

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: 4/7/08

SAMPLE IDENTIFICATION: B-2321UD, UD-4

(A) Mass of oven-dried soil, grams:	50.10
(B) Mass of pycnometer filled with water at test temperature (T), grams:	655.71
(C) Mass of pycnometer, water and soil, grams:	687.40
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.6
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.721
(F) Correction factor:	0.99966
(G x F) SPECIFIC GRAVITY @ 20°C:	2.720

MATERIAL TESTED:

☒ X

- # 4

☐

- # 10

PREPARATION METHOD:

☒ X

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Fat CLAY (CH)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER : 5.1.01

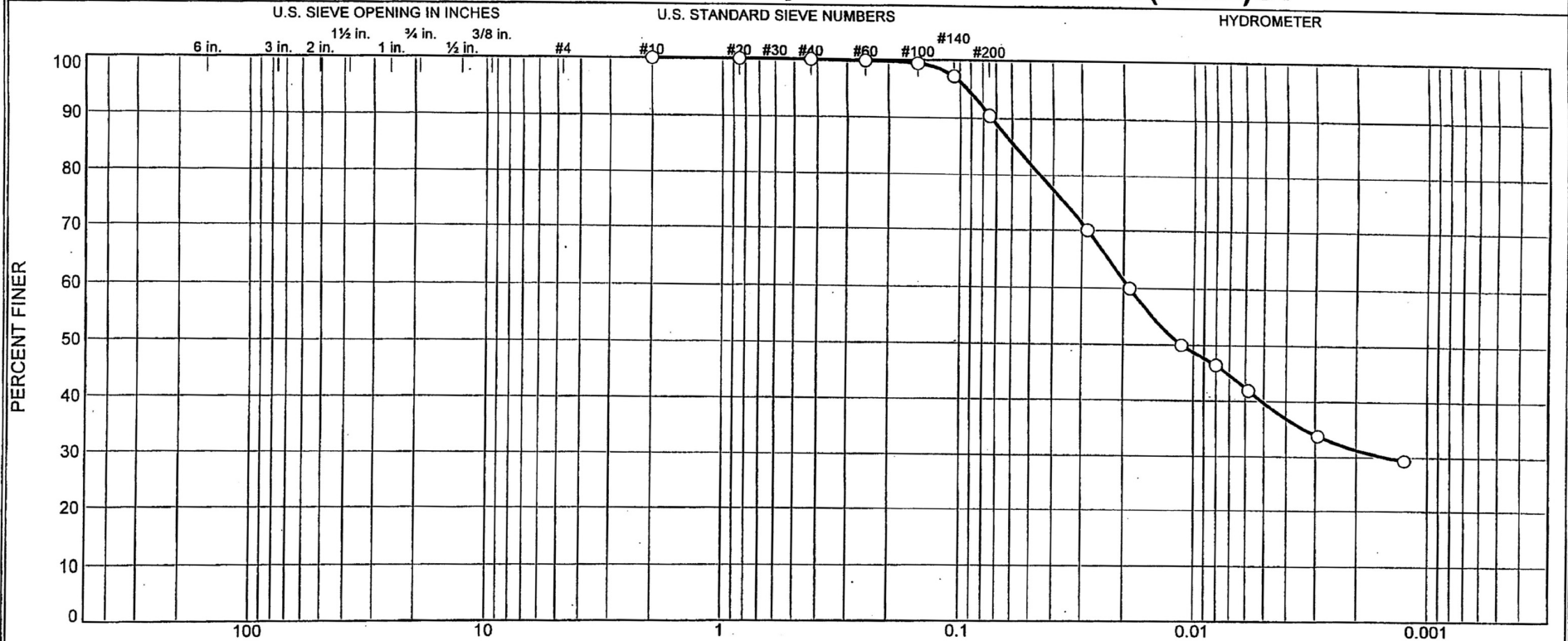
PYCNO METER : P-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/8/08

Particle Size Distribution Report / ASTM D422-63(2002)e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	9.5	50.7	39.7

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2321UD	UD-5	17.0-18.7	2/3/08	CL	Mottled Brownish Yellow and Light Gray Lean CLAY	19.1	40	15

Client Bechtel
 Project Exelon Texas COL (Victoria Reservoir)
 Project No. 6468071777

MACTEC, Inc.
Raleigh, North Carolina

○ Specific Gravity = 2.717 (ASTM D854-06)
 NM is average of values obtained from consolidation and triaxial test specimens

