Appendix V
Clay Test Results for Existing Phase 6 Liner Construction Documentation Report

Table 4
Clay Bulk Sample Test Results
Phase 6 East Liner Construction
ONYX Emerald Park Landfill, Muskego, WI

Sample No.	Sample Date	Atterberg Limits			P200 (%)	< 0.005mm (%)	Modified Proctor		Sample Location	Classification
		LL	PL	PI			Maximum Dry Density (pcf)	Optimum Moisture Content (%)		
CL - 1	6/3/2005	---	---	---	---	---	111.5	16.0	N5300, E5900 Source	---
CL - 2	6/10/2005	50	23	27	96.9	67.0	115.0	11.0	N4750, E6050 Lift 4	CH
CL - 3	6/16/2005	50	20	30	98.6	75.2	118.0	13.0	N5400, E5950 Lift 4	CH
CL - 4	6/21/2005	50	21	29	96.7	75.9	117.5	14.0	N5800, E6050 Lift 2	CH
CL - 5	6/24/2005	51	20	31	98.9	78.6	116.5	11.0	N5650, E5850 Lift 2	CH
CL - 6	6/25/2005	55	22	33	99.3	80.2	112.0	12.0	N5200, E5850 Source	CH
CL - 7	7/1/2005	51	21	30	99.0	85.8	115.0	13.5	N5250, E5800 Source	CH
CL - 8	7/1/2005	45	19	26	98.4	71.9	117.5	13.5	Stockpile Composite	CL
CL - 9	7/8/2005	46	19	27	98.7	76.5	118.5	11.0	N5200, E5850 Lift 5	CL
CL - 10	7/8/2005	45	18	27	97.2	74.9	116.0	13.0	N5100, E5700 Source	CL
Summary:										
	minimum	45	18	26	96.7	67.0	111.5	11.0	---	---
	maximum	55	23	33	99.3	85.8	118.5	16.0	---	---
	average	49	20	29	98.2	76.2	115.8	12.8	---	---
Specification										
	average	>=25	---	>=12	---	---	---	---	---	---
	minimum	20	---	10	50.0	---	---	---	---	---

Notes:
1. LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index
2. CH = High Plasticity Clay, CL = Lean Clay

By: DTL
Checked: CFS
File: K:\PROJECTS\587898\CQA\Phase 6 East CQA Report\Tables\Clay Sampling Summaries (bulk and tubes) 8-19\Bulk
Date: 8/23/2005

Table 5
Compacted Clay Undisturbed Soil Sample Test Results
Phase 6 East Liner Construction
ONYX Emerald Park Landfill, Muskego, WI

Sample Date	Sample No.	Sample Location North	Sample Location East	Lift No.	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Dry Density (pcf)	Moisture Content (%)	P200 (%)	< 0.005mm (%)	Hydraulic Conductivity	Classification
6/8/05	ST - 1	4900	6000	2	48	21	27	106.9	23.7	96.3	68.8	1.21E-08	CL
6/9/05	ST - 2	5100	6050	4	49	21	28	104.7	25.1	99.1	76.1		CL
6/10/05	ST - 3	4750	6050	4	50	21	29	101.9	24.9	99.2	73.8	1.68E-08	CH
6/10/05	ST - 4	5100	5950	6	48	22	26	107.3	20.4	98.4	70.3		CL
6/11/05	ST - 5	4800	5950	6	50	22	28	108.2	21.1	99.2	78.1		CH
6/15/05	ST - 6	5200	6000	2	44	20	24	108.7	19.4	97.4	67.2		CL
6/16/05	ST - 7	5400	6050	4	48	22	26	100.4	26.5	98.0	77.5		CL
6/20/05	ST - 8	5400	5950	6	49	18	31	107.9	20.8	99.2	72.5	2.85E-08	CL
6/21/05	ST - 9	5550	6000	2	51	21	30	108.1	20.1	99.2	71.7	9.80E-09	CH
6/21/05	ST - 10	5850	6050	2	50	21	29	105.9	23.2	71.4	44.5		CH
6/22/05	ST - 11	5700	6050	4	51	21	30	102.3	24.5	94.9	72.5	2.57E-08	CH
6/23/05	ST - 12	5350	6050	8	49	20	29	100.4	26.8	93.2	54.8		CL
6/24/05	ST - 13	5650	5850	2	49	21	28	106.7	22.9	83.2	54.9		CL
6/28/05	ST - 14	5800	5900	4	49	20	29	104.8	27.6	78.8	46.8		CL
6/29/05	ST - 15	5350	5850	2	40	17	23	113.0	20.2	98.4	66.8	4.54E-08	CL
6/29/05	ST - 16	5800	6050	6	51	20	31	110.0	22.6	92.6	72.9		CH
6/29/05	ST - 17	5800	5850	6	50	20	30	104.4	22.8	97.0	74.3		CH
6/30/05	ST - 18	5650	6000	8	45	19	26	109.5	21.0	82.6	53.7		CL
7/1/05	ST - 19	5450	5900	4	46	19	27	110.8	21.2	94.1	57.8	6.62E-09	CL
7/5/05	ST - 20	5500	5850	6	47	20	27	108.7	23.4	98.6	68.1	1.91E-08	CL
7/5/05	ST - 21	4750	5850	2	47	19	28	102.2	27.5	97.6	73.2		CL
7/6/05	ST - 22	5850	5950	8	49	19	30	108.4	20.7	98.6	72.1	1.69E-08	CL
7/6/05	ST - 23	5050	5950	2	49	19	30	104.1	22.0	99.0	75.4		CL
7/8/05	ST - 24	5150	5900	4	48	18	30	110.6	21.4	98.2	69.2		CL
7/9/05	ST - 25	5650	5900	8	50	20	30	105.0	22.3	96.5	71.1		CH
7/9/05	ST - 26	5050	6000	8	48	19	29	107.2	21.9	98.8	74.2	2.99E-08	CL
7/11/05	ST - 27	5250	5850	6	52	21	31	105.1	18.8	99.2	75.2		CH
7/11/05	ST - 28	4900	5900	4	49	19	30	103.2	20.9	96.8	69.2		CL
7/12/05	ST - 29	5350	5900	8	49	20	29	113.1	19.0	98.8	77.2		CL
7/12/05	ST - 30	5100	5850	8	39	17	22	106.3	25.1	99.4	71.5	1.40E-08	CL
7/15/05	ST - 31	4900	5850	6	49	20	29	105.1	23.3	99.2	76.7	2.53E-08	CL
7/18/05	ST - 32	4800	5900	8	49	21	28	108.8	21.2	97.2	67.4		CL
Summary:													
	minimum				39	17	22	100.4	18.8	71.4	44.5	6.6E-09	---
	maximum				52	22	31	113.1	27.6	99.4	78.1	4.5E-08	---
	average				48	20	28	106.6	22.6	95.3	68.6	2.1E-08	---
Specification													
	average				>=25	---	>=12	---	---	---	---	---	---
	minimum				20	---	10	---	---	50.0	---	---	---
	maximum				---	---	---	---	---	---	---	1.0E-07	---

Notes:
1. LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index
2. CH = High Plasticity Clay, CL = Lean Clay

By: DTL
Checked: CFS
File: K:\PROJECTS\587898\CQA\Phase 6 East CQA Report\Tables\Clay Sampling Summaries (bulk and tubes) 8-19\Shelby Tubes
Date: 8/23/2005

2

Appendix E - Select Clay Laboratory Test Results
Clay Borrow Samples
Compacted Clay Samples

Appendix E - Select Clay Laboratory Test Results
Clay Borrow Samples

Moisture - Density Relationship of Soils

Test specification: ASTM D 1557-91 Procedure B Modified

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

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 111.5 pcf Optimum moisture = 16 %	Silty Clay--Gray

Project No. 87898A **Client:**
Project: OEPL Phase 6 East

Remarks:

● **Source:** Confirmation Proctor **Sample No.:** CL-B-1

Moisture - Density Relationship of Soils

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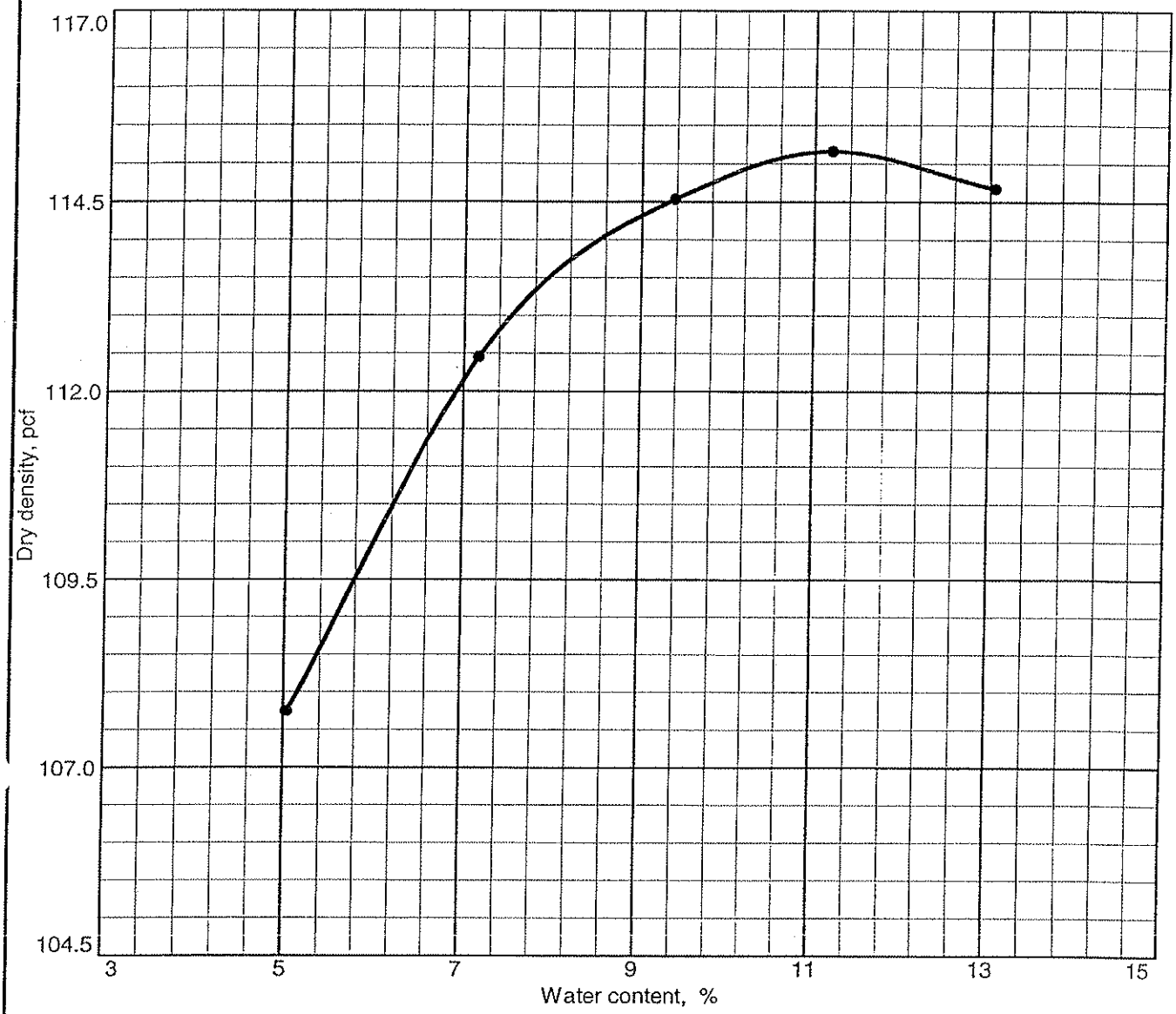
Figure 5

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
N4750 E6050	CH				50	27		96.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115 pcf Optimum moisture = 11 %	Silty Clay--Gray

Project No. 87898A **Client:**
Project: OEPL Phase 6 East

Remarks:

● **Source:** Lift 4 **Sample No.:** CL-B-2 **Elev./Depth:** N4750 E6050

Moisture - Density Relationship of Soils

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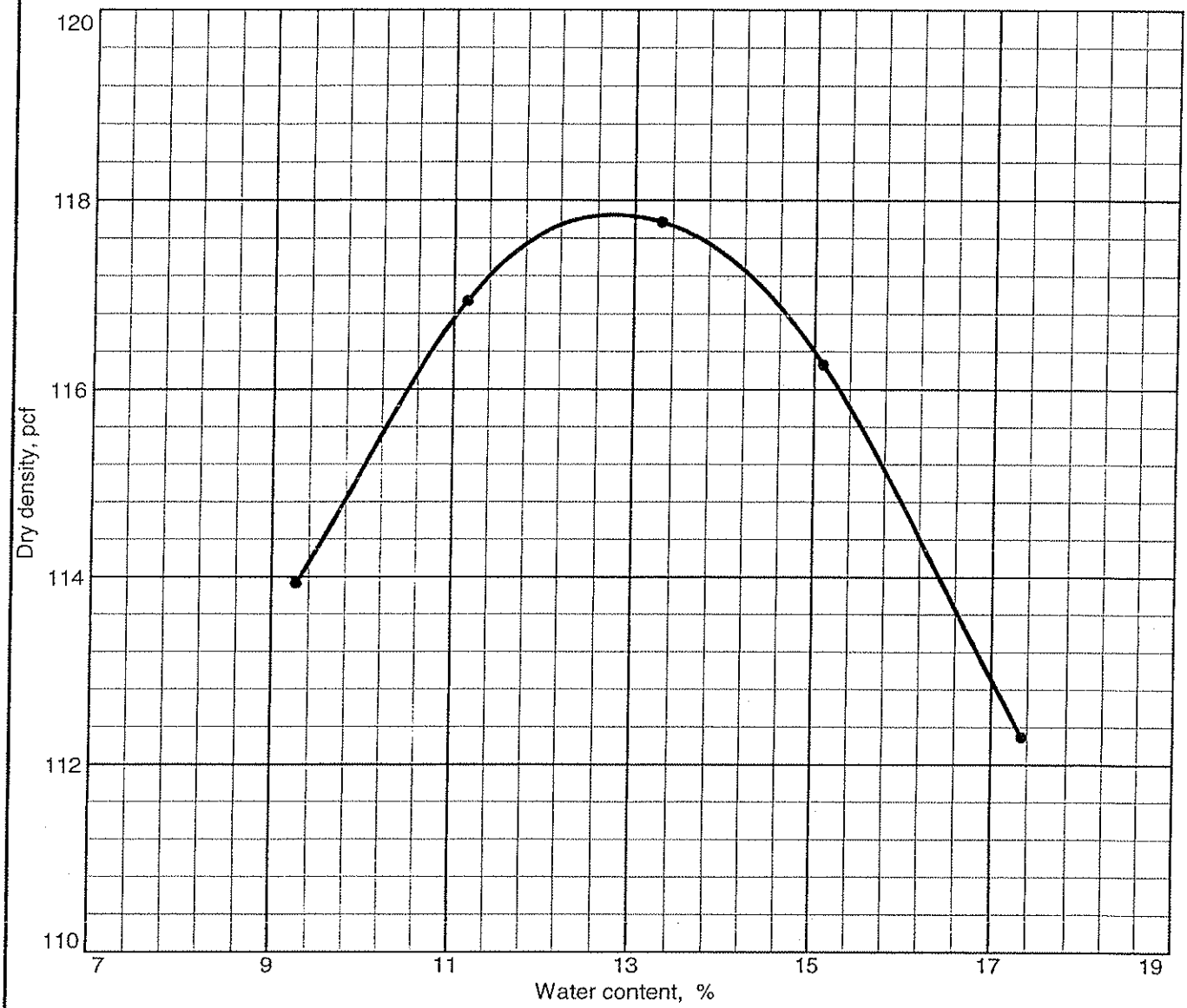
Figure 6

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CH				50	30		98.6

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118 pcf Optimum moisture = 13 %	Silty Clay Trace Sand--Gray

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

Remarks:

● **Source:** Lift 4 **Sample No.:** CL-B-3

Moisture - Density Relationship of Soils

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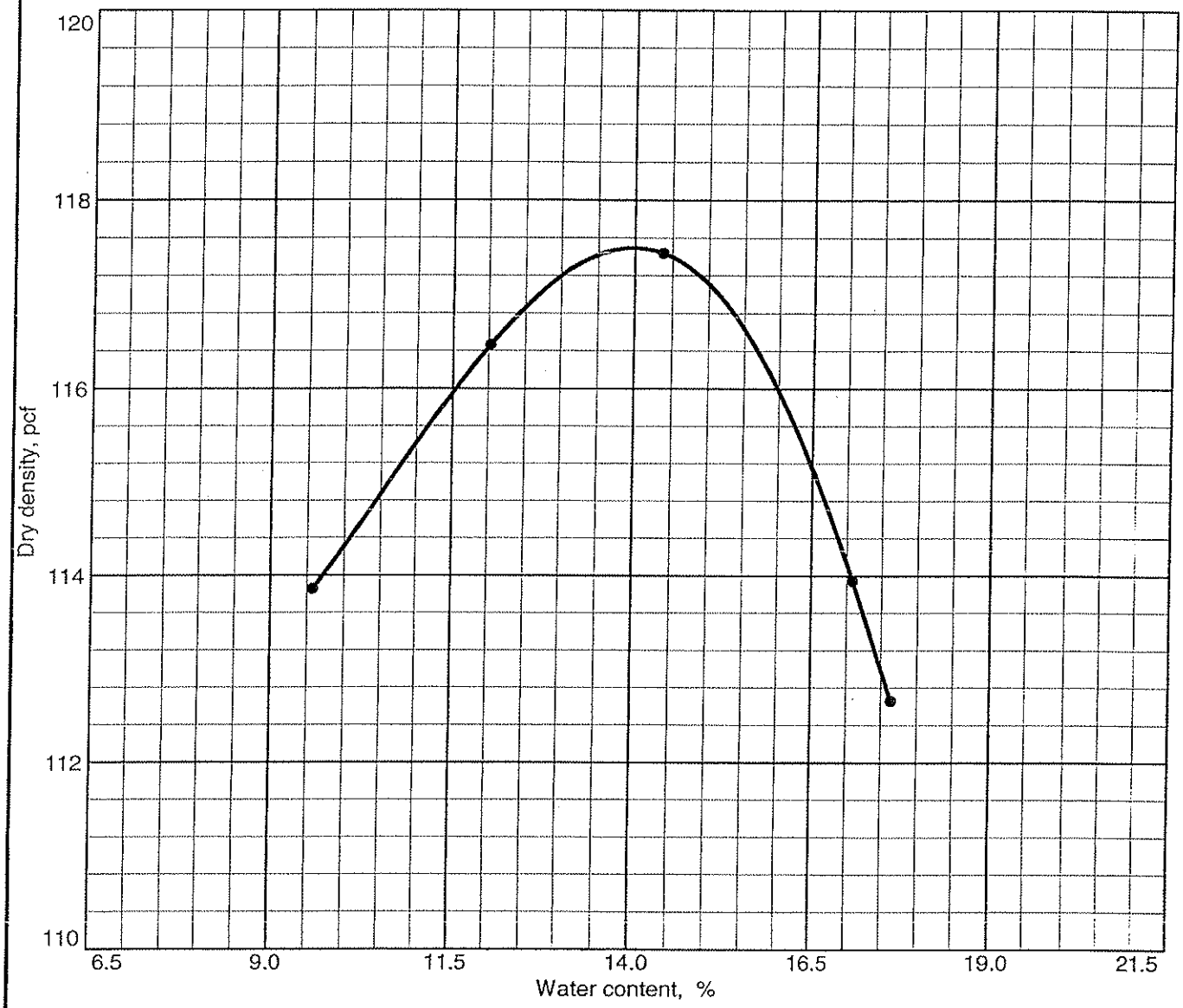
Figure 7

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CH				50	29		96.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 117.5 pcf Optimum moisture = 14 %	Silty Clay Trace Sand--Gray

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-B-4

Remarks:

Moisture - Density Relationship of Soils

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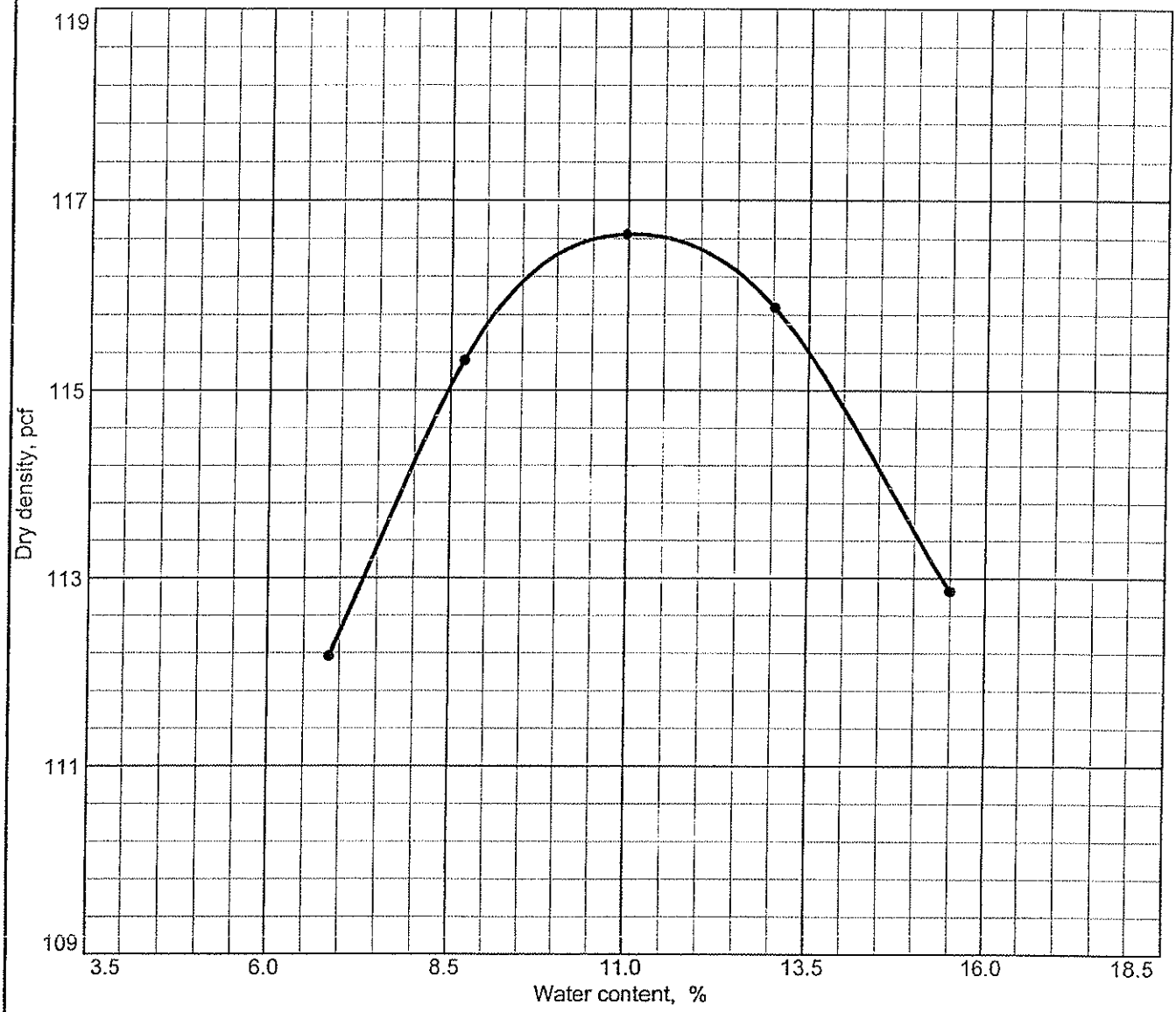
Figure

8

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
N5650 E5850	CH				51	31	0.0	98.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116.5 pcf Optimum moisture = 11 %	Silty Clay Trace Sand--Gray

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-B-5 **Elev./Depth:** N5650 E5850

Remarks:

Moisture - Density Relationship of Soils

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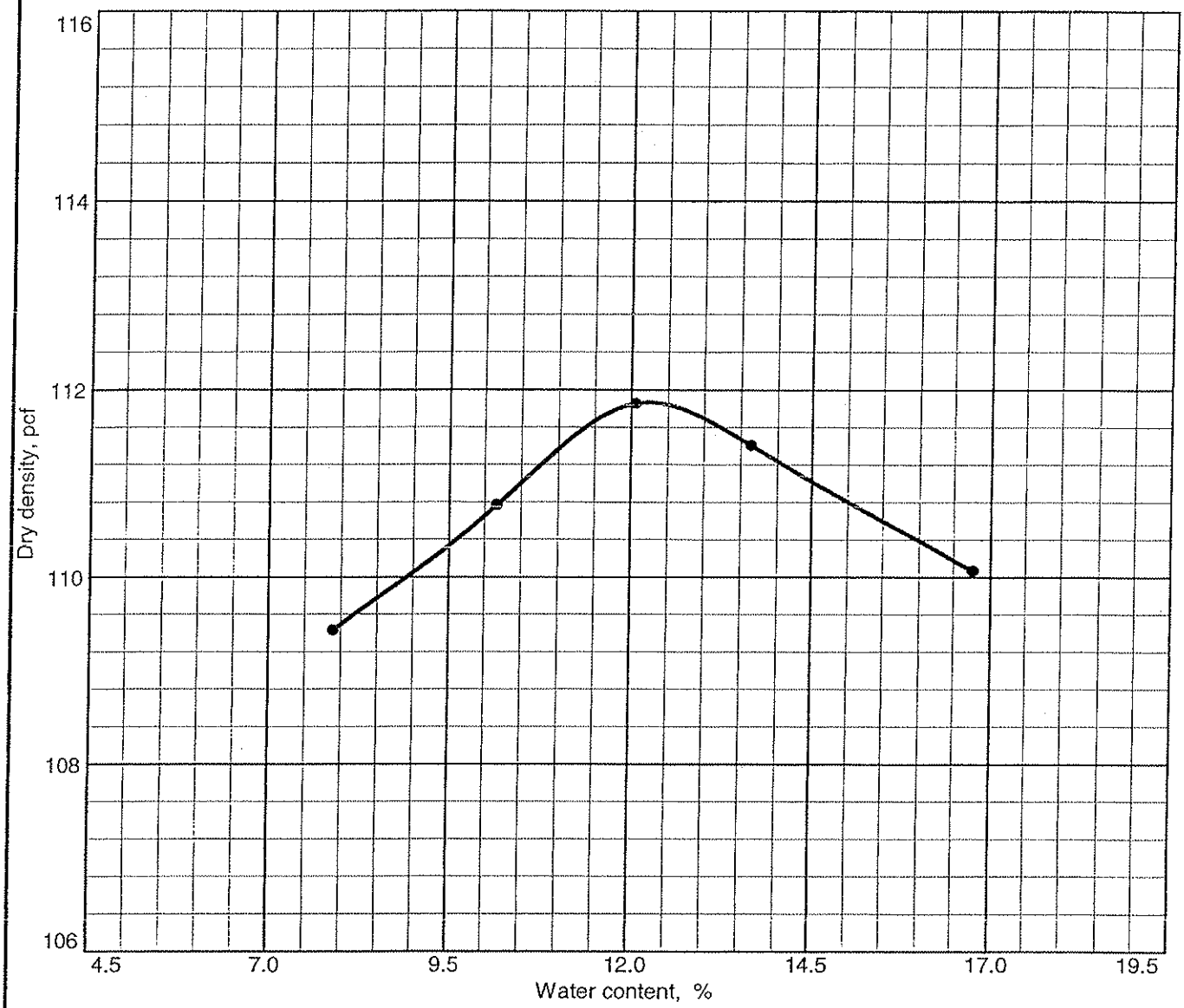
Figure

9

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
N5200 E5850	CH				55	33		99.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112 pcf Optimum moisture = 12 %	Silty Clay Trace Sand--Gray

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-6 **Elev./Depth:** N5200 E5850

Remarks:

Moisture - Density Relationship of Soils

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Figure

10

Moisture - Density Relationship of Soils

Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
N5250 E5800	CH				51	30		99.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115 pcf Optimum moisture = 13.5 %	Silty Clay Trace Sand--Gray

Project No. **Client:**
Project: OEPL Phase 6 East

Remarks:

● **Source:** Source **Sample No.:** CL-B-7 **Elev./Depth:** N5250 E5800

Moisture - Density Relationship of Soils

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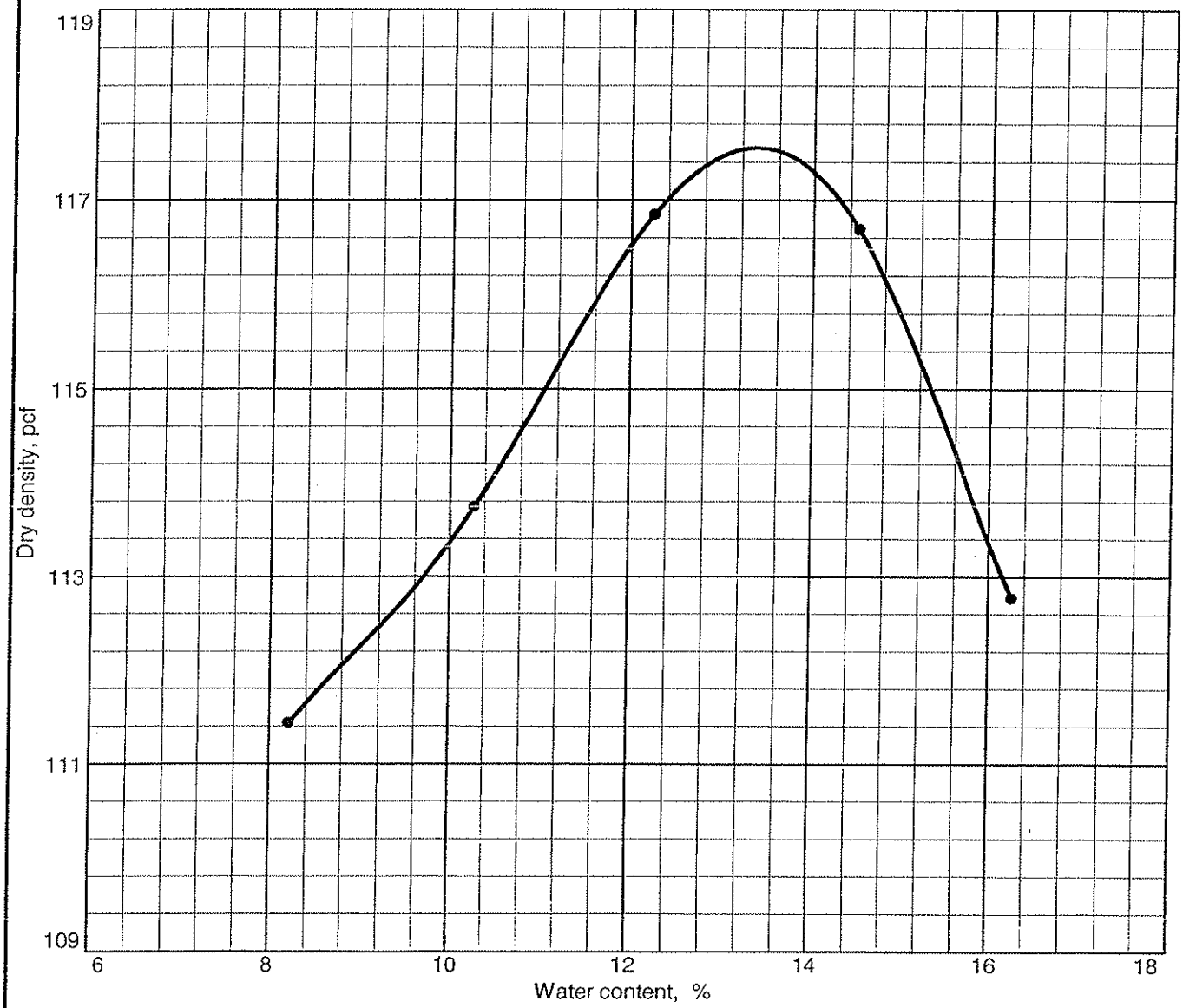
Figure

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
Stockpile	CL				45	26		98.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 117.5 pcf Optimum moisture = 13.5 %	Silty Clay--Gray

Project No. 87898A **Client:**
Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-8 **Elev./Depth:** Stockpile

Remarks:

Moisture - Density Relationship of Soils

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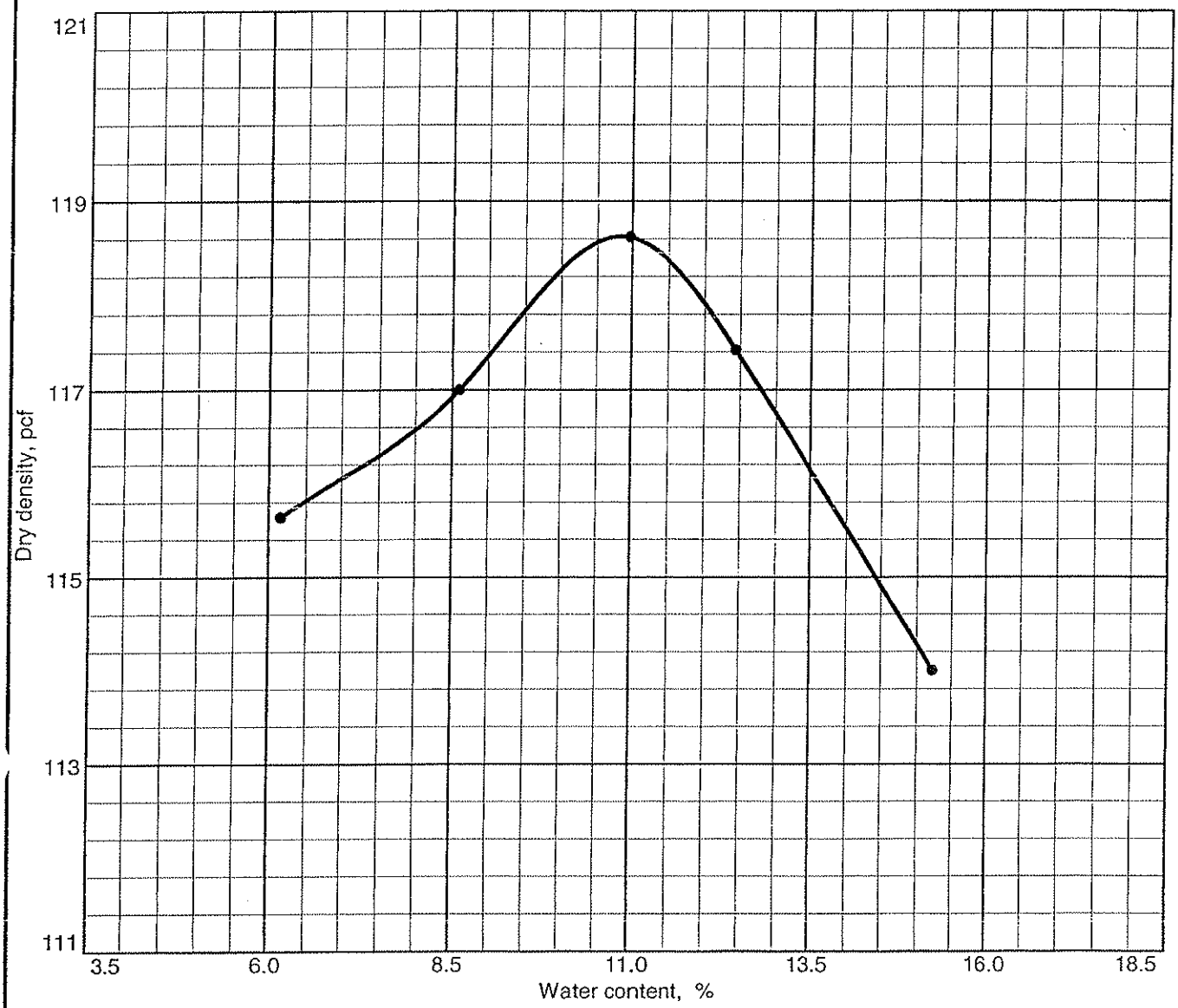
Figure

12

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
N5200 E5850	CL				46	27		98.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 118.5 pcf Optimum moisture = 11 %	Silty Clay Trace Sand--Gray

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

Remarks:

● **Source:** Lift 5 **Sample No.:** CL-B-9 **Elev./Depth:** N5200 E5850

Moisture - Density Relationship of Soils

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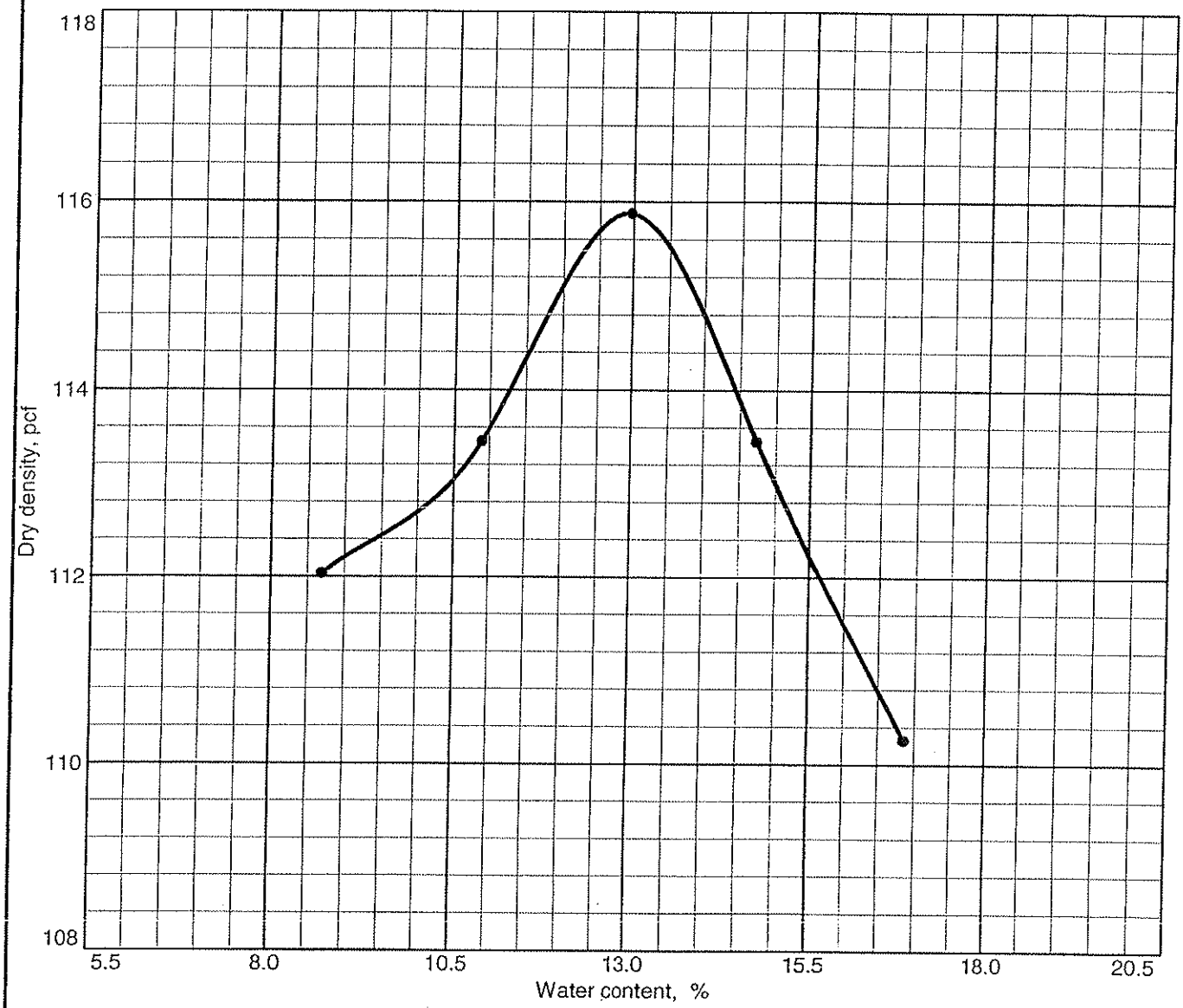
Figure

13

Moisture - Density Relationship of Soils



Test specification: ASTM D 1557-91 Procedure B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
N5100 E5700	CL				45	27		97.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116 pcf Optimum moisture = 13 %	Silty Clay--Gray

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-10 **Elev./Depth:** N5100 E5700

Remarks:

Moisture - Density Relationship of Soils

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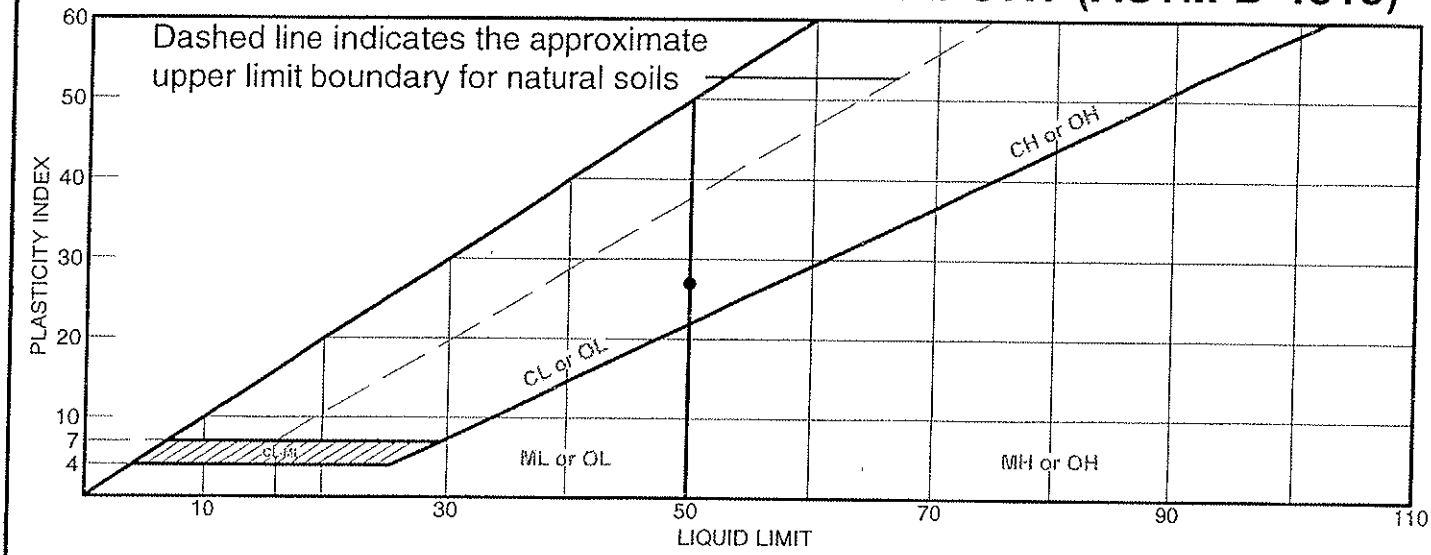
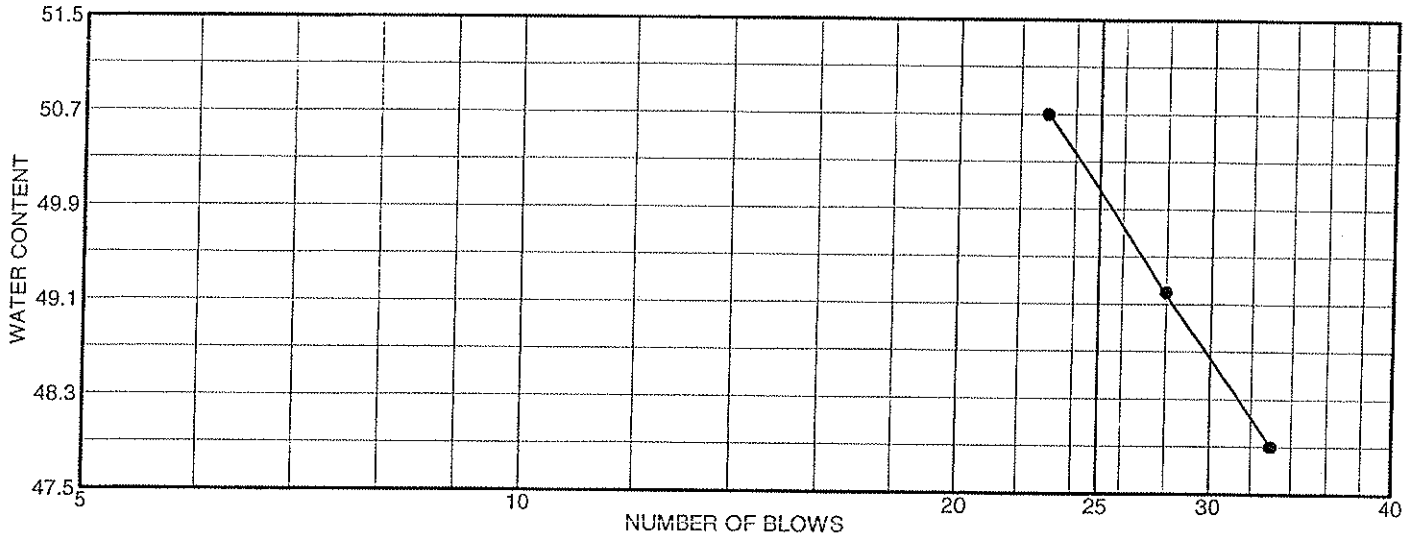
Figure

14

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay--Gray	50	23	27	99.0	96.9	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-B-2 **Elev./Depth:** N4750 E6050

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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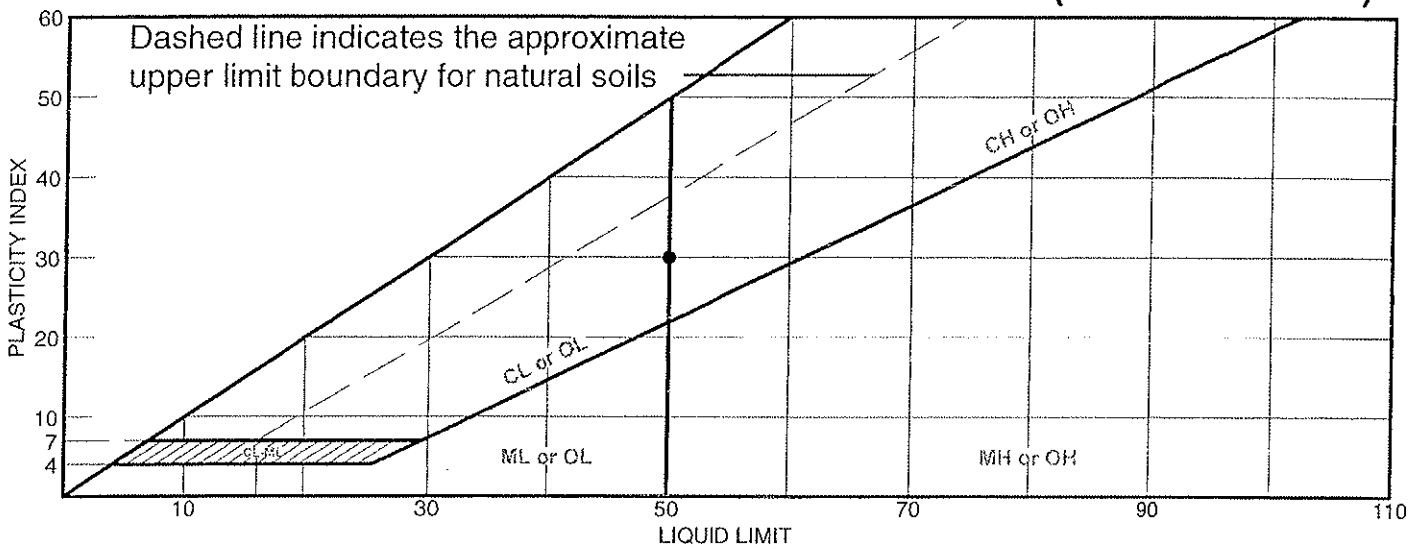
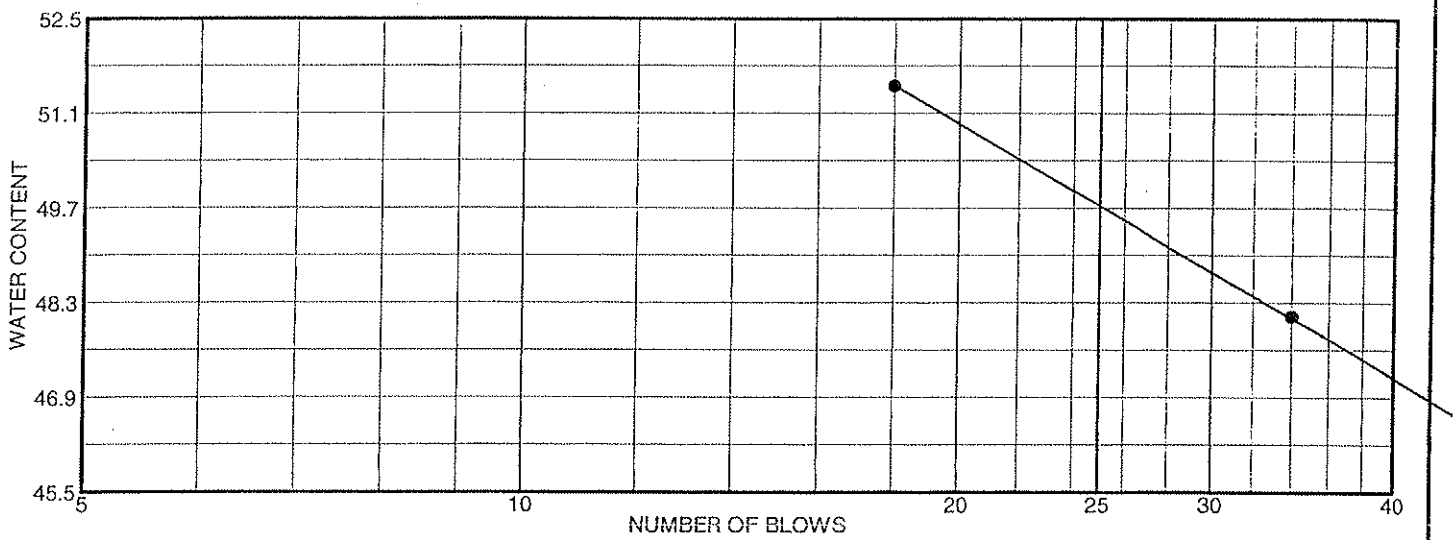
Figure

15

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	50	20	30	98.9	98.6	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-B-3

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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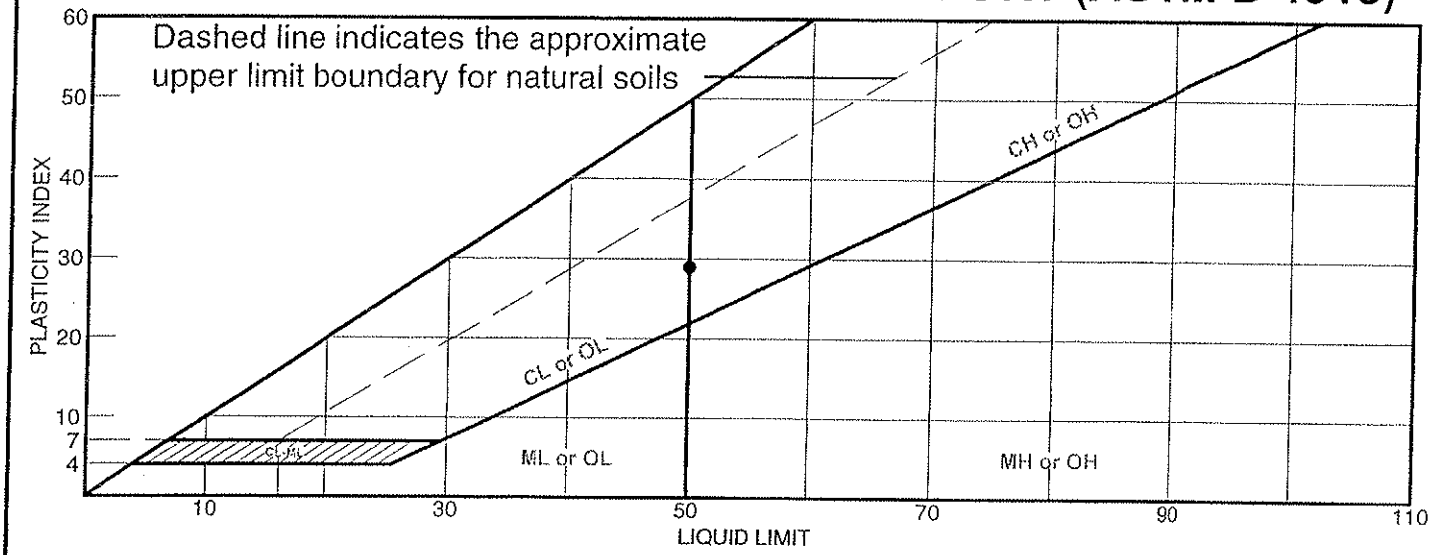
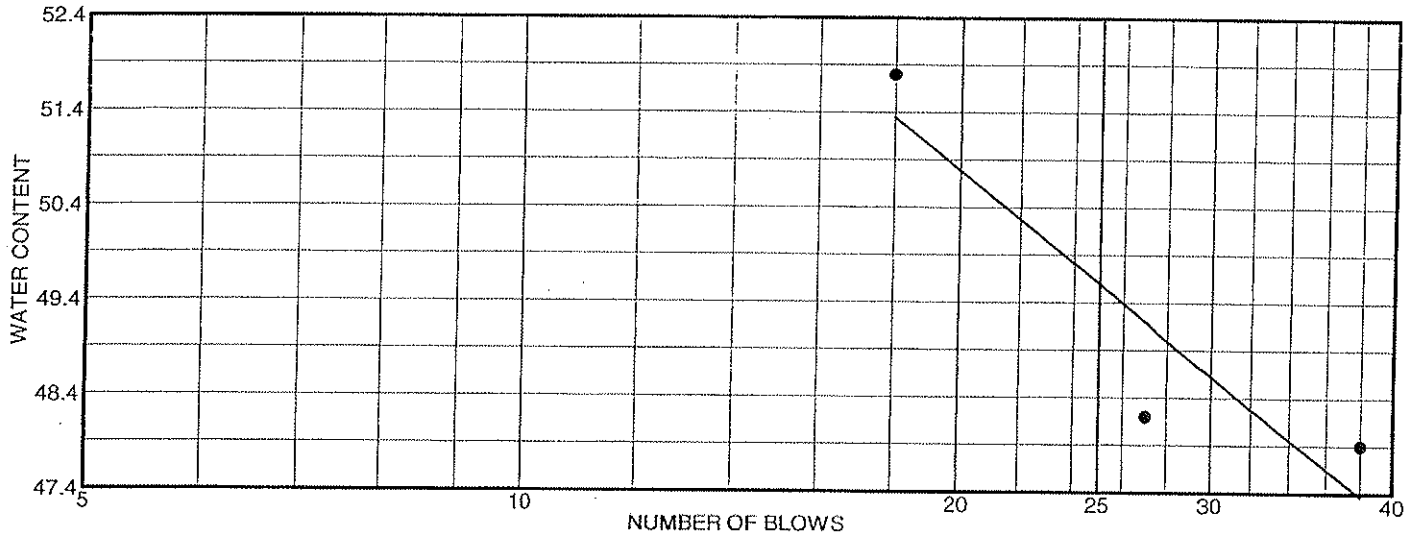
Figure

16

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	50	21	29	98.2	96.7	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-B-4

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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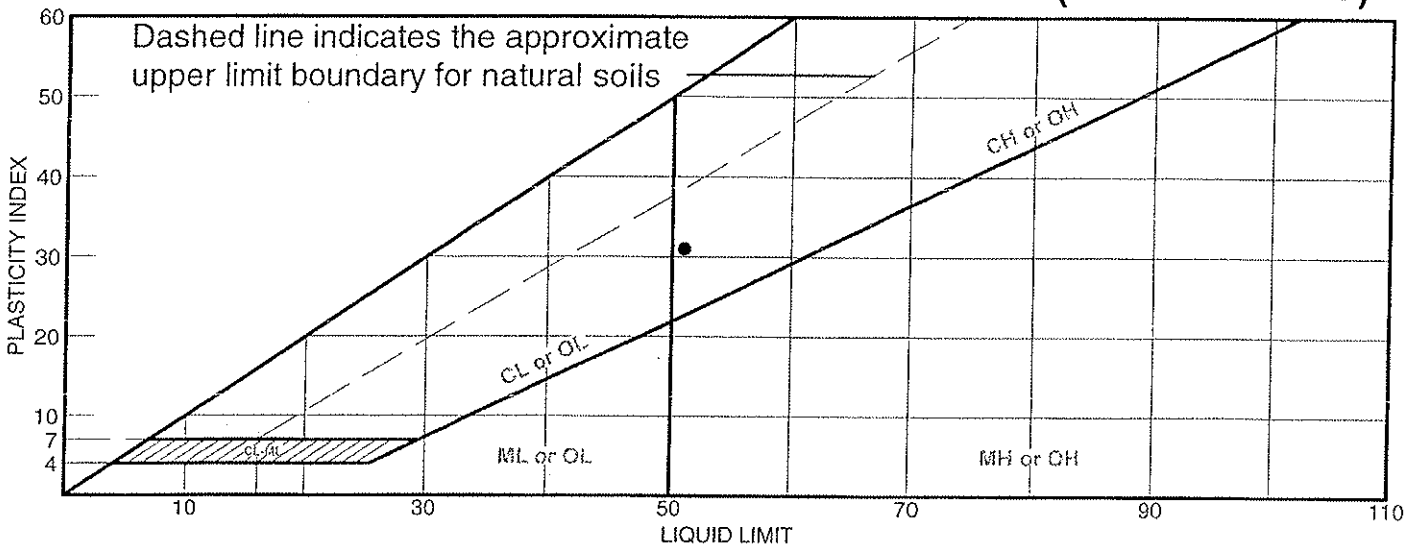
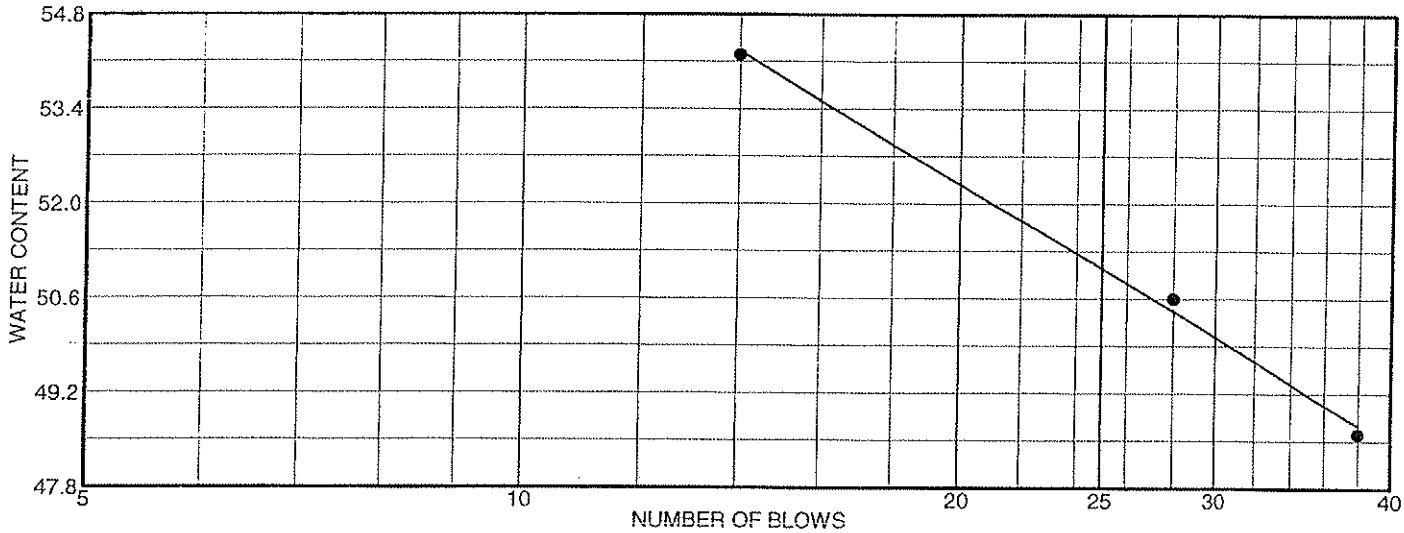
Figure

17

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	51	20	31	99.3	98.9	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-B-5 **Elev./Depth:** N5650 E5850

Remarks:

●

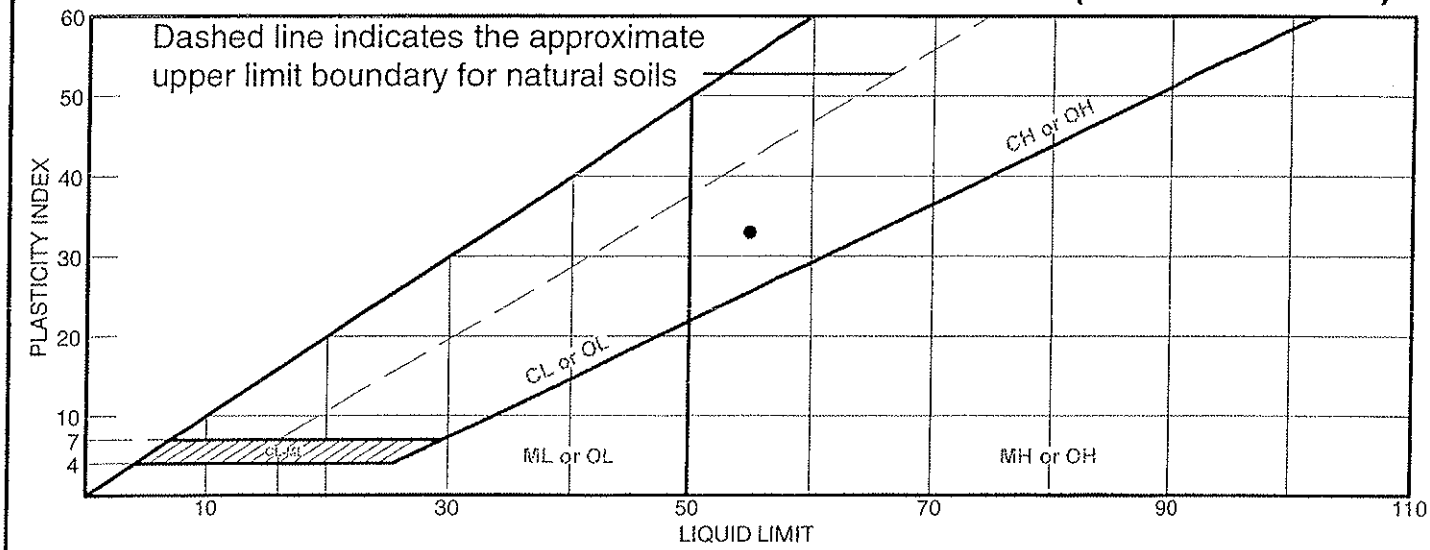
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

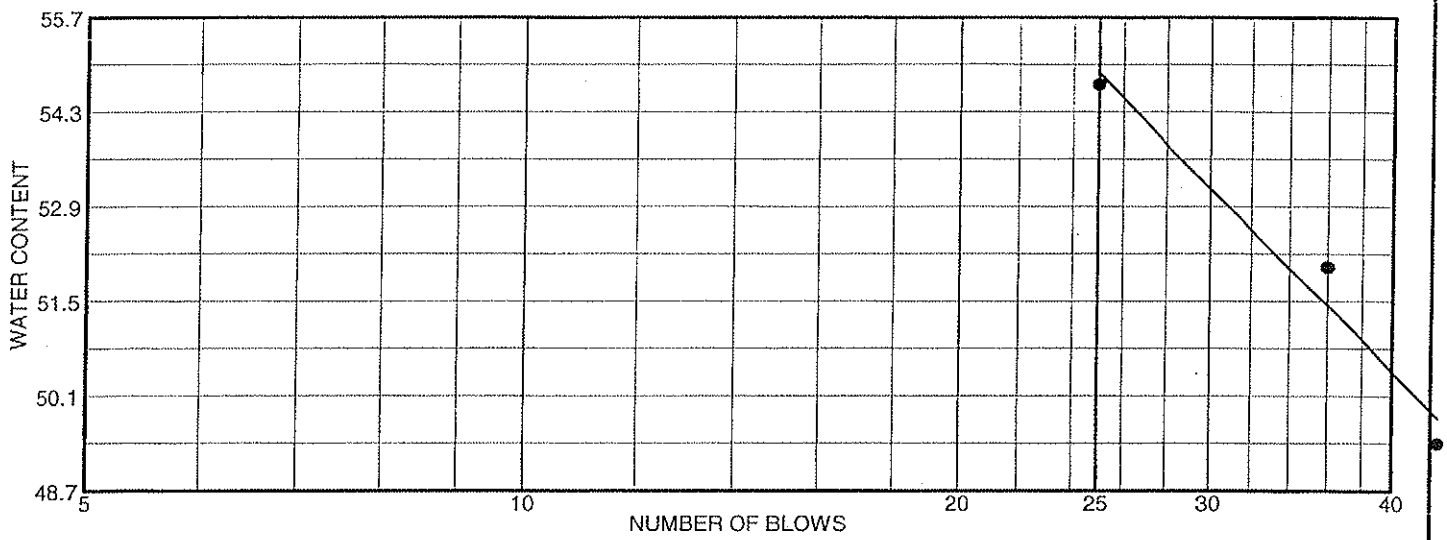
STS Consultants, Ltd.

