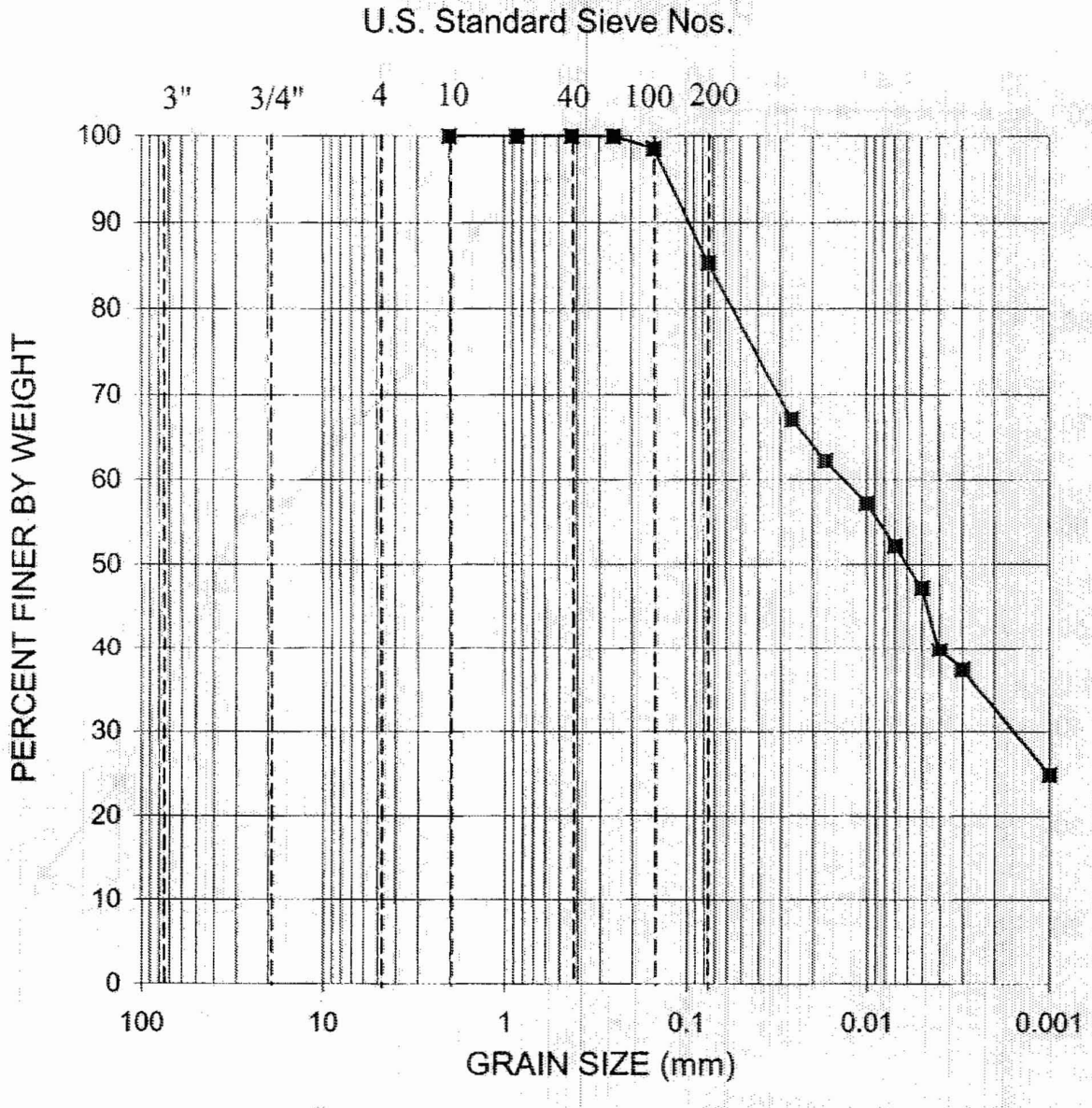


Key	Sample	Depth(ft.)	Sample Description	Class.	LL	PI
■	B-333	28.5-30.5	FAT CLAY with sand - gray	CH	52	33
▲						
●						

