

LIQUID AND PLASTIC LIMIT TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2251

Depth: 58.5-60'

Sample Number: SS-15

Material Description: Light Greenish Gray Sandy Lean CLAY

USCS: CL

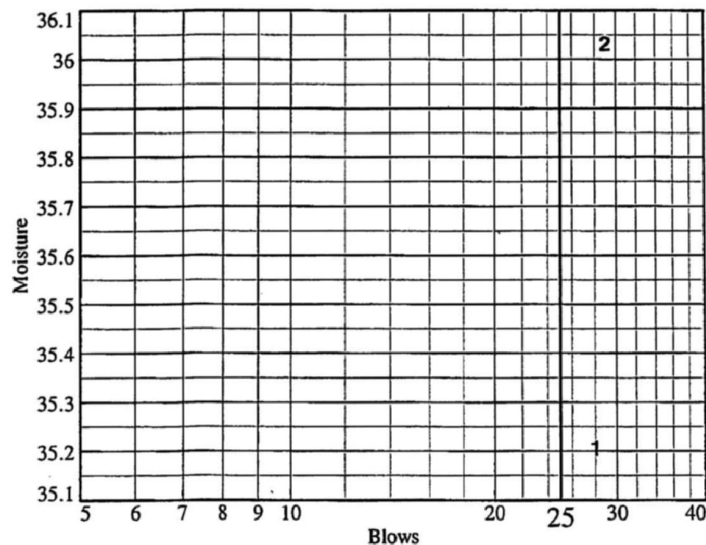
AASHTO: A-6(10)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.63	23.72				
Dry+Tare	22.25	21.54				
Tare	15.49	15.49				
# Blows	28	29				
Moisture	35.2	36.0				



Liquid Limit= 36
 Plastic Limit= 14
 Plasticity Index= 22
 Natural Moisture= ND

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	31.65	26.80			
Dry+Tare	29.66	25.40			
Tare	15.48	15.50			
Moisture	14.0	14.1			

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: 1/5/08

SAMPLE IDENTIFICATION: B-2251 SS-15

(A) Mass of oven-dried soil, grams:	49.64
(B) Mass of pycnometer filled with water at test temperature (T), grams:	656.60
(C) Mass of pycnometer, water and soil, grams:	687.76
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	22.7
(G) Specific Gravity at observed temperature: $A / [A + (B - C)]$	2.686
(F) <i>Correction factor:</i>	0.99940
(G x F) SPECIFIC GRAVITY @ 20°C:	2.685

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100%

Sandy Lean CLAY (CL)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER : 5.1.01

