

LIQUID AND PLASTIC LIMIT TEST DATA

5/7/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B2302UD

Depth: 120.5-122.5

Sample Number: UD-16

Material Description: Very Pale Brown Fat CLAY

USCS: CH

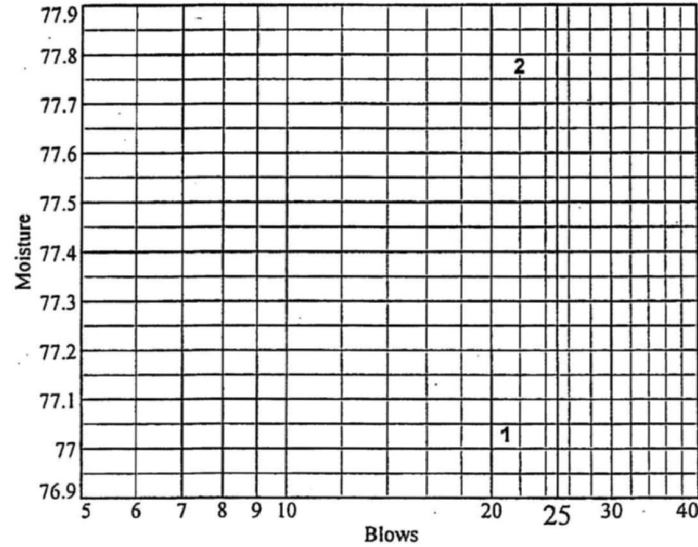
AASHTO: A-7-6(56)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	20.01	24.13				
Dry+Tare	16.12	20.35				
Tare	11.07	15.49				
# Blows	21	22				
Moisture	77.0	77.8				



Liquid Limit= 76
 Plastic Limit= 16
 Plasticity Index= 60
 Natural Moisture= 25.5
 Liquidity Index= 0.2

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.66	21.60			
Dry+Tare	20.79	20.77			
Tare	15.57	15.55			
Moisture	16.7	15.9			

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: 4/18/08

SAMPLE IDENTIFICATION: B-2302UD UD-16

(A) Mass of oven-dried soil, grams:	52.69
(B) Mass of pycnometer filled with water at test temperature (T), grams:	655.68
(C) Mass of pycnometer, water and soil, grams:	688.97
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.9
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.716
(F) Correction factor:	0.99959
(G x F) SPECIFIC GRAVITY @ 20°C:	2.715

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100%

Fat CLAY (CH)

EQUIPMENT USED

SCALES : 3.1.19

OVEN : 5.1.16

THERMOMETER : 5.1.01

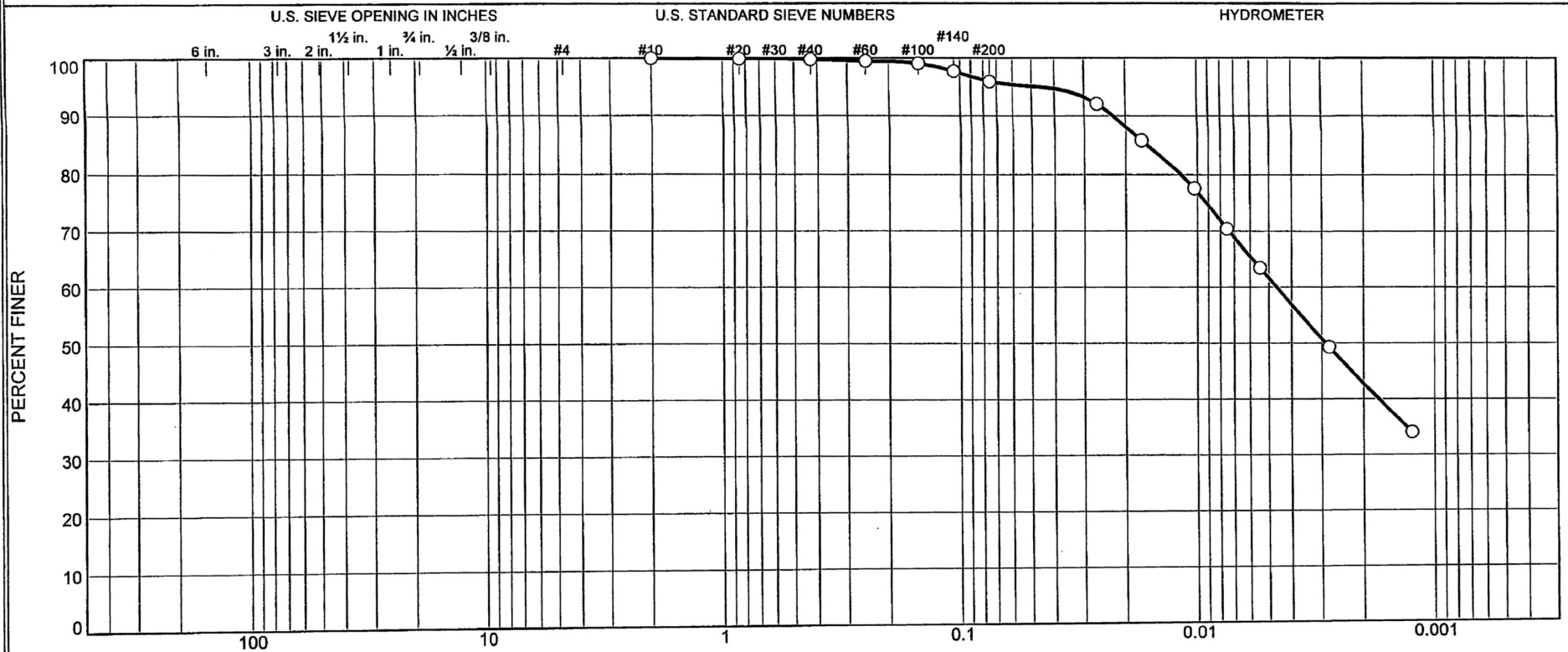
PYCNO METER : P-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/8/08