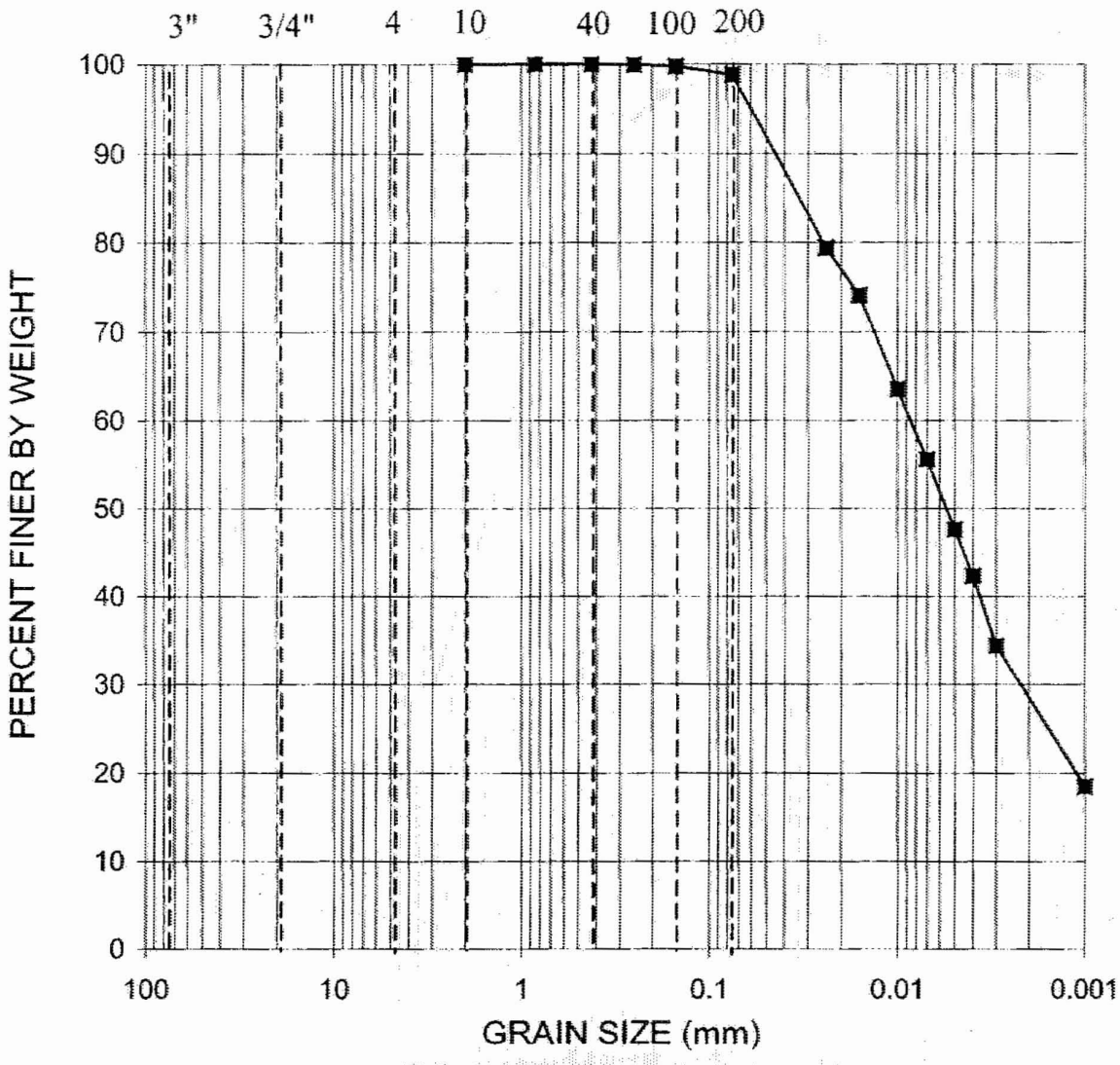
Schnabel Engineering

GRADATION CURVES

Project: Calvert Cliffs Nuclear Power Plant

Contract No. 06120048

Date: 10/30/06 Method: ASTM D422



Key	Sample	Depth(ft.)	Sample Description	Class.	LL	PI
■	B-333	38.5 - 40.5	FAT CLAY - gray	CH	61	38
▲						
●						

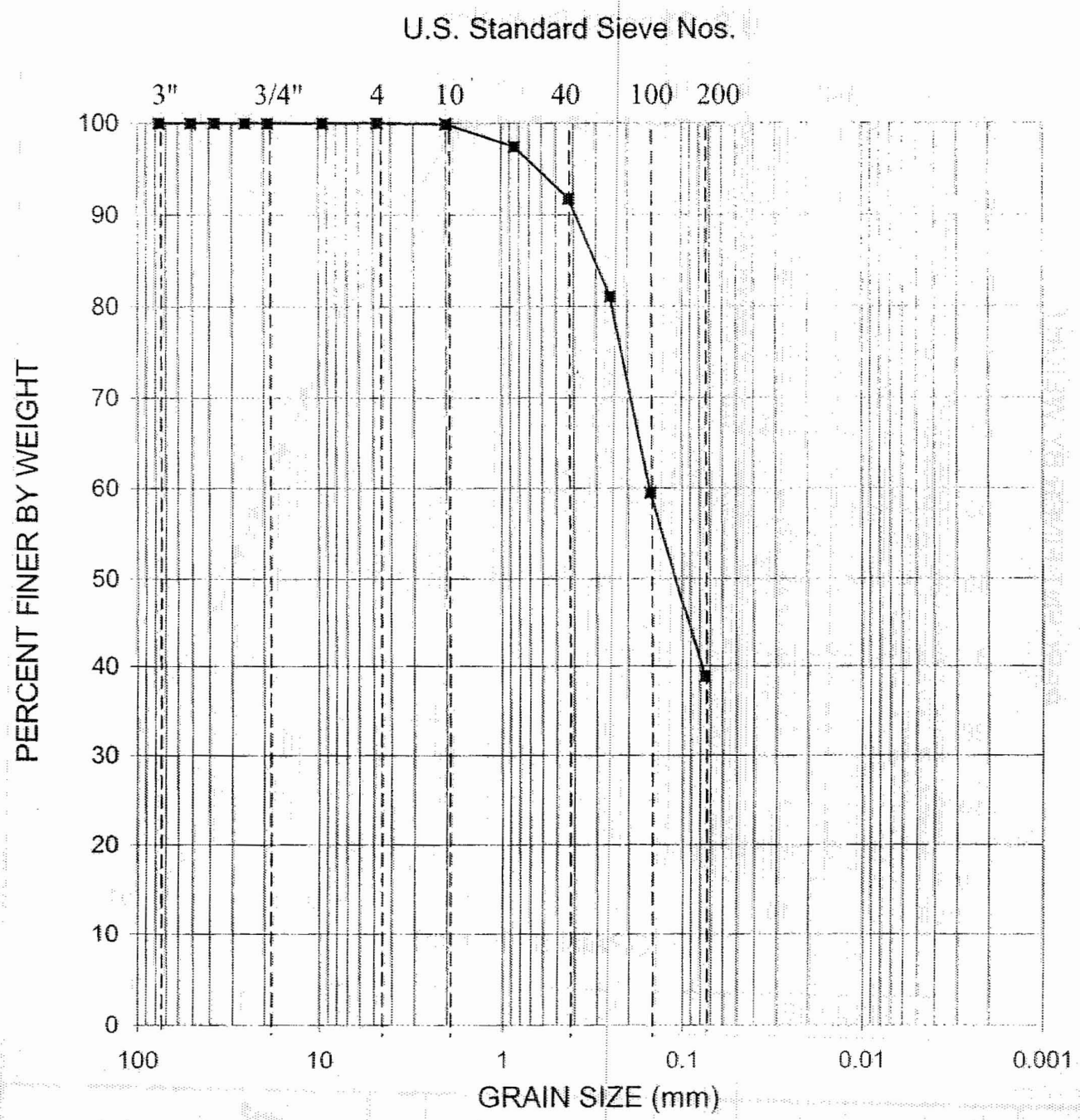
Schnabel Engineering

GRADATION CURVES

Project: Calvert Cliffs Nuclear Power Plant

Contract No. 06120048

Date: 11/10/06 Method: ASTM D422



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	8/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-333	43.5	SILTY SAND, dark gray	SM		