PYCNOMETER : P-6

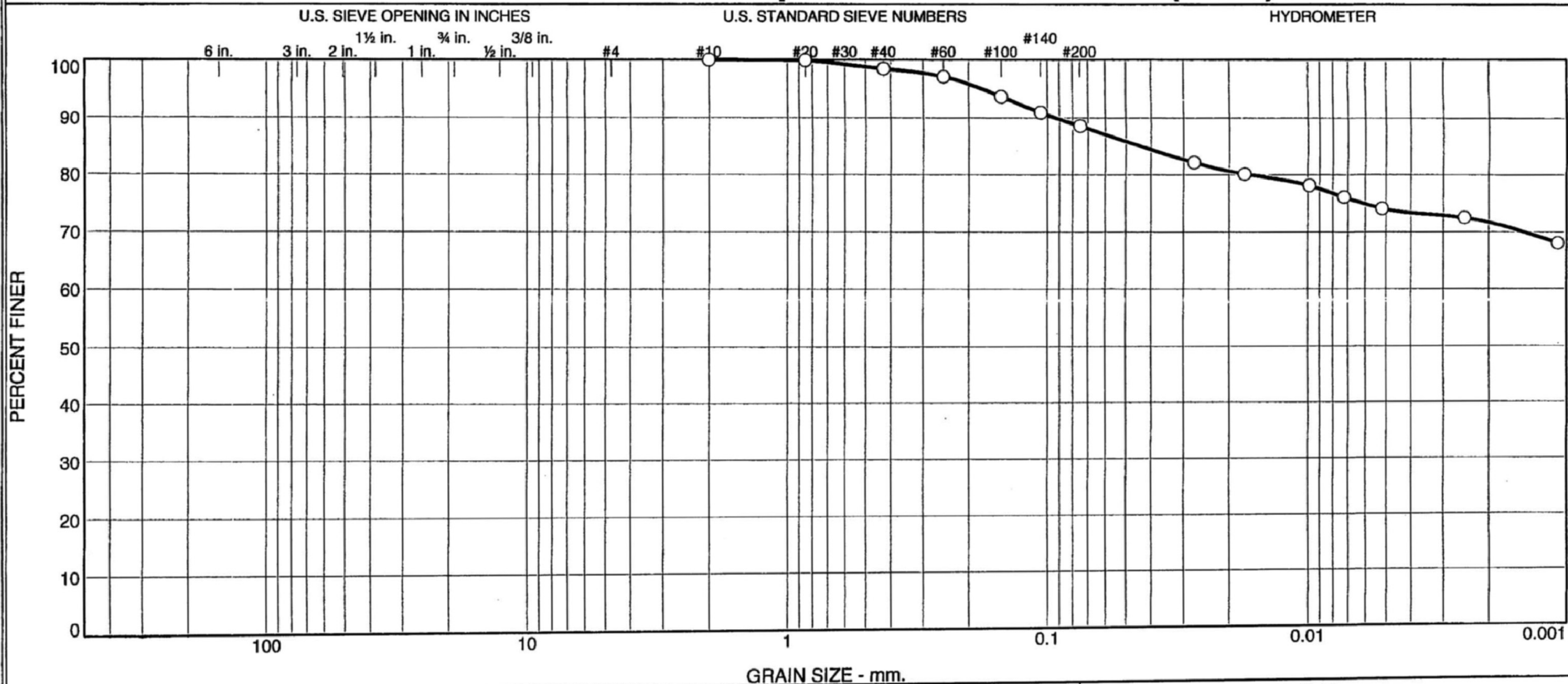
TESTED BY: CS

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

REVIEWED BY: Brian Johnson

DSC 1-25-08

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



GRAIN SIZE DISTRIBUTION TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2251

Depth: 63.5-65'

Sample Number: SS-16

Material Description: Greenish Gray Fat CLAY

Date: 12-03-07

Natural Moisture: 32.3

Liquid Limit: 73

Plastic Limit: 29

USCS Class.: CH

Testing Remarks: Specific Gravity is assumed.

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
195.70	0.00	0.00	#10	0.00	100.0
51.82	0.00	0.00	#20	0.05	99.9
			#40	0.80	98.5
			#60	1.50	97.1
			#100	3.30	93.6
			#140	4.70	90.9
			#200	5.90	88.6

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 51.82

Hygroscopic moisture correction:

Moist weight and tare = 28.20

Dry weight and tare = 27.52

Tare weight = 15.74

Hygroscopic moisture = 5.8%

Table of composite correction values:

Temp., deg. C: 12.3 27.3

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	45.0	40.7	0.0131	46.0	8.8	0.0273	82.1
5.00	22.4	44.0	39.7	0.0131	45.0	8.9	0.0174	80.1
16.00	22.5	43.0	38.7	0.0130	44.0	9.1	0.0098	78.2
30.00	22.5	42.0	37.7	0.0130	43.0	9.2	0.0072	76.1
60.00	22.5	41.0	36.7	0.0130	42.0	9.4	0.0052	74.1
258.00	23.3	40.0	35.9	0.0129	41.0	9.6	0.0025	72.5
1440.00	22.5	38.0	33.7	0.0130	39.0	9.9	0.0011	68.1

MACTEC, Inc.

