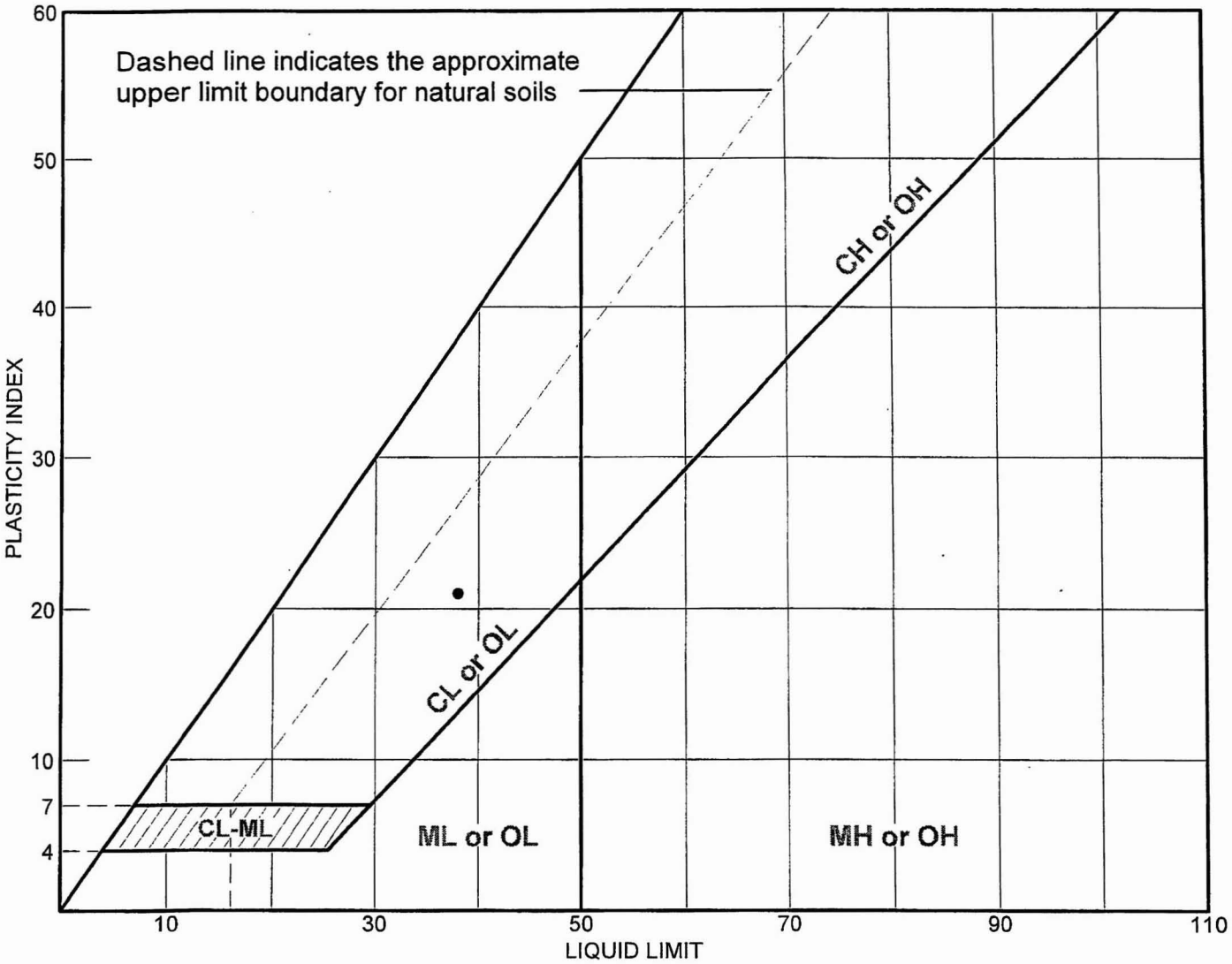
LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	2182UD	UD-13	120-121.7 Ft.	18.7	17	38	21	SC

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8186

DSC 5-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

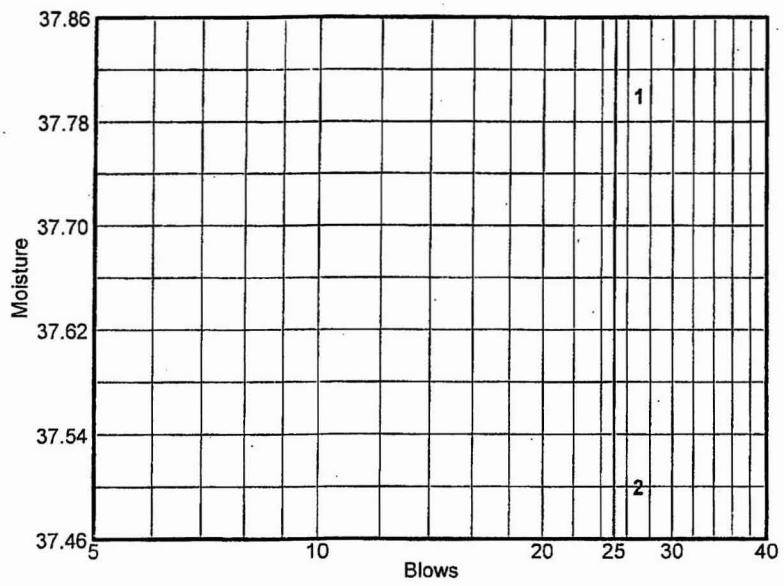
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-13
Elev. or Depth: 120-121.7 Ft **Sample Length(in./cm.):** ID#8186
Location: B-2182UD
Description: Light Gray Clayey SAND
Water Content: 18.7 **USCS:** SC **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.79	33.83				
Dry+Tare	29.77	30.52				
Tare	21.77	21.7				
# Blows	27	27				
Moisture	37.8	37.5				



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

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	28.68	29.04			
Dry+Tare	27.57	27.99			
Tare	21.03	21.81			
Moisture	17.0	17.0			

MACTEC ENGINEERING AND CONSULTING, INC.

REPORT OF THE STANDARD TEST METHOD FOR SPECIFIC GRAVITY OF SOILS
Performed in General Accordance with ASTM D 854-06 (Method B)

PROJECT NAME:EXELON COL PROJECT (VICTORIA)
PROJECT NUMBER: 6468071777
DATE: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-13 @ 120.0-121.7 Ft.

(A) Mass of oven-dried soil, grams:		37.38
(B) Mass of pycnometer filled with water at test temperature (T), grams:		338.40
(C) Mass of pycnometer, water and soil, grams:		361.98
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.709
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.707

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

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

REMARKS: Estimated % Passing # 4 : 100 %

Clayey SAND (SC)

EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2052

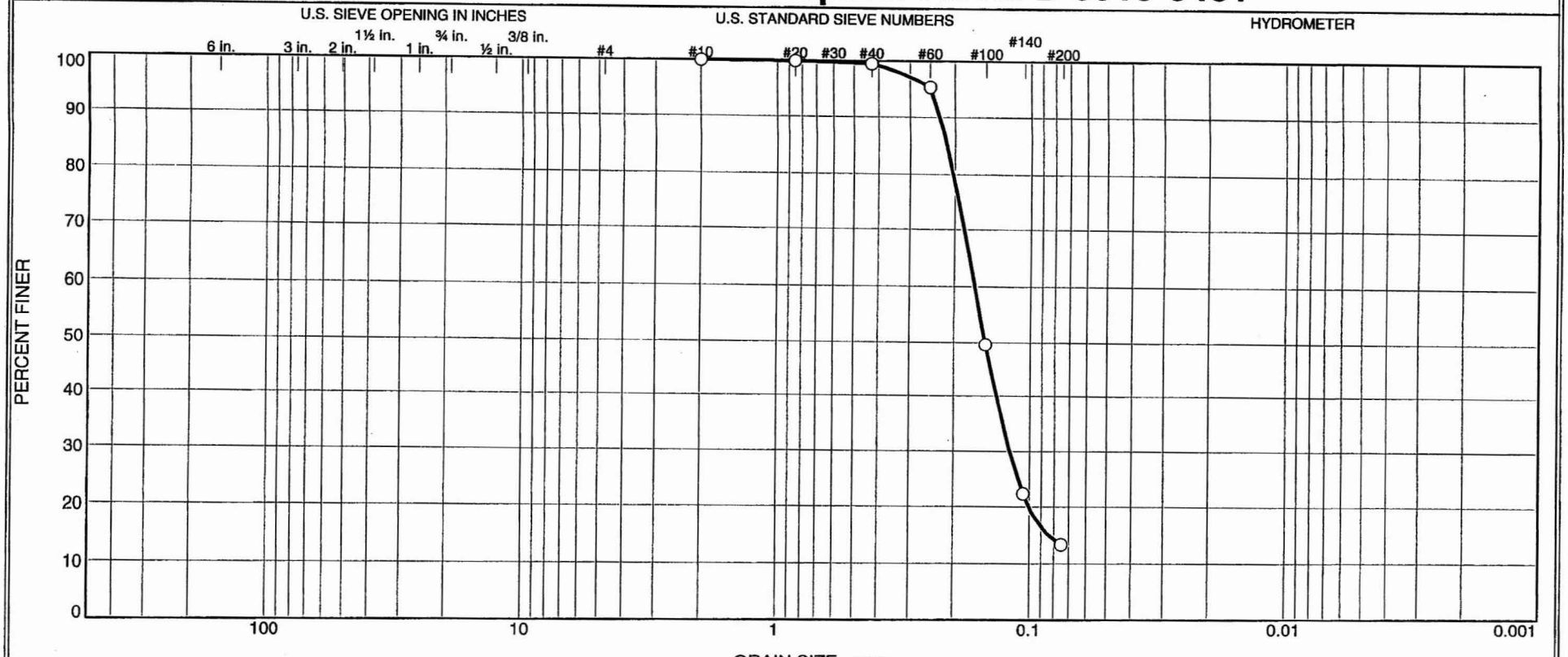
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

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	0.5	86.1	13.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2182UD	UD-14	123-124.7	12/12/07	SC	Pale Brown 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
ND = Not Determined
Specific Gravity = 2.655 (ASTM D 854-06)

Tested By: CS **Checked By:** LBJ DSC 4-30-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/24/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2182UD
Depth: 123-124.7 **Sample Number:** UD-14
Material Description: Pale Brown Clayey SAND (Visual)
Date: 12/12/07 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
ND = Not Determined
Specific Gravity = 2.655 (ASTM D 854-06)
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
387.77	0.00	0.00	#10	0.00	100.0
98.30	0.00	0.00	#20	0.09	99.9
			#40	0.50	99.5
			#60	4.58	95.3
			#100	49.51	49.6
			#140	76.38	22.3
			#200	85.13	13.4

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	86.1	86.6			13.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0836	0.1007	0.1200	0.1506	0.1660	0.2029	0.2149	0.2292	0.2484

Fineness Modulus
0.54

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:4/19/08

SAMPLE IDENTIFICATION: B-2182UD , UD-14

(A) Mass of oven-dried soil, grams:		75.20
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.67
(C) Mass of pycnometer, water and soil, grams:		703.55
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		20.0
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.655
(F)	***Correction factor:***	1.00000
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.655

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

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

REMARKS: Estimated % Passing # 4 : 100

Clayey SAND (SC) - Visual

EQUIPMENT USED

SCALES : 3.1.99

OVEN :5.1.16

THERMOMETER :5.1.01

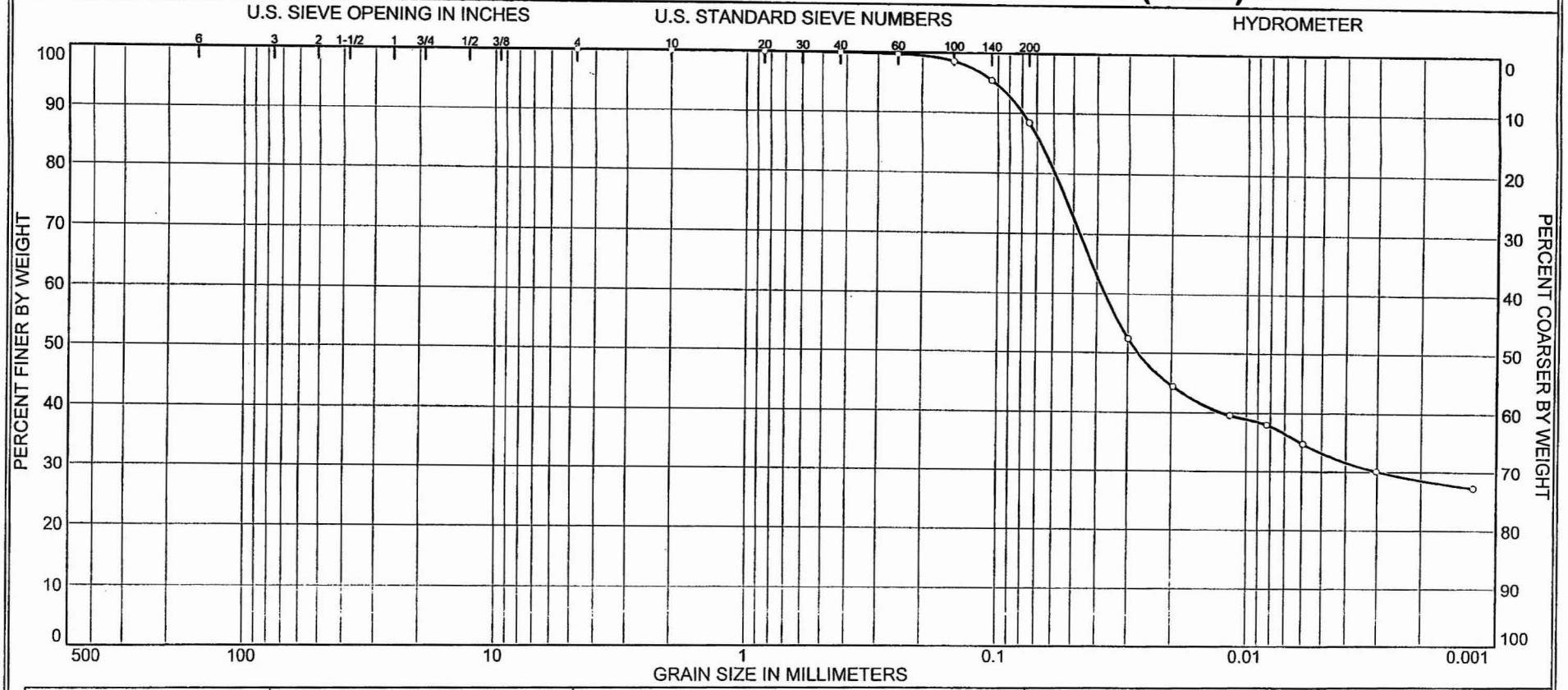
PYCNOMETER : P-6

TESTED BY: CS

REVIEWED BY: **Brian Johnson**

DSC 4-30-08

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	0.1	11.5	55.2	33.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-15	145-147.5 Ft.	12/12/07	ML	Very Pale Brown Mottled Brownish Yellow SILT	25.3	NV	NP

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8188

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.70 (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-2182UD
Sample No.: UD-15
Elev. or Depth: 145-147.5 Ft **Sample Length(in./cm.):** ID#8188
Location: B-2182UD
Description: Very Pale Brown Mottled Brownish Yellow SILT
Date: 12/12/07 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: ML **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

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

Mechanical Analysis Data

	Initial
Dry sample and tare=	77.85
Tare =	16.23
Dry sample weight =	61.62

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.02	100.0
# 20	0.03	100.0
# 40	0.06	99.9
# 60	0.19	99.7
# 100	0.89	98.6
# 140	2.78	95.5
# 200	7.13	88.4

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 88.4
Weight of hydrometer sample: 54.49
Calculated biased weight= 61.64
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.699
Specific gravity correction factor= 0.989
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

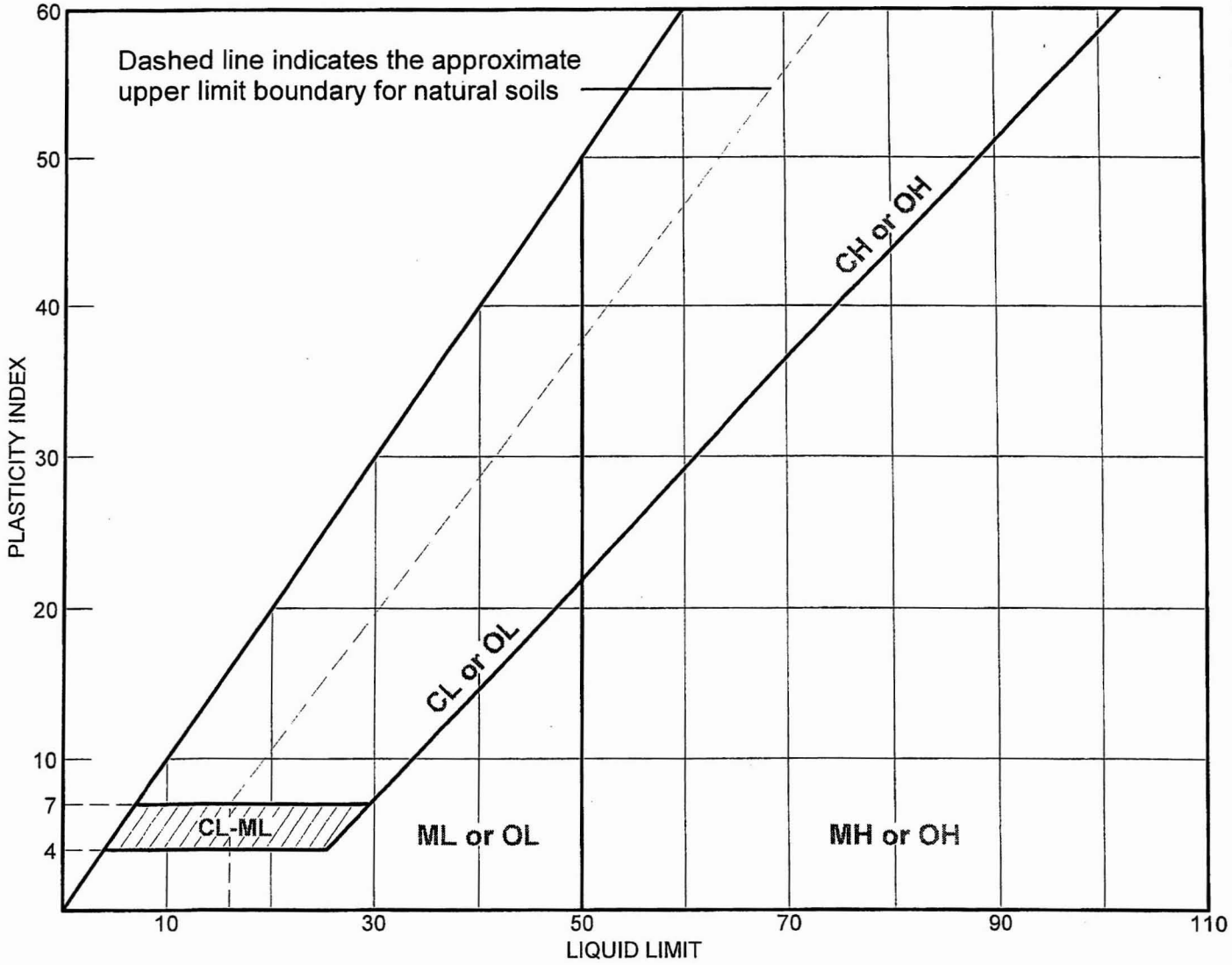
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	20.6	38.0	32.7	0.0133	38.0	10.1	0.0299	52.4
5.00	20.6	33.0	27.7	0.0133	33.0	10.9	0.0197	44.4
15.00	20.6	30.0	24.7	0.0133	30.0	11.4	0.0116	39.6
30.00	20.6	29.0	23.7	0.0133	29.0	11.5	0.0083	38.0
60.00	20.6	27.0	21.7	0.0133	27.0	11.9	0.0059	34.8
240.00	20.8	24.0	18.7	0.0133	24.0	12.4	0.0030	30.1
1440.00	21.7	22.0	16.9	0.0132	22.0	12.7	0.0012	27.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 11.6 (**% coarse =** 0.0 **% medium =** 0.1 **% fine =** 11.5)
% SILT = 55.2 **% CLAY =** 33.2

D_{85}= 0.07 D_{60}= 0.04 D_{50}= 0.03
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
●	2182UD	UD-15	145-147.5 Ft.	25.3	NP	NV	NP	ML

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8188

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-2182UD
Sample No.: UD-15
Elev. or Depth: 145-147.5 Ft **Sample Length(in./cm.):** ID#8188
Location: B-2182UD
Description: Very Pale Brown Mottled Brownish Yellow SILT
Water Content: 25.3 **USCS:** ML **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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-15 @ 145.0-147.5 Ft.

