.67	15.29

MATERIAL DESCRIPTION	USCS	AASHTO
Silt with sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-010-WT **Sample No.:** SE-010-WT

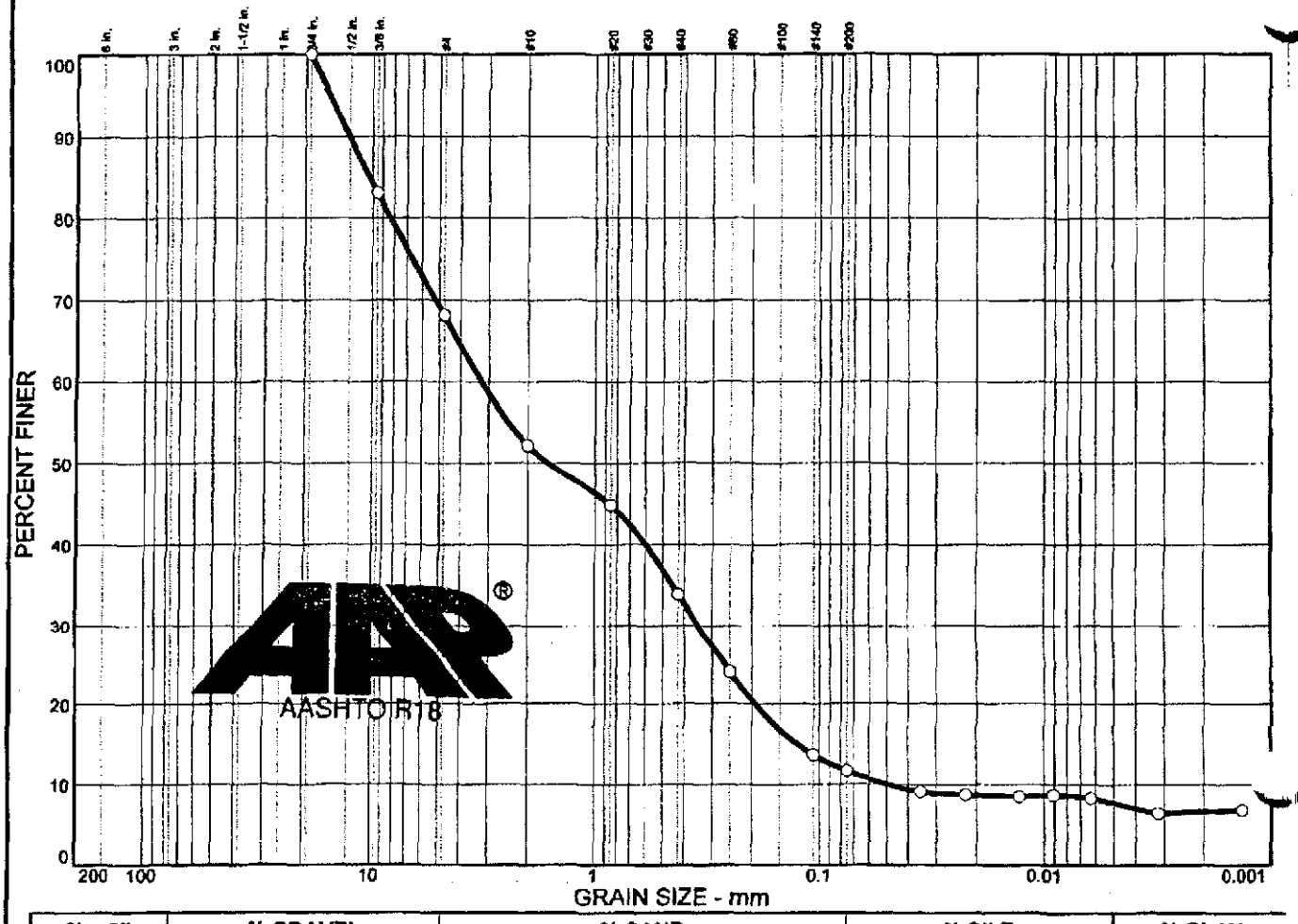
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-010-WT

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	31.9	56.4	4.0	7.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			10.3	3.22	1.63	0.347	0.125	0.0499	0.75	64.59

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with silt and gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-011-WT **Sample No.:** SE-011-WT

Remarks:

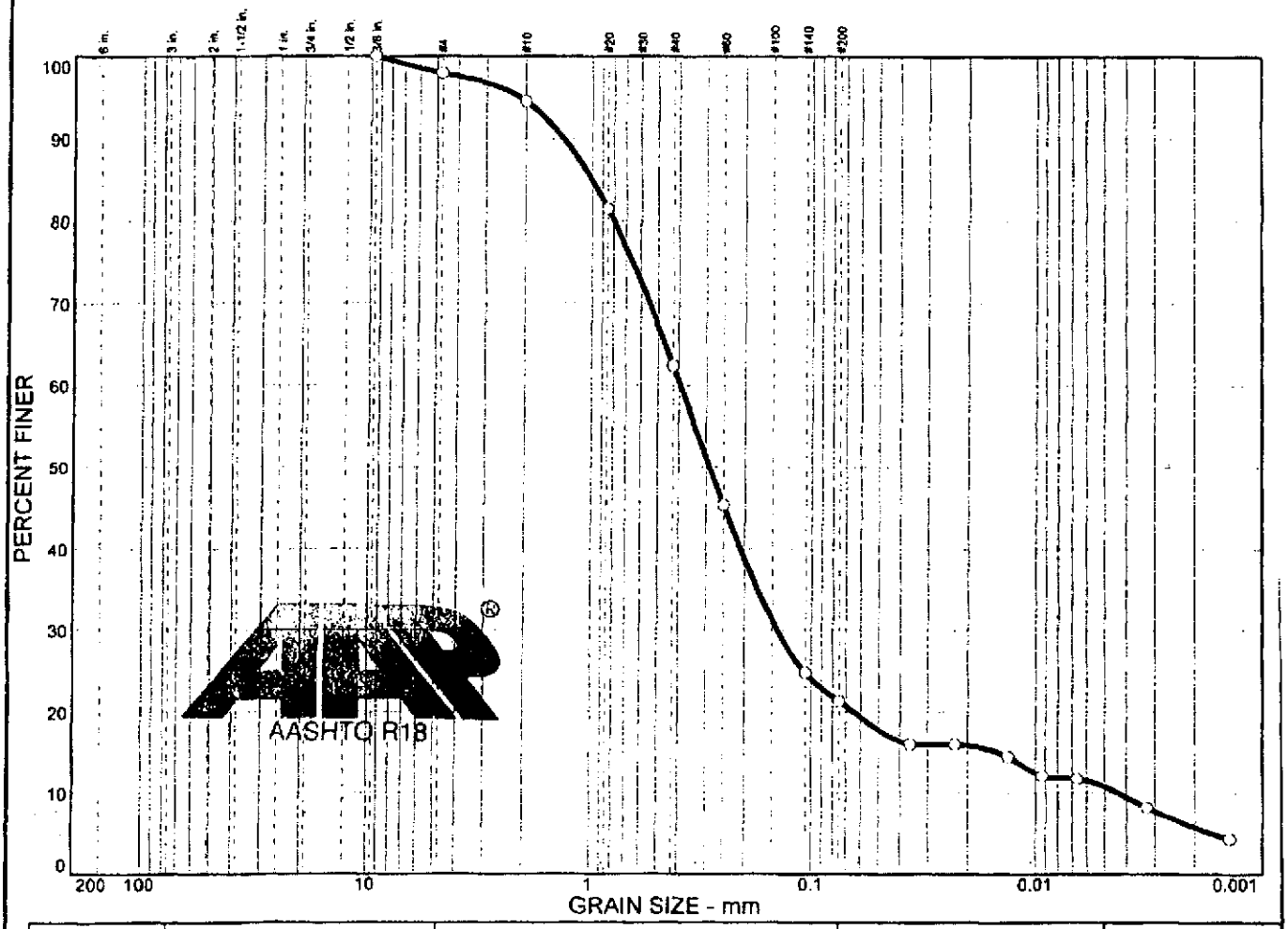
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-011-WT

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	2.0	76.7	10.5	10.8

☒	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.00	0.394	0.289	0.142	0.0144	0.0044	11.73	90.53

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)	SM	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SE-012-WT **Sample No.:** SE-012-WT

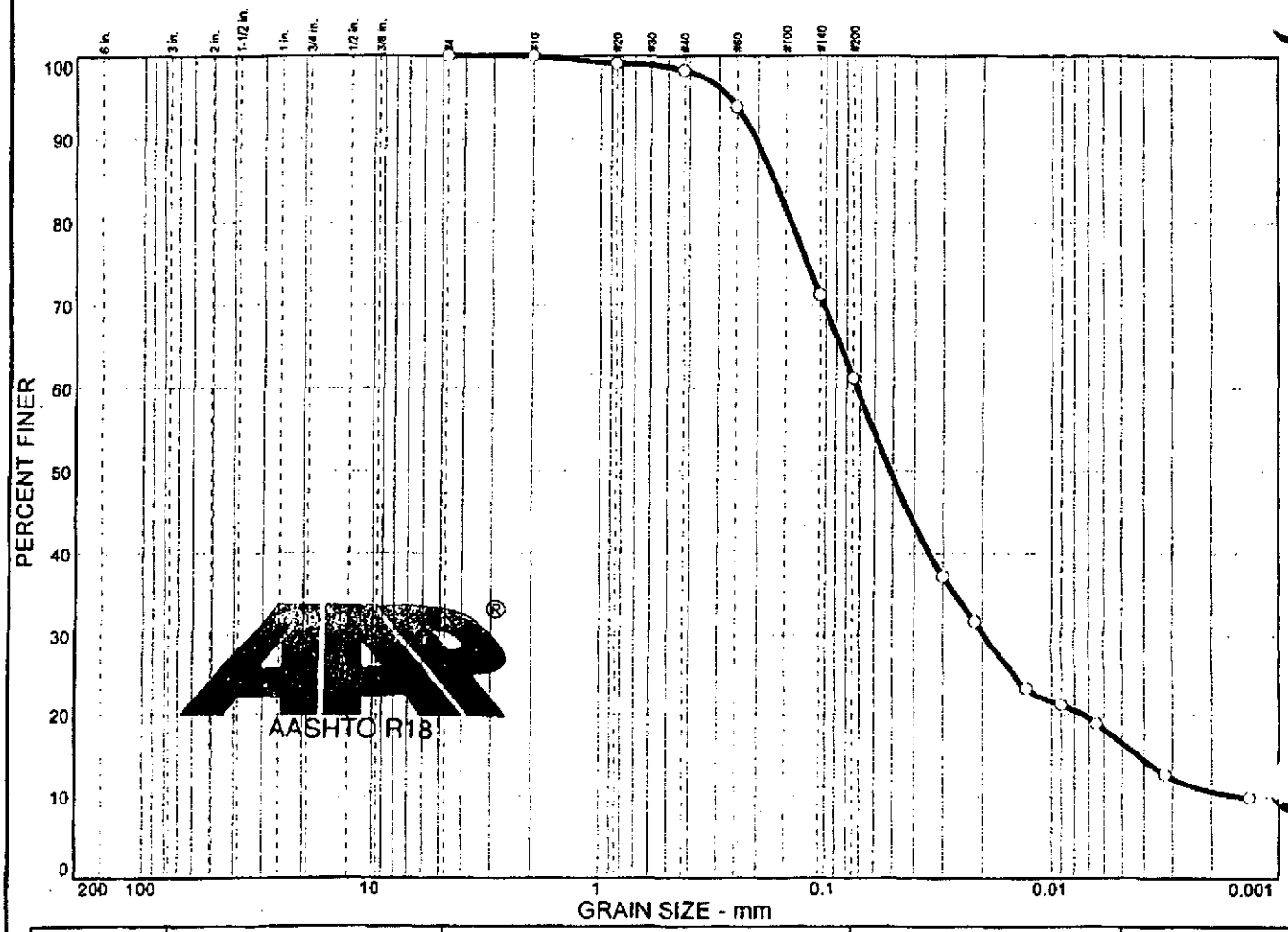
Remarks:
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-012-WT

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	38.8	44.7	16.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.168	0.0720	0.0510	0.0195	0.0042	0.0014	3.64	49.71

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy silt (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-013-WT **Sample No.:** SE-013-WT

Remarks:

