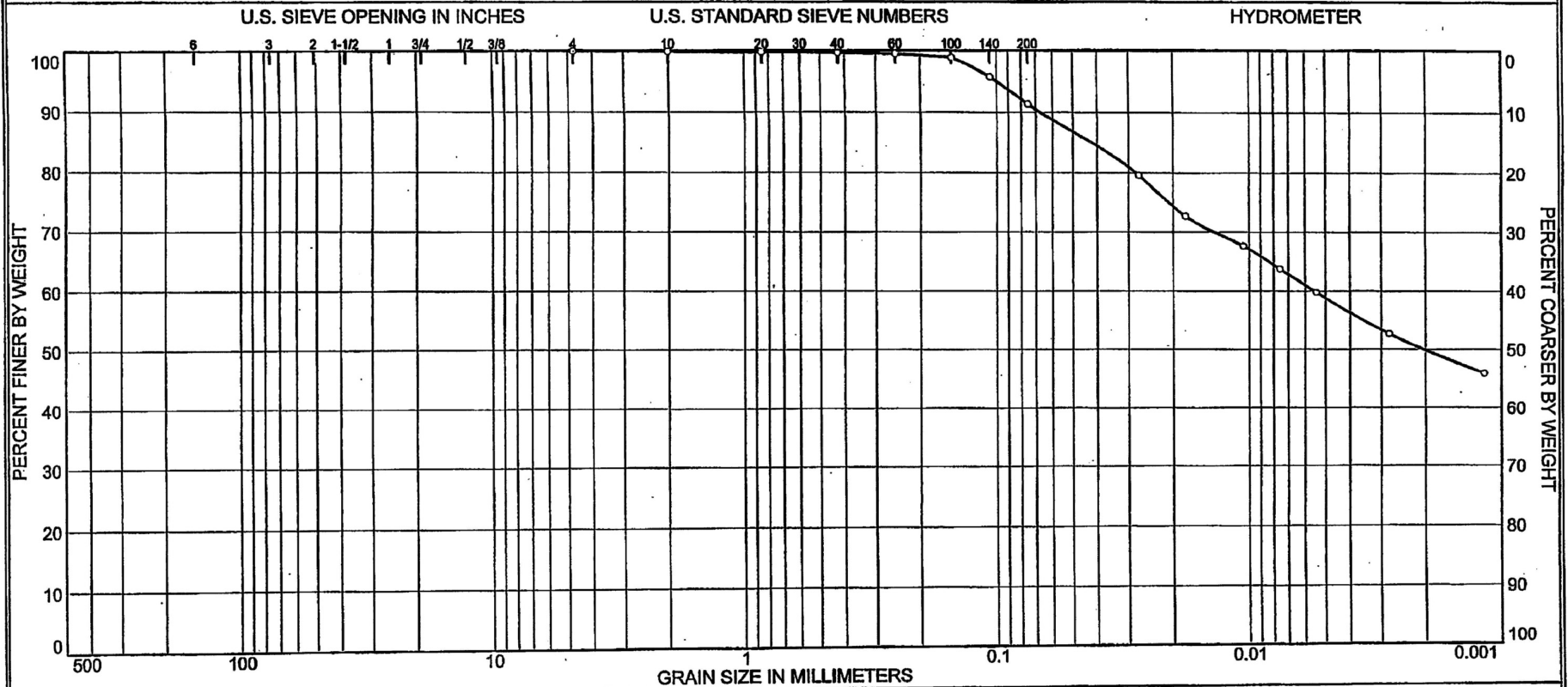


Particle Size Distribution Report ASTM D 422-63 (2002) e1



% COBBLES	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.1	0.2	8.4	32.5	58.8

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
B-2321UD	UD-7	38.5-40.2 Ft	2/3/08	CH	Very Pale Brown Mottled Brownish Yellow Fat CLAY	21.3	60	23

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777

Lab No. 8358

**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 5/9/08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2321UD
Sample No.: UD-7
Elev. or Depth: 38.5-40.2 Ft Sample Length(in./cm.): ID#8358
Location: B-2321UD
Description: Very Pale Brown Mottled Brownish Yellow Fat CLAY
Date: 2/3/08 PL: 23 LL: 60 PI: 37
USCS Classification: CH 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

Sieve	Cumul. Wt. retained	Percent finer
Initial		
Dry sample and tare=	192.62	
Tare =	142.53	
Dry sample weight =	50.09	
Tare for cumulative weight retained= .00		
# 4	0.00	100.0
# 10	0.03	99.9
# 20	0.11	99.8
# 40	0.16	99.7
# 60	0.23	99.5
# 100	0.57	98.9
# 140	2.13	95.7
# 200	4.37	91.3

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 91.3
Weight of hydrometer sample: 45.72
Calculated biased weight= 50.08
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.7
Specific gravity correction factor= 0.989
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	23.1	45.0	40.3	0.0129	45.0	8.9	0.0273	79.6
5.00	23.1	41.5	36.8	0.0129	41.5	9.5	0.0178	72.7
15.00	23.1	39.0	34.3	0.0129	39.0	9.9	0.0105	67.7
30.00	23.1	37.0	32.3	0.0129	37.0	10.2	0.0076	63.8
60.00	23.1	35.0	30.3	0.0129	35.0	10.6	0.0054	59.8
240.00	22.8	31.5	26.7	0.0130	31.5	11.1	0.0028	52.7
1440.00	23.1	28.0	23.3	0.0129	28.0	11.7	0.0012	46.0

