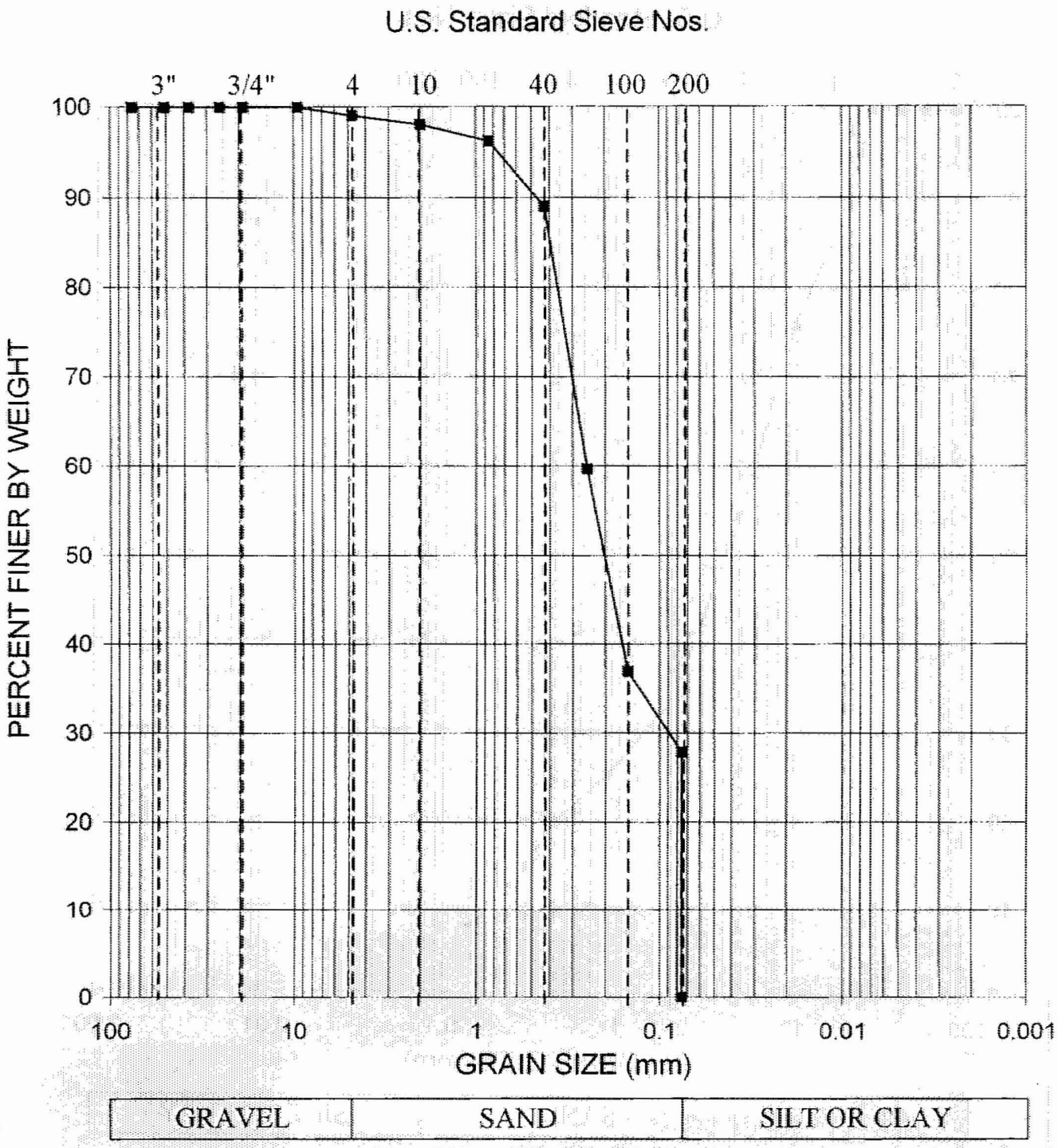


GRADATION CURVE

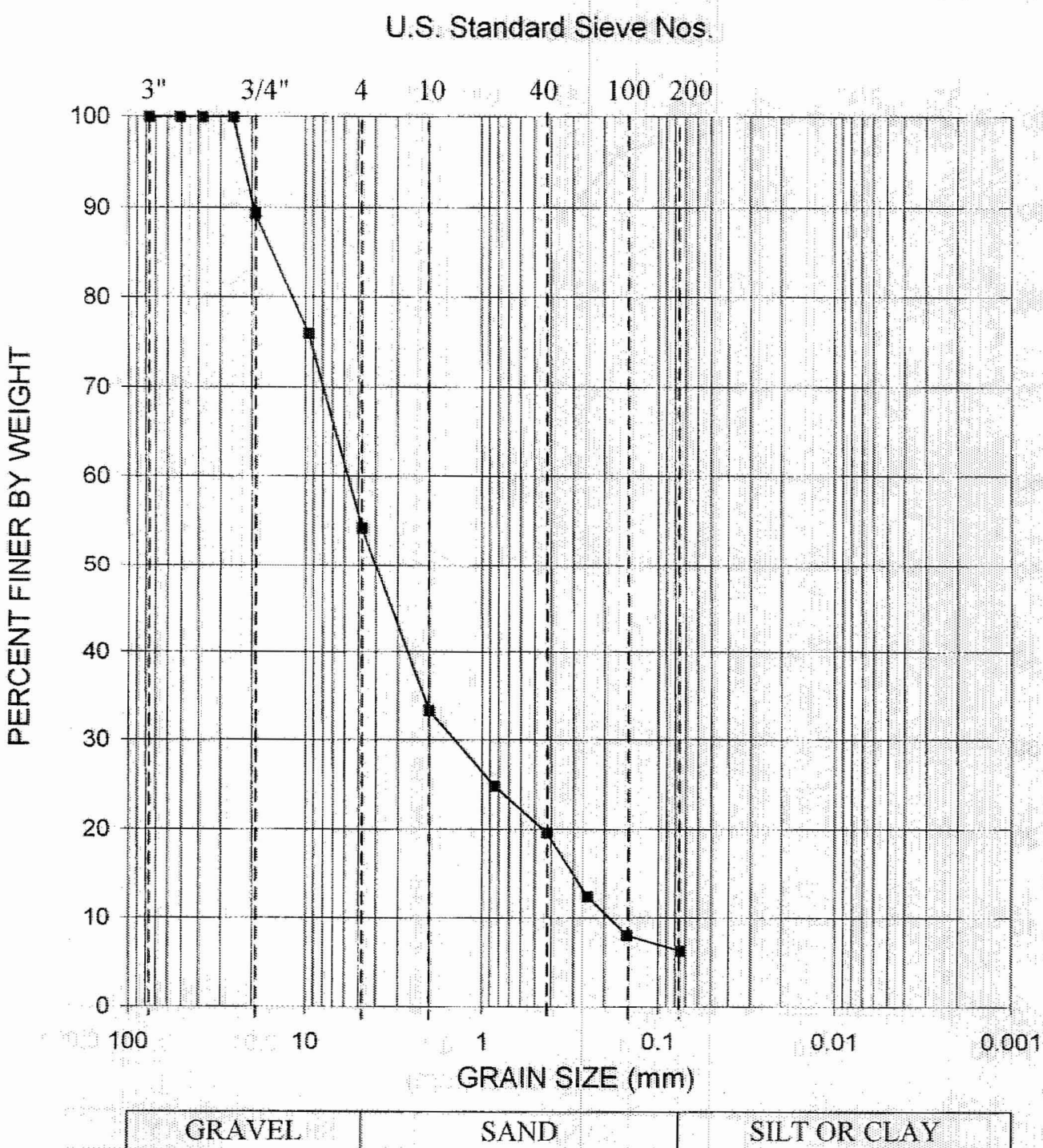
ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	9/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-701	7.5	Silty SAND, trace rock fragments, light brown	SM		

