

LIQUID AND PLASTIC LIMIT TEST DATA

1/26/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 148.3-148.8

Sample Number: SS-28a

Material Description: Pinkish Gray Clayey SAND

USCS: SC

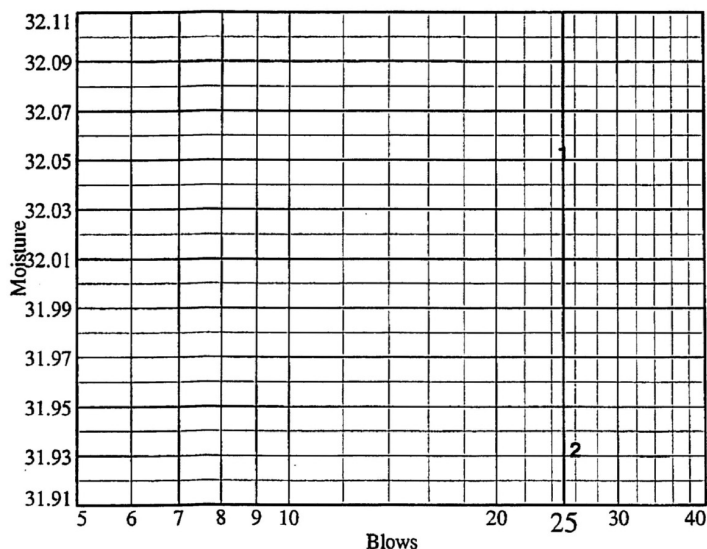
AASHTO: A-6(6)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	26.63	29.69				
Dry+Tare	23.96	26.27				
Tare	15.63	15.56				
# Blows	25	26				
Moisture	32.1	31.9				



Liquid Limit= 32
 Plastic Limit= 12
 Plasticity Index= 20
 Natural Moisture= 20.6
 Liquidity Index= 0.4

Plastic Limit Data

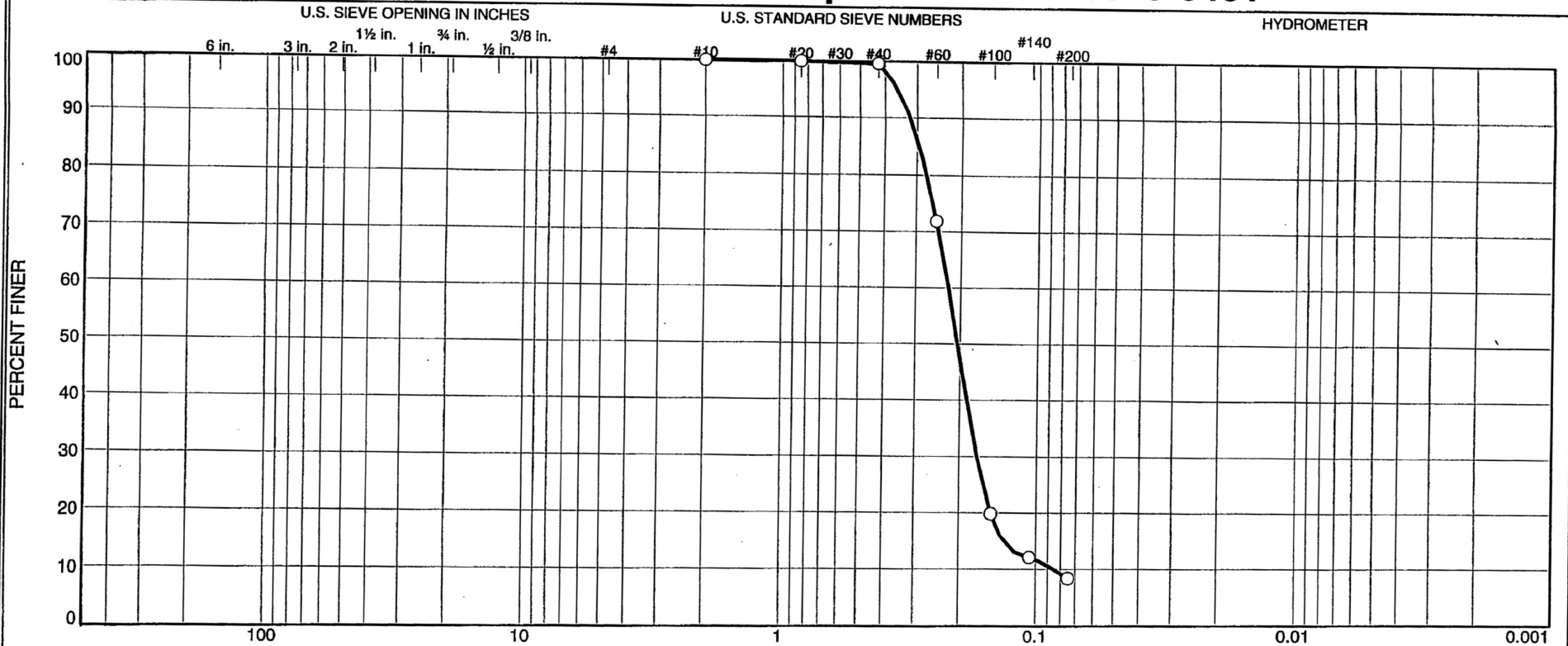
Run No.	1	2	3	4
Wet+Tare	23.21	23.96		
Dry+Tare	22.40	23.10		
Tare	15.47	15.54		
Moisture	11.7	11.4		

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
48.59	41.53	7.25	20.6

MACTEC, Inc.

