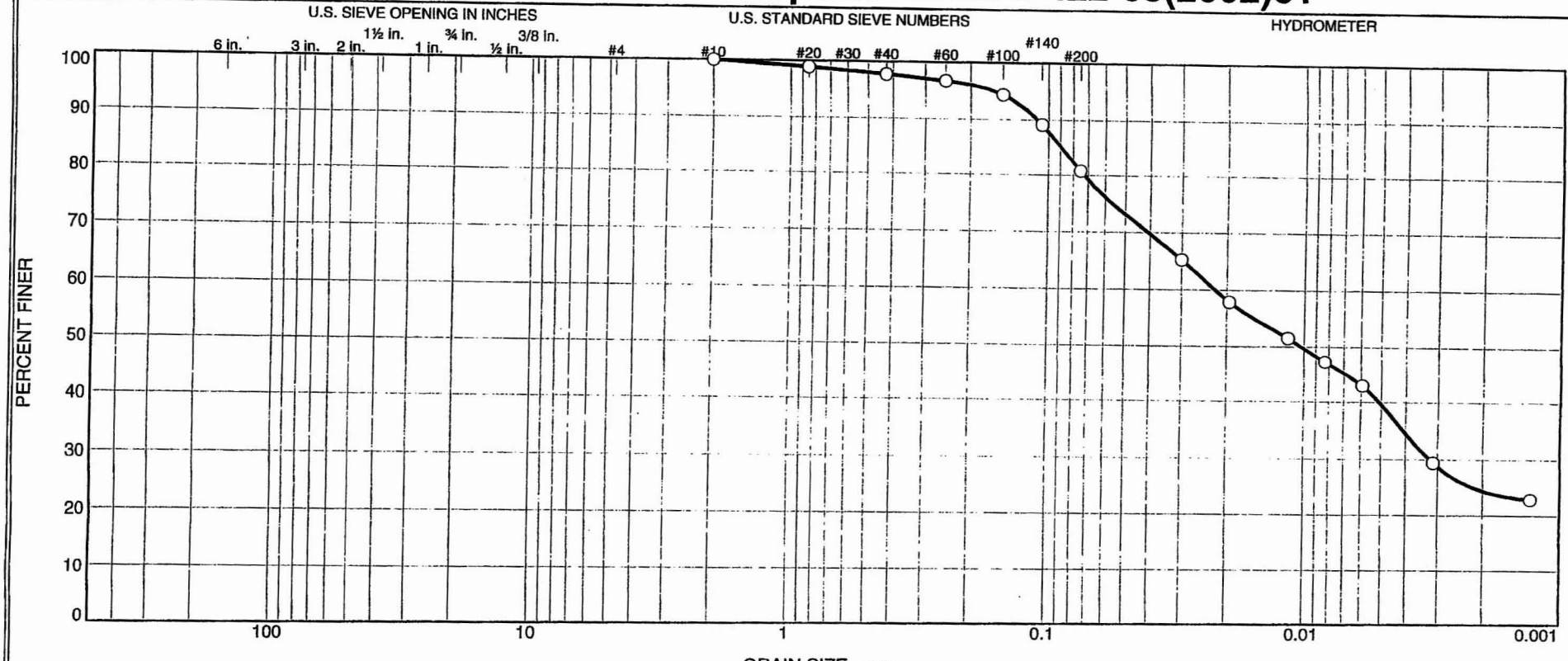
Particle Size Distribution Report / ASTM D 422-63(2002)e1



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.2	17.1	41.0	39.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2352	SS-28	148.5-150.0	1-4-08	CL	Light Yellowish Brown Lean CLAY with sand	21.5	36	14

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity = 2.670 (ASTM D854-06)