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



GRAIN SIZE - mm.								
% +3"	% Gravel		% Sand			% Fines		
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay	
0.0	0.0	0.0	0.0	0.2	4.0	34.1	61.7	

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2302UD	UD-19	145.5-147.3	2/7/08	CL	Pale Brown Lean CLAY	19.4	49	15

Client Bechtel
Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777

Figure *NA*

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Raleigh, North Carolina

○ Specific Gravity = 2.688 (ASTM D854-06)
ND = Not determined
NM determined from consolidation test specimen

KAW 5/12/08

Tested By: CS

Checked By: LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/12/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2302UD

Depth: 145.5-147.3

Sample Number: UD-19

Material Description: Pale Brown Lean CLAY

Date: 2/7/08

Natural Moisture: 19.4

Liquid Limit: 49

Plastic Limit: 15

USCS Class.: CL

Testing Remarks: Specific Gravity = 2.688 (ASTM D854-06)

ND = Not determined

NM determined 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
379.08	0.00	0.00	#10	0.00	100.0
50.41	0.00	0.00	#20	0.05	99.9
			#40	0.12	99.8
			#60	0.26	99.5
			#100	0.47	99.1
			#140	1.17	97.7
			#200	2.11	95.8

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 50.41

Hygroscopic moisture correction:

Moist weight and tare = 28.30

Dry weight and tare = 27.76

Tare weight = 15.43

Hygroscopic moisture = 4.4%

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 = 2.688

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	21.5	50.0	44.8	0.0132	51.0	7.9	0.0264	92.0
5.00	21.5	47.0	41.8	0.0132	48.0	8.4	0.0172	85.8
15.00	21.5	43.0	37.8	0.0132	44.0	9.1	0.0103	77.6
30.00	21.5	39.5	34.3	0.0132	40.5	9.7	0.0075	70.4
60.00	21.9	36.0	30.9	0.0132	37.0	10.2	0.0054	63.5
250.00	22.3	29.0	24.0	0.0131	30.0	11.4	0.0028	49.3
1440.00	20.7	22.0	16.6	0.0134	23.0	12.5	0.0012	34.0

MACTEC, Inc.

