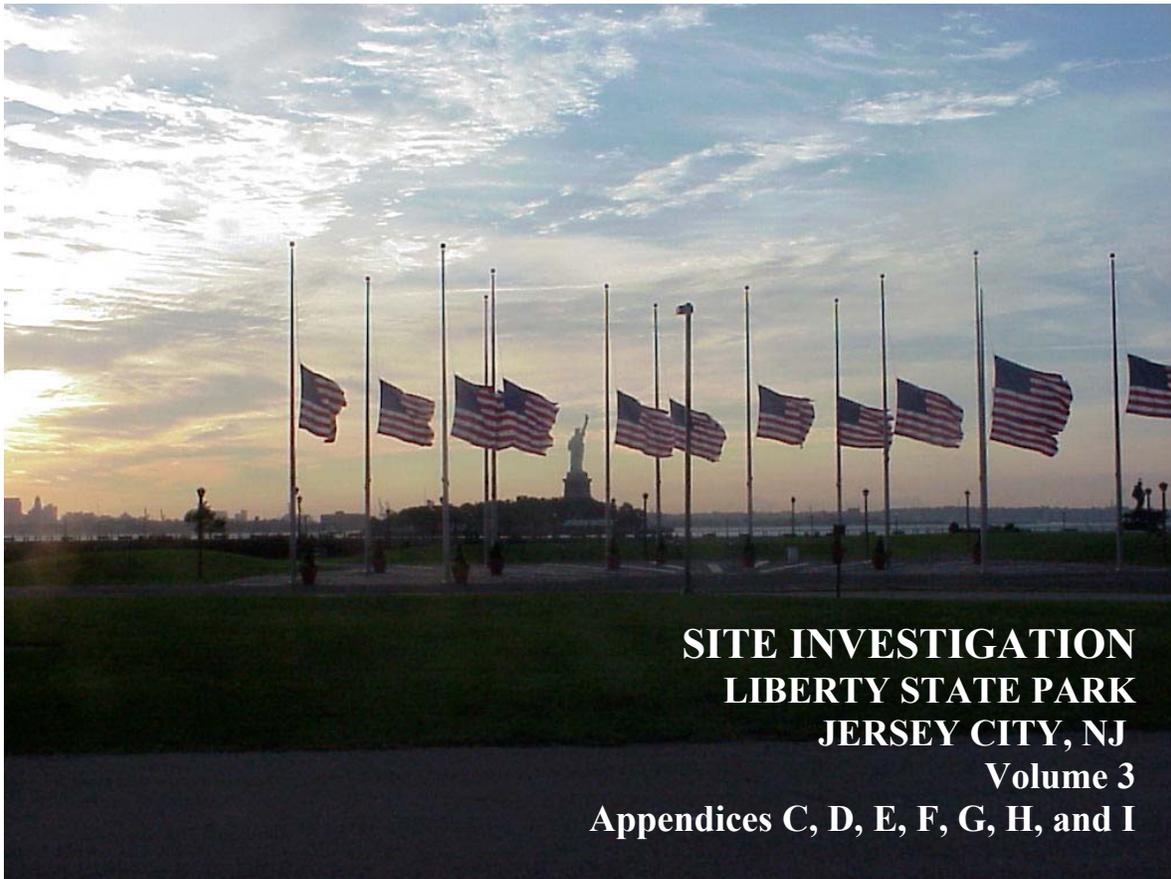




**US Army Corps
of Engineers**

BALTIMORE DISTRICT



**SITE INVESTIGATION
LIBERTY STATE PARK
JERSEY CITY, NJ
Volume 3
Appendices C, D, E, F, G, H, and I**

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**SITE INVESTIGATION
LIBERTY STATE PARK
JERSEY CITY, NJ**

**FINAL REPORT
Volume 3**

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APPENDIX C
VISUAL-MANUAL SOIL CLASSIFICATIONS

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: KUHN

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-03			
Jar-1	0.0-1.5	Moist dk grayish brn hard lean clay w/ sand	(CL)
Jar-2	1.5-3.0	Moist black silty coarse sand w/ gravel ^①	(SM)
Jar-3	3.0-4.5	Moist dk grayish brn silty med sand w/ gravel	(SM)
Jar-4	4.5-6.0	Wet black + brn silty med-coarse sand w/ gravel	(SM)
Jar-5	6.0-7.5	Wet black poorly graded coarse sand w/ silt + grav.	(SP-SM)
Jar-6	7.5-9.0	-ditto-	(SP-SM)
Jar-7	9.0-10.5	Wet black poorly graded coarse sand w/ silt	(SP-SM)
Jar-8	10.5-12.0	Wet black silty med-coarse sand	(SM)
Jar-9	12.0-13.5	-ditto-	(SM)
Jar-10	13.5-15.0	-ditto-	(SM)
Jar-11	15.0-16.5	-ditto-	(SM)
Jar-12	16.5-18.0	-ditto-	(SM)
Jar-13	18.0-19.5	-ditto-	(SM)
Jar-14	19.5-21.0	-ditto- w/ gravel	(SM)
Jar-15	21.0-22.5	V. moist grayish brn silty coarse sand w/ clay lense	(SM)
Jar-16	22.5-24.0	V. moist dk greenish gray soft lean clay w/ sand	(CL)
Jar-17	24.0-25.5	V. moist v. dk gray soft lean clay	(CL)
Jar-18	25.5-27.0	-ditto-	(CL)
Jar-19	27.0-28.5	V. moist v. dk gray soft lean clay	(CL)
Jar-20	28.5-30.0	-ditto-	(CL)
		① Sand is cinders	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: K. Foster

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-04			
Jan-1	0.0-1.5	moist dk yel brn silty sand ^{①②} trace of roots and gravel	(SM)
Jan-2	1.5-3.0	moist very dk gry brn silty sand ^{①⑤} w/ gravel	(SM)
Jan-3	3.0-4.5	wet dk gry ditto ^{②③}	(SM)
Jan-4	4.5-6.0	ditto ^{③④}	(SM)
<small>Small sample</small> Jan-5	6.0-7.5	wet very dk gry silty gravel w/ sand	(GM)
<small>Small sample</small> Jan-6	7.5-9.0	wet very dk gry silty sand w/ gravel	(SM)
<small>Small sample</small> Jan-7	9.0-10.5	moist dk gry brn fat clay w/ sand trace of gravel	(LH)
Jan-8	10.5-12.0	moist dk gry brn fat clay w/ sand	(LH)
Jan-9	12.0-13.5	moist dk gry brn fat clay trace of sand	(LH)
Jan-10	13.5-15.0	ditto ^④	(LH)
Jan-11	15.0-16.5	moist dk gry brn fat clay w/ sand trace of gravel ^④	(LH)
Jan-12	16.5-18.0	moist dk gry brn fat clay w/ sand	(LH)
Jan-13	18.0-19.5	moist dk gry brn fat clay ^④ trace of sand	(LH)
Jan-14	19.5-21.0	ditto ^④	(LH)
Jan-15	21.0-22.5	ditto ^④	(LH)
Jan-16	22.5-24.0	ditto ^④	(LH)
Jan-17	24.0-25.5	ditto ^④	(LH)
Jan-18	25.5-27.0	ditto ^④	(LH)
Jan-19	27.0-28.5	ditto ^④	(LH)
Jan-20	28.5-30.0	ditto ^④	(LH)
		① medium to fine sand	
		② coarse to fine sand	
		③ trace of cinders	
		④ trace of shell fragments	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: KUHN

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-05			
Jan-1	0.0-1.5	Moist brown silty fine sand w/ gravel ^① roots grass	(SM)
Jan-2	1.5-3.0	Moist black poorly graded coarse sand w/ silt	(SP-SM)
<small>Small sample</small> Jan-3	3.0-4.5	Wet v. dk gray poorly graded gravel w/ silt + sd	(GP-GM)
Jan-4	4.5-6.0	Wet v. dk gray poorly graded coarse sand	(SP)
Jan-5	6.0-7.5	Wet black poorly graded gravel w/ silt + sand	(GP-GM)
<small>V. Small sample</small> Jan-6	7.5-9.0	Wet gray silty med sand w/ trash	(SM)
Jan-7	9.0-10.5	v. moist black soft fat clay w/ sand ^②	(CH)
<small>Small sample</small> Jan-8	10.5-12.0	ditto ^②	(CH)
Jan-9	12.0-13.5	v. moist dk gray soft fat clay ^②	(CH)
Jan-10	13.5-15.0	ditto ^②	(CH)
Jan-11	15.0-16.5	- ditto - ^②	(CH)
Jan-12	16.5-18.0	ditto ^②	(CH)
Jan-13	18.0-19.5	- ditto - ^②	(CH)
Jan-14	19.5-21.0	ditto -	(CH)
Jan-15	21.0-22.5	- ditto -	(CH)
Jan-16	22.5-24.0	ditto ^②	(CH)
Jan-17	24.0-25.5	- ditto - ^②	(CH)
Jan-18	25.5-27.0	ditto ^②	(CH)
Jan-18	25.5-27.0	ditto -	(CH)
Jan-19	27.0-28.5	- ditto -	(CH)
Jan-20	28.5-30.0	- ditto -	(CH)
		① Gravel is sandstone fragments	
		② TRACE OF SHELL FRAGMENTS	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Danko

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-06			
Jar-1	0.0-1.5	Moist, Black, silty, SAND with Gravel ^① ^②	(SM)
Jar-2	1.5-3.0	Moist, Black, silty SAND with Gravel ^① ^②	(SM)
Jar-3	3.0-4.5	Moist, Black, silty, SAND with Gravel ^① ^② and Brown Clay lens	(SM)
Jar-4	4.5-6.0	Wet, V. Dark Gray, Clayey, SAND ^① Trace Gravel	(SC)
<small>Small Sample</small> Jar-5	6.0-7.5	Wet, Very Dark Gray, silty, SAND with Gravel	(SM)
Jar-6	7.5-9.0	Wet, V. Dark Gray, clayey, SAND with Gravel	(SC)
Jar-7	9.0-10.5	Ditto with Gravel tr. Cinders	(SC)
Jar-8	10.5-12.0	V. Moist, V. Dark Gray, Clayey, SAND Trace of Cinders	SC/CL
Jar-9	12.0-13.5	Wet, V. Dark Gray, clayey, SAND with Gravel, Pieces of Wood	SC/SM
Jar-10	13.5-15.0	Wet, V. D. Gray, silty, SAND ^① with Gravel ^② Clay lens, Tr. of shells + wood	(SM)
<small>Small Sample</small> Jar-11	15.0-16.5	Moist, V. D. Gray, Poorly Graded SAND with silt	(SP-SM)
Jar-12	16.5-18.0	Moist, Grayish Brown, silty, SAND Trace of organic matter	(SM)
Jar-13	18.0-19.5	Moist, D. Gray, silty, SAND Trace of organic matter	(SM)
Jar-14	19.5-21.0	Wet, D. Gray, silty, SAND	(SM)
Jar-15	21.0-22.5	Ditto	(SM)
Jar-16	22.5-24.0	Wet, Dark Gray, silty, SAND with Gravel	(SM)
Jar-17	24.0-25.5	Wet, Dark Gray, Clayey, SAND with Gravel	(SC)
Jar-18	25.5-27.0	Moist, Brown, clayey, SAND with Gravel	(SC)
Jar-19	27.0-28.5	Wet, Brown, silty, SAND with Gravel	(SM)
Jar-20	28.5-30.0	Moist, Brown, silty, SAND trace of Gravel	(SM)
		① Sand size particles are a mixture of Cinders.	
		② Gravel size particles are a mixture of Cinders	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Estes

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-07			
Jar-1	0.0-1.5	moist dk gry poorly graded sand ^① silt and gravel	(SP-SM)
Jar-2	1.5-3.0	no sample	—
<small>very small sample</small> Jar-3	3.0-4.5	wet dk gry brn silty gravel w/ sand	(GM)
Jar-4	4.5-6.0	ditto	(GM)
Jar-5	6.0-7.5	ditto	(GM)
<small>small sample</small> Jar-6	7.5-9.0	wet dk gry silty sand ^② w/ gravel	(SM)
Jar-7	9.0-10.5	very moist dk gry brn sandy lean to fat clay trace of gravel	(LL/CH)
Jar-8	10.5-12.0	moist dk gry brn fat clay trace of sand ^③	(LH)
Jar-9	12.0-13.5	ditto ^③	(LH)
Jar-10	13.5-15.0	ditto ^③	(LH)
Jar-11	15.0-16.5	ditto ^③	(LH)
Jar-12	16.5-18.0	ditto ^③	(LH)
Jar-13	18.0-19.5	ditto ^③	(LH)
Jar-14	19.5-21.0	ditto ^③	(LH)
Jar-15	21.0-22.5	ditto ^③	(LH)
Jar-16	22.5-24.0	ditto ^③	(LH)
Jar-17	24.0-25.5	very moist dk gry brn clayey sand ^②	(SL)
Jar-18	25.5-27.0	wet dk gry brn silty sand ^②	(SM)
Jar-19	27.0-28.5	ditto ^②	(SM)
Jar-20	28.5-30.0	ditto ^②	(SM)
		① trace of cinders	
		② medium to fine sand	
		③ trace of shell fragments	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Estes

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-08			
Jan-1	0.0-1.5	moist blk poorly graded sand w/ silt and gravel and roots (SP-SM) ^①	
Jan-2	1.5-3.0	moist gry brn ditto ^②	(SP-SM)
Jan-3	3.0-4.5	wet gry brn poorly graded sand w/ silt ^②	(SP-SM)
Jan-4	4.5-6.0	very moist dk gry brn sandy lean to fat clay trace of gravel (LH)	
Jan-5	6.0-7.5	moist dk gry fat clay w/ sand trace of gravel (LH)	
Jan-6	7.5-9.0	moist dk gry fat clay w/ sand (LH)	
Jan-7	9.0-10.5	ditto (LH)	
Jan-8	10.5-12.0	ditto (LH)	
Jan-9	12.0-13.5	moist dk gry brn fat clay w/ sand trace of gravel (LH)	
Jan-10	13.5-15.0	moist dk gry fat clay w/ sand trace of gravel (LH)	
Jan-11	15.0-16.5	moist dk gry brn fat clay trace of sand (LH)	
Jan-12	16.5-18.0	ditto (LH)	
Jan-13	18.0-19.5	ditto ^③ (LH)	
Jan-14	19.5-21.0	ditto (LH)	
Jan-15	21.0-22.5	moist dk gry brn sandy fat clay ^③ (LH)	
Jan-16	22.5-24.0	wet dk gry brn poorly graded sand w/ silt ^② (SP-SM)	
Jan-17	24.0-25.5	ditto ^② (SP-SM)	
Jan-18	25.5-27.0	wet dk yel brn silty sand ^② (SM)	
Jan-19	27.0-28.5	wet dk gry brn ditto ^② (SM)	
Jan-20	28.5-30.0	wet dk gry brn poorly graded sand w/ silt ^② (SP-SM)	
		① coarse to fine sand	
		② medium to fine sand	
		③ trace of wood pieces	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: KUHW

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-09			
Jan-1	0.0-1.5	Moist black silty coarse sand w/ roots ^①	(SM)
Jan-2	1.5-3.0	V. moist grayish brn silty coarse sand w/ grav ^(wood brick)	(SM)
Jan-3	3.0-4.5	Wet dk gray poorly graded med sand w/ silt	(SP-SM)
Jan-4	4.5-6.0	Wet dk gray soft fat clay	(CH)
Jan-5	6.0-7.5	- ditto -	(CH)
Jan-6	7.5-9.0	- ditto -	(CH)
Jan-7	9.0-10.5	- ditto -	(CH)
Jan-8	10.5-12.0	V. moist dk gray soft fat clay w/ sand	(CH)
Jan-9	12.0-13.5	- ditto - (Tr. shells)	(CH)
Jan-10	13.5-15.0	V. moist dk gray clayey fine sand	(SC)
Jan-11	15.0-16.5	V. moist brn clayey med-coarse sand w/ gravel	SC/SM
Jan-12	16.5-18.0	- ditto -	SC/SM
Jan-13	18.0-19.5	Wet brown silty fine sand	(SM)
Jan-14	19.5-21.0	Wet brown clayey fine sand	(SC)
Jan-15	21.0-22.5	Wet brown silty v. fine sand	(SM)
Jan-16	22.5-24.0	Wet brown sandy silt	(ML)
Jan-17	24.0-25.5	Wet brown silty fine sand w/ gravel	(SM)
Jan-18	25.5-27.0	Wet brown silty gravel w/ sand	(GM)
Jan-19	27.0-28.5	- ditto -	(GM)
^{Small Sample} Jan-20	28.5-30.0	- ditto -	(GM)
		① Sand is mostly cinders	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: DANKS

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-13			
Jar-1	0.0-1.5	Moist, Very Dark Gray, silty, SAND Trace of ^{Gravel, Roots} Grass	(SM)
Jar-2	1.5-3.0	NO SAMPLE	---
Jar-3	3.0-4.5	Moist, Very Dark Gray, silty, SAND w/Gravel, Tr. of ^{binders} Wood	(SM)
Jar-4	4.5-6.0	Moist, Brown, clayey, Fine SAND Tr. of Gravel	SC/SM
Jar-5	6.0-7.5	Moist, Grayish Brown, silty, Fine SAND	(SM)
Very Very Small Jar-6	7.5-9.0 *	Moist, Brown, silty, Fine SAND	(SM)
Very Very Small Jar-7	9.0-10.5 *	Moist, Brown, silty, FINE SAND w/ Large Rock Frag	(SM)
Jar-8	10.5-12.0	20grams of silty, sand and gravel frags	---
Small Sample Jar-9	12.0-13.5	Very Moist, Brown, clayey, SAND with Gravel	SC/GC
Very Small Jar-10	13.5-15.0	Ditto	SC/GC
Jar-11	15.0-16.5	V. Moist, Brown, clayey, SAND with Gravel	(SC)
Small Sample Jar-12	16.5-18.0	V. Moist, Brown, silty, SAND	(SM)
Jar-13	18.0-19.5	V. Moist, Brown, silty, SAND with Gravel	(SM)
Jar-14	19.5-21.0	Wet, Brown, silty, SAND with Gravel	(SM)
Jar-15	21.0-21.3	Ditto	(SM)
		* NOTE: Jar 6 - 8 don't contain a representative sample to test.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Danko

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-14			
Jar-1	0.0-1.5	Moist, Black, silty, Med to Coarse SAND Tr. of Gravel Cinders Glass	(SM)
Jar-2	1.5-3.0	Moist, Black, silty, Med-Coarse SAND ^① w/Gravel ^② Tr. Glass	(SM)
Jar-3	3.0-4.5	Ditto ^① ^② " " Tr. Glass + Wood	(SM)
Jar-4	4.5-6.0	V. Moist, Black, clayey, SAND ^① with Gravel ^② & Glass	(SC)
Small Jar-5 Sample	6.0-7.5	Wet, Black, clayey, SAND ^① with Gravel ^② Tr. Glass	(SC)
Jar-6	7.5-9.0	V. Moist, DK. Gray, silty, SAND	SM/SC
V. Small Jar-7 Sample	9.0-10.5	18 grams of Moist, DK Gray, silty, SAND	(SM)
Jar-8	10.5-12.0	Wet, V. DK Gray, clayey, SAND with Gravel & Glass	SC/SM
Jar-9	12.0-13.5	Ditto with Gravel Tr. of Glass	(SC)
Small Jar-10 Sample	13.5-15.0	Moist, Grayish Brown, silty, Fine SAND	(SM)
Jar-11	15.0-16.5	Wet, Ditto	(SM)
Jar-12	16.5-18.0	Wet, Brown, silty, Med-Coarse SAND	(SM)
Jar-13	18.0-19.5	Moist, Brown, Poorly Graded SAND	(SP-SM)
Jar-14	19.5-21.0	Moist, Brown, silty, SAND with Gravel	(SM)
Jar-15	21.0-22.5	Ditto " "	(SM)
Jar-16	22.5-24.0	Ditto " "	(SM)
Jar-17	24.0-25.5	Ditto Tr. Gravel	(SM)
Small Jar-18 Sample	25.5-27.0	Ditto No Gravel	(SM)
Jar-19	27.0-28.5	Mixture of (4) rock frags & SAND	—
		① Sand size particles are Cinders,	
		② Gravel size particles are Cinders,	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: KUH N

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-16			
Jan-1	0.0-1.5	Moist black poorly graded coarse sand w/ silt ^① (grass roots) (SP-SM)	(SP-SM)
Jan-2	1.5-3.0	Wet black poorly graded coarse sand w/ silt ^① (SP-SM)	(SP-SM)
Jan-3	3.0-4.5	- ditto - w/ silt & grav (SP-SM)	(SP-SM)
Jan-4	4.5-6.0	Wet black silty coarse sand w/ gravel (SM)	(SM)
v. Small Sample Jan-5	6.0-7.5	Wet v. dk grayish brn silty med sand (Tr. grav) (SM)	(SM)
v. Small Sample Jan-6	7.5-9.0	- ditto - (SM)	(SM)
v. Small Sample Jan-7	9.0-10.5	Wet v. dk brn silty coarse sand (Tr. wood pieces) (SM)	(SM)
Jan-8	10.5-12.0	- ditto - w/ pieces of wood (SM)	(SM)
v. Small Sample Jan-9	12.0-13.5	- ditto - w/ " (SM)	(SM)
Jan-10	13.5-15.0	EMPTY JAR	—
v. Small Sample Jan-11	15.0-16.5	Wet black silty fine sand (SM)	(SM)
Jan-12	16.5-18.0	Wet dk greenish gray soft fat clay (Tr. sd) (CH)	(CH)
Jan-13	18.0-19.5	v. moist - ditto - (CH)	(CH)
Jan-14	19.5-21.0	Wet v. dk gray soft fat clay (CH)	(CH)
Jan-15	21.0-22.5	Wet dk gray clayey fine to med sand (SC)	(SC)
Jan-16	22.5-24.0	Wet v. dk gray poorly graded coarse sand w/ silt (SP-SM)	(SP-SM)
Jan-17	24.0-25.5	ditto - (med) (SP-SM)	(SP-SM)
Jan-18	25.5-27.0	Wet brown poorly graded med sand w/ silt (SP-SM)	(SP-SM)
Jan-19	27.0-28.5	Wet brown silty med sand w/ gravel (SM)	(SM)
v. Small Sample Jan-20	28.5-30.0	Wet brown silty fine sand (SM)	(SM)
		① SAND IS MOSTLY CINDECS	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Danko

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-17			
Jar-1	0.0-1.5	Moist, Black, silty, SAND ^① Trace of Gravel, Glass, Cinders ^② (SM)	(SM)
Jar-2	1.5-3.0	Moist, Black, silty, SAND ^① Trace of Gravel and Coal ^② (SM)	(SM)
Jar-3	3.0-4.5	V. Moist, Very Dark Gray, silty, SAND with Gravel ^③ (SM)	(SM)
Jar-4	4.5-6.0	Wet, V. Dark Gray, silty, SAND ^① with Gravel ^② Tr. Glass (SM)	(SM)
Small Jar-5	6.0-7.5	Moist, Dark Brown, silty SAND (SM)	(SM)
V. Small Jar-6	7.5-9.0	Mixture of Brick Fragments, silty SAND, Cinders	—
Jar-7	9.0-10.5	V. Moist, Very DK Gray, clayey, SAND ^① Tr. of Gravel ^② (SC)	(SC)
Jar-8	10.5-12.0	Wet, Black, silty, SAND ^① Tr. of Gravel ^② , Glass (SM/SC)	SM/SC
Jar-9	12.0-13.5	Wet, Black, silty, SAND ^① Trace of Gravel ^② , Glass, Wood (SM)	(SM)
Jar-10	13.5-15.0	Ditto w/ Gravel ^② , Glass, Decaying Matrl, Glass (SM)	(SM)
Jar-11	15.0-16.5	Ditto w/ Gravel ^② , Glass, wood, Shell frags (SM)	(SM)
Small Jar-12	16.5-18.0	Ditto " " " " " (SM)	(SM)
Jar-13	18.0-19.5	Ditto " " " " " (SM)	(SM)
Jar-14	19.5-21.0	V. Moist, V. DK. Gray, SOFT FAT CLAY Tr. of Sand, Gravel, Brick frags ^① Wood, Leather ^② (CH)	(CH)
Jar-15	21.0-22.5	Ditto Trace of Sand ^① Shell frags + Piece of Leather (CH)	(CH)
Jar-16	22.5-24.0	V. Moist, V. DK. Gray, SOFT, FAT CLAY Trace of Organics (CH)	(CH)
Jar-17	24.0-25.5	Ditto (CH)	(CH)
Jar-18	25.5-27.0	Ditto (CH)	(CH)
Jar-19	27.0-28.5	V. Moist, V. DK. Gray, SOFT FAT CLAY Tr. of SAND + Shell frags (CH)	(CH)
Jar-20	28.5-30.0	Ditto Trace of Shell frags (CH)	(CH)
		① Sand size particles are a mixture of Sand, Cinders and Coal	
		② Gravel size particles are a mixture of Gravel, Cinders and Coal	
		③ Gravel = 3/4" diameter pieces of Cemented Sand Grains.	

VISUAL-MANUAL CLASSIFICATIONS
(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Danko

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-18		Approx 14 grams γ	
Jar-1	0.0-1.5	Mixture of Grass, Sand, (2) pieces of Gravel	—
Jar-2	1.5-3.0	Moist, Grayish Brown, LEAN CLAY Trace of roots	(CL)
Jar-3	3.0-4.5	(Very Small Sample) Ditto Trace of Roots	(CL)
Jar-4	4.5-6.0	Moist, Black, silty, Med to Coarse SAND*	(SM)
Jar-5	6.0-7.5	Ditto ^① Trace of Gravel ^②	(SM)
Jar-6	7.5-9.0	(Very Small Sample) Ditto ^①	(SM)
Jar-7	9.0-10.5	WET, Ditto ^① Trace of Gravel ^②	(SM)
Jar-8	10.5-12.0	Moist, Ditto ^① Trace of Gravel ^②	(SM)
Jar-9	12.0-13.5	Moist, Dark Gray, FAT CLAY tr. of sand + decaying Matil	(CH)
Jar-10	13.5-15.0	Moist, Dark Gray, SOFT FAT CLAY trace of shells	(CH)
Jar-11	15.0-16.5	Ditto " " "	(CH)
Jar-12	16.5-18.0	Ditto " " "	(CH)
Jar-13	18.0-19.5	Ditto " " "	(CH)
Jar-14	19.5-21.0	Ditto " " "	(CH)
Jar-15	21.0-22.5	Ditto " " "	(CH)
Jar-16	22.5-24.0	Ditto " " "	(CH)
Jar-17	24.0-25.5	Ditto " " "	(CH)
Jar-18	25.5-27.0	Ditto " " "	(CH)
Jar-19	27.0-28.5	Ditto " " "	(CH)
Jar-20	28.5-30.0	Ditto " " "	(CH)
		① Sand size particles are cinders	
		② Gravel size particles are a mixture of cinders and Gravel	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Estes

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-19			
Jan-1	0.0-1.5	slightly moist dk yellow silty sand w/ gravel ^{①②③}	(SM)
Jan-2	1.5-3.0	moist very dk grey brn ditto ^{①②③}	(SM)
Jan-3	3.0-4.5	wet very dk grey brn silty sand w/ gravel ^④	(SM)
Jan-4	4.5-6.0	wet dk grey brn ditto ^④	(SM)
<small>very small sample</small> Jan-5	6.0-7.5	wet grey silty gravel w/ sand	(GM)
Jan-6	7.5-9.0	wet grey silty sand w/ gravel ^④	(SM)
Jan-7	9.0-10.5	very moist dk grey sandy lean to fat clay trace of gravel	U _L CH
Jan-8	10.5-12.0	ditto ^⑤	U _L CH
Jan-9	12.0-13.5	moist dk grey brn fat clay ^⑤ trace of sand	(LH)
Jan-10	13.5-15.0	moist dk grey ditto ^⑤	(LH)
Jan-11	15.0-16.5	ditto ^⑤	(LH)
Jan-12	16.5-18.0	ditto ^⑤	(LH)
Jan-13	18.0-19.5	ditto ^⑤	(LH)
Jan-14	19.5-21.0	ditto ^⑤	(LH)
Jan-15	21.0-22.5	ditto ^⑤	(LH)
Jan-16	22.5-24.0	ditto ^⑤	(LH)
Jan-17	24.0-25.5	ditto ^⑤	(LH)
Jan-18	25.5-27.0	ditto ^⑤	(LH)
Jan-19	27.0-28.5	ditto ^⑤	(LH)
Jan-20	28.5-30.0	ditto ^⑤	(LH)
		① medium to fine sand	
		② trace of organic material	
		③ trace of cinders	
		④ coarse to fine sand	
		⑤ trace of shell fragments	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: DANKO

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-23			
Jar-1	0.0-1.5	Moist, Very Dark Gray, silty, SAND ^① Trace of Gravel ^②	(SM)
Jar-2	1.5-3.0	Ditto ^① " " ^②	(SM)
<small>Very Small</small> Jar-3	3.0-4.5	Wet, Very Dark Gray, silty, GRAVEL with sand ^①	(GM)
<small>Small</small> Jar-4	4.5-6.0	Wet, Very Dark Gray, silty, SAND ^① Trace of Gravel ^②	(SM)
<small>Very Small</small> Jar-5	6.0-7.5	Ditto ^① Trace of Gravel ^②	(SM)
<small>Very Small</small> Jar-6	7.5-9.0	Ditto ^① Trace of Gravel ^②	(SM)
<small>Small</small> Jar-7	9.0-10.5	Moist, Dark Gray, SOFT FAT CLAY ^{Gravel, SAND +} Trace of shell frags	(CH)
Jar-8	10.5-12.0	Moist, Dark Gray, SOFT FAT CLAY Trace of Gravel	(CH)
Jar-9	12.0-13.5	Ditto	(CH)
Jar-10	13.5-15.0	Ditto	(CH)
Jar-11	15.0-16.5	Ditto with Organic Material	(CH)
Jar-12	16.5-18.0	Moist, Very Dark Gray, clayey, FINE SAND with Organic Material	(SC)
Jar-13	18.0-19.5	Moist, Very Dark Gray, clayey, FINE SAND	(SC)
Jar-14	19.5-21.0	Wet, Dark Gray, Poorly Graded SAND with silt	(SP-SM)
Jar-15	21.0-22.5	Ditto	(SP-SM)
Jar-16	22.5-24.0	Very Moist Dark Gray, Poorly Graded SAND with Silt & ^{Brick} Frags	(SP-SM)
Jar-17	24.0-25.5	Ditto with Silt, Trace of ^{Brick} Frags & Gravel	(SP-SM)
Jar-18	25.5-27.0	Wet, Dark Gray, silty, SAND Trace of Gravel	(SM)
Jar-19	27.0-28.5	Moist, Dark Gray, silty, SAND Trace of Gravel	(SM)
Jar-20	28.5-30.0	Ditto Trace of Gravel	(SM)
		① Sand size particles are a mixture of Sand, Gravel and Coal.	
		② Gravel size particles are a mixture of Sand, Cinders and Coal.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: DANKO

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-24			
Small Jar-1	0.0-1.5	Moist, V. Dk. Grayish Brown, silty, SAND with Gravel & Grass ^① ^② (SM)	
Jar-2	1.5-3.0	Moist, Dark Grayish Brown, Clayey, SAND Trace of Roots (SC)	
Jar-3	3.0-4.5	Moist, V. Dark Gray sandy, LEAN CLAY Trace of Wood (CL)	
Jar-4	4.5-6.0	Moist, Black + V.D. Gray, FAT CLAY with sand & Gravel ^① ^② (CH)	
Jar-5	6.0-7.5	Wet, Black, silty, SAND with Gravel ^① ^② (SM)	
Very Small Jar-6	7.5-9.0	Ditto ^① (SM)	
Small Jar-7	9.0-10.5	Ditto ^① With Gravel ^② , Piece of Leather (SM)	
Very Small Jar-8	10.5-12.0	Ditto ^① Trace of Gravel ^② (SM)	
Small Jar-9	12.0-13.5	Ditto ^① With Gravel ^② , Trace of Wood (SM)	
Jar-10	13.5-15.0	Moist, Very Dark Gray, sandy, FAT CLAY Trace of Organics ^① (CH)	
Jar-11	15.0-16.5	Wet, Ditto ^① Trace of Gravel & Organics ^② (CH)	
Jar-12	16.5-18.0	Moist, Dark Gray, SOFT FAT CLAY Trace of Shells (CH)	
Jar-13	18.0-19.5	Ditto Trace of Shells (CH)	
Jar-14	19.5-21.0	Ditto " " " (CH)	
Jar-15	21.0-22.5	Ditto " " " (CH)	
Jar-16	22.5-24.0	Ditto " " " (CH)	
Jar-17	24.0-25.5	Ditto " " " (CH)	
Jar-18	25.5-27.0	Ditto " " " (CH)	
Jar-19	27.0-28.5	Ditto " " " (CH)	
Jar-20	28.5-30.0	Ditto " " " (CH)	
		① Sand size particles are a mixture of sand and cinders.	
		② Gravel size particles are a mixture of gravel and cinders.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: DANKO

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-25			
Jan-1	0.0-1.5	Moist, Black, silty, SAND ^① with Gravel ^②	(SM)
Jan-2	1.5-3.0	Ditto ^① with Gravel ^② , Brick Frags	(SM)
Jan-3	3.0-4.5	Moist, DK Gray, clayey, SAND Trace of Gravel	(SC)
Jan-4	4.5-6.0	3 pieces of cemented Sand Grains	—
Jan-5	6.0-7.5	Moist, DK. Grayish Brown, silty, SAND with Gravel + Wood	(SM)
Jan-6	7.5-9.0	A Dirty Jar	—
very small Jan-7	9.0-10.5	Moist, DK Gray, clayey, SAND Trace of Gravel	(SC)
Jan-8	10.5-12.0	Moist, DK Gray, SOFT FAT CLAY Trace of Sand	(CH)
Jan-9	12.0-13.5	Ditto Trace of Sand + Gravel	(CH)
Jan-10	13.5-15.0	Ditto Trace of Shells	(CH)
Jan-11	15.0-16.5	Ditto	(CH)
Jan-12	16.5-18.0	Moist, DK. Gray + Black, SOFT FAT Clay w/ ^{Trace of shells} organic material	(CH)
Jan-13	18.0-19.5	Wet, DK, Gray, Poorly Graded SAND with silt	(SP-SM)
Jan-14	19.5-21.0	Ditto	(SP-SM)
Jan-15	21.0-22.5	Wet, DK Gray, silty, SAND	(SM)
Jan-16	22.5-24.0	Moist, DK Grayish Brown, silty, SAND Tr. of ^{Gravel +} Shells	(SM)
Jan-17	24.0-25.5	Ditto Trace of Gravel	(SM)
Jan-18	25.5-27.0	Wet, DK Grayish Brown, silty, SAND Tr. of ^{Gravel +} Shells	(SM)
Jan-19	27.0-28.5	Ditto Trace of Shells + Gravel	(SM)
Jan-20	28.5-30.0	Ditto Trace of Gravel	SM/SC
		① Sand size particles are a mixture of Sand, Cinders and Coal.	
		② Gravel size particles are a mixture of Gravel, Cinders and Coal.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Danko

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-26			
Jan-1	0.0-1.5	Moist, Black, silty, SAND with Gravel ^① ^②	(SM)
Jan-2	1.5-3.0	ditto with Gravel ^① ^②	(SM)
Jan-3	3.0-4.5	Wet, Black, Poorly graded SAND with silt and Gravel ^① ^②	(SP-SM)
Jan-4	4.5-6.0	Moist, DK Gray, SOFT FAT CLAY with sand & ^{1 piece of} cemented SAND ^②	(CH)
Small Sample Jan-5	6.0-7.5	Wet, V. DK Gray, silty, SAND ^① Trace of Gravel ^②	(SM)
Small Sample Jan-6	7.5-9.0	Moist, V. DK. Gray, SOFT FAT CLAY	(CH)
Jan-7	9.0-10.5	Ditto	(CH)
Jan-8	10.5-12.0	Ditto	(CH)
Jan-9	12.0-13.5	Ditto	(CH)
Jan-10	13.5-15.0	Ditto Trace of Glass	(CH)
Jan-11	15.0-16.5	Ditto Trace of Shells	(CH)
Jan-12	16.5-18.0	Ditto	(CH)
Jan-13	18.0-19.5	Ditto Trace of Shells	(CH)
Jan-14	19.5-21.0	Ditto Trace of Decaying material	(CH)
Jan-15	21.0-22.5	V. Moist, DK Gray, silty, SAND	(SM)
Jan-16	22.5-24.0	Wet, DK Gray, silty, SAND Trace of Gravel	(SM)
Jan-17	24.0-25.5	Moist, Brown, Poorly Graded SAND	(SP-SM)
Jan-18	25.5-27.0	Ditto	(SP-SM)
		① Sand size particles are a mixture of sand, cinders and coal.	
		② Gravel size particles are a mixture of Gravel, cinders and coal.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Estes

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-27			
Jan-1	0.0-1.5	moist dk yel brn silty sand w/ gravel trace of roots ^②	(SM)
Jan-2	1.5-3.0	moist blk poorly graded sand w/ silt and gravel ^{①②}	(SP-SM)
Jan-3	3.0-4.5	very moist gry brn silty sand trace of gravel ^③	(SM)
Jan-4	4.5-6.0	wet brn silty sand ^③	(SM)
Jan-5	6.0-7.5	very moist gry brn sandy silt w/ gravel ^③	(ML)
Jan-6	7.5-9.0	wet dk gry brn silty sand w/ gravel ^③	(SM)
Jan-7	9.0-10.5	ditto ^③	(SM)
Jan-8	10.5-12.0	very moist dk gry brn sandy lean clay w/ gravel	(CL)
Jan-9	12.0-13.5	moist dk gry brn fat clay w/ sand trace of gravel	(CH)
Jan-10	13.5-15.0	moist dk gry brn fat clay - trace of gravel ^④	(CH)
Jan-11	15.0-16.5	ditto ^④	(CH)
Jan-12	16.5-18.0	moist dk gry ditto ^④	(CH)
Jan-13	18.0-19.5	ditto ^④	(CH)
Jan-14	19.5-21.0	ditto ^④	(CH)
Jan-15	21.0-22.5	moist dk gry brn sandy lean clay	(CL)
Jan-16	22.5-24.0	wet gry brn silty sand ^②	(SM)
Jan-17	24.0-25.5	ditto ^②	(SM)
Jan-18	25.5-27.0	ditto ^②	(SM)
Jan-19	27.0-28.5	very moist gry brn poorly graded sand w/ silt ^②	(SP-SM)
Jan-20	28.5-30.0	wet gry brn silty sand ^⑤	(SM)
		① contains cinders	
		② medium to fine sand	
		③ coarse to fine sand	
		④ trace of shell fragments	
		⑤ fine sand	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: KUHN

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-28			
Jan-1	0.0-1.5	Moist dk grayish brn silty fine sand w/ ^{roots} glass	(SM)
Jan-2	1.5-3.0	Moist black silty med-coarse sand (Tr. grass)	(SM)
Jan-3	3.0-4.5	V.moist black silty coarse sand w/ gravel ^①	(SM)
Jan-4	4.5-6.0	V.moist v. dk brn poorly graded coarse sand w/ silt	(SP-SM)
Jan-5	6.0-7.5	Wet dk greenish gray silty med sand w/ ^{large piece} of wood	(SM)
Jan-6	7.5-9.0	- ditto -	(SM)
Jan-7	9.0-10.5	Wet dk gray silty fine sand w/ clay lense	(SM)
Jan-8	10.5-12.0	- ditto - w/ " "	(SM)
Jan-9	12.0-13.5	Wet black silty med to coarse sand	(SM)
Jan-10	13.5-15.0	- ditto -	(SM)
Jan-11	15.0-16.5	Wet black silty med sand w/ clay lense	(SM)
Jan-12	16.5-18.0	V.moist black soft fat to lean clay	CH/CL
Jan-13	18.0-19.5	- ditto -	CH/CL
Jan-14	19.5-21.0	V.moist black soft fat clay	(CH)
Jan-15	21.0-22.5	V.moist dk gray soft fat clay	(CH)
Jan-16	22.5-24.0	- ditto -	(CH)
Jan-17	24.0-25.5	- ditto -	(CH)
Jan-18	25.5-27.0	- ditto -	(CH)
Jan-19	27.0-28.5	- ditto -	(CH)
Jan-20	28.5-30.0	EMPTY JAR	
		① Sand is mostly cinders	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Estes

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-32			
Jar-1	0.0-1.5	moist very dk gry silty sand ^{①②} w/ gravel	(SM)
Jar-2	1.5-3.0	ditto ^{①②}	(SM)
Jar-3	3.0-4.5	moist dk gry brn ditto ^{①②}	(SM)
Jar-4	4.5-6.0	wet gry brn poorly graded sand ^③ w/ silt	(SP-SM)
Jar-5	6.0-7.5	wet gry brn silty sand ^③	(SM)
Jar-6	7.5-9.0	very moist dk gry brn sandy lean clay trace of gravel	(LL)
Jar-7	9.0-10.5	moist dk gry lean to fat clay trace of sand	LLCH
Jar-8	10.5-12.0	very moist dk gry sandy lean clay trace of gravel	(LL)
Jar-9	12.0-13.5	very moist dk gry fat clay w/ sand	(LH)
Jar-10	13.5-15.0	moist dk gry lean to fat clay w/ sand	LLCH
Jar-11	15.0-16.5	moist dk gry brn fat clay trace of sand	(LH)
Jar-12	16.5-18.0	ditto ^④	(LH)
Jar-13	18.0-19.5	ditto	(LH)
Jar-14	19.5-21.0	moist dk gry ditto ^④	(LH)
Jar-15	21.0-22.5	moist very dk gry elastic silt trace of sand	(MH)
Jar-16	22.5-24.0	moist dk gry sandy lean clay trace of gravel	(LL)
Jar-17	24.0-25.5	moist gry brn silty sand ^⑤ trace of gravel	(SM)
Jar-18	25.5-27.0	very moist brn clayey sand ^③ w/ gravel	(SM)
Jar-19	27.0-28.5	wet brn silty sand ^⑤ w/ gravel	(SM)
Jar-20	28.5-30.0	wet gry brn ditto ^⑤	(SM)
		① contains cinders	
		② coarse to fine sand	
		③ medium to fine sand	
		④ trace of shell fragments	
		⑤ fine sand	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: DANKO

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-34			
Jan-1	0.0-1.5	Moist DK Brown, silty, SAND with Gravel, Trace of clay ^{Roots +} (SM)	(SM)
Jan-2	1.5-3.0	Ditto with Gravel, Trace of Clay (SM)	(SM)
Jan-3	3.0-4.5	Ditto with Gravel (SM)	(SM)
Jan-4	4.5-6.0	Ditto with Gravel, Trace of Clay (SM)	(SM)
Jan-5	6.0-7.5	Moist, Black + Brown, silty, SAND with Gravel + ^{Pieces of ROOTS +} Wood + Cinders (SM)	(SM)
very small Jan-6	7.5-9.0	Moist, Very Dark Brown, silty, SAND Trace of ^{Cinders,} roots + Gravel (SM)	(SM)
Jan-7	9.0-10.5	Wet, Black, silty, SAND with Gravel ^② (SM)	(SM)
Jan-8	10.5-12.0	Moist, Black silty, SAND ^① with Gravel ^② (SM)	(SM)
Jan-9	12.0-13.5	Moist, DK Gray, SOFT FAT CLAY Trace of sand ^① (CH)	(CH)
Jan-10	13.5-15.0	Ditto Trace of sand ^① (CH)	(CH)
Jan-11	15.0-16.5	Ditto " " " (CH)	(CH)
Jan-12	16.5-18.0	Ditto " " " (CH)	(CH)
Jan-13	18.0-19.5	Ditto Trace of sand + shells (CH)	(CH)
Jan-14	19.5-21.0	Moist, yell. BRN + Gray, clayey, SAND Trace of shells (SC)	(SC)
Jan-15	21.0-22.5	Ditto (SC)	(SC)
Jan-16	22.5-24.0	Moist, Brown, clayey, SAND SC/SM	SC/SM
Jan-17	24.0-25.5	ditto Trace of Gravel SC/SM	SC/SM
Jan-18	25.5-27.0	ditto with Gravel SC/SM	SC/SM
Jan-19	27.0-28.5	ditto with Gravel SC/SM	SC/SM
Jan-20	28.5-30.0	ditto with Gravel SC/SM	SC/SM
		① sand size particles are a mixture of Sand, Cinders and Coal.	
		② Gravel size particles are a mixture of Gravel, Cinders and Coal.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: DANKO

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-35			
Jan-1	0.0-1.5	Moist, Dark Brown, Silty, SAND Trace of Gravel	(SM)
Jan-2	1.5-3.0	Ditto Trace of Gravel	(SM)
Jan-3	3.0-4.5	Ditto With Cinders, Glass + roots	(SM)
Jan-4	4.5-6.0	Moist, Black, silty, SAND with Gravel	(SM)
Very Small Jan-5	6.0-7.5	Ditto ^① With Gravel ^② + 5 pieces of Concrete Frags	(SM)
Jan-6	7.5-9.0	Ditto ^① With Gravel ^② + Concrete Fragments	(SM)
Jan-7	9.0-10.5	Wet, Black, silty, SAND ^① With Gravel ^②	(SM)
Jan-8	10.5-12.0	Wet, V.DK. Gray, Poorly Graded SAND ^① With silt + Gravel ^②	(SP-SM)
Jan-9	12.0-13.5	Ditto ^① " " " ^②	(SP-SM)
Jan-10	13.5-15.0	Ditto ^① " " " ^②	(SP-SM)
Jan-11	15.0-16.5	Wet, DK Gray, Poorly Graded SAND with silt	(SP-SM)
Jan-12	16.5-18.0	Ditto ^① With silt + Gravel ^②	(SP-SM)
Jan-13	18.0-19.5	V. Moist, DK Gray + Brown, silty, SAND Trace of Shells ^{Gravel +}	(SM)
Jan-14	19.5-21.0	Wet, Brown, silty, SAND Trace of Gravel	(SM)
Jan-15	21.0-22.5	V. Moist, Brown, silty, FINE SAND Trace of Sand	(SM)
Jan-16	22.5-24.0	Ditto trace of Sand	(SM)
Jan-17	24.0-25.5	V. Moist, Brown, fine Sandy, Lean CLAY Trace of Gravel	(CL)
Jan-18	25.5-27.0	Ditto Trace of Gravel	(CL)
Jan-19	27.0-28.5	Ditto Trace of Gravel	(CL)
Very Small Jan-20	28.5-30.0	Moist, Brown, silty, SAND Trace of Gravel	(SM)
		① Sand size particles are a mixture of Sand, Cinders and Coal.	
		② Gravel size particles are a mixture of Gravel, Cinders and Coal.	

