

U.S. SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Grain Size (mm)	Sieve / Hydrometer	Percent Finer (%)
500	6	100
100	3	100
75	2	100
60	1-1/2	100
45	1	100
30	3/4	100
20	1/2	100
15	3/8	100
10	4	100
5	10	100
2.5	20	100
2.0	30	100
1.5	40	100
1.0	60	100
0.75	100	100
0.6	140	98
0.5	200	92
0.425	-	80
0.3	-	73
0.25	-	68
0.2	-	64
0.15	-	60
0.106	-	53
0.075	-	47

GRAIN SIZE IN MILLIMETERS							
% 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

[illegible]

Client <u>Bechtel</u>	
Project <u>Exelon Texas COL (Victoria)</u>	
Project No. <u>6468-07-1777</u>	Lab No. <u>8358</u>

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

○ Tested by: EH Reviewed by: HJ H

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

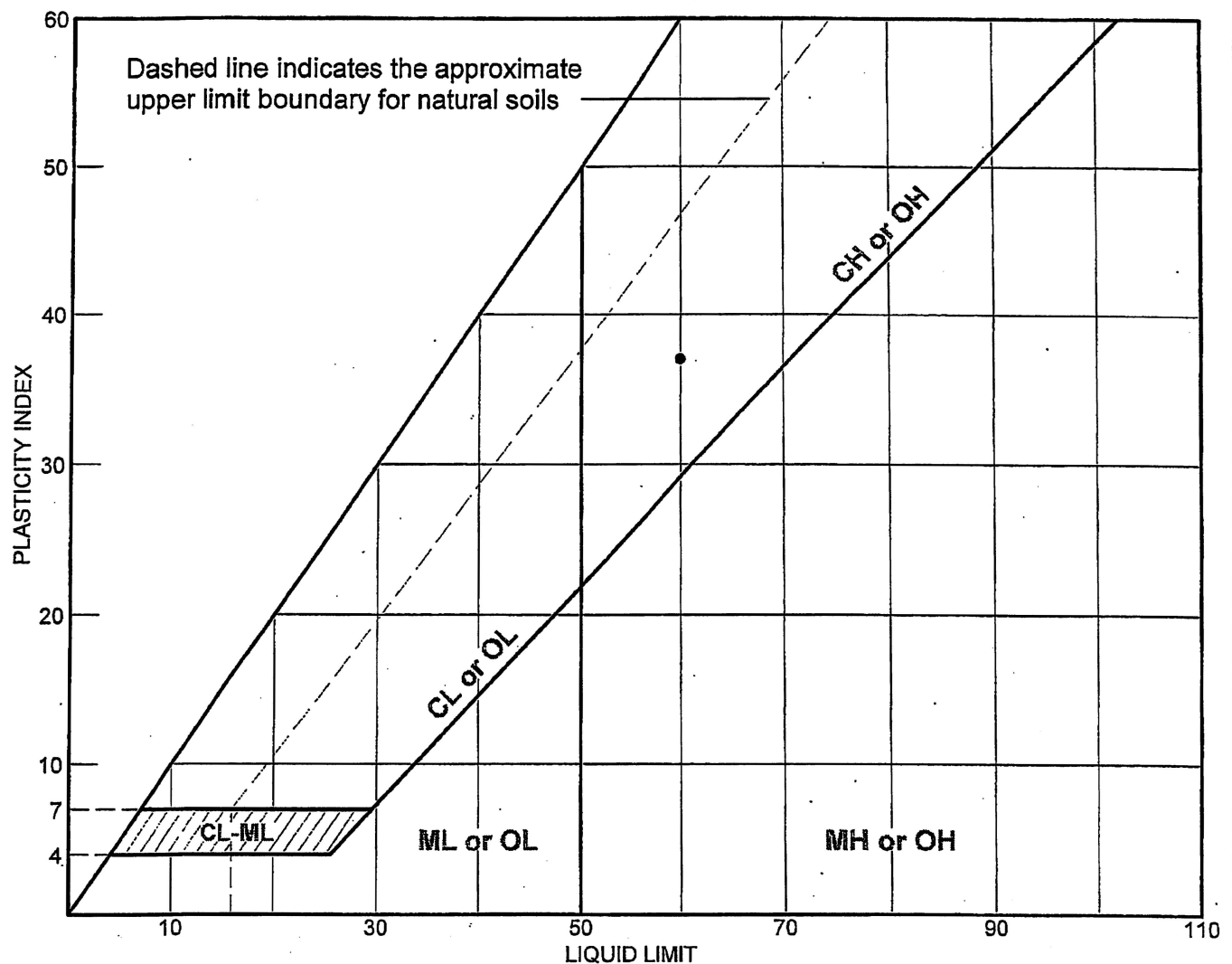
% COBBLES = % GRAVEL =

% 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

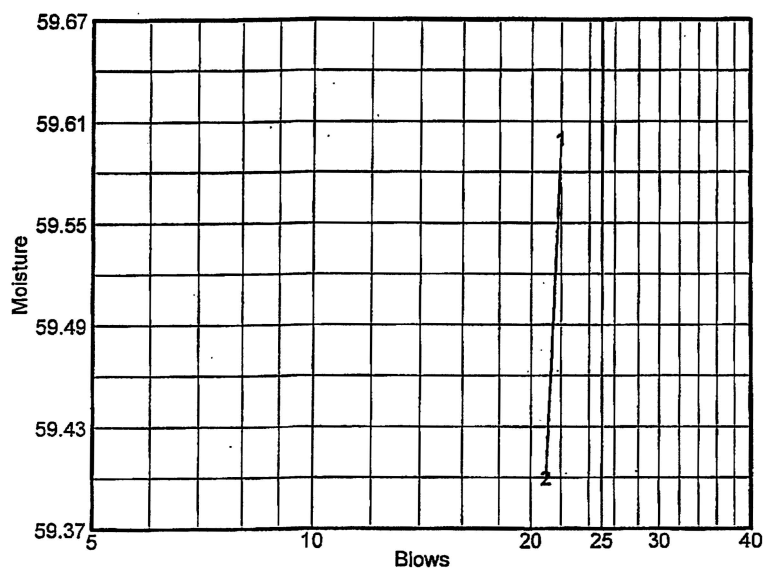
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