Schnabel

Schnabel Engineering



GRADATION CURVE

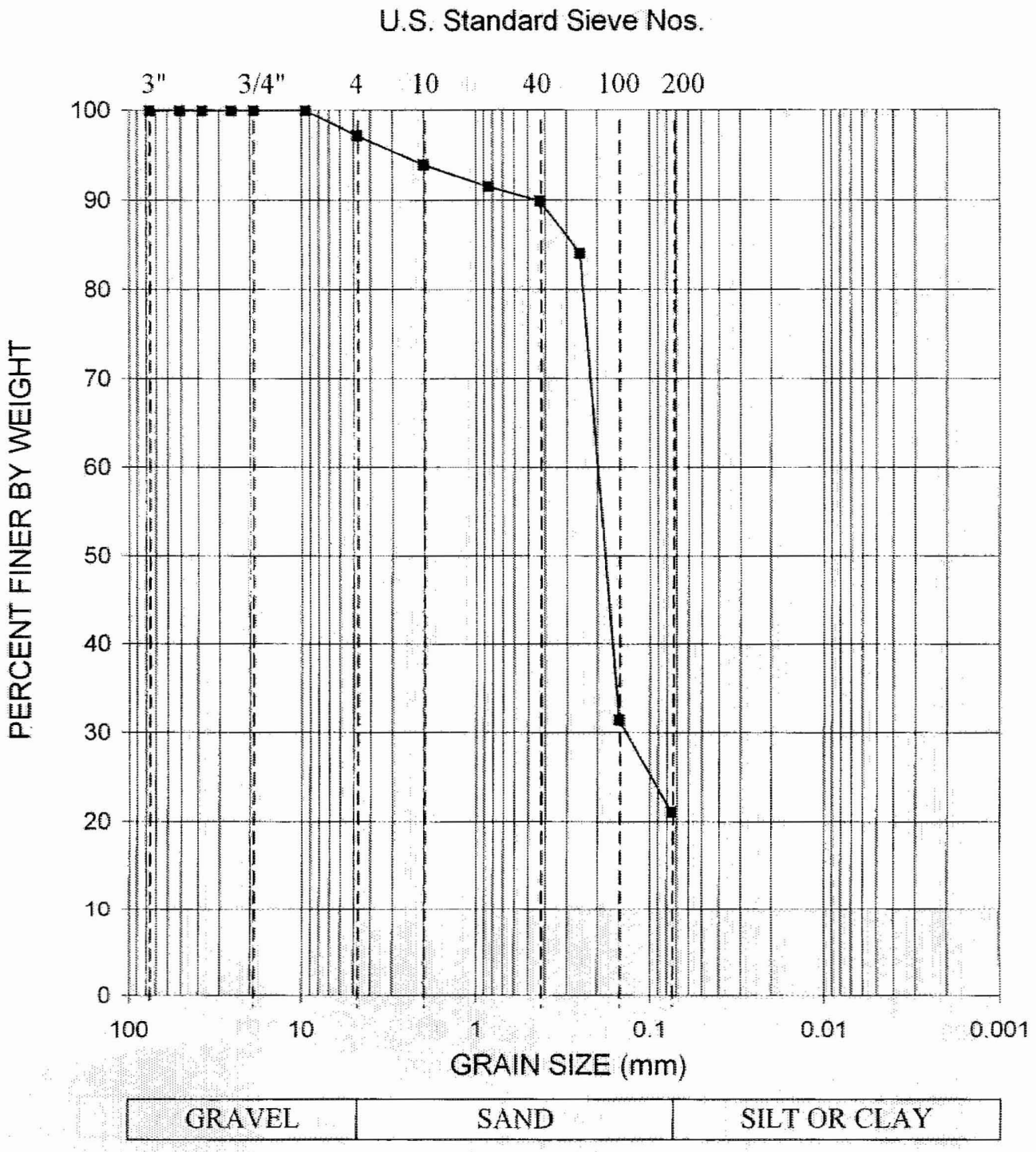
ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.: 06120048.00	Date: 9/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-701	10.5	Well Graded SAND, with silt and gravel, brown	SW-SM		

Schnabel

Schnabel Engineering



GRADATION CURVE

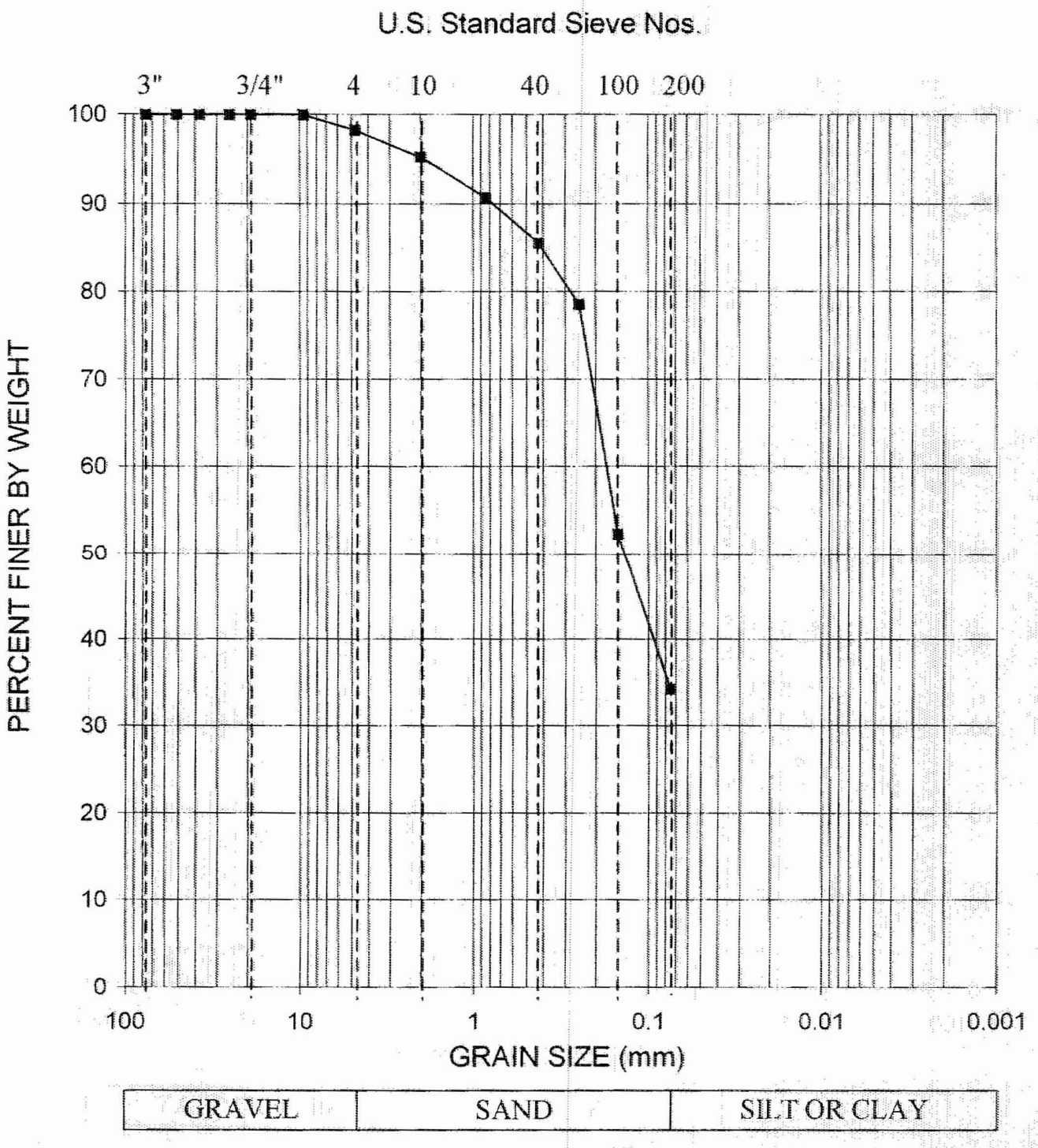
ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	9/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-701	18.5	Silty SAND, trace shells, gray	SM		