Figure

18

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	55	22	33	99.7	99.3	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-6 **Elev./Depth:** N5200 E5850

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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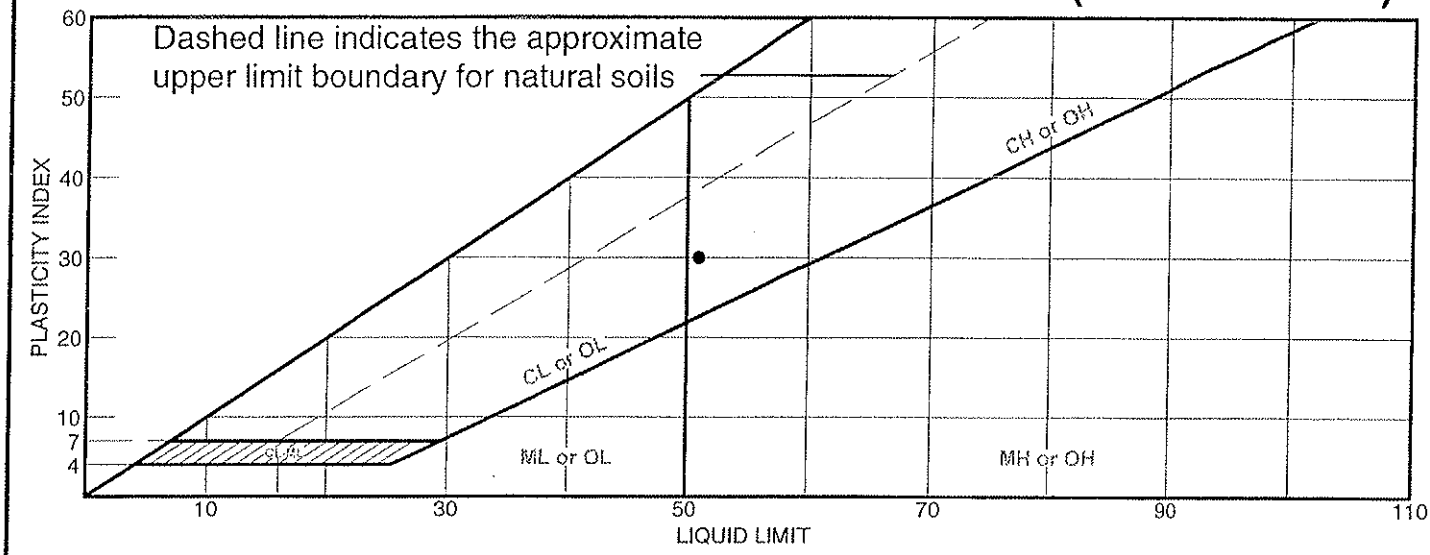
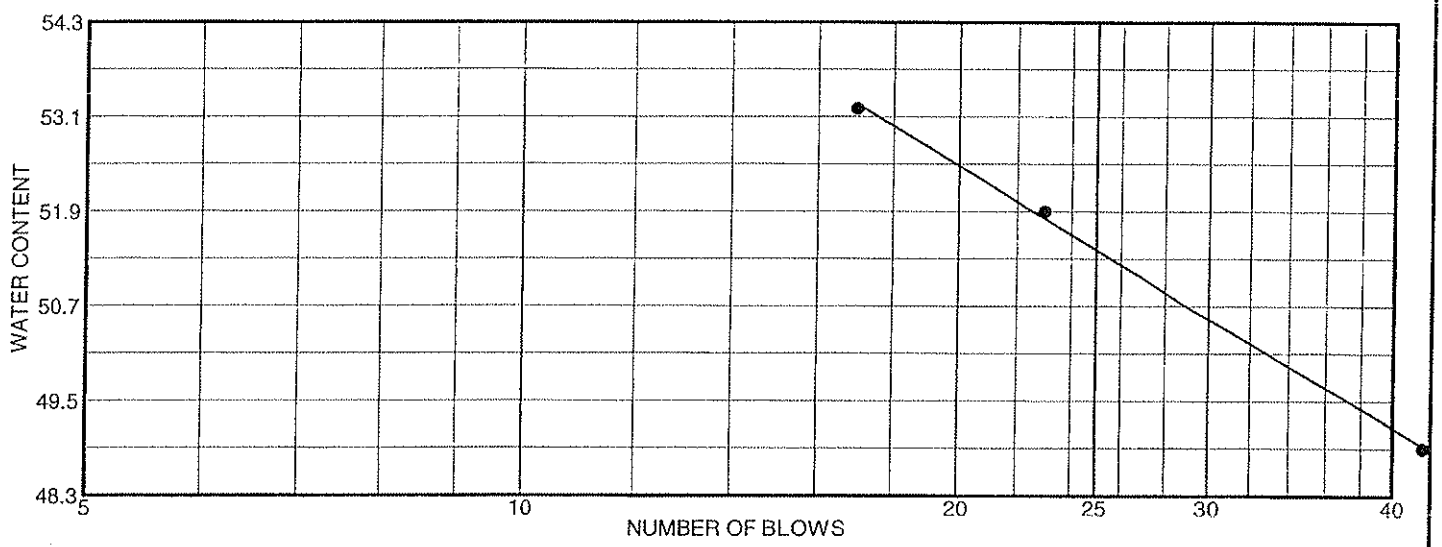
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	51	21	30	99.7	99.0	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-7 **Elev./Depth:** N5250 E5800

Remarks:

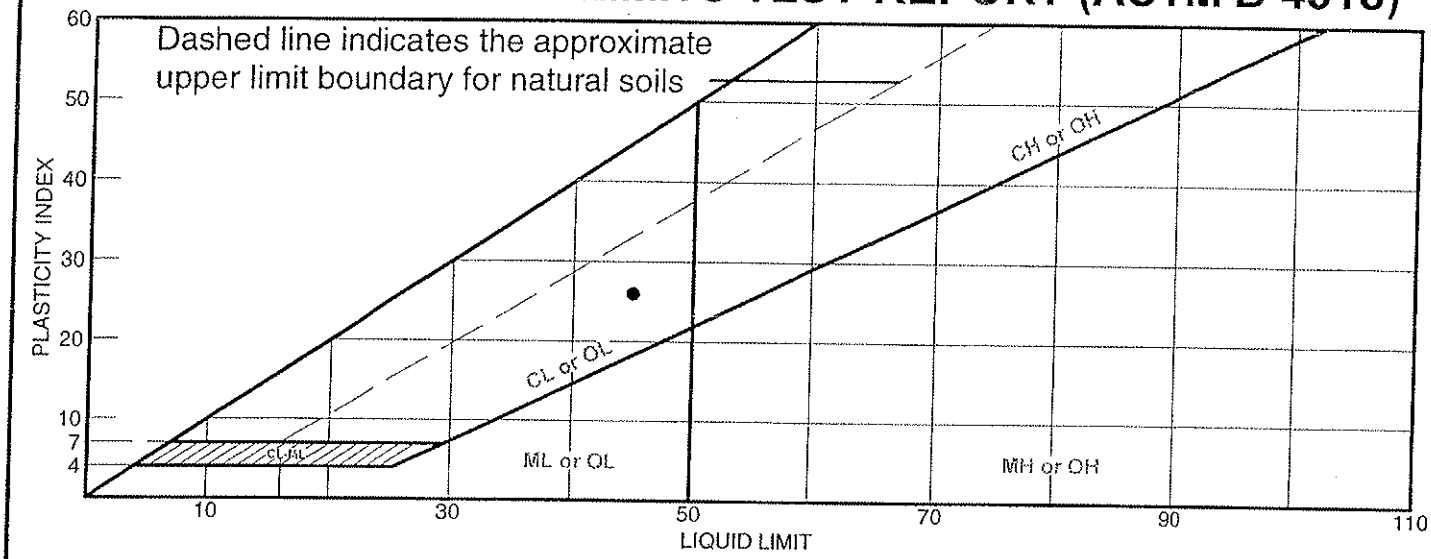
●

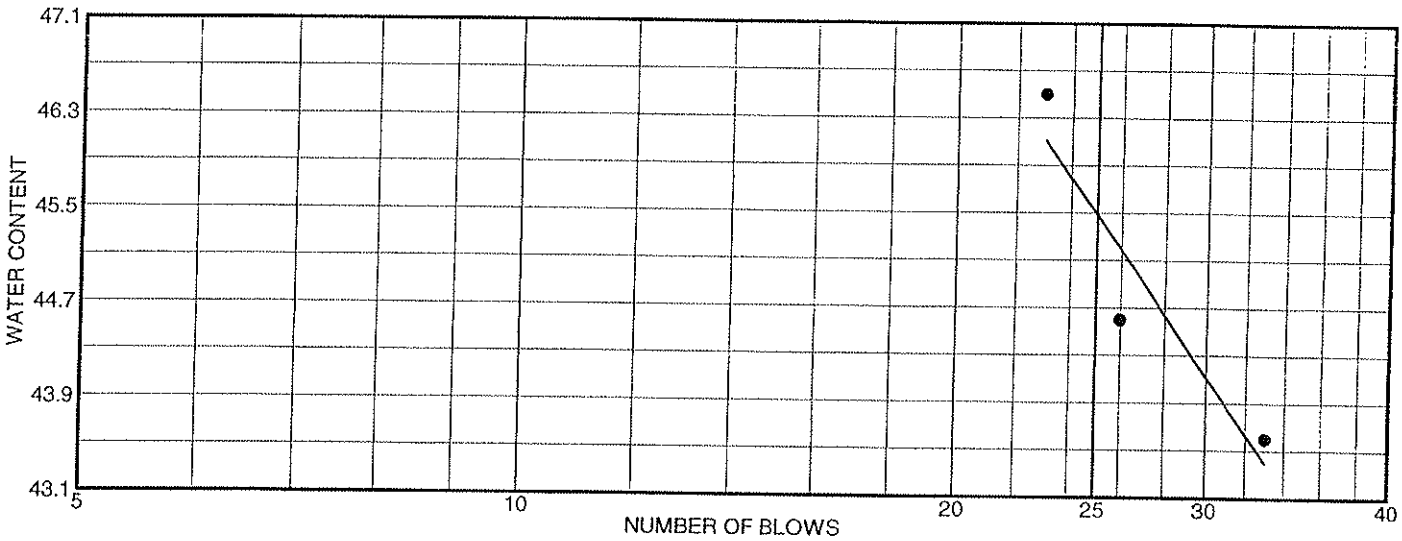
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure 20

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay--Gray	45	19	26	99.4	98.4	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-8 **Elev./Depth:** Stockpile

Remarks:

●

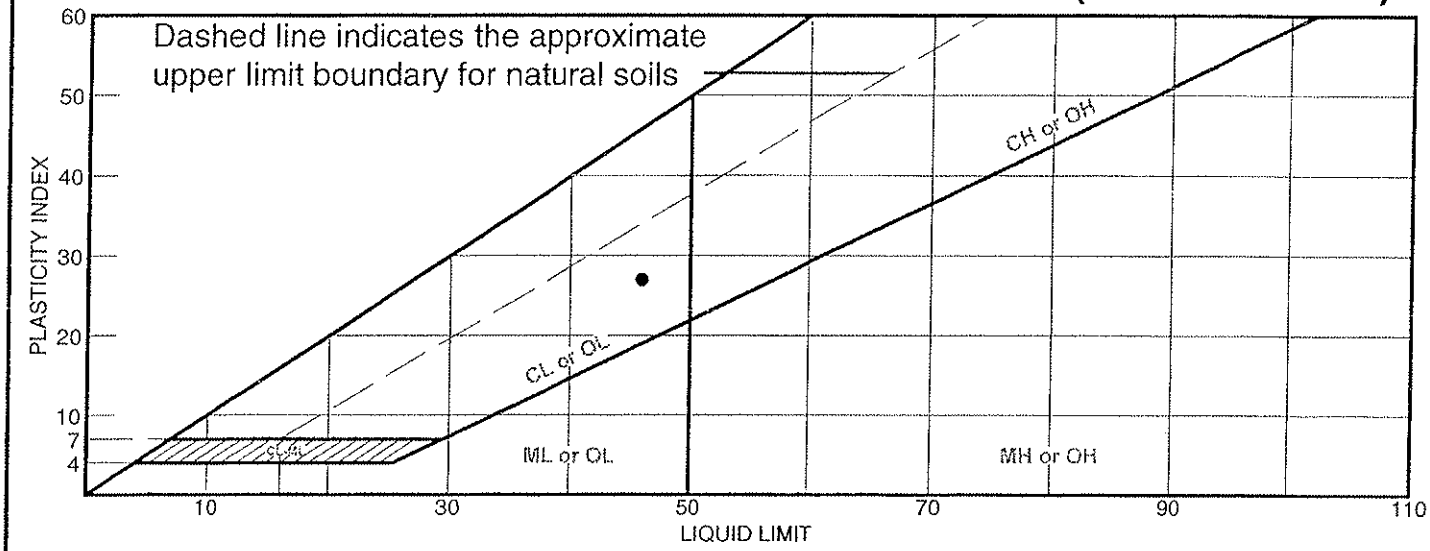
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

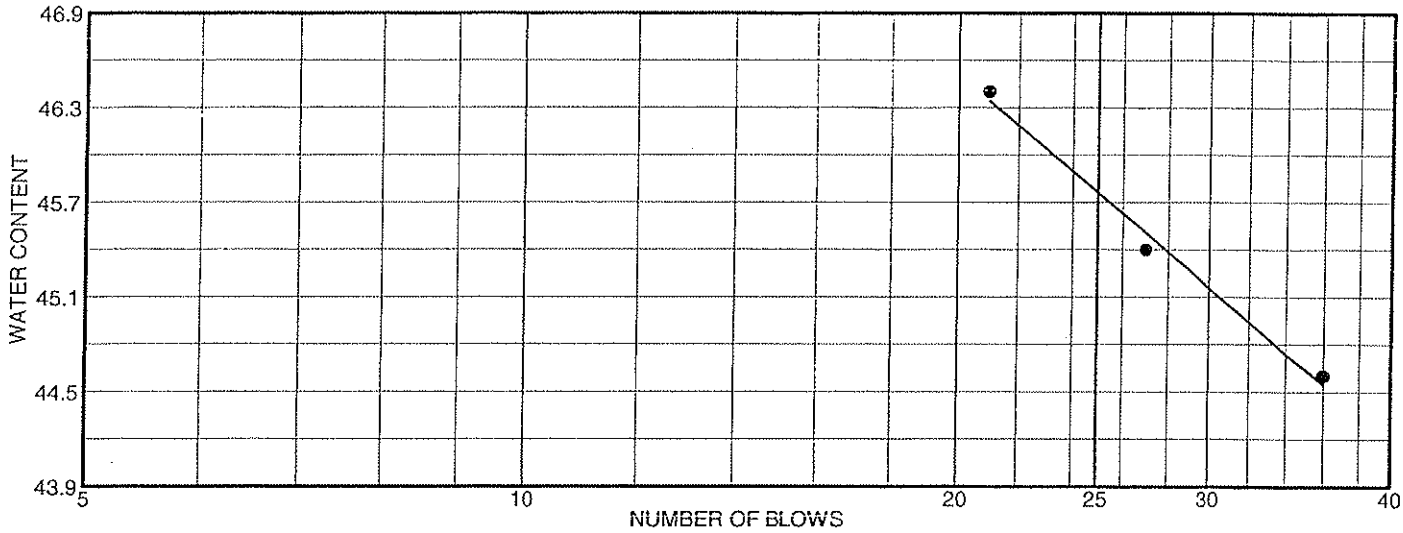
STS Consultants, Ltd.

Figure

21

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	46	19	27	99.1	98.7	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 5 **Sample No.:** CL-B-9 **Elev./Depth:** N5200 E5850

Remarks:

●

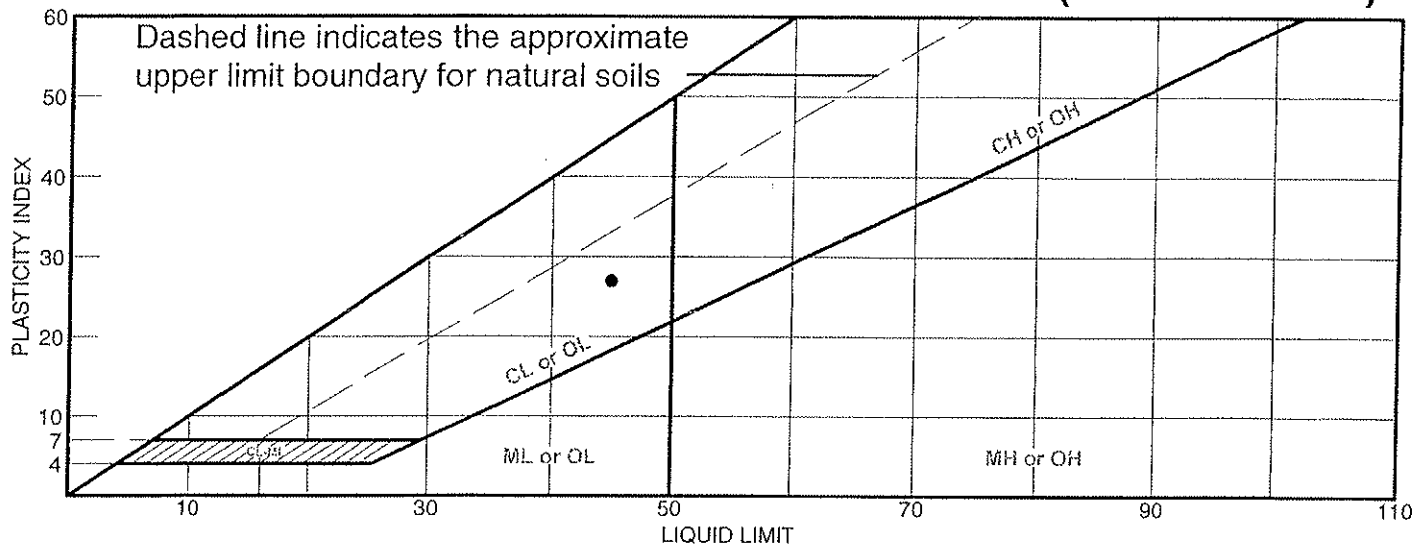
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

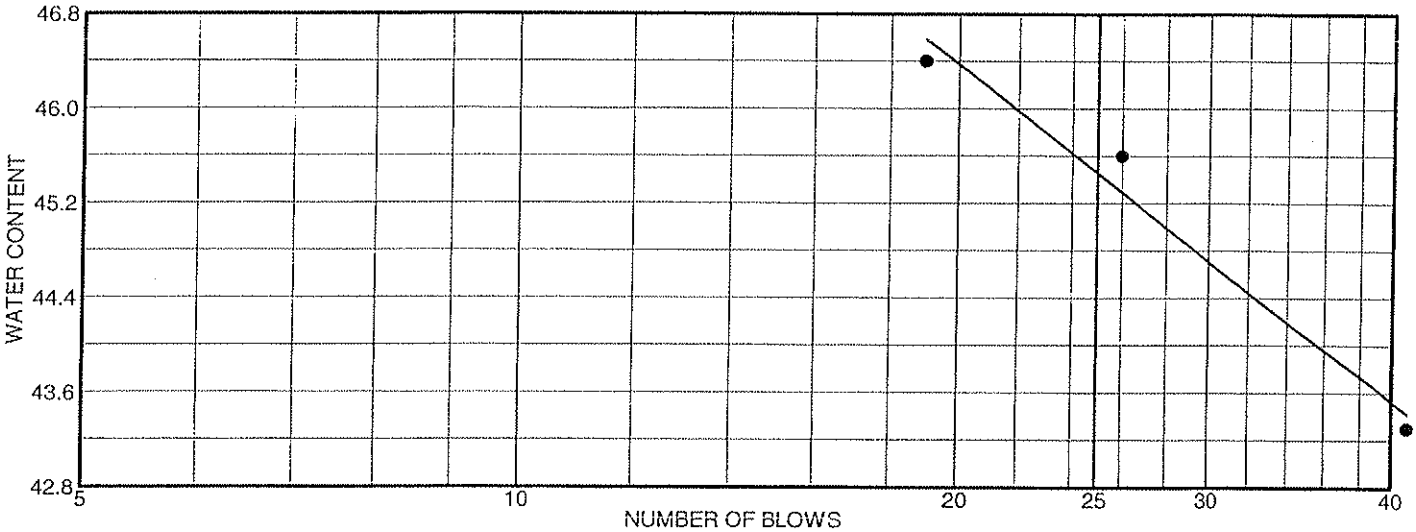
STS Consultants, Ltd.

Figure

22

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay--Gray	45	18	27	98.6	97.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Source **Sample No.:** CL-B-10 **Elev./Depth:** N5100 E5700

Remarks:

●

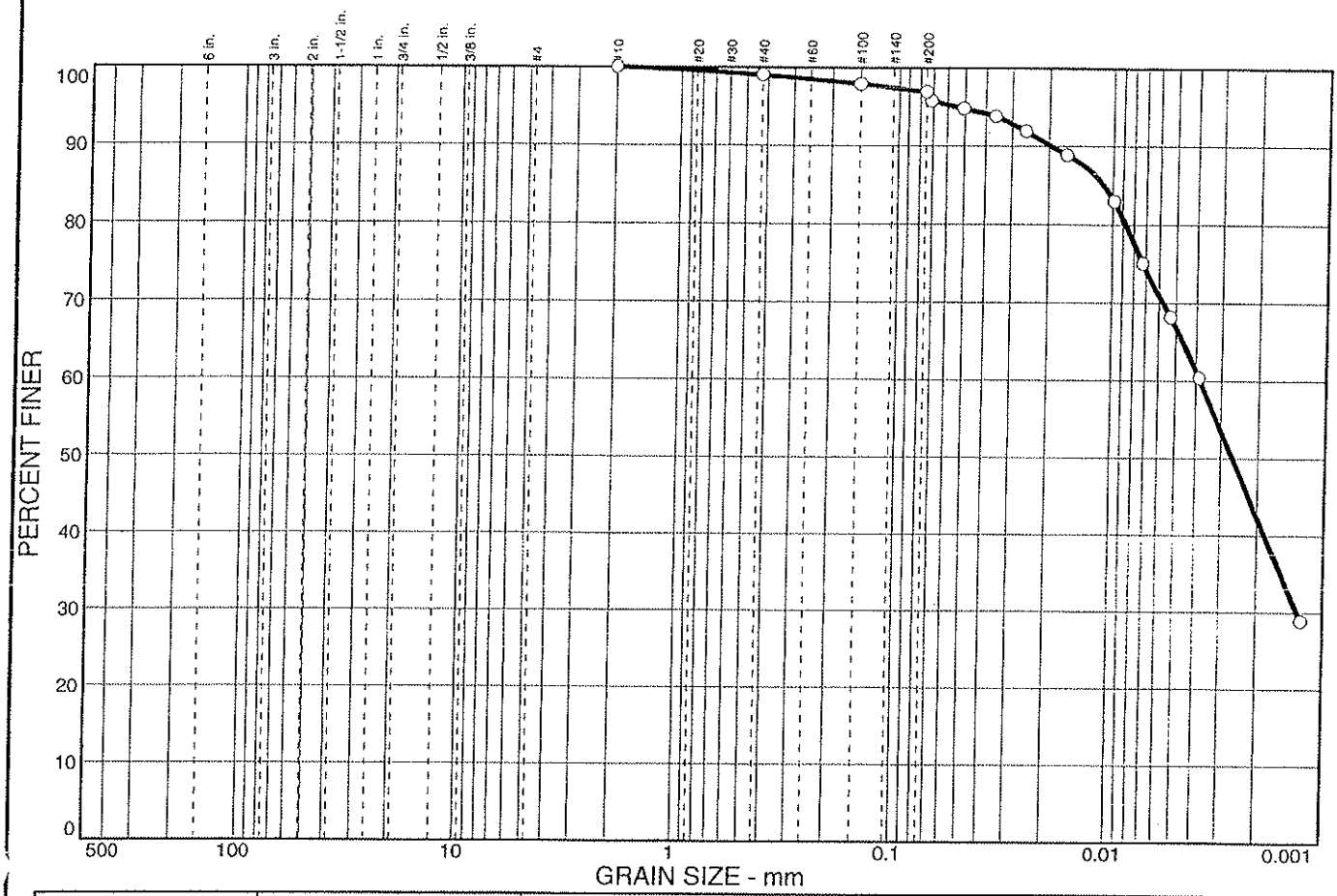
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

23

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.0	2.1	29.9	67.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.0		
#100	97.9		
#200	96.9		

* (no specification provided)

Material Description

Silty Clay--Gray

Atterberg Limits

PL= 23 LL= 50 PI= 27

Coefficients

D_{85}= 0.0110 D_{60}= 0.0038 D_{50}= 0.0026
D_{30}= 0.0013 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

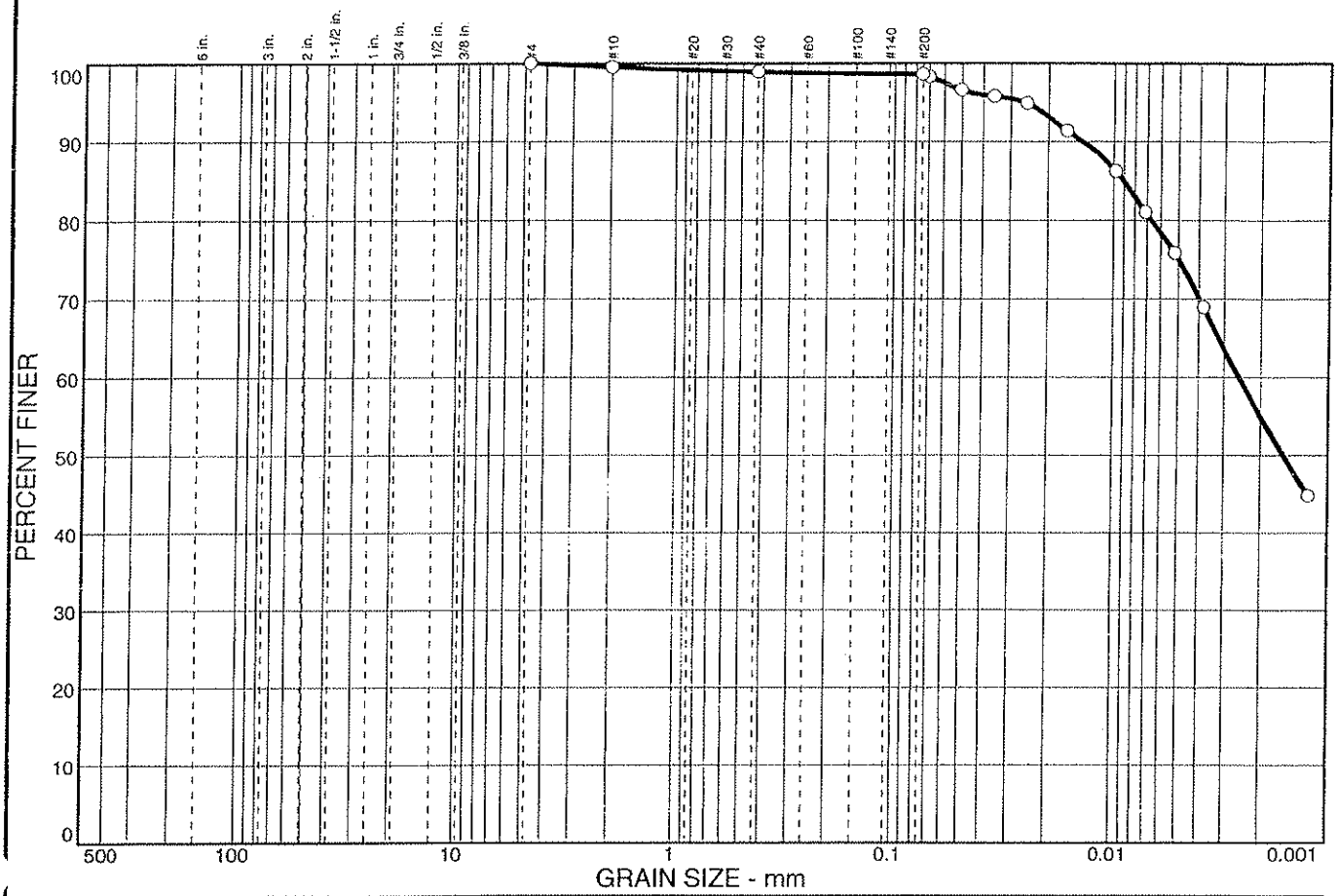
Sample No.: CL-B-2 **Source of Sample:** Lift 4 **Date:** 7/6/05
Location: **Elev./Depth:** N4750 E6050

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

24

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.5	0.6	0.3	23.4	75.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.5		
#40	98.9		
#200	98.6		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 50 PI= 30

Coefficients

D_{85}= 0.0090 D_{60}= 0.0025 D_{50}= 0.0016
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-B-3 **Source of Sample:** Lift 4 **Date:** 7/1/05
Location: **Elev./Depth:**

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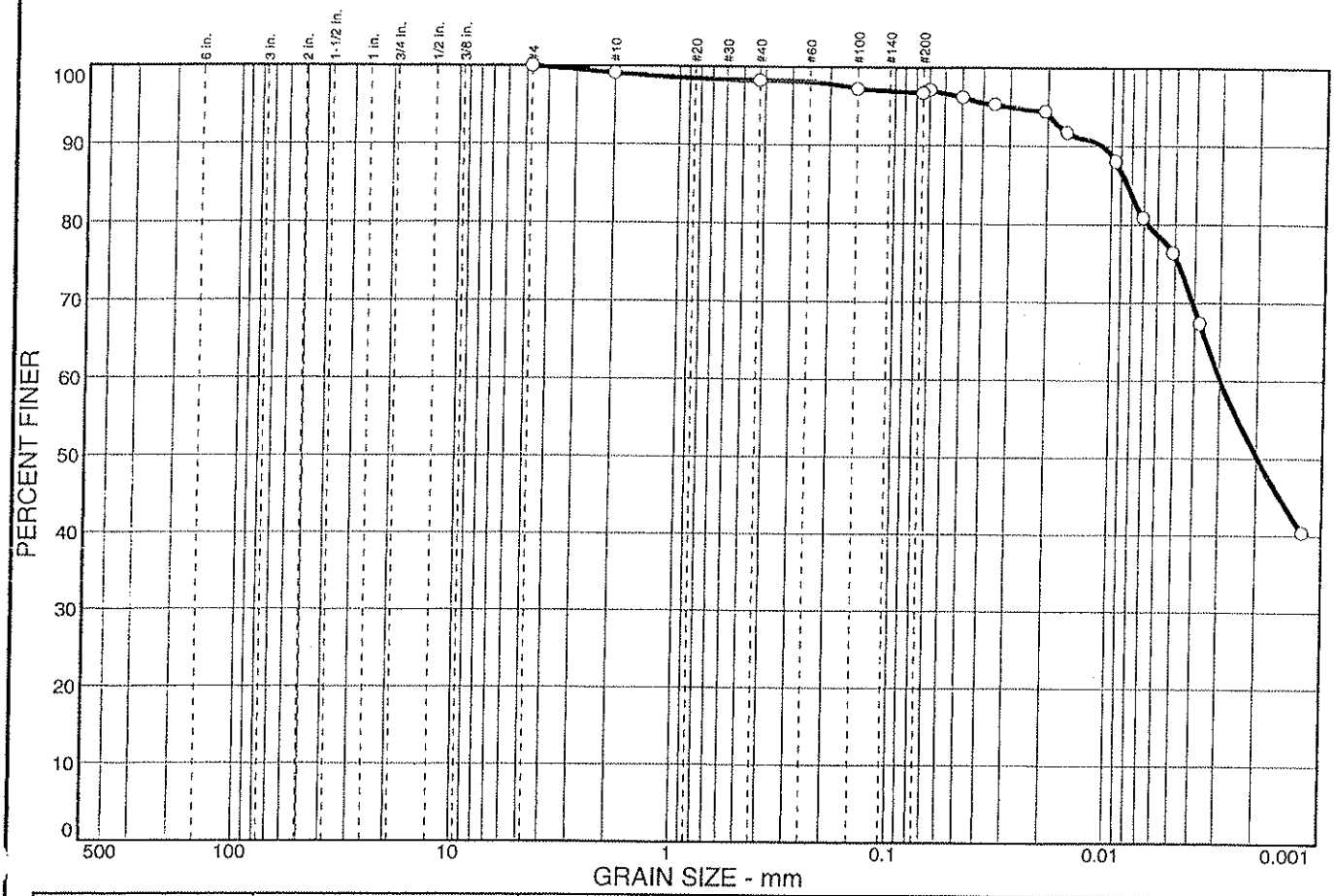
Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

25

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.9	0.9	1.5	20.8	75.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.1		
#40	98.2		
#100	97.2		
#200	96.7		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 50 PI= 29

Coefficients

D_{85}= 0.0084 D_{60}= 0.0030 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-B-4 **Source of Sample:** Lift 2 **Date:** 7/1/05
Location: **Elev./Depth:**

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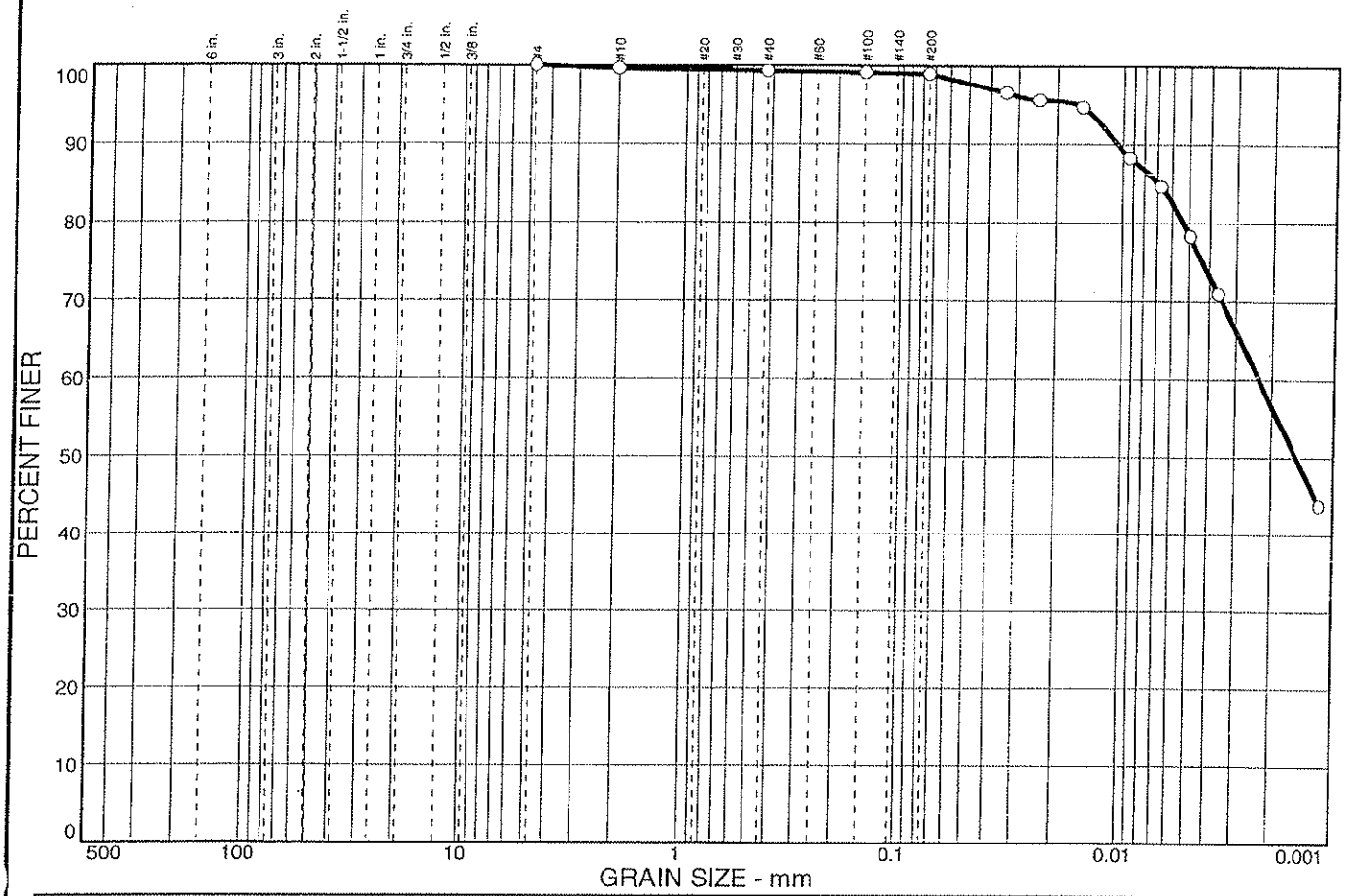
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

20

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.4	0.3	0.4	20.3	78.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.6		
#40	99.3		
#100	99.1		
#200	98.9		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 51 PI= 31

Coefficients

D_{85}= 0.0069 D_{60}= 0.0023 D_{50}= 0.0015
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-B-5 **Source of Sample:** Lift 2 **Date:** 7/1/05
Location: **Elev./Depth:** N5650 E5850

STS Consultants, Ltd.
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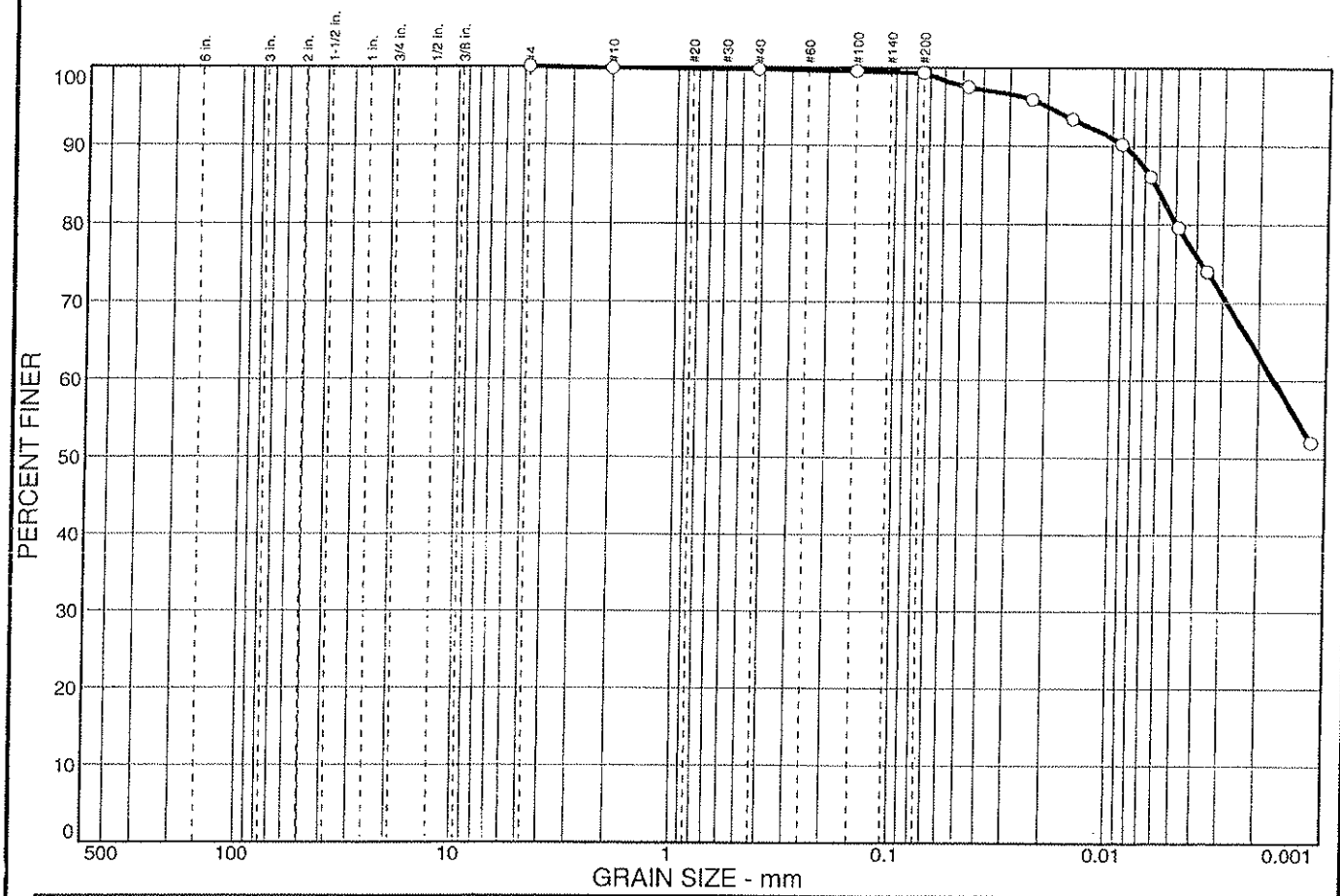
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	0.1	0.4	19.1	80.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#40	99.7		
#100	99.5		
#200	99.3		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 22 LL= 55 PI= 33

Coefficients

D_{85}= 0.0062 D_{60}= 0.0017 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-B-6 Source of Sample: Source Date: 7/01/05
Location: Elev./Depth: N5200 E5850

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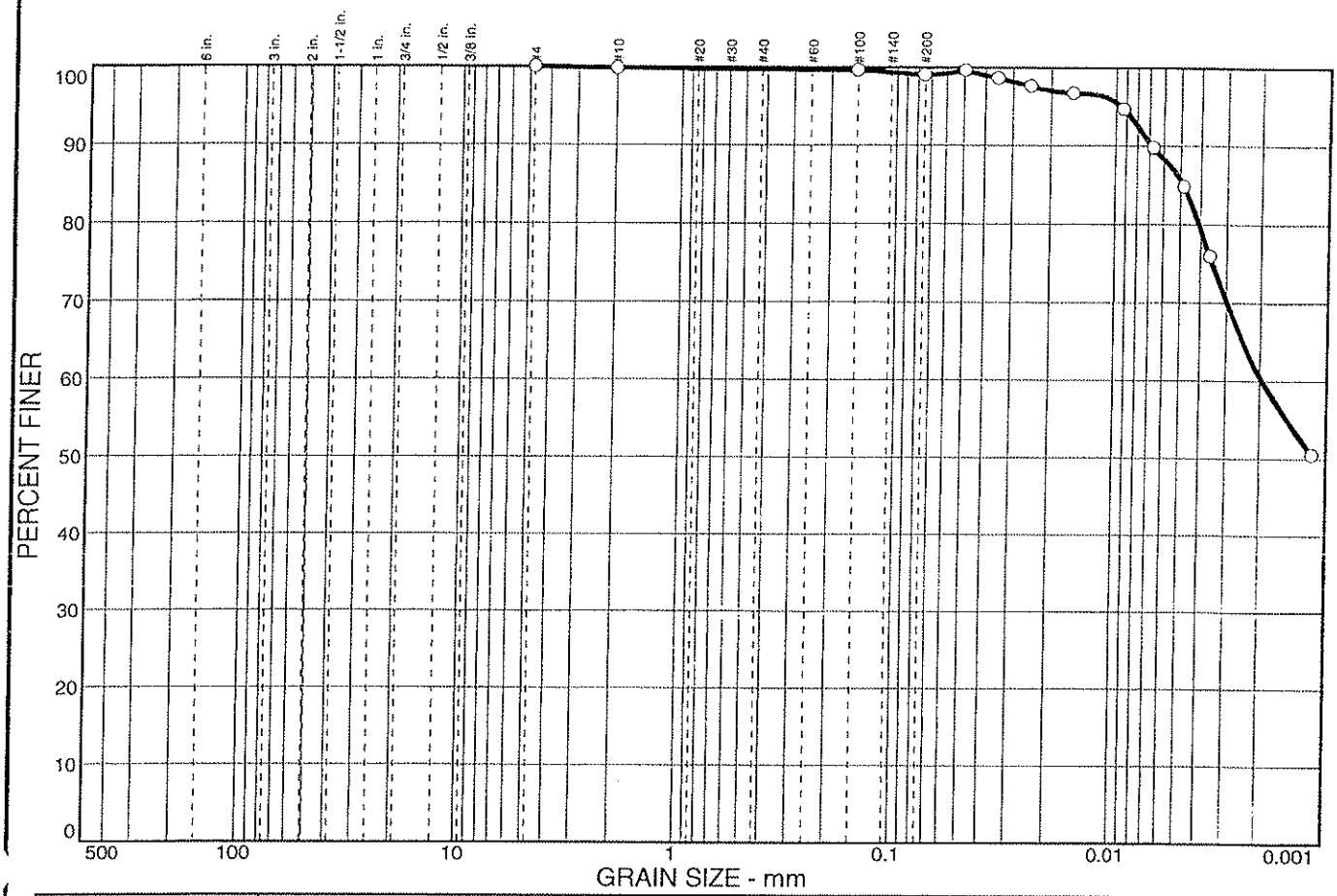
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A Figure

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	0.1	0.7	13.2	85.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#100	99.6		
#200	99.0		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 51 PI= 30

Coefficients

D_{85}= 0.0048 D_{60}= 0.0019 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

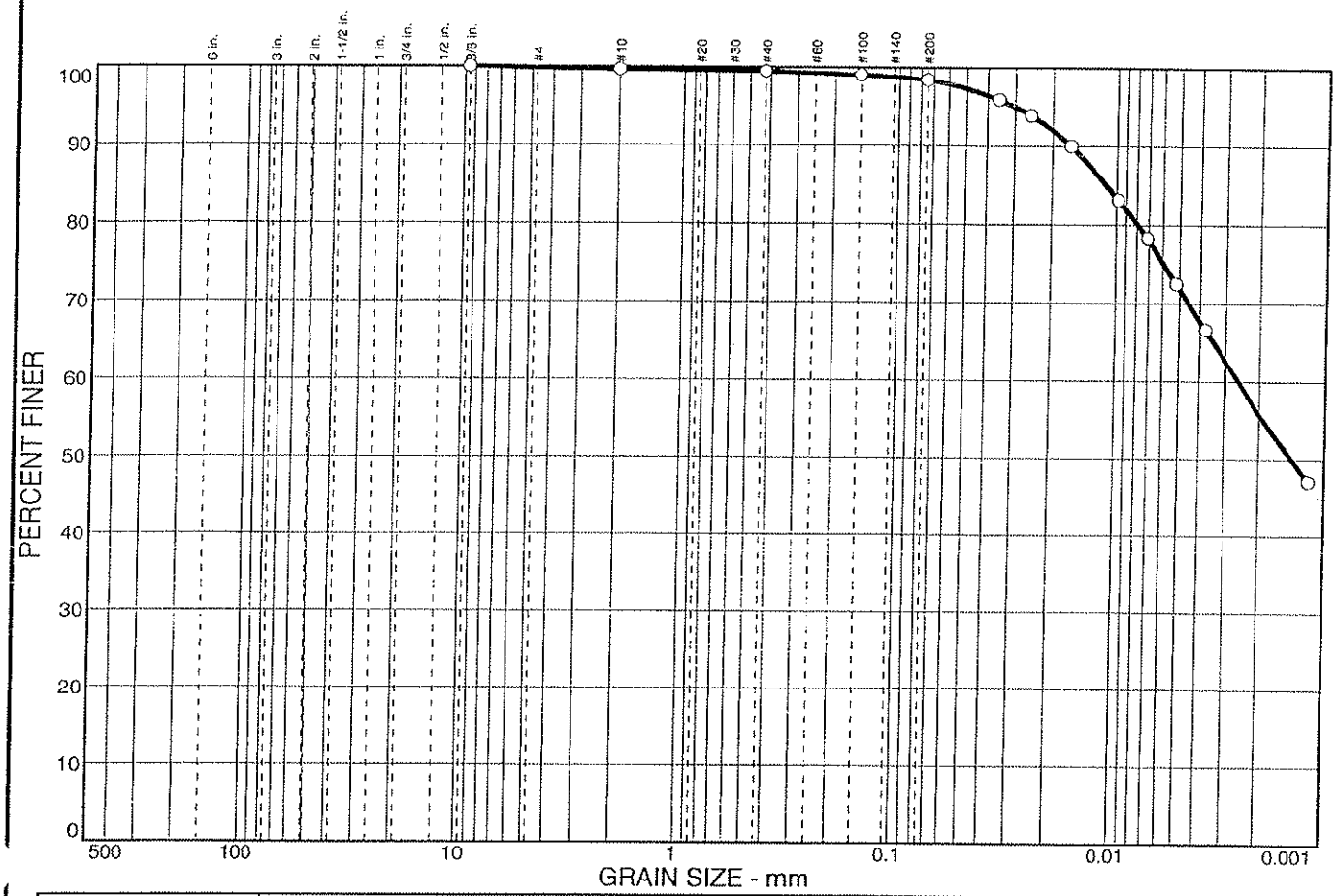
Remarks

Sample No.: CL-B-7 **Source of Sample:** Source **Date:** 7/20/05
Location: **Elev./Depth:** N5250 E5800

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.2	0.2	1.0	26.5	71.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#10	99.6		
#40	99.4		
#100	99.0		
#200	98.4		

* (no specification provided)

Material Description

Silty Clay--Gray

Atterberg Limits

PL= 19 LL= 45 PI= 26

Coefficients

D_{85}= 0.0111 D_{60}= 0.0026 D_{50}= 0.0014
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

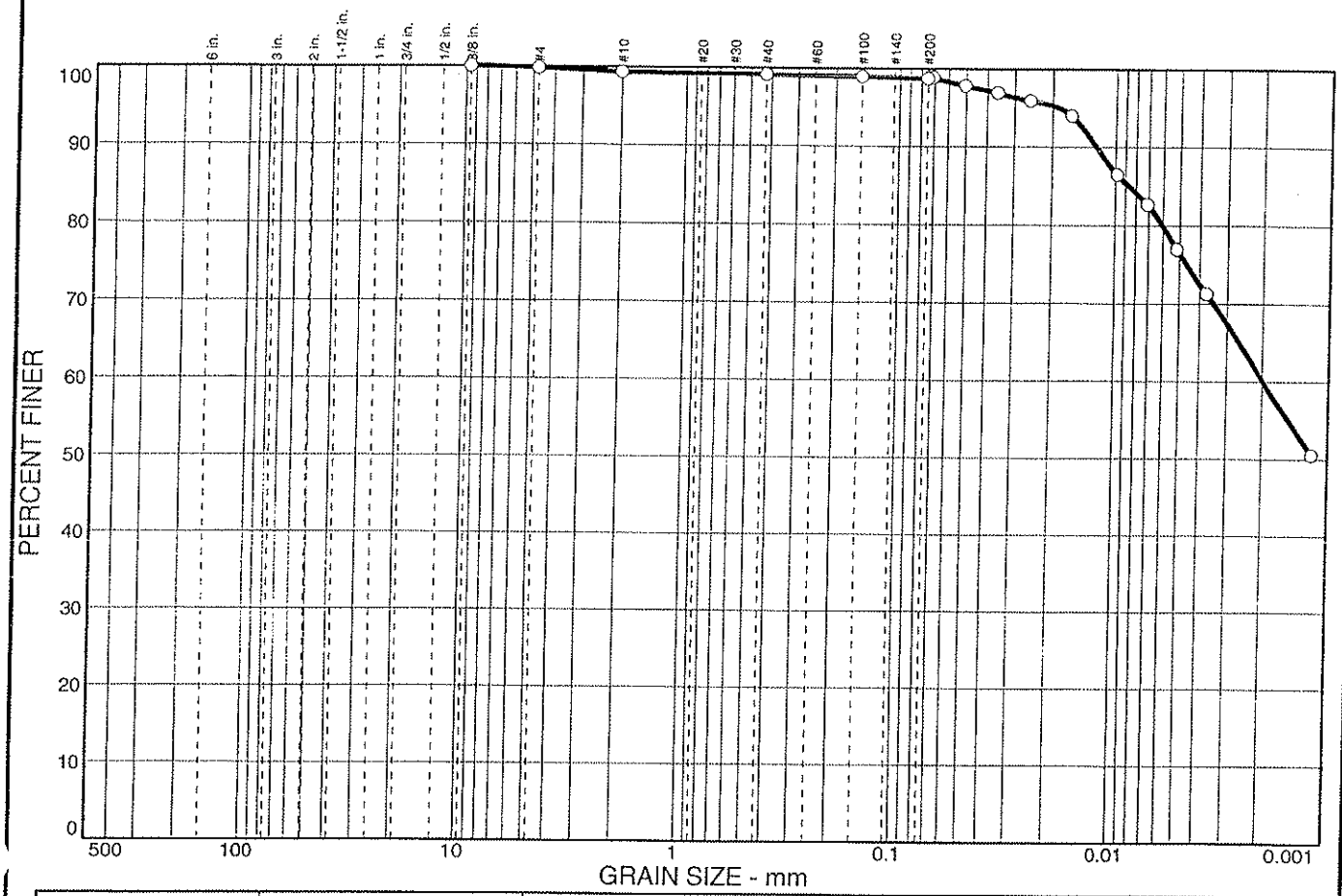
Remarks

Sample No.: CL-B-8 **Source of Sample:** Source **Date:** 7/20/05
Location: **Elev./Depth:** Stockpile

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.5	0.2	0.4	22.2	76.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.8		
#10	99.3		
#40	99.1		
#100	98.9		
#200	98.7		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 46 PI= 27

Coefficients

D_{85}= 0.0086 D_{60}= 0.0020 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

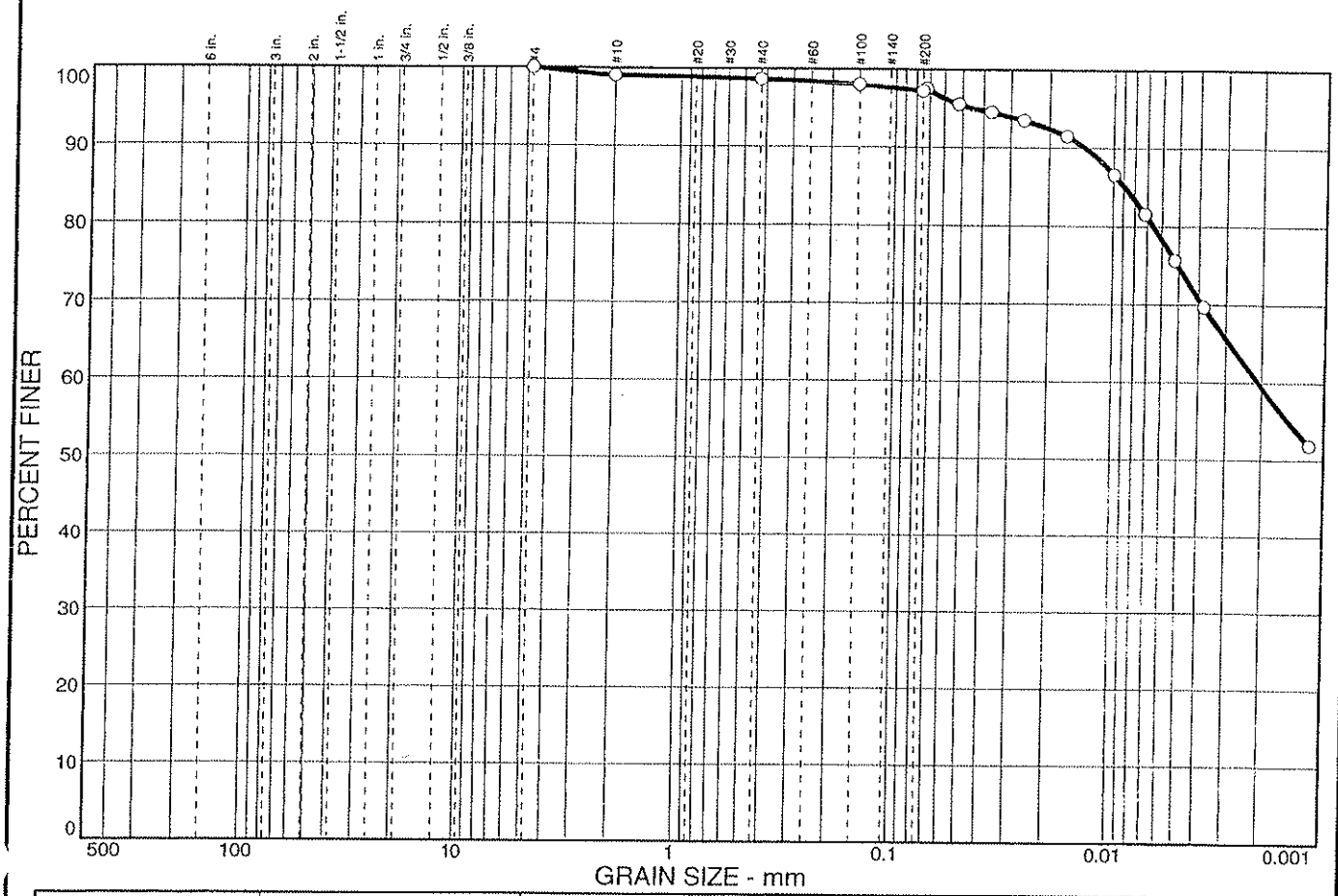
Remarks

Sample No.: CL-B-9 **Source of Sample:** Lift 5 **Date:** 7/25/05
Location: **Elev./Depth:** N5200 E5850

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	1.0	0.4	1.4	22.3	74.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.0		
#40	98.6		
#100	98.0		
#200	97.2		

* (no specification provided)

Material Description

Silty Clay--Gray

Atterberg Limits

PL= 18 LL= 45 PI= 27

Coefficients

D_{85}= 0.0088 D_{60}= 0.0021 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

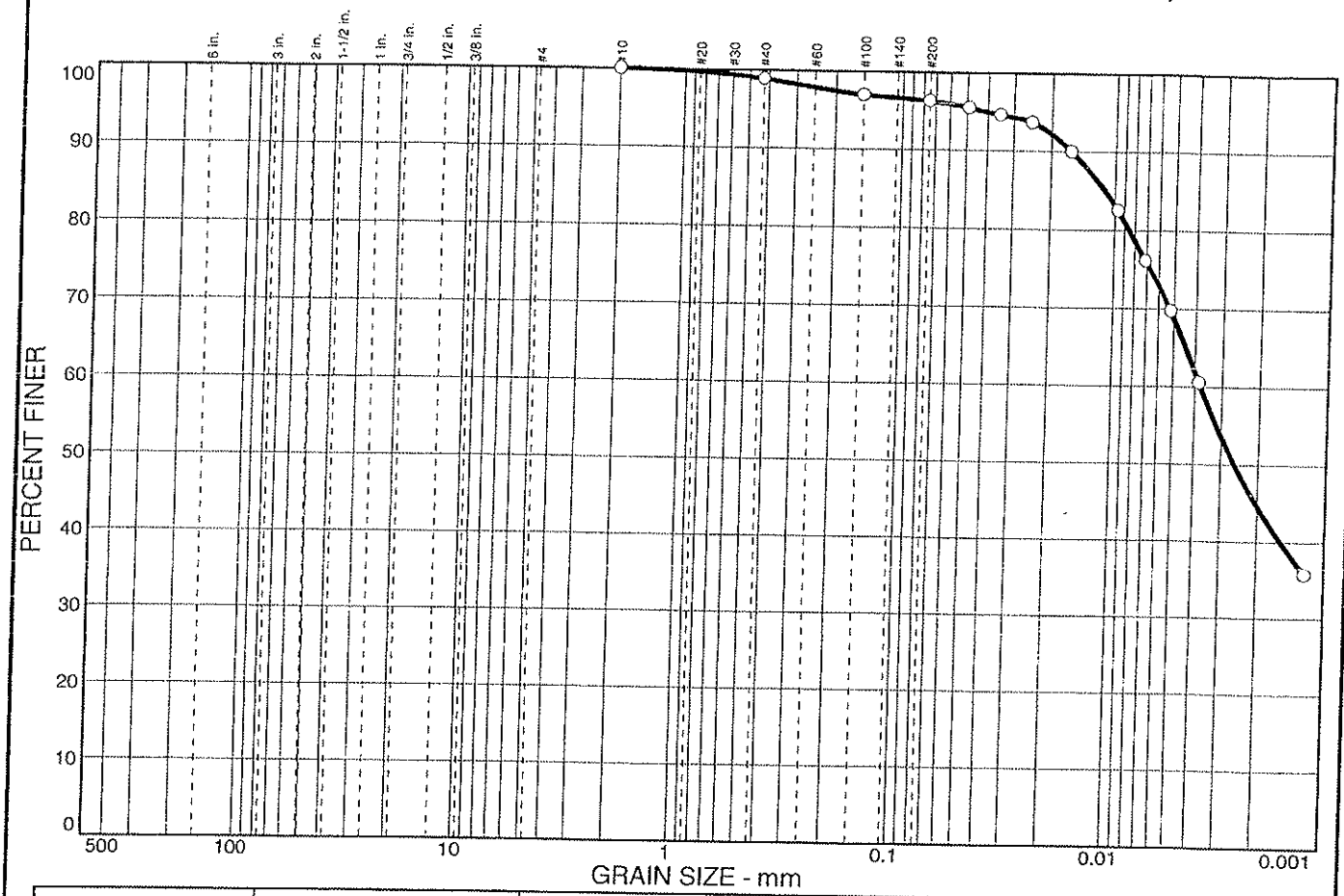
Sample No.: CL-B-10 **Source of Sample:** Source **Date:** 7/25/05
Location: **Elev./Depth:** N5100 E5700

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Appendix E - Select Clay Laboratory Test Results
Compacted Clay Samples

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.1	2.6	27.5	68.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	98.9		
#100	97.0		
#200	96.3		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 48 PI= 27

Coefficients

D_{85}= 0.0111 D_{60}= 0.0038 D_{50}= 0.0026
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-1 **Source of Sample:** Lift 2 **Date:** 7/1/05
Location: **Elev./Depth:** N4900 E6000

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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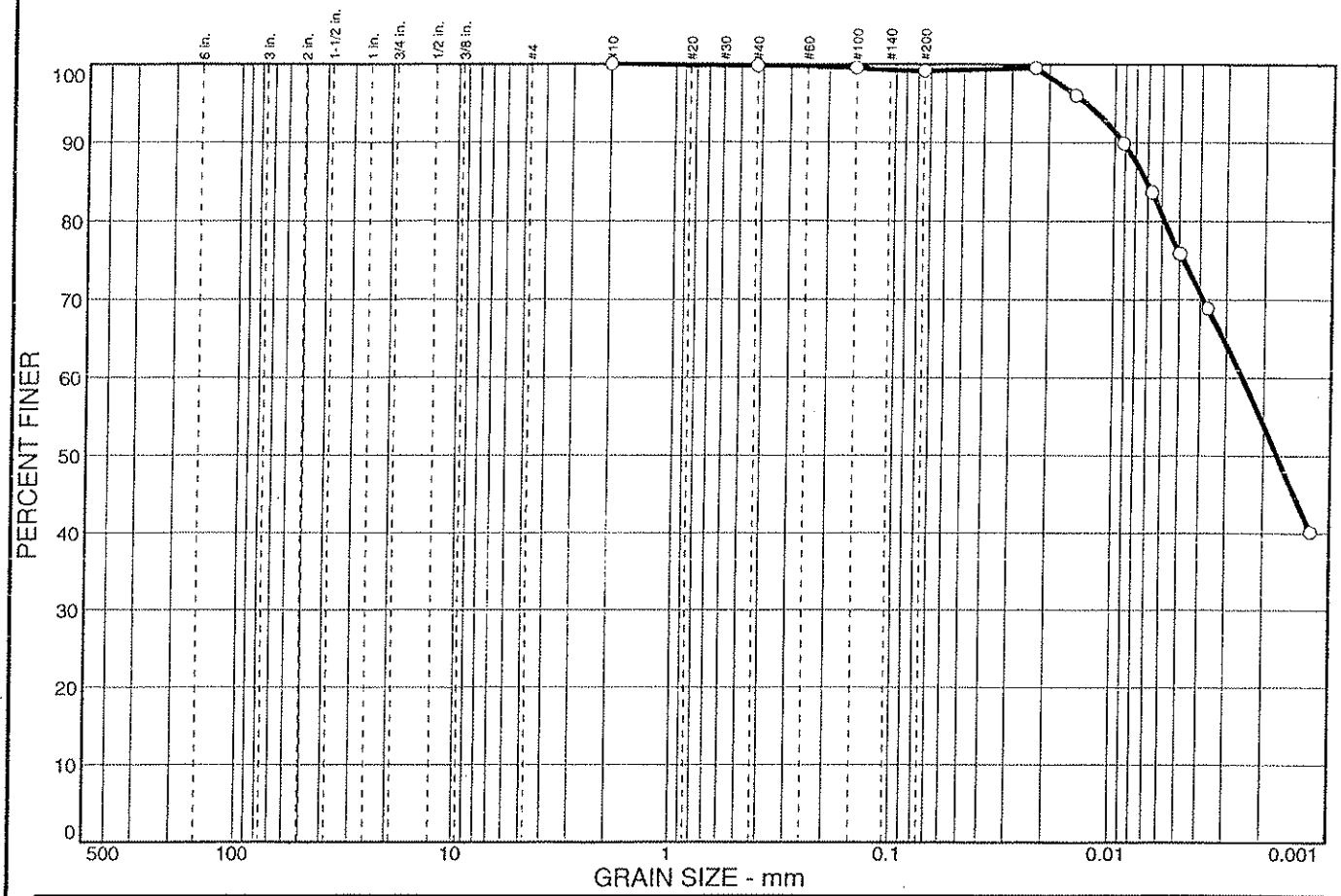
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	0.7	23.0	76.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.8		
#100	99.5		
#200	99.1		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 49 PI= 28

Coefficients

D_{85}= 0.0071 D_{60}= 0.0025 D_{50}= 0.0017
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