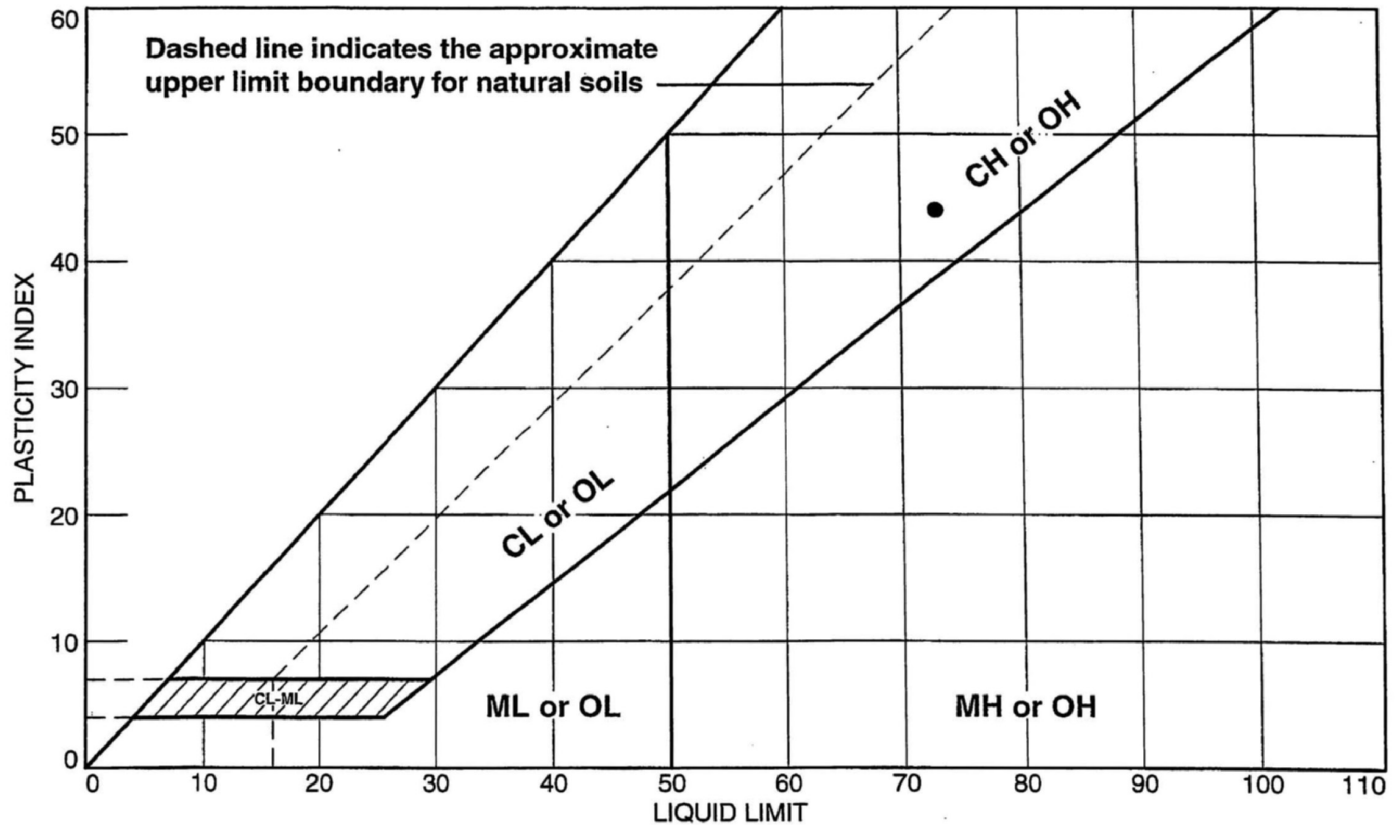
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.5	9.9	11.4	14.6	74.0	88.6

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0168	0.0436	0.0927	0.1787

Fineness Modulus
0.09

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-2251	SS-16	63.5-65'	32.3	29	73	44	CH

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project No.: 6468071777

Figure NA

Tested By: CS

Checked By: LBJ

DSC 1-25-08

LIQUID AND PLASTIC LIMIT TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2251

Depth: 63.5-65'

Sample Number: SS-16

Material Description: Greenish Gray Fat CLAY

USCS: CH

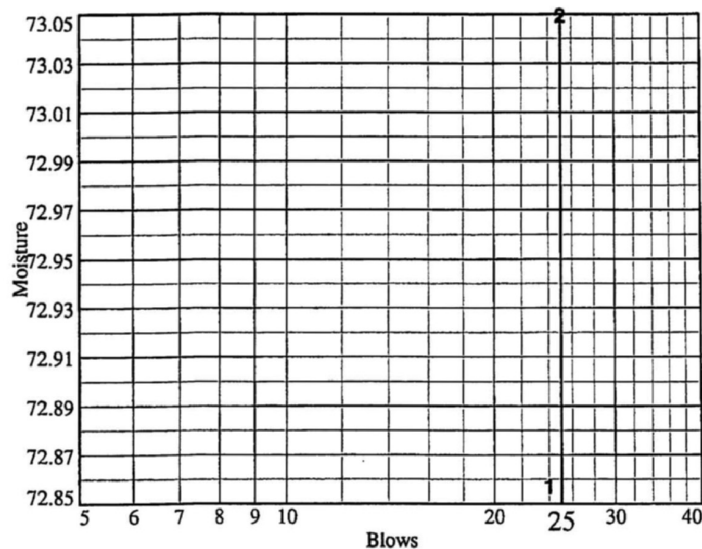
AASHTO: A-7-6(45)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.21	22.77				
Dry+Tare	21.13	19.68				
Tare	15.53	15.45				
# Blows	24	25				
Moisture	72.9	73.0				