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

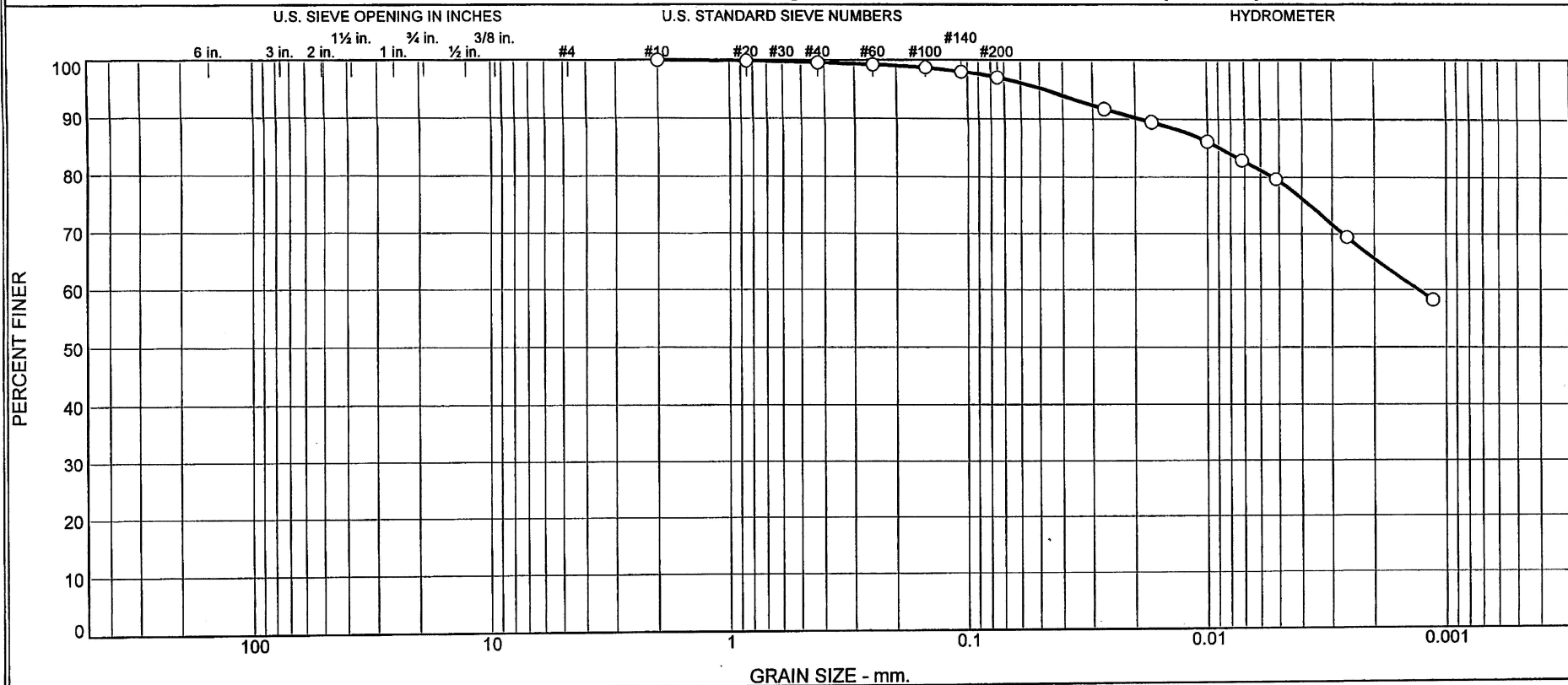
\\Test Reports\\Soils\\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Harry Johnson

HJ

KAW 5/9/08

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	0.5	2.5	17.6	79.4

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2321UD	UD-8	48.5-50.2	2/4/08	CH	Mottled Light Yellowish Brown and Light Gray Fat CLAY	28.5	64	16

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777

Figure 1A

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity = 2.721 (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: 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	R _m	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

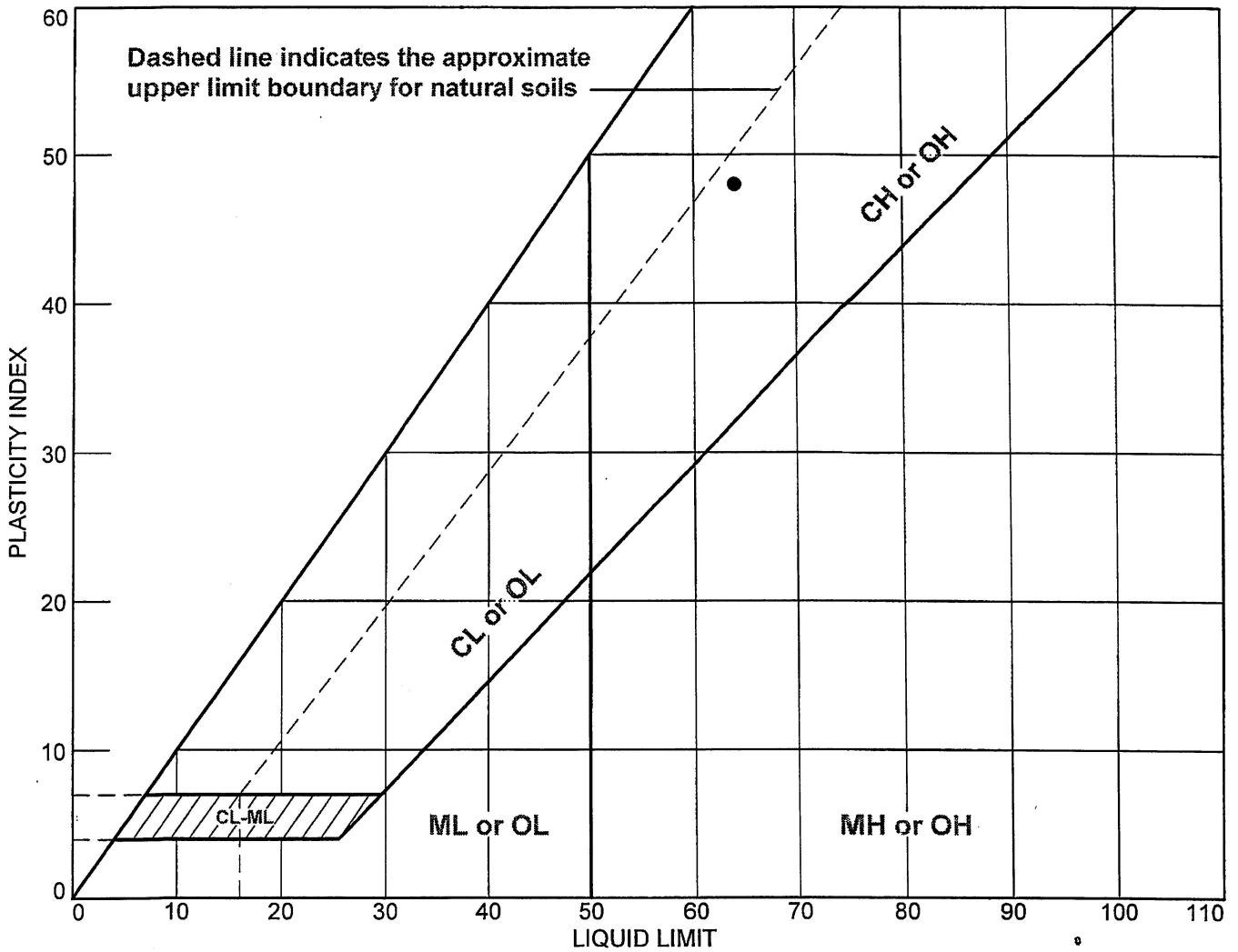
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.5	2.5	3.0	17.6	79.4	97.0