Fractional Components

Gravel/Sand based on #4

Sand/Fines based on #200

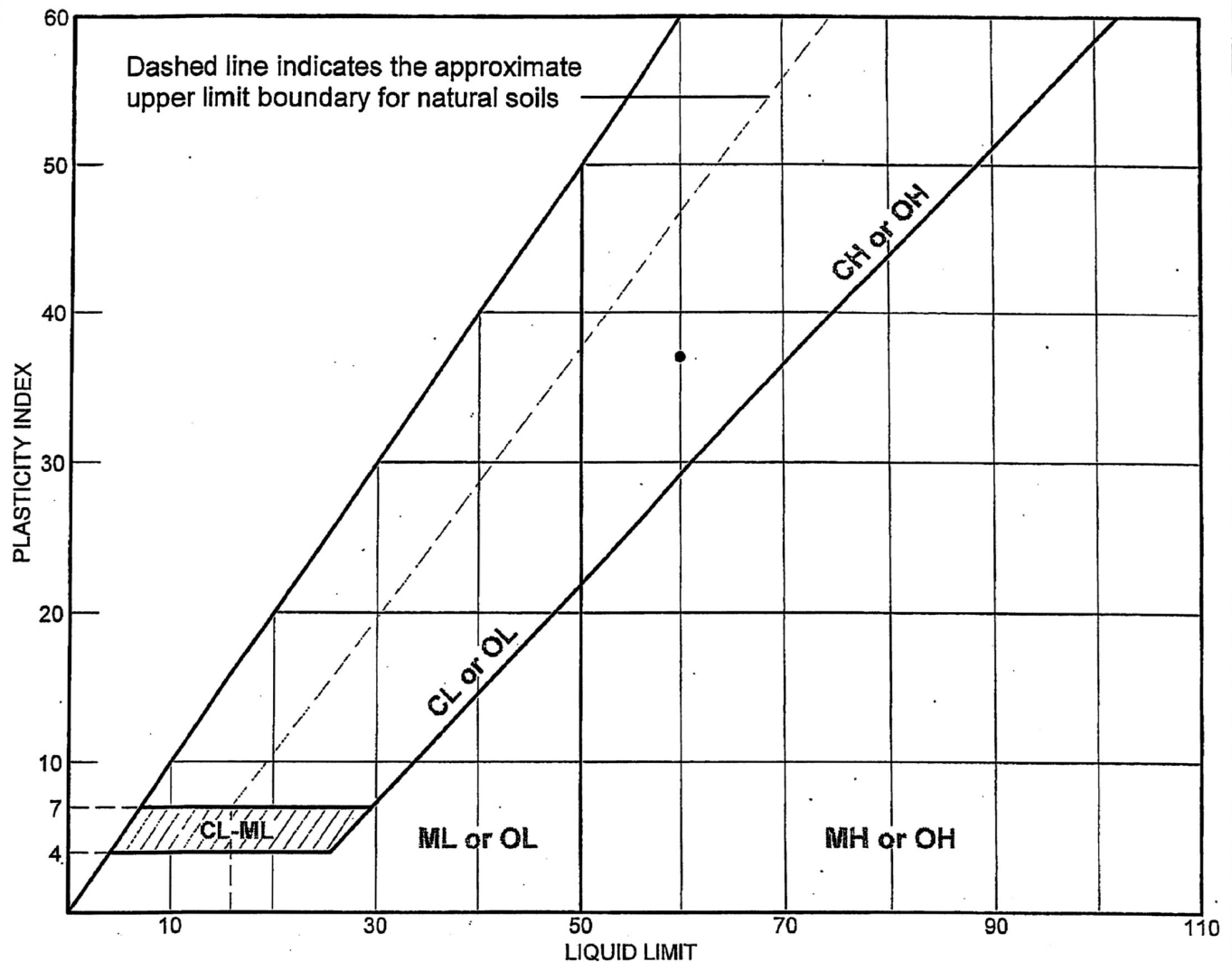
% COBBLES = % GRAVEL =

% SAND = 8.7 (% coarse = 0.1 % medium = 0.2 % fine = 8.4)

% SILT = 32.5 % CLAY = 58.8

D₈₅ = 0.04 D₆₀ = 0.01 D₅₀ = 0.00

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-2321UD	UD-7	38.5-40.2 Ft	21.3	23	60	37	CH