Liquid Limit= 73
 Plastic Limit= 29
 Plasticity Index= 44
 Natural Moisture= 32.3
 Liquidity Index= 0.1

Plastic Limit Data

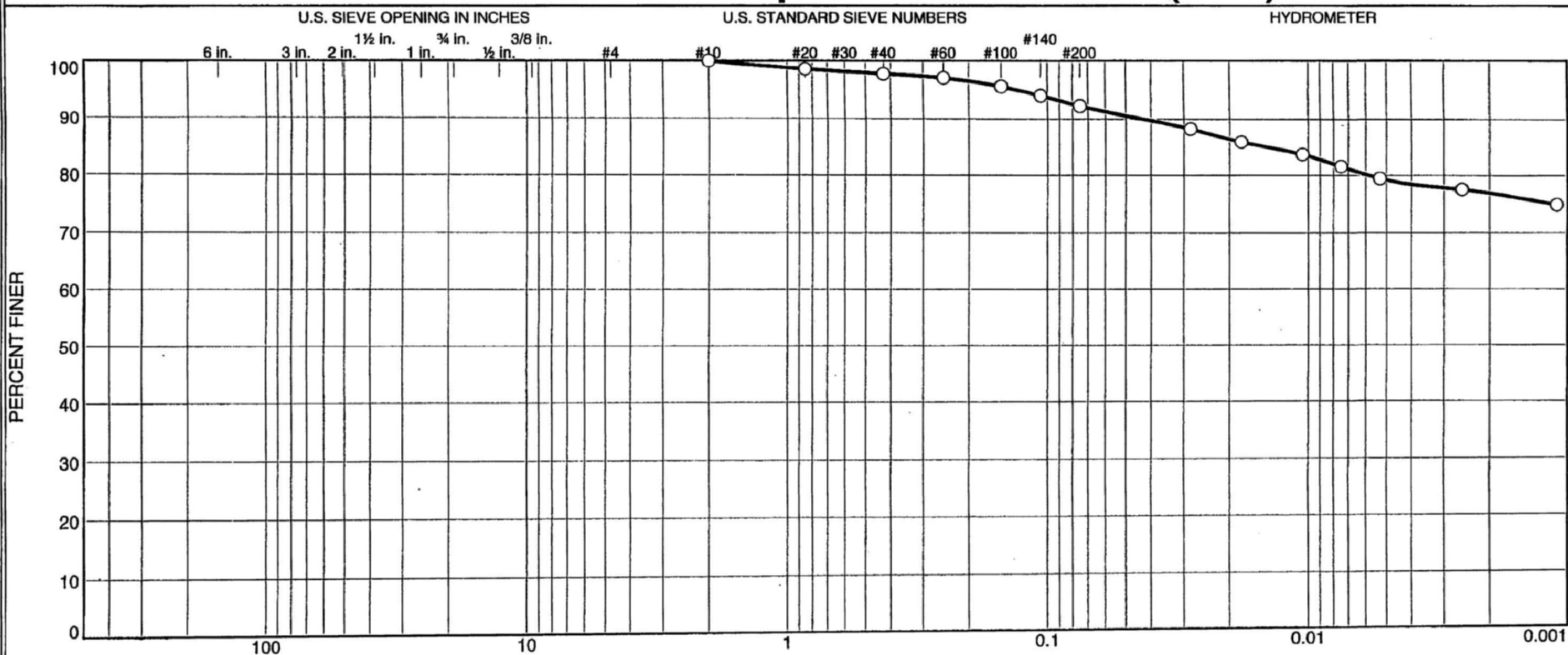
Run No.	1	2	3	4
Wet+Tare	21.48	21.96		
Dry+Tare	20.13	20.55		
Tare	15.48	15.70		
Moisture	29.0	29.1		

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
138.00	106.60	9.30	32.3

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	2.3	5.5	13.0	79.2

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2251	SS-17	68.5-70'	12-03-07	CH	Yellowish Brown Fat CLAY	33.2	74	30

Client Bechtel		MACTEC, Inc. Raleigh, North Carolina	○ Specific Gravity is assumed. Organic content = 3.1% (ASTM D2794-07)
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-2251

Depth: 68.5-70'

Sample Number: SS-17

Material Description: Yellowish Brown Fat CLAY

Date: 12-03-07

Natural Moisture: 33.2

Liquid Limit: 74

Plastic Limit: 30

USCS Class.: CH

Testing Remarks: Specific Gravity is assumed.