Fractional Components

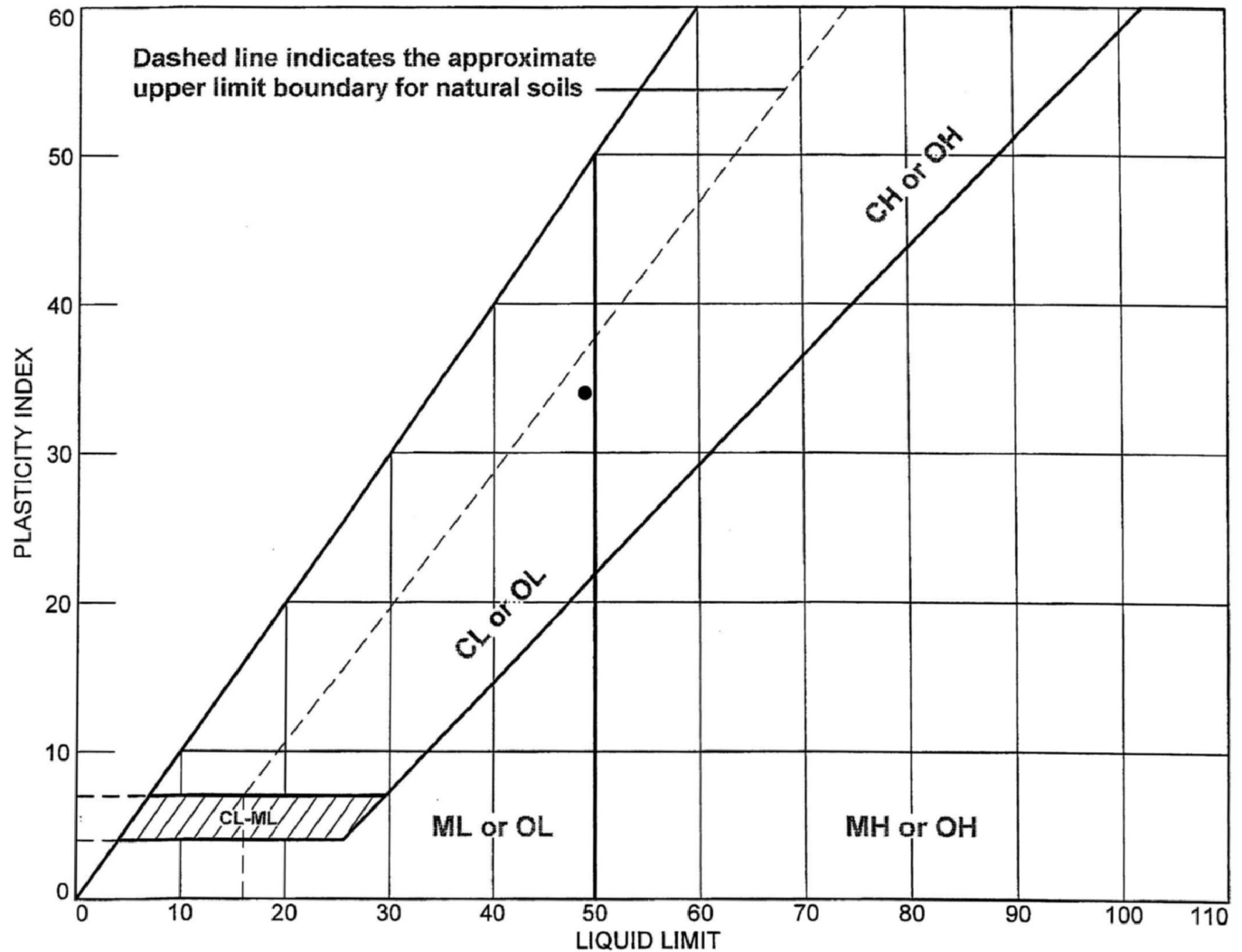
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.2	4.0	4.2	34.1	61.7	95.8

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0029	0.0046	0.0117	0.0163	0.0226	0.0511

Fineness Modulus
0.02

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LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	Boring B-2302UD	UD-19	145.5-147.3	19.4	15	49	34	CL

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project No.: 6468071777

Figure NA

KAW 5/12/09

Tested By: CS

Checked By: LBJ

LIQUID AND PLASTIC LIMIT TEST DATA

5/12/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2302UD

Depth: 145.5-147.3

Sample Number: UD-19

Material Description: Pale Brown Lean CLAY

USCS: CL

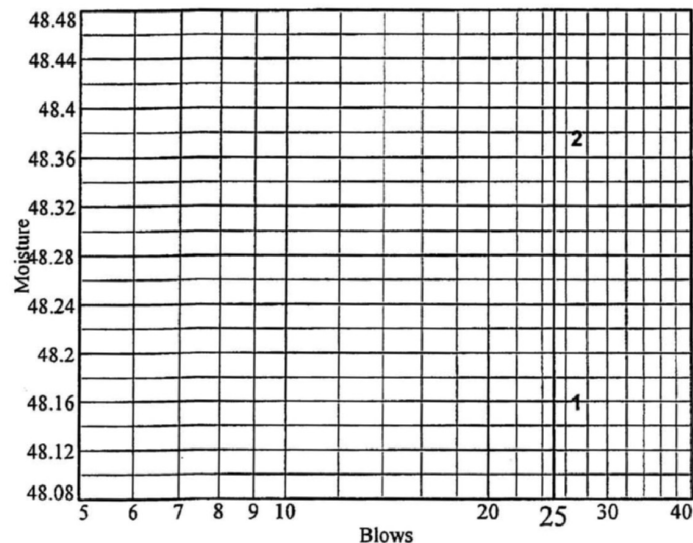
AASHTO: A-7-6(34)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.02	36.03				
Dry+Tare	25.31	29.33				
Tare	15.53	15.48				
# Blows	27	27				
Moisture	48.2	48.4				



