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: 2/15/08

SAMPLE IDENTIFICATION: B-2274UD,UD-1 @ 10.2 -11.9 Ft.

(A) Mass of oven-dried soil, grams:		36.43
(B) Mass of pycnometer filled with water at test temperature (T), grams:		341.25
(C) Mass of pycnometer, water and soil, grams:		364.44
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.3
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.752
(F)	***Correction factor:***	0.99926
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.749

MATERIAL TESTED: [ ] **- # 4** [X] **- # 10**

PREPARATION METHOD: [X] **DRY** [ ] **WET (dispersed)**

REMARKS: Estimated % Passing # 4 : 100 %

Lean CLAY (CL)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2057

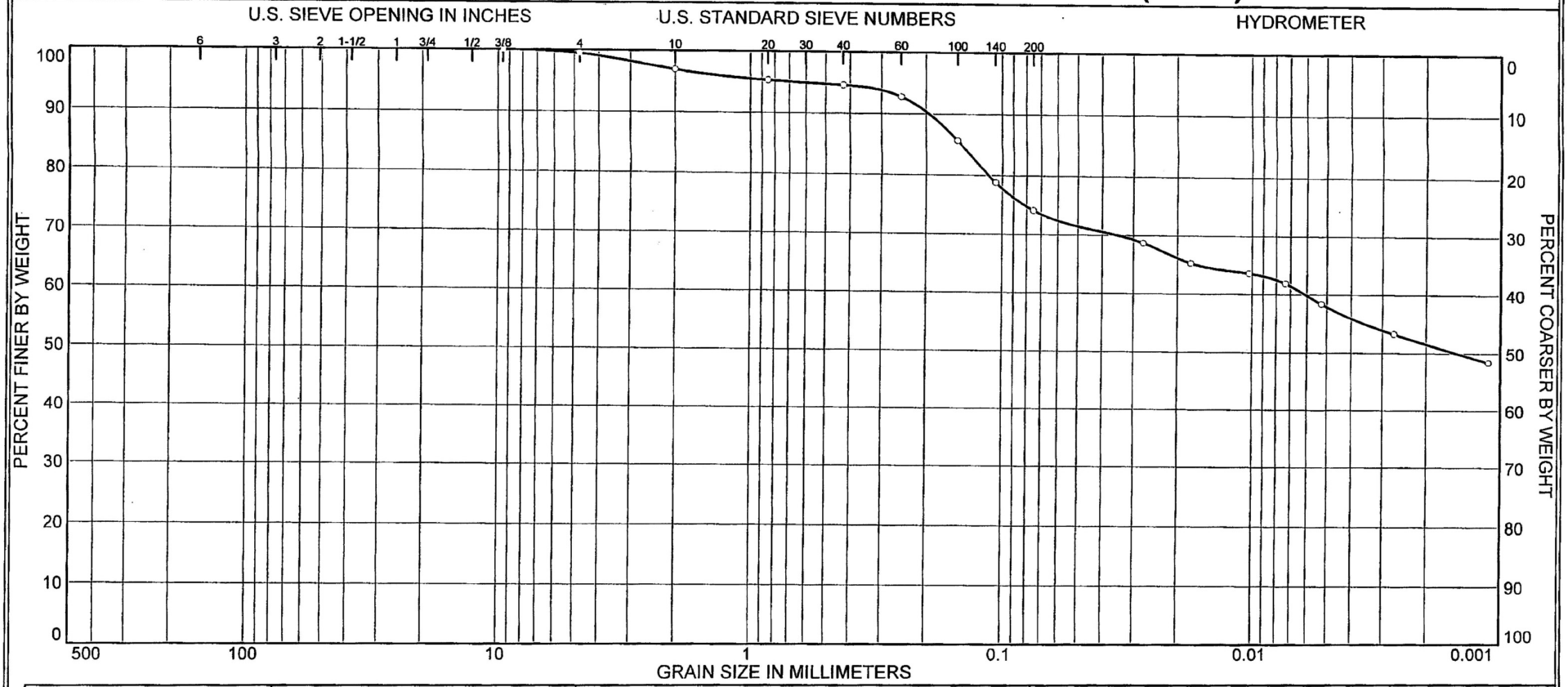
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

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	0.5	2.6	2.3	20.5	16.2	57.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2274UD	UD-3	64.9'-66.4'	01/06/08	CH	Light Brownish Gray Fat CLAY with sand	ND	73	24

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8313

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

ND = Not Determined

Specific Gravity = 2.72 (ASTM D 854-06)

DSC 3-3-08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2274UD
Sample No.: UD-3
Elev. or Depth: 64.9-66.4 Ft **Sample Length(in./cm.):** ID#8313
Location: B-2274UD
Description: Light Brownish Gray Fat CLAY with sand
Date: 01/06/08 **PL:** 24 **LL:** 73 **PI:** 49
USCS Classification: CH **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

ND = Not Determined
Specific Gravity = 2.72 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	74.01
Tare =	16.47
Dry sample weight =	57.54

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	0.28	99.5
# 10	1.78	96.9
# 20	2.70	95.3
# 40	3.11	94.6
# 60	4.13	92.8
# 100	8.24	85.7
# 140	12.22	78.8
# 200	14.90	74.1

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 74.1
Weight of hydrometer sample: 42.64
Calculated biased weight= 57.54
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.719
Specific gravity correction factor= 0.985
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

DSC 4-30-08

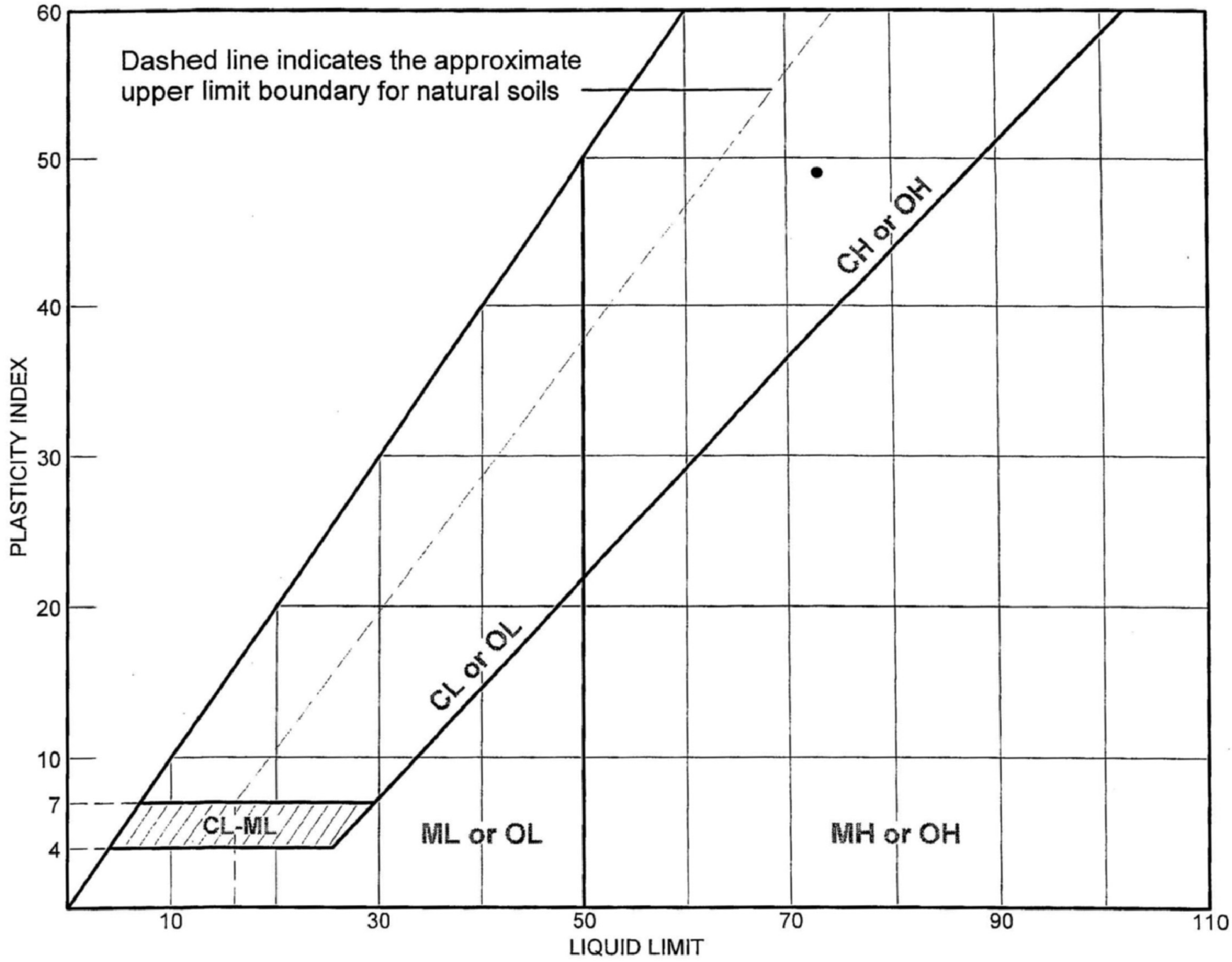
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.5	45.0	40.1	0.0130	45.0	8.9	0.0274	68.7
5.00	22.5	43.0	38.1	0.0130	43.0	9.2	0.0176	65.3
15.00	22.5	42.0	37.1	0.0130	42.0	9.4	0.0103	63.6
30.00	22.5	41.0	36.1	0.0130	41.0	9.6	0.0073	61.9
60.00	22.5	39.0	34.1	0.0130	39.0	9.9	0.0053	58.4
240.00	22.5	36.0	31.1	0.0130	36.0	10.4	0.0027	53.3
1440.00	23.1	33.0	28.3	0.0129	33.0	10.9	0.0011	48.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL** = 0.5 (**% coarse =** **% fine** = 0.5)
% SAND = 25.4 (**% coarse** = 2.6 **% medium** = 2.3 **% fine** = 20.5)
% SILT = 16.2 **% CLAY** = 57.9