Checked By: LBL DSC 2-28-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/19/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2352
Depth: 148.5-150.0 **Sample Number:** SS-28
Material Description: Light Yellowish Brown Lean CLAY with sand
Date: 1-4-08 **Natural Moisture:** 21.5
Liquid Limit: 36 **Plastic Limit:** 14 **USCS Class.:** CL
Testing Remarks: Specific Gravity = 2.670 (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
228.74	0.00	0.00	#10	0.00	100.0
48.05	0.00	0.00	#20	0.54	98.9
			#40	1.07	97.8
			#60	1.58	96.7
			#100	2.72	94.3
			#140	5.19	89.2
			#200	9.25	80.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =48.05
Hygroscopic moisture correction:
Moist weight and tare = 28.60
Dry weight and tare = 28.24
Tare weight = 15.47
Hygroscopic moisture = 2.8%
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 = 2.670
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	21.9	35.5	30.7	0.0132	36.5	10.3	0.0301	65.3
5.00	21.9	32.0	27.2	0.0132	33.0	10.9	0.0195	57.9
15.00	21.9	29.0	24.2	0.0132	30.0	11.4	0.0115	51.5
30.00	21.9	27.0	22.2	0.0132	28.0	11.7	0.0083	47.2
60.00	21.9	25.0	20.2	0.0132	26.0	12.0	0.0059	43.0
240.00	20.9	19.0	13.8	0.0134	20.0	13.0	0.0031	29.4
1440.00	20.7	16.0	10.8	0.0134	17.0	13.5	0.0013	22.9

MACTEC, Inc.

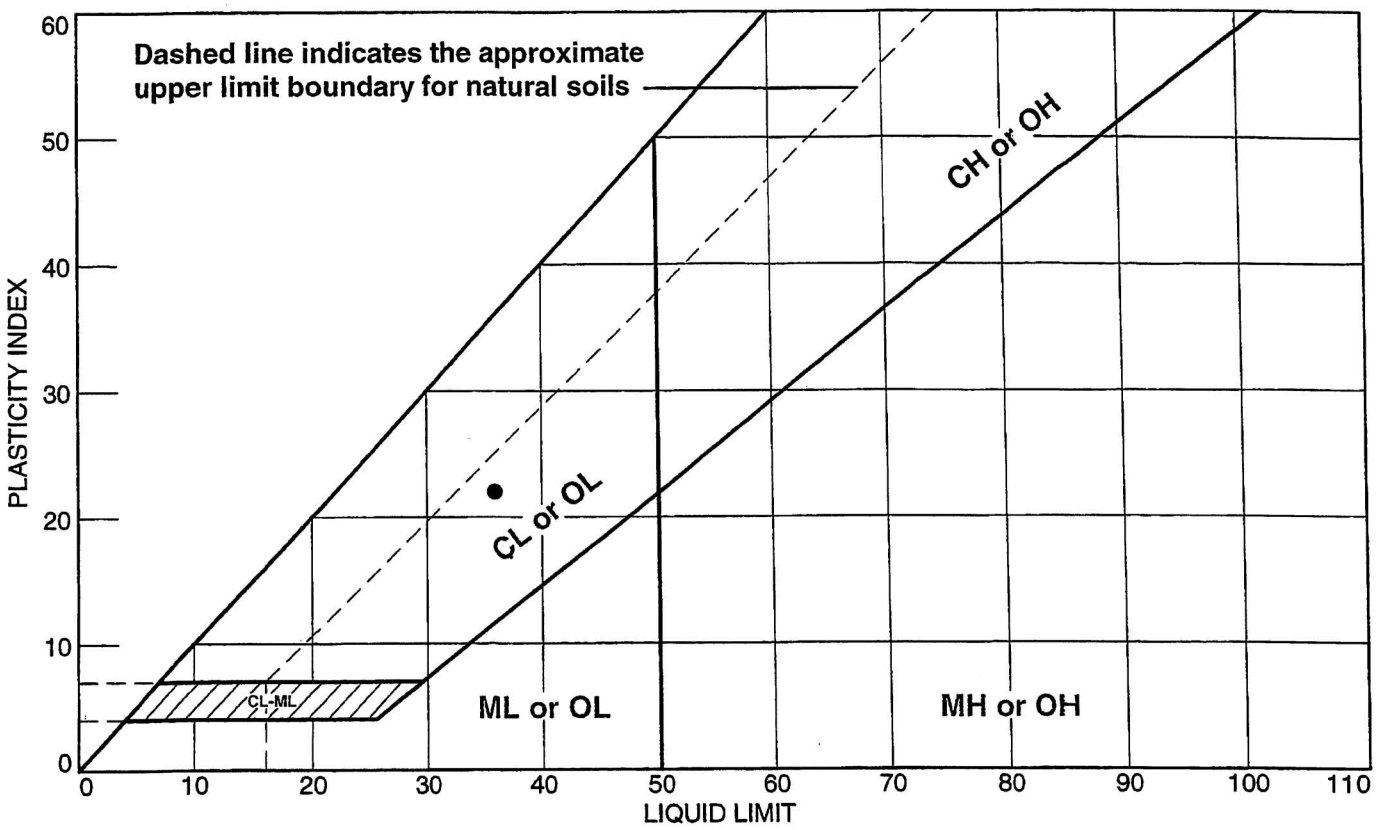
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.2	17.1	19.3	41.0	39.7	80.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0032	0.0103	0.0222	0.0726	0.0889	0.1102	0.1625