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

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

Lab No. 8358

Kaw 5/9/08

LIQUID AND PLASTIC LIMIT TEST DATA

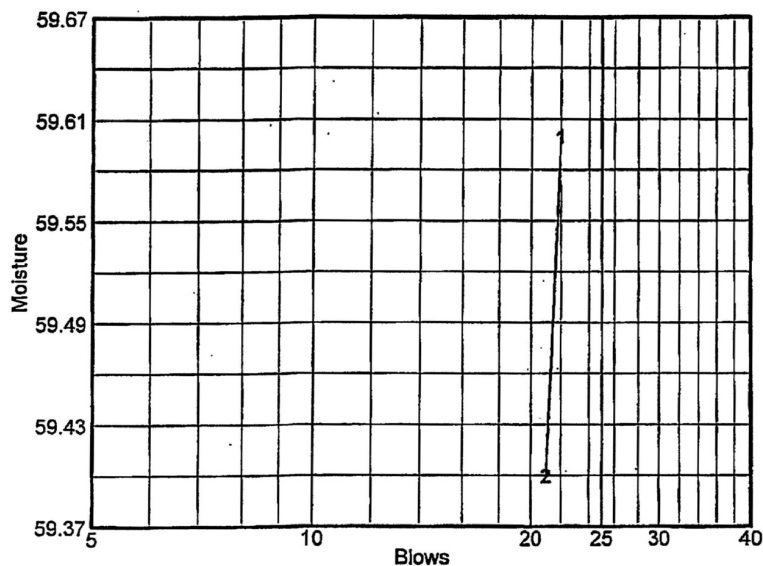
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2321UD
Sample No.: UD-7
Elev. or Depth: 38.5-40.2 Ft Sample Length(in./cm.): ID#8358
Location: B-2321UD
Description: Very Pale Brown Mottled Brownish Yellow Fat CLAY
Water Content: 21.3 USCS: CH AASHTO:

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.34	31.22				
Dry+Tare	27.82	27.19				
Tare	20.24	20.4				
# Blows	22	21				
Moisture	59.6	59.4				



Liquid Limit= 60
Plastic Limit= 23
Plasticity Index= 37

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	29.59	28.18		
Dry+Tare	28.09	26.81		
Tare	21.37	20.83		
Moisture	22.3	22.9		

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-2321UD, UD-7 @ 38.5-40.2 Ft.

(A) Mass of oven-dried soil, grams:	37.59
(B) Mass of pycnometer filled with water at test temperature (T), grams:	341.05
(C) Mass of pycnometer, water and soil, grams:	365.14
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	25.3
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.784
(F) Correction factor:	0.99876
(G x F) SPECIFIC GRAVITY @ 20°C:	2.781

MATERIAL TESTED:

☐ - # 4

☒ - # 10

PREPARATION METHOD:

☒ DRY

☐ WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Fat CLAY (CH)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNO METER : 2055

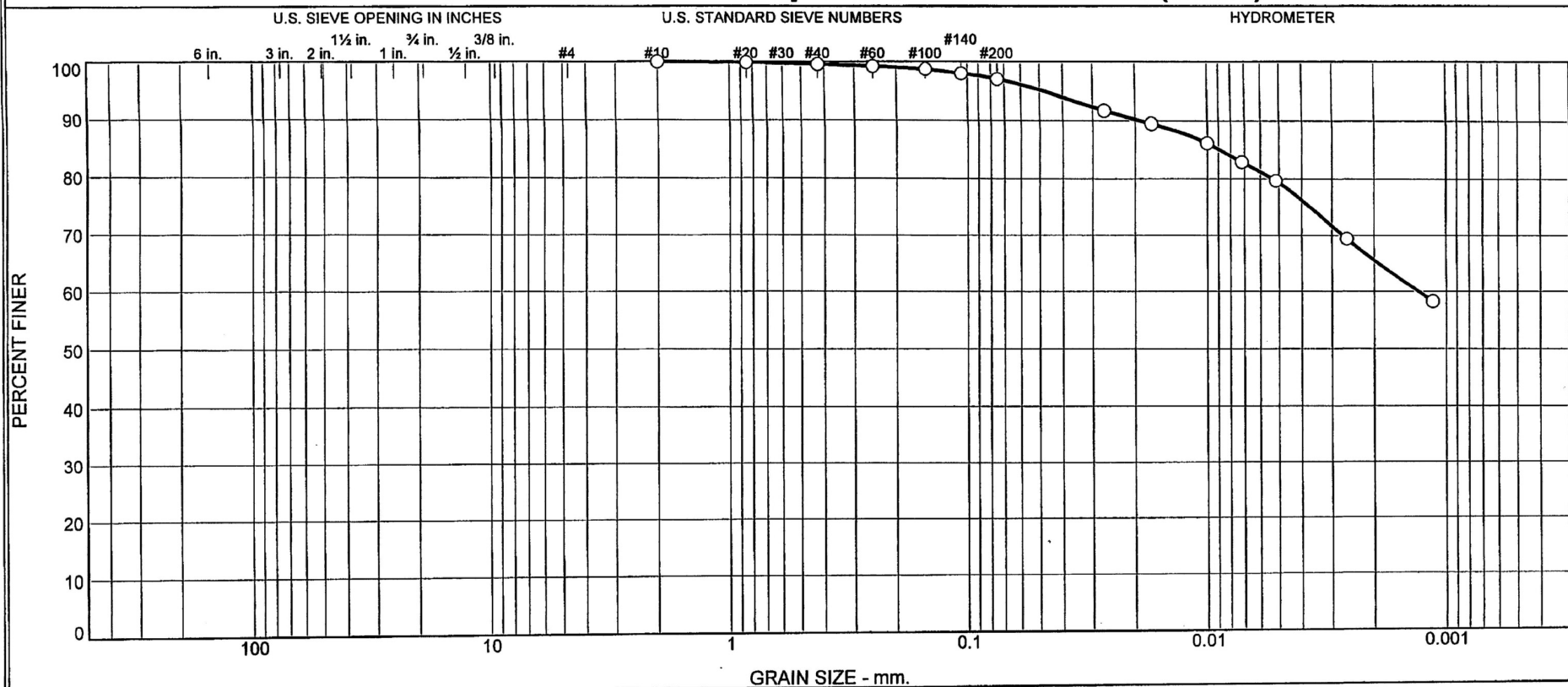
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

