

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: 3/19/08

SAMPLE IDENTIFICATION: B-2359UD, UD-17 @ 110-111.7 Ft.

(A) Mass of oven-dried soil, grams:	37.25
(B) Mass of pycnometer filled with water at test temperature (T), grams:	341.15
(C) Mass of pycnometer, water and soil, grams:	364.64
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	24.2
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.707
(F) Correction factor:	0.99904
(G x F)	SPECIFIC GRAVITY @ 20°C: 2.705

MATERIAL TESTED: - # 4 - # 10

PREPARATION METHOD: DRY WET (dispersed)

REMARKS: Estimated % Passing # 4 : 98
Silty SAND (SM)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNOMETER : 2055

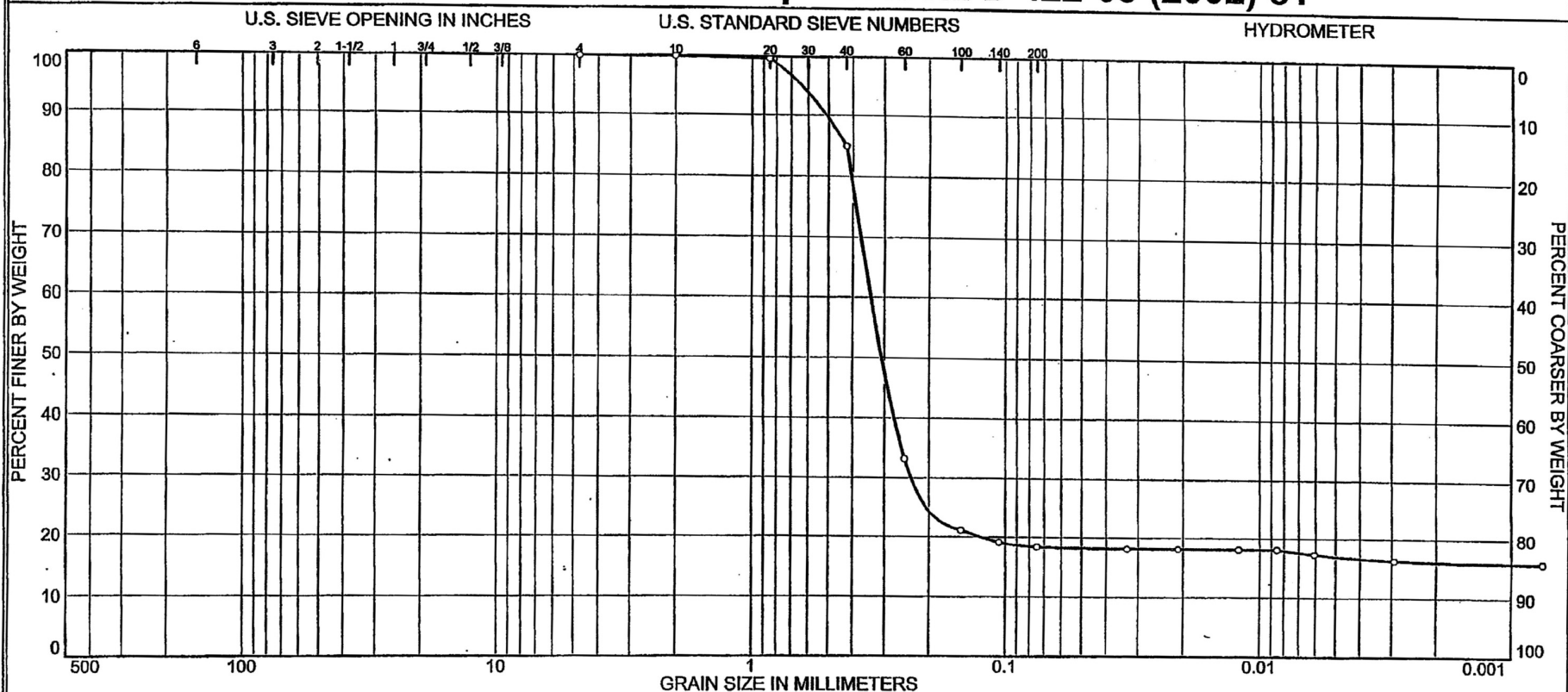
TESTED BY: EH

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REVIEWED BY: Harry Johnson *HJ*