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

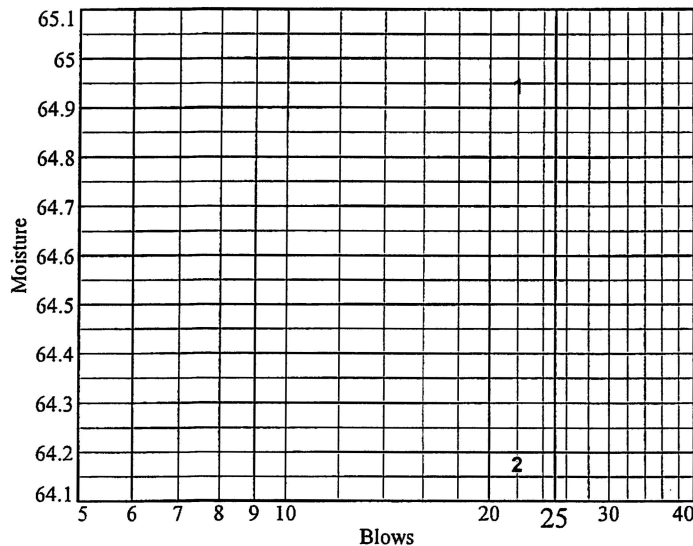
AASHTO: A-7-6(51)

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

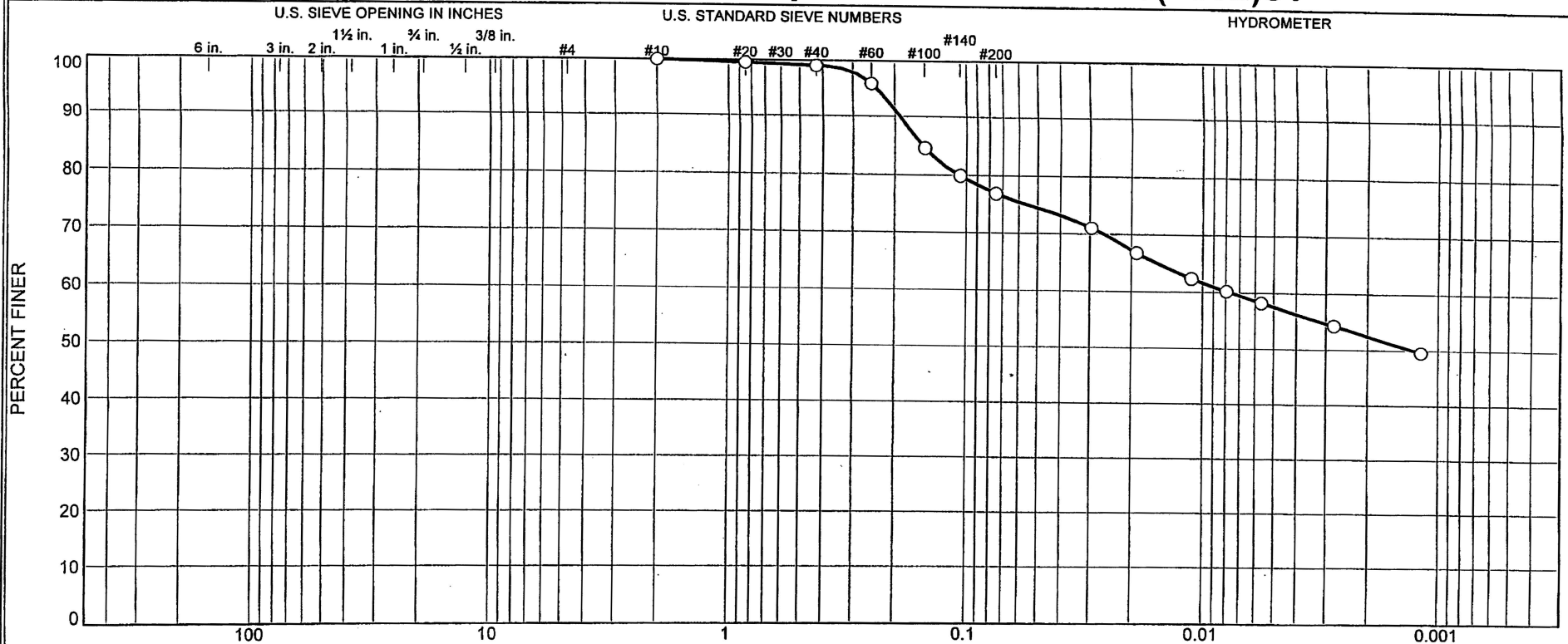
PYCNOMETER : P-6

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/8/08

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



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.0	22.0	19.4	57.6

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		MACTEC, Inc. Raleigh, North Carolina	○ Specific Gravity = 2.675 (ASTM D854-06) NM is average of values obtained from consolidation and triaxial test specimens
Project Exelon Texas COL (Victoria Reservoir)			
Project No. 6468071777	Figure <i>NA</i>		