D_{85}= 0.14 D_{60}= 0.01 D_{50}= 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
●	2274UD	UD-3	64.9'-66.4'	ND	24	73	49	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8313

DSC 3-08

LIQUID AND PLASTIC LIMIT TEST DATA

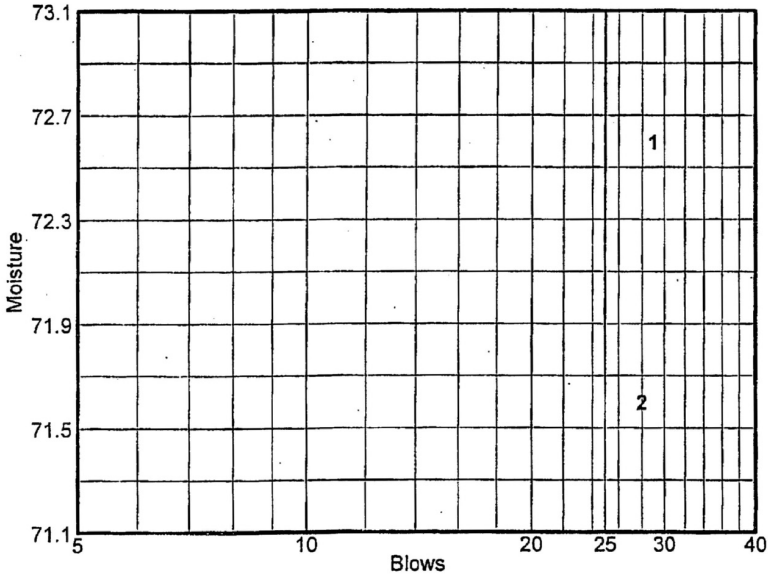
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2274UD
Sample No.: UD-3
Elev. or Depth: 64.9-66.4 Ft **Sample Length(in./cm.):** ID#8313
Location: B-2274UD
Description: Light Brownish Gray Fat CLAY with sand
Water Content: ND **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	29.69	31.24				
Dry+Tare	26.22	27.28				
Tare	21.44	21.75				
# Blows	29	28				
Moisture	72.6	71.6				



Liquid Limit= 73
Plastic Limit= 24
Plasticity Index= 49

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	31.17	29.52			
Dry+Tare	29.40	28.06			
Tare	21.90	21.91			
Moisture	23.6	23.7			

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: 2/15/08

SAMPLE IDENTIFICATION: B-2274UD,UD-3 @ 64.9 - 66.4 Ft.

(A) Mass of oven-dried soil, grams:		36.33
(B) Mass of pycnometer filled with water at test temperature (T), grams:		343.05
(C) Mass of pycnometer, water and soil, grams:		366.03
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.721
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.719

MATERIAL TESTED: [ ] **- # 4** [X] **- # 10**

PREPARATION METHOD: [X] **DRY** [ ] **WET (dispersed)**

REMARKS: Estimated % Passing # 4 : 100 %

Fat CLAY with sand (CH)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2052

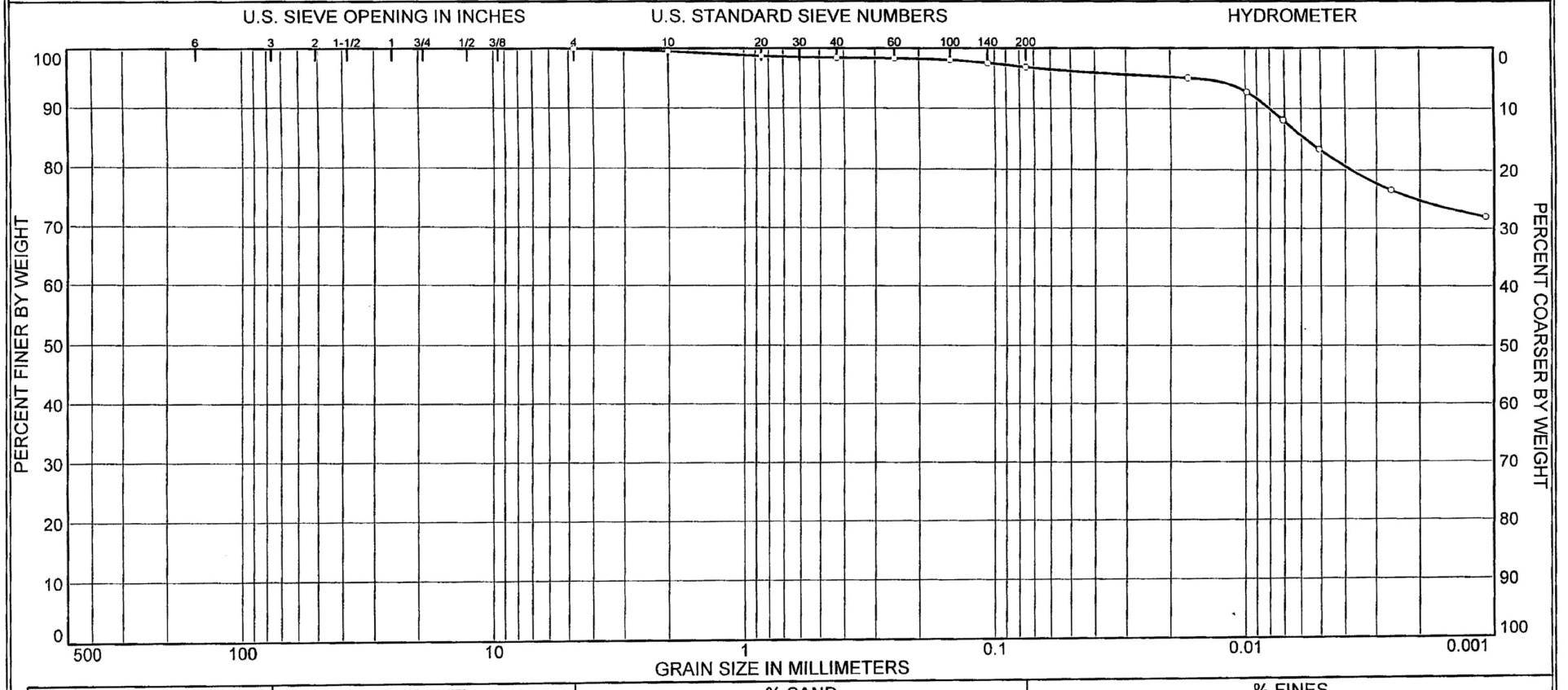
TESTED BY: EH

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

REVIEWED BY: Harry Johnson HJ

DSC
3-3-08

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	0.5	1.1	1.6	13.6	83.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2274UD	UD-4	67.0'-68.7'	01/06/08	CH	Light Yellowish Brown Fat CLAY	32.6	79	33

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8314

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

NM value from first strenght test performed.
Specific Gravity = 2.76 (ASTM D 854-06)

HJ

DSC
3-3-08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2274UD
Sample No.: UD-4
Elev. or Depth: 67.0-68.7 Ft **Sample Length(in./cm.):** ID#8314
Location: B-2274UD
Description: Light Yellowish Brown Fat CLAY
Date: 01/06/08 **PL:** 33 **LL:** 79 **PI:** 46
USCS Classification: CH **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strenght test performed.
Specific Gravity = 2.76 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	56.85
Tare =	14.53
Dry sample weight =	42.32

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.20	99.5
# 20	0.55	98.7
# 40	0.67	98.4
# 60	0.74	98.3
# 100	0.85	98.0
# 140	1.06	97.5
# 200	1.37	96.8

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 96.8
Weight of hydrometer sample: 40.95
Calculated biased weight= 42.30
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.763
Specific gravity correction factor= 0.976
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