KAW 5/9/08

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



GRAIN SIZE DISTRIBUTION TEST DATA

5/8/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 48.5-50.2

Sample Number: UD-8

Material Description: Mottled Light Yellowish Brown and Light Gray Fat CLAY

Date: 2/4/08

Natural Moisture: 28.5

Liquid Limit: 64

Plastic Limit: 16

USCS Class.: CH

Testing Remarks: Specific Gravity = 2.721 (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
171.70	0.00	0.00	#10	0.00	100.0
47.97	0.00	0.00	#20	0.07	99.9
			#40	0.22	99.5
			#60	0.38	99.2
			#100	0.63	98.7
			#140	0.97	98.0
			#200	1.44	97.0

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 47.97

Hygroscopic moisture correction:

Moist weight and tare = 23.04

Dry weight and tare = 22.42

Tare weight = 11.23

Hygroscopic moisture = 5.5%

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 = 2.721

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	47.5	42.3	0.0131	48.5	8.3	0.0268	91.6
5.00	21.5	46.5	41.3	0.0131	47.5	8.5	0.0171	89.5
15.00	21.5	45.0	39.8	0.0131	46.0	8.8	0.0100	86.2
30.00	21.5	43.5	38.3	0.0131	44.5	9.0	0.0072	83.0
60.00	21.5	42.0	36.8	0.0131	43.0	9.2	0.0051	79.7
250.00	22.4	37.0	32.0	0.0130	38.0	10.1	0.0026	69.4
1440.00	21.9	32.0	26.9	0.0131	33.0	10.9	0.0011	58.3

MACTEC, Inc.

Fractional Components

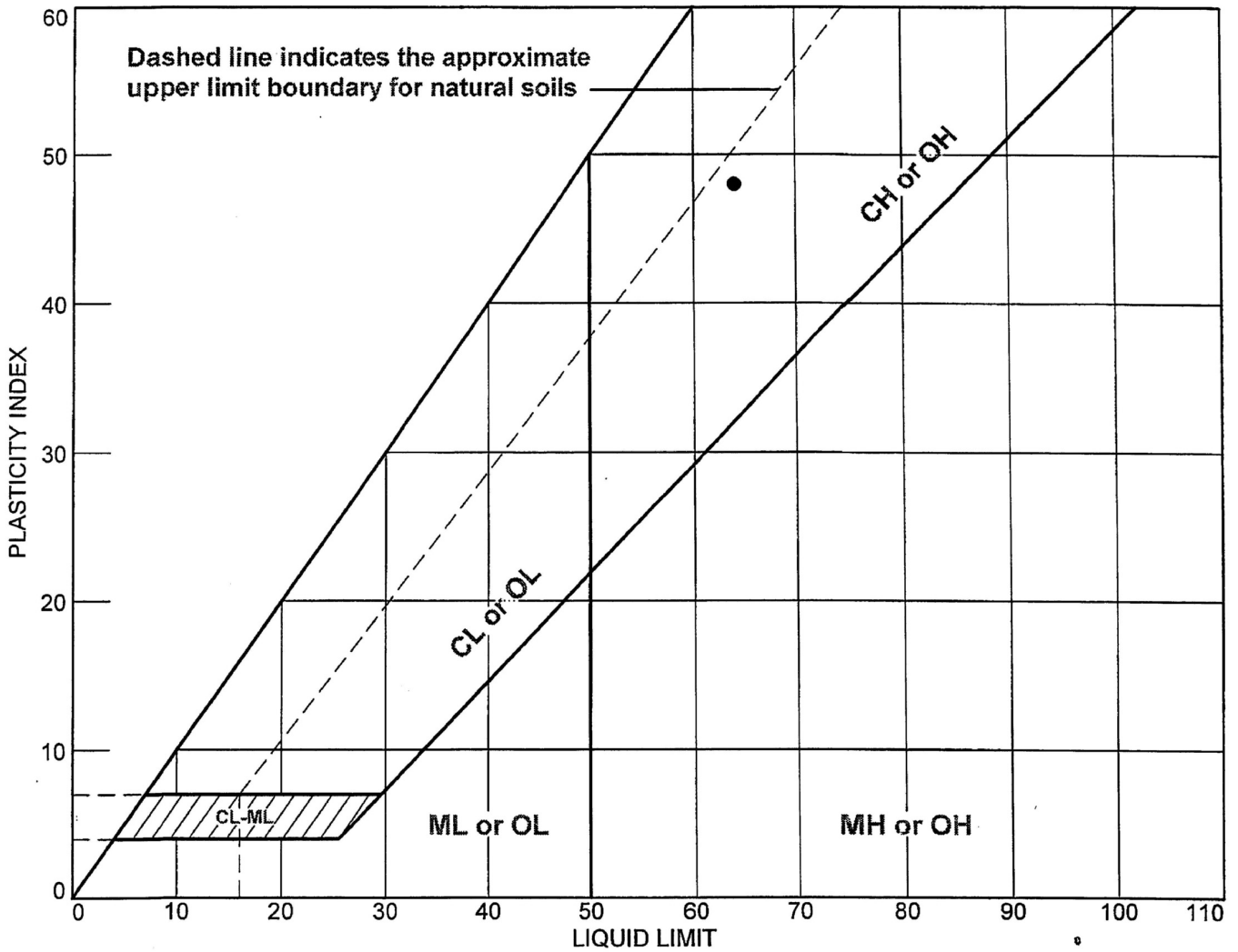
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.5	2.5	3.0	17.6	79.4	97.0