VISUAL-MANUAL CLASSIFICATIONS

(Test method: ASTM D2488)

PROJECT: Liberty State Park

DATE: Nov.2003

AREA: Jersey City, NJ

Classified by: Danko

Sample No.	Depth (ft.)	Visual Classification	Symbol
LSP-03-36			
Jan-1	0.0-1.5	Moist, Brown, clayey, SAND Trace of Gravel	SC/SM
Jan-2	1.5-3.0	Moist, DK Brown, silty, SAND Trace of Gravel	(SM)
Jan-3	3.0-4.5	Moist, DK Brown, silty, SAND ^① with Gravel ^②	SM/SC
Small Jan-4	4.5-6.0	Moist, Black, silty, SAND ^① Trace of Gravel ^②	(SM)
Jan-5	6.0-7.5	60% Moist, Black, silty, SAND ^① with Gravel ^② 40% Moist, Grayish Brown, silty, FINE SAND	(SM) SM/SC
Small Jan-6	7.5-9.0	Wet, Black, silty, SAND ^① with Gravel ^②	(SM)
Jan-7	9.0-10.5	Ditto ^① ②	(SM)
Jan-8	10.5-12.0	Ditto ^① ②	(SM)
Jan-9	12.0-13.5	Moist, Dark Gray, SOFT FAT CLAY	(CH)
Jan-10	13.5-15.0	50% Ditto 50% Moist, Dark Gray, silty, SAND Trace of Shells	(CH) (SM)
Jan-11	15.0-16.5	60% Moist, Dark Gray, clayey, SAND Trace of Shells 40% Moist, Dark Gray, SOFT FAT CLAY	(SC) (CH)
Jan-12	16.5-18.0	Moist, Dark Gray, SOFT FAT CLAY Trace of Sand & Shells	(CH)
Jan-13	18.0-19.5	Ditto Trace of Shells	(CH)
Jan-14	19.5-21.0	Ditto	(CH)
Jan-15	21.0-22.5	Ditto	(CH)
Jan-16	22.5-24.0	Ditto Trace of Shells & Organic Material	(CH)
Jan-17	24.0-25.5	Moist, Black, SILT (sample is mostly Organic Material)	ML/OL
Jan-18	25.5-27.0	Moist, DK Gray & Black, sandy, FAT CLAY with Organic Material	(CH)
Jan-19	27.0-28.5	Moist, DK Grayish Brown, clayey, SAND with Gravel	(SC)
Jan-20	28.5-30.0	Moist, Brown, sandy, CLAY Trace of Gravel	CL/SC
		① Sand size particles are a mixture of Sand, Cinders and coal.	
		② Gravel size particles are a mixture of Gravel, Cinders and Coal.	

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Liberty State Park

DATE: Feb 2004

AREA: Additional Borings

CLASSIFIED BY: KUHW

Jersey City, NJ

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
CA04-3			
JAR-1	0.0-1.5	V. moist v. dk grayish brn silty med sand (Tr. roots)	(SM)
-2	1.5-3.0	Moist v. dk grayish brn sandy silt w/ twigs & roots	(ML)
-3	3.0-4.5	V. moist black soft lean clay w/ sand (Tr. roots + petrol. odor)	(CL)
-4	4.5-6.0	Wet black poorly graded coarse sand ^①	(SP)
-5	6.0-7.5	ditto ^①	(SP)
-6	7.5-9.0	Wet black poorly graded coarse sand ^② w/ gravel	(SP)
-7	9.0-10.5	Wet black poorly graded coarse sand ^① w/ silt	(SP-SM)
-8	10.5-12.0	ditto ^①	(SP-SM)
-9	12.0-13.5	ditto ^①	(SP-SM)
-10	13.5-15.0	EMPTY JAR	-
-11	15.0-16.5	Wet black poorly graded med sand w/ silt	(SP-SM)
-12	16.5-18.0	- ditto -	(SP-SM)
-13	18.0-19.5	V. moist black + dk gray soft lean clay (Tr. shell frag)	(CL)
-14	19.5-21.0	V. moist v. dk gray soft fat clay (Tr. shells)	(CH)
-15	21.0-22.5	ditto -	(CH)
-16	22.5-24.0	- ditto -	(CH)
-17	24.0-25.5	- ditto -	(CH)
-18	25.5-27.0	- ditto -	(CH)
-19	27.0-28.5	- ditto -	(CH)
-20	28.5-30.0	- ditto -	(CH)

① Sand is cinders

② Sand & gravel are cinders

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Liberty State Park

DATE: Feb 2004

AREA: Additional Borings

CLASSIFIED BY: KUHN

Jersey City, NJ

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
CA04-4			
JAR-1	0.0-1.5	Moist, v. dk Grayish Brown, Sandy, LEAN CLAY w/ ^{Roots} ^{Cinders} Concrete Frags	(CL)
- 2	1.5-3.0	Moist, v. dk. Grayish Brown, Clayey, SAND w/ Gravel & Cinders	(SC)
- 3	3.0-4.5	75grams of Concrete Frags, Pieces of Wood & SAND	
- 4	4.5-6.0	Wet, v. dk. Gray & Black, Silty, SAND w/ organic MATL & GRAVEL & Cinders	(SM)
- 5	6.0-7.5	Ditto w/ Gravel, Organic MATL & Cinders	(SM)
- 6	7.5-9.0	Wet, dk. Grayish Brown, Poorly Graded SAND w/ silt & gravel	(SP-SM)
- 7	9.0-10.5	Wet, dk. Grayish Brown, Silty, SAND w/ Gravel & Shells	(SM)
^{Small} Sample - 8	10.5-12.0	Moist, dk. Grayish Brown, Silty, SAND w/ Gravel & Cinders	(SM)
^{Small} Sample - 9	12.0-13.5	Wet v. dk gray poorly graded med sand w/ silt	(SP-SM)
- 10	13.5-15.0	EMPTY JAR	-
- 11	15.0-16.5	v. moist dk gray & black soft fat clay	(CH)
- 12	16.5-18.0	- ditto - (to shells)	(CH)
- 13	18.0-19.5	v. moist dk gray & black soft fat clay ^①	(CH)
- 14	19.5-21.0	- ditto - (to shells)	(CH)
- 15	21.0-22.5	v. moist black soft fat clay (to shells)	(CH)
- 16	22.5-24.0	v. moist v. dk gray soft fat clay (to shells)	(CH)
- 17	24.0-25.5	- ditto - "	(CH)
- 18	25.5-27.0	- ditto - "	(CH)
- 19	27.0-28.5	- ditto - "	(CH)
- 20	28.5-30.0	- ditto - "	(CH)

^① Petroleum odor

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Liberty State Park

DATE: Feb 2004

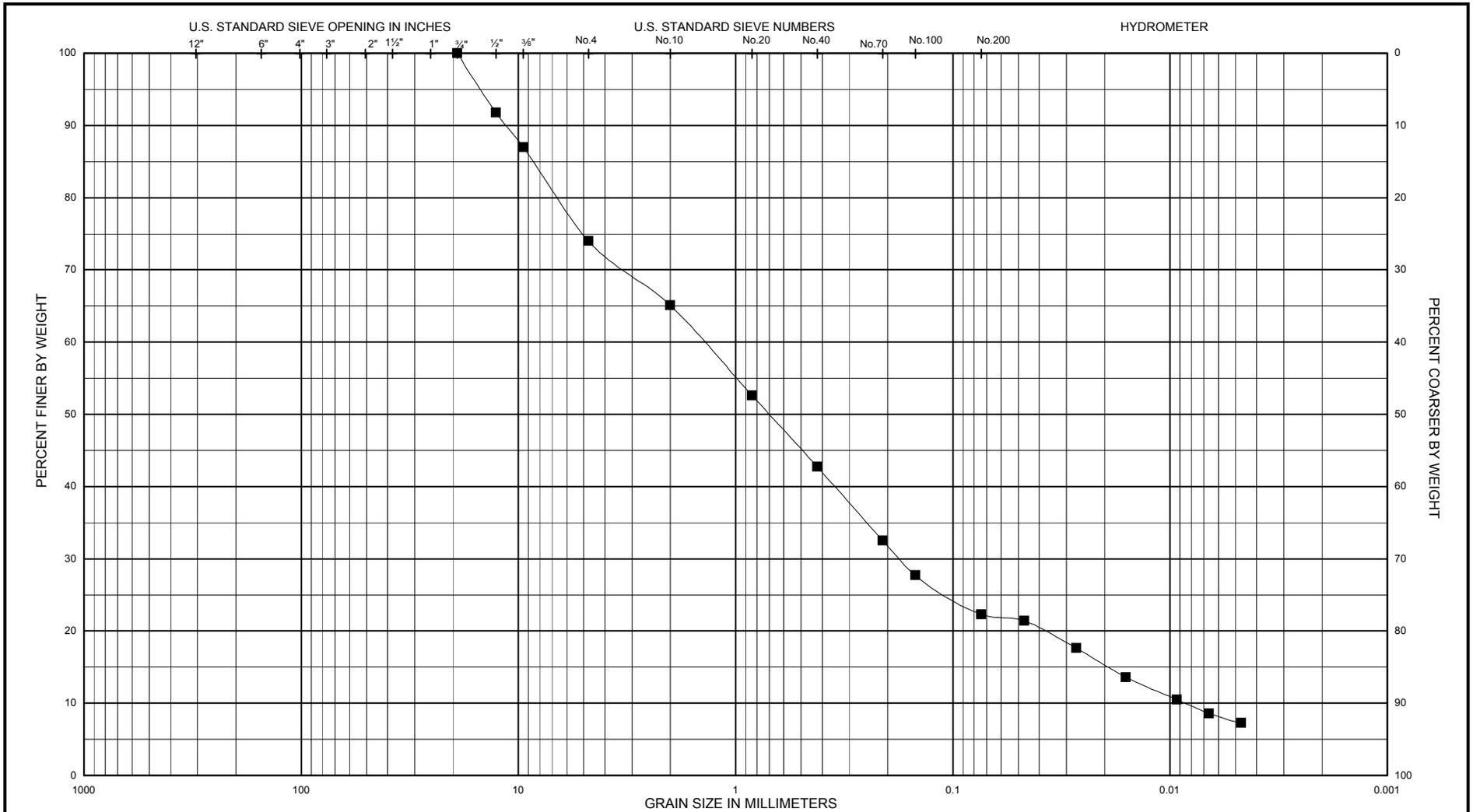
AREA: Additional Borings

CLASSIFIED BY: KLIHN

Jersey City, NJ

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
<u>NC04-5</u>			
JAR-1	0.0 - 1.5	Moist dk grayish brn silty fine sand w/ ^{roots} grass	(SM)
- 2	1.5 - 3.0	- ditto - w/ piece of wood	(SM)
- 3	3.0 - 4.5	- ditto - w/ Tr. gravel	(SM)
- 4	4.5 - 6.0	Moist black silty med sand w/ gravel	(SM)
- 5	6.0 - 7.5	Moist black silty coarse sand w/ pieces of wood	Ⓛ (SM)
V. Small Sample - 6	7.5 - 9.0	Moist v. dk gray silty med sand (tr gravel + wood)	(SM)
- 7	9.0 - 10.5	Wet black silty med sand w/ 50% pieces of wood	Ⓛ (SM)
- 8	10.5 - 12.0	Wet black poorly graded med sand w/ silt + gravel + wood	20% (SP-SM)
- 9	12.0 - 13.5	Wet black silty med-coarse sand w/ pieces of wood	(SM)
V. Small Sample 10	13.5 - 15.0	Wet v. dk gray silty med sand (tr gravel)	(SM)
V. Small Sample 11	15.0 - 16.5	Wet v. dk gray poorly graded med sand w/ silt	(SP-SM)
- 12	16.5 - 18.0	Wet v. dk gray poorly graded coarse sand w/ ^{silt} piece of wood	(SP-SM)
- 13	18.0 - 19.5	- ditto -	(SP-SM)
- 14	19.5 - 21.0	WOOD w/ (Tr sand)	-
		Ⓛ Petroleum odor	

APPENDIX D
GEOTECHNICAL TESTING RESULTS



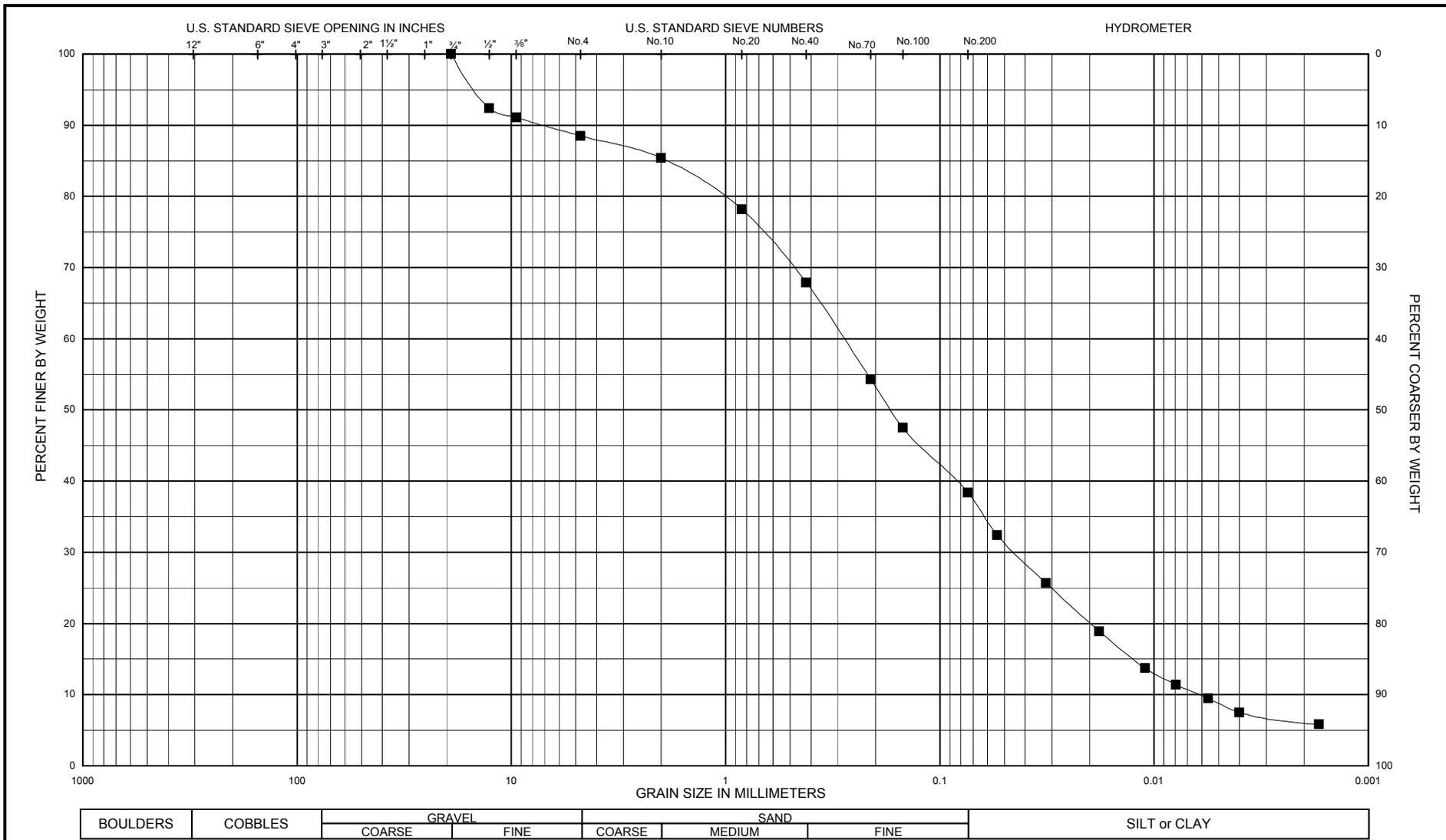
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-3	3.0-4.5	Silty sand with gravel (SM)	37.5	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-01
								DATE: Apr 2004

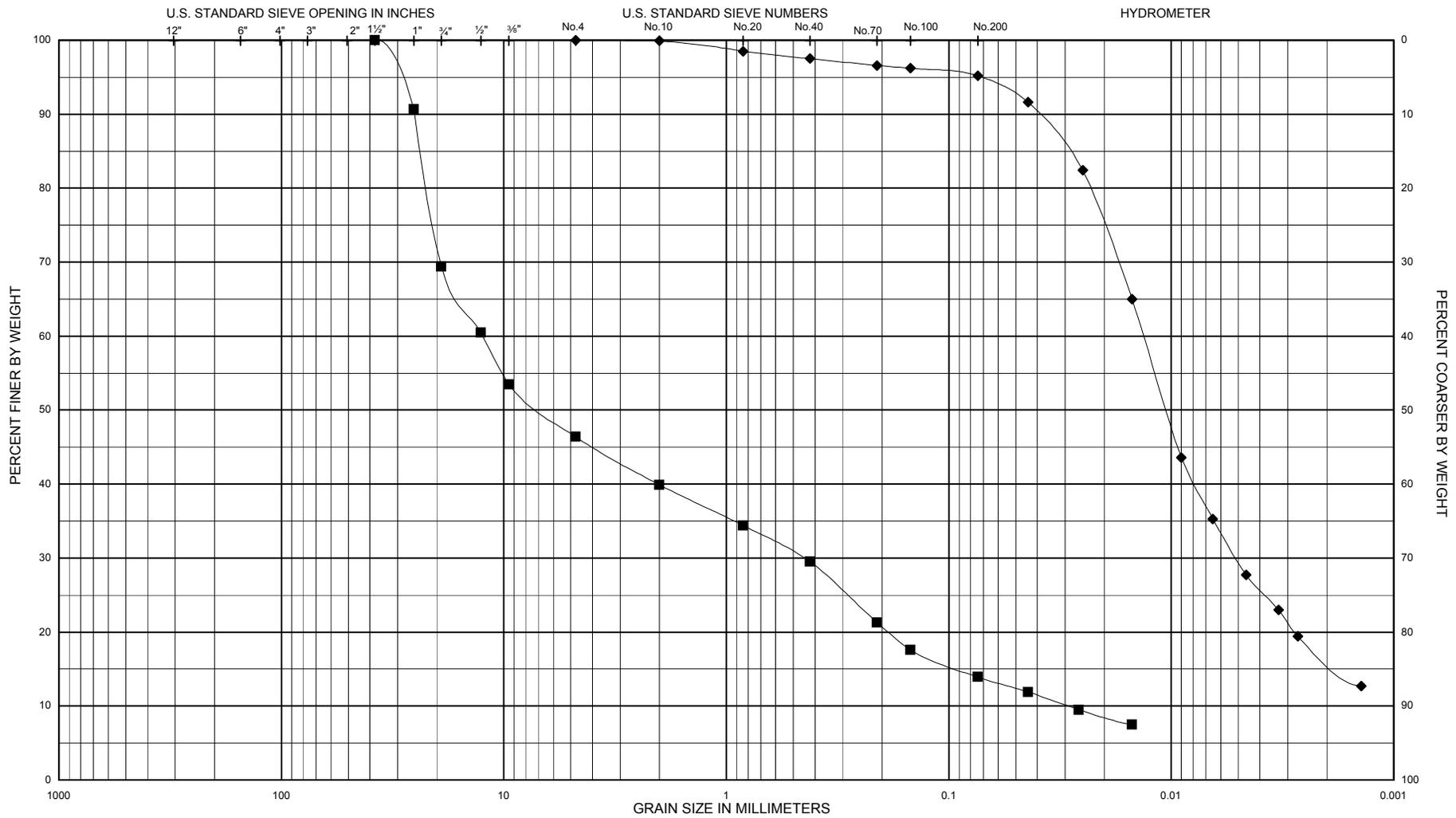
ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)

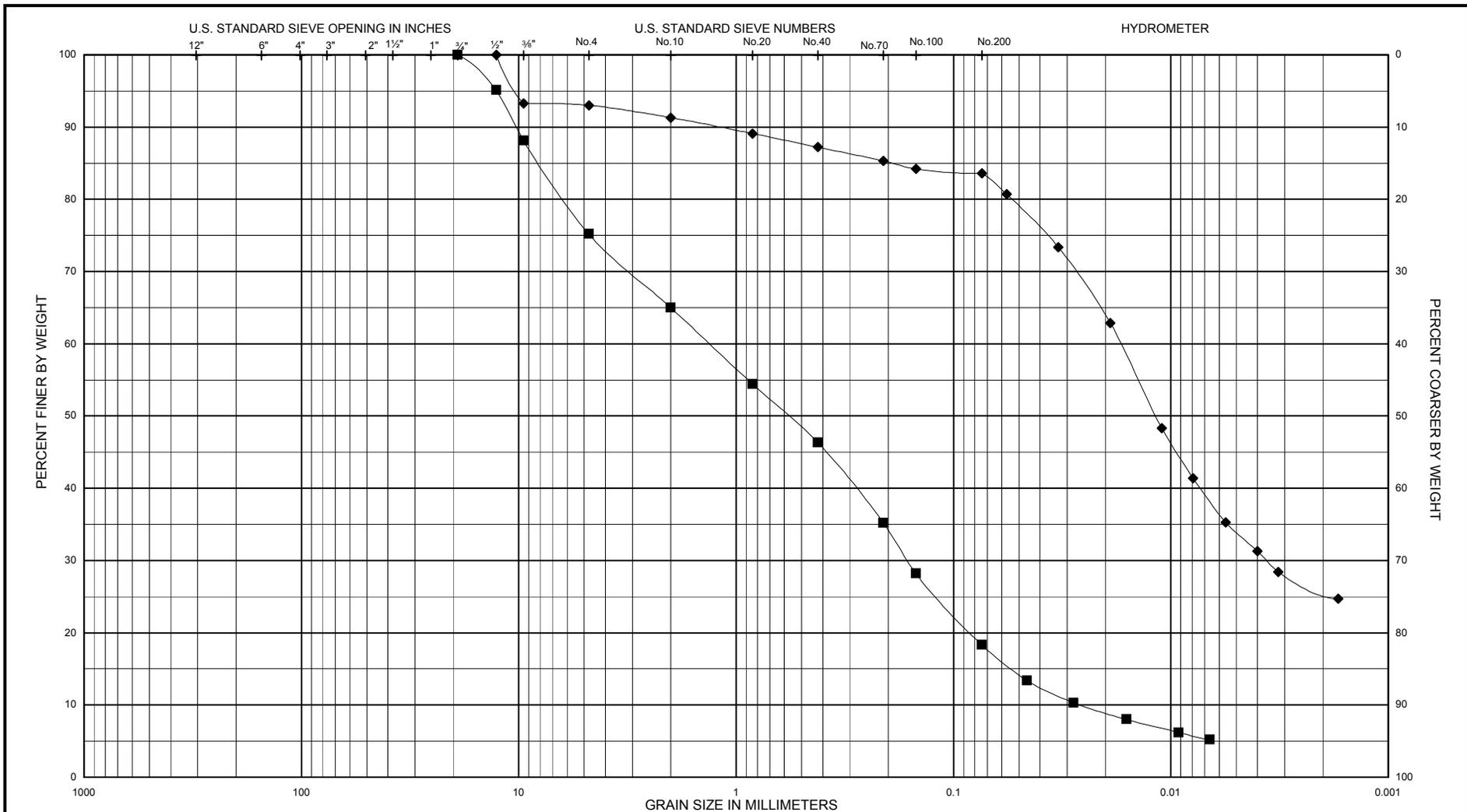


		BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY					
				COARSE	FINE	COARSE	MEDIUM	FINE						
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)						Nat w%	LL	PL	PI	PROJECT: Liberty State Park	
—■—	Jar-4	4.5-6.0	Silty sand (tr. gravel) (SM)						32.7	—	—	—		AREA: Jersey City, NJ
														Boring No.: LSP-03-02
														DATE: Apr 2004



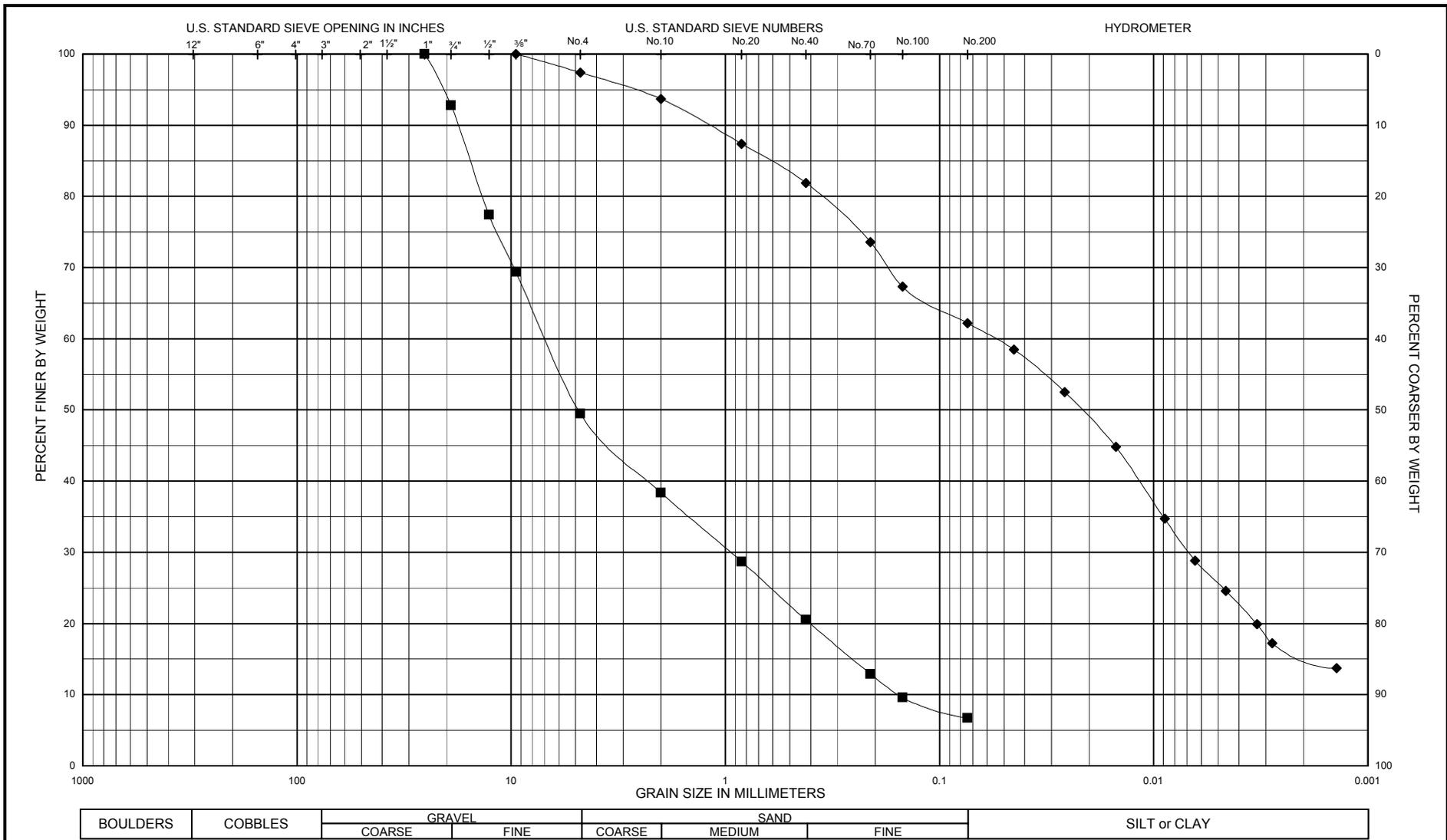
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-03 DATE: Apr 2004
—■—	Jar-4	4.5-6.0	Silty gravel with sand (GM)	15.8	—	—	—	
—◆—	Jar-17	24.0-25.5	Fat clay (tr. sand) (CH)	54.2	68	30	38	



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-04 DATE: Apr 2004
—■—	Jar-4	4.5-6.0	Silty sand with gravel (SM)	29.6	—	—	—	
—◆—	Jar-8	10.5-12.0	Fat clay (tr. gravel & sand) (CH)	57.1	68	31	37	

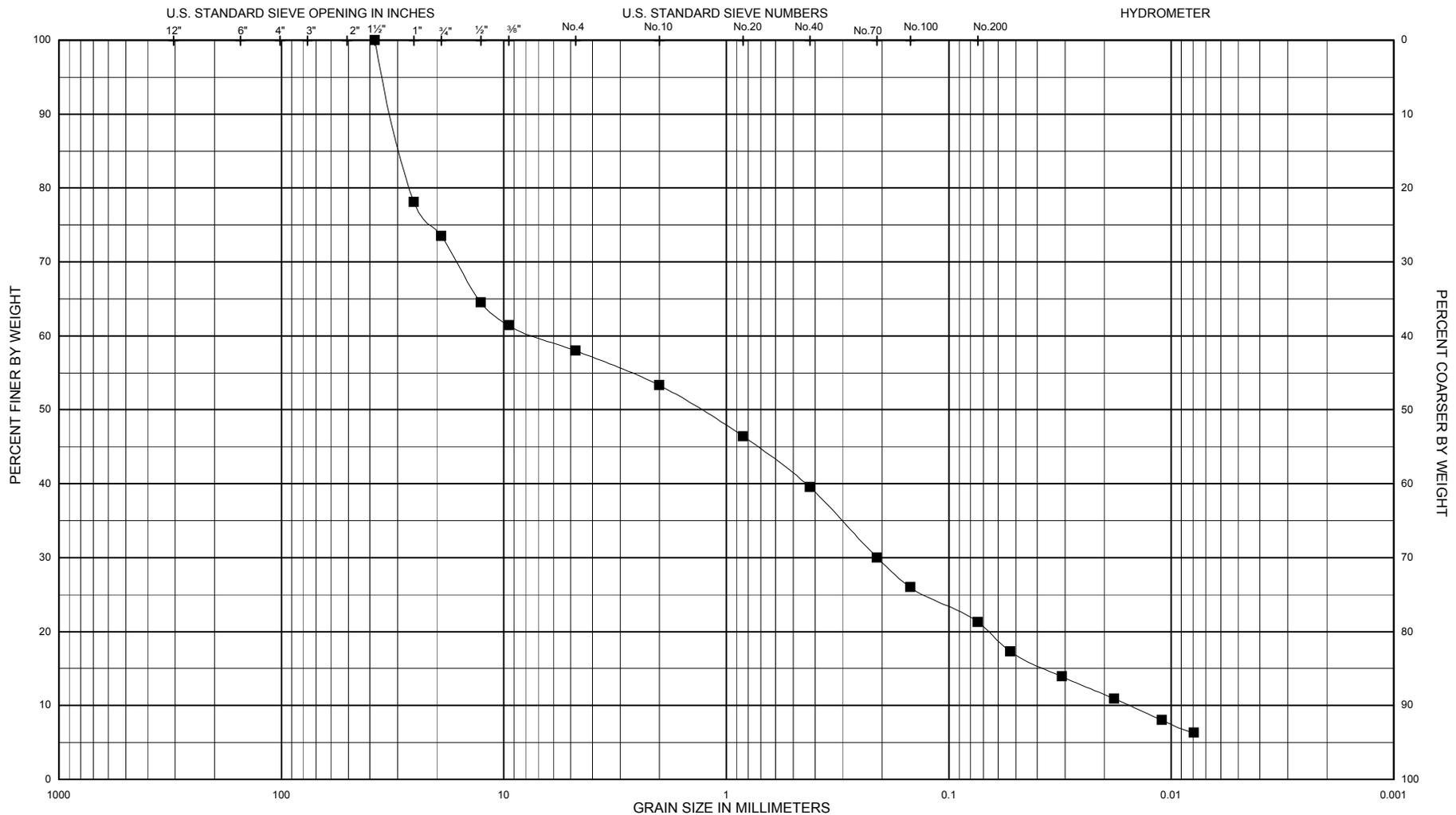


Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
■	Jar-4	4.5-6.0	Poorly graded gravel with silt and sand (GP-GM)	9.6	—	—	—	Liberty State Park
◆	Jar-7	9.0-10.5	Sandy elastic silt (tr. gravel) (MH)	60.5	74	39	35	AREA: Jersey City, NJ
								Boring No.: LSP-03-05
								DATE: Apr 2004

ENG FORM 2087

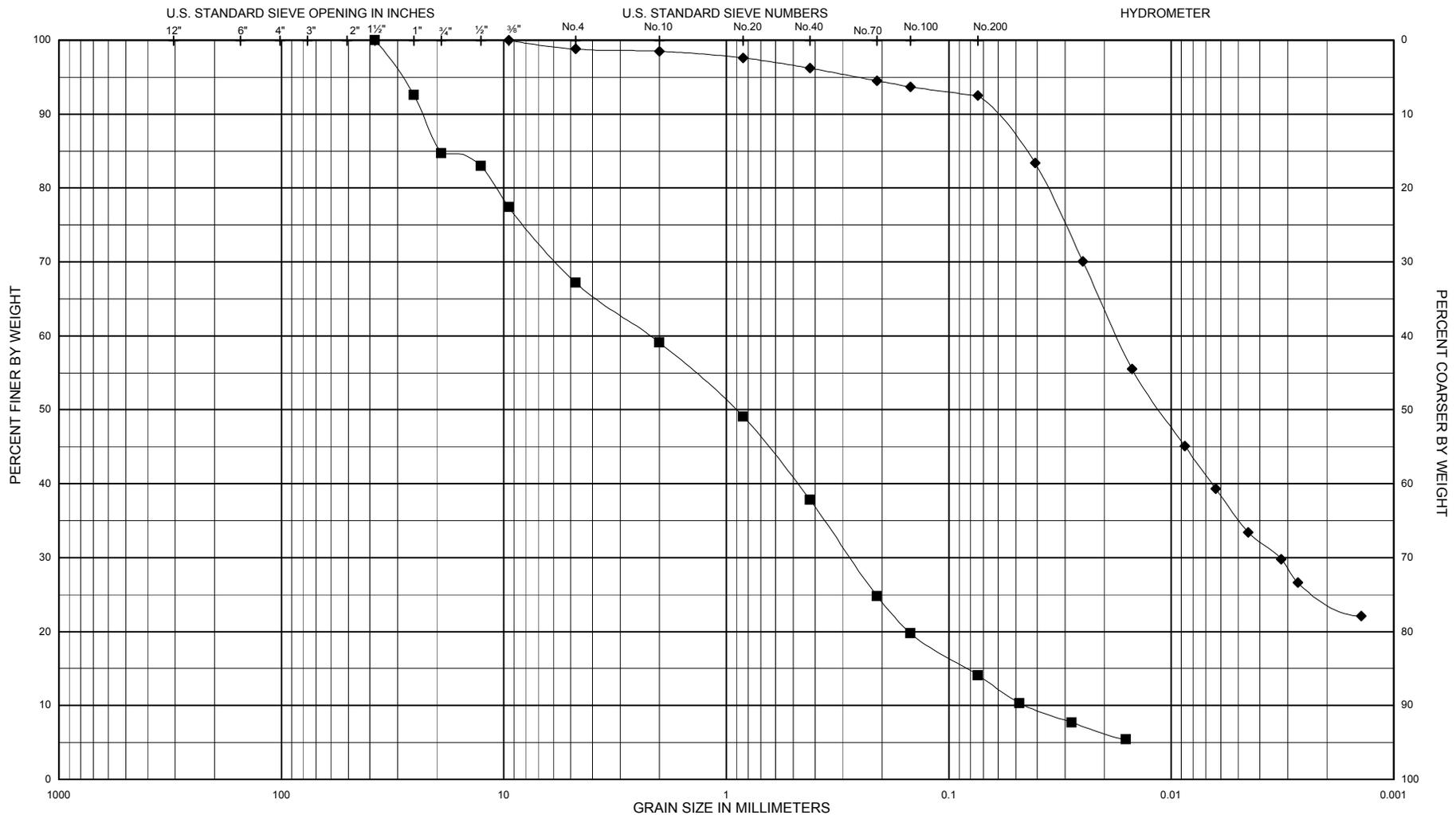
GRADATION CURVES

(Sieve Analysis: ASTM D422)



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-3	3.0-4.5	Silty gravel with sand (GM)	11.4	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-06
								DATE: Apr 2004



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

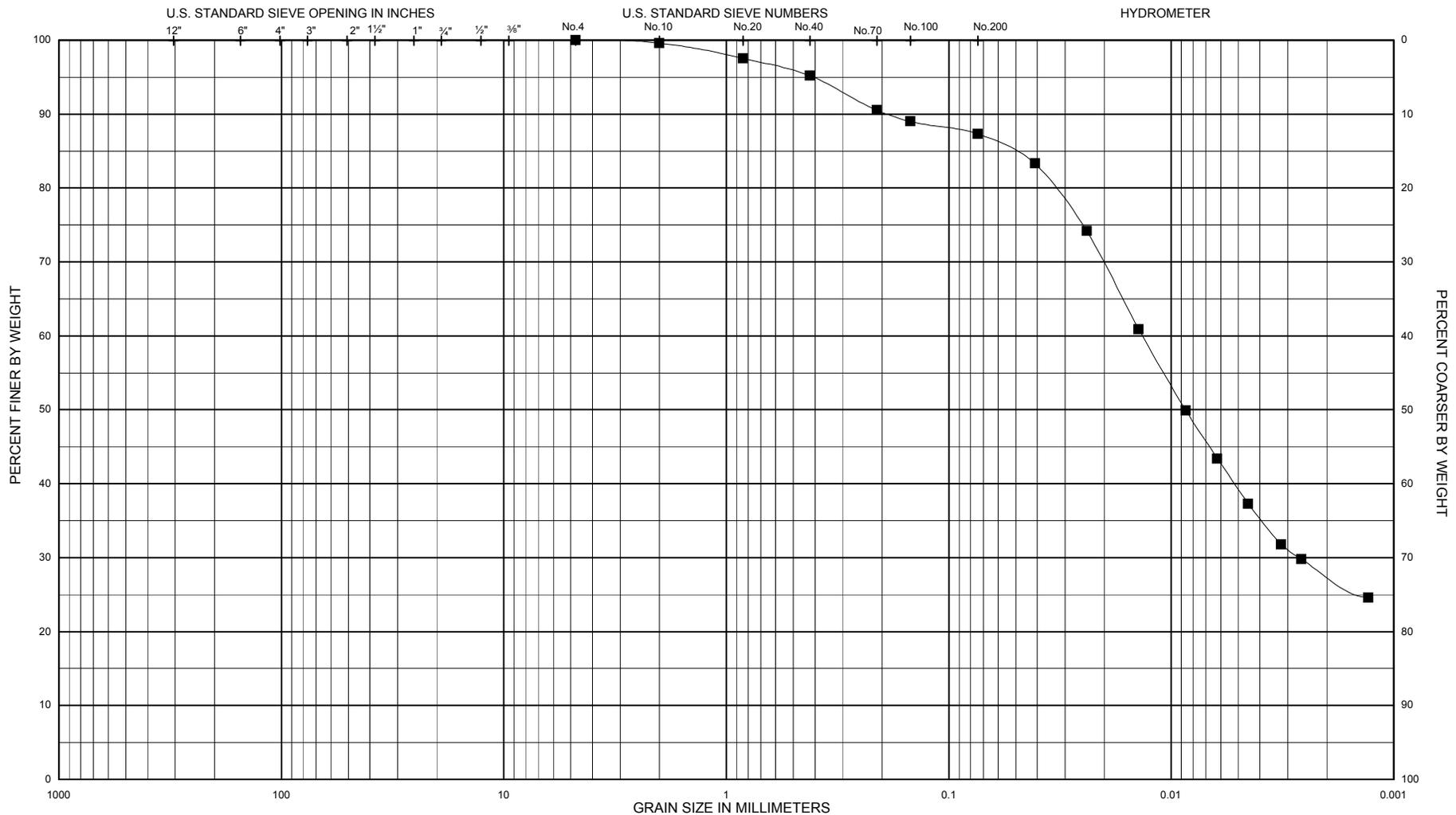
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI
■	Jar-4	4.5-6.0	Silty sand with gravel (SM)	30.9	—	—	—
◆	Jar-8	10.5-12.0	Elastic silt (tr. gravel & sand) (MH)	55.6	64	32	32