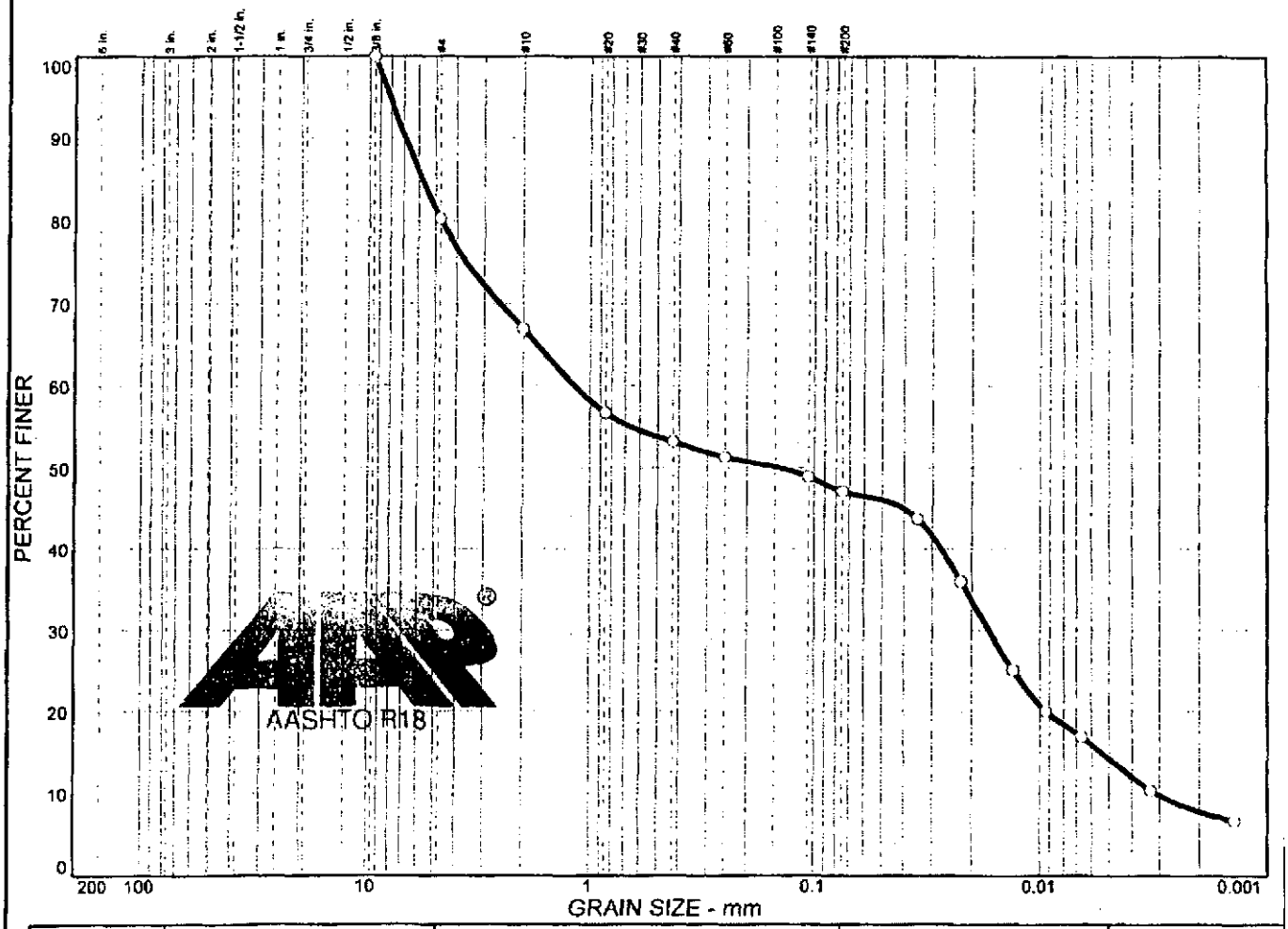
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-013-WT

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	19.7	33.2	32.9	14.2

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			5.75	1.17	0.142	0.0168	0.0054	0.0031	0.08	378.70

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand with gravel (visual)	SM	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-014-WT **Sample No.:** SE-014-WT

Remarks:

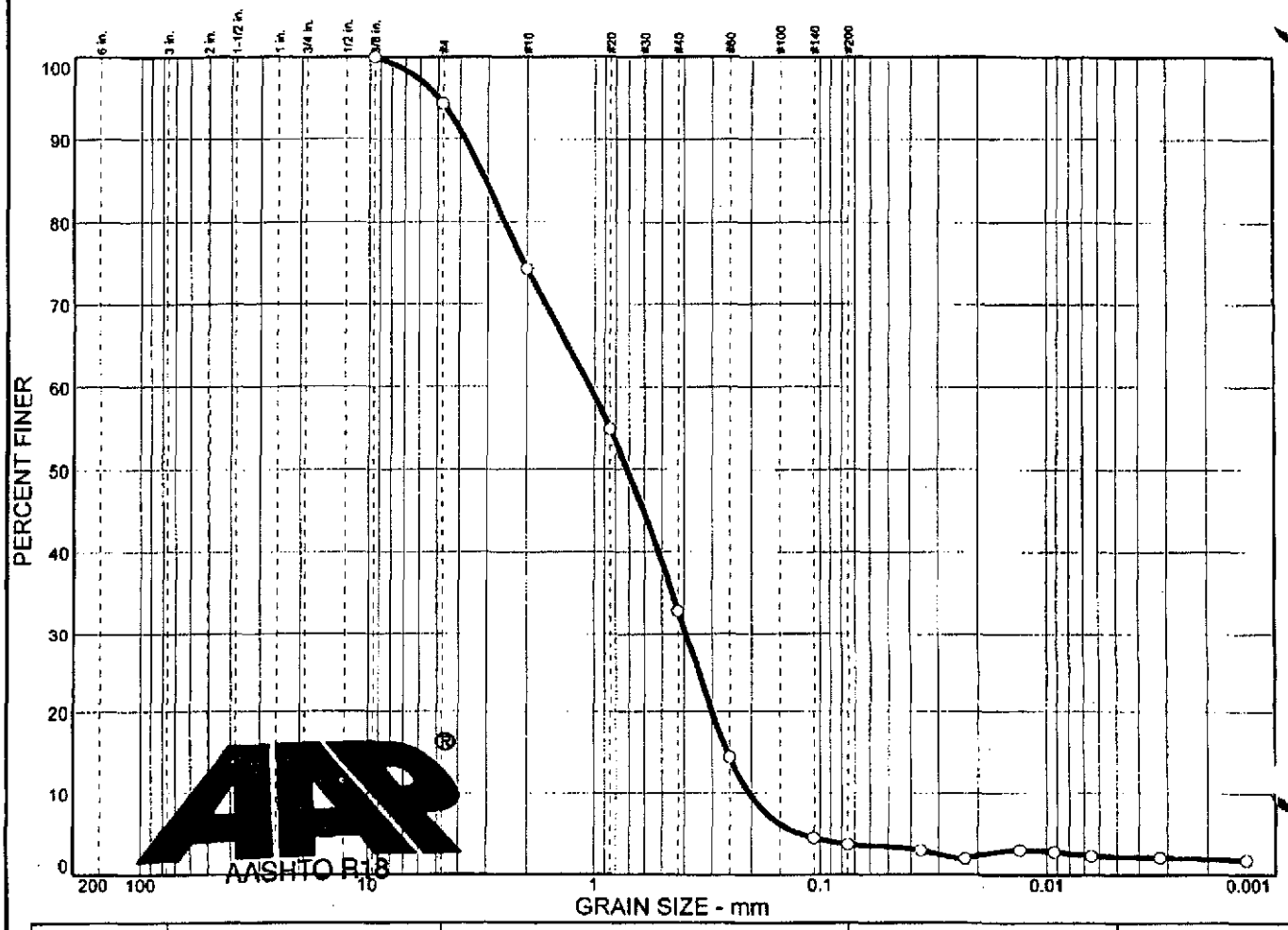
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-014-WT

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	5.7	90.6	1.5	2.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.06	1.05	0.711	0.393	0.256	0.205	0.72	5.12

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly Graded Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-015-WT **Sample No.:** SE-015-WT

Remarks:

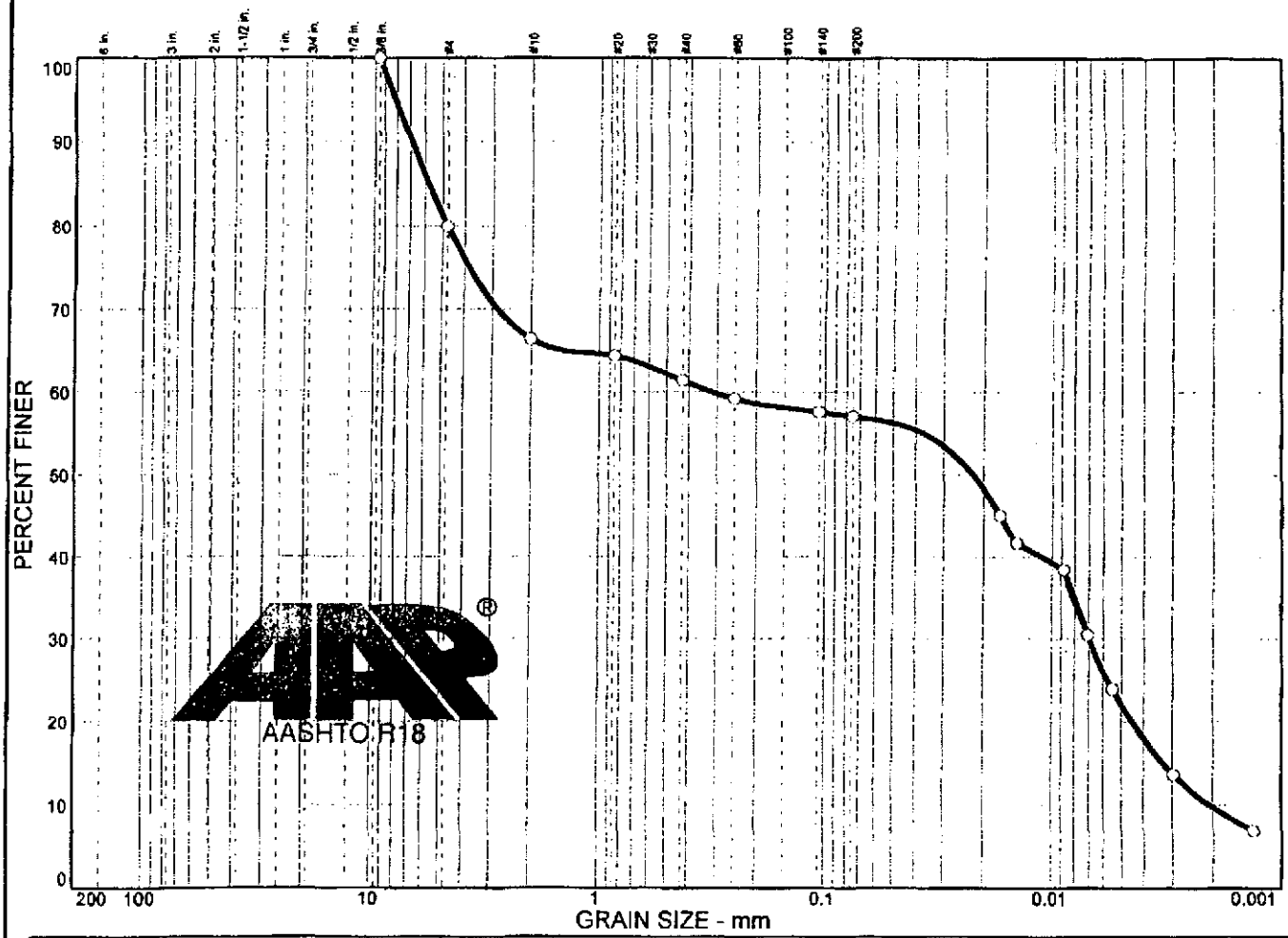
○ 10/15/03

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-015-WT

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	20.0	22.9	35.0	22.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			5.76	0.313	0.0222	0.0070	0.0033	0.0021	0.08	152.34

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy silt with gravel (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-016-WT **Sample No.:** SE-016-WT

Remarks:

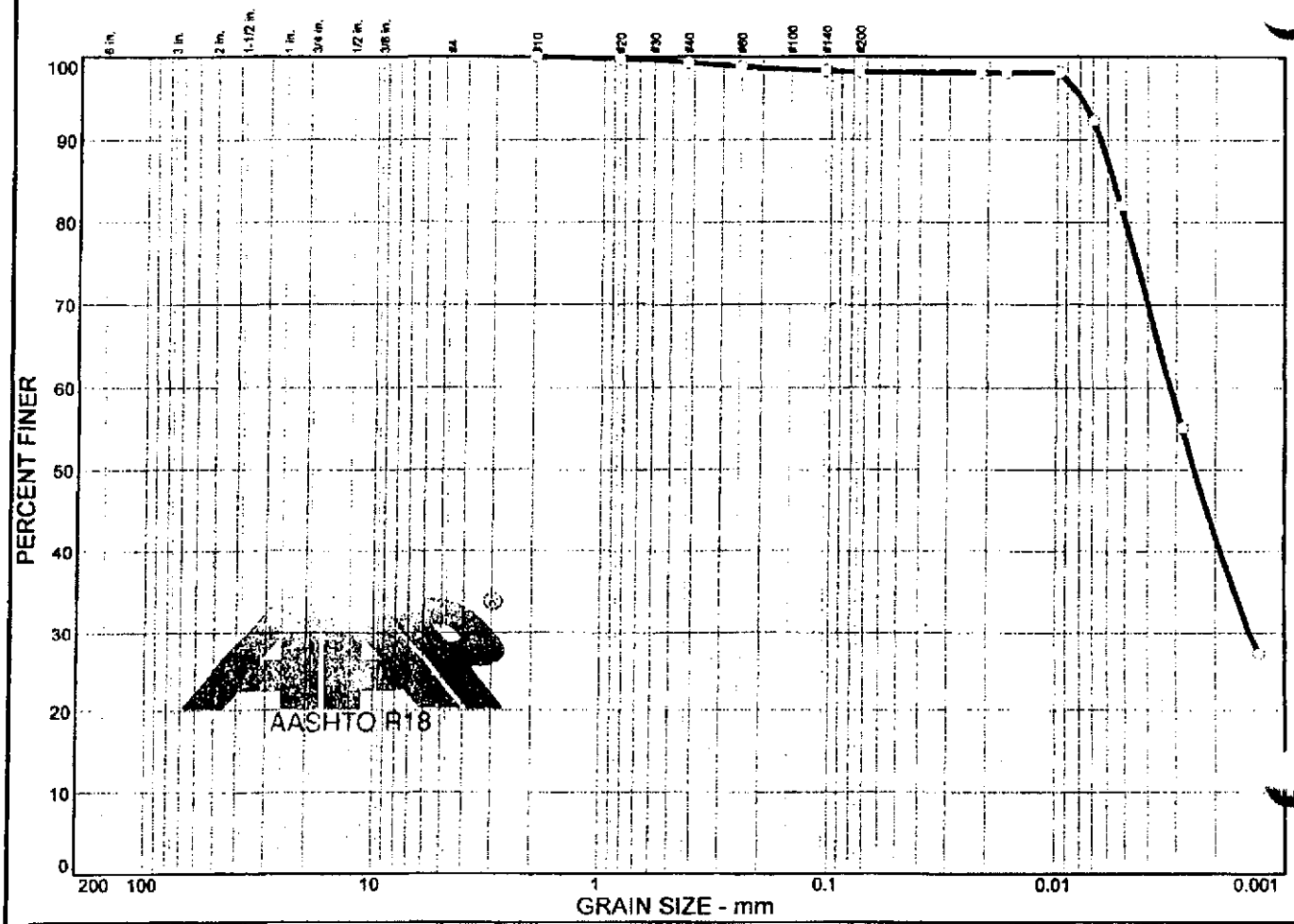
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-016-WT