(A) Mass of oven-dried soil, grams:		37.19
(B) Mass of pycnometer filled with water at test temperature (T), grams:		339.50
(C) Mass of pycnometer, water and soil, grams:		362.92
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		22.5
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.701
(F)	***Correction factor:***	0.99945
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.699

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

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

REMARKS: Estimated % Passing # 4 : 100 %

SILT (ML)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2053

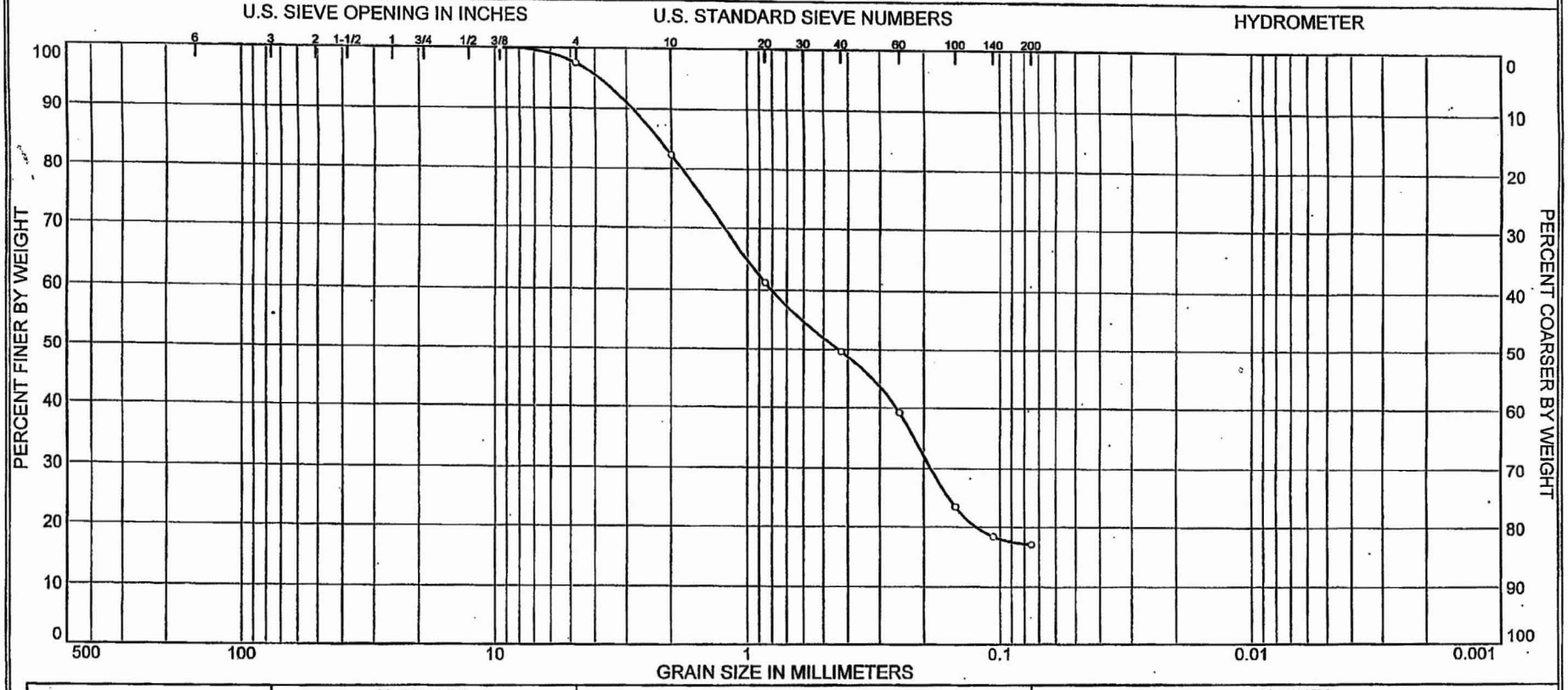
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

Particle Size Distribution Report ASTM D6913-04 e1



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	2.5	15.1	32.8	32.5	17.1	

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	B-2182UD	UD-16	180-182.5 Ft.	12/13/07	SM	Very Pale Brown Silty SAND (Visual)	15.1	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8443

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

Sieve Analysis Only.
NM value from average of strength tests performed.
Specific Gravity = 2.68 (ASTM D 854-06)
ND = Not Determined

DSC
4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

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

Sample Data

Source: B-2182UD
Sample No.: UD-16
Elev. or Depth: 180-182.5 Ft **Sample Length(in./cm.):** ID#8443
Location: B-2182UD
Description: Very Pale Brown Silty SAND (Visual)
Date: 12/13/07 **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 = 2.68 (ASTM D 854-06)
ND = Not Determined

Mechanical Analysis Data

	Initial
Dry sample and tare=	106.46
Tare =	16.11
Dry sample weight =	90.35

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	2.28	97.5
# 10	15.89	82.4
# 20	35.05	61.2
# 40	45.57	49.6
# 60	54.91	39.2
# 100	69.17	23.4
# 140	73.73	18.4
# 200	74.92	17.1

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 2.5 **(% coarse =** **% fine =** 2.5)
% SAND = 80.4 **(% coarse =** 15.1 **% medium =** 32.8 **% fine =** 32.5)
% FINES = 17.1

D_{85}= 2.23 D_{60}= 0.80 D_{50}= 0.44
D_{30}= 0.19

LIQUID AND PLASTIC LIMIT TEST DATA

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

Sample Data

Source: B-2182UD
Sample No.: UD-16
Elev. or Depth: 180-182.5 Ft **Sample Length(in./cm.):** ID#8443
Location: B-2182UD
Description: Very Pale Brown Silty SAND (Visual)
Water Content: 15.1 **USCS:** SM **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-2182UD,UD-16 @ 180-182.5 Ft.

(A) Mass of oven-dried soil, grams:		37.46
(B) Mass of pycnometer filled with water at test temperature (T), grams:		339.45
(C) Mass of pycnometer, water and soil, grams:		362.94
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.3
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.681
(F)	***Correction factor:***	0.99926
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.679

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

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

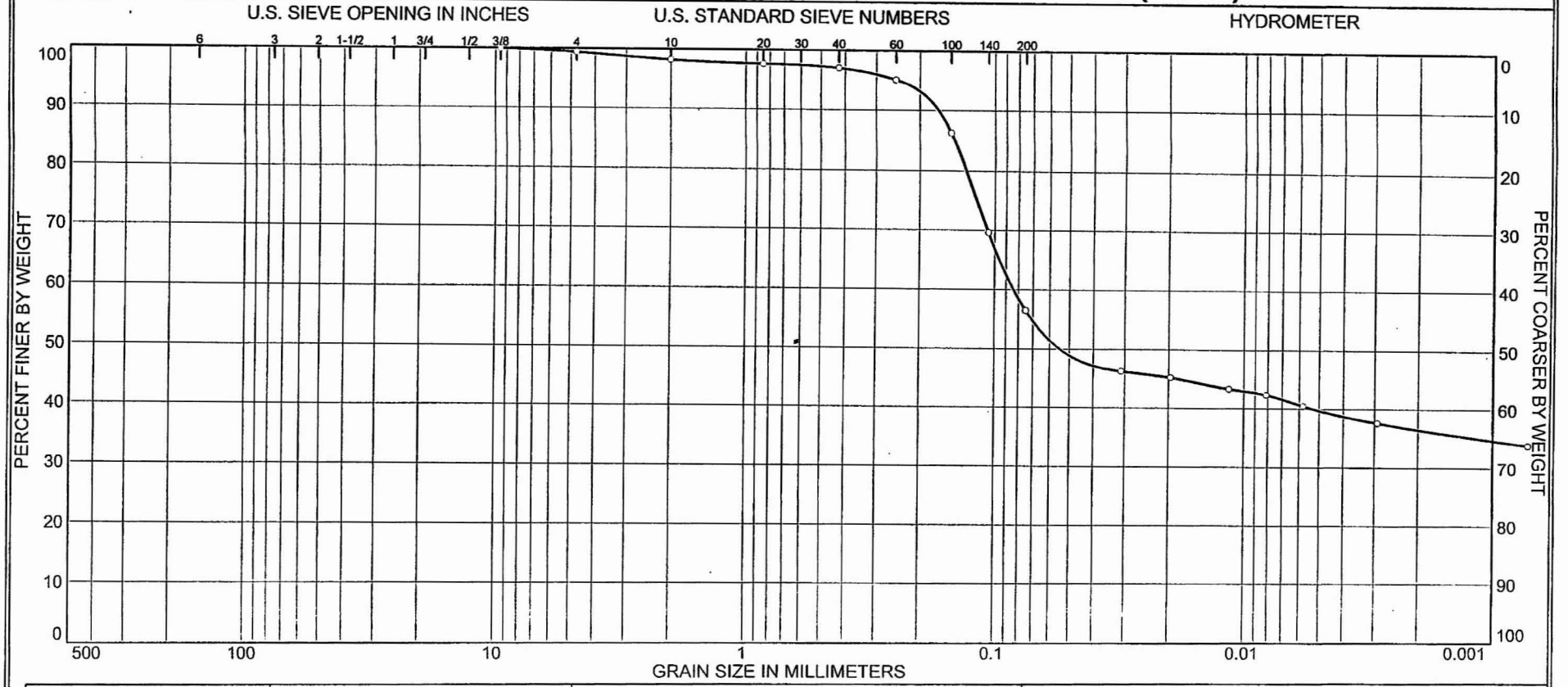
REMARKS: Estimated % Passing # 4 : 98%
Silty SAND (SM) - Visual

EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2053

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
○	0.0	0.0	0.6	1.2	1.2	40.5	16.8	39.7

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-17	215-217.5 Ft	12/13/07	CL	Light Gray Sandy Lean CLAY	22.8	43	17

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8189

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ HJ

NM value from first strength test performed.
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: 2182UD
Sample No.: UD-17
Elev. or Depth: 215-217.5 Ft **Sample Length(in./cm.):** 8189
Location: 2182UD ID# ZHU 5/6/08
Description: Light Gray Sandy Lean CLAY
Date: 12/13/07 **Natural Moisture:** 22.8
Liquid Limit: 43 **Plastic Limit:** 17 **USCS Class.:** CL
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.72 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	67.12
Tare =	16.53
Dry sample weight =	50.59

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	0.30	99.4
# 10	0.89	98.2
# 20	1.19	97.6
# 40	1.54	97.0
# 60	2.50	95.1
# 100	6.92	86.3
# 140	15.38	69.6
# 200	22.00	56.5

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 56.5
Weight of hydrometer sample: 28.59
Calculated biased weight= 50.60
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.72
Specific gravity correction factor= 0.985
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

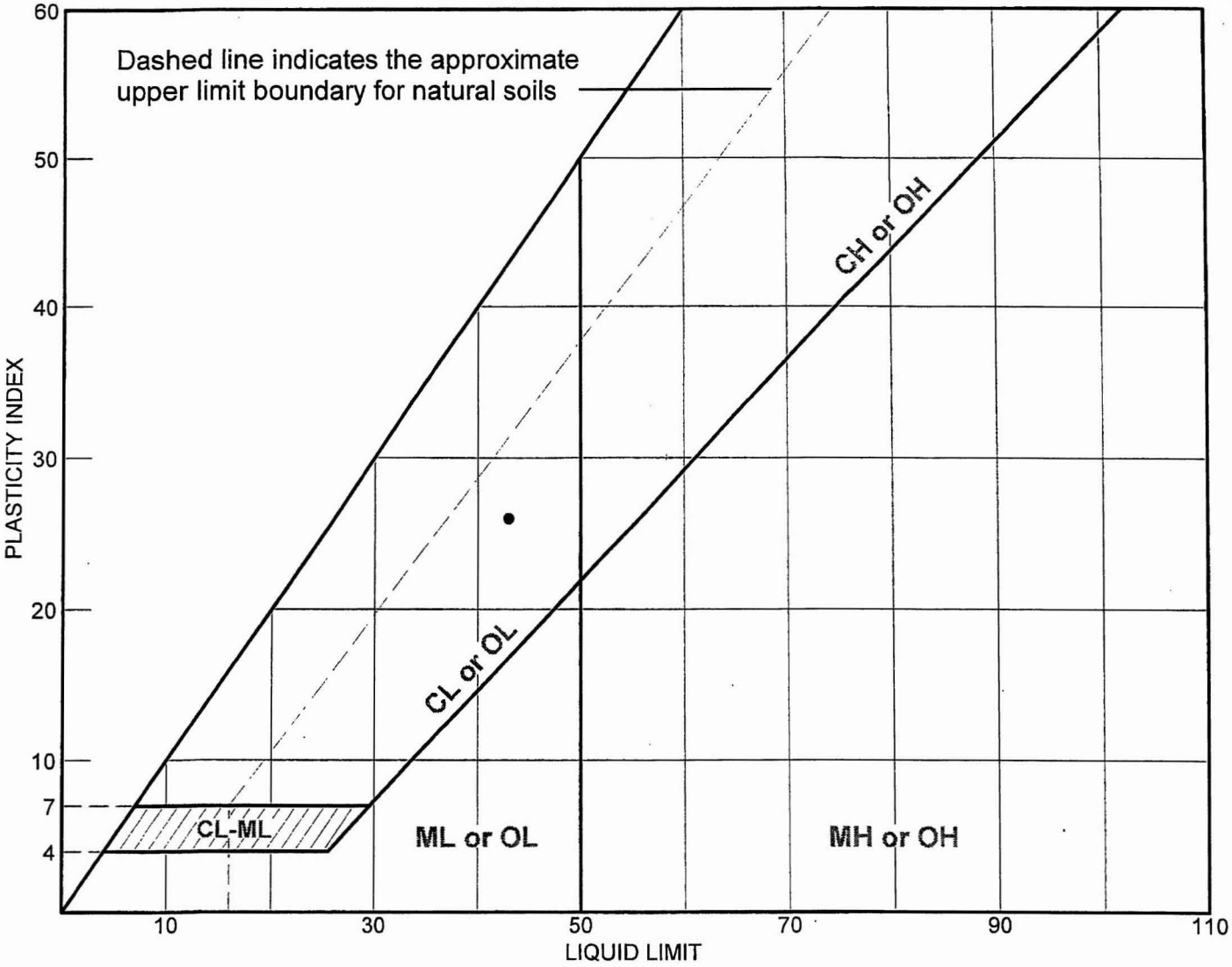
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	23.1	28.5	23.8	0.0129	28.5	11.6	0.0310	46.3
5.00	23.1	28.0	23.3	0.0129	28.0	11.7	0.0197	45.3
15.00	23.1	27.0	22.3	0.0129	27.0	11.9	0.0114	43.4
30.00	23.1	26.5	21.8	0.0129	26.5	11.9	0.0081	42.4
60.00	23.1	25.5	20.8	0.0129	25.5	12.1	0.0058	40.5
240.00	23.1	24.0	19.3	0.0129	24.0	12.4	0.0029	37.6
4160.00	21.7	22.5	17.4	0.0131	22.5	12.6	0.0007	33.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL** = 0.6 **(% coarse =** **% fine** = 0.6)
% SAND = 42.9 **(% coarse** = 1.2 **% medium** = 1.2 **% fine** = 40.5)
% SILT = 16.8 **% CLAY** = 39.7 **(% CLAY COLLOIDS** = 34.7)

D_{85}= 0.15 D_{60}= 0.08 D_{50}= 0.05

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
●	2182UD	UD-17	215-217.5 Ft	22.8	17	43	26	CL

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8189

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-2182UD
Sample No.: UD-17
Elev. or Depth: 215-217.5 Ft **Sample Length(in./cm.):** ID#8189
Location: B-2182UD
Description: Light Gray Sandy Lean CLAY
Water Content: 22.8 **USCS:** CL **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.98	30.43				
Dry+Tare	27.58	27.2				
Tare	19.59	19.61				
# Blows	28	29				
Moisture	42.6	42.6				

Liquid Limit= 43
Plastic Limit= 17
Plasticity Index= 26

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.52	26.2			
Dry+Tare	26.38	25.25			
Tare	19.79	19.67			
Moisture	17.3	17.0			

MACTEC ENGINEERING AND CONSULTING, INC.

REPORT OF THE STANDARD TEST METHOD FOR SPECIFIC GRAVITY OF SOILS
Performed in General Accordance with ASTM D 854-06 (Method B)

PROJECT NAME:EXELON COL PROJECT (VICTORIA)
PROJECT NUMBER: 6468071777
DATE: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-17 @ 215.0-217.5 Ft.

(A) Mass of oven-dried soil, grams:		37.41
(B) Mass of pycnometer filled with water at test temperature (T), grams:		341.25
(C) Mass of pycnometer, water and soil, grams:		364.89
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.717
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.715

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

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

REMARKS: Estimated % Passing # 4 : 99 %

Sandy Lean CLAY (CL)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2057

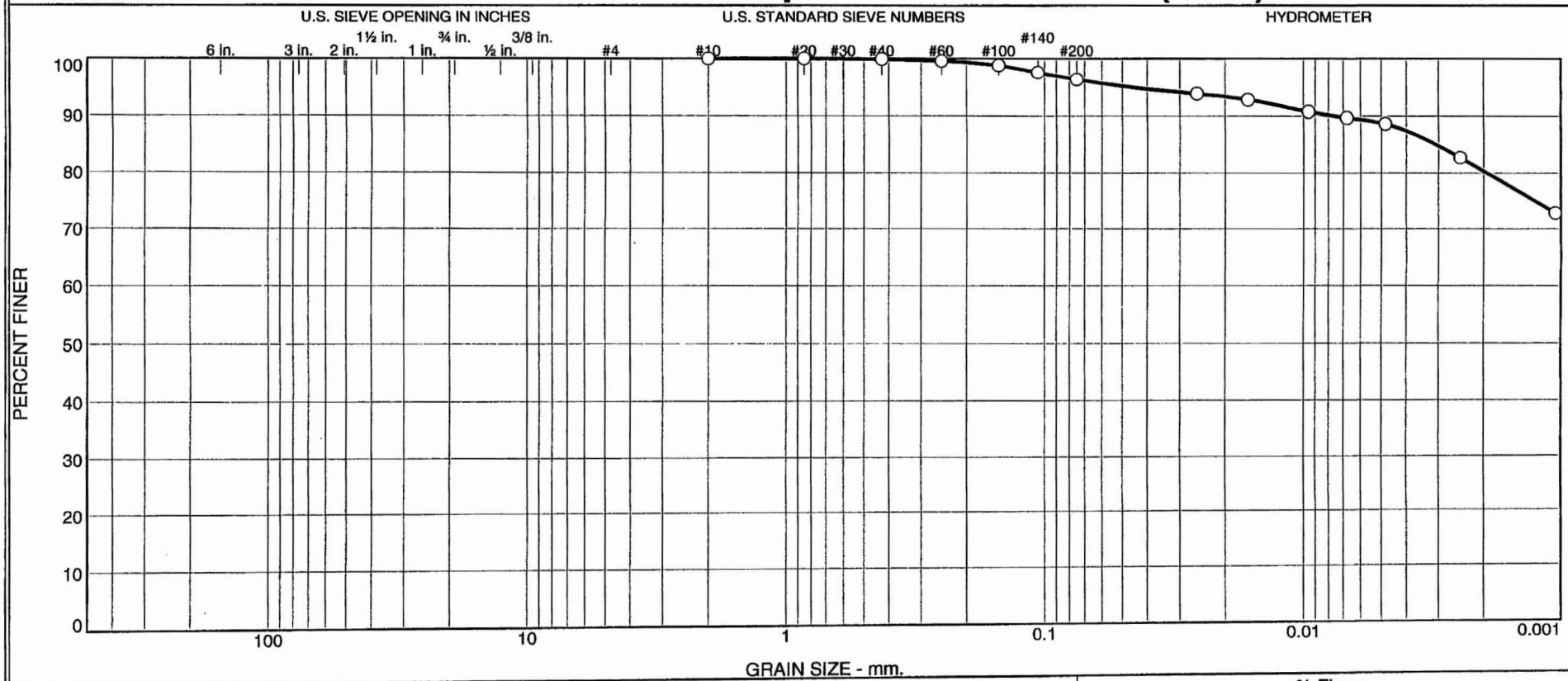
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

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
O	0.0	0.0	0.0	0.0	0.1	3.6	7.4	88.9

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2182UD	UD-18	218.0	12-13-07	CH	Light Gray with Brownish Yellow Fat CLAY	31.1	97	30

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O Specific Gravity = 2.699 (ASTM D854-06)

Tested By: CS **Checked By:** LBJ DSC 4-30-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/10/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2182UD
Depth: 218.0 **Sample Number:** UD-18
Material Description: Light Gray with Brownish Yellow Fat CLAY
Date: 12-13-07 **Natural Moisture:** 31.1
Liquid Limit: 97 **Plastic Limit:** 30 **USCS Class.:** CH
Testing Remarks: Specific Gravity = 2.699 (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
183.47	0.00	0.00	#10	0.00	100.0
49.97	0.00	0.00	#20	0.00	100.0
			#40	0.06	99.9
			#60	0.21	99.6
			#100	0.61	98.8
			#140	1.22	97.6
			#200	1.86	96.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =49.97
Hygroscopic moisture correction:
Moist weight and tare = 29.76
Dry weight and tare = 29.36
Tare weight = 15.92
Hygroscopic moisture = 3.0%
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 = 2.699
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	22.9	50.5	46.0	0.0130	51.5	7.8	0.0257	93.8
5.00	22.9	50.0	45.5	0.0130	51.0	7.9	0.0163	92.8
15.00	22.9	49.0	44.5	0.0130	50.0	8.1	0.0095	90.8
30.00	22.9	48.5	44.0	0.0130	49.5	8.2	0.0068	89.7
60.00	22.9	48.0	43.5	0.0130	49.0	8.3	0.0048	88.7
240.00	23.1	45.0	40.6	0.0129	46.0	8.8	0.0025	82.8
1440.00	23.5	40.0	35.7	0.0129	41.0	9.6	0.0011	72.9

MACTEC, Inc.

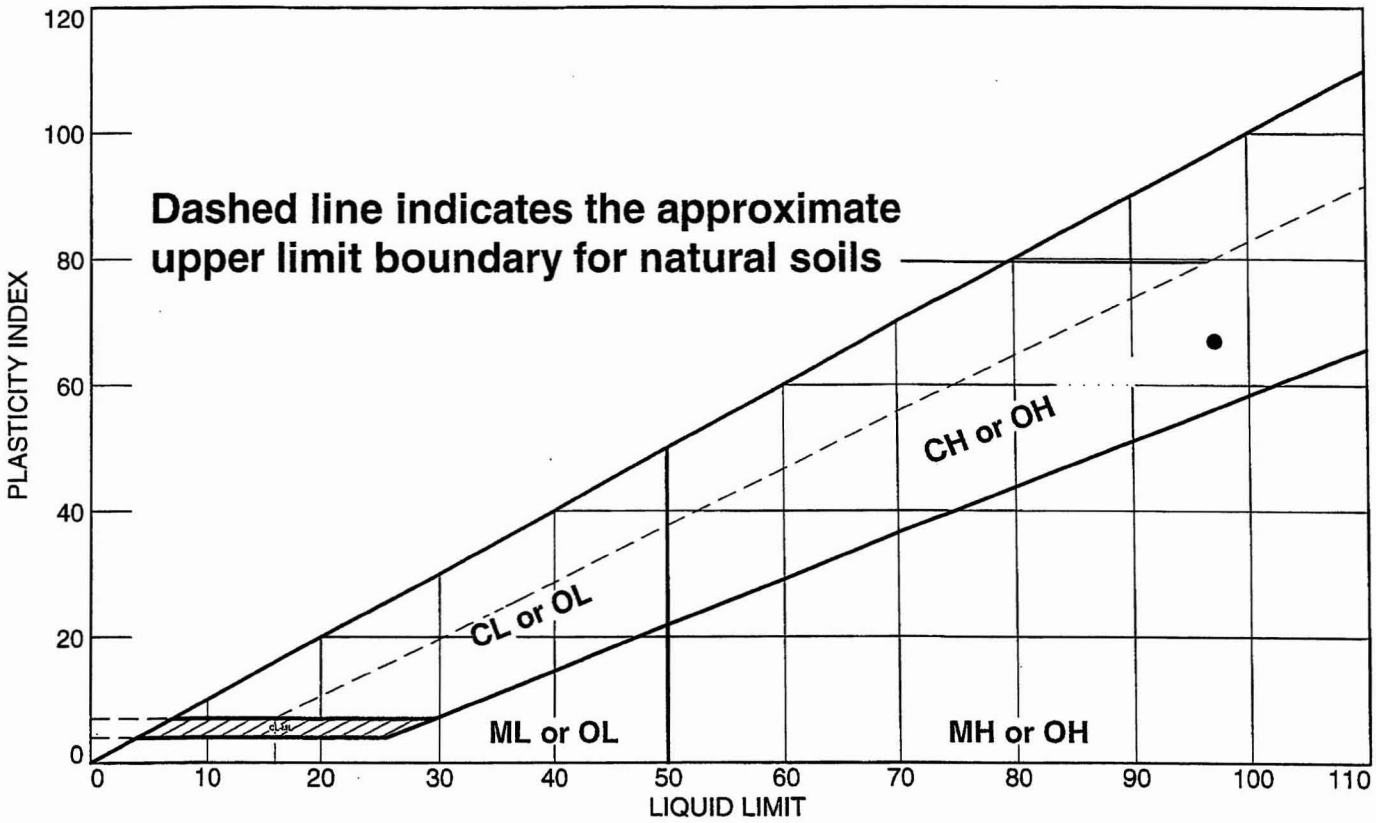
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	3.6	3.7	7.4	88.9	96.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.0019	0.0030	0.0075	0.0471

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-2182UD	UD-18	218.0	31.1	30	97	67	CH