Particle Size Distribution Report / ASTM D 6913-04e1



GRAIN SIZE DISTRIBUTION TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 148.8-149.8

Sample Number: SS-28b

Material Description: Yellowish Brown Poorly Graded SAND with silt (visual)

Date: 11/30/07

Natural Moisture: ND

Liquid Limit: ND

Plastic Limit: ND

USCS Class.: SP-SM

Testing Remarks: SIEVE ANALYSIS ONLY.

ND = Not determined

Tested by: CS

Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
292.08	0.00	0.00	#10	0.00	100.0
102.05	0.00	0.00	#20	0.03	100.0
			#40	0.36	99.6
			#60	28.71	71.9
			#100	81.81	19.8
			#140	89.71	12.1
			#200	93.51	8.4

Fractional Components

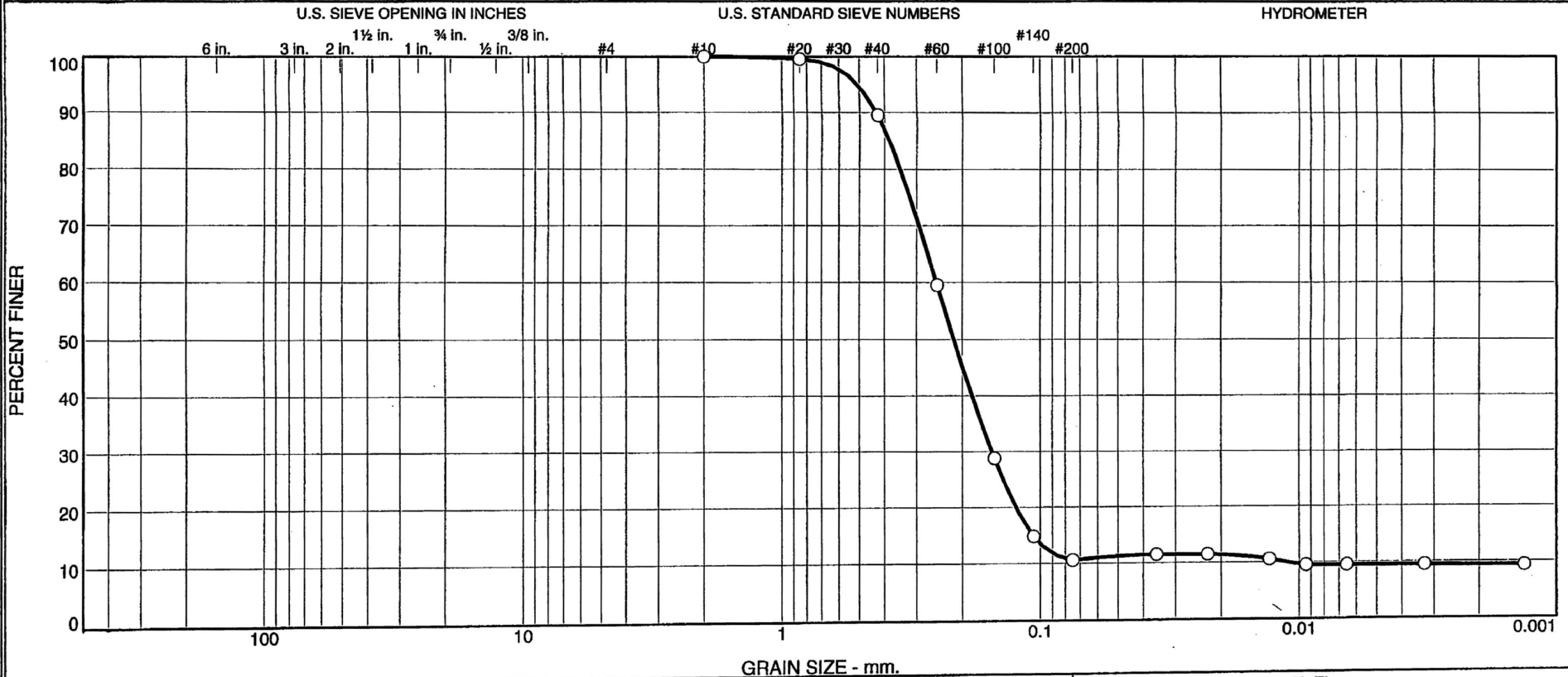
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.4	91.2	91.6			8.4

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.0854	0.1341	0.1504	0.1705	0.2048	0.2234	0.2744	0.2942	0.3202	0.3583

Fineness Modulus	C _u	C _c
0.94	2.62	1.52

MACTEC, Inc.