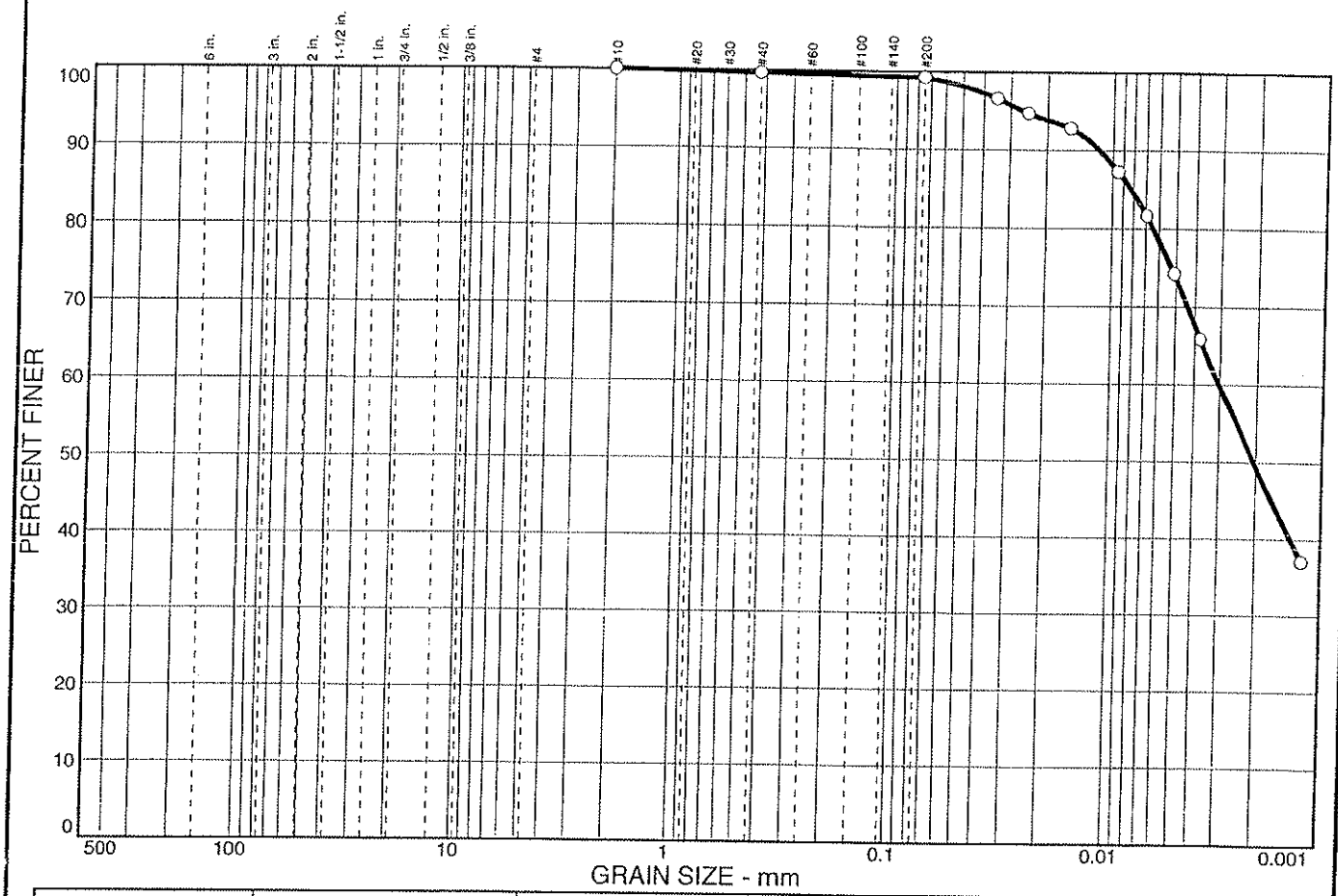
Sample No.: CL-T-2 **Source of Sample:** Lift 4 **Date:** 7/1/05
Location: **Elev./Depth:** N5100 E6050

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

35

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	0.4	25.4	73.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.6		
#200	99.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 50 PI= 29

Coefficients

D_{85}= 0.0082 D_{60}= 0.0030 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-3 **Source of Sample:** Lift 4 **Date:** 7/1/05
Location: **Elev./Depth:** N4750 E6050

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11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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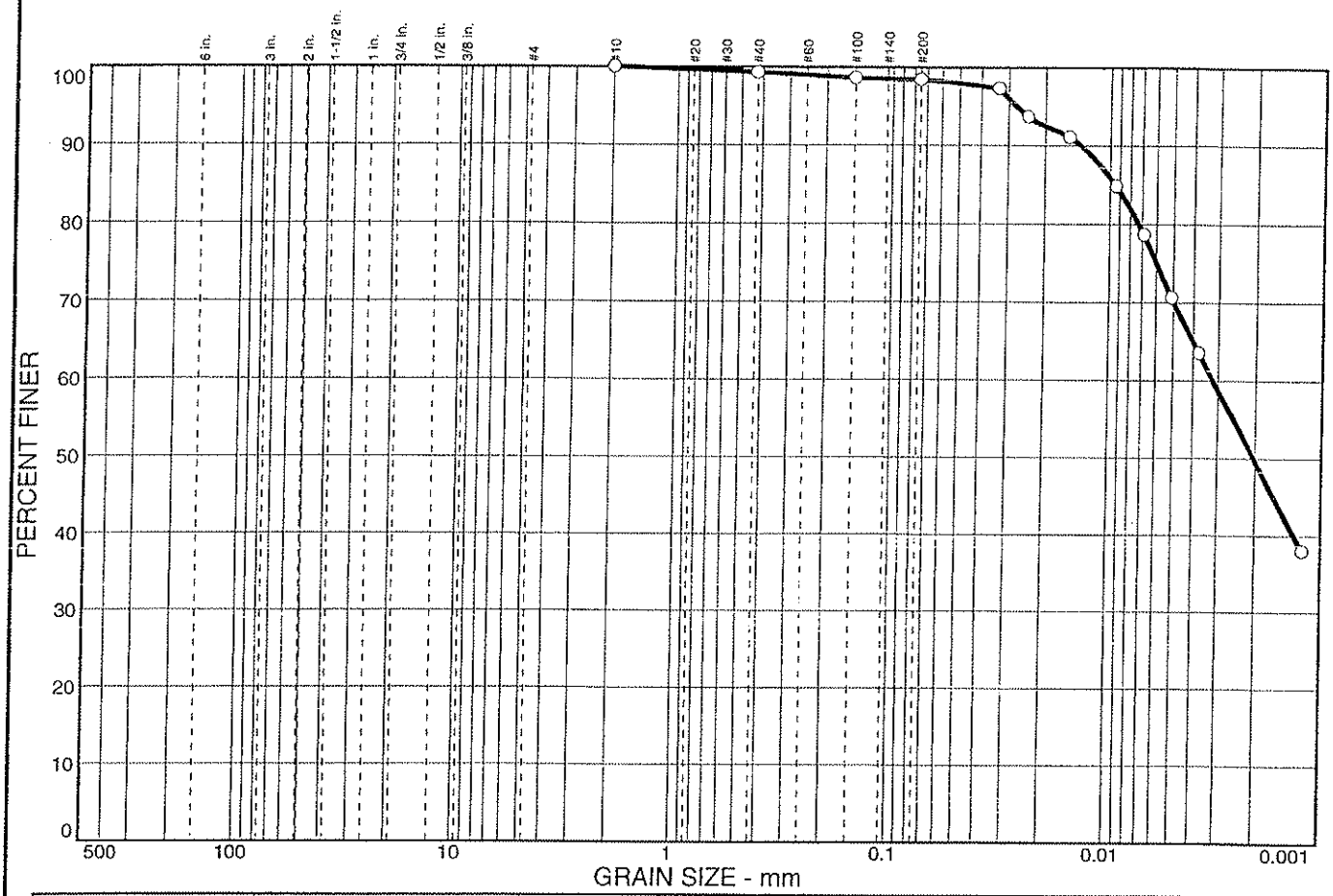
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.7	0.9	28.1	70.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.3		
#100	98.6		
#200	98.4		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 22 LL= 48 PI= 26

Coefficients

D_{85}= 0.0094 D_{60}= 0.0032 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

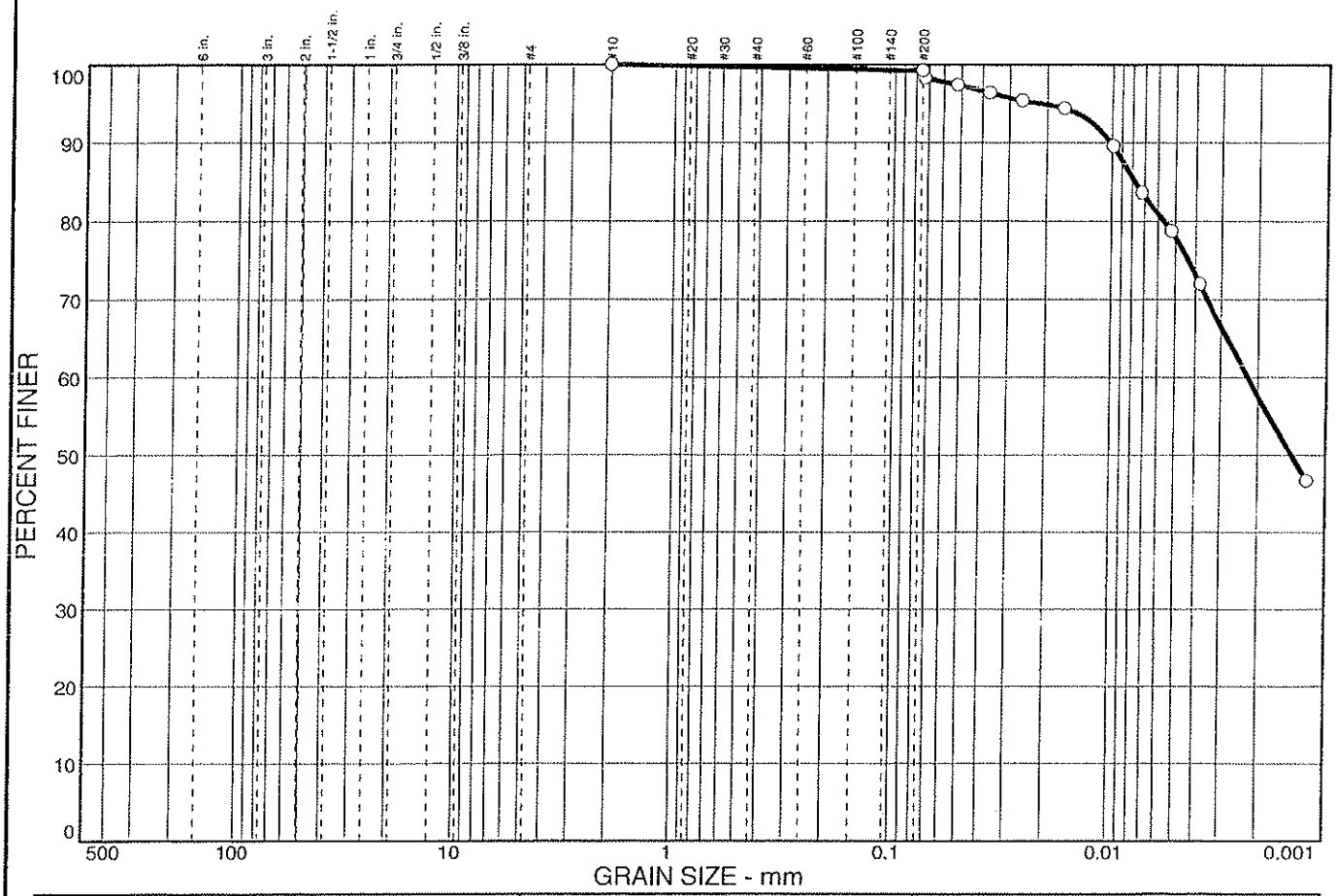
Remarks

Sample No.: CL-T-4 **Source of Sample:** Lift 6 **Date:** 7/1/05
Location: **Elev./Depth:** N5100 E5950

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	0.4	21.1	78.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#200	99.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 22 LL= 50 PI= 28

Coefficients

D_{85}= 0.0077 D_{60}= 0.0022 D_{50}= 0.0014
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-5 **Source of Sample:** Lift 6 **Date:** 7/1/05
Location: **Elev./Depth:** N4800 E5950

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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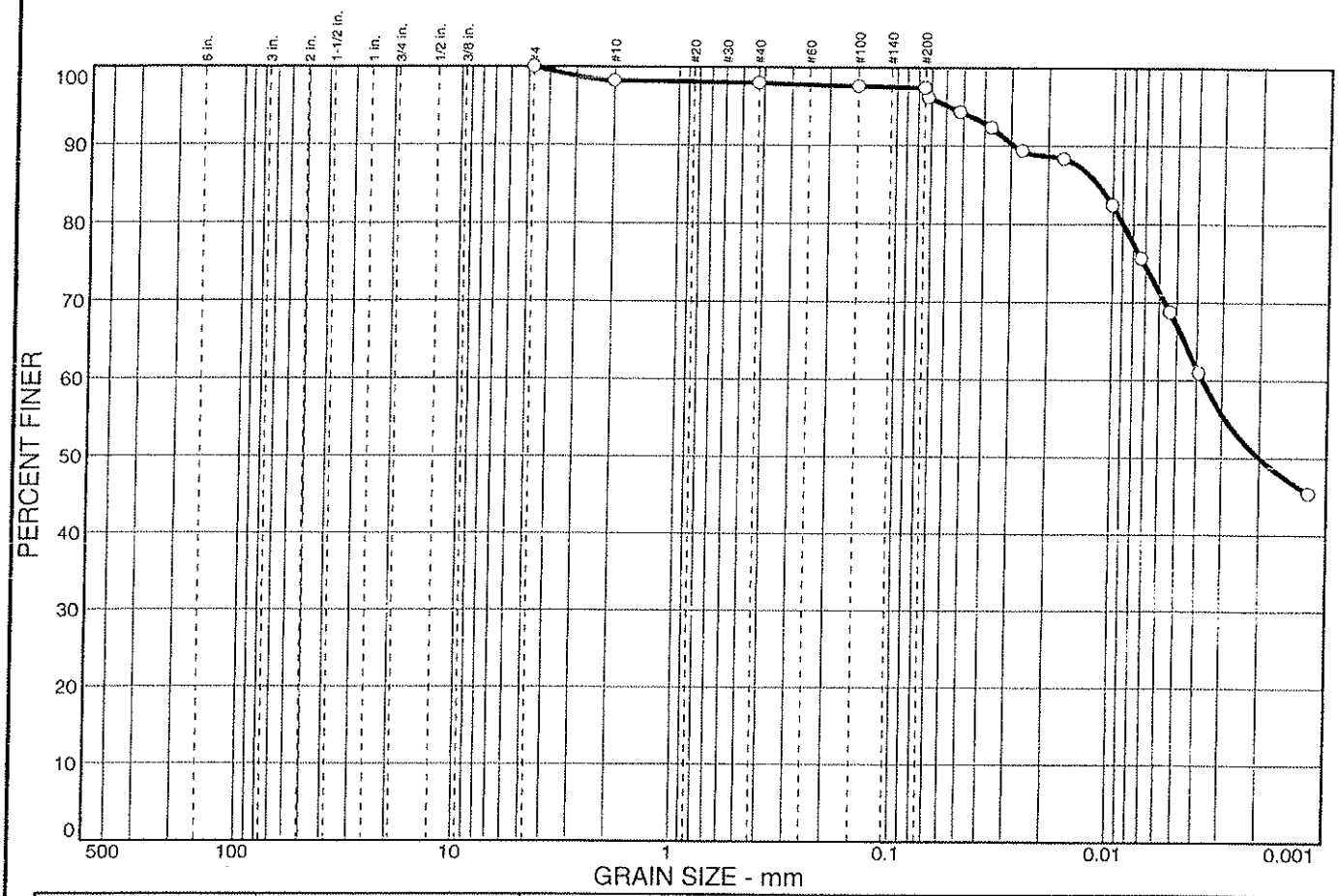
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	1.8	0.2	0.6	30.2	67.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.2		
#40	98.0		
#100	97.6		
#200	97.4		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 44 PI= 24

Coefficients

D_{85}= 0.0116 D_{60}= 0.0037 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-6 **Source of Sample:** Lift 2 **Date:** 07/25/2005
Location: **Elev./Depth:** N5200 E6000

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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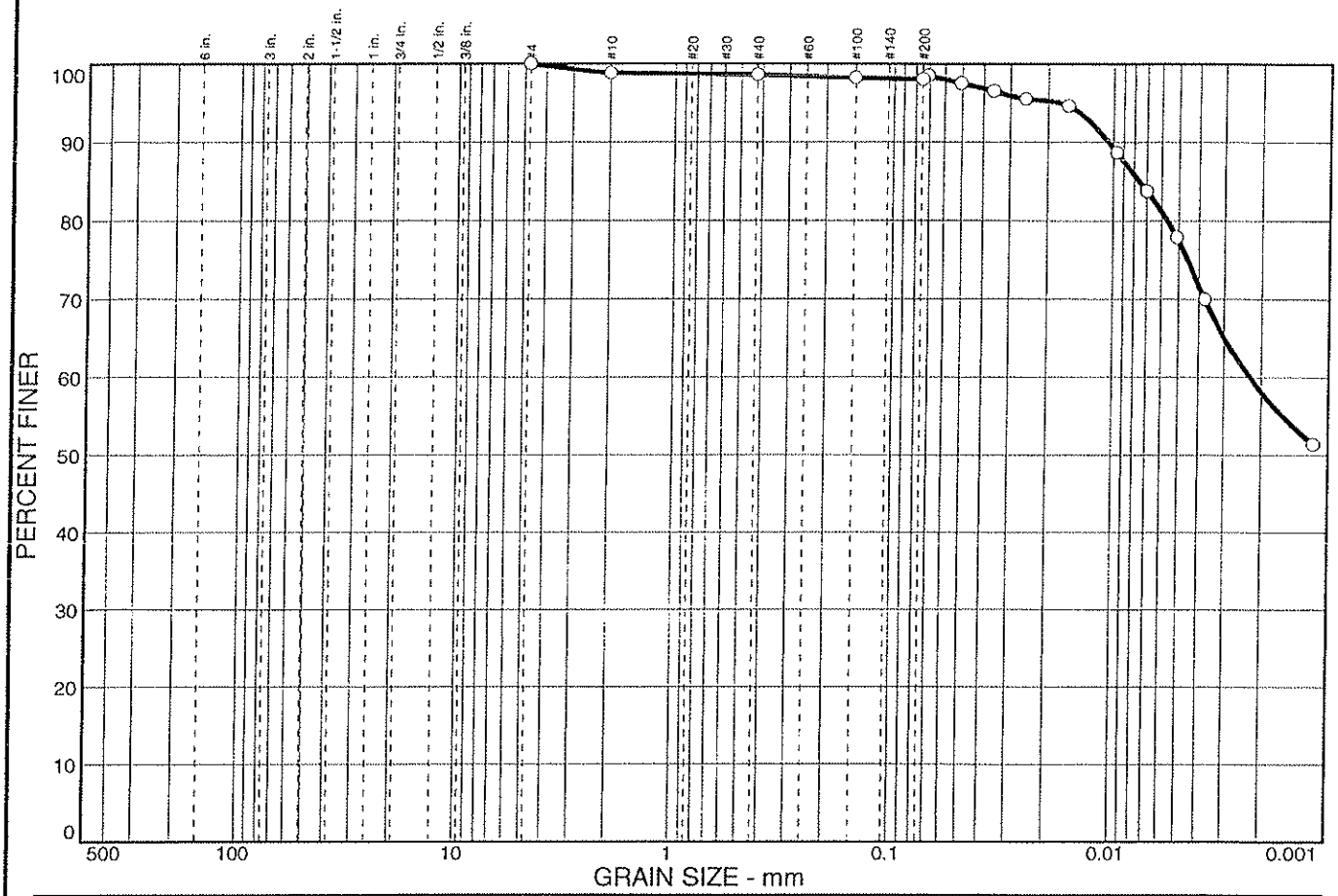
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	1.2	0.2	0.6	20.5	77.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.8		
#40	98.6		
#100	98.2		
#200	98.0		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 22 LL= 48 PI= 26

Coefficients

D_{85}= 0.0076 D_{60}= 0.0023 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-7 **Source of Sample:** Lift 4 **Date:** 7/25/05
Location: **Elev./Depth:** N5400 E6050

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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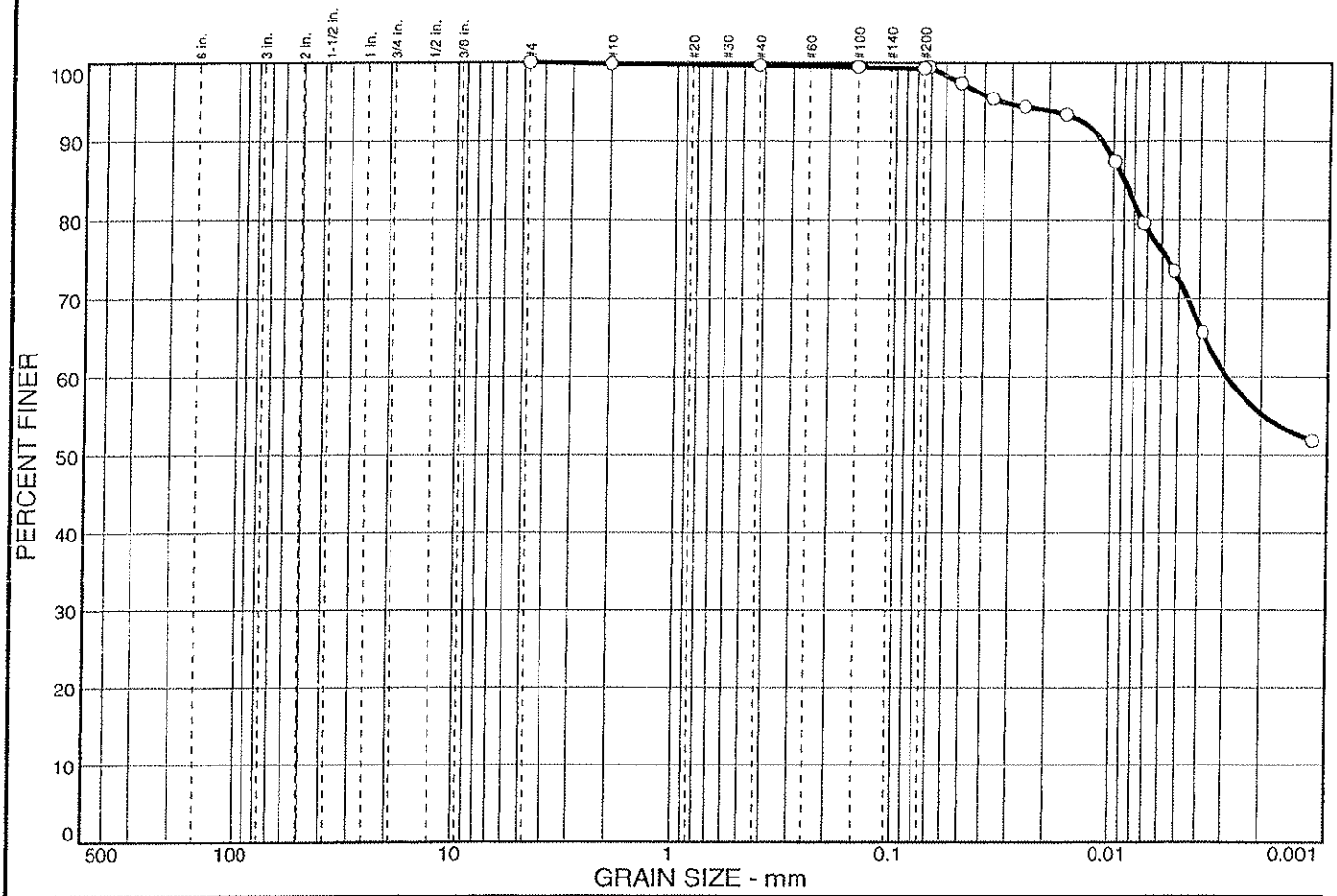
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	0.2	0.4	26.7	72.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#40	99.6		
#100	99.4		
#200	99.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 18 LL= 49 PI= 31

Coefficients

D_{85}= 0.0089 D_{60}= 0.0029 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-8 **Source of Sample:** Lift 6 **Date:** 7/25/05
Location: **Elev./Depth:** N5400 E5950

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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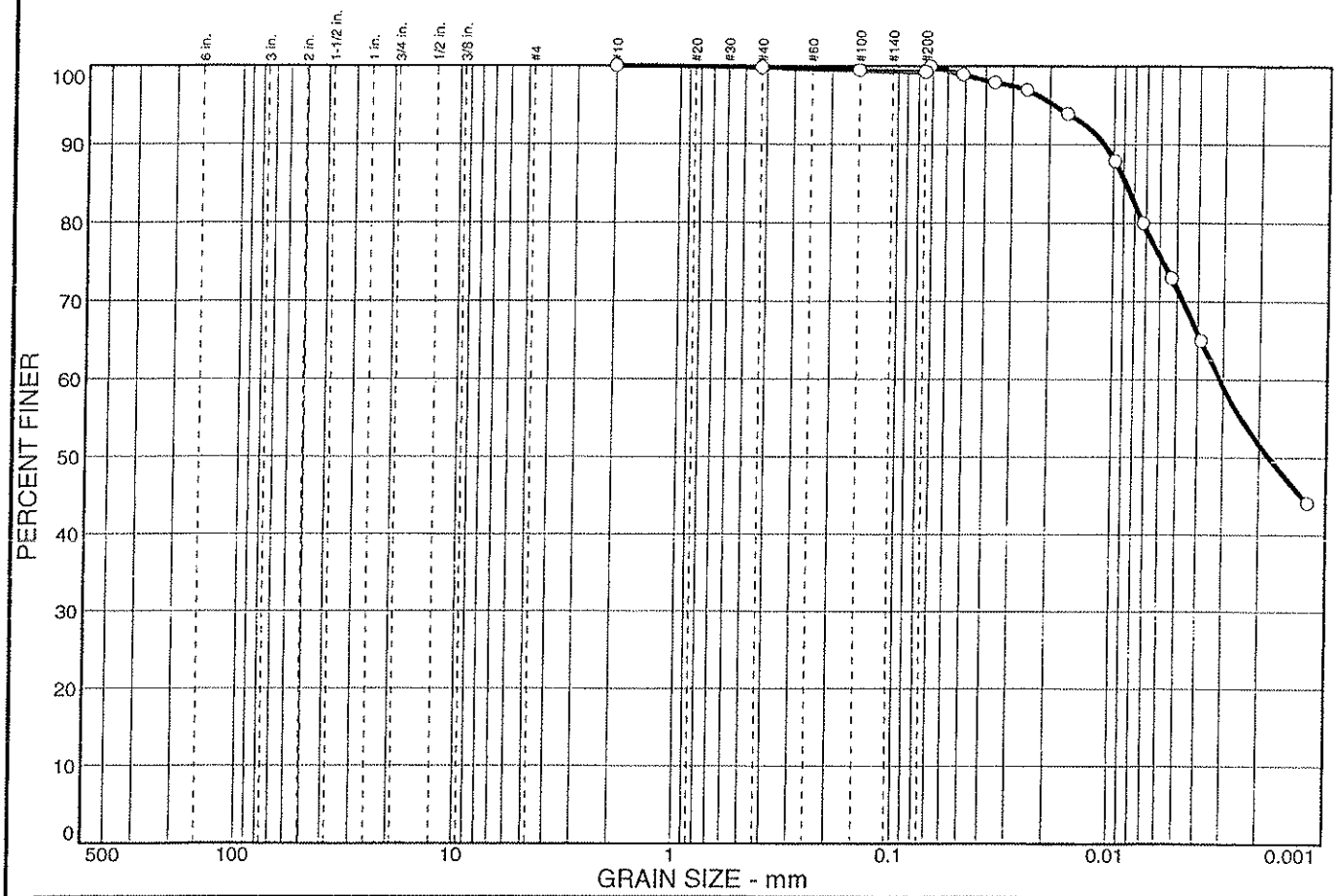
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	0.6	27.5	71.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.8		
#100	99.4		
#200	99.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 51 PI= 30

Coefficients

D_{85}= 0.0087 D_{60}= 0.0031 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-9 **Source of Sample:** Lift 2 **Date:** 7/25/05
Location: **Elev./Depth:** N5550 E6000

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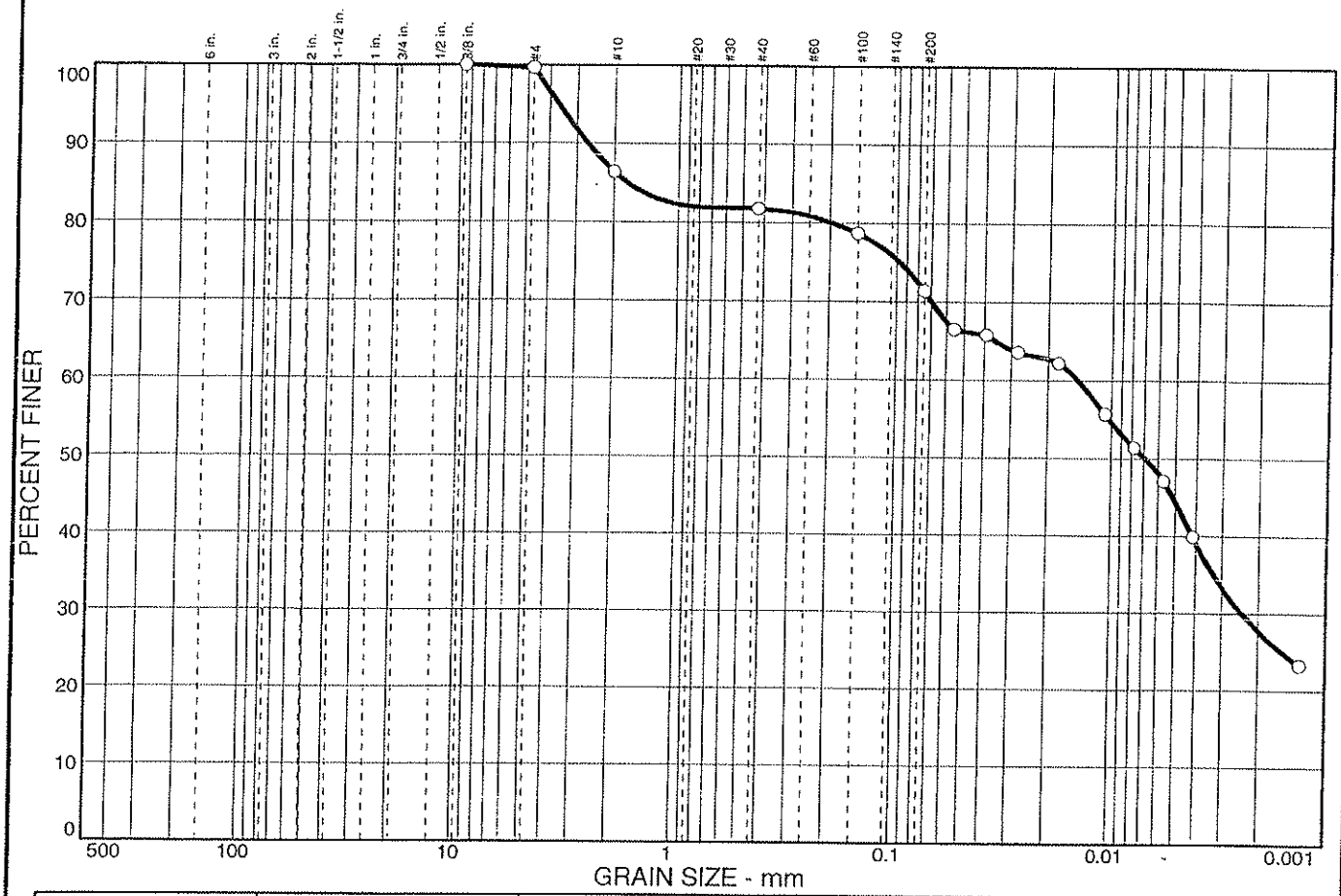
Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.4	13.2	4.6	10.4	26.9	44.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.6		
#10	86.4		
#40	81.8		
#100	78.7		
#200	71.4		

* (no specification provided)

Material Description

Silty Clay Some Sand Trace Gravel--Gray

Atterberg Limits

PL= 21 LL= 50 PI= 29

Coefficients

D_{85}= 1.72 D_{60}= 0.0144 D_{50}= 0.0069
D_{30}= 0.0024 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-10 **Source of Sample:** Lift 2 **Date:** 7/25/05
Location: **Elev./Depth:** N5850 E6050

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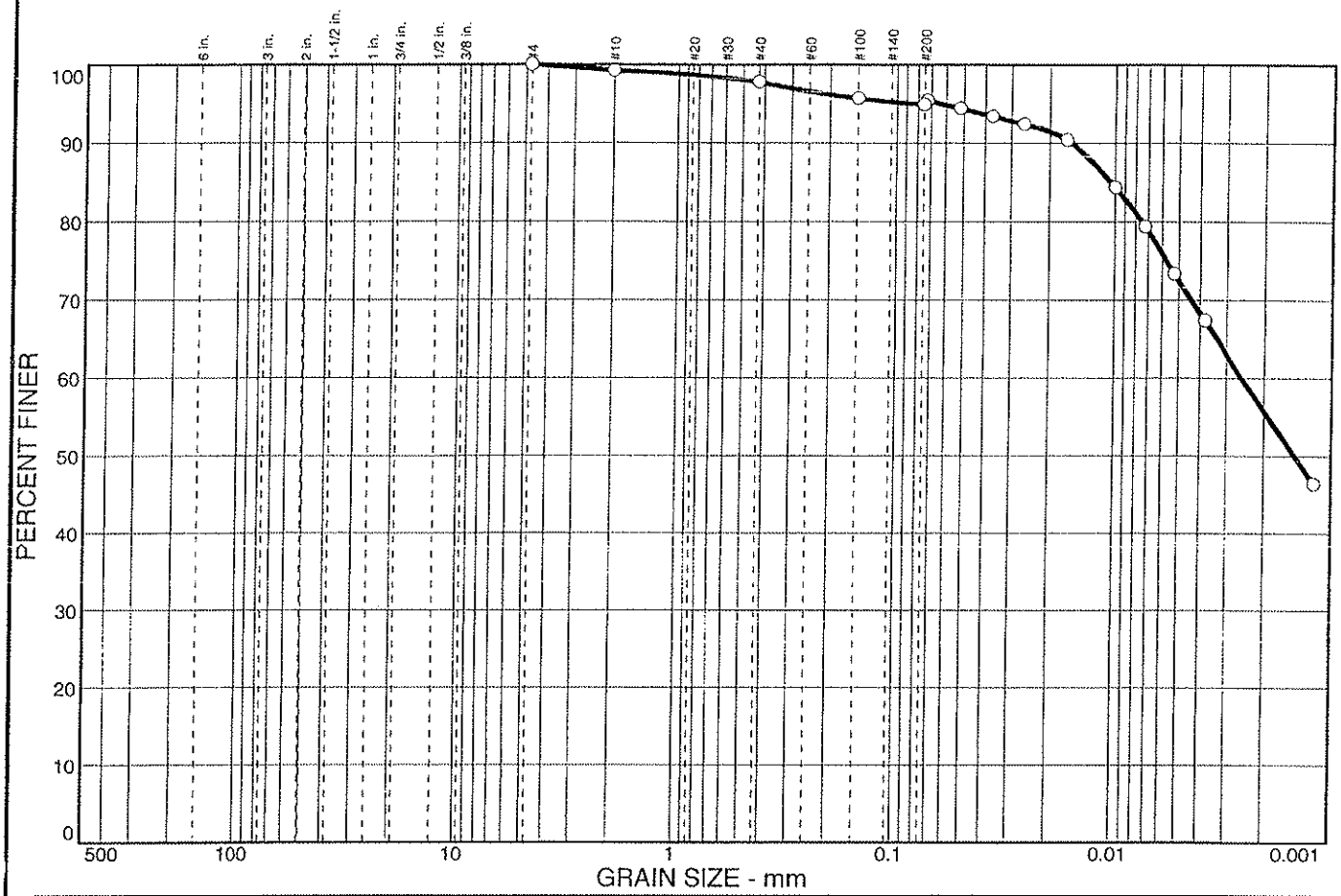
Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.8	1.4	2.9	22.4	72.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.2		
#40	97.8		
#100	95.7		
#200	94.9		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 51 PI= 30

Coefficients

D_{85}= 0.0104 D_{60}= 0.0025 D_{50}= 0.0015
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-11 **Source of Sample:** Lift 4 **Date:** 8/1/05
Location: **Elev./Depth:** N5700 E6050

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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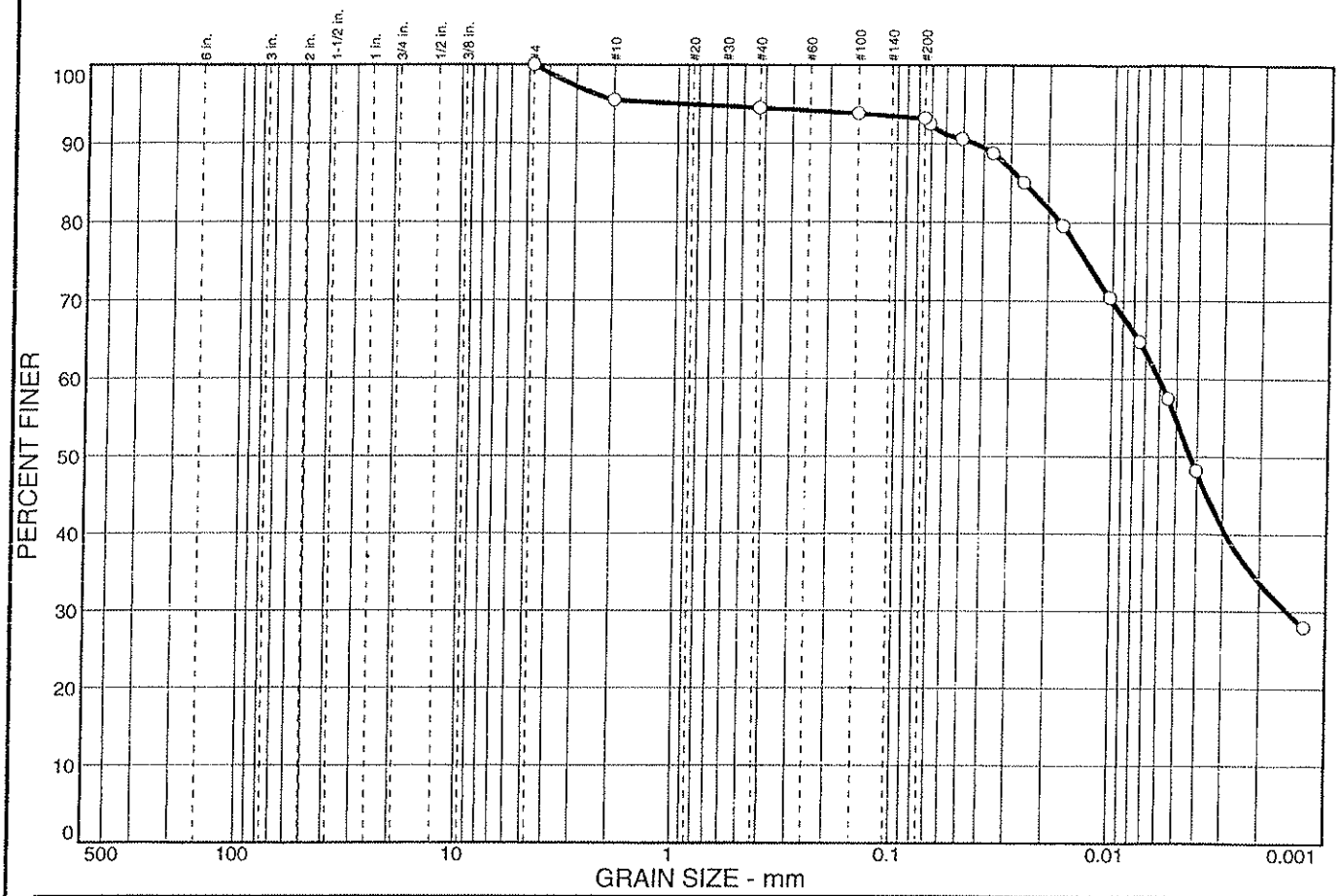
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	4.5	1.0	1.3	38.4	54.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	95.5		
#40	94.5		
#100	93.8		
#200	93.2		

* (no specification provided)

Material Description

Silty Clay--Gray

Atterberg Limits

PL= 20 LL= 49 PI= 29

Coefficients

D_{85}= 0.0260 D_{60}= 0.0060 D_{50}= 0.0043
D_{30}= 0.0015 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-12 **Source of Sample:** Lift 8 **Date:** 8/1/05
Location: **Elev./Depth:** N5350 E6050

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Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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Particle Size Distribution Report (ASTM D 422)

% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.8	6.3	3.7	5.0	28.3	54.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.8		
#4	98.2		
#10	91.9		
#40	88.2		
#100	85.8		
#200	83.2		

* (no specification provided)

Material Description

Silty Clay Little Sand Trace Gravel--Gray

Atterberg Limits

PL= 21 LL= 49 PI= 28

Coefficients

D_{85}= 0.118 D_{60}= 0.0065 D_{50}= 0.0039
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-13 **Source of Sample:** Lift 2 **Date:** 7/25/05
Location: **Elev./Depth:** N5650 E5850

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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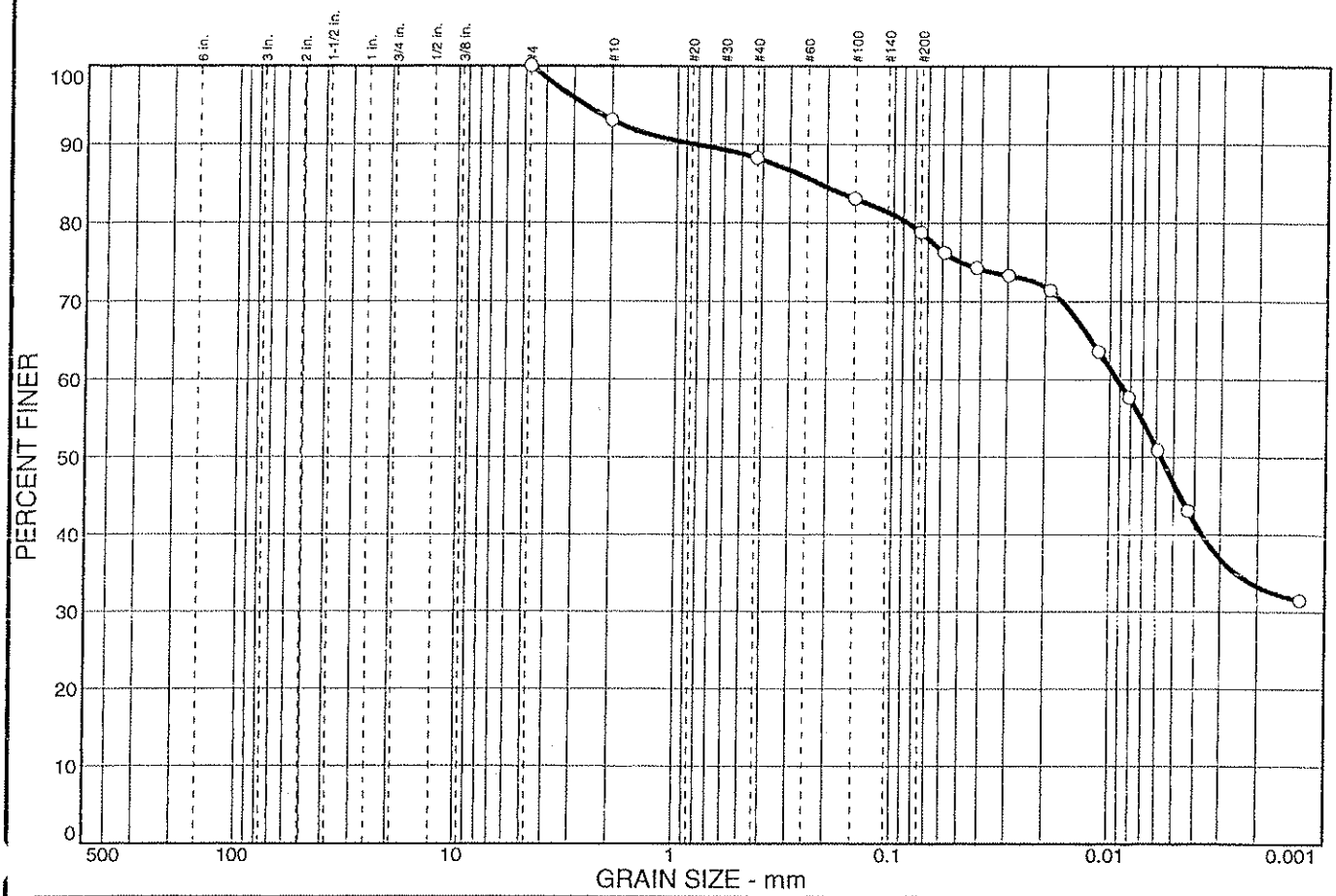
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	6.9	4.8	9.5	32.0	46.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	93.1		
#40	88.3		
#100	83.1		
#200	78.8		

* (no specification provided)

Material Description

Silty Clay Some Sand--Gray

Atterberg Limits

PL= 20 LL= 49 PI= 29

Coefficients

D_{85}= 0.216 D_{60}= 0.0092 D_{50}= 0.0057
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-14 **Source of Sample:** Lift 4 **Date:** 8/1/05
Location: **Elev./Depth:** N5800 E5900

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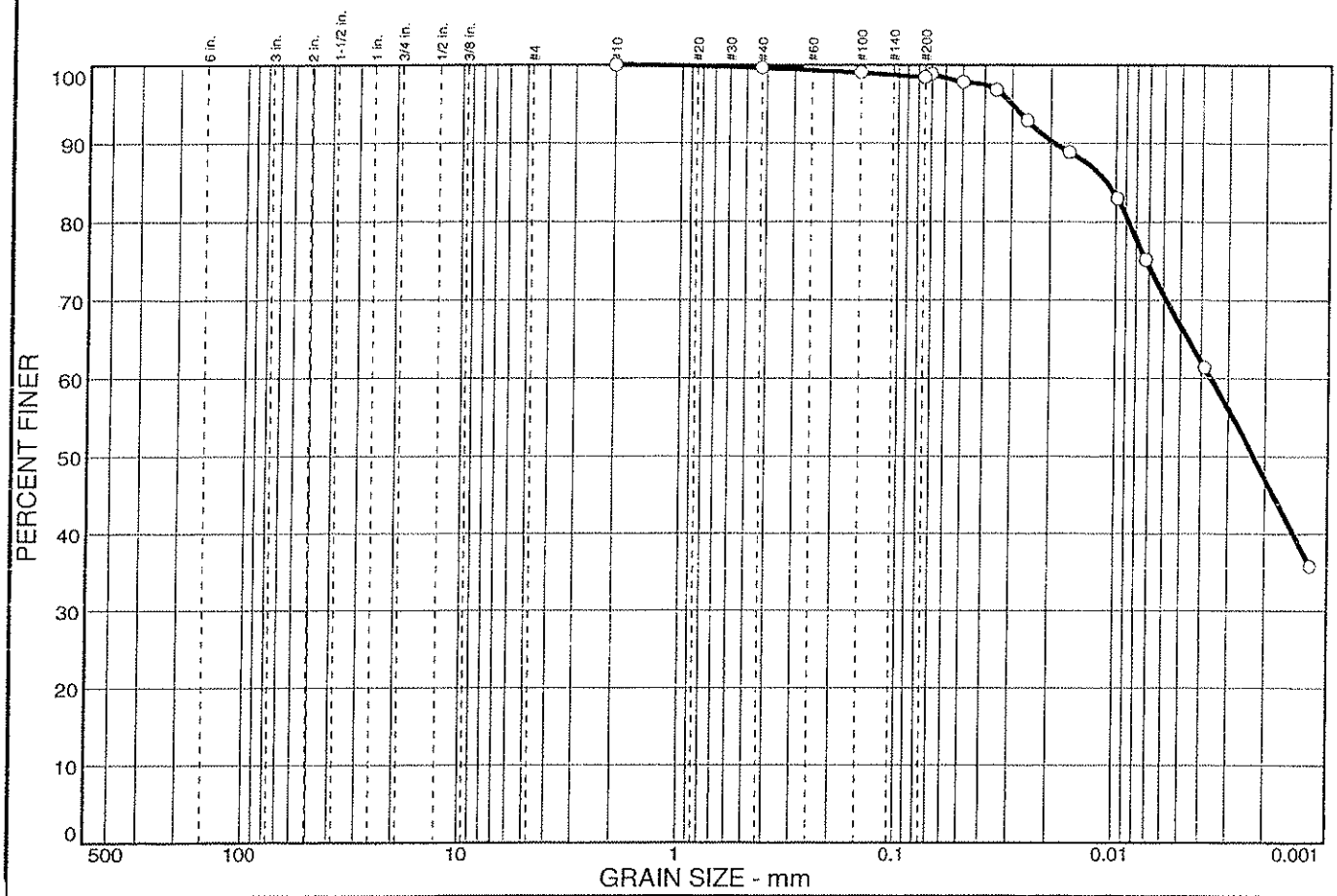
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	1.2	31.6	66.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.6		
#100	99.0		
#200	98.4		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 17 LL= 40 PI= 23

Coefficients

D_{85}= 0.0110 D_{60}= 0.0036 D_{50}= 0.0023
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-15 **Source of Sample:** Lift 2 **Date:** 8/1/05
Location: **Elev./Depth:** N5350 E5850

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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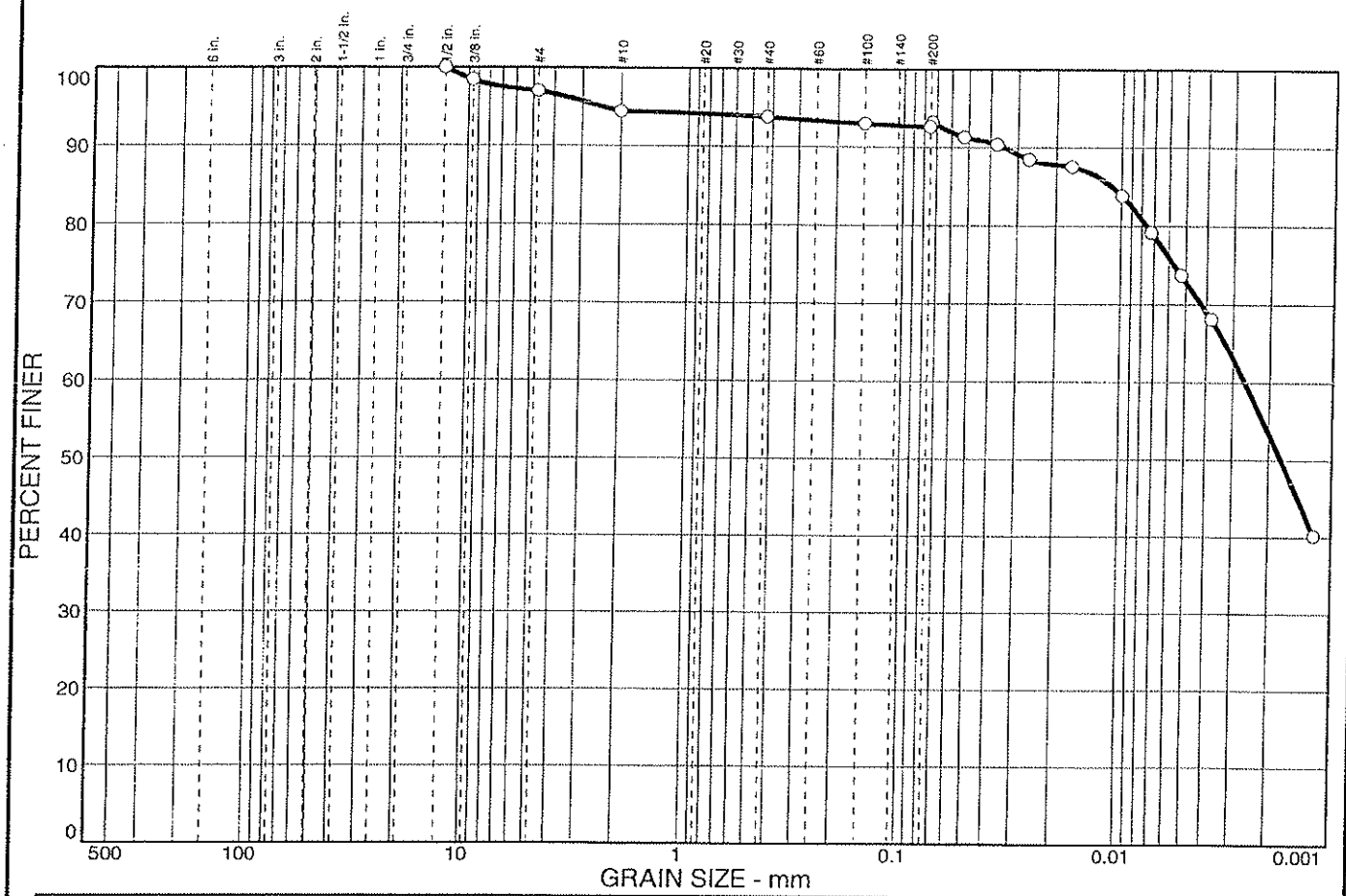
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	3.0	2.6	0.6	1.2	19.7	72.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.4		
#4	97.0		
#10	94.4		
#40	93.8		
#100	93.0		
#200	92.6		

* (no specification provided)

Material Description

Silty Clay Trace Gravel Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 51 PI= 31

Coefficients

D_{85}= 0.0110 D_{60}= 0.0026 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

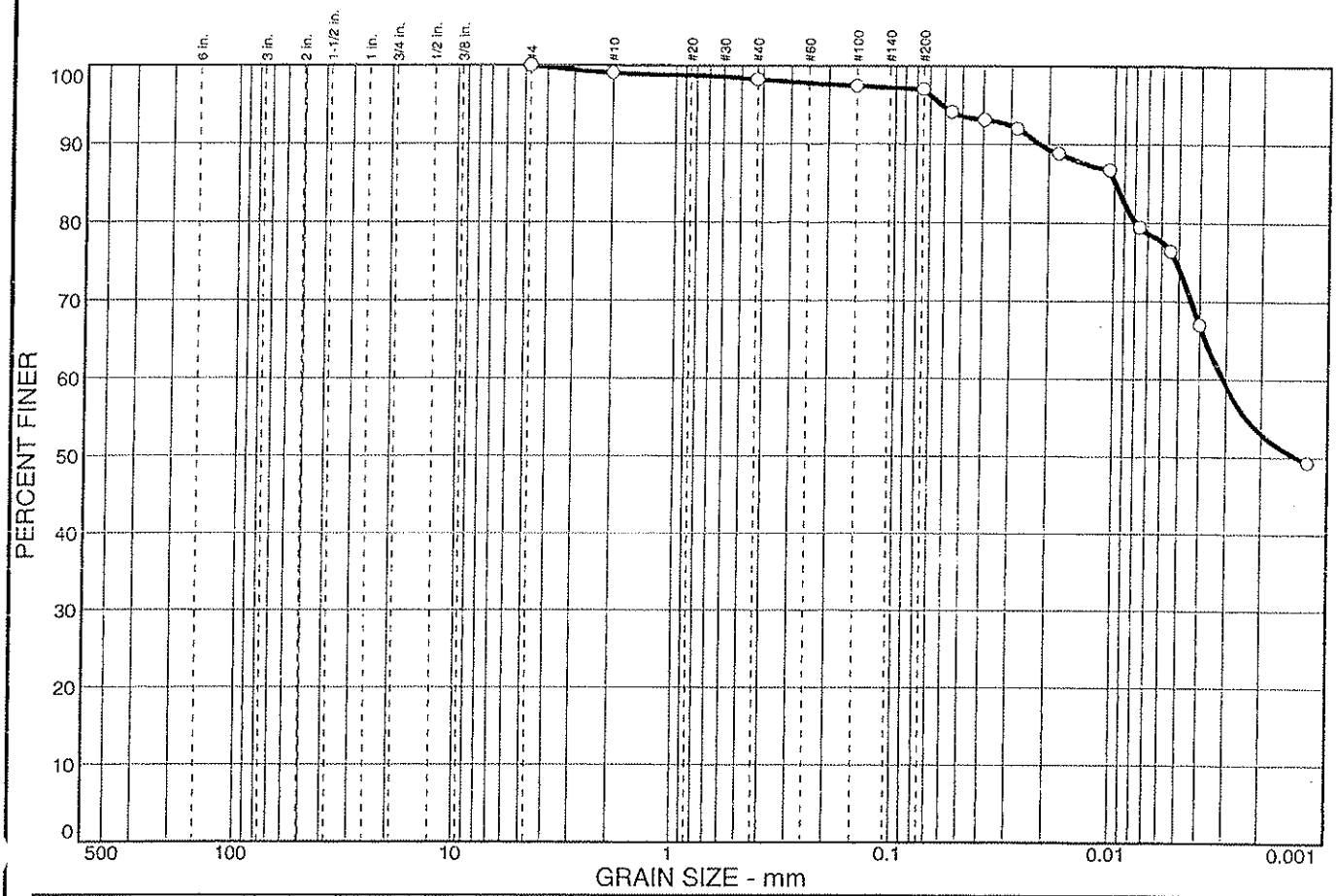
Remarks

Sample No.: CL-T-16 **Source of Sample:** Lift 6 **Date:** 7/25/05
Location: **Elev./Depth:** N5800 E6050

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	1.0	0.8	1.2	22.7	74.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.0		
#40	98.2		
#100	97.4		
#200	97.0		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 50 PI= 30

Coefficients

D_{85}= 0.0098 D_{60}= 0.0031 D_{50}= 0.0014
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-17 **Source of Sample:** Lift 6 **Date:** 8/1/05
Location: **Elev./Depth:** N5800 E5850

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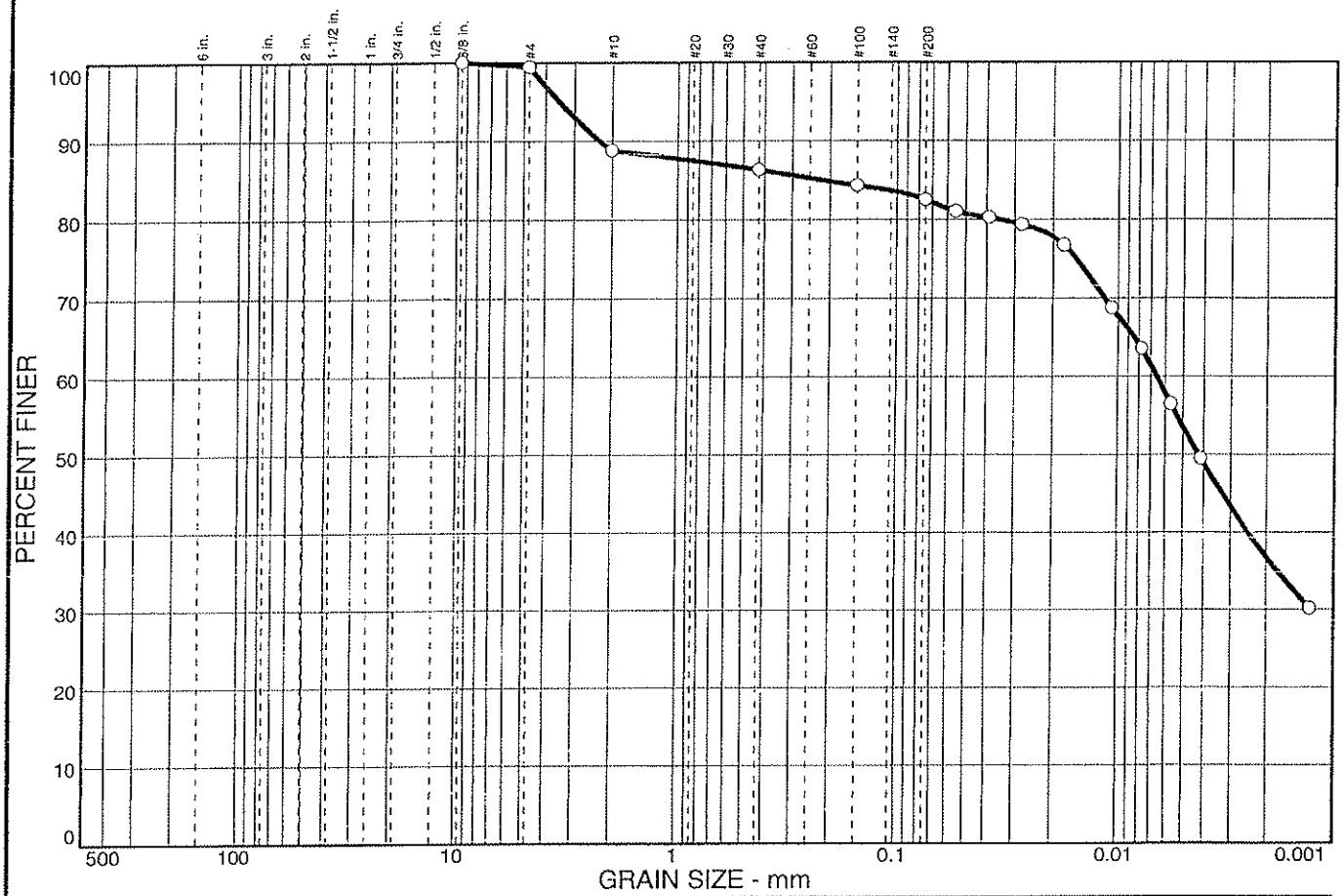
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.6	10.6	2.4	3.8	28.9	53.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.4		
#10	88.8		
#40	86.4		
#100	84.4		
#200	82.6		

* (no specification provided)

Material Description

Silty Clay Little Sand Trace Gravel--Gray

Atterberg Limits

PL= 19 LL= 45 PI= 26

Coefficients

D_{85}= 0.209 D_{60}= 0.0066 D_{50}= 0.0042
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-18 **Source of Sample:** Lift 8 **Date:** 7/25/05
Location: **Elev./Depth:** N5650 E6000

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Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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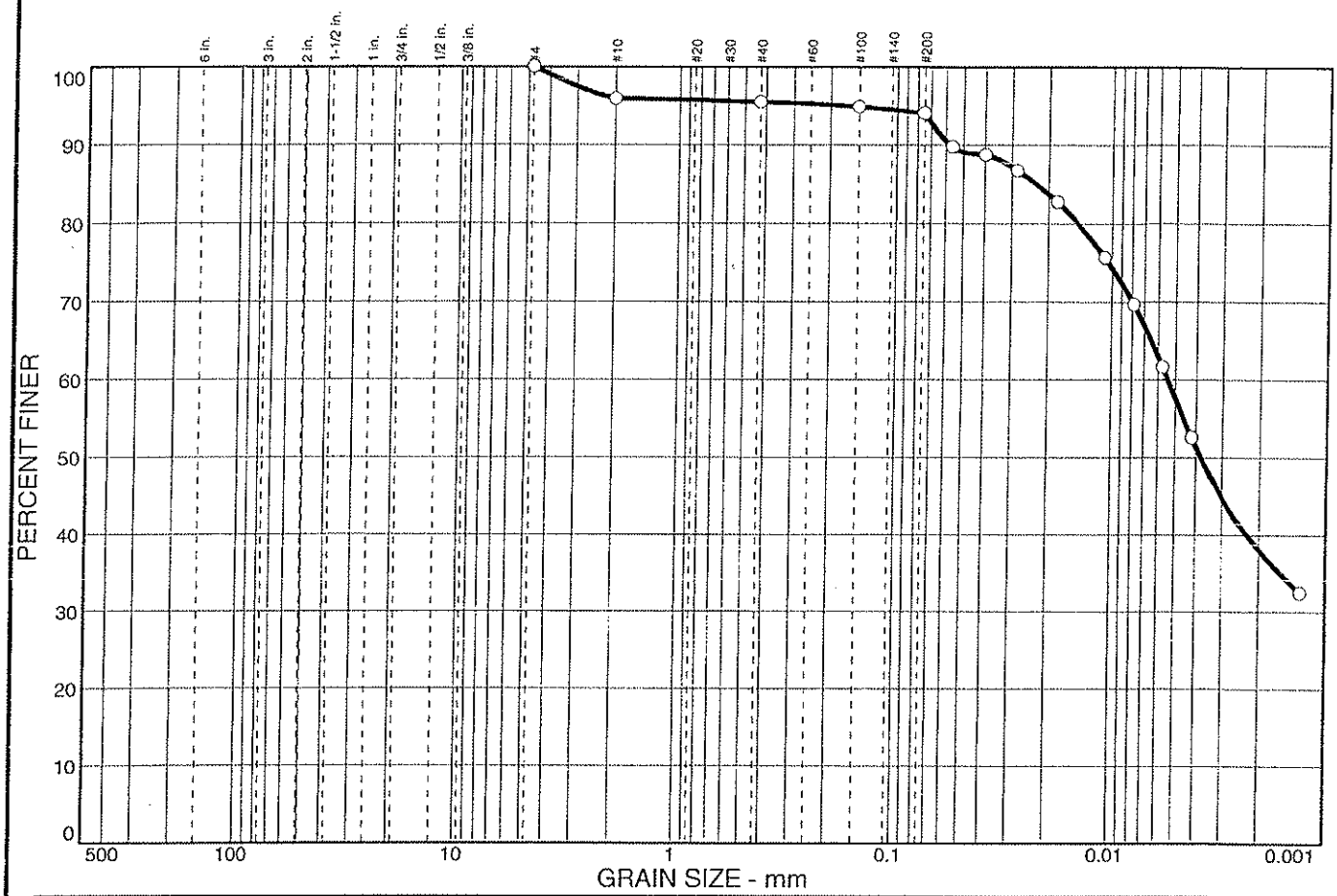
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	4.1	0.4	1.4	36.3	57.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	95.9		
#40	95.5		
#100	94.9		
#200	94.1		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 46 PI= 27

Coefficients

D_{85}= 0.0228 D_{60}= 0.0054 D_{50}= 0.0038
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-19 **Source of Sample:** Lift 4 **Date:** 8/1/05
Location: **Elev./Depth:** N5450 E5900