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

Tested By: CS **Checked By:** LBJ DSC 4-30-08

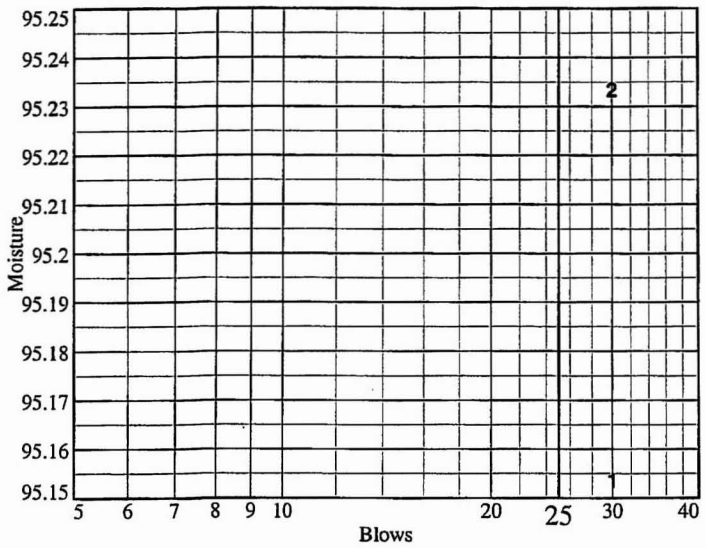
LIQUID AND PLASTIC LIMIT TEST DATA

4/10/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2182UD
Depth: 218.0 **Sample Number:** UD-18
Material Description: Light Gray with Brownish Yellow Fat CLAY
USCS: CH **AASHTO:** A-7-5(76)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.02	35.55				
Dry+Tare	23.97	25.76				
Tare	15.51	15.48				
# Blows	30	30				
Moisture	95.2	95.2				



Liquid Limit= 97
Plastic Limit= 30
Plasticity Index= 67
Natural Moisture= 31.1
Liquidity Index= 0.0

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	21.56	23.69			
Dry+Tare	20.15	21.79			
Tare	15.47	15.50			
Moisture	30.1	30.2			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
148.42	115.38	9.22	31.1

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: 3/6/08

SAMPLE IDENTIFICATION: B-2182UD, UD -18

(A) Mass of oven-dried soil, grams:		50.13
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.62
(C) Mass of pycnometer, water and soil, grams:		688.19
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.0
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.701
(F)	***Correction factor:***	0.99933
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.699

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

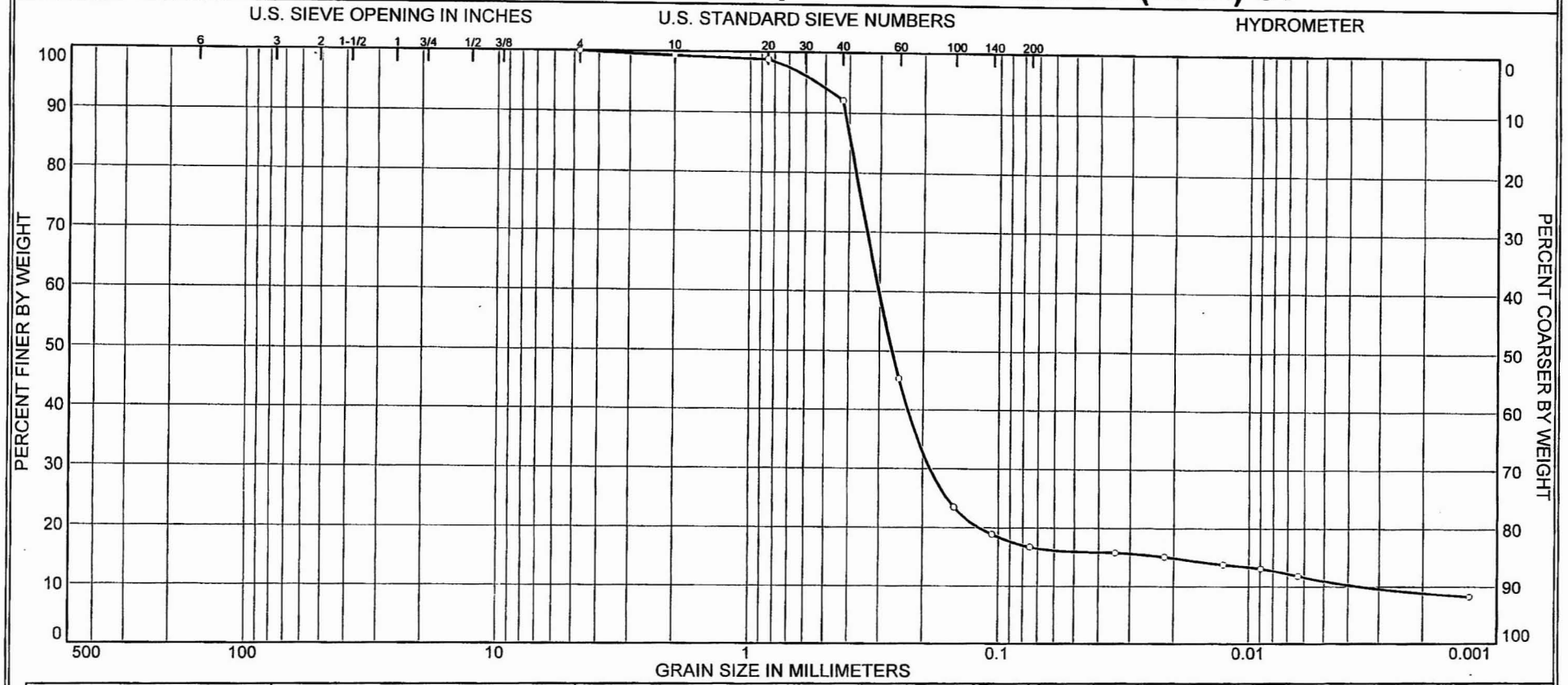
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 3-15-08

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



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.7	7.3	75.2	5.9	10.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-19	240-240.5 Ft.	12/13/07	SM	Light Gray Silty SAND	17.7	NV	NP

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8191

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

Specific Gravity = 2.74 (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-2182UD
Sample No.: UD-19
Elev. or Depth: 240-240.5 Ft
Sample Length(in./cm.): ID#8191
Location: B-2182UD
Description: Light Gray Silty SAND
Date: 12/13/07 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SM
AASHTO Classification:
Testing Remarks: Tested by: EH
Reviewed by: HJ

Specific Gravity = 2.74 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	88.11
Tare =	15.63
Dry sample weight =	72.48

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.50	99.3
# 20	0.88	98.8
# 40	5.81	92.0
# 60	39.65	45.3
# 100	55.47	23.5
# 140	58.79	18.9
# 200	60.31	16.8

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 16.8
Weight of hydrometer sample: 12.17
Calculated biased weight= 72.44
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.743
Specific gravity correction factor= 0.980
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

MACTEC Engineering and Consulting, Inc.

DSC 4-30-08

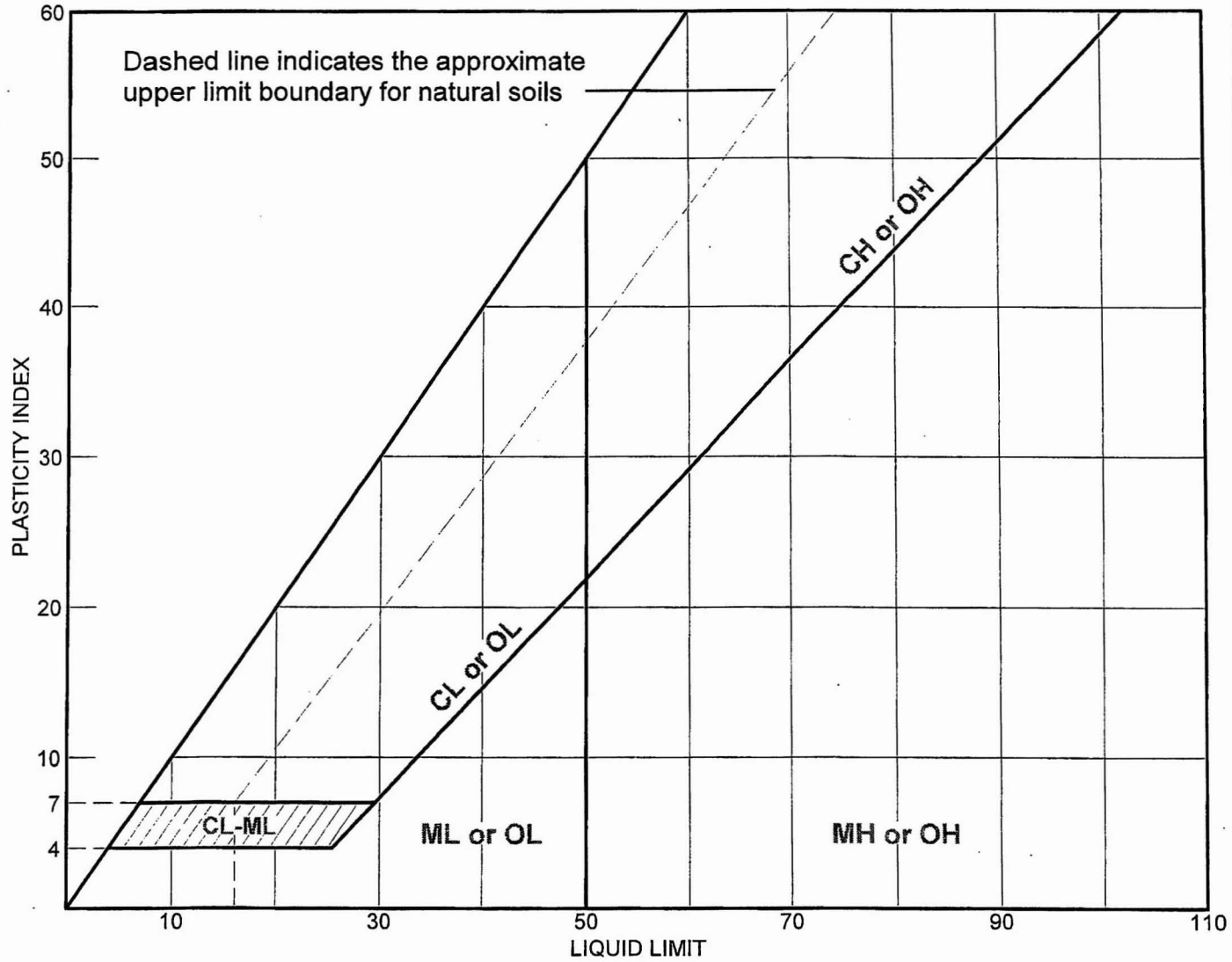
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	20.6	17.0	11.7	0.0132	17.0	13.5	0.0342	15.8
5.00	20.6	16.5	11.2	0.0132	16.5	13.6	0.0217	15.1
15.00	20.6	15.5	10.2	0.0132	15.5	13.8	0.0126	13.8
30.00	20.6	15.0	9.7	0.0132	15.0	13.8	0.0089	13.1
60.00	20.8	14.0	8.7	0.0131	14.0	14.0	0.0063	11.8
1450.00	22.2	11.0	6.1	0.0129	11.0	14.5	0.0013	8.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 83.2 **(% coarse =** 0.7 **% medium =** 7.3 **% fine =** 75.2)
% SILT = 5.9 **% CLAY =** 10.9

D_{85}= 0.40 D_{60}= 0.30 D_{50}= 0.27
D_{30}= 0.19 D_{15}= 0.02 D_{10}= 0.00
C_c= 32.2359 C_u= 84.0985

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
●	2182UD	UD-19	240-240.5 Ft.	17.7	NP	NV	NP	SM

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8191

DSC 5-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

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

Sample Data

Source: B-2182UD
Sample No.: UD-19
Elev. or Depth: 240-240.5 Ft
Sample Length(in./cm.): ID#8191
Location: B-2182UD
Description: Light Gray Silty SAND
Water Content: 17.7
USCS: SM
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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-19 @ 240.0-240.5 Ft.

(A) Mass of oven-dried soil, grams:		36.59
(B) Mass of pycnometer filled with water at test temperature (T), grams:		366.20
(C) Mass of pycnometer, water and soil, grams:		389.46
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		22.8
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.745
(F)	***Correction factor:***	0.99938
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.743

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

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

REMARKS: Estimated % Passing # 4 : 100 %

Silty SAND (SM)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2192

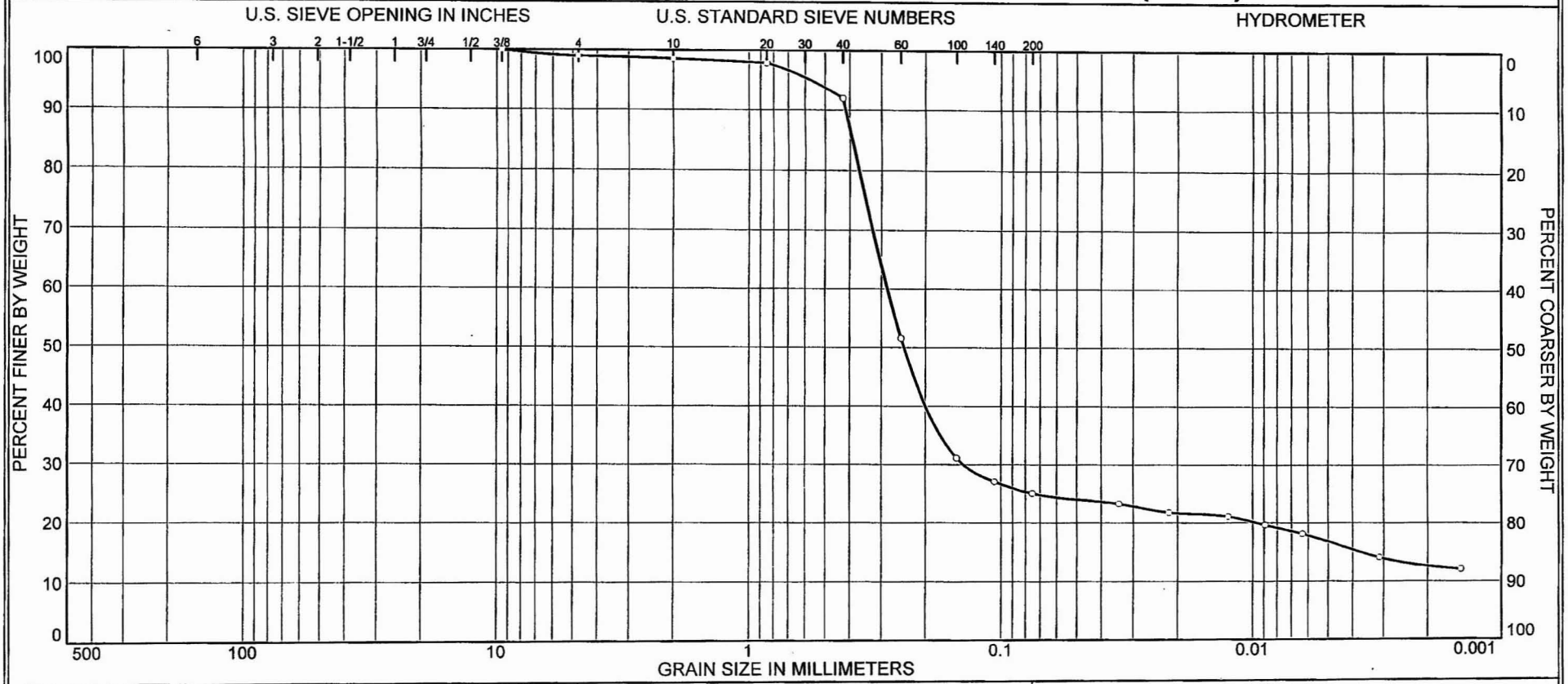
TESTED BY: EH

\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	1.0	0.4	6.6	66.9	8.3	16.8

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-20	242-244.5 Ft.	12/13/07	SC-SM	Light Gray Silty, Clayey SAND	27.1	18	12

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8192

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ HJ

Specific Gravity = 2.68 (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-2182UD
Sample No.: UD-20
Elev. or Depth: 242-244.5 Ft **Sample Length(in./cm.):** ID#8192
Location: B-2182UD
Description: Light Gray Silty, Clayey SAND
Date: 12/13/07 **PL:** 12 **LL:** 18 **PI:** 6
USCS Classification: SC-SM **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

Specific Gravity = 2.68 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	82.10
Tare =	15.13
Dry sample weight =	66.97

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	0.64	99.0
# 10	0.94	98.6
# 20	1.40	97.9
# 40	5.39	92.0
# 60	32.42	51.6
# 100	46.15	31.1
# 140	48.85	27.1
# 200	50.14	25.1

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 25.1
Weight of hydrometer sample: 16.83
Calculated biased weight= 67.05
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.682
Specific gravity correction factor= 0.993
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

MACTEC Engineering and Consulting, Inc.

DSC
4-30-08

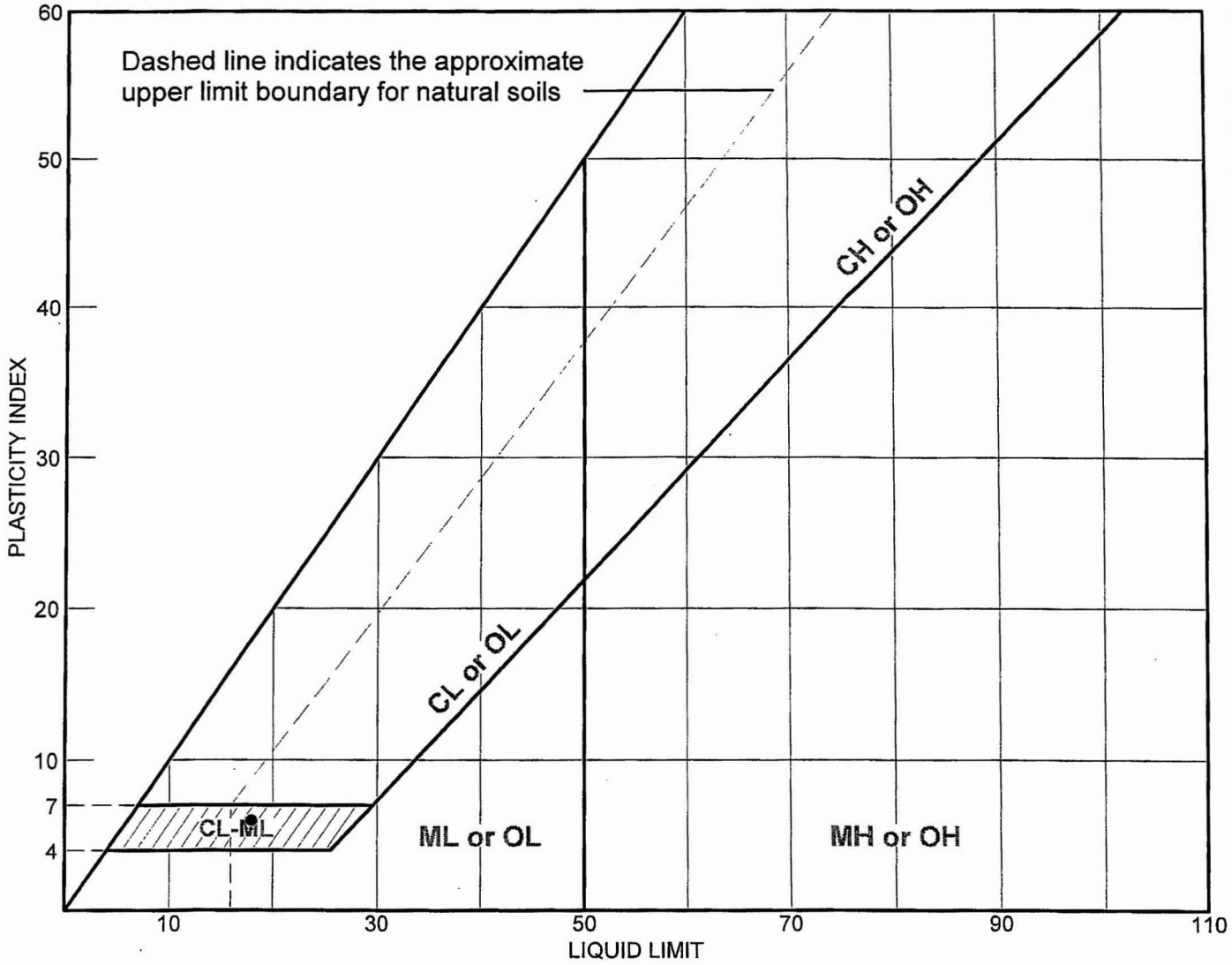
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	20.8	21.0	15.7	0.0134	21.0	12.9	0.0339	23.3
5.00	20.8	20.0	14.7	0.0134	20.0	13.0	0.0216	21.8
15.00	20.8	19.5	14.2	0.0134	19.5	13.1	0.0125	21.1
30.00	20.8	18.5	13.2	0.0134	18.5	13.3	0.0089	19.6
60.00	20.8	17.5	12.2	0.0134	17.5	13.4	0.0063	18.1
250.00	21.9	14.5	9.5	0.0132	14.5	13.9	0.0031	14.0
1140.00	22.5	13.0	8.1	0.0131	13.0	14.2	0.0015	12.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL** = 1.0 (**% coarse =** **% fine** = 1.0)
% SAND = 73.9 (**% coarse** = 0.4 **% medium** = 6.6 **% fine** = 66.9)
% SILT = 8.3 **% CLAY** = 16.8

D_{85}= 0.39 D_{60}= 0.28 D_{50}= 0.24
D_{30}= 0.14 D_{15}= 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
●	2182UD	UD-20	242-244.5 Ft.	27.1	12	18	6	SC-SM

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8192

DSC

LIQUID AND PLASTIC LIMIT TEST DATA

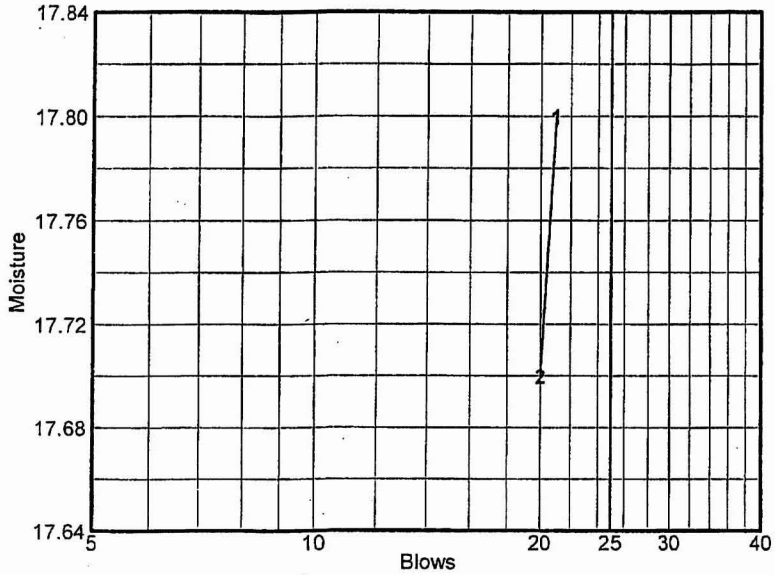
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-20
Elev. or Depth: 242-244.5 Ft **Sample Length(in./cm.):** ID#8192
Location: B-2182UD
Description: Light Gray Silty, Clayey SAND
Water Content: 27.1 **USCS:** SC-SM **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	34.39	34.3				
Dry+Tare	32.28	32.34				
Tare	20.41	21.28				
# Blows	21	20				
Moisture	17.8	17.7				



Liquid Limit= 18
Plastic Limit= 12
Plasticity Index= 6

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.81	27.68			
Dry+Tare	26.98	26.88			
Tare	20.29	20.45			
Moisture	12.4	12.4			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-20 @ 242.0-244.5 Ft.