Organic content = 3.1% (ASTM D2794-07)

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
163.78	0.00	0.00	#10	0.00	100.0
46.18	0.00	0.00	#20	0.67	98.5
			#40	1.06	97.7
			#60	1.40	97.0
			#100	2.08	95.5
			#140	2.80	93.9
			#200	3.61	92.2

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 46.18

Hygroscopic moisture correction:

Moist weight and tare = 26.41

Dry weight and tare = 25.63

Tare weight = 15.43

Hygroscopic moisture = 7.6%

Table of composite correction values:

Temp., deg. C: 12.8 27.3

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	21.1	43.0	38.3	0.0133	44.0	9.1	0.0283	88.3
5.00	21.1	42.0	37.3	0.0133	43.0	9.2	0.0180	86.0
15.00	21.2	41.0	36.3	0.0132	42.0	9.4	0.0105	83.7
30.00	21.5	40.0	35.4	0.0132	41.0	9.6	0.0075	81.6
60.00	21.8	39.0	34.5	0.0131	40.0	9.7	0.0053	79.5
258.00	22.4	38.0	33.6	0.0131	39.0	9.9	0.0026	77.6
1440.00	21.8	37.0	32.5	0.0131	38.0	10.1	0.0011	74.9

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	2.3	5.5	7.8	13.0	79.2	92.2

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0058	0.0142	0.0430	0.1329

Fineness Modulus
0.10

MACTEC, Inc.

Figure 2: Plasticity Chart (U.S. Customary Units)

The chart plots Plasticity Index (PI) on the y-axis (0 to 60) against Liquid Limit (LL) on the x-axis (0 to 110). The regions are defined as follows:

- CL or OL** (shaded region): $PI < 7$ and $LL < 50$.
- CH or OH** (dashed region): $PI < 7$ and $LL > 50$.
- MH or OH** (solid region): $PI > 7$.

A dashed line indicates the approximate upper limit boundary for natural soils. A point is plotted at $LL \approx 75$ and $PI \approx 45$, labeled "CH or OH".

DCN# EXE805

LIQUID AND PLASTIC LIMIT TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2251

Depth: 68.5-70'

Sample Number: SS-17

Material Description: Yellowish Brown Fat CLAY

USCS: CH

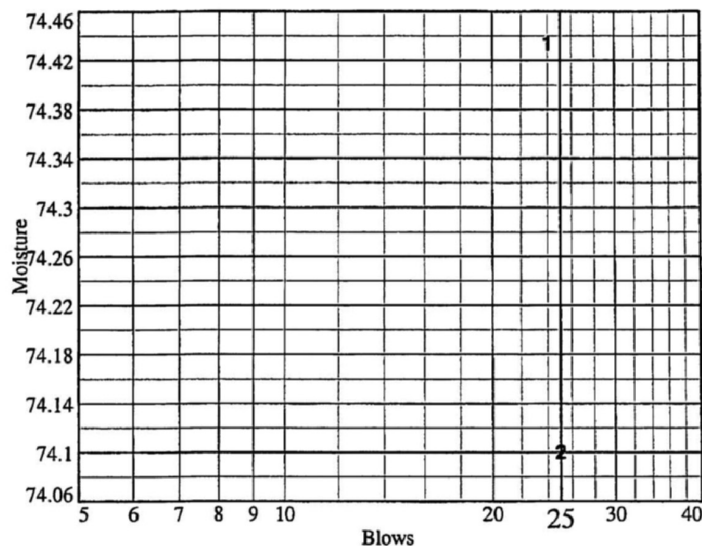
AASHTO: A-7-5(47)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.18	22.82				
Dry+Tare	19.89	19.73				
Tare	15.47	15.56				
# Blows	24	25				
Moisture	74.4	74.1				



Liquid Limit= 74
 Plastic Limit= 30
 Plasticity Index= 44
 Natural Moisture= 33.2
 Liquidity Index= 0.1