Figure *NA*

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Tested By: CS

Checked By: lbi

GRAIN SIZE DISTRIBUTION TEST DATA

5/7/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 17.0-18.7

Sample Number: UD-5

Material Description: Mottled Brownish Yellow and Light Gray Lean CLAY

Date: 2/3/08

Natural Moisture: 19.1

Liquid Limit: 40

Plastic Limit: 15

USCS Class.: CL

Testing Remarks: Specific Gravity = 2.717 (ASTM D854-06)

NM is average of values obtained from consolidation and triaxial test specimens

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
332.26	0.00	0.00	#10	0.00	100.0
50.19	0.00	0.00	#20	0.00	100.0
			#40	0.03	99.9
			#60	0.10	99.8
			#100	0.30	99.4
			#140	1.43	97.2
			#200	4.82	90.4

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 50.11

Hygroscopic moisture correction:

Moist weight and tare = 29.43

Dry weight and tare = 29.19

Tare weight = 15.78

Hygroscopic moisture = 1.8%

Table of composite correction values:

Temp., deg. C: 11.3 29.5

Comp. corr.: -8.0 -3.0

Meniscus correction only = 1.0

Specific gravity of solids = 2.717

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	22.2	40.0	35.0	0.0130	41.0	9.6	0.0285	70.0
5.00	22.2	35.0	30.0	0.0130	36.0	10.4	0.0188	60.0
15.00	22.2	30.0	25.0	0.0130	31.0	11.2	0.0113	50.0
30.00	22.9	28.0	23.2	0.0129	29.0	11.5	0.0080	46.4
60.00	21.9	26.0	20.9	0.0131	27.0	11.9	0.0058	41.9
250.00	21.8	22.0	16.9	0.0131	23.0	12.5	0.0029	33.8
1440.00	21.0	20.0	14.7	0.0132	21.0	12.9	0.0012	29.4

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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	0.1	9.5	9.6	50.7	39.7	90.4

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
			0.0015	0.0112	0.0187	0.0454	0.0581	0.0736	0.0931

Fineness Modulus
0.01

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Dashed line indicates the approximate upper limit boundary for natural soils

CH or OH

CL or OL

ML or OL

MH or OH

CL-ML

PLASTICITY INDEX

LIQUID LIMIT

SOIL DATA							
SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
• Boring B-2321UD	UD-5	17.0-18.7	19.1	15	40	25	CL

Figure NA

DCN# EXE808

LIQUID AND PLASTIC LIMIT TEST DATA

5/7/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 17.0-18.7

Sample Number: UD-5

Material Description: Mottled Brownish Yellow and Light Gray Lean CLAY

USCS: CL

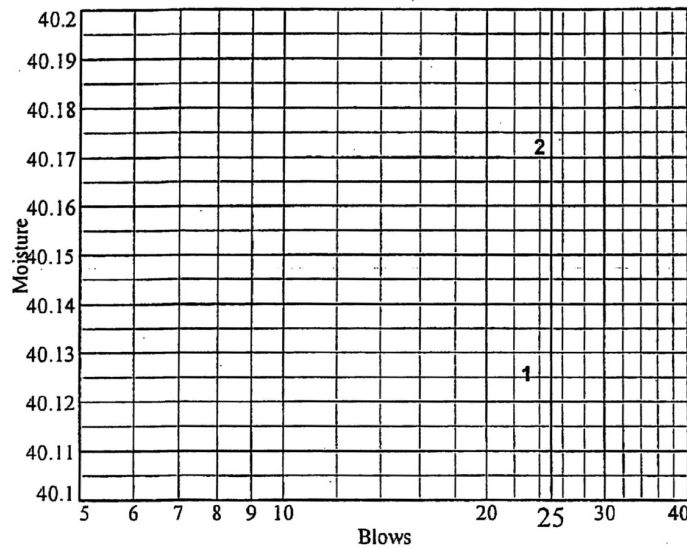
AASHTO: A-6(22)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	26.57	25.24				
Dry+Tare	23.38	22.44				
Tare	15.43	15.47				
# Blows	23	24				
Moisture	40.1	40.2				



Liquid Limit= 40
 Plastic Limit= 15
 Plasticity Index= 25
 Natural Moisture= 19.1
 Liquidity Index= 0.2

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.91	22.64			
Dry+Tare	21.12	21.68			
Tare	15.49	15.43			
Moisture	14.0	15.4			

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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: 3/12/08

