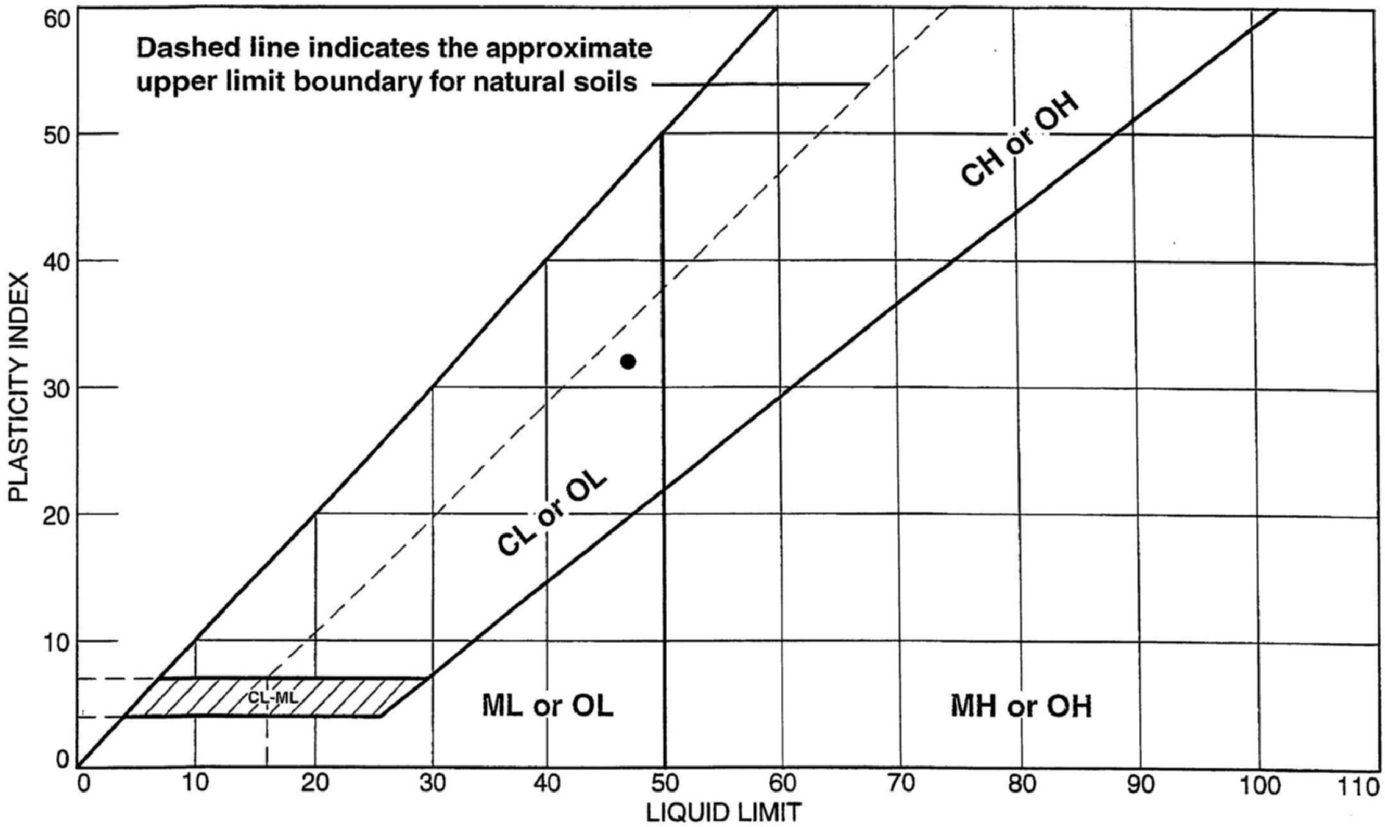
LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



SOIL DATA

	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Boring B-2304A	SS-2	3.5-5.0	19.0	15	47	32	CL

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

Tested By: CS **Checked By:** LBJ DSC 4-2-08

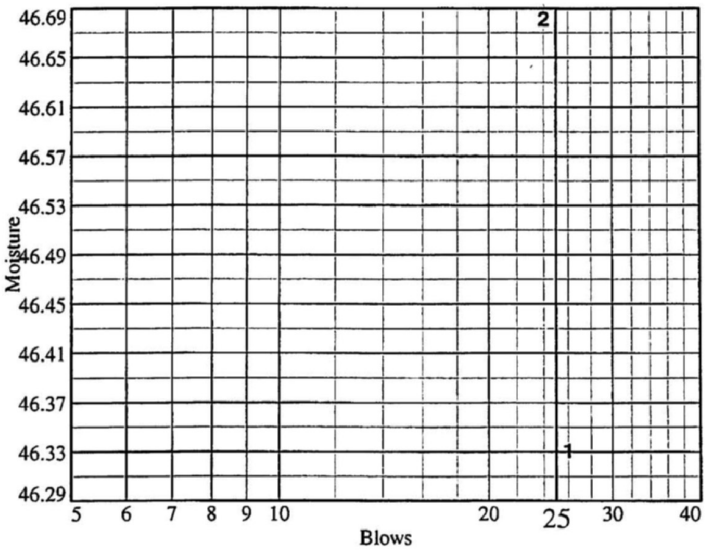
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 3.5-5.0 **Sample Number:** SS-2
Material Description: Yellowish Brown Sandy Lean CLAY
USCS: CL **AASHTO:** A-7-6(19)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.48	21.93				
Dry+Tare	20.27	19.89				
Tare	15.50	15.52				
# Blows	26	24				
Moisture	46.3	46.7				



Liquid Limit= 47
Plastic Limit= 15
Plasticity Index= 32
Natural Moisture= 19.0
Liquidity Index= 0.1

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	24.50	23.77			
Dry+Tare	23.31	22.67			
Tare	15.65	15.54			
Moisture	15.5	15.4			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
195.01	165.01	6.80	19.0

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: 4/1/08

SAMPLE IDENTIFICATION: B-2304A SS-2

(A) Mass of oven-dried soil, grams:		50.64
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.61
(C) Mass of pycnometer, water and soil, grams:		688.26
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.0
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.667
(F)	***Correction factor:***	0.99933
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.665

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

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

REMARKS: Estimated % Passing # 4 : 100

Sandy Lean CLAY (CL)

EQUIPMENT USED

SCALES : 3.1.99

OVEN :5.1.16

THERMOMETER :5.1.01

PYCNOMETER :P-6

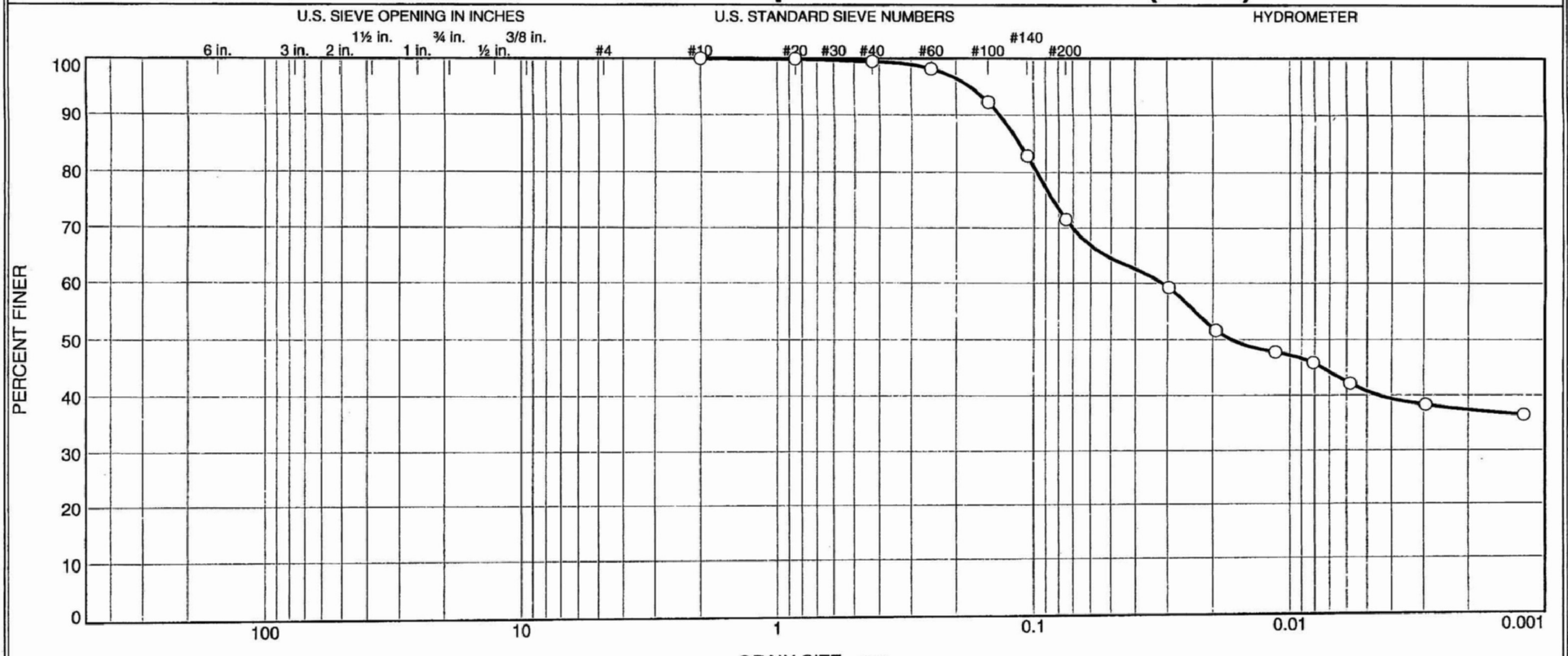
TESTED BY: CS

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

REVIEWED BY: LBJ

DSC 4-1-08

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	0.6	27.9	30.8	40.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2304A	SS-3	6-7.5	1-17-08	CL	Brownish Yellow Lean CLAY with sand	18.8	43	14