DSC 4-13-08

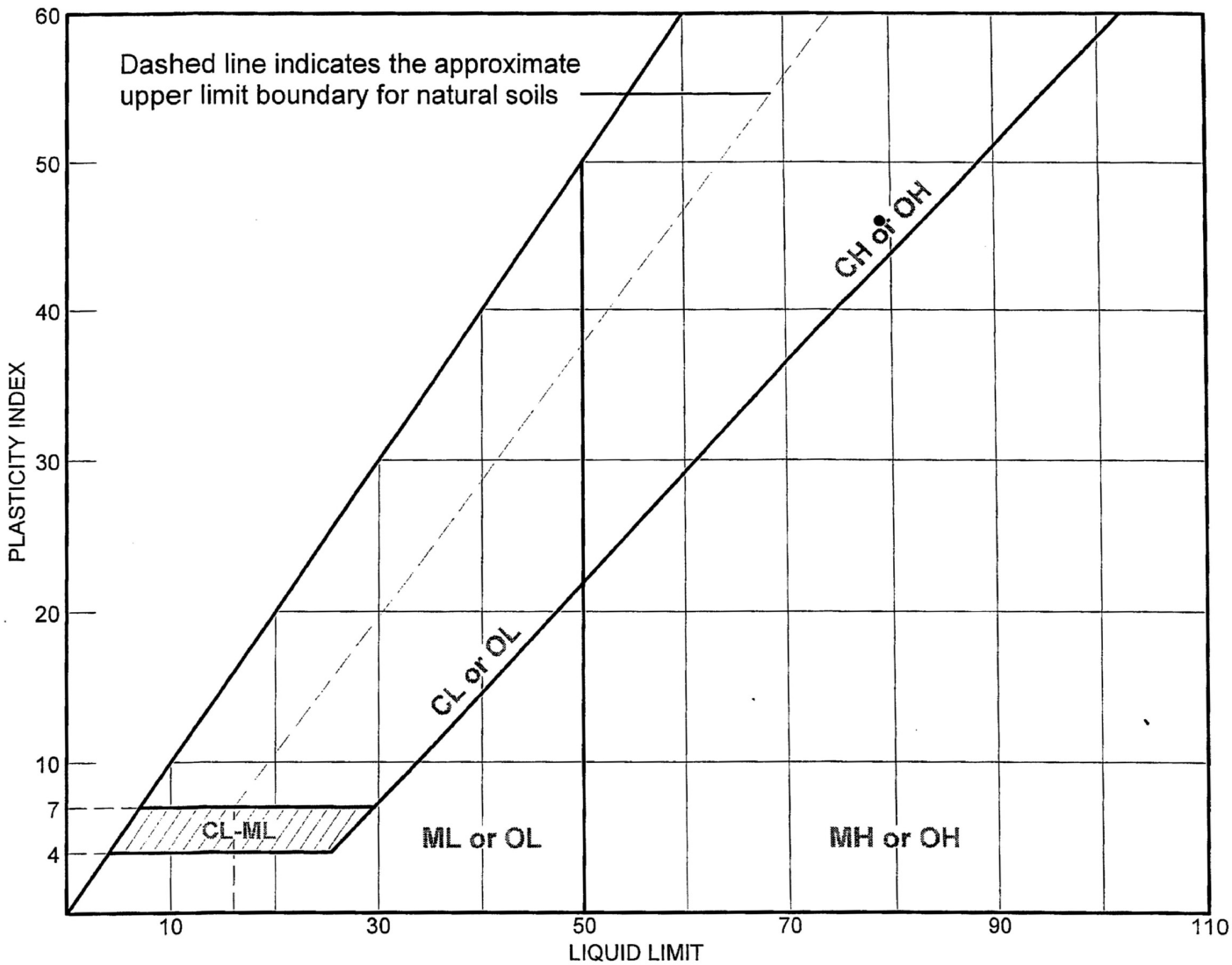
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
5.00	22.7	46.0	41.2	0.0128	46.0	8.8	0.0169	95.0
15.00	22.7	45.0	40.2	0.0128	45.0	8.9	0.0098	92.7
30.00	22.7	43.0	38.2	0.0128	43.0	9.2	0.0071	88.1
60.00	22.7	41.0	36.2	0.0128	41.0	9.6	0.0051	83.5
240.00	22.8	38.0	33.2	0.0128	38.0	10.1	0.0026	76.6
1440.00	22.8	36.0	31.2	0.0128	36.0	10.4	0.0011	72.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 3.2 (**% coarse** = 0.5 **% medium** = 1.1 **% fine** = 1.6)
% SILT = 13.6 **% CLAY** = 83.2

D_{85}= 0.01

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
●	2274UD	UD-4	67.0'-68.7'	32.6	33	79	46	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8314

DSC 3-9-08

LIQUID AND PLASTIC LIMIT TEST DATA

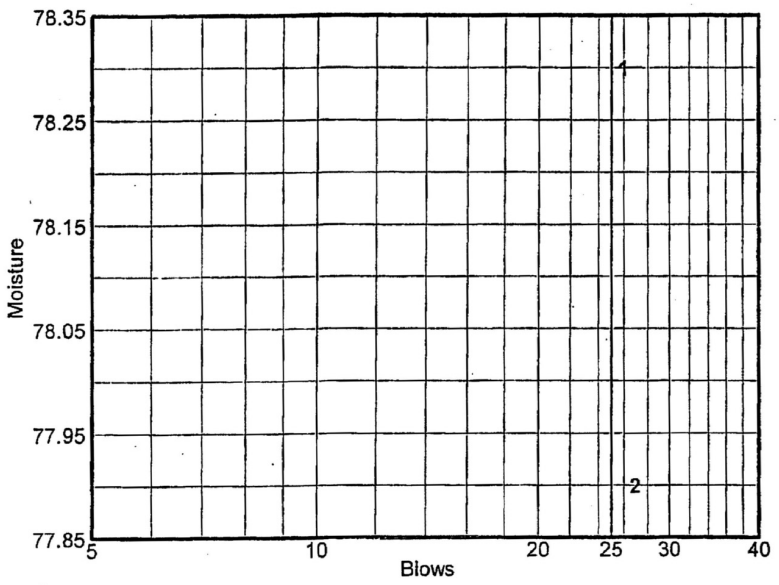
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2274UD
Sample No.: UD-4
Elev. or Depth: 67.0-68.7 Ft **Sample Length(in./cm.):** ID#8314
Location: B-2274UD
Description: Light Yellowish Brown Fat CLAY
Water Content: 32.6 **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.78	23.45				
Dry+Tare	20.27	19.53				
Tare	14.51	14.50				
# Blows	26	27				
Moisture	78.3	77.9				



Liquid Limit= 79
Plastic Limit= 33
Plasticity Index= 46

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	20.91	20.99			
Dry+Tare	19.31	19.49			
Tare	14.53	14.88			
Moisture	33.5	32.5			

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: 2/15/08

SAMPLE IDENTIFICATION: B-2274UD,UD-4 @ 67 - 68.7 Ft.

(A) Mass of oven-dried soil, grams:		36.25
(B) Mass of pycnometer filled with water at test temperature (T), grams:		363.65
(C) Mass of pycnometer, water and soil, grams:		386.79
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.6
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.765
(F)	***Correction factor:***	0.99919
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.763

MATERIAL TESTED: [ ] **- # 4** [X] **- # 10**

PREPARATION METHOD: [X] **DRY** [ ] **WET (dispersed)**

REMARKS: Estimated % Passing # 4 : 100 %

Fat CLAY (CH)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2184

TESTED BY: EH

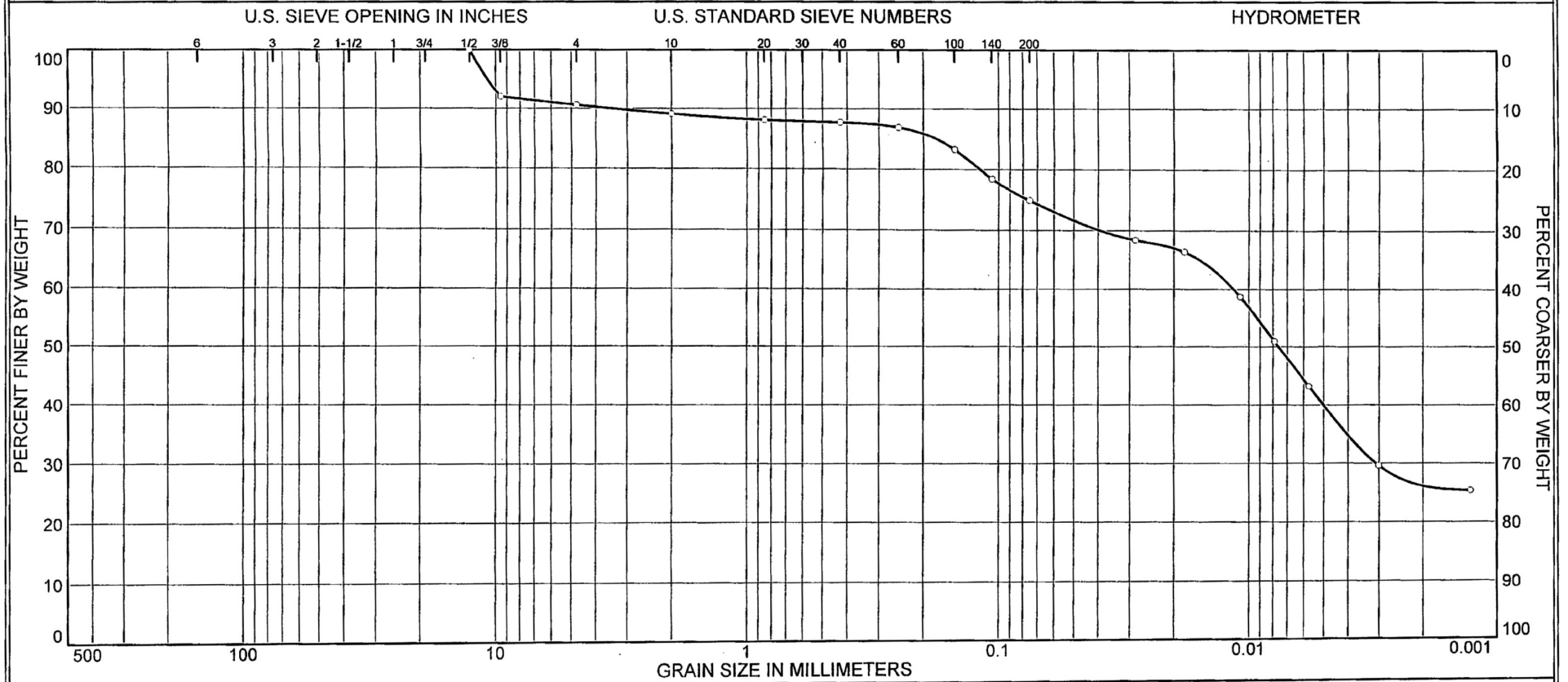
\Test Reports\Soils\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Harry Johnson