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0013	0.0053	0.0088	0.0192	0.0489

Fineness Modulus
0.02

MACTEC, Inc.

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-2321UD	UD-8	48.5-50.2	28.5	16	64	48	CH

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project No.: 6468071777

Figure 1/1

Tested By: CS

Checked By: LBj

KAW 5/8/08

LIQUID AND PLASTIC LIMIT TEST DATA

5/8/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 48.5-50.2

Sample Number: UD-8

Material Description: Mottled Light Yellowish Brown and Light Gray Fat CLAY

USCS: CH

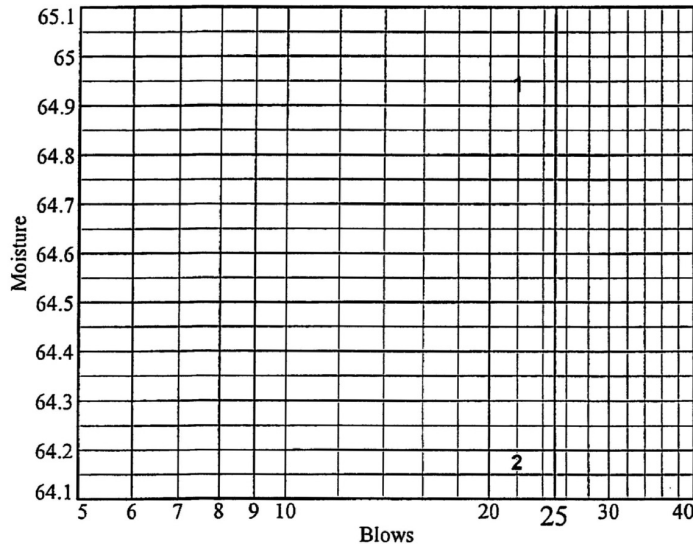
AASHTO: A-7-6(51)

Tested by: CS

Checked by: LBj

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.42	22.94				
Dry+Tare	20.90	20.02				
Tare	15.48	15.47				
# Blows	22	22				
Moisture	64.9	64.2				



Liquid Limit= 64
 Plastic Limit= 16
 Plasticity Index= 48
 Natural Moisture= 28.5
 Liquidity Index= 0.3

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.31	23.12			
Dry+Tare	20.46	22.07			
Tare	15.26	15.47			
Moisture	16.3	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: 4/15/08

SAMPLE IDENTIFICATION: B-2321UD, UD-8

(A) Mass of oven-dried soil, grams:	47.93
(B) Mass of pycnometer filled with water at test temperature (T), grams:	656.47
(C) Mass of pycnometer, water and soil, grams:	686.79
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.9
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.722
(F) <i>Correction factor:</i>	0.99959
(G x F) SPECIFIC GRAVITY @ 20°C:	2.721