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity is assumed
Organic content = 1.2% (ASTM D2794-07)

Tested By: CS **Checked By:** LBJ DSC 4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 6-7.5 **Sample Number:** SS-3
Material Description: Brownish Yellow Lean CLAY with sand
Date: 1-17-08 **Natural Moisture:** 18.8
Liquid Limit: 43 **Plastic Limit:** 14 **USCS Class.:** CL
Testing Remarks: Specific Gravity is assumed
Organic content = 1.2% (ASTM D2794-07)
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
230.83	0.00	0.00	#10	0.00	100.0
53.47	0.00	0.00	#20	0.06	99.9
			#40	0.31	99.4
			#60	0.98	98.2
			#100	4.19	92.2
			#140	9.11	83.0
			#200	15.23	71.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =53.47
Hygroscopic moisture correction:
Moist weight and tare = 28.11
Dry weight and tare = 27.76
Tare weight = 15.49
Hygroscopic moisture = 2.9%
Table of composite correction values:

Temp., deg. C:	13.0	29.8
Comp. corr.:	-8.0	-2.0

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	21.8	36.0	31.1	0.0131	37.0	10.2	0.0297	59.2
5.00	21.8	32.0	27.1	0.0131	33.0	10.9	0.0194	51.6
15.00	21.8	30.0	25.1	0.0131	31.0	11.2	0.0114	47.8
30.00	21.8	29.0	24.1	0.0131	30.0	11.4	0.0081	45.9
60.00	21.8	27.0	22.1	0.0131	28.0	11.7	0.0058	42.1
240.00	21.8	25.0	20.1	0.0131	26.0	12.0	0.0029	38.3
1440.00	21.9	24.0	19.2	0.0131	25.0	12.2	0.0012	36.5

MACTEC, Inc.

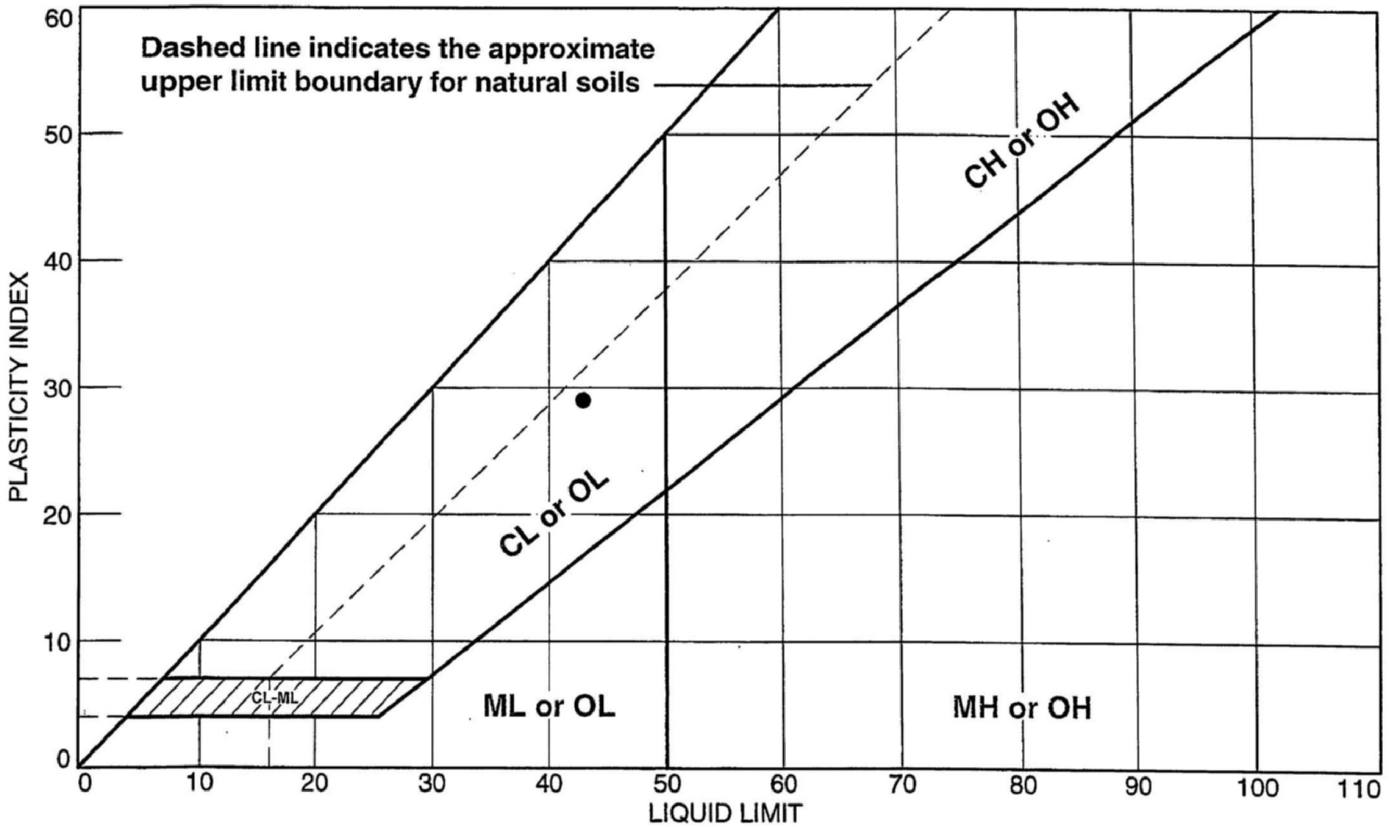
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.6	27.9	28.5	30.8	40.7	71.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0169	0.0314	0.0972	0.1130	0.1359	0.1776

Fineness Modulus
0.09

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-2304A	SS-3	6-7.5	18.8	14	43	29	CL

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

Tested By: CS **Checked By:** LBJ DSC 4-2-08

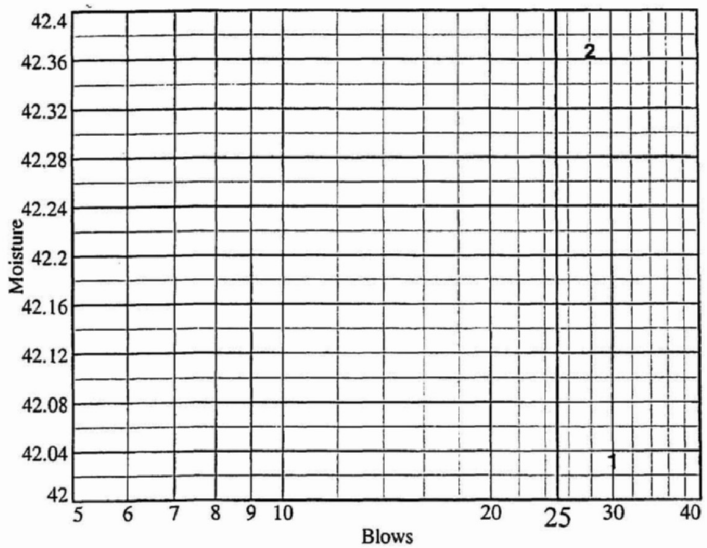
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 6-7.5 **Sample Number:** SS-3
Material Description: Brownish Yellow Lean CLAY with sand
USCS: CL **AASHTO:** A-7-6(19)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.67	23.85				
Dry+Tare	20.56	21.38				
Tare	15.54	15.55				
# Blows	30	28				
Moisture	42.0	42.4				



Liquid Limit= 43
Plastic Limit= 14
Plasticity Index= 29
Natural Moisture= 18.8
Liquidity Index= 0.2

Plastic Limit Data

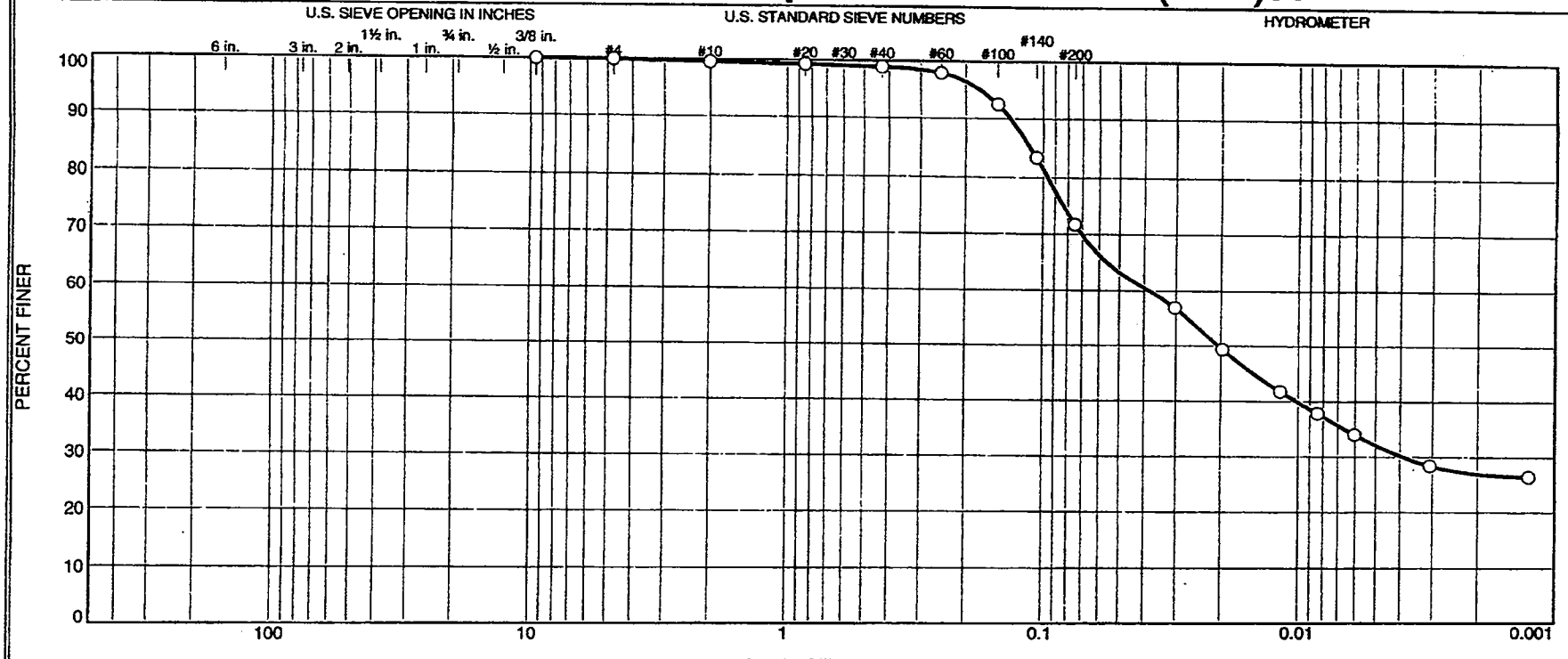
Run No.	1	2	3	4	
Wet+Tare	26.96	24.72			
Dry+Tare	25.56	23.58			
Tare	15.72	15.49			
Moisture	14.2	14.1			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
119.69	101.86	7.08	18.8

MACTEC, Inc.