HJ

DSC
3-3-08

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	9.4	1.5	1.4	12.8	35.0	39.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2274UD	UD-5	89.8'-90.8'	01/06/08	CL	Light Gray Lean CLAY with sand	17.7	38	17

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8315

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

Specific Gravity = 2.72 (ASTM D 854-06)

HJ

DSC 3-3-08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2274UD
Sample No.: UD-5
Elev. or Depth: 89.8-90.8 Ft **Sample Length(in./cm.):** ID#8315
Location: B-2274UD
Description: Light Gray Lean CLAY with sand
Date: 01/06/08 **PL:** 17 **LL:** 38 **PI:** 21
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

Specific Gravity = 2.72 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	66.74
Tare =	15.88
Dry sample weight =	50.86

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.500 inch	0.00	100.0
.375 inch	4.07	92.0
# 4	4.80	90.6
# 10	5.56	89.1
# 20	6.03	88.1
# 40	6.24	87.7
# 60	6.68	86.9
# 100	8.50	83.3
# 140	10.97	78.4
# 200	12.78	74.9

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 74.9
Weight of hydrometer sample: 38.08
Calculated biased weight= 50.84
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.718
Specific gravity correction factor= 0.985
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

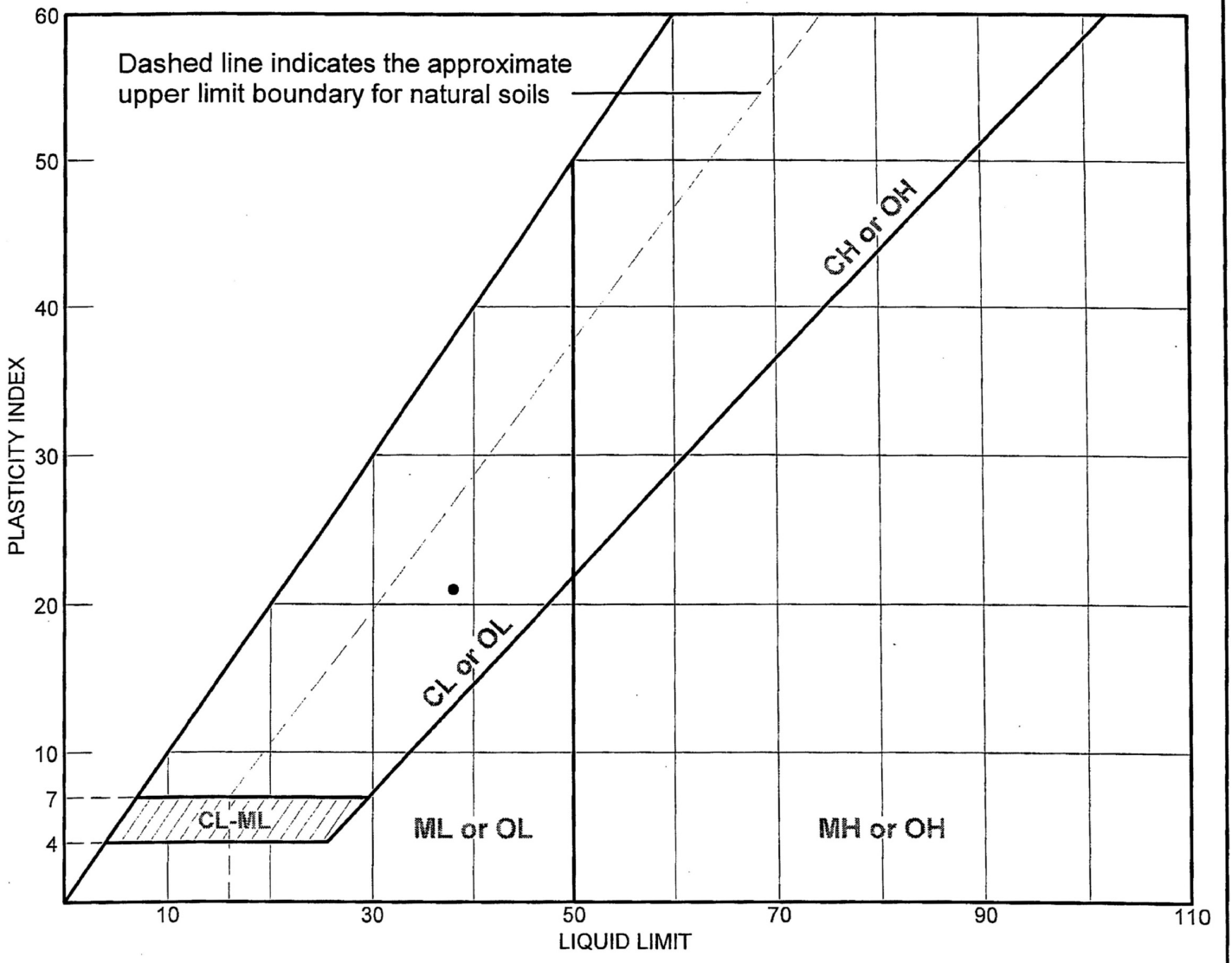
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	23.1	40.0	35.3	0.0129	40.0	9.7	0.0284	68.4
5.00	23.1	39.0	34.3	0.0129	39.0	9.9	0.0181	66.4
15.00	23.1	35.0	30.3	0.0129	35.0	10.6	0.0108	58.7
30.00	23.1	31.0	26.3	0.0129	31.0	11.2	0.0079	50.9
60.00	23.1	27.0	22.3	0.0129	27.0	11.9	0.0057	43.2
240.00	23.1	20.0	15.3	0.0129	20.0	13.0	0.0030	29.6
1440.00	20.0	18.5	13.1	0.0134	18.5	13.3	0.0013	25.3

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 9.4 **(% coarse =** **% fine =** 9.4)
% SAND = 15.7 **(% coarse =** 1.5 **% medium =** 1.4 **% fine =** 12.8)
% SILT = 35.0 **% CLAY =** 39.9

D_{85}= 0.18 D_{60}= 0.01 D_{50}= 0.01
D_{30}= 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
●	2274UD	UD-5	89.8'-90.8'	17.7	17	38	21	CL

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8315

DSC 3-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

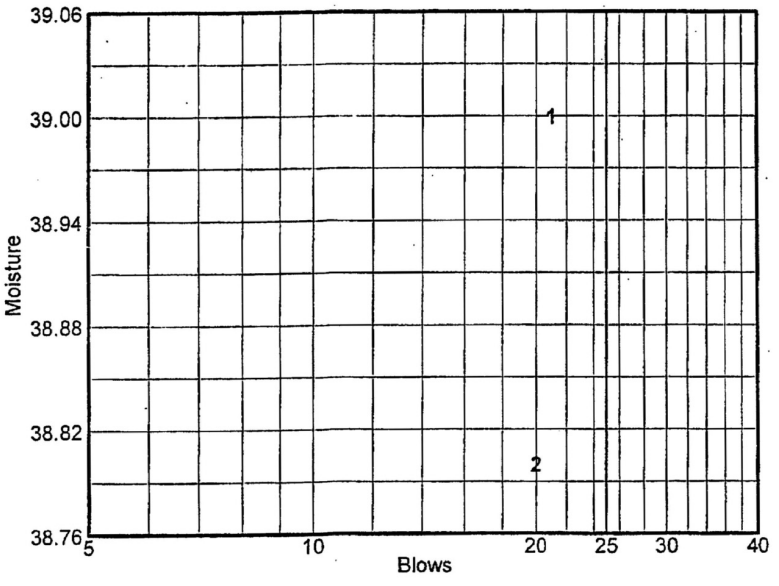
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2274UD
Sample No.: UD-5
Elev. or Depth: 89.8-90.8 Ft **Sample Length(in./cm.):** ID#8315
Location: B-2274UD
Description: Light Gray Lean CLAY with sand
Water Content: 17.7 **USCS:** CL **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	34.04	32.17				
Dry+Tare	30.63	29.21				
Tare	21.89	21.59				
# Blows	21	20				
Moisture	39.0	38.8				



Liquid Limit= 38
Plastic Limit= 17
Plasticity Index= 21

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	28.50	29.23			
Dry+Tare	27.25	27.94			
Tare	19.98	20.24			
Moisture	17.2	16.8			

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: 2/15/08

SAMPLE IDENTIFICATION: B-2274UD,UD-5 @ 89.8 - 90.8 Ft.