Liquid Limit= 49
 Plastic Limit= 15
 Plasticity Index= 34
 Natural Moisture= 19.4
 Liquidity Index= 0.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	23.34	23.90			
Dry+Tare	22.30	22.23			
Tare	15.56	11.29			
Moisture	15.4	15.3			

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: 5/7/08

SAMPLE IDENTIFICATION: B-2302UD UD-19

(A) Mass of oven-dried soil, grams:	50.13
(B) Mass of pycnometer filled with water at test temperature (T), grams:	655.75
(C) Mass of pycnometer, water and soil, grams:	687.24
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.3
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.689
(F) <i>Correction factor:</i>	0.99972
(G x F) SPECIFIC GRAVITY @ 20°C:	2.688

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100%

Lean CLAY (CL)

EQUIPMENT USED

SCALES : 3.1.19

OVEN : 5.1.16

THERMOMETER : 5.1.01

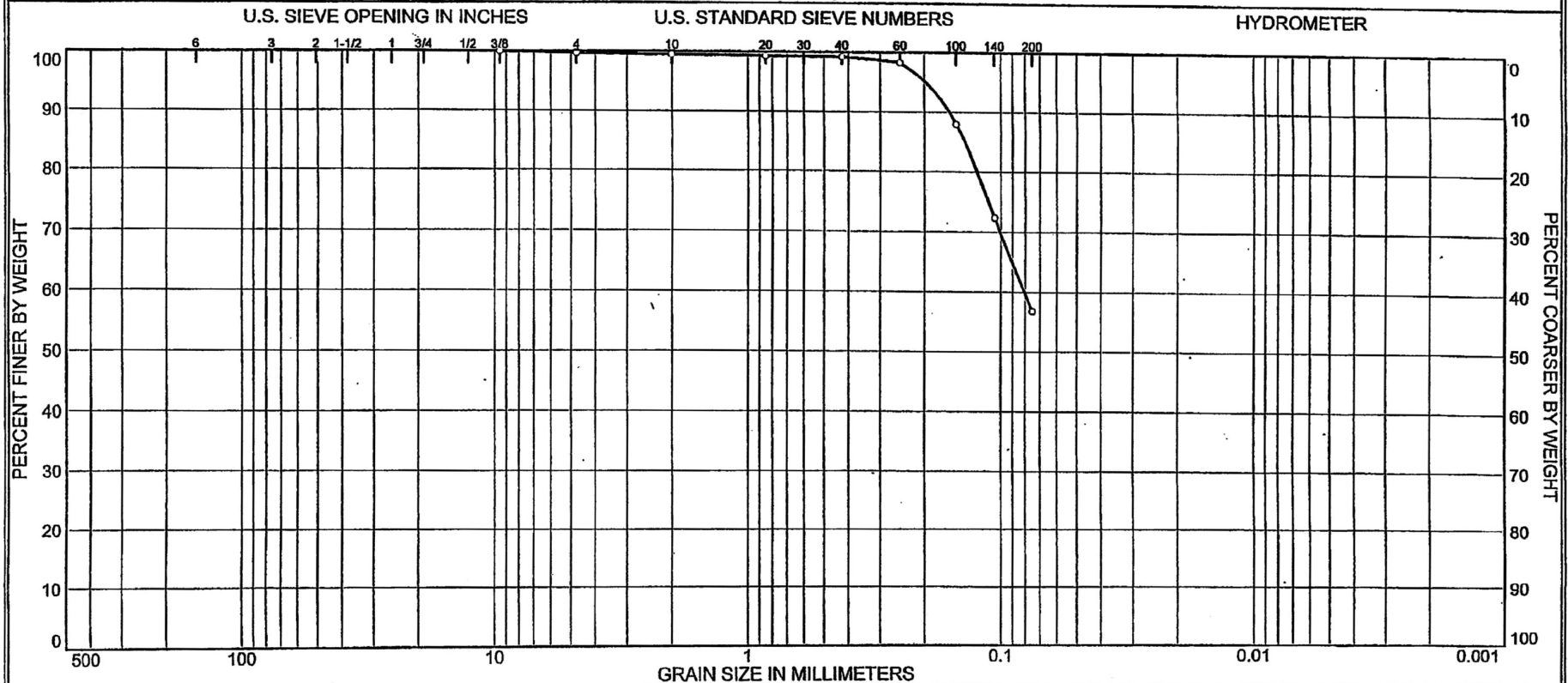
PYCNOMETER : P-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/12/08