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-2352	SS-28	148.5-150.0	21.5	14	36	22	CL

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 2-28-08

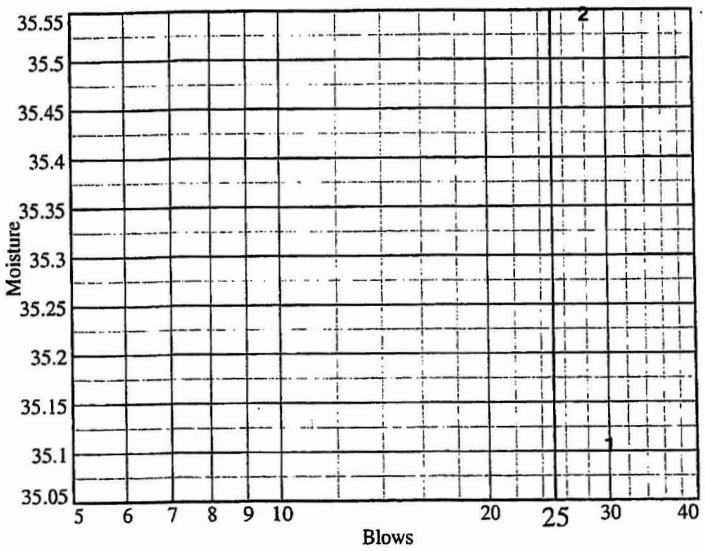
LIQUID AND PLASTIC LIMIT TEST DATA

2/19/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2352
Depth: 148.5-150.0 **Sample Number:** SS-28
Material Description: Light Yellowish Brown Lean CLAY with sand
USCS: CL **AASHTO:** A-6(16)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	33.37	31.16				
Dry+Tare	28.75	27.09				
Tare	15.59	15.64				
# Blows	30	28				
Moisture	35.1	35.5				



Liquid Limit= 36
Plastic Limit= 14
Plasticity Index= 22
Natural Moisture= 21.5
Liquidity Index= 0.3

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	24.13	24.53			
Dry+Tare	23.09	23.45			
Tare	15.48	15.49			
Moisture	13.7	13.6			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
158.04	131.78	9.51	21.5

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: 2/11/08

SAMPLE IDENTIFICATION: B-2352 SS-28

(A) Mass of oven-dried soil, grams:		74.70
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.54
(C) Mass of pycnometer, water and soil, grams:		702.28
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		23.1
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.672
(F)	***Correction factor:***	0.99931
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.670

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

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

REMARKS: Estimated % Passing # 4 :100

Lean CLAY with sand (CL)