Schnabel Engineering

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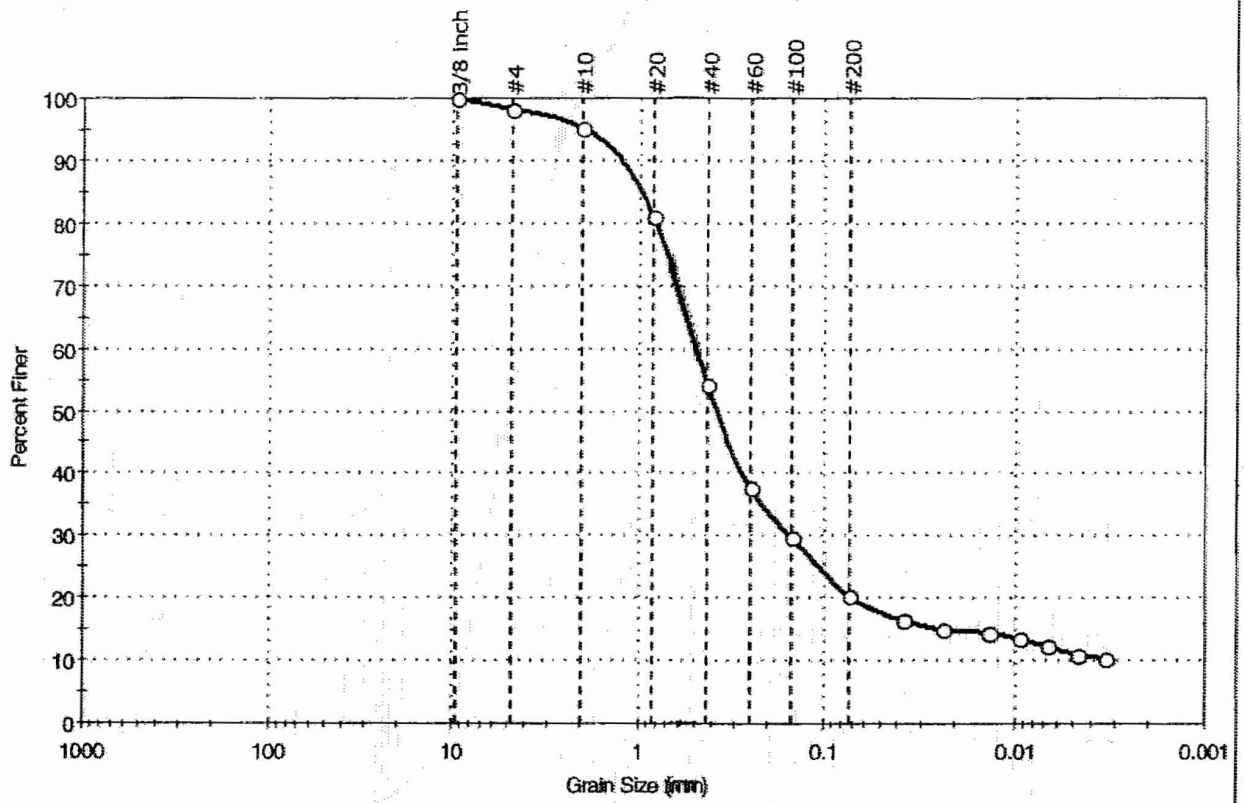
Client:	Schnabel Engineering, Inc.				
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP				
Location:	Calvert County, MD			Project No:	GTX-6880
Boring ID:	B-333	Sample Type:	tube	Tested By:	sam
Sample ID:	S-13	Test Date:	10/17/06	Checked By:	mcm
Depth :	48.5-48.8 ft	Test Id:	100186		
Test Comment:	---				
Sample Description:	Moist, mottled pretty brown, black, light gray, and dark greenish gray				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	1.7	78.0	20.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8 inch	9.50	100		
#4	4.75	98		
#10	2.00	95		
#20	0.84	81		
#40	0.42	54		
#60	0.25	38		
#100	0.15	30		
#200	0.074	20		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0375	16		
---	0.0234	15		
---	0.0134	14		
---	0.0095	13		
---	0.0067	12		
---	0.0047	11		
---	0.0033	10		

Coefficients

D_{85} = 1.0663 mm	D_{30} = 0.1520 mm
D_{60} = 0.4929 mm	D_{15} = 0.0238 mm
D_{50} = 0.3713 mm	D_{10} = 0.0029 mm
C_u = N/A	C_c = N/A

Classification

ASTM Clayey sand (SC)

AASHTO Clayey Gravel and Sand (A-2-6 (2))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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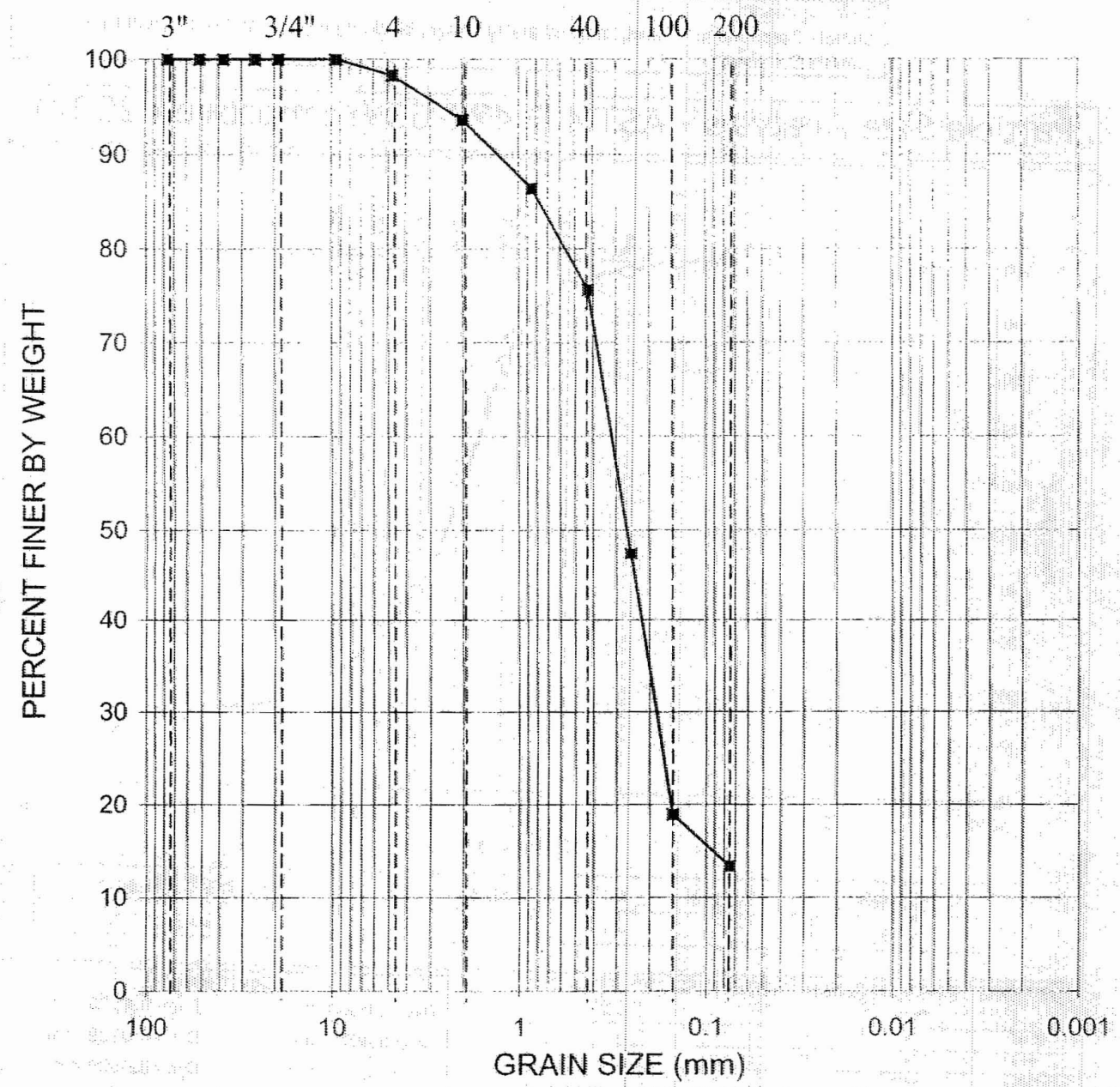