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	0.0	0.0	15.0	66.7	1.5	16.8

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
B-2359UD	UD-18	112-113.1 Ft	1/31/08	SC	Yellowish Brown Clayey SAND	25.5	27	15

Client **Bechtel**
 Project **Exelon Texas COL (Victoria)**
 Project No. **6468-07-1777** Lab No. **8369**

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

Tested by: EH Reviewed by: HJ *HJ*
 NM value from first strength test performed.
 Specific Gravity = 2.77 (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-2359UD
Sample No.: UD-18
Elev. or Depth: 112-113.1 Ft **Sample Length(in./cm.):** ID#8369
Location: B-2359UD
Description: Yellowish Brown Clayey SAND
Date: 1/31/08 **PL:** 15 **LL:** 27 **PI:** 12
USCS Classification: SC **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.77 (ASTM D 854-06)

Mechanical Analysis Data

	Initial	
Dry sample and tare=	77.95	
Tare =	16.54	
Dry sample weight =	61.41	
Tare for cumulative weight retained=	.00	
Sieve	Cumul. Wt.	Percent
	retained	finer
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.26	99.6
# 40	9.23	85.0
# 60	41.04	33.2
# 100	48.43	21.1
# 140	49.66	19.1
# 200	50.19	18.3

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 18.3
Weight of hydrometer sample: 11.22
Calculated biased weight= 61.31
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.766
Specific gravity correction factor= 0.975
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	23.3	16.0	11.3	0.0127	16.0	13.7	0.0331	18.0
5.00	23.3	16.0	11.3	0.0127	16.0	13.7	0.0209	18.0
15.00	23.3	16.0	11.3	0.0127	16.0	13.7	0.0121	18.0
30.00	23.3	16.0	11.3	0.0127	16.0	13.7	0.0086	18.0
60.00	23.3	15.5	10.8	0.0127	15.5	13.8	0.0061	17.2
260.00	22.8	15.0	10.2	0.0127	15.0	13.8	0.0029	16.2
4140.00	21.7	15.0	9.9	0.0129	15.0	13.8	0.0007	15.8