Schnabel

Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 9/24/2006	
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI	
B-701	28.5	Silty SAND, trace shells, green	SM			Schnabel Schnabel Engineering

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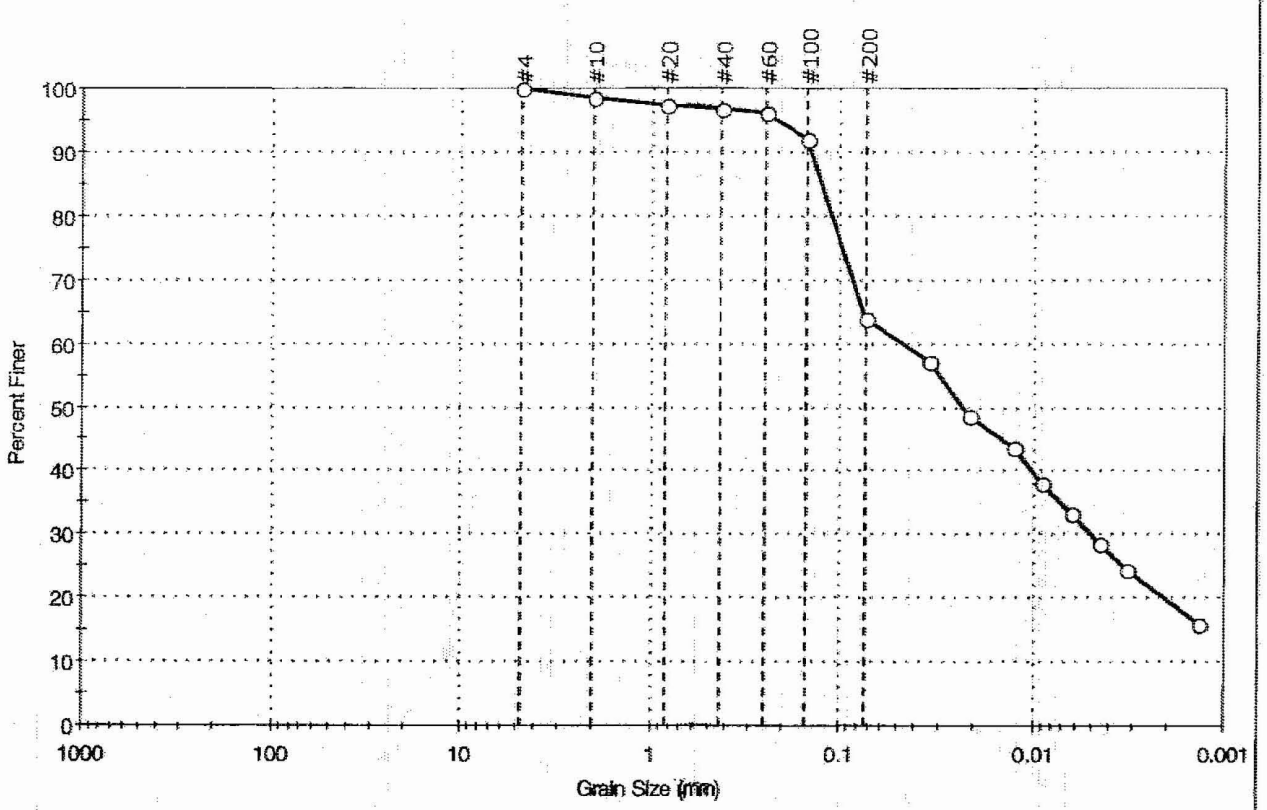
Client:	Schnabel Engineering, Inc.		
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP		
Location:	Calvert County, MD	Project No:	GTX-6880
Boring ID: B-701	Sample Type: tube	Tested By:	sam
Sample ID: S-12	Test Date: 10/17/06	Checked By:	mcm
Depth : 43.5-45.2 ft	Test Id: 97911		

Test Comment: ---
Sample Description: Moist, mottled olive gray and light gray sandy silt
Sample Comment: ---

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	35.9	64.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.84	97		
#40	0.42	97		
#60	0.25	96		
#100	0.15	92		
#200	0.074	64		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0339	57		
---	0.0213	49		
---	0.0125	44		
---	0.0090	38		
---	0.0063	33		
---	0.0045	29		
---	0.0032	24		
---	0.0014	16		

Coefficients

D_{85} = 0.1254 mm	D_{30} = 0.0050 mm
D_{60} = 0.0461 mm	D_{15} = N/A
D_{50} = 0.0228 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Sandy elastic silt (MH)