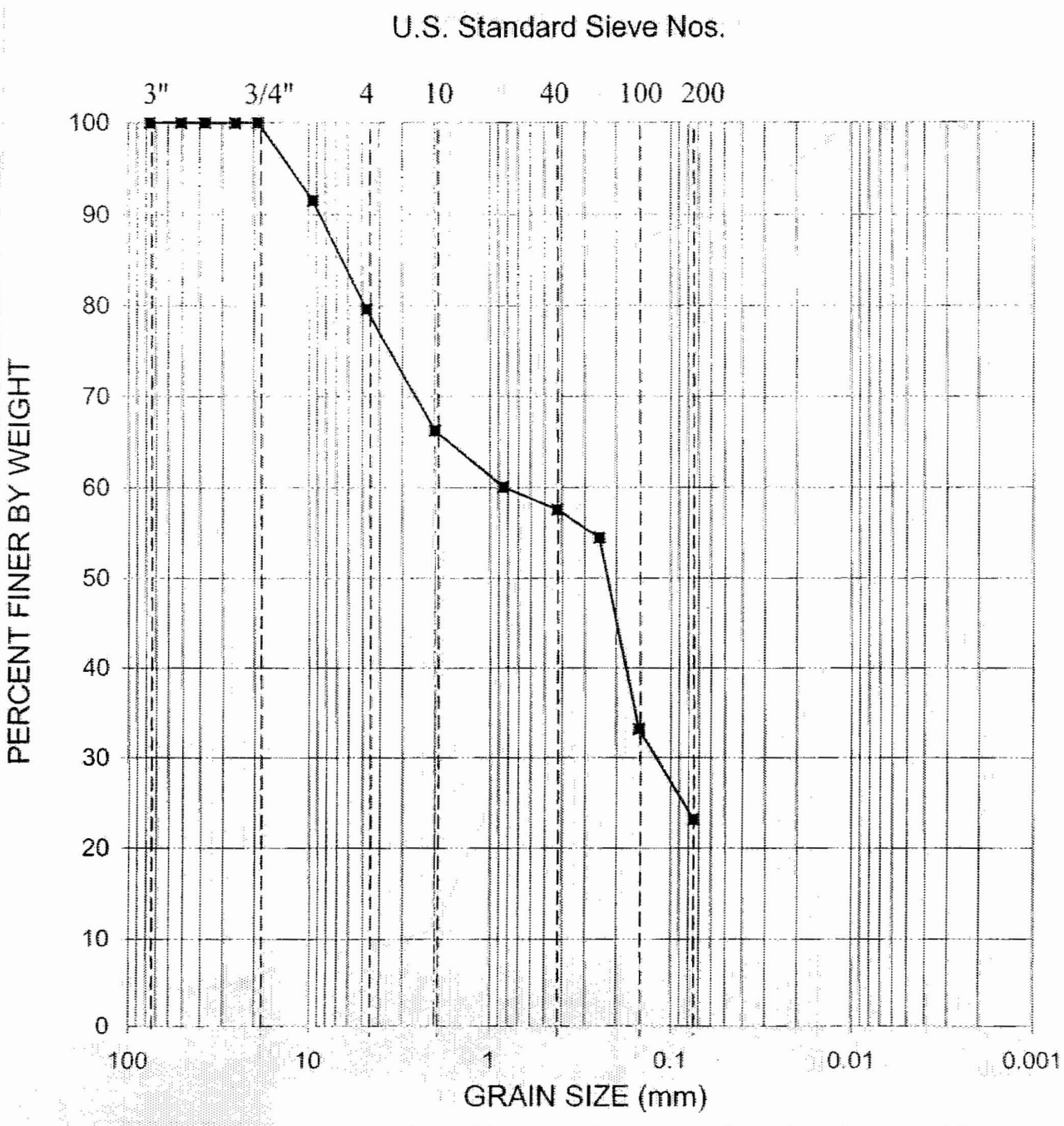
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-333	53.5	SILTY SAND, trace shells, dark gray	SM		

Schnabel Engineering



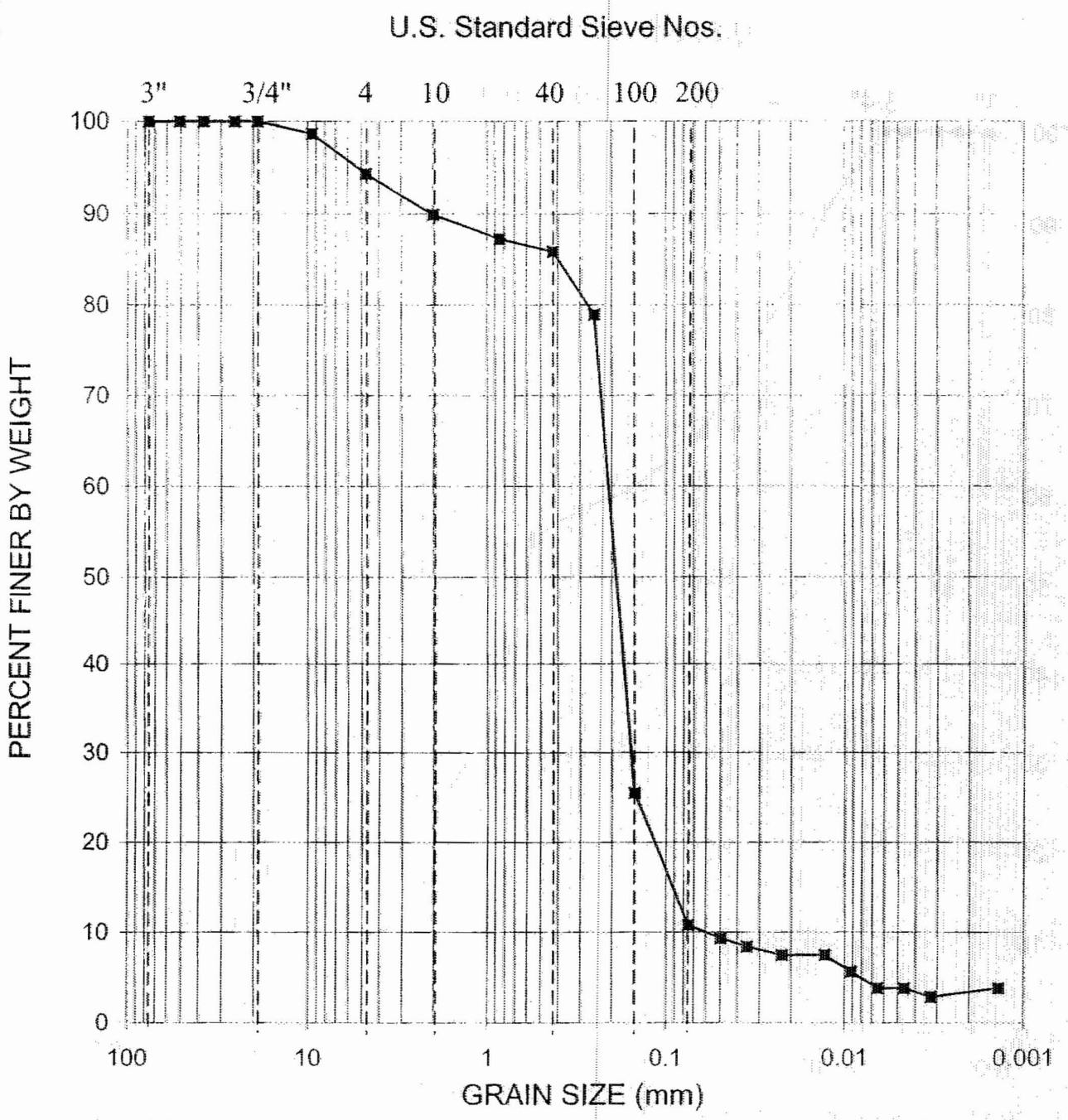
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-333	68.5	SILTY SAND, with gravel, trace shells and cemented sand, gray	SM		