Particle Size Distribution Report / ASTM D 422-63(2002)e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	10.4	79.0	1.1	9.5

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2182A	SS-29	158.3-159.8	11/30/07	SW-SM	Light Gray Well Graded SAND with silt (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468071777

Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS AND HYDROMETER ONLY
 Specific gravity = 2.665 (ASTM D 854-06)
 ND = Not determined

Tested By: CS

Checked By: LBJ KAW 1/24/08

GRAIN SIZE DISTRIBUTION TEST DATA

1/26/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 158.3-159.8

Sample Number: SS-29

Material Description: Light Gray Well Graded SAND with silt (Visual)

Date: 11/30/07

Natural Moisture: ND

Liquid Limit: ND

Plastic Limit: ND

USCS Class.: SW-SM

Testing Remarks: SIEVE ANALYSIS AND HYDROMETER ONLY

Specific gravity = 2.665 (ASTM D 854-06)

ND = Not determined

Tested by: CS

Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
209.94	0.00	0.00	#10	0.00	100.0
49.99	0.00	0.00	#20	0.24	99.5
			#40	5.22	89.6
			#60	20.23	59.5
			#100	35.58	28.8
			#140	42.58	14.8
			#200	44.71	10.6

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 49.99

Hygroscopic moisture correction:

Moist weight and tare = 26.24

Dry weight and tare = 26.13

Tare weight = 15.53

Hygroscopic moisture = 1.0%

Table of composite correction values:

Temp., deg. C: 12.2 27.1

Comp. corr.: -7.0 -3.0

Meniscus correction only = 1.0

Specific gravity of solids = 2.665

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.3	10.0	5.7	0.0132	11.0	14.5	0.0355	11.5
5.00	22.3	10.0	5.7	0.0132	11.0	14.5	0.0225	11.5
15.00	22.4	9.5	5.2	0.0132	10.5	14.6	0.0130	10.6
29.00	22.3	9.0	4.7	0.0132	10.0	14.7	0.0094	9.5
60.00	22.3	9.0	4.7	0.0132	10.0	14.7	0.0065	9.5
240.00	22.3	9.0	4.7	0.0132	10.0	14.7	0.0033	9.5
1440.00	22.1	9.0	4.7	0.0132	10.0	14.7	0.0013	9.4

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	10.4	79.0	89.4	1.1	9.5	10.6

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.0112	0.1067	0.1240	0.1534	0.2155	0.2518	0.3478	0.3829	0.4300	0.5091

Fineness Modulus	C _u	C _c
1.02	22.56	8.37

MACTEC, Inc.

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REPORT OF THE STANDARD TEST METHOD FOR SPECIFIC GRAVITY OF SOILS
Performed in General Accordance with ASTM D 854-06 (Method B)

PROJECT NAME: EXELON COL PROJECT [VICTORIA]

PROJECT NUMBER: 6468071777

DATE: 12/22/07

SAMPLE IDENTIFICATION: B-2182A SS-29

(A) Mass of oven-dried soil, grams:	75.16
(B) Mass of pycnometer filled with water at test temperature (T), grams:	654.89
(C) Mass of pycnometer, water and soil, grams:	701.80
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	22.5
(G) Specific Gravity at observed temperature:	$A / [A + (B - C)]$ 2.666
(F) <i>Correction factor:</i>	0.99945
(G x F) SPECIFIC GRAVITY @ 20°C:	2.665

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100%

Well Graded SAND with silt (SP-SM) - visual

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER : 5.1.01

PYCNOMETER : P-5

TESTED BY: CS

\\Test Reports\\Soils\\SPECIFIC GRAVITY(ref).xls

REVIEWED BY:

Brian Johnson

DSC 1-26-08

U.S. SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

PERCENT FINER

Sieve / Size	Percent Finer (%)
3/8 in. / #40	100
#10 / 2.0 mm	100
#20 / 0.85 mm	84
#40 / 0.425 mm	67
#60 / 0.25 mm	57
#100 / 0.15 mm	46
#200 / 0.075 mm	35
#400 / 0.0375 mm	29
#600 / 0.025 mm	26
#800 / 0.018 mm	24
#1000 / 0.015 mm	22
#1250 / 0.012 mm	20
#1500 / 0.01 mm	19
#2000 / 0.0075 mm	18
#2500 / 0.006 mm	16
#3000 / 0.005 mm	15

[illegible][illegible]

Raleigh, North Carolina

○ SIEVE ANALYSIS AND HYDROMETER ONLY.
Specific gravity is assumed
ND = Not determined.

Checked By: LBJ DSC 1-25-08

GRAIN SIZE DISTRIBUTION TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 168.3-169.8

Sample Number: SS-30

Material Description: Pinkish Gray Clayey SAND (Visual)

Date: 11/30/07

Natural Moisture: ND

Liquid Limit: ND

Plastic Limit: ND

USCS Class.: SC

Testing Remarks: SIEVE ANALYSIS AND HYDROMETER ONLY.

Specific gravity is assumed

ND = Not determined.

Tested by: CS

Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
252.00	0.00	0.00	3/8"	0.00	100.0
			#4	2.60	99.0
			#10	3.93	98.4
97.18	0.00	0.00	#20	12.98	85.3
			#40	29.78	68.3
			#60	39.49	58.4
			#100	50.45	47.3
			#140	61.46	36.2
			#200	67.67	29.9

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 98.4

Weight of hydrometer sample = 97.18

Hygroscopic moisture correction:

Moist weight and tare = 28.48

Dry weight and tare = 28.41

Tare weight = 15.54

Hygroscopic moisture = 0.5%

Table of composite correction values:

Temp., deg. C: 12.2 27.1

Comp. corr.: -7.0 -3.0

Meniscus correction only = 1.0

Specific gravity of solids = 2.700

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.4	31.0	26.7	0.0131	32.0	11.0	0.0307	26.9
5.00	22.4	29.0	24.7	0.0131	30.0	11.4	0.0197	24.9
15.00	22.4	27.0	22.7	0.0131	28.0	11.7	0.0115	22.9
30.00	22.4	25.0	20.7	0.0131	26.0	12.0	0.0083	20.9
60.00	22.4	24.0	19.7	0.0131	25.0	12.2	0.0059	19.9
240.00	22.4	21.0	16.7	0.0131	22.0	12.7	0.0030	16.9
1440.00	22.3	20.0	15.7	0.0131	21.0	12.9	0.0012	15.8

MACTEC, Inc.