AASHTO Clayey Soils (A-7-5 (15))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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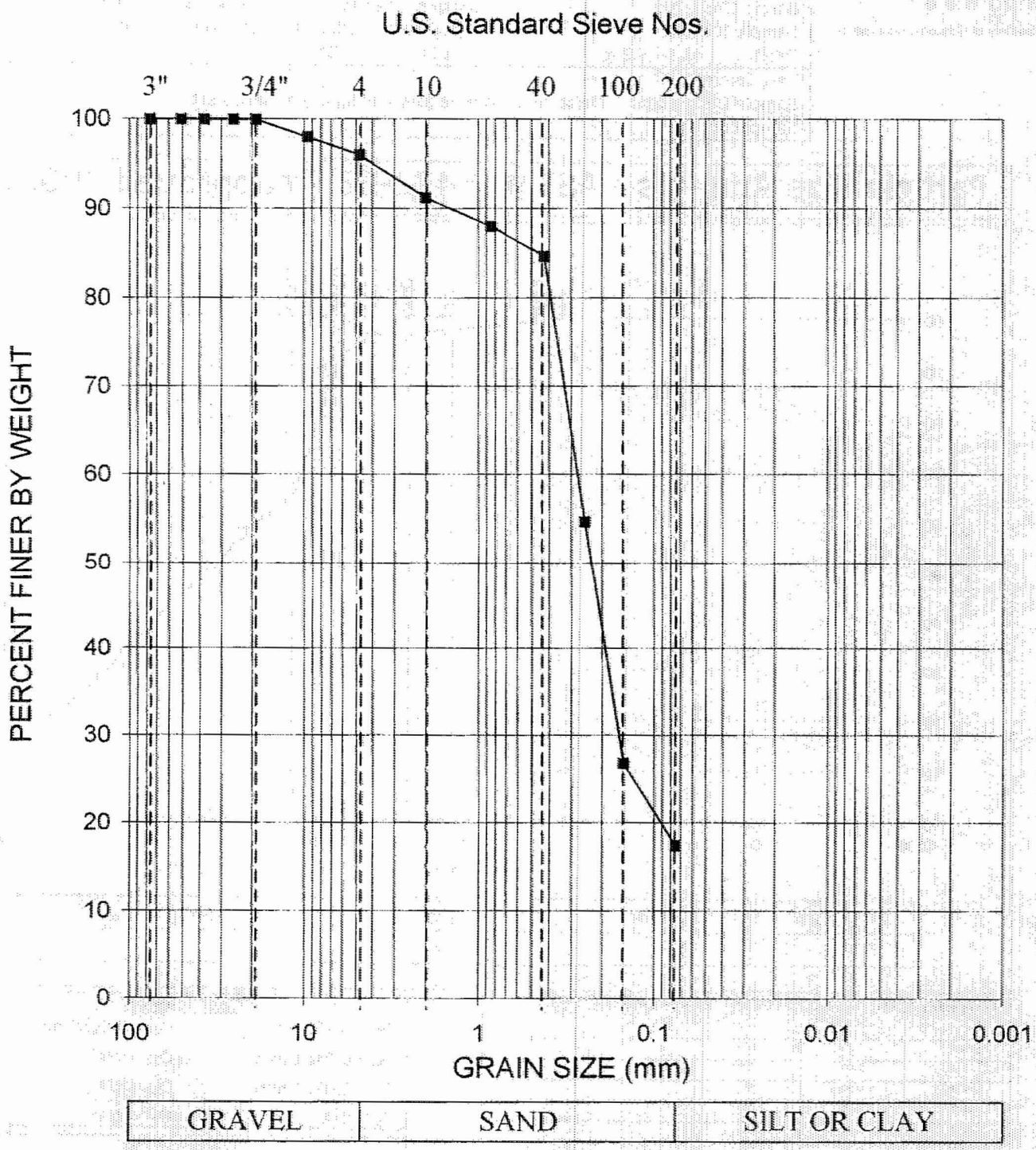

GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.: 06120048.00	Date: 9/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-701	48.5	Silty SAND, trace shells, dark green	SM		

Schnabel

Schnabel Engineering

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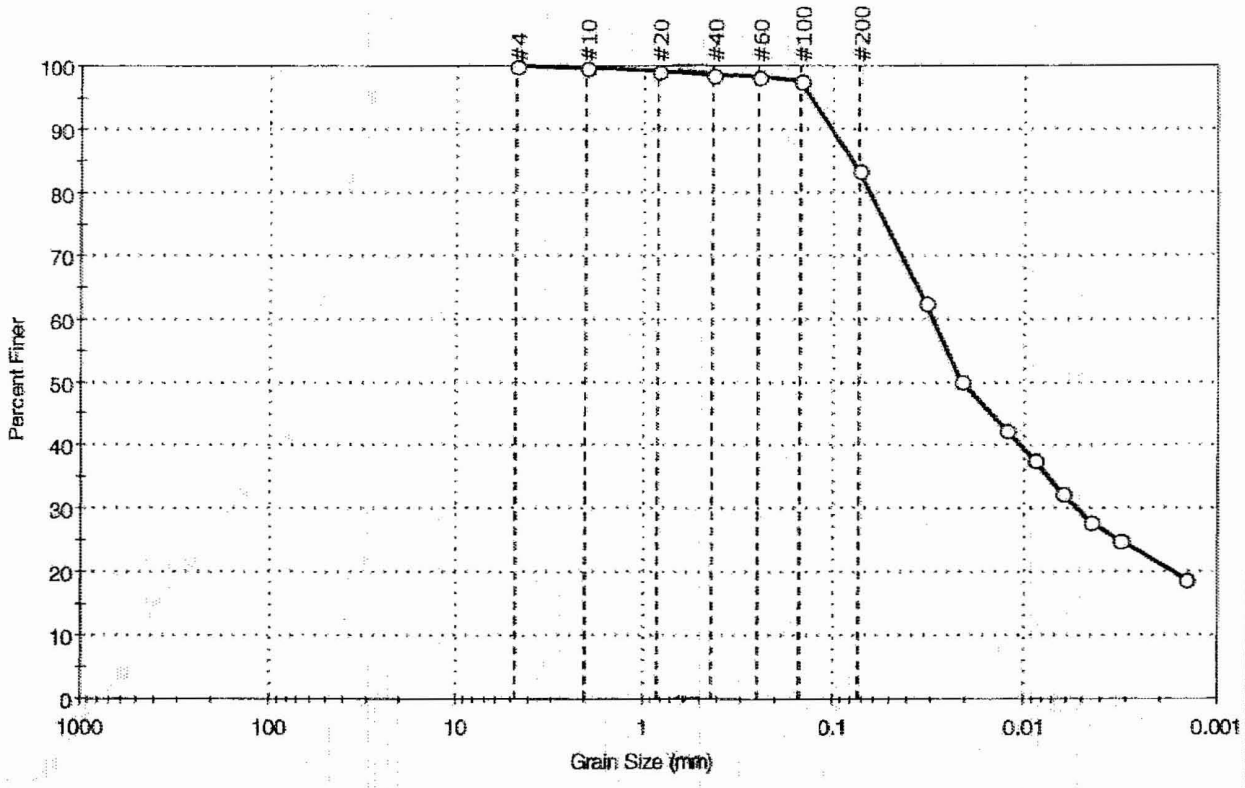
Client:	Schnabel Engineering, Inc.		
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP		
Location:	Calvert County, MD	Project No:	GTX-6880
Boring ID: B-703	Sample Type: tube	Tested By:	sam
Sample ID: S-7	Test Date: 11/08/06	Checked By:	mcm
Depth : 18.5-20.5 ft	Test Id: 102399		
Test Comment:	---		
Sample Description:	Moist, mottled light yellowish brown, dark gray, and brownish yellow		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	16.6	83.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	98		
#200	0.074	83		
--	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
--	0.0327	63		
--	0.0211	50		
--	0.0123	42		
--	0.0088	38		
--	0.0063	32		
--	0.0045	28		
--	0.0032	25		
--	0.0015	19		