EQUIPMENT USED

SCALES :3.1.99

OVEN : 5.1.16

THERMOMETER :5.1.01

PYCNOMETER : P-3

TESTED BY: CS

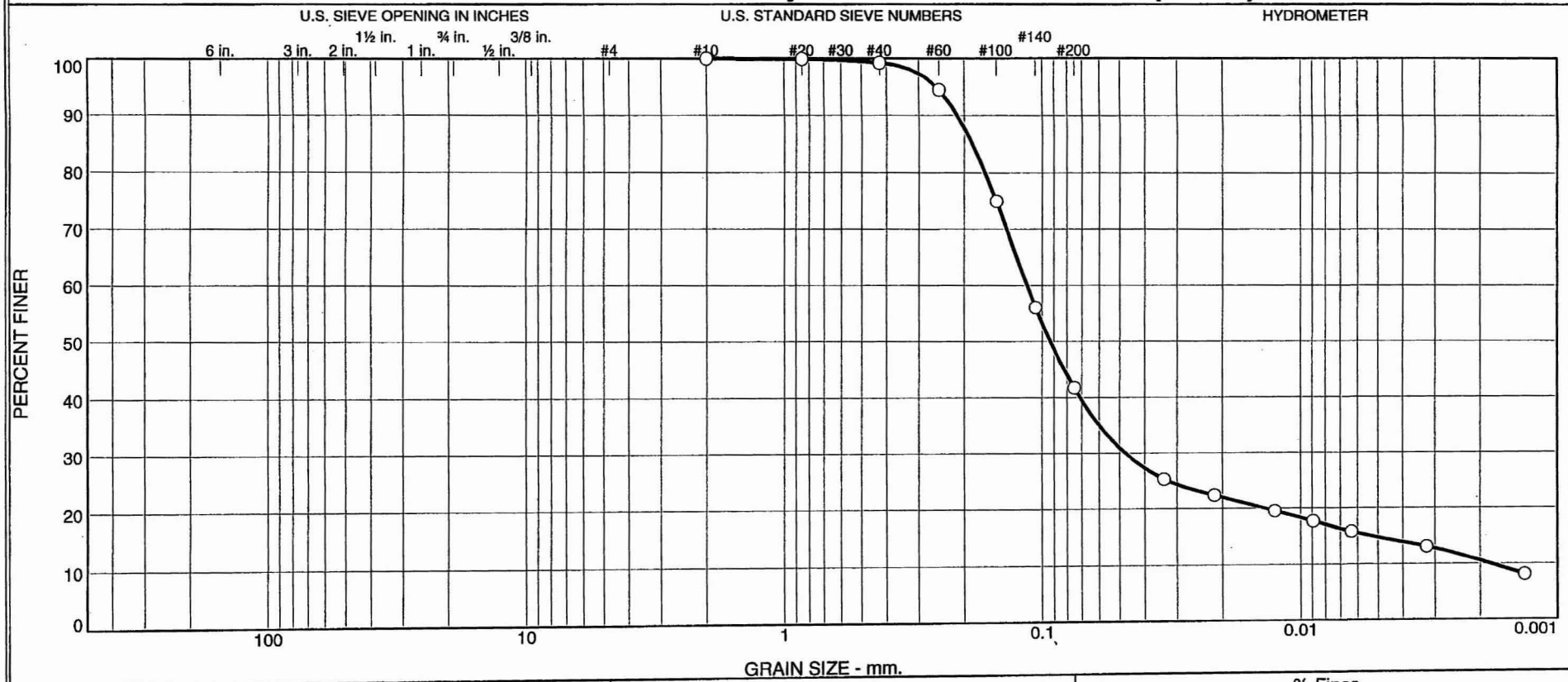
\Test Reports\Soils\SPECIFIC GRAVITY(ref).xls

REVIEWED BY: Brian Johnson

DSC 2-28-08

Boring B-2359

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



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.8	57.5	27.0	14.7

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-1	0.0-1.5	1-3-08	SM	Dark Brown Silty SAND	9.1	21	20

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity is assumed
Organic Content = 2.1% (ASTM D2974-07)

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 0.0-1.5 **Sample Number:** SS-1
Material Description: Dark Brown Silty SAND
Date: 1-3-08 **Natural Moisture:** 9.1
Liquid Limit: 21 **Plastic Limit:** 20 **USCS Class.:** SM
Testing Remarks: Specific Gravity is assumed
Organic Content = 2.1% (ASTM D2974-07)
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
190.26	0.00	0.00	#10	0.00	100.0
51.73	0.00	0.00	#20	0.05	99.9
			#40	0.39	99.2
			#60	2.85	94.5
			#100	12.99	74.9
			#140	22.72	56.1
			#200	30.16	41.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =51.73
Hygroscopic moisture correction:
Moist weight and tare = 27.95
Dry weight and tare = 27.94
Tare weight = 15.45
Hygroscopic moisture = 0.1%
Table of composite correction values:

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

Meniscus correction only = 1.0
Specific gravity of solids = 2.700
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	22.0	18.0	13.2	0.0131	19.0	13.2	0.0337	25.3
5.00	22.0	16.5	11.7	0.0131	17.5	13.4	0.0215	22.4
15.00	22.0	15.0	10.2	0.0131	16.0	13.7	0.0125	19.5
30.00	22.1	14.0	9.2	0.0131	15.0	13.8	0.0089	17.7
60.00	22.1	13.0	8.2	0.0131	14.0	14.0	0.0063	15.8
240.00	20.9	12.0	6.8	0.0133	13.0	14.2	0.0032	13.1
1440.00	20.7	9.5	4.3	0.0133	10.5	14.6	0.0013	8.1

MACTEC, Inc.