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	1.8	18.1	80.1

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		0.0056	0.0032	0.0025	0.0014				

MATERIAL DESCRIPTION	USCS	AASHTO
Silt (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-017-WT **Sample No.:** SE-017-WT

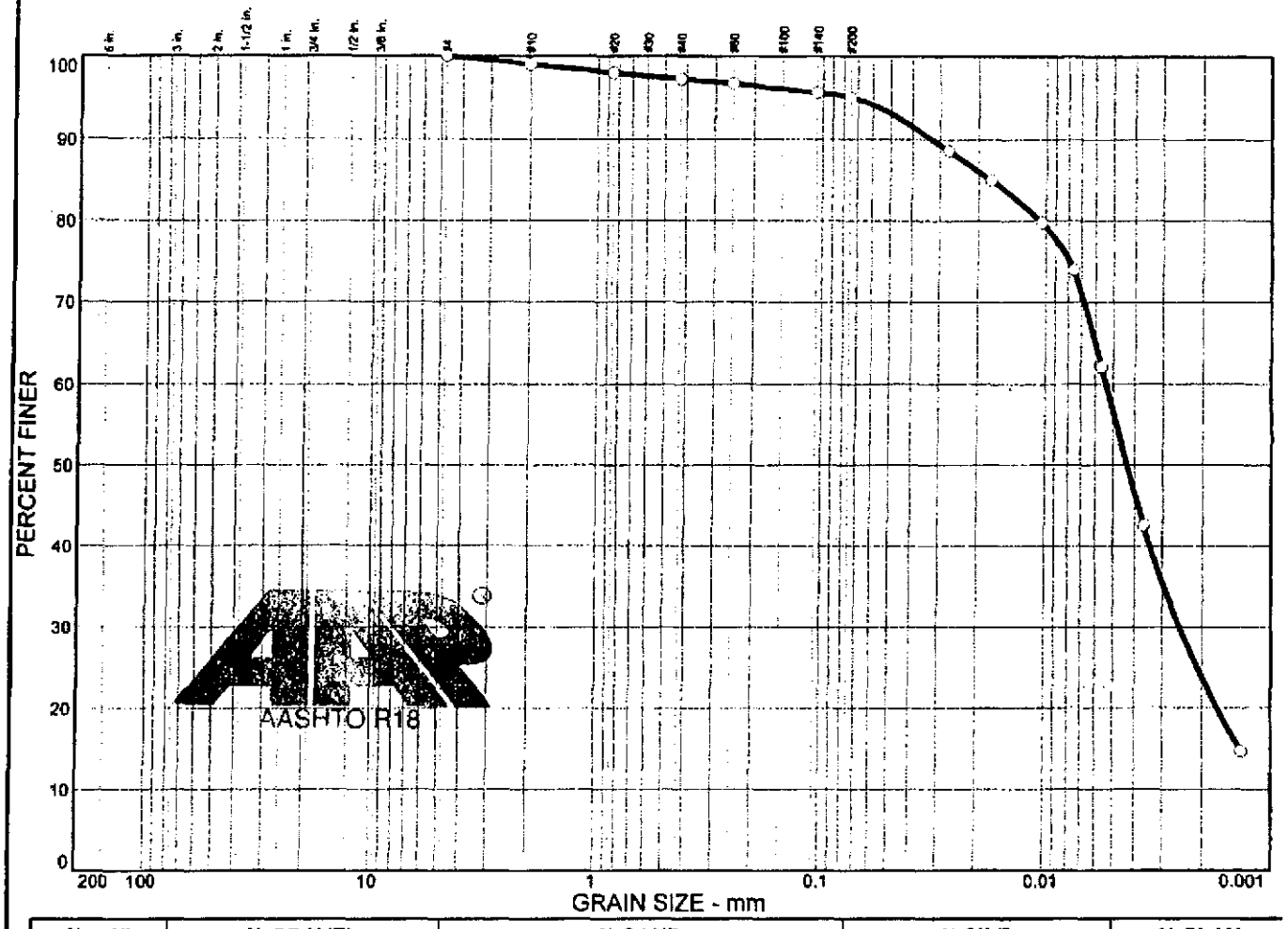
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-017-WT

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	4.9	38.4	56.7

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		0.0176	0.0054	0.0043	0.0025	0.0014			

MATERIAL DESCRIPTION	USCS	AASHTO
Silty- clay (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-018-WT **Sample No.:** SE-018-WT

Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-018-WT

Particle Size Distribution Report

	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.6	20.5	56.5	22.4

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.140	0.0220	0.0160	0.0070	0.0026			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silt With Sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-019-LF **Sample No.:** SE-019-LF

Remarks:

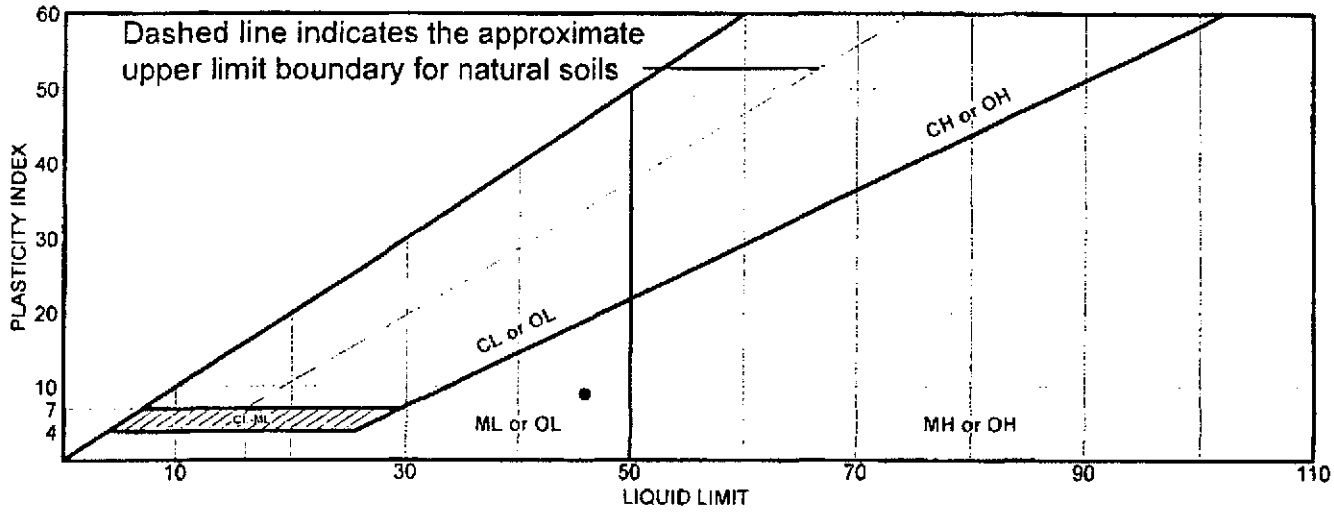
○ 10/15/03

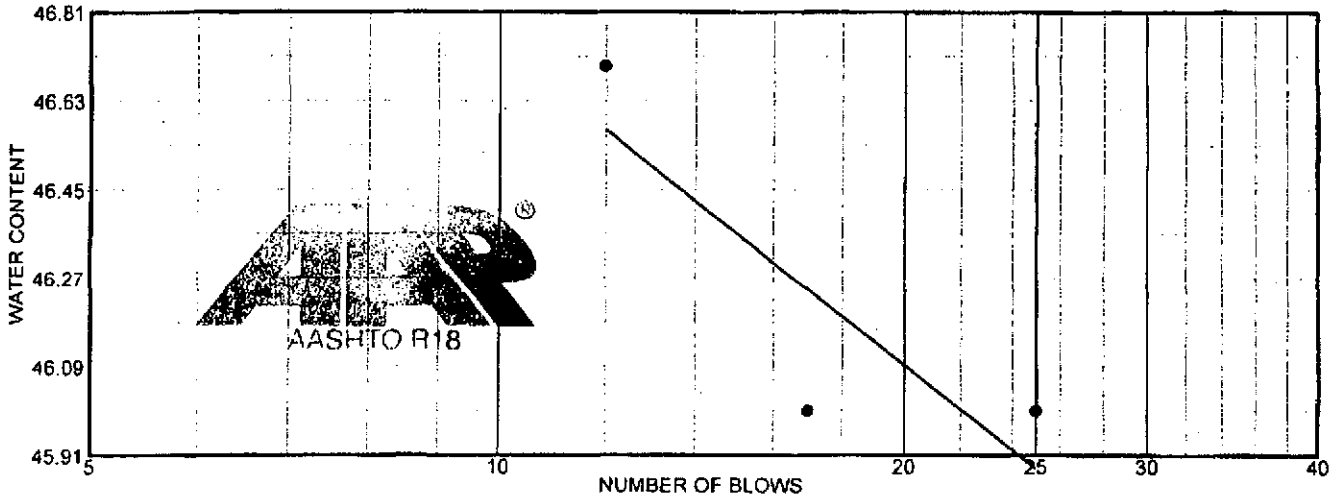
Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-019-LF

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silt With Sand (Visual)	46	37	9	87.9	78.9	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

● **Source:** SE-019-LF **Sample No.:** SE-019-LF

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT

SHIELD ENGINEERING

Figure SE-019-LF

LIQUID AND PLASTIC LIMIT TEST DATA

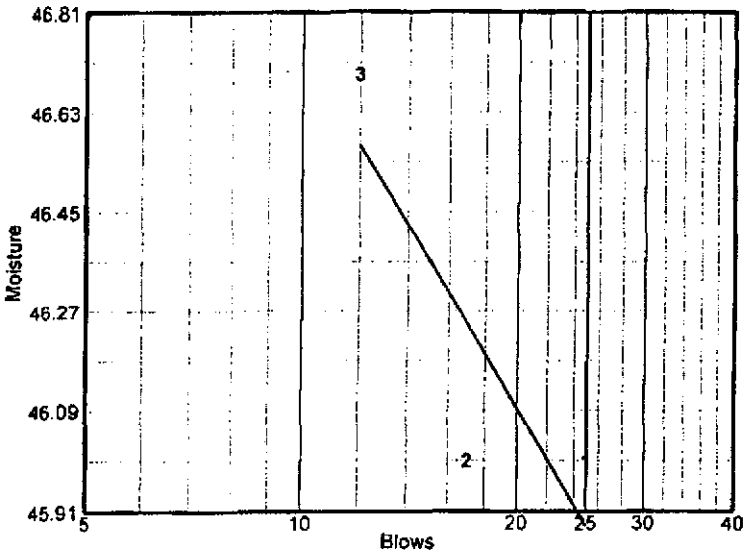
Client: Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2
Project Number: 1030105-01

Sample Data

Source: SE-019-LF
Sample No.: SE-019-LF
Elev. or Depth: **Sample Length (in./cm.):**
Location:
Description: Silt With Sand (Visual)
%<#40: 87.9 **%<#200:** 78.9 **USCS:** **AASHTO:**
Testing Remarks:

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.311	24.358	25.363			
Dry+Tare	21.796	21.491	22.299			
Tare	14.159	15.253	15.738			
# Blows	25	17	12			
Moisture	46.0	46.0	46.7			