Coefficients

D_{85} = 0.0802 mm D_{30} = 0.0052 mm
D_{60} = 0.0297 mm D_{15} = N/A
D_{50} = 0.0207 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM organic clay with sand (OH)

AASHTO Clayey Soils (A-7-6 (45))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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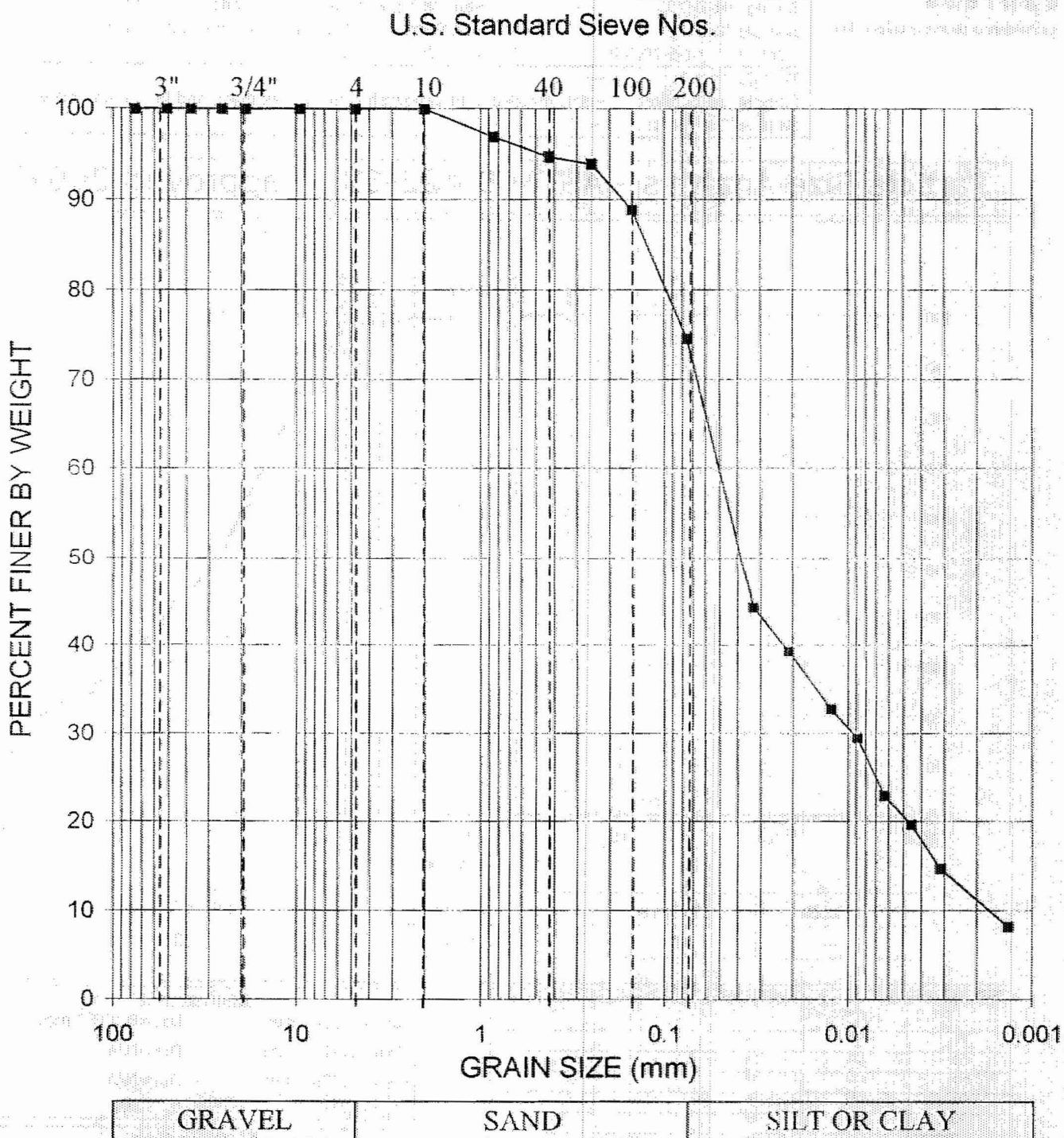


GRADATION CURVE

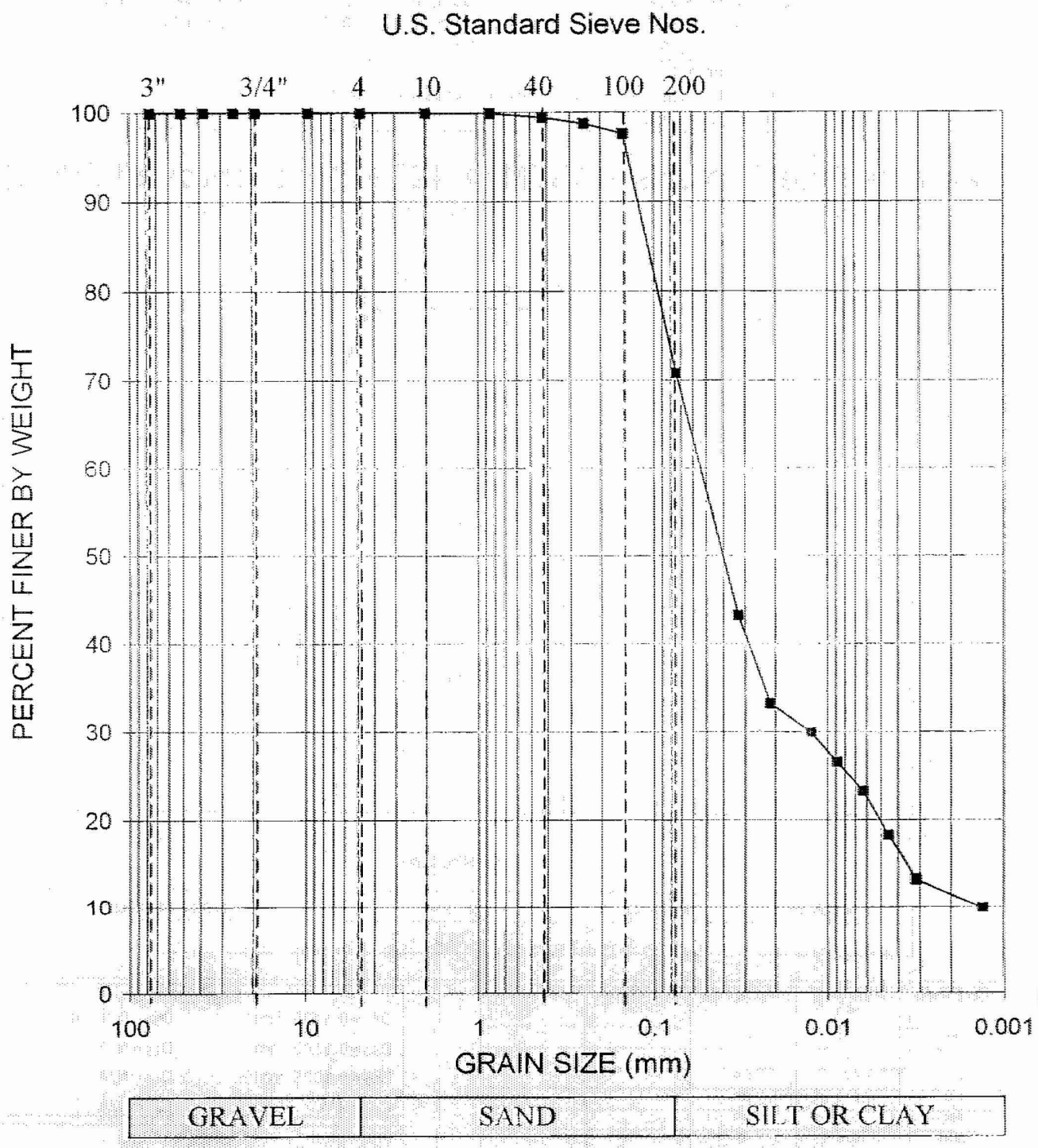
ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.: 06120048.00	Date: 10/12/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-707	7.5	FAT CLAY, with sand, dark gray	CH	59	38