(A) Mass of oven-dried soil, grams:		37.29
(B) Mass of pycnometer filled with water at test temperature (T), grams:		338.35
(C) Mass of pycnometer, water and soil, grams:		361.93
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.6
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.720
(F)	***Correction factor:***	0.99916
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.718

MATERIAL TESTED: [ ] **- # 4** [X] **- # 10**

PREPARATION METHOD: [X] **DRY** [ ] **WET (dispersed)**

REMARKS: Estimated % Passing # 4 : 91 %

Lean CLAY with sand (CL)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2054

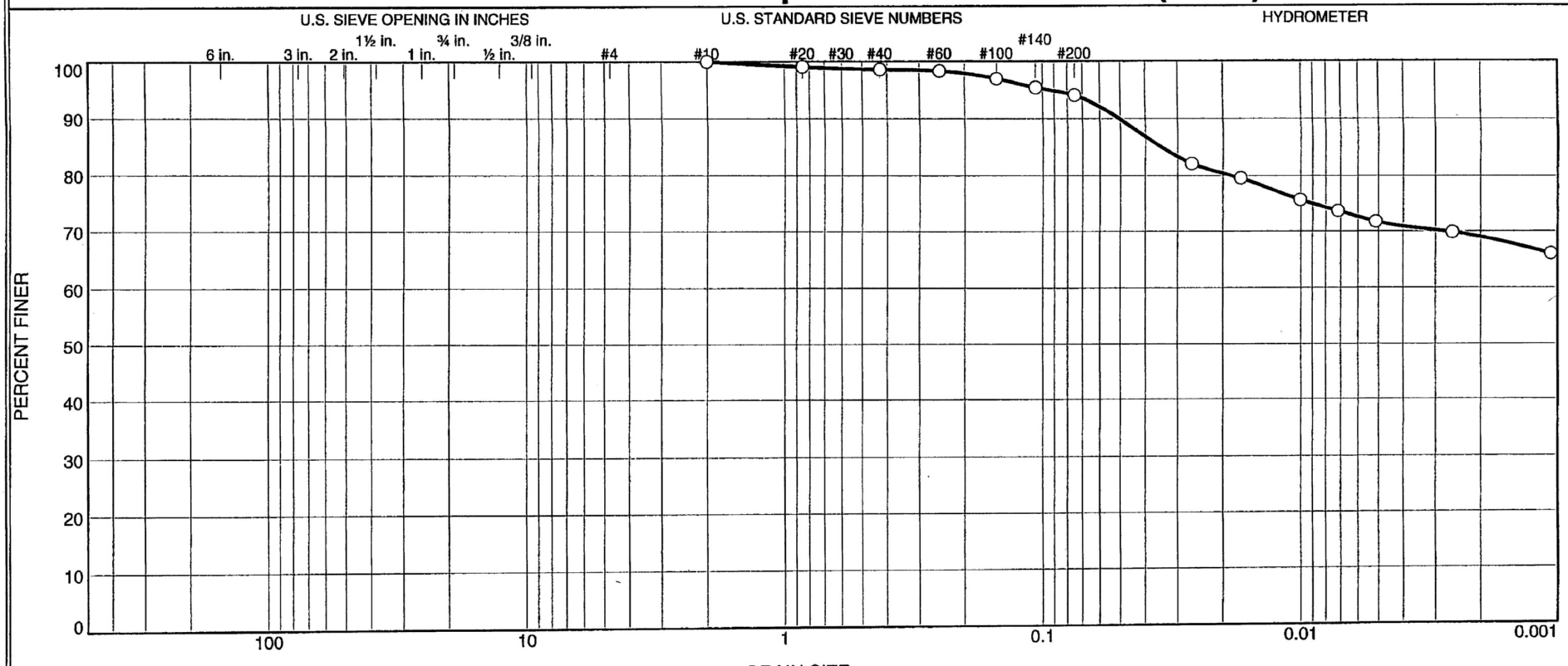
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

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



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.4	4.5	22.5	71.6

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2274UD	UD-8	120.0-122.0	1-7-08	CH	Light Gray Fat CLAY	34.4	93	29

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specfic Gravity = 2.715 (ASTM D854-06)

Tested By: CS **Checked By:** LBJ ZHU 4-28-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/10/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2274UD
Depth: 120.0 **Sample Number:** UD-8
Material Description: Light Gray Fat CLAY
Date: 1-7-08 **Natural Moisture:** 34.4
Liquid Limit: 93 **Plastic Limit:** 29 **USCS Class.:** CH
Testing Remarks: Specfic Gravity = 2.715 (ASTM D854-06)
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
169.39	0.00	0.00	#10	0.00	100.0
51.81	0.00	0.00	#20	0.48	99.1
			#40	0.72	98.6
			#60	0.86	98.3
			#100	1.58	97.0
			#140	2.39	95.4
			#200	3.08	94.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =51.81
Hygroscopic moisture correction:
Moist weight and tare = 28.76
Dry weight and tare = 28.36
Tare weight = 15.57
Hygroscopic moisture = 3.1%
Table of composite correction values:

Temp., deg. C:	12.9	29.9
Comp. corr.:	-8.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.715
Hydrometer type = 152H
Hydrometer effective depth equation: 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	23.9	46.0	41.9	0.0128	47.0	8.6	0.0264	82.2
5.00	23.0	45.0	40.6	0.0129	46.0	8.8	0.0171	79.6
15.00	23.0	43.0	38.6	0.0129	44.0	9.1	0.0100	75.7
30.00	23.0	42.0	37.6	0.0129	43.0	9.2	0.0072	73.7
60.00	23.0	41.0	36.6	0.0129	42.0	9.4	0.0051	71.7
240.00	23.1	40.0	35.6	0.0129	41.0	9.6	0.0026	69.8
1440.00	23.4	38.0	33.7	0.0128	39.0	9.9	0.0011	66.1

MACTEC, Inc.

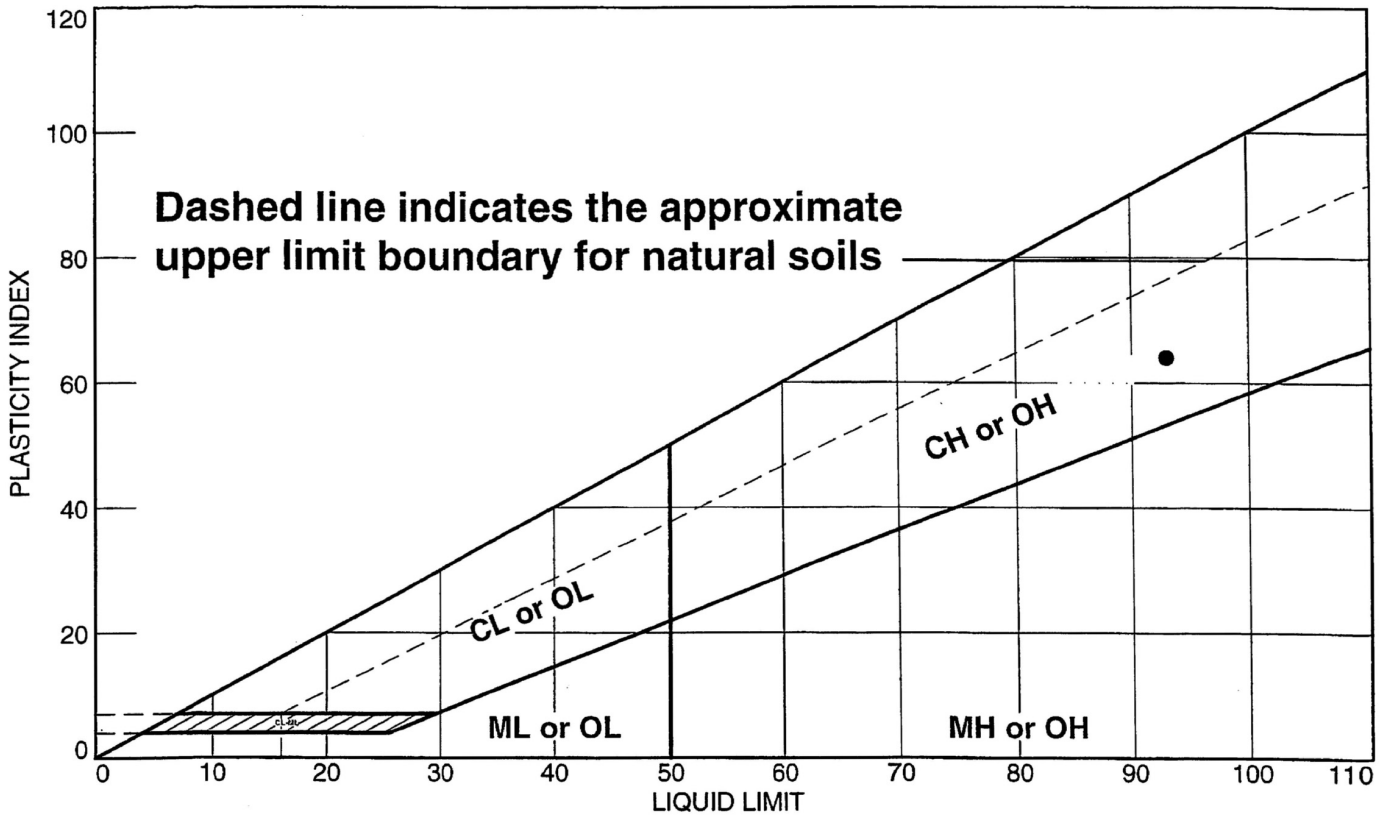
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.4	4.5	5.9	22.5	71.6	94.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.0183	0.0345	0.0503	0.0940