Fractional Components

Gravel/Sand based on #4

Sand/Fines based on #200

% COBBLES = % GRAVEL =

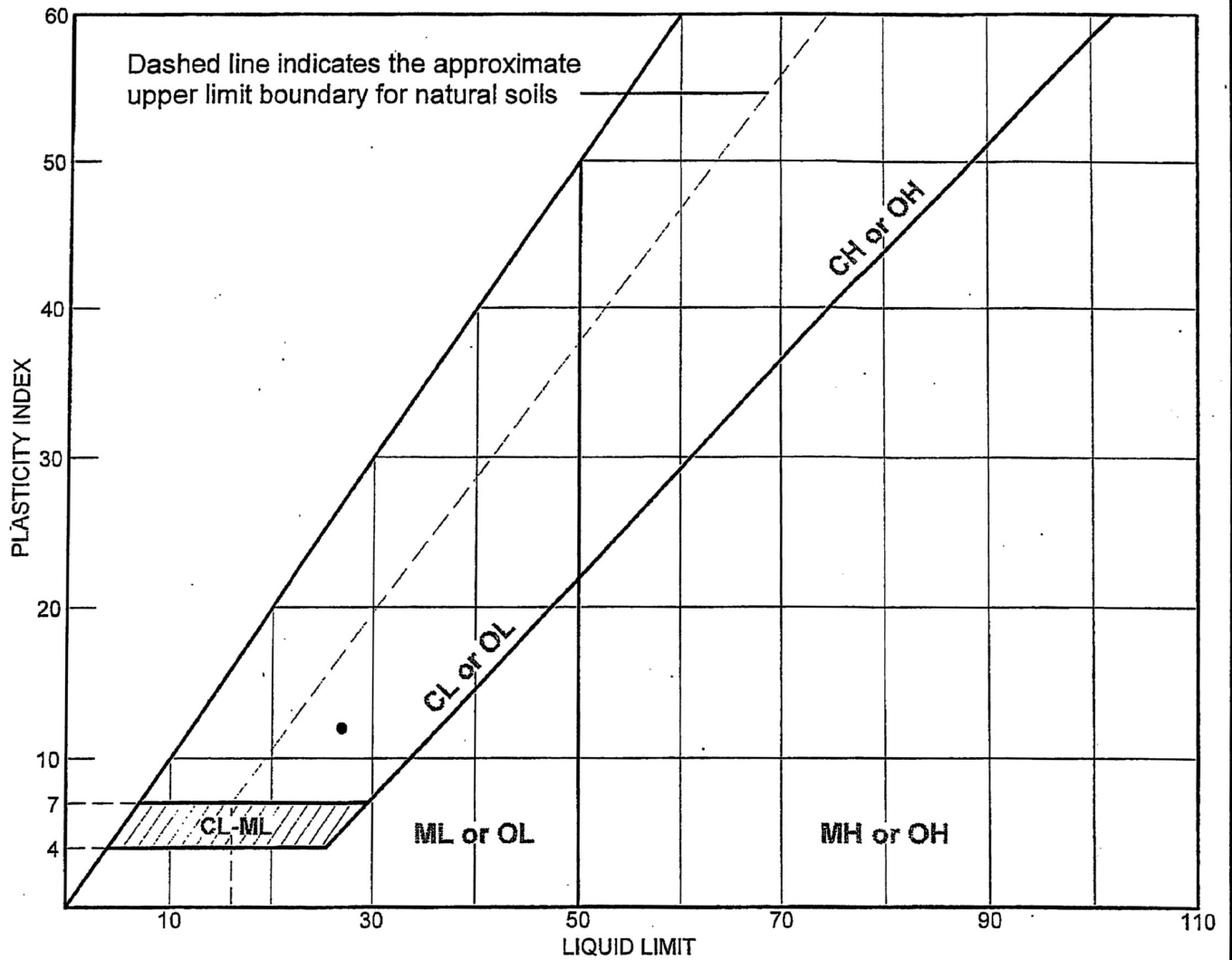
% SAND = 81.7 (% coarse = 0.0 % medium = 15.0 % fine = 66.7)

% SILT = 1.5 % CLAY = 16.8 (% CLAY COLLOIDS = 15.8)

D₈₅= 0.43 D₆₀= 0.34 D₅₀= 0.31

D₃₀= 0.24

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-2359UD	UD-18	112-113.1 Ft	25.5	15	27	12	SC

**MACTEC ENGINEERING
AND
CONSULTING, INC.**

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

Lab No. 8369

LIQUID AND PLASTIC LIMIT TEST DATA

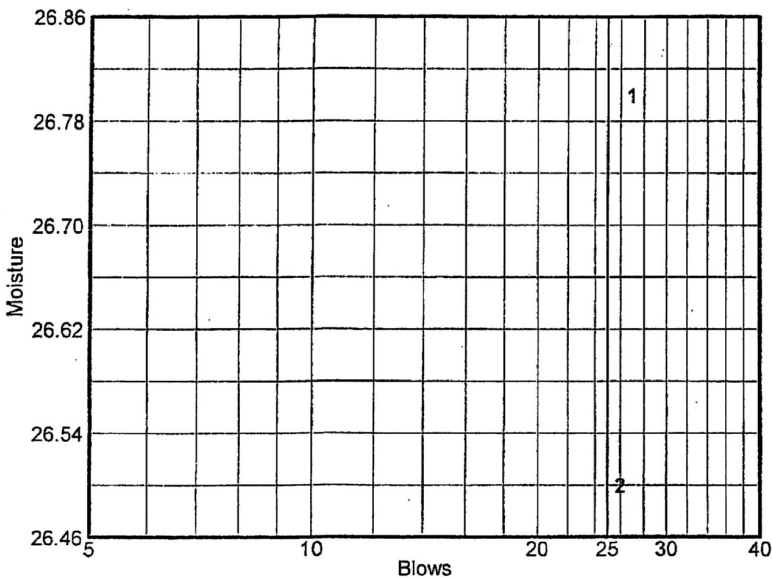
Client: Bechtel
 Project: Exelon Texas COL (Victoria)
 Project Number: 6468-07-1777