SAMPLE IDENTIFICATION: B-2321UD, UD-5

(A) Mass of oven-dried soil, grams:	52.10
(B) Mass of pycnometer filled with water at test temperature (T), grams:	656.50
(C) Mass of pycnometer, water and soil, grams:	689.43
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.6
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.718
(F)	Correction factor: 0.99966
(G x F)	SPECIFIC GRAVITY @ 20°C: 2.717

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Lean CLAY (CL)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER : 5.1.01

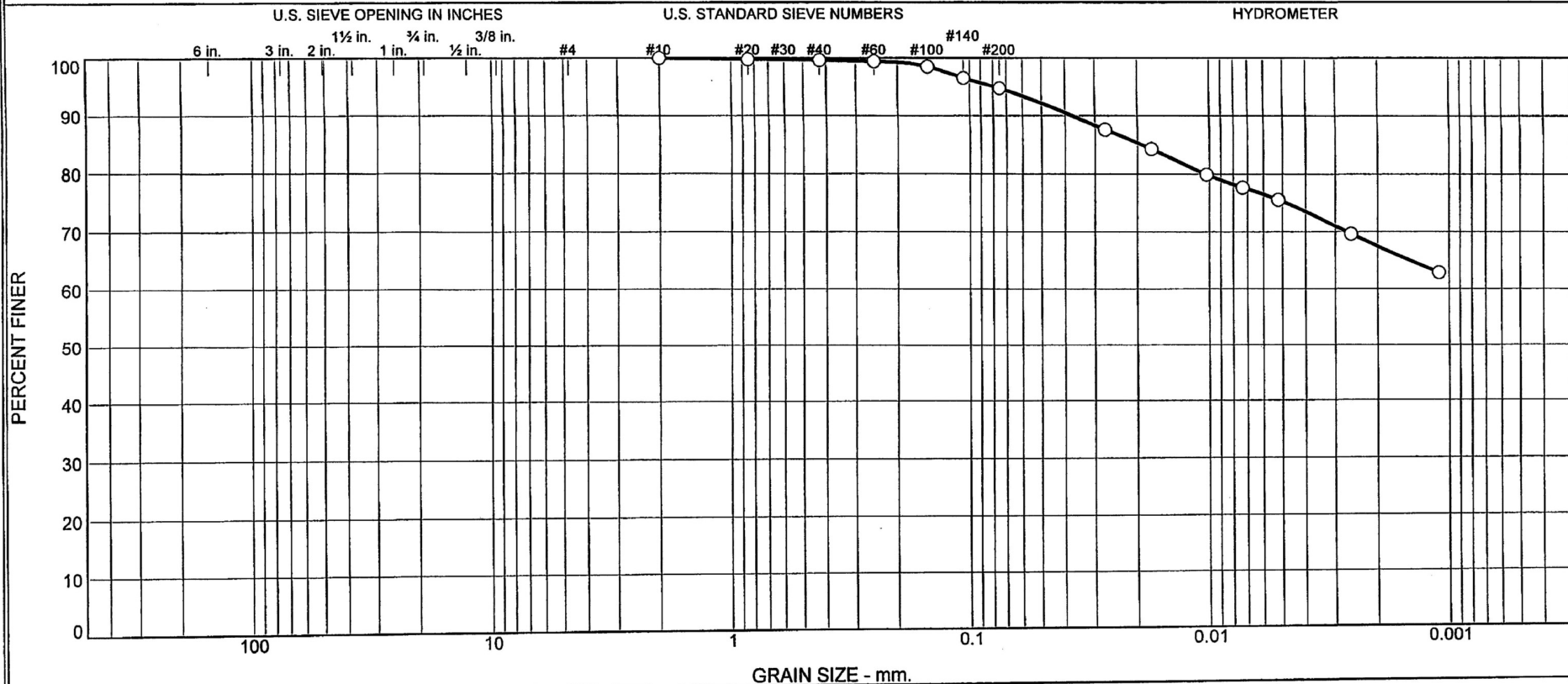
PYCNOMETER : P-6

TESTED BY: CS

REVIEWED BY: Brian Johnson

Kaw 5/8/08

Particle Size Distribution Report / ASTM D422-63(2002)e1



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	4.9	19.4	75.3

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2321UD	UD-6	28.50-30.20	2/3/08	CH	Mottled Brownish Yellow and Light Gray Fat CLAY	23.9	75	20