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

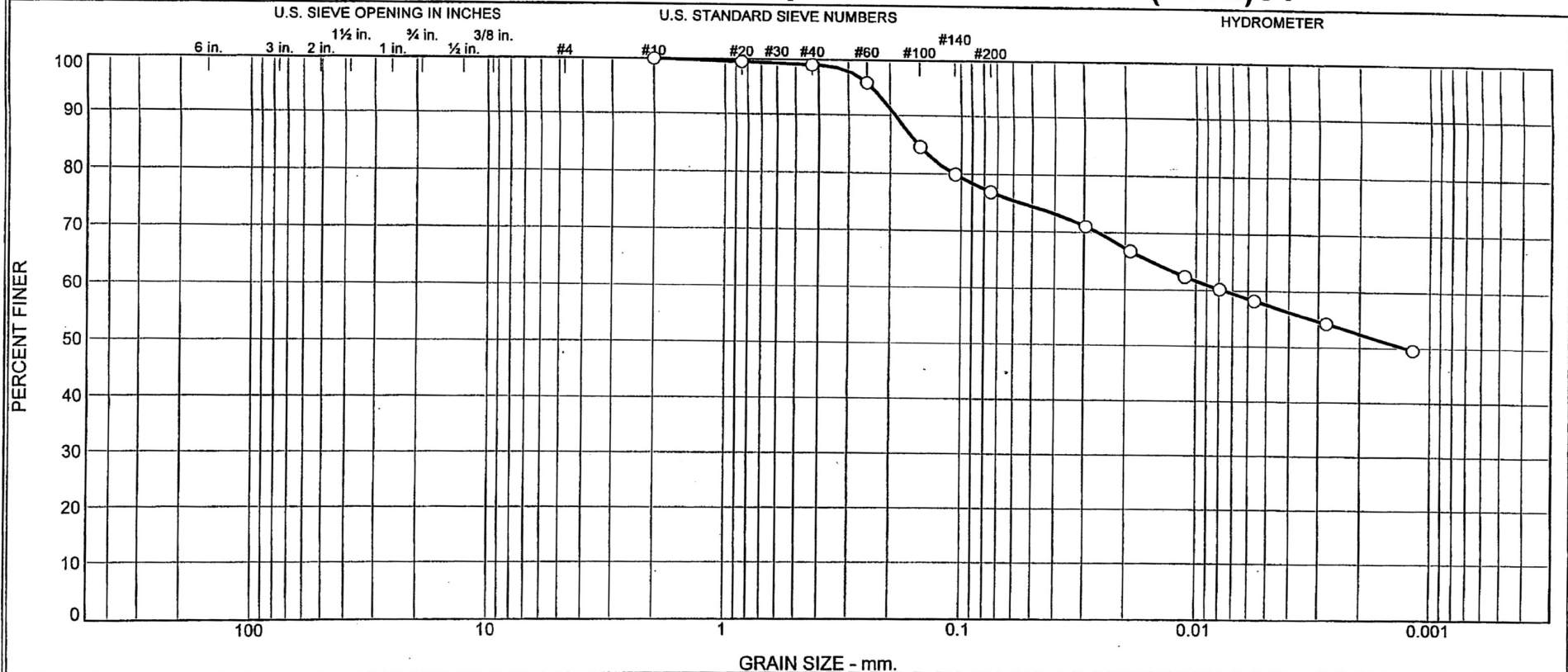
PYCNOMETER : P-6

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/8/08

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



Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2321UD	UD-9	58.5-61.0	2/4/08	CL	Mottled Very Pale Brown and Brownish Yellow Lean CLAY with sand	19.6	49	14

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

MACTEC, Inc.
Raleigh, North Carolina

○ Specific Gravity = 2.675 (ASTM D854-06)
 NM is average of values obtained from consolidation and triaxial test specimens

KAW 5/8/08

Tested By: CS

Checked By: LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/7/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 58.5-61.0

Sample Number: UD-9

Material Description: Mottled Very Pale Brown and Brownish Yellow Lean CLAY with sand

Date: 2/4/08

Natural Moisture: 19.6

Liquid Limit: 49

Plastic Limit: 14

USCS Class.: CL

Testing Remarks: Specific Gravity = 2.675 (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
247.27	0.00	0.00	#10	0.00	100.0
48.22	0.00	0.00	#20	0.23	99.5
			#40	0.47	99.0
			#60	2.02	95.8
			#100	7.45	84.5
			#140	9.68	79.9
			#200	11.11	77.0

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample =100.0

Weight of hydrometer sample =48.21

Hygroscopic moisture correction:

Moist weight and tare = 28.45

Dry weight and tare = 27.84

Tare weight = 15.56

Hygroscopic moisture =5.0%

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 =2.675

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	21.6	38.0	32.8	0.0133	39.0	9.9	0.0295	71.1
5.00	21.6	36.0	30.8	0.0133	37.0	10.2	0.0190	66.7
15.00	21.6	34.0	28.8	0.0133	35.0	10.6	0.0111	62.4
30.00	21.6	33.0	27.8	0.0133	34.0	10.7	0.0079	60.3
60.00	21.9	32.0	26.9	0.0132	33.0	10.9	0.0056	58.3
250.00	22.6	30.0	25.1	0.0131	31.0	11.2	0.0028	54.4
1440.00	21.9	28.0	22.9	0.0132	29.0	11.5	0.0012	49.6

MACTEC, Inc.