Sample Data

Source: B-2359UD
 Sample No.: UD-18
 Elev. or Depth: 112-113.1 Ft Sample Length(in./cm.): ID#8369
 Location: B-2359UD
 Description: Yellowish Brown Clayey SAND
 Water Content: 25.5 USCS: SC AASHTO:

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	35.43	32.66				
Dry+Tare	32.27	30.07				
Tare	20.47	20.30				
# Blows	27	26				
Moisture	26.8	26.5				



Liquid Limit= 27
 Plastic Limit= 15
 Plasticity Index= 12

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	29.55	29.28		
Dry+Tare	28.36	28.02		
Tare	20.59	19.94		
Moisture	15.3	15.6		

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: 3/19/08

SAMPLE IDENTIFICATION: B-2359UD, UD-18 @ 112-113.1 Ft.

(A) Mass of oven-dried soil, grams:	37.42
(B) Mass of pycnometer filled with water at test temperature (T), grams:	366.20
(C) Mass of pycnometer, water and soil, grams:	390.10
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	23.3
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$ 2.768
(F) Correction factor:	0.99926
(G x F) SPECIFIC GRAVITY @ 20°C:	2.766

MATERIAL TESTED:

- # 4

- # 10

PREPARATION METHOD:

DRY

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Clayey SAND (SC)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNOMETER : 2192

TESTED BY: EH

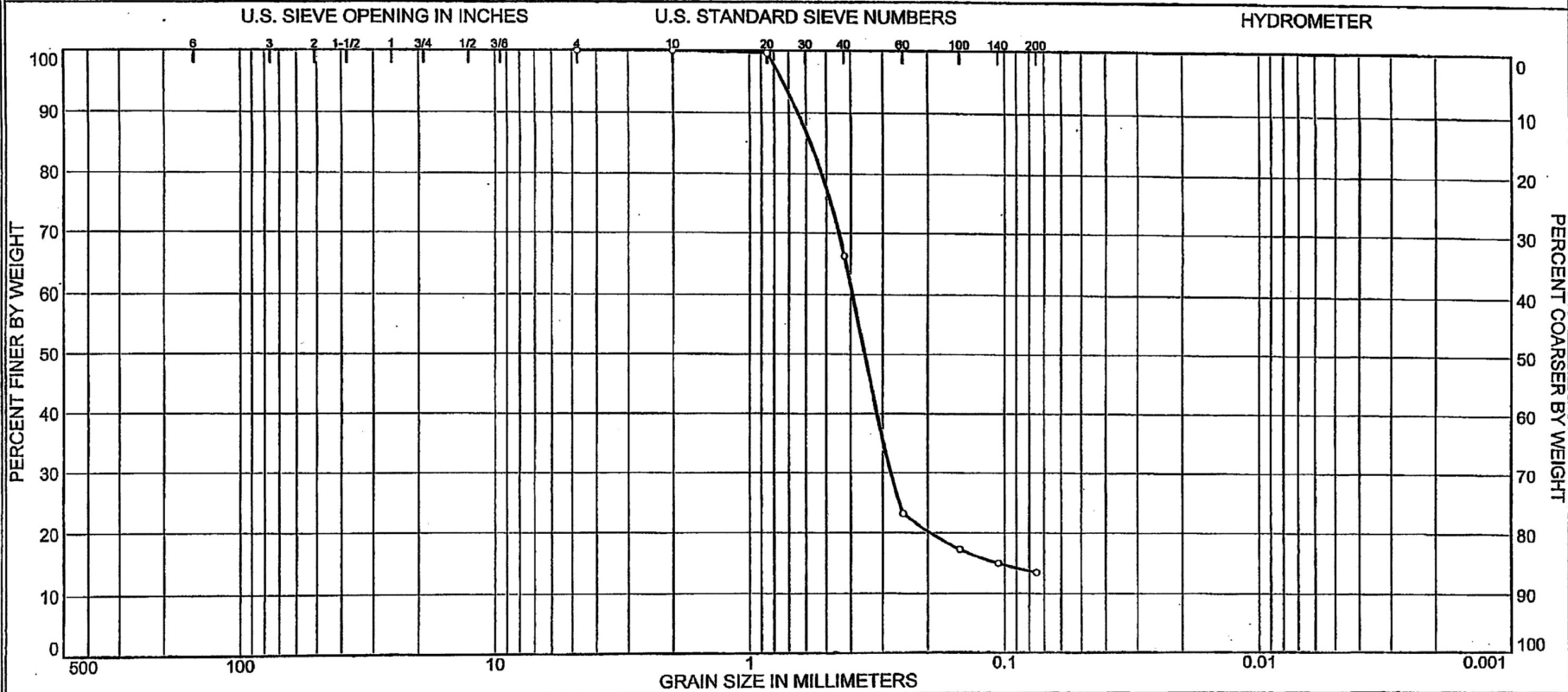
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REVIEWED BY: _____