Fractional Components

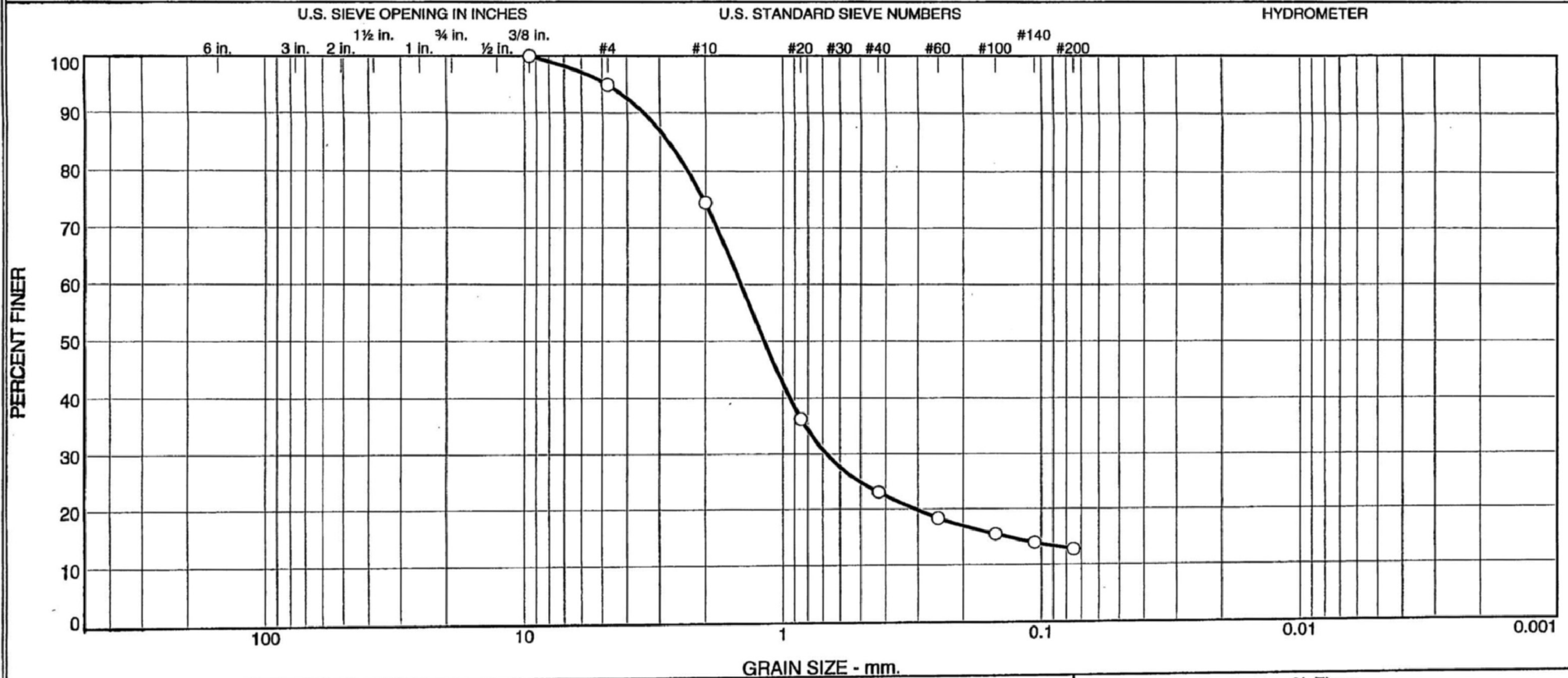
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.0	1.0	0.6	30.1	38.4	69.1	10.6	19.3	29.9

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0061	0.0757	0.1649	0.2738	0.6849	0.8394	1.0588	1.4263

Fineness Modulus
1.25

MACTEC, Inc.

Particle Size Distribution Report / ASTM D 6913-04e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.1	20.5	51.3	10.4	12.7	

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2182A	SS-31	178.3-179.8	11/30/07	SM	Pale Brown Silty SAND (Visual)	ND	ND	ND

Client Bechtel		MACTEC, Inc. Raleigh, North Carolina	○ SIEVE ANALYSIS ONLY. ND = Not determined.
Project Exelon Texas COL (Victoria)			
Project No. 6468071777	Figure NA		

Tested By: CS Checked By: LBJ DSC 1-26-08

GRAIN SIZE DISTRIBUTION TEST DATA

1/25/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 178.3-179.8

Sample Number: SS-31

Material Description: Pale Brown Silty SAND (Visual)

Date: 11/30/07

Natural Moisture: ND

Liquid Limit: ND

Plastic Limit: ND

USCS Class.: SM

Testing Remarks: SIEVE ANALYSIS ONLY.

ND = Not determined.