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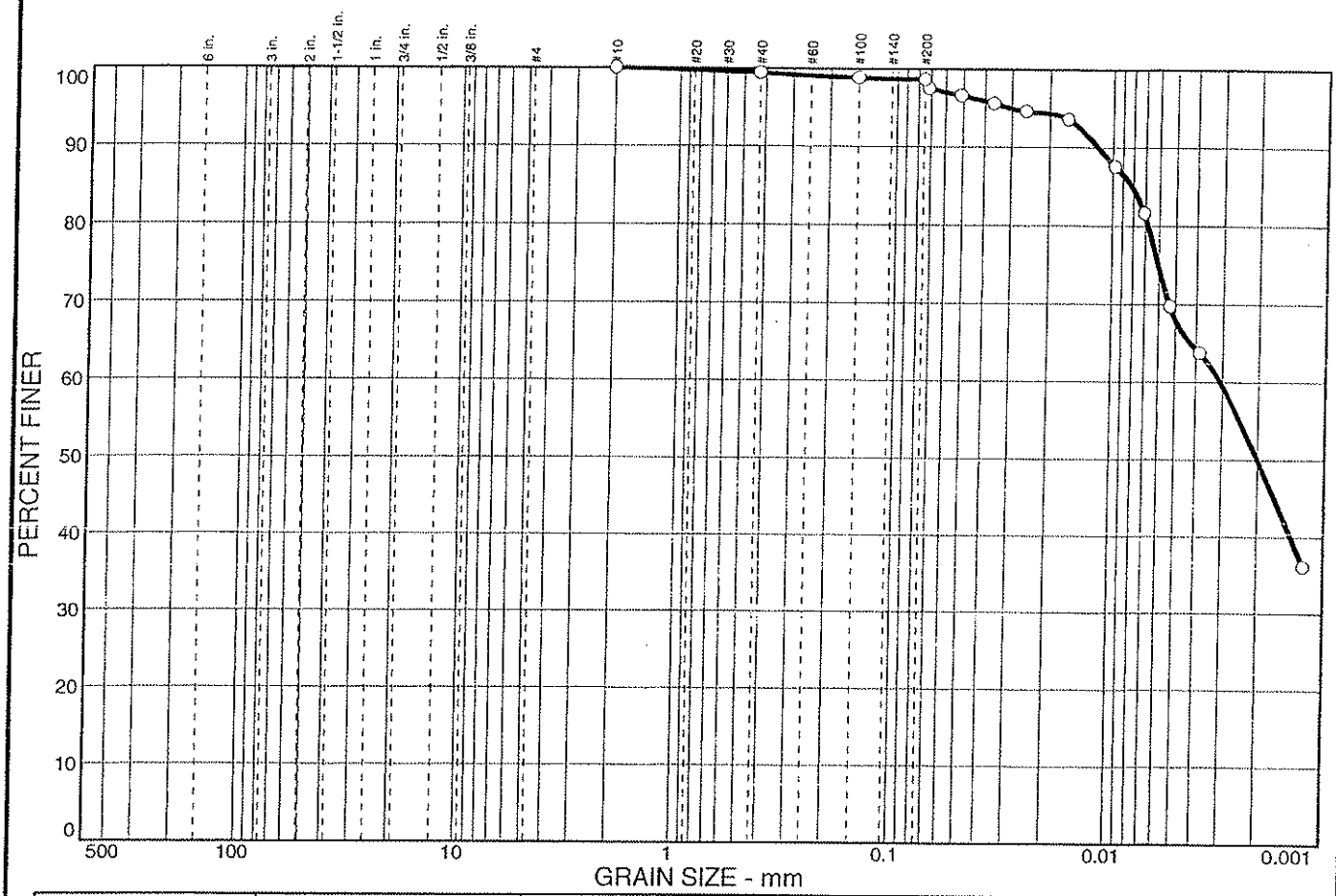
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.6	0.8	30.5	68.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.4		
#100	98.8		
#200	98.6		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 47 PI= 27

Coefficients

D_{85}= 0.0081 D_{60}= 0.0031 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-20 **Source of Sample:** Lift 6 **Date:** 8/1/05
Location: **Elev./Depth:** N5500 E5850

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Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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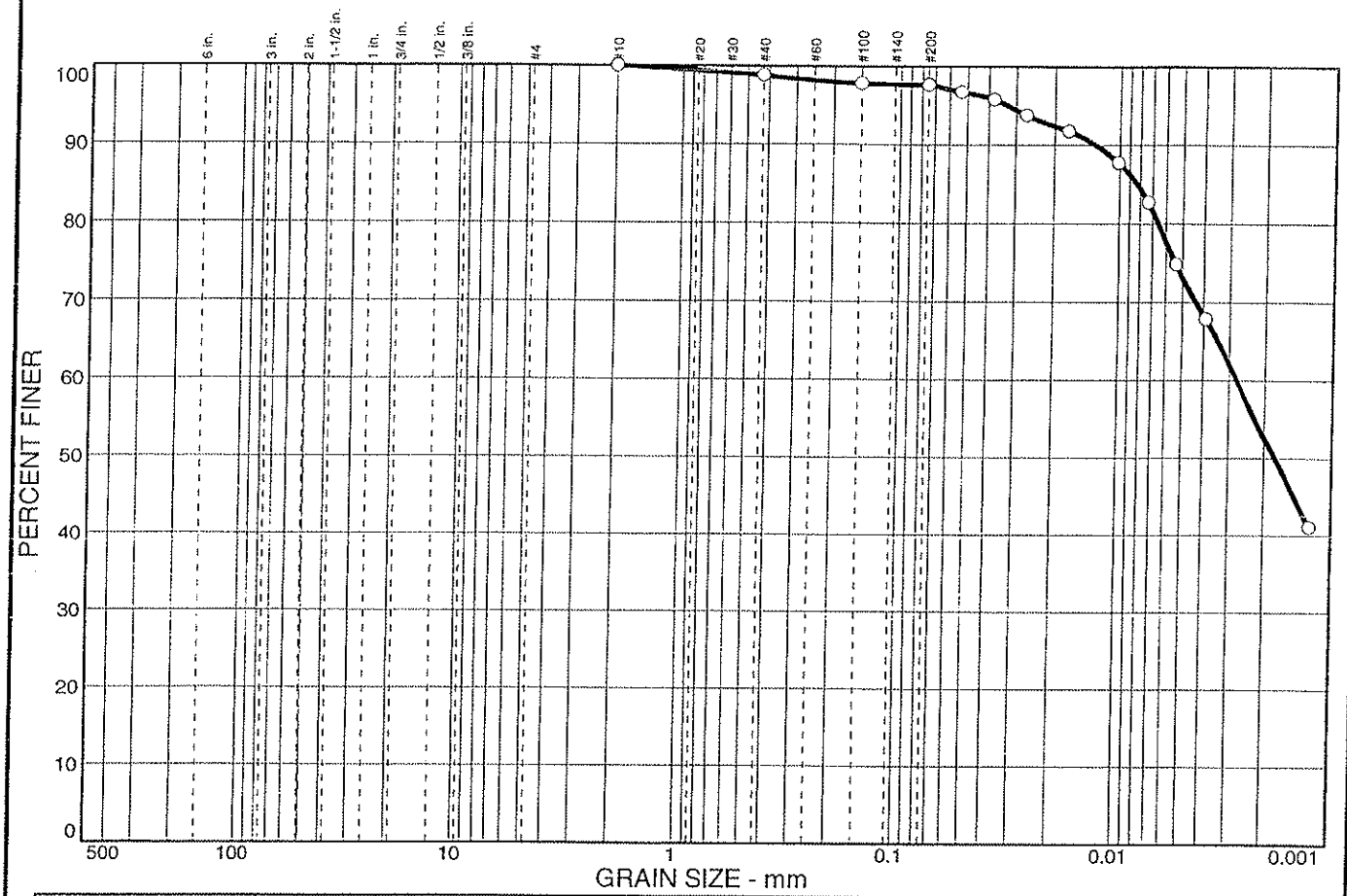
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.2	1.2	24.4	73.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	98.8		
#100	97.8		
#200	97.6		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 47 PI= 28

Coefficients

D_{85}= 0.0082 D_{60}= 0.0027 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

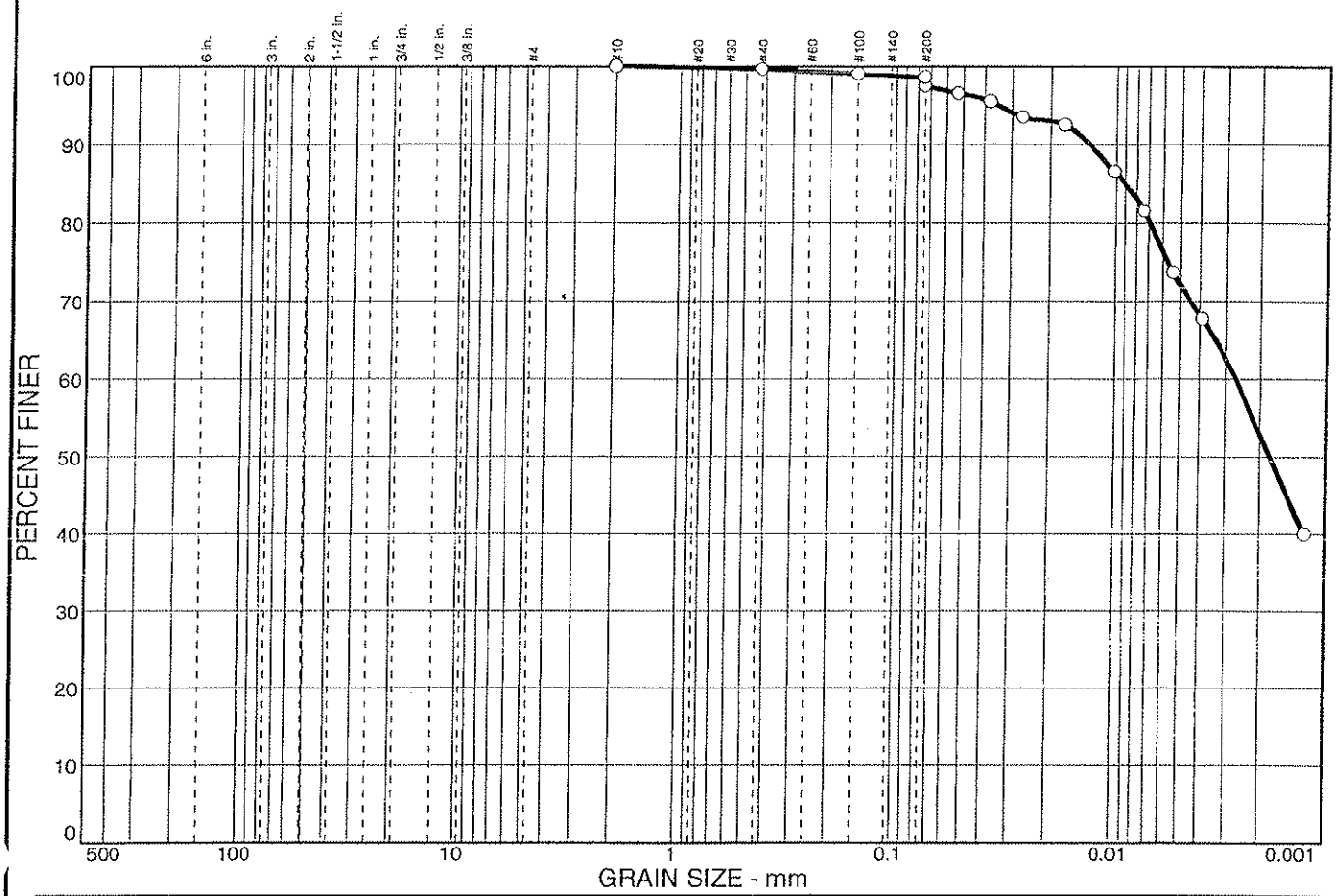
Sample No.: CL-T-21 **Source of Sample:** Lift 2 **Date:** 8/1/05
Location: **Elev./Depth:** N4750 E5850

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

54

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	1.0	26.5	72.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.6		
#100	99.0		
#200	98.6		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 49 PI= 30

Coefficients

D_{85}= 0.0090 D_{60}= 0.0027 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

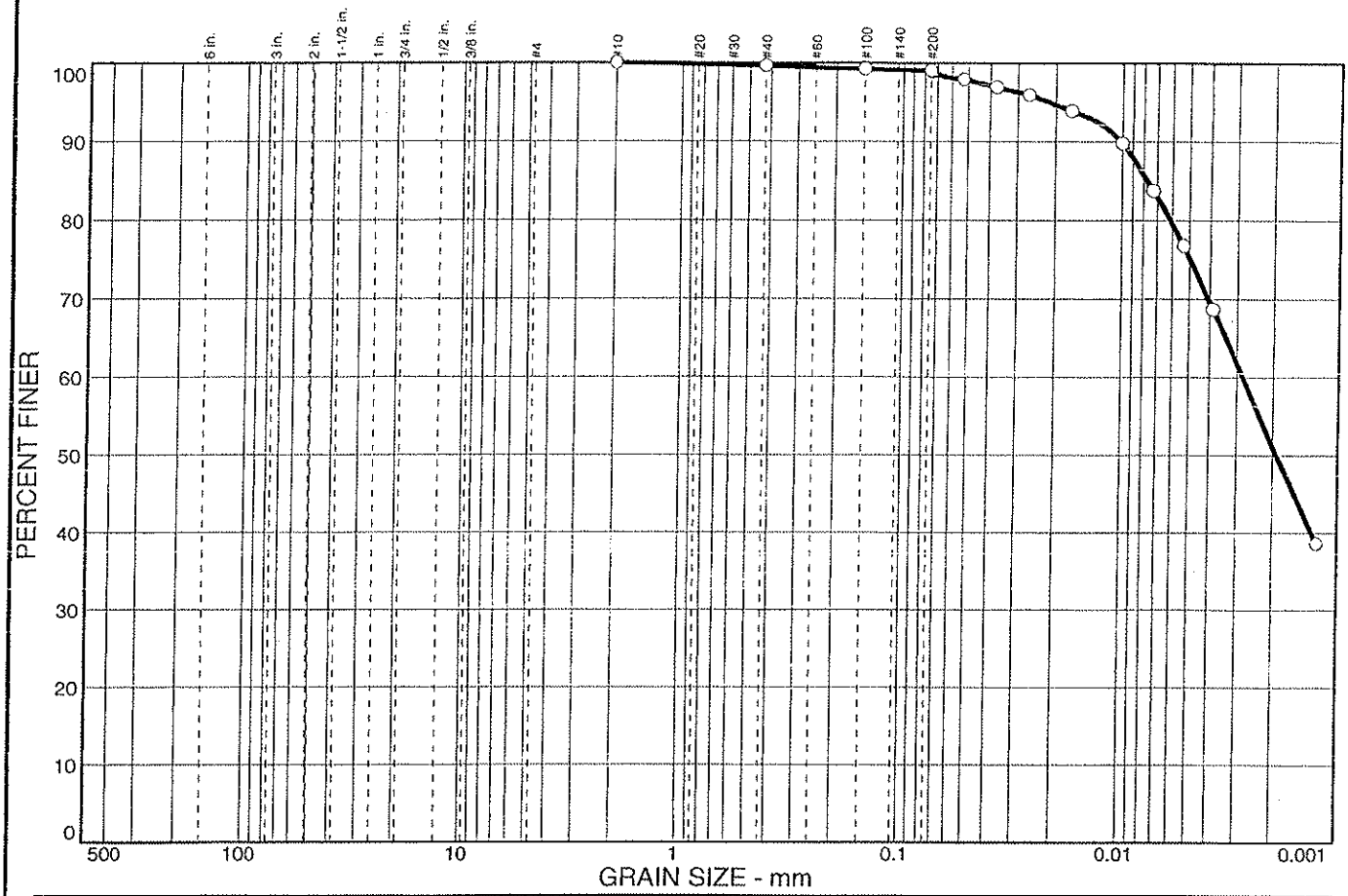
Sample No.: CL-T-22 **Source of Sample:** Lift 8 **Date:** 8/1/05
Location: **Elev./Depth:** N5850 E5950

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

55

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	0.6	23.6	75.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.6		
#100	99.2		
#200	99.0		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 49 PI= 30

Coefficients

D_{85}= 0.0077 D_{60}= 0.0028 D_{50}= 0.0019
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

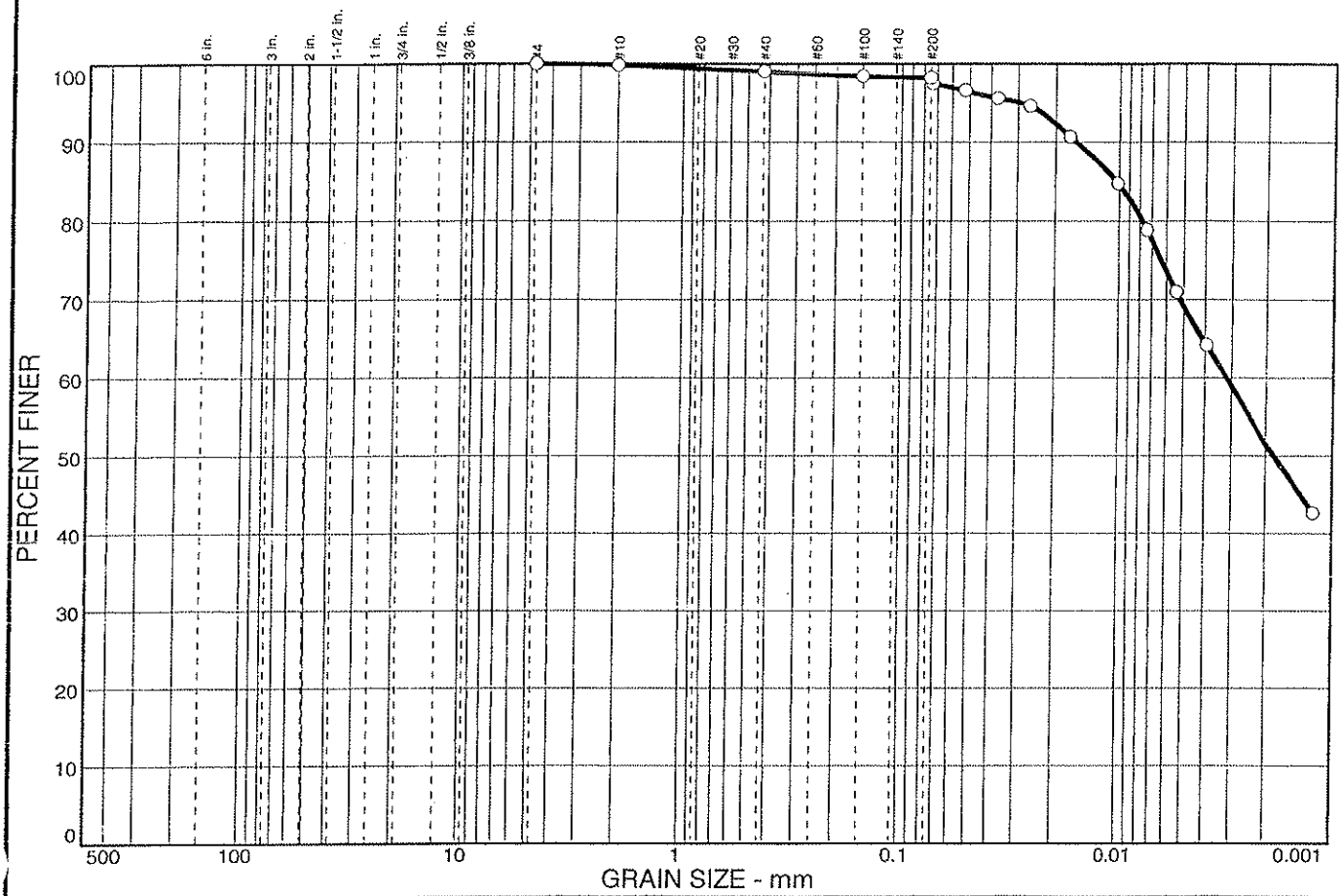
Sample No.: CL-T-23 **Source of Sample:** Lift 2 **Date:** 8/1/05
Location: **Elev./Depth:** N5050 E5850

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

56

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	0.8	0.8	29.0	69.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#40	99.0		
#100	98.4		
#200	98.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 18 LL= 48 PI= 30

Coefficients

D_{85}= 0.0103 D_{60}= 0.0032 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-24 **Source of Sample:** Lift 4 **Date:** 8/1/05
Location: **Elev./Depth:** N5150 E5900

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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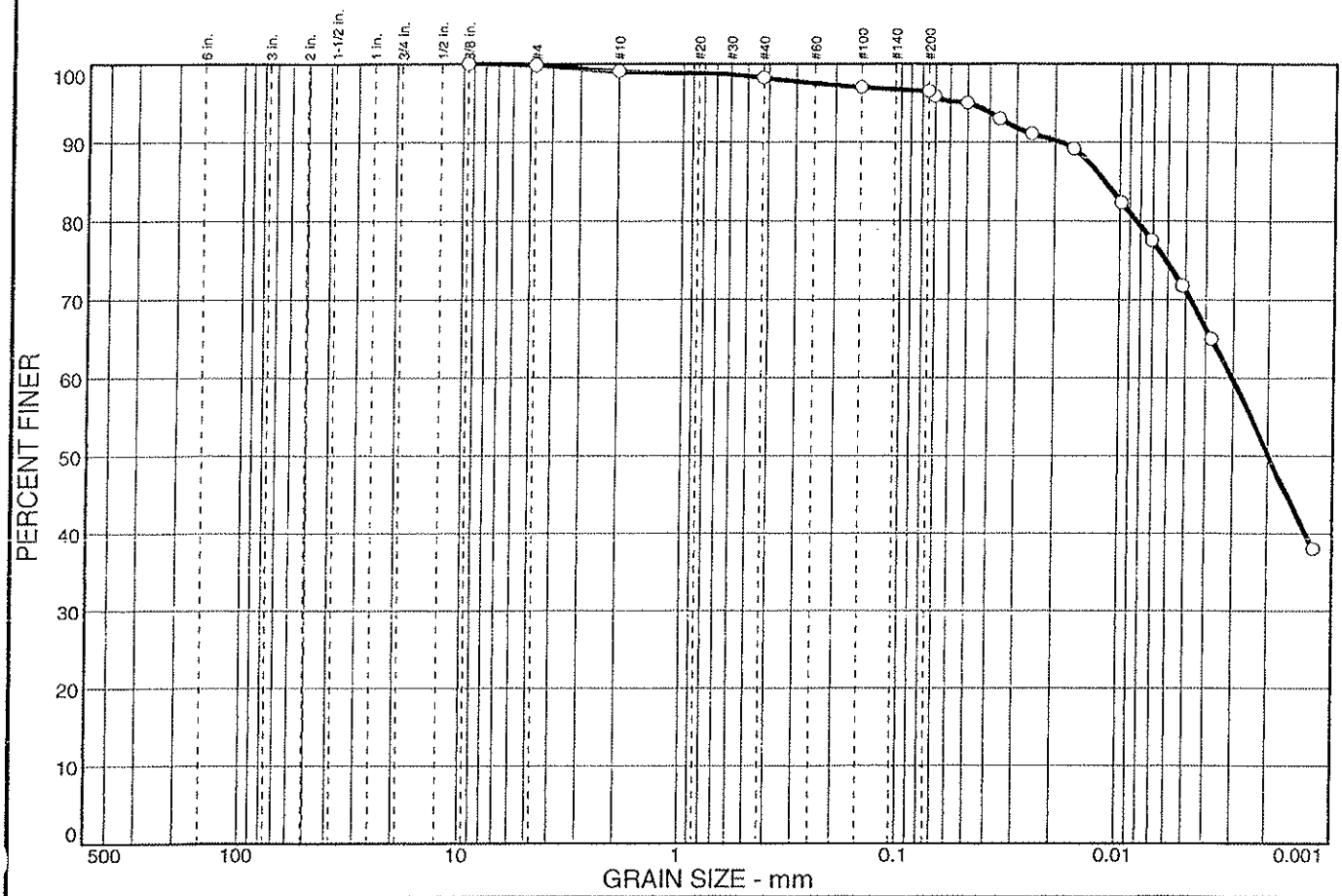
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.8	0.8	1.7	25.4	71.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.8		
#10	99.0		
#40	98.2		
#100	97.0		
#200	96.5		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 50 PI= 30

Coefficients

D_{85}= 0.0116 D_{60}= 0.0030 D_{50}= 0.0020
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-25 **Source of Sample:** Lift 8 **Date:** 8/1/05
Location: **Elev./Depth:** N5650 E5900

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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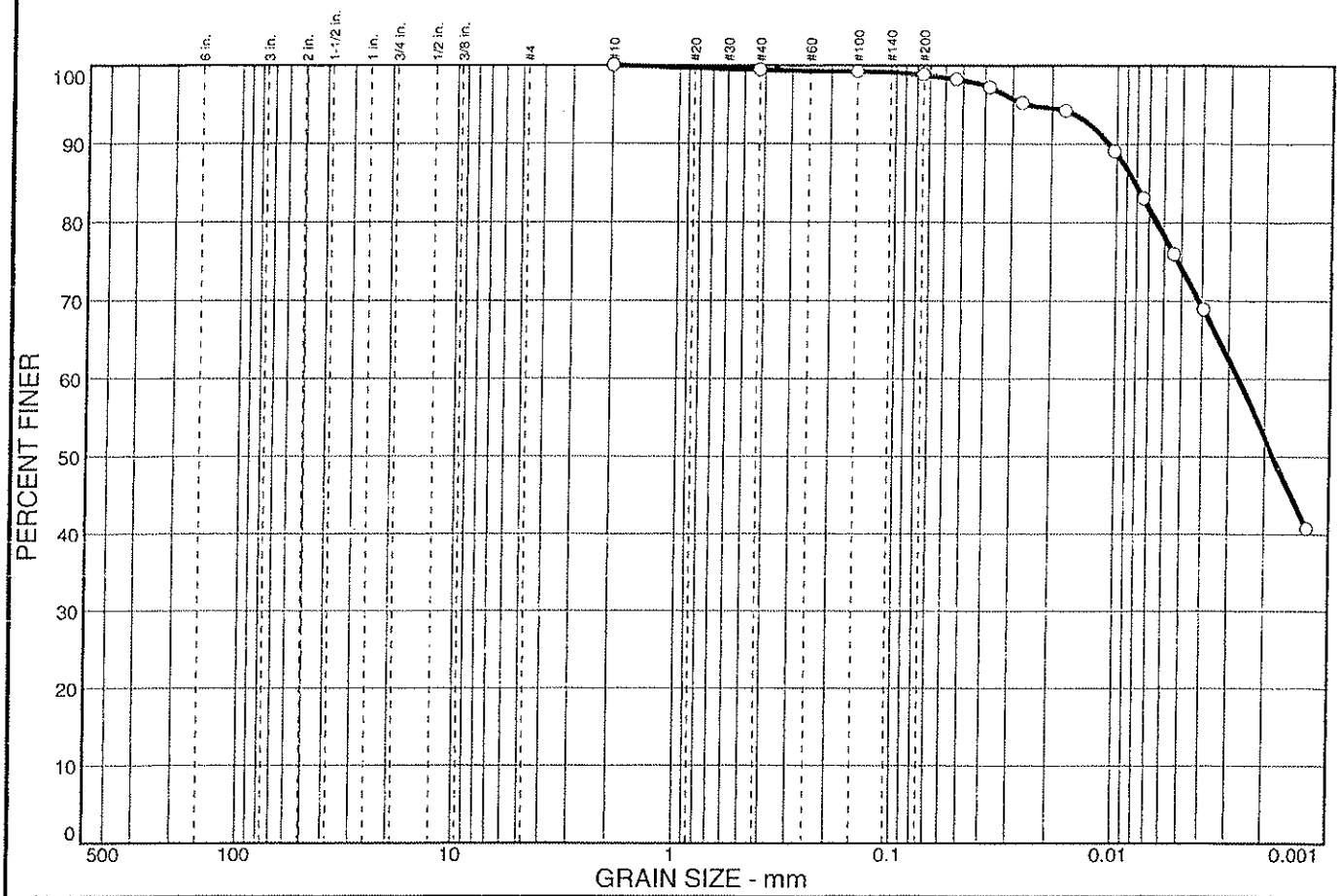
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.6	0.6	24.6	74.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.4		
#100	99.2		
#200	98.8		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 48 PI= 29

Coefficients

D_{85}= 0.0081 D_{60}= 0.0027 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-26 **Source of Sample:** Lift 8 **Date:** 08/01/2005
Location: **Elev./Depth:** N5050 E6000

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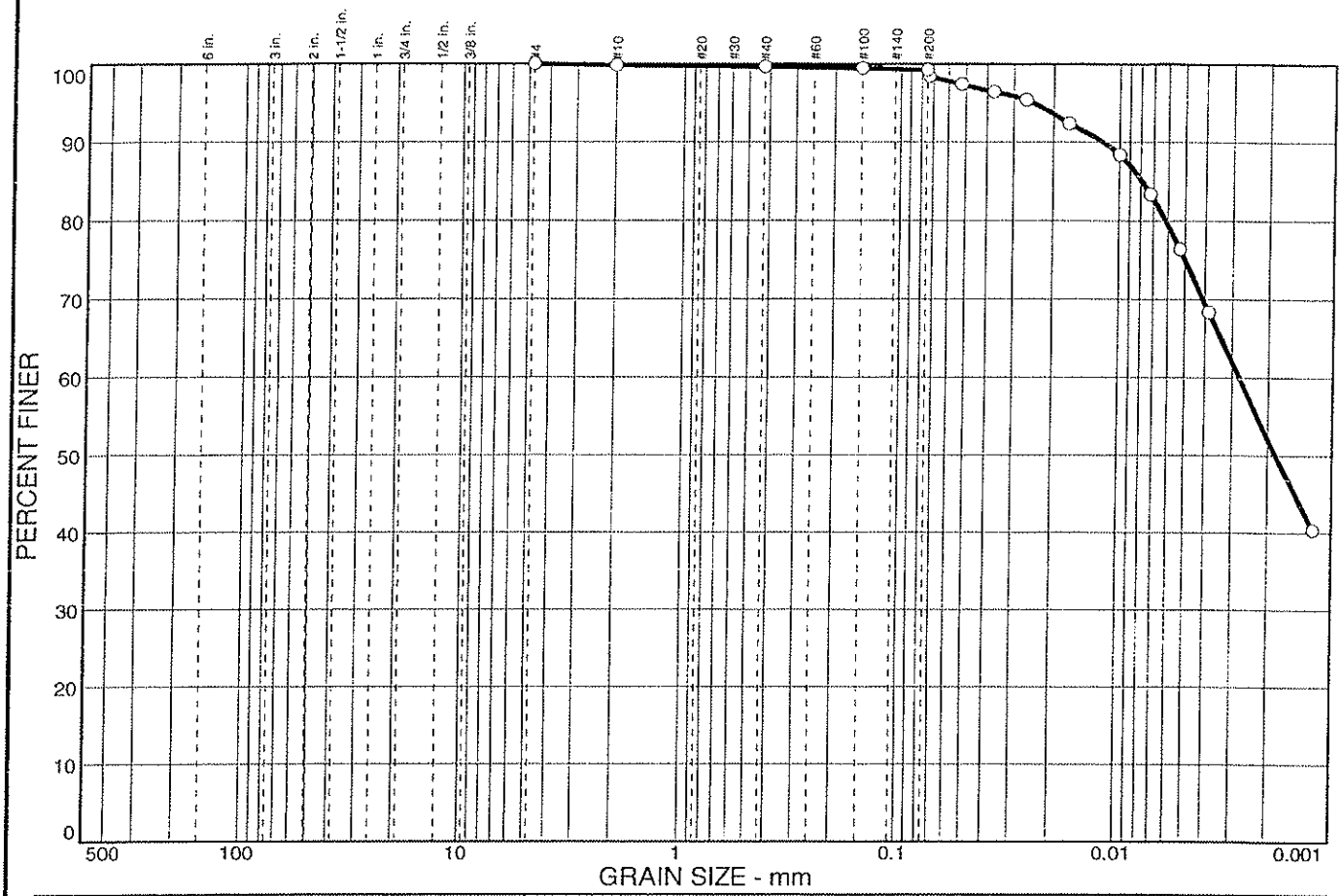
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	0.2	0.4	24.0	75.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#40	99.6		
#100	99.4		
#200	99.2		

* (no specification provided)

Material Description

Silty Clay--Gray

Atterberg Limits

PL= 21 LL= 52 PI= 31

Coefficients

D_{85}= 0.0079 D_{60}= 0.0028 D_{50}= 0.0018
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO=

Remarks

Sample No.: CL-T-27 **Source of Sample:** Lift 6 **Date:** 8/1/05
Location: **Elev./Depth:** N5250 E5850

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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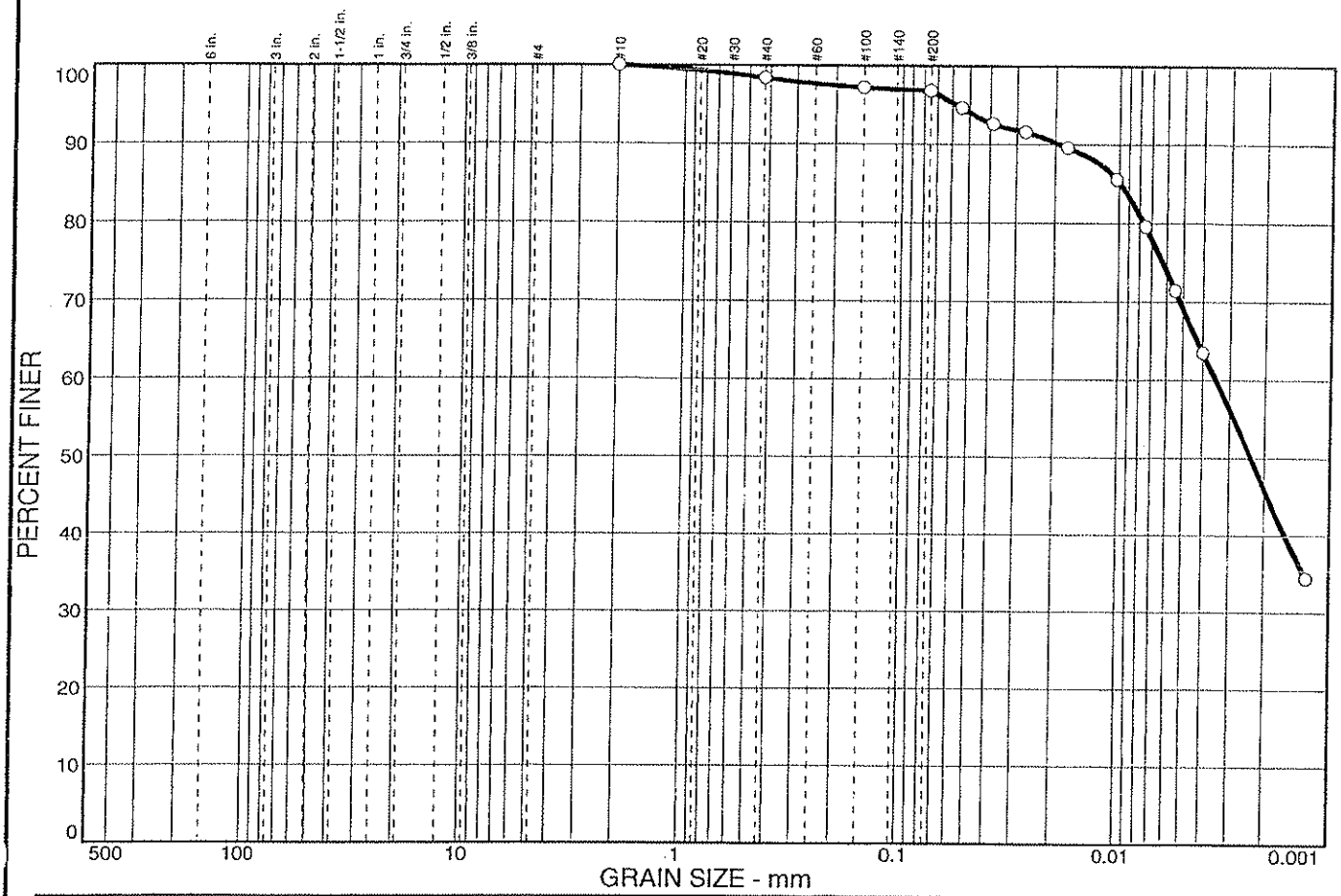
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.6	1.6	27.6	69.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	98.4		
#100	97.2		
#200	96.8		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 19 LL= 49 PI= 30

Coefficients

D_{85}= 0.0099 D_{60}= 0.0035 D_{50}= 0.0023
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-28 **Source of Sample:** Lift 4 **Date:** 8/1/05
Location: **Elev./Depth:** N4900 E5900

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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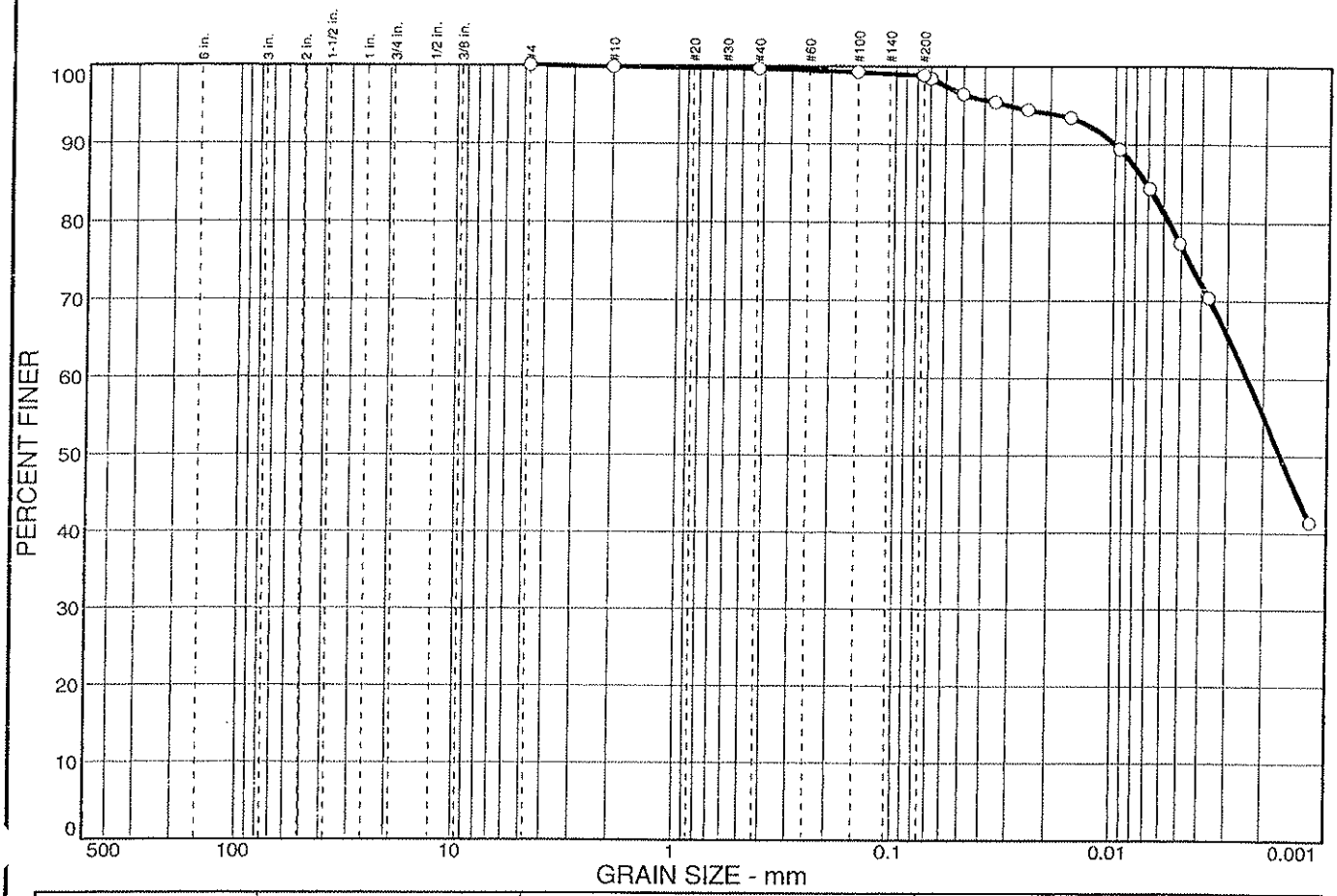
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	0.2	0.8	21.6	77.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#40	99.6		
#100	99.2		
#200	98.8		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 49 PI= 29

Coefficients

D_{85}= 0.0071 D_{60}= 0.0024 D_{50}= 0.0016
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-29 **Source of Sample:** Lift 8 **Date:** 8/1/05
Location: **Elev./Depth:** N5350 E5900

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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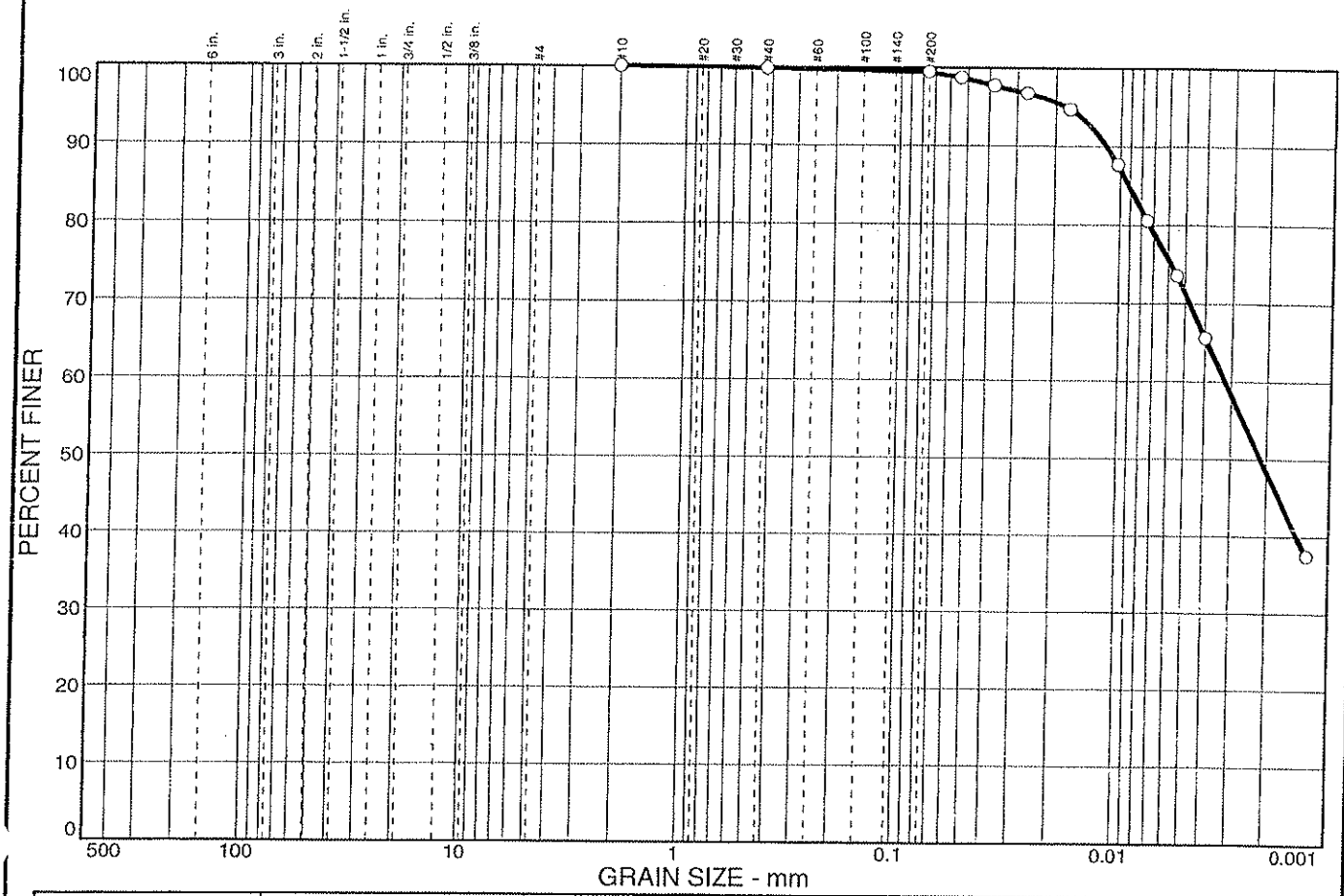
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	0.4	27.9	71.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.8		
#200	99.4		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 17 LL= 39 PI= 22

Coefficients

D_{85}= 0.0091 D_{60}= 0.0032 D_{50}= 0.0021
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-30 **Source of Sample:** Lift 8 **Date:** 8/1/05
Location: **Elev./Depth:** N5100 E5850

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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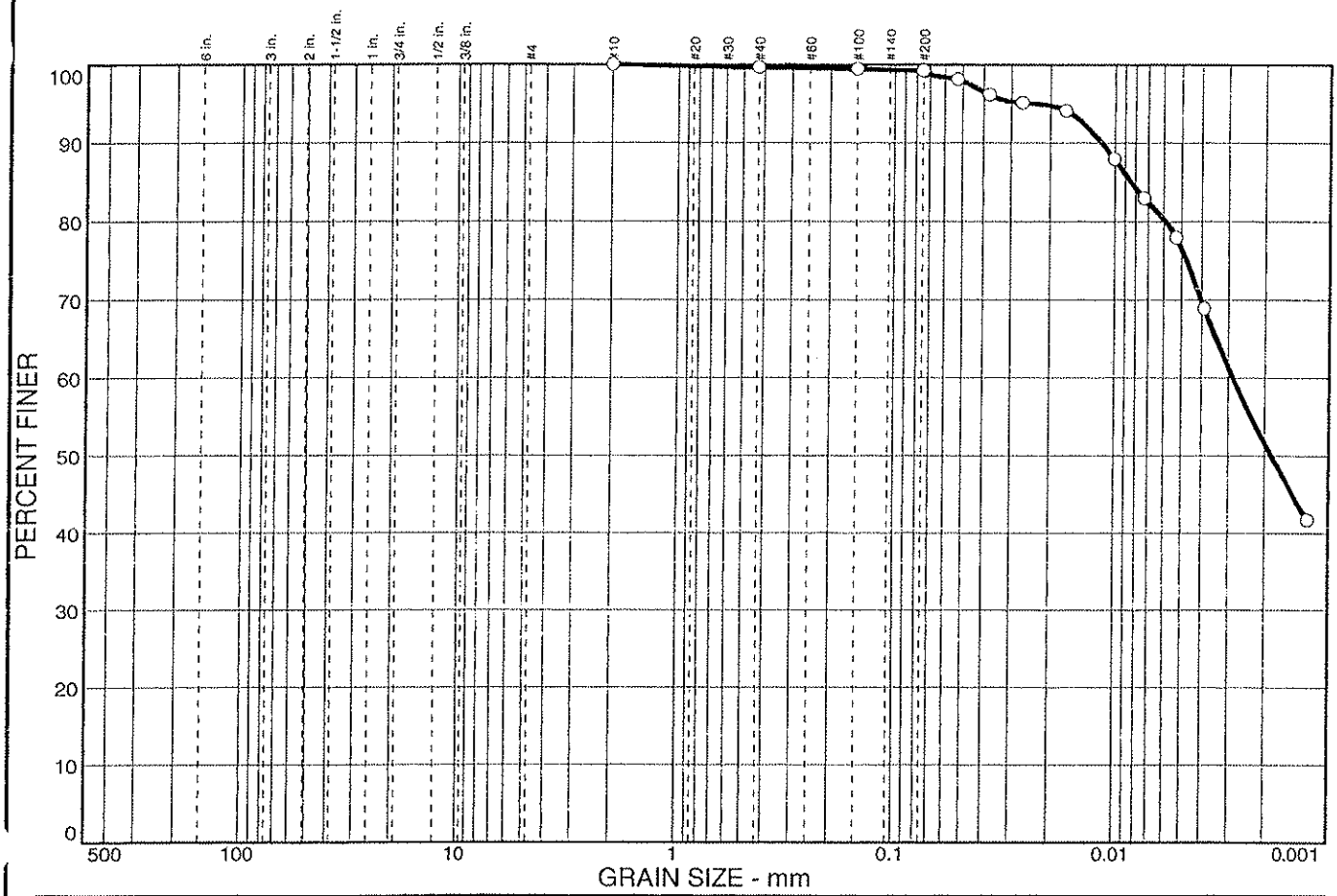
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.4	0.4	22.5	76.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.6		
#100	99.4		
#200	99.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 20 LL= 49 PI= 29

Coefficients

D_{85}= 0.0084 D_{60}= 0.0028 D_{50}= 0.0019
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: CL-T-31 **Source of Sample:** Lift 6 **Date:** 8/1/05
Location: **Elev./Depth:** N4900 E5850

STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

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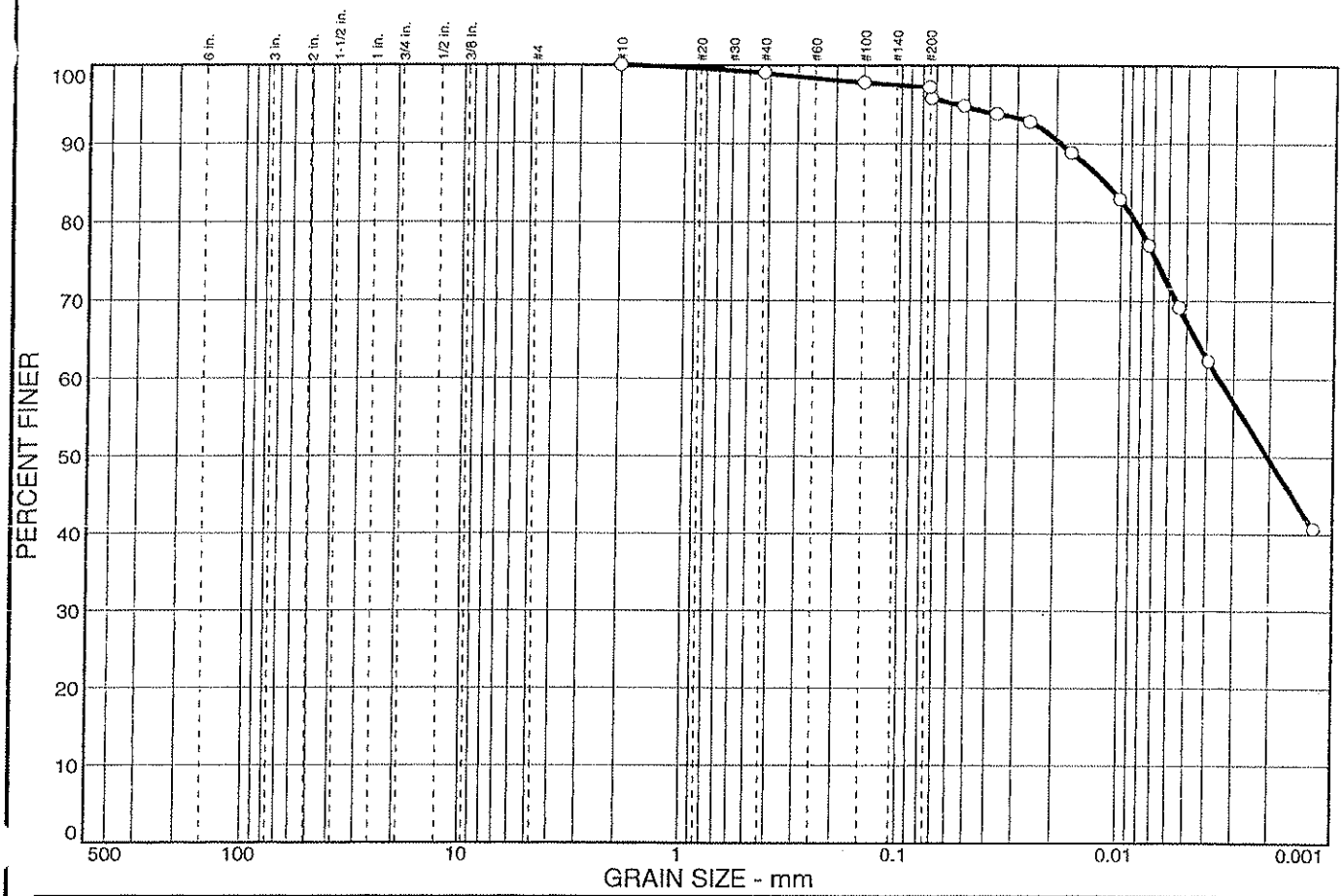
Particle Size Distribution Report (ASTM D 422)



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	1.0	1.8	29.8	67.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	99.0		
#100	97.8		
#200	97.2		

* (no specification provided)

Material Description

Silty Clay Trace Sand--Gray

Atterberg Limits

PL= 21 LL= 49 PI= 28

Coefficients

D_{85}= 0.0118 D_{60}= 0.0035 D_{50}= 0.0021
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

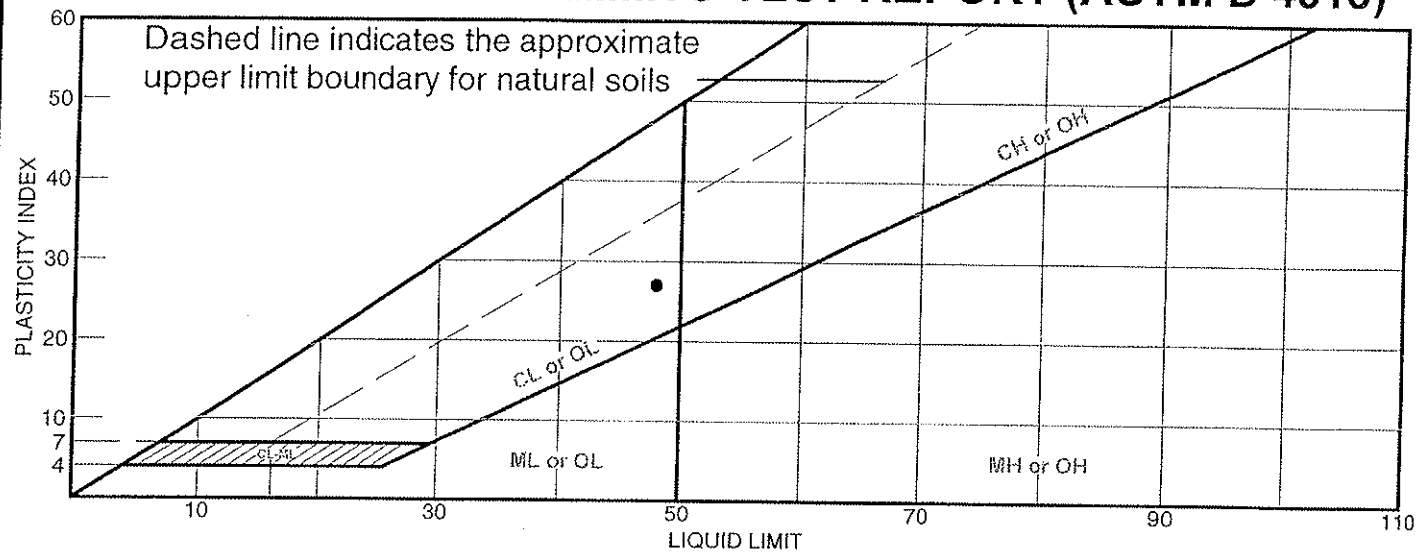
Sample No.: CL-T-32 **Source of Sample:** Lift 8 **Date:** 8/2/05
Location: **Elev./Depth:** N4800 E5900

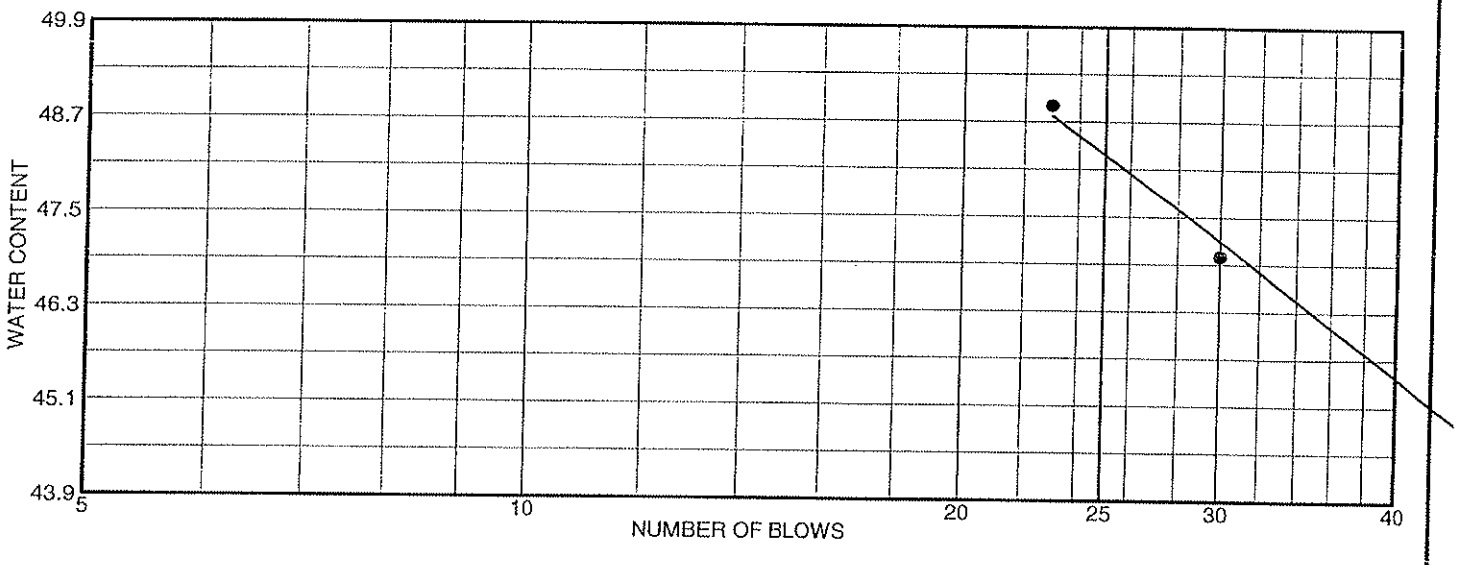
STS Consultants, Ltd.
11425 West Lake Park Drive
Milwaukee, WI 53224

Client:
Project: OEPL Phase 6 East
Project No: 87898A **Figure**

65

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	48	21	27	98.9	96.3	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-1 **Elev./Depth:** N4900 E6000

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

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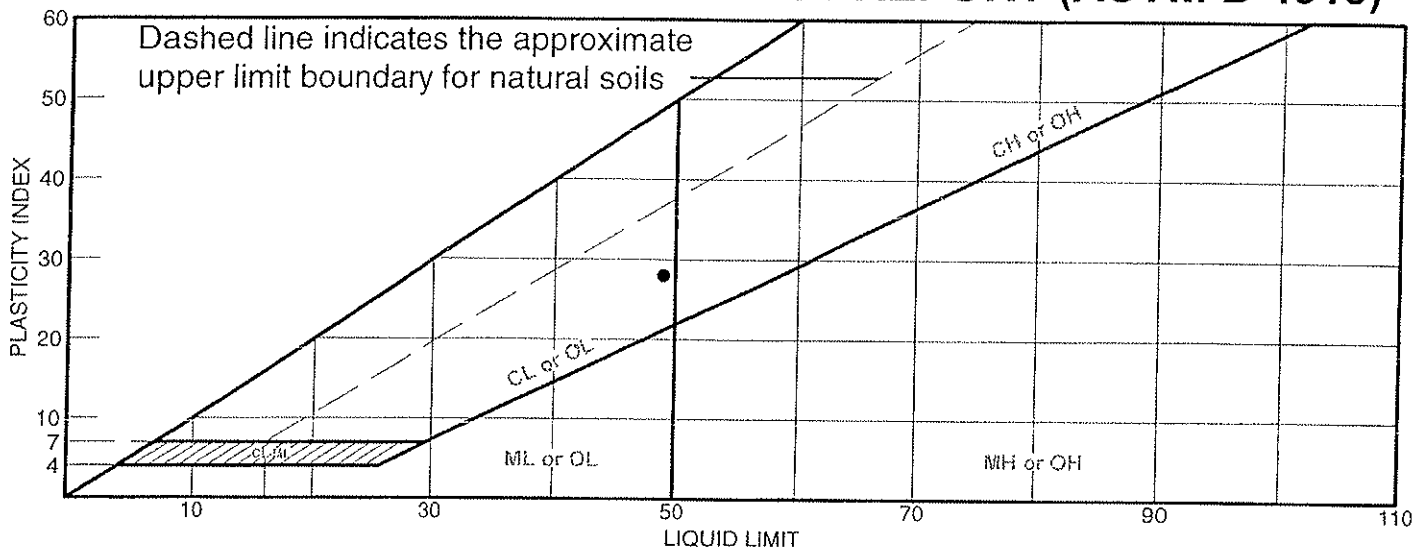
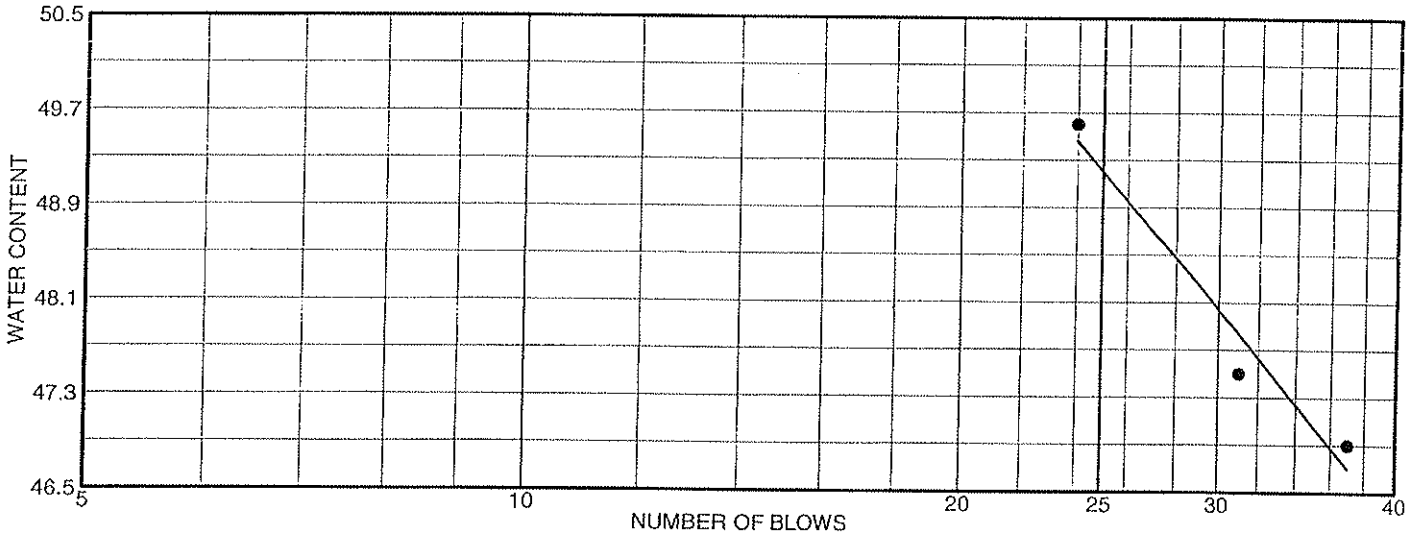
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	21	28	99.8	99.1	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-2 **Elev./Depth:** N5100 E6050

Remarks:

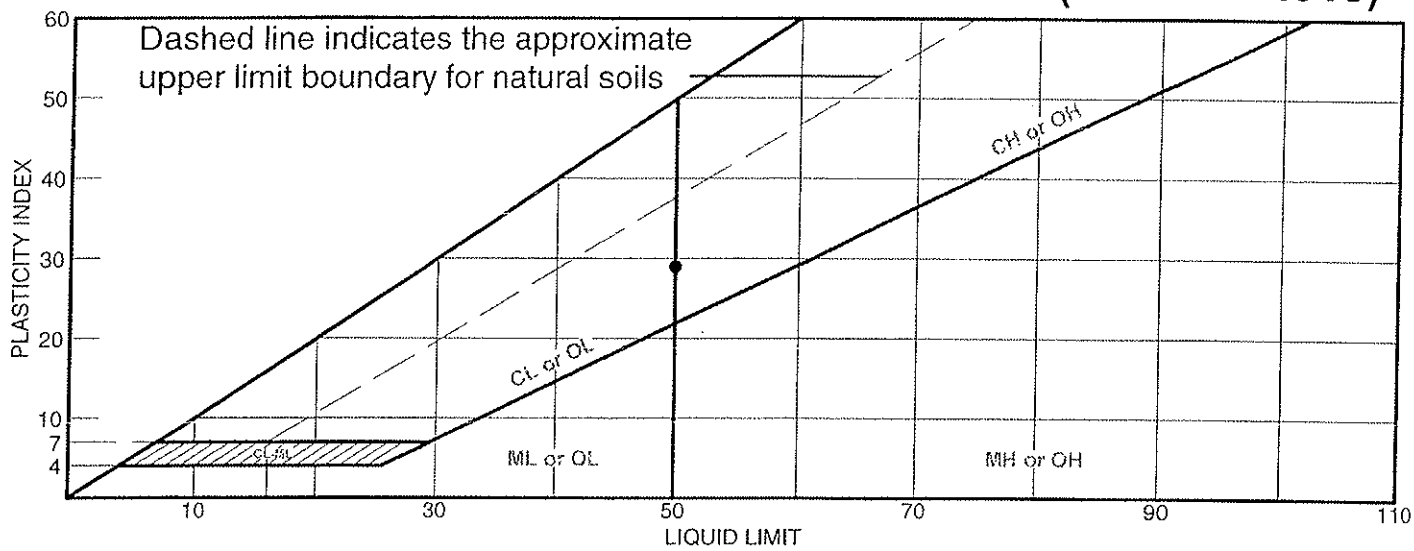
●

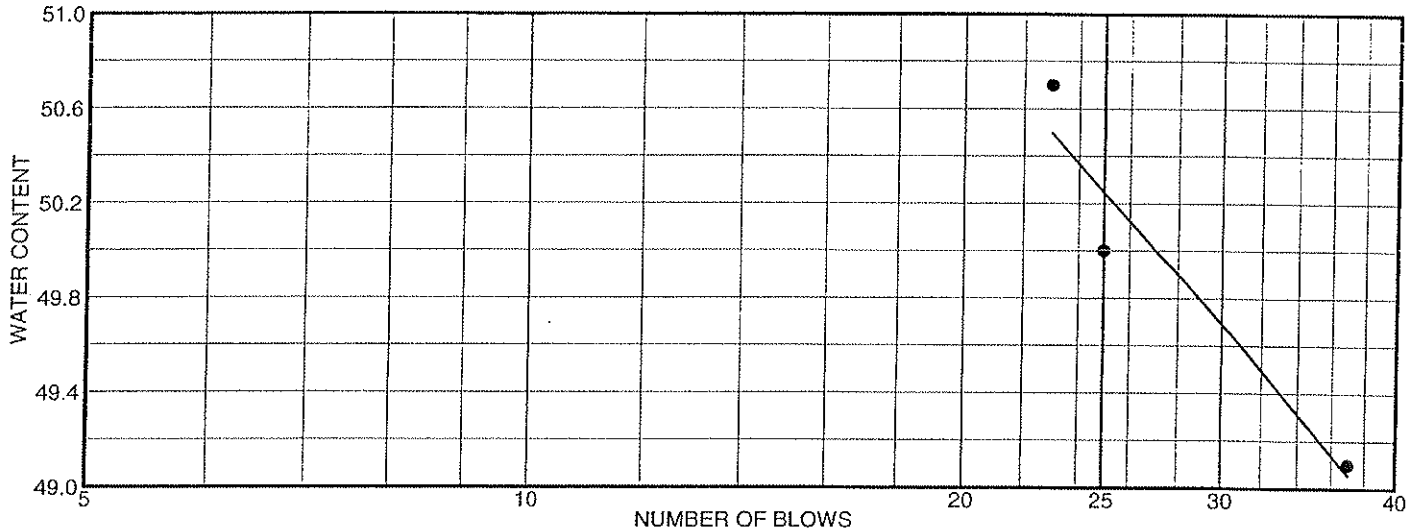
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	50	21	29	99.6	99.2	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-3 **Elev./Depth:** N4750 E6050