Harry Johnson *HJ*

KAW 4.15.08

Particle Size Distribution Report ASTM D6913-04 e1



% COBBLES	% GRAVEL		% SAND			% FINES	
	COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	33.7	52.8	13.5	

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
B-2359UD	UD-19	114-116.6 Ft	1/31/08	SM	Light Gray Silty SAND (Visual)	17.3	ND	ND

Client Bechtel	MACTEC ENGINEERING AND CONSULTING, INC.	Project Exelon Texas COL (Victoria)	Tested by: EH Reviewed by: HJ <i>HJ</i>
Project No. 6468-07-1777		Lab No. 8370	Sieve Analysis Only NM value from average of strength tests performed. Specific Gravity = 2.70 (ASTM D 854-06) ND = Not Determined

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-2359UD
Sample No.: UD-19
Elev. or Depth: 114-116.6 Ft Sample Length(in./cm.): ID#830
Location: B-2359UD
Description: Light Gray Silty SAND (Visual)
Date: 1/31/08 PL: ND LL: ND PI: ND
USCS Classification: SM AASHTO Classification:
Testing Remarks: Tested by: EH Reviewed by: HJ

Sieve Analysis Only
NM value from average of strength tests performed.
Specific Gravity = 2.70 (ASTM D 854-06)
ND = Not Determined

Mechanical Analysis Data

Sieve	Initial Cumul. Wt. retained	Percent finer
Dry sample and tare=	303.05	
Tare =	100.19	
Dry sample weight =	202.86	
Tare for cumulative weight retained=	.00	
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.84	99.6
# 40	68.44	66.3
# 60	155.91	23.1
# 100	167.79	17.3
# 140	172.49	15.0
# 200	175.57	13.5

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL =
% SAND = 86.5 (% coarse = 0.0 % medium = 33.7 % fine = 52.8)
% FINES = 13.5

D₈₅= 0.57 D₆₀= 0.39 D₅₀= 0.35
D₃₀= 0.28 D₁₅= 0.11

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-2359UD, UD-19 @ 114-116.6 Ft.

(A) Mass of oven-dried soil, grams:		37.58
(B) Mass of pycnometer filled with water at test temperature (T), grams:		363.70
(C) Mass of pycnometer, water and soil, grams:		387.36
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$	2.700
(F)	Correction factor:	0.99931
(G x F)	SPECIFIC GRAVITY @ 20°C:	2.698

MATERIAL TESTED:

- # 4

- # 10

PREPARATION METHOD:

DRY

WET (dispersed)