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	0.4	0.7	27.2	39.5	32.2

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2304A	SS-4	8.5-10.0	1-17-08	CL	Olive Yellow Lean CLAY with sand	19.6	36	14

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O Specific Gravity is assumed

Tested By: CS **Checked By:** LBJ DSC 4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 8.5-10.0 **Sample Number:** SS-4
Material Description: Olive Yellow Lean CLAY with sand
Date: 1-17-08 **Natural Moisture:** 19.6
Liquid Limit: 36 **Plastic Limit:** 14 **USCS Class.:** CL
Testing Remarks: Specific Gravity is assumed
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
214.48	0.00	0.00	3/8	0.00	100.0
			#4	0.10	100.0
			#10	0.89	99.6
52.42	0.00	0.00	#20	0.16	99.3
			#40	0.34	98.9
			#60	0.85	98.0
			#100	3.73	92.5
			#140	8.52	83.4
			#200	14.68	71.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.6
Weight of hydrometer sample =52.42
Hygroscopic moisture correction:
Moist weight and tare = 28.40
Dry weight and tare = 28.19
Tare weight = 15.44
Hygroscopic moisture = 1.6%
Table of composite correction values:

Temp., deg. C:	13.0	29.8
Comp. corr.:	-8.0	-2.0

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	21.0	35.0	29.9	0.0133	36.0	10.4	0.0303	57.0
5.00	21.0	31.0	25.9	0.0133	32.0	11.0	0.0197	49.4
15.00	21.0	27.0	21.9	0.0133	28.0	11.7	0.0117	41.7
30.00	21.0	25.0	19.9	0.0133	26.0	12.0	0.0084	37.9
60.00	21.0	23.0	17.9	0.0133	24.0	12.4	0.0060	34.1
240.00	21.2	20.0	14.9	0.0132	21.0	12.9	0.0031	28.5
1440.00	21.1	19.0	13.9	0.0133	20.0	13.0	0.0013	26.5

MACTEC, Inc.

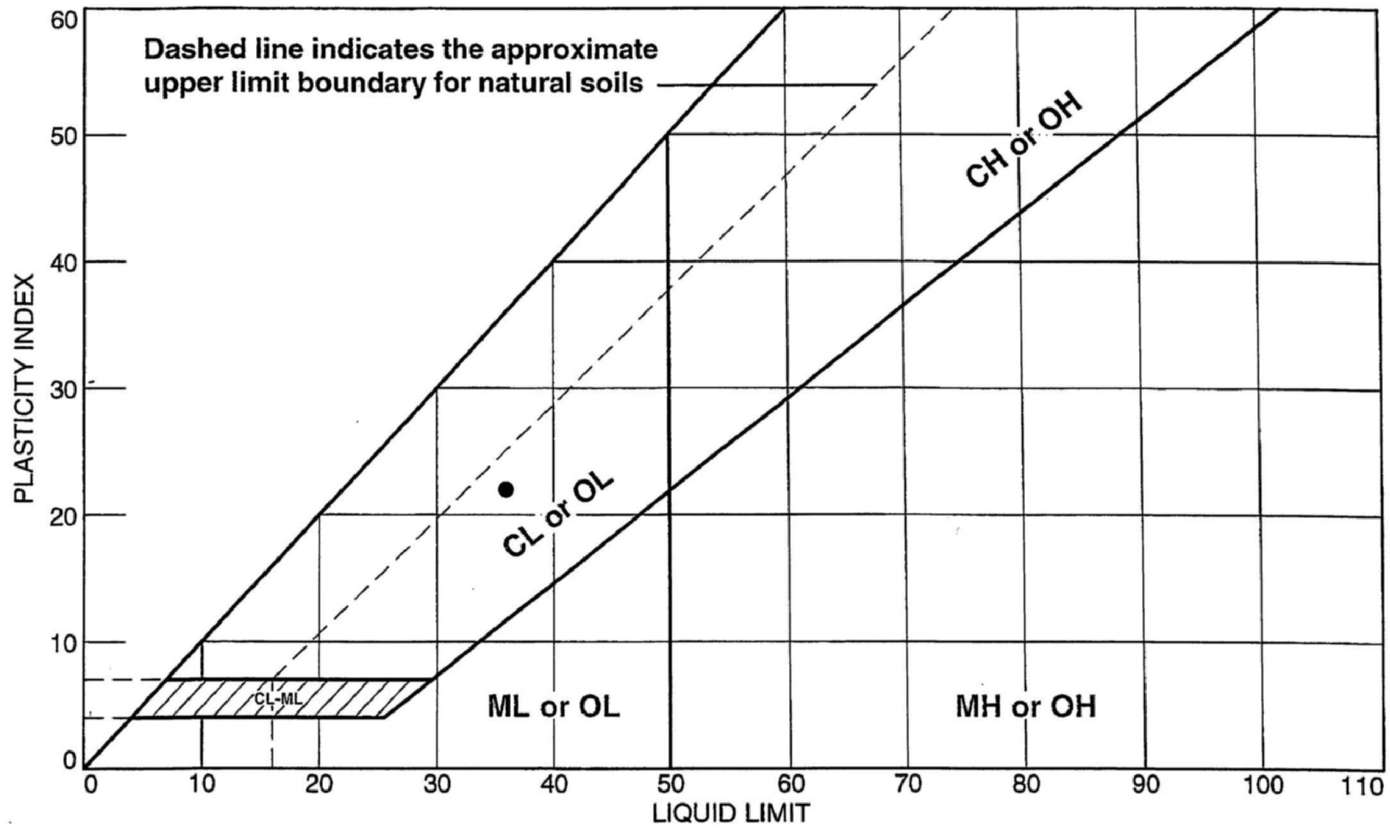
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.4	0.7	27.2	28.3	39.5	32.2	71.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0039	0.0204	0.0380	0.0960	0.1114	0.1336	0.1751

Fineness Modulus
0.11

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-2304A	SS-4	8.5-10.0	19.6	14	36	22	CL

MACTEC, Inc.

Raleigh, North Carolina

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project No.: 6468071777 **Figure** NA

Tested By: CS **Checked By:** LBJ DSC 4-2-08

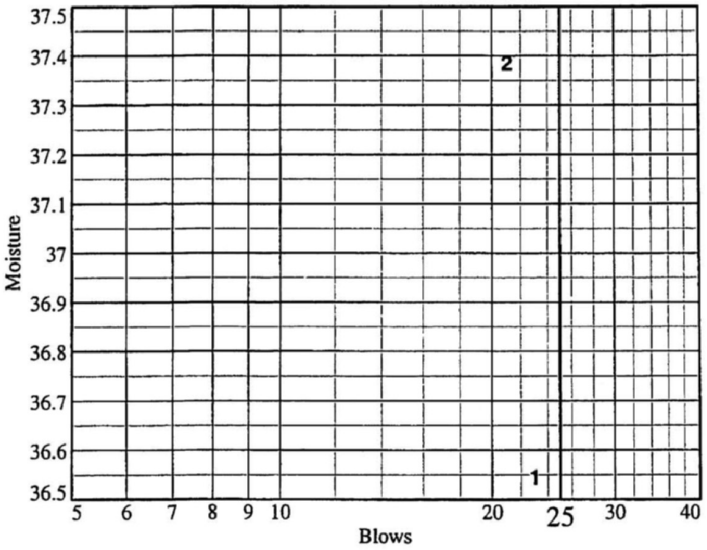
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 8.5-10.0 **Sample Number:** SS-4
Material Description: Olive Yellow Lean CLAY with sand
USCS: CL **AASHTO:** A-6(14)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	22.54	23.03				
Dry+Tare	20.72	20.97				
Tare	15.74	15.46				
# Blows	23	21				
Moisture	36.5	37.4				



Liquid Limit= 36
Plastic Limit= 14
Plasticity Index= 22
Natural Moisture= 19.6
Liquidity Index= 0.3