Tested by: CS

Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
315.43	0.00	0.00	3/8"	0.00	100.0
			#4	16.24	94.9
			#10	80.61	74.4
104.43	0.00	0.00	#20	53.49	36.3
			#40	72.06	23.1
			#60	78.63	18.4
			#100	82.66	15.5
			#140	84.87	13.9
			#200	86.55	12.7

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.1	5.1	20.5	51.3	10.4	82.2			12.7

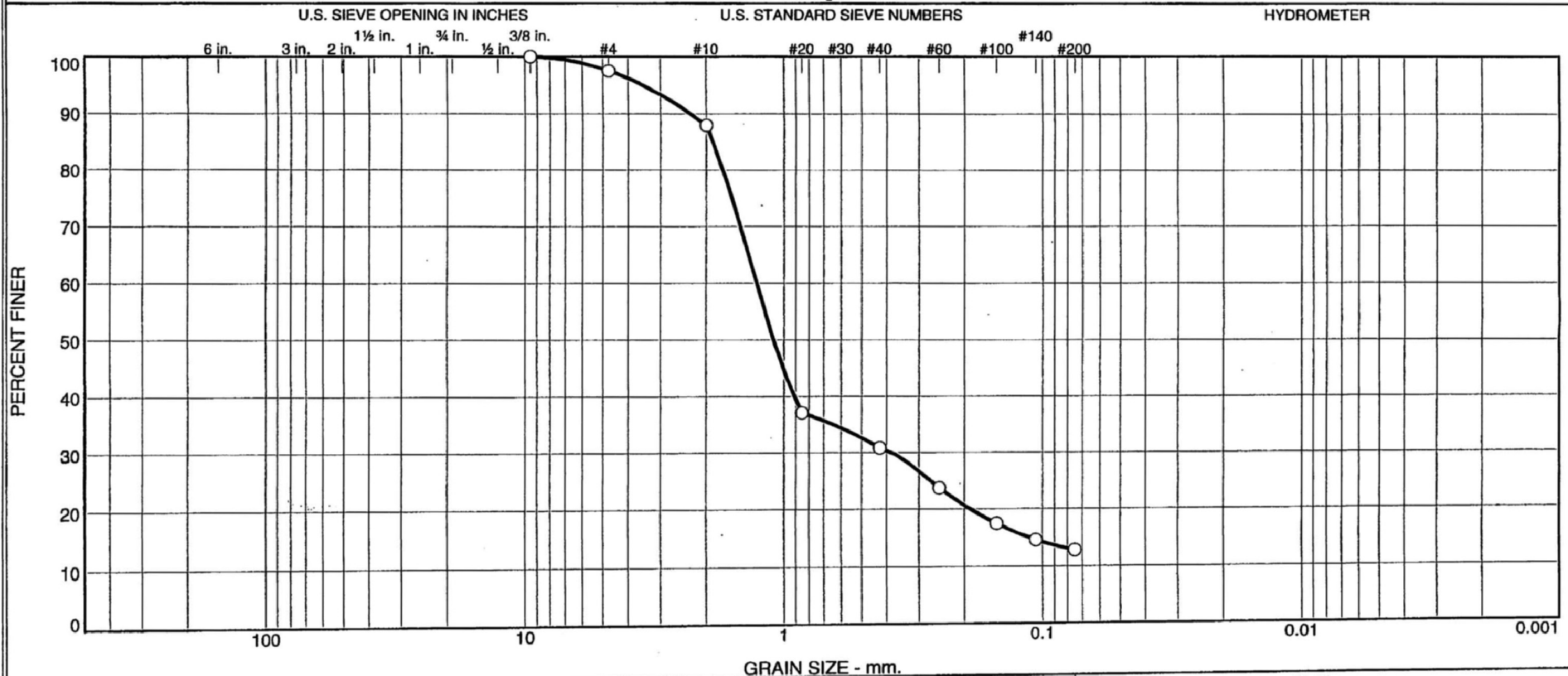
D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.1347	0.3080	0.6764	1.1807	1.4528	2.3306	2.7597	3.4427	4.8119

Fineness Modulus

3.12

MACTEC, Inc.

Particle Size Distribution Report / ASTM D 6913-04e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.5	9.5	57.1	18.1	12.8	

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2182A	SS-32	188.3-189.8	11/30/07	SM	Pale Brown Silty SAND (Visual)	ND	ND	ND

Client Bechtel		MACTEC, Inc. Raleigh, North Carolina	○ SIEVE ANALYSIS ONLY. ND = Not determined.
Project Exelon Texas COL (Victoria)			
Project No. 6468071777	Figure NA		

GRAIN SIZE DISTRIBUTION TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 188.3-189.8

Sample Number: SS-32

Material Description: Pale Brown Silty SAND (Visual)

Date: 11/30/07

Natural Moisture: ND

Liquid Limit: ND

Plastic Limit: ND

USCS Class.: SM

Testing Remarks: SIEVE ANALYSIS ONLY.

ND = Not determined.