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

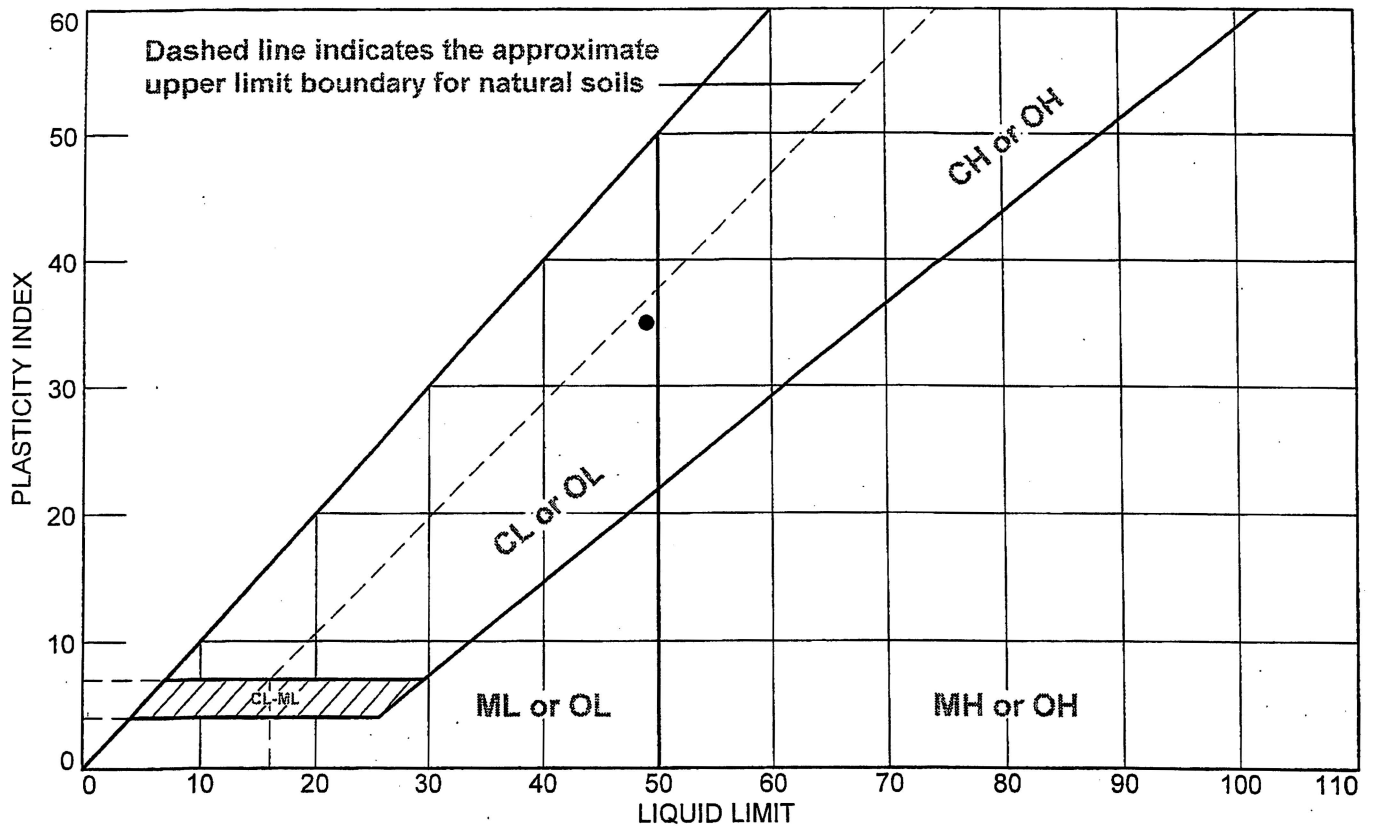
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.0	22.0	23.0	19.4	57.6	77.0

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

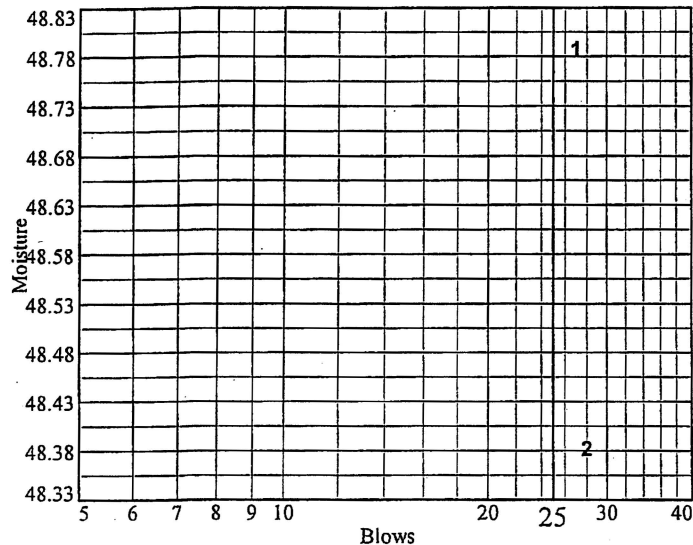
AASHTO: A-7-6(26)

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

HYDROMETER



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

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: 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.

Fractional Components

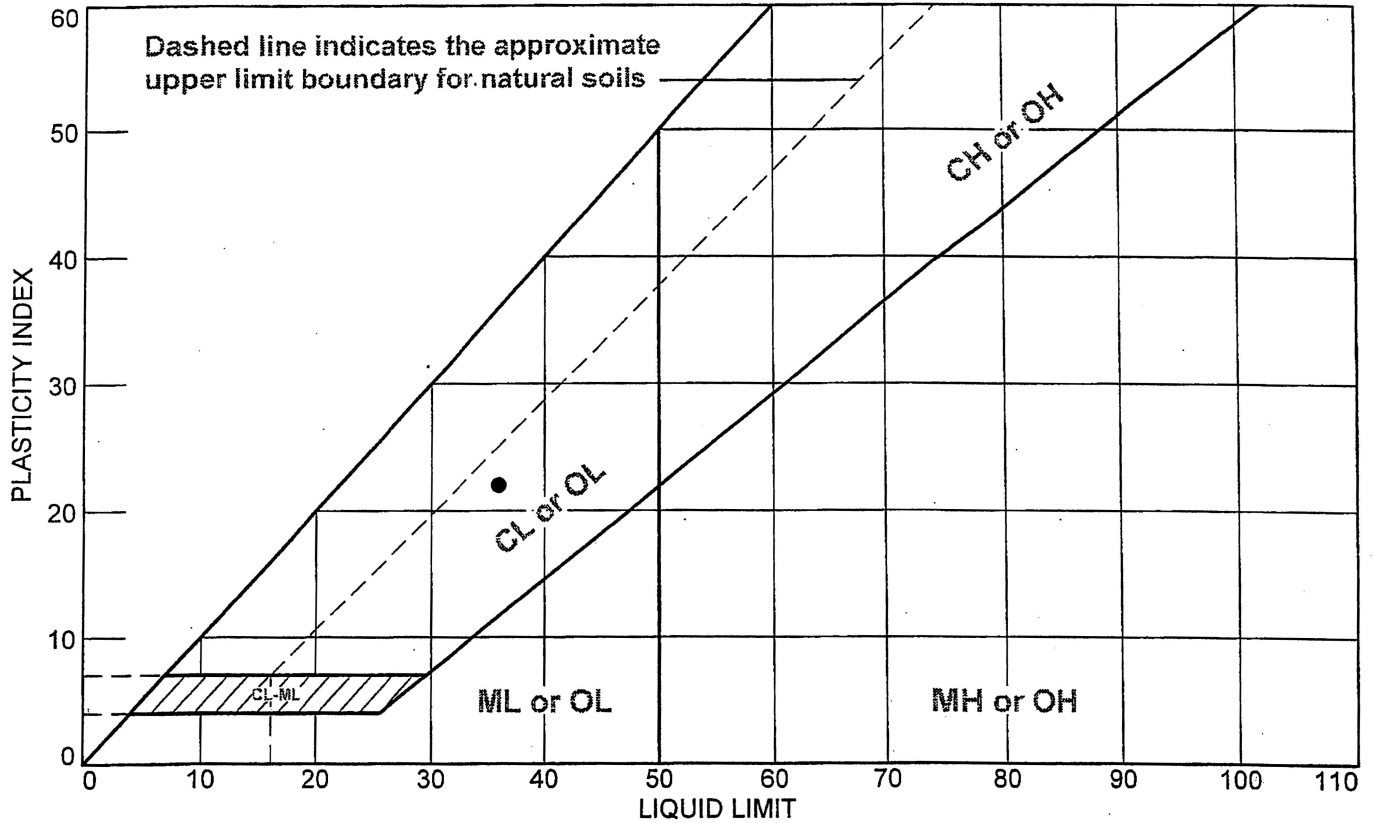
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.7	38.2	39.9	21.7	38.4	60.1