Particle Size Distribution Report ASTM D6913-04 e1



% COBBLES	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.3	0.2	0.3	42.4	56.8	

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
B-2304UD	UD-2	11-13.3 Ft	1/30/08	ML	Light Yellowish Brown Sandy SILT (Visual)	11.9	ND	ND

Client Bechtel		MACTEC ENGINEERING AND CONSULTING, INC.	Tested by: EH Reviewed by: HJ Sieve Analysis Only NM value from average of strength tests performed. Specific Gravity = 2.74 (ASTM D 854-06) ND = Not Determined
Project Exelon Texas COL (Victoria)			
Project No. 6468-07-1777	Lab No. 8348		

KAW 4.15.06

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2304UD
Sample No.: UD-2
Elev. or Depth: 11-13.3 Ft Sample Length(in./cm.): ID#8348
Location: B-2304UD
Description: Light Yellowish Brown Sandy SILT (Visual)
Date: 1/30/08 PL: ND LL: ND PI: ND
USCS Classification: ML AASHTO Classification:
Testing Remarks: Tested by: EH Reviewed by: HJ

Sieve Analysis Only
NM value from average of strength tests performed.
Specific Gravity = 2.74 (ASTM D 854-06)
ND = Not Determined

Mechanical Analysis Data

Sieve	Cumul. Wt. retained	Percent finer
Dry sample and tare=	Initial 262.57	
Tare =	113.89	
Dry sample weight =	148.68	
Tare for cumulative weight retained=	.00	
.375 inch	0.00	100.0
# 4	0.44	99.7
# 10	0.81	99.5
# 20	1.00	99.3
# 40	1.18	99.2
# 60	2.53	98.3
# 100	17.81	88.0
# 140	41.14	72.3
# 200	64.17	56.8

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = 0.3 (% coarse = % fine = 0.3)
% SAND = 42.9 (% coarse = 0.2 % medium = 0.3 % fine = 42.4)
% FINES = 56.8

D₈₅= 0.14 D₆₀= 0.08

MACTEC ENGINEERING AND CONSULTING, INC.

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-2304UD, UD-2 @ 11-13.3 Ft.

(A) Mass of oven-dried soil, grams:	37.32
(B) Mass of pycnometer filled with water at test temperature (T), grams:	365.95
(C) Mass of pycnometer, water and soil, grams:	389.64
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	24.7
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$
(F) Correction factor:	0.99892
(G x F)	SPECIFIC GRAVITY @ 20°C: 2.735

MATERIAL TESTED:

☐

- # 4

☒

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Sandy SILT (ML) - Visual

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNO METER : 2193

TESTED BY: EH

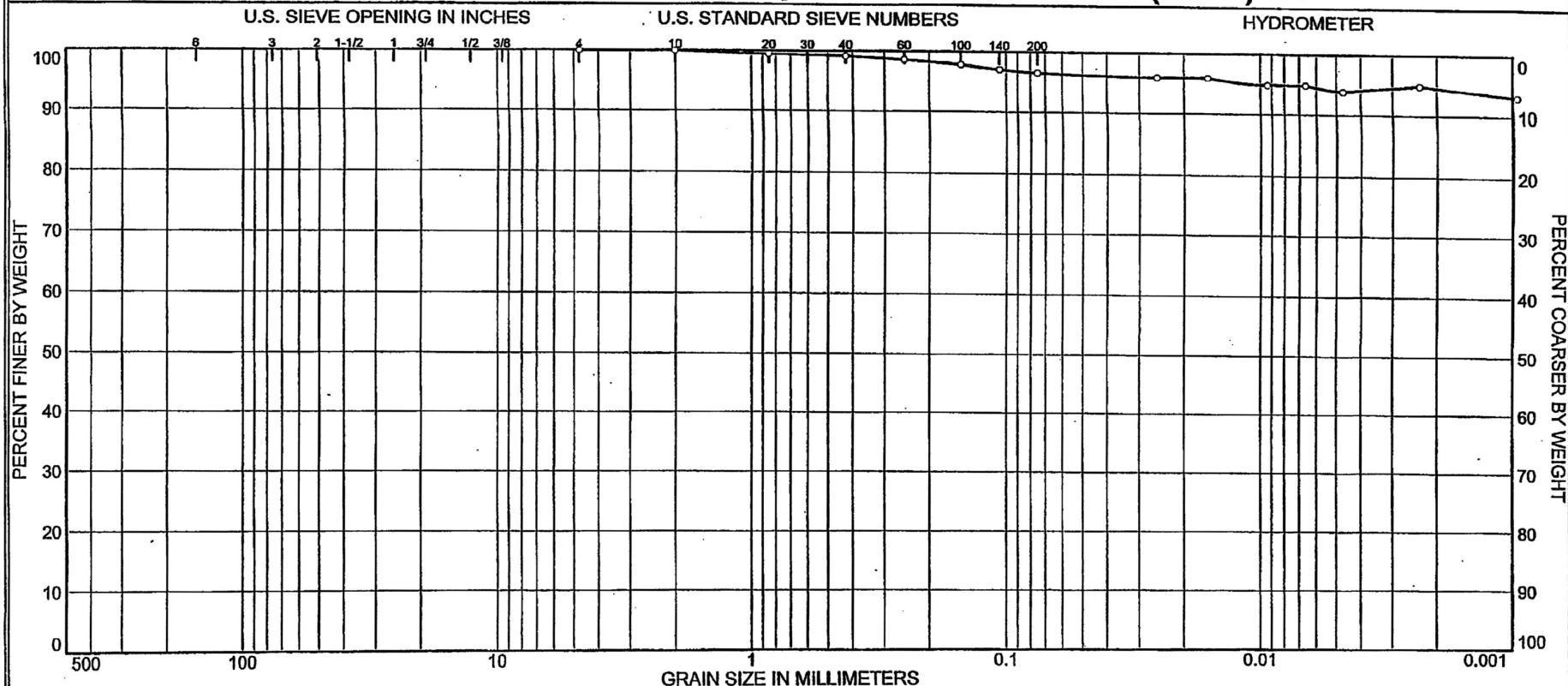
\\Test Reports\\Soils\\SPECIFIC GRAVITY(ref).xls

REVIEWED BY:

Harry Johnson

KAW 4-15-08

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

[illegible]

Client Bechtel	
Project Exelon Texas COL (Victoria)	
Project No. 6468-07-1777	Lab No. 8349

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

○ Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.78 (ASTM D 854-06)

KAW 4-15-08

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2304UD
Sample No.: UD-7
Elev. or Depth: 73.5-75.5 Ft **Sample Length(in./cm.):** ID#8349
Location: B-2304UD
Description: Mottled Brownish Yellow and Pale Yellow Elastic SILT
Date: 1/31/08 **PL:** 34 **LL:** 69 **PI:** 35
USCS Classification: MH **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.78 (ASTM D 854-06)

Mechanical Analysis Data

	Initial	
Dry sample and tare=	61.70	
Tare =	15.31	
Dry sample weight =	46.39	
Tare for cumulative weight retained=	.00	
Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.26	99.4
# 40	0.42	99.1
# 60	0.65	98.6
# 100	1.04	97.8
# 140	1.37	97.0
# 200	1.61	96.5

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 96.5
Weight of hydrometer sample: 44.78
Calculated biased weight= 46.40
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.777
Specific gravity correction factor= 0.973
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.8	50.5	45.7	0.0127	50.5	8.0	0.0254	95.9
5.00	22.8	50.5	45.7	0.0127	50.5	8.0	0.0161	95.9
15.00	22.8	50.0	45.2	0.0127	50.0	8.1	0.0093	94.8
30.00	22.8	50.0	45.2	0.0127	50.0	8.1	0.0066	94.8
60.00	22.8	49.5	44.7	0.0127	49.5	8.2	0.0047	93.8
240.00	22.8	50.0	45.2	0.0127	50.0	8.1	0.0023	94.8
1440.00	23.3	49.0	44.3	0.0126	49.0	8.3	0.0010	93.0