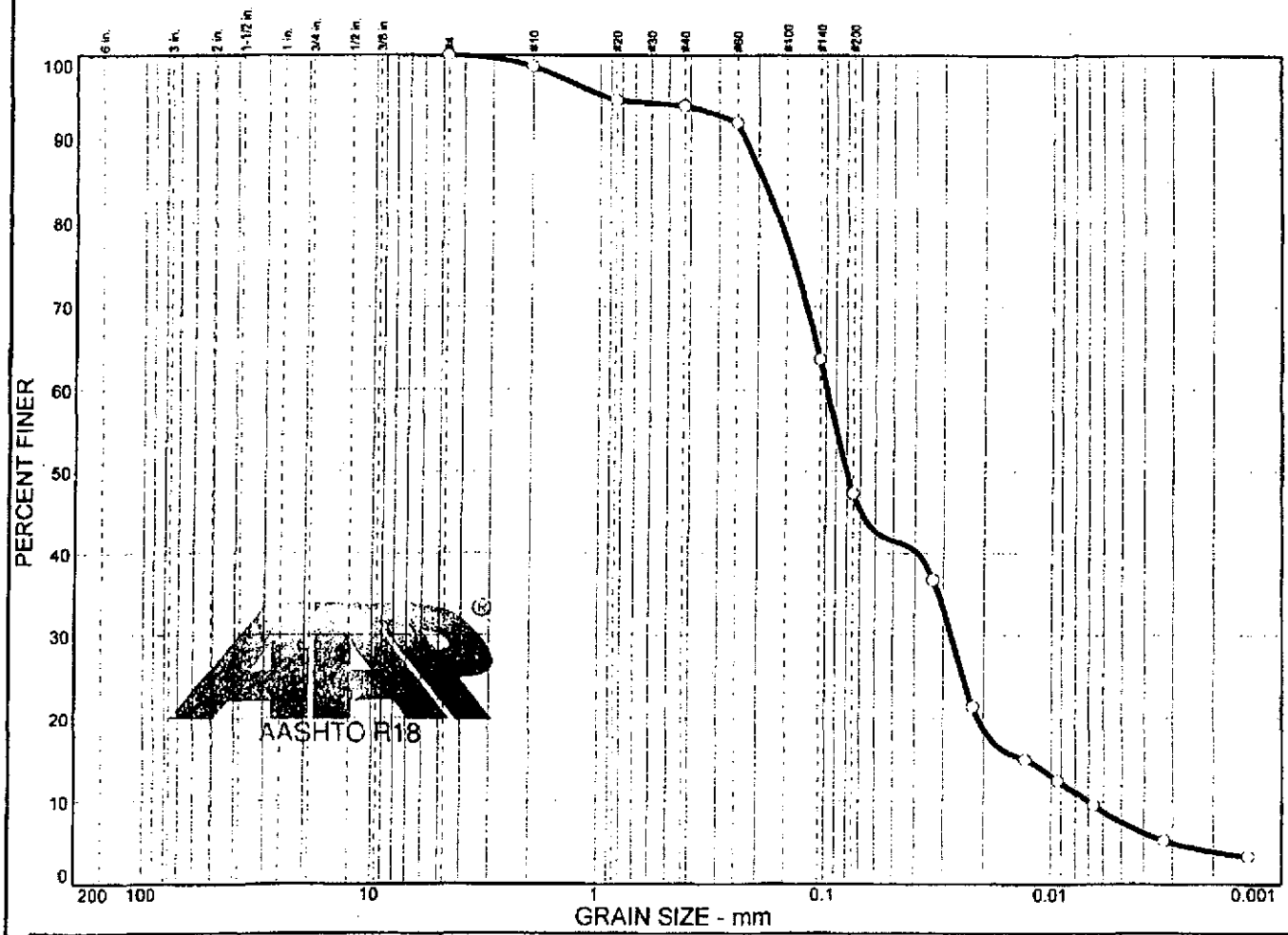


Liquid Limit= 46
Plastic Limit= 37
Plasticity Index= 9

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	20.443	20.175	19.975	
Dry+Tare	18.7	18.514	18.319	
Tare	14.043	14.006	13.853	
Moisture	37.4	36.8	37.1	

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	52.6	40.0	7.4

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.190	0.0985	0.0803	0.0277	0.0131	0.0070	1.10	13.98

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)	SM	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-020-LF **Sample No.:** SE-020-LF

Remarks:

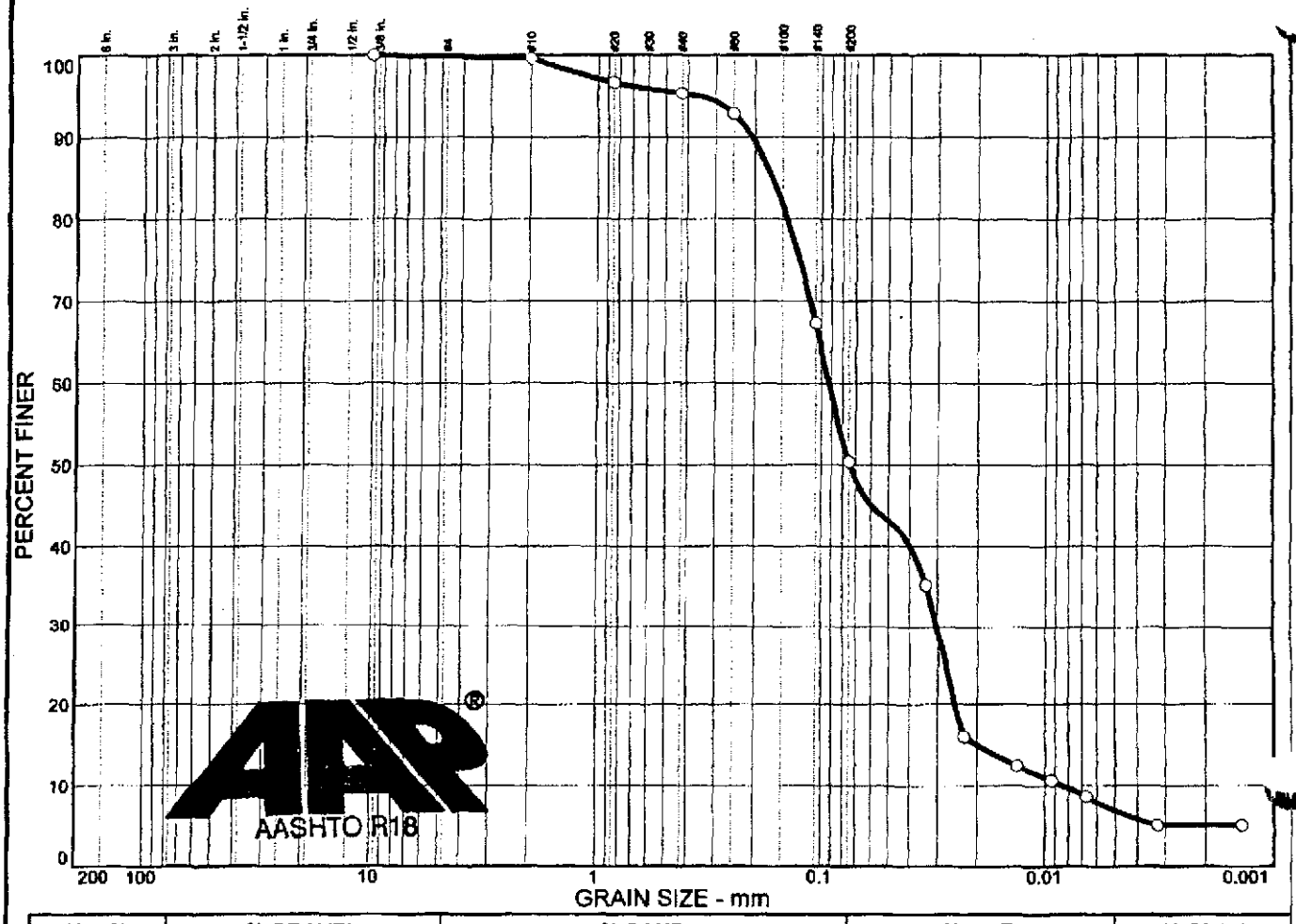
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-020-LF

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.2	49.4	43.5	6.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.167	0.0923	0.0742	0.0304	0.0199	0.0084	1.19	10.98

MATERIAL DESCRIPTION	USCS	AASHTO
○ Sandy silt (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-021-NP **Sample No.:** SE-021-NP

Remarks:

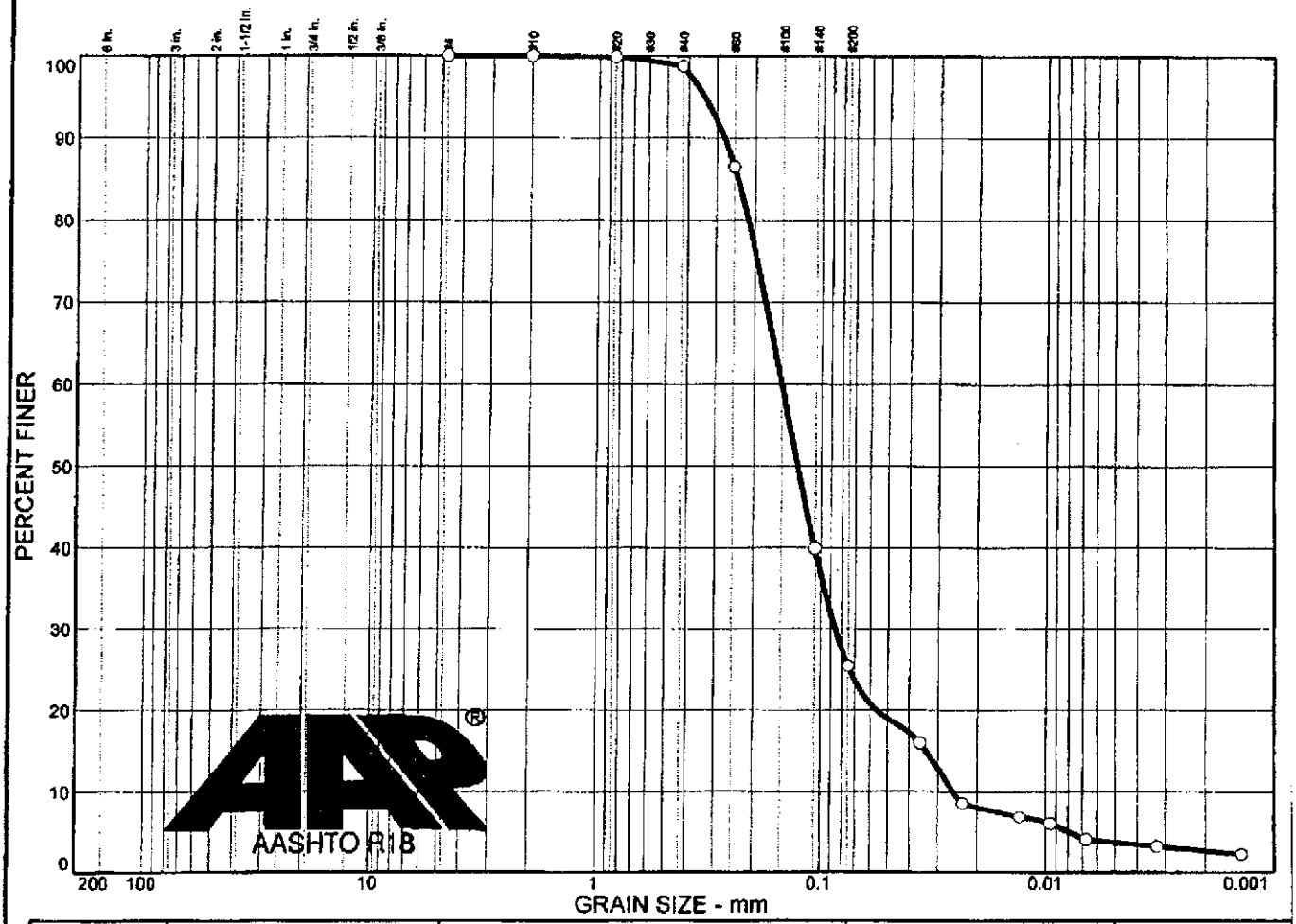
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-021-NP

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	0.0	74.6	21.6	3.8

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.240	0.150	0.127	0.0857	0.0339	0.0257	1.90	5.84

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-022-BR **Sample No.:** SE-022-BR

Remarks:

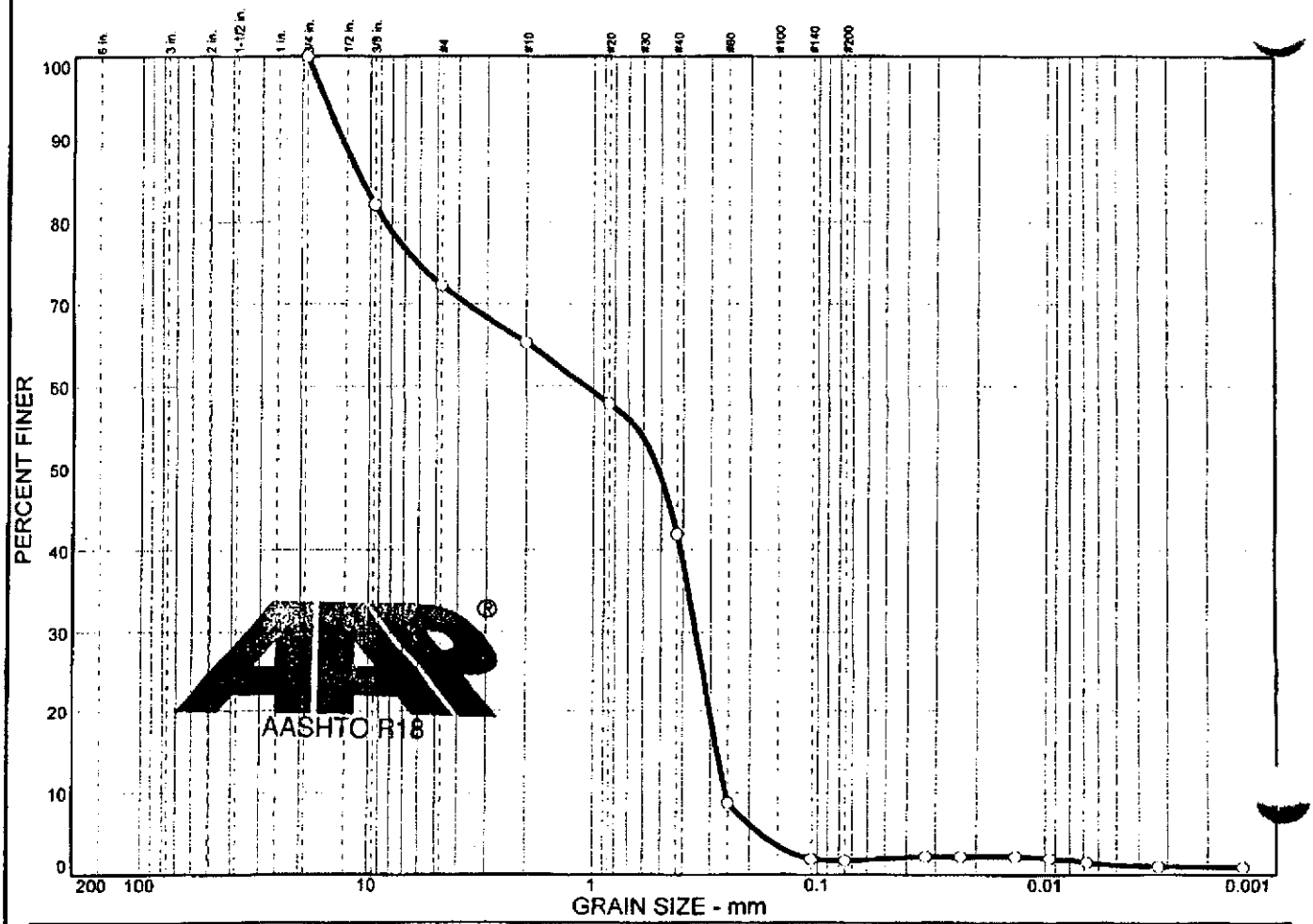
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-022-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	27.7	70.6	0.5	1.2