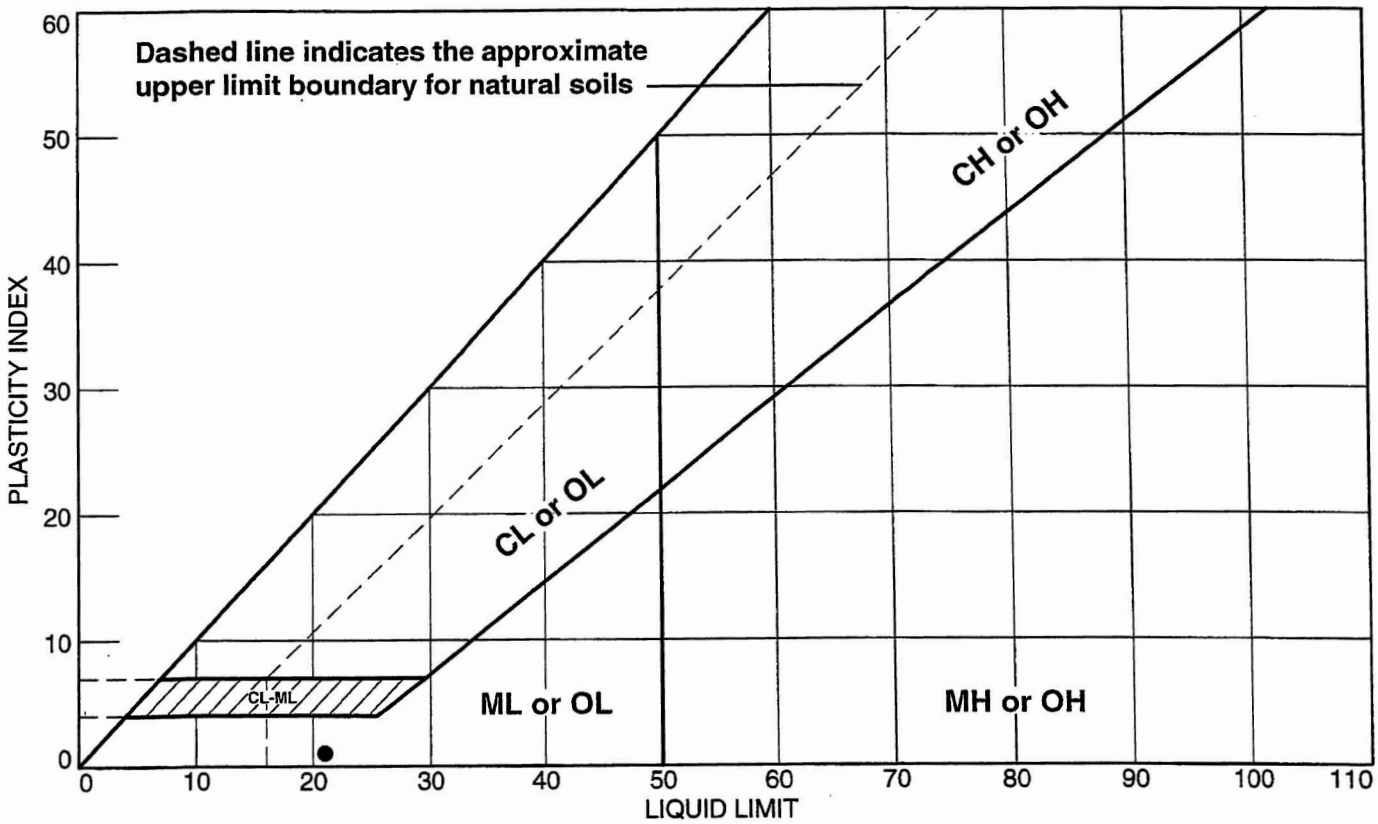
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.8	57.5	58.3	27.0	14.7	41.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0018	0.0053	0.0137	0.0476	0.0931	0.1143	0.1662	0.1860	0.2127	0.2561

Fineness Modulus	C_u	C_c
0.28	63.00	10.91

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-2359	SS-1	0.0-1.5	9.1	20	21	1	SM