Tested by: CS

Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
369.15	0.00	0.00	3/8"	0.00	100.0
			#4	9.16	97.5
			#10	44.28	88.0
100.37	0.00	0.00	#20	58.09	37.1
			#40	65.16	30.9
			#60	73.37	23.7
			#100	80.41	17.5
			#140	83.75	14.6
			#200	85.78	12.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.5	2.5	9.5	57.1	18.1	84.7			12.8

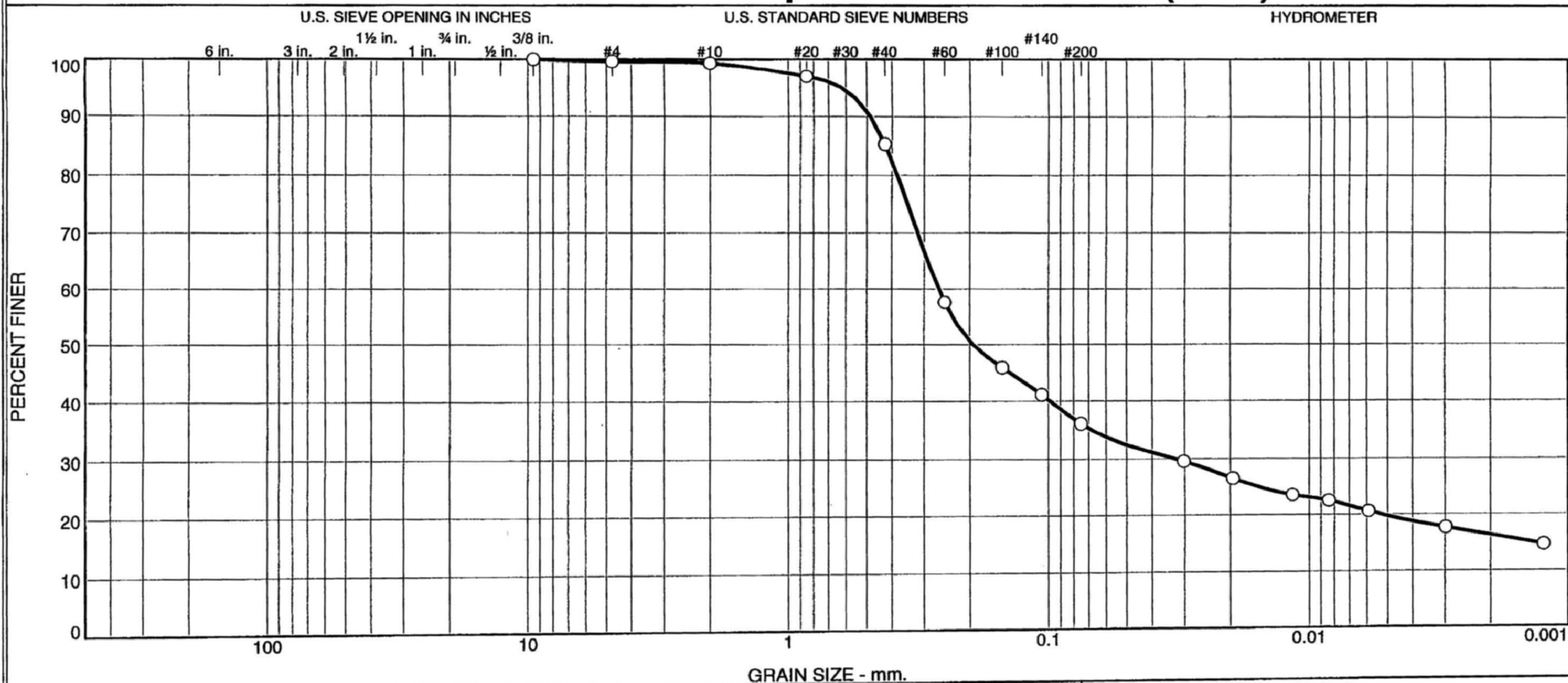
D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.1127	0.1900	0.3809	1.0950	1.2731	1.7181	1.8788	2.2959	3.5094

Fineness Modulus

2.79

MACTEC, Inc.

Particle Size Distribution Report / ASTM D 422-63(2002)e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.3	14.0	49.2	16.4	19.7

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2182A	SS-33	198.3-199.8	12/01/07	SC	Light Gray Clayey SAND	ND	21	12

Client Bechtel	MACTEC, Inc. Raleigh, North Carolina	○ Specific Gravity is assumed ND = Not Determined
Project Exelon Texas COL (Victoria)		
Project No. 6468071777		

GRAIN SIZE DISTRIBUTION TEST DATA

3/12/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 198.3-199.8

Sample Number: SS-33

Material Description: Light Gray Clayey SAND

Date: 12/01/07

Natural Moisture: ND

Liquid Limit: 21

Plastic Limit: 12

USCS Class.: SC

Testing Remarks: Specific Gravity is assumed

ND = Not Determined

Tested by: CS

Checked by: LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
344.89	0.00	0.00	3/8"	0.00	100.0
			#4	1.23	99.6
			#10	2.37	99.3
99.24	0.00	0.00	#20	2.37	96.9
			#40	13.97	85.3
			#60	41.67	57.6
			#100	53.41	45.9
			#140	58.16	41.1
			#200	63.13	36.1

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 99.3

Weight of hydrometer sample = 99.24

Hygroscopic moisture correction:

Moist weight and tare = 28.30

Dry weight and tare = 28.14

Tare weight = 15.50

Hygroscopic moisture = 1.3%

Table of composite correction values:

Temp., deg. C: 12.2 27.1

Comp. corr.: -7.0 -3.0

Meniscus correction only = 1.0

Specific gravity of solids = 2.700

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	21.7	34.0	29.6	0.0132	35.0	10.6	0.0302	29.6
5.00	21.7	31.0	26.6	0.0132	32.0	11.0	0.0196	26.6
15.00	21.6	28.0	23.5	0.0132	29.0	11.5	0.0116	23.6
29.00	21.6	27.0	22.5	0.0132	28.0	11.7	0.0084	22.6
60.00	21.6	25.0	20.5	0.0132	26.0	12.0	0.0059	20.6
242.00	22.2	22.0	17.7	0.0131	23.0	12.5	0.0030	17.7
1440.00	22.2	19.0	14.7	0.0131	20.0	13.0	0.0012	14.7

MACTEC, Inc.