Plastic Limit Data

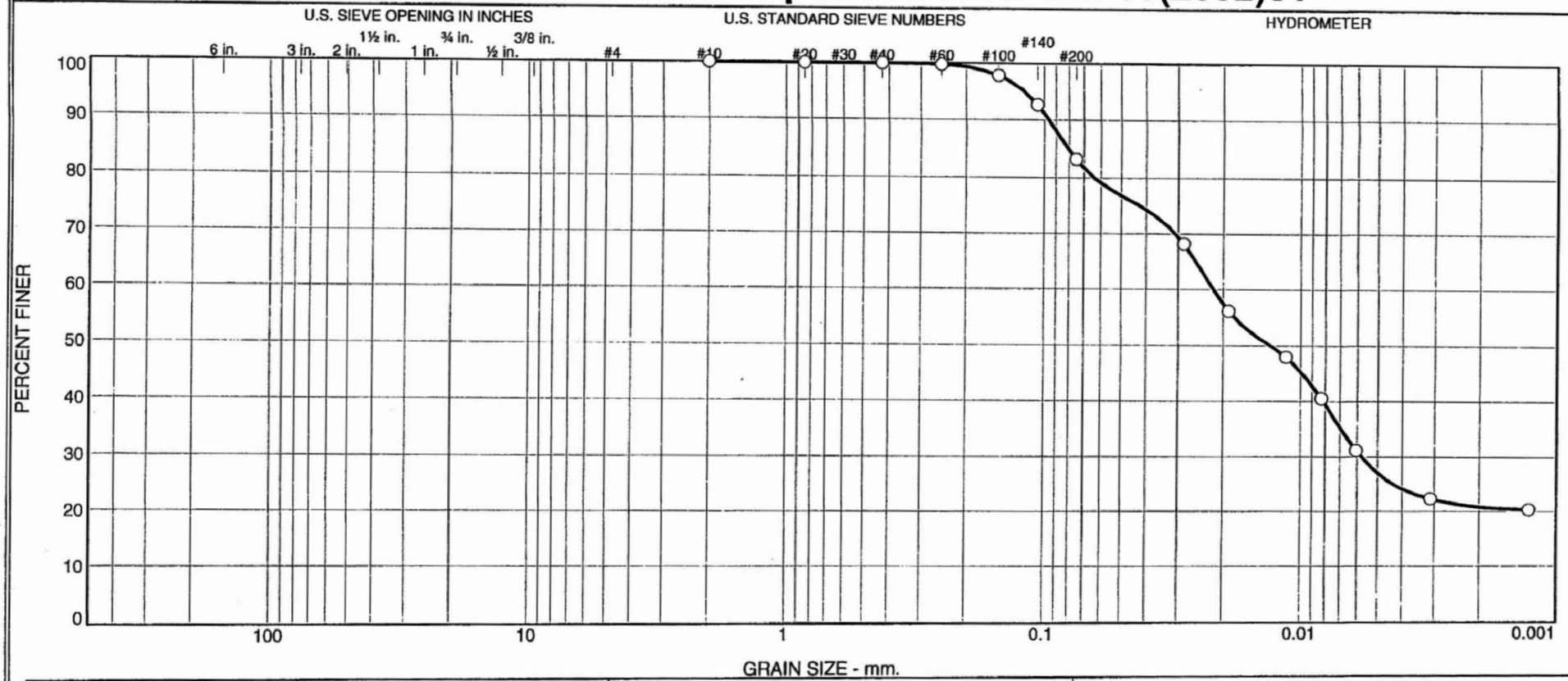
Run No.	1	2	3	4	
Wet+Tare	25.42	28.46			
Dry+Tare	24.22	26.77			
Tare	15.46	15.44			
Moisture	13.7	14.9			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
131.53	111.06	6.69	19.6

MACTEC, Inc.

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	0.1	16.7	56.1	27.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2304A	SS-5	11-12.5	1-17-08	CL	Brownish Yellow Lean CLAY with sand	17.3	27	16

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specfic Gravity is assumed

Tested By: CS **Checked By:** LBJ DSC 4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 11-12.5 **Sample Number:** SS-5
Material Description: Brownish Yellow Lean CLAY with sand
Date: 1-17-08 **Natural Moisture:** 17.3
Liquid Limit: 27 **Plastic Limit:** 16 **USCS Class.:** CL
Testing Remarks: Specfic Gravity is assumed
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
225.81	0.00	0.00	#10	0.00	100.0
54.56	0.00	0.00	#20	0.02	100.0
			#40	0.03	99.9
			#60	0.12	99.8
			#100	1.20	97.8
			#140	4.02	92.6
			#200	9.14	83.2

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =54.56
Hygroscopic moisture correction:
Moist weight and tare = 27.14
Dry weight and tare = 26.91
Tare weight = 15.60
Hygroscopic moisture = 2.0%
Table of composite correction values:

Temp., deg. C:	13.0	29.8
Comp. corr.:	-8.0	-2.0

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	21.1	42.0	36.9	0.0133	43.0	9.2	0.0285	68.2
5.00	21.1	35.5	30.4	0.0133	36.5	10.3	0.0190	56.2
15.00	21.1	31.0	25.9	0.0133	32.0	11.0	0.0114	47.9
30.00	21.1	27.0	21.9	0.0133	28.0	11.7	0.0083	40.5
60.00	21.1	22.0	16.9	0.0133	23.0	12.5	0.0061	31.2
240.00	21.6	17.0	12.1	0.0132	18.0	13.3	0.0031	22.3
1440.00	21.4	16.0	11.0	0.0132	17.0	13.5	0.0013	20.3

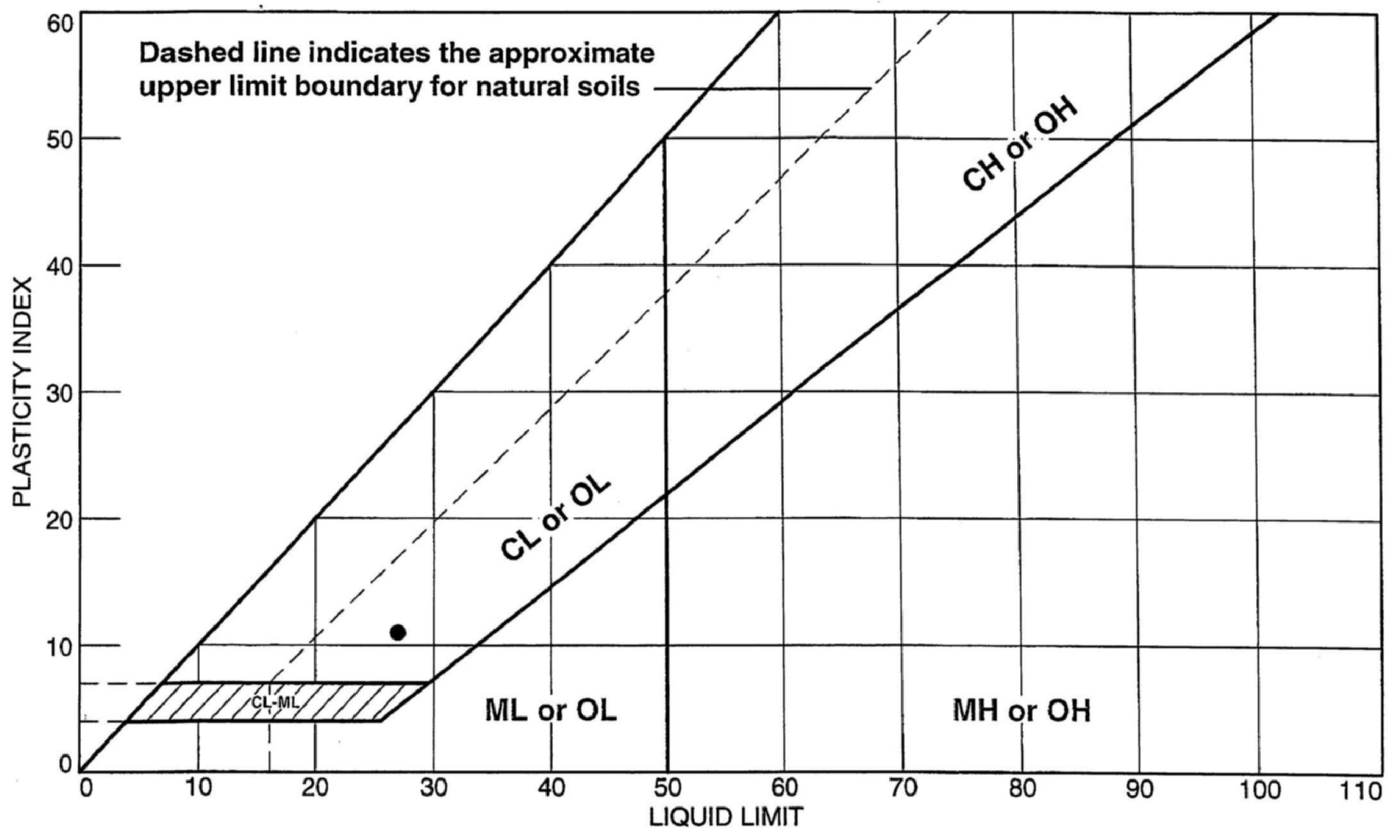
Fractional Components

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	16.7	16.8	56.1	27.1	83.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0058	0.0131	0.0218	0.0637	0.0803	0.0958	0.1193

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-2304A	SS-5	11-12.5	17.3	16	27	11	CL

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

Tested By: CS **Checked By:** LBJ DSC 4-2-08

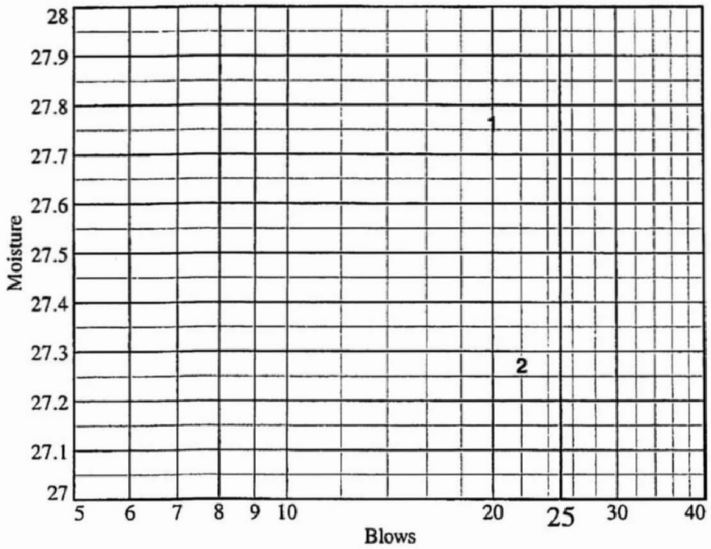
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 11-12.5 **Sample Number:** SS-5
Material Description: Brownish Yellow Lean CLAY with sand
USCS: CL **AASHTO:** A-6(7)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.63	22.63				
Dry+Tare	22.67	21.10				
Tare	15.61	15.49				
# Blows	20	22				
Moisture	27.8	27.3				