Schnabel Engineering



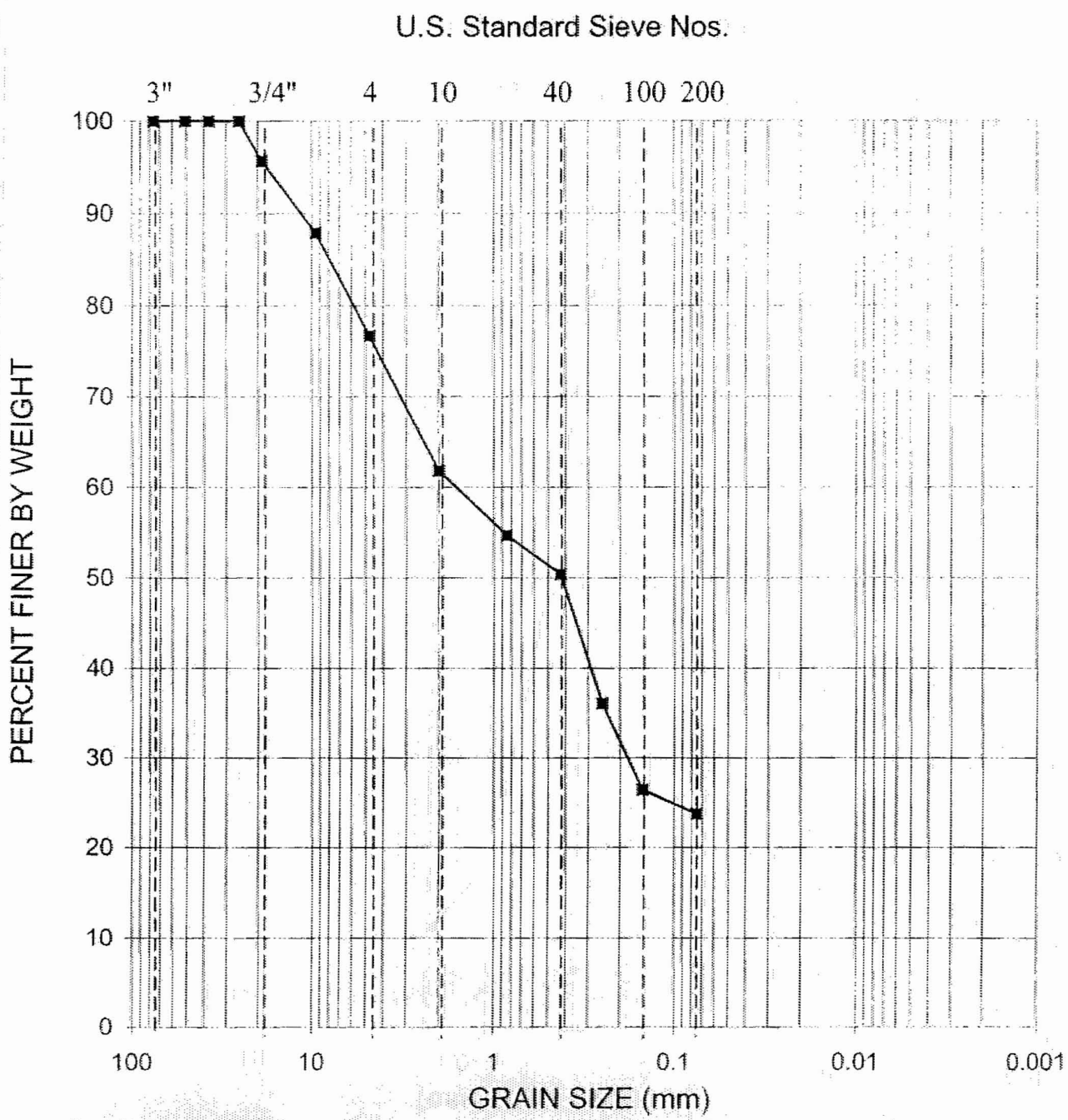
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 9/8/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-333	78.5	Poorly Graded SAND, with silt, trace shells, green	SP-SM	NP	NP

Schnabel Engineering



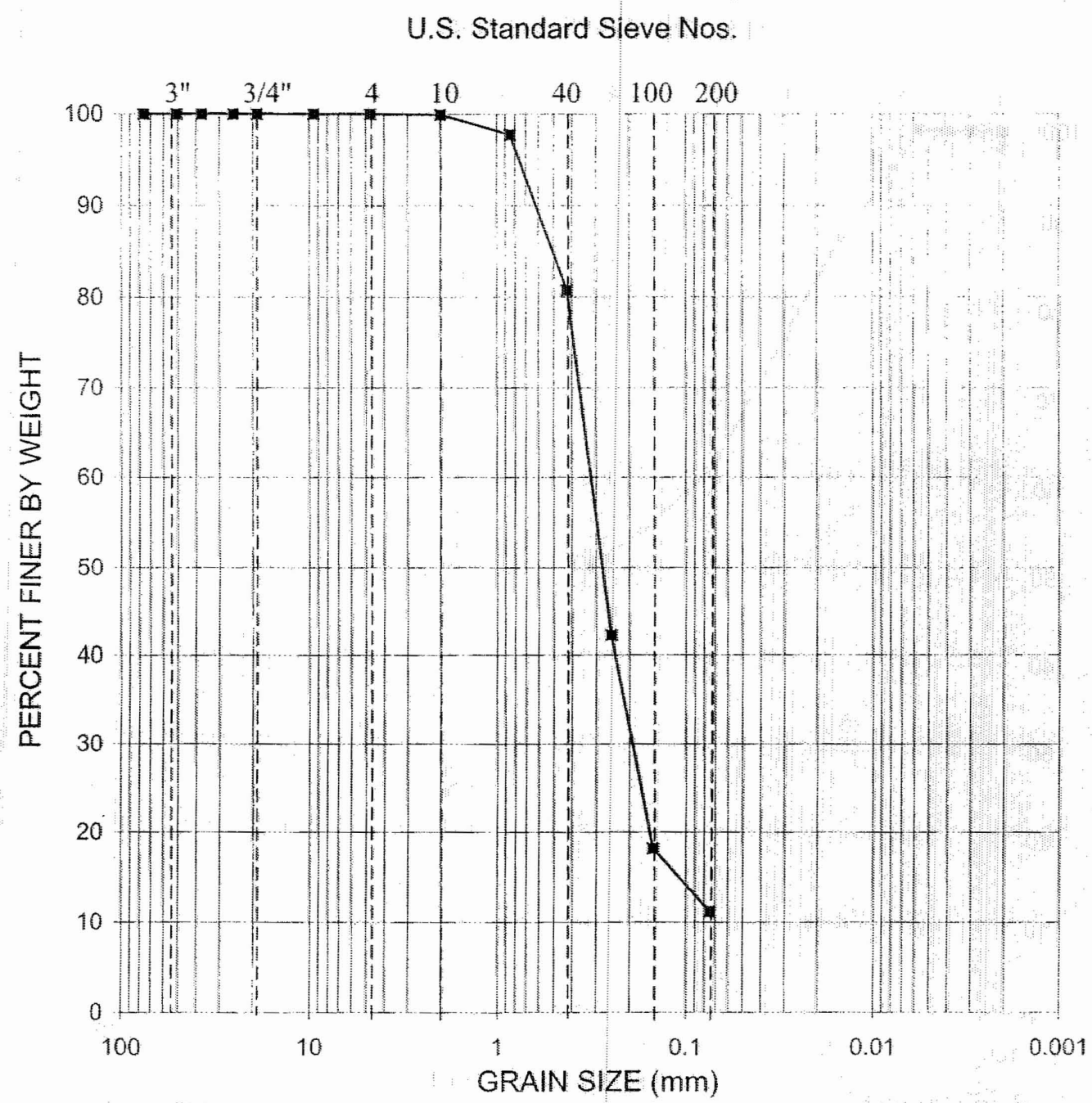
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.:	06120048.00		Date:	8/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-333	93.5	Silty SAND, with shells, trace cemented sand, light green	SM		