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

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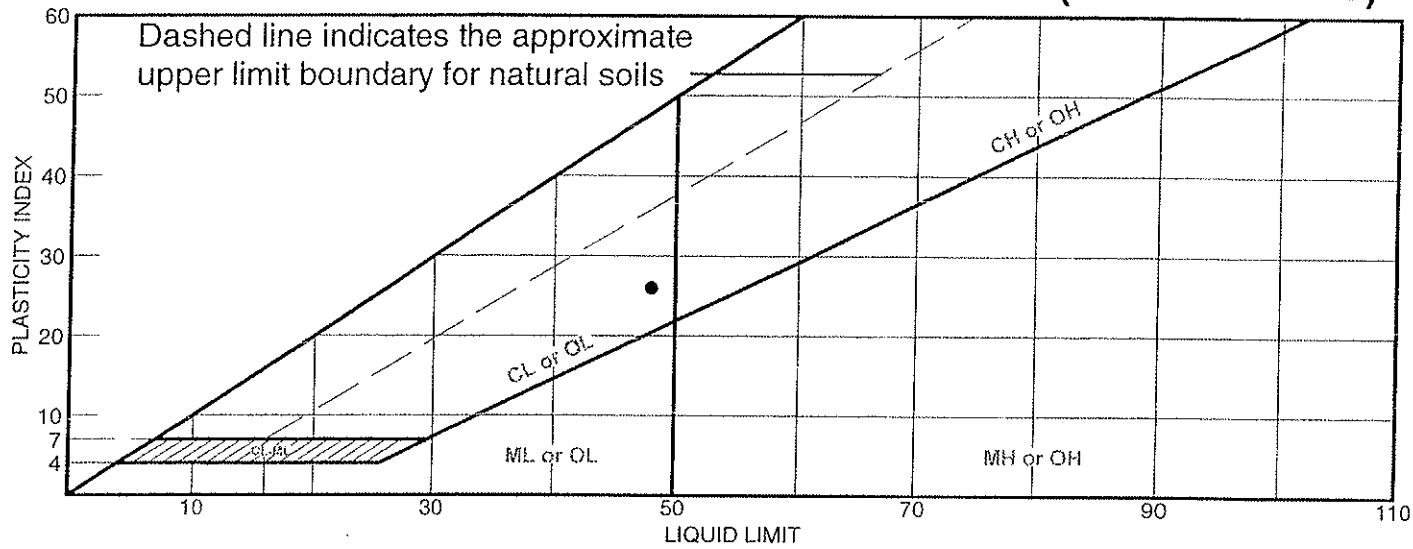
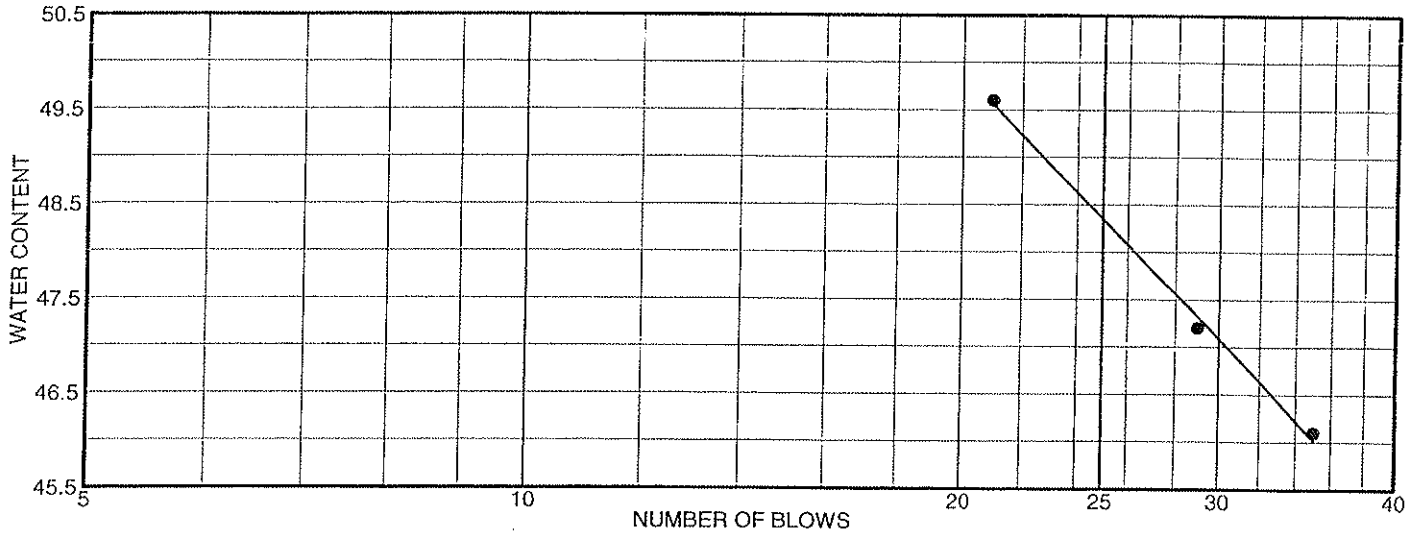
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	48	22	26	99.3	98.4	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-4 **Elev./Depth:** N5100 E5950

Remarks:

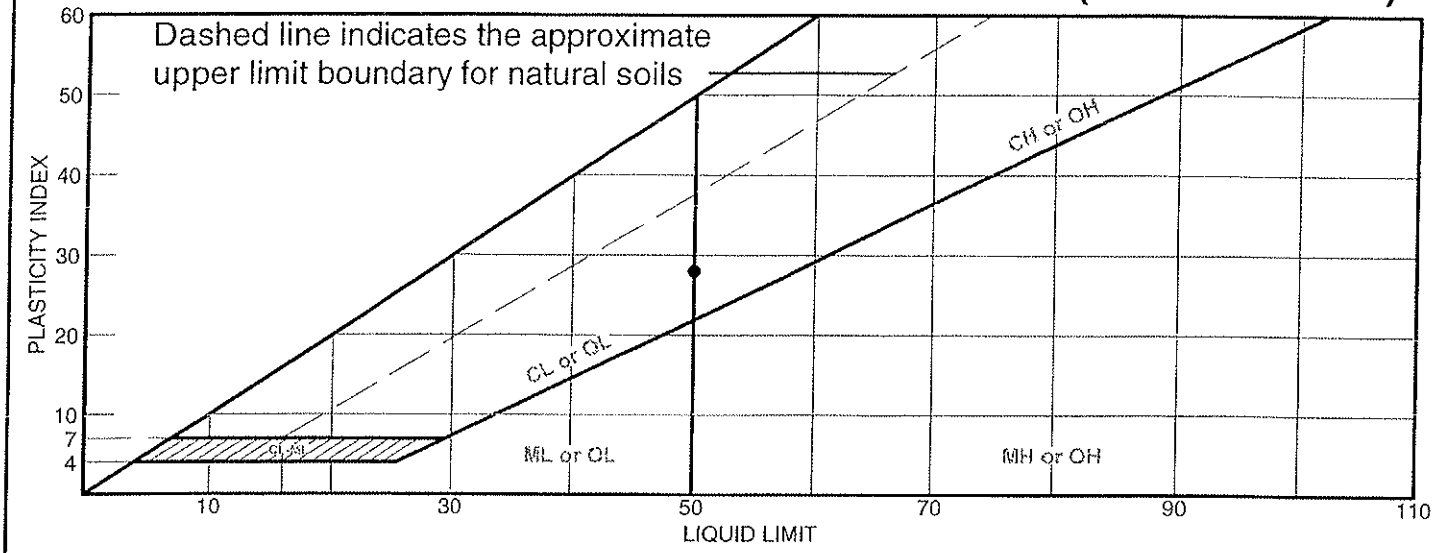
●

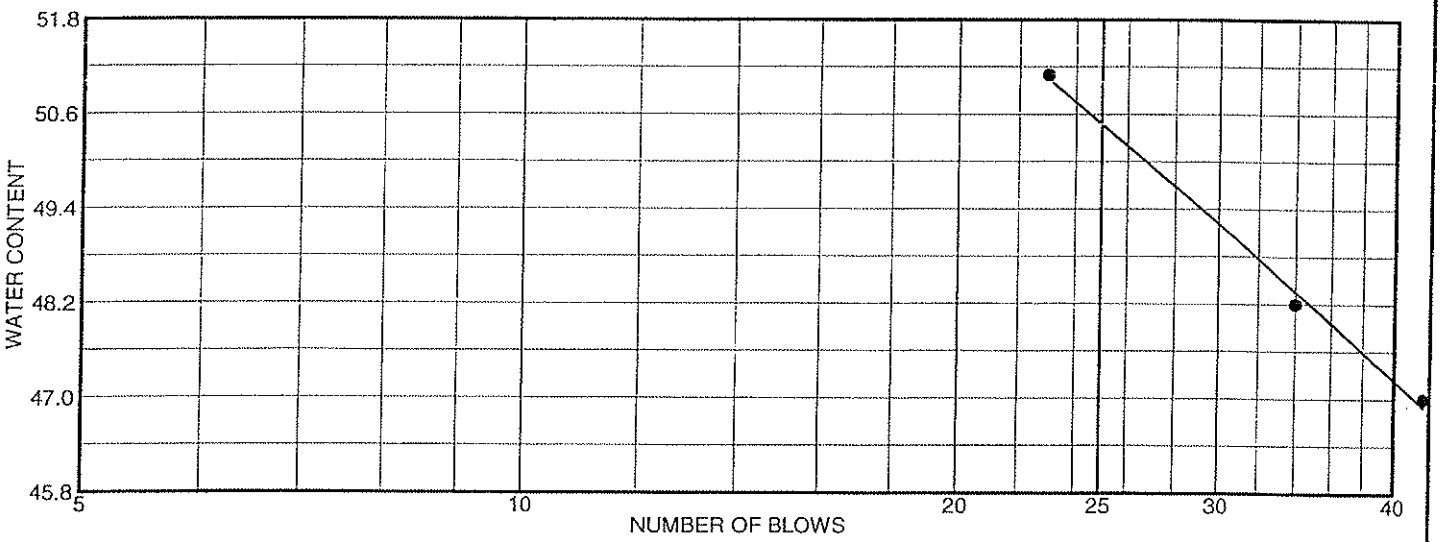
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	50	22	28	99.6	99.2	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-5 **Elev./Depth:** N4800 E5950

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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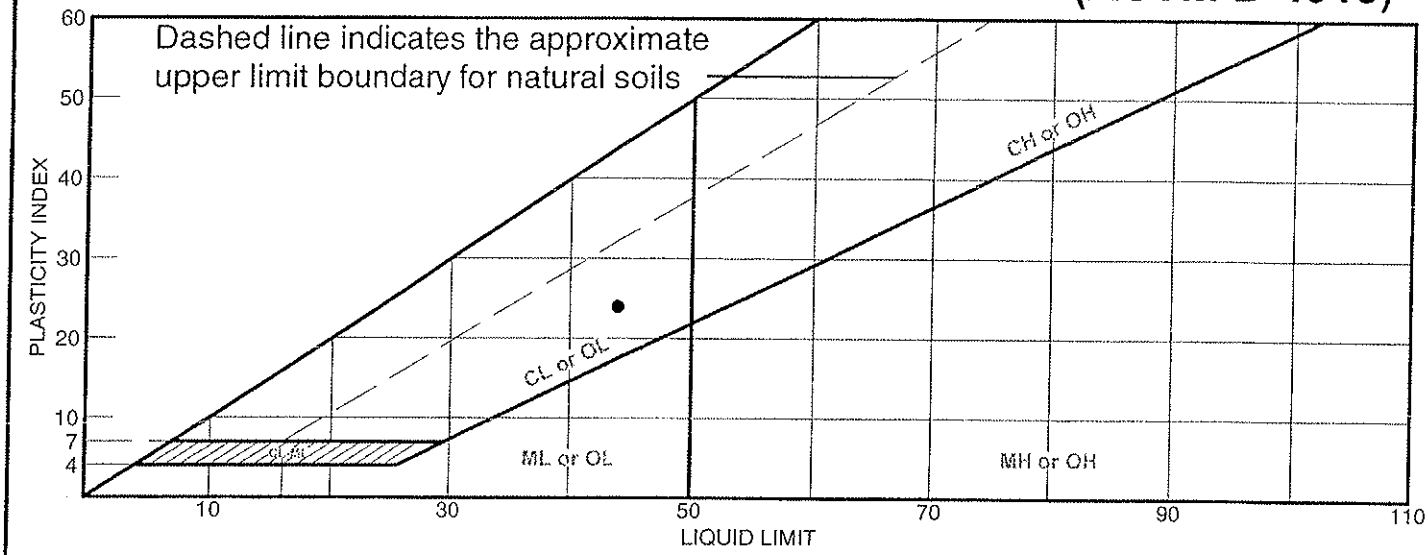
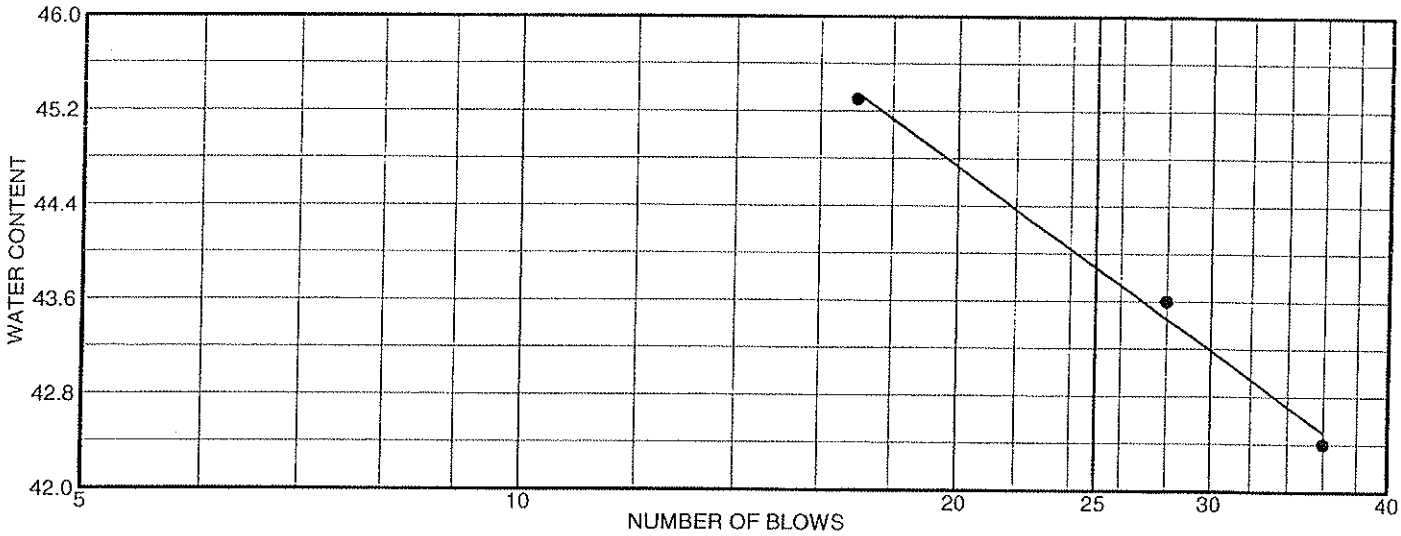
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	44	20	24	98.0	97.4	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-6 **Elev./Depth:** N5200 E6000

Remarks:

●

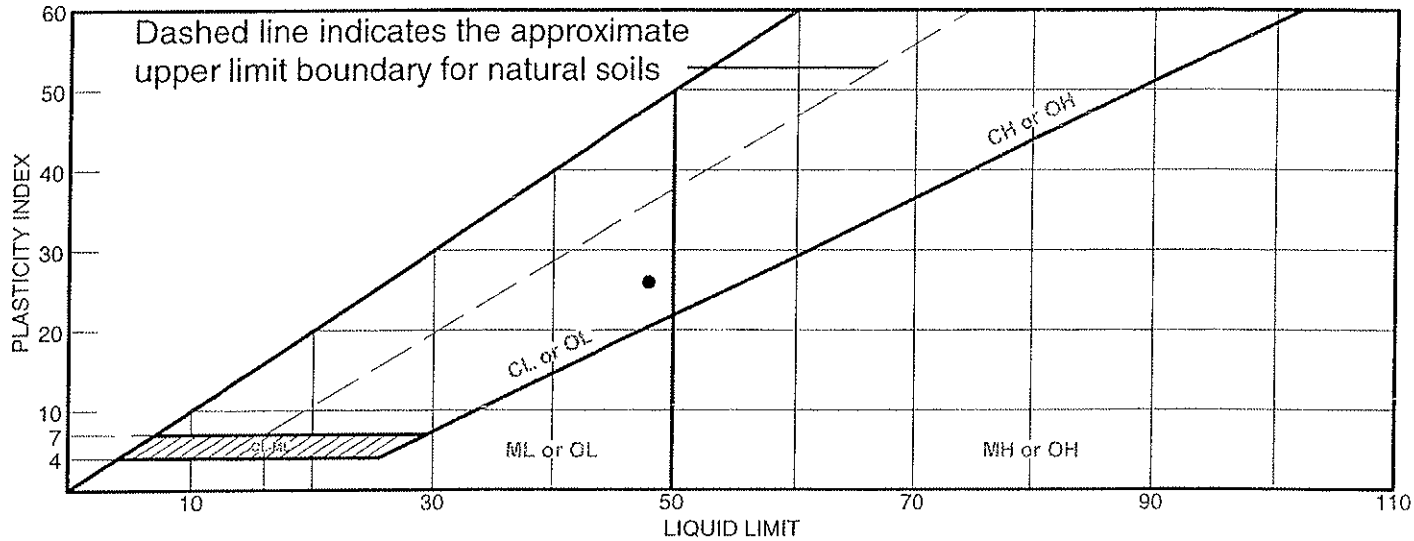
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

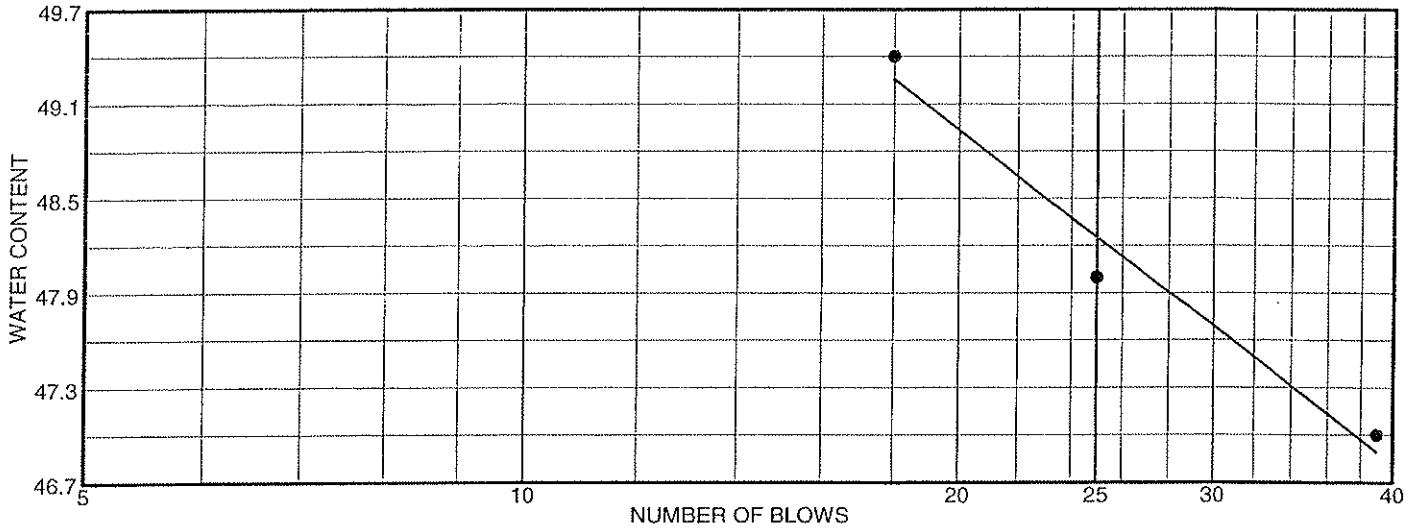
STS Consultants, Ltd.

Figure

71

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	48	22	26	98.6	98.0	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-7 **Elev./Depth:** N5400 E6050

Remarks:

●

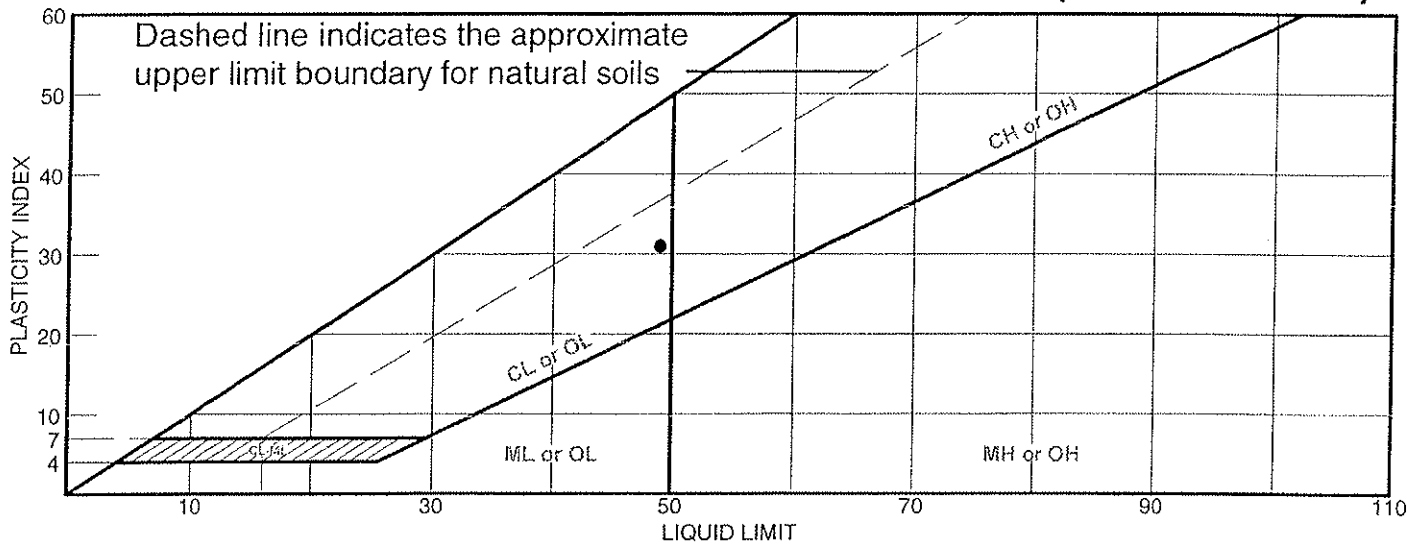
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

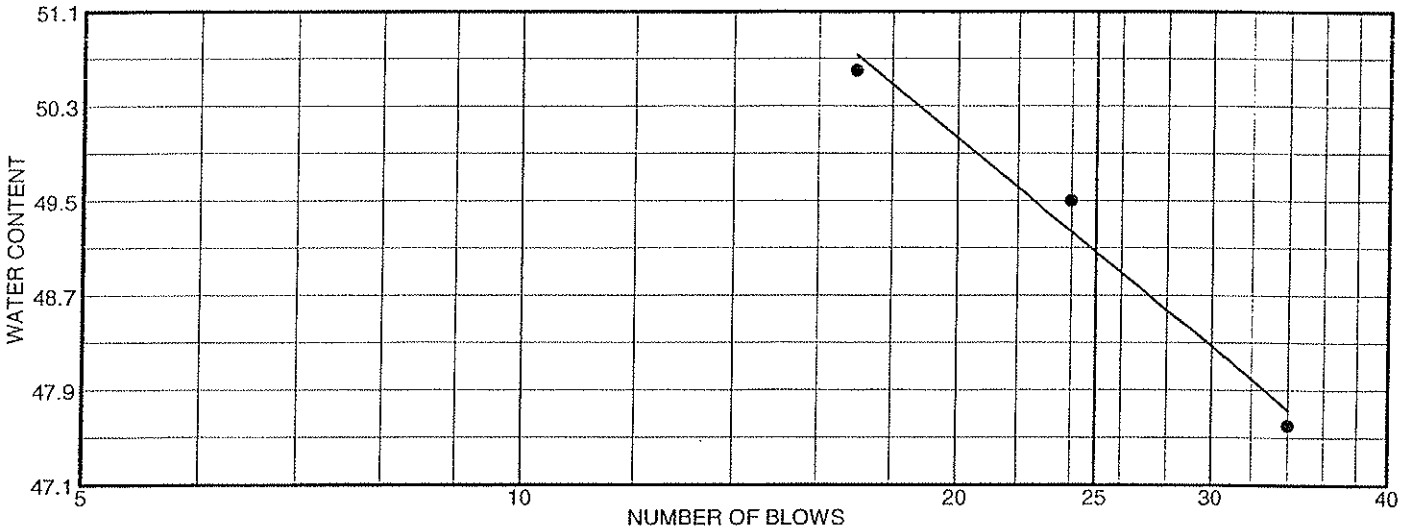
STS Consultants, Ltd.

Figure

72

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	18	31	99.6	99.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-8 **Elev./Depth:** N5400 E5950

Remarks:

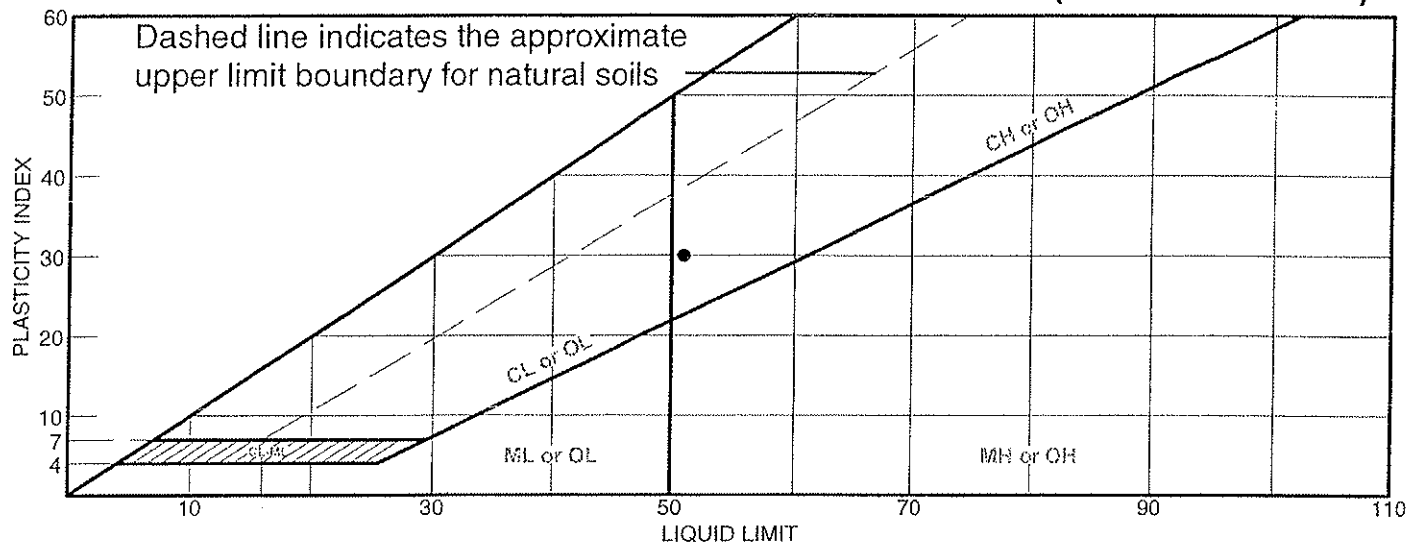
●

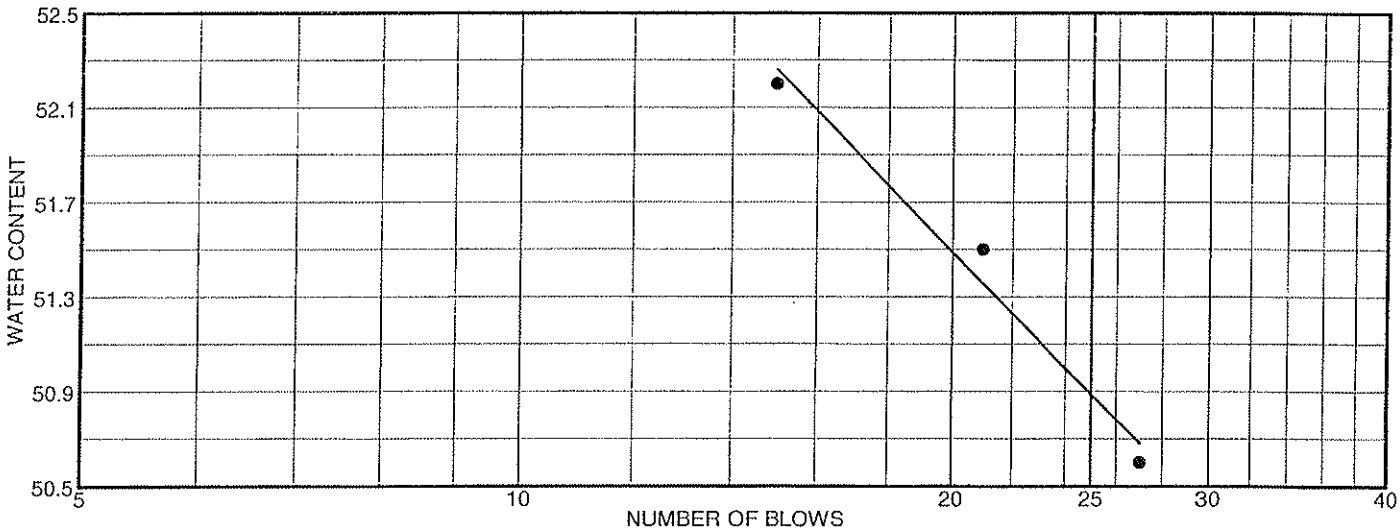
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	51	21	30	99.8	99.2	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-9 **Elev./Depth:** N5550 E6000

Remarks:

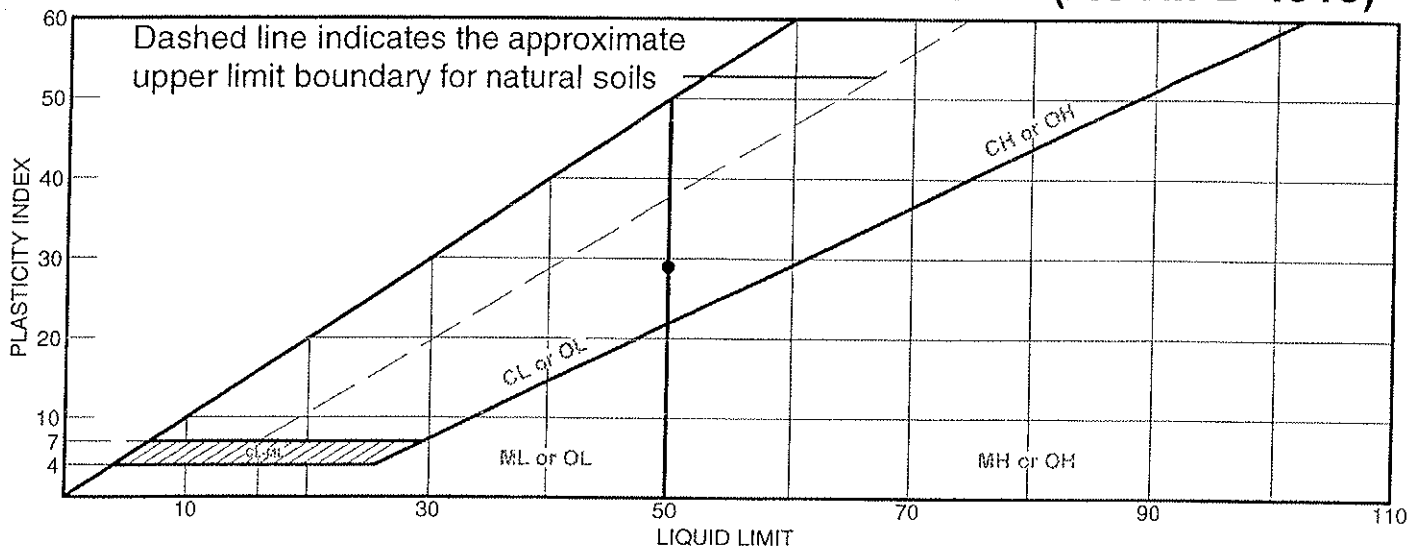
●

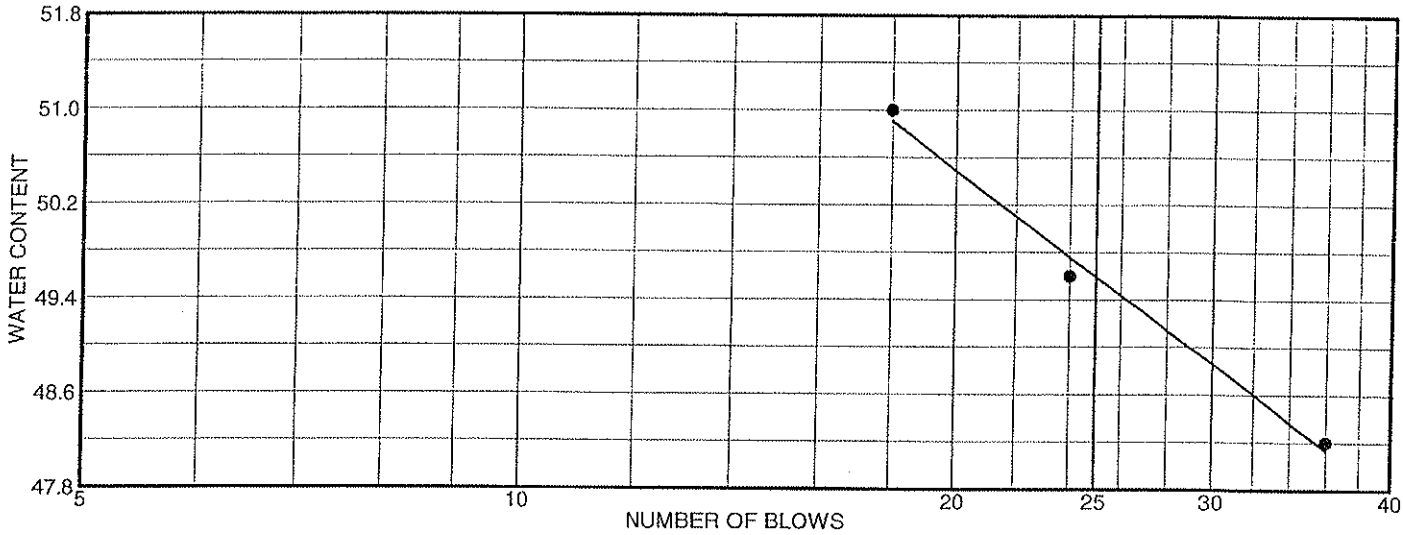
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Some Sand Trace Gravel--Gray	50	21	29	81.8	71.4	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-10 **Elev./Depth:** N5850 E6050

Remarks:

●

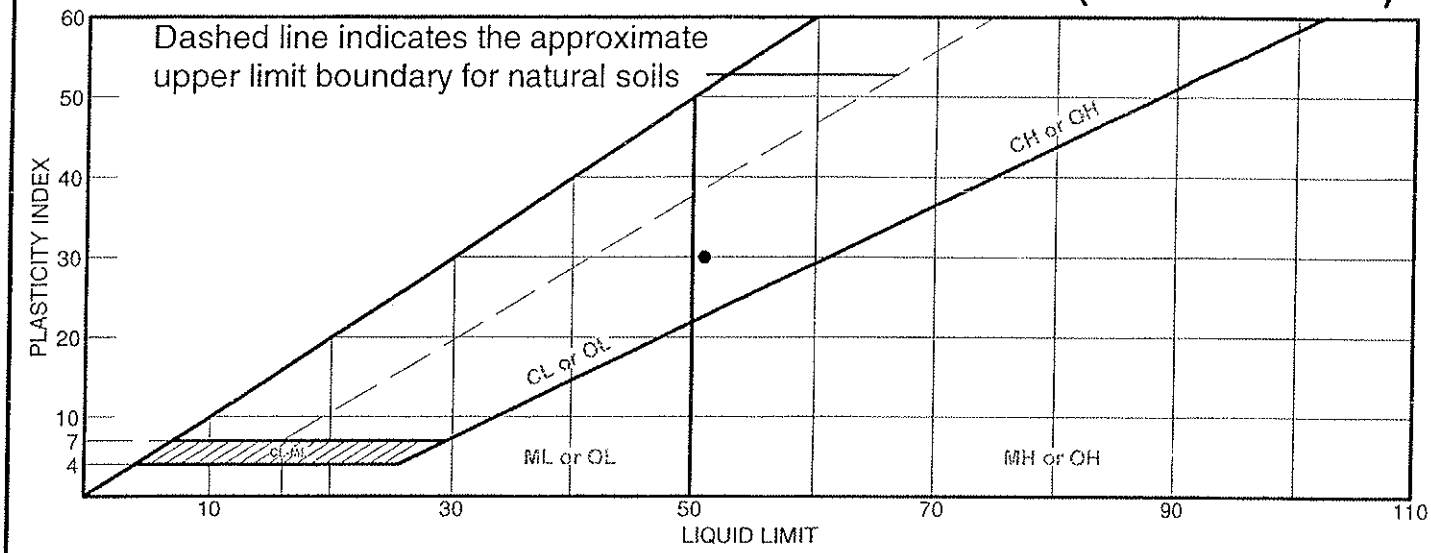
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

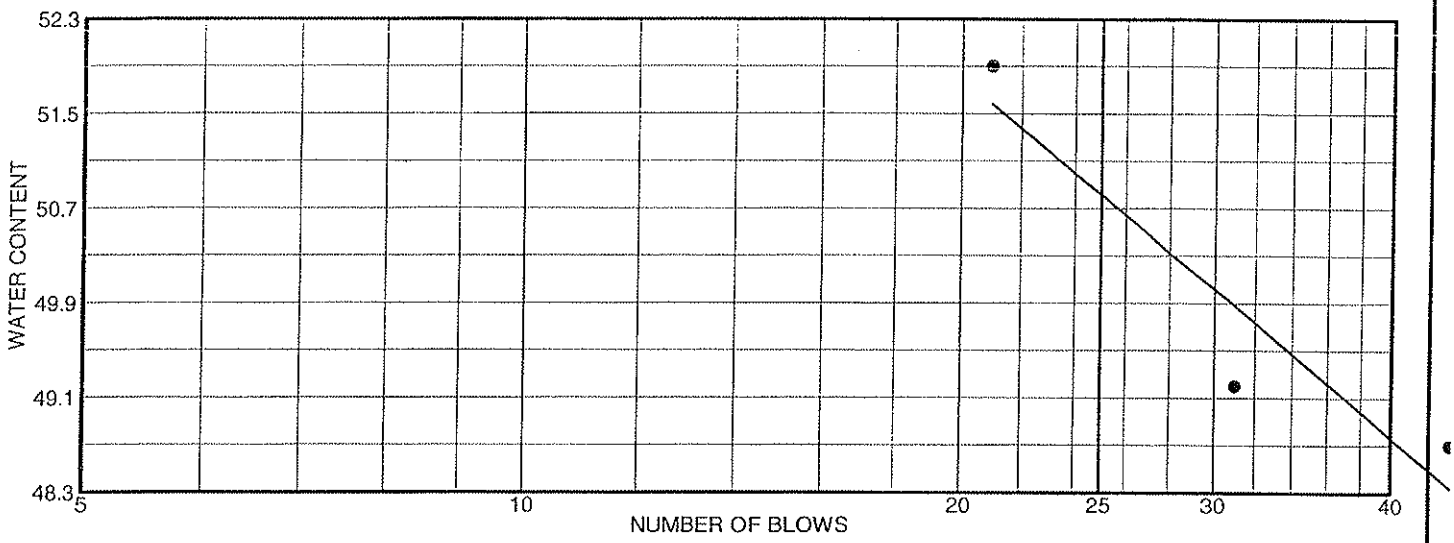
STS Consultants, Ltd.

Figure

75

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	51	21	30	97.8	94.9	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-11 **Elev./Depth:** N5700 E6050

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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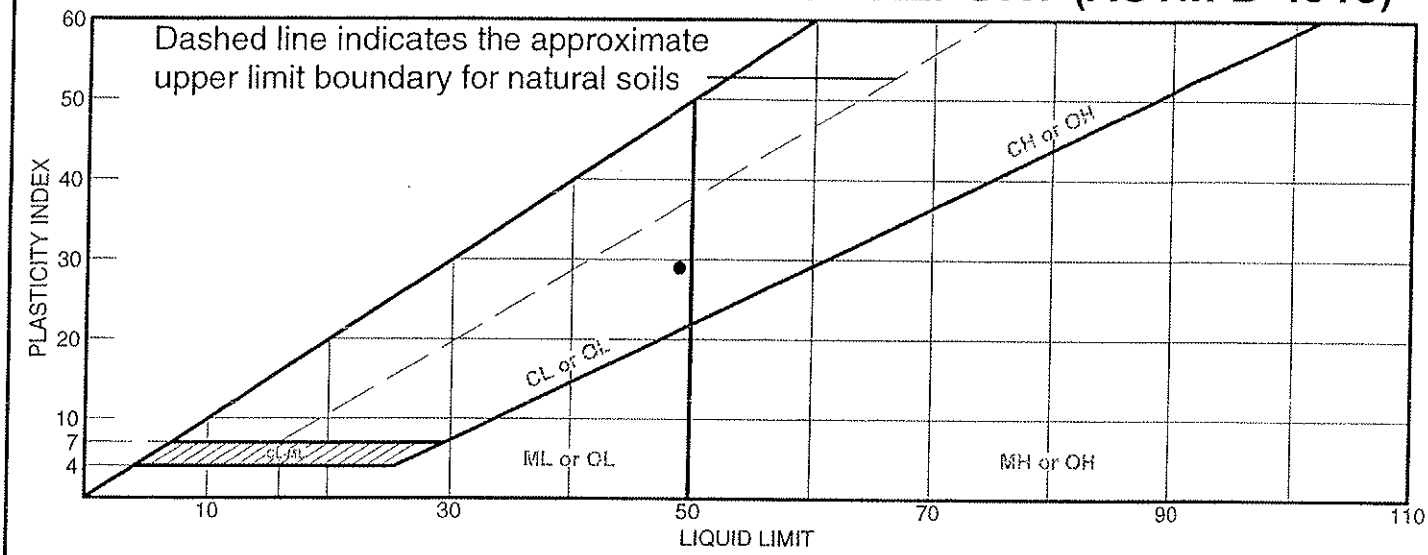
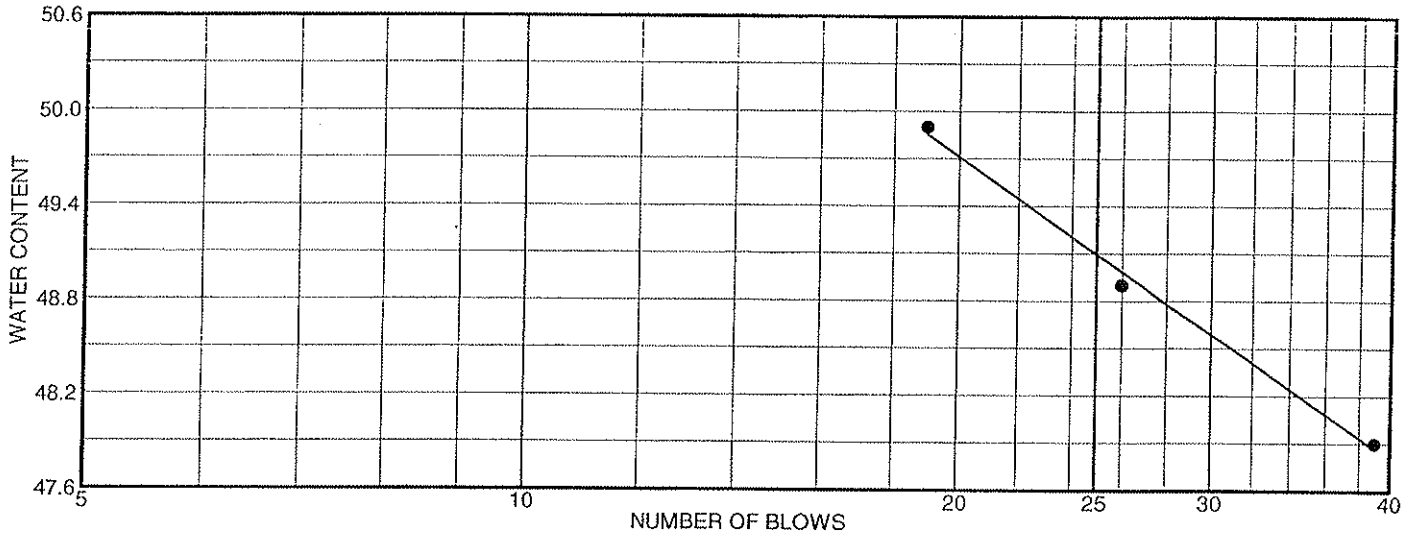
Figure

70

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay--Gray	49	20	29	94.5	93.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-12 **Elev./Depth:** N5350 E6050

Remarks:

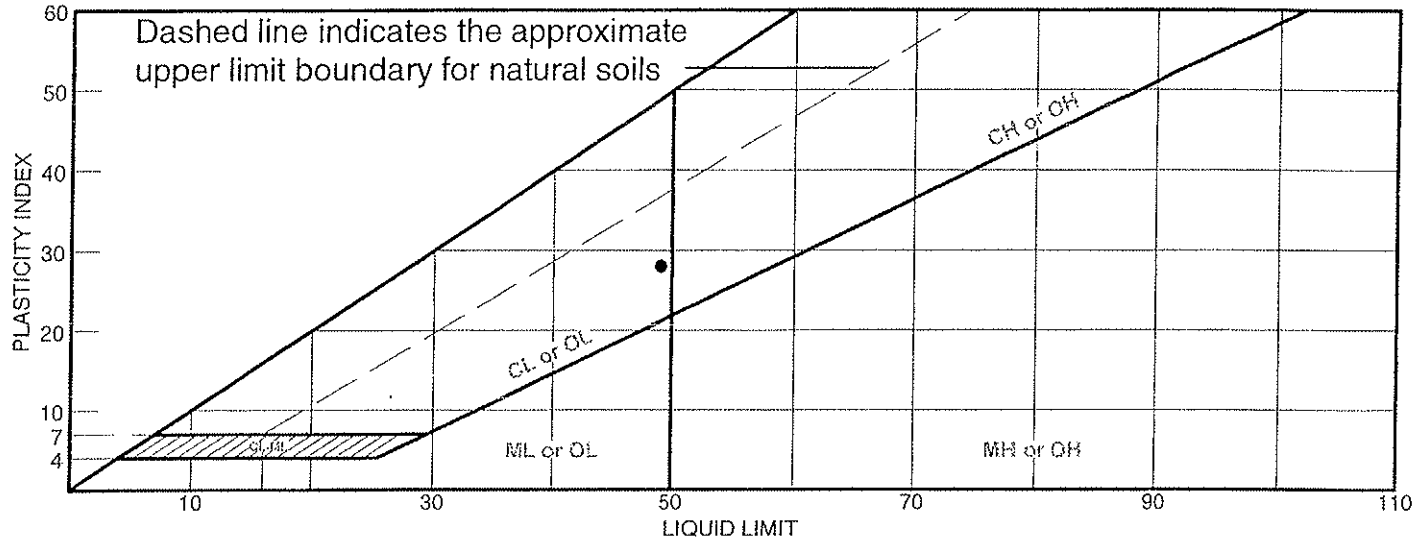
●

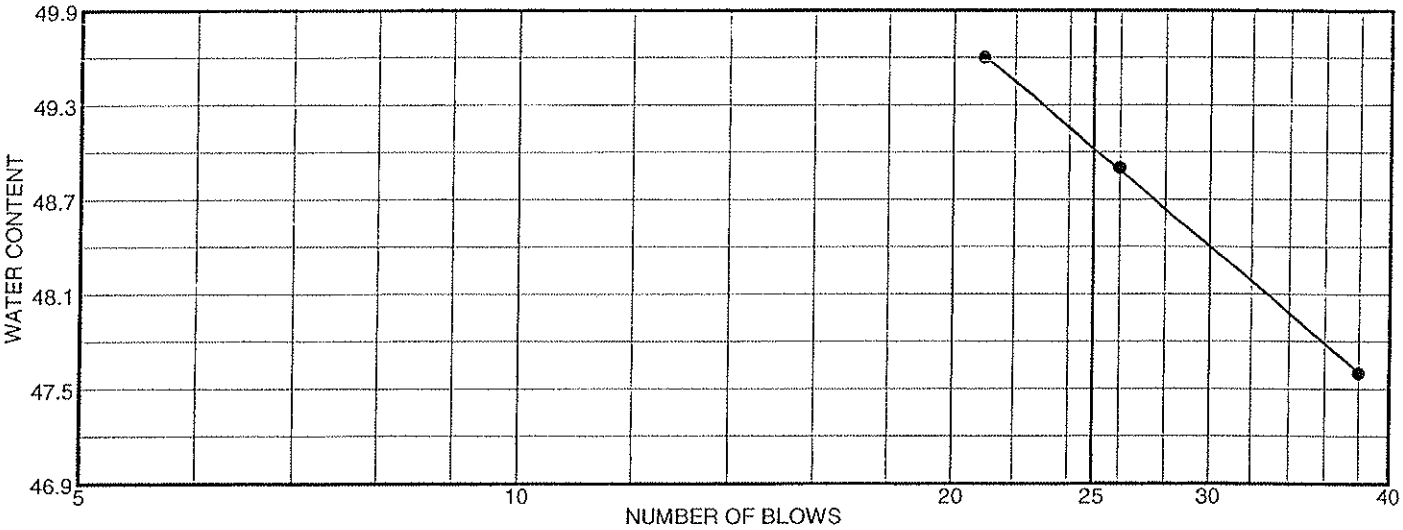
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

STS Consultants, Ltd.

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Little Sand Trace Gravel--Gray	49	21	28	88.2	83.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-13 **Elev./Depth:** N5650 E5850

Remarks:

●

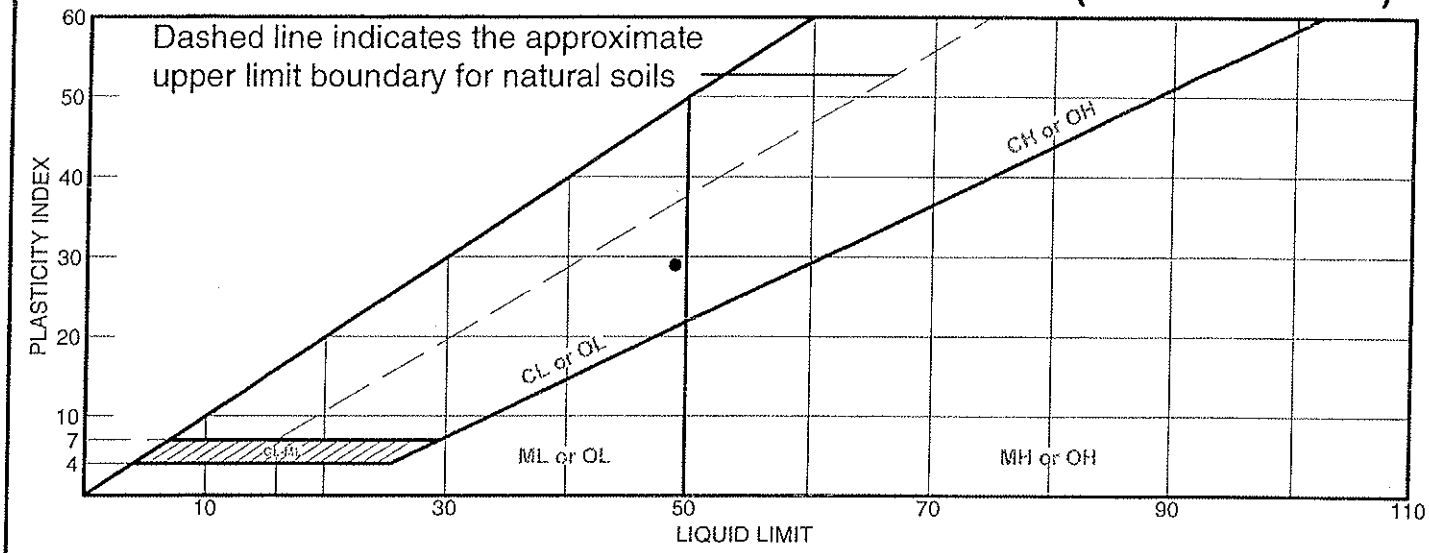
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

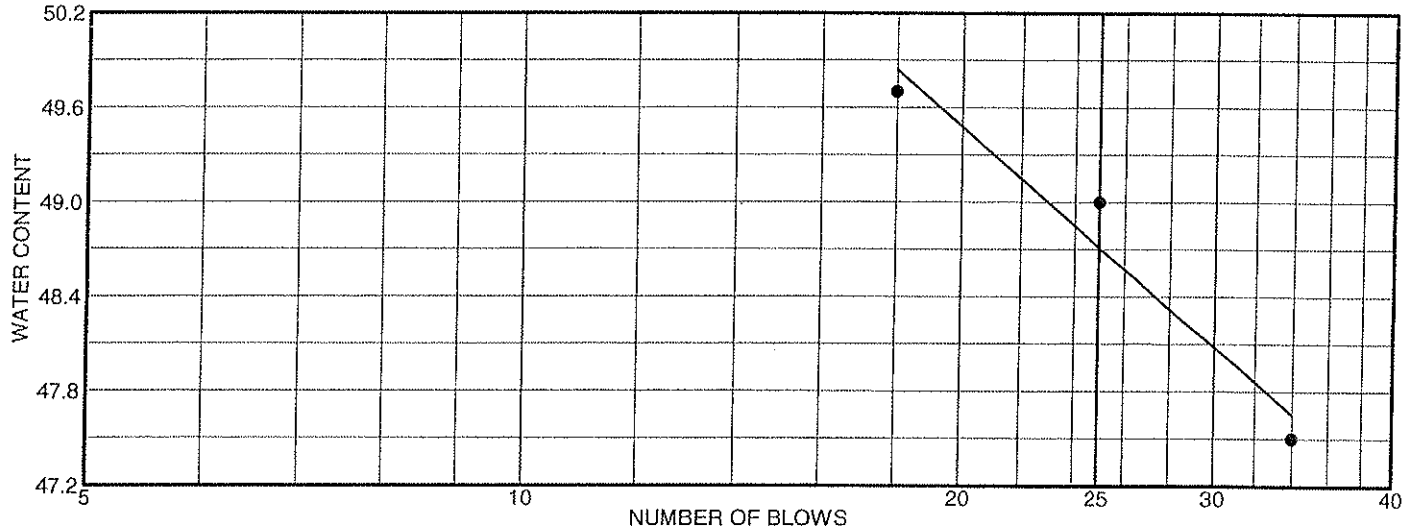
STS Consultants, Ltd.

Figure

78

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Some Sand--Gray	49	20	29	88.3	78.8	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-14 **Elev./Depth:** N5800 E5900

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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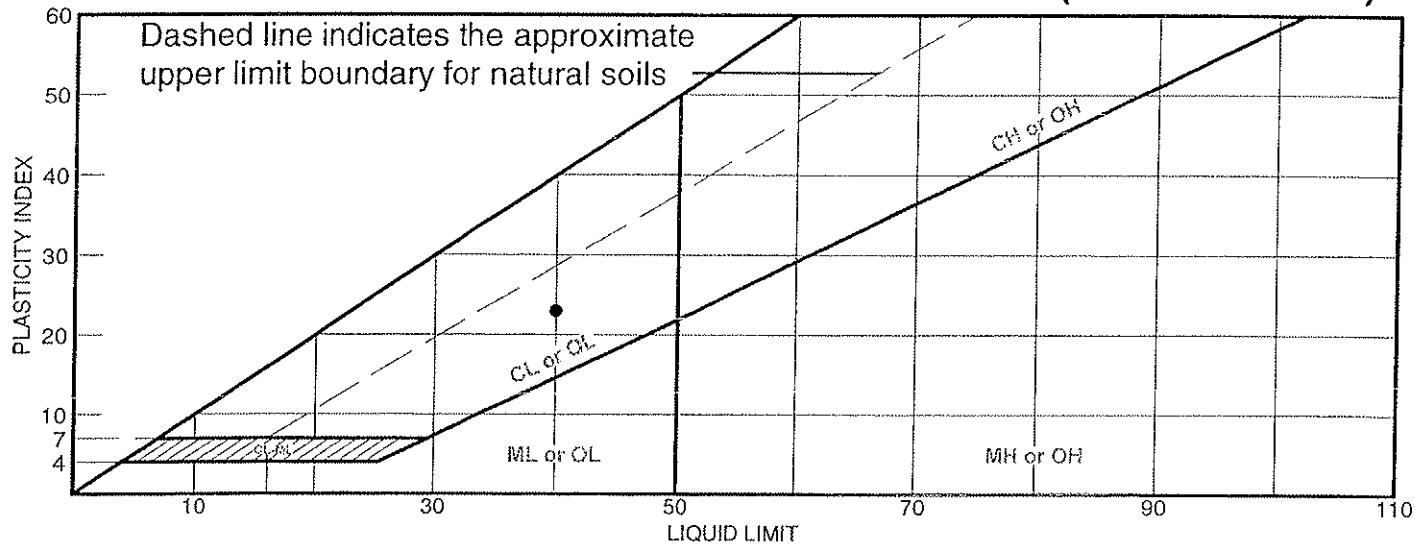
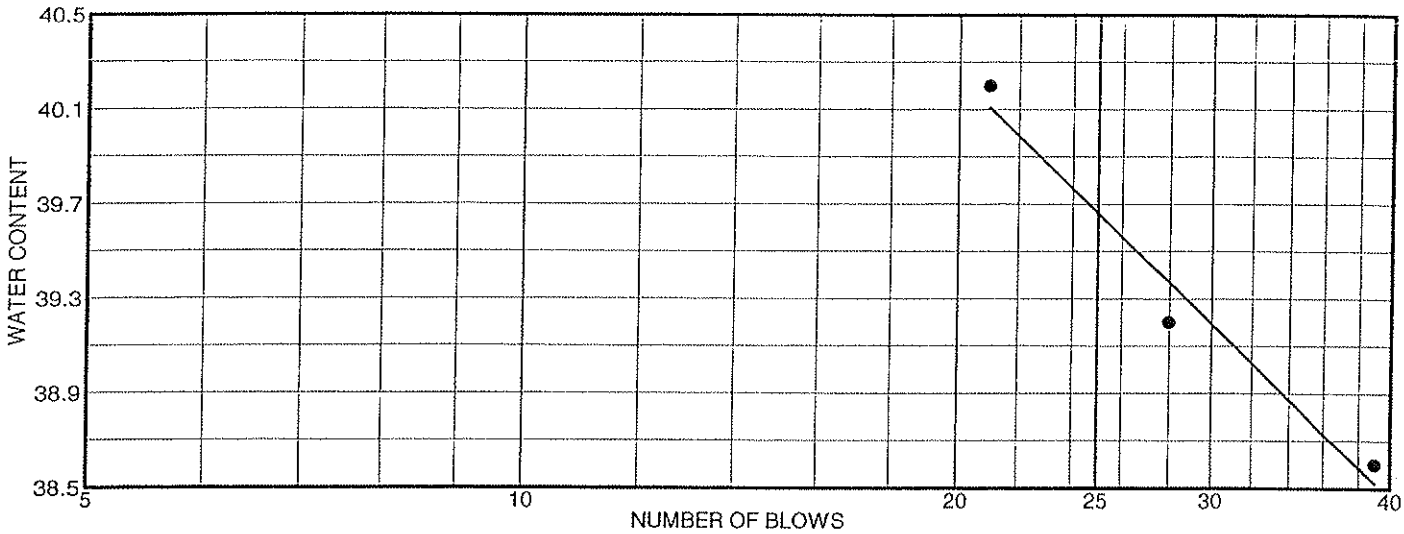
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	40	17	23	99.6	98.4	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-15 **Elev./Depth:** N5350 E5850

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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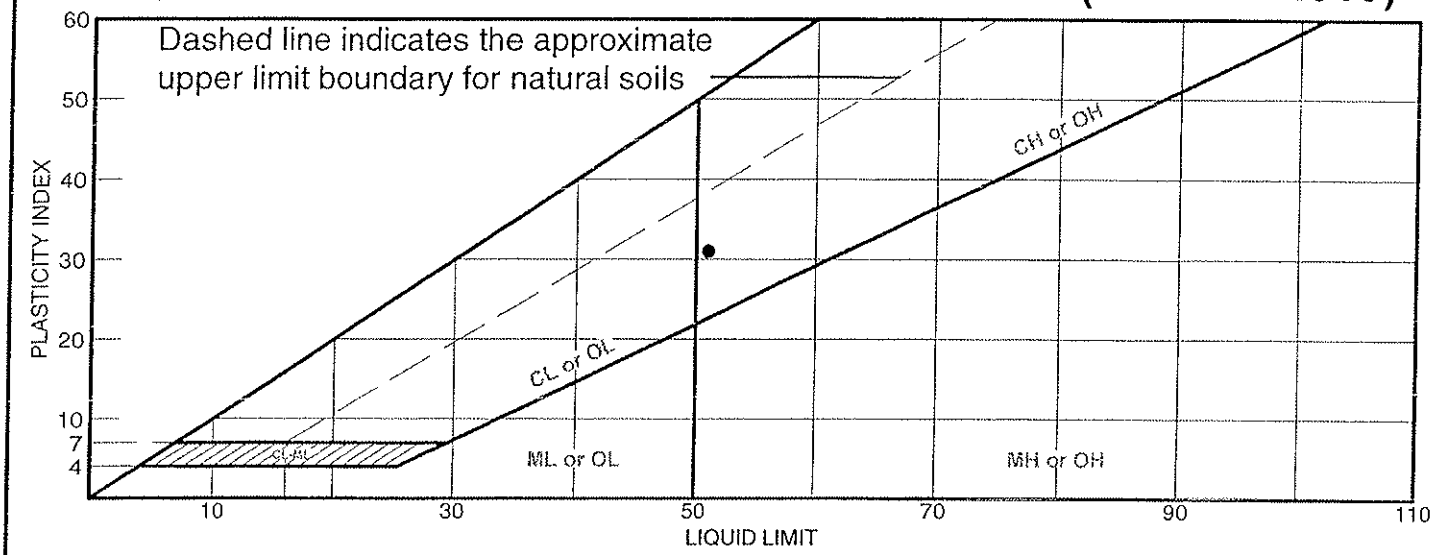
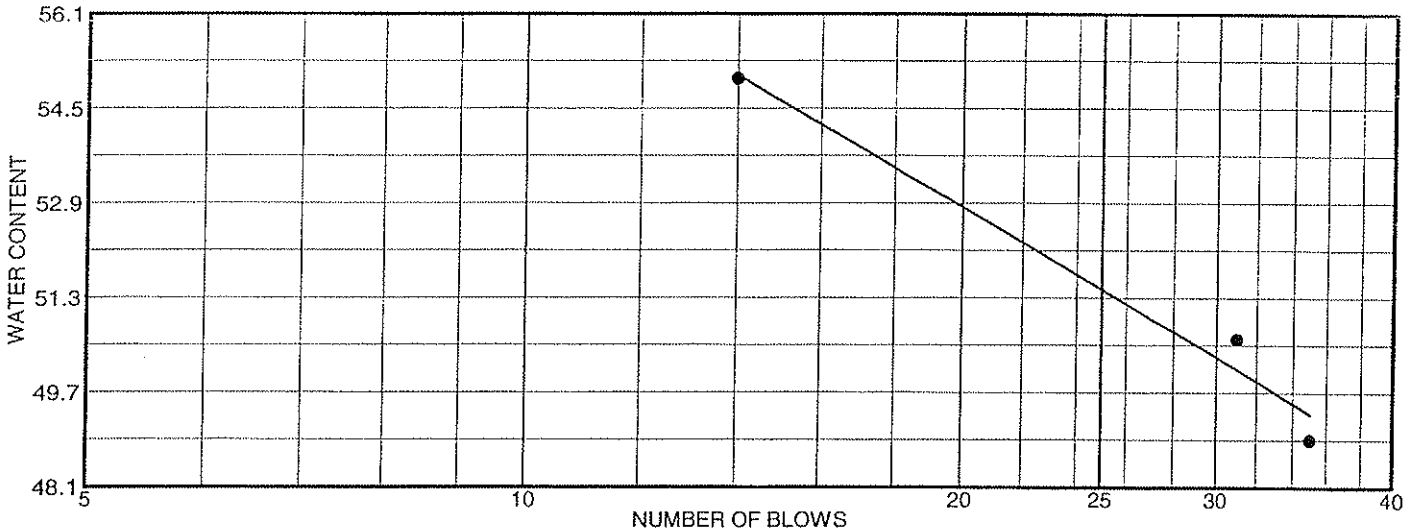
Figure

80

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Gravel Trace Sand--Gray	51	20	31	93.8	92.6	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-16 **Elev./Depth:** N5800 E6050