PROJECT: Liberty State Park

AREA: Jersey City, NJ

Boring No.: LSP-03-07

DATE: Apr 2004



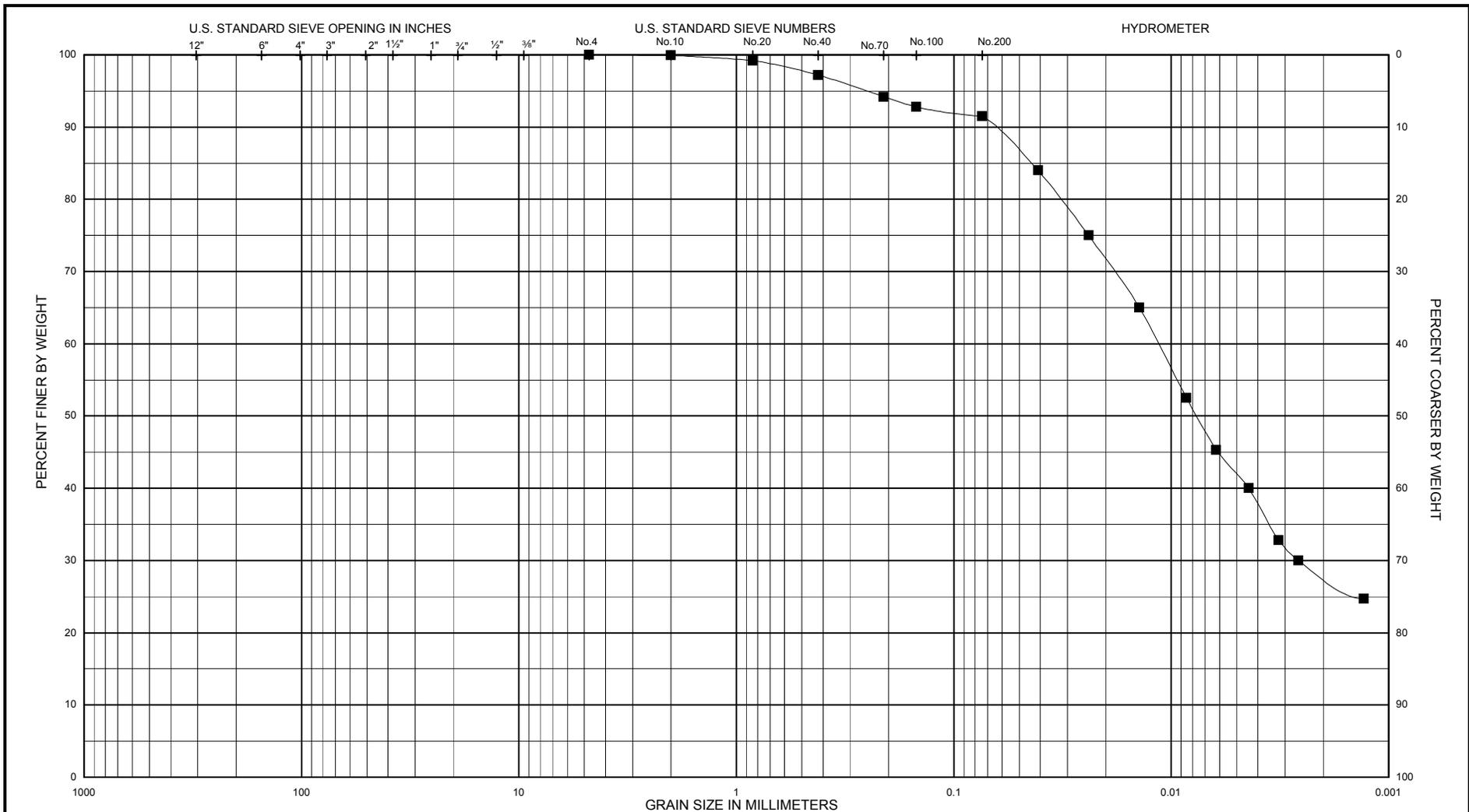
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-08 DATE: Apr 2004
—■—	Jar-6	7.5-9.0	Fat clay (tr. sand) (CH)	47.9	62	28	34	

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GRADATION CURVES

(Sieve Analysis: ASTM D422)



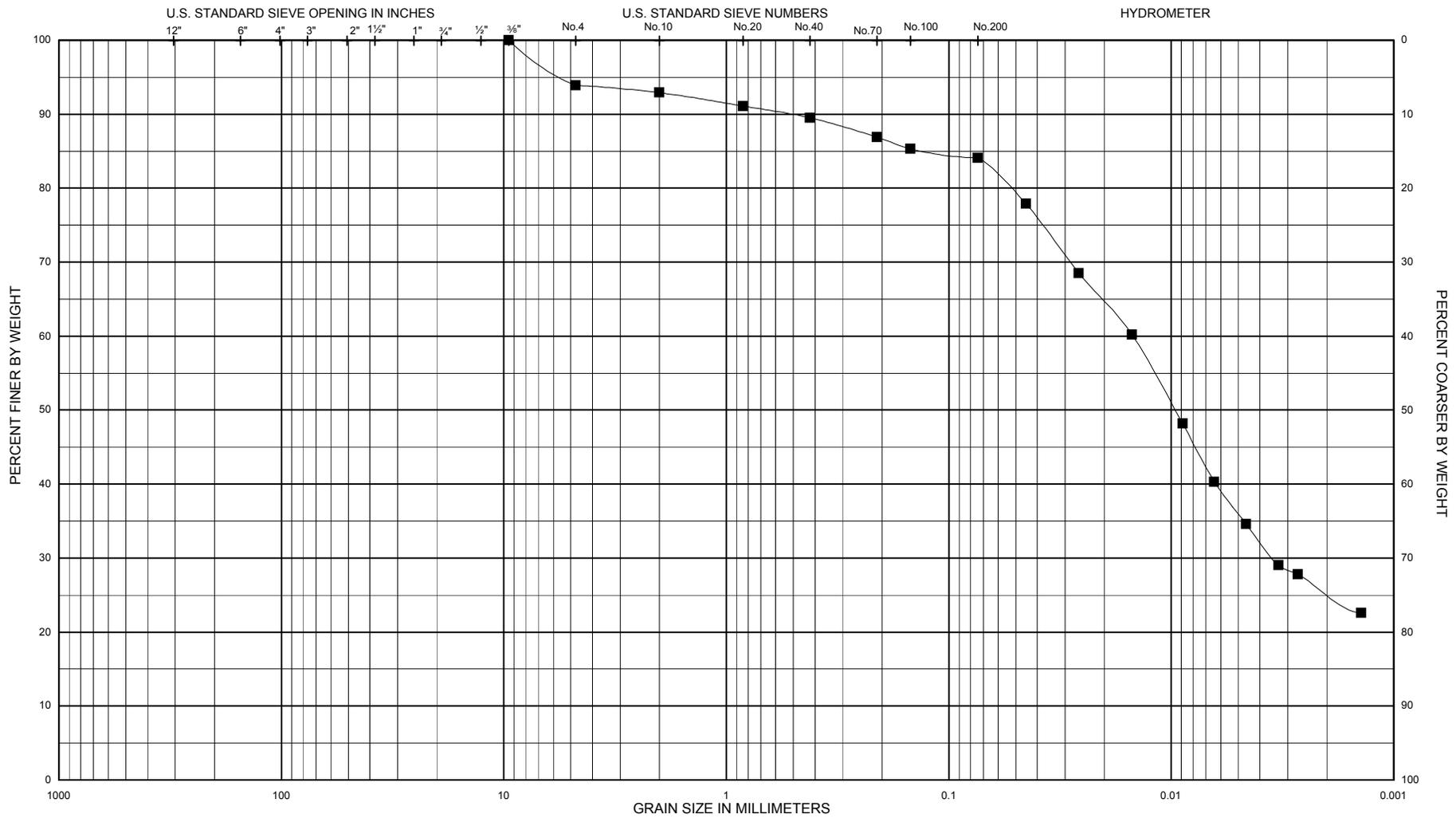
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-09 DATE: Apr 2004
—■—	Jar-4	4.5-6.0	Fat clay (tr. sand) (CH)	66.1	72	32	40	

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



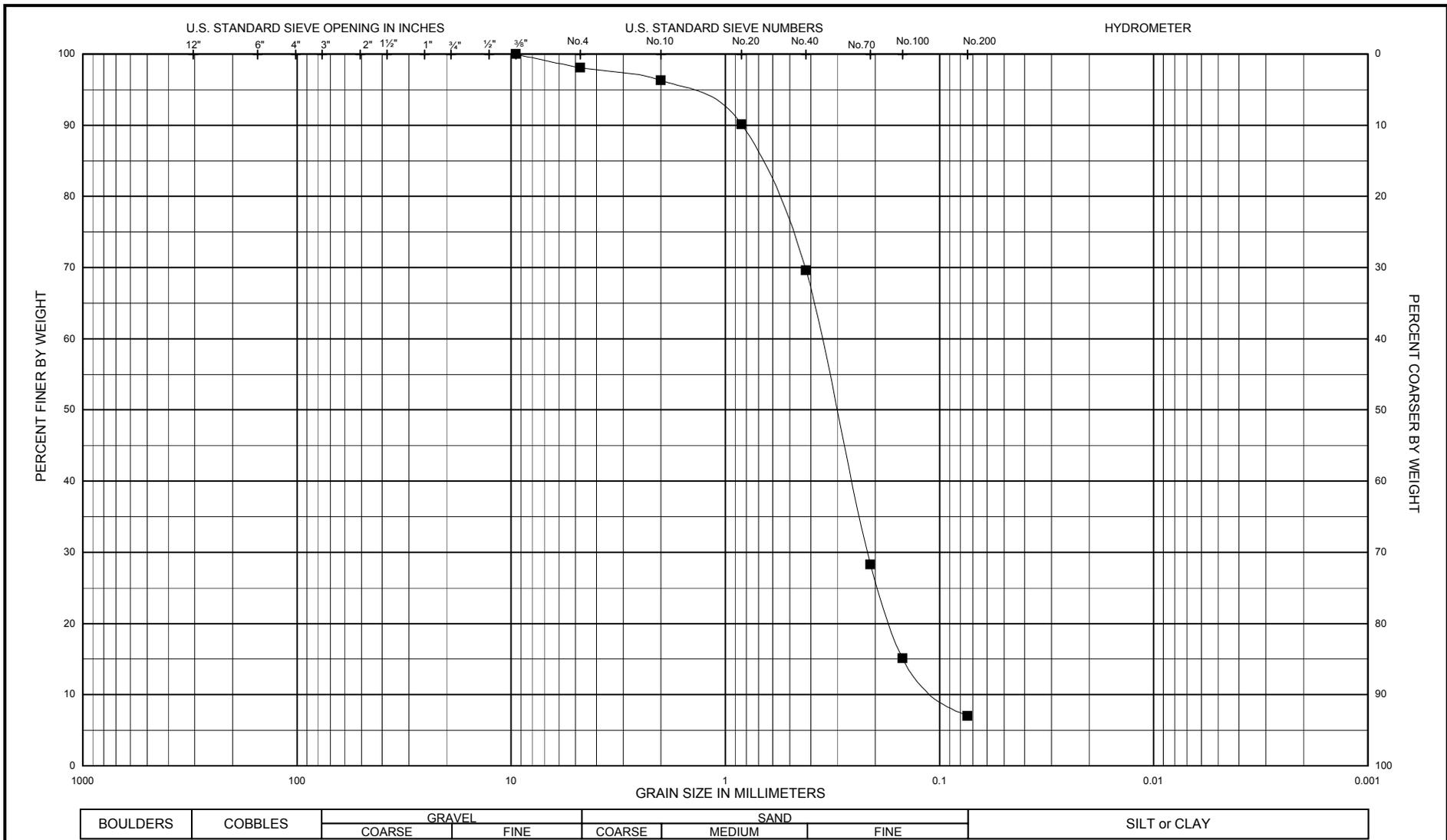
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-10 DATE: Apr 2004
—■—	Jar-11	15.0-16.5	Fat clay (tr. gravel & sand) (CH)	64.0	75	32	43	

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)

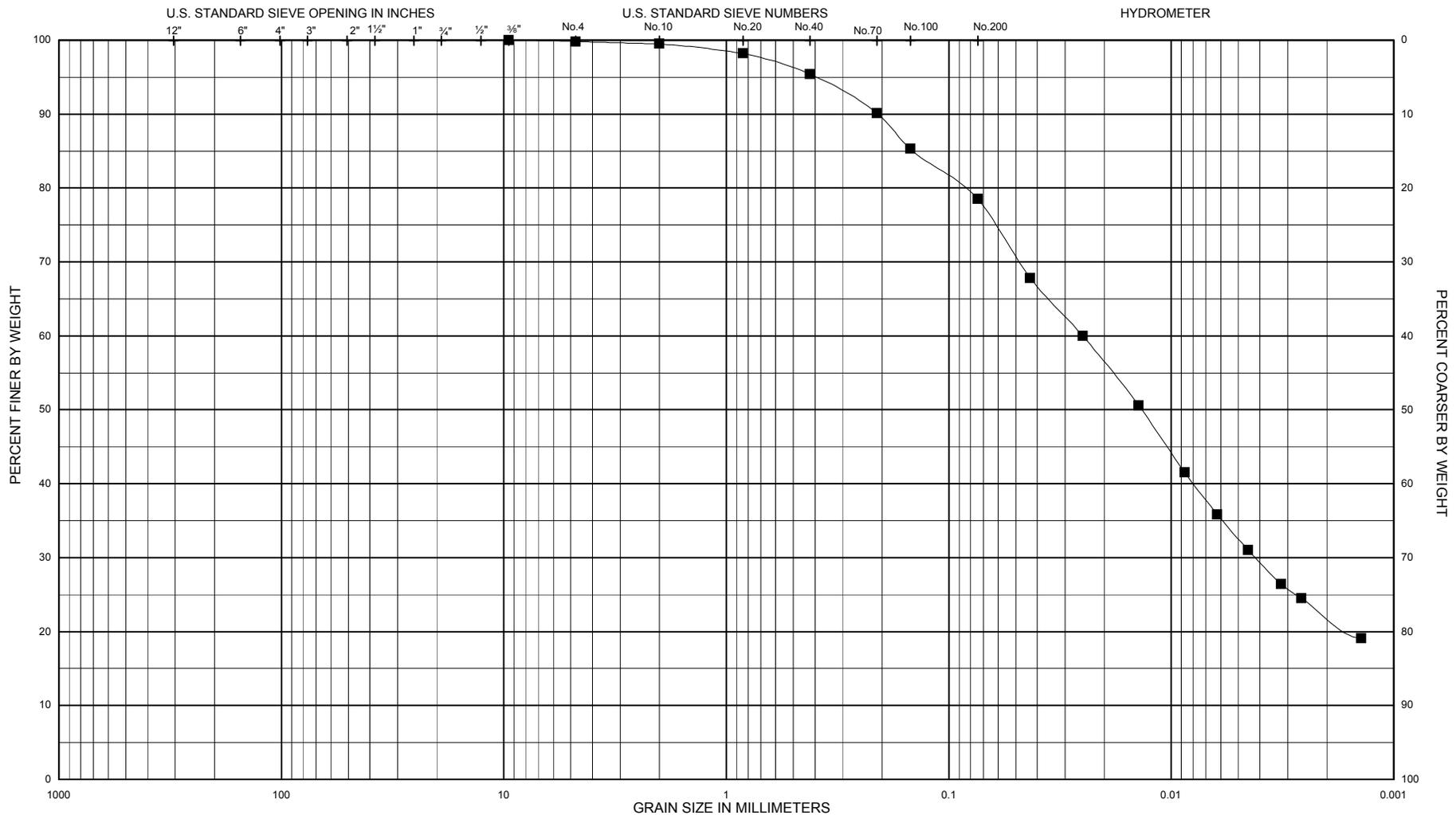


Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-3	3.0-4.5	Poorly graded sand with silt (tr. gravel) (SP-SM)	20.5	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-11
								DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



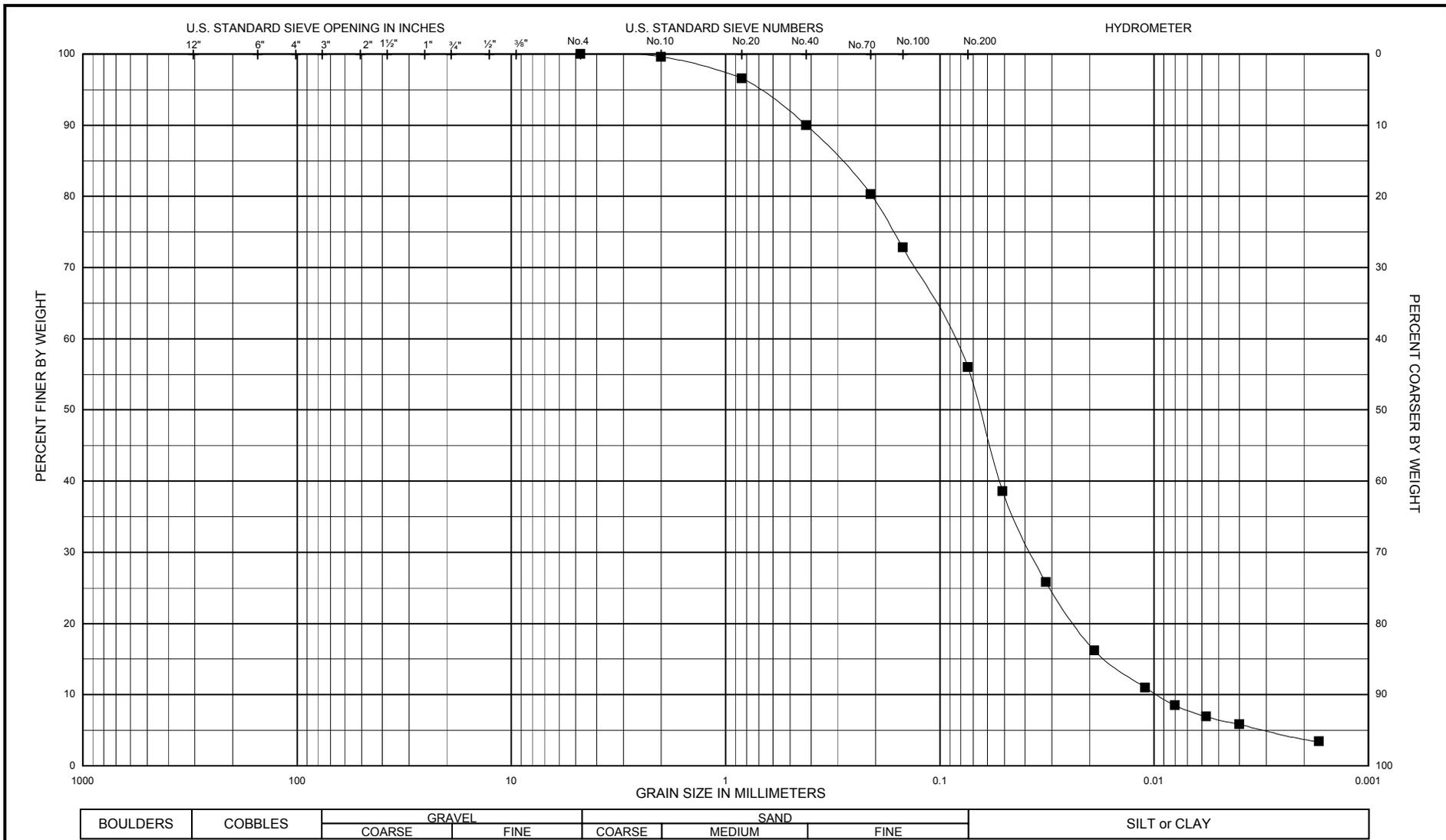
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

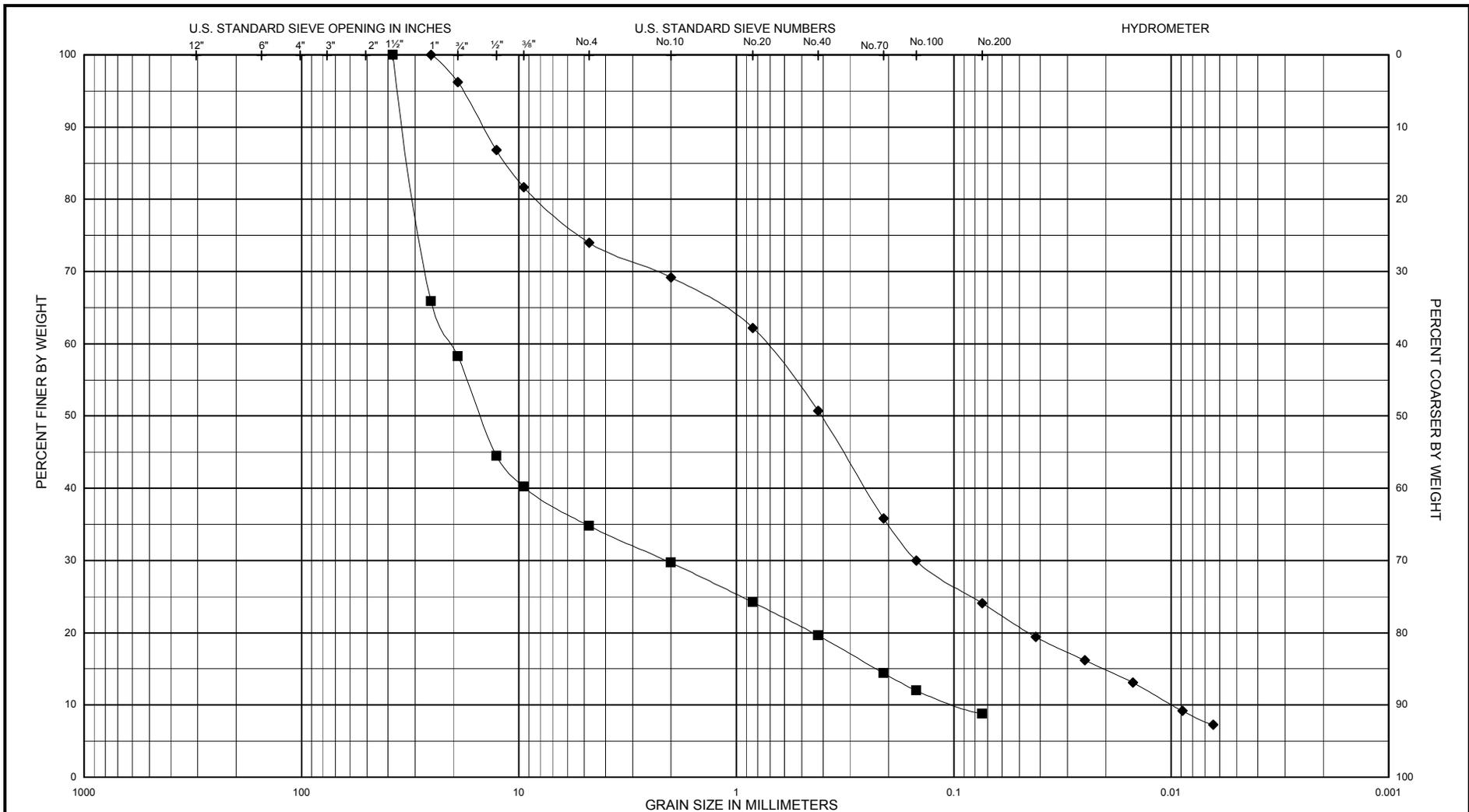
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-13	18.0-19.5	Fat clay with sand (CH)	58.2	64	30	34	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-12
								DATE: Apr 2004

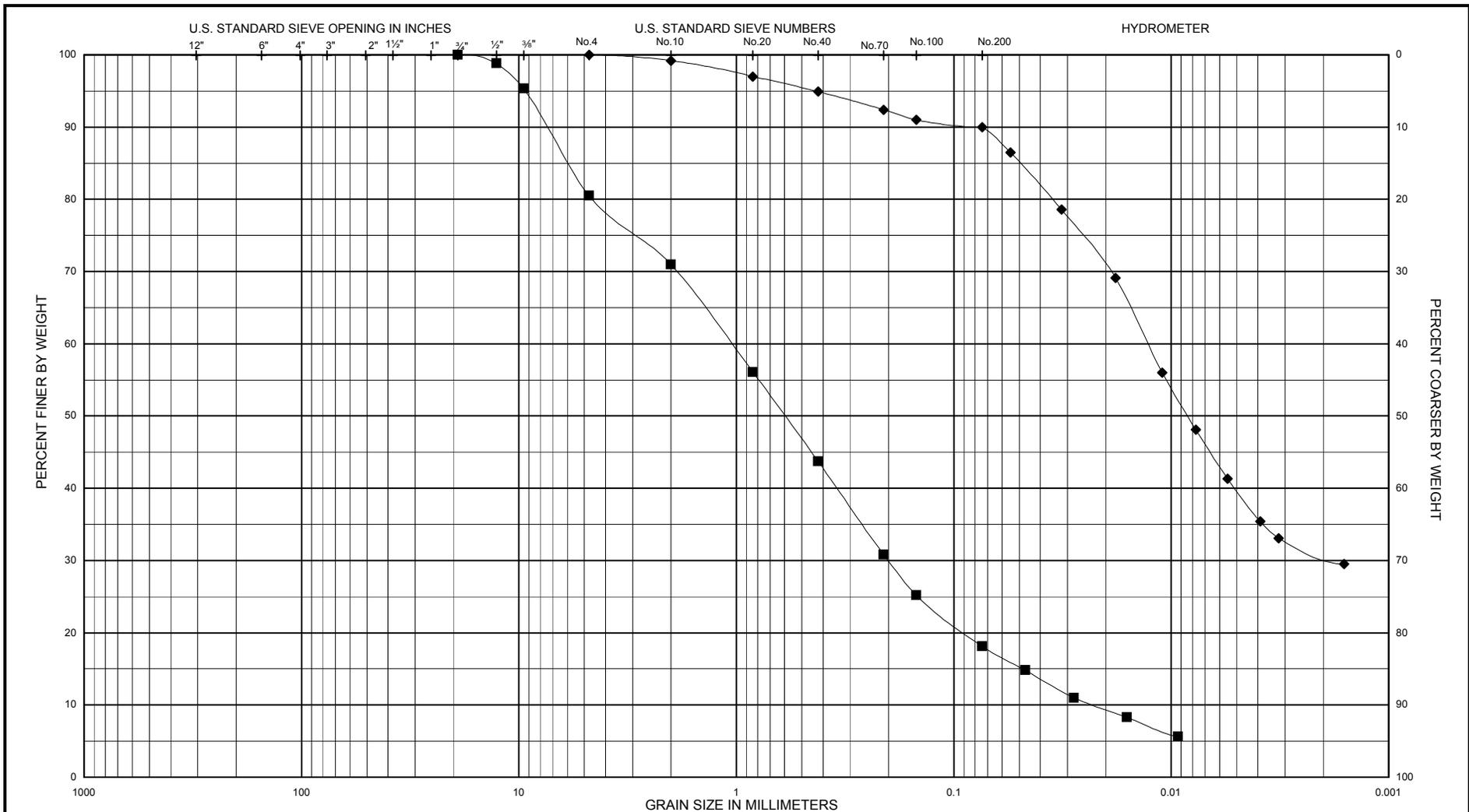
ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)

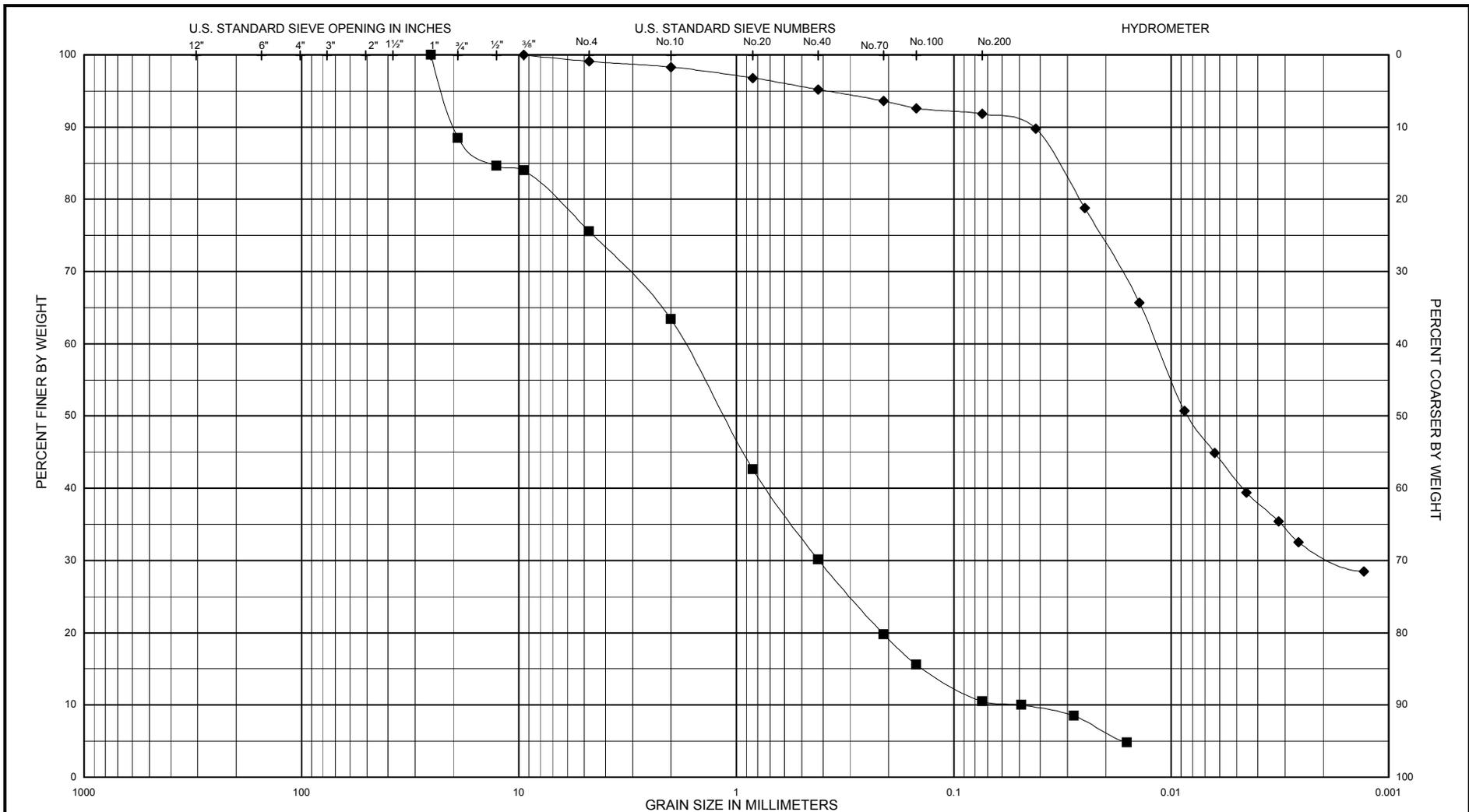






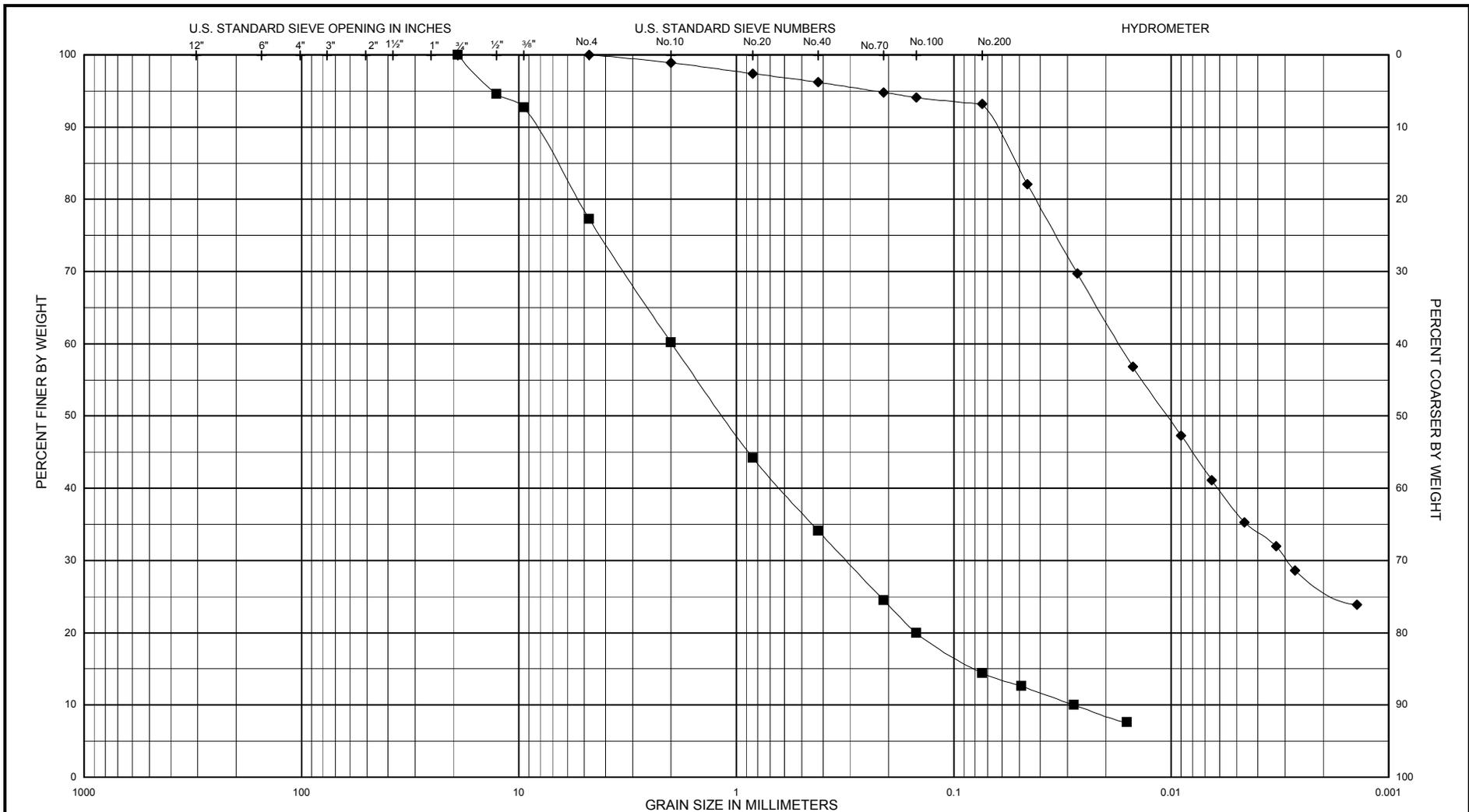
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-16 DATE: Apr 2004
—■—	Jar-2	1.5-3.0	Silty sand with gravel (SM)	29.4	—	—	—	
—◆—	Jar-13	18.0-19.5	Fat clay (tr. sand) (CH)	52.7	74	31	43	



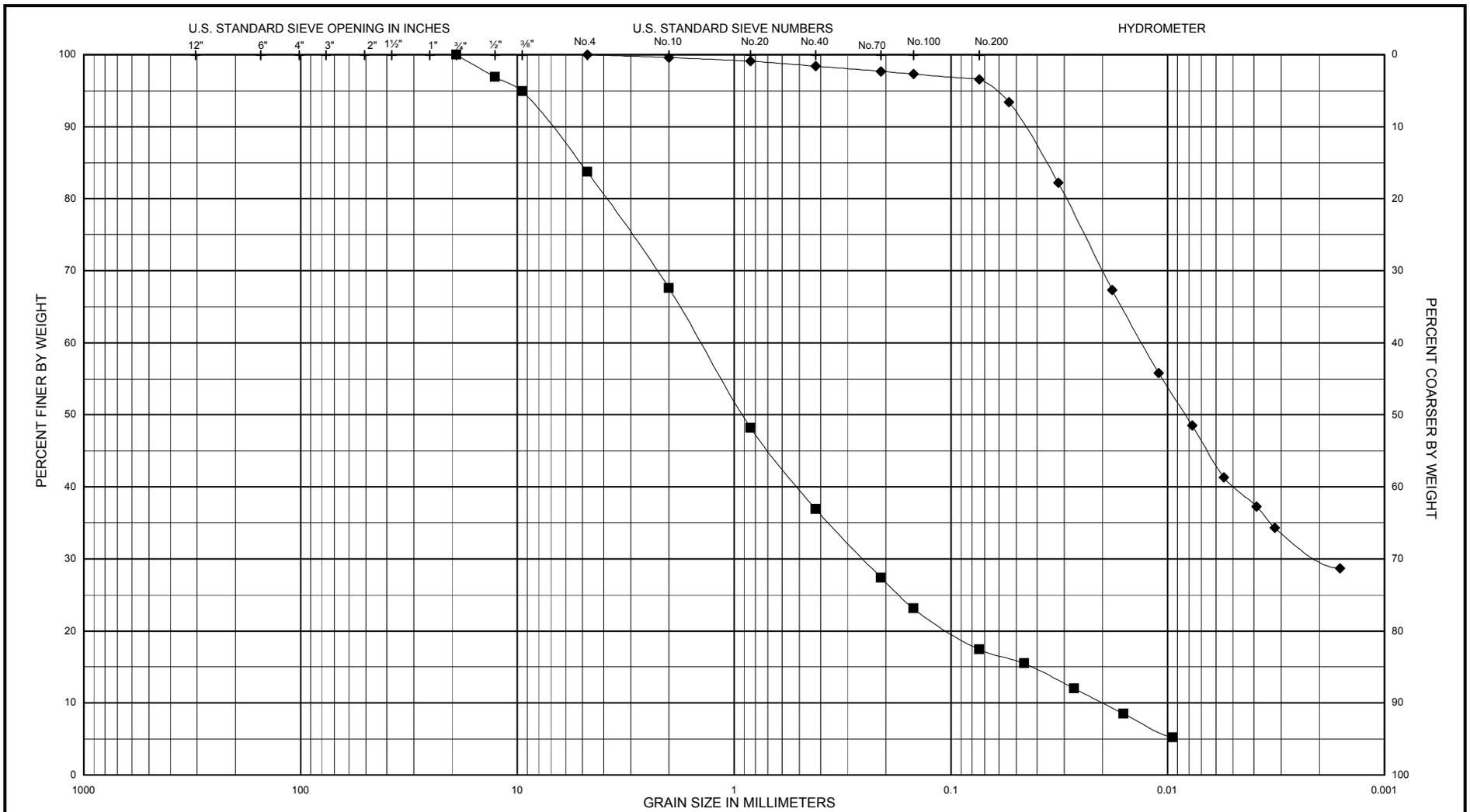
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

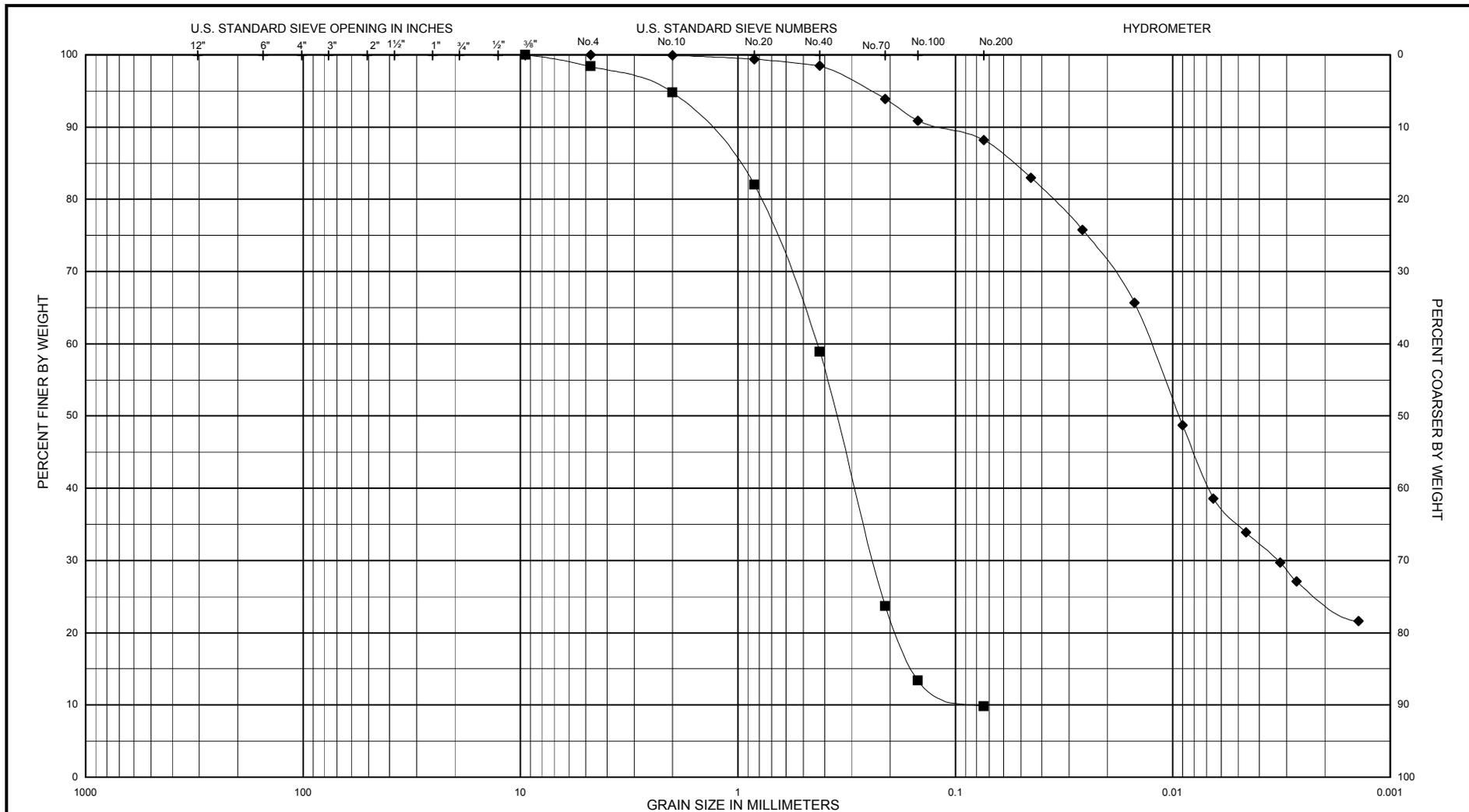
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-17 DATE: Apr 2004
—■—	Jar-3	3.0-4.5	Well-graded sand with silt and gravel (SW-SM)	26.5	—	—	—	
—◆—	Jar-16	22.5-24.0	Elastic silt (tr. sand) (MH)	65.3	75	35	40	



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-18 DATE: Apr 2004
—■—	Jar-4	4.5-6.0	Silty sand with gravel (SM)	23.9	—	—	—	
—◆—	Jar-9	12.0-13.5	Fat clay (tr. sand) (CH)	51.0	65	31	34	





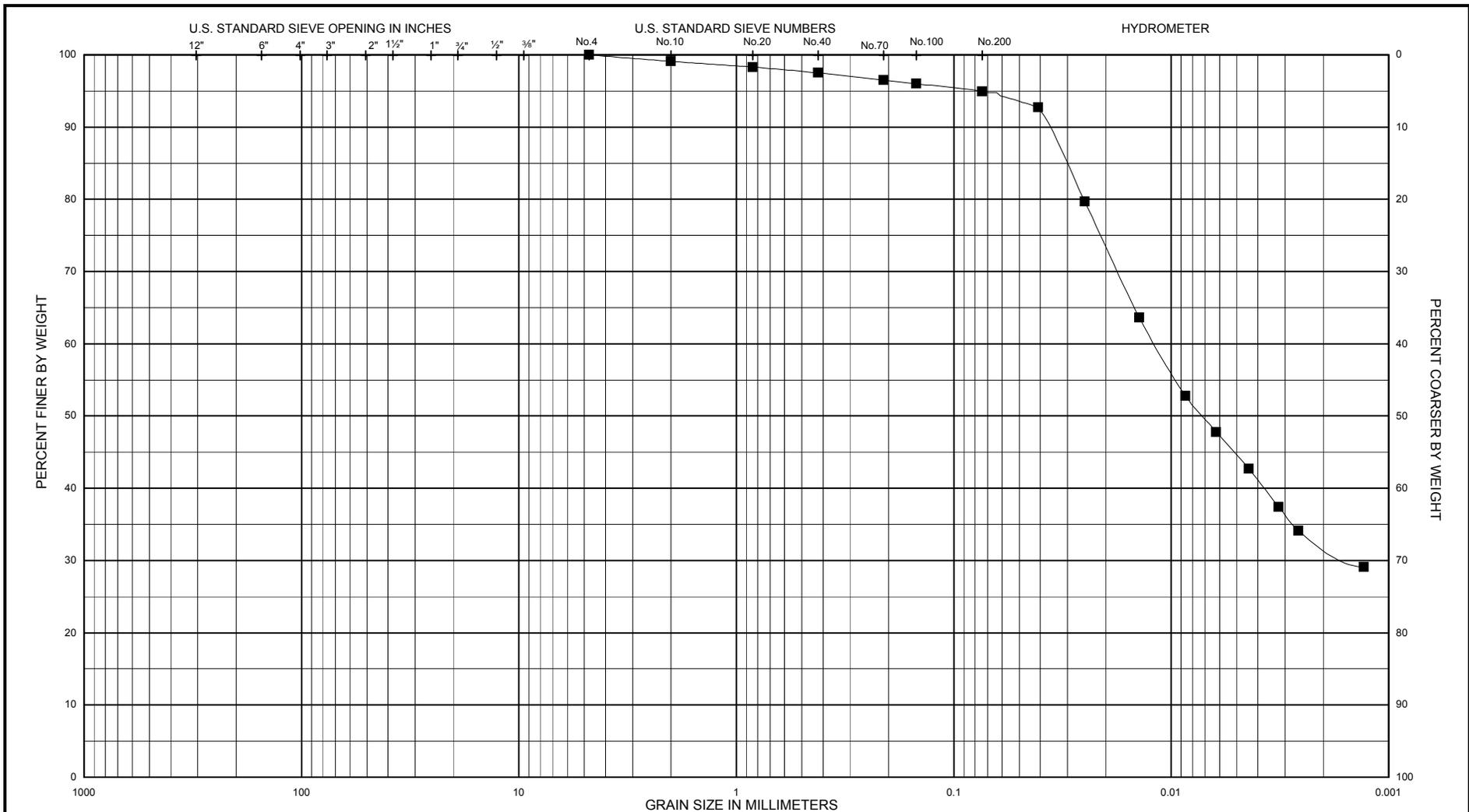
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-20 DATE: Apr 2004
—■—	Jar-2	1.5-3.0	Poorly graded sand with silt (tr. gravel) (SP-SM)	3.6	—	—	—	
—◆—	Jar-15	21.0-22.5	Fat clay (tr. sand) (CH)	75.7	92	38	54	