Client Bechtel		MACTEC, Inc. Raleigh, North Carolina	○ Specific Gravity = 2.719 (ASTM D854-06) NM obtained from consolidation test specimen
Project Exelon Texas COL (Victoria Reservoir)			
Project No. 6468071777	Figure <i>NA</i>		

KAW 5/8/08

GRAIN SIZE DISTRIBUTION TEST DATA

5/8/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 28.50-30.20

Sample Number: UD-6

Material Description: Mottled Brownish Yellow and Light Gray Fat CLAY

Date: 2/3/08

Natural Moisture: 23.9

Liquid Limit: 75

Plastic Limit: 20

USCS Class.: CH

Testing Remarks: Specific Gravity = 2.719 (ASTM D854-06)

NM obtained from consolidation test specimen

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
257.12	0.00	0.00	#10	0.00	100.0
47.56	0.00	0.00	#20	0.10	99.8
			#40	0.18	99.6
			#60	0.29	99.4
			#100	0.70	98.5
			#140	1.65	96.5
			#200	2.53	94.7

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample =100.0

Weight of hydrometer sample =47.56

Hygroscopic moisture correction:

Moist weight and tare = 24.89

Dry weight and tare = 23.99

Tare weight = 11.09

Hygroscopic moisture =7.0%

Table of composite correction values:

Temp., deg. C: 11.3 29.5

Comp. corr.: -8.0 -3.0

Meniscus correction only =1.0

Specific gravity of solids =2.719

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	22.5	44.5	39.6	0.0130	45.5	8.8	0.0272	87.7
5.00	22.5	43.0	38.1	0.0130	44.0	9.1	0.0175	84.3
15.00	22.5	41.0	36.1	0.0130	42.0	9.4	0.0103	79.9
30.00	22.5	40.0	35.1	0.0130	41.0	9.6	0.0073	77.7
60.00	22.7	39.0	34.1	0.0129	40.0	9.7	0.0052	75.6
250.00	23.8	36.0	31.4	0.0128	37.0	10.2	0.0026	69.6
1440.00	23.6	33.0	28.4	0.0128	34.0	10.7	0.0011	62.9

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Fractional Components

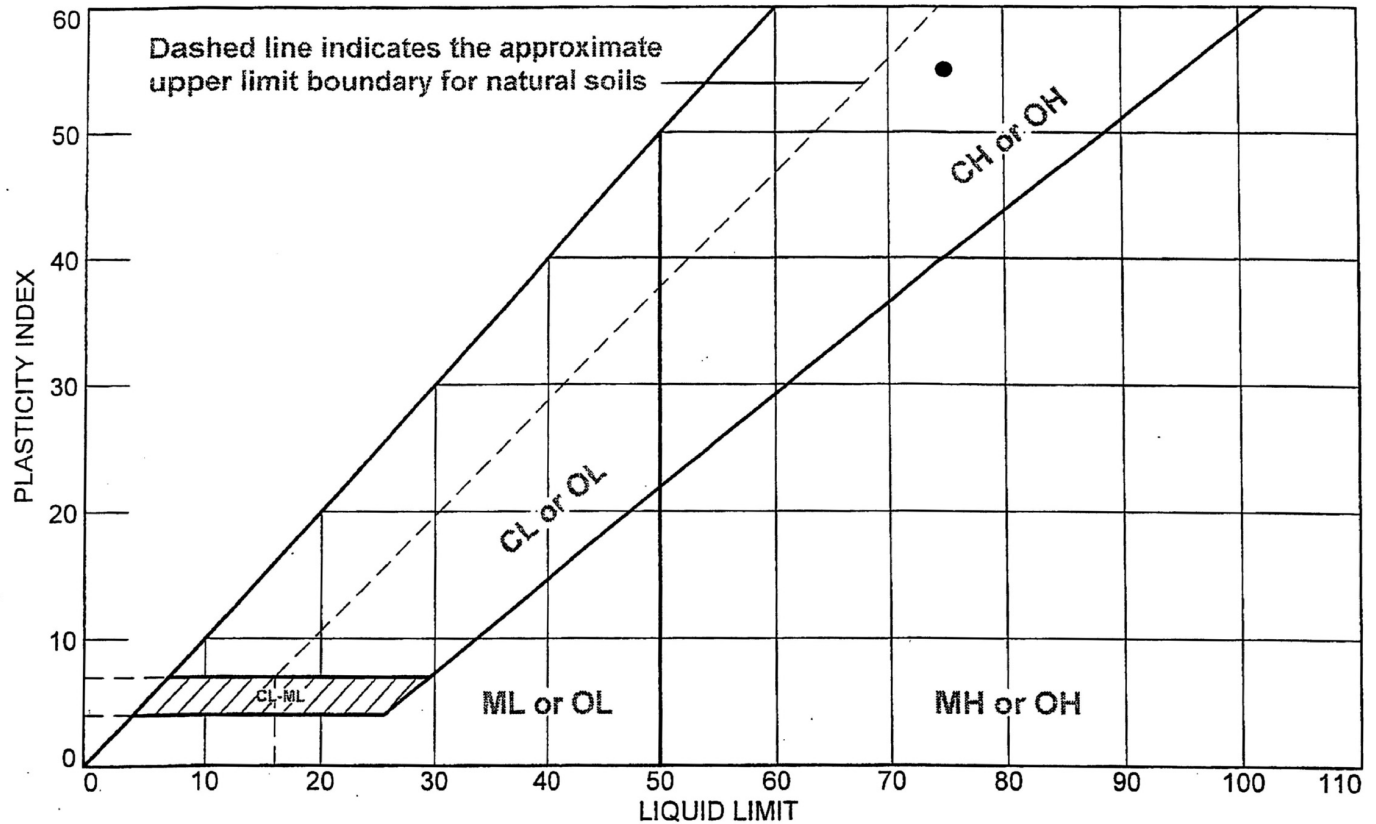
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.4	4.9	5.3	19.4	75.3	94.7