Liquid Limit= 27
Plastic Limit= 16
Plasticity Index= 11
Natural Moisture= 17.3
Liquidity Index= 0.1

Plastic Limit Data

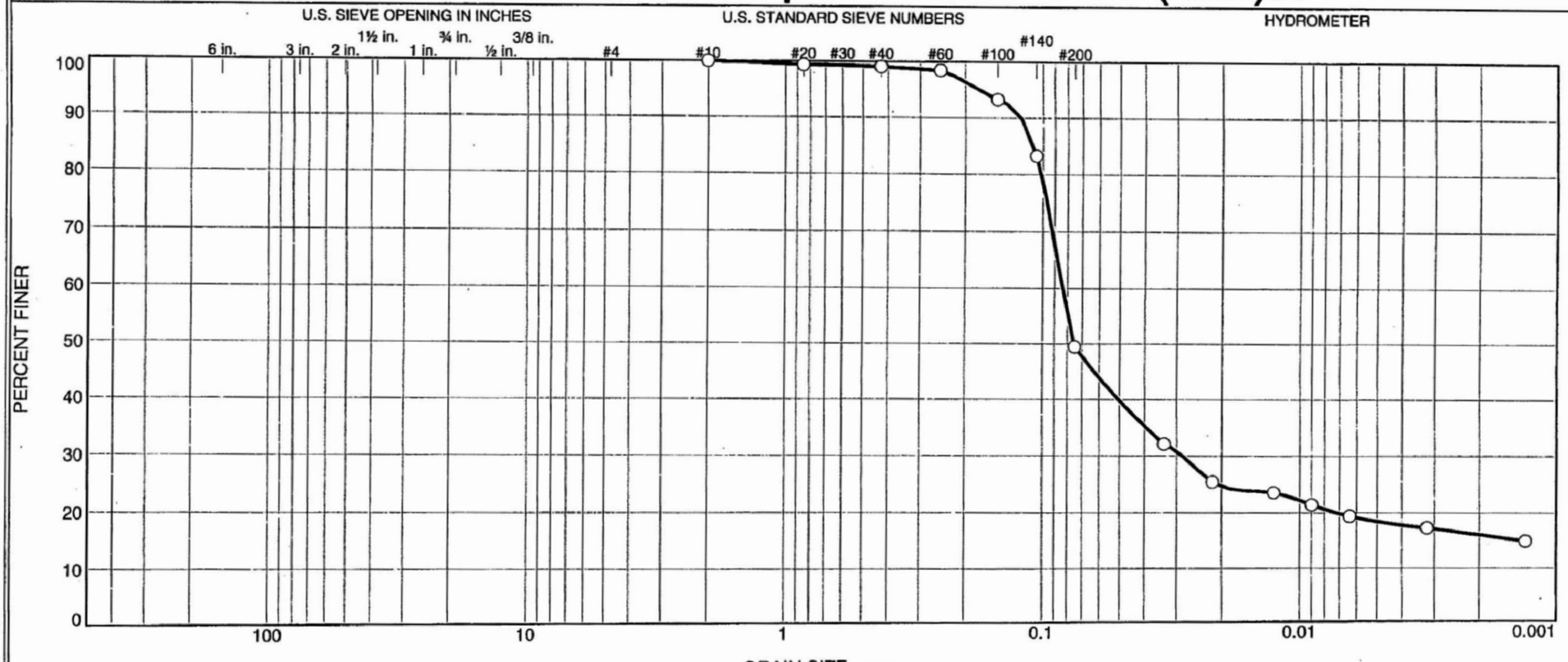
Run No.	1	2	3	4	
Wet+Tare	25.85	26.36			
Dry+Tare	24.35	24.88			
Tare	15.33	15.64			
Moisture	16.6	16.0			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
122.01	104.98	6.66	17.3

MACTEC, Inc.

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	0.9	49.7	30.9	18.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2304A	SS-6	13.5-15	1-7-08	SC-SM	Mottled Olive Yellow and Pale Yellow Silty, Clayey SAND	17.9	22	15

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity = 2.672 (ASTM D850-06)

Tested By: CS **Checked By:** LBJ DSC 4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 13.5-15 **Sample Number:** SS-6
Material Description: Mottled Olive Yellow and Pale Yellow Silty, Clayey SAND
Date: 1-7-08 **Natural Moisture:** 17.9
Liquid Limit: 22 **Plastic Limit:** 15 **USCS Class.:** SC-SM
Testing Remarks: Specific Gravity = 2.672 (ASTM D850-06)
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
217.64	0.00	0.00	#10	0.00	100.0
47.47	0.00	0.00	#20	0.30	99.4
			#40	0.45	99.1
			#60	0.73	98.5
			#100	3.23	93.2
			#140	7.92	83.3
			#200	24.00	49.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =47.47
Hygroscopic moisture correction:
Moist weight and tare = 28.60
Dry weight and tare = 28.45
Tare weight = 15.52
Hygroscopic moisture = 1.2%
Table of composite correction values:

Temp., deg. C:	13.0	29.8
Comp. corr.:	-8.0	-2.0

Meniscus correction only = 1.0
Specific gravity of solids = 2.672
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	21.8	20.0	15.1	0.0133	21.0	12.9	0.0336	32.1
5.00	21.6	17.0	12.1	0.0133	18.0	13.3	0.0217	25.6
15.00	21.8	16.0	11.1	0.0133	17.0	13.5	0.0126	23.6
30.00	21.7	15.0	10.1	0.0133	16.0	13.7	0.0090	21.4
60.00	21.8	14.0	9.1	0.0133	15.0	13.8	0.0064	19.4
240.00	21.9	13.0	8.2	0.0132	14.0	14.0	0.0032	17.3
1440.00	21.6	12.0	7.1	0.0133	13.0	14.2	0.0013	15.0

MACTEC, Inc.

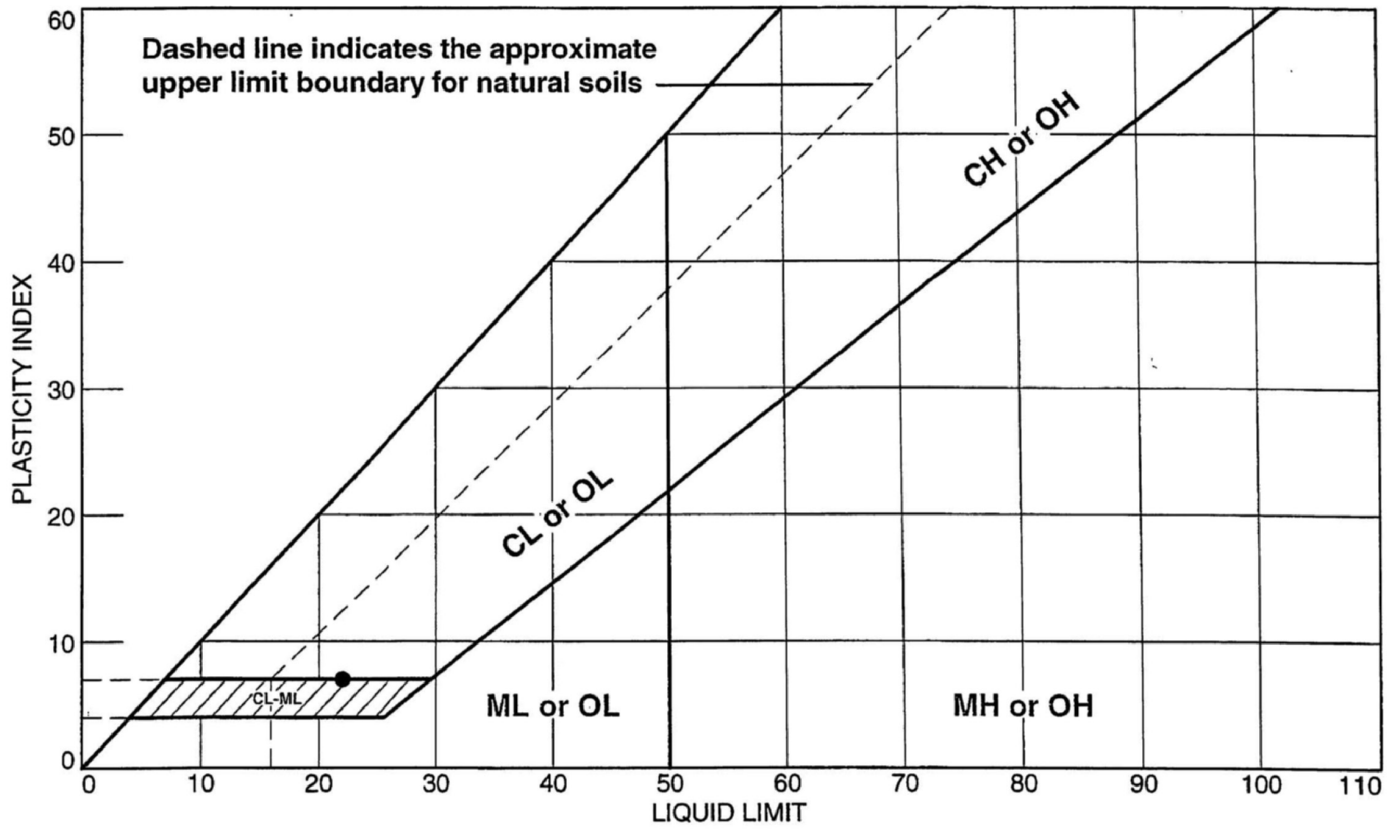
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.9	49.7	50.6	30.9	18.5	49.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0013	0.0072	0.0284	0.0755	0.0835	0.1016	0.1087	0.1217	0.1776