ENG FORM 2087

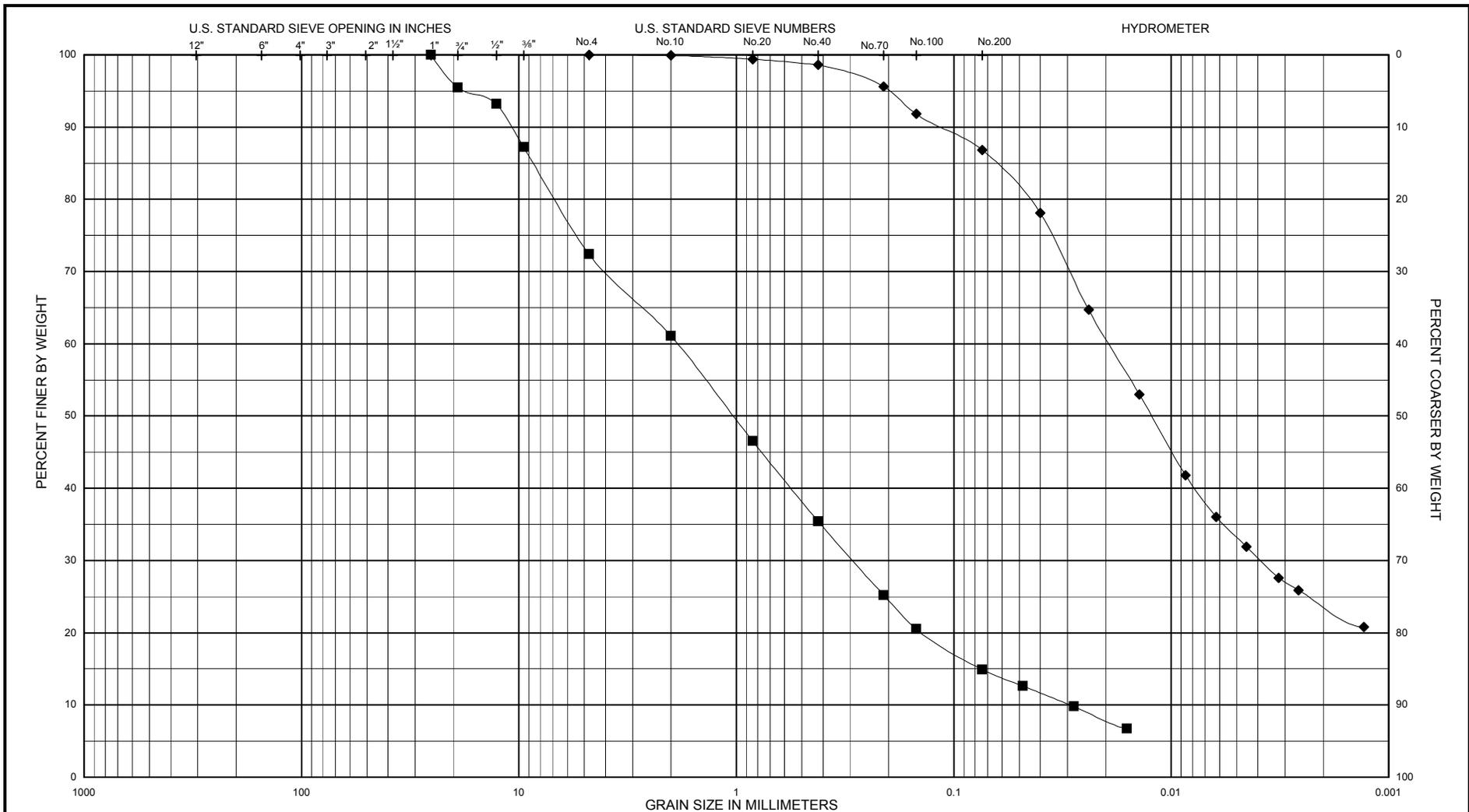
GRADATION CURVES

(Sieve Analysis: ASTM D422)



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-8	10.5-12.0	Elastic silt (tr. sand) (MH)	61.6	81	38	43	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-23



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

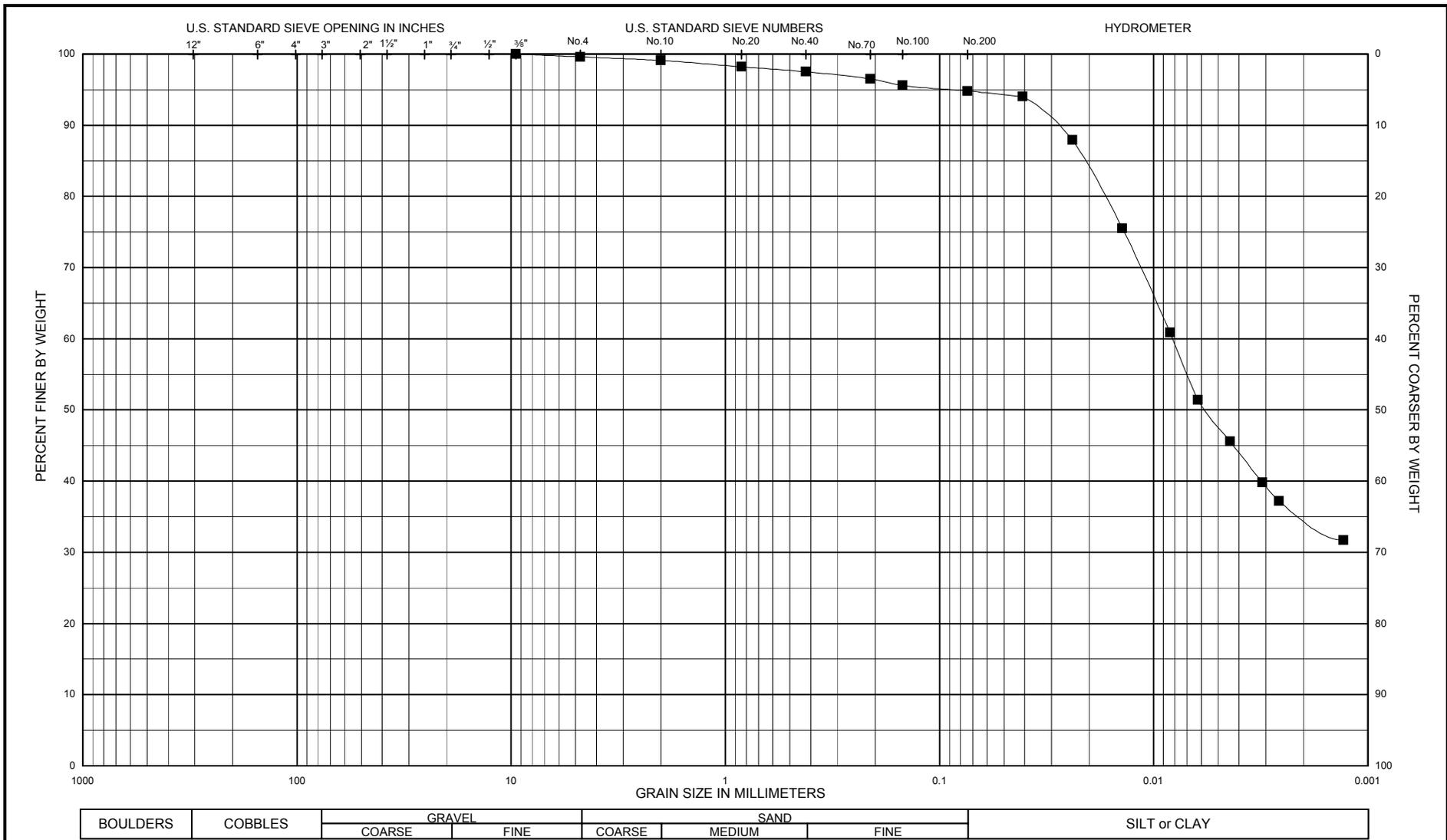
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI
■	Jar-5	6.0-7.5	Silty sand with gravel (SM)	32.7	—	—	—
◆	Jar-10	13.5-15.0	Lean clay (tr. sand) (CL)	52.8	49	27	22

PROJECT: Liberty State Park

AREA: Jersey City, NJ

Boring No.: LSP-03-24

DATE: Apr 2004

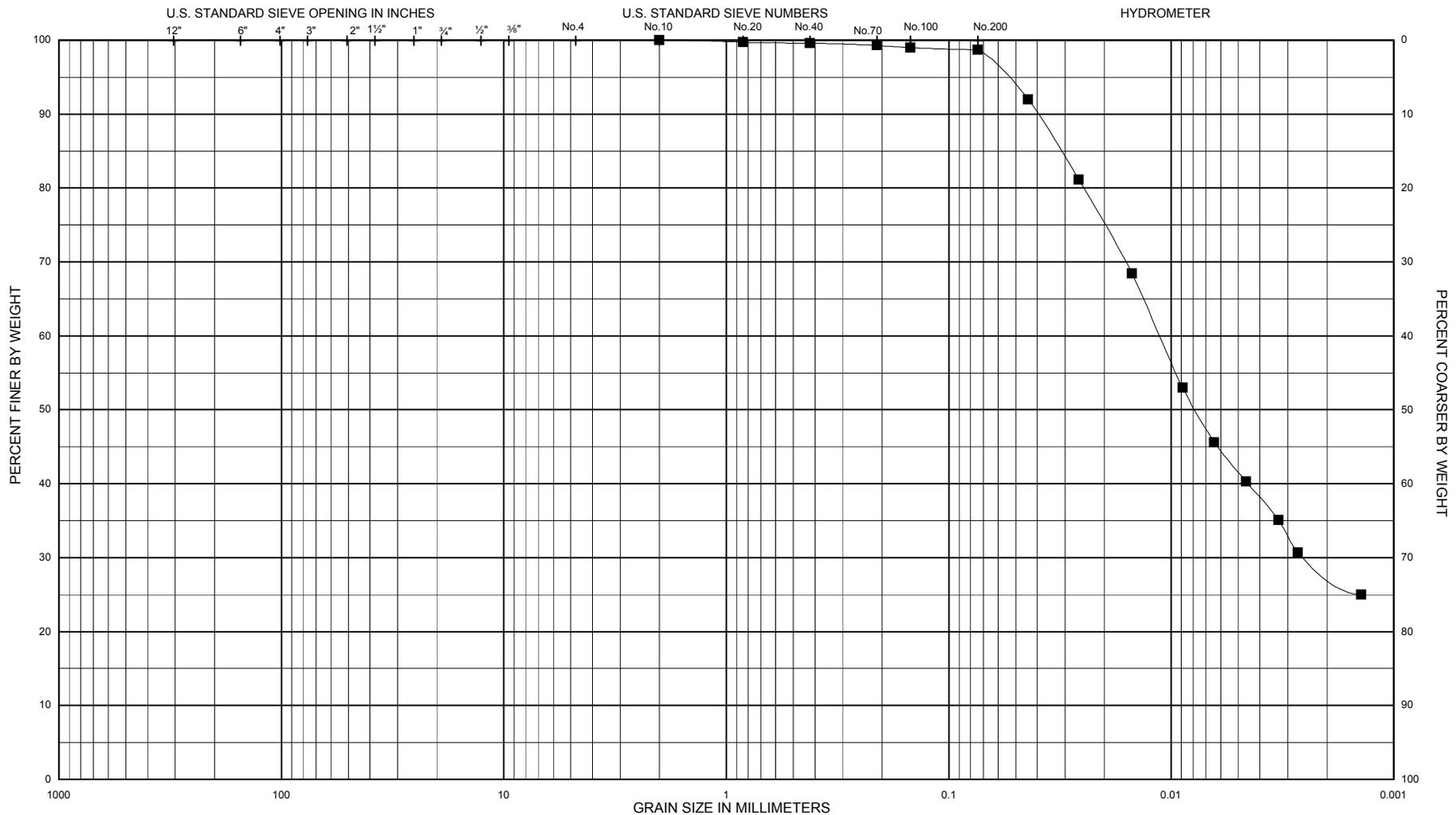


Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)				Nat w%	LL	PL	PI	PROJECT:
			GRAVEL	SAND	SILT or CLAY						
—■—	Jar-10	13.5-15.0	COARSE	FINE	COARSE	MEDIUM	FINE				Liberty State Park
											AREA: Jersey City, NJ
											Boring No.: LSP-03-25
											DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



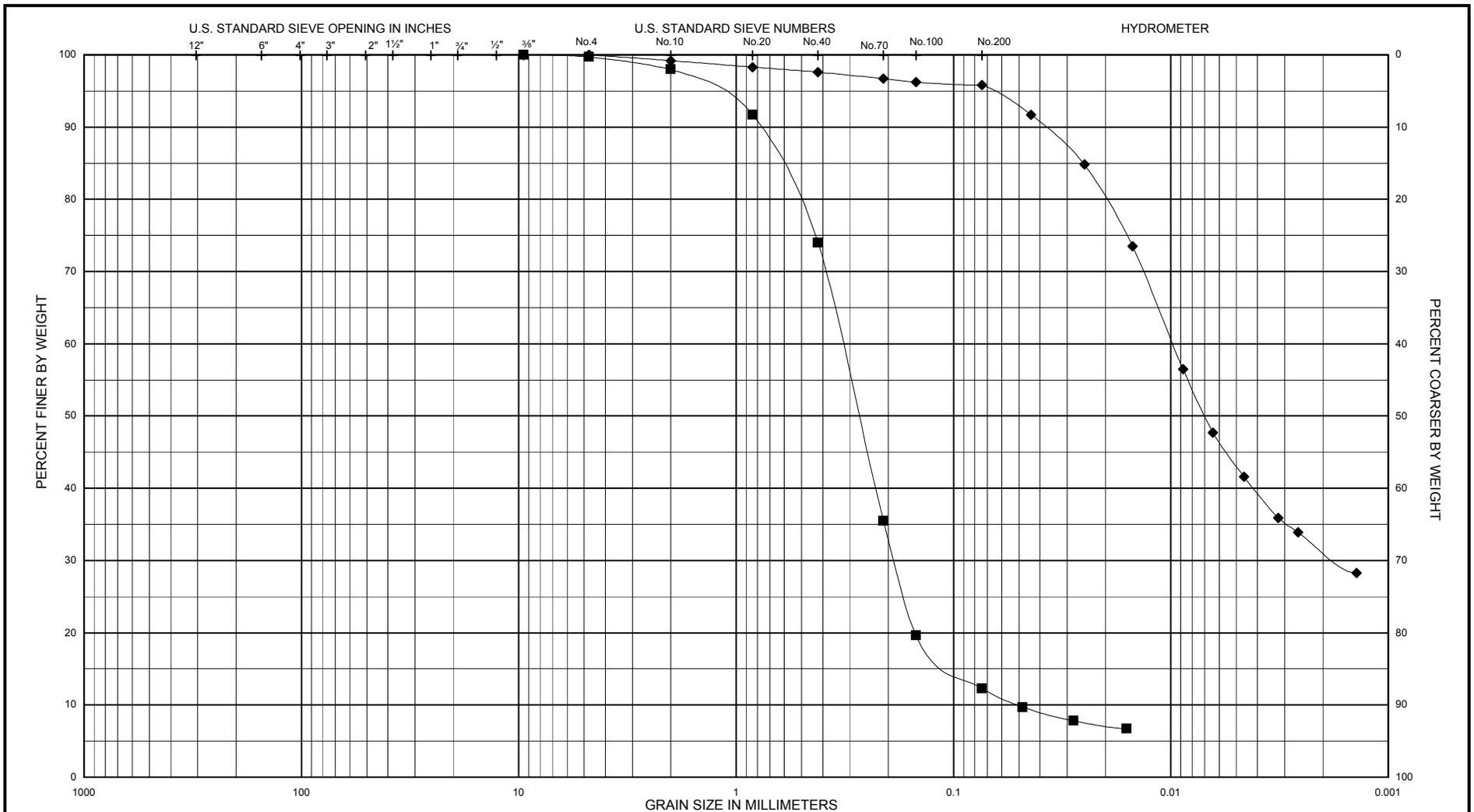
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-8	10.5-12.0	Fat clay (tr. sand) (CH)	69.8	80	35	45	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-26
								DATE: Apr 2004

ENG FORM 2087

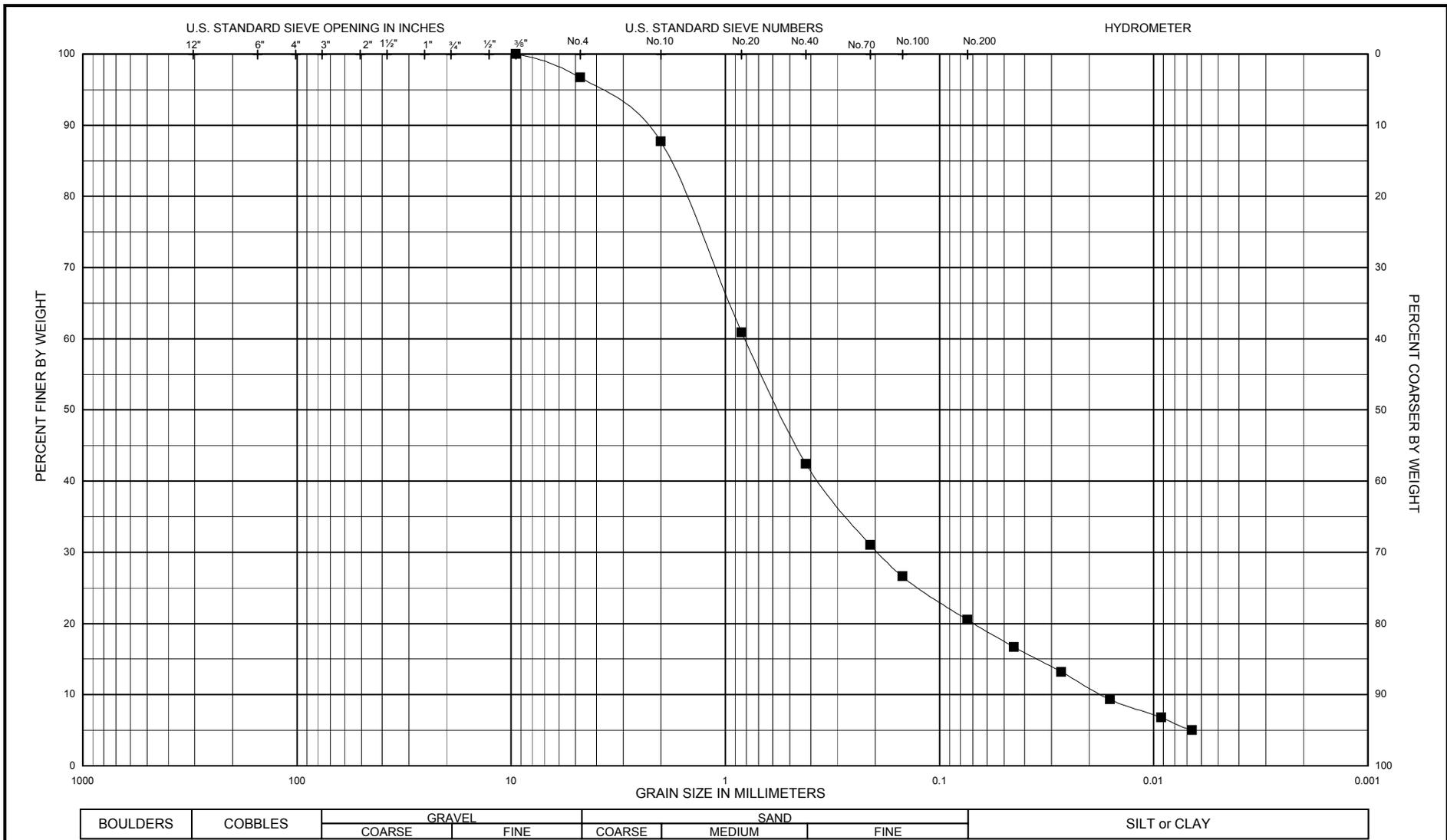
GRADATION CURVES

(Sieve Analysis: ASTM D422)

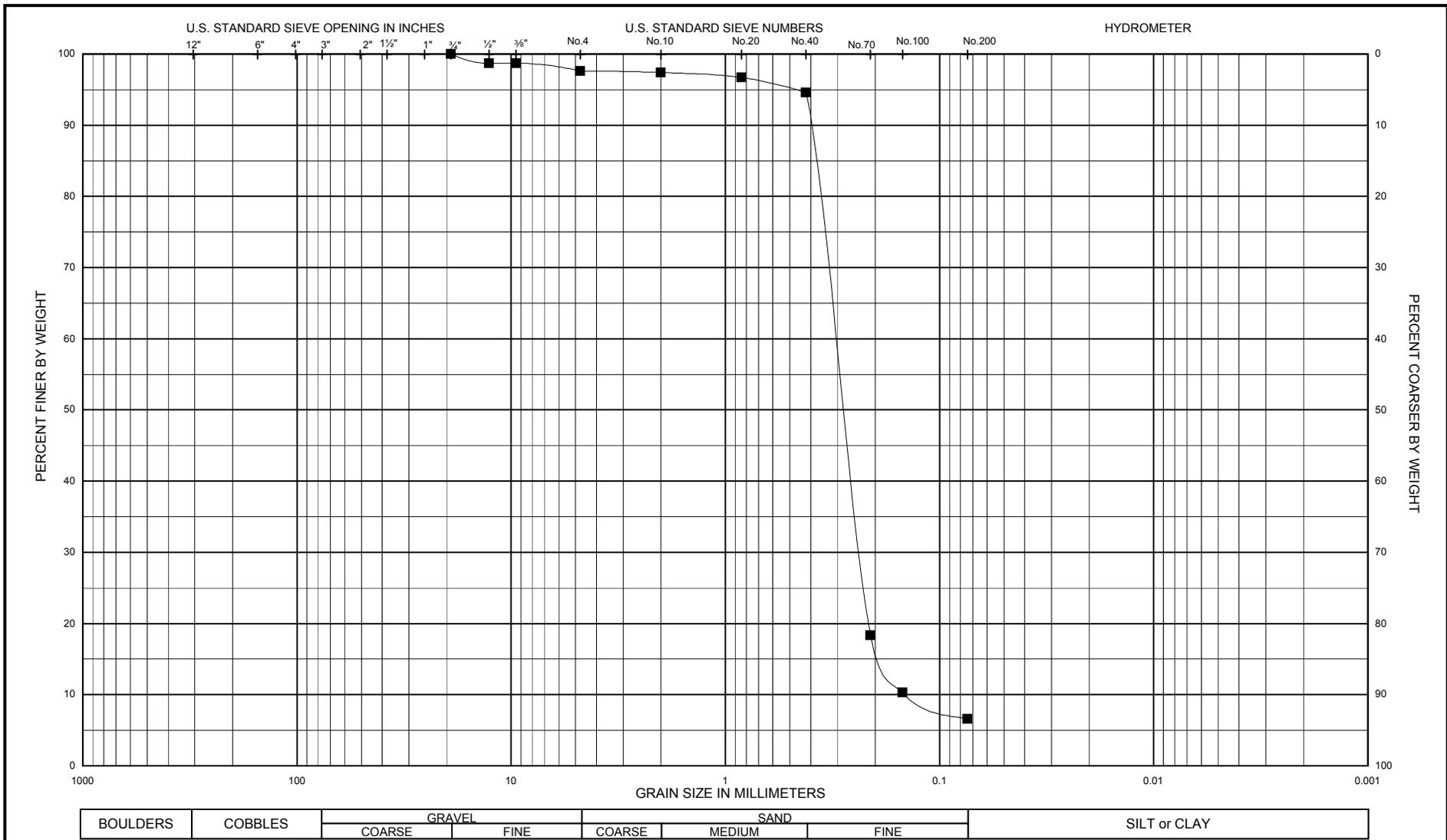


BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-27 DATE: Apr 2004
—■—	Jar-4	4.5-6.0	Silty sand (SM)	20.9	—	—	—	
—◆—	Jar-9	12.0-13.5	Fat clay (tr. sand) (CH)	59.4	69	33	36	



Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)			Nat w%	LL	PL	PI	PROJECT:
			GRAVEL	SAND	SILT or CLAY					
—■—	Jar-4	4.5-6.0	COARSE	FINE	COARSE	MEDIUM	FINE		Liberty State Park	
									AREA: Jersey City, NJ	
									Boring No.: LSP-03-28	
									DATE: Apr 2004	

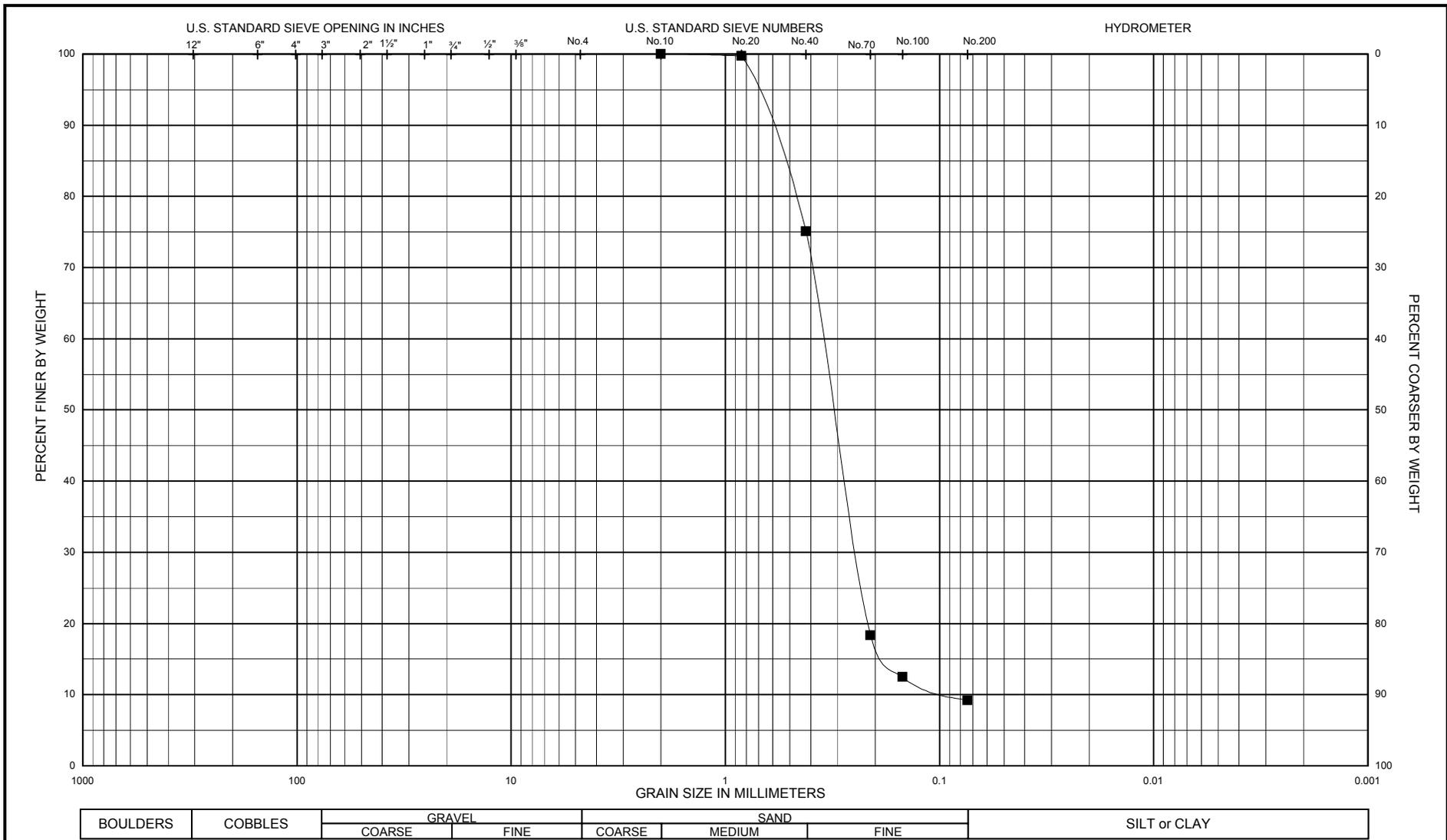


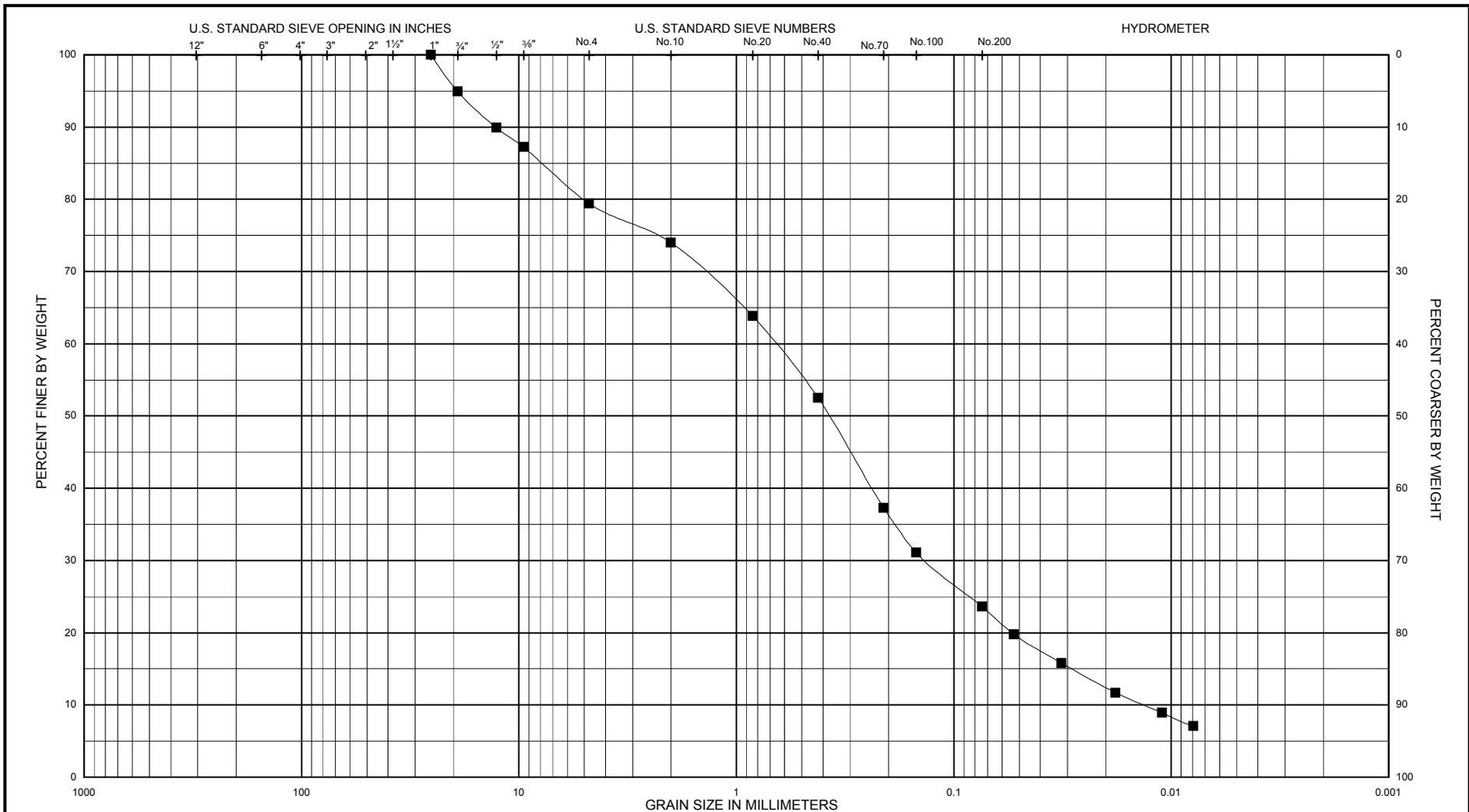
Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-3	3.0-4.5	Poorly graded sand with silt (tr. gravel) (SP-SM)	22.9	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-29
								DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

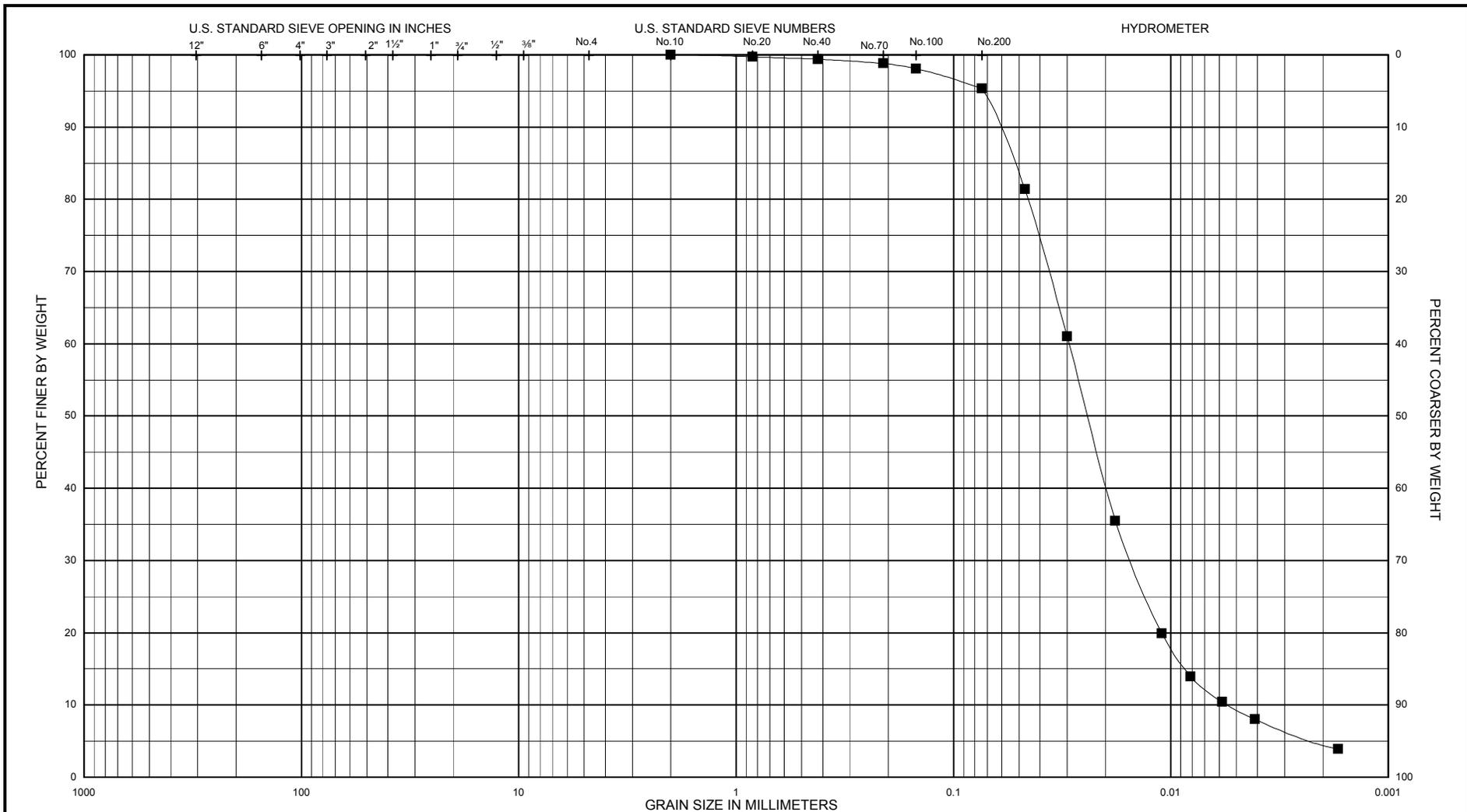
(Sieve Analysis: ASTM D422)





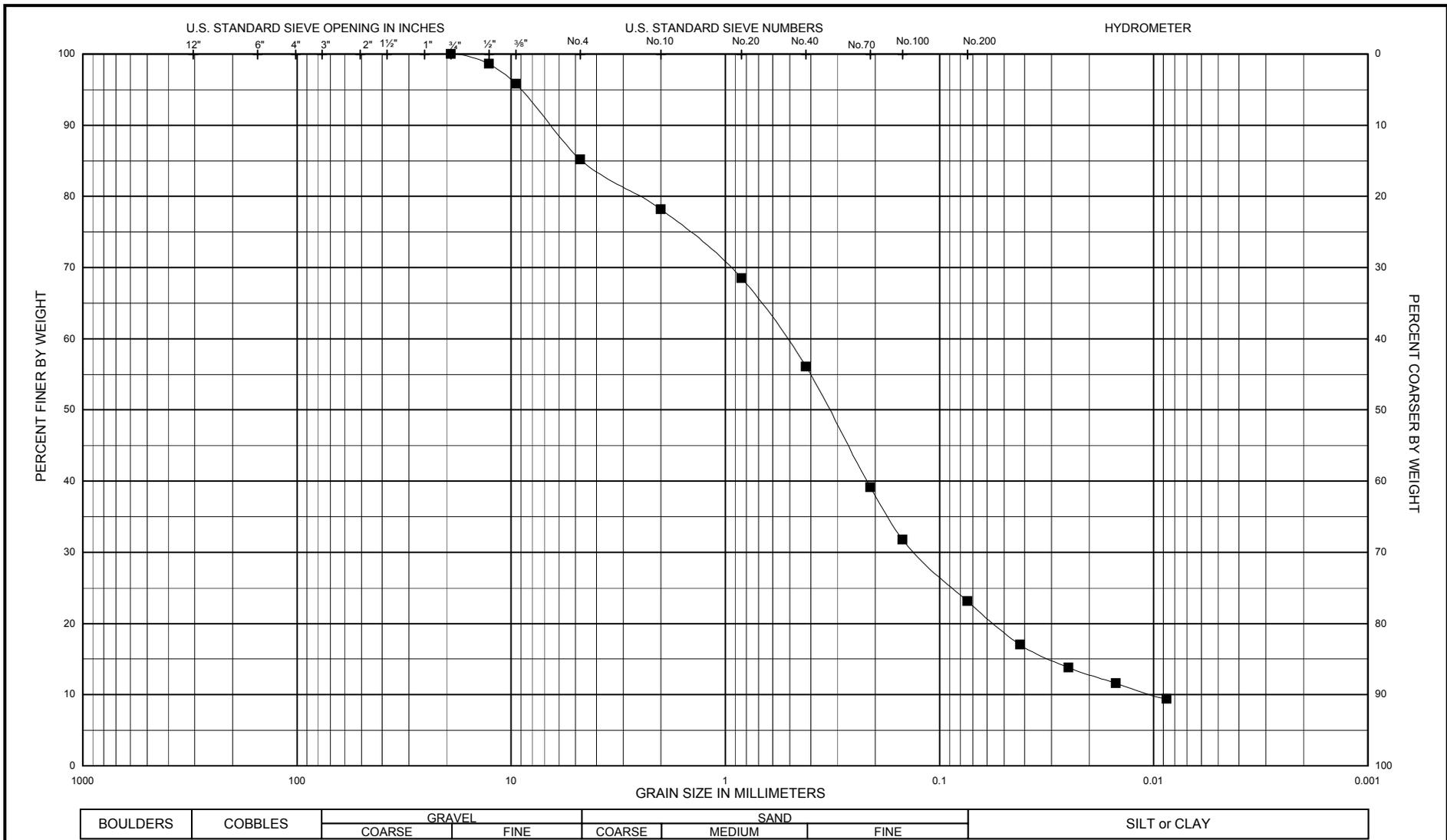
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-32 DATE: Apr 2004
—■—	Jar-3	3.0-4.5	Silty sand with gravel (SM)	21.0	—	—	—	



BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-33 DATE: Apr 2004
—■—	Jar-8	10.5-12.0	Silt (tr. sand) (ML)	49.9	46	33	13	

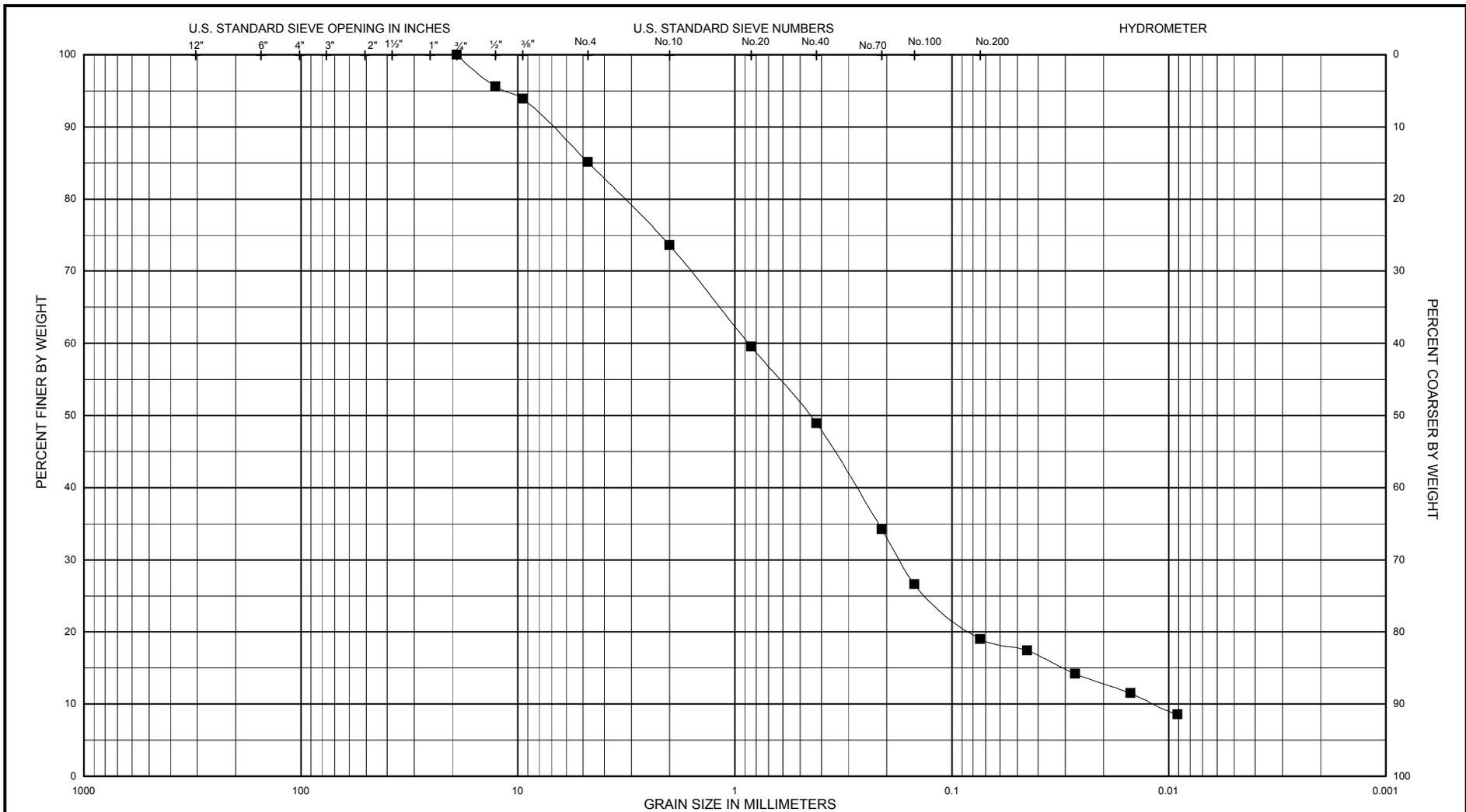


Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-3	3.0-4.5	Silty sand (tr. gravel) (SM)	9.2	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-34
								DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