Schnabel

Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 10/18/2006	
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI	
B-707	33.5	ELASTIC SILT, with sand, dark green	MH	59	14	Schnabel Engineering

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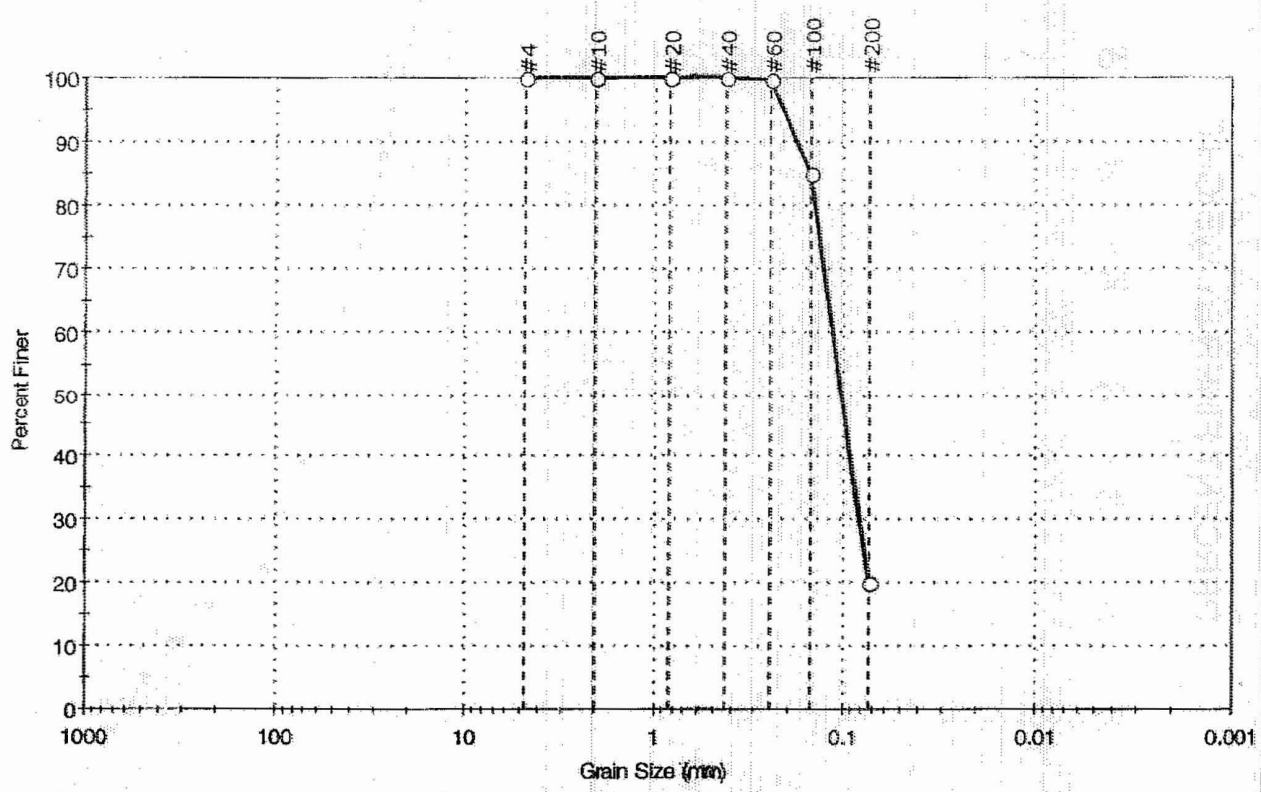
Client:	Schnabel Engineering, Inc.		
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP		
Location:	Calvert County, MD	Project No:	GTX-6880
Boring ID: B-722	Sample Type: tube	Tested By:	sam
Sample ID: UD-1	Test Date: 09/22/06	Checked By:	mcm
Depth : 33.5-35.5 ft	Test Id: 97917		
Test Comment: ---			
Sample Description:	Moist, brownish yellow silty sand		
Sample Comment: ---			

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	—	79.9	20.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	85		
#200	0.074	20		

Coefficients

D_{85} = 0.1499 mm D_{30} = 0.0824 mm
D_{60} = 0.1142 mm D_{15} = N/A
D_{50} = 0.1025 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Silty sand (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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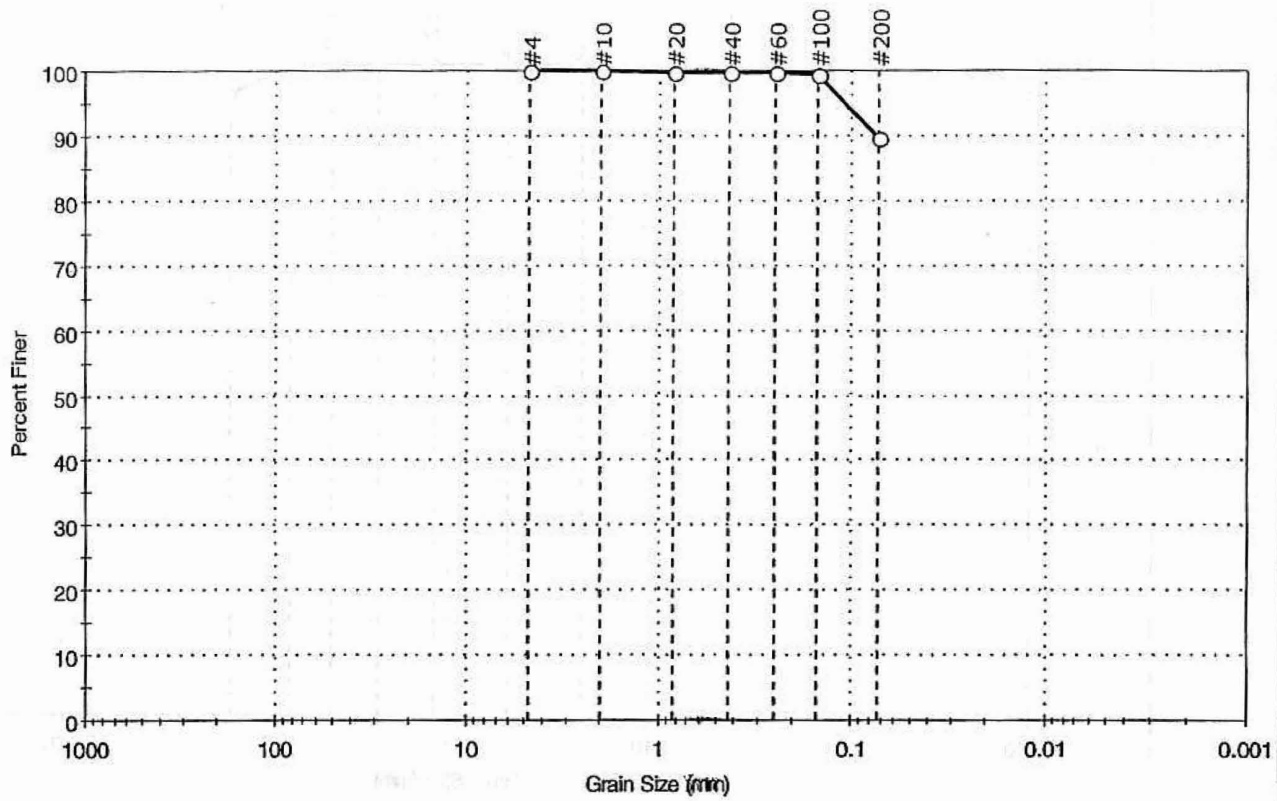
Client:	Schnabel Engineering, Inc.				
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP				
Location:	Calvert County, MD			Project No:	GTX-6880
Boring ID:	B-723	Sample Type:	tube	Tested By:	sam
Sample ID:	UD-2	Test Date:	09/20/06	Checked By:	mcm
Depth :	28.5-30.5 ft	Test Id:	97925		
Test Comment:	---				
Sample Description:	Moist, dark olive gray clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	10.3	89.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.074	90		