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0253	0.0745	0.1553	0.1782	0.2100	0.2667

Fineness Modulus
0.26

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-10	63.0-65.5	13.7	14	36	22	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: 63.0-65.5

Sample Number: UD-10

Material Description: Light Olive Gray Sandy Lean CLAY

USCS: CL

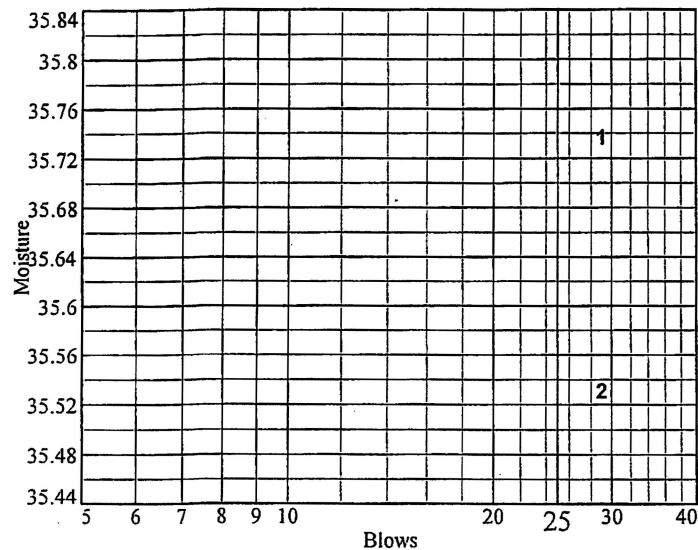
AASHTO: A-6(10)

Tested by: CS

Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.97	22.90				
Dry+Tare	21.74	20.96				
Tare	15.50	15.50				
# Blows	29	29				
Moisture	35.7	35.5				



Liquid Limit= 36
 Plastic Limit= 14
 Plasticity Index= 22
 Natural Moisture= 13.7
 Liquidity Index= 0.0

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.52	21.81			
Dry+Tare	21.66	21.05			
Tare	15.54	15.51			
Moisture	14.1	13.7			

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-10

(A) Mass of oven-dried soil, grams:	50.69
(B) Mass of pycnometer filled with water at test temperature (T), grams:	655.68
(C) Mass of pycnometer, water and soil, grams:	687.36
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	21.9
(G) Specific Gravity at observed temperature: $A / [B - (C - A)]$	2.666
(F) <i>Correction factor:</i>	0.99959
(G x F) SPECIFIC GRAVITY @ 20°C:	2.665

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

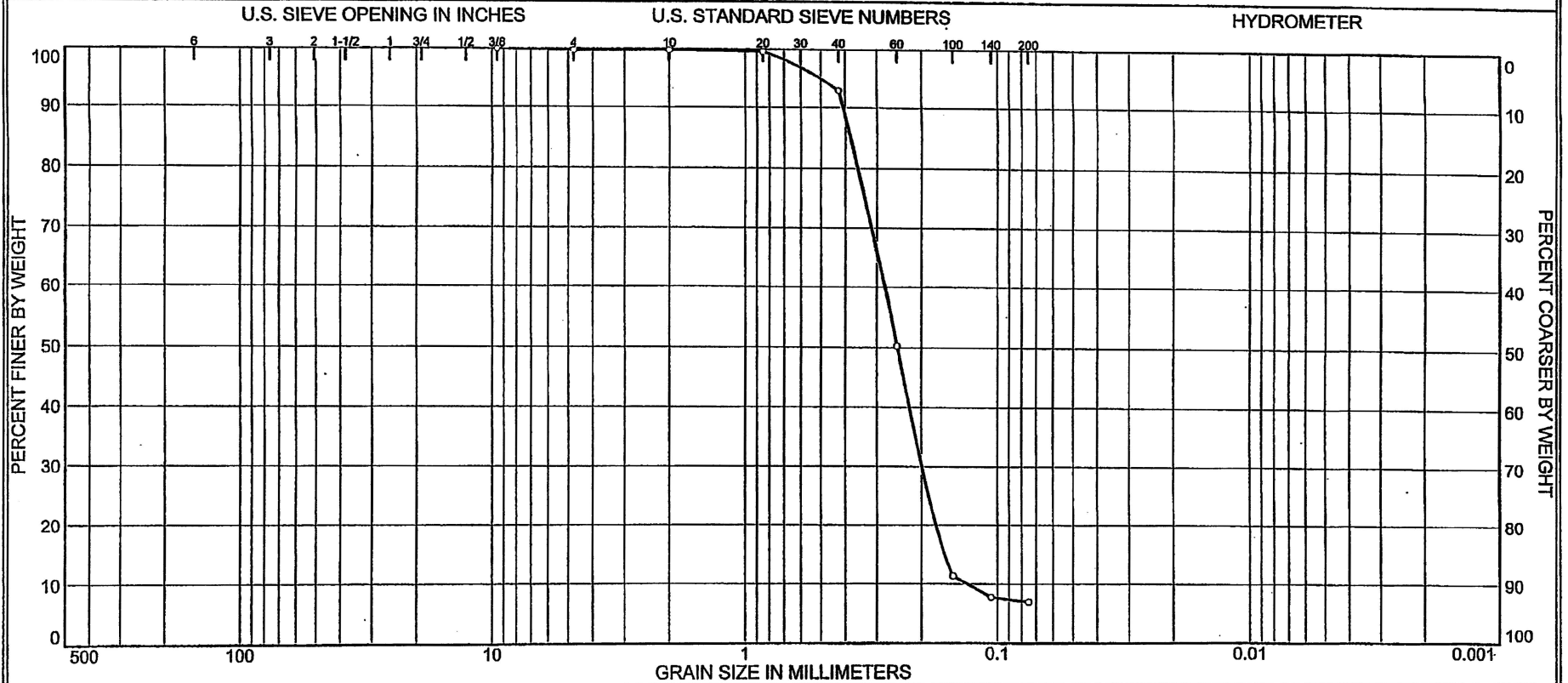
PYCNO METER : P-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/8/08