Fractural Components

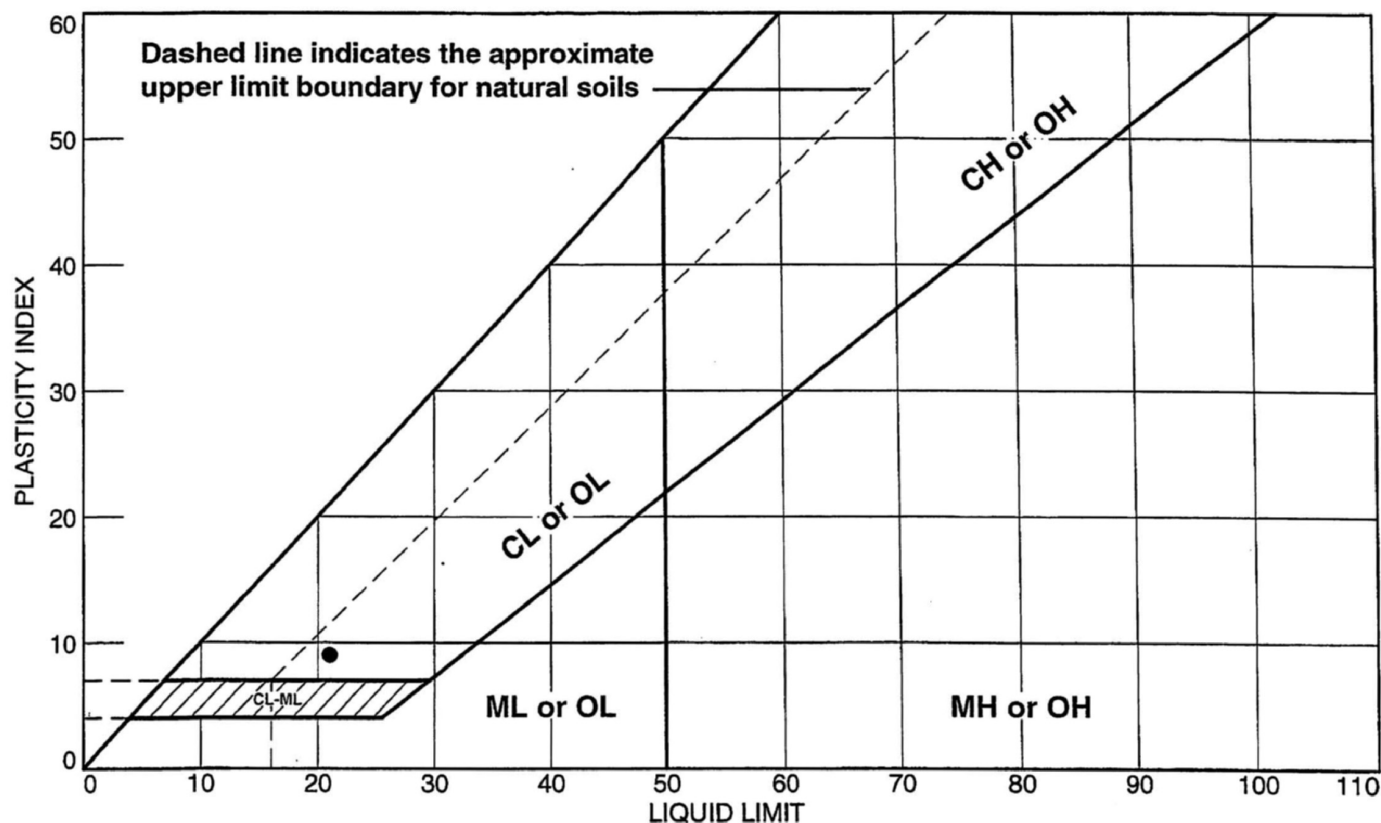
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.4	0.4	0.3	14.0	49.2	63.5	16.4	19.7	36.1

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0013	0.0053	0.0323	0.1946	0.2636	0.3802	0.4217	0.4843	0.6254

Fineness Modulus
0.96

MACTEC, Inc.

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



SOIL DATA

	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	Boring B-2182A	SS-33	198.3-199.8	ND	12	21	9	SC