(A) Mass of oven-dried soil, grams:		36.47
(B) Mass of pycnometer filled with water at test temperature (T), grams:		363.70
(C) Mass of pycnometer, water and soil, grams:		386.58
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.684
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.682

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

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

REMARKS: Estimated % Passing # 4 : 99 %

Silty, Clayey SAND (SC-SM)

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

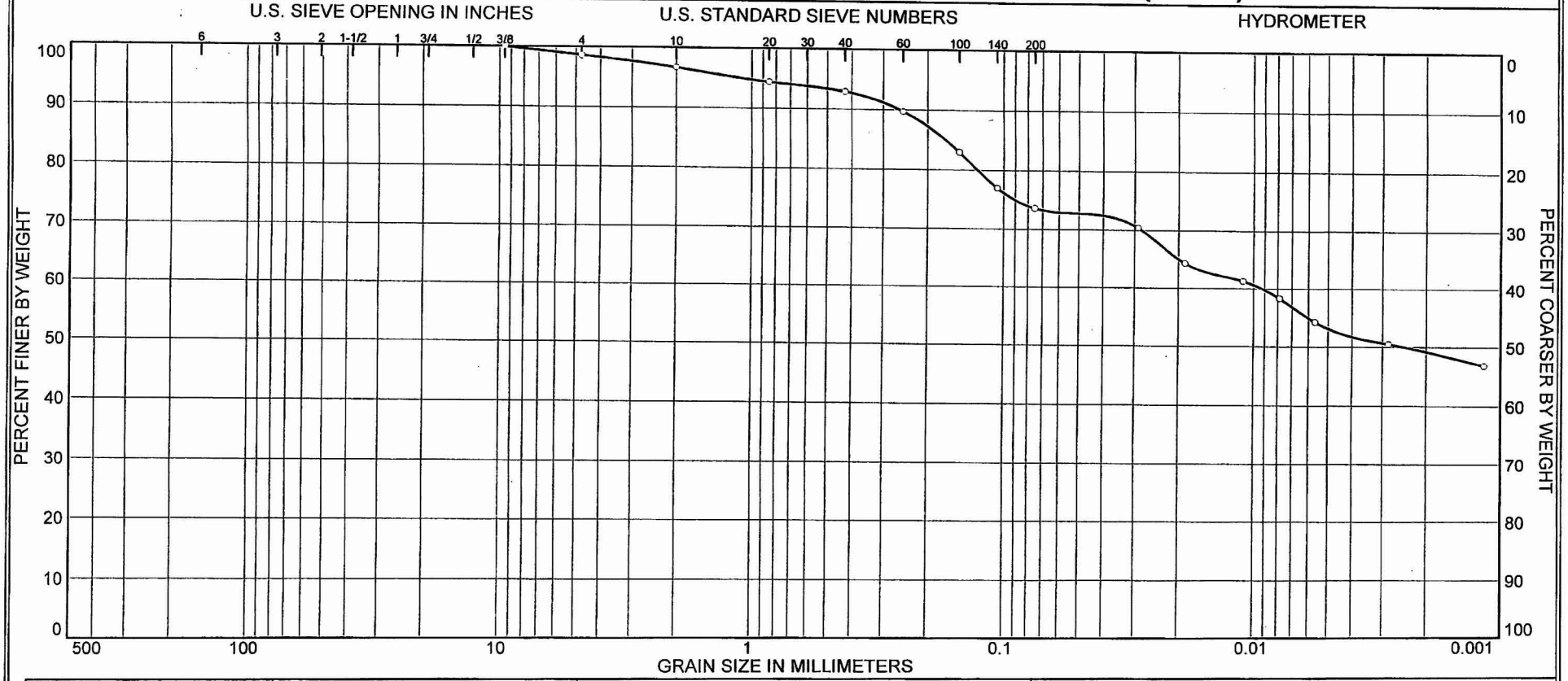
PYCNOMETER : 2184

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	1.4	2.0	3.8	19.2	20.5	53.1

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-22	270-272.5 Ft.	12/14/07	CH	Light Gray Fat CLAY with sand	30.3	60	22

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8193

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

Specific Gravity = 2.73 (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-2182UD
Sample No.: UD-22
Elev. or Depth: 270-272.5 Ft **Sample Length(in./cm.):** ID#8193
Location: B-2182UD
Description: Light Gray Fat CLAY with sand
Date: 12/14/07 **PL:** 22 **LL:** 60 **PI:** 38
USCS Classification: CH **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

Specific Gravity = 2.73 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	64.79
Tare =	16.26
Dry sample weight =	48.53

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	0.69	98.6
# 10	1.66	96.6
# 20	2.75	94.3
# 40	3.50	92.8
# 60	4.98	89.7
# 100	8.25	83.0
# 140	11.15	77.0
# 200	12.79	73.6

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 73.6
Weight of hydrometer sample: 35.74
Calculated biased weight= 48.56
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.730
Specific gravity correction factor= 0.983
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

MACTEC Engineering and Consulting, Inc.

DSC
4-30-08

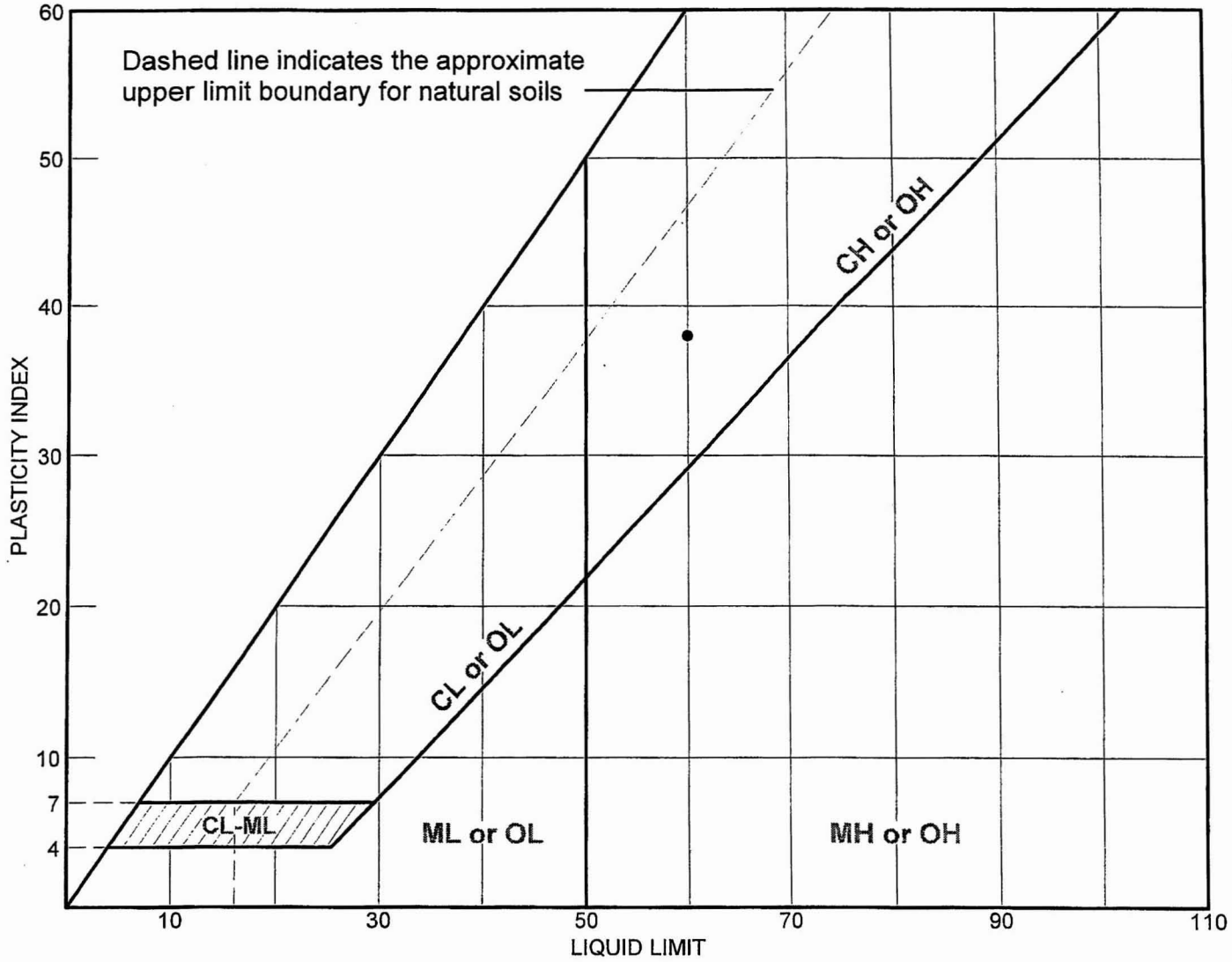
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	21.1	40.0	34.8	0.0131	40.0	9.7	0.0290	70.4
5.00	21.1	37.0	31.8	0.0131	37.0	10.2	0.0188	64.4
15.00	21.1	35.5	30.3	0.0131	35.5	10.5	0.0110	61.3
30.00	21.1	34.0	28.8	0.0131	34.0	10.7	0.0079	58.3
60.00	21.1	32.0	26.8	0.0131	32.0	11.0	0.0056	54.2
240.00	21.7	30.0	24.9	0.0130	30.0	11.4	0.0028	50.5
1440.00	22.5	28.0	23.1	0.0129	28.0	11.7	0.0012	46.8

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 1.4 **(% coarse =** **% fine =** 1.4)
% SAND = 25.0 **(% coarse =** 2.0 **% medium =** 3.8 **% fine =** 19.2)
% SILT = 20.5 **% CLAY =** 53.1

D_{85}= 0.17 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
●	2182UD	UD-22	270-272.5 Ft.	30.3	22	60	38	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8193

DSC 5-5-08

LIQUID AND PLASTIC LIMIT TEST DATA

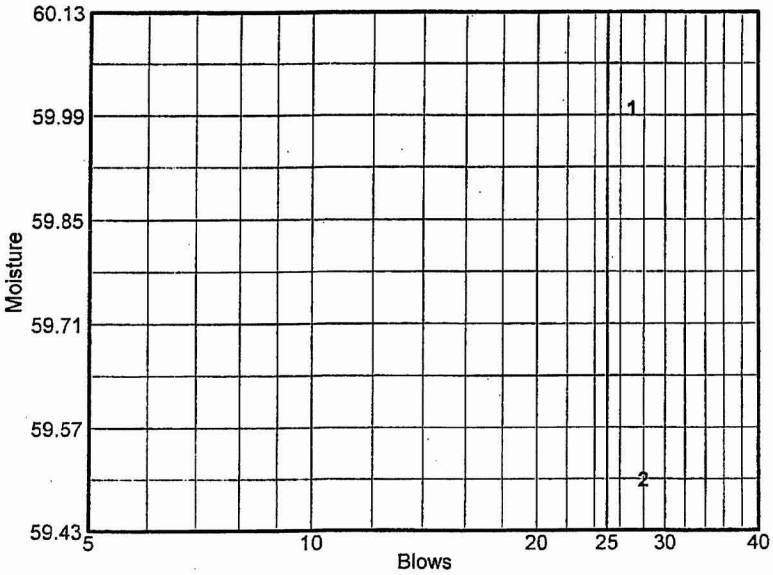
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-22
Elev. or Depth: 270-272.5 Ft **Sample Length(in./cm.):** ID#8193
Location: B-2182UD
Description: Light Gray Fat CLAY with sand
Water Content: 30.3 **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.02	30.5				
Dry+Tare	27.02	26.99				
Tare	20.35	21.09				
# Blows	27	28				
Moisture	60.0	59.5				



Liquid Limit= 60
Plastic Limit= 22
Plasticity Index= 38

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.9	27.85			
Dry+Tare	26.44	26.5			
Tare	19.97	20.34			
Moisture	22.6	21.9			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-22 @ 270.0-272.5 Ft.

(A) Mass of oven-dried soil, grams:		36.42
(B) Mass of pycnometer filled with water at test temperature (T), grams:		366.00
(C) Mass of pycnometer, water and soil, grams:		389.09
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.732
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.730

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

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

REMARKS: Estimated % Passing # 4 : 98 %
Fat CLAY with sand (CH)

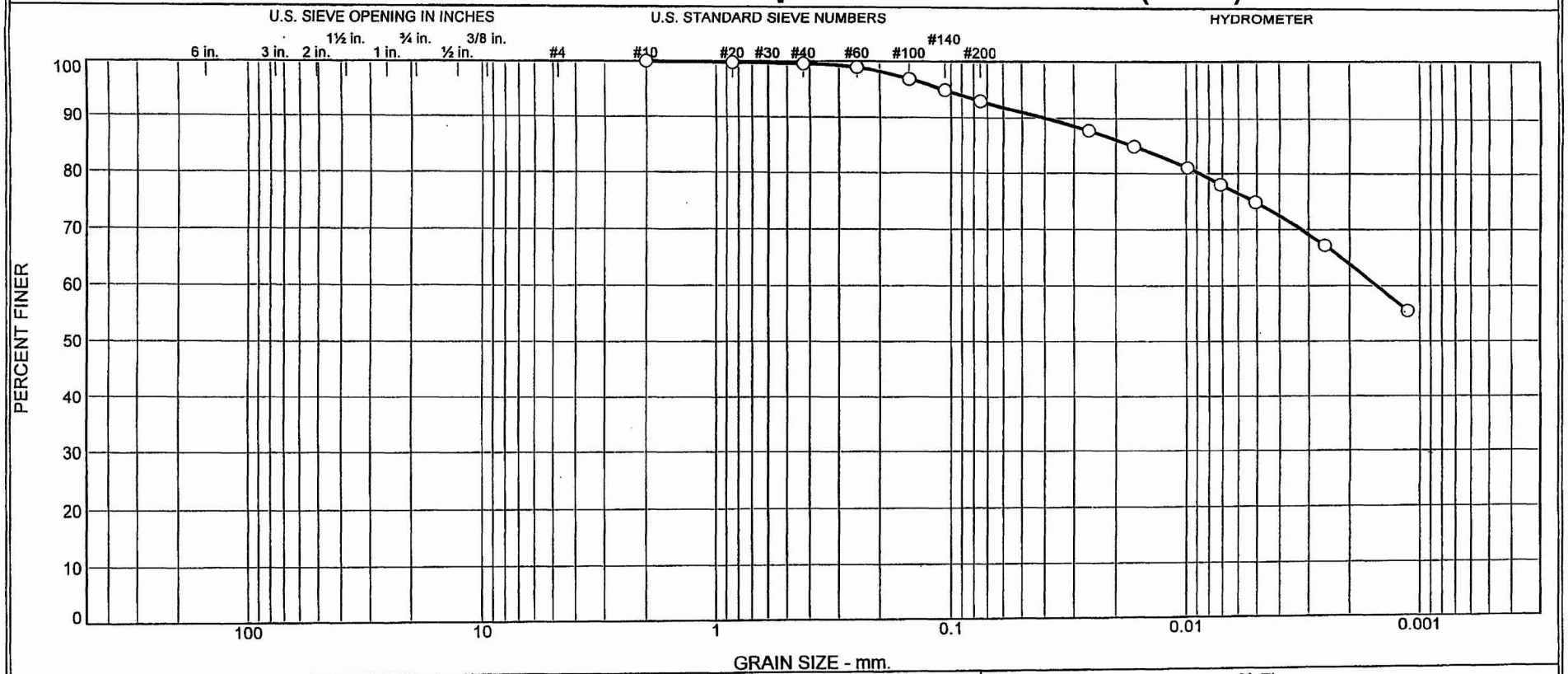
EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2193

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

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



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
O	0.0	0.0	0.0	0.0	0.4	6.6	18.3	74.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2182UD	UD-24	300.0-301.3	12/14/07	CH	Pale Brown Fat CLAY	22.7	69	20

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O Specific Gravity = 2.717 (ASTM D854-06)
Material Tested Obtained From UD Tube Sample
ND = Not Determined
NM obtained from RCTS Specimen

KAW 6/13/08

Tested By: CS **Checked By:** LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/19/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2182UD UT Sample
Depth: 300.0-301.3 **Sample Number:** UD-24
Material Description: Pale Brown Fat CLAY
Date: 12/14/07 **Natural Moisture:** 22.7
Liquid Limit: 69 **Plastic Limit:** 20 **USCS Class.:** CH
Testing Remarks: Specific Gravity = 2.717 (ASTM D854-06)
Material Tested Obtained From UD Tube Sample
ND = Not Determined
NM obtained from RCTS 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
236.96	0.00	0.00	#10	0.00	100.0
52.27	0.00	0.00	#20	0.11	99.8
			#40	0.22	99.6
			#60	0.56	98.9
			#100	1.62	96.9
			#140	2.64	94.9
			#200	3.68	93.0

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =52.27
Hygroscopic moisture correction:
Moist weight and tare = 29.69
Dry weight and tare = 29.49
Tare weight = 15.55
Hygroscopic moisture =1.4%
Table of composite correction values:

Temp., deg. C:	11.6	29.4
Comp. corr.:	-8.0	-3.0

Meniscus correction only =1.0
Specific gravity of solids =2.700
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	21.4	51.0	45.8	0.0132	52.0	7.8	0.0260	87.8
5.00	21.4	49.5	44.3	0.0132	50.5	8.0	0.0167	84.9
15.00	21.4	47.5	42.3	0.0132	48.5	8.3	0.0099	81.1
30.00	21.0	46.0	40.6	0.0133	47.0	8.6	0.0071	78.0
60.00	22.2	44.0	39.0	0.0131	45.0	8.9	0.0050	74.8
250.00	22.3	40.0	35.0	0.0131	41.0	9.6	0.0026	67.2
1440.00	22.0	34.0	28.9	0.0131	35.0	10.6	0.0011	55.5

MACTEC, Inc.

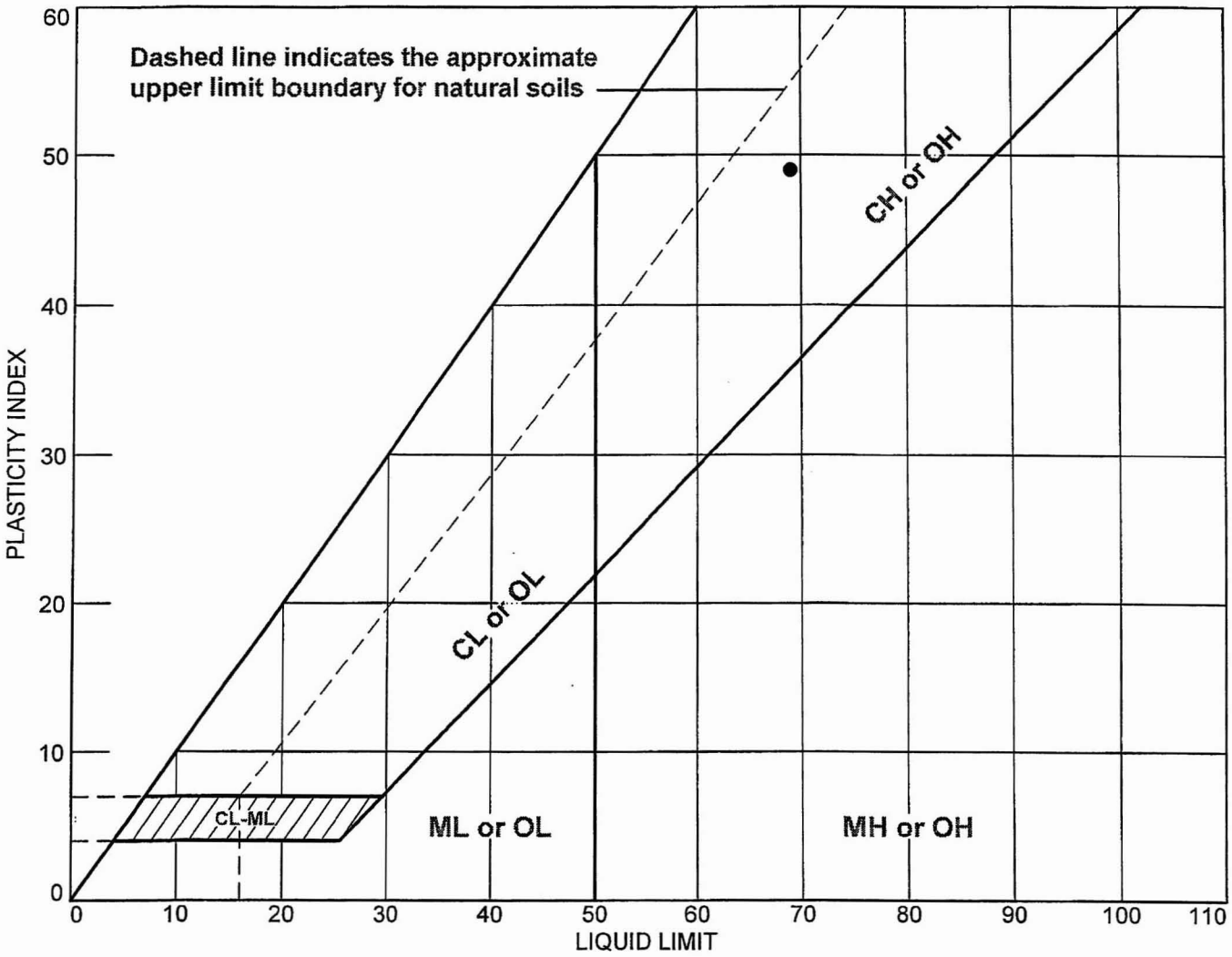
Fractional Components

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	6.6	7.0	18.3	74.7	93.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0015	0.0087	0.0169	0.0400	0.1069

Fineness Modulus
0.04

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-2182UD UT Sample	UD-24	300.0-301.3	22.7	20	69	49	CH

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 6/13/08

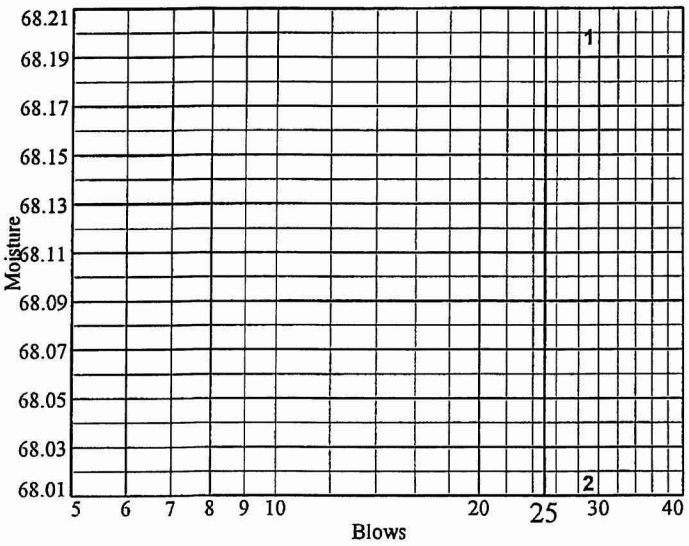
LIQUID AND PLASTIC LIMIT TEST DATA

5/19/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2182UD UT Sample
Depth: 300.0-301.3 **Sample Number:** UD-24
Material Description: Pale Brown Fat CLAY
USCS: CH **AASHTO:** A-7-6(50)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	29.53	28.74				
Dry+Tare	23.89	23.36				
Tare	15.62	15.45				
# Blows	29	29				
Moisture	68.2	68.0				



Liquid Limit= 69
Plastic Limit= 20
Plasticity Index= 49
Natural Moisture= 22.7
Liquidity Index= 0.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	22.13	18.82			
Dry+Tare	21.00	17.49			
Tare	15.34	11.09			
Moisture	20.0	20.8			

MACTEC, Inc.