Particle Size Distribution Report ASTM D6913-04 e1



% COBBLES	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.0	6.9	85.9	7.0	

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
B-2321UD	UD-12	93-95.7 Ft	2/4/08	SP-SM	Light Yellowish Brown Poorly Graded SAND with Silt (Visual)	22.7	ND	ND

Client Bechtel		MACTEC ENGINEERING AND CONSULTING, INC.	○ Tested by: EH Reviewed by: HJ	
Project Exelon Texas COL (Victoria)			Sieve Analysis Only NM value from average of strength tests performed. Specific Gravity = 2.69 (ASTM D 854-06) ND = Not Determined	
Project No. 6468-07-1777	Lab No. 8359			

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-2321UD
Sample No.: UD-12
Elev. or Depth: 93-95.7 Ft Sample Length(in./cm.): 8359
Location: B-2321UD
Description: Light Yellowish Brown Poorly Graded SAND with Silt (Visual)
Date: 2/4/08 Natural Moisture: 22.7
Liquid Limit: ND Plastic Limit: NP USCS Class.: SP-SM
Testing Remarks: Tested by: EH Reviewed by: HJ

Sieve Analysis Only
NM value from average of strength tests performed.
Specific Gravity = 2.69 (ASTM D 854-06)
ND = Not Determined

Mechanical Analysis Data

Sieve	Cumul. Wt. retained	Percent finer
Dry sample and tare=	Initial 267.16	
Tare =	109.35	
Dry sample weight =	157.81	
Tare for cumulative weight retained= .00		
.375 inch	0.00	100.0
# 4	0.33	99.8
# 10	0.34	99.8
# 20	0.60	99.6
# 40	11.17	92.9
# 60	78.36	50.3
# 100	139.90	11.3
# 140	145.48	7.8
# 200	146.76	7.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = 0.2 (% coarse = % fine = 0.2)
% SAND = 92.8 (% coarse = 0.0 % medium = 6.9 % fine = 85.9)
% FINES = 7.0

D₈₅= 0.38 D₆₀= 0.28 D₅₀= 0.25
D₃₀= 0.20 D₁₅= 0.16 D₁₀= 0.13
C_c= 1.0811 C_u= 2.1191

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: 4/10/08

SAMPLE IDENTIFICATION: B-2321UD, UD-12 @ 93-95.7 Ft.

(A) Mass of oven-dried soil, grams:	37.36
(B) Mass of pycnometer filled with water at test temperature (T), grams:	341.20
(C) Mass of pycnometer, water and soil, grams:	364.66
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	24.2
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.688
(F) Correction factor:	0.99904
(G x F) SPECIFIC GRAVITY @ 20°C:	2.685

MATERIAL TESTED:

☐

- # 4

☒

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Poorly Graded SAND with Silt (SP-SM) - Visual

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNOMETER : 2057

TESTED BY: EH

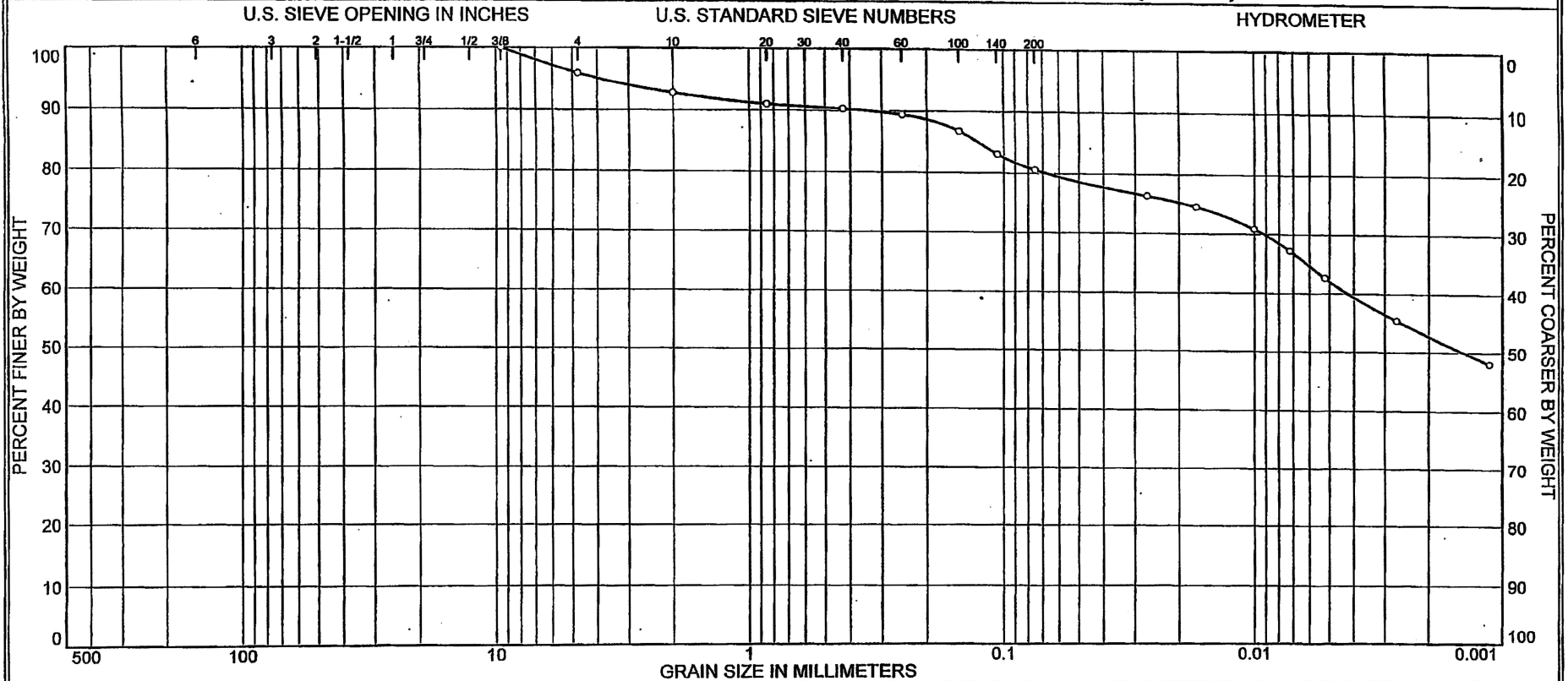
\\Test Reports\\Soils\\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Harry Johnson



KAW 4-15-08

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



% COBBLES	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
0.0	0.0	4.2	3.1	2.4	9.7	18.5	62.1