Fractional Components

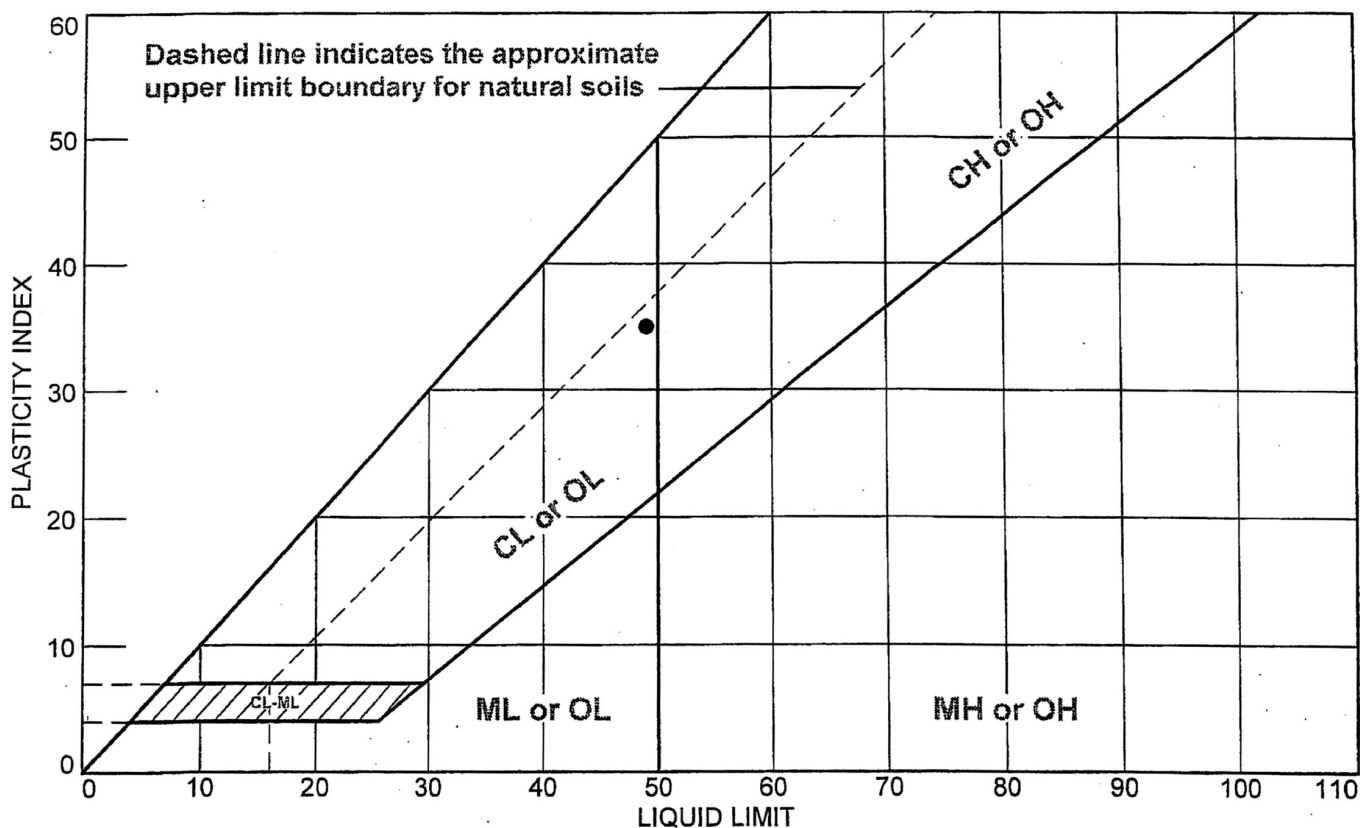
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.0	22.0	23.0	19.4	57.6	77.0

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0013	0.0076	0.1068	0.1535	0.1908	0.2387

Fineness Modulus
0.19

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-2321UD	UD-9	58.5-61.0	19.6	14	49	35	CL

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: 58.5-61.0

Sample Number: UD-9

Material Description: Mottled Very Pale Brown and Brownish Yellow Lean CLAY with sand

USCS: CL

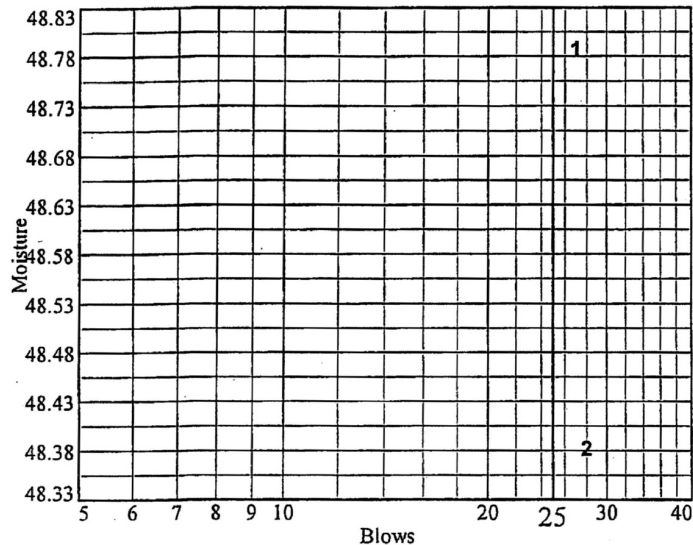
AASHTO: A-7-6(26)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.65	26.00				
Dry+Tare	21.63	22.71				
Tare	15.44	15.91				
# Blows	27	28				
Moisture	48.8	48.4				



Liquid Limit= 49
 Plastic Limit= 14
 Plasticity Index= 35
 Natural Moisture= 19.6
 Liquidity Index= 0.2

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.44	22.27			
Dry+Tare	21.60	21.39			
Tare	15.54	15.48			
Moisture	13.9	14.9			

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: 4/13/08

SAMPLE IDENTIFICATION: B-2321UD, UD-9

(A) Mass of oven-dried soil, grams:	49.67
(B) Mass of pycnometer filled with water at test temperature (T), grams:	656.47
(C) Mass of pycnometer, water and soil, grams:	687.58
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.9
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.676
(F) <i>Correction factor:</i>	0.99959
(G x F) SPECIFIC GRAVITY @ 20°C:	2.675

MATERIAL TESTED:

☒

- # 4

☐

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Lean CLAY with sand (CL)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER : 5.1.01