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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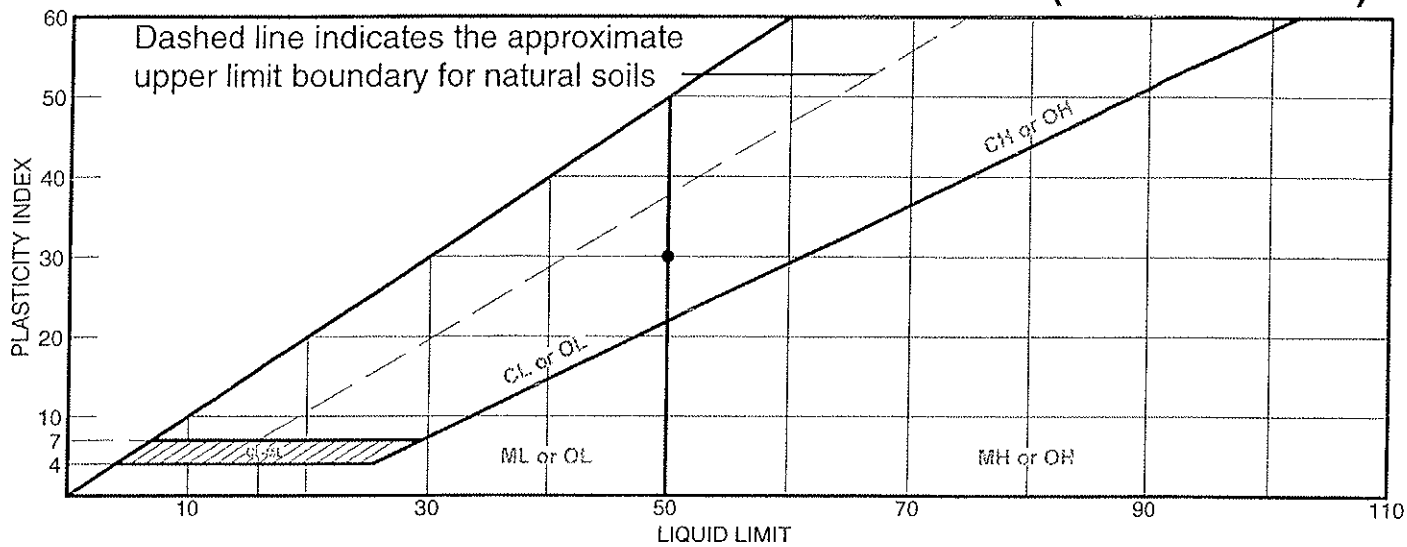
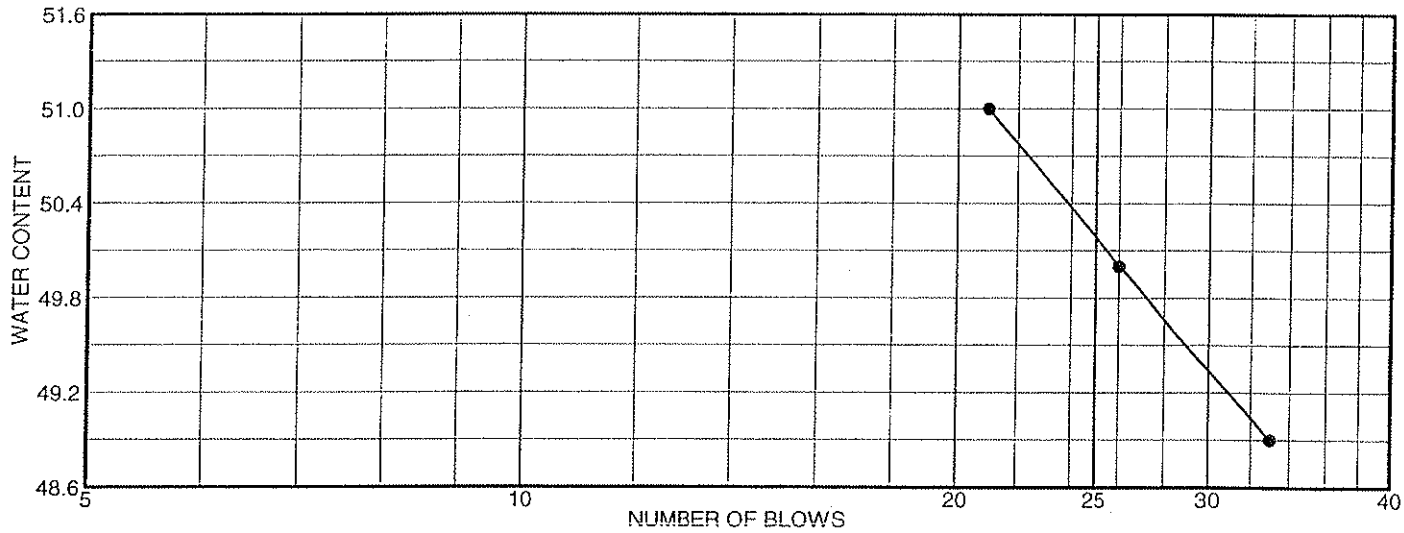
Figure

8A

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	50	20	30	98.2	97.0	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-17 **Elev./Depth:** N5800 E5850

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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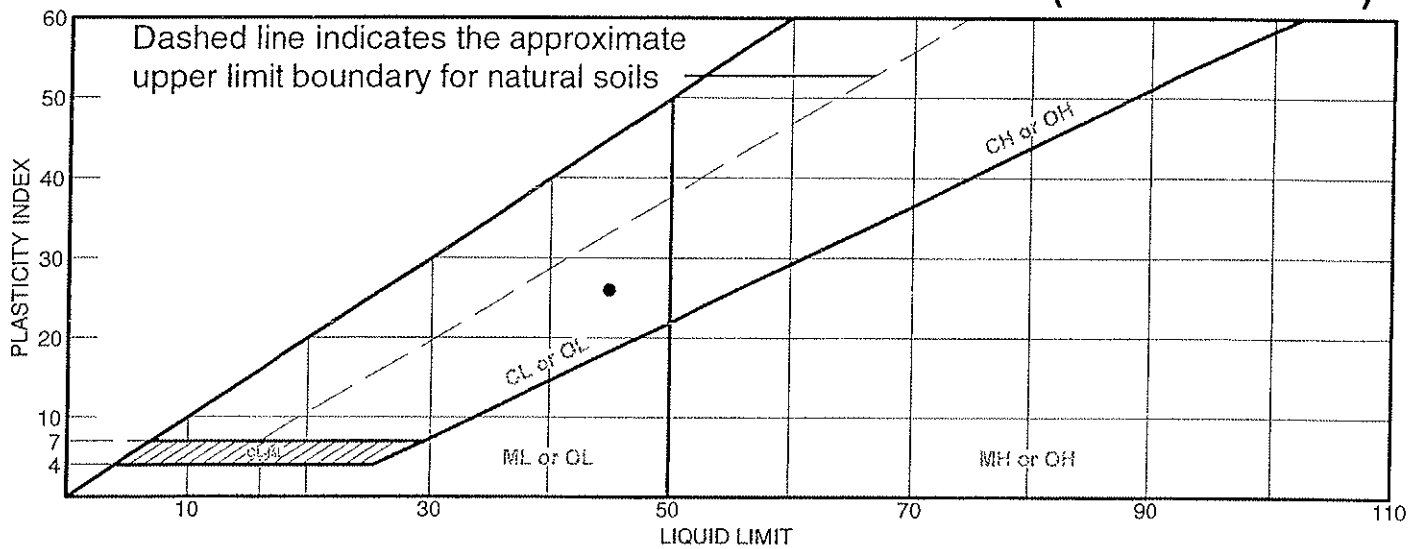
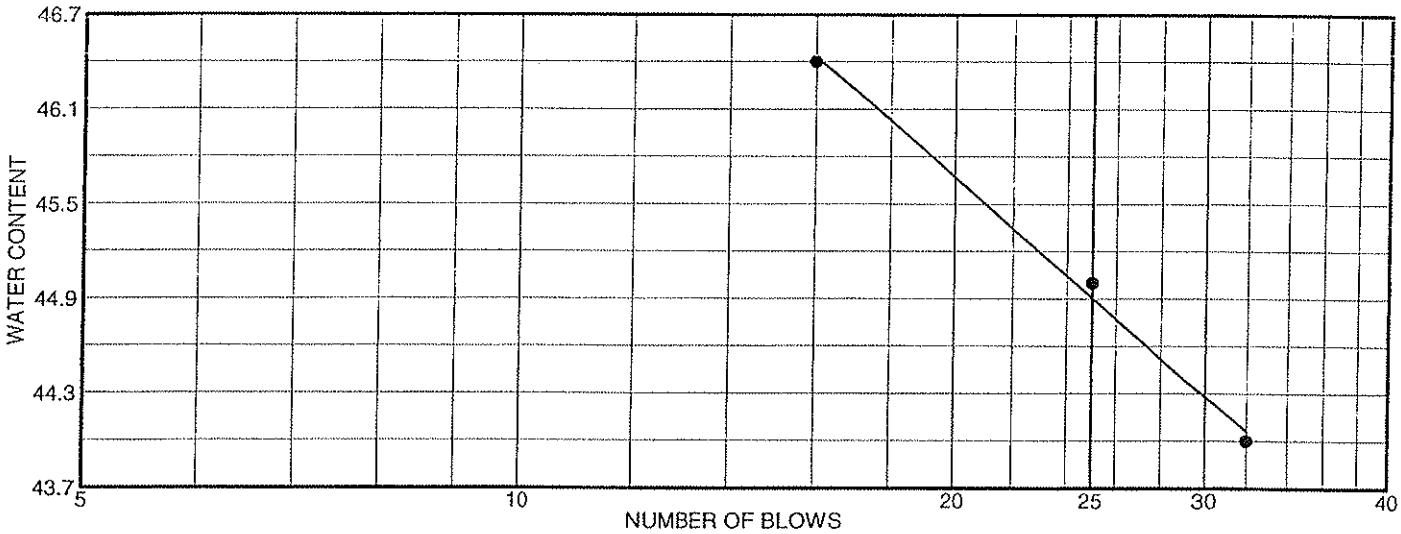
Figure

82

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Little Sand Trace Gravel--Gray	45	19	26	86.4	82.6	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-18 **Elev./Depth:** N5650 E6000

Remarks:

●

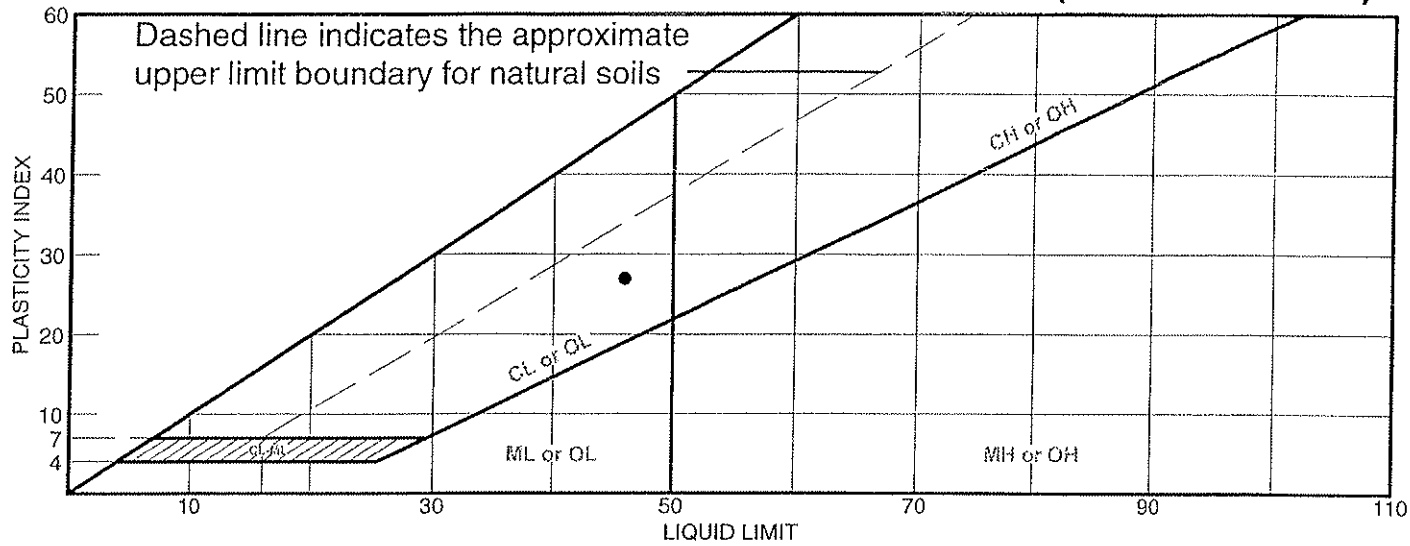
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

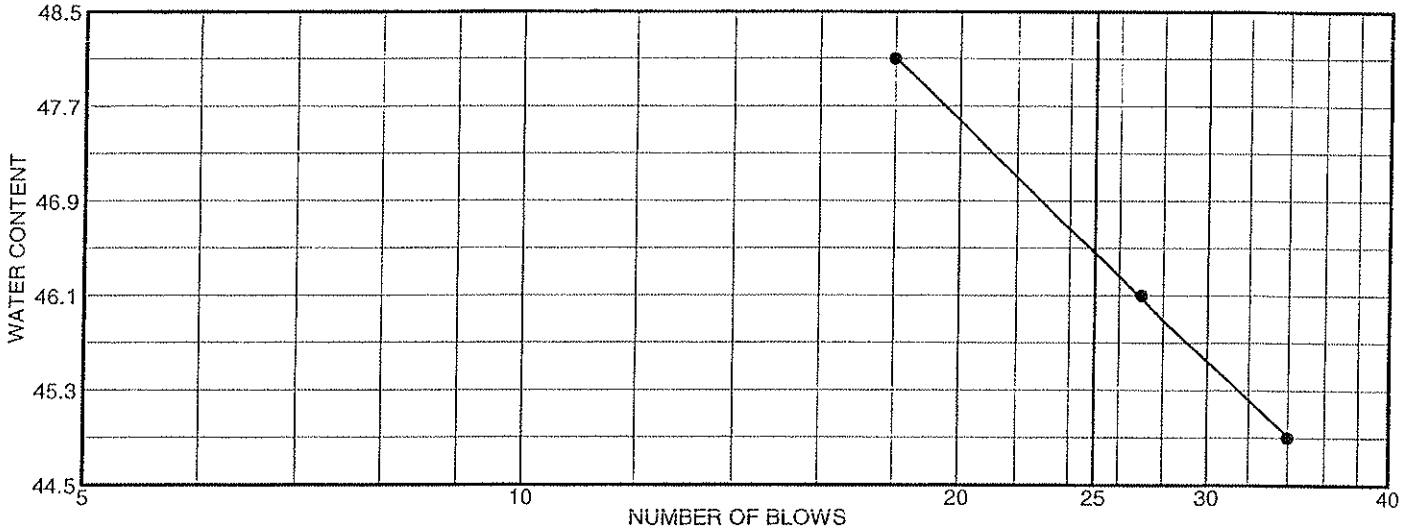
STS Consultants, Ltd.

Figure

83

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	46	19	27	95.5	94.1	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-19 **Elev./Depth:** N5450 E5900

Remarks:

●

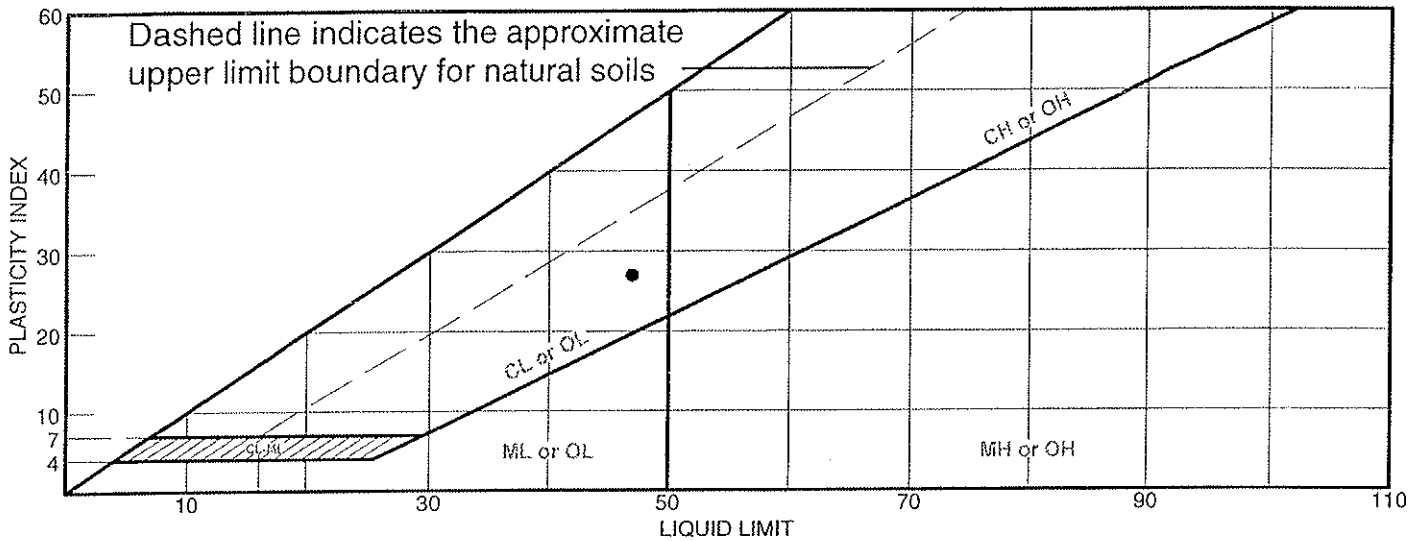
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

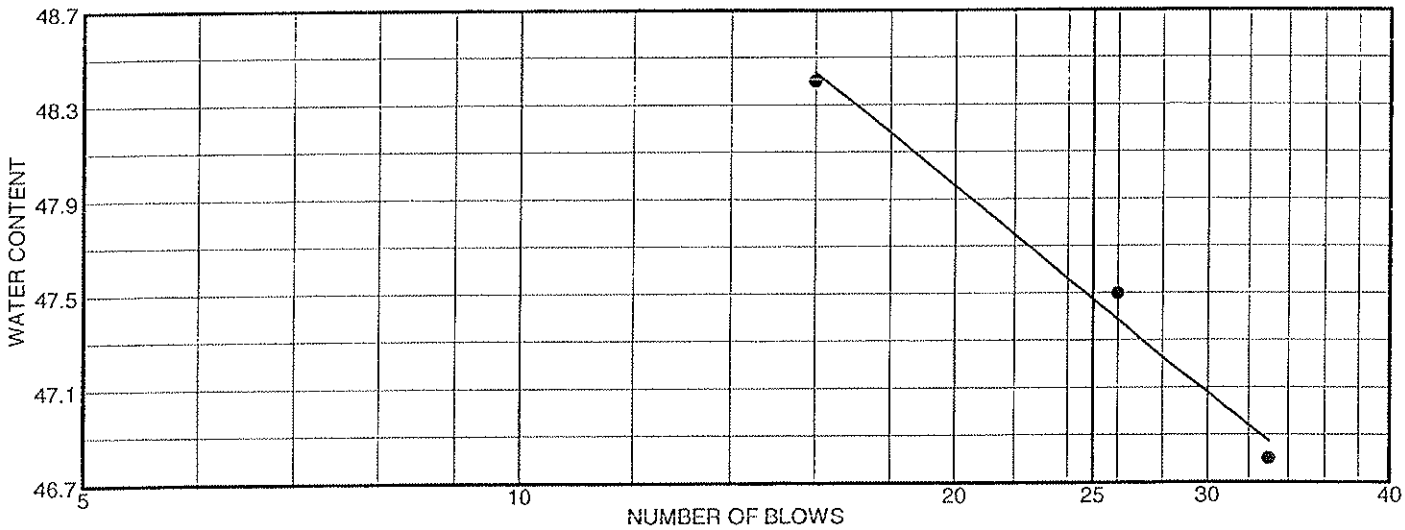
STS Consultants, Ltd.

Figure

84

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	47	20	27	99.4	98.6	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-20 **Elev./Depth:** N5500 E5850

Remarks:

●

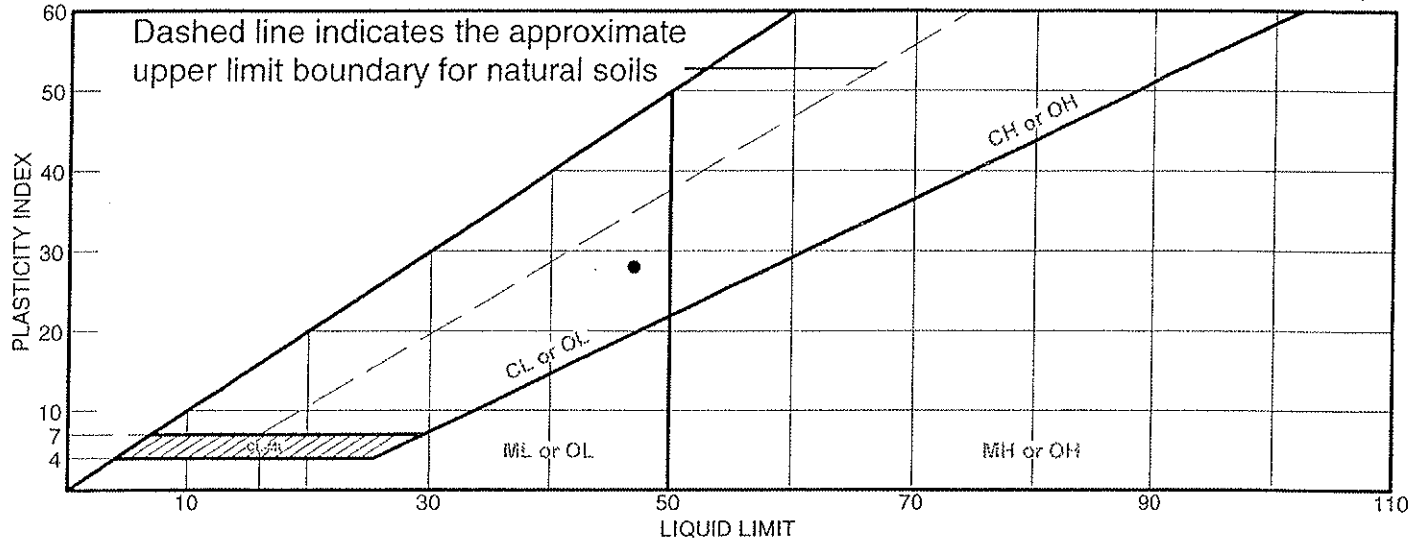
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

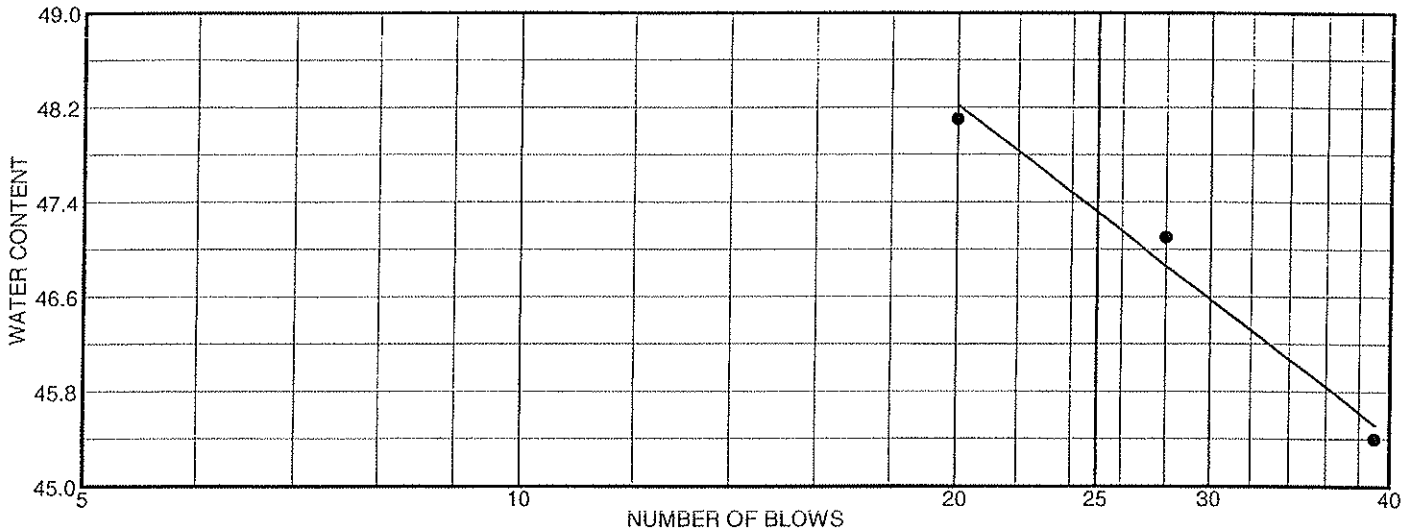
STS Consultants, Ltd.

Figure

85

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	47	19	28	98.8	97.6	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-21 **Elev./Depth:** N4750 E5850

Remarks:

●

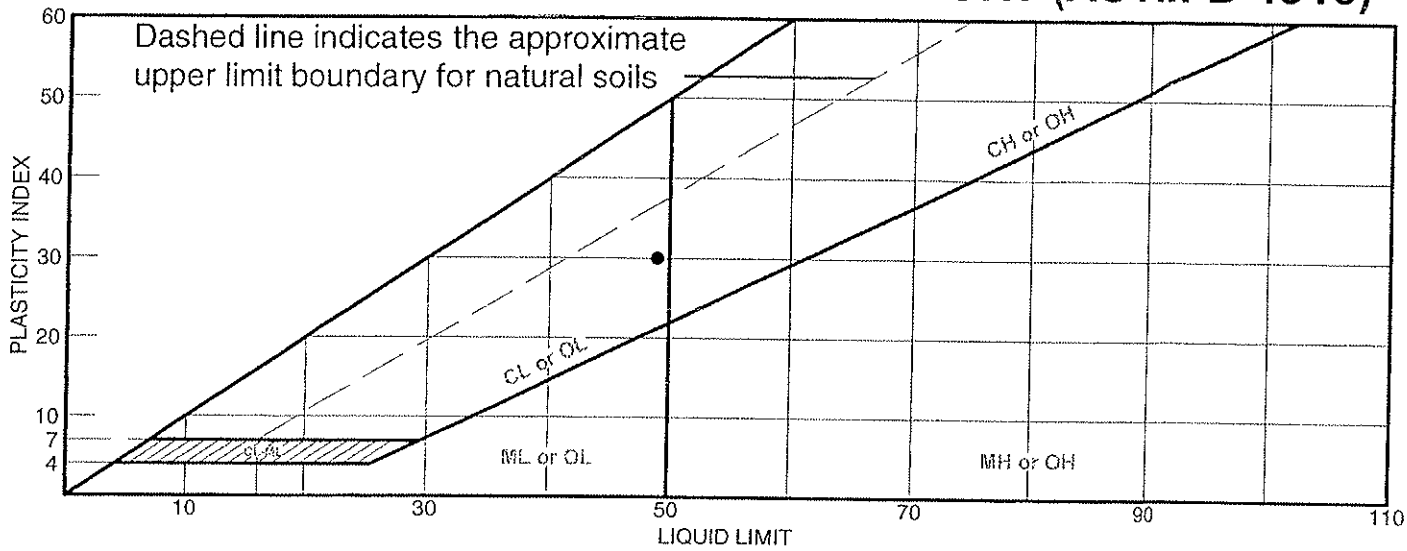
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

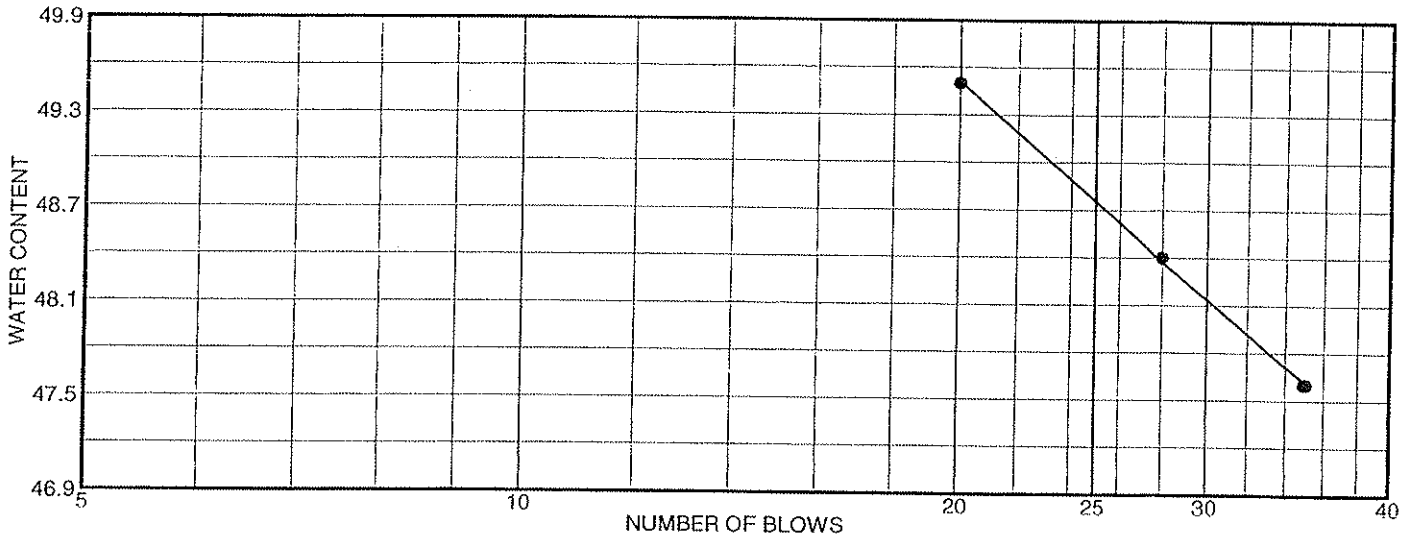
STS Consultants, Ltd.

Figure

86

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	19	30	99.6	98.6	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-22 **Elev./Depth:** N5850 E5950

Remarks:

●

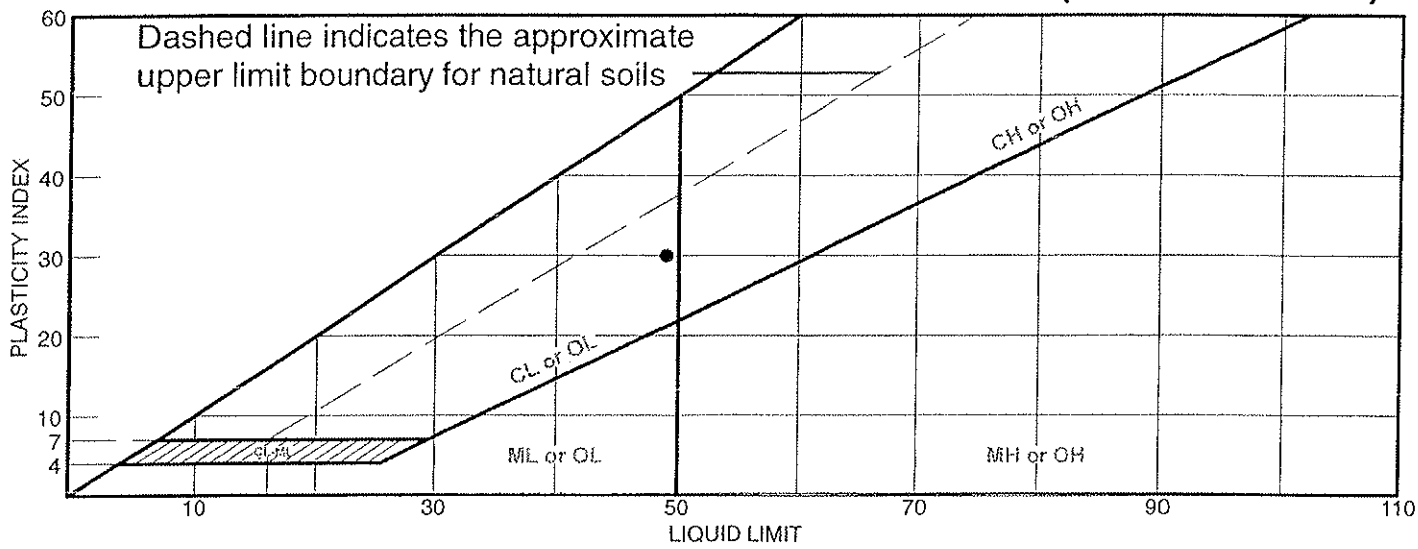
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

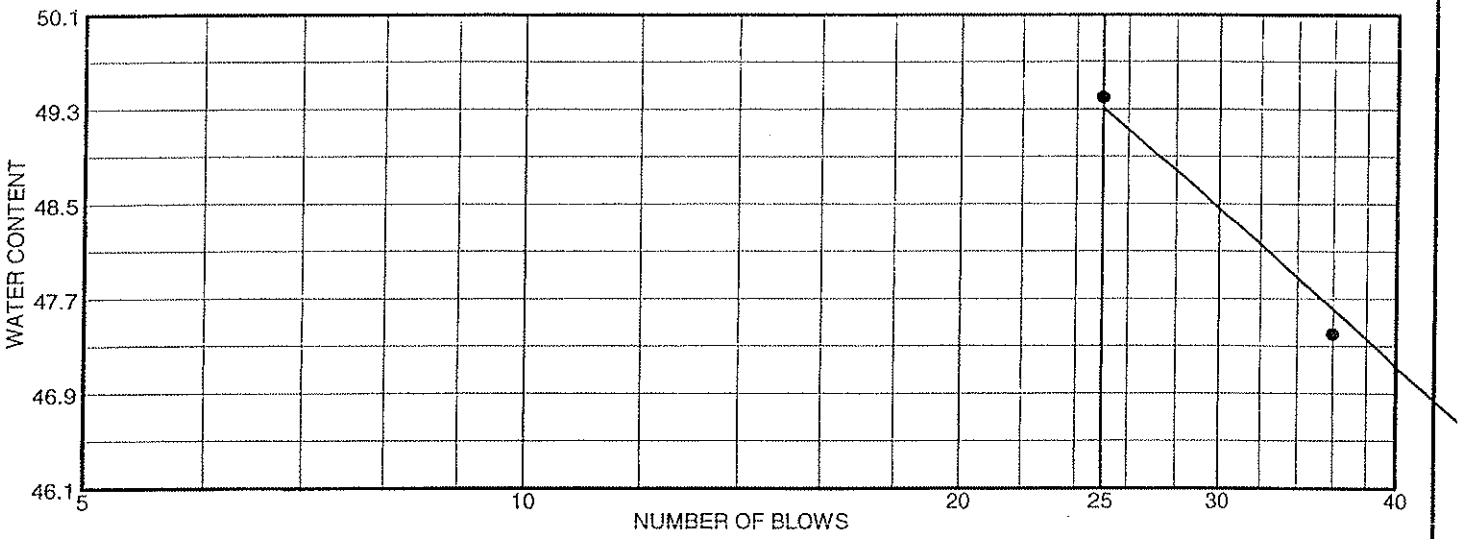
STS Consultants, Ltd.

Figure

87

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	19	30	99.6	99.0	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 2 **Sample No.:** CL-T-23 **Elev./Depth:** N5050 E5850

Remarks:

●

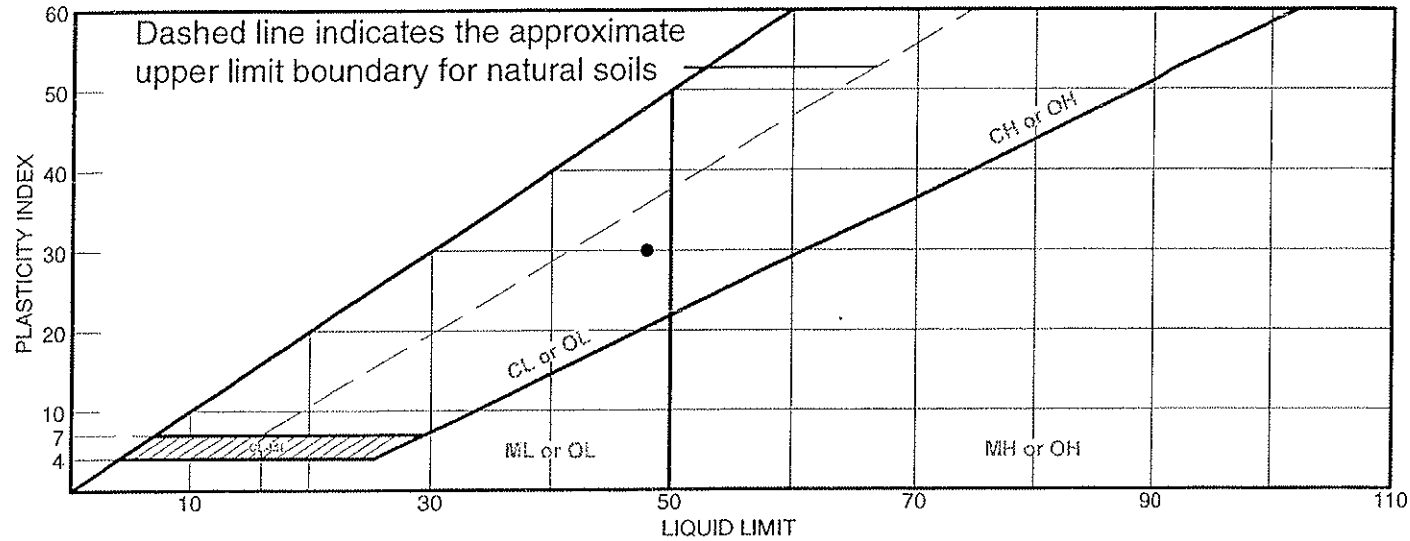
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

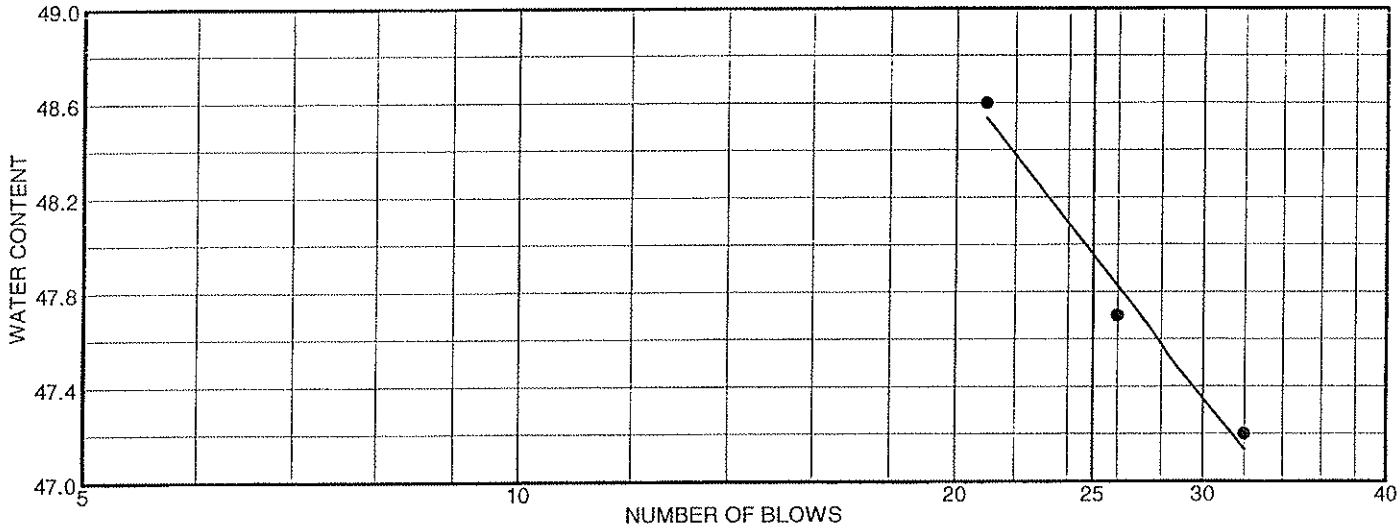
STS Consultants, Ltd.

Figure

88

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	48	18	30	99.0	98.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-24 **Elev./Depth:** N5150 E5900

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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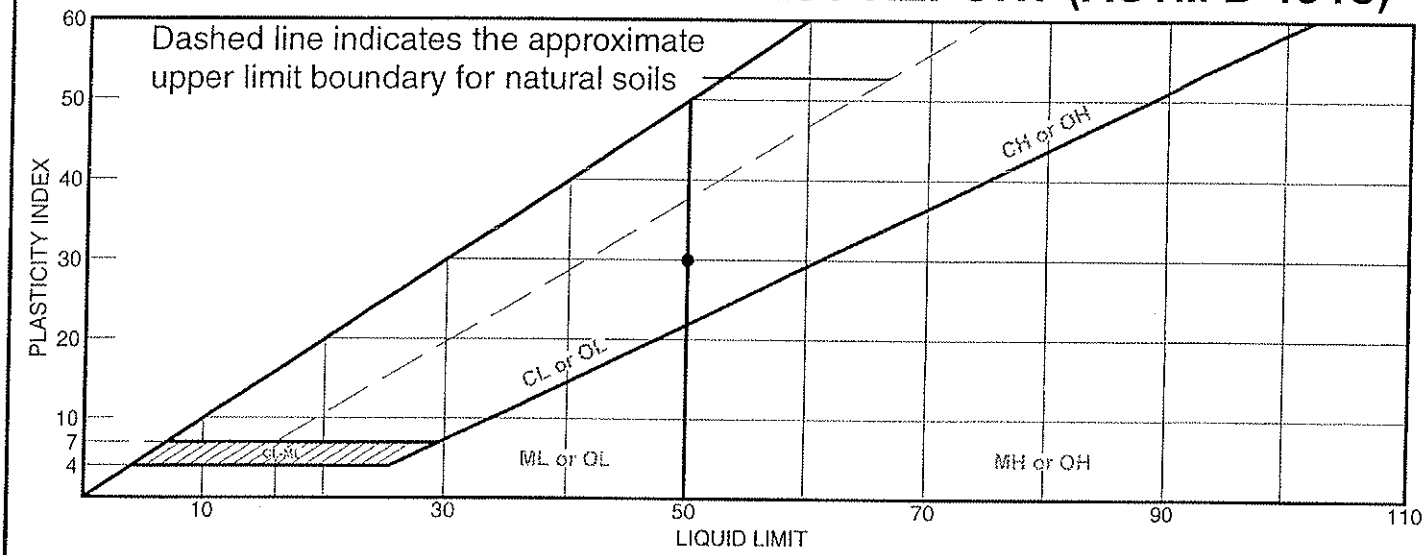
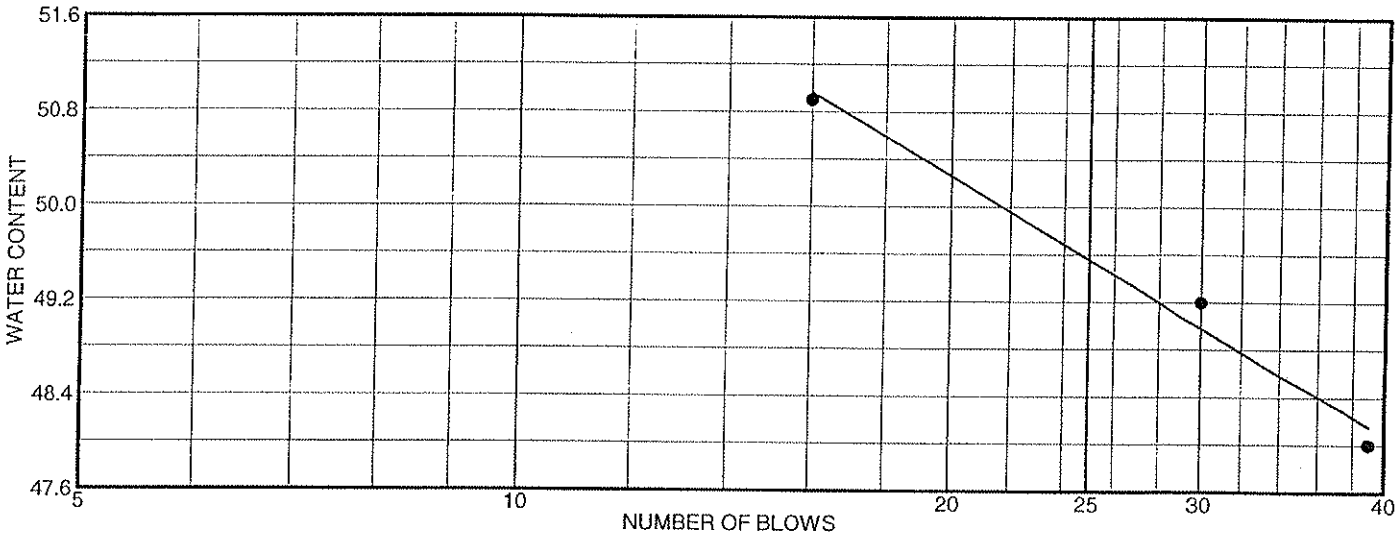
Figure

89

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	50	20	30	98.2	96.5	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-25 **Elev./Depth:** N5650 E5900

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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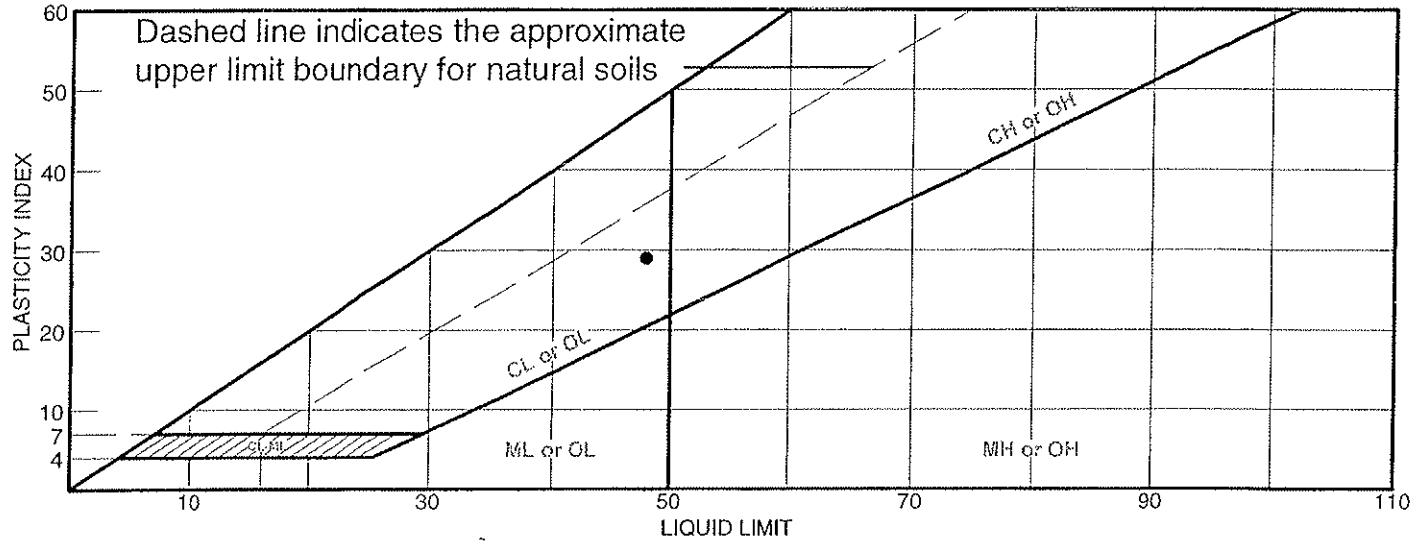
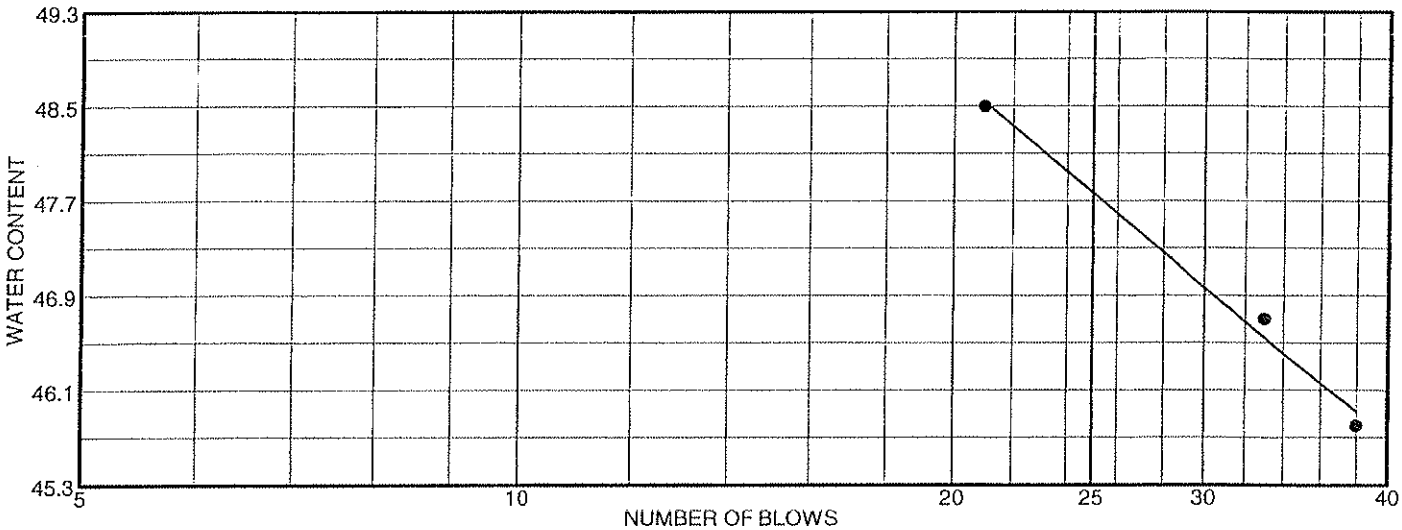
Figure

90

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	48	19	29	99.4	98.8	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-26 **Elev./Depth:** N5050 E6000

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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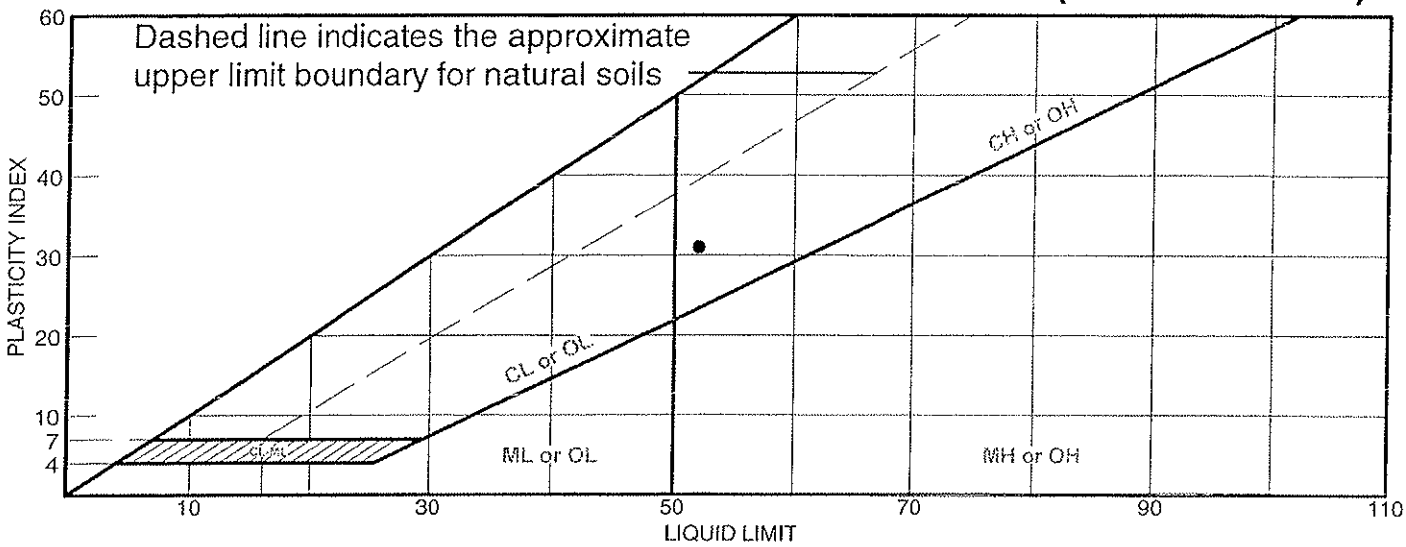
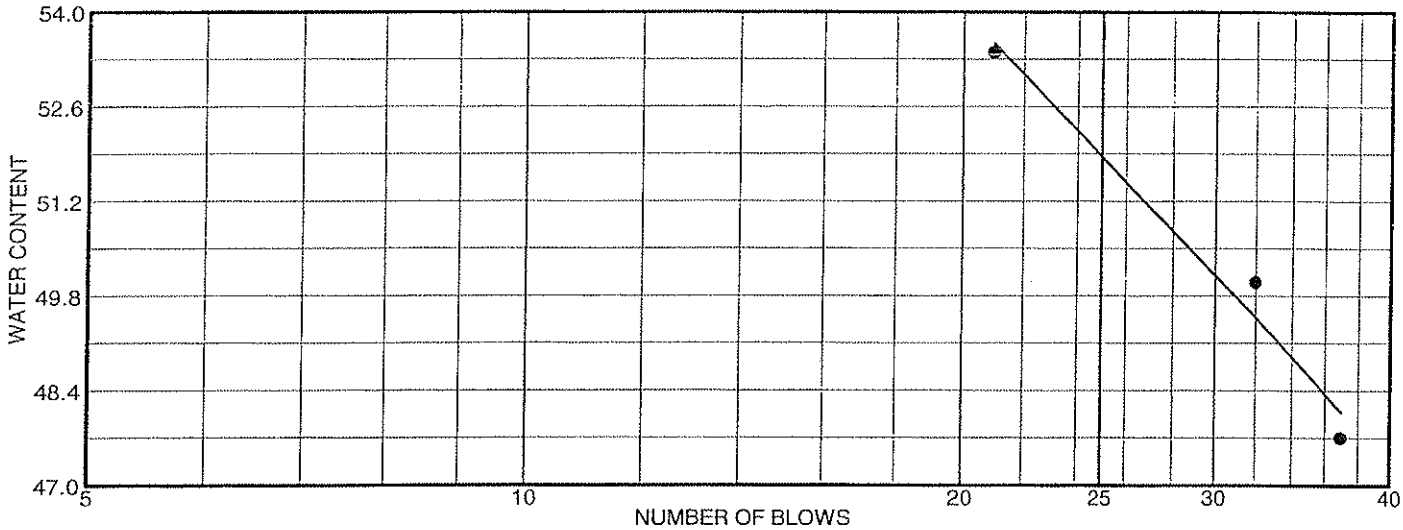
Figure

94

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay--Gray	52	21	31	99.6	99.2	CH

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-27 **Elev./Depth:** N5250 E5850

Remarks:

●

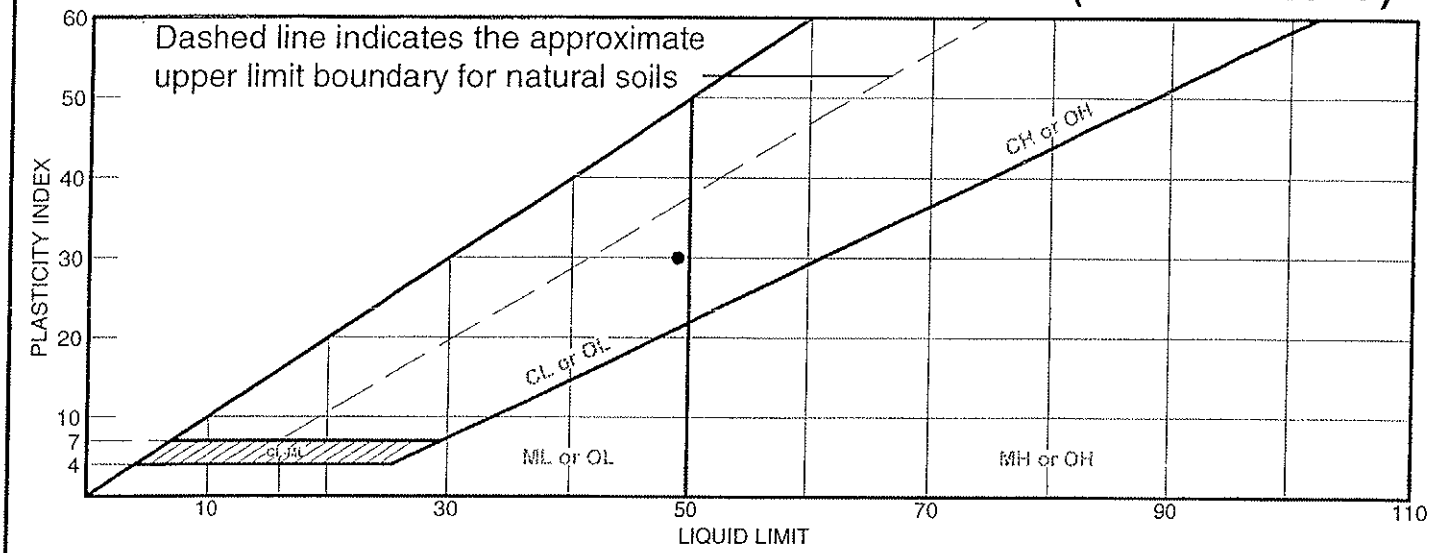
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

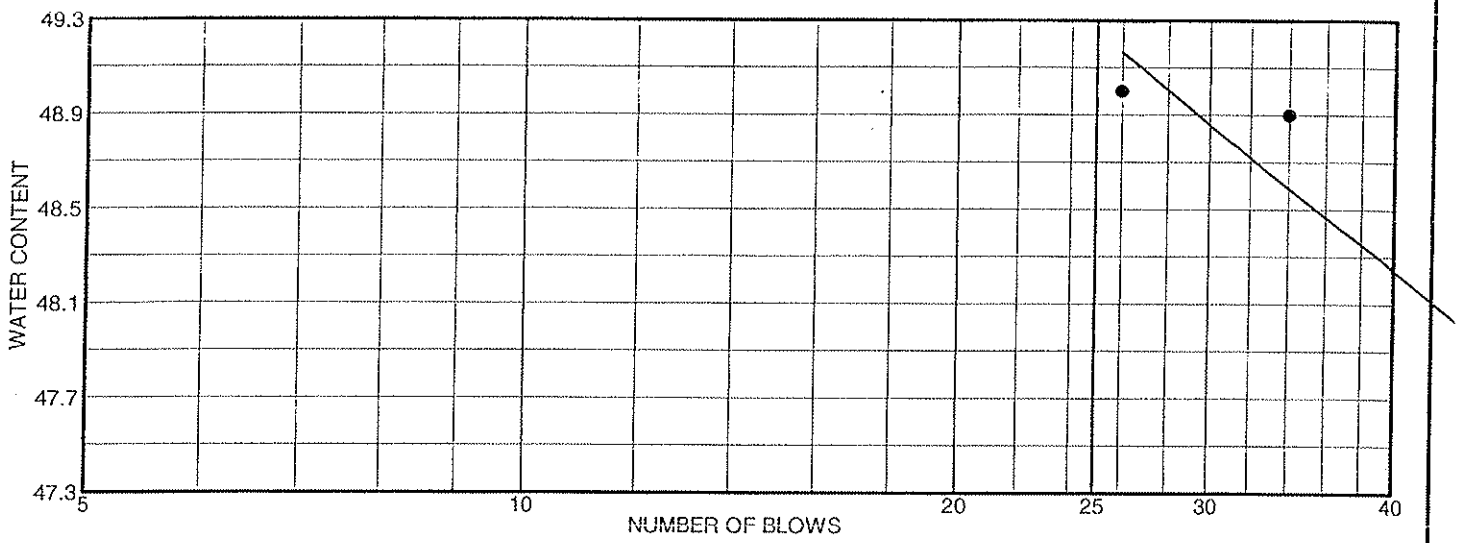
STS Consultants, Ltd.

Figure

92

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	19	30	98.4	96.8	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 4 **Sample No.:** CL-T-28 **Elev./Depth:** N4900 E5900

Remarks:

●

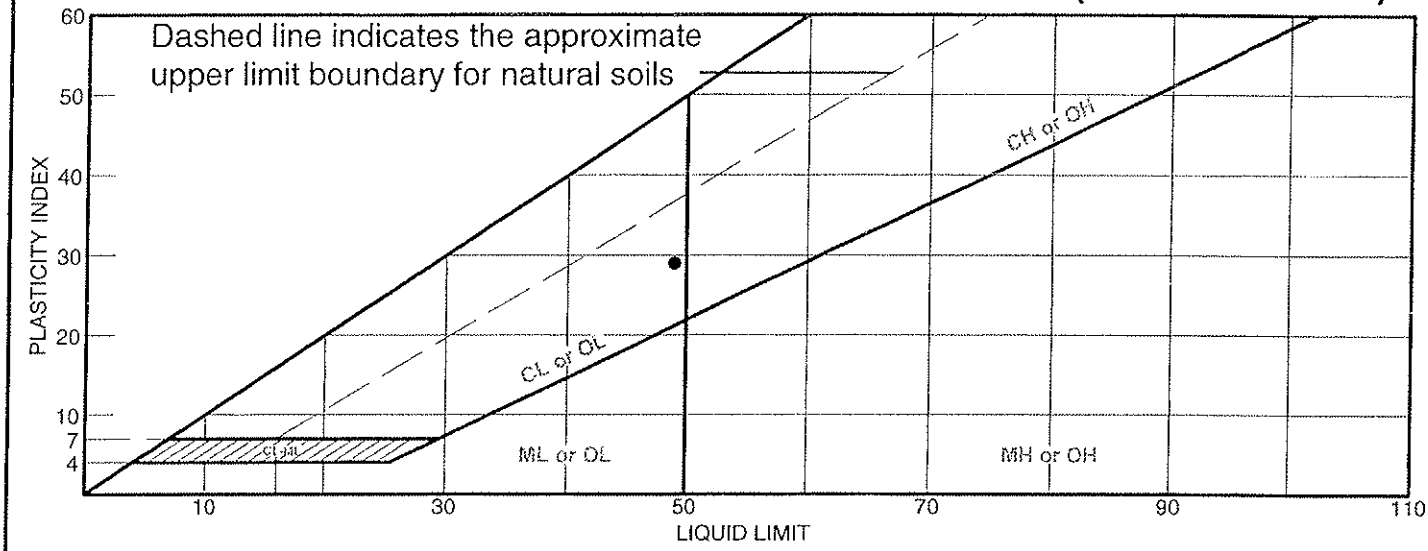
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

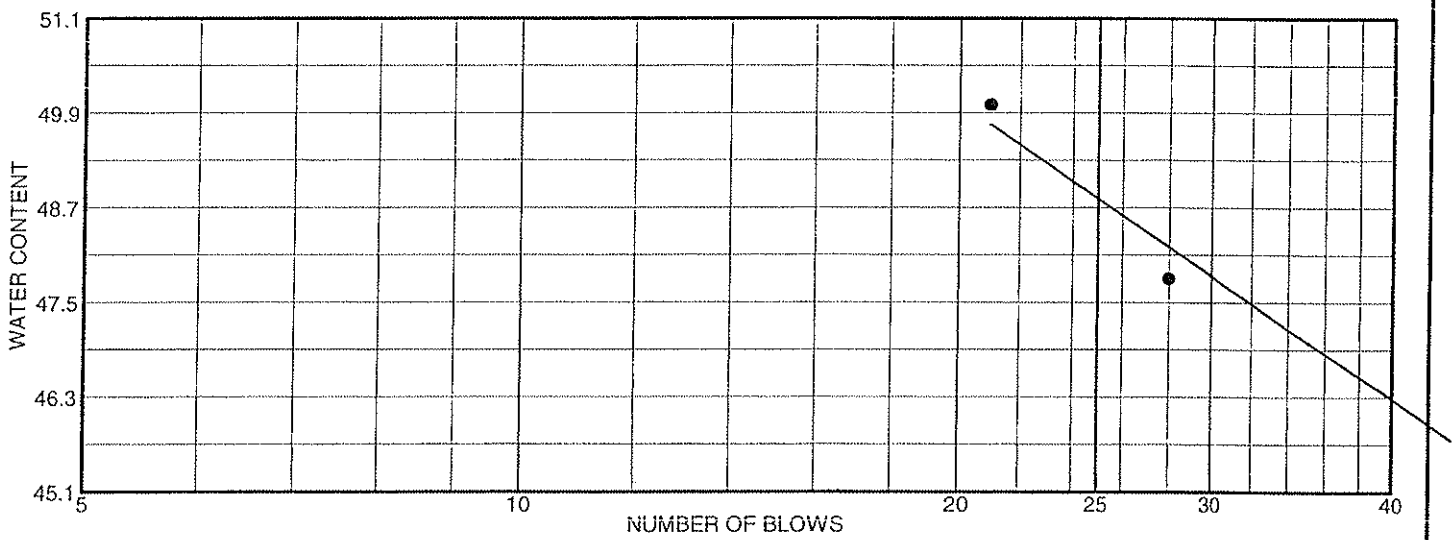
STS Consultants, Ltd.