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
B-2321UD	UD-14	128.5-130.25	2/5/08	CH	Pale Yellow Fat CLAY with sand	25.0	58	27
		Ft						

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777

Lab No. 8360

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

Tested by: EH *EH* Reviewed by: HJ *HJ*

NM value from first test performed.
Specific Gravity = 2.75 (ASTM D 854-06)

ZHU 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-14
Elev. or Depth: 128.5-130.25 Ft Sample Length(in./cm.): ID#8360
Location: B-2321UD
Description: Pale Yellow Fat CLAY with sand
Date: 2/5/08 PL: 27 LL: 58 PI: 31
USCS Classification: CH AASHTO Classification:
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first test performed.
Specific Gravity = 2.75 (ASTM D 854-06)

Mechanical Analysis Data

	Initial	
Dry sample and tare=	70.02	
Tare =	16.57	
Dry sample weight =	53.45	
Tare for cumulative weight retained=	.00	
Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	2.22	95.8
# 10	3.89	92.7
# 20	4.79	91.0
# 40	5.20	90.3
# 60	5.64	89.4
# 100	7.01	86.9
# 140	8.96	83.2
# 200	10.35	80.6

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 80.6
Weight of hydrometer sample: 43.10
Calculated biased weight= 53.47
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.74
Specific gravity correction factor= 0.980
Hydrometer type: 152H
Effective depth $L = 16.294964 - 0.164 \times R_m$

Elapsed time, min	Temp, Actual deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.8	46.5	41.7	0.0128	46.5	8.7	0.0267	76.4
5.00	22.8	45.5	40.7	0.0128	45.5	8.8	0.0171	74.6
15.00	22.8	43.5	38.7	0.0128	43.5	9.2	0.0100	70.9
30.00	22.8	41.5	36.7	0.0128	41.5	9.5	0.0072	67.3
60.00	22.8	39.0	34.2	0.0128	39.0	9.9	0.0052	62.7
240.00	22.8	35.0	30.2	0.0128	35.0	10.6	0.0027	55.4
1440.00	22.8	31.0	26.2	0.0128	31.0	11.2	0.0011	48.0

Fractional Components

Gravel/Sand based on #4

Sand/Fines based on #200

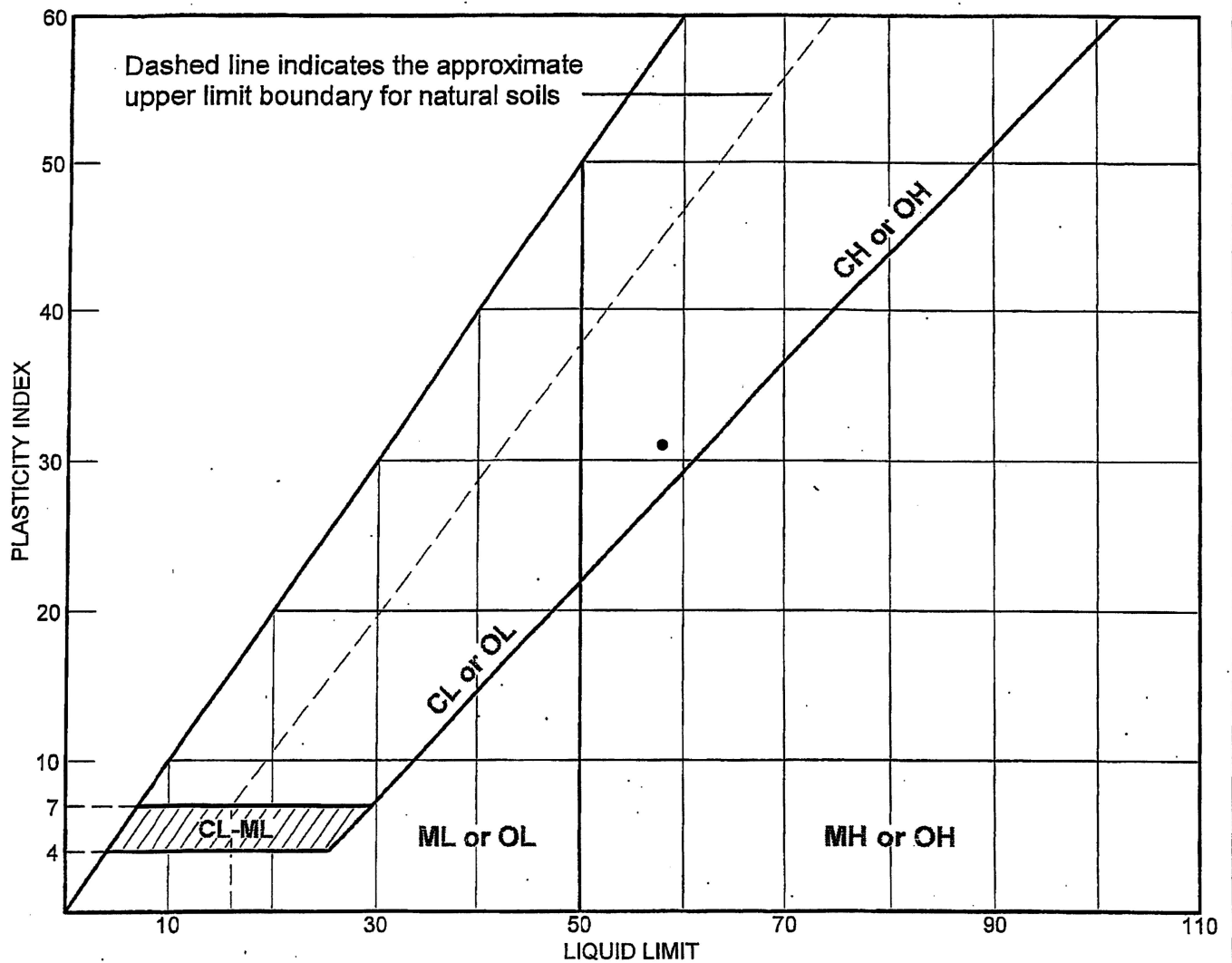
% COBBLES = % GRAVEL = 4.2 (% coarse = % fine = 4.2)

% SAND = 15.2 (% coarse = 3.1 % medium = 2.4 % fine = 9.7)

% SILT = 18.5 % CLAY = 62.1

D₈₅= 0.13 D₆₀= 0.00 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-14	128.5-130.25	25.0	27	58	31	CH