Fineness Modulus
0.06

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-2274UD	UD-8	120.0	34.4	29	93	64	CH

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

Tested By: CS **Checked By:** LBJ ZHU 4-28-08

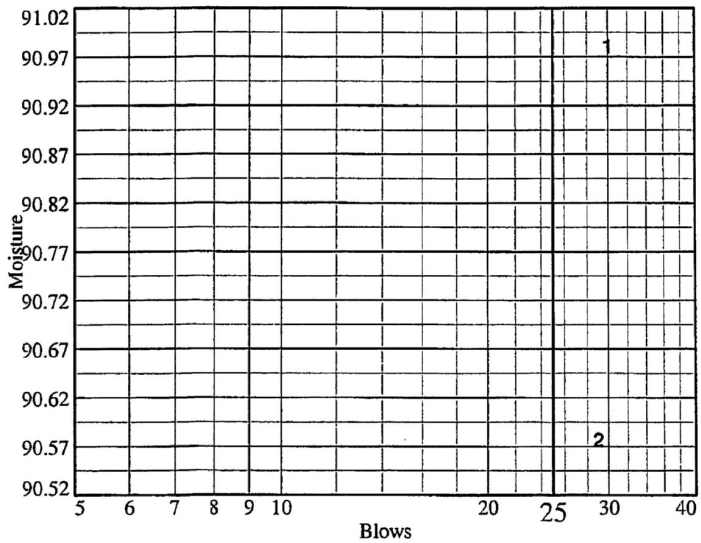
LIQUID AND PLASTIC LIMIT TEST DATA

4/10/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2274UD
Depth: 120.0 **Sample Number:** UD-8
Material Description: Light Gray Fat CLAY
USCS: CH **AASHTO:** A-7-6(70)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	27.57	31.79				
Dry+Tare	21.82	24.10				
Tare	15.50	15.61				
# Blows	30	29				
Moisture	91.0	90.6				



Liquid Limit= 93
Plastic Limit= 29
Plasticity Index= 64
Natural Moisture= 34.4
Liquidity Index= 0.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.53	22.60			
Dry+Tare	20.17	21.03			
Tare	15.41	15.53			
Moisture	28.6	28.5			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
115.05	87.37	6.80	34.4

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: 3/4/08

SAMPLE IDENTIFICATION: B 2274UD, UD - 8

(A) Mass of oven-dried soil, grams:		51.05
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.78
(C) Mass of pycnometer, water and soil, grams:		689.03
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.6
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.715
(F)	***Correction factor:***	0.99966
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.715

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

PYCNOMETER :P-6

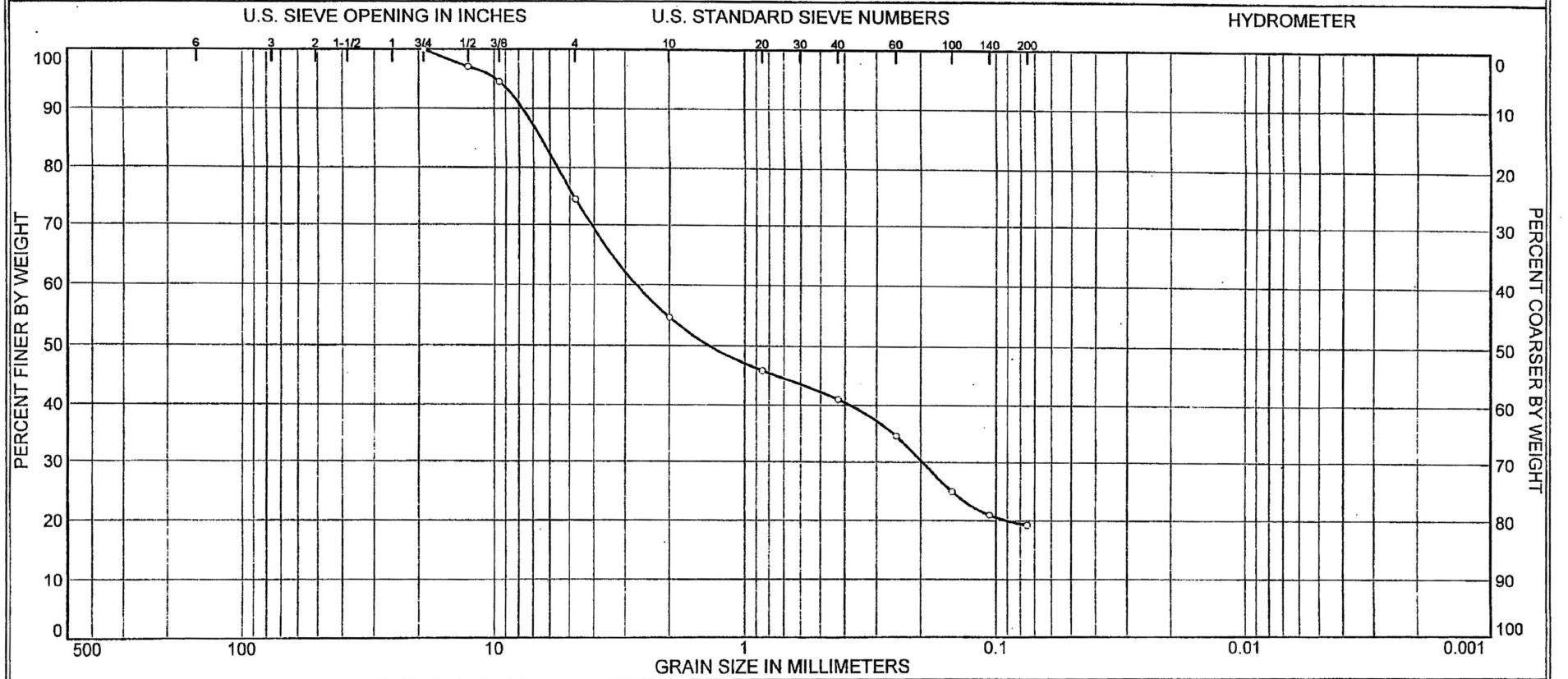
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 3-15-08

Particle Size Distribution Report ASTM D6913-04 e1



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	25.5	19.9	13.6	21.8	19.2	

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	B-2274UD	UD-12	221.1-223.6	1/10/08	SC	Light Gray Clayey SAND with Gravel (Visual)	10.6	ND	ND
			Ft						

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8447

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ HJ

Sieve Analysis Only.
NM value from average of strength tests performed.
Specific Gravity = 2.66 (ASTM D 854-06)
ND = Not Determined

DSC
3-31-08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2274UD
Sample No.: UD-12
Elev. or Depth: 221.1-223.6 Ft **Sample Length(in./cm.):** ID#8447
Location: B-2274UD
Description: Light Gray Clayey SAND with Gravel (Visual)
Date: 1/10/08 **PL:** ND **LL:** ND **PI:** ND
USCS Classification: SC **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

Sieve Analysis Only.
NM value from average of strength tests performed.
Specific Gravity = 2.66 (ASTM D 854-06)
ND = Not Determined

Mechanical Analysis Data

	Initial
Dry sample and tare=	146.01
Tare =	15.33
Dry sample weight =	130.68

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.75 inch	0.00	100.0
.5 inch	3.74	97.1
.375 inch	7.11	94.6
# 4	33.30	74.5
# 10	59.34	54.6
# 20	70.70	45.9
# 40	77.16	41.0
# 60	85.43	34.6
# 100	98.14	24.9
# 140	103.32	20.9
# 200	105.56	19.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 25.5 **(% coarse =** **% fine =** 25.5)
% SAND = 55.3 **(% coarse =** 19.9 **% medium =** 13.6 **% fine =** 21.8)
% FINES = 19.2

D_{85}= 6.52 D_{60}= 2.71 D_{50}= 1.39
D_{30}= 0.20

MACTEC Engineering and Consulting, Inc.