Fineness Modulus
0.09

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-2304A	SS-6	13.5-15	17.9	15	22	7	SC-SM

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

Tested By: CS **Checked By:** LBJ DSC 4-2-08

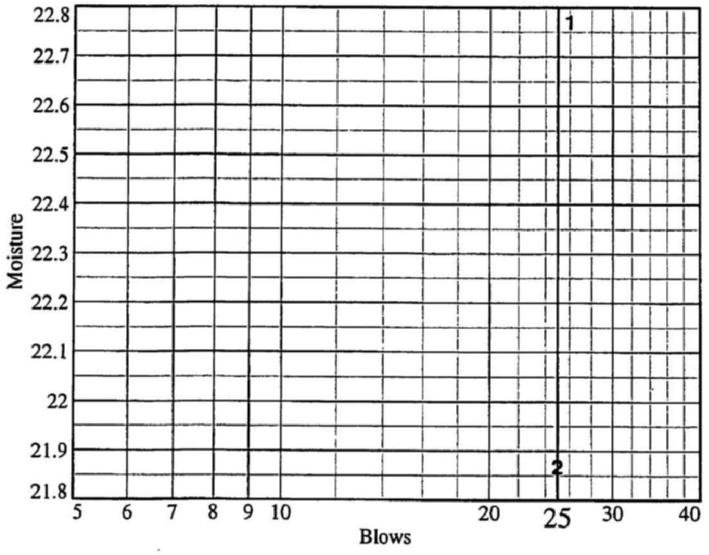
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 13.5-15 **Sample Number:** SS-6
Material Description: Mottled Olive Yellow and Pale Yellow Silty, Clayey SAND
USCS: SC-SM **AASHTO:** A-4(1)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	27.20	27.80				
Dry+Tare	25.08	25.60				
Tare	15.77	15.54				
# Blows	26	25				
Moisture	22.8	21.9				



Liquid Limit= 22
Plastic Limit= 15
Plasticity Index= 7
Natural Moisture= 17.9
Liquidity Index= 0.4

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	26.52	28.09			
Dry+Tare	25.06	26.50			
Tare	15.43	15.47			
Moisture	15.2	14.4			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
104.48	89.63	6.79	17.9

MACTEC, Inc.

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

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

PROJECT NAME:EXELON COL PROJECT (VICTORIA)

PROJECT NUMBER: 6468071777

DATE: 4/1/08

SAMPLE IDENTIFICATION: B-2304A SS-6

(A) Mass of oven-dried soil, grams:		52.28
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.58
(C) Mass of pycnometer, water and soil, grams:		688.31
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		22.8
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.674
(F)	***Correction factor:***	0.99938
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.672

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

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

REMARKS: Estimated % Passing # 4 : 100

Silty, Clayey SAND (SC-SM)

EQUIPMENT USED

SCALES : 3.1.99

OVEN :5.1.16

THERMOMETER :5.1.01

PYCNOMETER :P-3

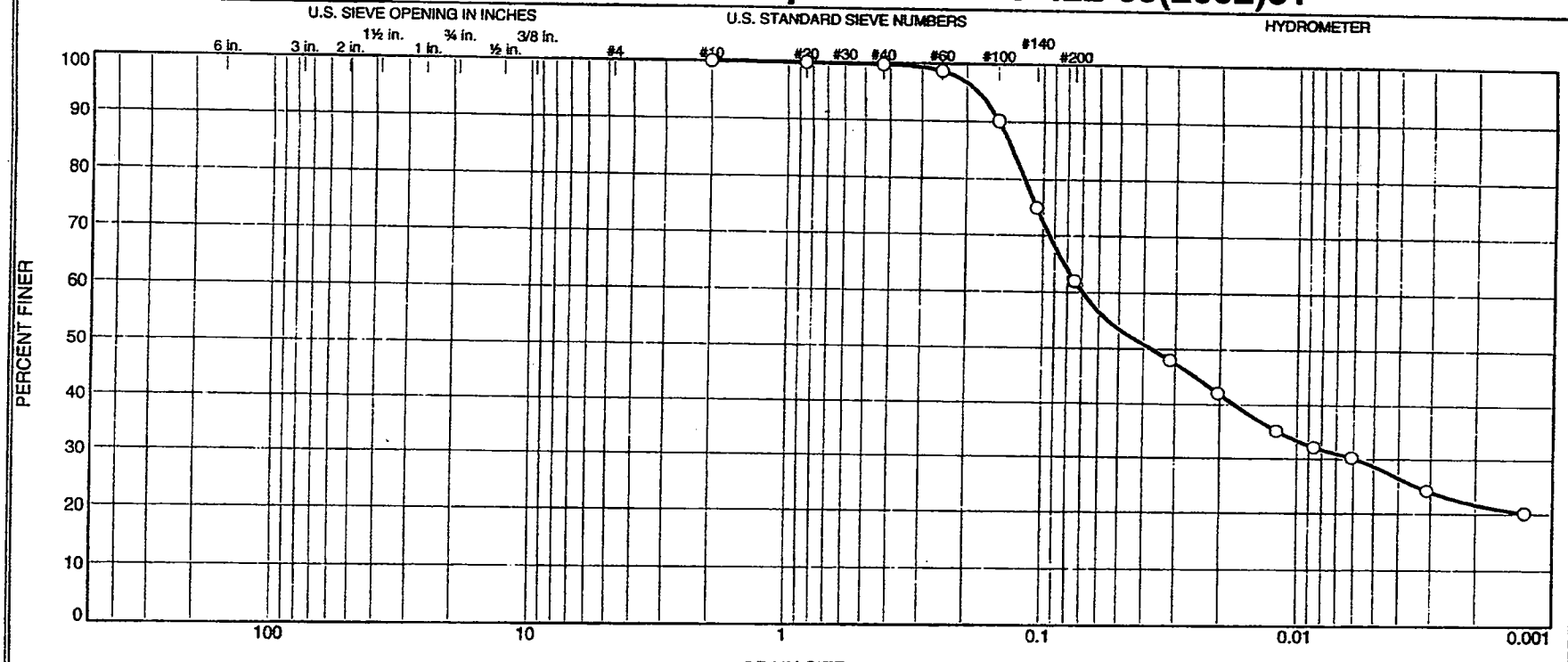
TESTED BY: CS

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

REVIEWED BY: LBJ

DSC 4-1-08

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	0.3	37.6	33.4	28.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2304A	SS-7	18.5-20.0	1-17-08	CL	Mottled Olive Yellow and Pale Yellow Sandy Lean CLAY	16.3	27	16

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O Specific Gravity is assumed

Tested By: CS Checked By: LBJ DSC 4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 18.5-20.0 **Sample Number:** SS-7
Material Description: Mottled Olive Yellow and Pale Yellow Sandy Lean CLAY
Date: 1-17-08 **Natural Moisture:** 16.3
Liquid Limit: 27 **Plastic Limit:** 16 **USCS Class.:** CL
Testing Remarks: Specific Gravity is assumed
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
235.05	0.00	0.00	#10	0.00	100.0
50.34	0.00	0.00	#20	0.05	99.9
			#40	0.14	99.7
			#60	0.66	98.7
			#100	4.94	90.2
			#140	12.58	75.0
			#200	19.10	62.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =50.34
Hygroscopic moisture correction:
Moist weight and tare = 27.64
Dry weight and tare = 27.42
Tare weight = 15.66
Hygroscopic moisture = 1.9%
Table of composite correction values:

Temp., deg. C:	13.0	29.8
Comp. corr.:	-8.0	-2.0

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	21.5	29.0	24.0	0.0132	30.0	11.4	0.0315	48.1
5.00	21.5	26.0	21.0	0.0132	27.0	11.9	0.0203	42.1
15.00	21.6	22.5	17.6	0.0132	23.5	12.4	0.0120	35.2
30.00	21.6	21.0	16.1	0.0132	22.0	12.7	0.0086	32.2
60.00	21.7	20.0	15.1	0.0132	21.0	12.9	0.0061	30.2
240.00	21.7	17.0	12.1	0.0132	18.0	13.3	0.0031	24.2
1440.00	21.6	15.0	10.1	0.0132	16.0	13.7	0.0013	20.2