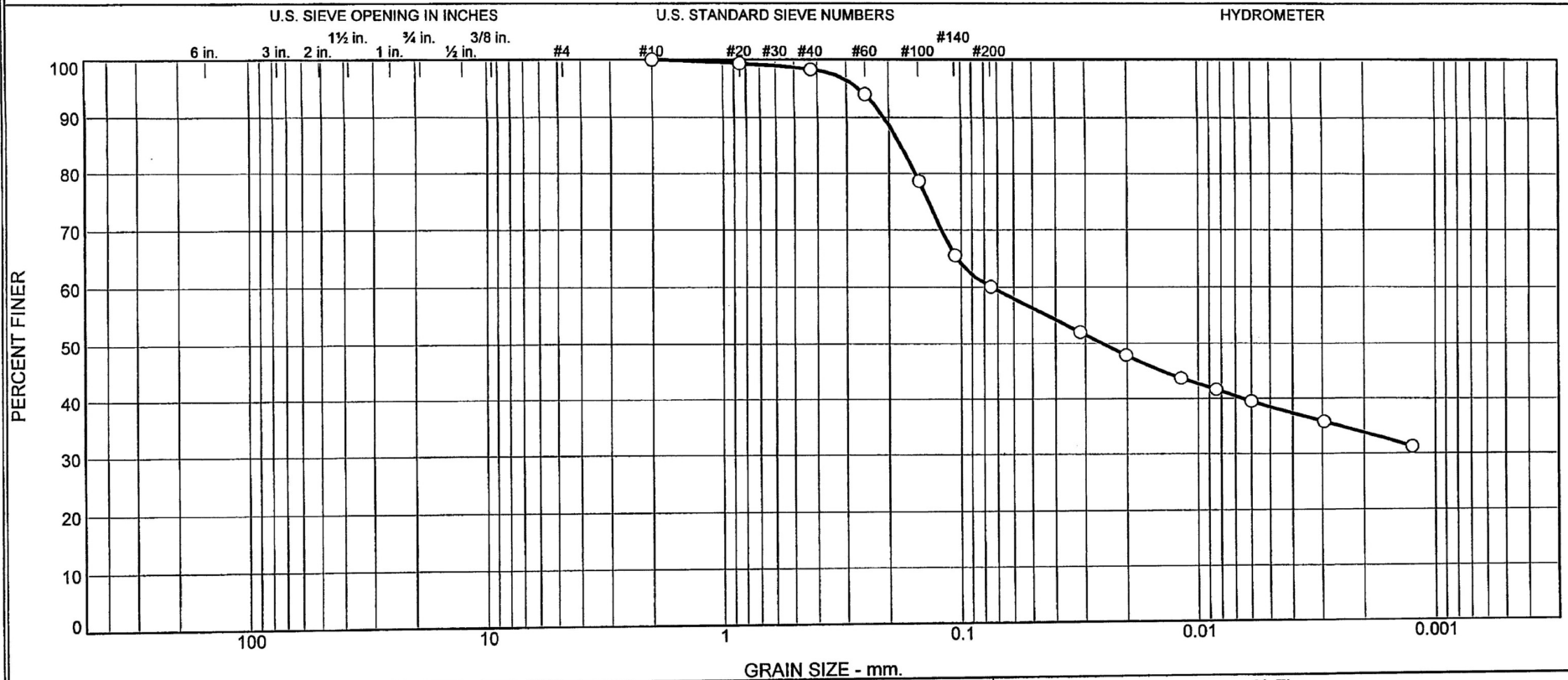
PYCNO METER : P-6

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	1.7	38.2	21.7	38.4

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2321UD	UD-10	63.0-65.5	2/4/08	CL	Light Olive Gray Sandy Lean CLAY	13.7	36	14

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777

Figure NA

MACTEC, Inc.
Raleigh, North Carolina

 Specific Gravity = 2.665 (ASTM D854-06)
 NM obtained from consolidation test specimen

KAW 5/8/08

Tested By: CS

Checked By: LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/8/2008

Client: Bechtel

Project: Exelon Texas COL (Victoria Reservoir)

Project Number: 6468071777

Location: Boring B-2321UD

Depth: 63.0-65.5

Sample Number: UD-10

Material Description: Light Olive Gray Sandy Lean CLAY

Date: 2/4/08

Natural Moisture: 13.7

Liquid Limit: 36

Plastic Limit: 14

USCS Class.: CL

Testing Remarks: Specific Gravity = 2.665 (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
207.71	0.00	0.00	#10	0.00	100.0
49.18	0.00	0.00	#20	0.32	99.3
			#40	0.85	98.3
			#60	2.98	93.9
			#100	10.51	78.6
			#140	16.94	65.6
			#200	19.64	60.1

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 49.18

Hygroscopic moisture correction:

Moist weight and tare = 27.76

Dry weight and tare = 27.36

Tare weight = 15.57

Hygroscopic moisture = 3.4%

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 = 2.665

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	21.7	30.0	24.9	0.0133	31.0	11.2	0.0315	52.1
5.00	21.7	28.0	22.9	0.0133	29.0	11.5	0.0202	47.9
15.00	21.7	26.0	20.9	0.0133	27.0	11.9	0.0118	43.7
30.00	21.7	25.0	19.9	0.0133	26.0	12.0	0.0084	41.6
60.00	21.6	24.0	18.8	0.0133	25.0	12.2	0.0060	39.5
250.00	22.4	22.0	17.0	0.0132	23.0	12.5	0.0030	35.7
1440.00	21.9	20.0	14.9	0.0133	21.0	12.9	0.0013	31.2

MACTEC, Inc.