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REPORT OF THE STANDARD TEST METHOD FOR SPECIFIC GRAVITY OF SOILS
Performed in General Accordance with ASTM D 854-06 (Method B)

PROJECT NAME:EXELON COL PROJECT (VICTORIA)

PROJECT NUMBER: 6468071777

DATE: 5/16/08

SAMPLE IDENTIFICATION: B-2182 UD 24 (UT)

(A) Mass of oven-dried soil, grams:		47.36
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.43
(C) Mass of pycnometer, water and soil, grams:		686.37
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		22.2
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.719
(F)	***Correction factor:***	0.99952
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.717

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

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

REMARKS: Estimated % Passing # 4 :

Fat CLAY (CH)

EQUIPMENT USED

SCALES : 3.1.99

OVEN 5.1.16:

THERMOMETER :5.1.01

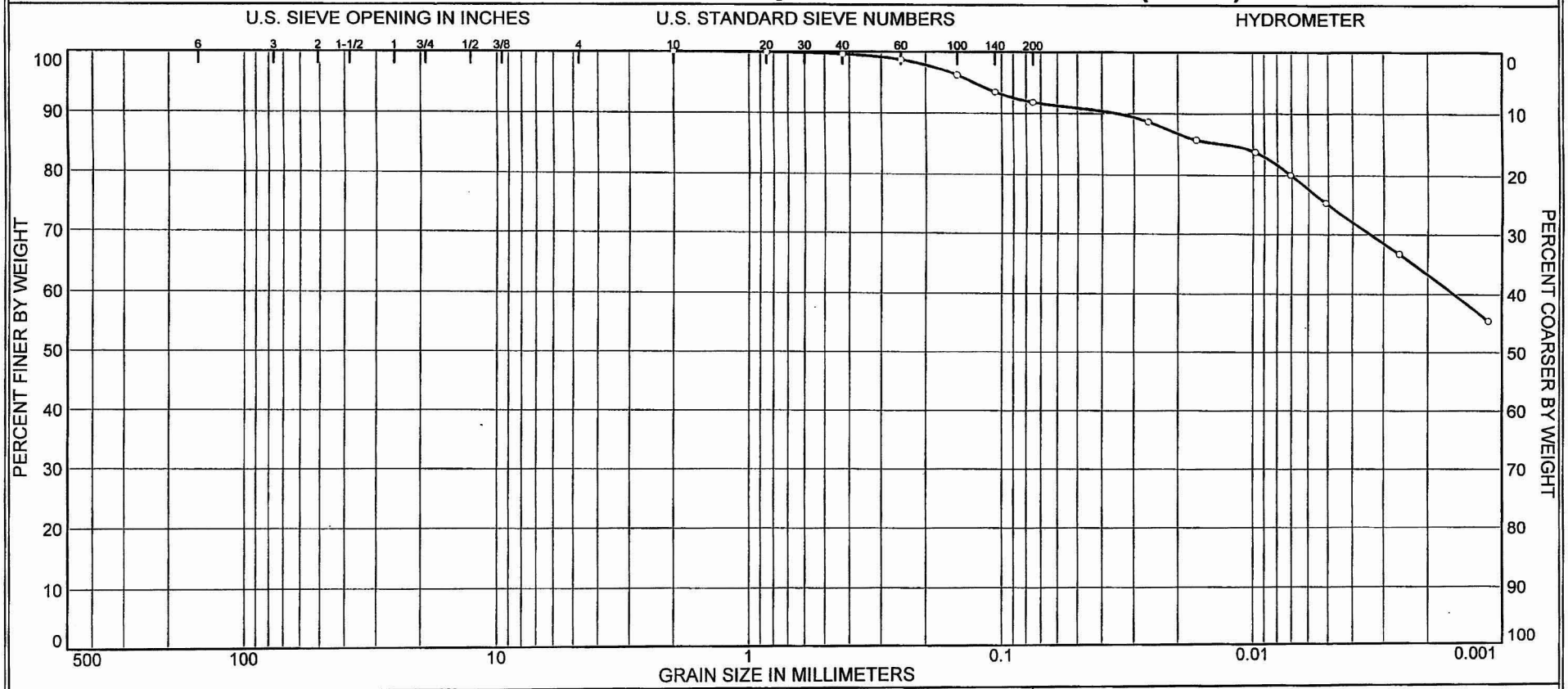
PYCNOMETER :P-3

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 6/13/08

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	0.4	7.8	16.8	75.0

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-25	303-304.2	12/14/07	CH	Light Gray Fat CLAY	25.1	52	26

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8195

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by:EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.79 (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-2182UD
Sample No.: UD-25
Elev. or Depth: 303-304.2 Ft **Sample Length(in./cm.):** ID#8195
Location: B-2182UD
Description: Light Gray Fat CLAY
Date: 12/14/07 **PL:** 26 **LL:** 52 **PI:** 26
USCS Classification: CH **AASHTO Classification:**
Testing Remarks: Tested by:EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.79 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	160.75
Tare =	109.04
Dry sample weight =	51.71

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 10	0.00	100.0
# 20	0.06	99.9
# 40	0.21	99.6
# 60	0.65	98.7
# 100	1.95	96.2
# 140	3.35	93.5
# 200	4.25	91.8

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 91.8
Weight of hydrometer sample: 47.46
Calculated biased weight= 51.70
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.784
Specific gravity correction factor= 0.972
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	21.4	51.5	46.4	0.0129	51.5	7.8	0.0256	87.2
5.00	21.4	50.0	44.9	0.0129	50.0	8.1	0.0164	84.4
15.00	21.4	49.0	43.9	0.0129	49.0	8.3	0.0096	82.5

MACTEC Engineering and Consulting, Inc.

DSC 4-30-08

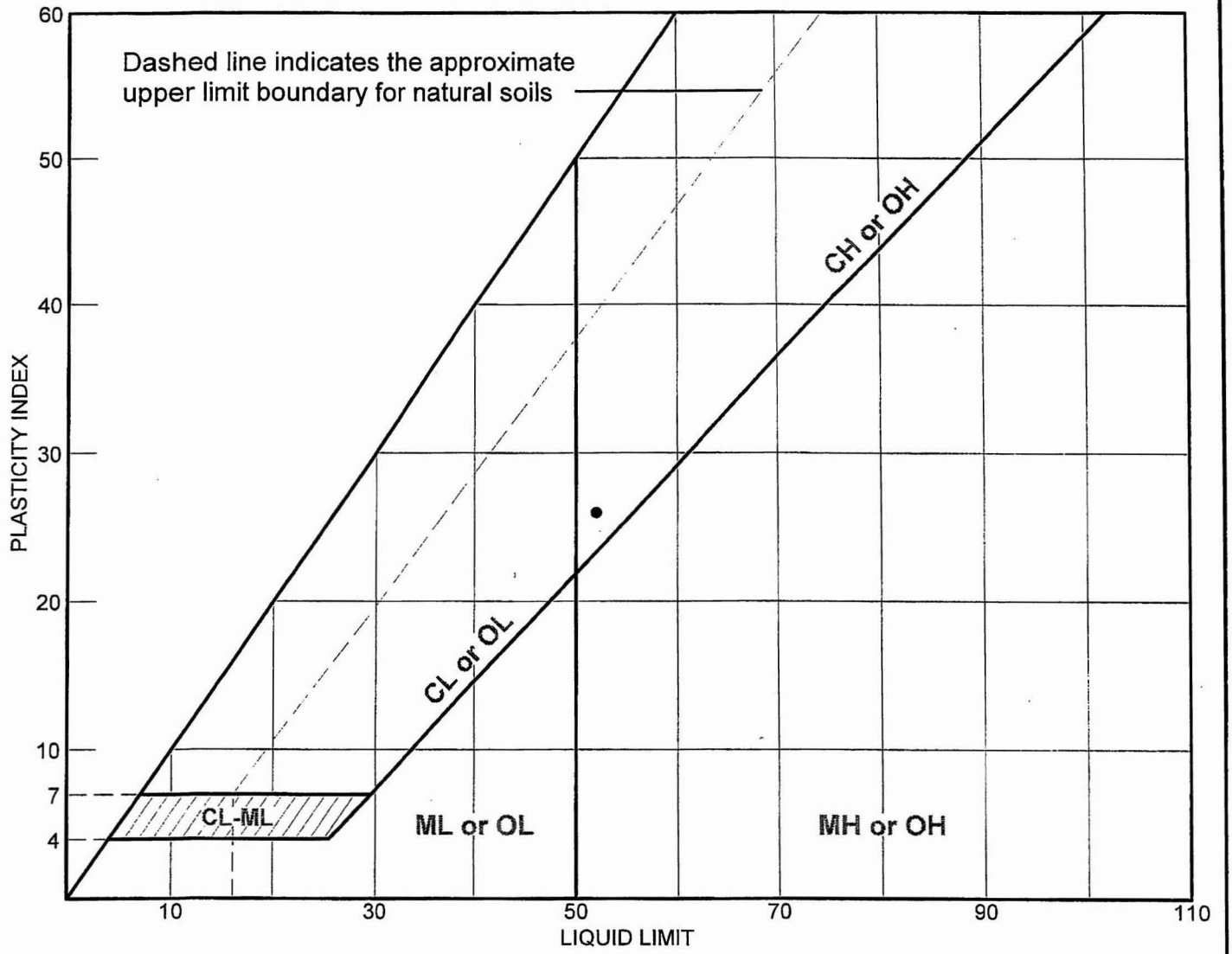
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
30.00	21.4	47.0	41.9	0.0129	47.0	8.6	0.0069	78.7
60.00	21.4	44.5	39.4	0.0129	44.5	9.0	0.0050	74.0
250.00	21.7	40.0	34.9	0.0129	40.0	9.7	0.0025	65.7
1440.00	21.7	34.0	28.9	0.0129	34.0	10.7	0.0011	54.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 8.2 (**% coarse =** **% medium** = 0.4 **% fine** = 7.8)
% SILT = 17.8 **% CLAY** = 74.0

D_{85}= 0.02 D_{60}= 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
●	2182UD	UD-25	303-304.2	25.1	26	52	26	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8195

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-2182UD
Sample No.: UD-25
Elev. or Depth: 303-304.2 Ft **Sample Length(in./cm.):** ID#8195
Location: B-2182UD
Description: Light Gray Fat CLAY
Water Content: 25.1 **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.09	34.67				
Dry+Tare	27.8	30.25				
Tare	21.55	21.84				
# Blows	24	25				
Moisture	52.6	52.6				

Liquid Limit= 52
Plastic Limit= 26
Plasticity Index= 26

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	28.65	29.17			
Dry+Tare	27.22	27.69			
Tare	21.64	21.99			
Moisture	25.6	26.0			

MACTEC ENGINEERING AND CONSULTING, INC.

REPORT OF THE STANDARD TEST METHOD FOR SPECIFIC GRAVITY OF SOILS
Performed in General Accordance with ASTM D 854-06 (Method B)

PROJECT NAME:EXELON COL PROJECT (VICTORIA)
PROJECT NUMBER: 6468071777
DATE: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-25 @ 303.0-304.2 Ft.

(A) Mass of oven-dried soil, grams:		37.33
(B) Mass of pycnometer filled with water at test temperature (T), grams:		363.80
(C) Mass of pycnometer, water and soil, grams:		387.75
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		22.2
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.790
(F)	***Correction factor:***	0.99952
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.789

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

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

REMARKS: Estimated % Passing # 4 : 100 %
Fat CLAY (CH)

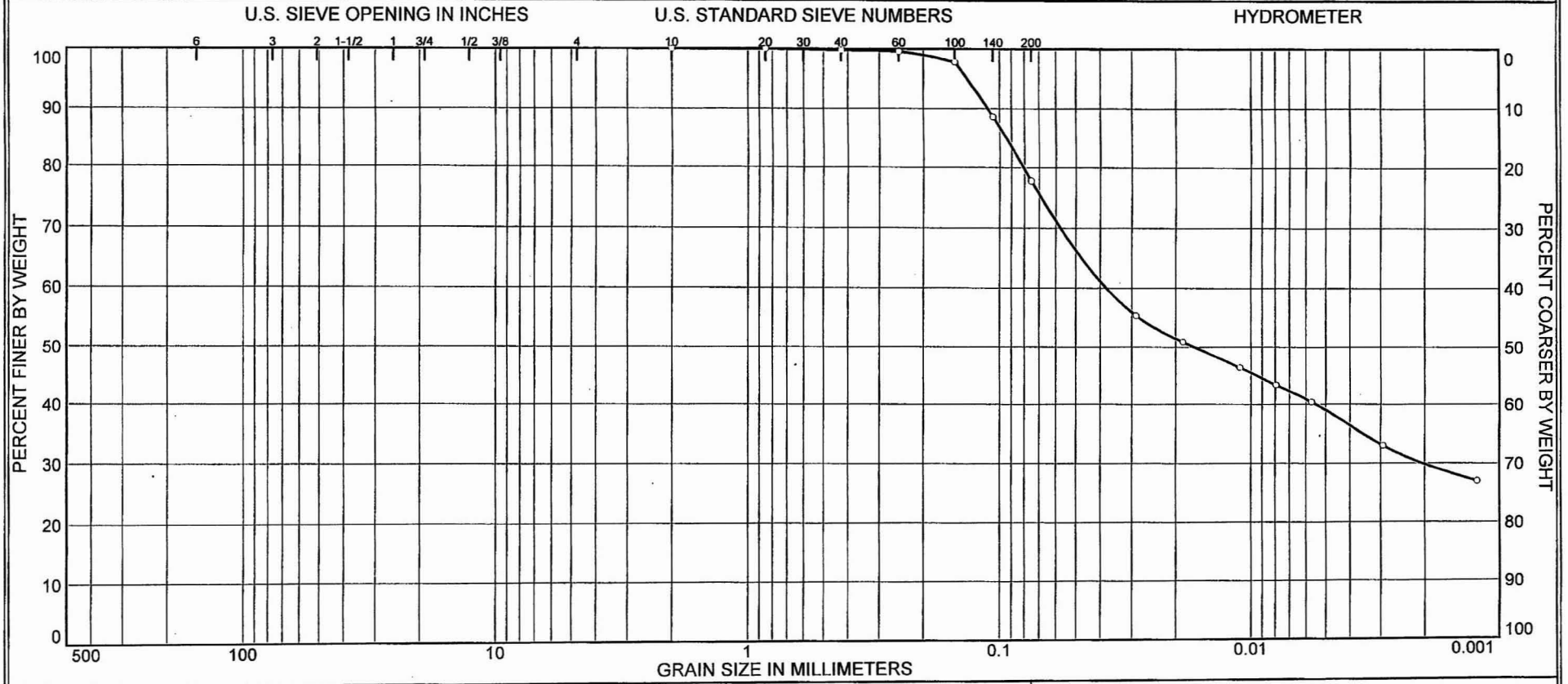
EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2184

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

REVIEWED BY: Harry Johnson

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	0.0	0.2	22.0	38.8	39.0

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-26	320-321.5 Ft.	12/15/07	CL	Pale Brown Lean CLAY with sand	15.5	35	16

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 | Lab No. 8196

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.73 (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-2182UD
Sample No.: UD-26
Elev. or Depth: 320-321.5 Ft **Sample Length(in./cm.):** ID#8196
Location: B-2182UD
Description: Pale Brown Lean CLAY with sand
Date: 12/15/07 **PL:** 16 **LL:** 35 **PI:** 19
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.73 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	179.60
Tare =	113.90
Dry sample weight =	65.70

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 10	0.00	100.0
# 20	0.03	100.0
# 40	0.10	99.8
# 60	0.23	99.6
# 100	1.44	97.8
# 140	7.52	88.6
# 200	14.61	77.8

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 77.8
Weight of hydrometer sample: 51.09
Calculated biased weight= 65.67
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.726
Specific gravity correction factor= 0.983
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	21.1	42.0	36.8	0.0132	42.0	9.4	0.0285	55.1
5.00	21.1	39.0	33.8	0.0132	39.0	9.9	0.0185	50.6
15.00	21.1	36.0	30.8	0.0132	36.0	10.4	0.0110	46.1

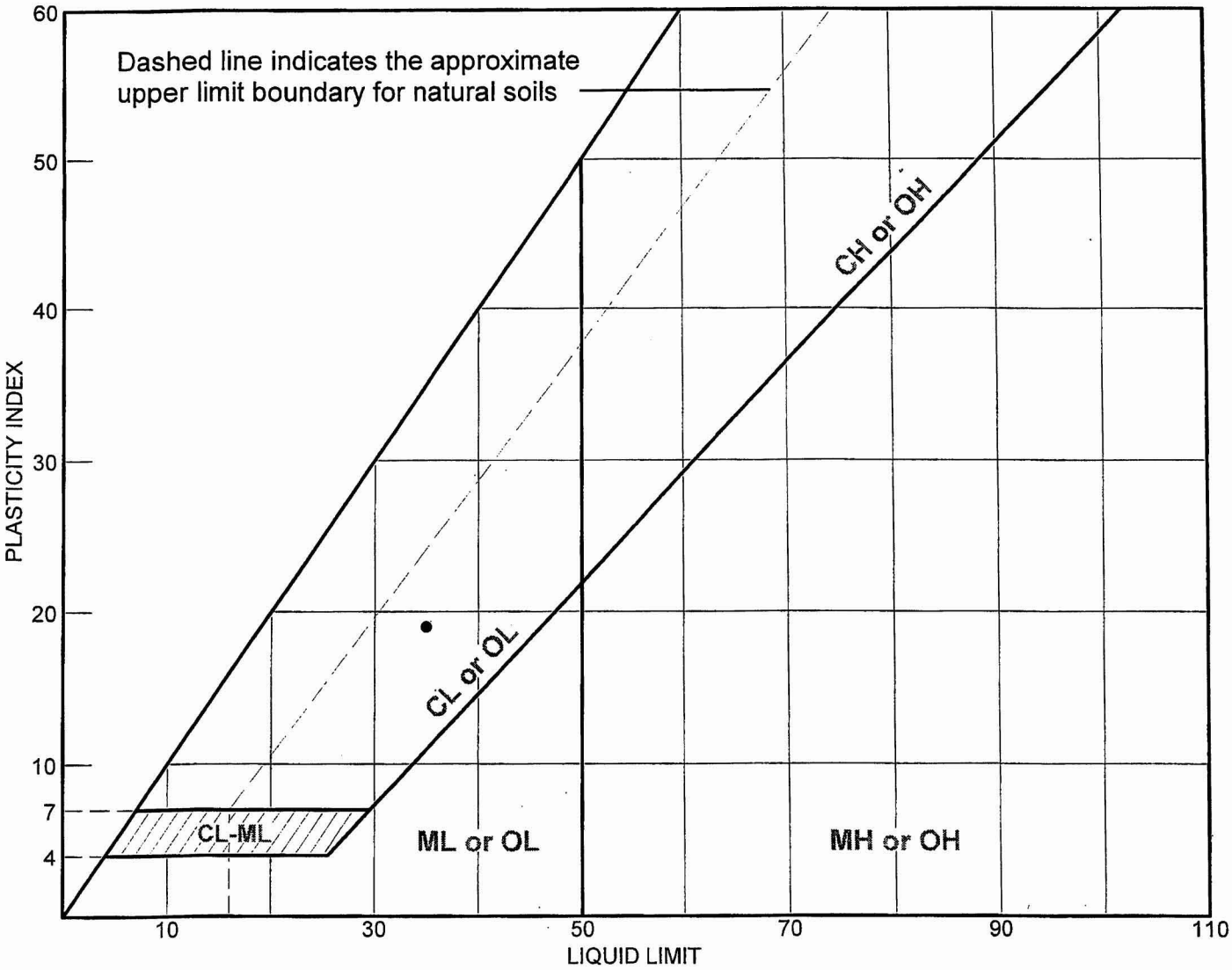
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
30.00	21.1	34.0	28.8	0.0132	34.0	10.7	0.0079	43.1
60.00	21.1	32.0	26.8	0.0132	32.0	11.0	0.0056	40.1
240.00	21.7	27.0	21.9	0.0131	27.0	11.9	0.0029	32.8
1440.00	21.7	23.0	17.9	0.0131	23.0	12.5	0.0012	26.8

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 22.2 **(% coarse =** **% medium =** 0.2 **% fine =** 22.0)
% SILT = 39.0 **% CLAY =** 38.8

D_{85}= 0.09 D_{60}= 0.04 D_{50}= 0.02
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
●	2182UD	UD-26	320-321.5 Ft.	15.5	16	35	19	CL

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8196

DSC 3-08

LIQUID AND PLASTIC LIMIT TEST DATA

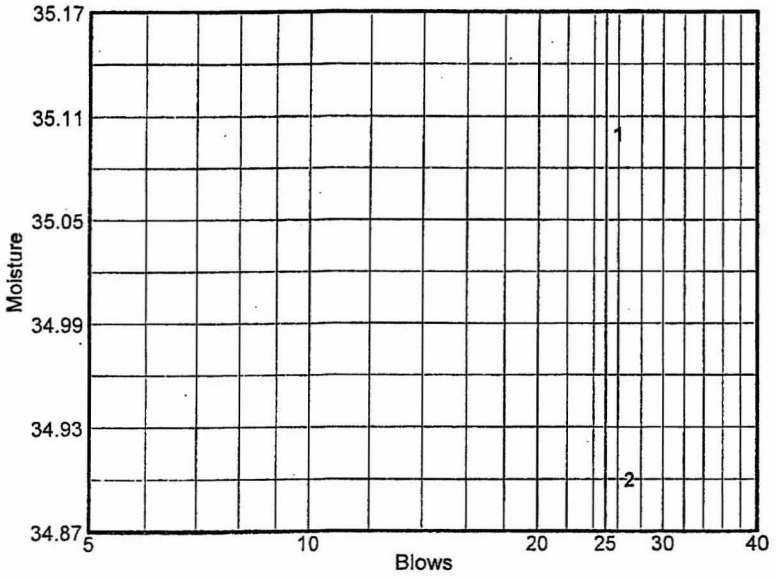
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-26
Elev. or Depth: 320-321.5 Ft **Sample Length(in./cm.):** ID#8196
Location: B-2182UD
Description: Pale Brown Lean CLAY with sand
Water Content: 15.5 **USCS:** CL **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.22	32.21				
Dry+Tare	29.54	29.54				
Tare	21.91	21.89				
# Blows	26	27				
Moisture	35.1	34.9				



Liquid Limit= 35
Plastic Limit= 16
Plasticity Index= 19

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	31.26	29.79			
Dry+Tare	29.99	28.65			
Tare	21.88	21.57			
Moisture	15.7	16.1			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-26 @ 320.0-321.5 Ft.