Schnabel Engineering



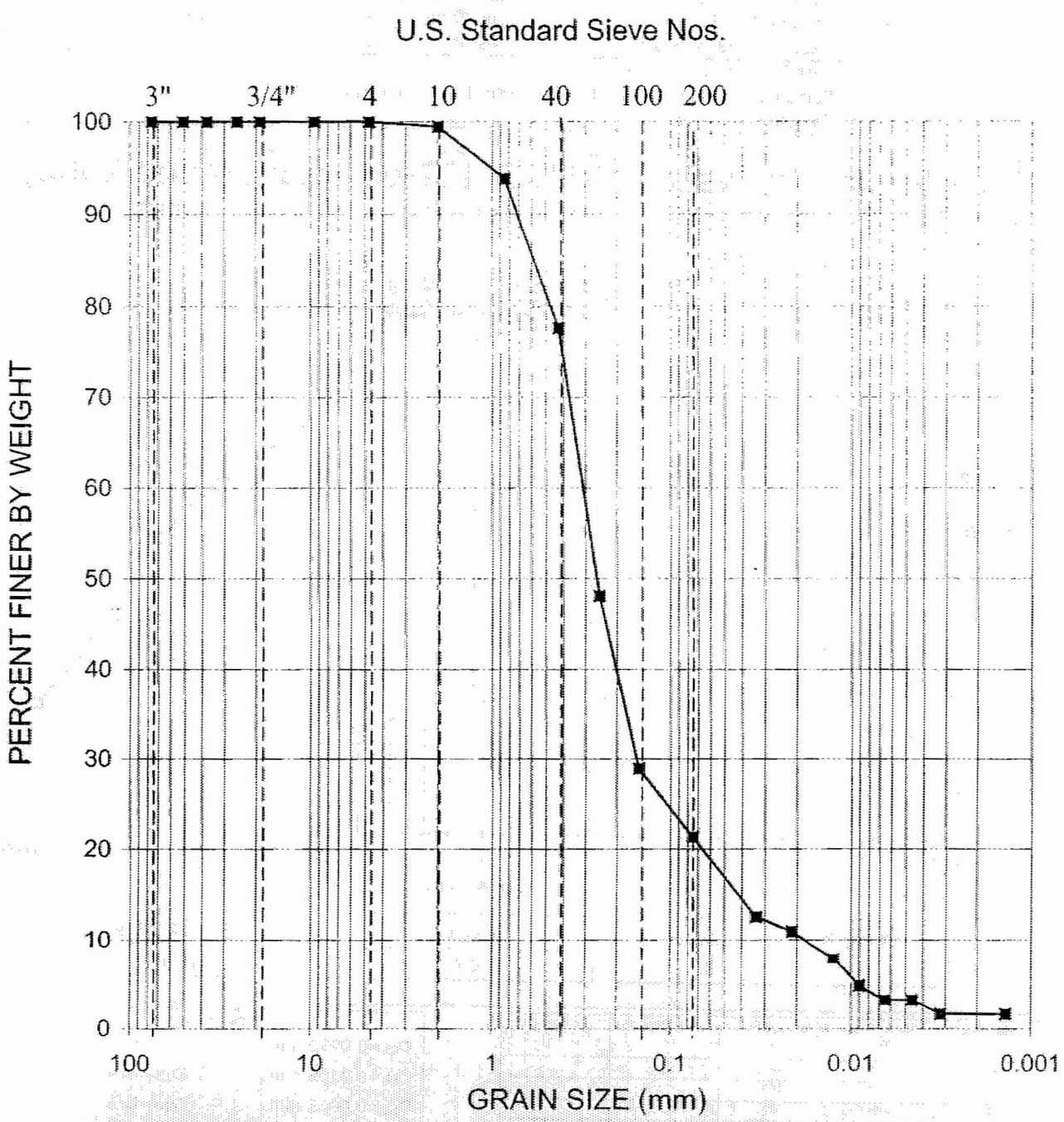
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-334	0.0	Poorly Graded SAND, with silt dark brown	SP-SM		

Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/30/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-334	5.0	Silty SAND, light brown	SM		

Schnabel Engineering

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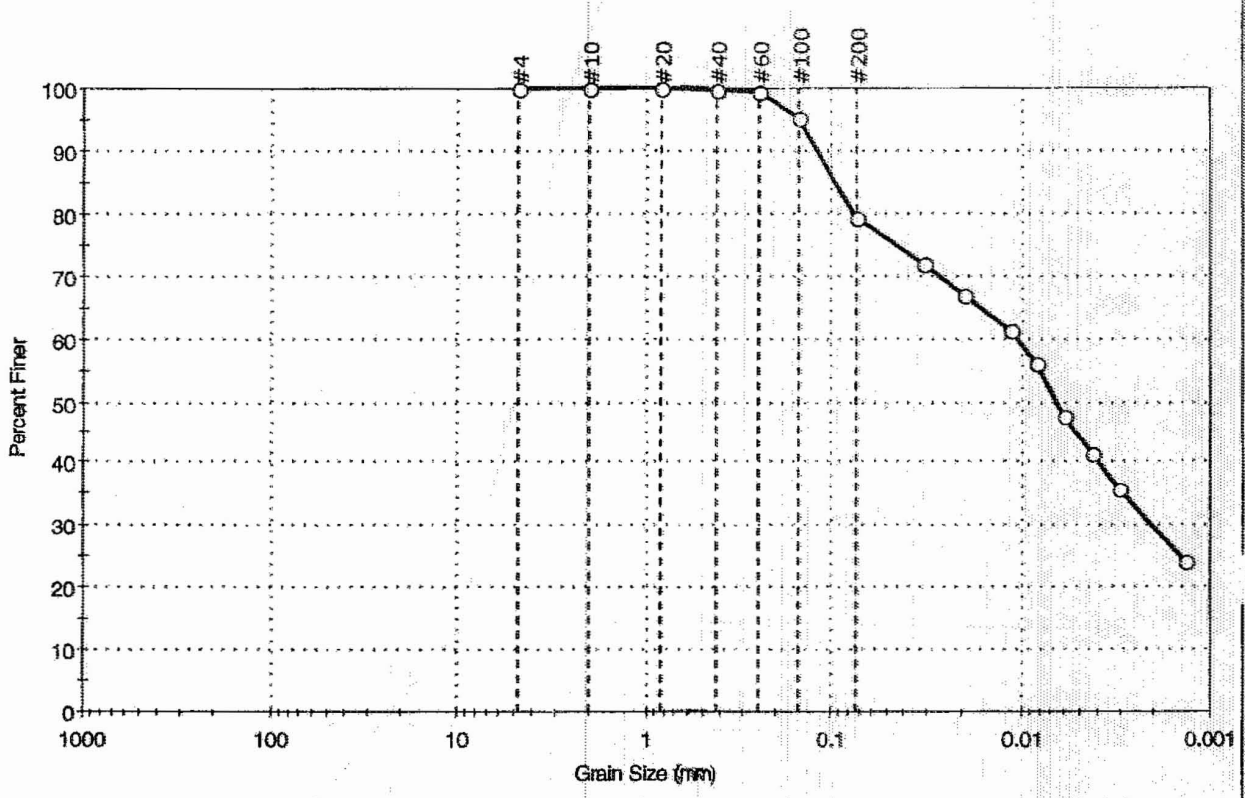
Client:	Schnabel Engineering, Inc.				
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP				
Location:	Calvert County, MD			Project No:	GTX-6880
Boring ID:	B-334	Sample Type:	tube	Tested By:	sam
Sample ID:	S-8	Test Date:	09/14/06	Checked By:	mcm
Depth :	23.0-25.0 ft	Test Id:	95799		
Test Comment:	---				
Sample Description:	Moist, dark greenish gray clay with sand				
Sample Comment:	---				