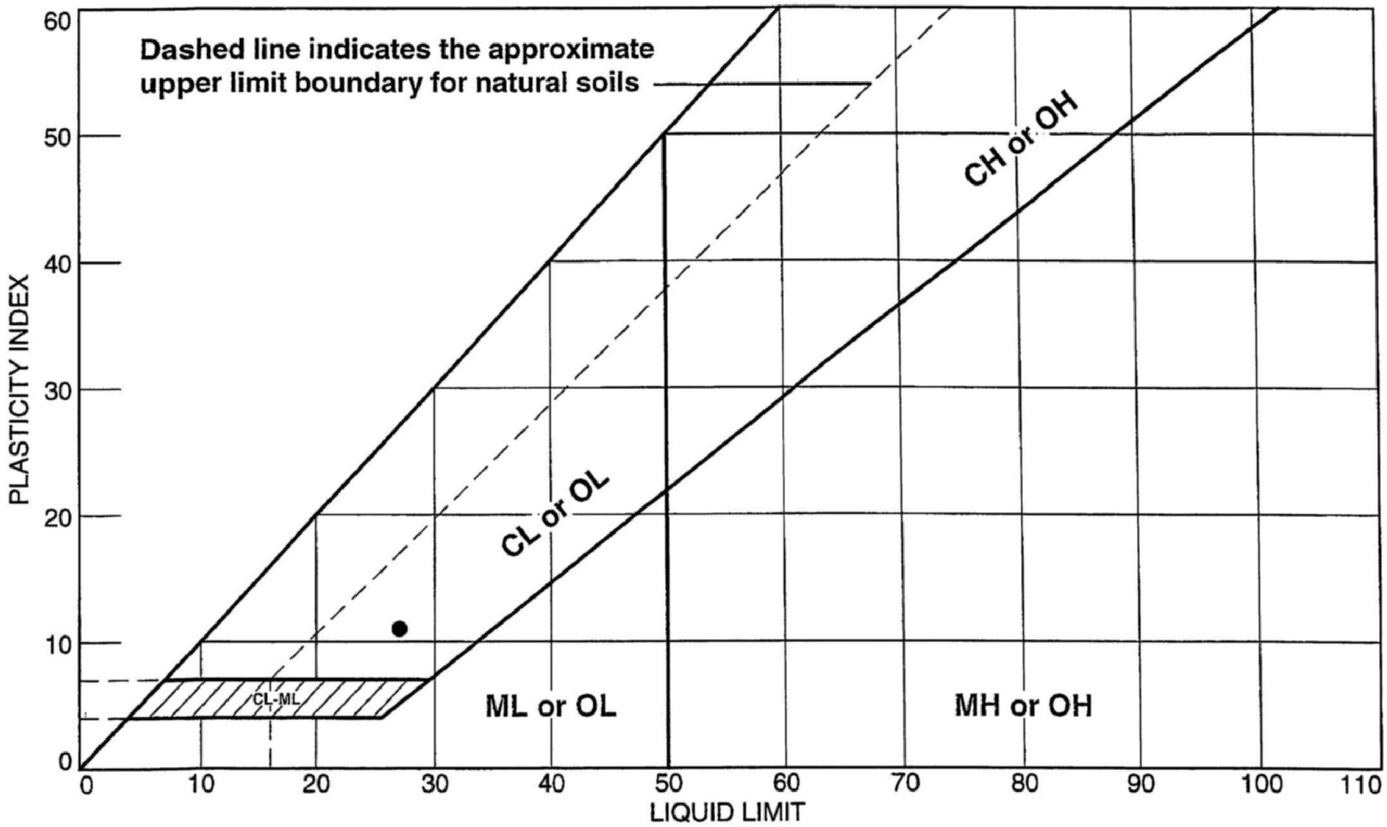
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.3	37.6	37.9	33.4	28.7	62.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0059	0.0372	0.0696	0.1181	0.1317	0.1492	0.1794

Fineness Modulus
0.11

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-2304A	SS-7	18.5-20.0	16.3	16	27	11	CL

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

Tested By: CS **Checked By:** LBJ DSC 4-2-08

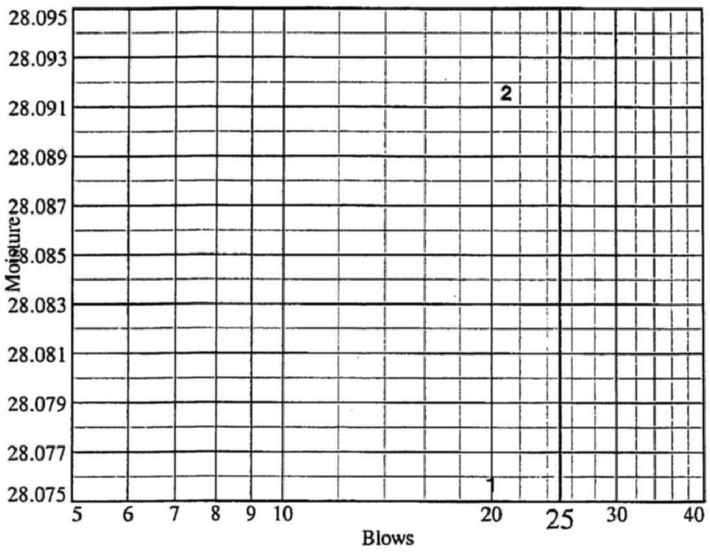
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 18.5-20.0 **Sample Number:** SS-7
Material Description: Mottled Olive Yellow and Pale Yellow Sandy Lean CLAY
USCS: CL **AASHTO:** A-6(4)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	23.57	23.72				
Dry+Tare	21.79	21.88				
Tare	15.45	15.33				
# Blows	20	21				
Moisture	28.1	28.1				



Liquid Limit= 27
Plastic Limit= 16
Plasticity Index= 11
Natural Moisture= 16.3
Liquidity Index= 0.0

Plastic Limit Data

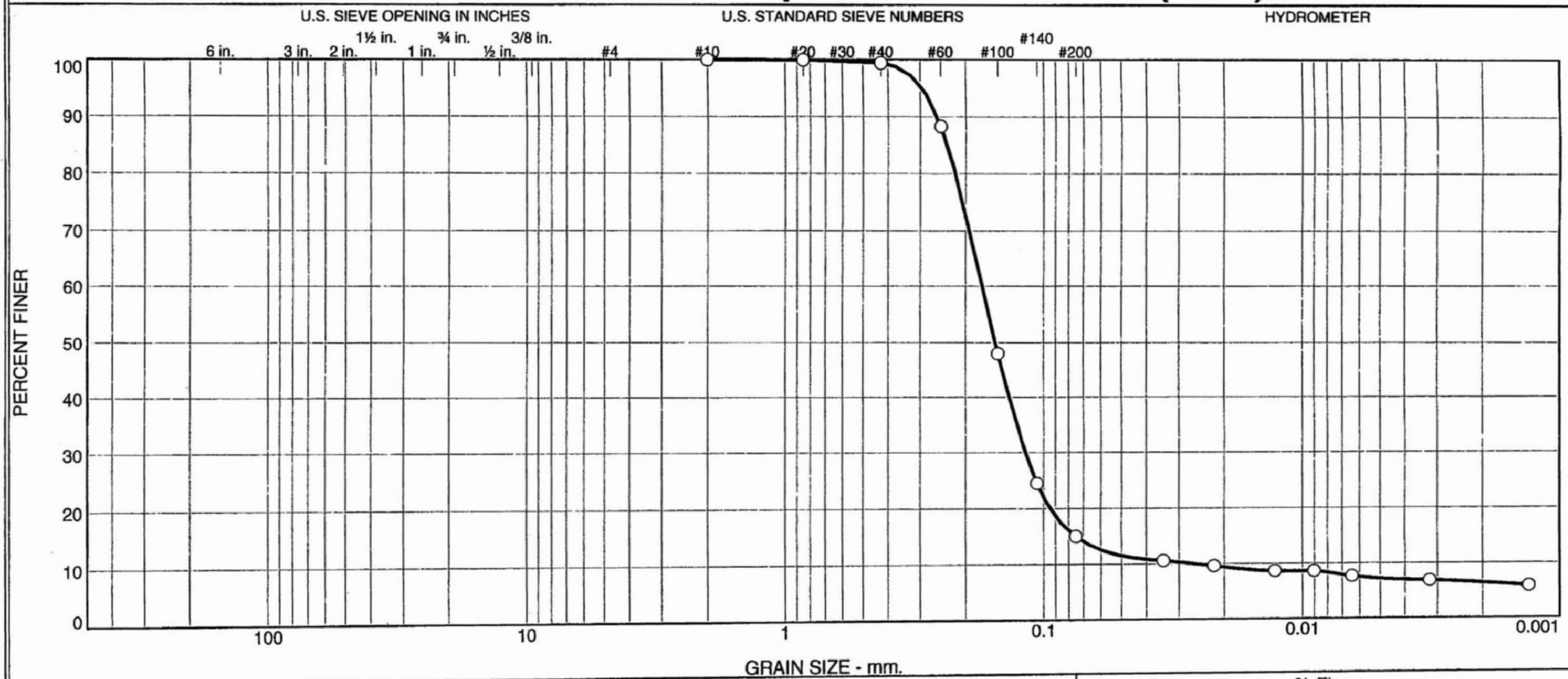
Run No.	1	2	3	4	
Wet+Tare	24.34	29.02			
Dry+Tare	23.12	27.18			
Tare	15.45	15.44			
Moisture	15.9	15.7			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
133.91	116.04	6.50	16.3

MACTEC, Inc.

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	0.6	84.3	8.0	7.1

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2304A	SS-8	23.5-25.0	1-17-08	SM	Light Yellowish Brown Silty SAND	11.0	NV	NP

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity is assumed

Tested By: CS **Checked By:** LBJ DSC 4-2-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 23.5-25.0 **Sample Number:** SS-8
Material Description: Light Yellowish Brown Silty SAND
Date: 1-17-08 **Natural Moisture:** 11.0
Liquid Limit: NV **Plastic Limit:** NP **USCS Class.:** SM
Testing Remarks: Specific Gravity is assumed
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
246.76	0.00	0.00	#10	0.00	100.0
101.83	0.00	0.00	#20	0.05	100.0
			#40	0.57	99.4
			#60	11.88	88.3
			#100	52.99	48.0
			#140	76.89	24.5
			#200	86.47	15.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =101.83
Hygroscopic moisture correction:
Moist weight and tare = 27.80
Dry weight and tare = 27.78
Tare weight = 15.44
Hygroscopic moisture = 0.2%
Table of composite correction values:

Temp., deg. C:	13.0	29.8
Comp. corr.:	-8.0	-2.0

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	21.1	16.0	10.9	0.0133	17.0	13.5	0.0345	10.6
5.00	21.1	15.0	9.9	0.0133	16.0	13.7	0.0219	9.6
15.00	21.1	14.0	8.9	0.0133	15.0	13.8	0.0127	8.7
30.00	21.0	14.0	8.9	0.0133	15.0	13.8	0.0090	8.6
60.00	21.0	13.0	7.9	0.0133	14.0	14.0	0.0064	7.6
240.00	21.4	12.0	7.0	0.0132	13.0	14.2	0.0032	6.8
1440.00	21.3	11.0	6.0	0.0132	12.0	14.3	0.0013	5.8