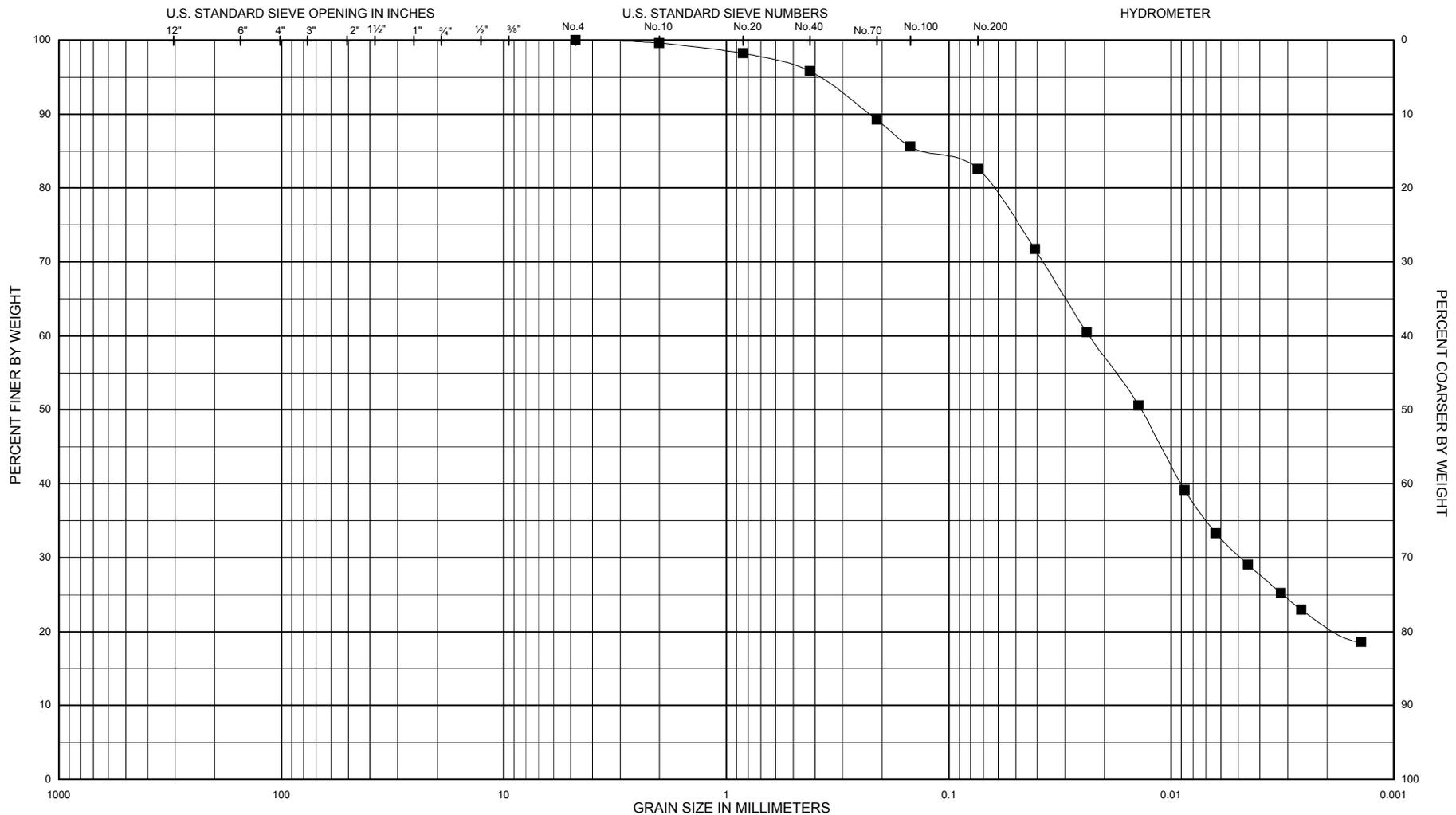
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-4	4.5-6.0	Silty sand (tr. gravel) (SM)	14.3	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-35
								DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



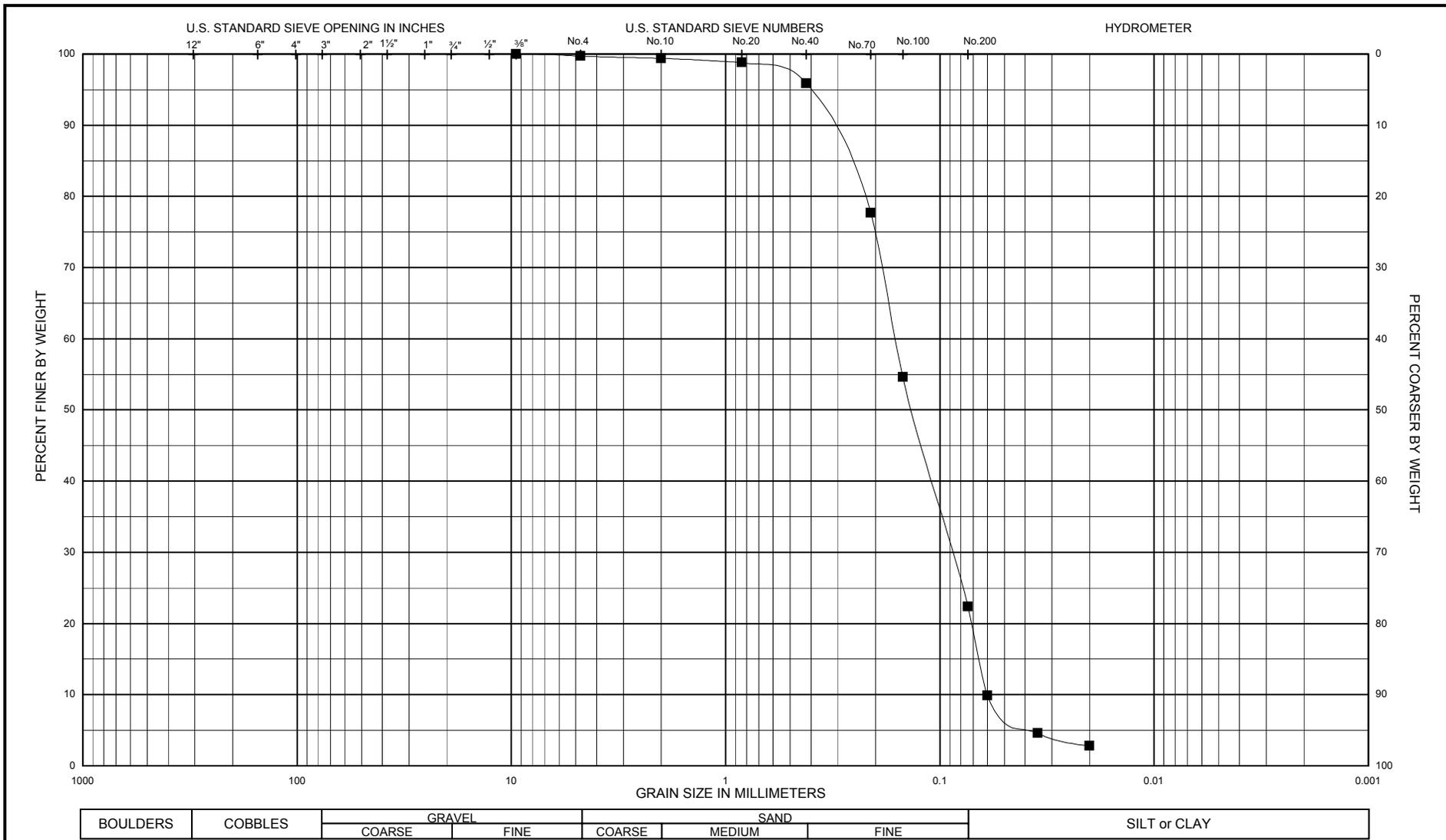
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-36 DATE: Apr 2004
—■—	Jar-12	16.5-18.0	Fat clay with sand (CH)	45.2	56	28	28	

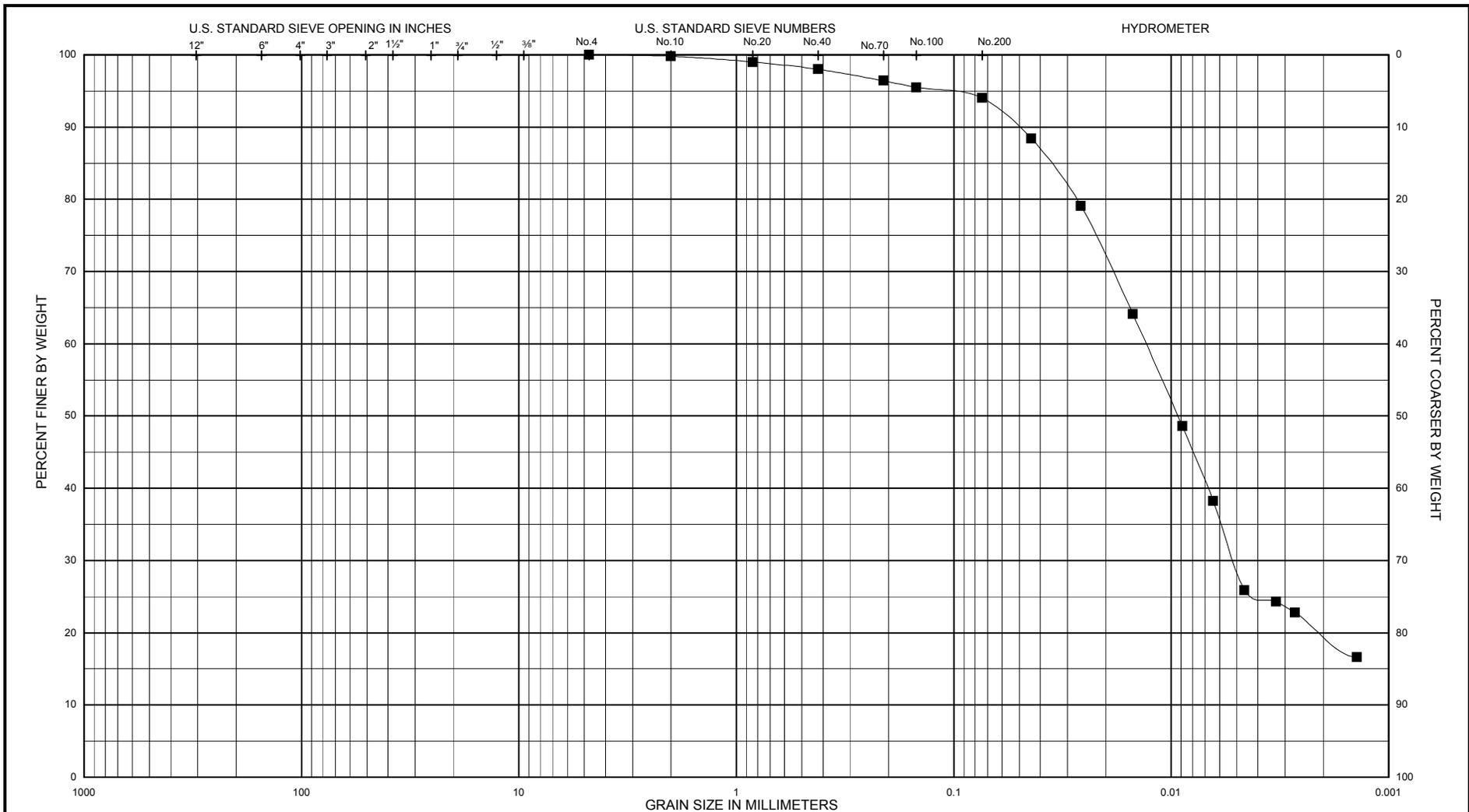
ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)			Nat w%	LL	PL	PI	PROJECT:
			GRAVEL	SAND	SILT or CLAY					
—■—	Jar-3	3.0-4.5	COARSE	FINE	COARSE	MEDIUM	FINE			Liberty State Park
										AREA: Jersey City, NJ
										Boring No.: LSP-03-37
										DATE: Apr 2004



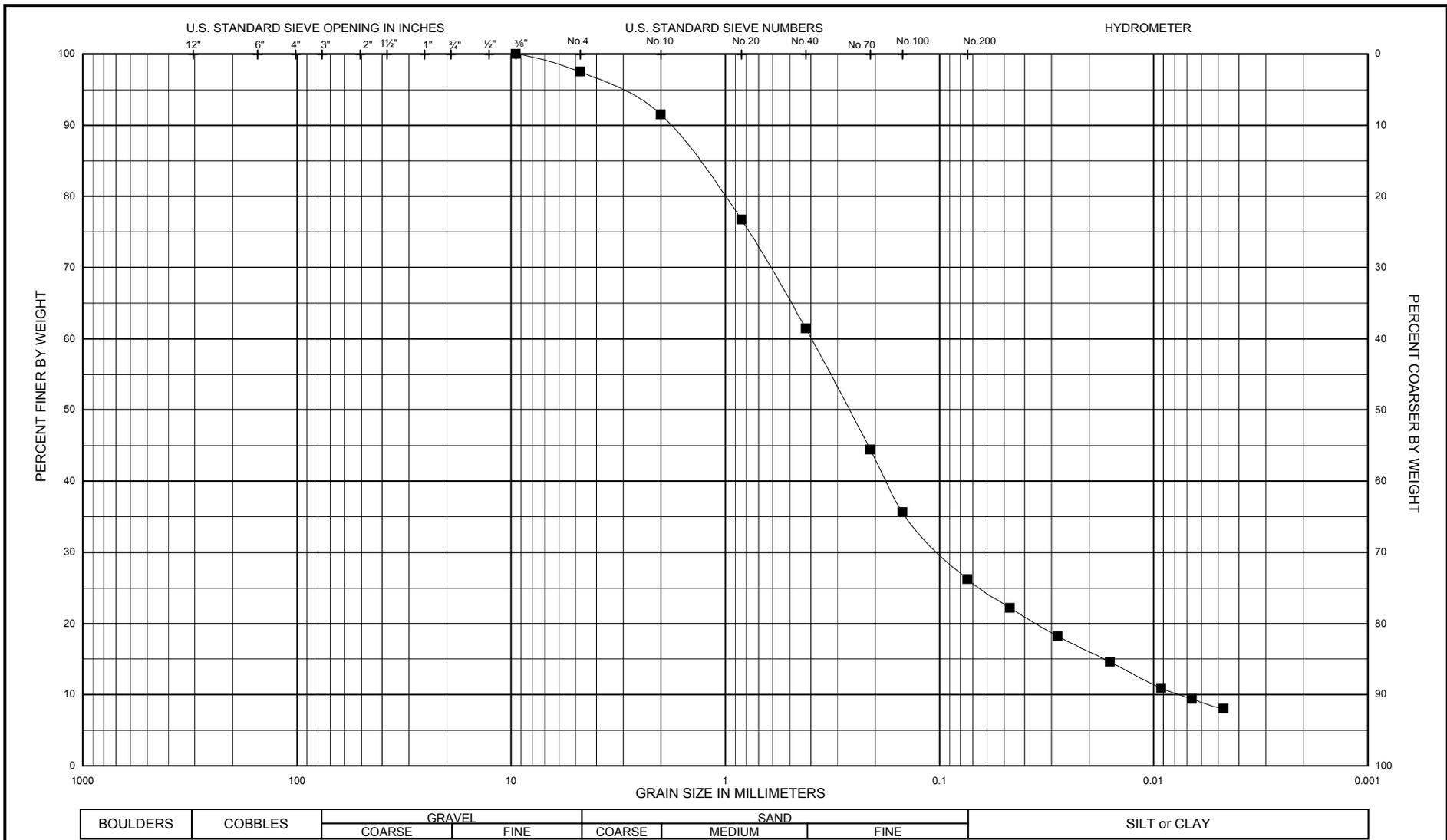
BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT: Liberty State Park AREA: Jersey City, NJ Boring No.: LSP-03-38 DATE: Apr 2004
—■—	Jar-14	19.5-21.0	Fat clay (tr. sand) (CH)	63.4	74	32	42	

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)

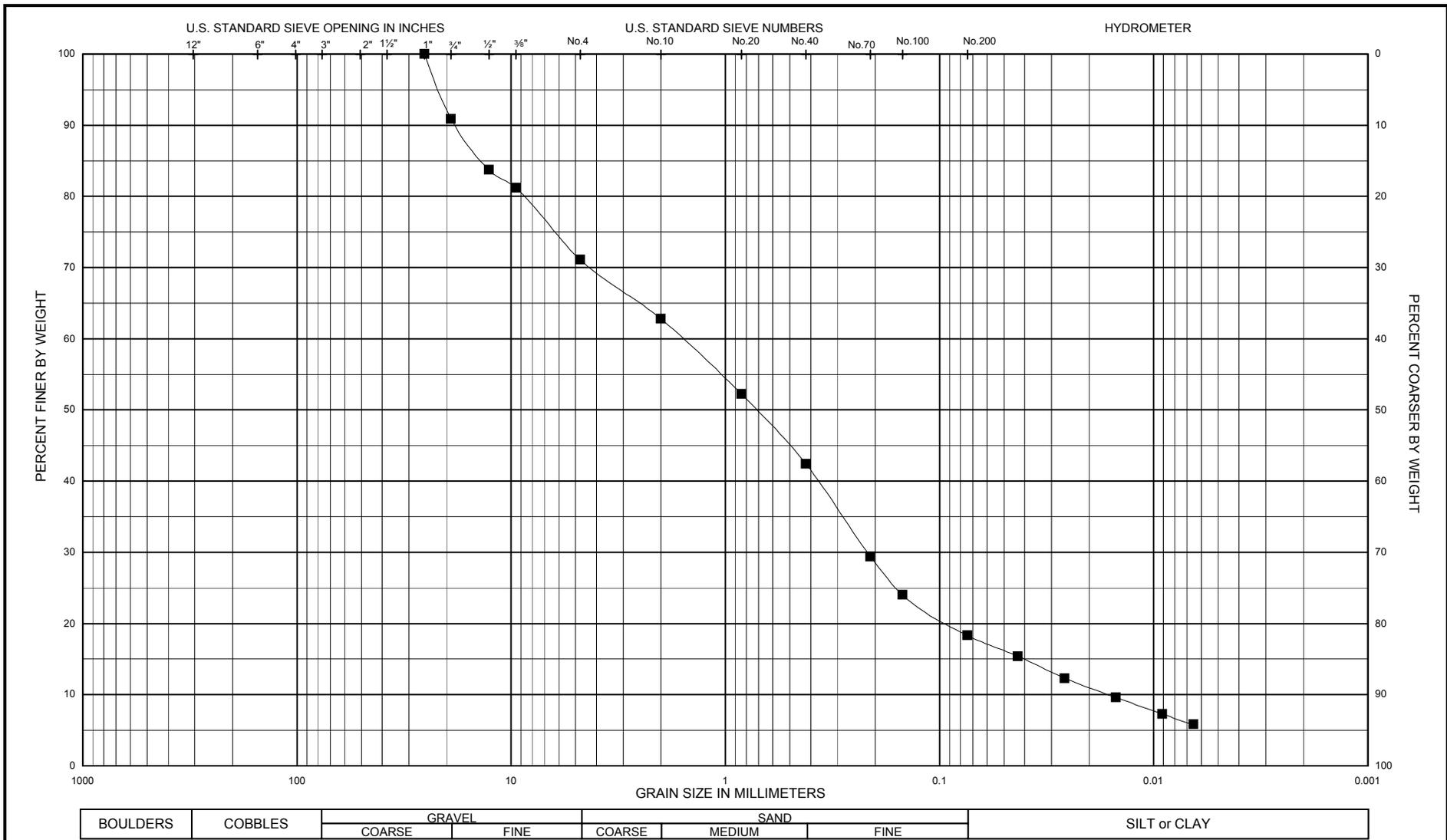


Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-7	9.0-10.5	Silty sand (tr. gravel) (SM)	52.1	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-39
								DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)



Legend	Sample No.	Depth (ft)	USCS Classification (ASTM D2487)	Nat w%	LL	PL	PI	PROJECT:
—■—	Jar-4	4.5-6.0	Silty sand with gravel (SM)	38.1	—	—	—	Liberty State Park
								AREA: Jersey City, NJ
								Boring No.: LSP-03-40
								DATE: Apr 2004

ENG FORM 2087

GRADATION CURVES

(Sieve Analysis: ASTM D422)

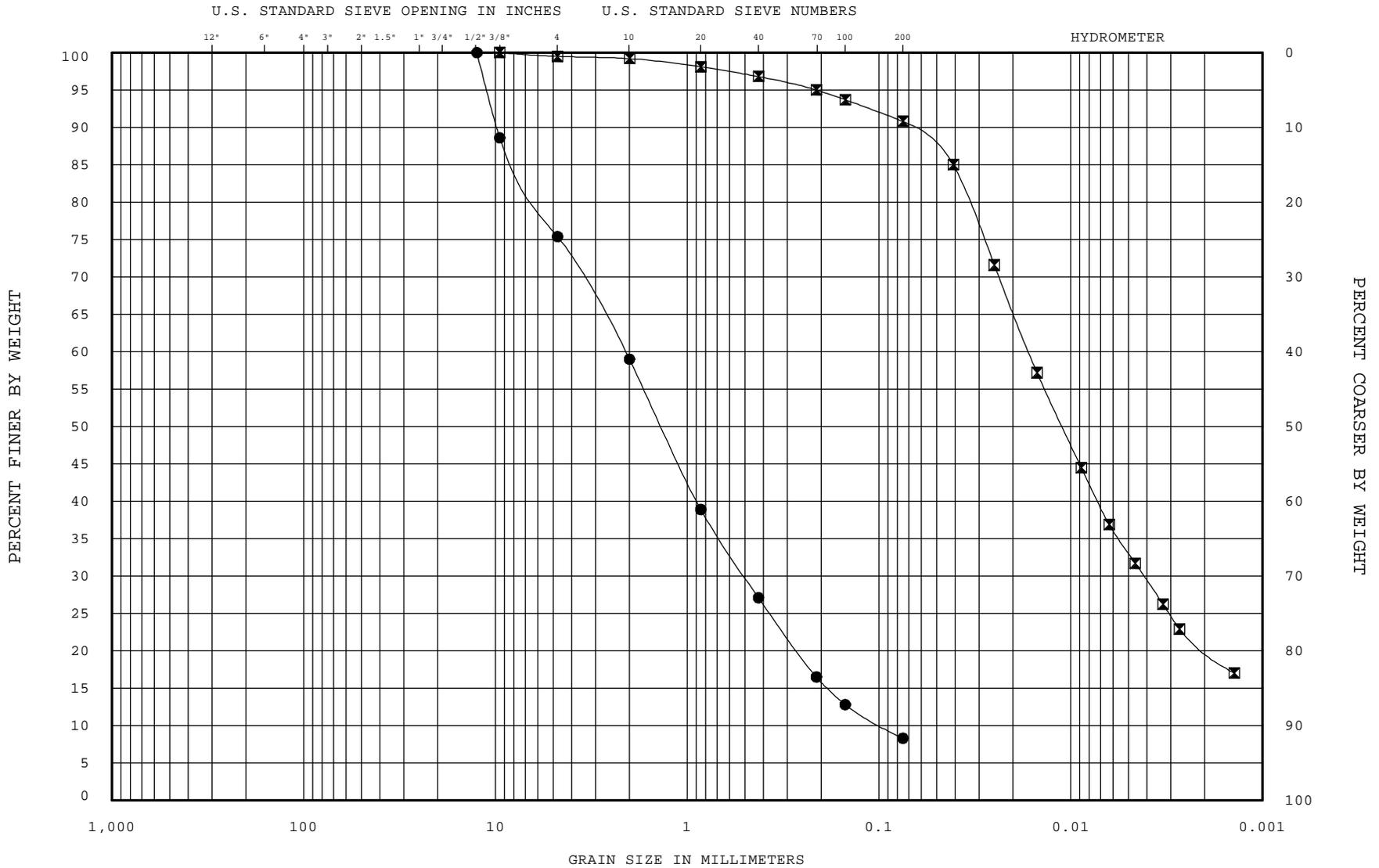
Borehole	Jar No.	Depth	Liquid Limit	Plastic Limit	Plasticity Index	%<#200 Sieve	Classification	Water Content (%)	D60 % Finer	D30 % Finer	D10 % Finer
CA04-1	Jar-6	7.5-9.0				8	SW-SM	18.2	2.108	0.504	0.097
CA04-1	Jar-13	18.0-19.5	54	29	25	91	CH	59.7	0.017	0.004	
CA04-2	Jar-4	4.5-6.0				15	SM	37.8	1.788	0.323	0.016
CA04-2	Jar-11	15.0-16.5	60	35	25	92	MH	70.1	0.016	0.005	
CA04-3	Jar-4	4.5-6.0				10	SW-SM	31.1	2.623	0.493	0.050
CA04-3	Jar-14	19.5-21.0	56	29	27	83	CH	53.8	0.023	0.006	
CA04-4	Jar-7	9.0-10.5				11	SW-SM	25.4	0.575	0.232	0.060
CA04-4	Jar-11	15.0-16.5	54	31	23	83	MH	60.9	0.018	0.006	
CA04-5	Jar-6	7.5-9.0				35	SM	26.5	0.271	0.058	0.008
CA04-5	Jar-11	15.0-16.5	51	29	22	93	MH	54.9	0.014	0.005	
CA04-6	Jar-3	3.0-4.5				9	SP-SM	23.6	0.314	0.206	0.084
CA04-6	Jar-10	13.5-15.0	52	27	25	94	CH	59.4	0.014	0.003	
NC04-1	Jar-4	4.5-6.0	84	37	47	94	CH	125.0	0.011	0.003	
NC04-2	Jar-3	3.0-4.5	82	39	43	92	MH	103.5	0.014	0.004	
NC04-3	Jar-2	1.5-3.0				22	SM	9.6	0.601	0.125	0.013
NC04-4	Jar-2	1.5-3.0				26	SM	8.7	0.286	0.092	0.010
NC04-5	Jar-4	4.5-6.0				10	SP-SM	8.9	7.025	0.466	0.080

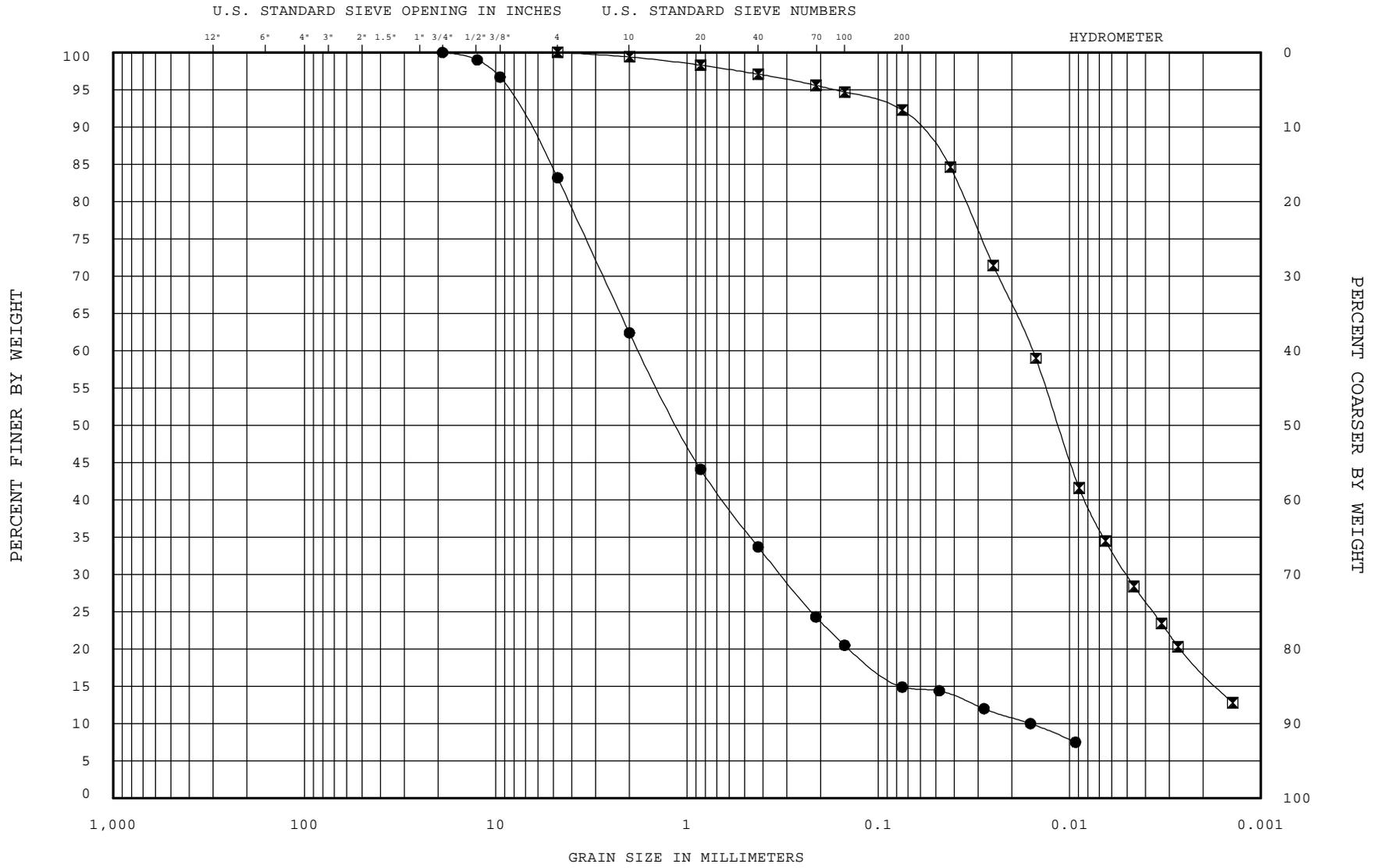
Summary of Laboratory Results

Sheet 1 of 1

PROJECT: *Liberty State Park - Additional Borings*
 AREA: *Jersey City, NJ*

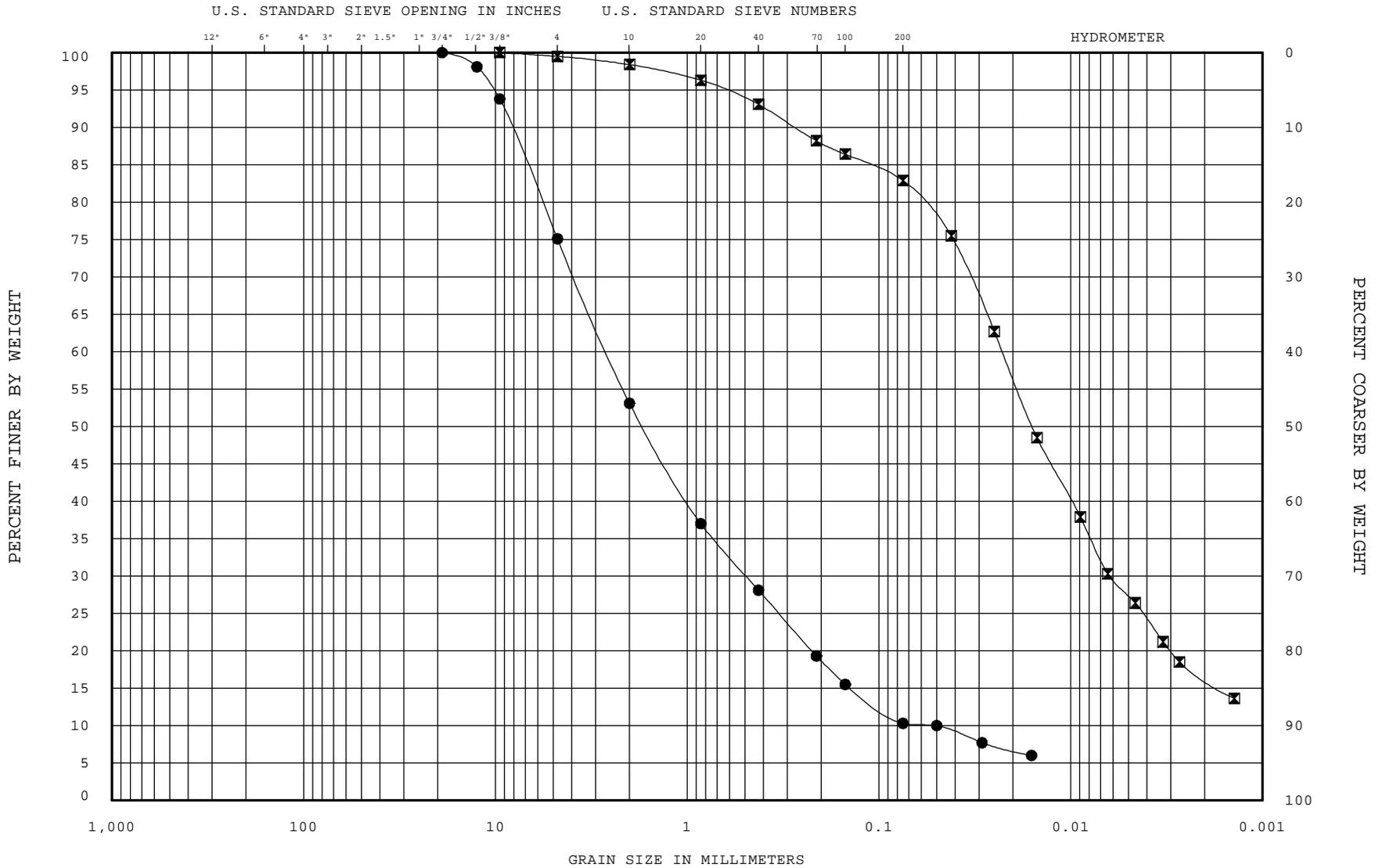
DATE: *Mar 04*





COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: <i>Liberty State Park - Additional Borings</i> AREA: <i>Jersey City, NJ</i>
●	Jar-4	4.5-6.0	SILTY SAND with GRAVEL	SM	37.8			
☒	Jar-11	15.0-16.5	ELASTIC SILT	MH	70.1	60	35	
Remarks:								

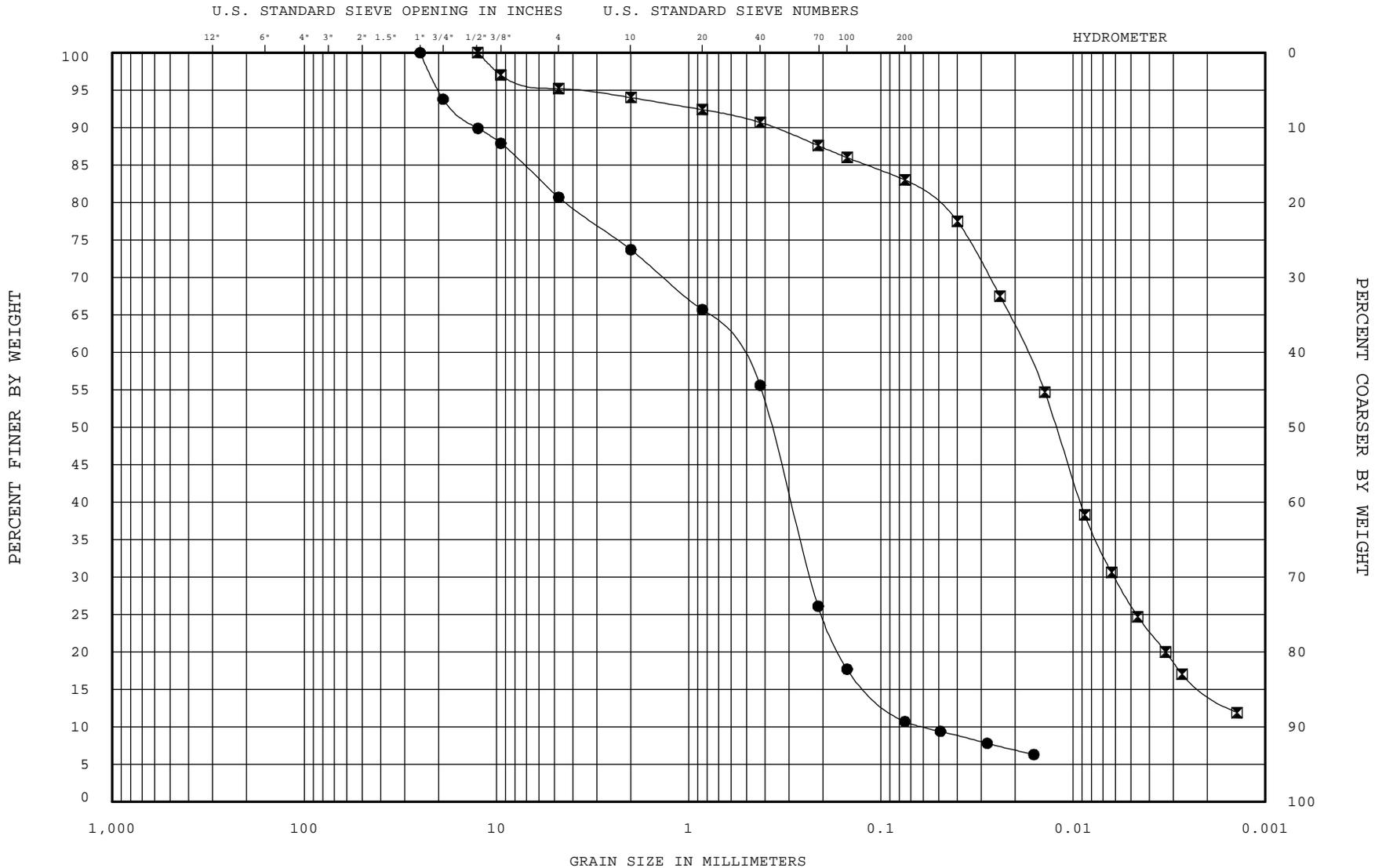


COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: Liberty State Park - Additional Borings
—●—	Jar-4	4.5-6.0	WELL-GRADED SAND with SILT and GRAVEL	SW-SM	31.1			AREA: Jersey City, NJ
—■—	Jar-14	19.5-21.0	FAT CLAY with SAND	CH	53.8	56	29	
— — —								BORING NO.: CA04-3
— — —								DATE: Mar 04

Remarks: GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

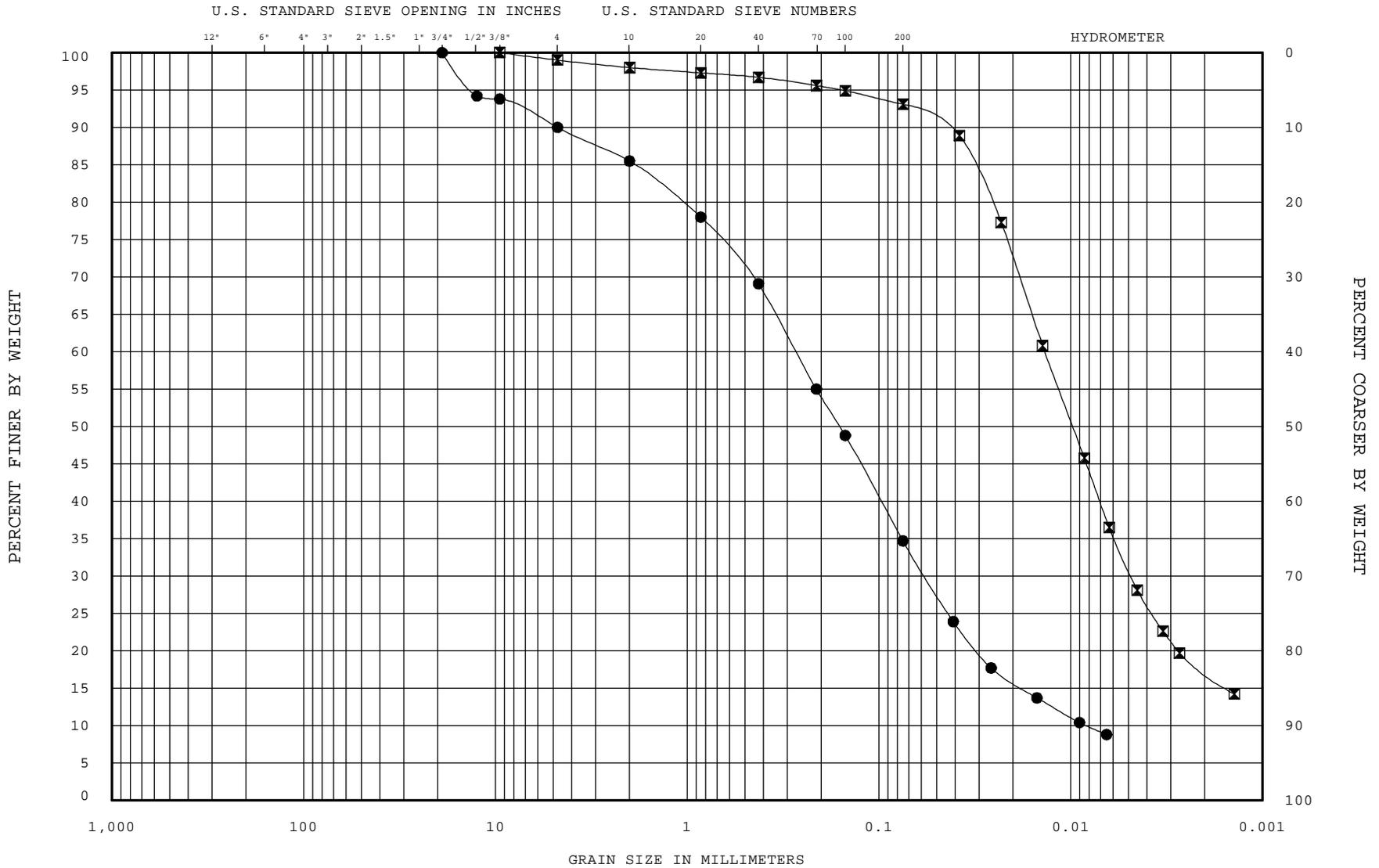
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: Liberty State Park - Additional Borings
●	Jar-7	9.0-10.5	WELL-GRADED SAND with SILT and GRAVEL SW-SM	25.4				AREA: Jersey City, NJ
⊠	Jar-11	15.0-16.5	ELASTIC SILT with SAND MH	60.9	54	31	23	
—								
—								