Coefficients

D_{85} = N/A D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM fat clay (CH)

AASHTO Clayey Soils (A-7-6 (43))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GeoTesting express
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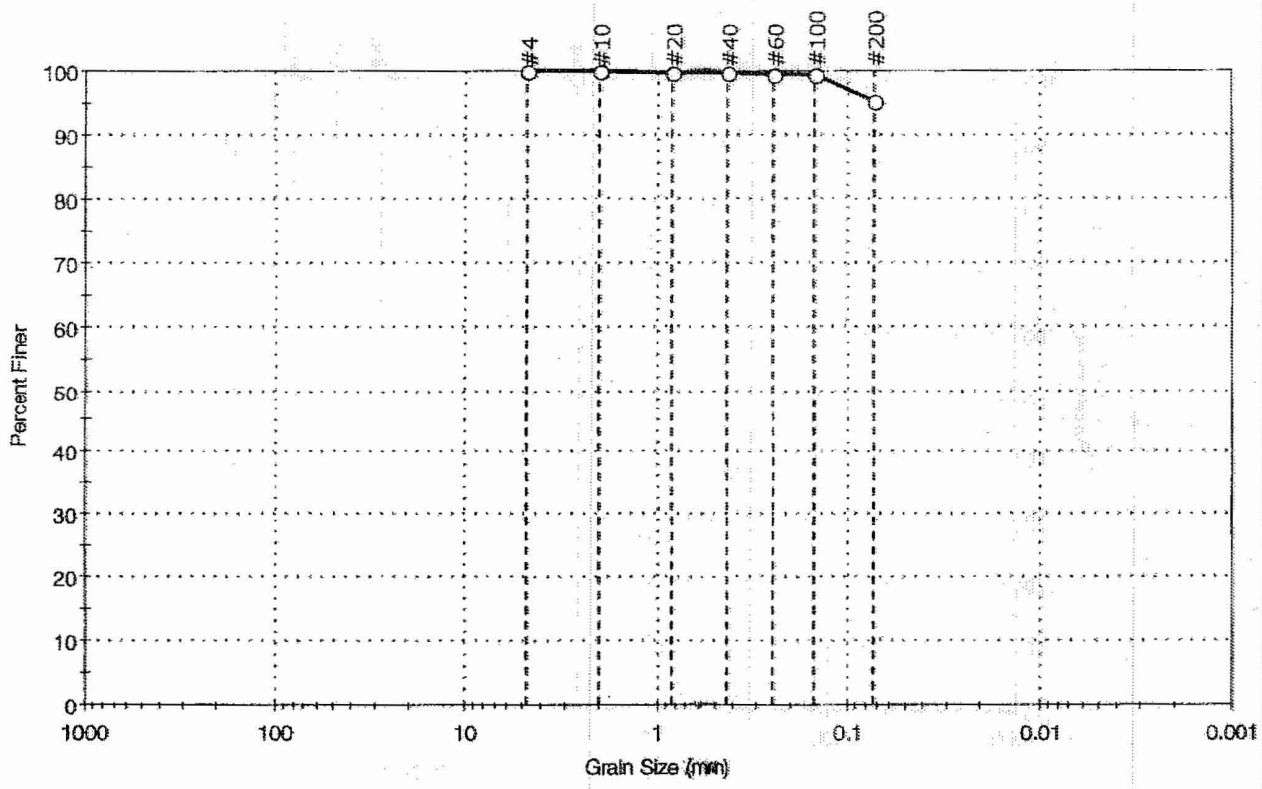
Client:	Schnabel Engineering, Inc.		
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP		
Location:	Calvert County, MD	Project No:	GTX-6880
Boring ID: B-723	Sample Type: tube	Tested By:	sam
Sample ID:UD-3	Test Date: 11/14/06	Checked By:	mcm
Depth : 38.5-40.5 ft	Test Id: 102652		
Test Comment: ---			
Sample Description:	Moist, dark olive gray clay		
Sample Comment: ---			

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	4.8	95.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#200	0.074	95		

Coefficients

D_{85} = N/A D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM fat clay (CH)