Fractional Components

Gravel/Sand based on #4

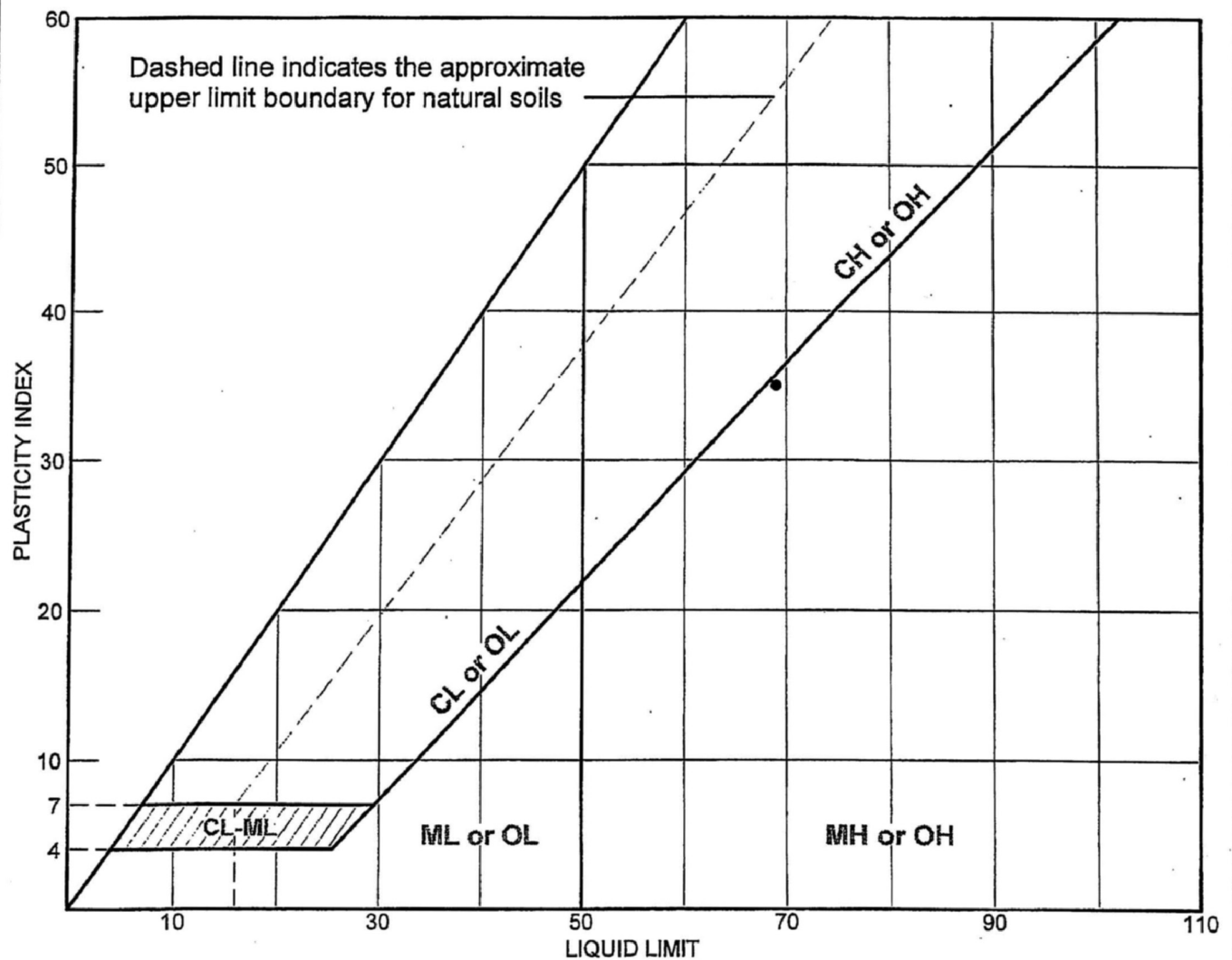
Sand/Fines based on #200

% COBBLES = % GRAVEL =

% SAND = 3.5 (% coarse = 0.0 % medium = 0.9 % fine = 2.6)

% SILT = 2.6 % CLAY = 93.9 (% CLAY COLLOIDS = 93.1)

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-2304UD	UD-7	73.5-75.5 Ft	27.6	34	69	35	MH