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		10.9	1.08	0.517	0.351	0.280	0.256	0.44	4.22

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-023-BR **Sample No.:** SE-023-BR

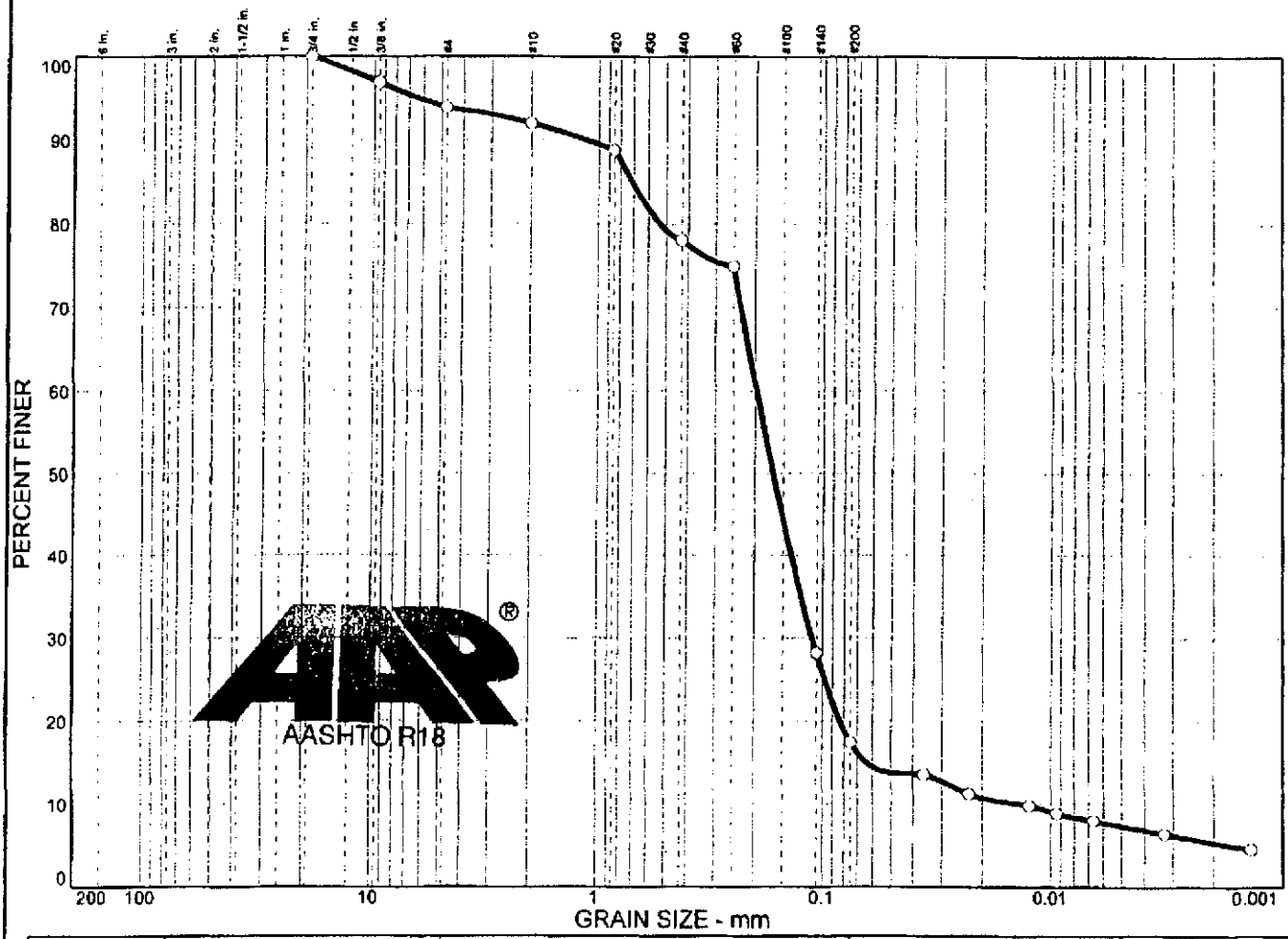
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-023-BR

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	6.1	76.5	10.1	7.3

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.710	0.197	0.166	0.111	0.0639	0.0136	4.56	14.46

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-024-BR **Sample No.:** SE-024-BR

Remarks:

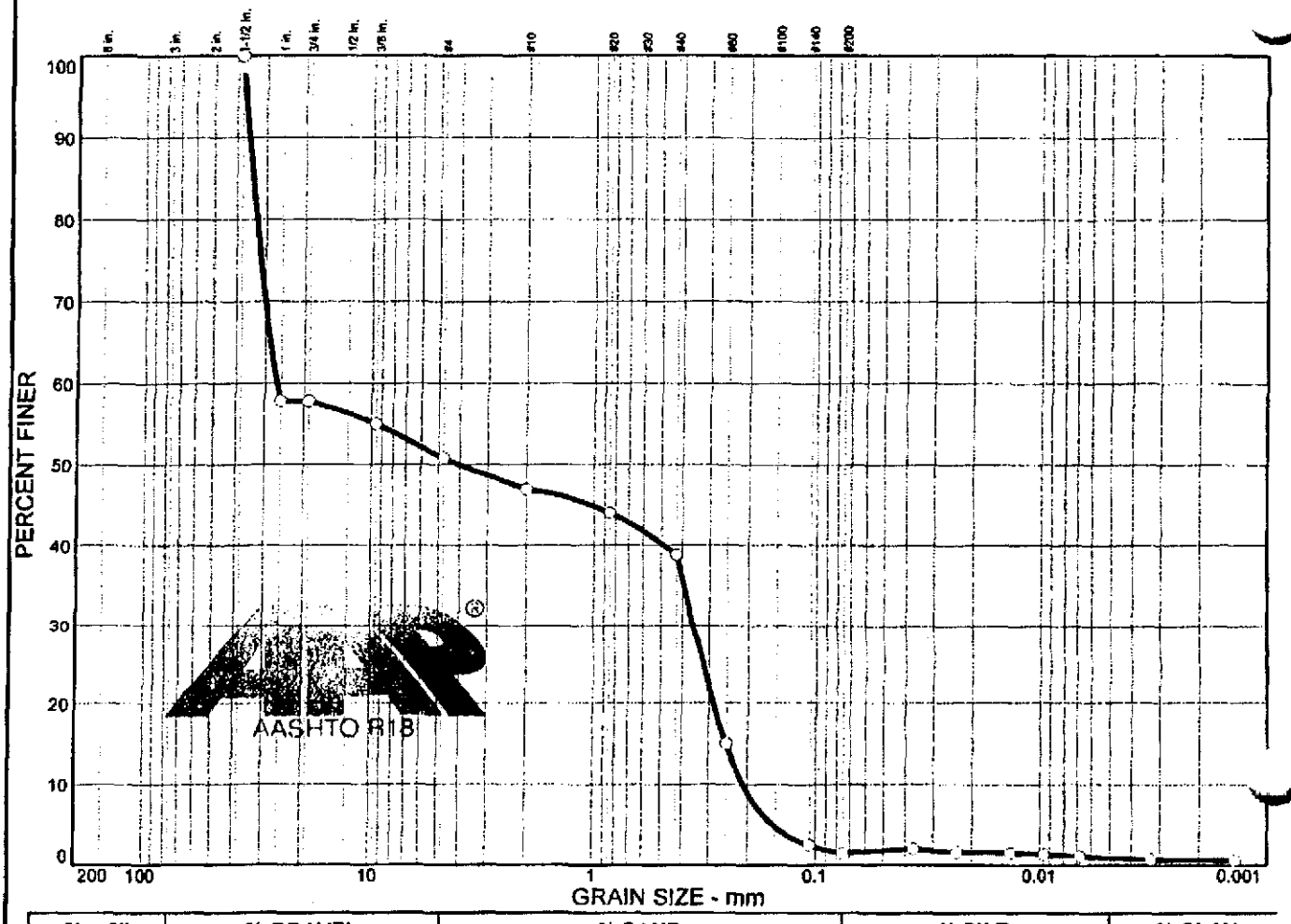
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-024-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	49.2	49.3	0.6	0.9

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		34.0	26.5	4.06	0.356	0.250	0.210	0.02	126.52

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-025-BR **Sample No.:** SE-025-BR

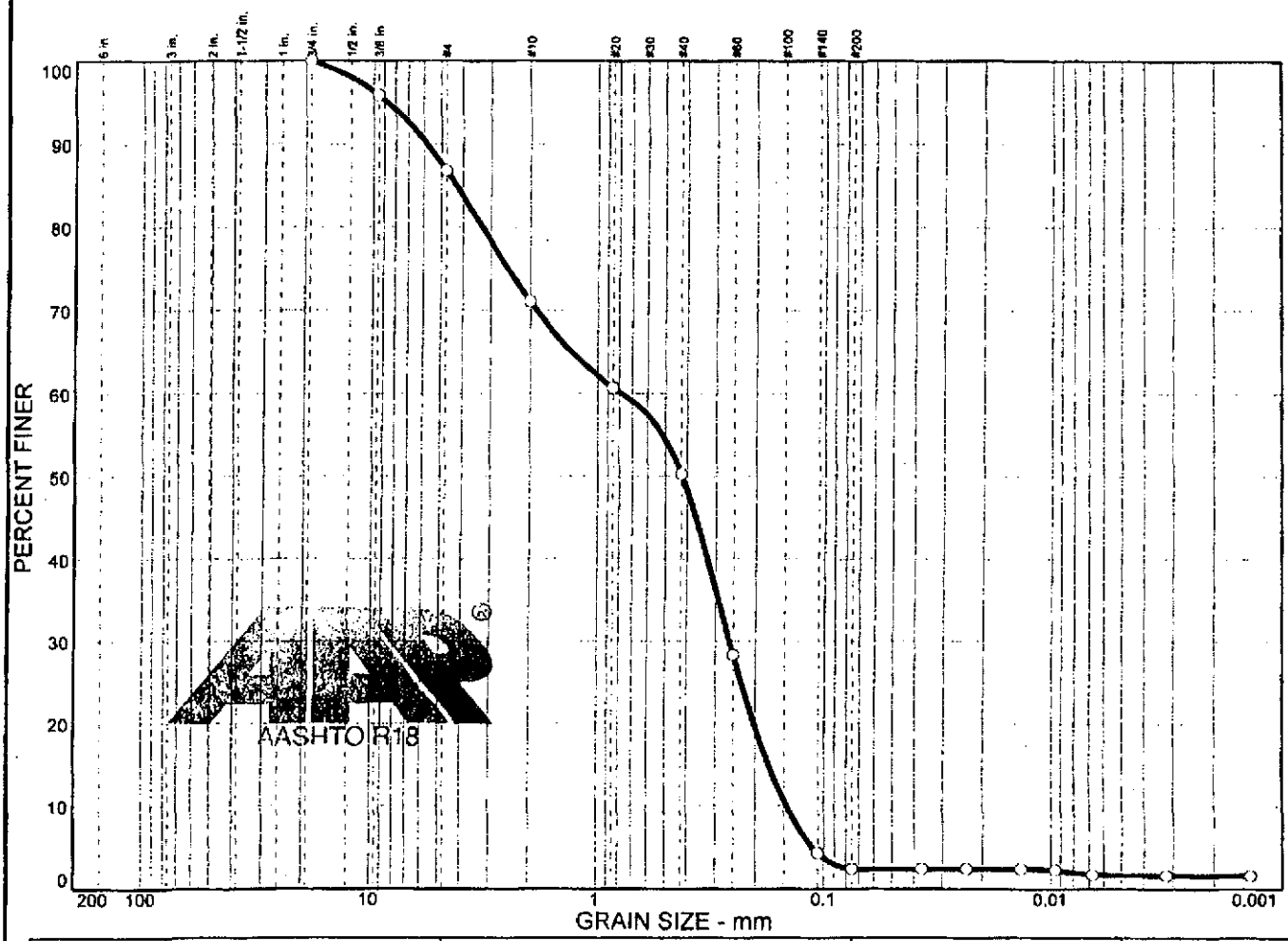
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-025-BR

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	13.1	84.5	0.7	1.7

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			4.26	0.780	0.421	0.260	0.175	0.146	0.59	5.35

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SE-026-BR **Sample No.:** SE-026-BR