Plastic Limit Data

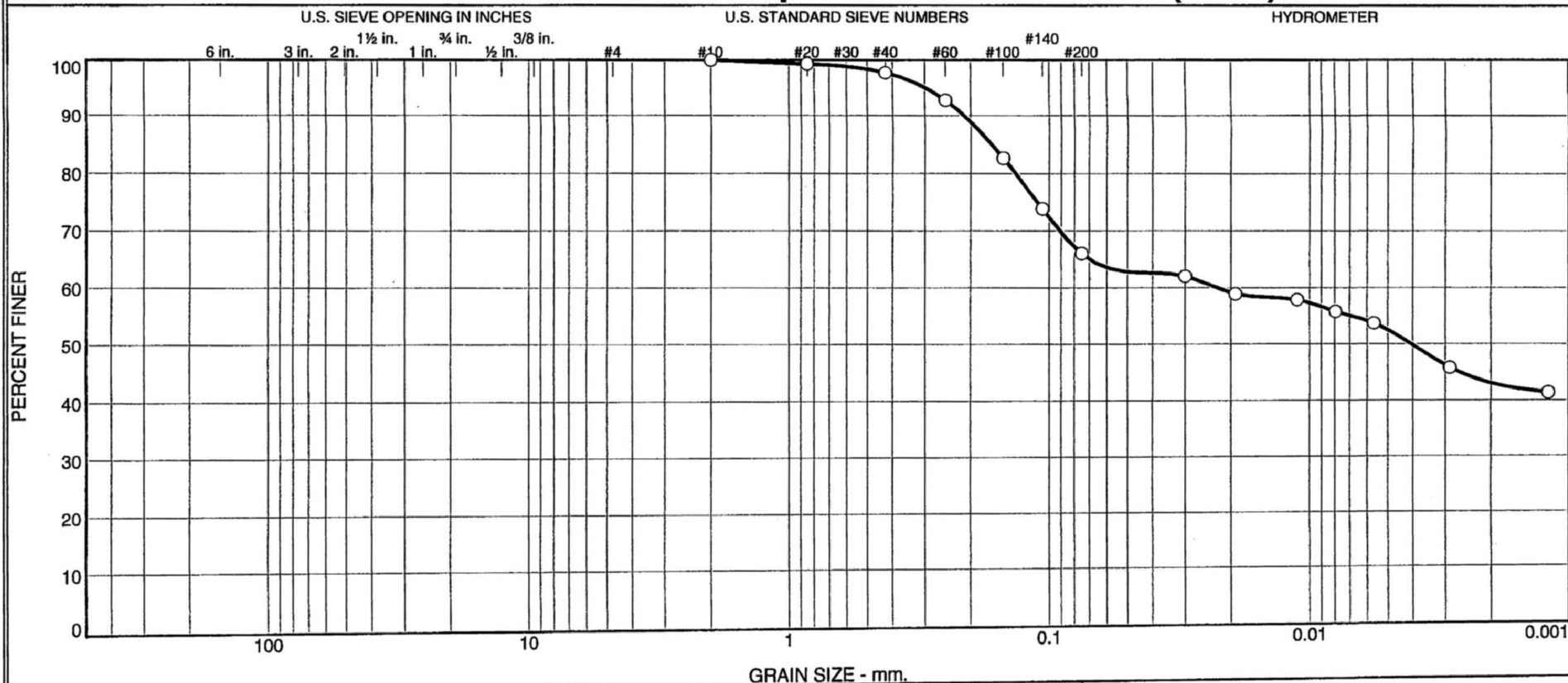
Run No.	1	2	3	4
Wet+Tare	22.94	23.38		
Dry+Tare	21.22	21.55		
Tare	15.55	15.49		
Moisture	30.3	30.2		

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
108.30	83.00	6.80	33.2

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	2.3	31.6	13.5	52.6

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2251	SS-18	73.5-75'	12-03-07	CL	Greenish Gray Sandy Lean CLAY	15.4	40	13

Client Bechtel		MACTEC, Inc.	○ Specific Gravity is assumed
Project Exelon Texas COL (Victoria)			
Project No. 6468071777	Figure 21A	Raleigh, North Carolina	

Tested By: CS

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-2251

Depth: 73.5-75'

Sample Number: SS-18

Material Description: Greenish Gray Sandy Lean CLAY

Date: 12-03-07

Natural Moisture: 15.4

Liquid Limit: 40

Plastic Limit: 13

USCS Class.: CL

Testing Remarks: Specific Gravity is assumed

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
232.60	0.00	0.00	#10	0.00	100.0
48.67	0.00	0.00	#20	0.34	99.3
			#40	1.10	97.7
			#60	3.54	92.7
			#100	8.43	82.7
			#140	12.72	73.9
			#200	16.51	66.1

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 48.66

Hygroscopic moisture correction:

Moist weight and tare = 28.77

Dry weight and tare = 28.40

Tare weight = 15.72

Hygroscopic moisture = 2.9%

Table of composite correction values:

Temp., deg. C: 12.3 27.3

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	R _m	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	22.4	34.0	29.7	0.0131	35.0	10.6	0.0300	62.1
5.00	22.4	32.5	28.2	0.0131	33.5	10.8	0.0192	59.0
15.00	22.4	32.0	27.7	0.0131	33.0	10.9	0.0111	57.9
30.00	22.4	31.0	26.7	0.0131	32.0	11.0	0.0079	55.8
60.00	22.4	30.0	25.7	0.0131	31.0	11.2	0.0056	53.7
240.00	23.0	26.0	21.9	0.0130	27.0	11.9	0.0029	45.7
1440.00	22.6	24.0	19.7	0.0130	25.0	12.2	0.0012	41.3

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Fractional Components

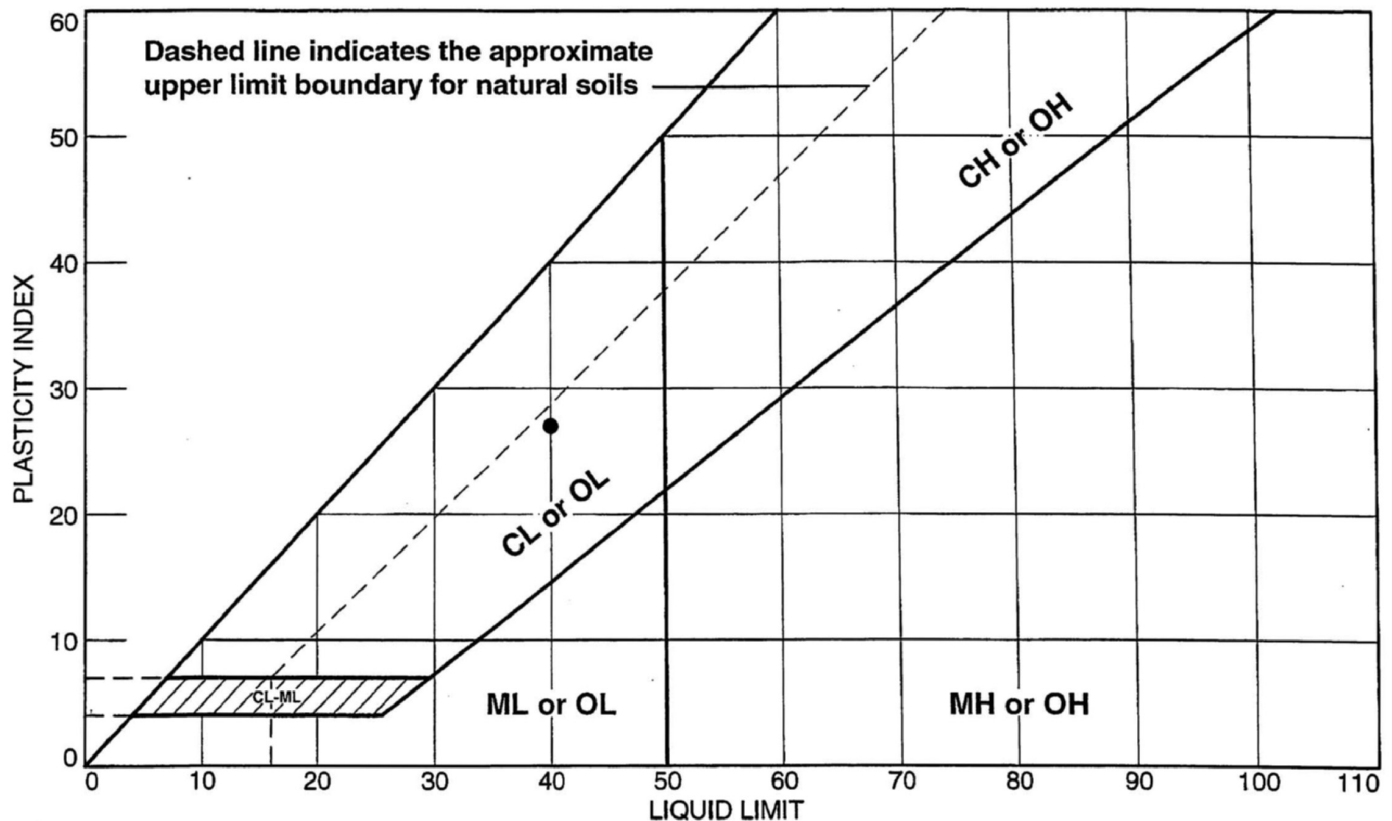
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.3	31.6	33.9	13.5	52.6	66.1