REMARKS: Estimated % Passing # 4 : 100

Silty SAND (SM) - Visual

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER : 2759

PYCNOMETER : 2184

TESTED BY: EH

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

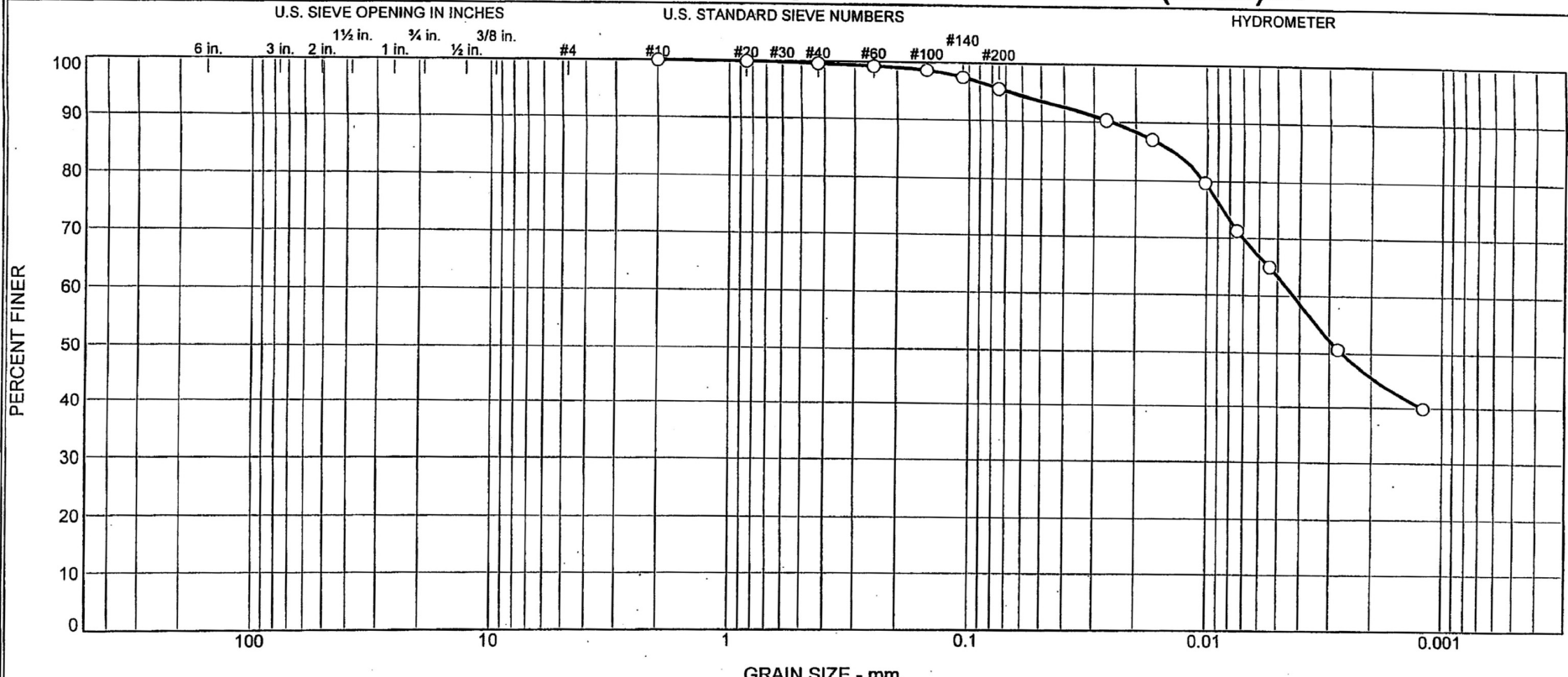
REVIEWED BY:

Harry Johnson

HJ

KAW 4.15.08

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	4.2	32.0	63.4

Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
Boring B-2359UD	UD-20	120.0-121.7	1/31/08	CH	Light Gray Fat CLAY	34.0	51	15

Client Bechtel	MACTEC, Inc.	○ Specific Gravity = 2.721 (ASTM D854-06) NM obtained from consolidation test specimen
Project Exelon Texas COL (Victoria Reservoir)		
Project No. 6468071777		
Figure <i>NA</i>	Raleigh, North Carolina	