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



%Cobble	%Gravel	%Sand	%Silt & Clay Size
--	0.0	20.7	79.3

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	95		
#200	0.074	79		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0317	72		
---	0.0198	67		
---	0.0115	61		
---	0.0083	56		
---	0.0060	48		
---	0.0043	41		
---	0.0031	36		
---	0.0014	24		

Coefficients

D_{85} = 0.0950 mm	D_{30} = 0.0021 mm
D_{60} = 0.0105 mm	D_{15} = N/A
D_{50} = 0.0065 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM fat clay with sand (CH)

AASHTO Clayey Soils (A-7-6 (31))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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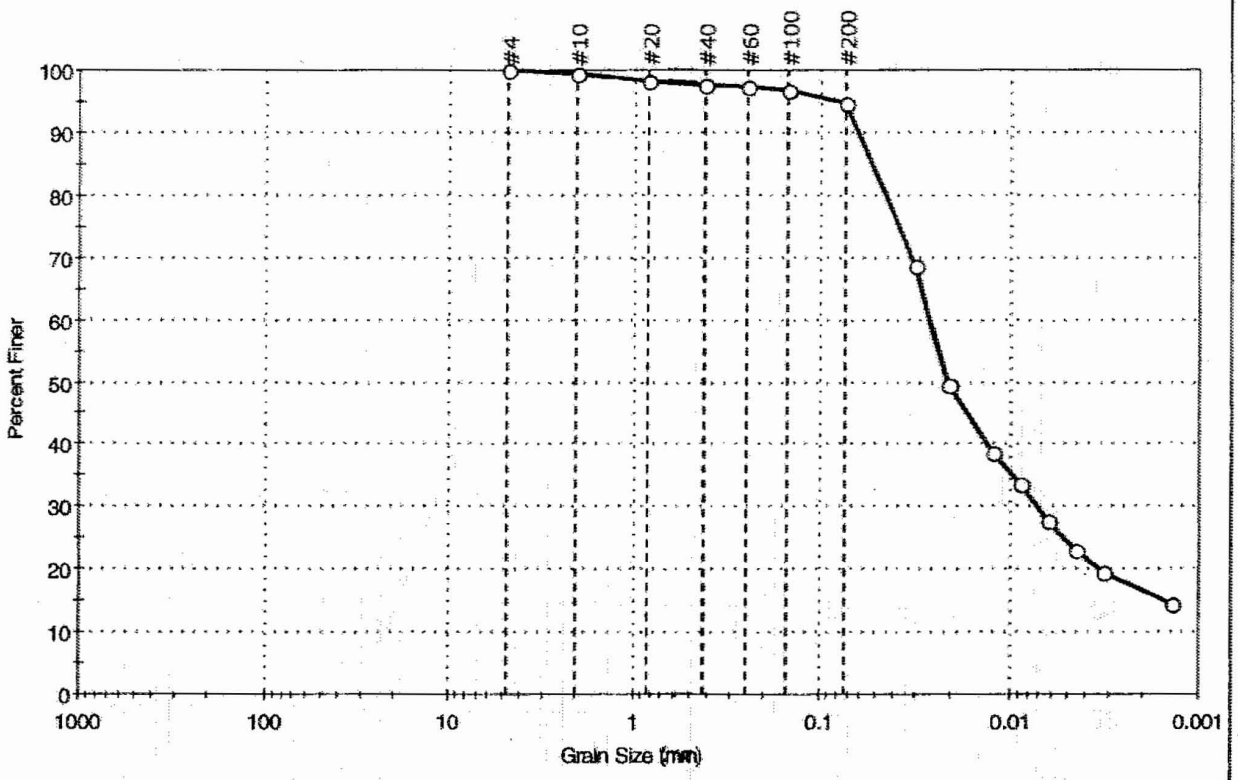
Client:	Schnabel Engineering, Inc.				
Project:	Subsurface Investigation Calvert Cliffs Nuclear PP				
Location:	Calvert County, MD			Project No:	GTX-6880
Boring ID:	B-334	Sample Type:	tube	Tested By:	sam
Sample ID:	S-10	Test Date:	09/14/06	Checked By:	mcm
Depth :	33.0-34.7 ft	Test Id:	95800		
Test Comment:	---				
Sample Description:	Moist, dark greenish gray clay				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	5.3	94.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.84	98		
#40	0.42	98		
#60	0.25	97		
#100	0.15	97		
#200	0.074	95		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
—	0.0300	69		
—	0.0206	50		
—	0.0122	39		
—	0.0068	34		
—	0.0063	28		
—	0.0045	23		
—	0.0032	19		
—	0.0014	15		

Coefficients

D_{85} = 0.0529 mm	D_{30} = 0.0072 mm
D_{60} = 0.0253 mm	D_{15} = 0.0015 mm
D_{50} = 0.0208 mm	D_{10} = 0.0007 mm
C_u = N/A	C_c = N/A