AASHTO Clayey Soils (A-7-6 (53))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GeoTesting express
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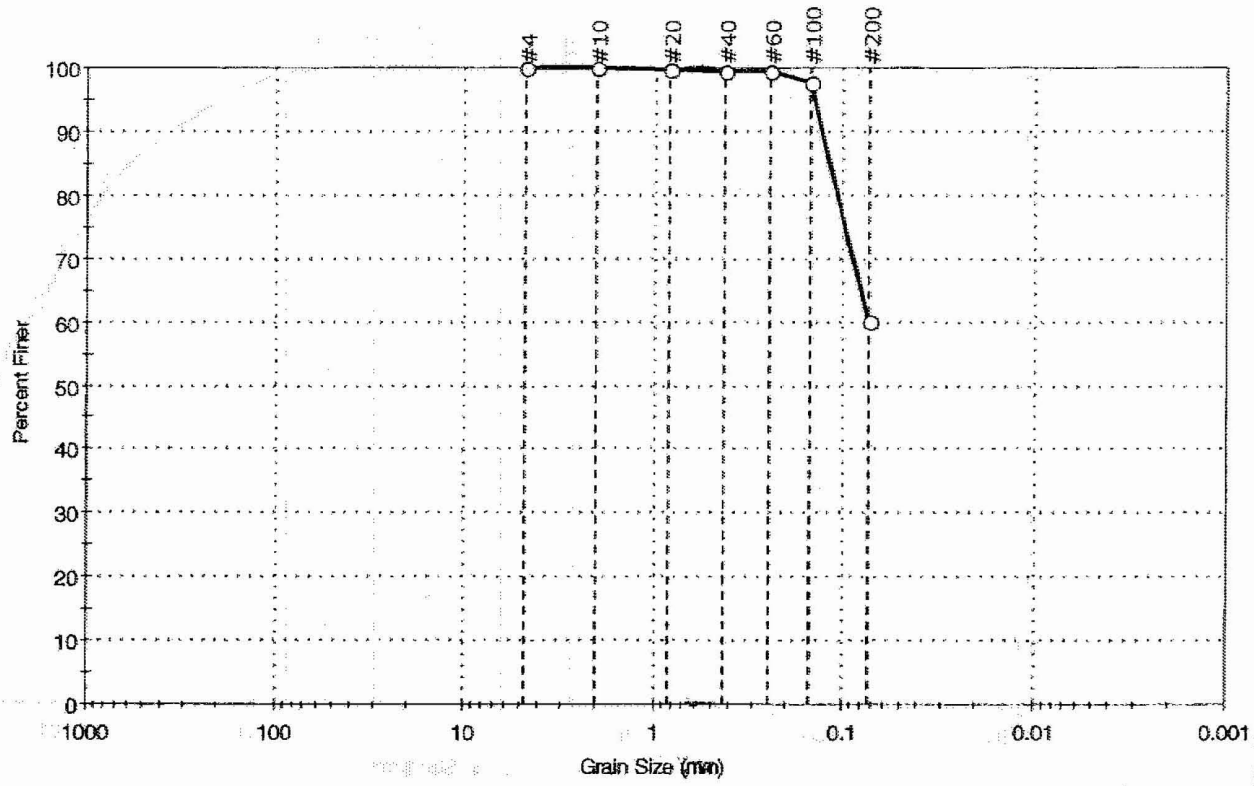
Client:	Schnabel Engineering, Inc.		
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP		
Location:	Calvert County, MD	Project No:	GTX-6880
Boring ID: B-724	Sample Type: tube	Tested By:	sam
Sample ID: UD-1	Test Date: 10/26/06	Checked By:	mcm
Depth : 73.5-75.5 ft	Test Id: 97935		
Test Comment: ---			
Sample Description:	Moist, dark olive gray sandy organic clay		
Sample Comment: ---			

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.1	39.8	60.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#200	0.074	60		

Coefficients

D_{85} = 0.1176 mm	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Sandy organic clay (OL)

AASHTO Clayey Soils (A-7-6 (12))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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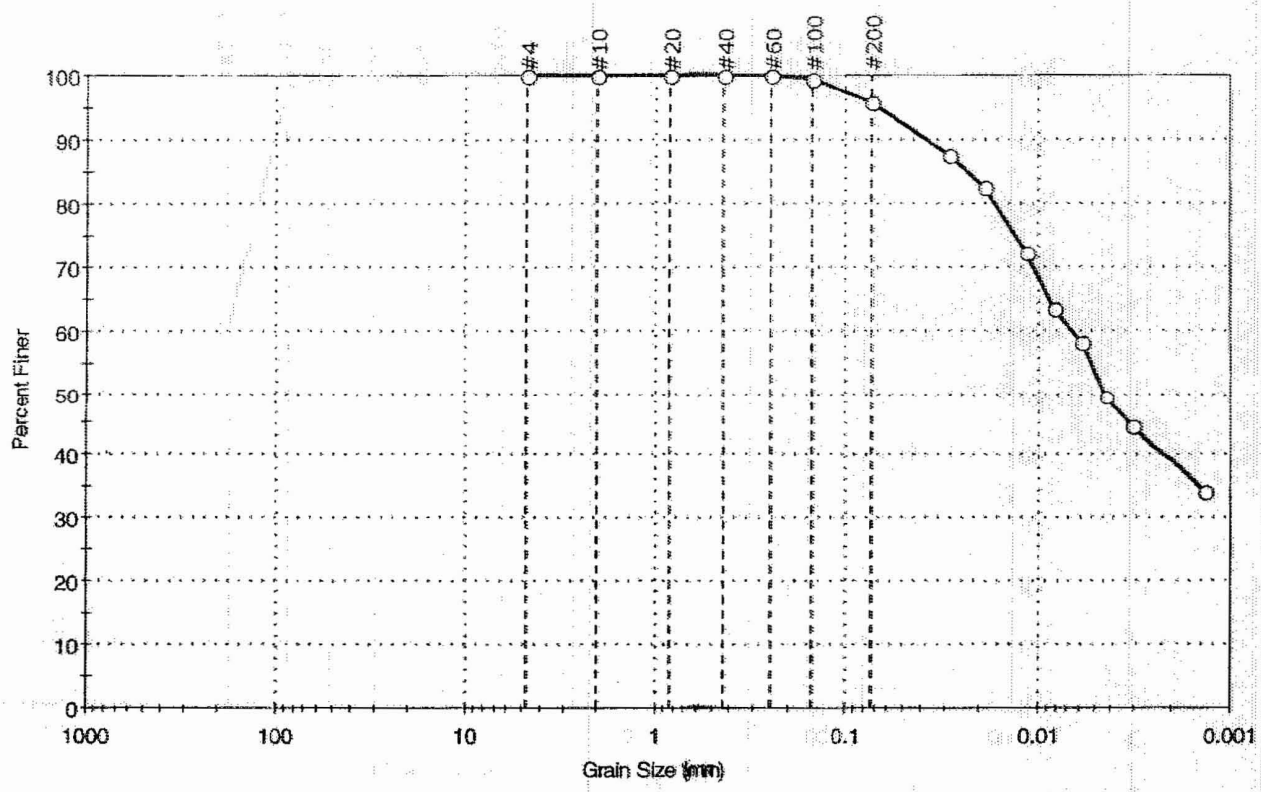
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Schnabel Engineering, Inc.		
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP		
Location:	Calvert County, MD	Project No:	GTX-6880
Boring ID: B-726	Sample Type: tube	Tested By:	sam
Sample ID:UD-2	Test Date: 10/11/06	Checked By:	mcm
Depth : 23.5-25.5 ft	Test Id: 97941		
Test Comment: ---			
Sample Description: Moist, black clay			
Sample Comment: ---			

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	4.0	96.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.074	96		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
—	0.0291	86		
---	0.0190	83		
—	0.0113	72		
---	0.0082	63		
---	0.0059	58		
---	0.0043	50		
---	0.0030	45		
—	0.0014	34		

Coefficients

D_{85} =0.0233 mm	D_{30} =N/A
D_{60} =0.0066 mm	D_{15} =N/A
D_{50} =0.0043 mm	D_{10} =N/A
C_u =N/A	C_c =N/A

Classification

ASTM fat clay (CH)

AASHTO Clayey Soils (A-7-6 (57))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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