Figure

93

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	20	29	99.6	98.8	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-29 **Elev./Depth:** N5350 E5900

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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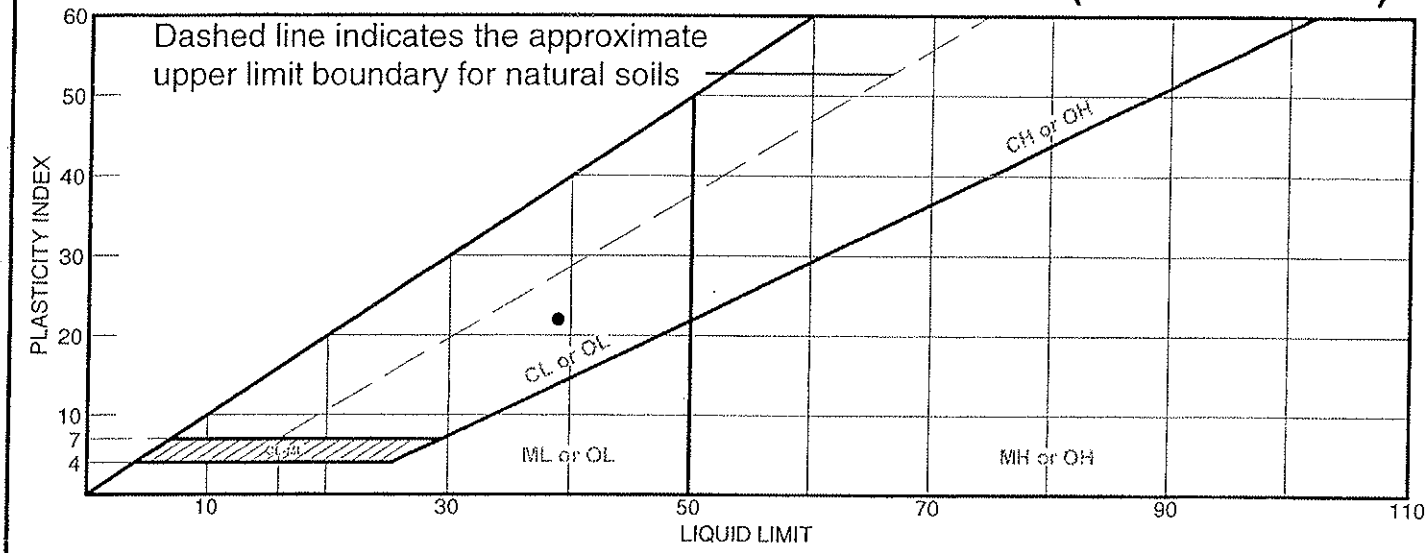
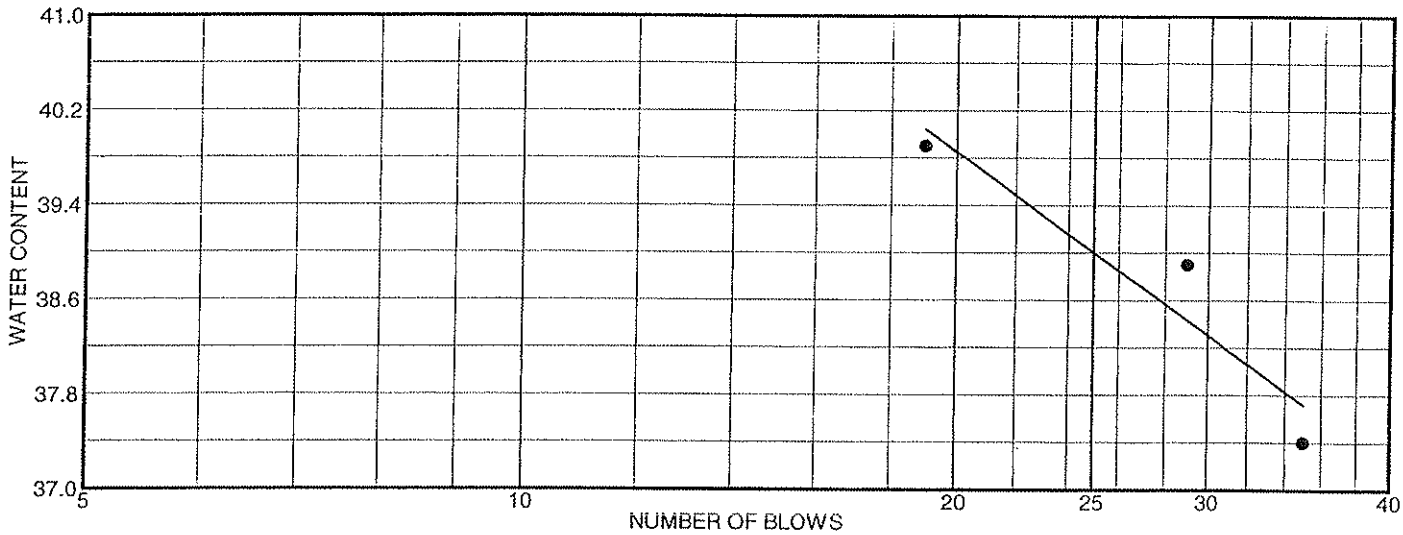
Figure

94

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	39	17	22	99.8	99.4	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-30 **Elev./Depth:** N5100 E5850

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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Figure

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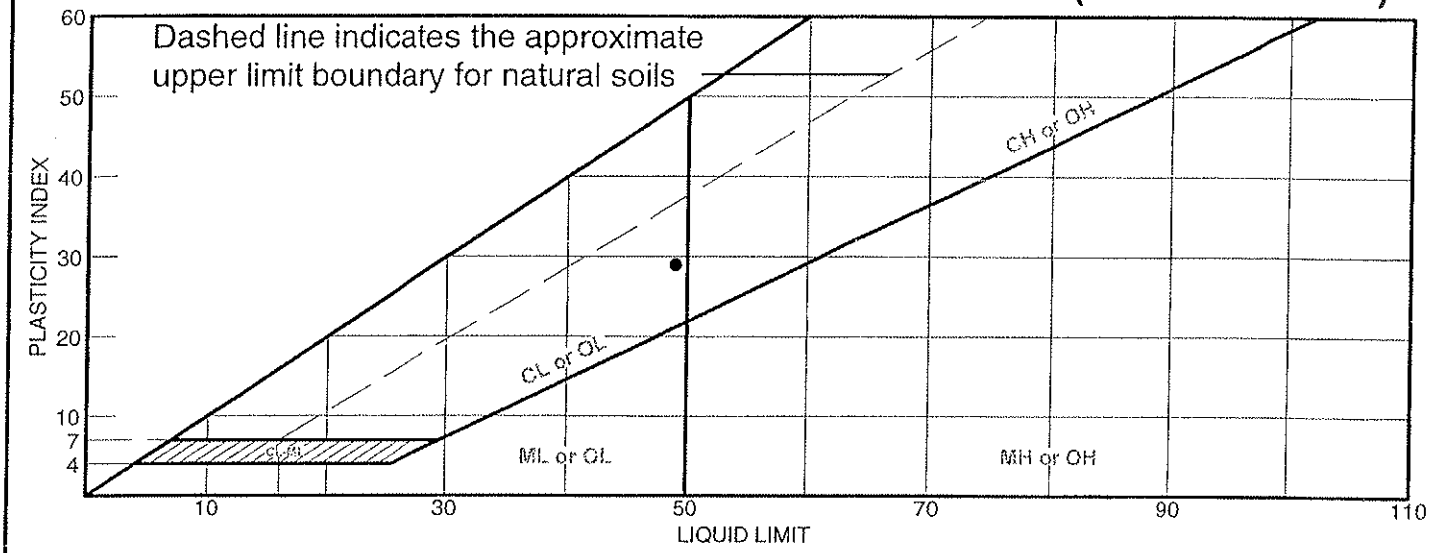
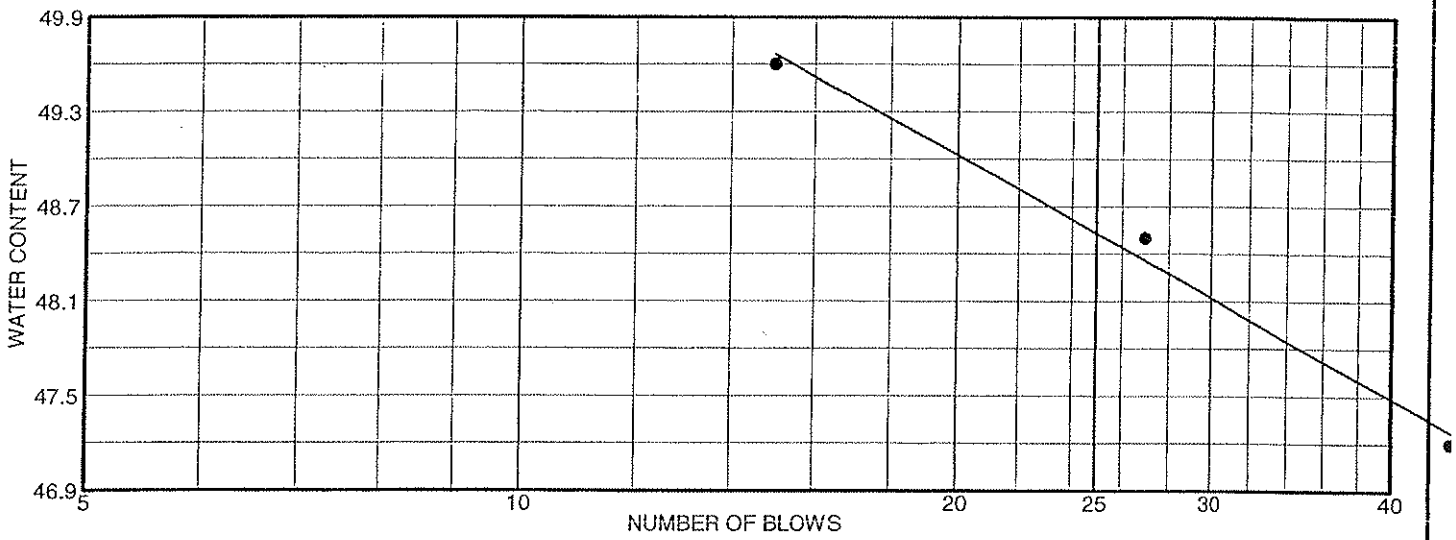
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	20	29	99.6	99.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 6 **Sample No.:** CL-T-31 **Elev./Depth:** N4900 E5850

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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Figure

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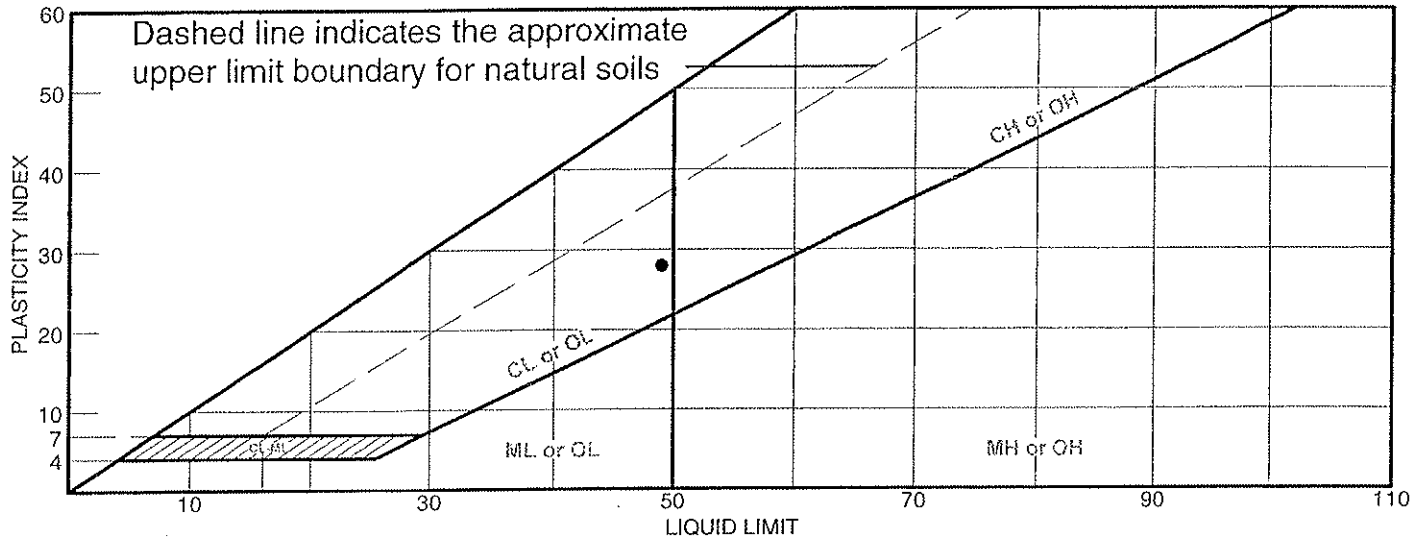
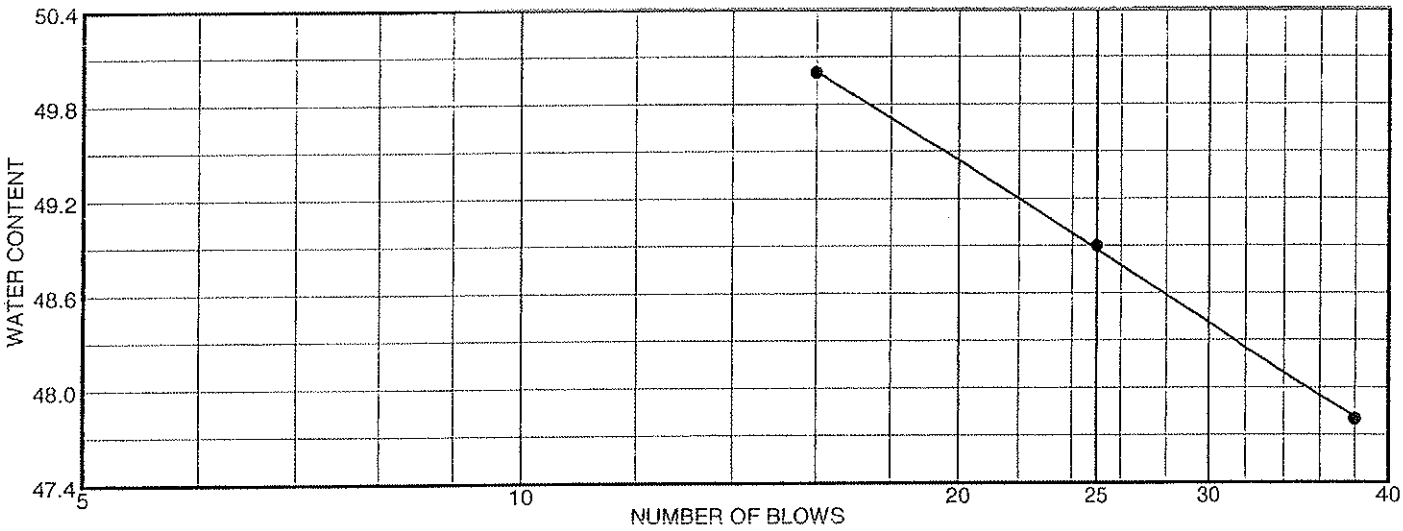
LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silty Clay Trace Sand--Gray	49	21	28	99.0	97.2	CL

Project No. 87898A **Client:**

Project: OEPL Phase 6 East

● **Source:** Lift 8 **Sample No.:** CL-T-32 **Elev./Depth:** N4800 E5900

Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 4318)

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Figure

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Laboratory Services Group
750 Corporate Woods Parkway Vernon Hills, Illinois 60061
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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 6/27/2005

SUMMARY OF TEST RESULTS

LIFT	2
SAMPLE NO.	CL-T-1
SAMPLE LOCATION	N4900 E6000
CLASSIFICATION	Silty Clay, Trace Fine to Coarse Sand, Trace Fine Gravel - Gray (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	102.1	102.7
WATER CONTENT (%)	22.8	25.0
DIAMETER (cm)	7.246	7.240
LENGTH (cm)	8.555	8.517

HYDRAULIC GRADIENT (MAXIMUM)	19.2	
PERCENT SATURATION	104.9	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**1.21E-08**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 6/27/2005

SUMMARY OF TEST RESULTS

LIFT	4
SAMPLE NO.	CL-T-3
SAMPLE LOCATION	N4750 E6050
CLASSIFICATION	Silty Clay, Trace Fine to Medium Sand - Gray (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	103.4	103.0
WATER CONTENT (%)	24.4	23.6
DIAMETER (cm)	7.185	7.220
LENGTH (cm)	7.238	7.197

HYDRAULIC GRADIENT (MAXIMUM)	22.7
PERCENT SATURATION	99.7
HYDRAULIC CONDUCTIVITY k (cm/sec)	**1.68E-08**

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 6/27/2005

SUMMARY OF TEST RESULTS

LIFT	6
SAMPLE NO.	CL-T-8
SAMPLE LOCATION	N5400 E5950
CLASSIFICATION	Silty Clay, Trace Fine Sand - Gray (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	107.8	108.3
WATER CONTENT (%)	20.7	21.1
DIAMETER (cm)	7.301	7.300
LENGTH (cm)	8.582	8.550

HYDRAULIC GRADIENT (MAXIMUM)	19.2	
PERCENT SATURATION	101.6	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**2.85E-08**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 6/27/2005

SUMMARY OF TEST RESULTS

LIFT	2
SAMPLE NO.	CL-T-9
SAMPLE LOCATION	N5550 E6000
CLASSIFICATION	Silty Clay, Trace Fine Sand - Gray (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	106.5	108.3
WATER CONTENT (%)	21.6	20.8
DIAMETER (cm)	7.267	7.230
LENGTH (cm)	8.189	8.141

HYDRAULIC GRADIENT (MAXIMUM)	20.1	
PERCENT SATURATION	100.2	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**9.80E-09**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 6/27/2005

SUMMARY OF TEST RESULTS

LIFT	4
SAMPLE NO.	CL-T-11
SAMPLE LOCATION	N5700 E6050
CLASSIFICATION	Silty Clay Trace F- Sand - Grayish Brown CL

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	105.0	105.7
WATER CONTENT (%)	23.0	22.0
DIAMETER (cm)	7.205	7.190
LENGTH (cm)	8.282	8.264

HYDRAULIC GRADIENT (MAXIMUM)	19.8	
PERCENT SATURATION	99.4	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**2.57E-08**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/5/2005

SUMMARY OF TEST RESULTS

LIFT	2
SAMPLE NO.	CL-T-15
SAMPLE LOCATION	N5350 E5850
CLASSIFICATION	Silty Clay Trace F Sand - Gray Brown (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	112.5	112.5
WATER CONTENT (%)	15.6	18.2
DIAMETER (cm)	7.209	7.209
LENGTH (cm)	9.333	9.333

HYDRAULIC GRADIENT (MAXIMUM)	17.6	
PERCENT SATURATION	98.0	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**4.54E-08**	

Deaired tap water was used as the liquid permeant.

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Phone:(847) 279-2500 Fax:(847) 279-2550

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/5/2005

SUMMARY OF TEST RESULTS

LIFT	4
SAMPLE NO.	CL-T-19
SAMPLE LOCATION	N5450 E5900
CLASSIFICATION	Silty Clay Trace F-C Sand Trace F. Gravel - Gray Brown (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	111.9	113.6
WATER CONTENT (%)	19.4	20.9
DIAMETER (cm)	7.214	7.184
LENGTH (cm)	6.667	6.621

HYDRAULIC GRADIENT (MAXIMUM)	24.7	
PERCENT SATURATION	116.0	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**6.62E-09**	

Deaired tap water was used as the liquid permeant.

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Laboratory Services Group
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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/7/2005

SUMMARY OF TEST RESULTS

LIFT	6
SAMPLE NO.	CL-T-20
SAMPLE LOCATION	N5500 E5850
CLASSIFICATION	Silty Clay Trace F-C Sand Trace F - Gray Brown (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	109.4	109.6
WATER CONTENT (%)	23.4	24.4
DIAMETER (cm)	7.228	7.220
LENGTH (cm)	6.421	6.421

HYDRAULIC GRADIENT (MAXIMUM)	25.5	
PERCENT SATURATION	121.9	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**1.91E-08**	

Deaired tap water was used as the liquid permeant.

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Laboratory Services Group
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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/11/2005

SUMMARY OF TEST RESULTS

LIFT	8
SAMPLE NO.	CL-T-22
SAMPLE LOCATION	N5850 E5950
CLASSIFICATION	Silty Clay Trace F Sand - Gray Brown (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	106.2	106.5
WATER CONTENT (%)	21.8	22.7
DIAMETER (cm)	7.203	7.196
LENGTH (cm)	7.890	7.881

HYDRAULIC GRADIENT (MAXIMUM)	20.9	
PERCENT SATURATION	104.8	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**1.69E-08**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/12/2005

SUMMARY OF TEST RESULTS

LIFT	8
SAMPLE NO.	CL-T-26
SAMPLE LOCATION	N5050 E6000
CLASSIFICATION	Silty Clay Trace F Sand - Gray Brown (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	107.1	107.3
WATER CONTENT (%)	22.1	22.3
DIAMETER (cm)	7.190	7.182
LENGTH (cm)	6.562	6.562

HYDRAULIC GRADIENT (MAXIMUM)	24.9	
PERCENT SATURATION	105.1	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**2.99E-08**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/13/2005

SUMMARY OF TEST RESULTS

LIFT	8
SAMPLE NO.	CL-T-30
SAMPLE LOCATION	N5100 E5850
CLASSIFICATION	Silty Clay Trace F-M Sand - Gray Brown (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	106.1	106.2
WATER CONTENT (%)	24.9	25.8
DIAMETER (cm)	7.127	7.124
LENGTH (cm)	13.946	13.948

HYDRAULIC GRADIENT (MAXIMUM)	11.8	
PERCENT SATURATION	117.9	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**1.40E-08**	

Deaired tap water was used as the liquid permeant.

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HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

STS PROJECT NO.: 87898A
PROJECT NAME: OEPL Phase 6 East
CLIENT NAME: Onyx Waste Services, Inc.
SAMPLED BY: STS

Report Date: 7/25/2005
Date Tested: 7/16/2005

SUMMARY OF TEST RESULTS

LIFT	6
SAMPLE NO.	CL-T-31
SAMPLE LOCATION	N4900 E5850
CLASSIFICATION	Silty Clay - Gray Brown (CH)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	109.1	109.4
WATER CONTENT (%)	22.5	22.4
DIAMETER (cm)	7.103	7.096
LENGTH (cm)	12.621	12.618

HYDRAULIC GRADIENT (MAXIMUM)	13.0	
PERCENT SATURATION	110.8	(Percent saturation calculation is based on final measurements and an estimated specific gravity.)
HYDRAULIC CONDUCTIVITY k (cm/sec)	**2.53E-08**	

Deaired tap water was used as the liquid permeant.

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TABLE 6

SUMMARY OF LABORATORY TEST RESULTS FOR CLAY LINER MATERIAL (BORROW SOURCE)

VEOLIA ES EMERALD PARK LANDFILL PHASE 6 WEST LINER CONSTRUCTION

NOVEMBER 2007

ASTM No.			D422		D4318			D2216	D1557		D2487
			Grain Size Analysis		Atterberg Limits			Sampled Water Content	Modified Proctor Density		
Date Sampled	Sample Number	Sample Location	%Fines <#200	%Clay <.005	Liquid Limit	Plastic Limit	Plasticity Index	(%)	Max. Dry Density (pcf)	Optimum Water (%)	U.S.C.S.
5/21/07	EP-CS-1	Borrow Source	98.9	87.0	46.2	21.1	25.1	17.6	116.3	15.9	CL
5/21/07	EP-CS-2	Borrow Source	99.5	85.5	45.8	20.6	25.2	25.1	114.9	16.1	CL
7/16/07	EP-CS-3	Borrow Source	97.0	70.0	38.4	17.5	20.9	16.7	122.3	11.6	CL
7/16/07	EP-CS-4	Borrow Source	97.4	73.0	38.0	16.5	21.5	17.5	123.0	11.8	CL
7/16/07	EP-CS-5	Borrow Source	98.0	73.0	38.4	18.4	20.0	20.2	122.9	12.0	CL
7/20/07	EP-CS-6	Borrow Source	98.8	84.0	47.3	21.6	25.7	25.5	114.1	16.1	CL
8/3/07	EP-CS-7	Borrow Source	99.2	81.0	46.0	20.1	25.9	21.0	117.8	13.4	CL
8/3/07	EP-CS-8	Borrow Source	99.4	81.5	45.1	19.9	25.2	23.4	114.3	15.1	CL
8/3/07	EP-CS-9	Borrow Source	99.0	81.0	46.9	20.1	26.8	25.7	117.5	14.7	CL
Minimum:			**97.0**	**70.0**	**38.0**	**16.5**	**20.0**	**16.7**	**114.1**	**11.6**	
Maximum:			**99.5**	**87.0**	**47.3**	**21.6**	**26.8**	**25.7**	**123.0**	**16.1**	
Average:			**98.6**	**79.6**	**43.6**	**19.5**	**24.0**	**21.4**	**118.1**	**14.1**	
Project Requirements:			**≥50.0**		**≥20.0** Avg. **≥25.0**		**≥10.0** Avg. **≥12.0**				**CL/CH**

Table 7

Summary of In-Place Moisture Density Testing of Clay Liner

TABLE 7

CLIENT: VEOLIA ES EMERALD PARK LANDFILL
PROJECT NAME: PHASE 6 WEST LINER CONSTRUCTION
LOCATION AND SOIL TYPE: CLAY LINER
IN-PLACE MOISTURE DENSITY TESTING
DENSITY METER: TROXLER 3440
PROBE DEPTH: 12 INCHES
COMPACTION REQUIREMENTS: 90% OF MODIFIED PROCTOR DENSITY @ 2.0% ABOVE OPTIMUM

Test No.	Date Tested	Coordinates North	Coordinates East	Lift No.	Moisture (%)	Percent Above Optimum Moisture	Dry Density (PCF)	Proctor Value (PCF)	Compaction (%)
Clay Liner									
1	7/10/07	4750	5750	2	18.0	2.1	106.4	116.3	91.5
2	7/10/07	4850	5750	2	18.8	2.9	106.0	116.3	91.1
3	7/12/07	4950	5750	2	19.9	4.0	105.2	116.3	90.5
4	7/12/07	5050	5750	2	18.4	2.5	109.7	116.3	94.3
5	7/18/07	5150	5750	2	18.4	2.5	110.5	116.3	95.0
6	7/18/07	5250	5750	2	19.4	3.5	105.0	116.3	90.3
7	7/13/07	5350	5750	2	20.0	4.1	103.9	116.3	89.3
7R	7/13/07	5350	5750	2	18.9	3.0	106.8	116.3	91.8
8	7/13/07	5450	5750	2	19.2	3.3	107.1	116.3	92.1
9	7/13/07	5550	5750	2	18.9	3.0	107.6	116.3	92.5
10	7/13/07	5650	5750	2	18.7	2.8	104.8	116.3	90.1
11	7/12/07	5750	5750	2	17.9	2.0	110.6	116.3	95.1
12	7/12/07	5850	5750	2	21.0	7.6	104.2	117.8	88.5
12R	7/12/07	5850	5750	2	18.4	2.5	106.7	116.3	91.7
13	7/18/07	4950	5723	2	19.7	3.8	105.2	116.3	90.5
14	7/18/07	5050	5723	2	19.0	3.1	108.0	116.3	92.9
15	7/18/07	5150	5723	2	18.6	2.7	103.0	116.3	88.6
15R	7/13/07	5150	5723	2	20.3	4.4	105.7	116.3	90.9
16	7/13/07	5250	5723	2	18.1	2.2	108.4	116.3	93.2
17	7/13/07	5350	5723	2	18.0	2.1	106.1	116.3	91.2
18	7/13/07	5450	5723	2	19.4	3.5	107.1	116.3	92.1
19	7/13/07	5550	5723	2	18.8	2.9	107.3	116.3	92.3
20	7/13/07	5650	5723	2	19.5	6.1	107.9	116.3	92.8
21	8/16/07	4750	5650	2	19.4	6.0	106.4	117.8	90.3
22	8/16/07	4850	5650	2	19.5	6.1	106.5	117.8	90.4

TABLE 7

CLIENT: VEOLIA ES EMERALD PARK LANDFILL
PROJECT NAME: PHASE 6 WEST LINER CONSTRUCTION
LOCATION AND SOIL TYPE: CLAY LINER
IN-PLACE MOISTURE DENSITY TESTING
DENSITY METER: TROXLER 3440
PROBE DEPTH: 12 INCHES
COMPACTION REQUIREMENTS: 90% OF MODIFIED PROCTOR DENSITY @ 2.0% ABOVE OPTIMUM

Test No.	Date Tested	Coordinates North	Coordinates East	Lift No.	Moisture (%)	Percent Above Optimum Moisture	Dry Density (PCF)	Proctor Value (PCF)	Compaction (%)
23	8/16/07	4950	5650	2	19.0	5.6	106.1	117.8	90.1
24	8/16/07	5050	5650	2	19.4	6.0	106.5	117.8	90.4
25	8/16/07	5150	5650	2	19.1	5.7	106.4	117.8	90.3
26	9/7/07	5250	5650	2	19.4	6.0	104.8	117.8	89.0
26R	9/7/07	5250	5650	2	16.0	2.6	114.2	117.8	96.9
27	9/17/07	5350	5650	2	19.7	6.3	106.2	117.8	90.2
28	9/17/07	5450	5650	2	19.0	5.6	107.3	117.8	91.1
29	9/14/07	5550	5650	2	16.4	3.0	113.2	117.8	96.1
30	9/14/07	5650	5650	2	18.6	5.2	106.1	117.8	90.1
31	9/13/07	5750	5650	2	17.0	3.6	106.4	117.8	90.3
32	9/13/07	5850	5650	2	19.5	6.1	104.8	117.8	89.0
32R	9/13/07	5850	5650	2	16.4	3.0	107.0	117.8	90.8
33	7/12/07	4800	5800	4	17.9	2.0	107.5	116.3	92.4
34	7/12/07	4900	5800	4	18.0	2.1	112.2	116.3	96.5
35	7/12/07	5000	5800	4	17.9	2.0	106.3	116.3	91.4
36	7/12/07	5100	5800	4	19.2	3.3	109.2	116.3	93.9
37	7/12/07	5200	5800	4	18.5	2.6	109.9	116.3	94.5
38	7/12/07	5300	5800	4	18.2	2.3	109.2	116.3	93.9
39	7/13/07	5400	5800	4	18.3	2.4	106.4	116.3	91.5
40	7/13/07	5500	5800	4	18.0	2.1	110.6	116.3	95.1
41	7/13/07	5600	5800	4	19.2	5.8	103.8	117.8	88.1
41R	7/13/07	5600	5800	4	17.9	4.5	110.9	117.8	94.1
42	7/13/07	5700	5800	4	17.9	2.0	110.5	116.3	95.0
43	7/13/07	5800	5800	4	20.2	4.3	108.0	116.3	92.9
44	7/13/07	5900	5800	4	19.4	3.5	108.4	116.3	93.2
45	8/16/07	4800	5700	4	19.7	6.3	106.5	117.8	90.4
46	8/31/07	4900	5700	4	18.1	4.7	108.3	117.8	91.9
47	9/7/07	5000	5700	4	16.3	2.9	110.2	117.8	93.5
48	9/5/07	5100	5700	4	17.5	4.1	106.7	117.8	90.6
49	9/5/07	5200	5700	4	15.7	2.3	107.1	117.8	90.9

TABLE 7

CLIENT: VEOLIA ES EMERALD PARK LANDFILL
PROJECT NAME: PHASE 6 WEST LINER CONSTRUCTION
LOCATION AND SOIL TYPE: CLAY LINER
IN-PLACE MOISTURE DENSITY TESTING
DENSITY METER: TROXLER 3440
PROBE DEPTH: 12 INCHES
COMPACTION REQUIREMENTS: 90% OF MODIFIED PROCTOR DENSITY @ 2.0% ABOVE OPTIMUM

Test No.	Date Tested	Coordinates North	Coordinates East	Lift No.	Moisture (%)	Percent Above Optimum Moisture	Dry Density (PCF)	Proctor Value (PCF)	Compaction (%)
50	9/7/07	5300	5700	4	16.4	3.0	110.2	117.8	93.5
51	9/17/07	5400	5700	4	16.9	3.5	109.5	117.8	93.0
52	9/17/07	5500	5700	4	17.1	3.7	109.9	117.8	93.3
53	9/17/07	5600	5700	4	17.6	4.2	109.6	117.8	93.0
54	9/17/07	5700	5700	4	19.2	5.8	107.3	117.8	91.1
55	9/17/07	5800	5700	4	17.1	3.7	110.2	117.8	93.5
3	9/17/07	5900	5700	4	18.4	5.0	109.4	117.8	92.9
57	7/13/07	4750	5750	6	19.7	3.8	105.0	116.3	90.3
58	7/13/07	4850	5750	6	20.1	4.2	105.7	116.3	90.9
59	7/20/07	4950	5750	6	20.1	4.2	105.5	116.3	90.7
60	7/20/07	5050	5750	6	19.7	3.8	107.0	116.3	92.0
61	7/20/07	5150	5750	6	19.0	3.1	106.4	116.3	91.5
62	7/20/07	5250	5750	6	20.0	4.1	106.8	116.3	91.8
63	7/19/07	5350	5750	6	19.3	3.4	109.9	116.3	94.5
64	7/19/07	5450	5750	6	19.3	3.4	111.3	116.3	95.7
65	7/19/07	5550	5750	6	18.4	2.5	110.9	116.3	95.4
66	7/19/07	5650	5750	6	18.4	2.5	112.3	116.3	96.6
67	7/23/07	5750	5750	6	18.8	2.9	109.9	116.3	94.5
68	7/21/07	5850	5750	6	18.3	2.4	110.4	116.3	94.9
69	7/23/07	4950	5723	6	18.8	2.9	107.6	116.3	92.5
70	7/23/07	5050	5723	6	19.0	3.1	106.8	116.3	91.8
71	7/25/07	5150	5723	6	20.4	4.5	107.8	116.3	92.7
72	7/25/07	5250	5723	6	21.1	5.2	107.1	116.3	92.1
73	7/23/07	5350	5723	6	18.0	2.1	111.6	116.3	96.0
74	7/23/07	5450	5723	6	18.1	2.2	110.5	116.3	95.0
75	7/23/07	5550	5723	6	18.6	2.7	111.6	116.3	96.0
76	7/23/07	5650	5723	6	18.0	2.1	110.6	116.3	95.1
7	9/8/07	4750	5650	6	15.8	2.4	111.6	117.8	94.7
78	9/8/07	4850	5650	6	17.0	3.6	108.3	117.8	91.9
79	9/13/07	4950	5650	6	15.8	2.4	110.2	117.8	93.5

TABLE 7

CLIENT: VEOLIA ES EMERALD PARK LANDFILL
PROJECT NAME: PHASE 6 WEST LINER CONSTRUCTION
LOCATION AND SOIL TYPE: CLAY LINER
IN-PLACE MOISTURE DENSITY TESTING
DENSITY METER: TROXLER 3440
PROBE DEPTH: 12 INCHES
COMPACTION REQUIREMENTS: 90% OF MODIFIED PROCTOR DENSITY @ 2.0% ABOVE OPTIMUM

Test No.	Date Tested	Coordinates North	Coordinates East	Lift No.	Moisture (%)	Percent Above Optimum Moisture	Dry Density (PCF)	Proctor Value (PCF)	Compaction (%)
80	9/13/07	5050	5650	6	15.9	2.5	116.4	117.8	98.8
81	9/21/07	5150	5650	6	18.0	4.6	113.0	117.8	95.9
82	9/21/07	5250	5650	6	16.9	3.5	113.9	117.8	96.7
83	9/21/07	5350	5650	6	16.8	3.4	114.5	117.8	97.2
84	9/21/07	5450	5650	6	20.4	7.0	109.6	117.8	93.0
85	9/21/07	5550	5650	6	18.8	5.4	111.3	117.8	94.5
86	9/21/07	5650	5650	6	18.5	5.1	112.6	117.8	95.6
87	9/21/07	5750	5650	6	16.1	2.7	108.9	117.8	92.4
88	9/21/07	5850	5650	6	16.3	2.9	109.3	117.8	92.8
89	7/30/07	4800	5800	8	20.5	4.6	105.3	116.3	90.5
90	7/30/07	4900	5800	8	19.4	3.5	106.0	116.3	91.1
91	7/30/07	5000	5800	8	18.8	2.9	107.6	116.3	92.5
92	7/30/07	5100	5800	8	19.0	3.1	106.8	116.3	91.8
93	7/30/07	5200	5800	8	20.3	4.4	104.9	116.3	90.2
94	7/30/07	5300	5800	8	20.7	4.8	105.8	116.3	91.0
95	7/30/07	5400	5800	8	19.7	3.8	107.1	116.3	92.1
96	7/30/07	5500	5800	8	19.6	3.7	108.4	116.3	93.2
97	7/30/07	5600	5800	8	18.0	2.1	109.9	116.3	94.5
98	7/30/07	5700	5800	8	18.7	2.8	109.2	116.3	93.9
99	7/30/07	5800	5800	8	18.2	2.3	109.2	116.3	93.9
100	7/30/07	5900	5800	8	20.4	4.5	106.5	116.3	91.6
101	9/19/07	4800	5700	8	16.4	3.0	107.9	117.8	91.6
102	9/19/07	4900	5700	8	21.0	7.6	106.0	117.8	90.0
103	9/21/07	5000	5700	8	15.8	2.4	114.7	117.8	97.4
104	9/25/07	5100	5700	8	19.1	5.7	108.8	117.8	92.4
105	9/21/07	5200	5700	8	20.1	6.7	106.0	117.8	90.0
106	9/21/07	5300	5700	8	20.5	7.1	108.2	117.8	91.9
107	9/21/07	5400	5700	8	20.6	7.2	108.5	117.8	92.1
108	9/21/07	5500	5700	8	20.3	6.9	109.2	117.8	92.7
109	9/21/07	5600	5700	8	19.8	6.4	110.6	117.8	93.9

TABLE 7

CLIENT: VEOLIA ES EMERALD PARK LANDFILL
PROJECT NAME: PHASE 6 WEST LINER CONSTRUCTION
LOCATION AND SOIL TYPE: CLAY LINER
IN-PLACE MOISTURE DENSITY TESTING
DENSITY METER: TROXLER 3440
PROBE DEPTH: 12 INCHES
COMPACTION REQUIREMENTS: 90% OF MODIFIED PROCTOR DENSITY @ 2.0% ABOVE OPTIMUM

Test No.	Date Tested	Coordinates North	Coordinates East	Lift No.	Moisture (%)	Percent Above Optimum Moisture	Dry Density (PCF)	Proctor Value (PCF)	Compaction (%)
110	9/27/07	5700	5700	8	20.5	7.1	108.3	117.8	91.9
111	9/21/07	5800	5700	8	19.4	6.0	108.8	117.8	92.4
112	9/27/07	5900	5700	8	19.3	5.9	109.8	117.8	93.2
Anchor Trench									
113	10/4/07	4724	5813	1	18.6	2.7	106.4	116.3	91.5
114	10/4/07	4715	5718	1	17.9	2.0	109.0	116.3	93.7
115	10/4/07	4706	5618	1	17.9	2.0	107.2	116.3	92.2
116	10/4/07	4704	5602	2	17.9	2.0	106.0	116.3	91.1
117	10/4/07	4710	5668	2	18.0	2.1	110.9	116.3	95.4
118	10/4/07	4721	5778	2	18.1	2.2	109.3	116.3	94.0

Proctors Used: EP-CS-1 - 116.3 pcf @ 15.9% optimum moisture EP-CS-7 - 117.8 pcf @ 13.4% optimum moisture

Table 8

Summary of Laboratory Test Results for Clay Liner Material (In-Place)

TABLE 8

SUMMARY OF LABORATORY TEST RESULTS FOR CLAY LINER MATERIAL (IN-PLACE)

VEOLIA ES EMERALD PARK LANDFILL PHASE 6 WEST LINER CONSTRUCTION

NOVEMBER 2007

ASTM No.					D422		D4318			D2937	D2216	D5084	D2487	
					Grain Size Analysis		Atterberg Limits							
Date Sampled	Sample Number	Lift No.	Coordinates North	Coordinates East	%Fines <#200	%Clay <.005	Liquid Limit	Plastic Limit	Plasticity Index	Dry Density (pcf)	Water Content (%)	Coefficient Permeability (cm/sec)	U.S.C.S.	Sampled Water Content
7/10/07	EP-CL-1	2	4750	5750	94.8	76.0	43.5	17.7	25.8	107.5	20.6	5.7×10^{-8}	CL	18.7
7/18/07	EP-CL-2	2	5050	5723	97.6	69.0	40.0	16.5	23.5	110.2	20.7		CL	20.6
9/7/07	EP-CL-3	2	5250	5650	98.5	76.5	43.1	17.7	25.4	109.7	17.8		CL	18.5
7/13/07	EP-CL-4	2	5350	5750	98.7	77.5	40.9	18.0	22.9	109.0	21.7	3.7×10^{-8}	CL	21.5
9/19/07	EP-CL-5	2	5550	5650	98.1	79.0	44.5	19.5	25.0	109.7	17.2		CL	16.4
7/13/07	EP-CL-6	2	5650	5723	98.7	81.0	42.7	18.4	24.3	104.6	21.4	2.7×10^{-8}	CL	19.9
9/13/07	EP-CL-7	2	5850	5650	98.9	77.5	43.4	17.9	25.5	105.9	21.2		CL	24.6
7/12/07	EP-CL-8	4	4800	5800	97.9	81.5	43.8	19.0	24.8	114.6	18.6		CL	18.8
8/31/07	EP-CL-9	4	4900	5700	98.4	77.5	41.8	16.6	25.2	104.6	22.6		CL	18.6
7/12/07	EP-CL-10	4	5000	5800	86.6	52.5	32.4	14.7	17.7	109.2	18.9	2.8×10^{-8}	CL	16.2
9/5/07	EP-CL-11	4	5200	5700	98.4	78.0	42.8	16.5	26.3	109.3	21.3	2.1×10^{-8}	CL	18.0
7/13/07	EP-CL-12	4	5400	5800	98.8	76.5	44.7	19.4	25.3	115.7	18.4		CL	17.8
9/17/07	EP-CL-13	4	5600	5700	98.6	82.0	46.8	20.4	26.4	111.6	18.0		CL	17.7
7/18/07	EP-CL-14	4	5900	5800	96.6	77.0	43.4	19.5	23.9	110.6	20.8	4.6×10^{-8}	CL	18.5
9/8/07	EP-CL-15	6	4750	5650	98.6	75.0	45.0	18.0	27.0	106.7	20.5		CL	19.3
7/23/07	EP-CL-16	6	4950	5723	97.1	76.0	44.9	21.1	23.8	100.8	25.9	5.6×10^{-8}	CL	19.2
9/13/07	EP-CL-17	6	5050	5650	98.0	76.5	44.0	16.8	27.2	114.3	16.0		CL	16.1
7/25/07	EP-CL-18	6	5250	5723	99.2	86.5	47.7	22.7	25.0	109.4	21.7		CL	21.2
9/21/07	EP-CL-19	6	5350	5650	98.7	81.5	44.6	19.8	24.8	114.2	19.3	5.8×10^{-8}	CL	18.8
7/19/07	EP-CL-20	6	5650	5750	99.1	79.5	45.0	21.1	23.9	103.1	21.7		CL	21.4

TABLE 8

SUMMARY OF LABORATORY TEST RESULTS FOR CLAY LINER MATERIAL (IN-PLACE)

VEOLIA ES EMERALD PARK LANDFILL PHASE 6 WEST LINER CONSTRUCTION

NOVEMBER 2007

ASTM No.					D422		D4318			D2937	D2216	D5084	D2487	
					Grain Size Analysis		Atterberg Limits							
Date Sampled	Sample Number	Lift No.	Coordinates North	Coordinates East	%Fines <#200	%Clay <.005	Liquid Limit	Plastic Limit	Plasticity Index	Dry Density (pcf)	Water Content (%)	Coefficient Permeability (cm/sec)	U.S.C.S.	Sampled Water Content
7/21/07	EP-CL-21	6	5850	5750	99.4	78.5	43.5	20.6	22.9	104.6	23.7		CL	23.4
9/21/07	EP-CL-22	8	4800	5700	99.1	74.0	44.0	18.0	26.0	113.2	16.8		CL	18.5
7/30/07	EP-CL-23	8	4900	5800	99.3	83.0	46.0	19.7	26.3	105.5	23.3		CL	23.3
9/19/07	EP-CL-24	8	5000	5700	98.6	75.0	41.5	17.3	24.2	112.8	19.1	7.2×10^{-8}	CL	20.2
7/30/07	EP-CL-25	8	5200	5800	99.3	79.5	42.9	19.5	23.4	103.7	25.0		CL	20.6
9/27/07	EP-CL-26	8	5400	5700	98.7	79.0	45.5	17.7	27.8	110.1	20.3		CL	21.0
7/30/07	EP-CL-27	8	5600	5800	99.1	81.0	44.3	20.0	24.3	113.0	18.7	6.0×10^{-8}	CL	16.5
9/27/07	EP-CL-28	8	5800	5700	97.9	75.0	43.8	17.3	26.5	105.9	22.1		CL	22.1
Minimum:					**86.6**	**52.5**	**32.4**	**14.7**	**17.7**	**100.8**	**16.0**	**2.1×10^{-8}**		**16.1**
Maximum:					**99.4**	**86.5**	**47.7**	**22.7**	**27.8**	**115.7**	**25.9**	**7.2×10^{-8}**		**24.6**
Average:					**98.0**	**77.2**	**43.4**	**18.6**	**24.8**	**108.9**	**20.5**	**4.6×10^{-8}**		**19.6**
Project Requirements:					**$\geq$50.0**		**$\geq$20.0**		**>10.0**			**$\leq 1.0 \times 10^{-7}$**	**CL/CH**	
							Avg. $\geq$25.0		**Avg. $\geq$12.0**					

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CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-1
Depth of Sample:	
Date Received:	5/23/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	10YR 4/1
Date Sampled:	5/21/07

LABORATORY DATA:

Date Tested:	May 23-25, 2007
Test Performed By:	KAK

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

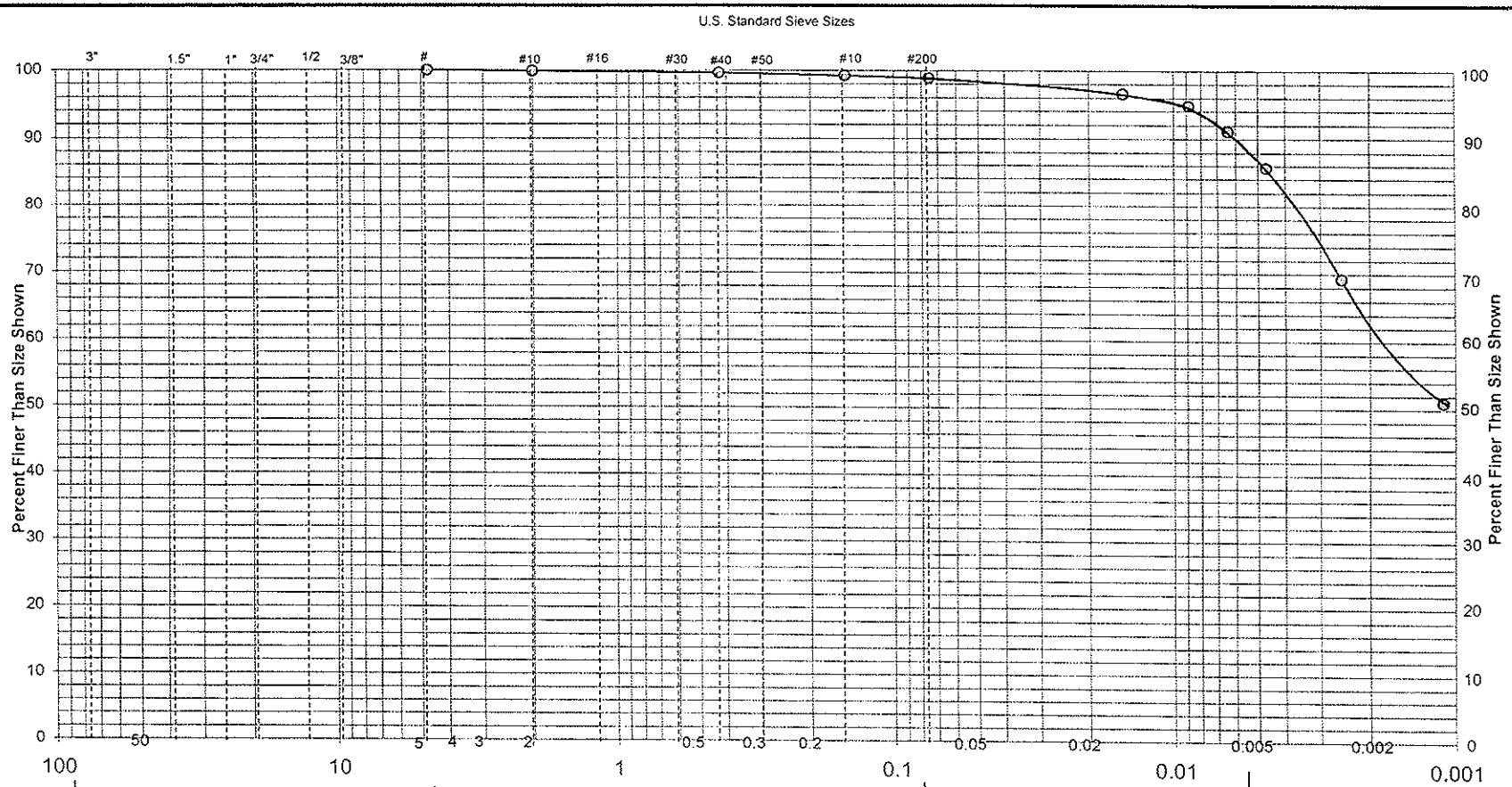
Dry Weight of Soil (gms): 546.0

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"					
#4	0.0	0.0	100.0		
#10	0.6	0.1	99.9		
#40	1.5	0.3	99.6		
#100	2.1	0.4	99.2		
#200	1.4	0.3	98.9	50-100	

REVIEWED BY:	Robert R. Rouse
DATE REVIEWED:	11/8/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		0.1%	0.3%	0.7%	11.9%	87.0%

Soil Classification: LEAN CLAY, dark gray (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled:	5/21/07
Sample Number: EP-CS-1	Sampled Moisture Content (%): 17.6	Report No.:	CS-1
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 46.2 PL= 21.1 PI= 25.1	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 10YR 4/1	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 5/23/07	Prepared by: Michael R. Andraschko	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R Rowe	Date:	11/1/07

CQM, INC.

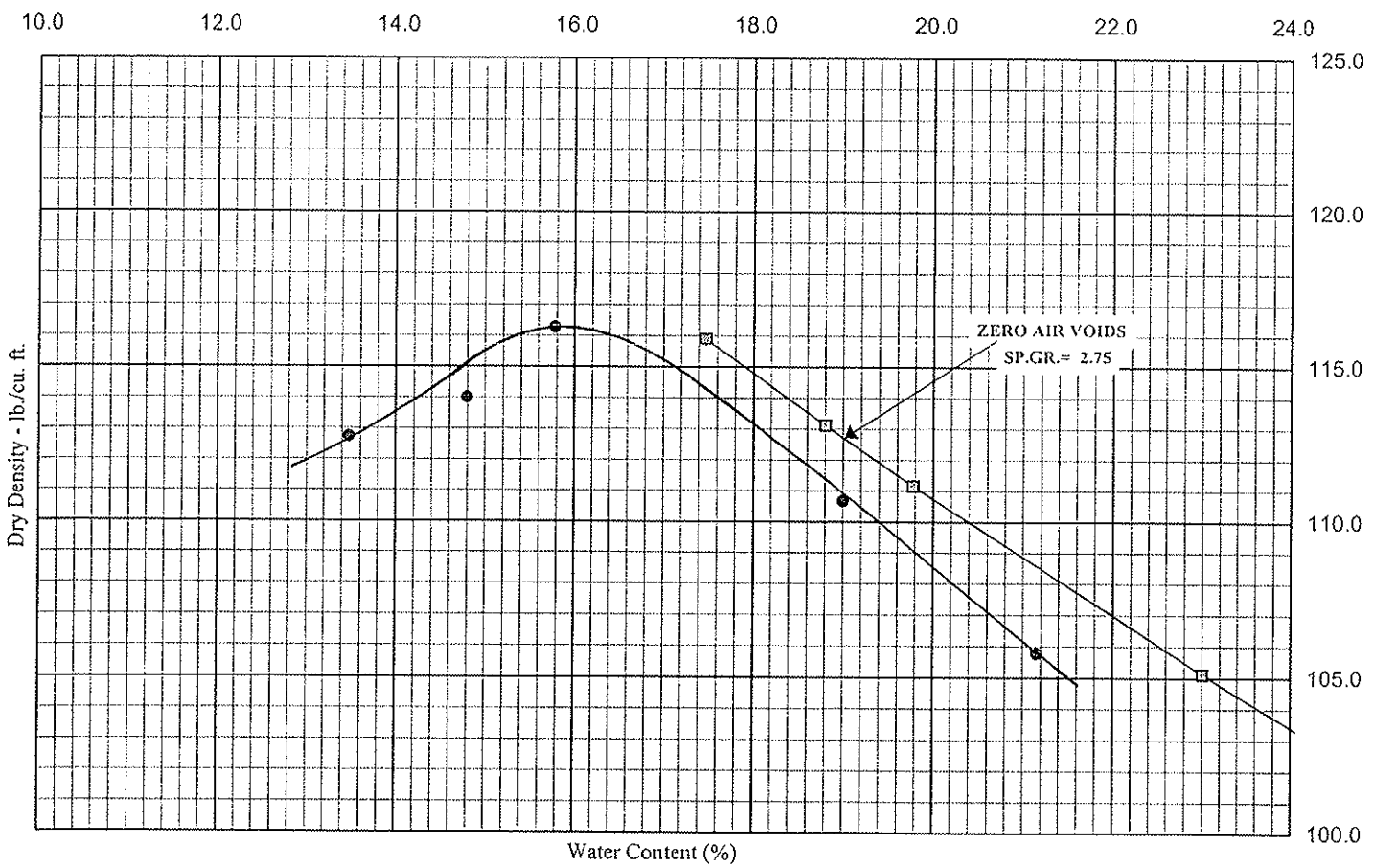
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-1	**Date Received:**	5/23/07
Tested By:	JRP	**Reviewed By:**	Robert R Rowe 11/1/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark gray (CL)				
Munsell Color Code:	10YR 4/1	**Atterberg Limits:**	LL=46.2	PL=21.1	PI=25.1
Maximum Dry Density (lb/cu.ft.):	116.3	**Optimum Moisture (%):**	15.9	**Wet Density (lb/cu.ft.):**	134.8



10/15/2007 TLS P-EPCS1

CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-2
Depth of Sample:	
Date Received:	5/23/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	2.5Y 4/1
Date Sampled:	5/21/07

LABORATORY DATA:

Date Tested:	May 23-25, 2007
Test Performed By:	KAK

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

Dry Weight of Soil (gms): 536.8

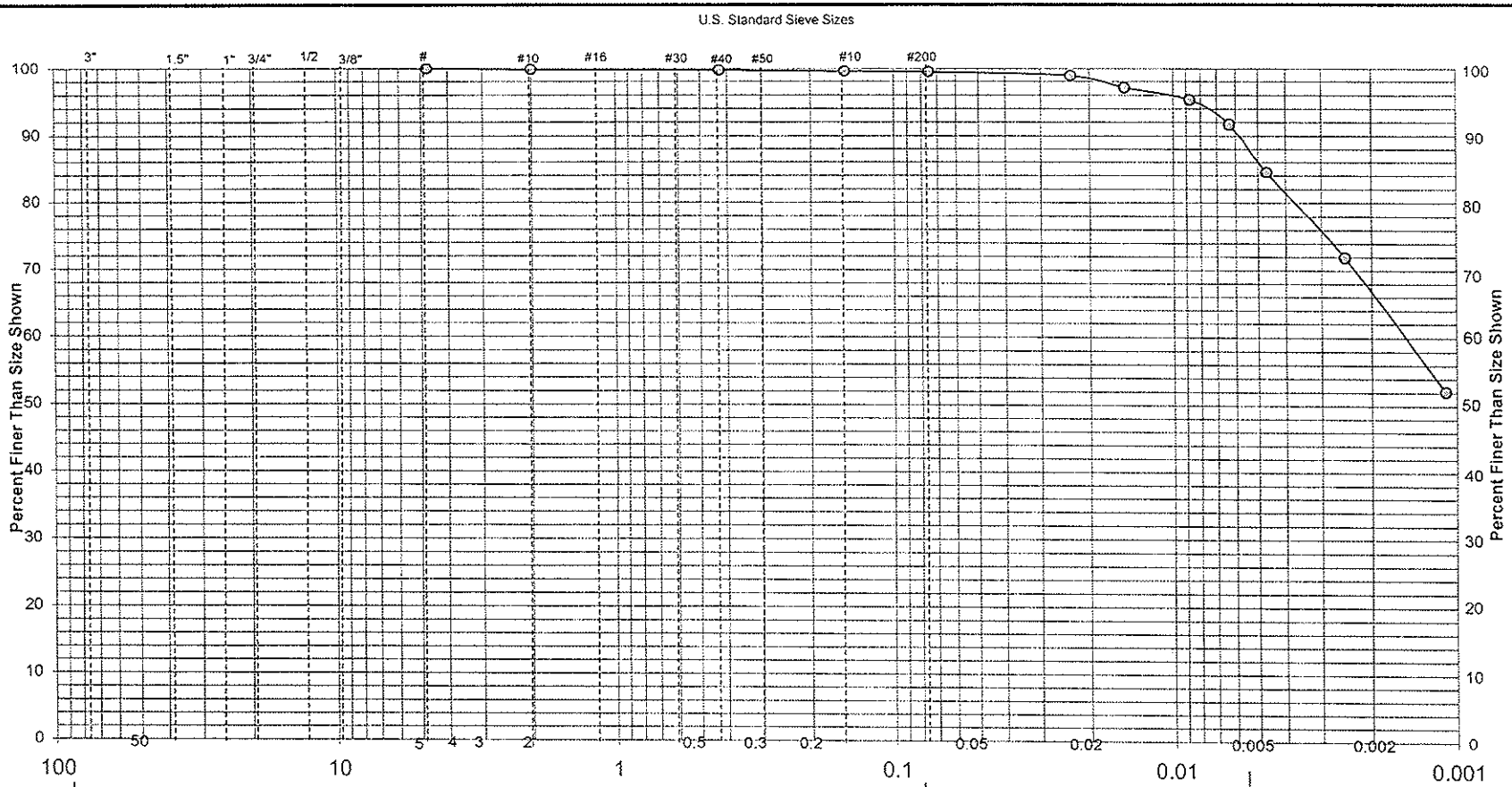
Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"					
#4	0.0	0.0	100.0		
#10	0.6	0.1	99.9		
#40	0.7	0.1	99.8		
#100	1.1	0.2	99.6		
#200	0.6	0.1	99.5	50-100	

REVIEWED BY:	Robert K Rouse
DATE REVIEWED:	11/1/07

Remarks:

10/15/2007 TLS G-EPCS2

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		0.1%	0.1%	0.3%	14.0%	85.5%

Soil Classification: LEAN CLAY, dark gray (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled:	5/21/07
Sample Number: EP-CS-2	Sampled Moisture Content (%): 25.1	Report No.:	CS-2
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 45.8 PL= 20.6 PI= 25.2	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 2.5Y 4/1	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 5/23/07	Prepared by: Michael R. Andraschko	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/1/07

CQM, INC.

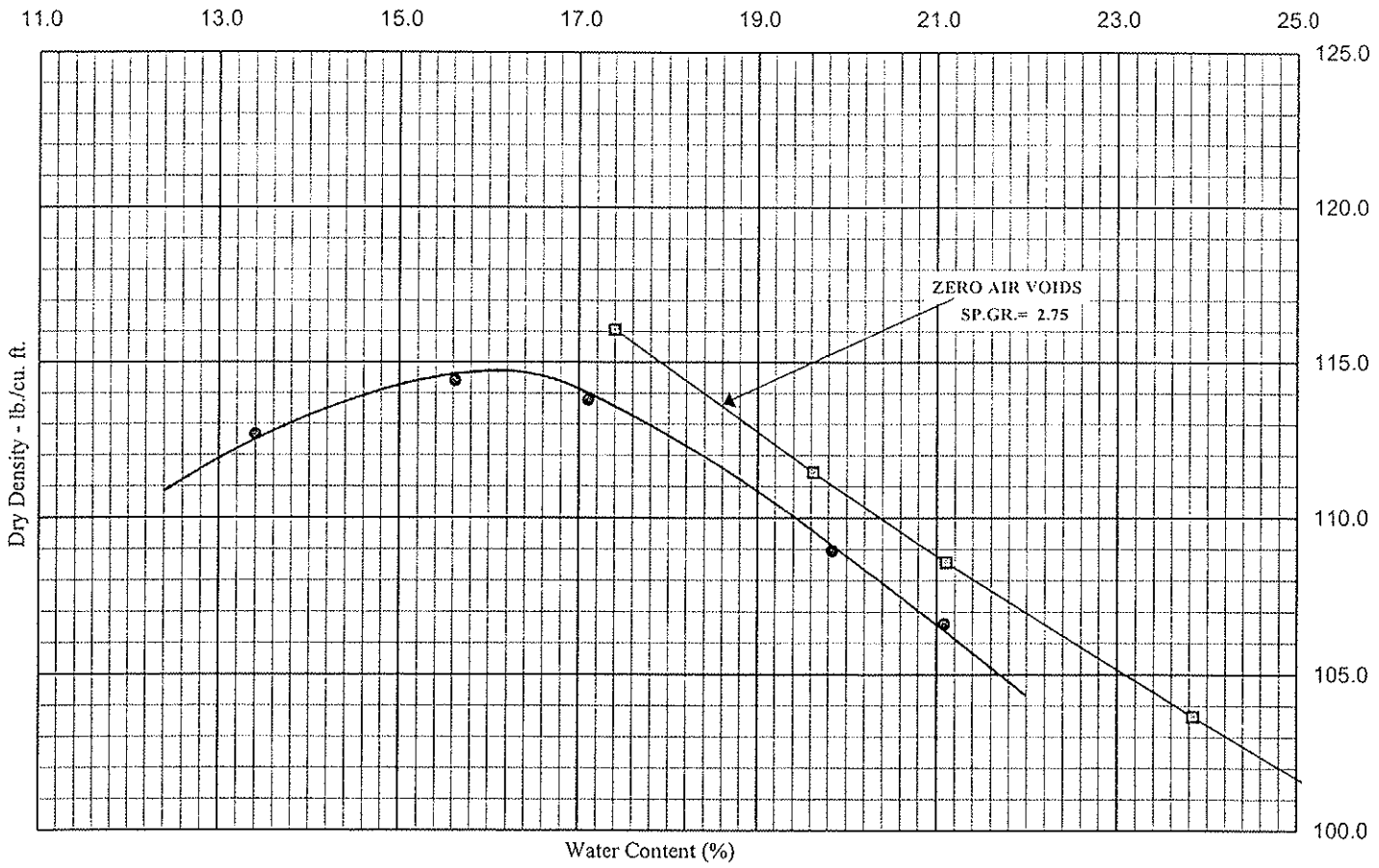
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-2	**Date Received:**	5/23/07
Tested By:	JRP	**Reviewed By:**	Robert R. Rouse 11/2/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark gray (CL)				
Munsell Color Code:	2.5Y 4/1	**Atterberg Limits:**	**LL=45.8**	**PL=20.6**	**PI=25.2**
Maximum Dry Density (lb/cu.ft.):	114.9	**Optimum Moisture (%):**	16.1	**Wet Density (lb/cu.ft.):**	133.4



10/15/2007 TLS P-EPCS2

CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-3
Depth of Sample:	
Date Received:	7/18/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	2.5Y 4/2
Date Sampled:	7/16/07

LABORATORY DATA:

Date Tested:	July 18-23, 2007
Test Performed By:	JLN

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

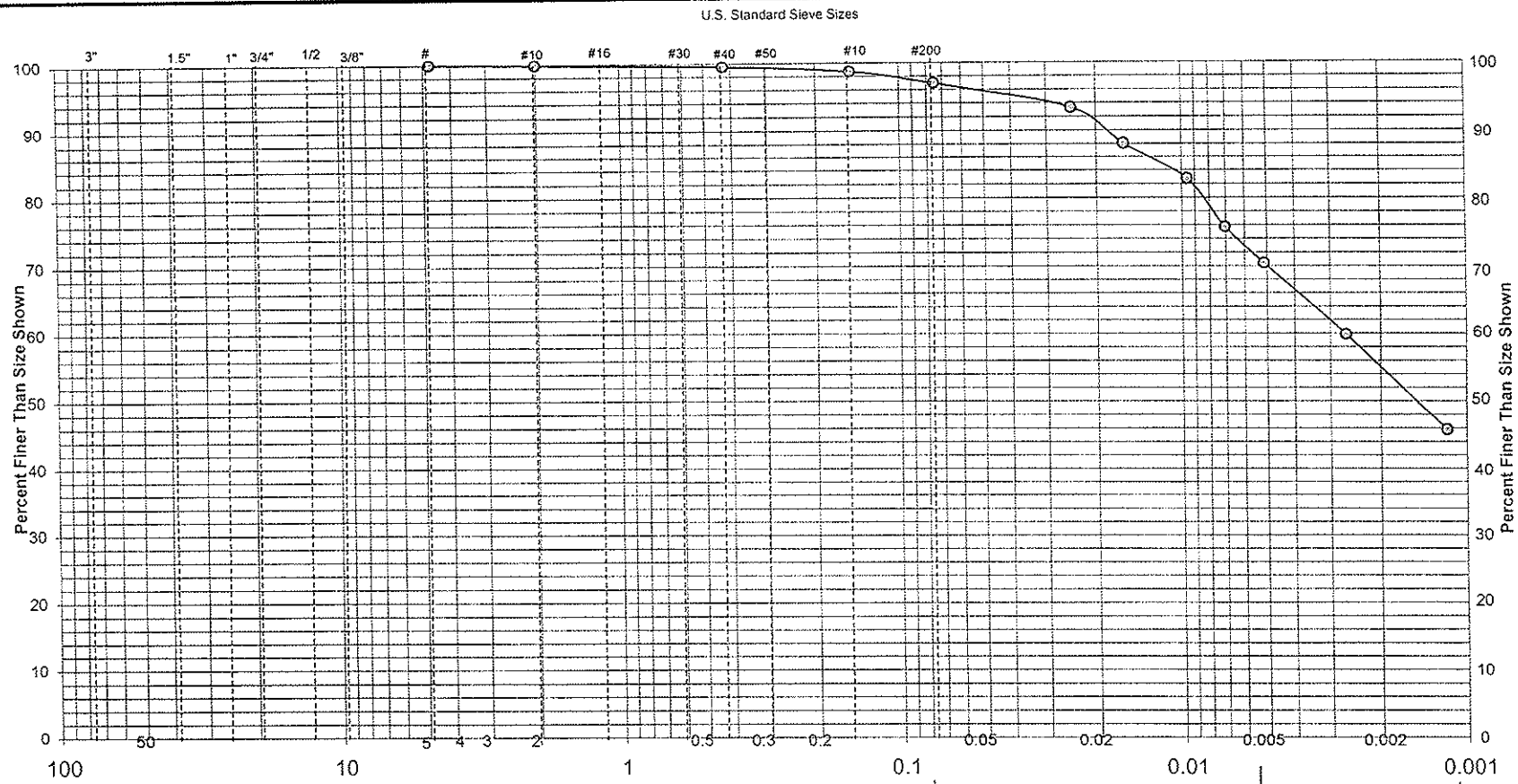
Dry Weight of Soil (gms): 492.9

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"					
#4	0.0	0.0	100.0		
#10	0.6	0.1	99.9		
#40	2.0	0.4	99.5		
#100	4.1	0.8	98.7		
#200	8.2	1.7	97.0	50-100	

REVIEWED BY:	Robert R. Rouse
DATE REVIEWED:	11/1/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		0.1%	0.4%	2.5%	27.0%	70.0%

Soil Classification: LEAN CLAY, dark grayish brown (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 7/16/07	
Sample Number: EP-CS-3	Sampled Moisture Content (%): 16.7	Report No.: CS-3	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 38.4 PL= 17.5 PI= 20.9	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 2.5Y 4/2	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 7/18/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/1/07

CQM, INC.