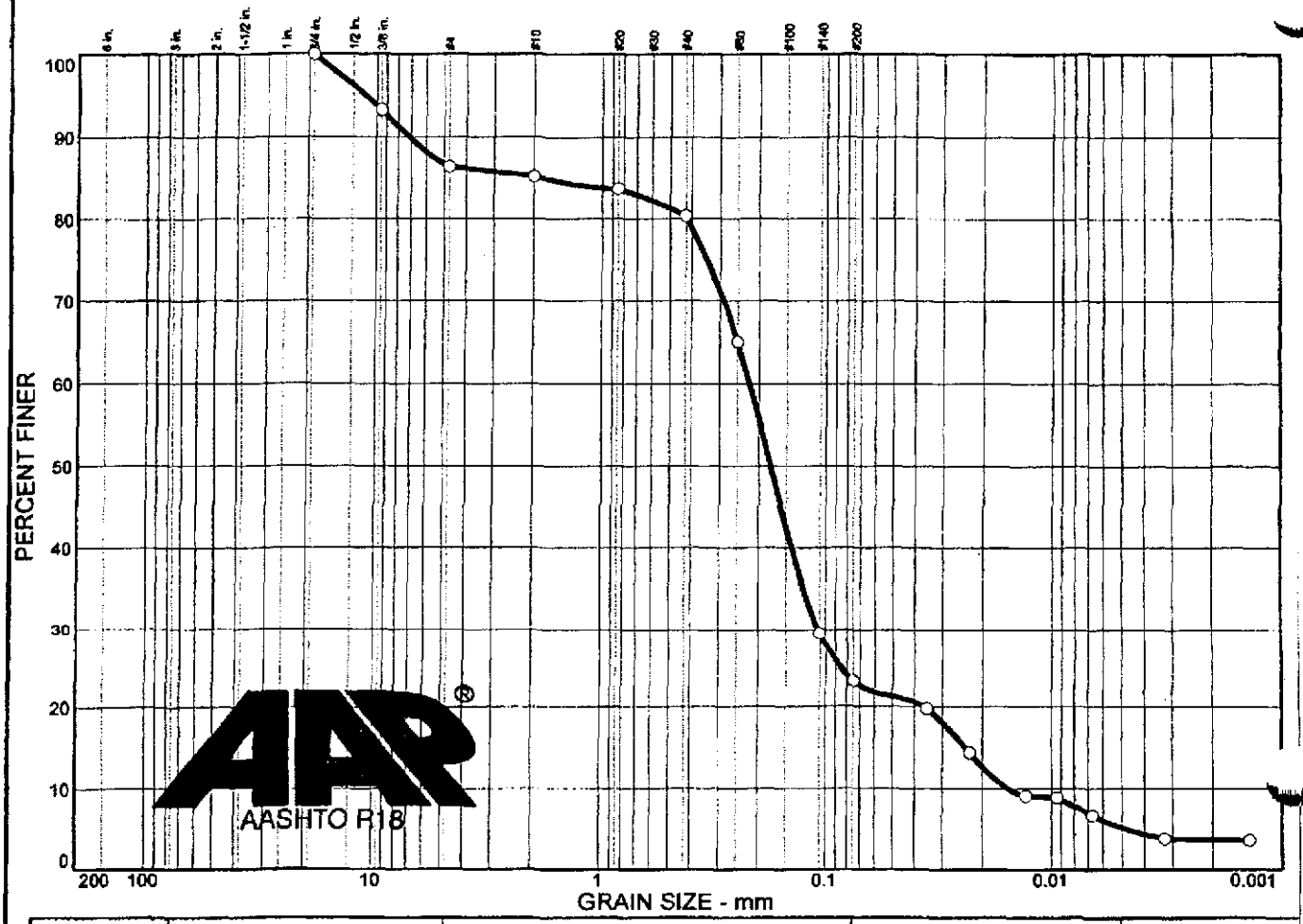
Remarks:
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-026-BR

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	13.6	63.1	18.1	5.2

	LL	PI	D_{85}	D_{60}	D_{60}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.85	0.220	0.177	0.108	0.0236	0.0154	3.44	14.34

MATERIAL DESCRIPTION	USCS	AASHTO
○ Silty sand (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-027-BR **Sample No.:** SE-027-BR

Remarks:

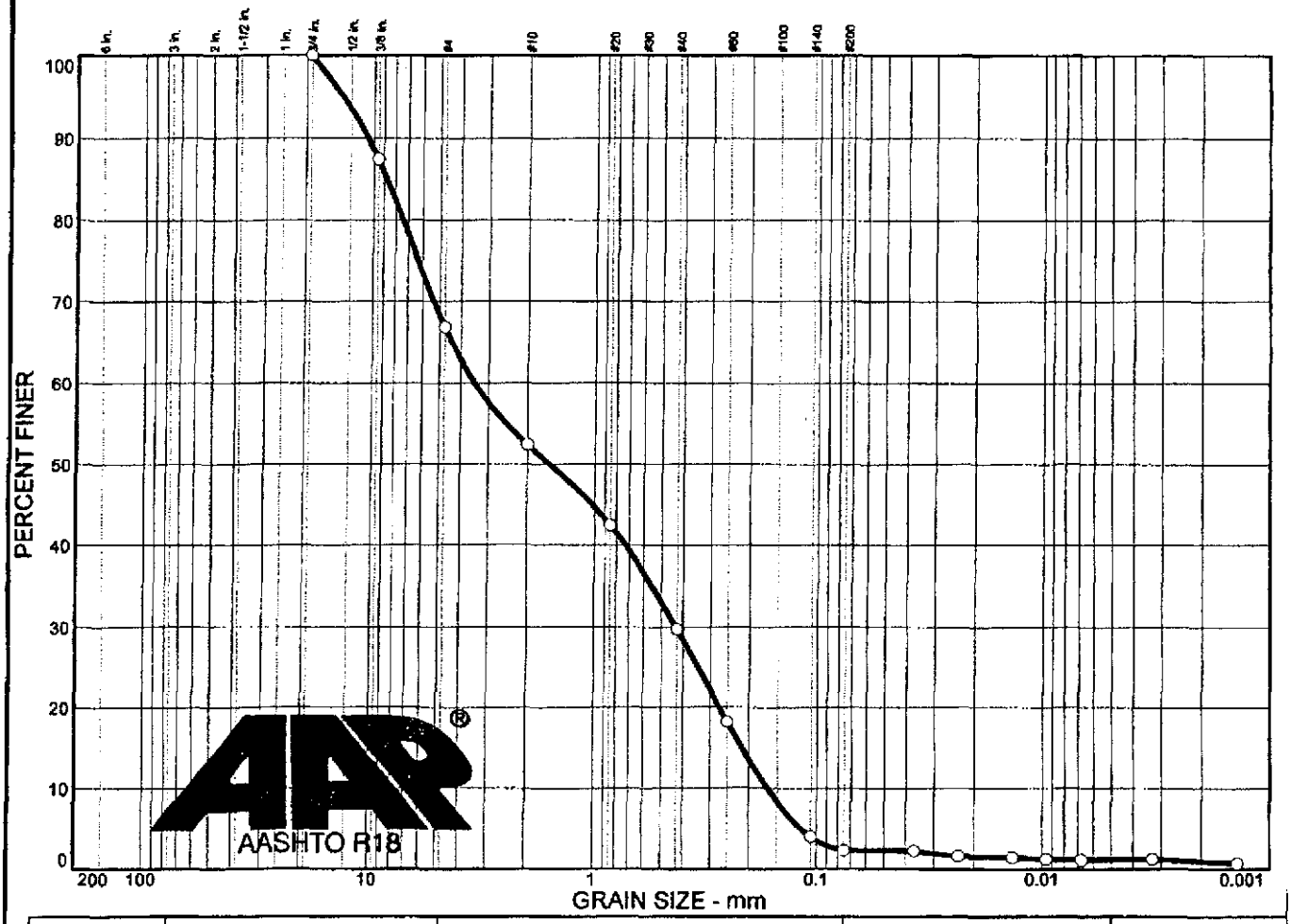
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-027-BR

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	33.1	64.6	1.2	1.1

X	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			8.71	3.47	1.60	0.431	0.215	0.165	0.32	20.96

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with gravel (Visual)		

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

○ **Source:** SE-028-BR **Sample No.:** SE-028-BR

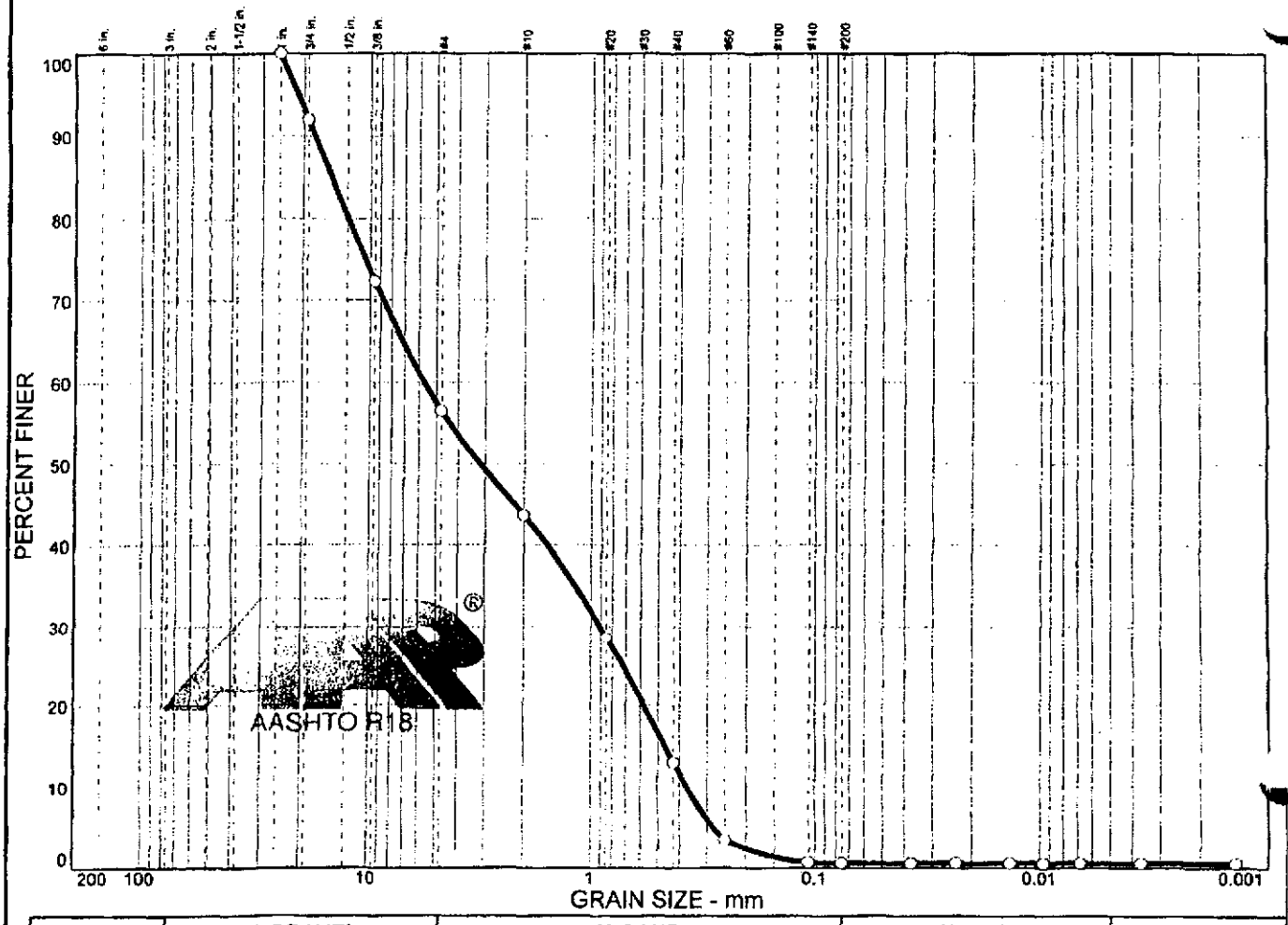
Remarks:
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-028-BR

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	43.5	55.9	0.0	0.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			14.9	5.68	3.15	0.909	0.465	0.370	0.39	15.37

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-029-BR **Sample No.:** SE-029-BR

Remarks:

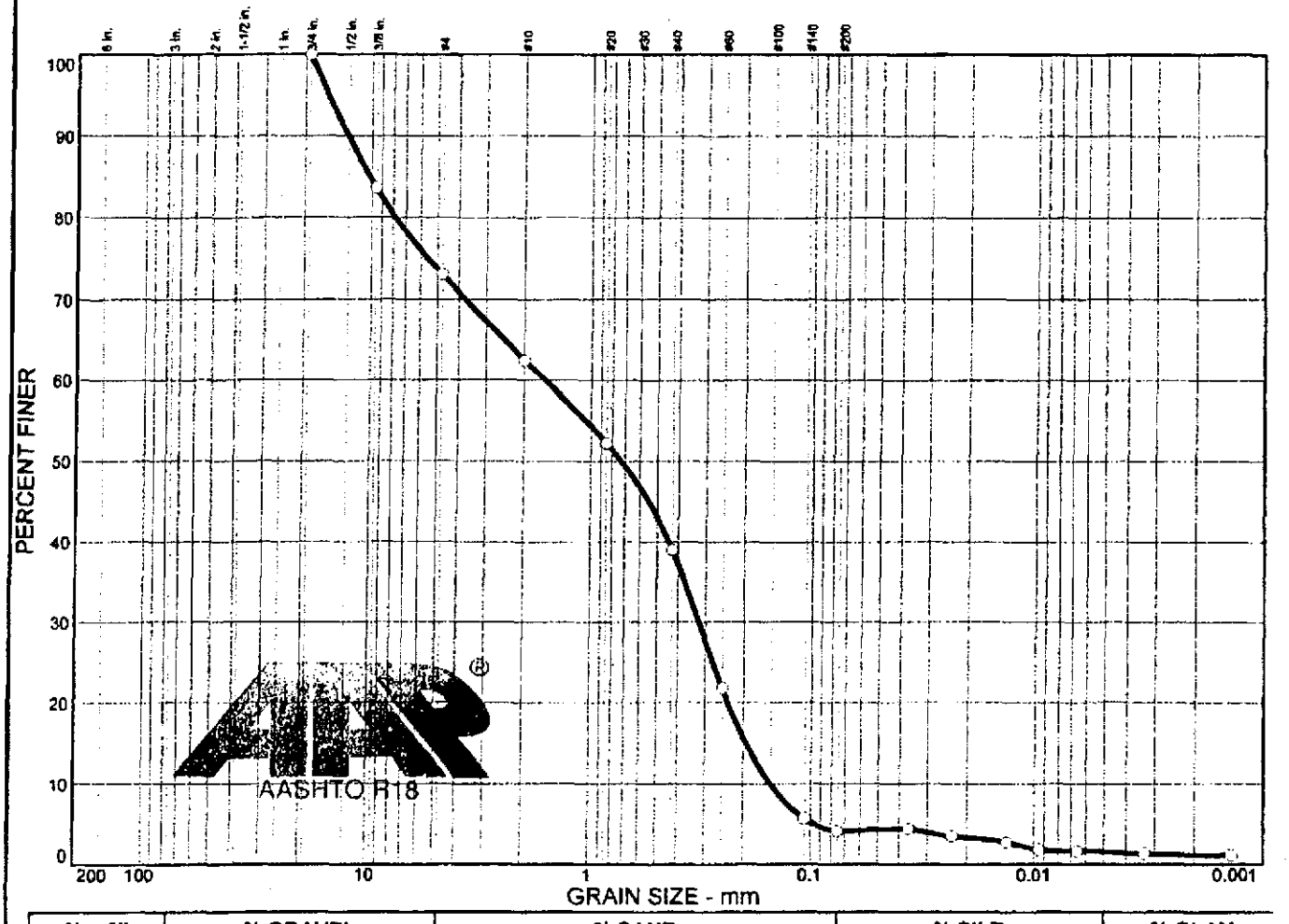
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-029-BR

Particle Size Distribution Report



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	26.9	69.0	2.6	1.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			10.2	1.61	0.727	0.321	0.194	0.151	0.42	10.69

MATERIAL DESCRIPTION	USCS	AASHTO
○ Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

○ **Source:** SE-030-BR **Sample No.:** SE-030-BR

Remarks:

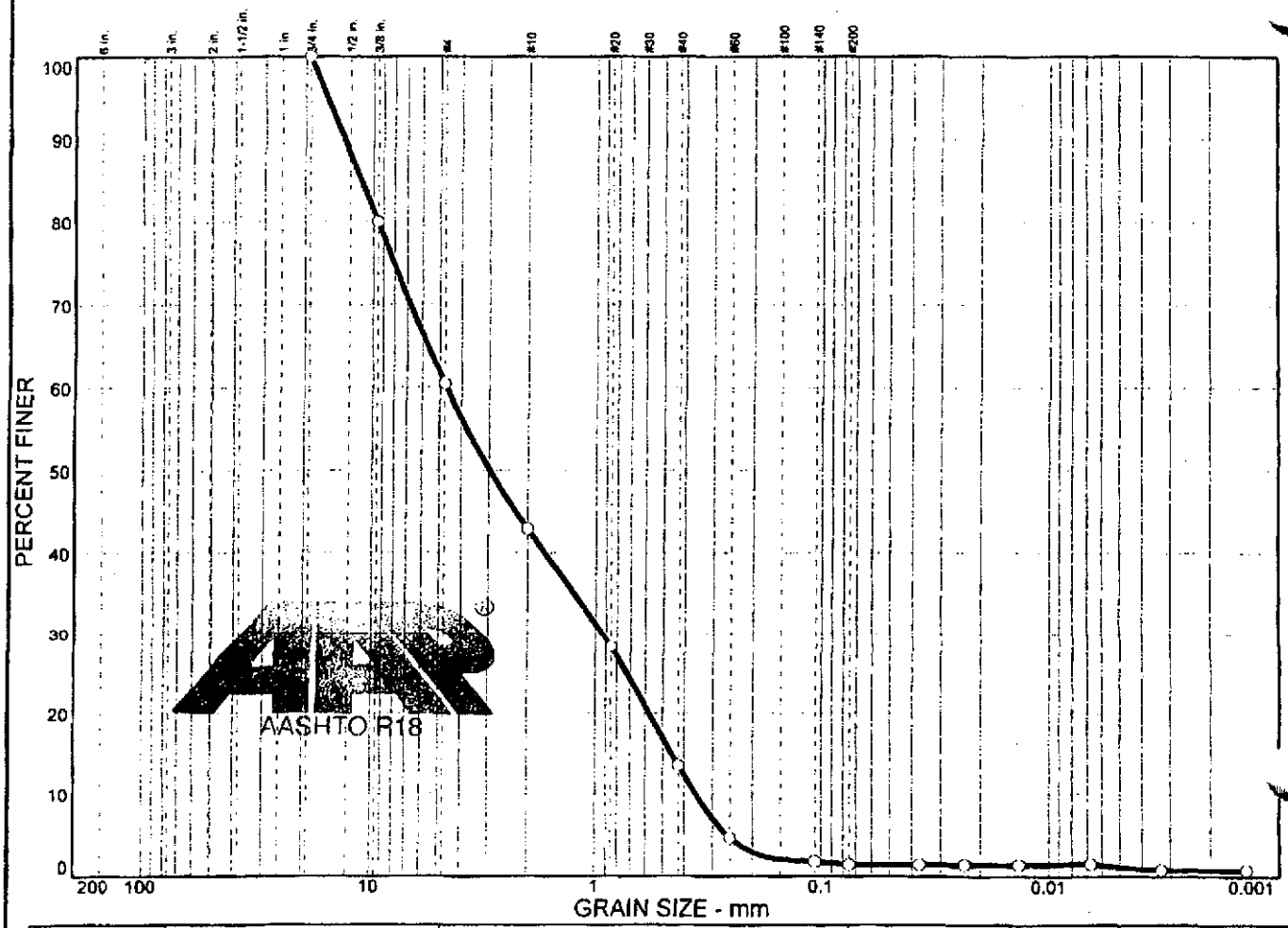
○

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-030-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	39.5	59.1	0.3	1.1

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		11.3	4.66	2.96	0.934	0.457	0.356	0.53	13.09

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-031-RB **Sample No.:** SE-031-RB redone

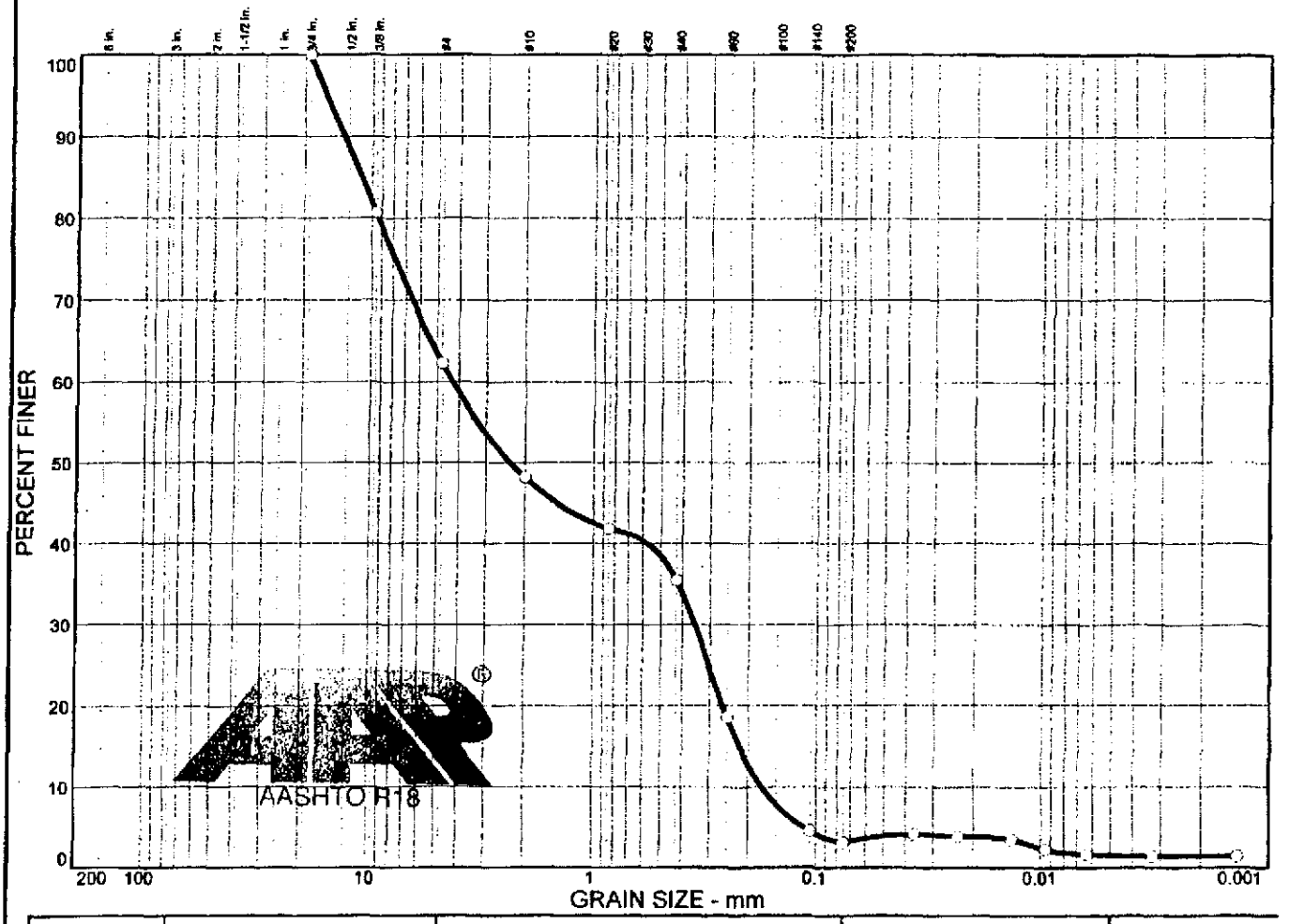
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-031-RB

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	37.7	59.2	1.6	1.5

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		11.1	4.27	2.33	0.351	0.220	0.173	0.17	24.68

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-032-BR **Sample No.:** SE-032-BR

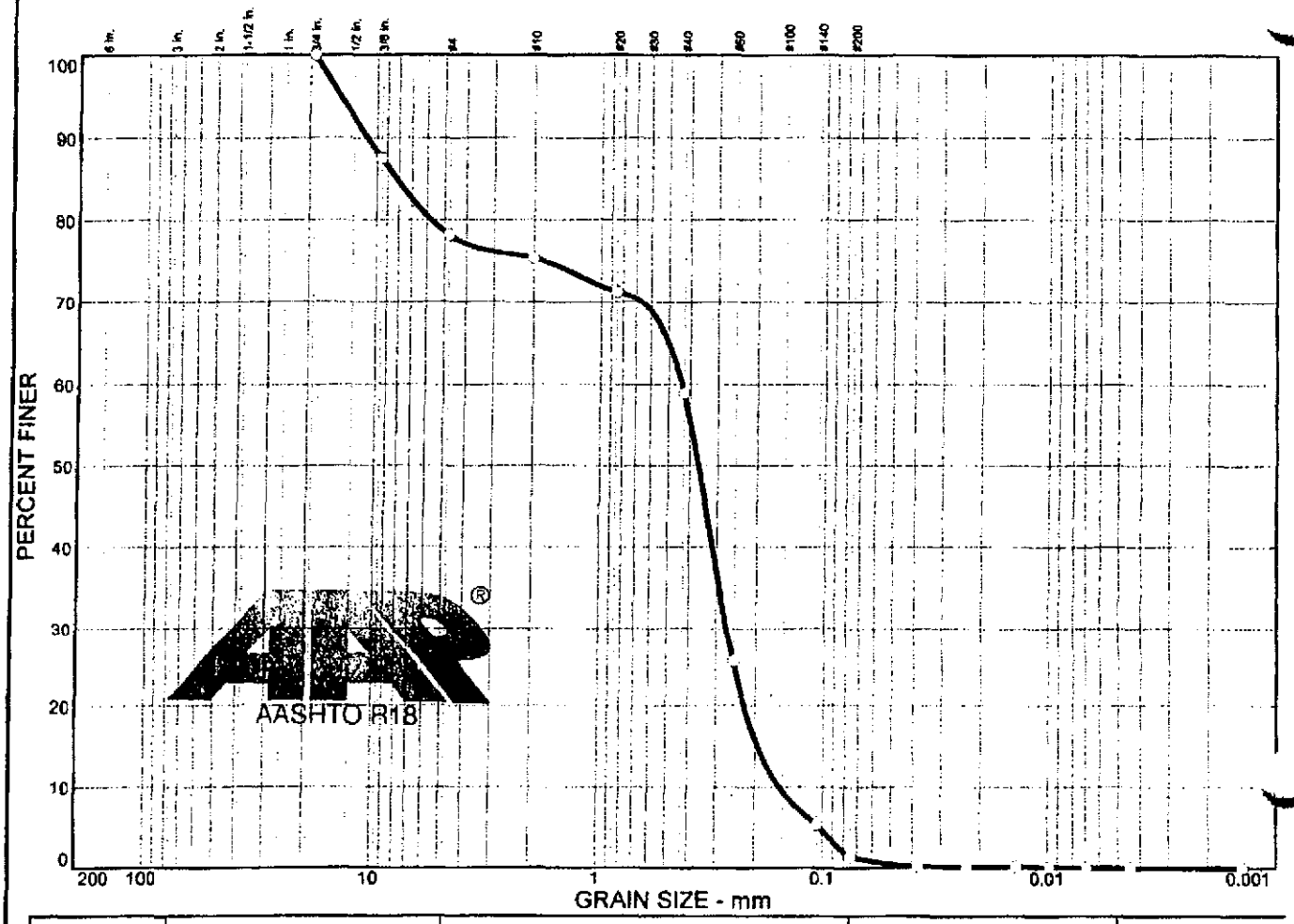
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-032-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	21.8	76.9	1.3	0.0