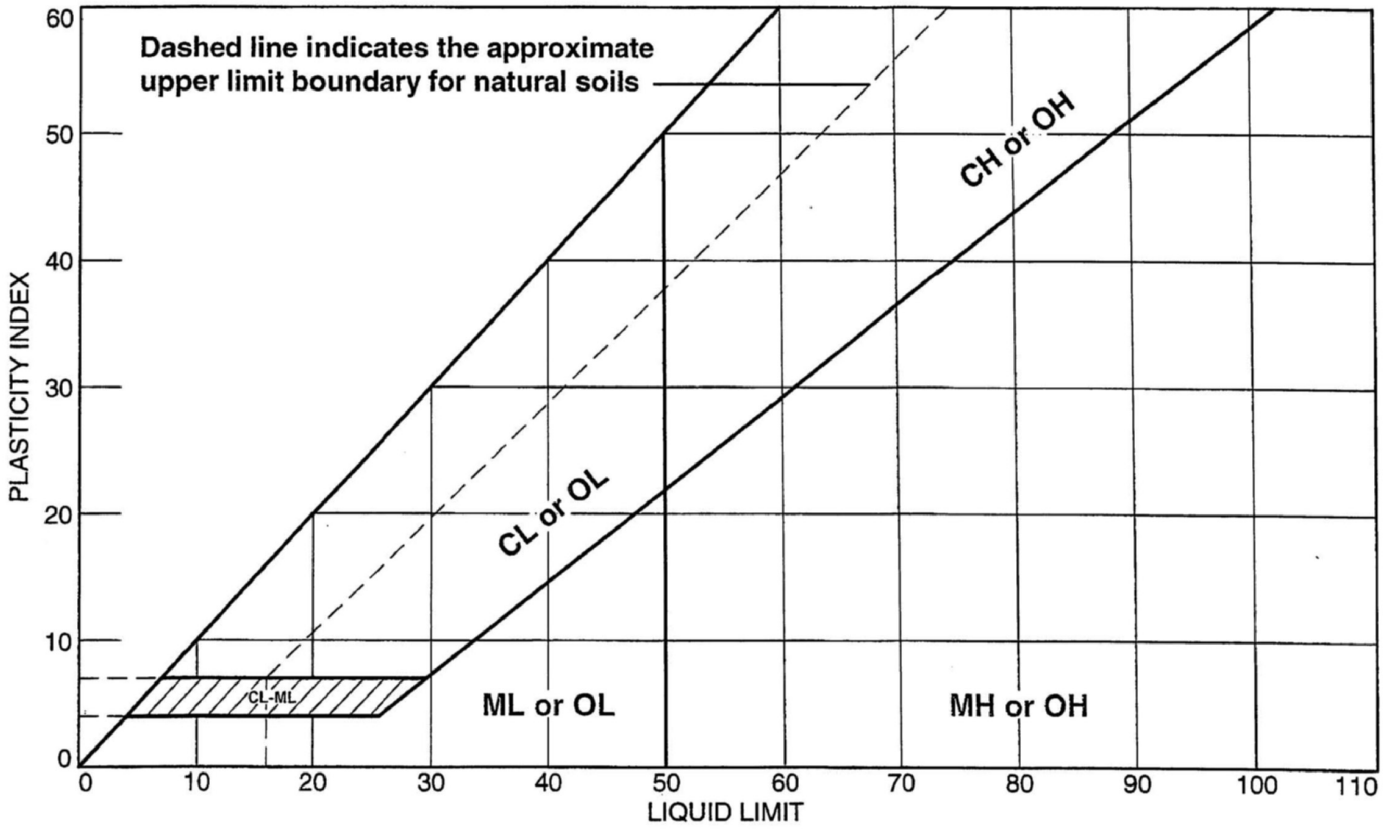
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.6	84.3	84.9	8.0	7.1	15.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0257	0.0746	0.0943	0.1174	0.1537	0.1724	0.2195	0.2362	0.2583	0.2950

Fineness Modulus	C_u	C_c
0.57	6.70	3.11

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-2304A	SS-8	23.5-25.0	11.0	NP	NV	NP	SM

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

Tested By: CS **Checked By:** LBJ DSC 4-2-08

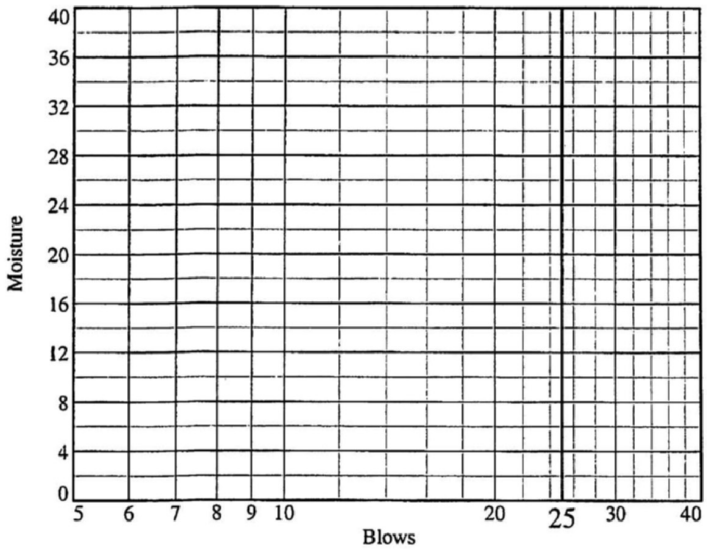
LIQUID AND PLASTIC LIMIT TEST DATA

4/2/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2304A
Depth: 23.5-25.0 **Sample Number:** SS-8
Material Description: Light Yellowish Brown Silty SAND
USCS: SM **AASHTO:** A-2-4(0)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare						
Dry+Tare						
Tare						
# Blows						
Moisture						



Liquid Limit= NV
Plastic Limit= NP
Plasticity Index= NP
Natural Moisture= 11.0

Plastic Limit Data

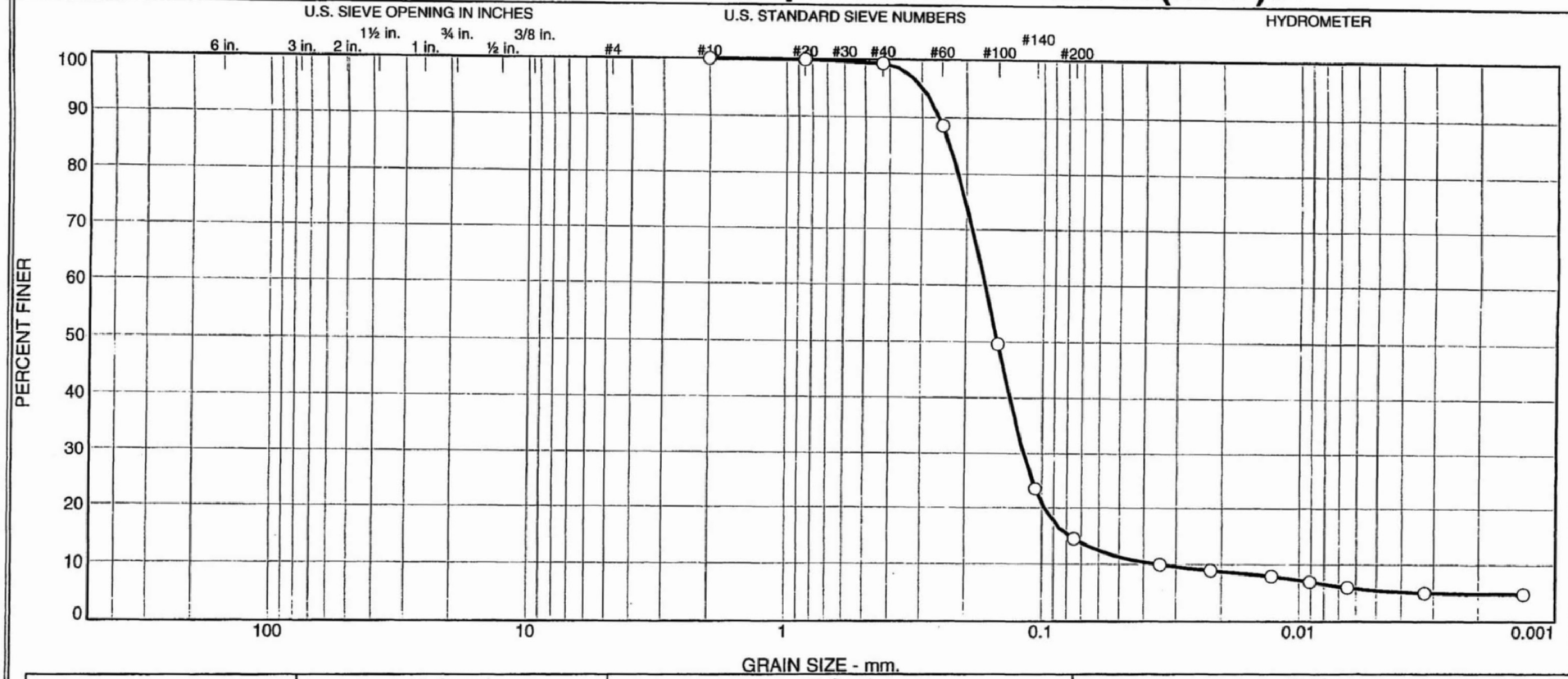
Run No.	1	2	3	4	
Wet+Tare					
Dry+Tare					
Tare					
Moisture					

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
110.07	99.86	6.80	11.0

MACTEC, Inc.

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	0.7	84.8	9.0	5.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2304A	SS-9	28.5-30.0	1-17-08	SM	Pale Yellow Silty SAND	10.4	NV	NP

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity is assumed

Tested By: CS Checked By: LBL DSC 4-2-08