DSC 4-30-08

LIQUID AND PLASTIC LIMIT TEST DATA

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

Sample Data

Source: B-2274UD
Sample No.: UD-12
Elev. or Depth: 221.1-223.6 Ft **Sample Length(in./cm.):** ID#8447
Location: B-2274UD
Description: Light Gray Clayey SAND with Gravel (Visual)
Water Content: 10.6 **USCS:** SC **AASHTO:**

Liquid Limit= NV
Plastic Limit= NP
Plasticity Index= NP

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-2274UD,UD-12 @ 221.1-223.6 Ft.

(A) Mass of oven-dried soil, grams:		37.40
(B) Mass of pycnometer filled with water at test temperature (T), grams:		338.40
(C) Mass of pycnometer, water and soil, grams:		361.74
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.3
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.660
(F)	***Correction factor:***	0.99926
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.658

MATERIAL TESTED: [ ] **- # 4** [X] **- # 10**

PREPARATION METHOD: [X] **DRY** [ ] **WET (dispersed)**

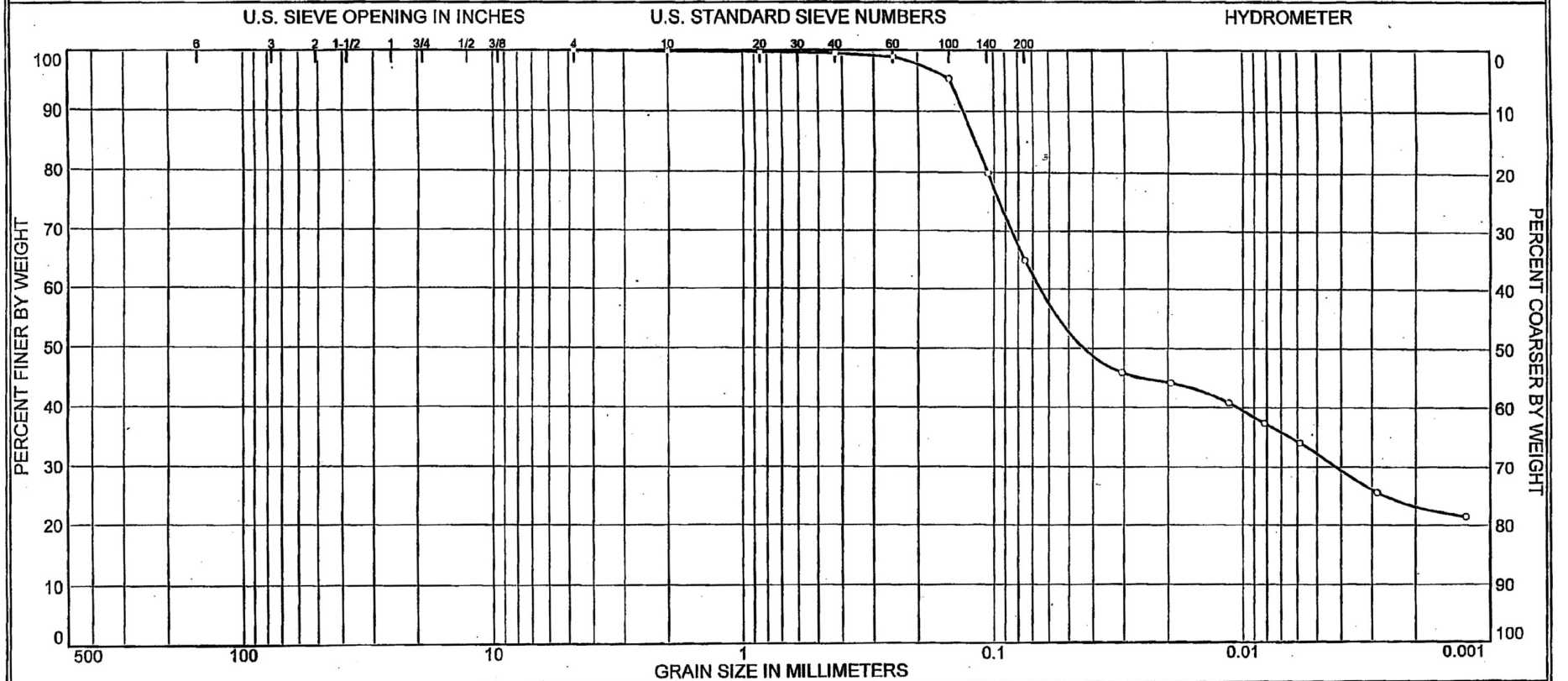
REMARKS: Estimated % Passing # 4 : 75 %
Clayey SAND with Gravel (SC) - Visual

EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2054

TESTED BY: EH
\Test Reports\Soils\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Harry Johnson HJ
DSC 3-31-08

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



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	0.0	0.0	0.2	0.3	34.6	32.6	32.3

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	B-2274UD	UD-13	240-242.5 Ft	1/10/08	CL	Light Gray Sandy Lean CLAY	17.1	32	15

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8446

MACTEC ENGINEERING AND CONSULTING, INC.

O Tested by: EH Reviewed by: HJ

NM value from first strength tests performed.
Specific Gravity = 2.70 (ASTM D 854-06)

DSC
3-31-08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2274UD
Sample No.: UD-13
Elev. or Depth: 240-242.5 Ft **Sample Length(in./cm.):** ID#8446
Location: B-2274UD
Description: Light Gray Sandy Lean CLAY
Date: 1/10/08 **PL:** 15 **LL:** 32 **PI:** 17
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength tests performed.
Specific Gravity = 2.70 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	74.50
Tare =	15.78
Dry sample weight =	58.72

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.12	99.8
# 20	0.15	99.7
# 40	0.27	99.5
# 60	0.64	98.9
# 100	2.77	95.3
# 140	11.80	79.9
# 200	20.63	64.9

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 64.9
Weight of hydrometer sample: 38.09
Calculated biased weight= 58.69
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

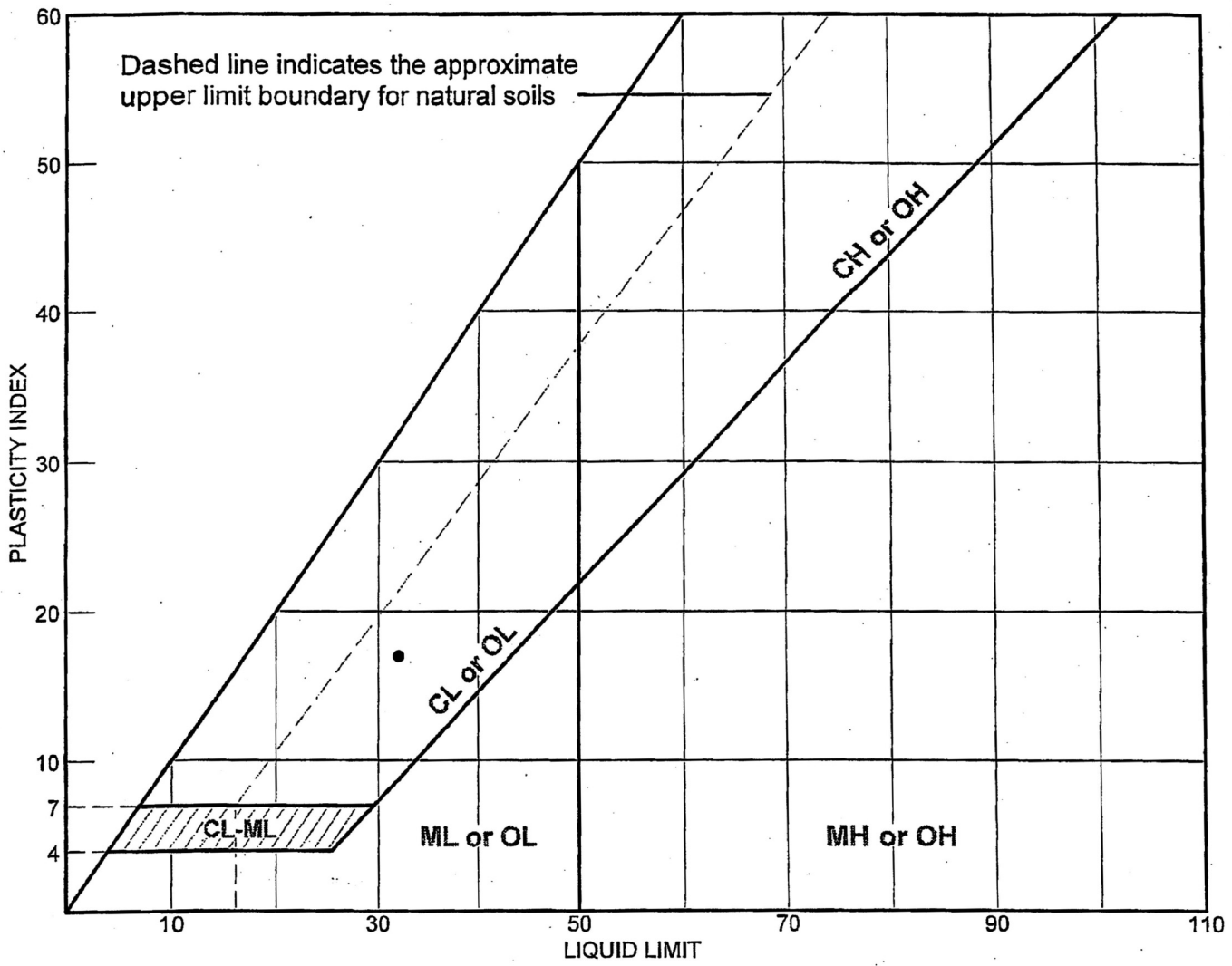
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.8	32.0	27.2	0.0130	32.0	11.0	0.0305	45.9
5.00	22.8	31.0	26.2	0.0130	31.0	11.2	0.0195	44.2
15.00	22.8	29.0	24.2	0.0130	29.0	11.5	0.0114	40.8
30.00	22.8	27.0	22.2	0.0130	27.0	11.9	0.0082	37.4
60.00	22.8	25.0	20.2	0.0130	25.0	12.2	0.0059	34.1
270.00	22.8	20.0	15.2	0.0130	20.0	13.0	0.0029	25.6
1440.00	22.8	17.5	12.7	0.0130	17.5	13.4	0.0013	21.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL =
% SAND = 35.1 (% coarse = 0.2 % medium = 0.3 % fine = 34.6)
% SILT = 32.6 % CLAY = 32.3