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project No.: 6468-07-1777

Lab No. 8349

LIQUID AND PLASTIC LIMIT TEST DATA

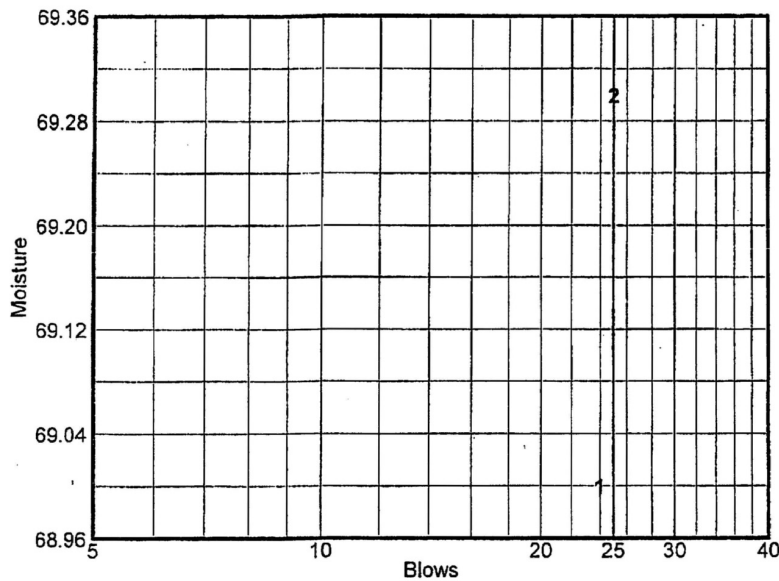
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2304UD
Sample No.: UD-7
Elev. or Depth: 73.5-75.5 Ft Sample Length(in./cm.): ID#8349
Location: B-2304UD
Description: Mottled Brownish Yellow and Pale Yellow Elastic SILT
Water Content: 27.6 USCS: MH AASHTO:

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.20	30.88				
Dry+Tare	26.63	26.73				
Tare	20.01	20.74				
# Blows	24	25				
Moisture	69.0	69.3				



Liquid Limit= 69
Plastic Limit= 34
Plasticity Index= 35

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	29.26	27.25			
Dry+Tare	27.06	25.42			
Tare	20.50	20.03			
Moisture	33.5	34.0			

MACTEC ENGINEERING AND CONSULTING, INC.

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-2304UD, UD-7 @ 73.5-75.5 Ft.

(A) Mass of oven-dried soil, grams:	36.70
(B) Mass of pycnometer filled with water at test temperature (T), grams:	341.30
(C) Mass of pycnometer, water and soil, grams:	364.79
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	22.2
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.778
(F) Correction factor:	0.99952
(G x F) SPECIFIC GRAVITY @ 20°C:	2.777

MATERIAL TESTED:

☐

- # 4

☒

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Elastic SILT (MH)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNO METER : 2055

TESTED BY: EH

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

REVIEWED BY:

Harry Johnson

KA W 4.15.08

HYDROMETER



Checked By: LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/8/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B2304UD

Depth: 83.5-85.5

Sample Number: UD-8

Material Description: Mottled Brownish Yellow and Pale Yellow Fat CLAY

Date: 1/3/08

Natural Moisture: 30.2

Liquid Limit: 61

Plastic Limit: 26

USCS Class.: CH

Testing Remarks: Specific Gravity = 2.712 (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
257.49	0.00	0.00	3/8"	0.00	100.0
			#4	0.35	99.9
			#10	0.69	99.7
50.46	0.00	0.00	#20	0.39	99.0
			#40	0.66	98.4
			#60	1.41	96.9
			#100	2.16	95.5
			#140	2.65	94.5
			#200	3.03	93.7

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample =99.7

Weight of hydrometer sample =50.46

Hygroscopic moisture correction:

Moist weight and tare = 27.39

Dry weight and tare = 26.67

Tare weight = 15.42

Hygroscopic moisture =6.4%

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 =2.712

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	22.0	49.0	43.9	0.0131	50.0	8.1	0.0263	91.1
5.00	22.0	48.0	42.9	0.0131	49.0	8.3	0.0168	89.1
15.00	22.0	47.0	41.9	0.0131	48.0	8.4	0.0098	87.0
30.00	21.7	46.0	40.9	0.0131	47.0	8.6	0.0070	84.7
60.00	21.6	45.0	39.8	0.0131	46.0	8.8	0.0050	82.6
330.00	21.6	43.5	38.3	0.0131	44.5	9.0	0.0022	79.5
1440.00	21.1	40.0	34.7	0.0132	41.0	9.6	0.0011	72.0

MACTEC, Inc.

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.2	1.3	4.7	6.2	11.1	82.6	93.7

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0024	0.0073	0.0206	0.1277

Fineness Modulus
0.09

MACTEC, Inc.