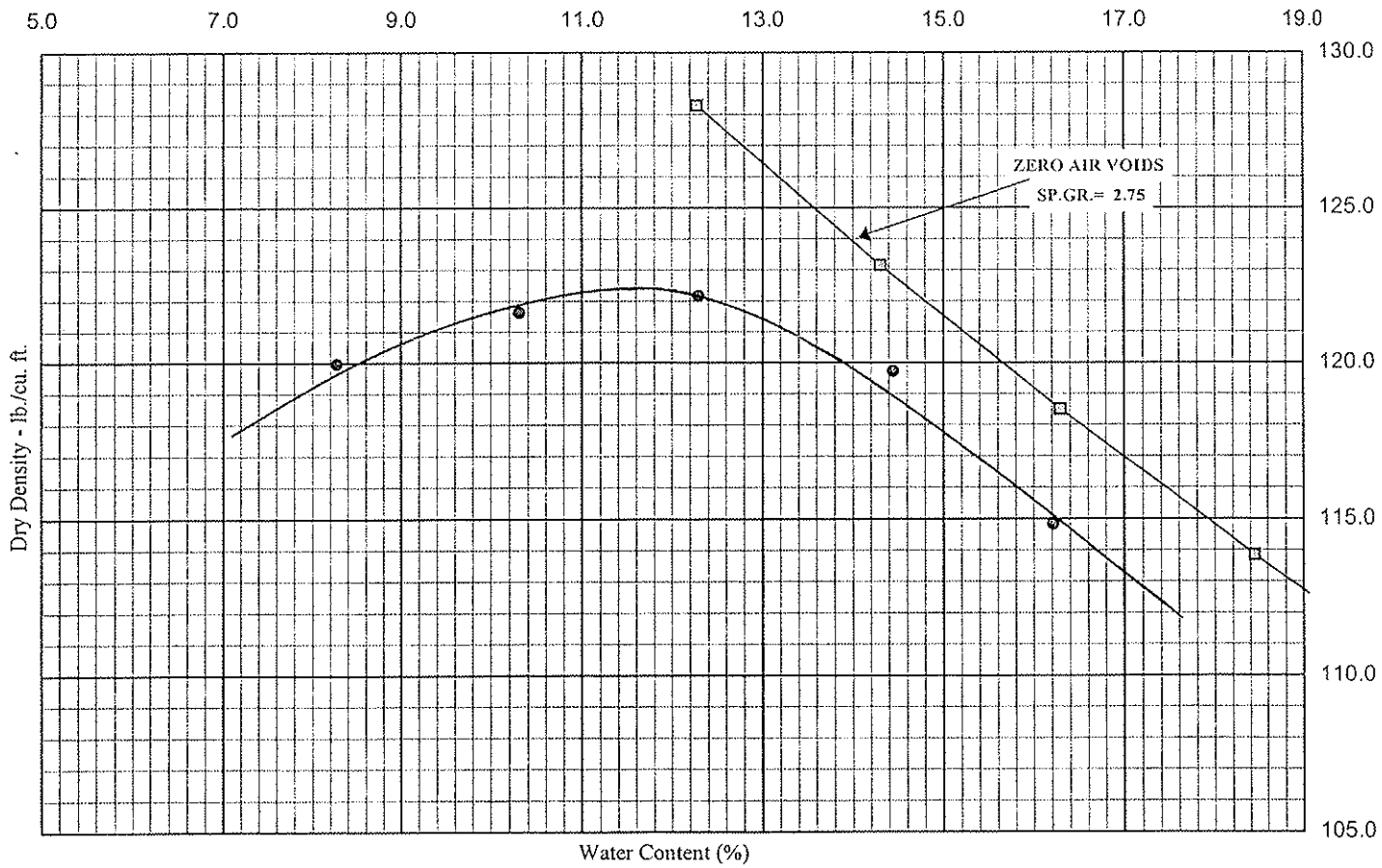
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-3	**Date Received:**	7/18/07
Tested By:	JRH	**Reviewed By:**	Robert R. Rouse 11/2/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark grayish brown (CL)				
Munsell Color Code:	2.5Y 4/2	**Atterberg Limits:**	LL=38.4	PL=17.5	PI=20.9
Maximum Dry Density (lb/cu.ft.):	122.3	**Optimum Moisture (%):**	11.6	**Wet Density (lb/cu.ft.):**	136.5



CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-4
Depth of Sample:	
Date Received:	7/18/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	2.5Y 4/2
Date Sampled:	7/16/07

LABORATORY DATA:

Date Tested:	July 18-23, 2007
Test Performed By:	JLN

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

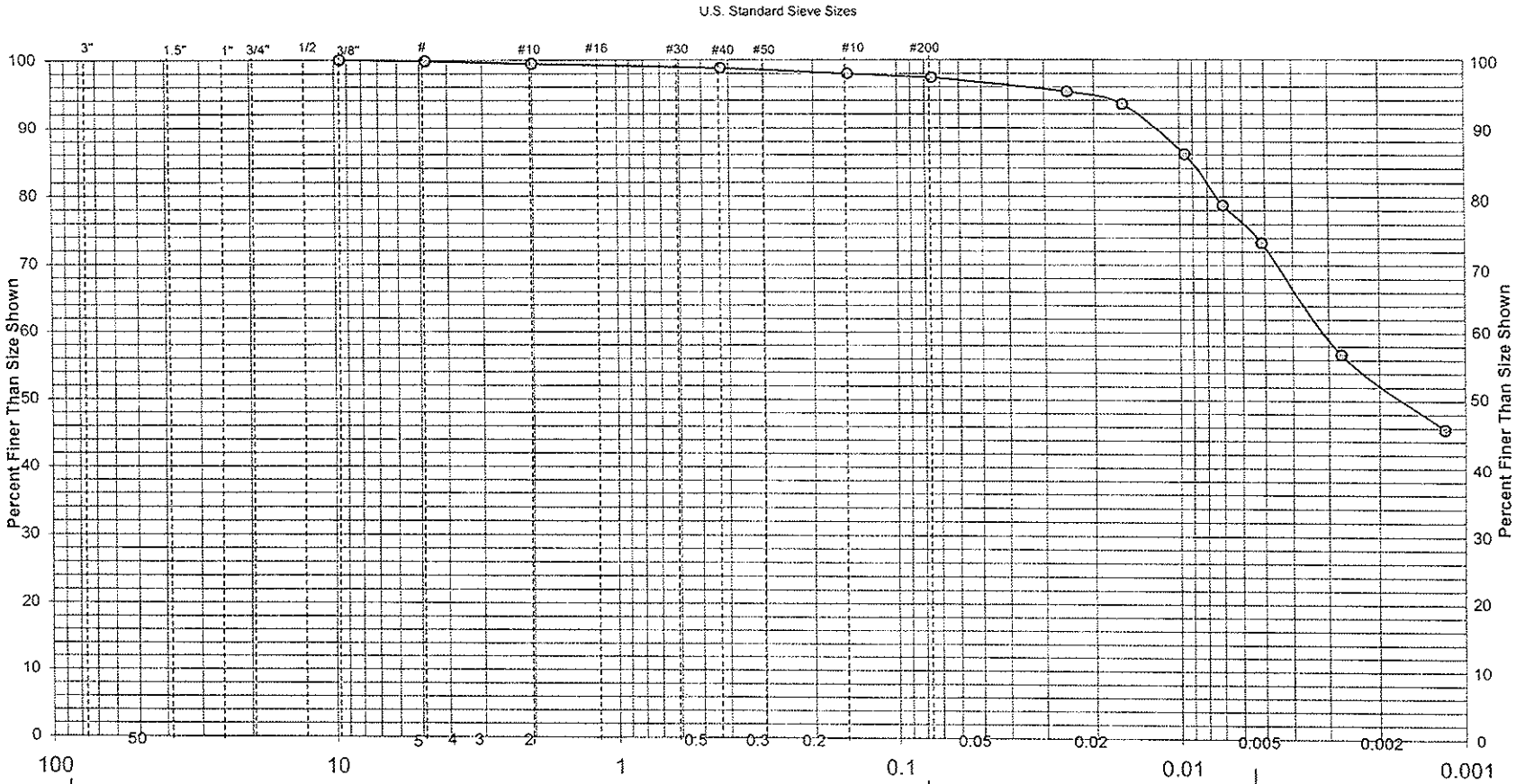
Dry Weight of Soil (gms): 488.9

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"	0.0	0.0	100.0		
#4	0.9	0.2	99.8		
#10	1.9	0.4	99.4		
#40	2.7	0.6	98.8		
#100	3.9	0.8	98.0		
#200	2.9	0.6	97.4	50-100	

REVIEWED BY:	Robert R. Rowe
DATE REVIEWED:	11/1/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		
	0.2%	0.4%	0.6%	1.4%	24.5%	73.0%

Soil Classification: LEAN CLAY, dark grayish brown (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 7/16/07	
Sample Number: EP-CS-4	Sampled Moisture Content (%): 17.5	Report No.: CS-4	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 38.0 PL= 16.5 PI= 21.5	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 2.5Y 4/2	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 7/18/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/1/07

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CQM, INC.

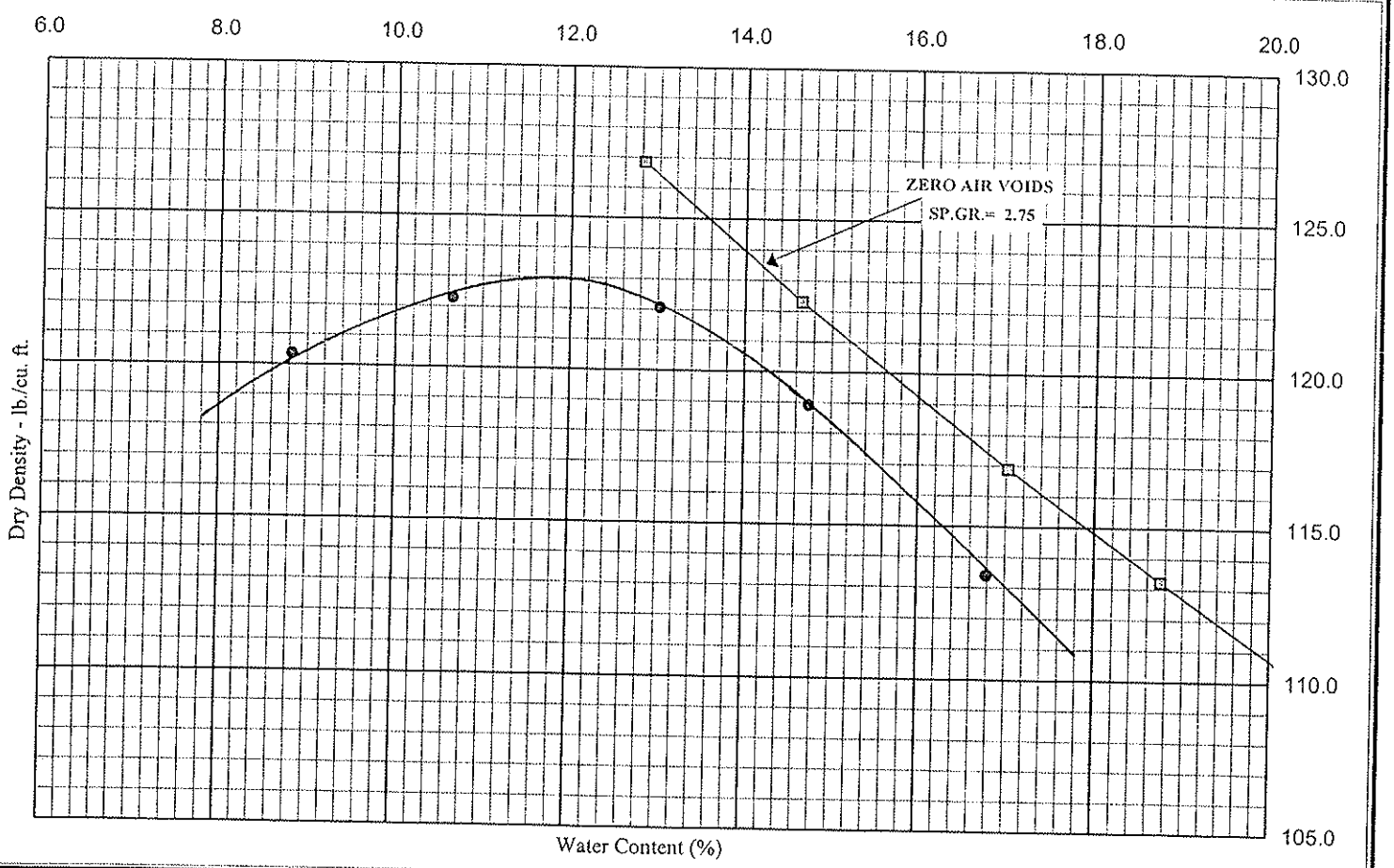
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		Sampled From:	Borrow Source
Sample No:	EP-CS-4	Date Received:	7/18/07
Tested By:	JRH	Reviewed By:	Robert R. Rouse 11/1/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark grayish brown (CL)				
Munsell Color Code:	2.5Y 4/2	Atterberg Limits:	LL=38.0	PL=16.5	PI=21.5
Maximum Dry Density (lb/cu.ft.):	123.0	Optimum Moisture (%):	11.8	Wet Density (lb/cu.ft.):	137.5



10/15/2007 TLS P-EPCS4

CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-5
Depth of Sample:	
Date Received:	7/18/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	2.5Y 4/2
Date Sampled:	7/16/07

LABORATORY DATA:

Date Tested:	July 18-23, 2007
Test Performed By:	JLN

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

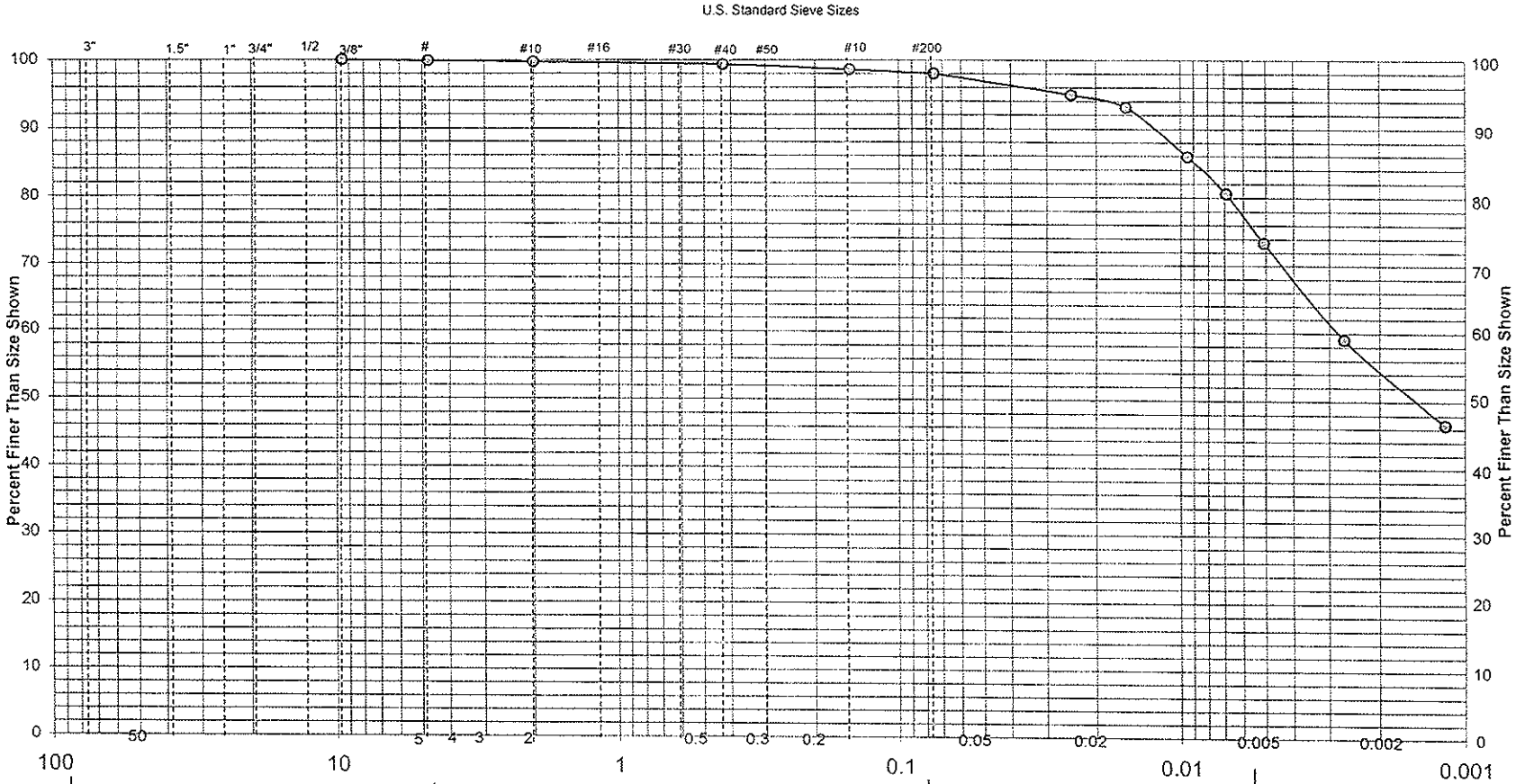
Dry Weight of Soil (gms): 507.7

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"	0.0	0.0	100.0		
#4	0.7	0.1	99.9		
#10	1.1	0.2	99.7		
#40	2.2	0.4	99.3		
#100	3.5	0.7	98.6		
#200	3.2	0.6	98.0	50-100	

REVIEWED BY:	Robert R. Rouse
DATE REVIEWED:	11/1/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		
	0.1%	0.2%	0.4%	1.3%	25.0%	73.0%

Soil Classification: LEAN CLAY, dark grayish brown (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 7/16/07	
Sample Number: EP-CS-5	Sampled Moisture Content (%): 20.2	Report No.: CS-5	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 38.4 PL= 18.4 PI= 20.0	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 2.5Y 4/2	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 7/18/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/1/07

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CQM, INC.

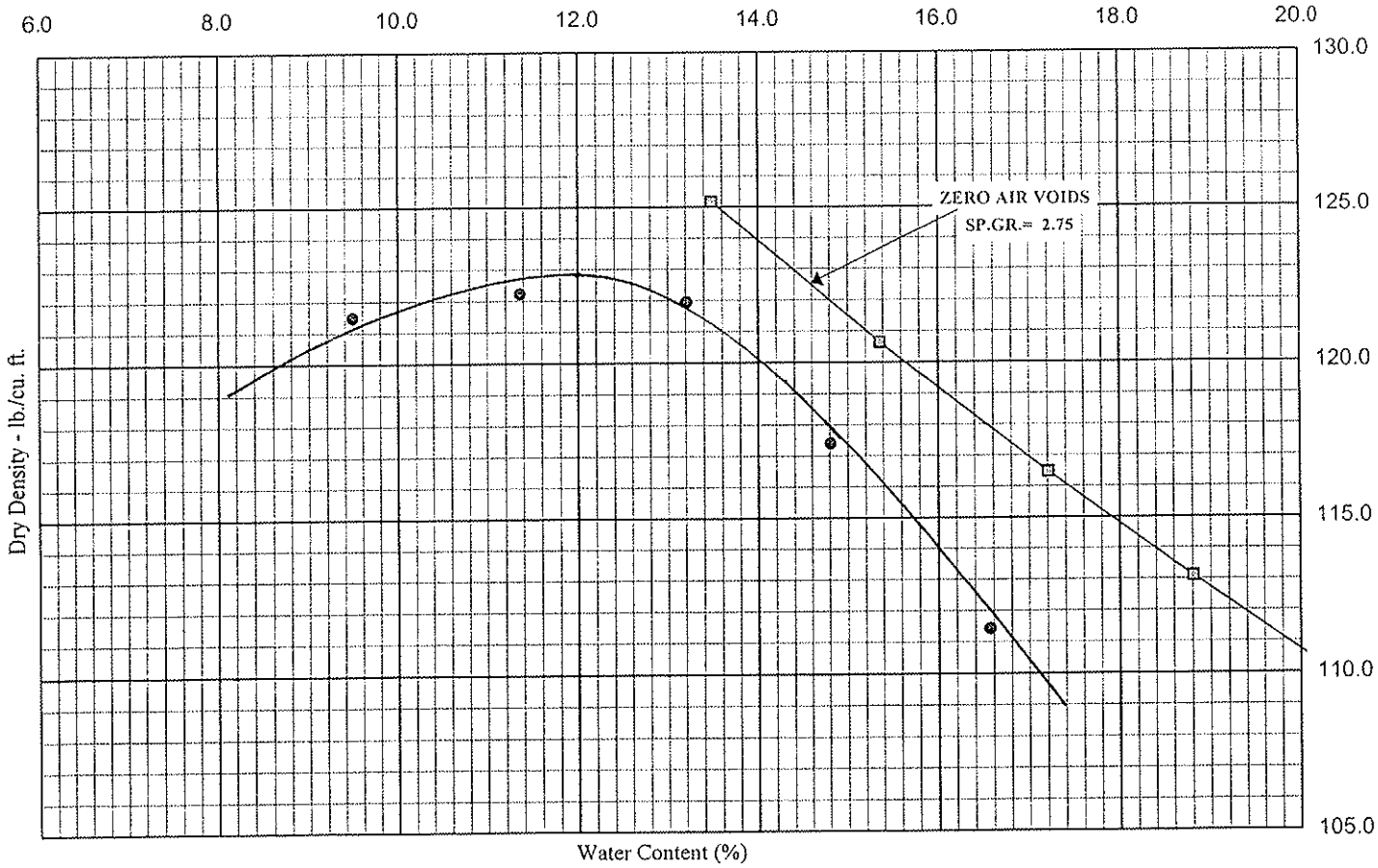
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		Sampled From:	Borrow Source
Sample No:	EP-CS-5	Date Received:	7/18/07
Tested By:	JRP	Reviewed By:	Robert A. Rouse 11/1/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark grayish brown (CL)				
Munsell Color Code:	2.5Y 4/2	Atterberg Limits:	LL=38.4	PL=18.4	PI=20.0
Maximum Dry Density (lb/cu.ft.):	122.9	Optimum Moisture (%):	12.0	Wet Density (lb/cu.ft.):	137.6



10/15/2007 TLS P-EPCS5

CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-6
Depth of Sample:	
Date Received:	7/23/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	2.5Y 4/2
Date Sampled:	7/20/07

LABORATORY DATA:

Date Tested:	July 23-26, 2007
Test Performed By:	AJP

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

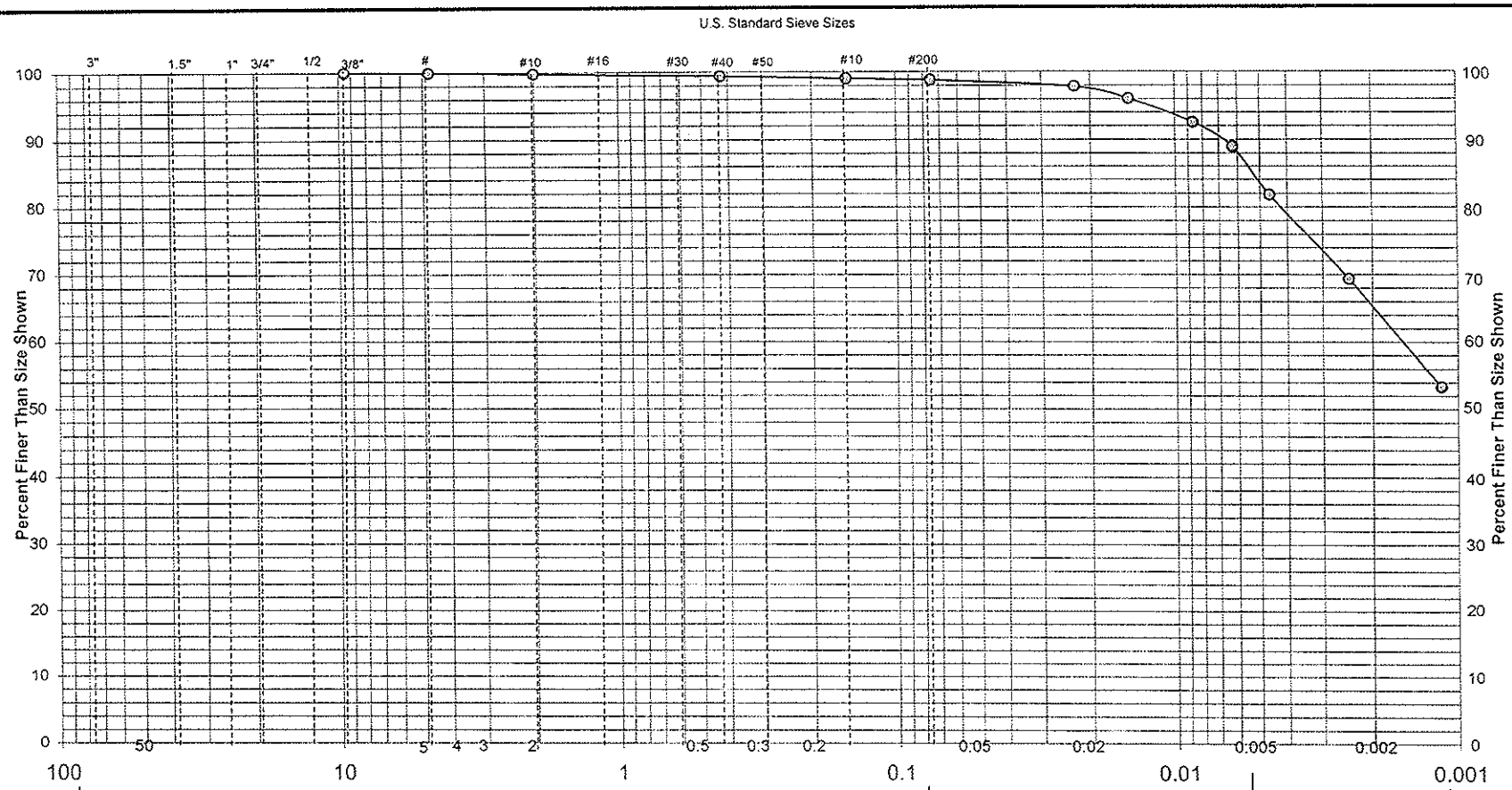
Dry Weight of Soil (gms): 481.8

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"	0.0	0.0	100.0		
#4	0.5	0.1	99.9		
#10	0.7	0.1	99.8		
#40	1.8	0.4	99.4		
#100	2.1	0.4	99.0		
#200	1.1	0.2	98.8	50-100	

REVIEWED BY:	Robert A. Rouse
DATE REVIEWED:	11/1/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
	0.1%	0.1%	0.4%	0.6%	14.8%	84.0%

Soil Classification: LEAN CLAY, dark grayish brown (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 7/20/07	
Sample Number: EP-CS-6	Sampled Moisture Content (%): 25.5	Report No.: CS-6	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 47.3 PL= 21.6 PI= 25.7	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 2.5Y 4/2	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 7/23/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/1/07

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CQM, INC.

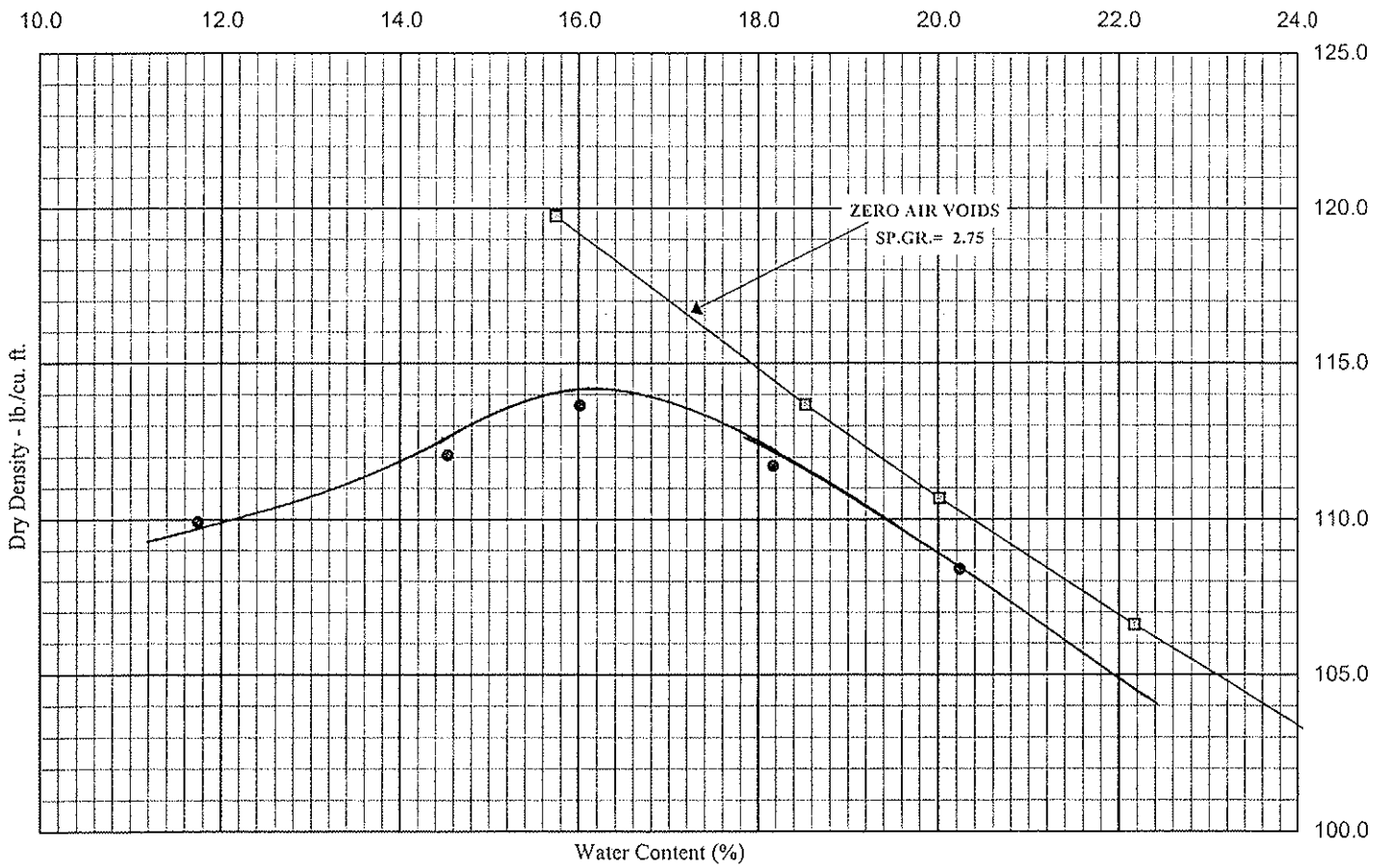
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-6	**Date Received:**	7/23/07
Tested By:	JRP	**Reviewed By:**	Robert R. Rouse 11/2/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark grayish brown (CL)				
Munsell Color Code:	2.5Y 4/2	**Atterberg Limits:**	LL=47.3	PL=21.6	PI=25.7
Maximum Dry Density (lb/cu.ft.):	114.1	**Optimum Moisture (%):**	16.1	**Wet Density (lb/cu.ft.):**	132.5



10/15/2007 TLS P-EPCS6

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CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-7
Depth of Sample:	
Date Received:	8/6/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	10YR 4/1
Date Sampled:	8/3/07

LABORATORY DATA:

Date Tested:	August 6-9, 2007
Test Performed By:	JRH

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

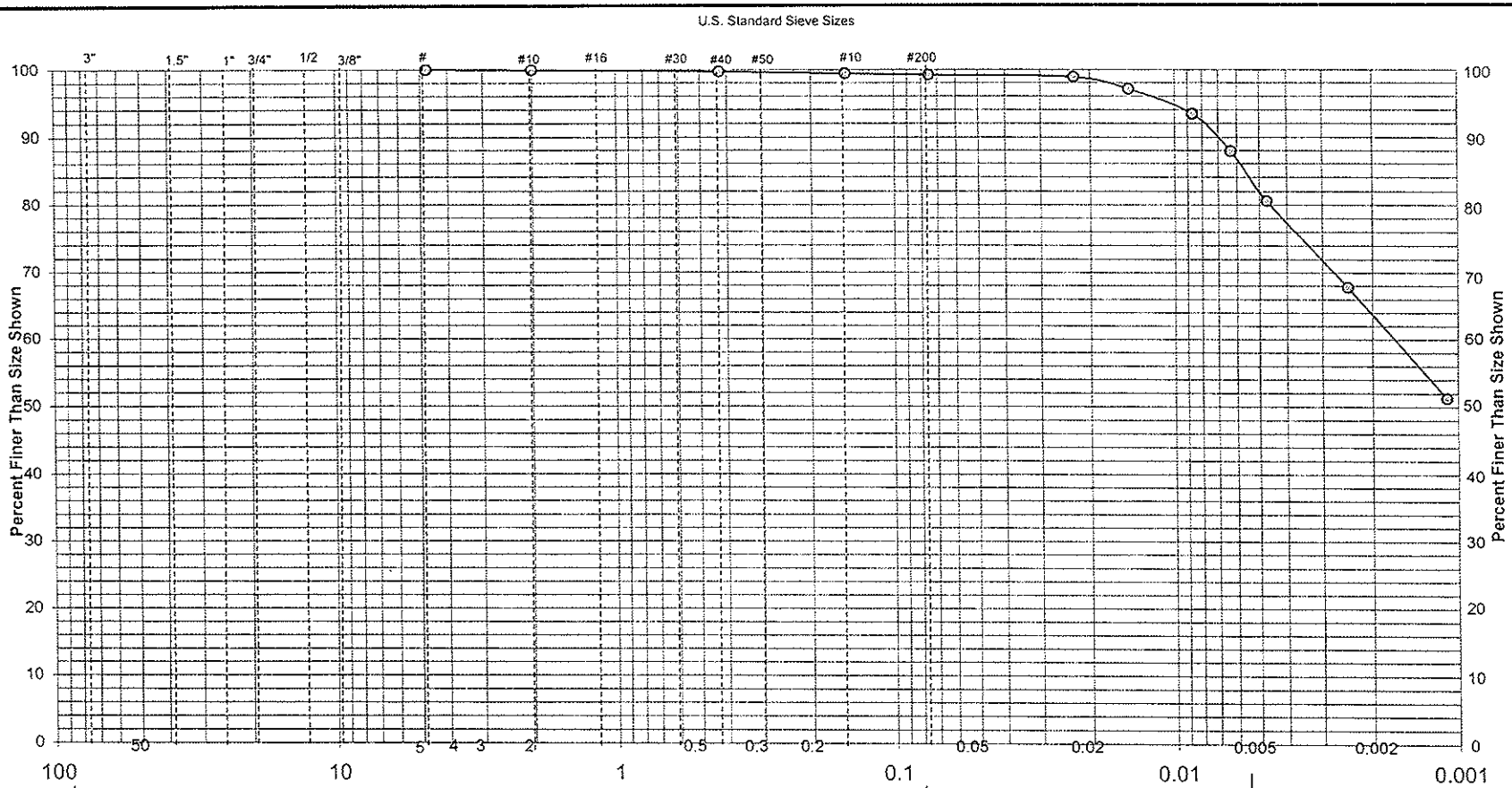
Dry Weight of Soil (gms): 481.9

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"					
#4	0.0	0.0	100.0		
#10	0.4	0.1	99.9		
#40	1.1	0.2	99.7		
#100	1.4	0.3	99.4		
#200	1.0	0.2	99.2	50-100	

REVIEWED BY:	Robert R. Rouse
DATE REVIEWED:	11/1/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		0.1%	0.2%	0.5%	18.2%	81.0%

Soil Classification: LEAN CLAY, dark gray (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 8/3/07	
Sample Number: EP-CS-7	Sampled Moisture Content (%): 21.0	Report No.: CS-7	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 46.0 PL= 20.1 PI= 25.9	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 10YR 4/1	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 8/6/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert A. Rouse	Date:	11/2/07

CQM, INC.

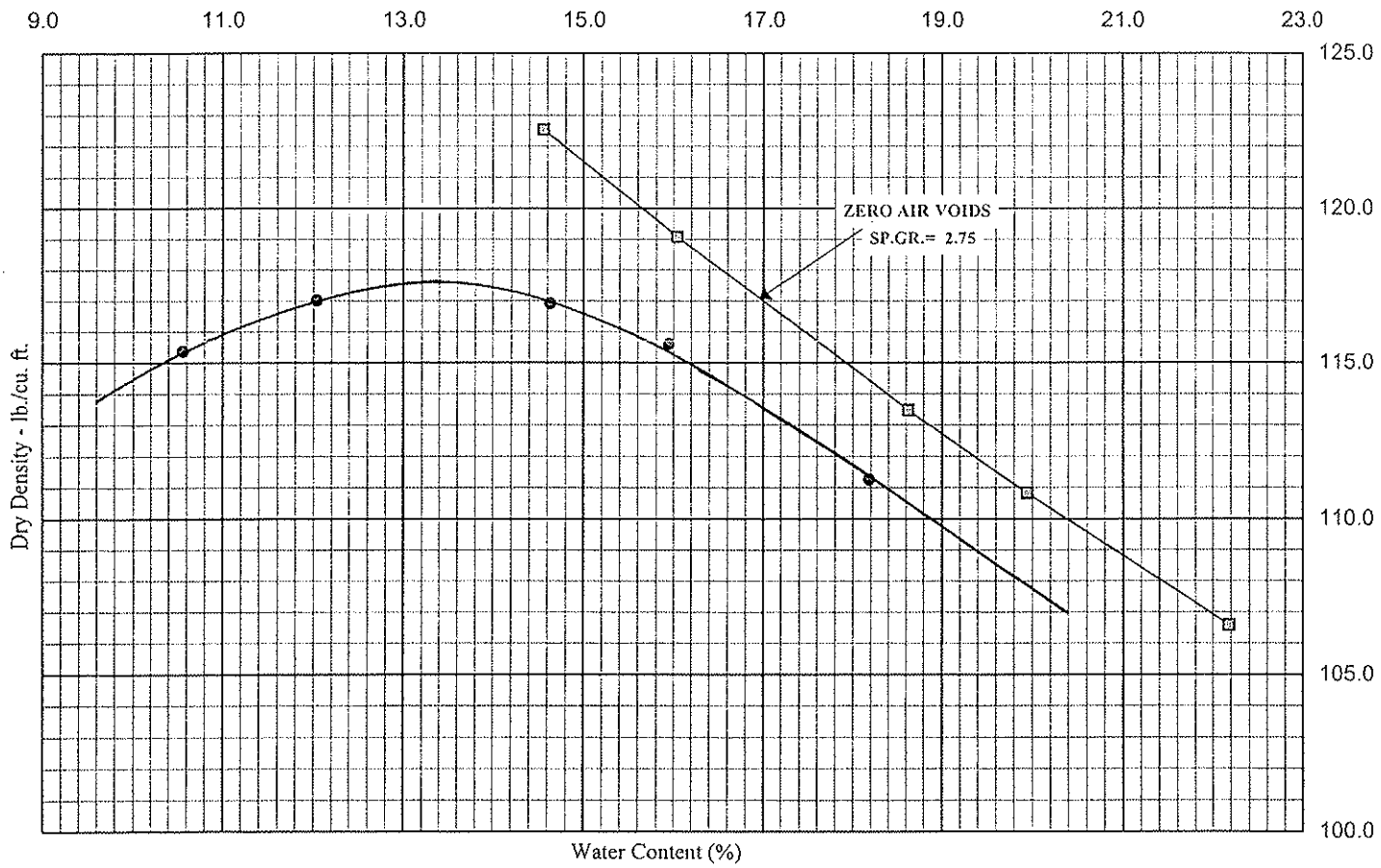
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-7	**Date Received:**	8/6/07
Tested By:	JRP	**Reviewed By:**	Robert R. Rouse 11/1/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark gray (CL)				
Munsell Color Code:	10YR 4/1	**Atterberg Limits:**	LL=46.0	PL=20.1	PI=25.9
Maximum Dry Density (lb/cu.ft.):	117.8	**Optimum Moisture (%):**	13.4	**Wet Density (lb/cu.ft.):**	133.6



10/15/2007 TLS P-EPCS7

CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-8
Depth of Sample:	
Date Received:	8/6/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	10YR 4/1
Date Sampled:	8/3/07

LABORATORY DATA:

Date Tested:	August 6-9, 2007
Test Performed By:	JRH

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

Dry Weight of Soil (gms): 414.8

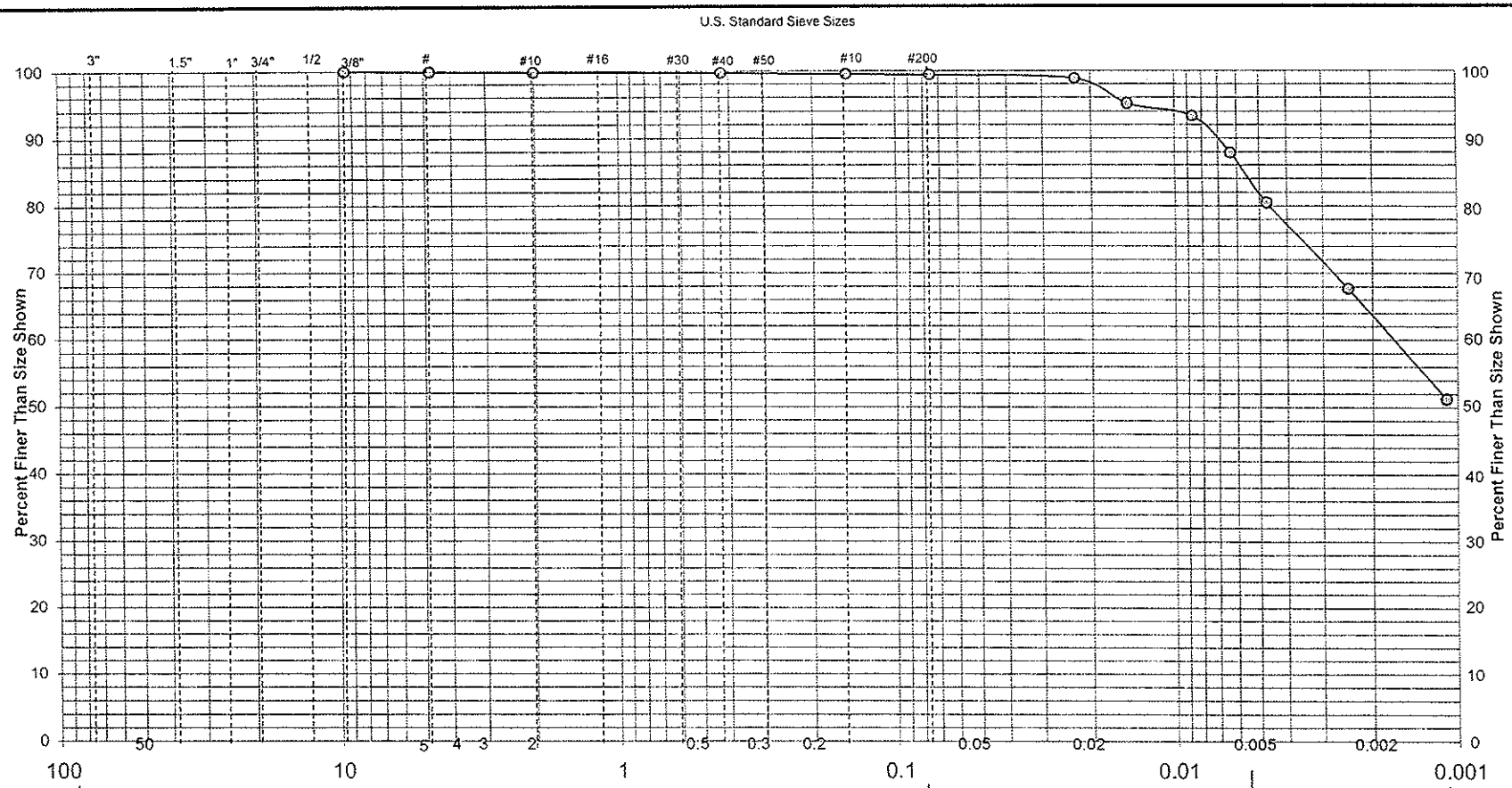
Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"	0.0	0.0	100.0		
#4	0.3	0.1	99.9		
#10	0.5	0.1	99.8		
#40	0.6	0.1	99.7		
#100	0.7	0.2	99.5		
#200	0.5	0.1	99.4	50-100	

REVIEWED BY:	Robert R. Rowe
DATE REVIEWED:	11/1/07

Remarks:

10/15/2007 TLS G-EPCS8

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
	0.1%	0.1%	0.1%	0.3%	17.9%	81.5%

Soil Classification: LEAN CLAY, dark gray (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 8/3/07	
Sample Number: EP-CS-8	Sampled Moisture Content (%): 23.4	Report No.: CS-8	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 45.1 PL= 19.9 PI= 25.2	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 10YR 4/1	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 8/6/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/2/07

CQM, INC.

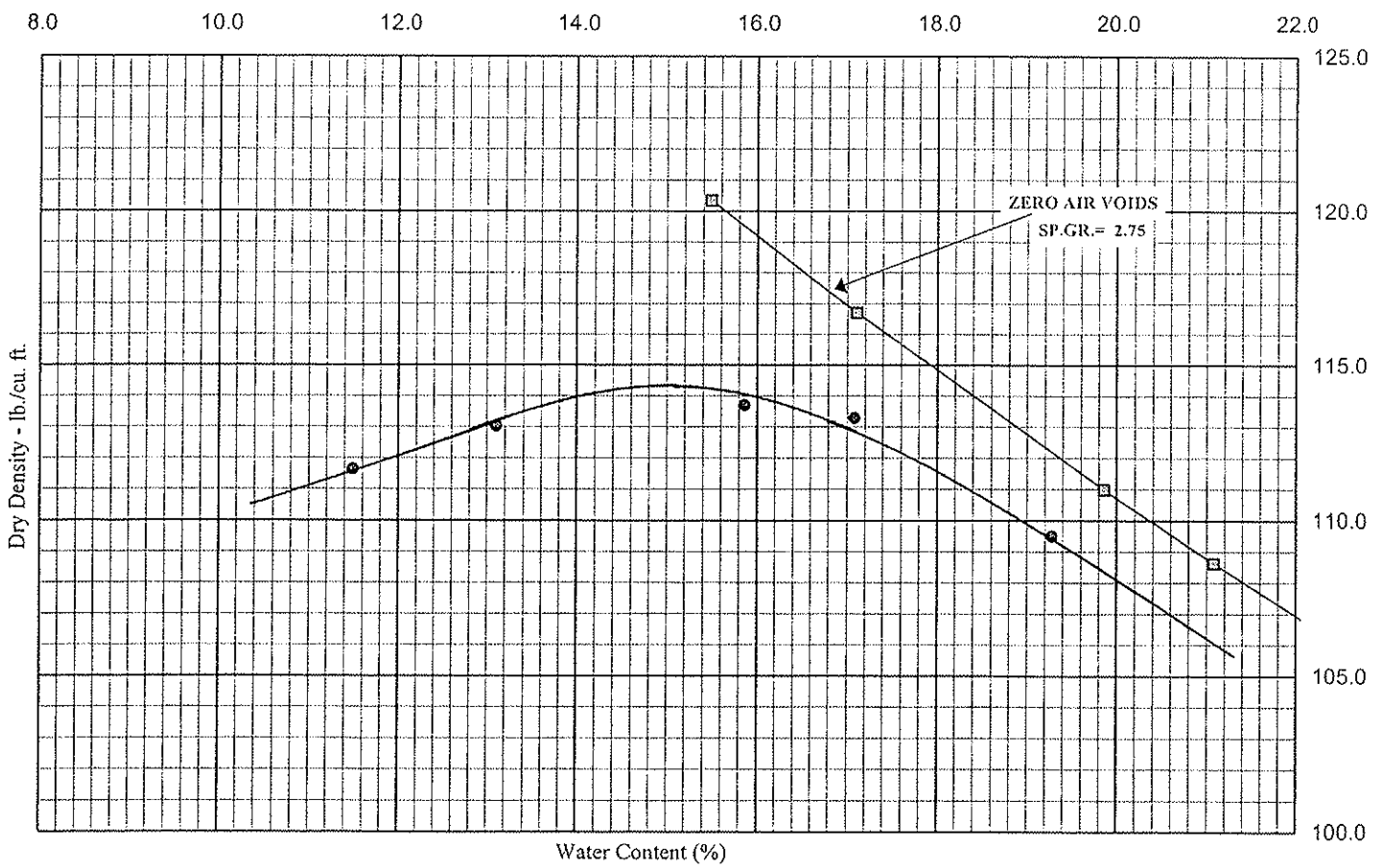
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-8	**Date Received:**	8/6/07
Tested By:	JRP	**Reviewed By:**	Robert R. Rourke 11/1/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark grayish brown (CL)				
Munsell Color Code:	10YR 4/1	**Atterberg Limits:**	**LL=45.1**	**PL=19.9**	**PI=25.2**
Maximum Dry Density (lb/cu.ft.):	114.3	**Optimum Moisture (%):**	15.1	**Wet Density (lb/cu.ft.):**	131.6



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CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	Borrow Source
Sample No:	EP-CS-9
Depth of Sample:	
Date Received:	8/6/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	10YR 4/1
Date Sampled:	8/3/07

LABORATORY DATA:

Date Tested:	August 6-9, 2007
Test Performed By:	JRH

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

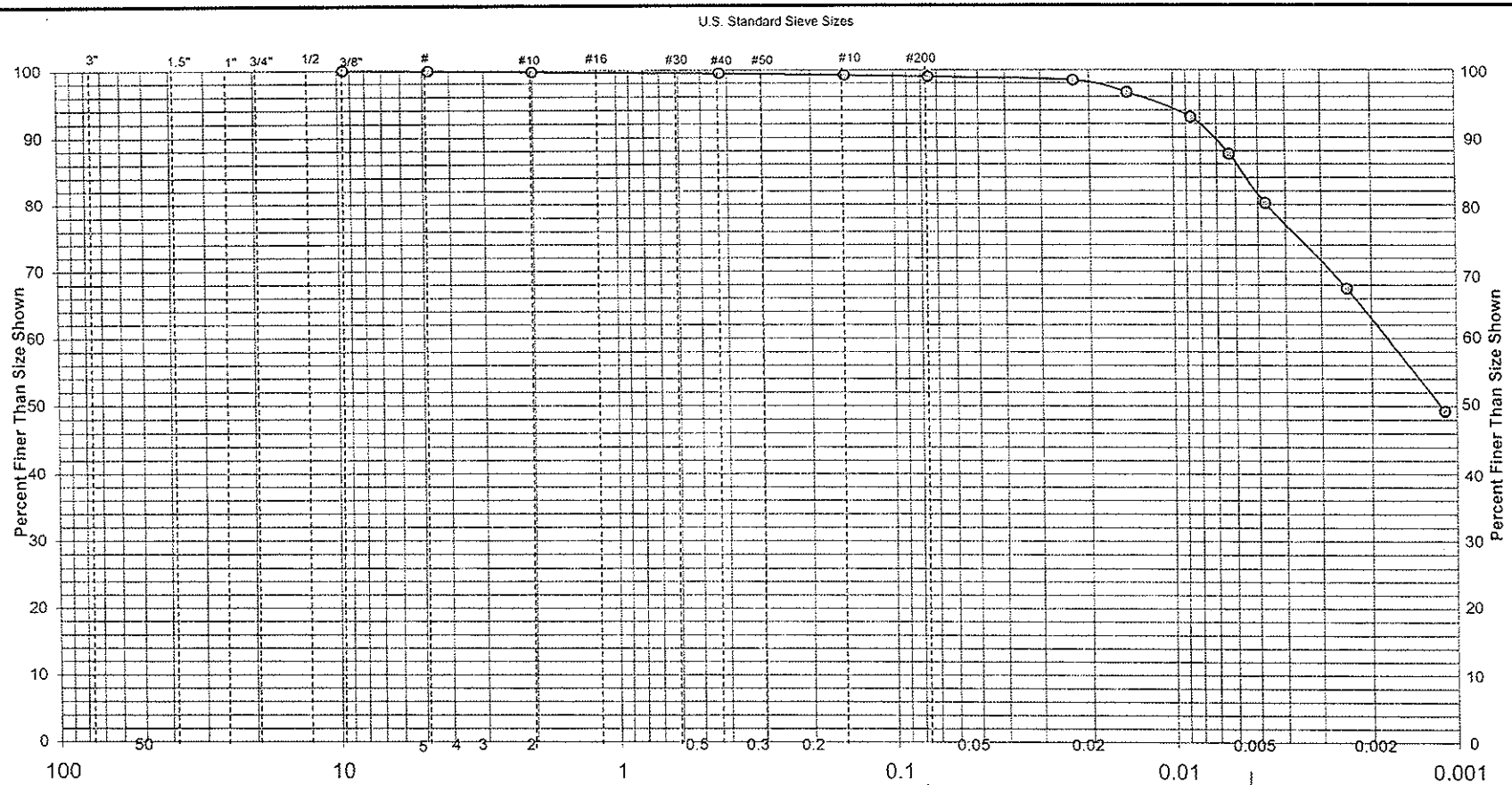
Dry Weight of Soil (gms): 422.3

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"					
3/8"	0.0	0.0	100.0		
#4	0.4	0.1	99.9		
#10	0.6	0.1	99.8		
#40	1.1	0.3	99.5		
#100	1.3	0.3	99.2		
#200	0.9	0.2	99.0	50-100	

REVIEWED BY:	Robert A. Rouse
DATE REVIEWED:	11/3/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand				
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
	0.1%	0.1%	0.3%	0.5%	18.0%	81.0%

Soil Classification: LEAN CLAY, dark gray (CL)			
Location Sampled: Borrow Source	Elevation or Depth:	Date Sampled: 8/3/07	
Sample Number: EP-CS-9	Sampled Moisture Content (%): 25.7	Report No.: CS-9	
Sample Source:	COM, INC.		
Atterberg Limits: LL= 46.9 PL= 20.1 PI= 26.8	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 10YR 4/1	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 8/6/07	Prepared by: John L. Novak	Date:	10/15/07
Coefficients: Cc= Cu=	Checked by: Robert R. Power	Date:	11/2/07

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CQM, INC.

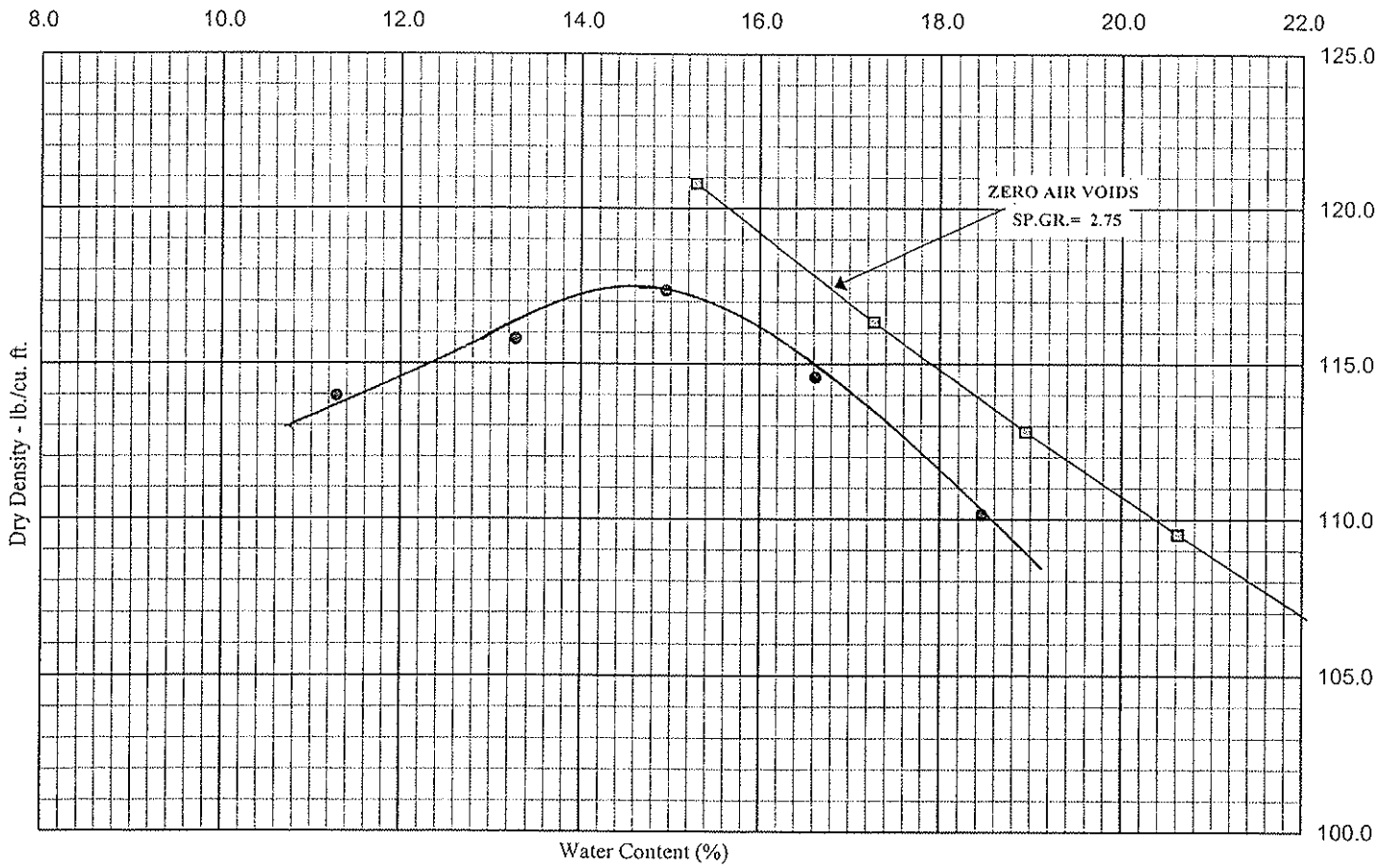
MOISTURE - DENSITY RELATIONS OF SOIL

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill		
Project:	Phase 6 West Liner Construction		
Contractor:		**Sampled From:**	Borrow Source
Sample No:	EP-CS-9	**Date Received:**	8/6/07
Tested By:	JRP	**Reviewed By:**	Robert R. Rouse 11/2/07

LABORATORY DATA:

Method of Test:	ASTM D1557 - Method "A"				
Soil Classification:	LEAN CLAY, dark gray (CL)				
Munsell Color Code:	10YR 4/1	**Atterberg Limits:**	**LL=46.9**	**PL=20.1**	**PI=26.8**
Maximum Dry Density (lb/cu.ft.):	117.5	**Optimum Moisture (%):**	14.7	**Wet Density (lb/cu.ft.):**	134.8



10/15/2007 TLS P-EPCS9

CQM, INC.

SIEVE ANALYSIS OF COARSE TO FINE AGGREGATES (ASTM D422)

GENERAL DATA:

Client:	Veolia ES Emerald Park Landfill
Project:	Phase 6 West Liner Construction
Location Sampled:	4750N 5750E
Sample No:	EP-CL-1
Depth of Sample:	Lift No. 2
Date Received:	7/16/07
Sample Designated For:	Clay Liner
Source of Sample:	
Munsell Color Code:	2.5Y 4/2
Date Sampled:	7/10/07

LABORATORY DATA:

Date Tested:	July 16-19, 2007
Test Performed By:	AJP

24 Hrs. Turn Around:	NO
Washed Gradation:	YES

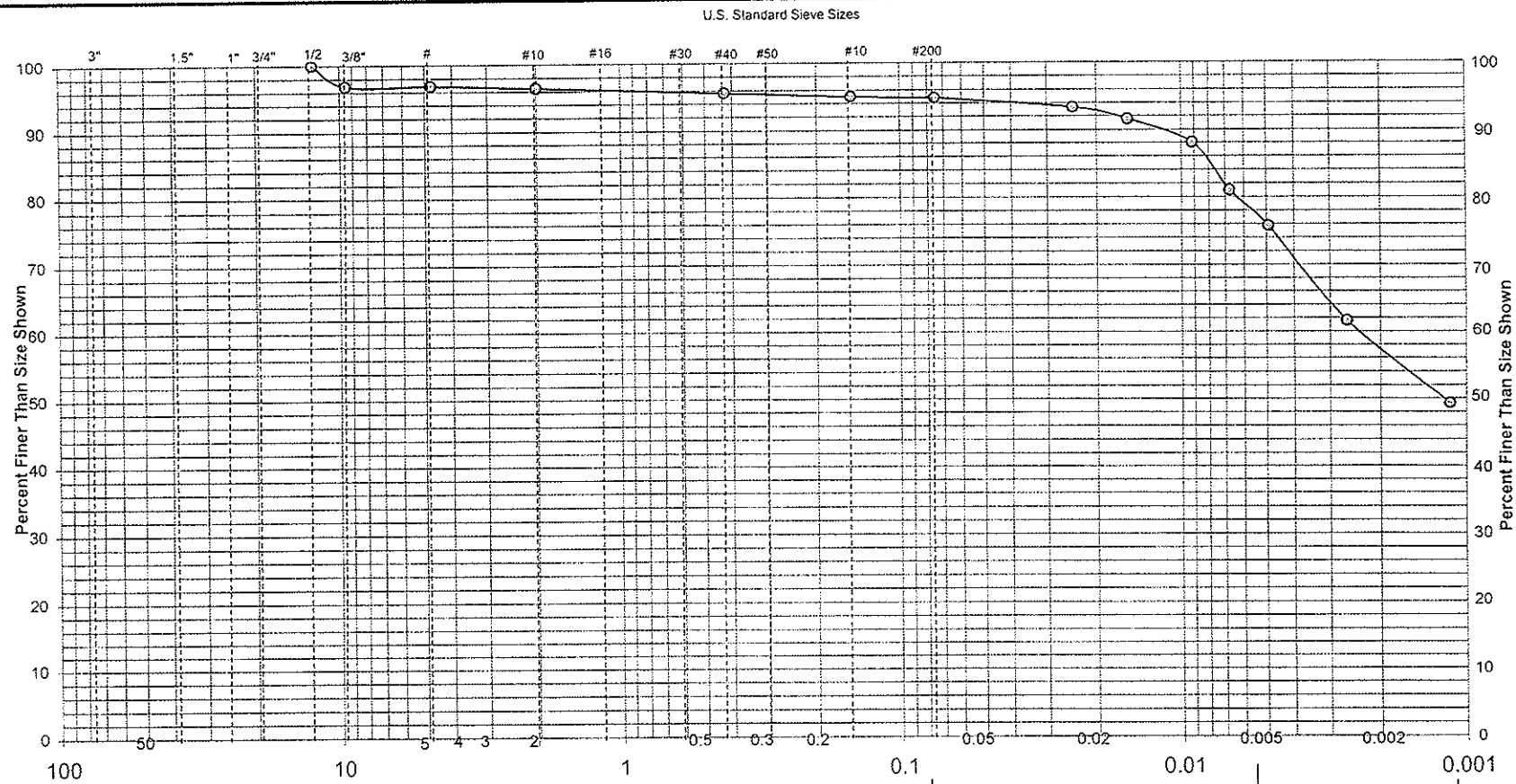
Dry Weight of Soil (gms): 468.5

Sieve Size	Weight Retained	% Retained	% Passing	Project Specification % Passing by Weight	Source of Specification
3"					WDNR Approved Landfill Plan
1 1/2"					
1"					
3/4"					
1/2"	0.0	0.0	100.0		
3/8"	14.7	3.1	96.9		
#4	0.0	0.0	96.9		
#10	1.8	0.4	96.5		
#40	4.0	0.9	95.6		
#100	2.6	0.6	95.0		
#200	1.0	0.2	94.8	50-100	

REVIEWED BY:	Robert A. Rouse
DATE REVIEWED:	11/1/07

Remarks:

GRAIN SIZE DISTRIBUTION CURVE



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		
	3.1%	0.4%	0.9%	0.8%	18.8%	76.0%

Soil Classification: LEAN CLAY, a little gravel, dark grayish brown (CL)			
Location Sampled: 4750N 5750E	Elevation or Depth: Lift No. 2	Date Sampled: 7/10/07	
Sample Number: EP-CL-1	Sampled Moisture Content (%): 18.7	Report No.: CL-1	
Sample Source:	CQM, INC.		
Atterberg Limits: LL= 43.5 PL= 17.7 PI= 25.8	Client: Veolia ES Emerald Park Landfill		
Munsell Color Code: 2.5Y 4/2	Project: Phase 6 West Liner Construction	Page:	2
Date Received: 7/16/07	Prepared by: Michael R. Andraschko	Date:	10/29/07
Coefficients: Cc= Cu=	Checked by: Robert R. Rouse	Date:	11/1/07

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