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-2359UD

Depth: 120.0-121.7

Sample Number: UD-20

Material Description: Light Gray Fat CLAY

Date: 1/31/08

Natural Moisture: 34.0

Liquid Limit: 51

Plastic Limit: 15

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
171.38	0.00	0.00	#10	0.00	100.0
48.73	0.00	0.00	#20	0.04	99.9
			#40	0.18	99.6
			#60	0.38	99.2
			#100	0.68	98.6
			#140	1.27	97.4
			#200	2.24	95.4

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample =100.0

Weight of hydrometer sample =48.73

Hygroscopic moisture correction:

Moist weight and tare = 28.86

Dry weight and tare = 28.31

Tare weight = 15.62

Hygroscopic moisture =4.3%

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	21.6	48.0	42.8	0.0131	49.0	8.3	0.0266	90.3
5.00	21.6	46.5	41.3	0.0131	47.5	8.5	0.0171	87.1
15.00	21.6	43.0	37.8	0.0131	44.0	9.1	0.0102	79.7
30.00	21.6	39.0	33.8	0.0131	40.0	9.7	0.0075	71.3
60.00	21.6	36.0	30.8	0.0131	37.0	10.2	0.0054	65.0
250.00	22.4	29.0	24.0	0.0130	30.0	11.4	0.0028	50.7
1440.00	21.9	24.0	18.9	0.0131	25.0	12.2	0.0012	39.9

MACTEC, Inc.

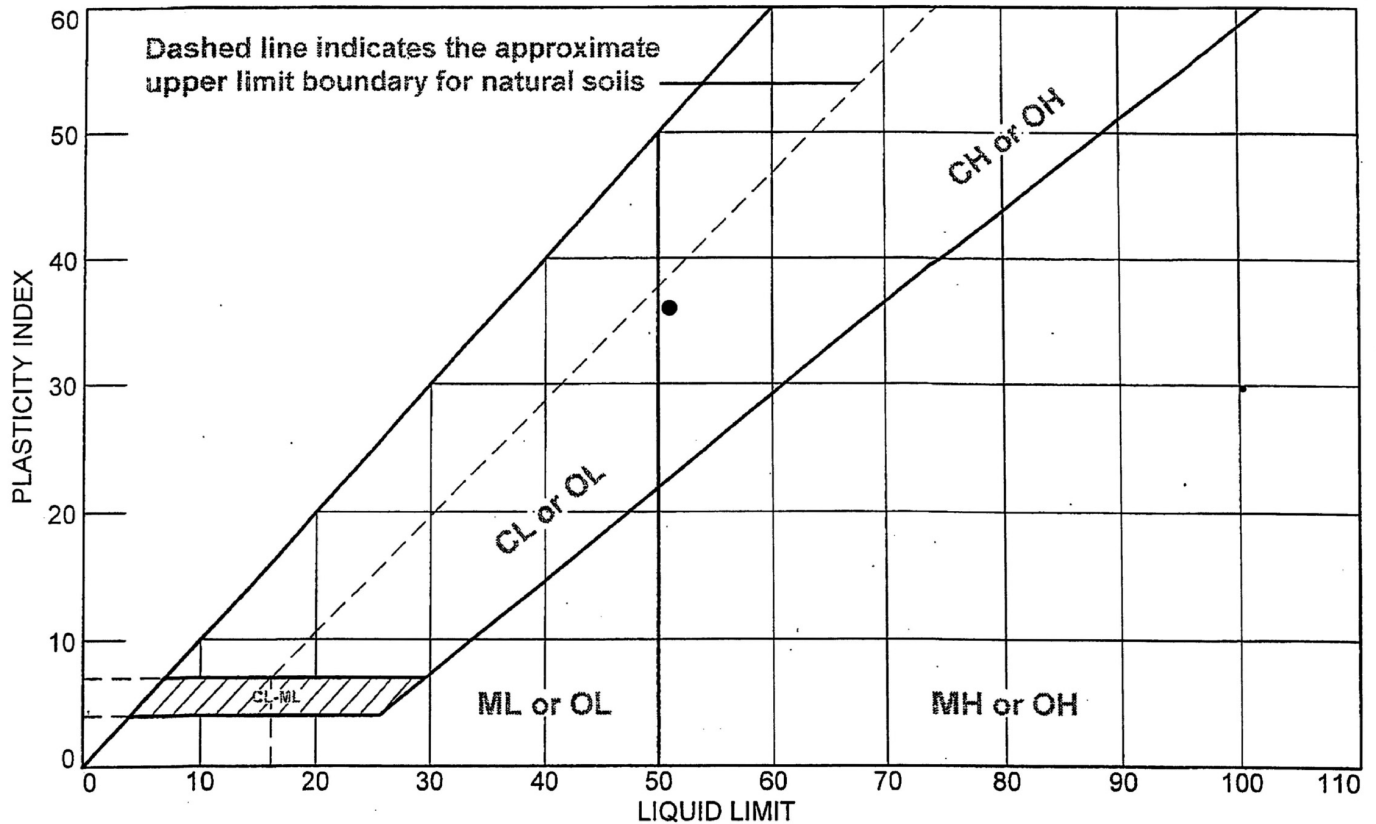
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.4	4.2	4.6	32.0	63.4	95.4