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 2-27-08

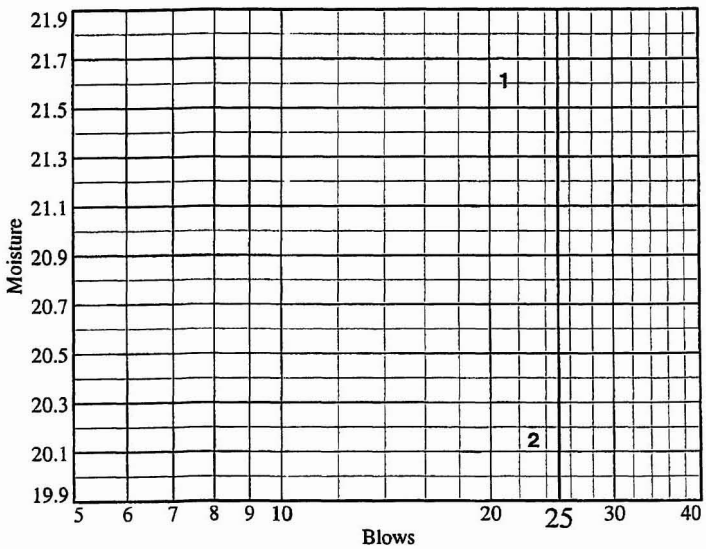
LIQUID AND PLASTIC LIMIT TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 0.0-1.5 **Sample Number:** SS-1
Material Description: Dark Brown Silty SAND
USCS: SM **AASHTO:** A-4(0)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.93	33.19				
Dry+Tare	29.90	30.23				
Tare	15.88	15.54				
# Blows	21	23				
Moisture	21.6	20.1				



Liquid Limit= 21
Plastic Limit= 20
Plasticity Index= 1
Natural Moisture= 9.1
Liquidity Index= -10.9

Plastic Limit Data

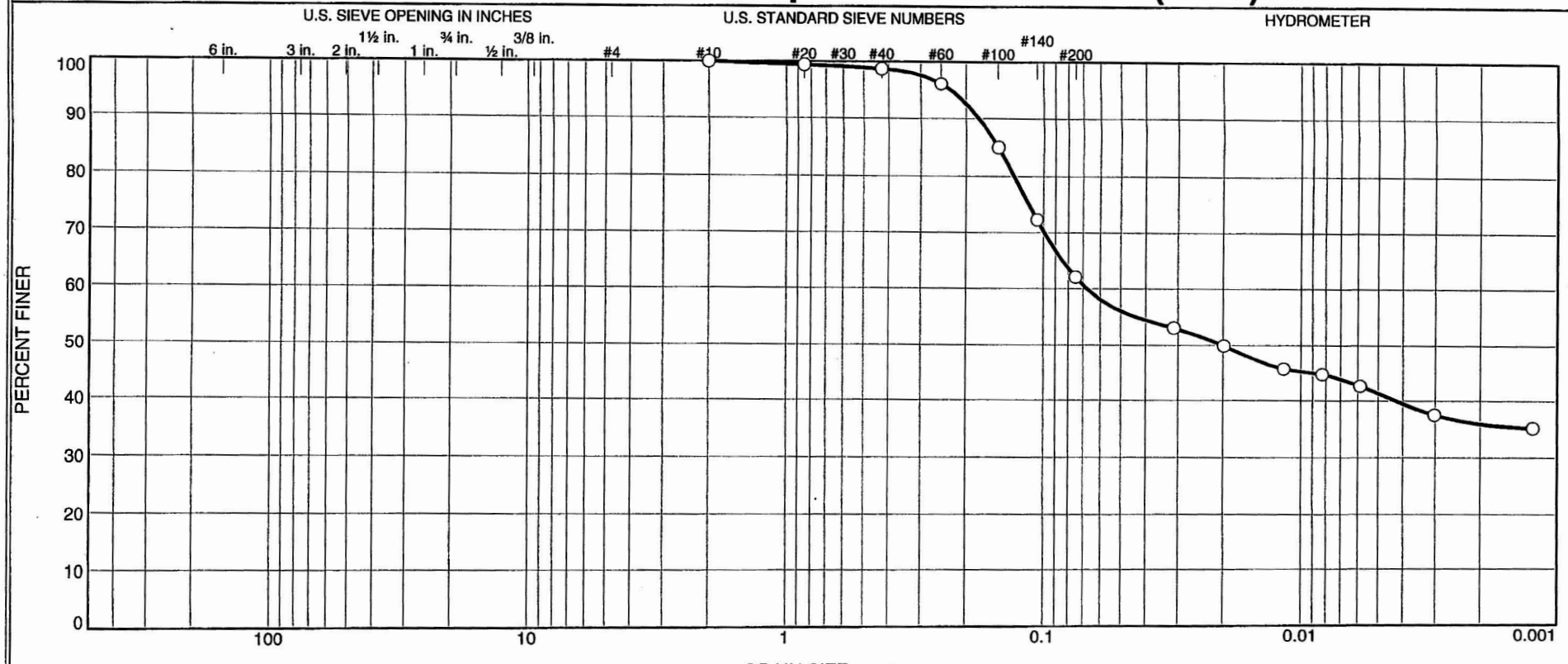
Run No.	1	2	3	4	
Wet+Tare	36.69	37.69			
Dry+Tare	33.12	34.00			
Tare	15.50	15.49			
Moisture	20.3	19.9			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
114.33	105.40	7.05	9.1