(A) Mass of oven-dried soil, grams:		36.64
(B) Mass of pycnometer filled with water at test temperature (T), grams:		339.45
(C) Mass of pycnometer, water and soil, grams:		362.66
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.728
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.726

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

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

REMARKS: Estimated % Passing # 4 : 100 %

Lean CLAY with sand (CL)

EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2053

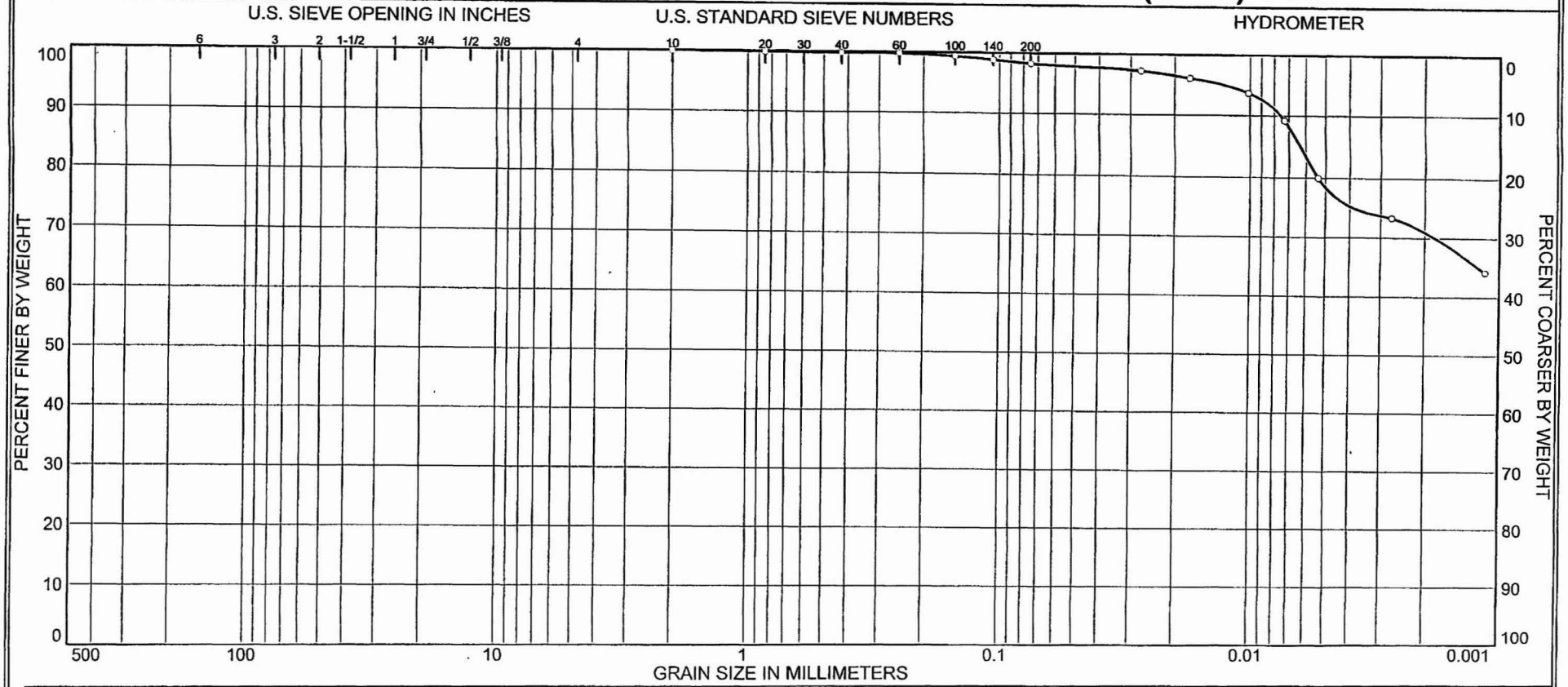
TESTED BY: EH

\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	0.0	0.0	0.2	1.5	19.8	78.5

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-28	330-332 ft.	12/15/07	CH	Pale Brown Fat CLAY	28.0	69	29

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8197

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ HJ

NM value from first strength test performed.
Specific Gravity = 2.74 (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-2182UD
Sample No.: UD-28
Elev. or Depth: 330-332 Ft
Sample Length(in./cm.): ID#8197
Location: B-2182UD
Description: Pale Brown Fat CLAY
Date: 12/15/07 **PL:** 29 **LL:** 69 **PI:** 40
USCS Classification: CH
AASHTO Classification:
Testing Remarks: Tested by: EH
Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.74 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	58.84
Tare =	16.44
Dry sample weight =	42.40

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 10	0.00	100.0
# 20	0.03	99.9
# 40	0.08	99.8
# 60	0.08	99.8
# 100	0.24	99.4
# 140	0.47	98.9
# 200	0.70	98.3

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 98.3
Weight of hydrometer sample: 41.7
Calculated biased weight= 42.42
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.739
Specific gravity correction factor= 0.981
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	20.3	47.5	42.1	0.0132	47.5	8.5	0.0273	97.4
5.00	20.3	47.0	41.6	0.0132	47.0	8.6	0.0174	96.3
15.00	20.3	46.0	40.6	0.0132	46.0	8.8	0.0101	93.9

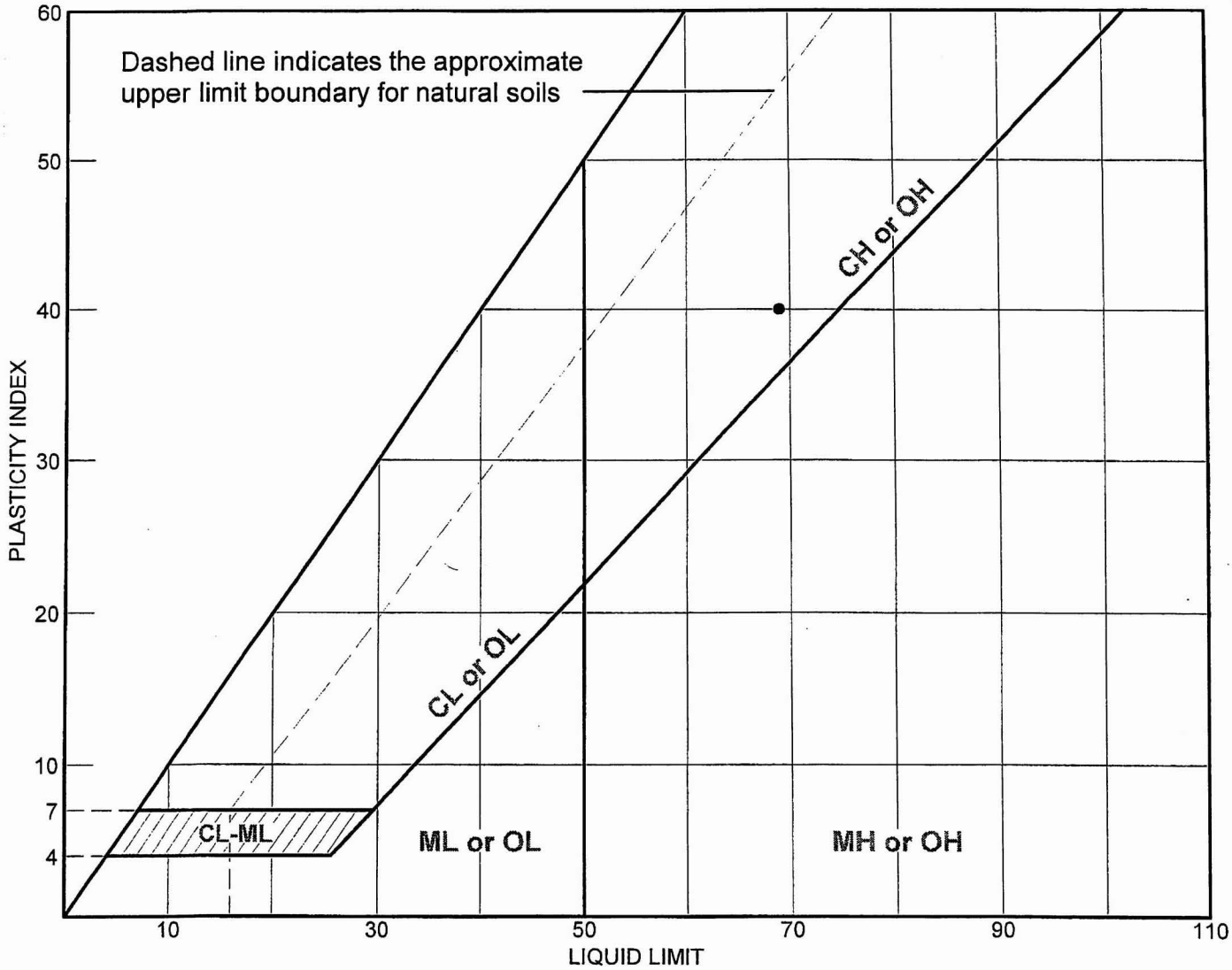
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
30.00	20.3	44.0	38.6	0.0132	44.0	9.1	0.0073	89.3
60.00	20.3	40.0	34.6	0.0132	40.0	9.7	0.0053	80.1
240.00	20.8	37.0	31.7	0.0132	37.0	10.2	0.0027	73.4
1440.00	21.1	33.0	27.8	0.0131	33.0	10.9	0.0011	64.3

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 1.7 **(% coarse =** **% medium =** 0.2 **% fine =** 1.5**)**
% SILT = 19.7 **% CLAY =** 78.6

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
●	2182UD	UD-28	330-332 ft.	28.0	29	69	40	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8197

DSC 3-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

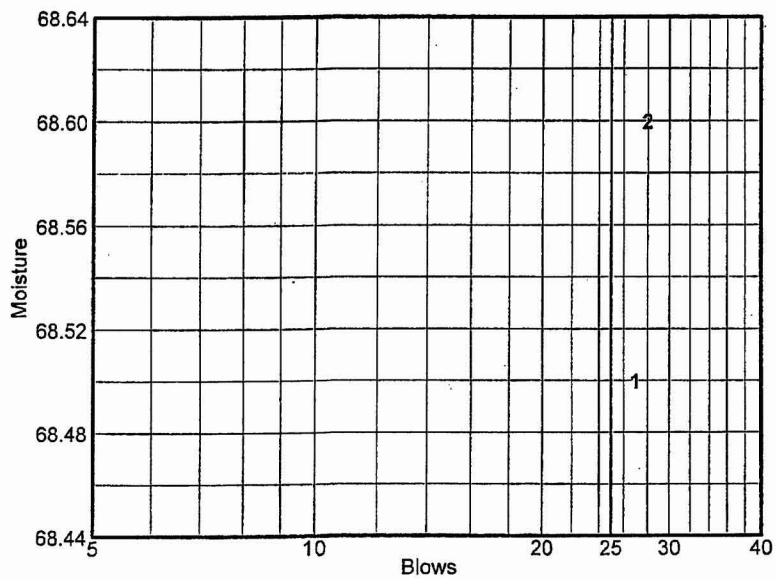
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-28
Elev. or Depth: 330-332 Ft **Sample Length(in./cm.):** ID#8197
Location: B-2182UD
Description: Pale Brown Fat CLAY
Water Content: 28.0 **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.78	31.12				
Dry+Tare	27.64	27.27				
Tare	21.6	21.66				
# Blows	27	28				
Moisture	68.5	68.6				



Liquid Limit= 69
Plastic Limit= 29
Plasticity Index= 40

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	26.42	30.53			
Dry+Tare	24.89	28.58			
Tare	19.57	21.82			
Moisture	28.8	28.8			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-28 @ 330.0-332.0 Ft.

(A) Mass of oven-dried soil, grams:		37.37
(B) Mass of pycnometer filled with water at test temperature (T), grams:		339.40
(C) Mass of pycnometer, water and soil, grams:		363.14
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.9
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.742
(F)	***Correction factor:***	0.99912
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.739

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

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

REMARKS: Estimated % Passing # 4 : 100 %

Fat CLAY (CH)

Note: Retest of Sample

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2053

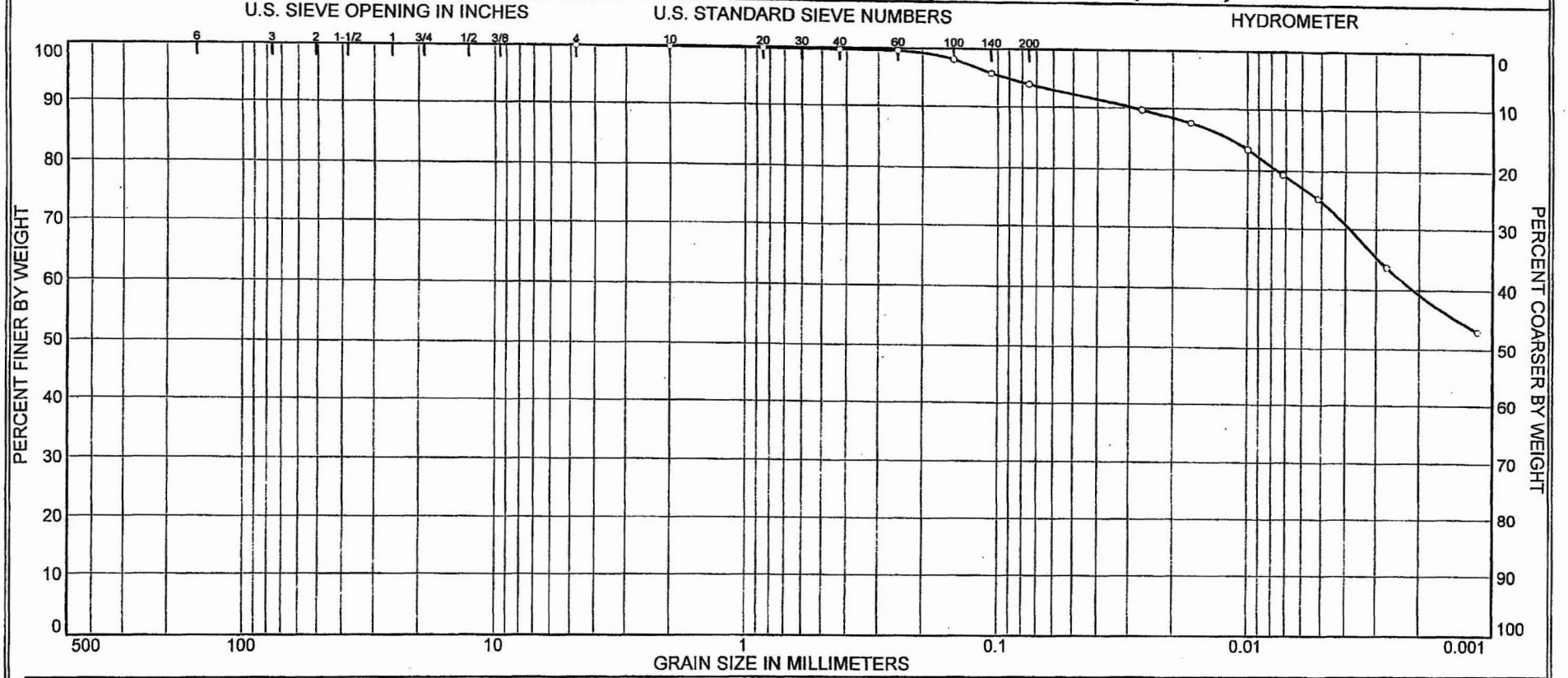
TESTED BY: EH

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

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



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.1	0.2	5.7	19.4	74.6

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	B-2182UD	UD-29	333-334.7 Ft.	2/15/07	CH	Pale Brown Mottled Light Gray Fat CLAY	24.7	56	26

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8444

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.72 (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-2182UD
Sample No.: UD-29
Elev. or Depth: 333-334.7 Ft **Sample Length(in./cm.):** ID#8444
Location: B-2182UD
Description: Pale Brown Mottled Light Gray Fat CLAY
Date: 2/15/07 **PL:** 26 **LL:** 56 **PI:** 30
USCS Classification: CH **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.72 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	64.06
Tare =	16.73
Dry sample weight =	47.33

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.05	99.9
# 20	0.10	99.8
# 40	0.14	99.7
# 60	0.21	99.6
# 100	0.87	98.2
# 140	2.01	95.8
# 200	2.83	94.0

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 94.0
Weight of hydrometer sample: 44.50
Calculated biased weight= 47.34
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.724
Specific gravity correction factor= 0.984
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

MACTEC Engineering and Consulting, Inc.

DSC
4-30-08

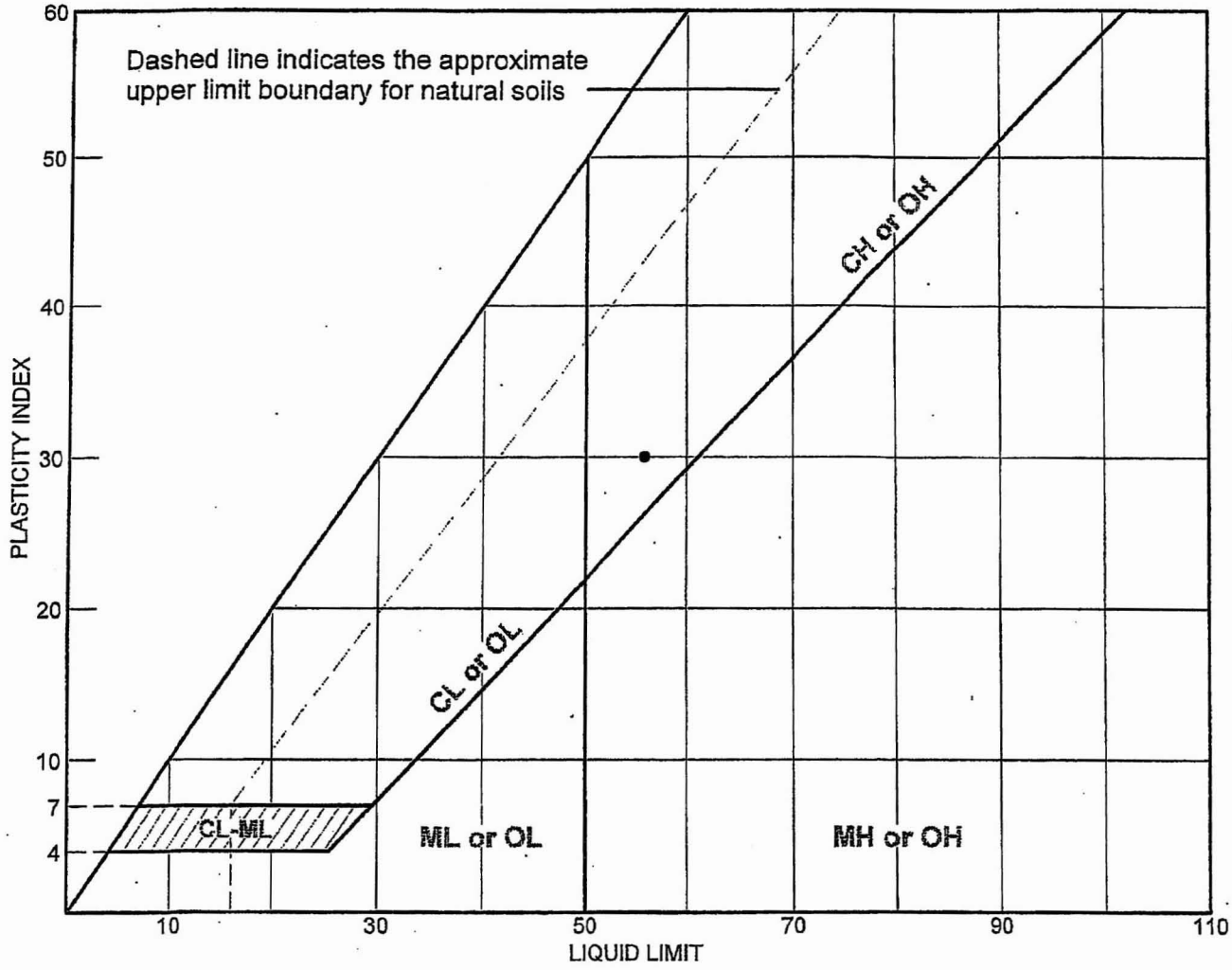
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.5	48.0	43.1	0.0129	48.0	8.4	0.0266	89.7
5.00	22.5	47.0	42.1	0.0129	47.0	8.6	0.0170	87.6
15.00	22.5	45.0	40.1	0.0129	45.0	8.9	0.0100	83.4
30.00	22.5	43.0	38.1	0.0129	43.0	9.2	0.0072	79.3
60.00	22.5	41.0	36.1	0.0129	41.0	9.6	0.0052	75.1
240.00	22.5	35.5	30.6	0.0129	35.5	10.5	0.0027	63.7
1440.00	22.2	30.5	25.6	0.0130	30.5	11.3	0.0012	53.1

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 6.0 (**% coarse =** 0.1 **% medium =** 0.2 **% fine =** 5.7)
% SILT = 19.4 **% CLAY =** 74.6

D_{85}= 0.01 D_{60}= 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-2182UD	UD-29	333-334.7 Ft.	24.7	26	56	30	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8444

DSC
3-31-08

LIQUID AND PLASTIC LIMIT TEST DATA

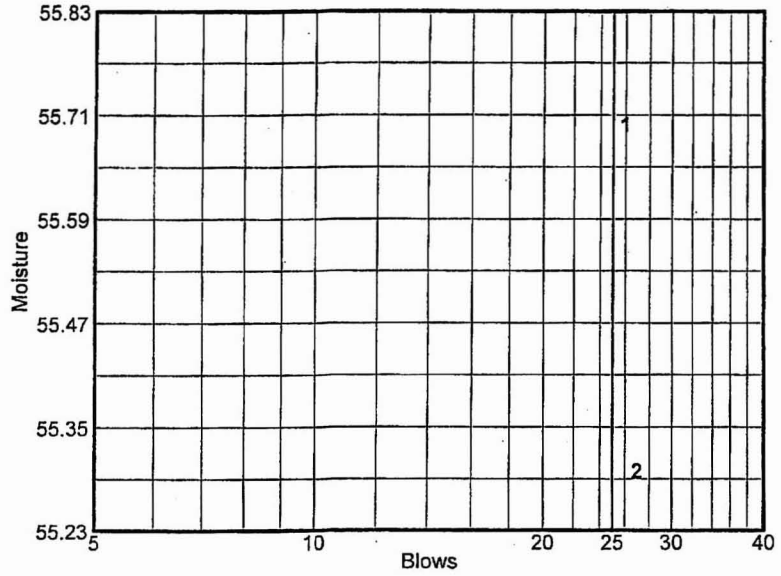
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-29
Elev. or Depth: 333-334.7 Ft **Sample Length(in./cm.):** ID#8444
Location: B-2182UD
Description: Pale Brown Mottled Light Gray Fat CLAY
Water Content: 24.7 **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.11	30.99				
Dry+Tare	28.18	27.29				
Tare	21.13	20.60				
# Blows	26	27				
Moisture	55.7	55.3				



Liquid Limit= 56
Plastic Limit= 26
Plasticity Index= 30

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	27.76	27.33			
Dry+Tare	26.17	25.84			
Tare	20.03	20.12			
Moisture	25.9	26.0			

MACTEC ENGINEERING AND CONSULTING, INC.

REPORT OF THE STANDARD TEST METHOD FOR SPECIFIC GRAVITY OF SOILS
Performed in General Accordance with ASTM D 854-06 (Method B)

PROJECT NAME:EXELON COL PROJECT (VICTORIA)
PROJECT NUMBER: 6468071777
DATE: 3/19/08

SAMPLE IDENTIFICATION: B-2182UD,UD-29 @ 333-334.7 Ft.