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		8.18	0.435	0.364	0.270	0.194	0.156	1.08	2.80

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-033-BR **Sample No.:** SE-033-BR

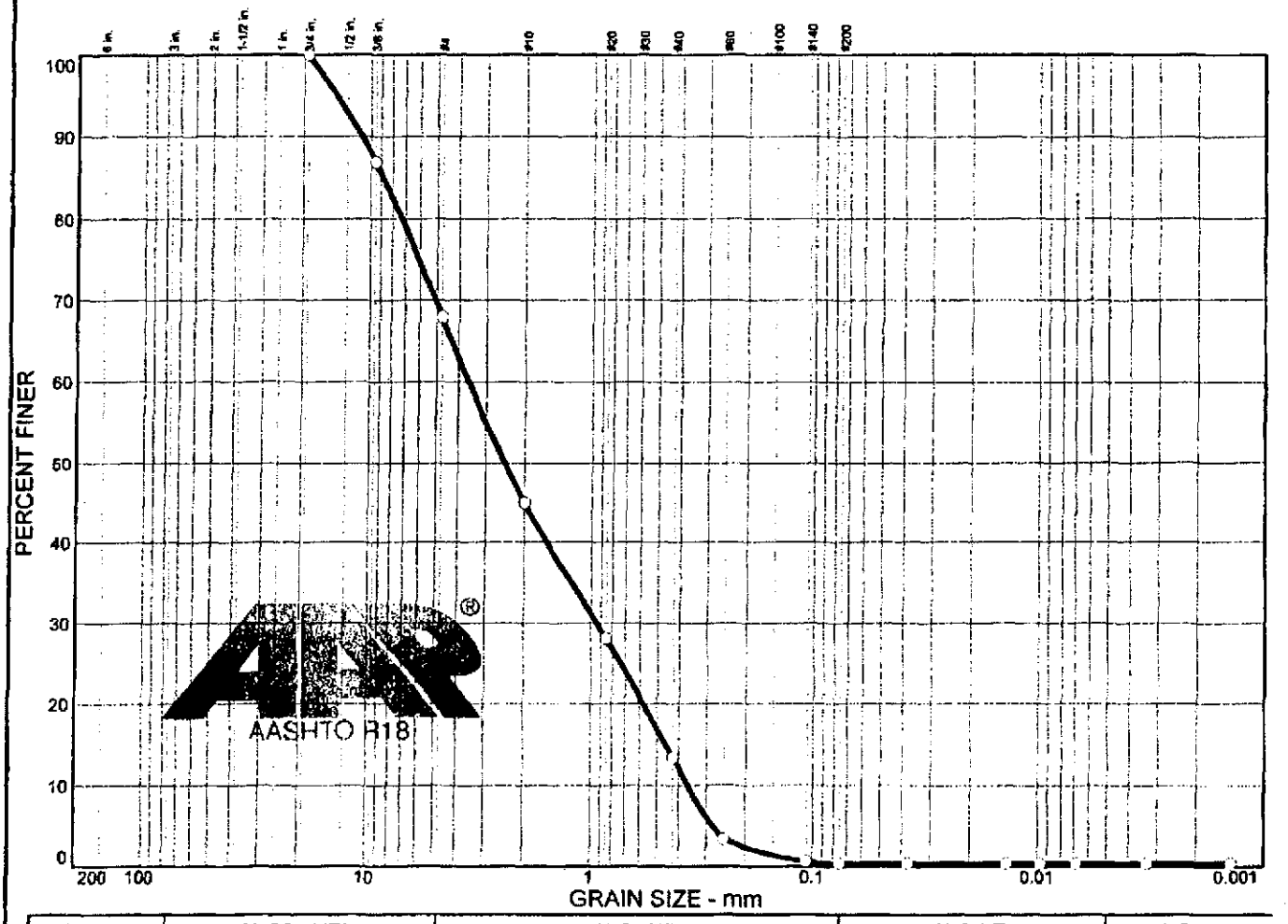
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-033-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	32.0	67.6	0.0	0.4

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		8.76	3.59	2.47	0.937	0.457	0.364	0.67	9.88

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-034-BR **Sample No.:** SE-034-BR

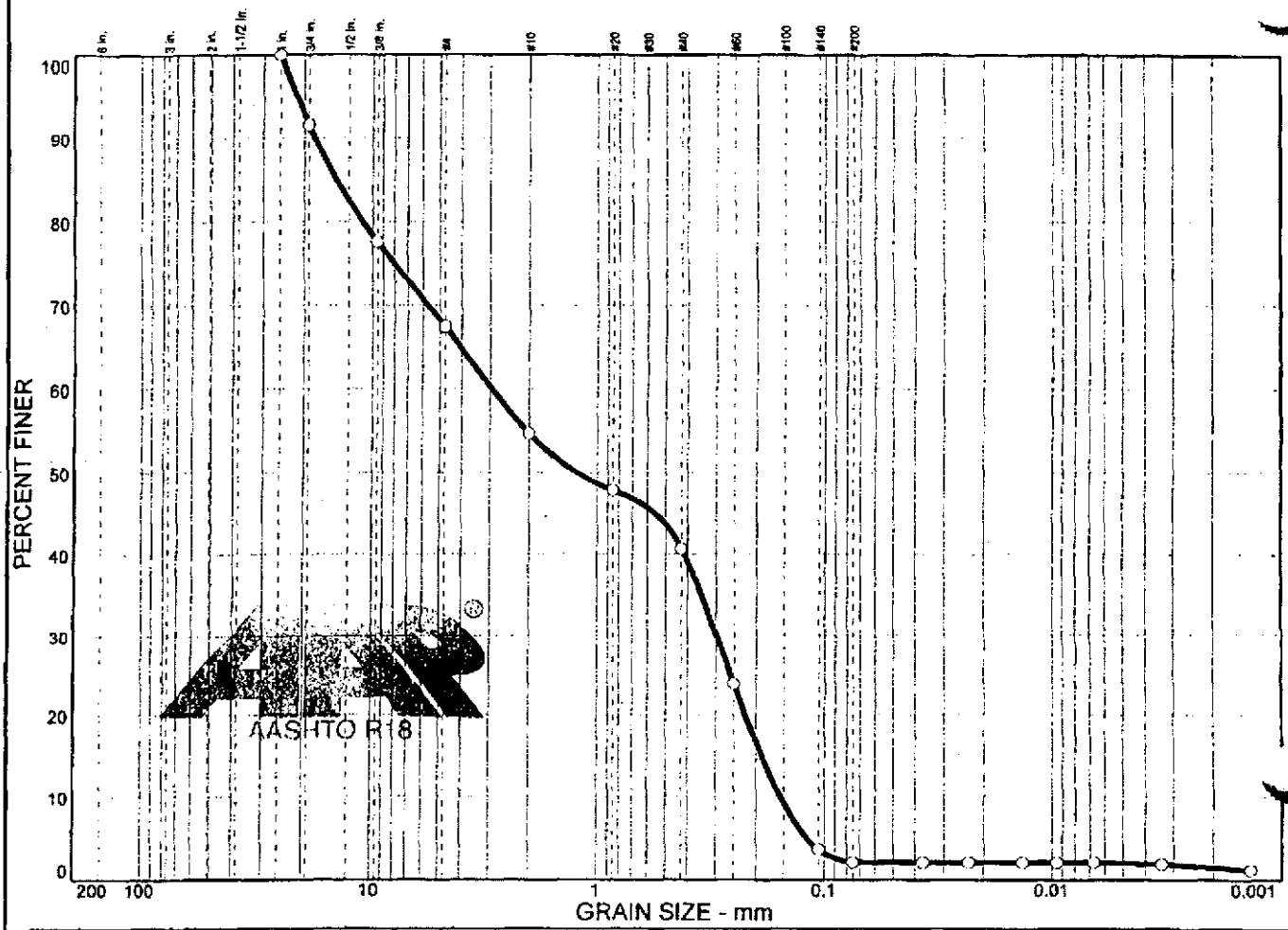
Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-034-BR

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	32.6	65.3	0.1	2.0

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
		14.4	2.94	1.23	0.299	0.189	0.155	0.20	18.92

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.

Project: Peterson's-Puritan OU2

Source: SE-FD02 **Sample No.:** SE-FD-02

Remarks:

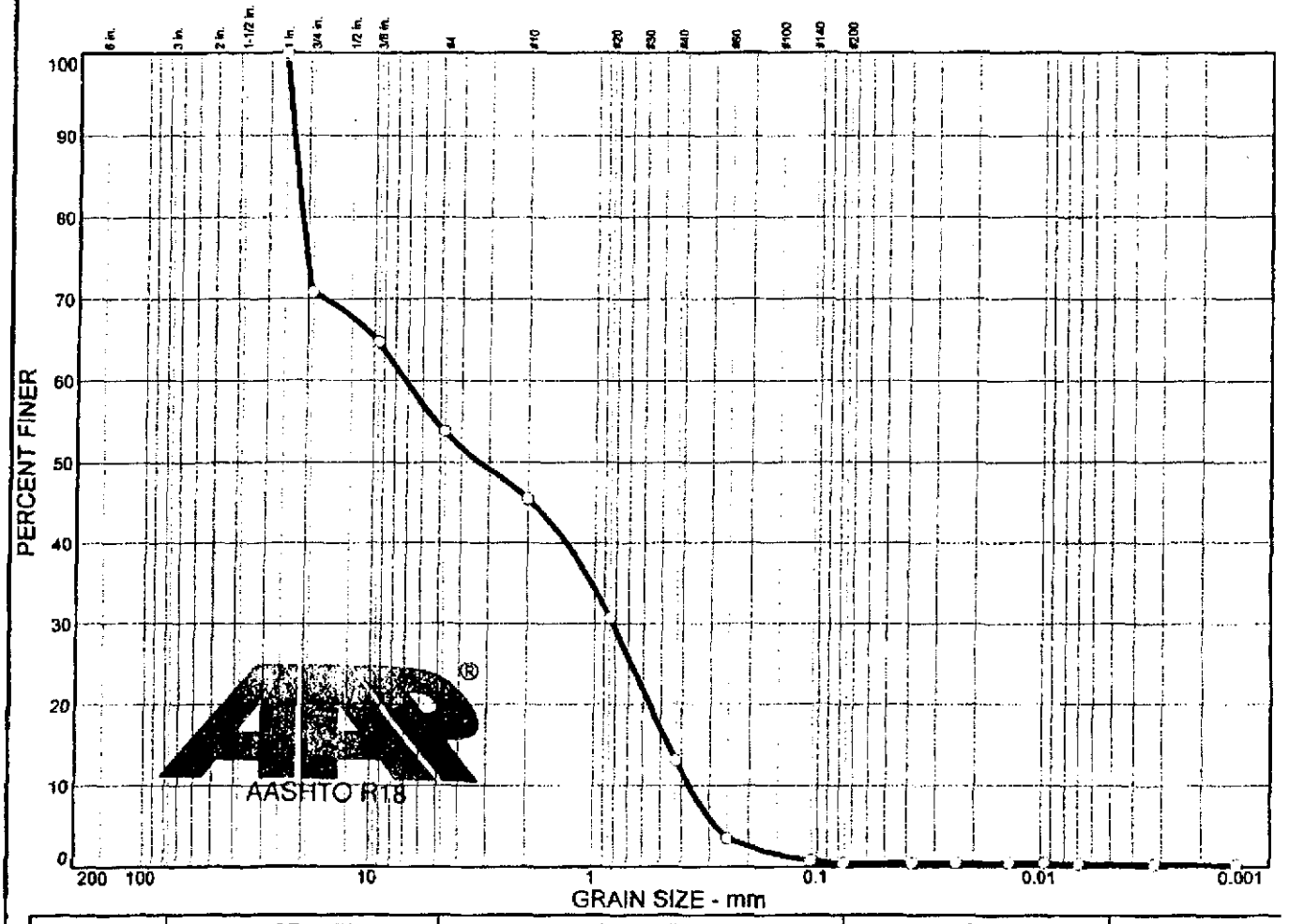
Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-FD-02

Click Here to Continue to Appendix G

Particle Size Distribution Report



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	46.3	53.2	0.2	0.3

LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
		22.3	7.16	3.30	0.825	0.460	0.370	0.26	19.35

MATERIAL DESCRIPTION	USCS	AASHTO
Poorly graded sand with gravel (SP)	SP	

Project No. 1030105-01 **Client:** Shield Environmental Associates, Inc.
Project: Peterson's-Puritan OU2

Source: SE-FD-03 **Sample No.:** SE-FD-03

Remarks:

Particle Size Distribution Report

SHIELD ENGINEERING

Figure SE-FD-03