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0027	0.0043	0.0103	0.0138	0.0254	0.0698

Fineness Modulus
0.02

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-2359UD	UD-20	120.0-121.7	34.0	15	51	36	CH

MACTEC, Inc. Raleigh, North Carolina	Client: Bechtel Project: Exelon Texas COL (Victoria Reservoir)
	Project No.: 6468071777

Figure **MA**

Tested By: CS

Checked By: LBJ

KAW 5/8/08

LIQUID AND PLASTIC LIMIT TEST DATA

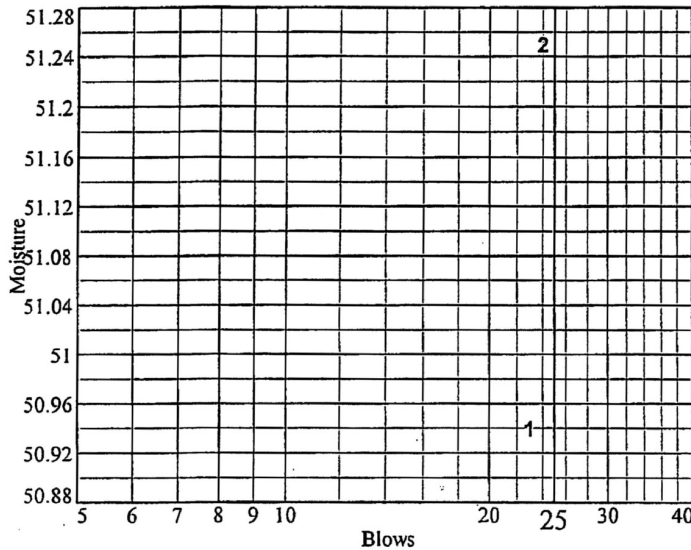
5/7/2008

Client: Bechtel
 Project: Exelon Texas COL (Victoria Reservoir)
 Project Number: 6468071777
 Location: Boring B-2359UD
 Depth: 120.0-121.7
 Material Description: Light Gray Fat CLAY
 USCS: CH
 Tested by: CS

Sample Number: UD-20
 AASHTO: A-7-6(36)
 Checked by: LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.47	25.46				
Dry+Tare	20.76	22.18				
Tare	15.44	15.78				
# Blows	23	24				
Moisture	50.9	51.3				



Liquid Limit= 51
 Plastic Limit= 15
 Plasticity Index= 36
 Natural Moisture= 34.0
 Liquidity Index= 0.5

Plastic Limit Data

Run No.	1	2	3	4
Wet+Tare	21.65	17.32		
Dry+Tare	20.87	16.53		
Tare	15.55	11.24		
Moisture	14.7	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: 4/17/08

SAMPLE IDENTIFICATION: B-2359UD, UD-20

(A) Mass of oven-dried soil, grams:		51.09
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.71
(C) Mass of pycnometer, water and soil, grams:		688.03
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.6
(G) Specific Gravity at observed temperature:	$A / [B - (C - A)]$	2.722
(F)	Correction factor:	0.99966
(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-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 5/8/08

Unconsolidated Undrained Triaxial Compression Tests