(A) Mass of oven-dried soil, grams:	37.67
(B) Mass of pycnometer filled with water at test temperature (T), grams:	343.05
(C) Mass of pycnometer, water and soil, grams:	366.90
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	23.6
(G) Specific Gravity at observed temperature: A / [B - (C - A)]	2.726
(F) ***Correction factor:***	0.99919
(G x F) **SPECIFIC GRAVITY @ 20°C:**	2.724

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

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

REMARKS: Estimated % Passing # 4 : 100 %

Fat CLAY (CH)

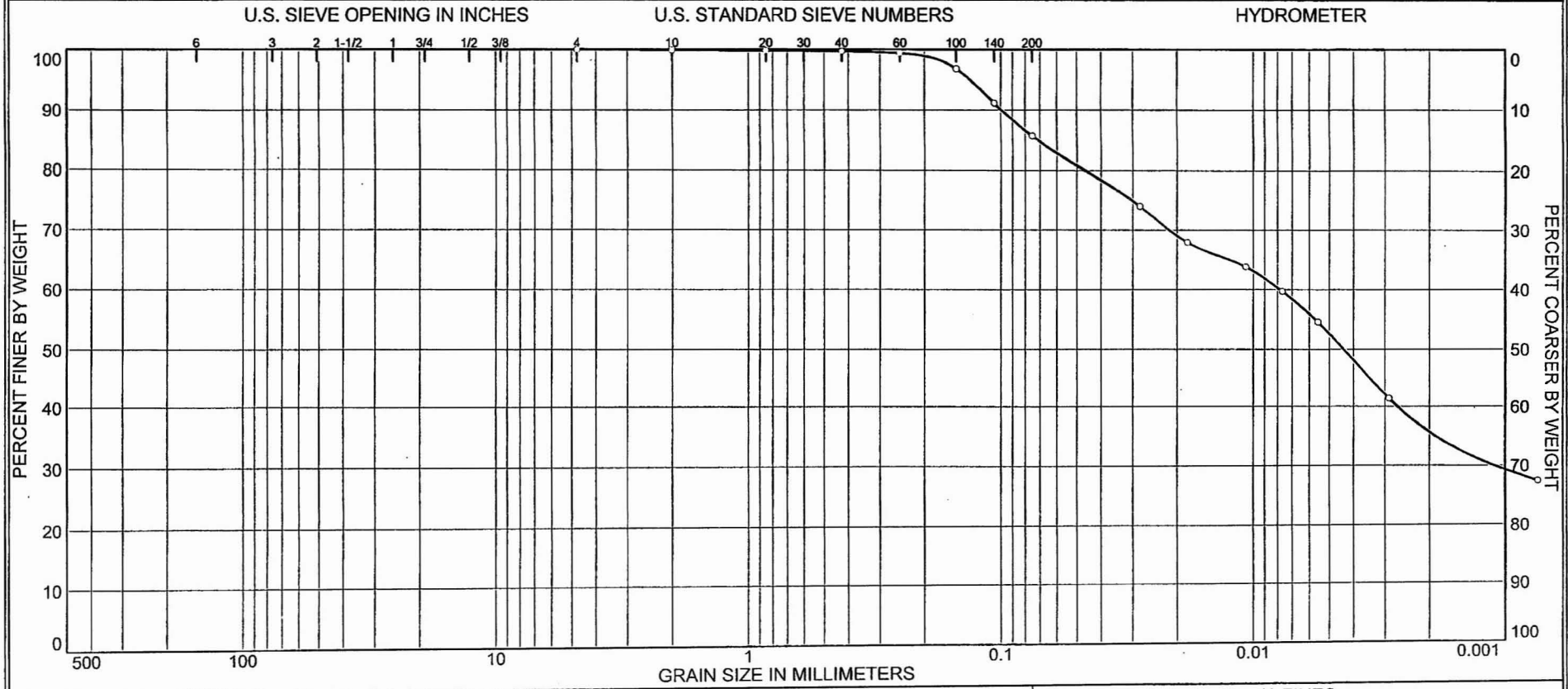
EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2052

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
○	0.0	0.0	0.0	0.1	0.2	14.0	33.0	52.7

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-30	340-341.1 Ft.	12/15/07	CL	Light Gray Lean CLAY	15.3	43	17

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8198

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.73 (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-2182UD
Sample No.: UD-30
Elev. or Depth: 340-341.1 Ft **Sample Length(in./cm.):** ID#8198
Location: B-2182UD
Description: Light Gray Lean CLAY
Date: 12/15/07 **PL:** 17 **LL:** 43 **PI:** 26
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.73 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	65.04
Tare =	16.83
Dry sample weight =	48.21

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.07	99.9
# 20	0.08	99.8
# 40	0.15	99.7
# 60	0.30	99.4
# 100	1.54	96.8
# 140	4.29	91.1
# 200	6.89	85.7

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 85.7
Weight of hydrometer sample: 41.32
Calculated biased weight= 48.21
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.733
Specific gravity correction factor= 0.982
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

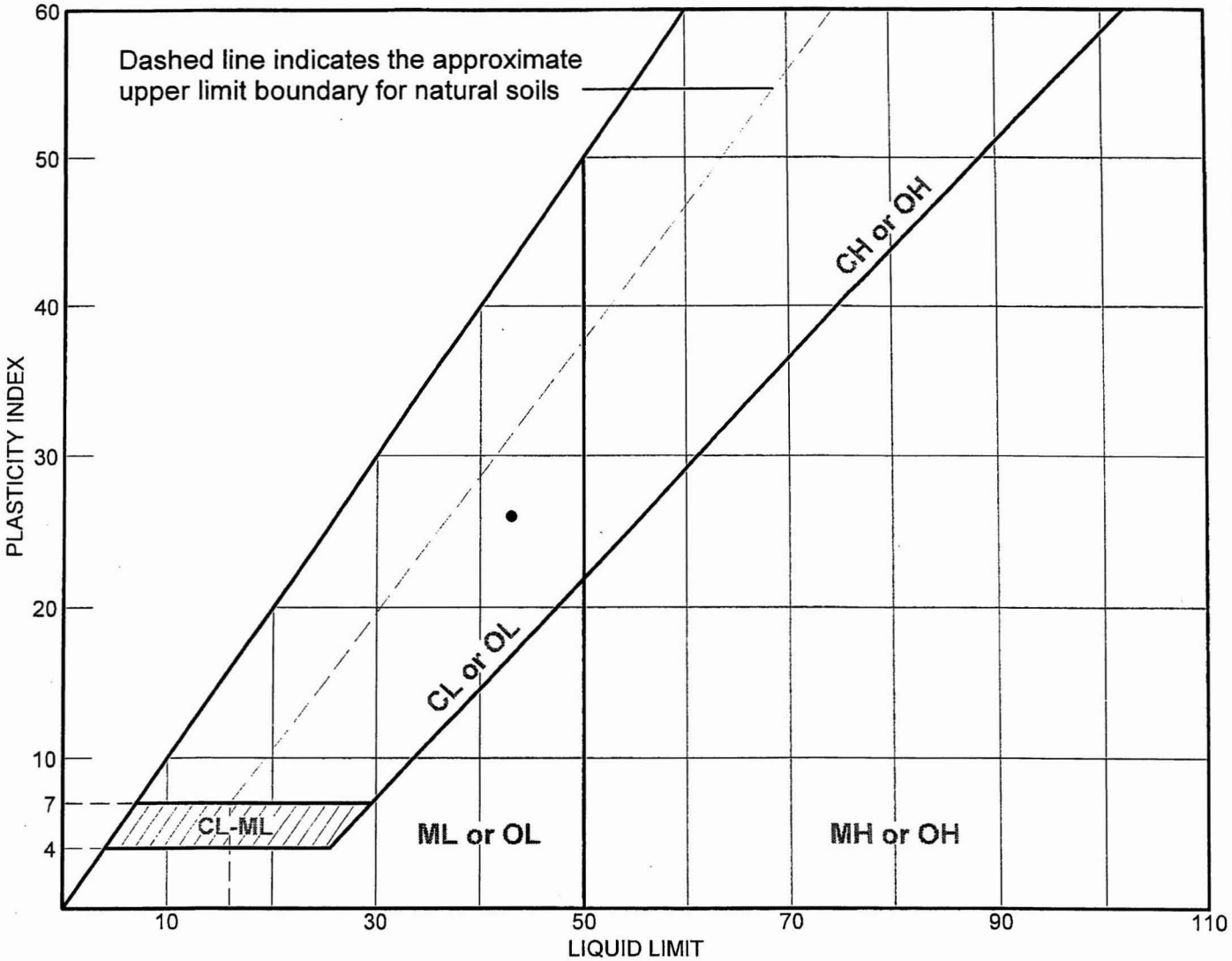
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	23.1	41.0	36.3	0.0128	41.0	9.6	0.0280	73.9
5.00	23.1	38.0	33.3	0.0128	38.0	10.1	0.0182	67.8
15.00	23.1	36.0	31.3	0.0128	36.0	10.4	0.0107	63.7
30.00	23.1	34.0	29.3	0.0128	34.0	10.7	0.0077	59.7
60.00	23.1	31.5	26.8	0.0128	31.5	11.1	0.0055	54.6
240.00	23.1	25.0	20.3	0.0128	25.0	12.2	0.0029	41.3
4142.00	21.7	18.5	13.4	0.0130	18.5	13.3	0.0007	27.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 14.3 (**% coarse** = 0.1 **% medium** = 0.2 **% fine** = 14.0)
% SILT = 33.0 **% CLAY** = 52.7 (**% CLAY COLLOIDS** = 29.3)

D_{85}= 0.07 D_{60}= 0.01 D_{50}= 0.00
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
●	2182UD	UD-30	340-341.1 Ft.	15.3	17	43	26	CL

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8198

DSC 3-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

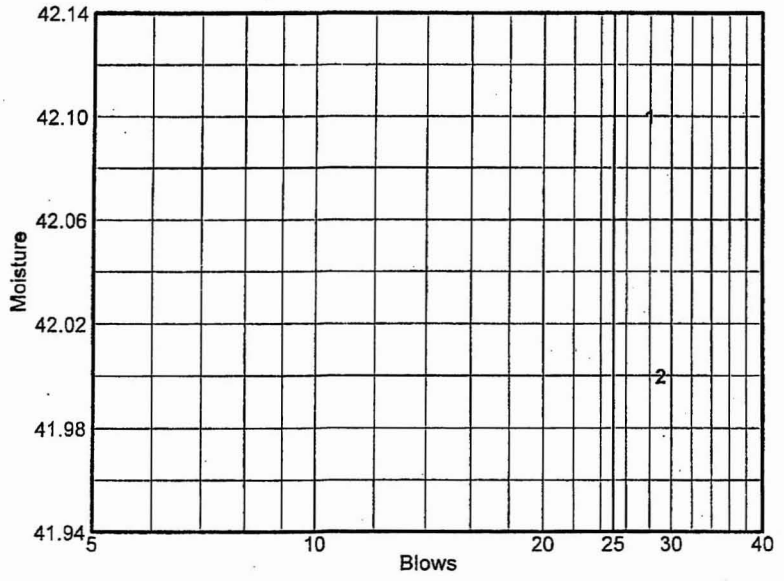
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-30
Elev. or Depth: 340-341.1 Ft **Sample Length(in./cm.):** ID#8198
Location: B-2182UD
Description: Light Gray Lean CLAY
Water Content: 15.3 **USCS:** CL **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	31.57	29.61				
Dry+Tare	27.96	26.49				
Tare	19.38	19.06				
# Blows	28	29				
Moisture	42.1	42.0				



Liquid Limit= 43
Plastic Limit= 17
Plasticity Index= 26

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	25.88	25.18			
Dry+Tare	24.93	24.28			
Tare	19.32	18.97			
Moisture	16.9	16.9			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-30 @ 340.0-341.1 Ft.

(A) Mass of oven-dried soil, grams:		37.52
(B) Mass of pycnometer filled with water at test temperature (T), grams:		338.40
(C) Mass of pycnometer, water and soil, grams:		362.20
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.0
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.735
(F)	***Correction factor:***	0.99933
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.733

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 : 2054

TESTED BY: EH

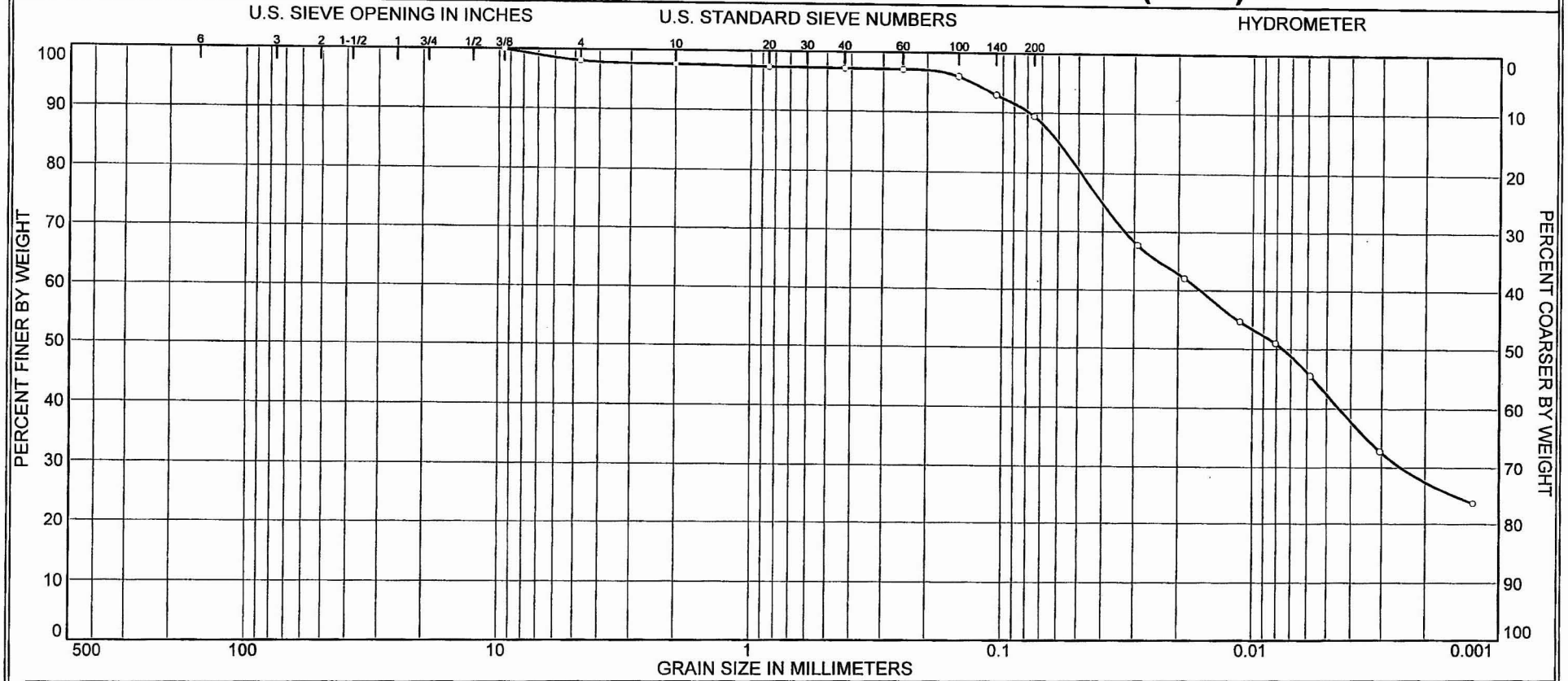
\Test Reports\Soils\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: **Harry Johnson**

DSC
3-3-08

HJ

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	1.9	0.5	0.4	7.8	47.0	42.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-31	343-344 Ft.	12/16/07	CL	Light Gray Lean CLAY	15.8	47	18

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8199

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ HJ

NM value from first strength test performed.
Specific Gravity = 2.74 (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-2182UD
Sample No.: UD-31
Elev. or Depth: 343-344 Ft
Sample Length(in./cm.): ID#8199
Location: B-2182UD
Description: Light Gray Lean CLAY
Date: 12/16/07 **PL:** 18 **LL:** 47 **PI:** 29
USCS Classification: CL
AASHTO Classification:
Testing Remarks: Tested by: EH
Reviewed by: HJ

NM value from first strength test performed.
Specific Gravity = 2.74 (ASTM D 854-06)

Mechanical Analysis Data

	Initial
Dry sample and tare=	70.29
Tare =	16.75
Dry sample weight =	53.54

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
.375 inch	0.00	100.0
# 4	1.02	98.1
# 10	1.30	97.6
# 20	1.45	97.3
# 40	1.51	97.2
# 60	1.57	97.1
# 100	2.16	96.0
# 140	3.78	92.9
# 200	5.69	89.4

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 89.4
Weight of hydrometer sample: 47.85
Calculated biased weight= 53.52
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.735
Specific gravity correction factor= 0.982
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

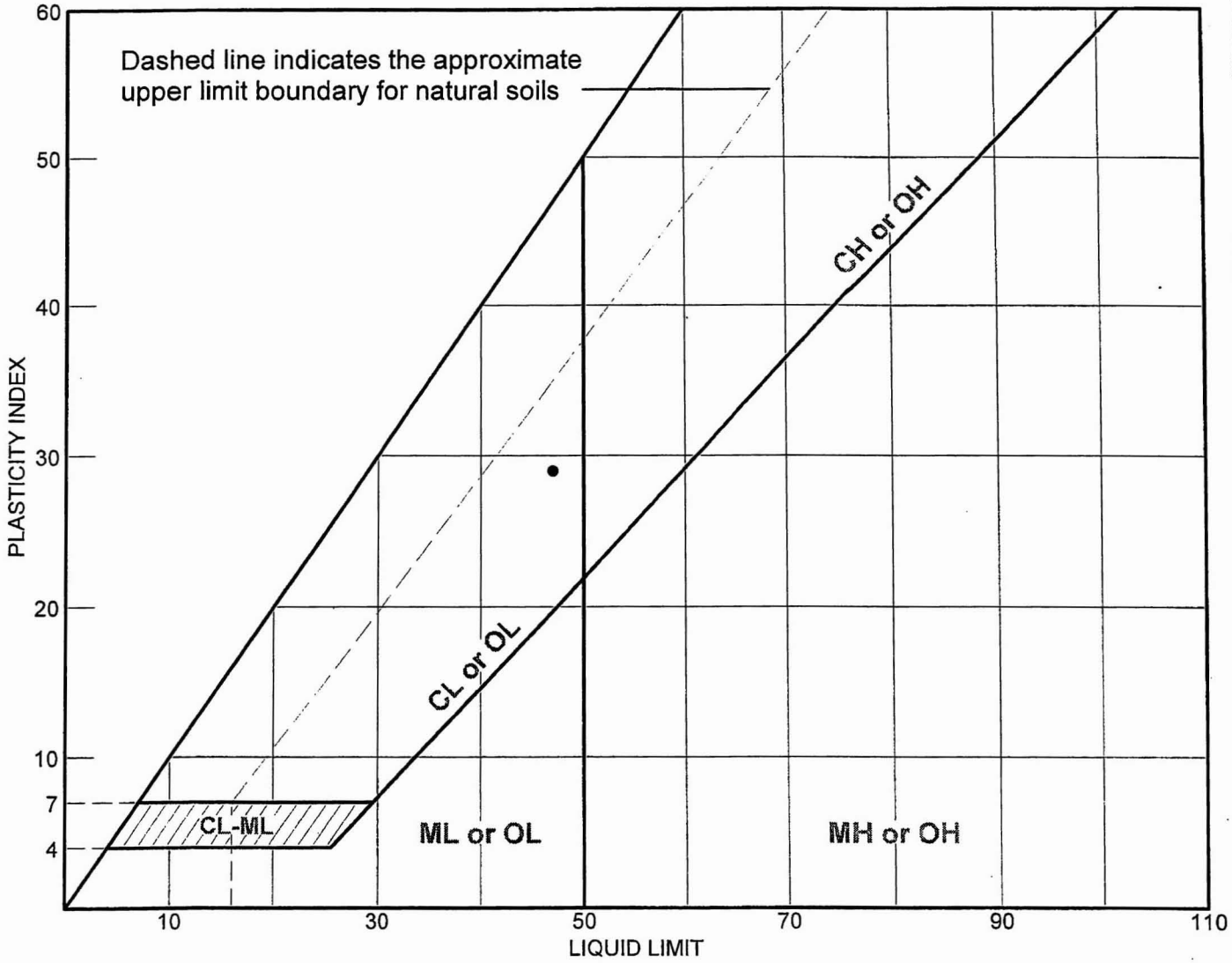
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	20.3	42.0	36.6	0.0133	42.0	9.4	0.0288	67.2
5.00	20.3	39.0	33.6	0.0133	39.0	9.9	0.0187	61.7
15.00	20.3	35.0	29.6	0.0133	35.0	10.6	0.0111	54.4
30.00	20.3	33.0	27.6	0.0133	33.0	10.9	0.0080	50.7
60.00	20.3	30.0	24.6	0.0133	30.0	11.4	0.0058	45.2
240.00	20.8	23.0	17.7	0.0132	23.0	12.5	0.0030	32.5
1440.00	21.1	18.0	12.8	0.0131	18.0	13.3	0.0013	23.5

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL** = 1.9 (**% coarse =** **% fine** = 1.9)
% SAND = 8.7 (**% coarse** = 0.5 **% medium** = 0.4 **% fine** = 7.8)
% SILT = 47.1 **% CLAY** = 42.3

D_{85}= 0.06 D_{60}= 0.02 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
●	2182UD	UD-31	343-344 Ft.	15.8	18	47	29	CL

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8199

DSC 9-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

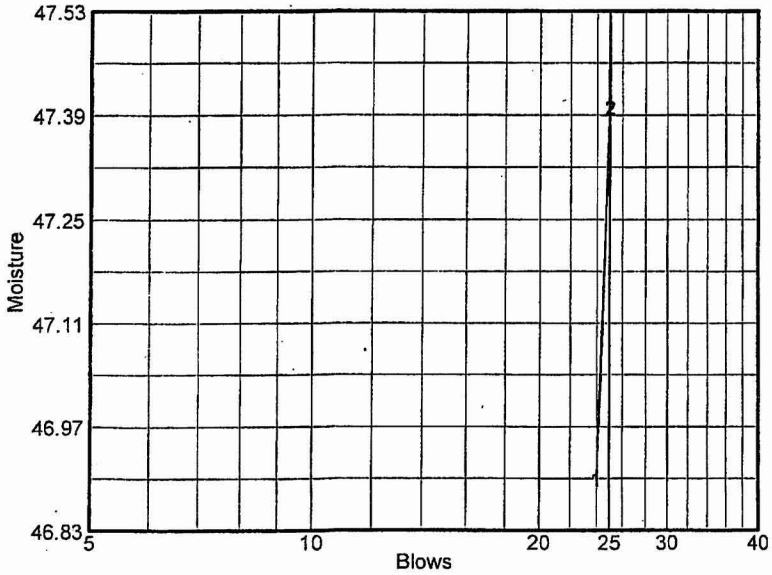
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-31
Elev. or Depth: 343-344 Ft **Sample Length(in./cm.):** ID#8199
Location: B-2182UD
Description: Light Gray Lean CLAY
Water Content: 15.8 **USCS:** CL **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.52	31.21				
Dry+Tare	27.61	28.17				
Tare	21.4	21.76				
# Blows	24	25				
Moisture	46.9	47.4				



Liquid Limit= 47
Plastic Limit= 18
Plasticity Index= 29

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	29.36	29.43			
Dry+Tare	28.24	28.3			
Tare	21.88	21.83			
Moisture	17.6	17.5			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-31 @ 343.0-344.0 Ft.