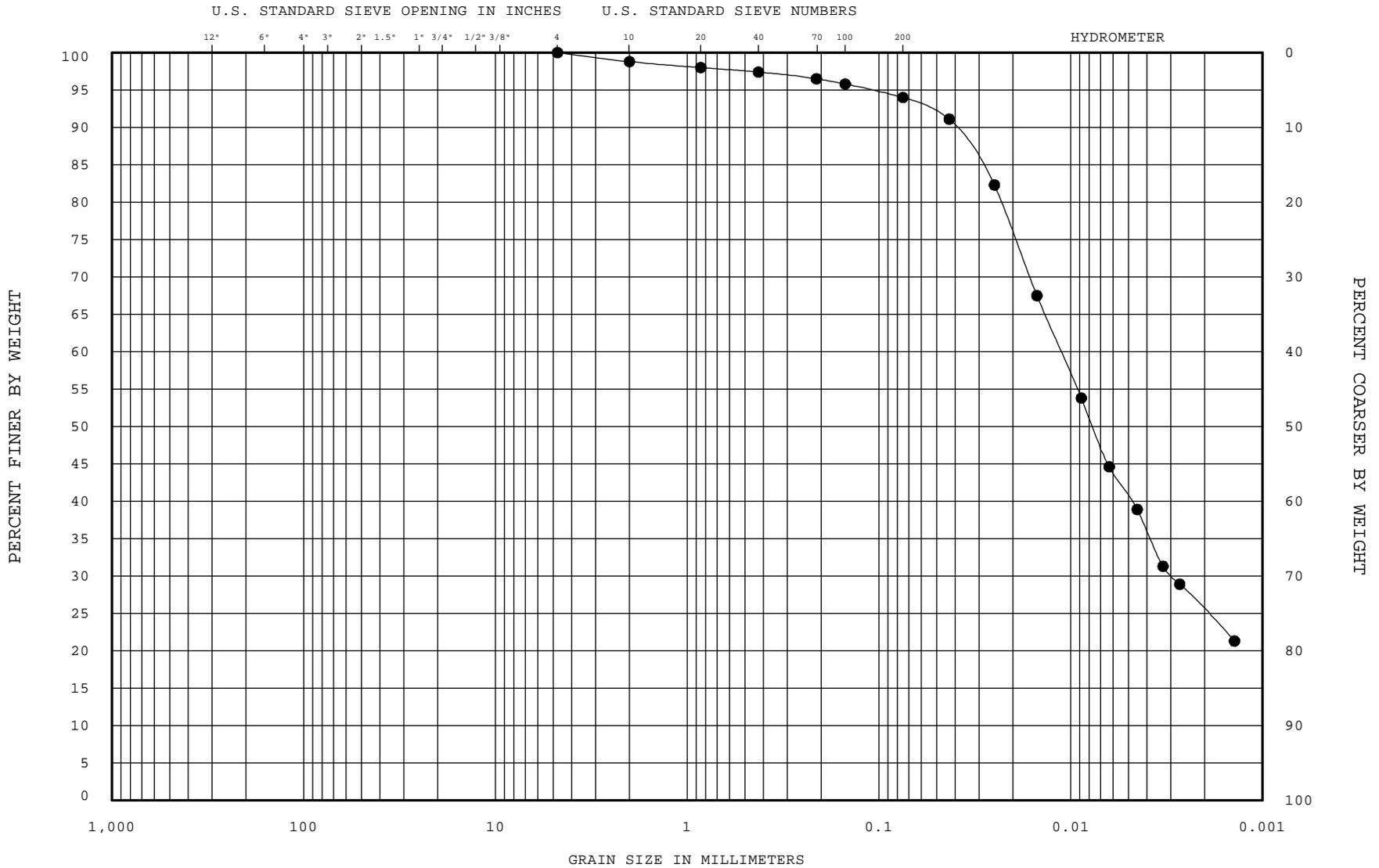
Remarks:	BORING NO.:	CA04-4
	DATE:	Mar 04



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: <i>Liberty State Park - Additional Borings</i> AREA: <i>Jersey City, NJ</i>
●	Jar-6	7.5-9.0	SILTY SAND	SM	26.5			
☒	Jar-11	15.0-16.5	ELASTIC SILT	MH	54.9	51	29	
—								BORING NO.: <i>CA04-5</i>

Remarks:								DATE: <i>Mar 04</i>
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ								GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216

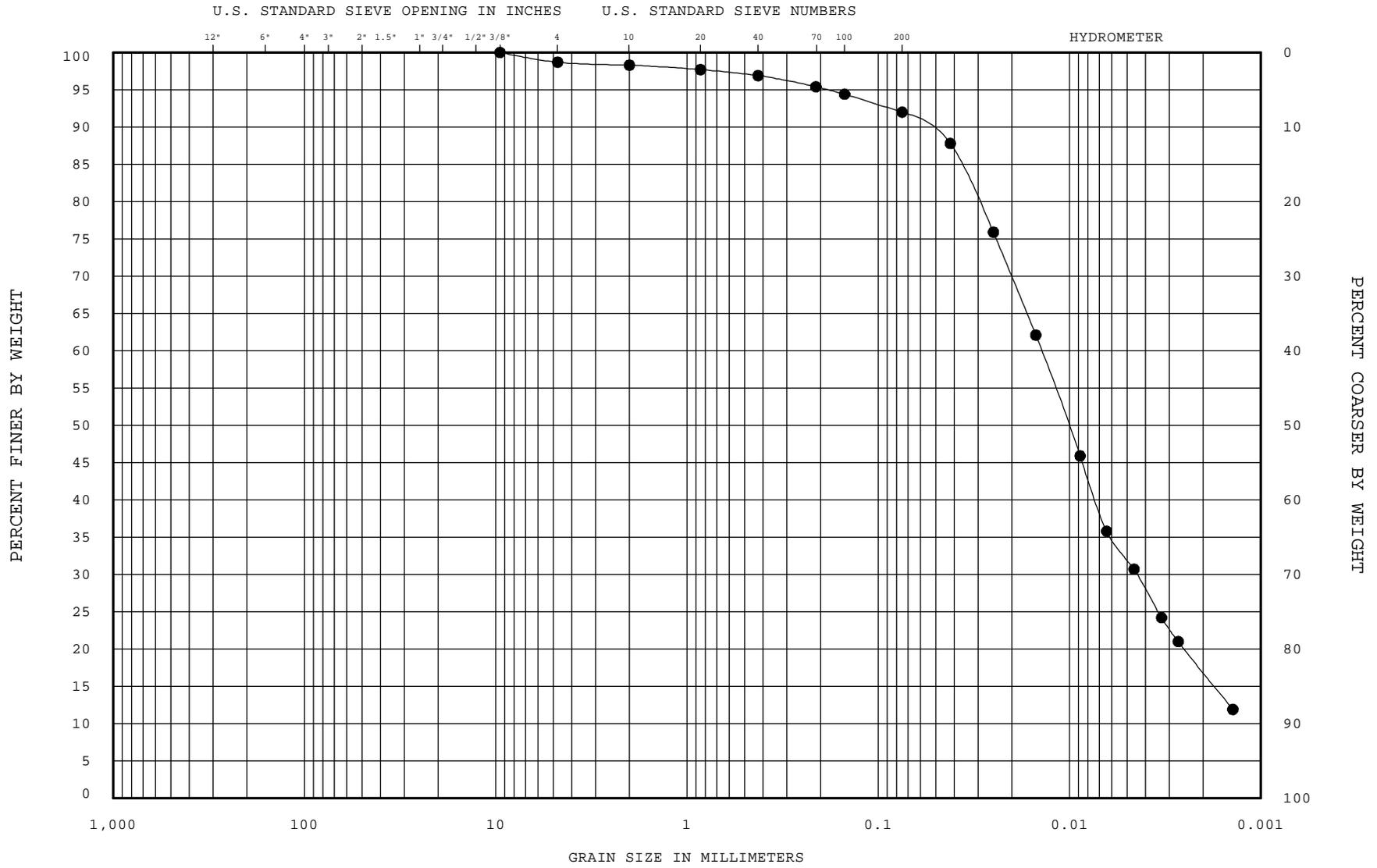


COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT:
—●—	Jar-4	4.5-6.0	FAT CLAY	CH	125.0	84	37	Liberty State Park - Additional Borings
— — —								Jersey City, NJ
— — —								
— — —								

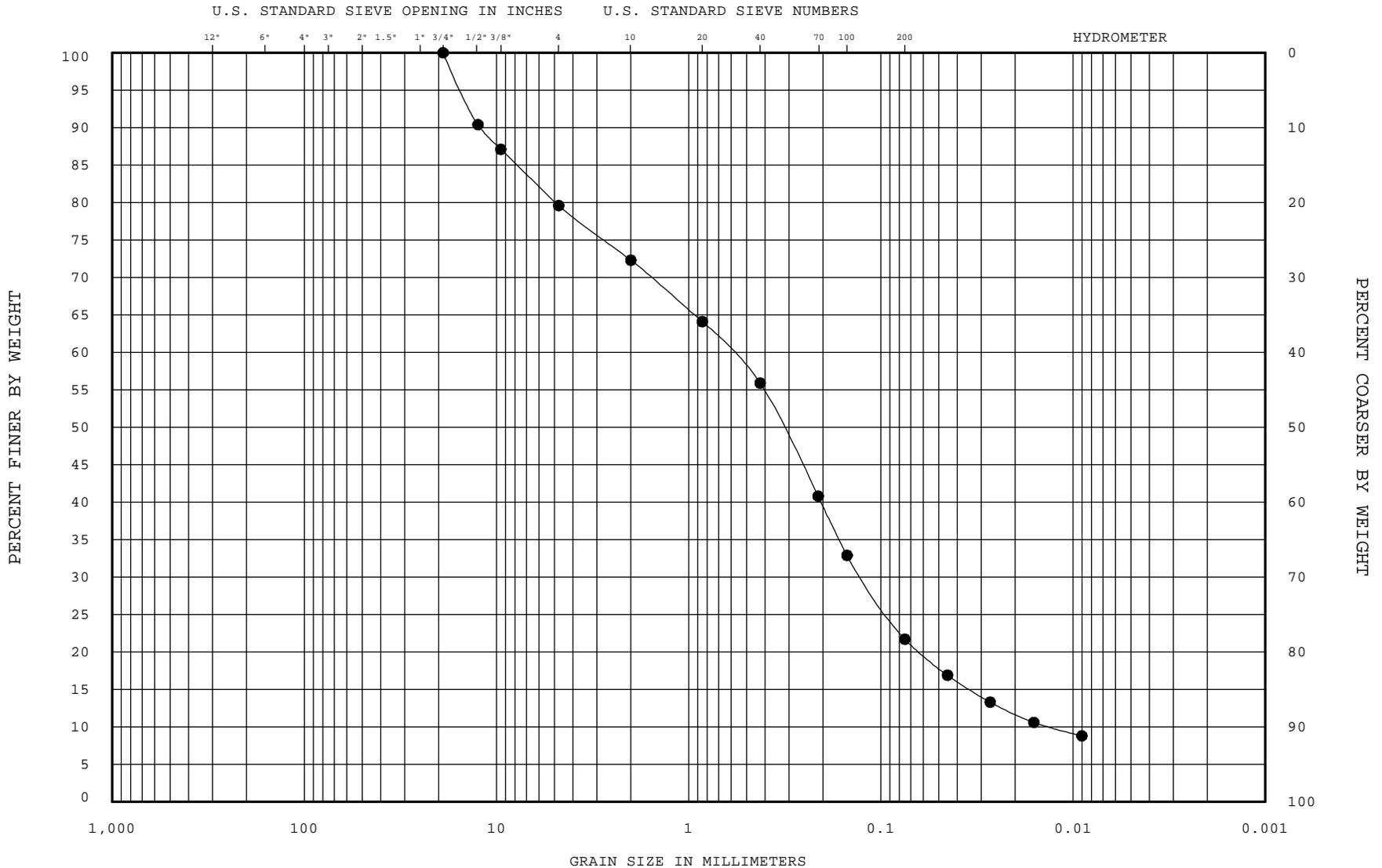
BORING NO.: NC04-1
DATE: Mar 04

Remarks:
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



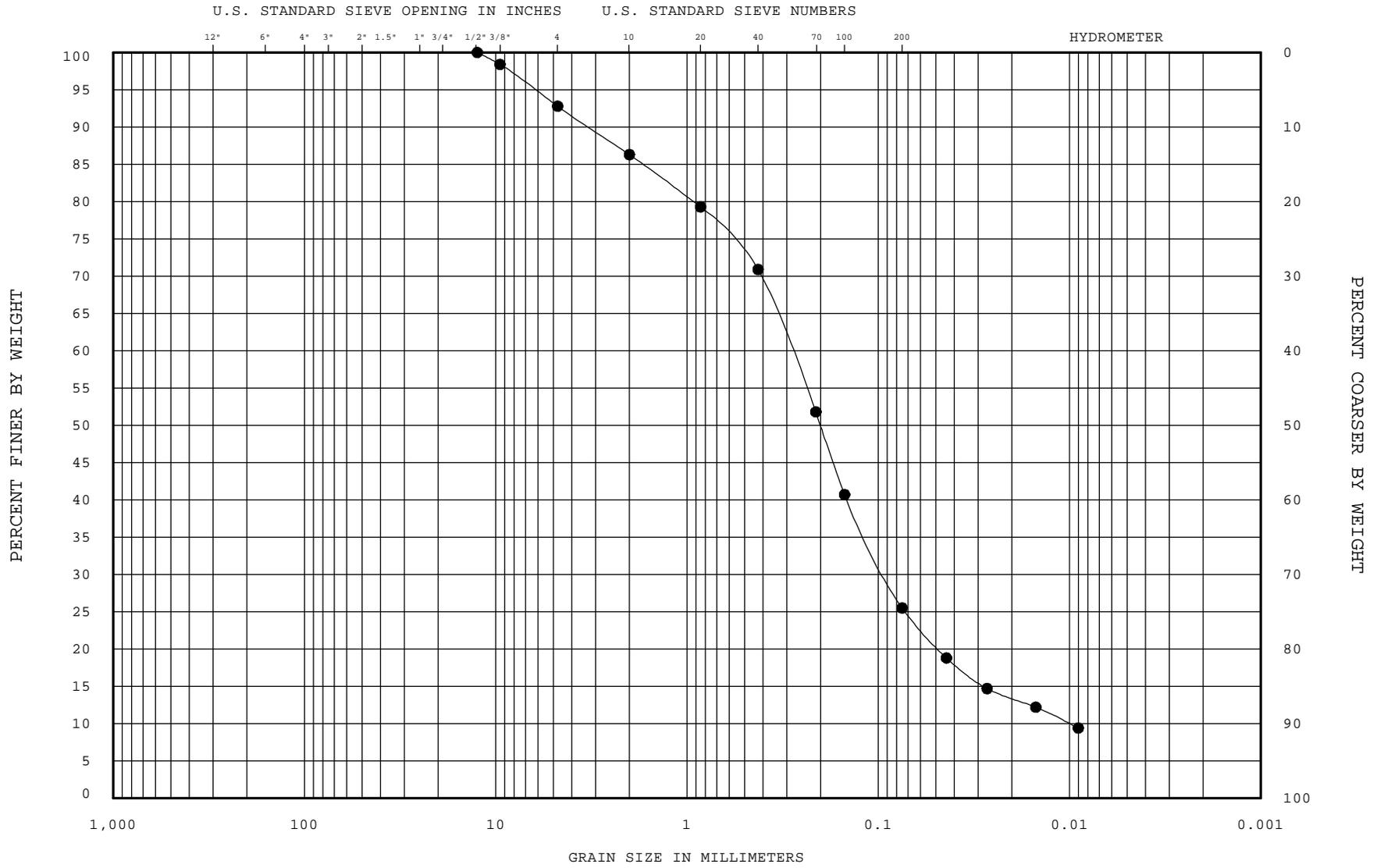
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: <i>Liberty State Park - Additional Borings</i> AREA: <i>Jersey City, NJ</i>
—●—	Jar-3	3.0-4.5	ELASTIC SILT	MH 103.5	82	39	43	
— — —								BORING NO.: <i>NC04-2</i>
— — —								DATE: <i>Mar 04</i>
Remarks:								
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ								GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



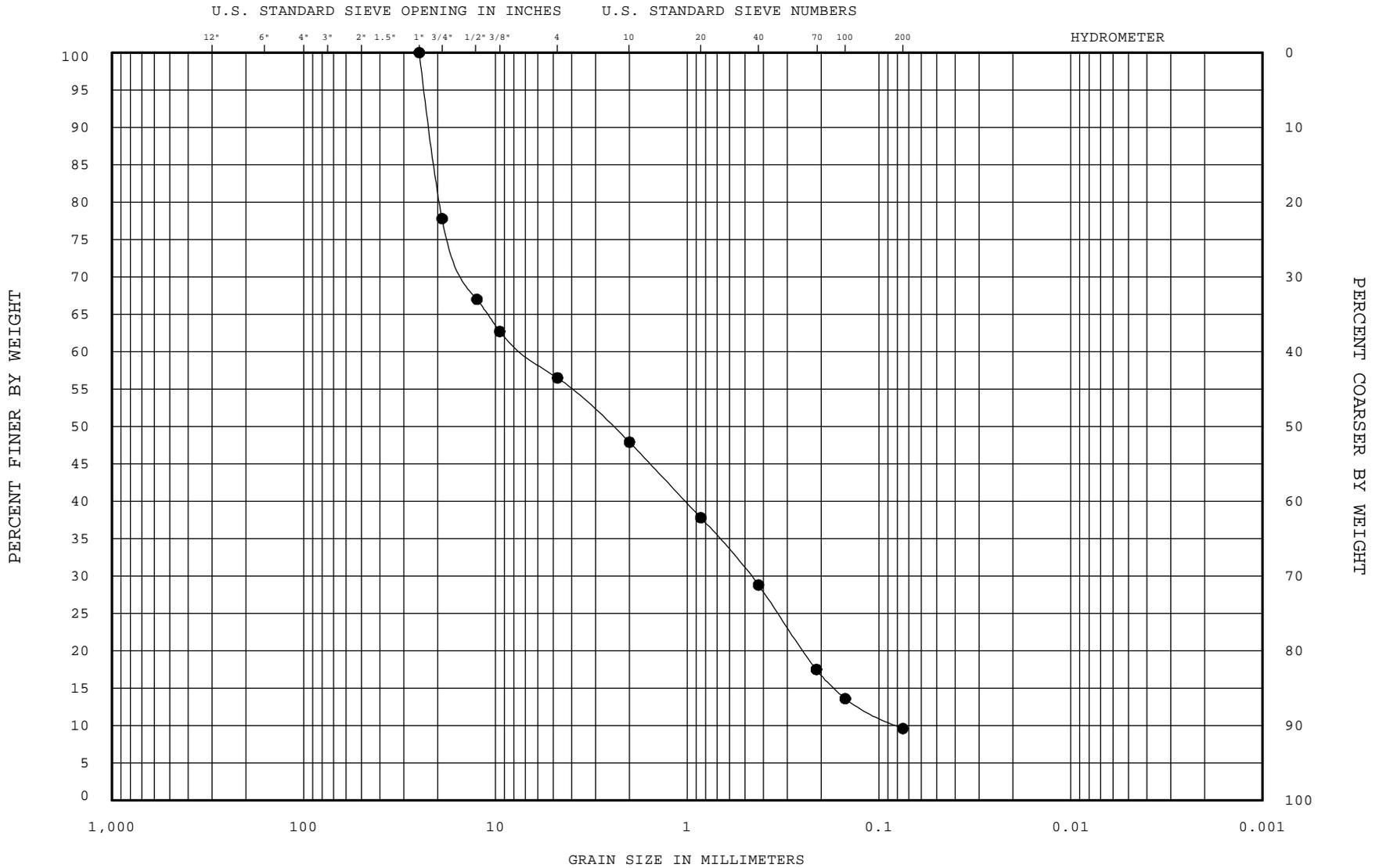
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: <i>Liberty State Park - Additional Borings</i>
—●—	Jar-2	1.5-3.0	SILTY SAND with GRAVEL	9.6				AREA: <i>Jersey City, NJ</i>
— — —								BORING NO.: <i>NC04-3</i>
— — —								DATE: <i>Mar 04</i>
Remarks:								
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ								GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT: <i>Liberty State Park - Additional Borings</i>
—●—	Jar-2	1.5-3.0	SILTY SAND	8.7				AREA: <i>Jersey City, NJ</i>
— — —								BORING NO.: <i>NC04-4</i>
— — —								DATE: <i>Mar 04</i>
Remarks:								
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ								GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216



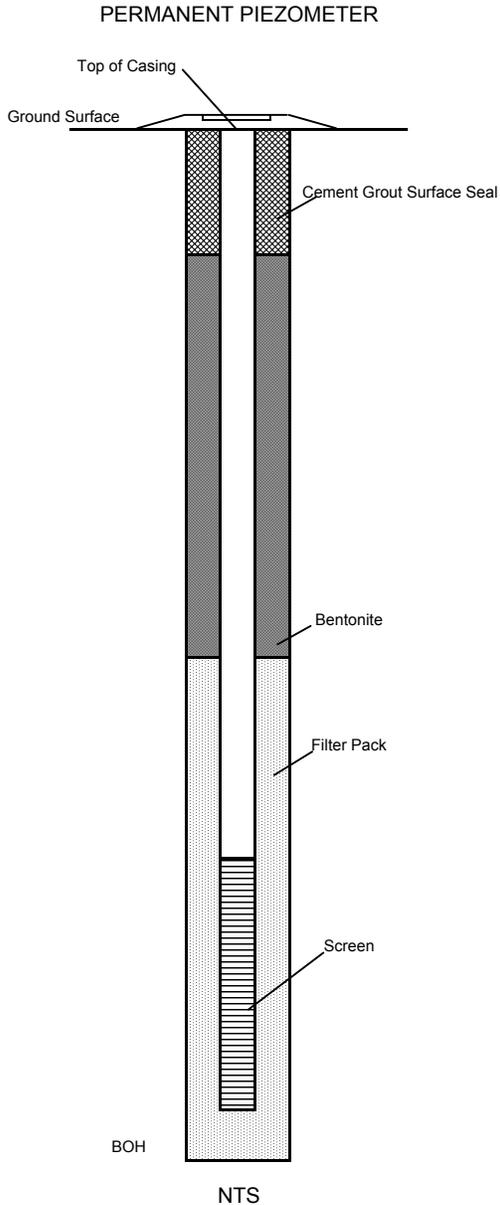
COBBLES	GRAVEL		SAND			SILT or CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification (ASTM D 2487)	Nat wc%	LL	PL	PI	PROJECT:
—●—	Jar-4	4.5-6.0	POORLY-GRADED SAND with SILT and GRAVEL SP-SM	8.9				<i>Liberty State Park - Additional Borings</i>
— — —								<i>Jersey City, NJ</i>
— — —								BORING NO.:
— — —								<i>NC04-5</i>
Remarks:								DATE:
ENG FORM ENG2087LIBERTY STATE PARK-ADD. BORINGS.GPJ								<i>Mar 04</i>
GRADATION CURVES TEST METHODS: ASTM D 422, D4318, D2216								

APPENDIX E
PERMANENT PIEZOMETER AS-BUILT RECORDS

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-01	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 2.8'
DATE WELL COMPLETED:	SURFACE: 6.90'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/9/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N683832.04799 E616002.71436
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.0'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	16.4'

* Depth to groundwater measured relative to ground surface

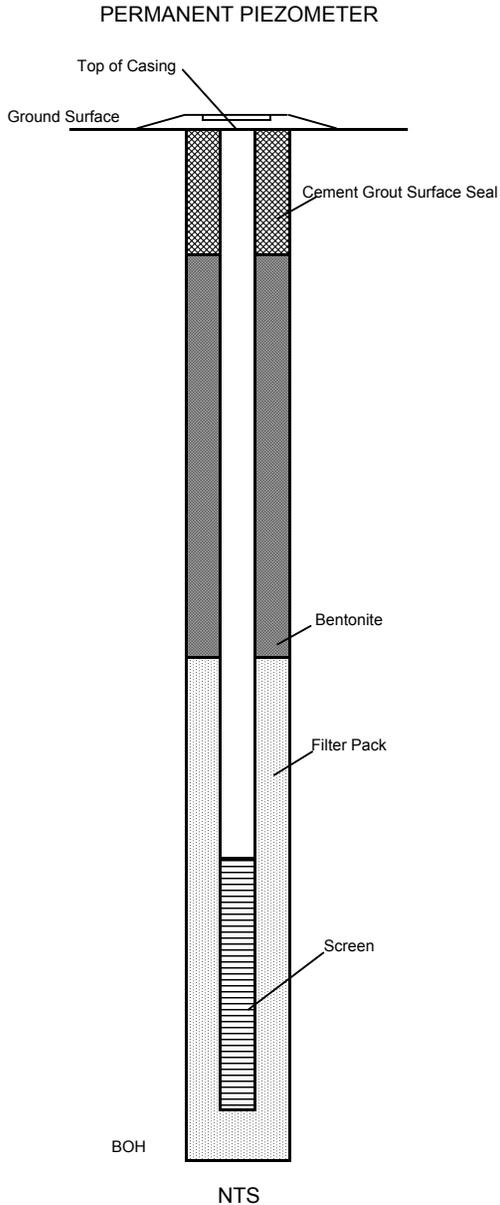


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-01

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-02	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.7'
DATE WELL COMPLETED:	SURFACE: 7.37'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/9/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N683517.39349 E616362.32508
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.0'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	16.4'

* Depth to groundwater measured relative to ground surface

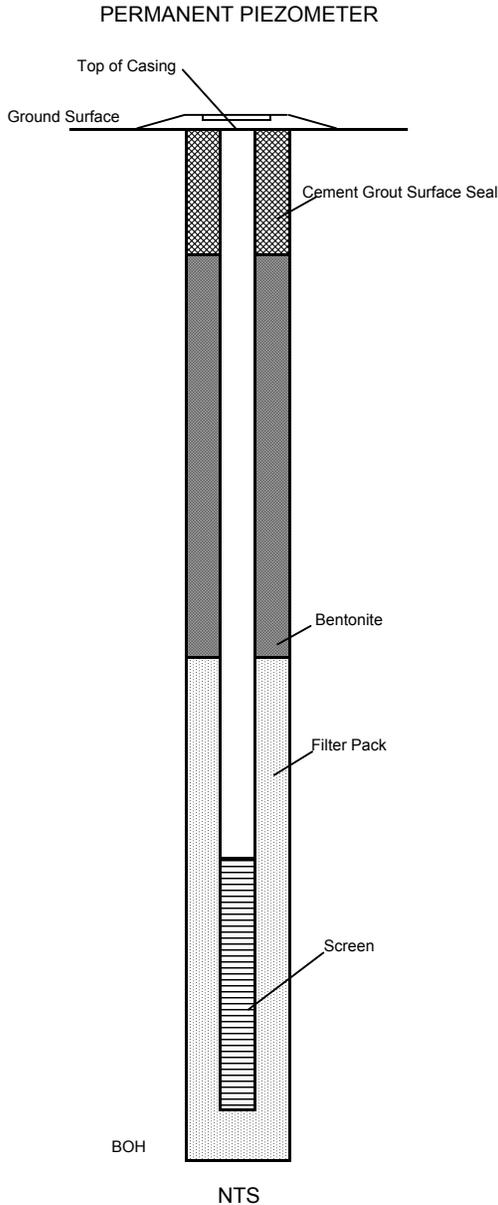


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-02

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-03	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 4.5'
DATE WELL COMPLETED:	SURFACE: 7.05'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/5/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane
	N683192.86435
	E617998.45475
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Concrete
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	7.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	17.0'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.4'

* Depth to groundwater measured relative to ground surface

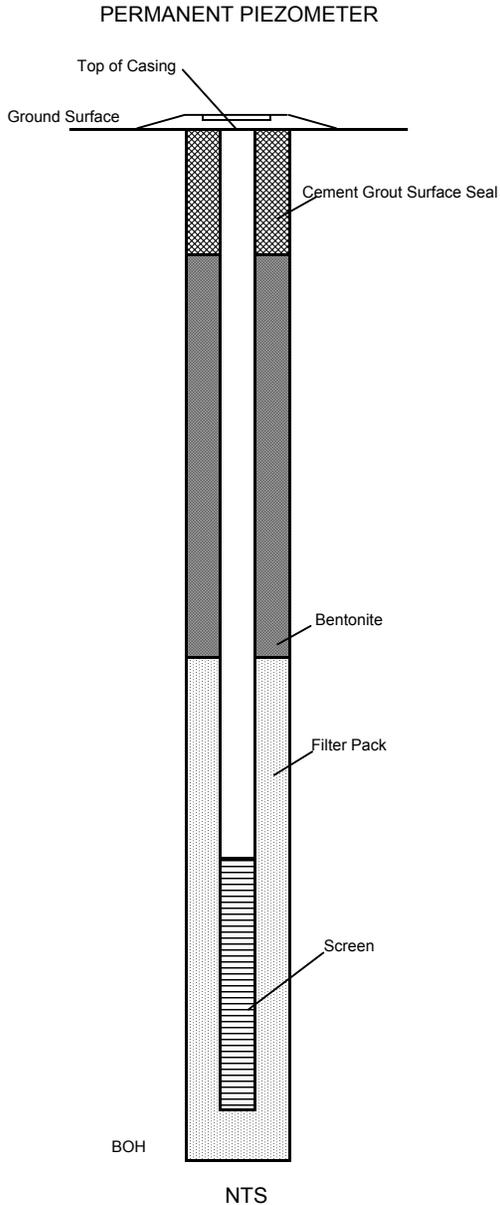


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-03

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-04	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.2'
DATE WELL COMPLETED:	SURFACE: 5.04'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/8/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N682884.30817 E618440.32038
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.0'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	16.4'

* Depth to groundwater measured relative to ground surface

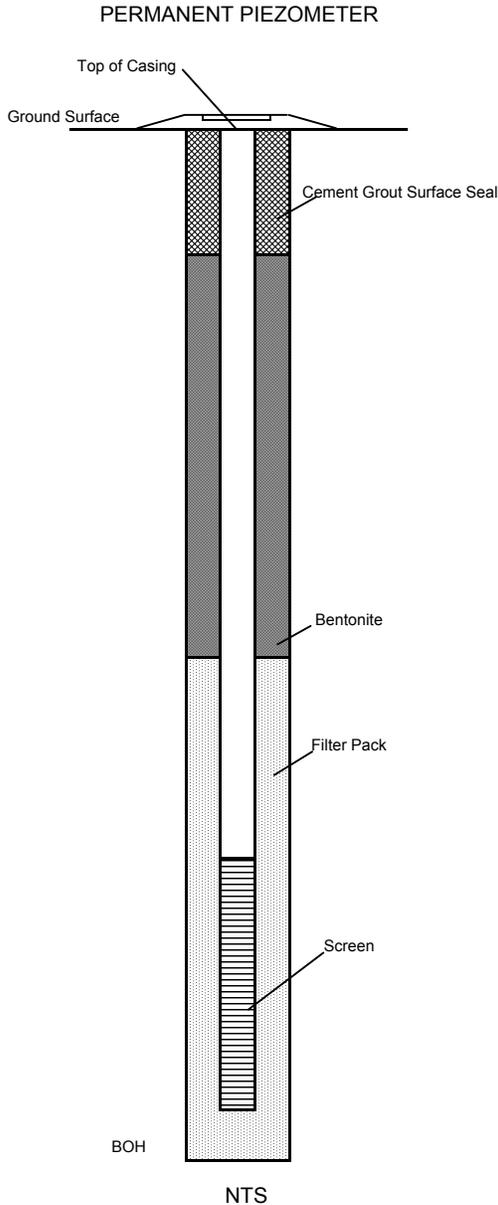


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-04

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-05	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.45'
DATE WELL COMPLETED:	SURFACE: 9.78'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/8/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	<u>NJ State Plane</u> N682589.50605 E618535.55579
DEPTH TO TOP OF CASING:	<u>N/A</u>
TYPE OF SURFACE SEAL:	<u>Cement Grout</u>
DEPTH OF SEAL:	<u>1.0'</u>
I.D. OF RISER PIPE:	<u>2"</u>
TYPE OF RISER PIPE:	<u>PVC</u>
DEPTH TO TOP OF SEAL:	<u>1.0'</u>
TYPE OF SEAL:	<u>Bentonite Pellets</u> <u>5 Gals. Water</u>
DEPTH TO TOP OF FILTER PACK:	<u>3.5'</u>
TYPE OF FILTER PACK:	<u>#1 sand</u> <u>Bags</u>
DEPTH TO TOP OF SCREEN:	<u>6.5'</u>
TYPE OF SCREEN:	<u>PVC</u>
SLOT SIZE AND LENGTH:	<u>10 slot 10'</u>
I.D. OF SCREEN:	<u>2"</u>
DEPTH TO BOTTOM OF SCREEN:	<u>16.5'</u>
BOREHOLE DIAMETER:	<u>10.25"</u>
BOTTOM OF HOLE:	<u>16.9'</u>

* Depth to groundwater measured relative to ground surface

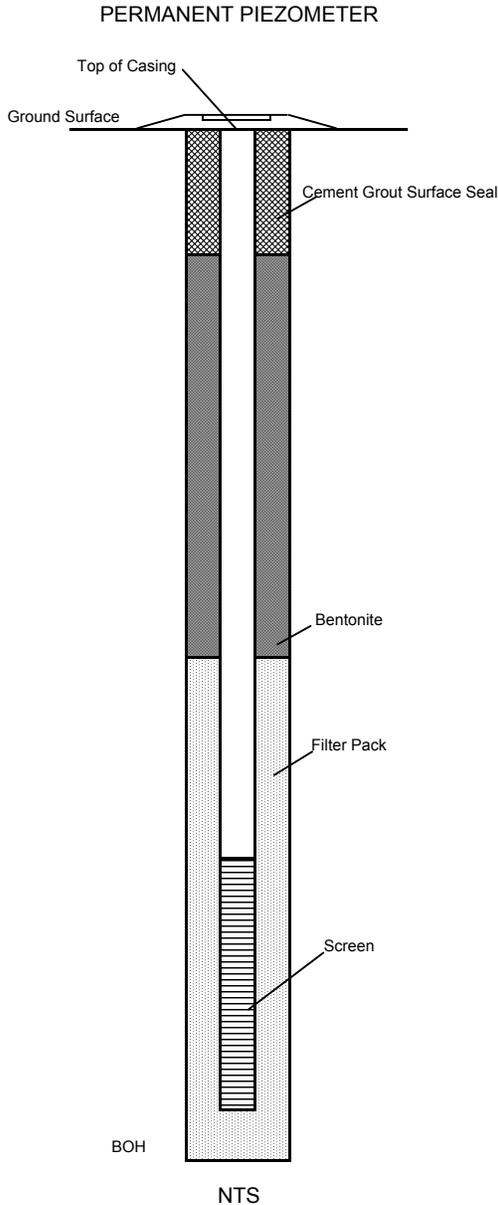


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-05

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-06	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 4.02'
DATE WELL COMPLETED:	SURFACE: 7.56'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/6/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N682834.70794 E615902.61584
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.6'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.6'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.6'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.0'

* Depth to groundwater measured relative to ground surface

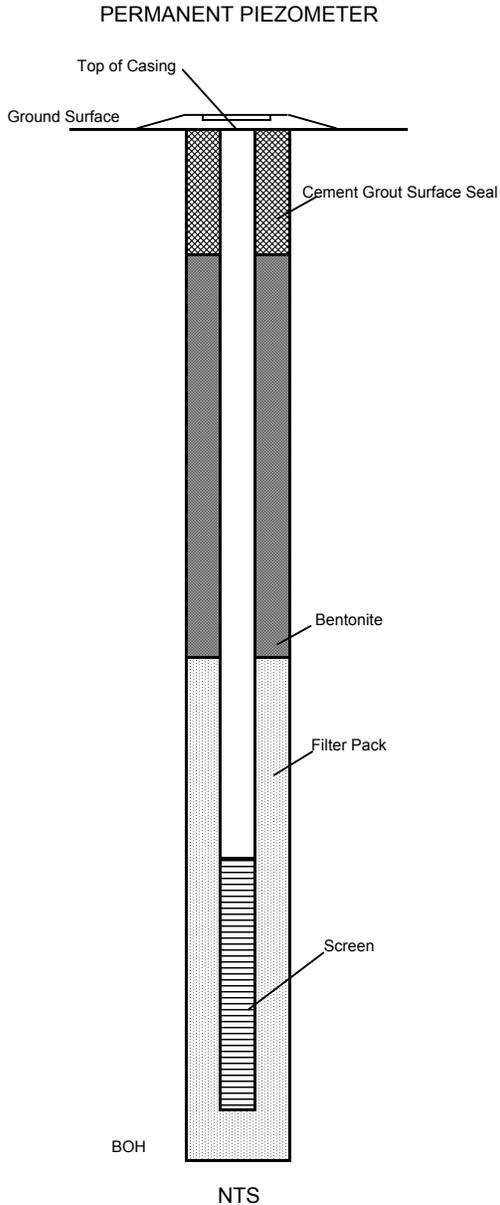


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-06

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-07	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 2.6'
DATE WELL COMPLETED:	SURFACE: 6.53'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/10/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane
	N682579.04042
	E616800.74738
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	7.5'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	17.5'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.9'

* Depth to groundwater measured relative to ground surface

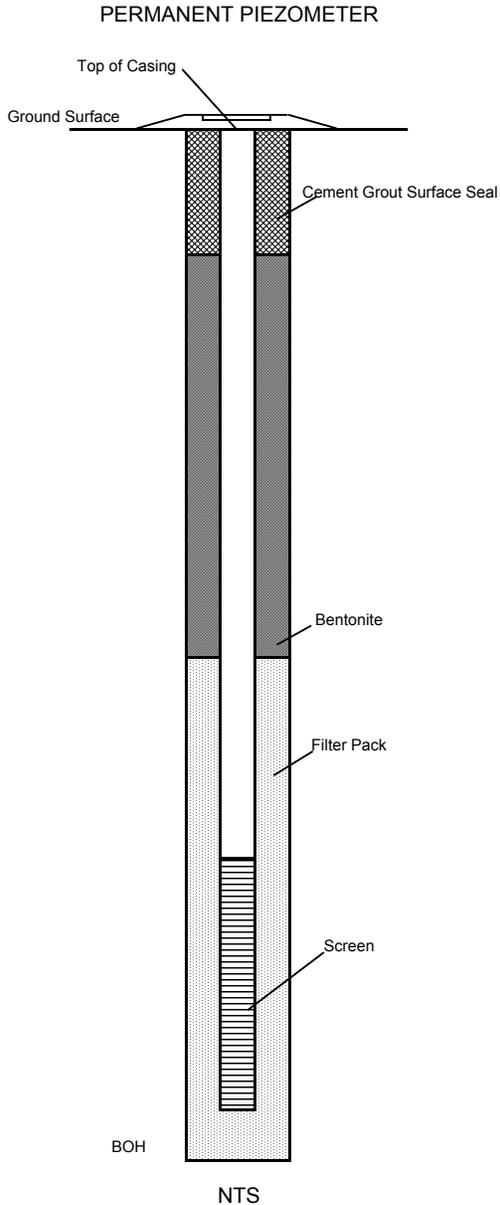


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-07

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-08	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.7'
DATE WELL COMPLETED:	SURFACE: 6.73'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/10/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N682288.46765 E615978.02068
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.5'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.5'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.5'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	16.9'

* Depth to groundwater measured relative to ground surface

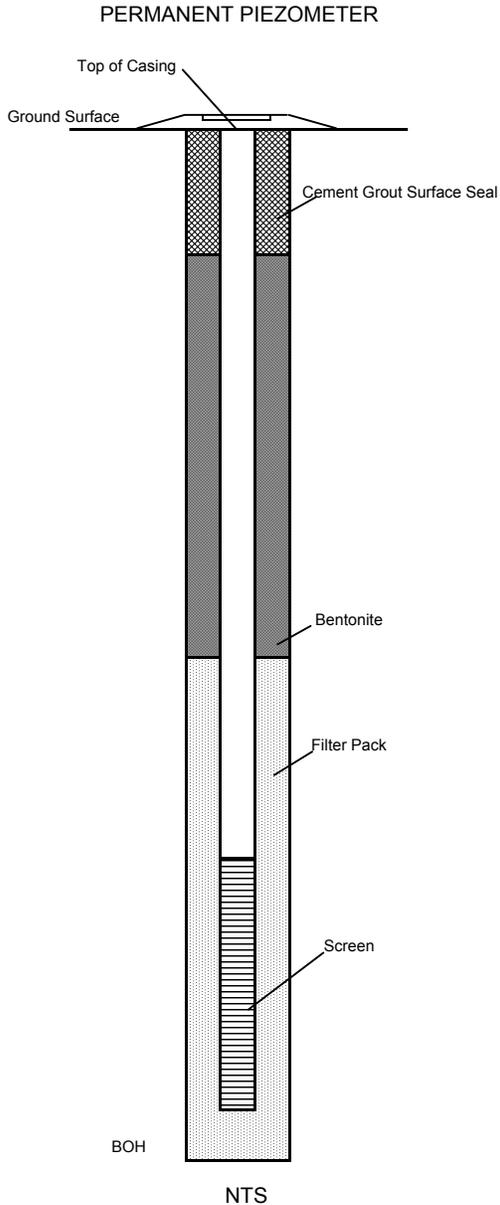


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-08

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-09	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 4.7'
DATE WELL COMPLETED:	SURFACE: 11.59'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/5/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane
	N682011.33282
	E614834.20085
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	4.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	7.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	17.0'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.4'

* Depth to groundwater measured relative to ground surface

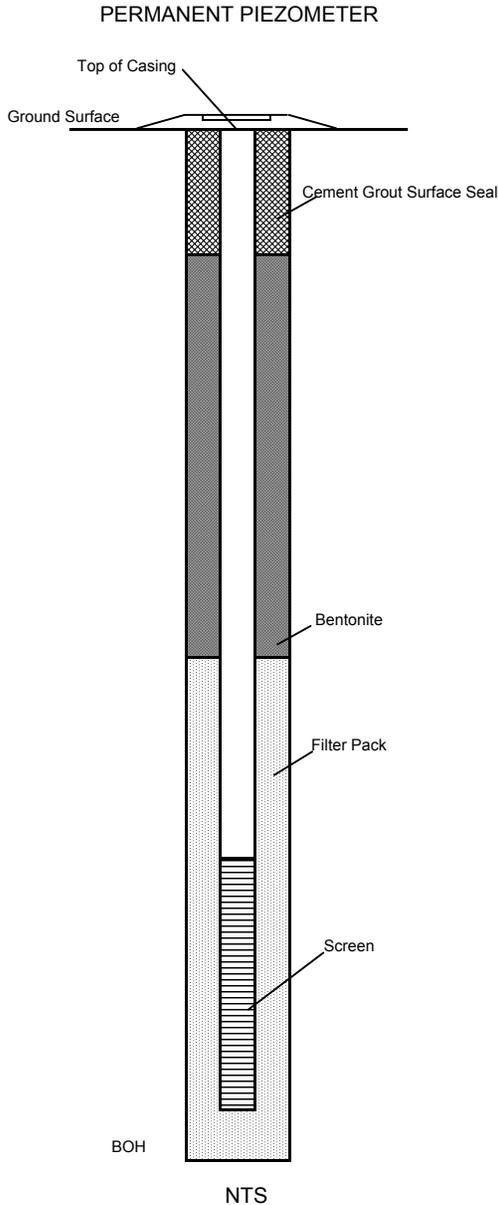


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-09

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-10	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 4.0'
DATE WELL COMPLETED:	SURFACE: 9.05'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/9/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N681879.57853 E616168.43446
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	4.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	7.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	17.0'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.4'

* Depth to groundwater measured relative to ground surface

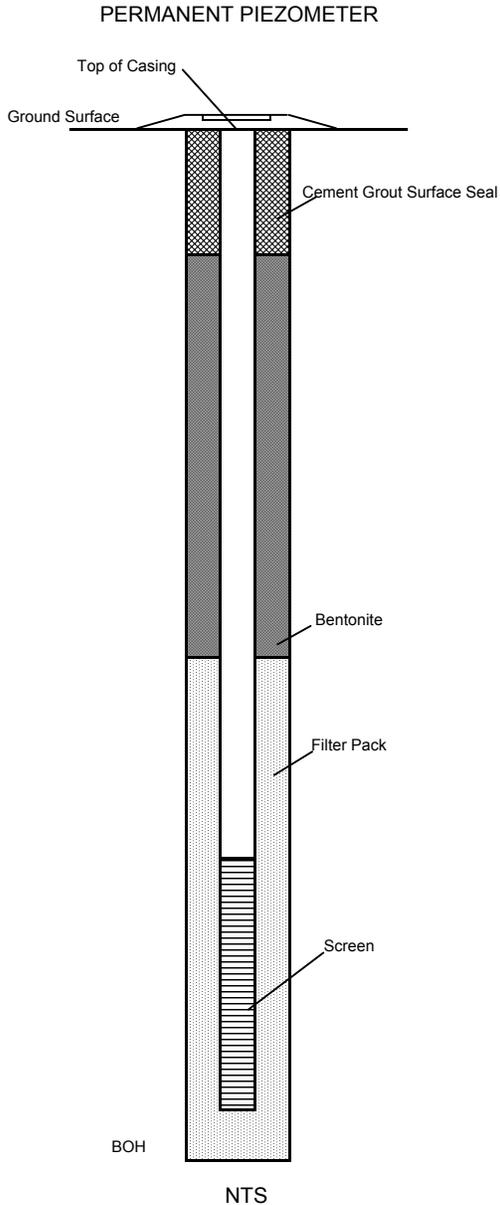


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-10

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-11	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.2'
DATE WELL COMPLETED:	SURFACE: 7.91'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/5/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane
	N681150.51366
	E615521.93360
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.5'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.5'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.5'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.6'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.6'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.0'

* Depth to groundwater measured relative to ground surface

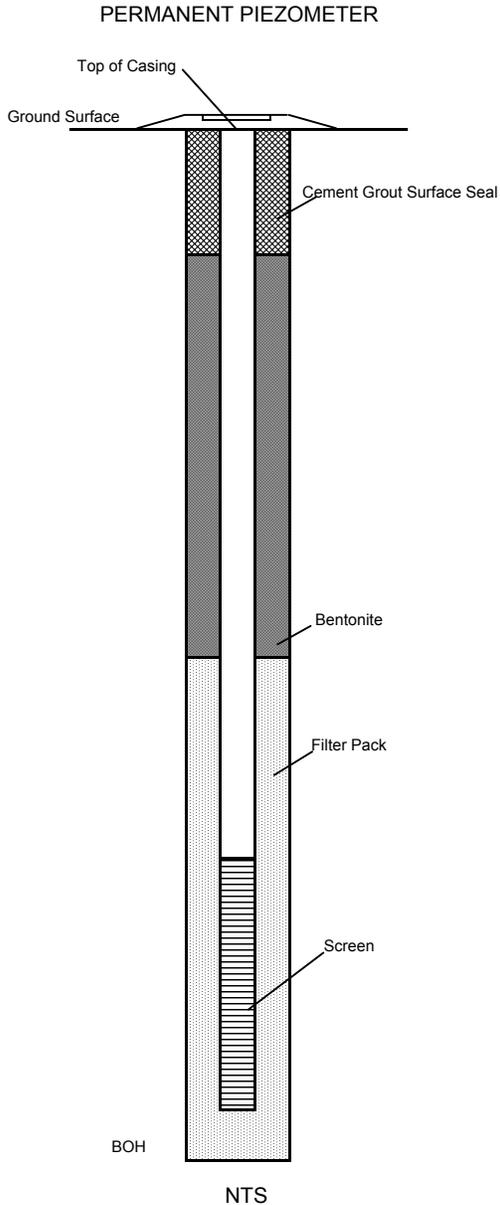


PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-11

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-12	LOCATION: Jersey City, NJ	DRILLER: B Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.4'
DATE WELL COMPLETED:	SURFACE: 8.70'	DRILLING METHOD: HSA
DATE DEVEL. COMPLETED: 9/9/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane N681514.54832 E616749.81368
DEPTH TO TOP OF CASING:	N/A
TYPE OF SURFACE SEAL:	Cement Grout
DEPTH OF SEAL:	1.0'
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
DEPTH TO TOP OF SEAL:	1.0'
TYPE OF SEAL:	Bentonite Pellets 5 Gals. Water
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand Bags
DEPTH TO TOP OF SCREEN:	6.6'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.6'
BOREHOLE DIAMETER:	10.25"
BOTTOM OF HOLE:	17.0'

* Depth to groundwater measured relative to ground surface



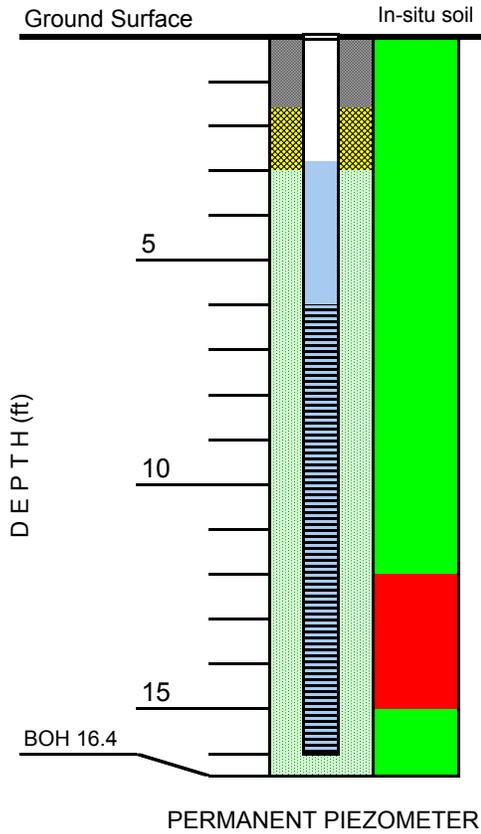
PROJECT Liberty State Park, Jersey City, NJ

USACE - Baltimore District
HOLE NO.: LSP-03-12

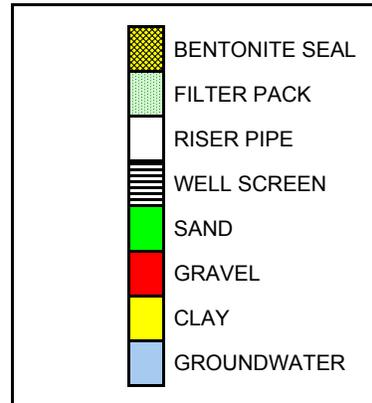
APPENDIX F
PERMANENT PIEZOMETER CONSTRUCTION SCHEMATICS

PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-01	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	6.90
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	4.10
		TOP OF WELL SCREEN:	0.90
DEPTH TO GROUNDWATER (FT)*:	2.8	BOTTOM OF WELL SCREEN:	-9.10



LEGEND



***Notes:**

1. Depth to Groundwater (GW) measured relative to existing ground surface.
2. Groundwater reading taken at 24-hours after installation of piezometer.