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0104	0.0190	0.0373	0.0796

Fineness Modulus
0.02

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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-2321UD	UD-6	28.50-30.20	23.9	20	75	55	CH

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project No.: 6468071777

Figure **NA**

Tested By: CS

Checked By: LBJ

Kaw 5/8/08

LIQUID AND PLASTIC LIMIT TEST DATA

5/7/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 28.50-30.20

Sample Number: UD-6

Material Description: Mottled Brownish Yellow and Light Gray Fat CLAY

USCS: CH

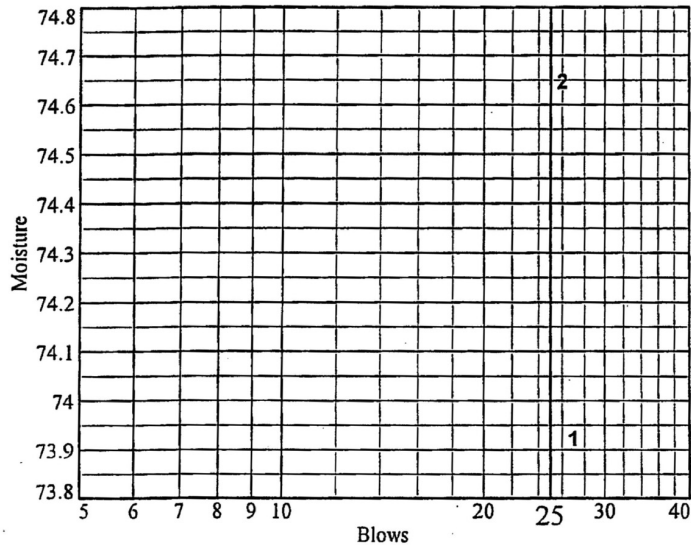
AASHTO: A-7-6(58)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.11	23.18				
Dry+Tare	19.85	20.00				
Tare	15.44	15.74				
# Blows	27	26				
Moisture	73.9	74.6				



Liquid Limit= 75
 Plastic Limit= 20
 Plasticity Index= 55
 Natural Moisture= 23.9
 Liquidity Index= 0.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.54	21.64			
Dry+Tare	20.53	20.58			
Tare	15.46	15.42			
Moisture	19.9	20.5			

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PROJECT NAME: EXELON COL PROJECT (VICTORIA)

PROJECT NUMBER: 6468071777

DATE: 4/7/08

SAMPLE IDENTIFICATION: B-2321UD, UD-6

(A) Mass of oven-dried soil, grams:	49.32
(B) Mass of pycnometer filled with water at test temperature (T), grams:	656.50
(C) Mass of pycnometer, water and soil, grams:	687.69
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.6
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.720
(F) <i>Correction factor:</i>	0.99966
(G x F) SPECIFIC GRAVITY @ 20°C:	2.719

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Fat CLAY (CH)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER : 5.1.01

PYCNOMETER : P-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

Kaw 5/8/08