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

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

Lab No. 8360

244 5/9/08

LIQUID AND PLASTIC LIMIT TEST DATA

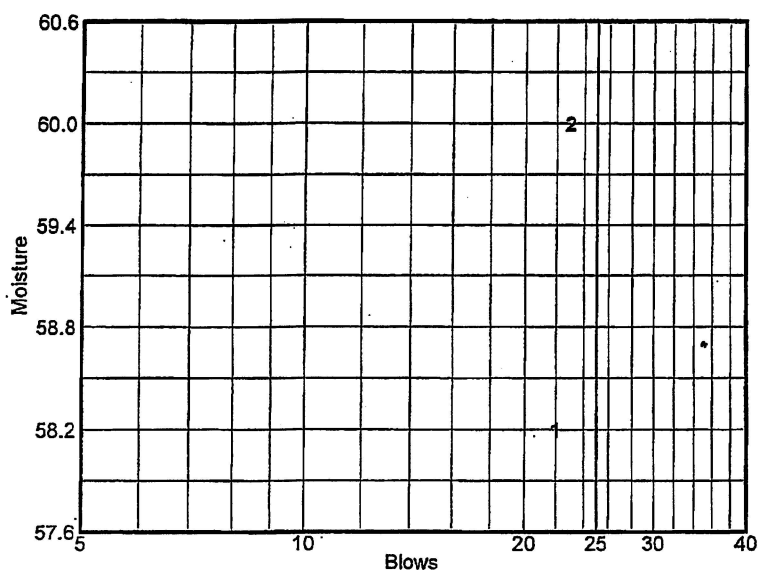
Client: Bechtel
 Project: Exelon Texas COL (Victoria)
 Project Number: 6468-07-1777

Sample Data

Source: B-2321UD
 Sample No.: UD-14
 Elev. or Depth: 128.5-130.25 Ft Sample Length(in./cm.): ID#8360
 Location: B-2321UD
 Description: Pale Yellow Fat CLAY with sand
 Water Content: 25.0 USCS: CH AASHTO:

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.16	29.23				
Dry+Tare	27.16	25.65				
Tare	20.29	19.68				
# Blows	22	23				
Moisture	58.2	60.0				



Liquid Limit= 58
 Plastic Limit= 27
 Plasticity Index= 31

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.57	27.85			
Dry+Tare	26.08	26.34			
Tare	20.60	20.88			
Moisture	27.2	27.7			

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: 4/18/08

SAMPLE IDENTIFICATION: B-2321UD, UD-14 @ 128.5-130.25 Ft.

(A) Mass of oven-dried soil, grams:	37.37
(B) Mass of pycnometer filled with water at test temperature (T), grams:	338.35
(C) Mass of pycnometer, water and soil, grams:	362.16
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	23.6
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$
(F)	Correction factor:
(G x F)	SPECIFIC GRAVITY @ 20°C:

MATERIAL TESTED:

☐

- # 4

☒

- # 10

PREPARATION METHOD:

☒

DRY

☐

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 96

Fat CLAY with Sand (CH)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

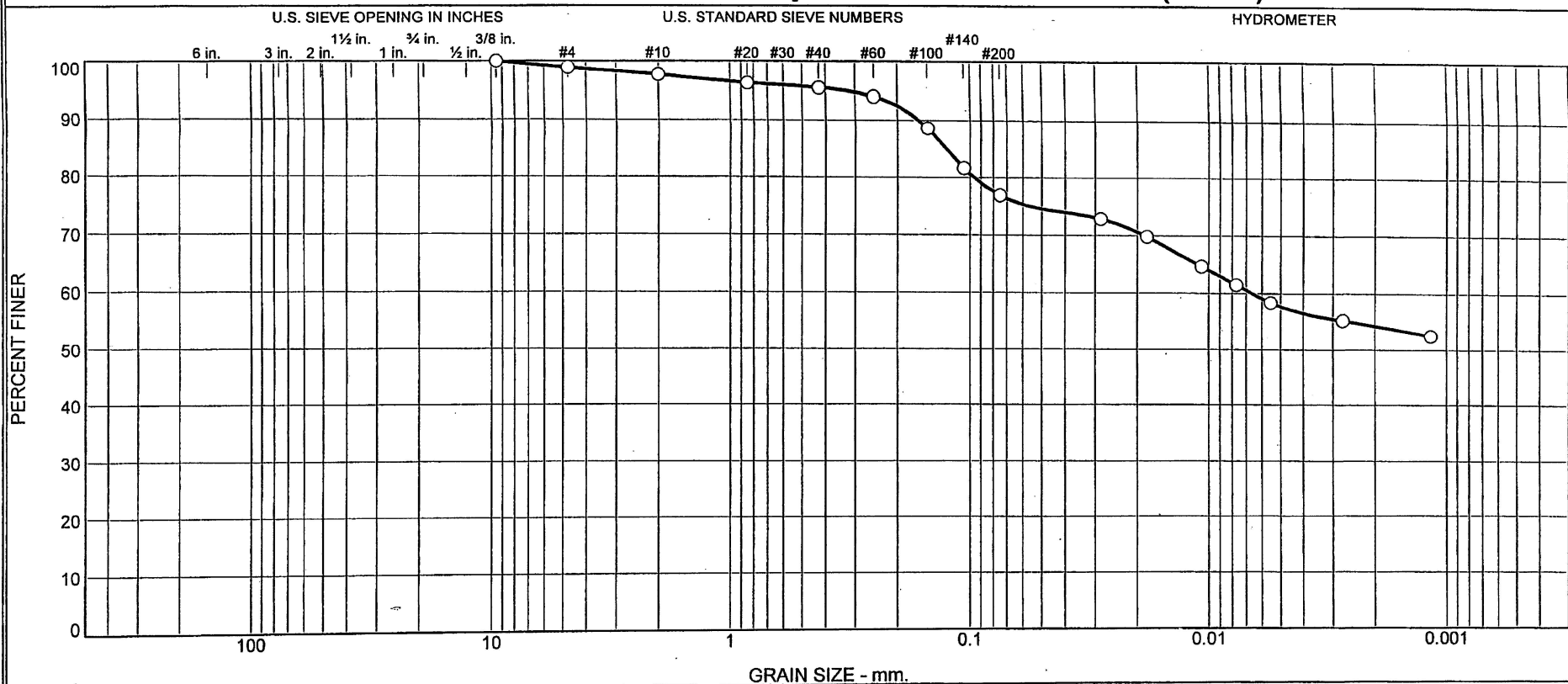
PYCNO METER : 2054

TESTED BY: EH *EH*

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

REVIEWED BY: Harry Johnson *HJ*

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



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.1	1.2	2.3	18.4	19.3	57.7

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2321UD	UD-15	130.5-132.5	2/5/08	CH	Pale Yellow Fat CLAY with sand	20.6	61	17

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777

Figure *NA***MACTEC, Inc.****Raleigh, North Carolina**

○ Specific Gravity = 2.712 (ASTM D854-06)
 NM is average of values obtained from consolidation and triaxial test specimens

KAW 5/8/08Tested By: CSChecked By: LBJ