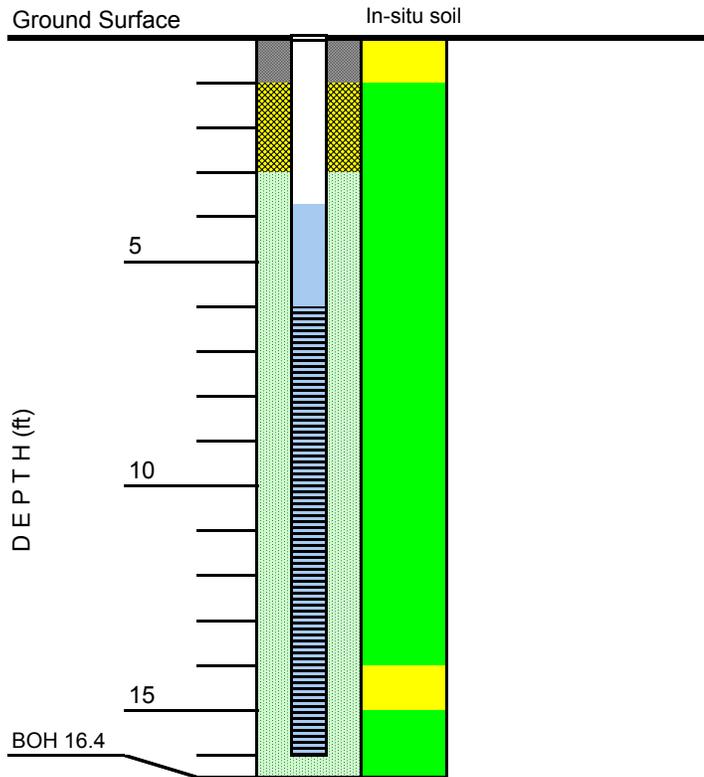


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-01
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-02	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	7.37
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	3.67
		TOP OF WELL SCREEN:	1.37
DEPTH TO GROUNDWATER (FT):	3.7	BOTTOM OF WELL SCREEN:	-8.63



PERMANENT PIEZOMETER

LEGEND

	CEMENT GROUT
	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

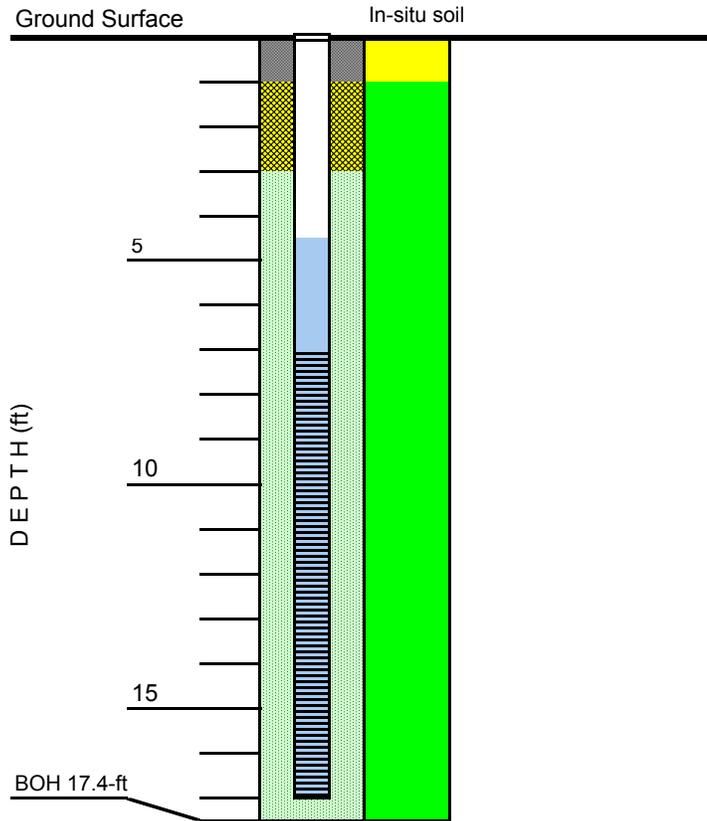


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-02
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-03	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	7.37
LOCATION:	JERSEY CITY, NJ	GROUNDWATER:	2.87
		TOP OF WELL SCREEN:	0.37
DEPTH TO GROUNDWATER (FT):	4.5	BOTTOM OF WELL SCREEN:	-9.63

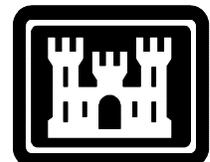


LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

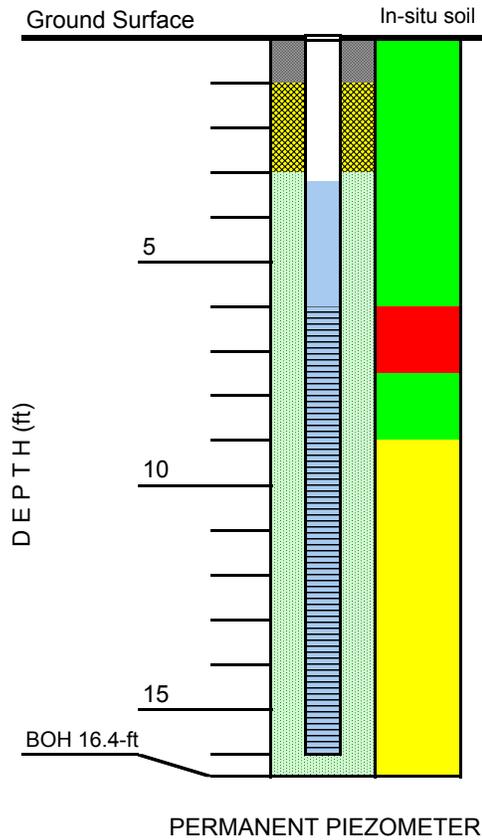


USACE - Baltimore District

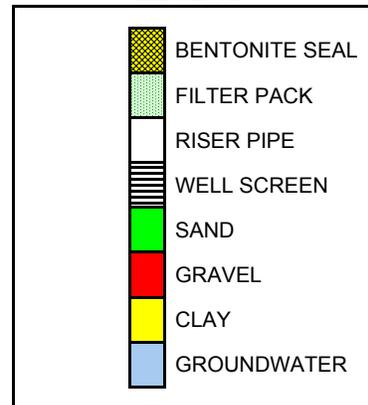
PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-03
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-04	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	5.04
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	1.84
		TOP OF WELL SCREEN:	-0.96
DEPTH TO GROUNDWATER (FT):	3.2	BOTTOM OF WELL SCREEN:	-10.96

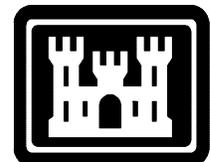


LEGEND



Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

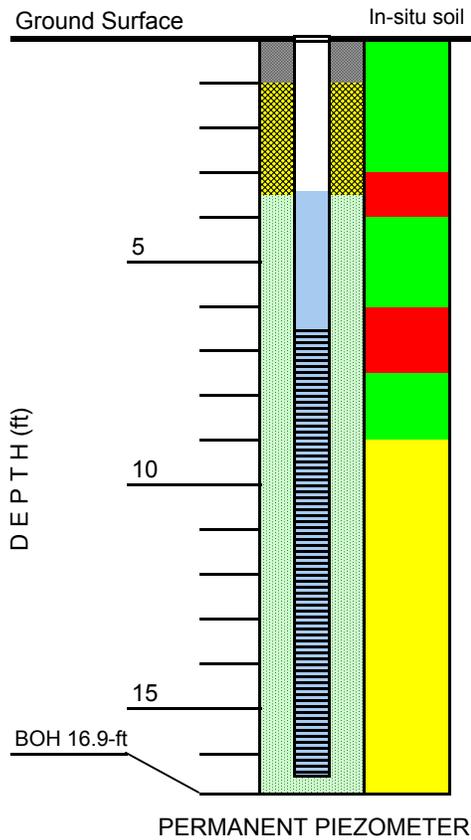


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-04
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-05	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	9.78
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	6.33
		TOP OF WELL SCREEN:	3.28
DEPTH TO GROUNDWATER (FT):	3.45	BOTTOM OF WELL SCREEN:	-6.72



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

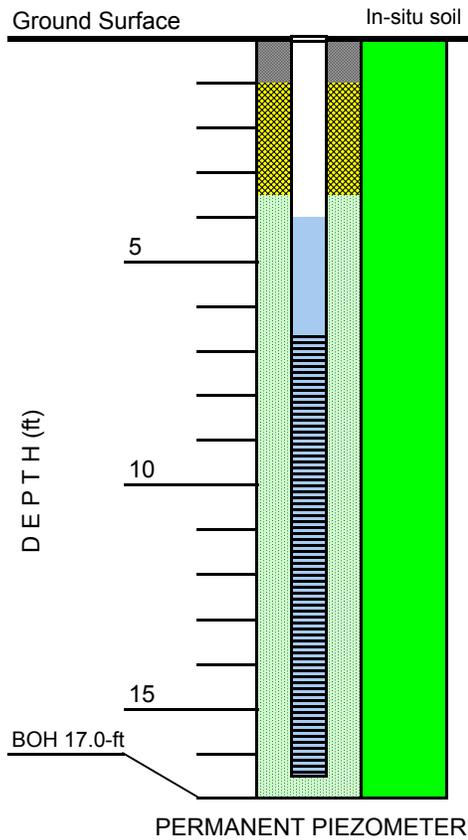


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-05
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-06	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	9.78
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	5.76
		TOP OF WELL SCREEN:	3.18
DEPTH TO GROUNDWATER (FT):	4.02	BOTTOM OF WELL SCREEN:	-6.82



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

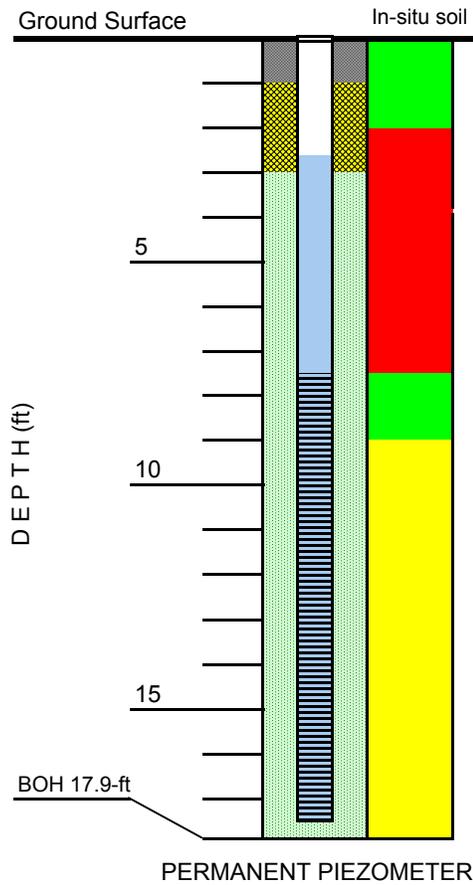


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK	HOLE NO.: LSP-03-06
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-07	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	6.53
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	3.93
		TOP OF WELL SCREEN:	-0.97
DEPTH TO GROUNDWATER (FT):	2.6	BOTTOM OF WELL SCREEN:	-10.97



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

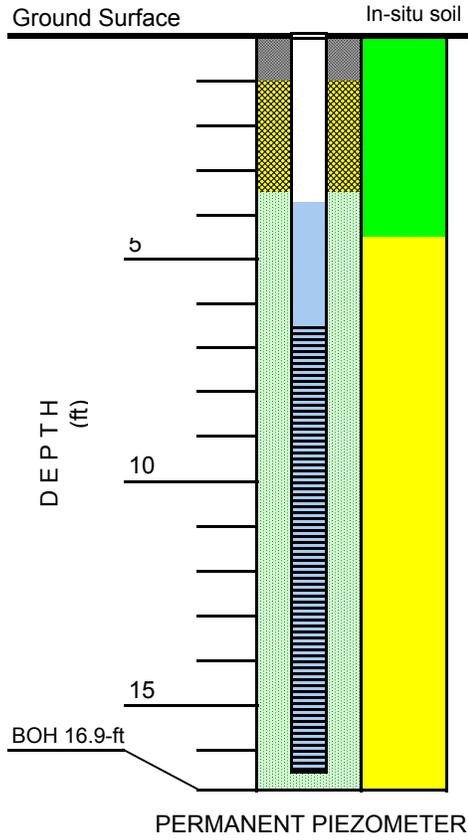


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-07
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-08	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	6.73
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	3.03
		TOP OF WELL SCREEN:	0.23
DEPTH TO GROUNDWATER (FT): ▼	3.7	BOTTOM OF WELL SCREEN:	-9.77



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

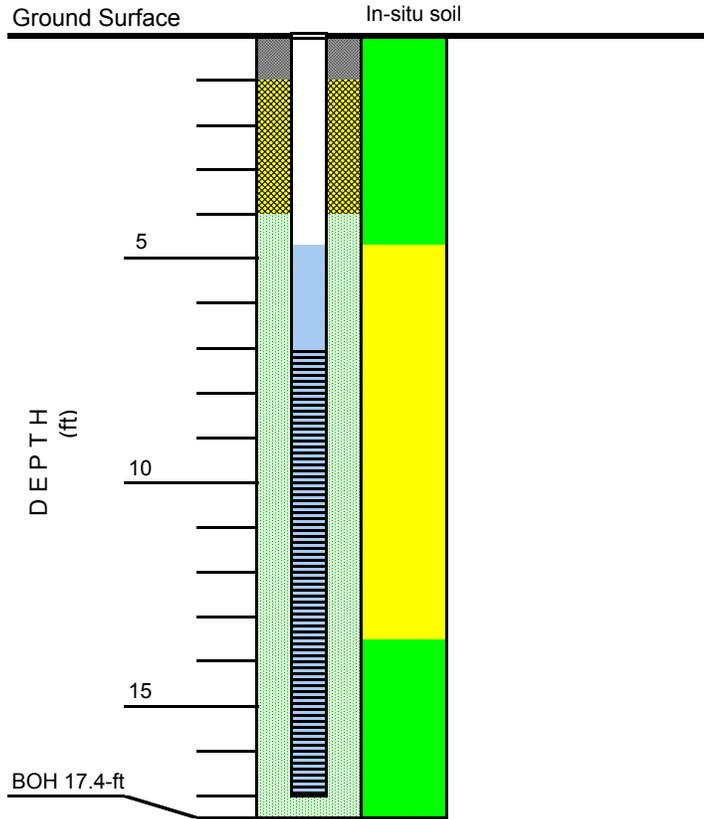


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK	HOLE NO.: LSP-03-08
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-09	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	11.59
LOCATION:	JERSEY CITY, NJ	GROUNDWATER:	6.89
		TOP OF WELL SCREEN:	4.59
DEPTH TO GROUNDWATER (FT):	4.7	BOTTOM OF WELL SCREEN:	-5.41

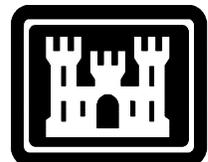


LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

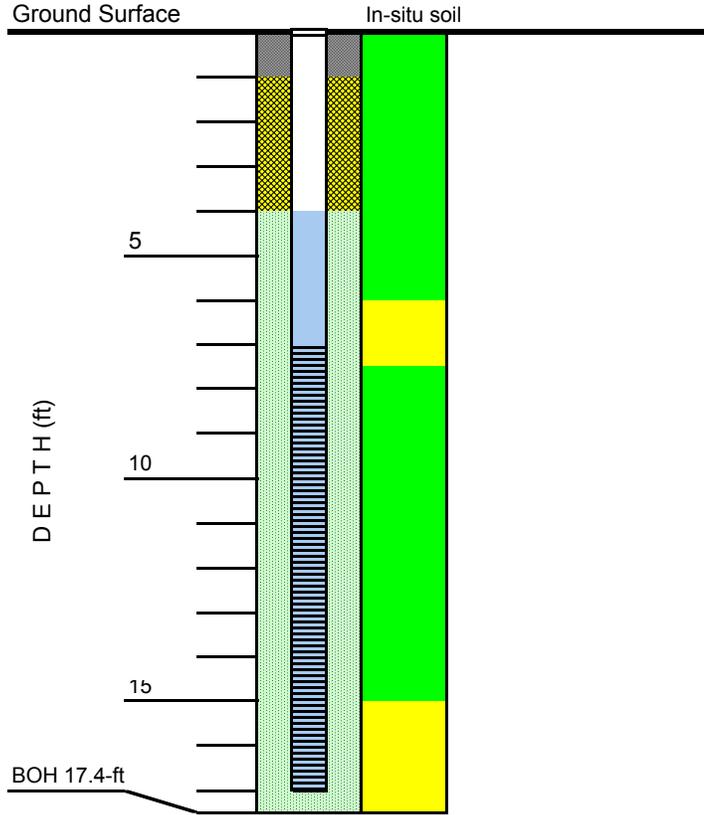


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK	HOLE NO.: LSP-03-09
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-10	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	9.05
LOCATION:	JERSEY CITY, NJ	GROUNDWATER:	5.05
		TOP OF WELL SCREEN:	2.05
DEPTH TO GROUNDWATER (FT):	4.0	BOTTOM OF WELL SCREEN:	-7.95



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

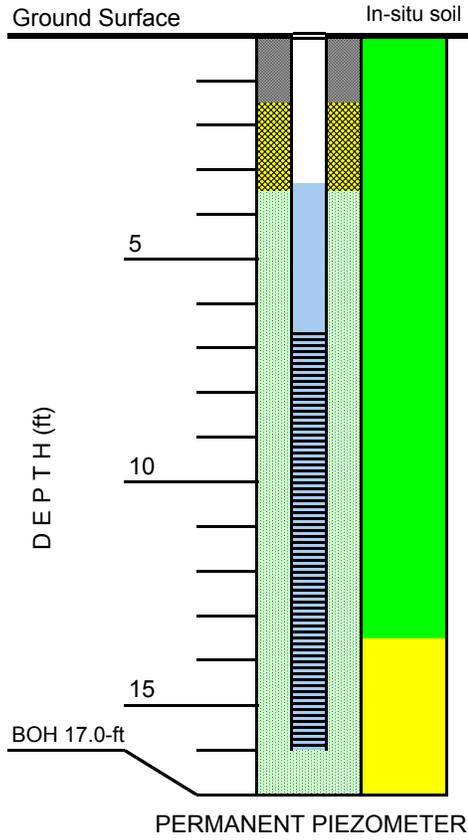


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-10
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-11	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	7.91
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	4.71
		TOP OF WELL SCREEN:	1.31
DEPTH TO GROUNDWATER (FT):	3.2	BOTTOM OF WELL SCREEN:	-8.69



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

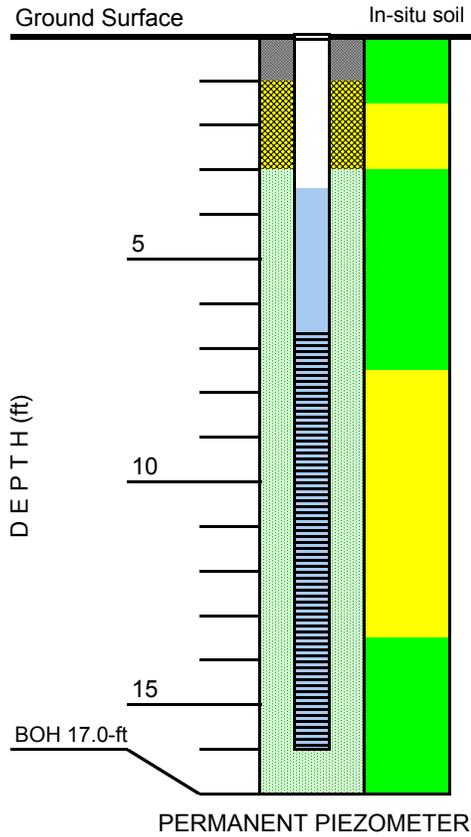


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-11
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PIEZOMETER CONSTRUCTION SCHEMATIC

DRILL HOLE NUMBER LSP-03-12		ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	8.70
LOCATION:	JERSEY CITY, NJ	GROUNDWATER:	5.30
		TOP OF WELL SCREEN:	2.10
GROUNDWATER DEPTH (FT):	▼ 3.4	BOTTOM OF WELL SCREEN:	-7.90



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER



Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

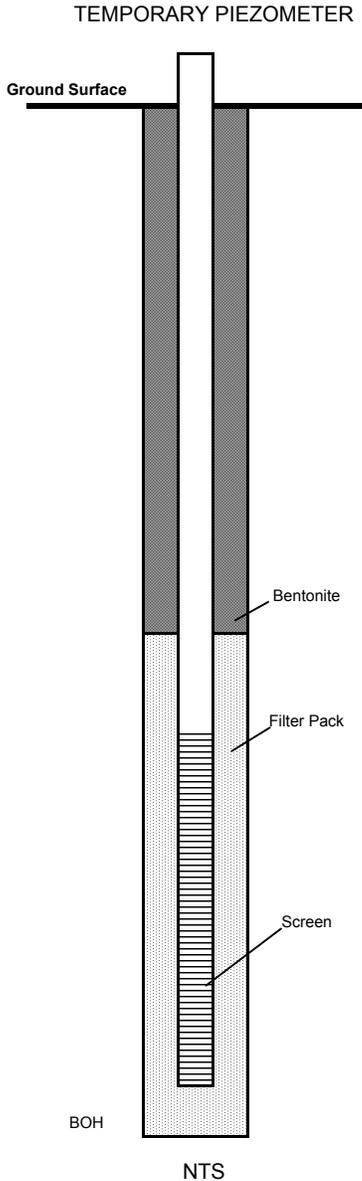
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PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-12
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APPENDIX G
TEMPORARY PIEZOMETER AS-BUILT RECORDS

AS BUILT MONITORING WELL RECORD

HOLE NUMBER:	LSP-03-17	LOCATION:	Jersey City, NJ	DRILLER:	Bobby Creamer
PROJECT:	Liberty State Park	ELEVATIONS (FT MSL)		DEPTH TO GW (FT)*:	3.0'
DATE WELL COMPLETED:	9/7/2003	SURFACE:	6.80'	DRILLING METHOD:	Augers
DATE DEVEL. COMPLETED:	9/9/2003	TOP OF PVC CASING:	N/A	DEVELOPMENT METHOD:	
INSPECTOR:	W. E. Shipley	TOP OF OUTER CASING:	N/A		Actuator Pumping



COORDINATES:	NJ State Plane 2900 NAD83
	N 682979.20081
	E 616986.62282
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	3.0'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH OF SEAL:	3.0'
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	6.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.0'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	16.4'

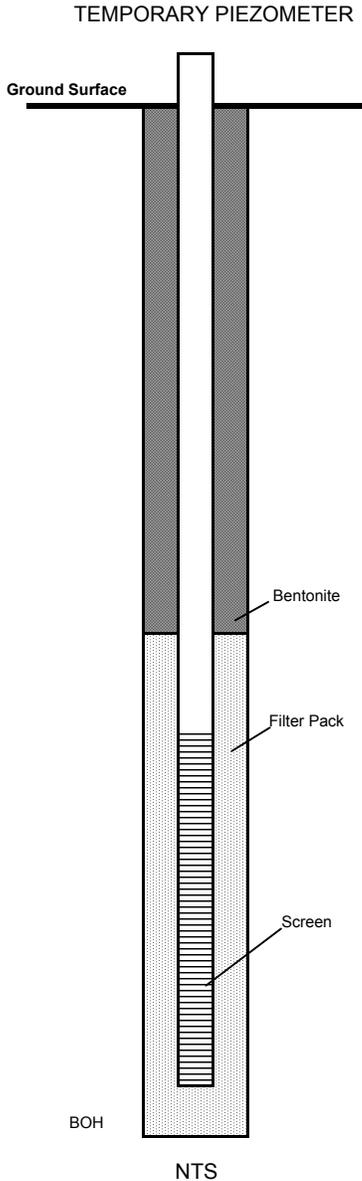
* Depth to groundwater measured relative to ground surface



PROJECT: Liberty State Park, Jersey City, NJ	USACE - Baltimore District HOLE NO.: LSP-03-17
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AS BUILT MONITORING WELL RECORD

HOLE NUMBER:	LSP-03-19	LOCATION:	Jersey City, NJ	DRILLER:	Bobby Creamer
PROJECT:	Liberty State Park	ELEVATIONS (FT MSL)		DEPTH TO GW (FT)*:	4.3'
DATE WELL COMPLETED:	9/5/2003	SURFACE:	7.38'	DRILLING METHOD:	Augers
DATE DEVEL. COMPLETED:	9/9/2003	TOP OF PVC CASING:	N/A	DEVELOPMENT METHOD:	
INSPECTOR:	W. E. Shipley	TOP OF OUTER CASING:	N/A		Actuator Pumping



COORDINATES:	NJ State Plane 2900 NAD83
	N 682477.62098
	E 617933.68717
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	4.0'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	4.0'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	7.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	17.0'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	17.4'

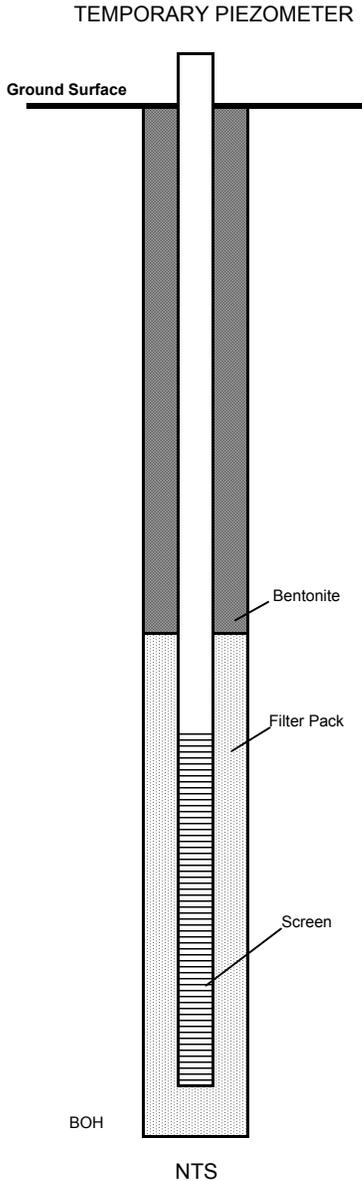
* Depth to groundwater measured relative to ground surface



PROJECT: Liberty State Park, Jersey City, NJ	USACE - Baltimore District HOLE NO.: LSP-03-19
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AS BUILT MONITORING WELL RECORD

HOLE NUMBER:	LSP-03-24	LOCATION:	Jersey City, NJ	DRILLER:	Bobby Creamer
PROJECT:	Liberty State Park	ELEVATIONS (FT MSL)		DEPTH TO GW (FT)*:	4.8'
DATE WELL COMPLETED:	8/28/2003	SURFACE:	10.31'	DRILLING METHOD:	Augers
DATE DEVEL. COMPLETED:	9/12/2003	TOP OF PVC CASING:	N/A	DEVELOPMENT METHOD:	
INSPECTOR:	W. E. Shipley	TOP OF OUTER CASING:	N/A	Actuator Pumping	



COORDINATES:	NJ State Plane 2900 NAD83
	N 682189.16123
	E 617249.39812
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	5.0'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	5.0'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	8.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	18.0'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	18.4'

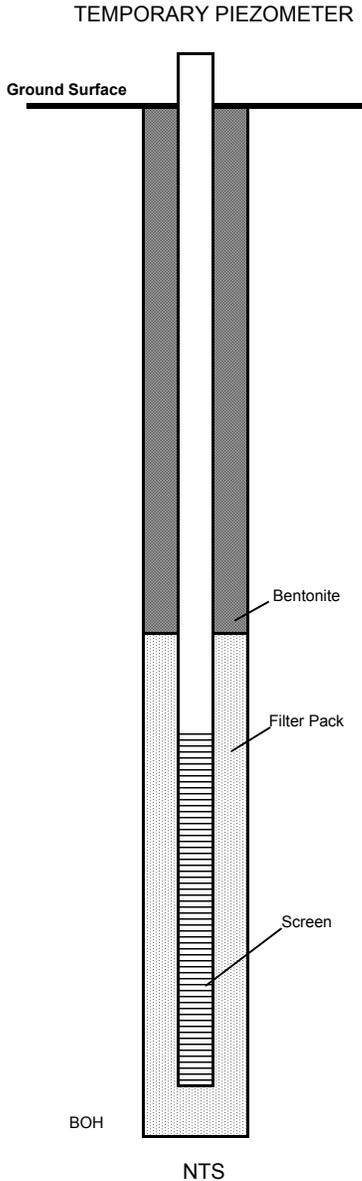
* Depth to groundwater measured relative to ground surface



PROJECT: Liberty State Park, Jersey City, NJ	USACE - Baltimore District HOLE NO.: LSP-03-24
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AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-28	LOCATION: Jersey City, NJ	DRILLER: Bobby Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 5.4'
DATE WELL COMPLETED: 9/4/2003	SURFACE: 7.45'	DRILLING METHOD: Augers
DATE DEVEL. COMPLETED: 9/15/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W. E. Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



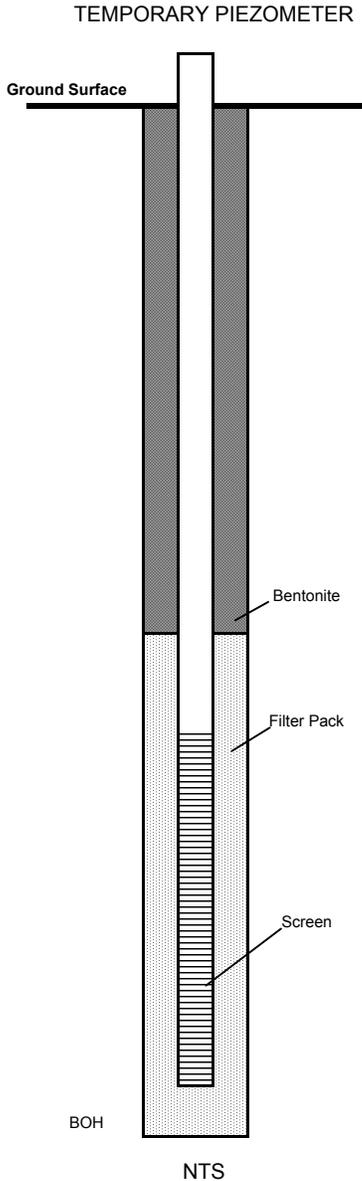
COORDINATES:	NJ State Plane 2900 NAD83
	N 681500.67515
	E 617241.07892
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	5.0'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	5.0'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	8.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	18.0'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	18.4'

* Depth to groundwater measured relative to ground surface



AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-31	LOCATION: Jersey City, NJ	DRILLER: Bobby Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 3.1'
DATE WELL COMPLETED: 8/28/2003	SURFACE: 7.16'	DRILLING METHOD: Augers
DATE DEVEL. COMPLETED: 9/8/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W. E. Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane 2900 NAD83
	N 681126.57585
	E 616796.39857
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	3.0'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	3.0'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	6.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	16.0'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	16.4'

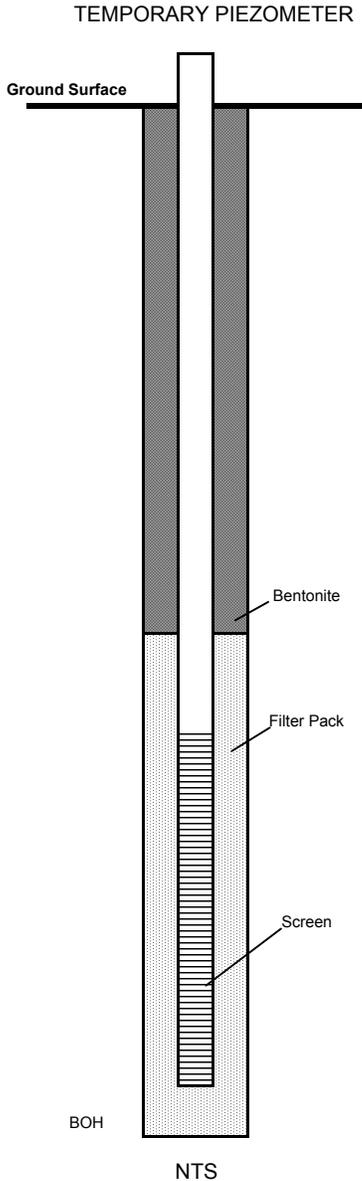
* Depth to groundwater measured relative to ground surface



PROJECT: Liberty State Park, Jersey City, NJ	USACE - Baltimore District HOLE NO.: LSP-03-31
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AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-32	LOCATION: Jersey City, NJ	DRILLER: Bobby Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 5.6'
DATE WELL COMPLETED: 8/28/2003	SURFACE: 8.15'	DRILLING METHOD: Augers
DATE DEVEL. COMPLETED: 9/9/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W. E. Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane 2900 NAD83
	N 680562.33551
	E 614827.67803
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	5.5'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	5.5'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	8.5'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	18.5'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	18.9'

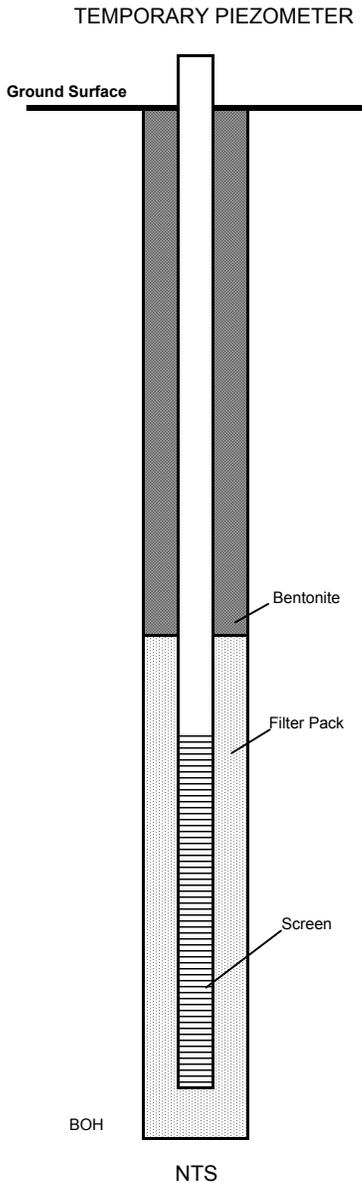
* Depth to groundwater measured relative to ground surface



PROJECT: Liberty State Park, Jersey City, NJ	USACE - Baltimore District HOLE NO.: LSP-03-32
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AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-35	LOCATION: Jersey City, NJ	DRILLER: Bobby Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 10.1'
DATE WELL COMPLETED: 8/27/2003	SURFACE: 12.46'	DRILLING METHOD: Augers
DATE DEVEL. COMPLETED: 9/12/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W. E. Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES: **NJ State Plane 2900 NAD83**

N 681672.48762
 E 613786.85158
 STICK UP TO TOP OF SURFACE CASING: _____
 STICK UP TO TOP OF RISER PIPE: 2.5'

TYPE OF SURFACE SEAL: Bentonite
 DEPTH OF SEAL: 10.0'

I.D. OF SURFACE CASING: N/A
 TYPE OF SURFACE CASING: N/A

I.D. OF RISER PIPE: 2"
 TYPE OF RISER PIPE: PVC

TYPE OF GROUT: Bentonite

DEPTH TO TOP OF SEAL: Surface
 TYPE OF SEAL: Bentonite

DEPTH TO TOP OF FILTER PACK: 10.0'
 TYPE OF FILTER PACK: #1 sand

DEPTH TO TOP OF SCREEN: 12.0'
 TYPE OF SCREEN: PVC
 SLOT SIZE AND LENGTH: 10 slot 10'
 I.D. OF SCREEN: 2"

DEPTH TO BOTTOM OF SCREEN: 22.0'
 BOREHOLE DIAMETER: 7.25"

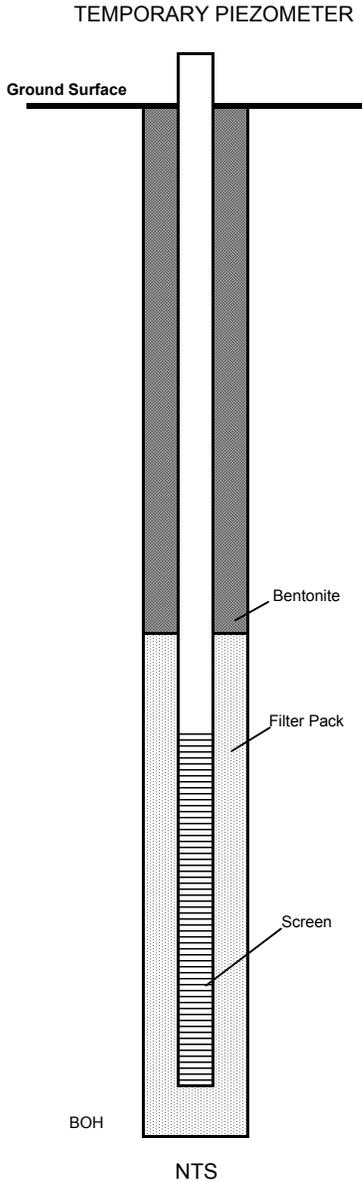
BOTTOM OF HOLE: 22.4'

* Depth to groundwater measured relative to ground surface



AS BUILT MONITORING WELL RECORD

HOLE NUMBER: LSP-03-38	LOCATION: Jersey City, NJ	DRILLER: Bobby Creamer
PROJECT: Liberty State Park	ELEVATIONS (FT MSL)	DEPTH TO GW (FT)*: 9.6'
DATE WELL COMPLETED: 8/27/2003	SURFACE: 9.44'	DRILLING METHOD: Augers
DATE DEVEL. COMPLETED: 9/12/2003	TOP OF PVC CASING: N/A	DEVELOPMENT METHOD:
INSPECTOR: W. E. Shipley	TOP OF OUTER CASING: N/A	Actuator Pumping