MACTEC, Inc.

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	1.2	36.7	20.8	41.3

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2359	SS-2	3.5-5.0	1-3-08	CL	Reddish Yellow Sandy Lean CLAY	18.7	44	16

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O Organic Content = 1.7% (ASTM 2974-07)
Specific Gravity is assumed

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 3.5-5.0 **Sample Number:** SS-2
Material Description: Reddish Yellow Sandy Lean CLAY
Date: 1-3-08 **Natural Moisture:** 18.7
Liquid Limit: 44 **Plastic Limit:** 16 **USCS Class.:** CL
Testing Remarks: Organic Content = 1.7% (ASTM 2974-07)
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
211.28	0.00	0.00	#10	0.00	100.0
48.67	0.00	0.00	#20	0.28	99.4
			#40	0.60	98.8
			#60	1.89	96.1
			#100	7.27	85.1
			#140	13.48	72.3
			#200	18.44	62.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =48.67
Hygroscopic moisture correction:
Moist weight and tare = 27.44
Dry weight and tare = 27.01
Tare weight = 15.49
Hygroscopic moisture = 3.7%
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 = 2.700
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	21.9	30.0	25.2	0.0131	31.0	11.2	0.0311	53.1
5.00	21.9	28.5	23.7	0.0131	29.5	11.5	0.0199	49.9
15.00	21.9	26.5	21.7	0.0131	27.5	11.8	0.0116	45.7
30.00	22.0	26.0	21.2	0.0131	27.0	11.9	0.0082	44.7
60.00	22.0	25.0	20.2	0.0131	26.0	12.0	0.0059	42.6
240.00	20.9	23.0	17.8	0.0133	24.0	12.4	0.0030	37.6
1440.00	20.6	22.0	16.7	0.0133	23.0	12.5	0.0012	35.2

MACTEC, Inc.