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0041	0.0224	0.1345	0.1658	0.2118	0.2992

Fineness Modulus
0.24

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-2251	SS-18	73.5-75'	15.4	13	40	27	CL

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project No.: 6468071777

Figure NA

Tested By: CS

Checked By: LBJ

DSC 1-25-08

LIQUID AND PLASTIC LIMIT TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2251

Depth: 73.5-75'

Sample Number: SS-18

Material Description: Greenish Gray Sandy Lean CLAY

USCS: CL

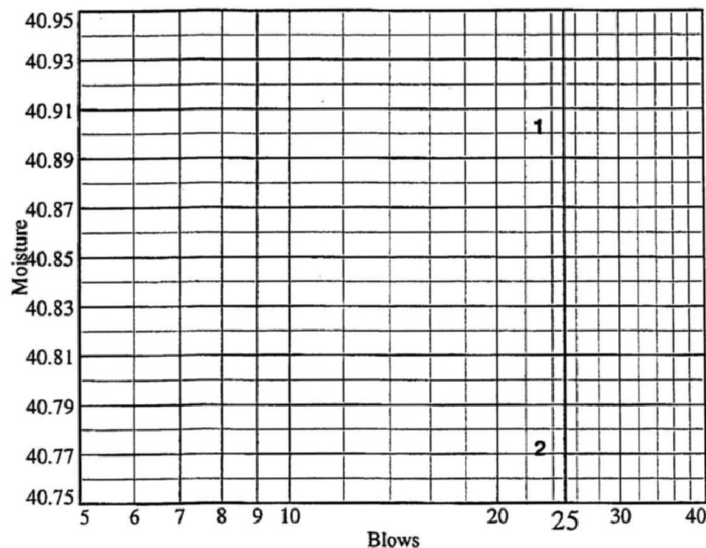
AASHTO: A-6(15)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.71	25.18				
Dry+Tare	22.81	22.33				
Tare	15.72	15.34				
# Blows	23	23				
Moisture	40.9	40.8				



Liquid Limit= 40
 Plastic Limit= 13
 Plasticity Index= 27
 Natural Moisture= 15.4
 Liquidity Index= 0.1

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	22.46	17.10		
Dry+Tare	21.70	16.42		
Tare	15.54	11.09		
Moisture	12.3	12.8		

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
117.70	102.90	6.80	15.4

MACTEC, Inc.

HYDROMETER



DSC 1-25-09

GRAIN SIZE DISTRIBUTION TEST DATA

1/24/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria)

Project Number: 6468071777

Location: Boring B-2251

Depth: 78.5-80'

Sample Number: SS-19

Material Description: Gray Sandy Lean CLAY

Date: 12-03-07

Natural Moisture: 18.3

Liquid Limit: 34

Plastic Limit: 15

USCS Class.: CL

Testing Remarks: Specific Gravity = 2.664 (ASTM D854-06)

Organic content = 4.6% (ASTM D2794-07)

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
196.17	0.00	0.00	#10	0.00	100.0
47.92	0.00	0.00	#20	0.06	99.9
			#40	0.61	98.7
			#60	3.34	93.0
			#100	9.16	80.9
			#140	14.82	69.1
			#200	19.31	59.7

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 47.92

Hygroscopic moisture correction:

Moist weight and tare = 26.52

Dry weight and tare = 26.25

Tare weight = 15.49

Hygroscopic moisture = 2.5%

Table of composite correction values:

Temp., deg. C: 12.3 27.3

Comp. corr.: -7.0 -3.0

Meniscus correction only = 1.0

Specific gravity of solids = 2.664

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	22.1	28.0	23.6	0.0132	29.0	11.5	0.0318	50.4
5.00	22.1	27.0	22.6	0.0132	28.0	11.7	0.0203	48.2
15.00	22.1	26.0	21.6	0.0132	27.0	11.9	0.0118	46.1
30.00	22.3	25.0	20.7	0.0132	26.0	12.0	0.0084	44.1
60.00	22.3	24.0	19.7	0.0132	25.0	12.2	0.0060	41.9
240.00	22.5	21.0	16.7	0.0132	22.0	12.7	0.0030	35.7
1440.00	21.9	19.0	14.6	0.0133	20.0	13.0	0.0013	31.0

MACTEC, Inc.

Fractonal 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	1.3	39.0	40.3	19.3	40.4	59.7

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0297	0.0760	0.1459	0.1725	0.2126	0.2850

Fineness Modulus
0.24