COORDINATES:	NJ State Plane 2900 NAD83
	N 680654.67995
	E 615601.34192
STICK UP TO TOP OF SURFACE CASING:	2.5'
STICK UP TO TOP OF RISER PIPE:	2.5'
TYPE OF SURFACE SEAL:	Bentonite
DEPTH OF SEAL:	4.0'
I.D. OF SURFACE CASING:	N/A
TYPE OF SURFACE CASING:	N/A
I.D. OF RISER PIPE:	2"
TYPE OF RISER PIPE:	PVC
TYPE OF GROUT:	Bentonite
DEPTH TO TOP OF SEAL:	Surface
TYPE OF SEAL:	Bentonite
DEPTH TO TOP OF FILTER PACK:	4.0'
TYPE OF FILTER PACK:	#1 sand
DEPTH TO TOP OF SCREEN:	7.0'
TYPE OF SCREEN:	PVC
SLOT SIZE AND LENGTH:	10 slot 10'
I.D. OF SCREEN:	2"
DEPTH TO BOTTOM OF SCREEN:	17.0'
BOREHOLE DIAMETER:	7.25"
BOTTOM OF HOLE:	17.4

* Depth to groundwater measured relative to ground surface

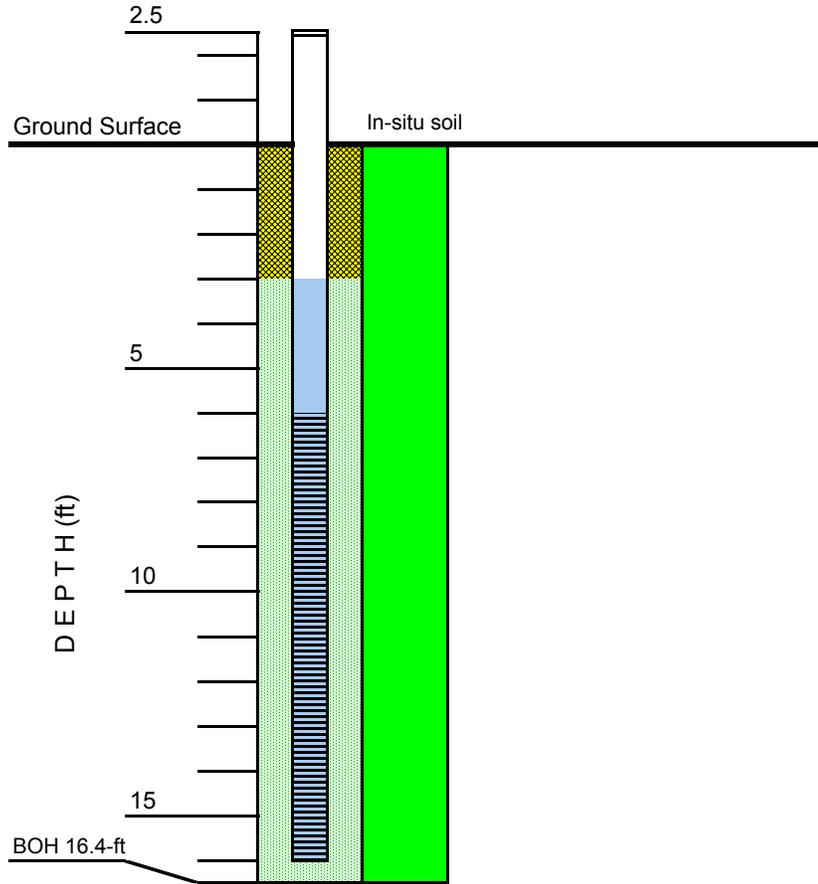


PROJECT: Liberty State Park, Jersey City, NJ	USACE - Baltimore District HOLE NO.: LSP-03-38
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APPENDIX H
TEMPORARY PIEZOMETER CONSTRUCTION SCHEMATICS

PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-17	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	6.80
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	3.80
		TOP OF WELL SCREEN:	0.80
DEPTH TO GROUNDWATER (FT):	3.0	BOTTOM OF WELL SCREEN:	-9.20



TEMPORARY PIEZOMETER

LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

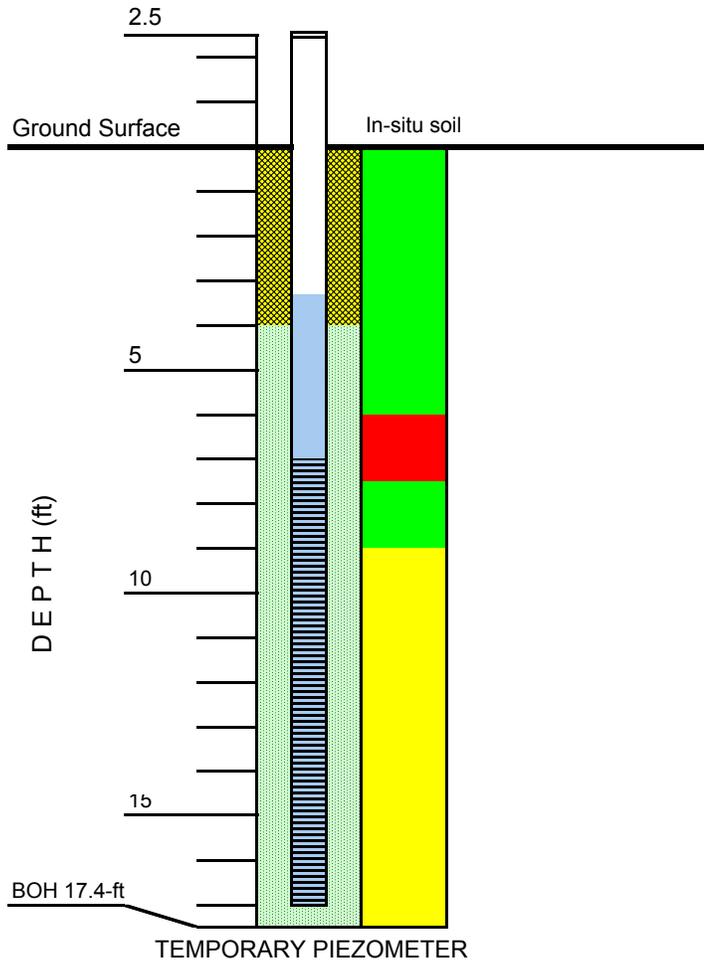


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-17
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER: LSP-03-19	ELEVATIONS (FT MSL)
PROJECT: LIBERTY STATE PARK	GROUND SURFACE: 7.38
LOCATION: JERSEY CITY, NJ	GROUNDWATER: 3.08
	TOP OF WELL SCREEN: 0.38
DEPTH TO GROUNDWATER (FT): 4.3	BOTTOM OF WELL SCREEN: -9.62



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

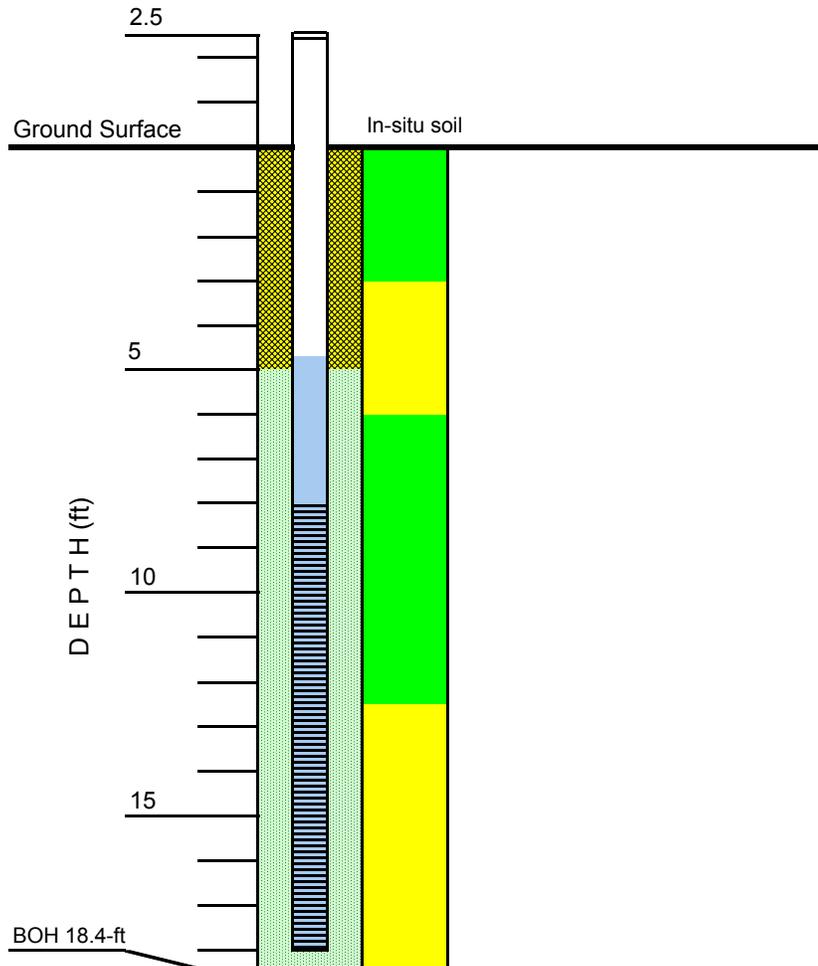


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-19
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-24	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	10.31
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	5.51
		TOP OF WELL SCREEN:	2.31
DEPTH TO GROUNDWATER (FT):	4.8	BOTTOM OF WELL SCREEN:	-7.69



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

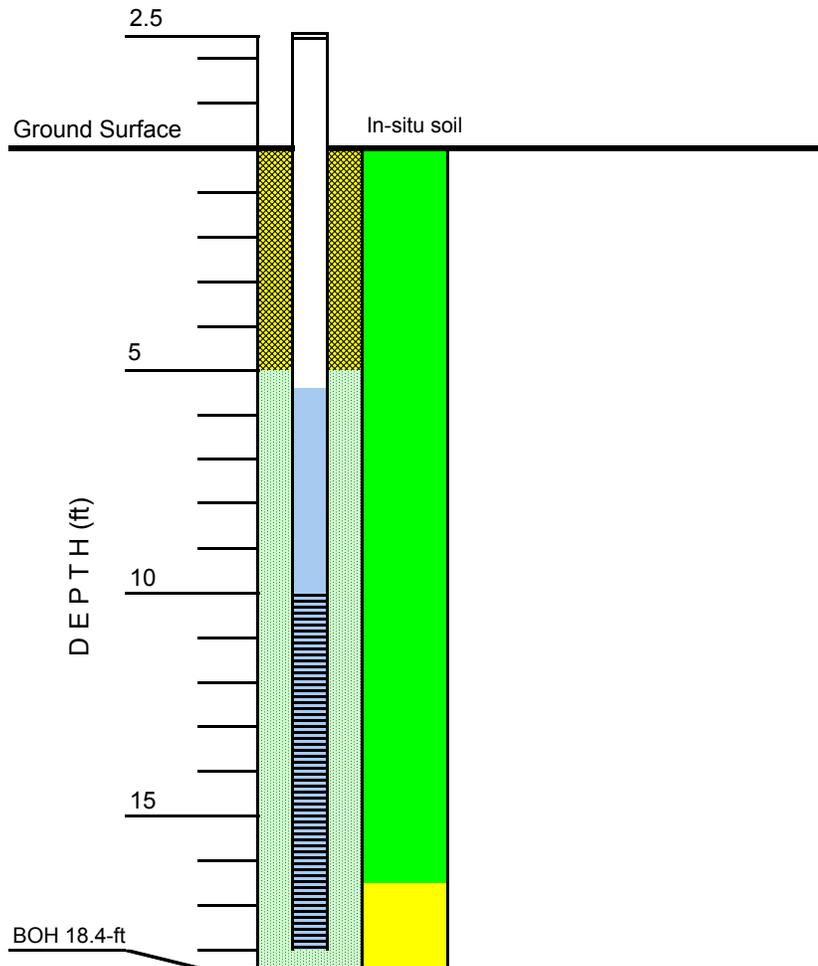


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-24
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-28	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	7.45
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	2.05
		TOP OF WELL SCREEN:	-0.55
DEPTH TO GROUNDWATER (FT):	5.4	BOTTOM OF WELL SCREEN:	-10.55



TEMPORARY PIEZOMETER

LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

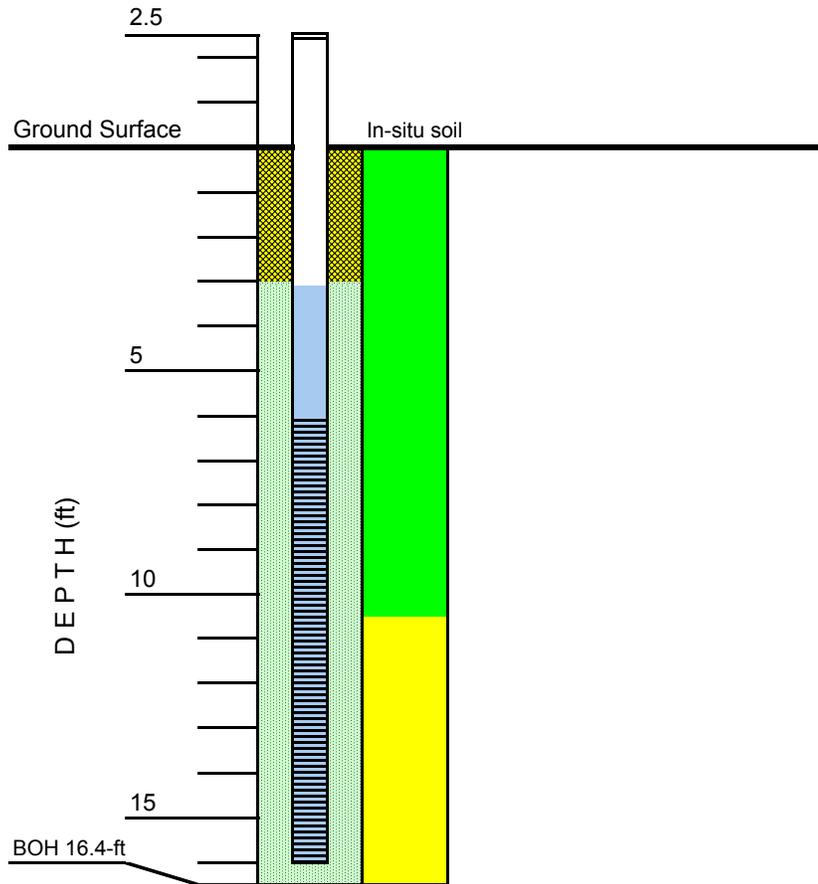


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-28
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-31	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	7.16
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	4.06
		TOP OF WELL SCREEN:	1.16
DEPTH TO GROUNDWATER (FT):	3.1	BOTTOM OF WELL SCREEN:	-8.84

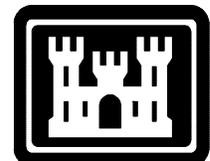


LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

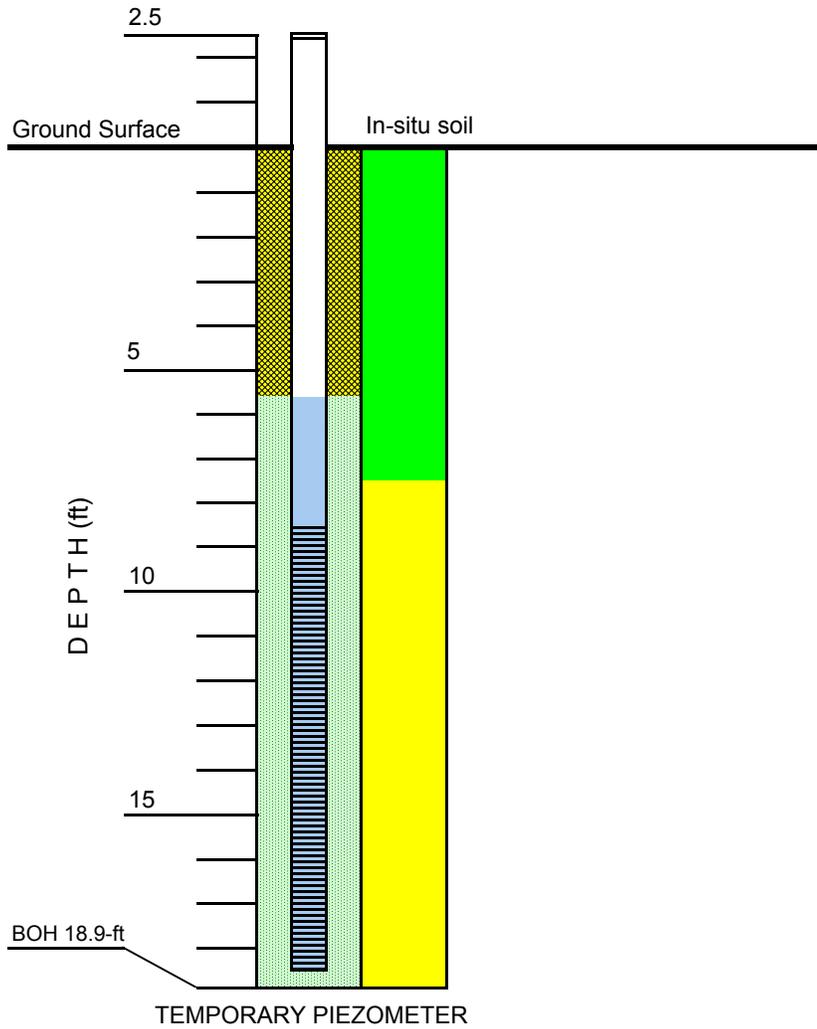


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PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-31
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-32	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	8.15
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	2.55
		TOP OF WELL SCREEN:	-0.35
DEPTH TO GROUNDWATER (FT):	5.6	BOTTOM OF WELL SCREEN:	-10.35



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

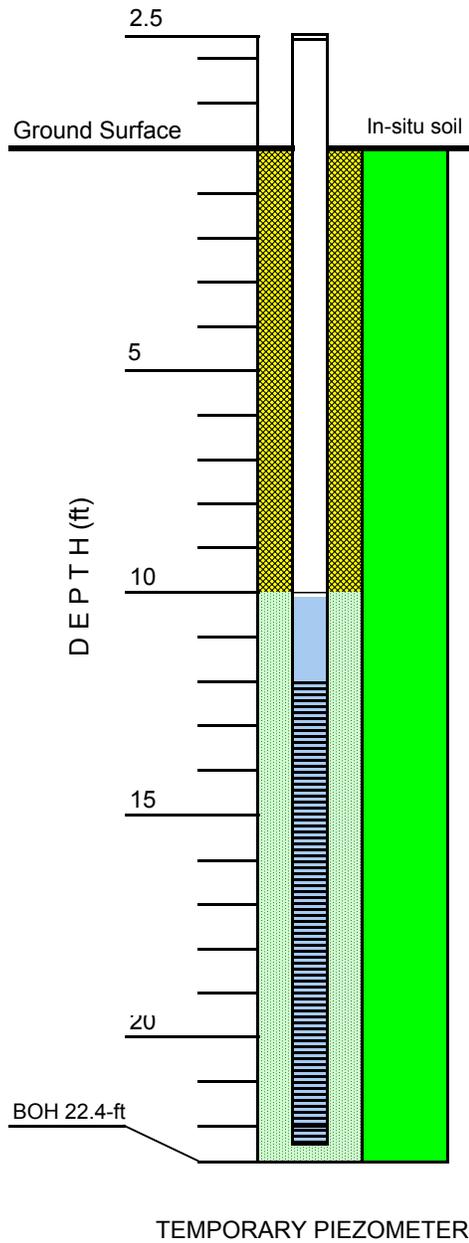


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PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-32
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-35	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	12.46
LOCATION:	JERSEY CITY, NJ	GROUNDWATER (24-hour reading):	2.36
		TOP OF WELL SCREEN:	2.46
DEPTH TO GROUNDWATER (FT):	10.1	BOTTOM OF WELL SCREEN:	-9.54



LEGEND

▨	BENTONITE SEAL
▨	FILTER PACK
▨	RISER
▨	WELL SCREEN
▨	SAND
▨	GRAVEL
▨	CLAY
▨	GROUNDWATER

Notes:
 2. Groundwater reading taken at 24-hour after installation of piezometer.

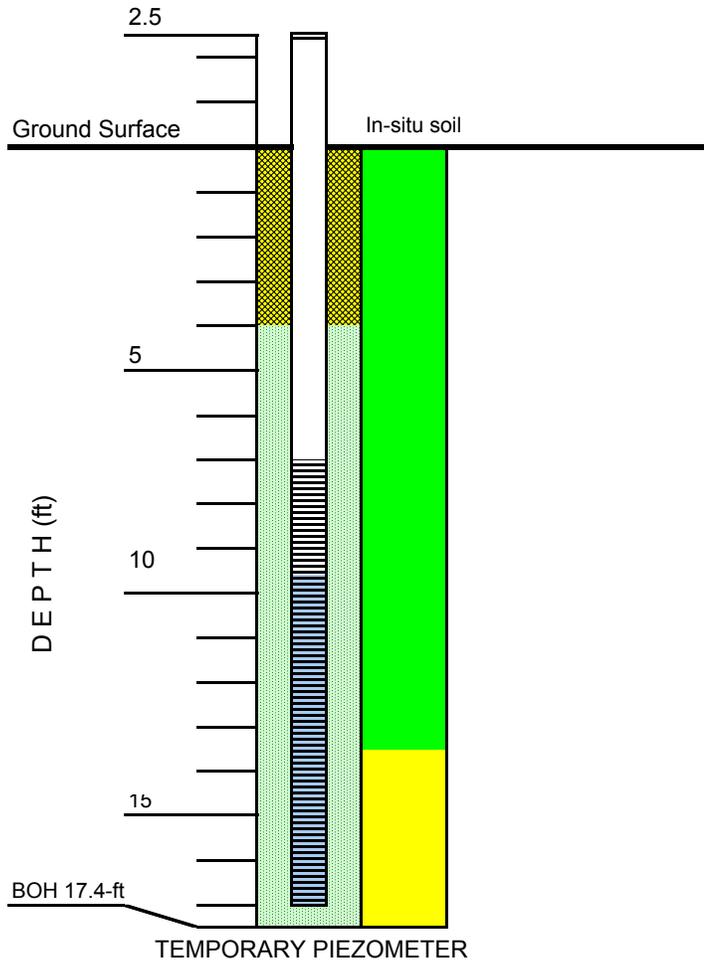


USACE - Baltimore District

PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-35
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PIEZOMETER CONSTRUCTION SCHEMATIC

HOLE NUMBER:	LSP-03-38	ELEVATIONS (FT MSL)	
PROJECT:	LIBERTY STATE PARK	GROUND SURFACE:	9.44
LOCATION:	JERSEY CITY, NJ	GROUNDWATER:	-0.16
		TOP OF WELL SCREEN:	2.44
DEPTH TO GROUNDWATER (FT):	9.6	BOTTOM OF WELL SCREEN:	-7.56



LEGEND

	BENTONITE SEAL
	FILTER PACK
	RISER PIPE
	WELL SCREEN
	SAND
	GRAVEL
	CLAY
	GROUNDWATER

Notes:

1. Depth to groundwater measured relative to ground surface.
2. Groundwater reading taken at 24-hour after installation of piezometer.

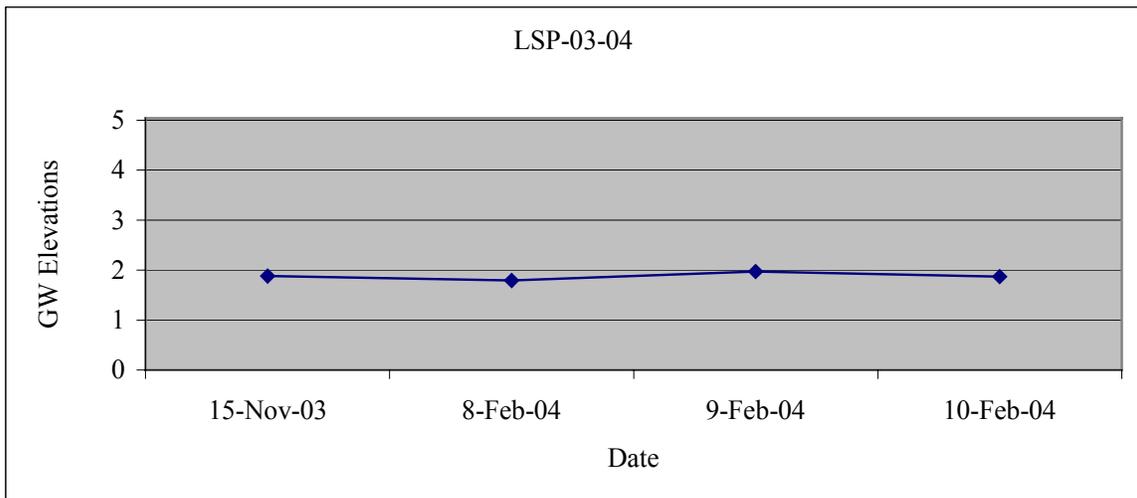
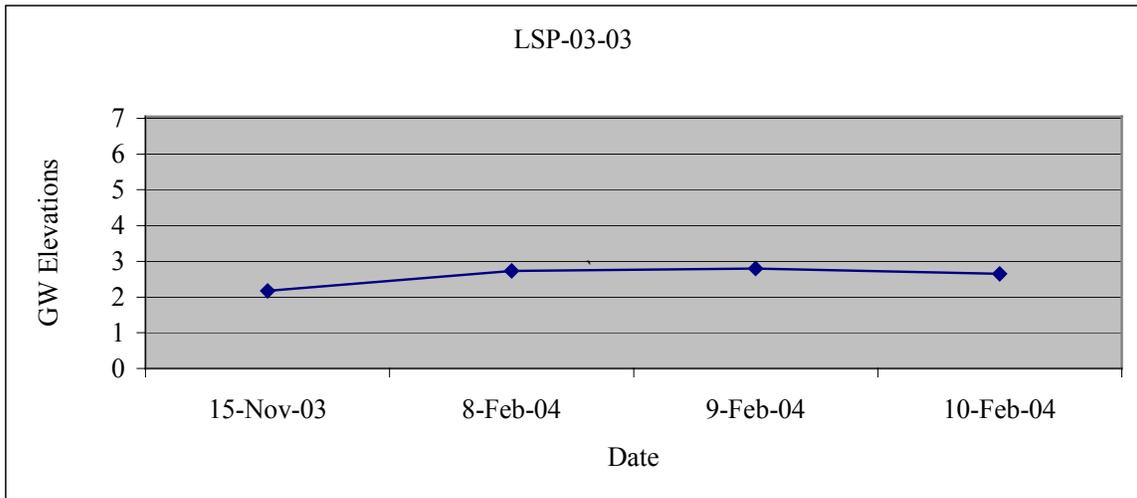
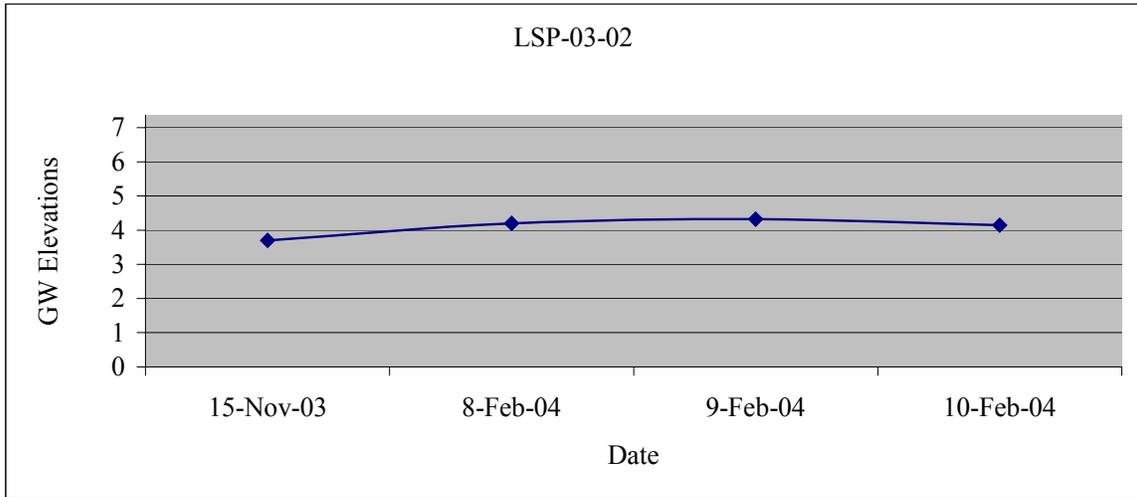


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PROJECT: LIBERTY STATE PARK, Jersey City, NJ	HOLE NO.: LSP-03-38
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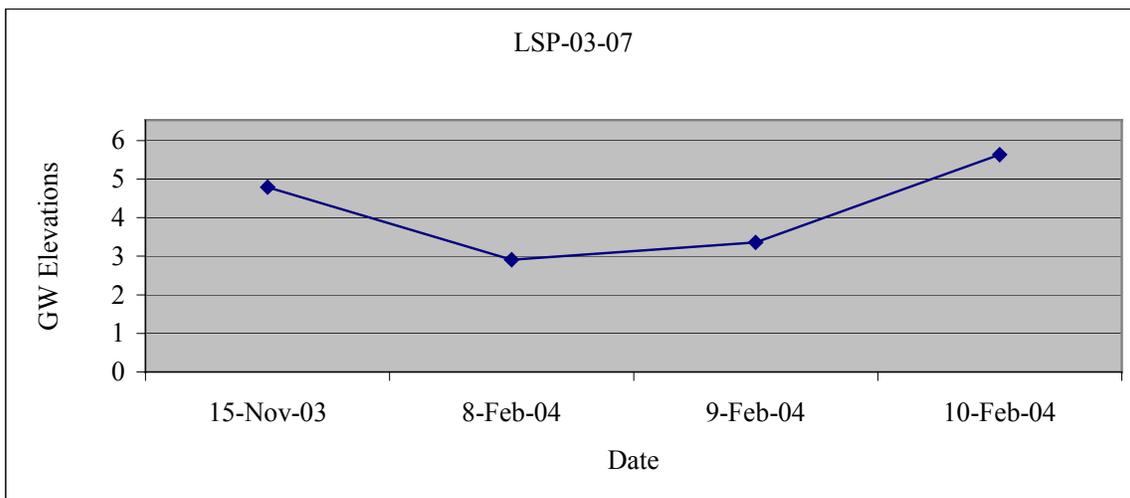
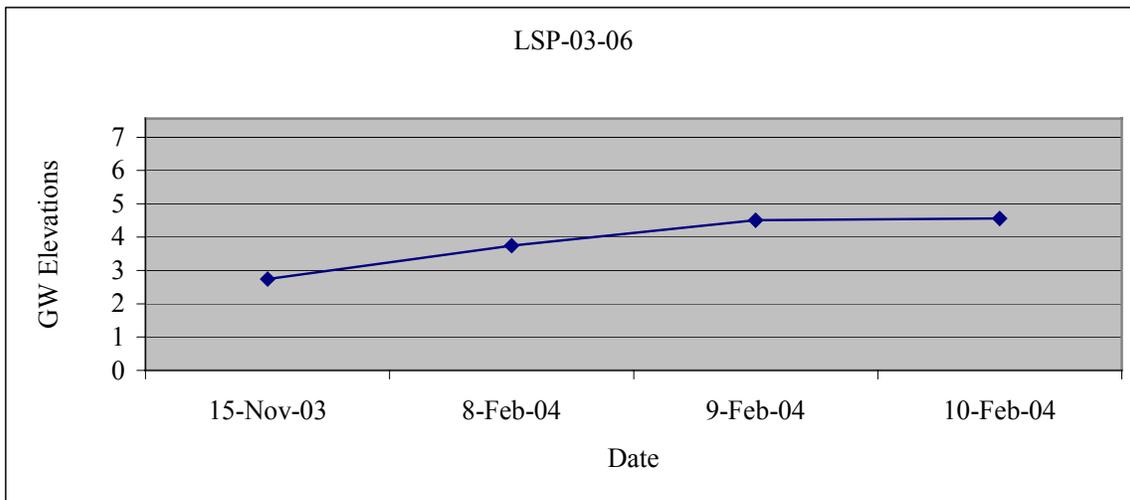
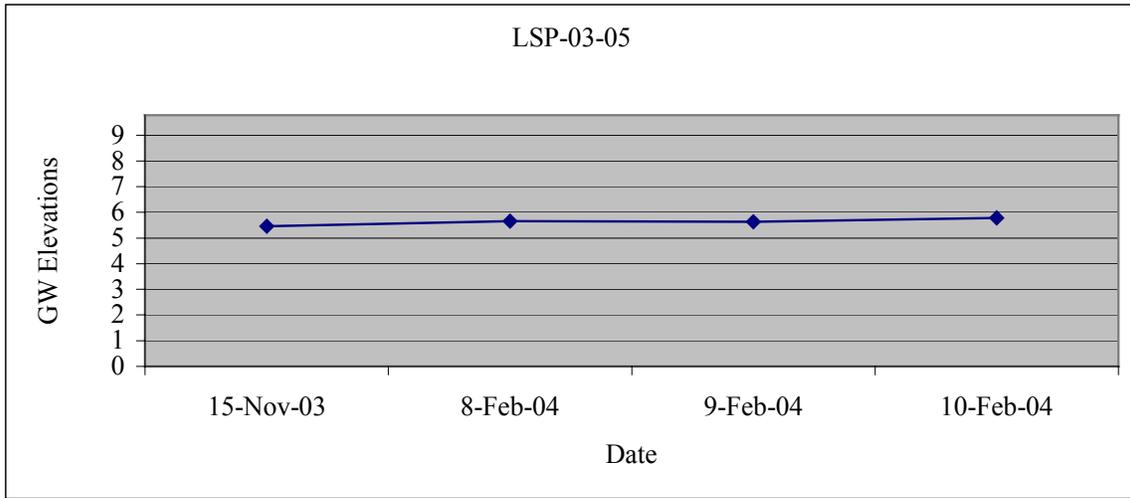
APPENDIX I
CHANGES IN GROUNDWATER ELEVATIONS IN
PERMANENT PIEZOMETERS

**LIBERTY STATE PARK
CHANGES IN GROUNDWATER ELEVATIONS
PERMANENT PIEZOMETERS**



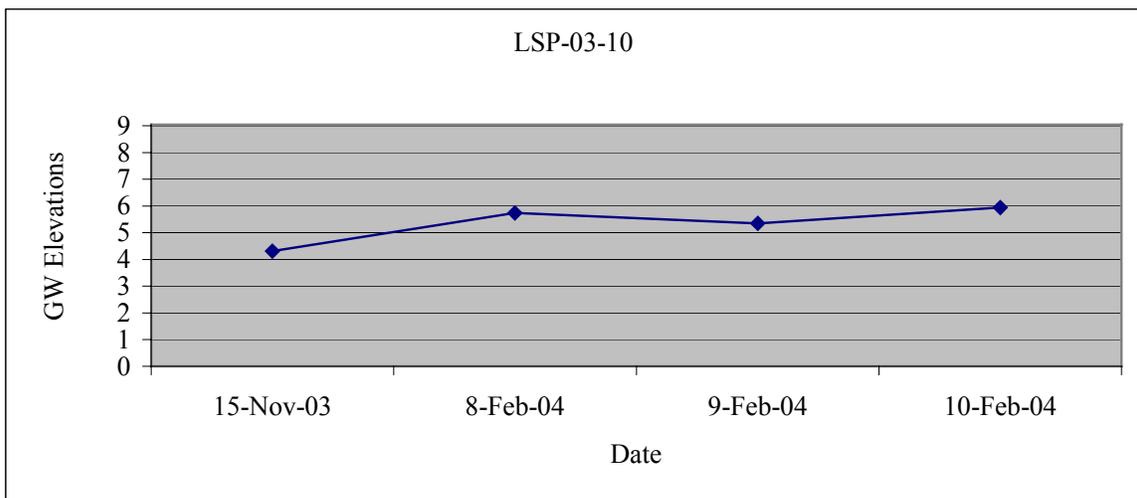
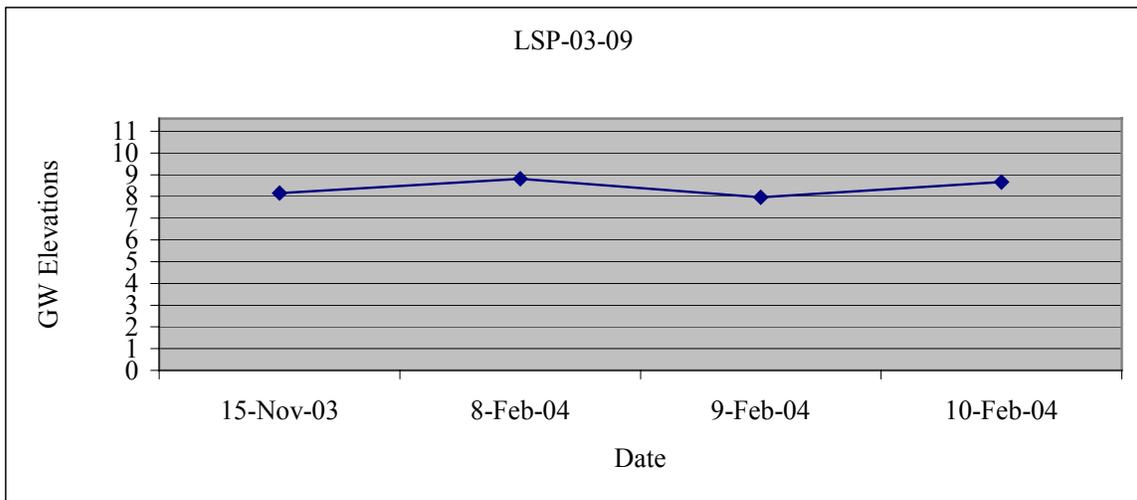
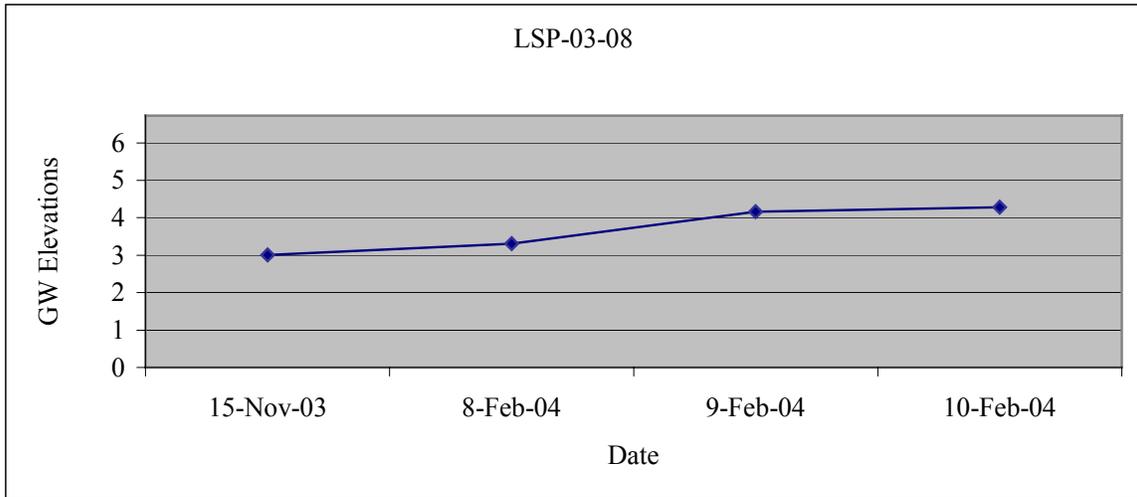
Note: Top of Graph Represents Top of Drill Hole Elevation

**LIBERTY STATE PARK
CHANGES IN GROUNDWATER ELEVATIONS
PERMANENT PIEZOMETERS**



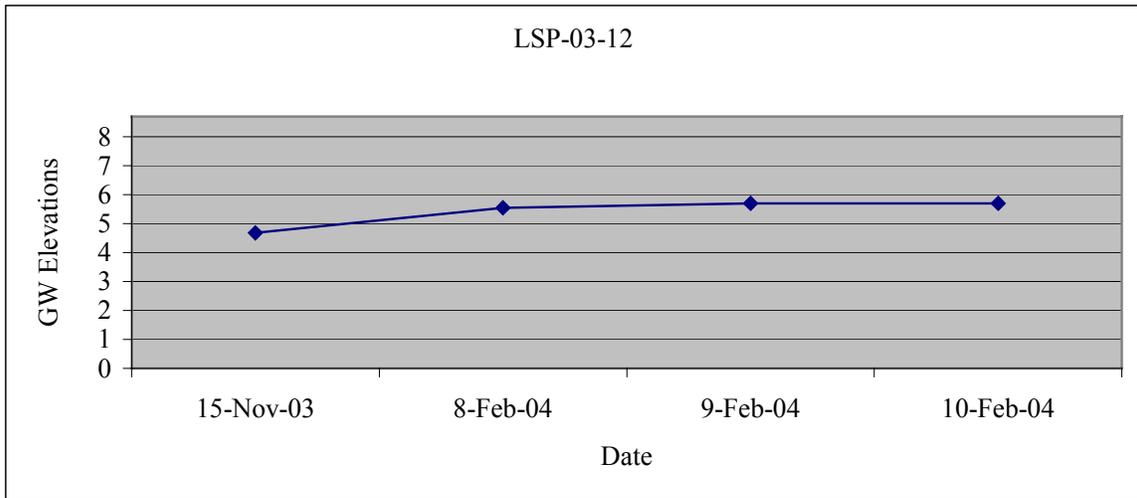
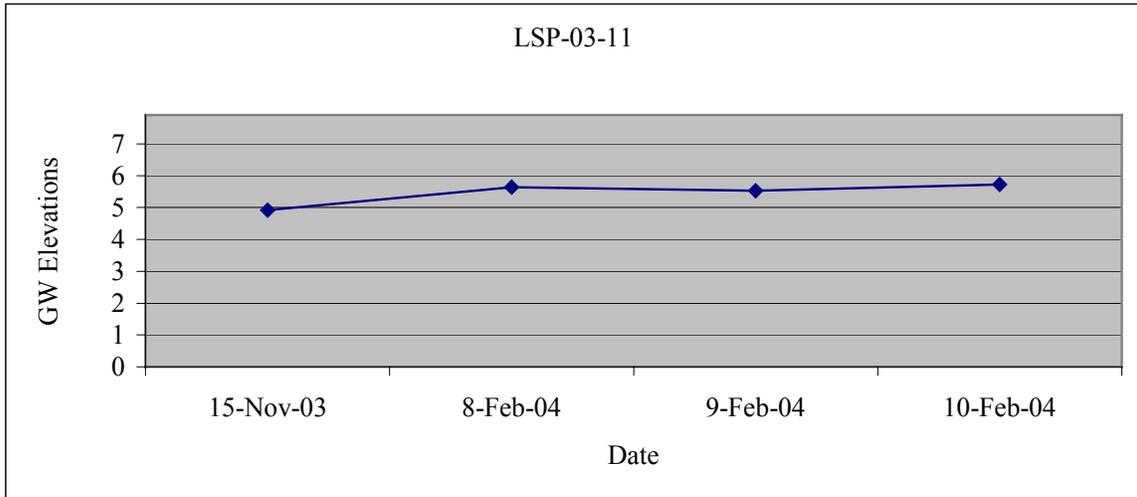
Note: Top of Graph Represents Top of Drill Hole Elevation

**LIBERTY STATE PARK
CHANGES IN GROUNDWATER ELEVATIONS
PERMANENT PIEZOMETERS**



Note: Top of Graph Represents Top of Drill Hole Elevation

**LIBERTY STATE PARK
CHANGES IN GROUNDWATER ELEVATIONS
PERMANENT PIEZOMETERS**



Note: Top of Graph Represents Top of Drill Hole Elevation