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-7-6 (36))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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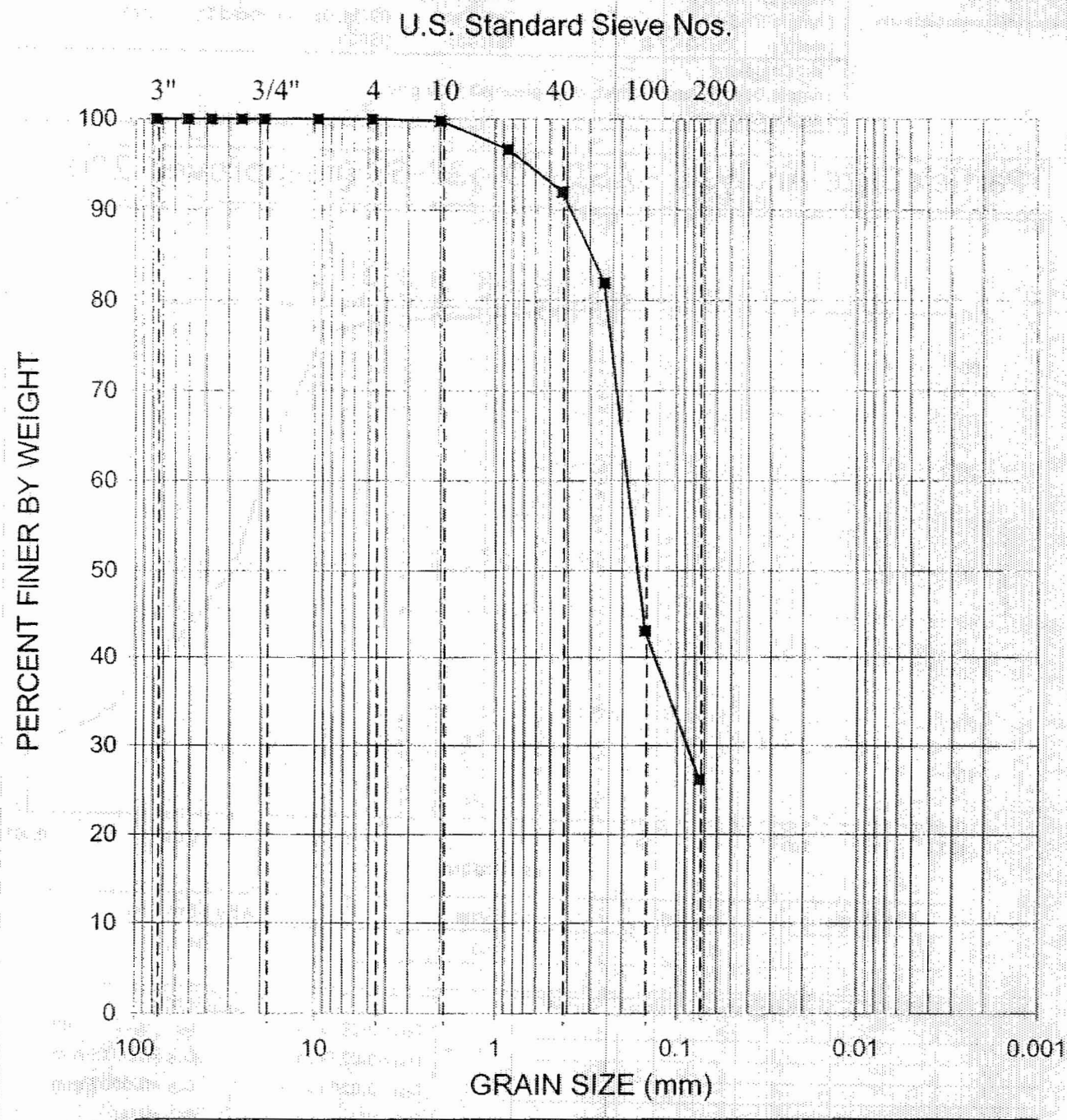


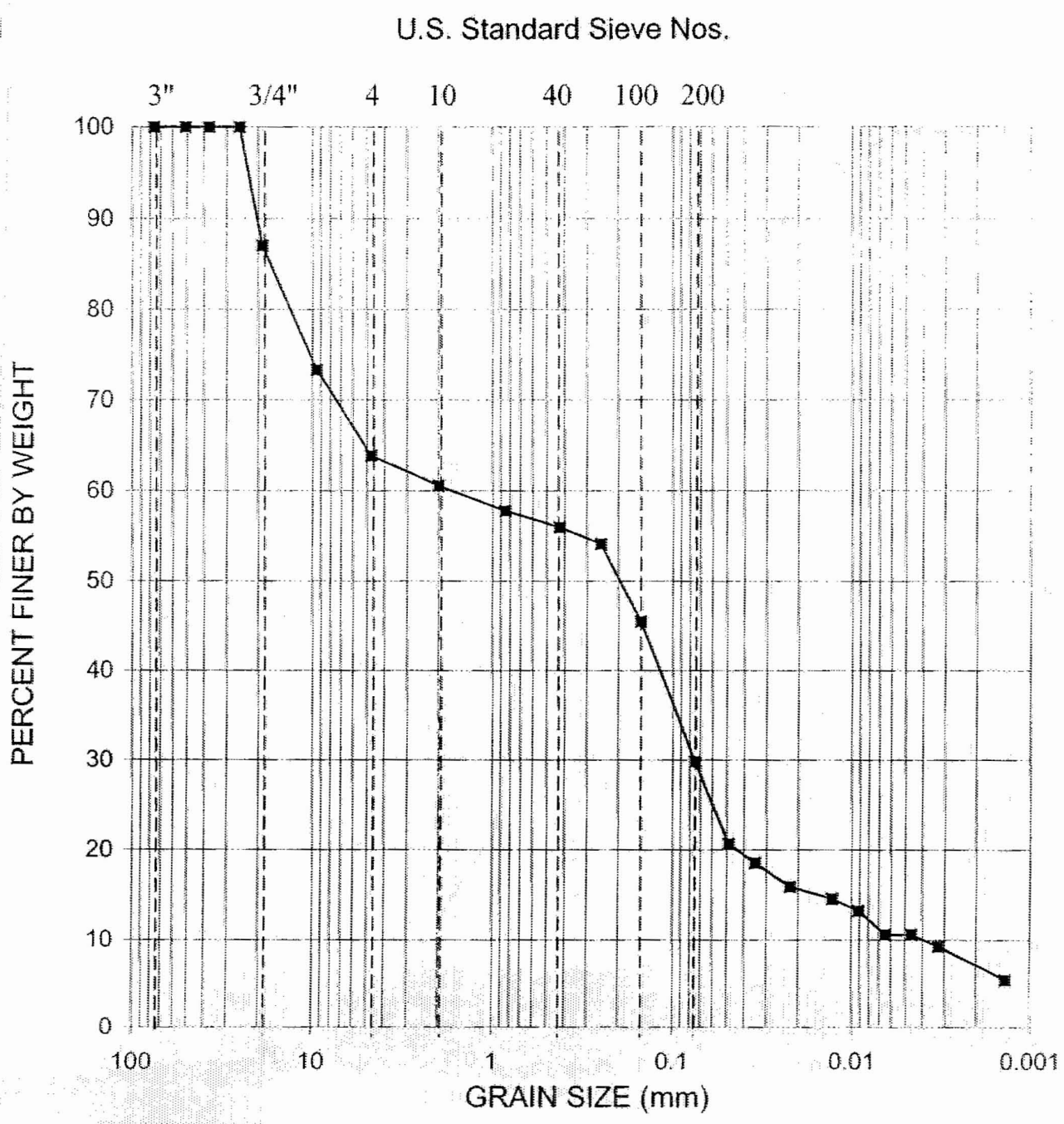
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland	Contract No.: 06120048.00	Date: 8/22/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-334	48.5	Silty SAND, dark gray	SM		

Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 9/5/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-334	63.5	Silty GRAVEL, with sand, dark gray	GM	NP	NP

Schnabel Engineering