D_{85}= 0.12 D_{60}= 0.07 D_{50}= 0.04
D_{30}= 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-2274UD	UD-13	240-242.5 Ft	17.1	15	32	17	CL

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8446

DSC 5-31-08

LIQUID AND PLASTIC LIMIT TEST DATA

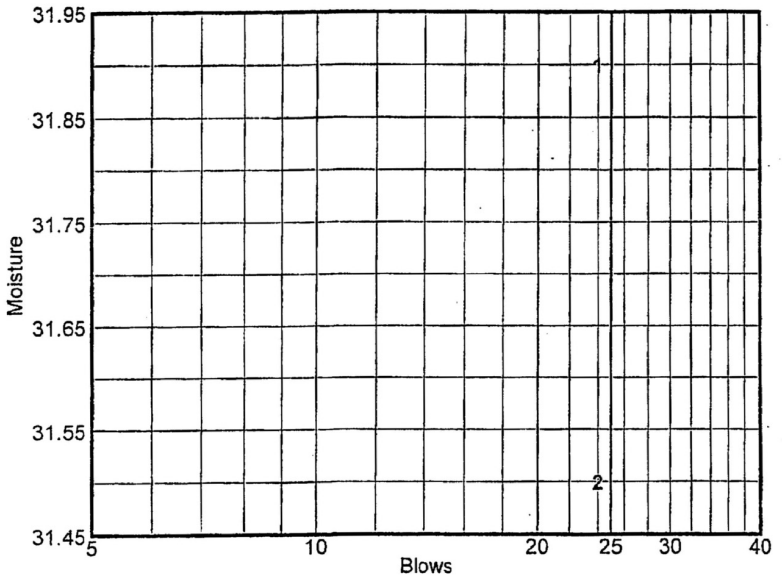
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2274UD
Sample No.: UD-13
Elev. or Depth: 240-242.5 Ft **Sample Length(in./cm.):** ID#8446
Location: B-2274UD
Description: Light Gray Sandy Lean CLAY
Water Content: 17.1 **USCS:** CL **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.94	32.36				
Dry+Tare	29.23	29.47				
Tare	20.74	20.29				
# Blows	24	24				
Moisture	31.9	31.5				



Liquid Limit= 32
Plastic Limit= 15
Plasticity Index= 17

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	28.21	28.83			
Dry+Tare	27.17	27.72			
Tare	20.24	20.35			
Moisture	15.0	15.1			

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-2274UD,UD-13 @ 240-242.5 Ft.

(A) Mass of oven-dried soil, grams:		37.41
(B) Mass of pycnometer filled with water at test temperature (T), grams:		341.20
(C) Mass of pycnometer, water and soil, grams:		364.77
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.9
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.703
(F)	***Correction factor:***	0.99912
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.701

MATERIAL TESTED: [ ] **- # 4** [X] **- # 10**

PREPARATION METHOD: [X] **DRY** [ ] **WET (dispersed)**

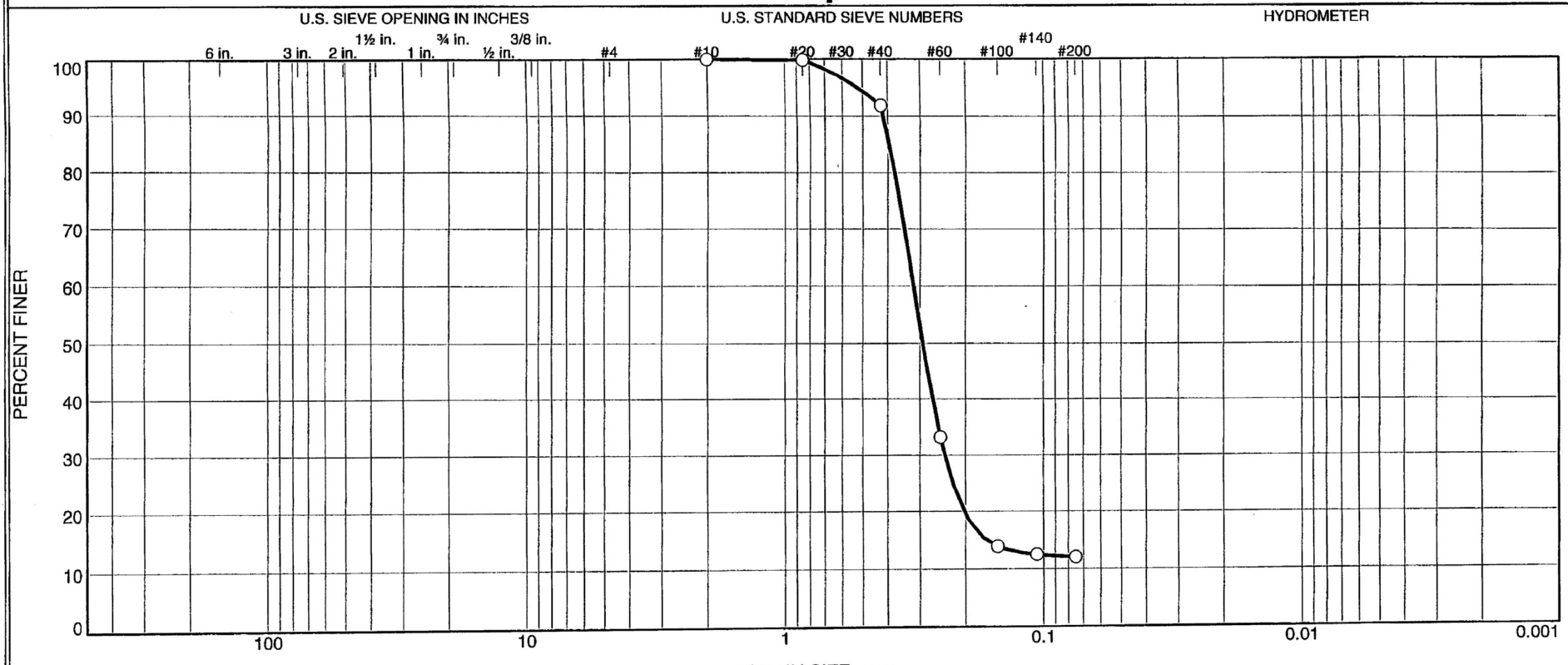
REMARKS: Estimated % Passing # 4 : 100 %
Sandy Lean CLAY (CL)

EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2057

TESTED BY: EH
\Test Reports\Soils\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Harry Johnson HJ
DSC 3-31-08

Particle Size Distribution Report / ASTM D 6913-04e1



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
O	0.0	0.0	0.0	0.0	8.2	79.8	12.0	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2274UD	UD-14	265.0	1-19-08	SC	Light Gray Clayey SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O SIEVE ANALYSIS ONLY
Specific Gravity = 2.651 (ASTM D854-06)
ND = Not Determined

Tested By: CS **Checked By:** LBJ ZHU 4-28-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/10/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2274UD
Depth: 265.0 **Sample Number:** UD-14
Material Description: Light Gray Clayey SAND (Visual)
Date: 1-19-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
Specific Gravity = 2.651 (ASTM D854-06)
ND = Not Determined
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
269.10	0.00	0.00	#10	0.00	100.0
98.31	0.00	0.00	#20	0.16	99.8
			#40	8.03	91.8
			#60	65.68	33.2
			#100	84.62	13.9
			#140	86.00	12.5
			#200	86.48	12.0

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	8.2	79.8	88.0			12.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.1661	0.2024	0.2406	0.2928	0.3178	0.3757	0.3940	0.4157	0.5243

Fineness Modulus
1.37

MACTEC, Inc.