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project No.: 6468071777

Figure NA

Tested By: CS

Checked By: LBJ

DSC 3-13-08

LIQUID AND PLASTIC LIMIT TEST DATA

3/12/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2182A

Depth: 198.3-199.8

Sample Number: SS-33

Material Description: Light Gray Clayey SAND

USCS: SC

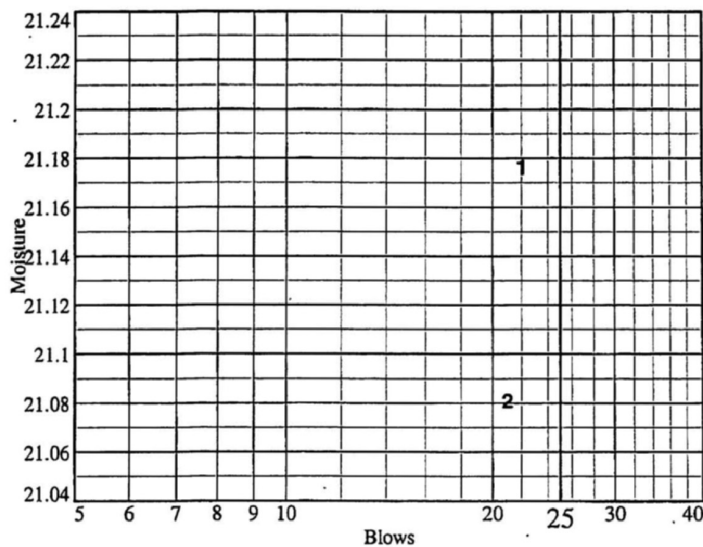
AASHTO: A-4(0)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	27.86	28.94				
Dry+Tare	25.70	26.60				
Tare	15.50	15.50				
# Blows	22	21				
Moisture	21.2	21.1				



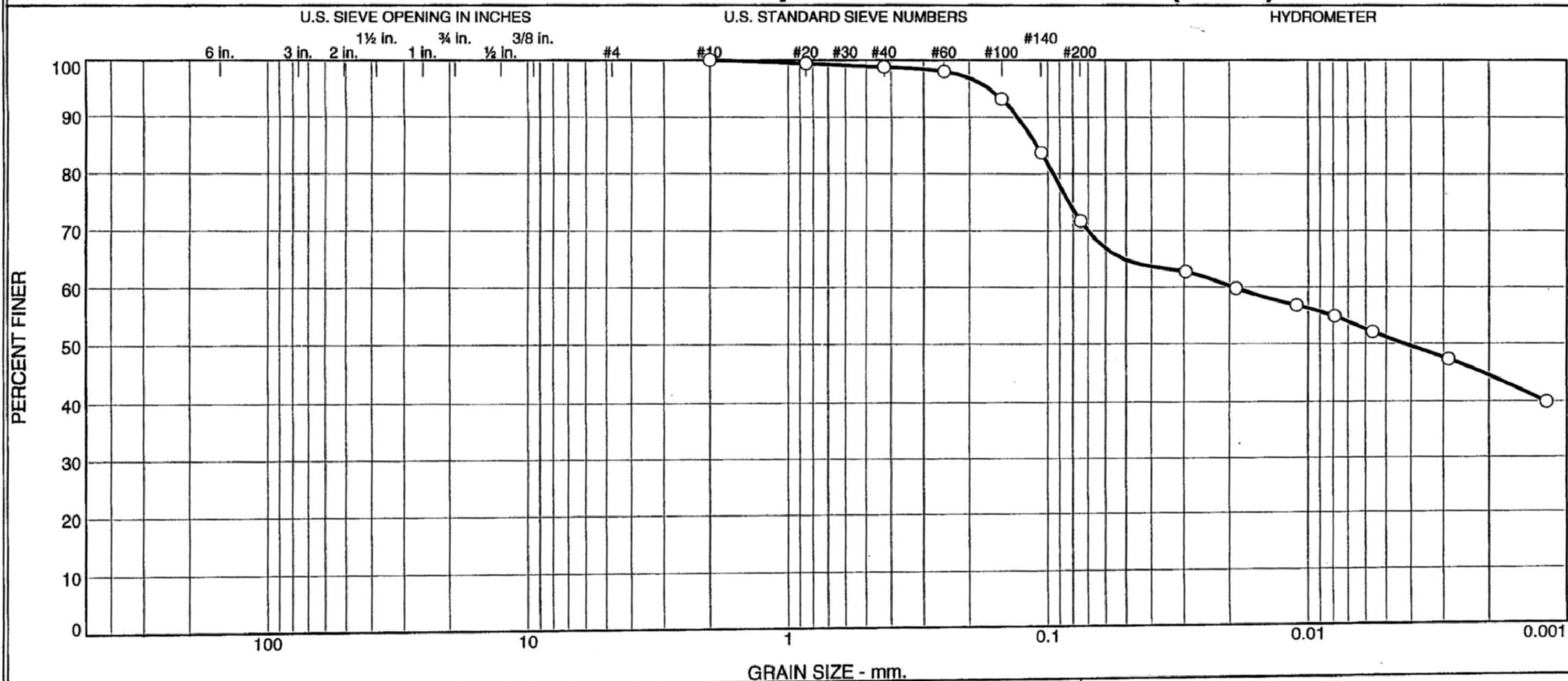
Liquid Limit= 21
 Plastic Limit= 12
 Plasticity Index= 9
 Natural Moisture= ND

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	22.19	23.04		
Dry+Tare	21.47	22.28		
Tare	15.61	15.54		
Moisture	12.3	11.3		

MACTEC, Inc.

Particle Size Distribution Report / ASTM D- 422-63(2002)e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	27.1	20.6	51.1

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2182A	SS-34	218.3-219.8	12/01/07	CL	Pinkish Gray Lean CLAY with sand	22.0	48	16

Client Bechtel		MACTEC, Inc.	○ Specific gravity is assumed
Project Exelon Texas COL (Victoria)			
Project No. 6468071777	Figure NA		
		Raleigh, North Carolina	