(A) Mass of oven-dried soil, grams:	36.46
(B) Mass of pycnometer filled with water at test temperature (T), grams:	339.45
(C) Mass of pycnometer, water and soil, grams:	362.59
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	23.6
(G) Specific Gravity at observed temperature: A / [B - (C - A)]	2.737
(F) ***Correction factor:***	0.99919
(G x F) **SPECIFIC GRAVITY @ 20°C:**	2.735

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

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

REMARKS: Estimated % Passing # 4 : 98 %
Lean CLAY (CL)

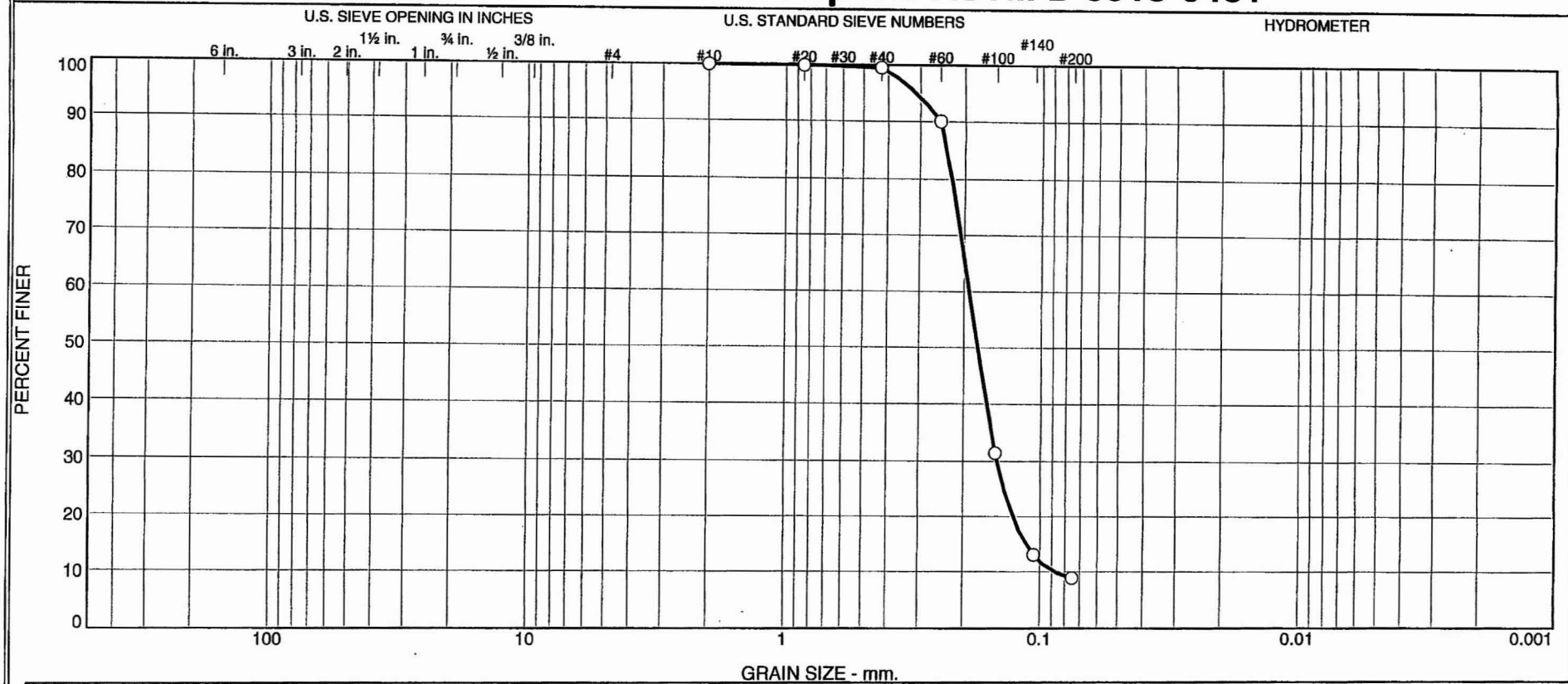
EQUIPMENT USED
SCALES : 418
OVEN : 144
THERMOMETER :2759
PYCNOMETER : 2053

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

REVIEWED BY: Harry Johnson

DSC
3-3-08

Particle Size Distribution Report / ASTM D 6913-04e1



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.5	90.6	8.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2182UD	UD-32	350.0	12-16-07	SP-SC	Light Yellowish Brown Poorly Graded SAND with clay (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468071777 Figure

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
Specific Gravity = 2.655 (ASTM D854-06)
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 4-30-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/10/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Boring B-2182UD
Depth: 350.0 **Sample Number:** UD-32
Material Description: Light Yellowish Brown Poorly Graded SAND with clay (Visual)
Date: 12-16-07 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SP-SC
Testing Remarks: SIEVE ANALYSIS ONLY
Specific Gravity = 2.655 (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
257.05	0.00	0.00	#10	0.00	100.0
102.59	0.00	0.00	#20	0.09	99.9
			#40	0.47	99.5
			#60	10.13	90.1
			#100	70.29	31.5
			#140	89.22	13.0
			#200	93.48	8.9

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	90.6	91.1			8.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0875	0.1138	0.1280	0.1476	0.1767	0.1910	0.2248	0.2359	0.2496	0.3117

Fineness Modulus	C_u	C_c
0.75	2.18	1.30

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: 3/15/08

SAMPLE IDENTIFICATION: B-2182UD, UD-32

(A) Mass of oven-dried soil, grams:	74.98
(B) Mass of pycnometer filled with water at test temperature (T), grams:	655.96
(C) Mass of pycnometer, water and soil, grams:	702.69
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	18.8
(G) Specific Gravity at observed temperature: A / [B - (C - A)]	2.654
(F) ***Correction factor:***	1.00024
(G x F) **SPECIFIC GRAVITY @ 20°C:**	2.655

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

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

REMARKS: Estimated % Passing # 4 : 100

Poorly Graded SAND with clay (SP-SC)-Visual

EQUIPMENT USED

SCALES : 3.1.99

OVEN 5.1.16:

THERMOMETER :5.1.01

PYCNOMETER :P-6

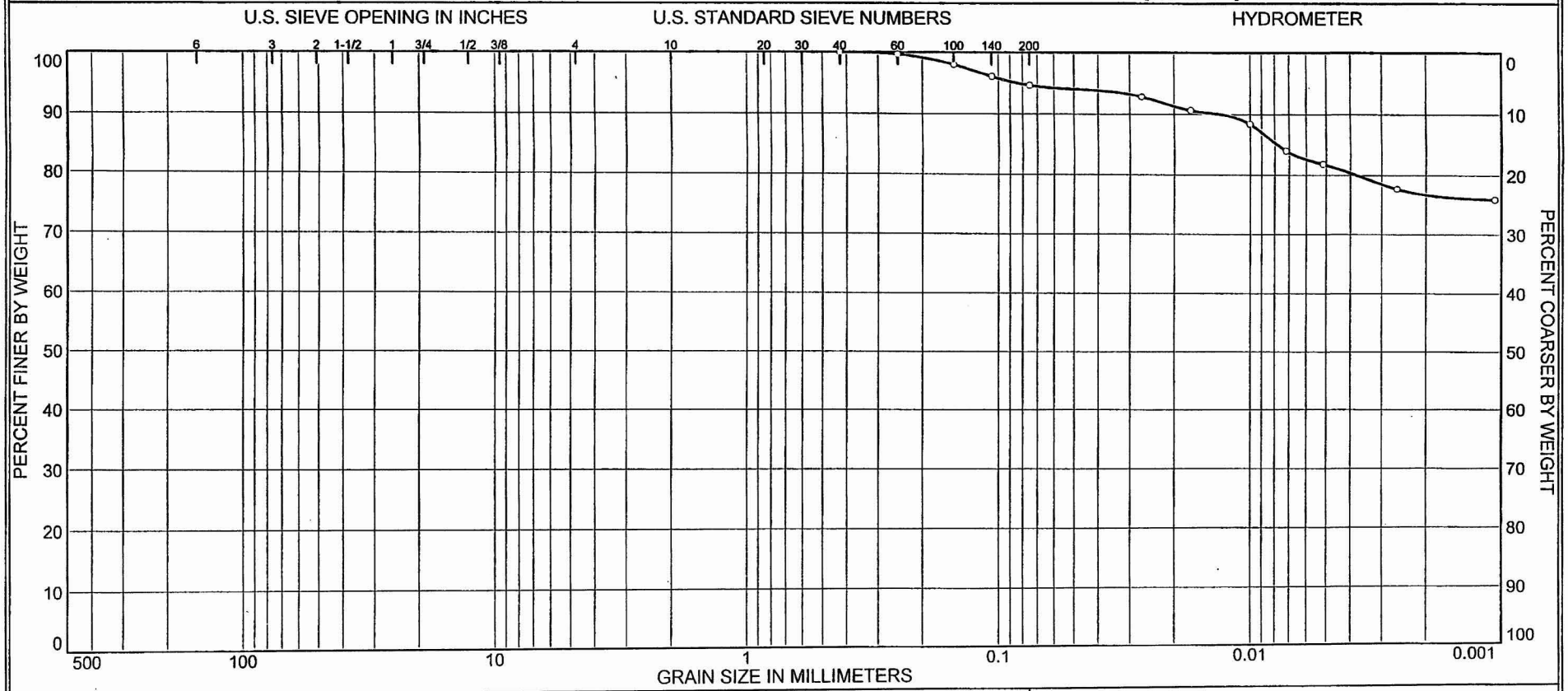
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 3-15-08

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



	% COBBLES	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.0	0.0	5.3	12.9	81.8

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-33	380-381.7 Ft.	12/16/07	CH	Light Gray Mottled Light Yellowish Brown Fat CLAY	32.2	68	32

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8200

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)

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-2182UD
Sample No.: UD-33
Elev. or Depth: 380-381.7 Ft **Sample Length(in./cm.):** ID#8200
Location: B-2182UD
Description: Light Gray Mottled Light Yellowish Brown Fat CLAY
Date: 12/16/07 **PL:** 32 **LL:** 68 **PI:** 36
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

	Initial
Dry sample and tare=	60.87
Tare =	16.21
Dry sample weight =	44.66

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 40	0.00	100.0
# 60	0.14	99.7
# 100	0.88	98.0
# 140	1.76	96.1
# 200	2.37	94.7

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 94.7
Weight of hydrometer sample: 42.29
Calculated biased weight= 44.66
Automatic temperature correction
Composite correction at 20 deg C = -5.4

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

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	20.3	48.0	42.6	0.0131	48.0	8.4	0.0269	92.9
5.00	20.3	47.0	41.6	0.0131	47.0	8.6	0.0172	90.7
15.00	20.3	46.0	40.6	0.0131	46.0	8.8	0.0100	88.5
30.00	20.3	44.0	38.6	0.0131	44.0	9.1	0.0072	84.1
60.00	20.3	43.0	37.6	0.0131	43.0	9.2	0.0051	82.0

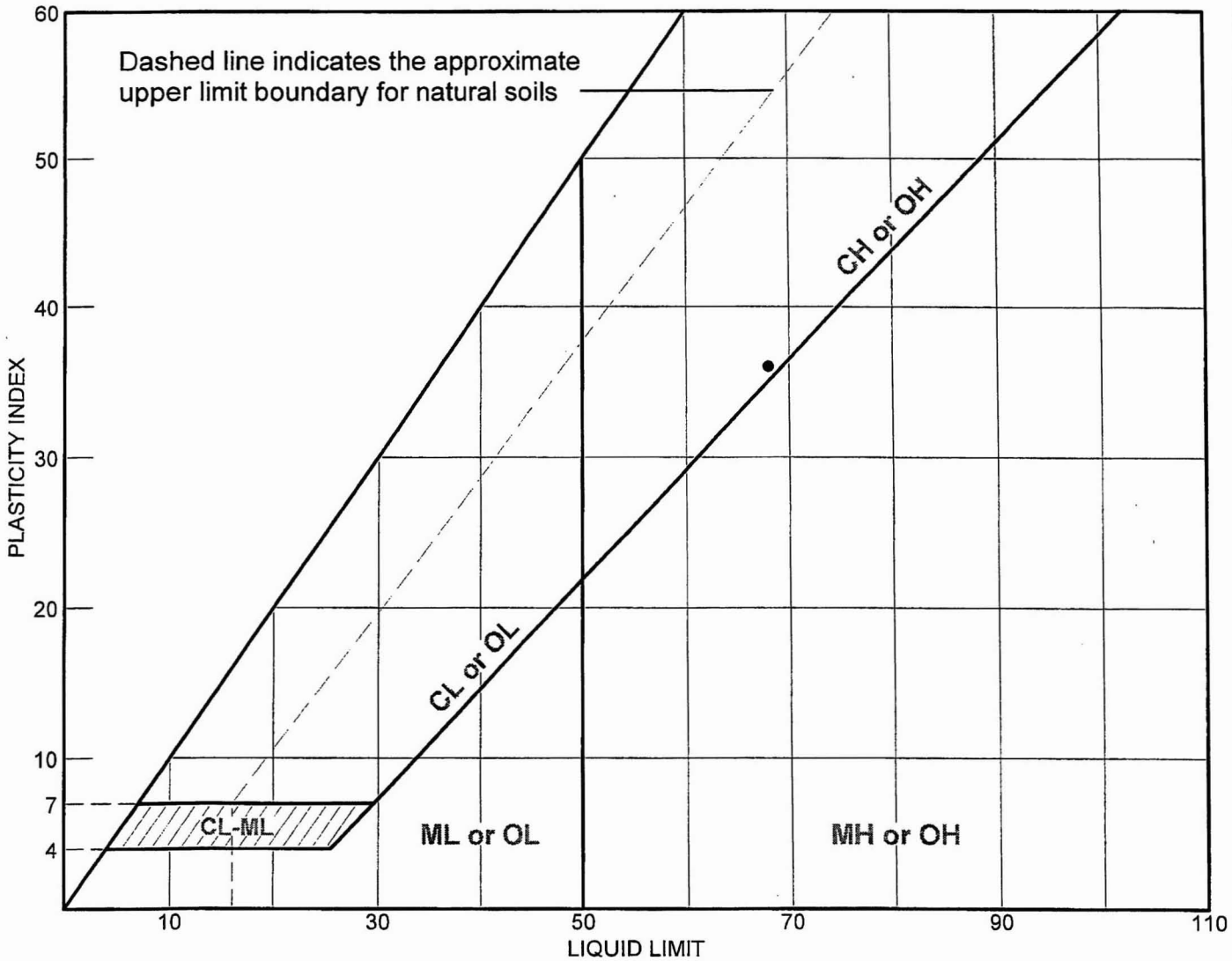
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
240.00	20.6	41.0	35.7	0.0131	41.0	9.6	0.0026	77.8
1440.00	21.4	40.0	34.9	0.0129	40.0	9.7	0.0011	76.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL =
% SAND = 5.3 (% coarse = % medium = % fine = 5.3)
% SILT = 12.8 % CLAY = 81.9

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
●	2182UD	UD-33	380-381.7 Ft.	32.2	32	68	36	CH

MACTEC ENGINEERING AND CONSULTING, INC.	**Client:** Bechtel **Project:** Exelon Texas COL (Victoria) **Project No.:** 6468-07-1777 **Lab No.** 8200

DSC 5-3-08

LIQUID AND PLASTIC LIMIT TEST DATA

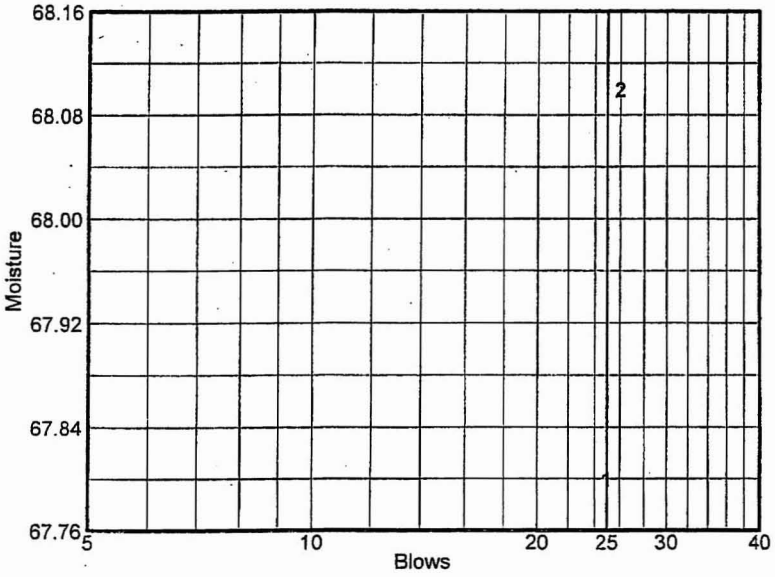
Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468-07-1777

Sample Data

Source: B-2182UD
Sample No.: UD-33
Elev. or Depth: 380-381.7 Ft **Sample Length(in./cm.):** ID#8200
Location: B-2182UD
Description: Light Gray Mottled Light Yellowish Brown Fat CLAY
Water Content: 32.2 **USCS:** CH **AASHTO:**

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	35.29	34.85				
Dry+Tare	29.91	29.47				
Tare	21.97	21.57				
# Blows	25	26				
Moisture	67.8	68.1				



Liquid Limit= 68
Plastic Limit= 32
Plasticity Index= 36

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	19.67	18.6			
Dry+Tare	17.9	17.11			
Tare	12.28	12.41			
Moisture	31.5	31.7			

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: 2/8/08

SAMPLE IDENTIFICATION: B-2182UD,UD-33 @ 380.0-381.7 Ft.

(A) Mass of oven-dried soil, grams:		37.27
(B) Mass of pycnometer filled with water at test temperature (T), grams:		341.20
(C) Mass of pycnometer, water and soil, grams:		365.06
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.3
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.779
(F)	***Correction factor:***	0.99926
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.777

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

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

REMARKS: Estimated % Passing # 4 : 100 %

Fat CLAY (CH)

Note: Retest of Sample

EQUIPMENT USED

SCALES : 418

OVEN : 144

THERMOMETER :2759

PYCNOMETER : 2055

TESTED BY: EH

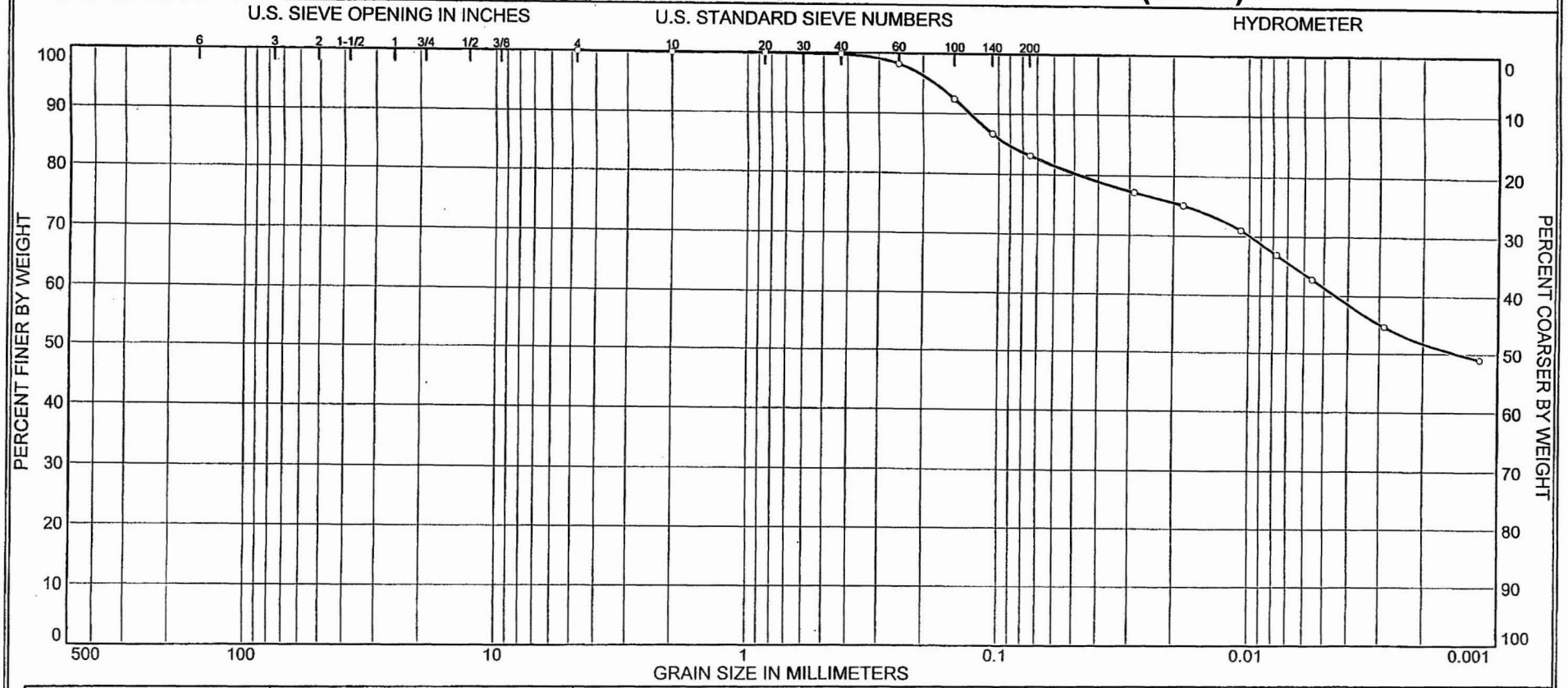
\Test Reports\Soils\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Harry Johnson

DSC
3-3-08

HJ

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	0.1	16.6	21.8	61.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	2182UD	UD-37	400-402.5	12/17/07	CL	Light Gray Mottled Yellowish Brown Lean CLAY with sand	23.6	49	25

Client Bechtel

Project Exelon Texas COL (Victoria)

Project No. 6468-07-1777 Lab No. 8201

MACTEC ENGINEERING AND CONSULTING, INC.

○ Tested by: EH Reviewed by: HJ

NM value from first strength 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-2182UD
Sample No.: UD-37
Elev. or Depth: 400-402.5 Ft **Sample Length(in./cm.):** ID#8201
Location: B-2182UD
Description: Light Gray Mottled Yellowish Brown Lean CLAY with sand
Date: 12/17/07 **PL:** 25 **LL:** 49 **PI:** 24
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Tested by: EH Reviewed by: HJ

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

Mechanical Analysis Data

	Initial
Dry sample and tare=	64.40
Tare =	16.21
Dry sample weight =	48.19

Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	0.03	99.9
# 20	0.03	99.9
# 40	0.08	99.8
# 60	0.85	98.2
# 100	3.68	92.4
# 140	6.41	86.7
# 200	8.08	83.2

Hydrometer Analysis Data

Separation sieve is #200
Percent -#200 based upon complete sample= 83.2
Weight of hydrometer sample: 40.11
Calculated biased weight= 48.21
Automatic temperature correction
Composite correction at 20 deg C = -5.4

Meniscus correction only= 0
Specific gravity of solids= 2.756
Specific gravity correction factor= 0.977
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	20.3	43.0	37.6	0.0132	43.0	9.2	0.0283	76.2
5.00	20.3	42.0	36.6	0.0132	42.0	9.4	0.0181	74.2
15.00	20.3	40.0	34.6	0.0132	40.0	9.7	0.0106	70.2
30.00	20.3	38.0	32.6	0.0132	38.0	10.1	0.0076	66.1
60.00	20.3	36.0	30.6	0.0132	36.0	10.4	0.0055	62.1
240.00	20.6	32.0	26.7	0.0131	32.0	11.0	0.0028	54.1
1440.00	21.4	29.0	23.9	0.0130	29.0	11.5	0.0012	48.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 16.8 **(% coarse =** 0.1 **% medium =** 0.1 **% fine =** 16.6**)**
% SILT = 22.2 **% CLAY =** 61.0

D_{85}= 0.09 D_{60}= 0.00 D_{50}= 0.00