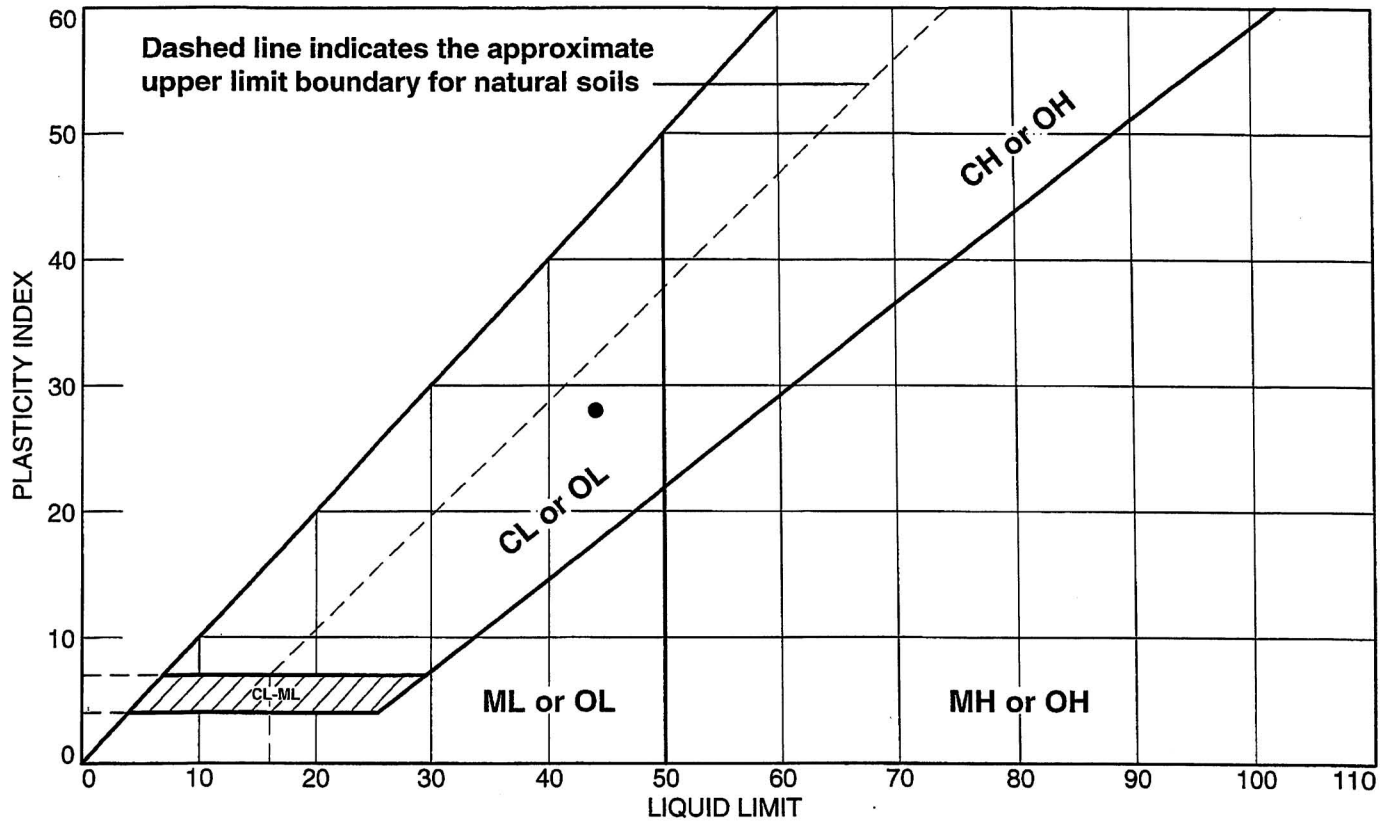
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.2	36.7	37.9	20.8	41.3	62.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0201	0.0676	0.1301	0.1497	0.1779	0.2294

Fineness Modulus
0.18

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-2359	SS-2	3.5-5.0	18.7	16	44	28	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 2-27-08

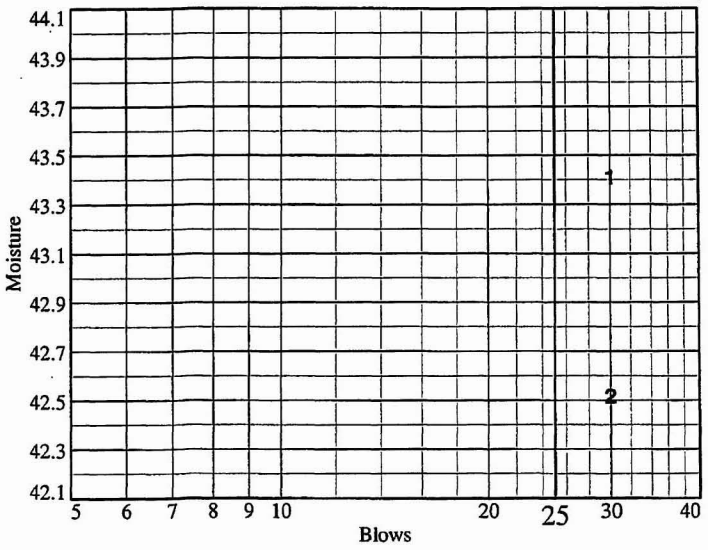
LIQUID AND PLASTIC LIMIT TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 3.5-5.0 **Sample Number:** SS-2
Material Description: Reddish Yellow Sandy Lean CLAY
USCS: CL **AASHTO:** A-7-6(14)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	33.21	27.37				
Dry+Tare	27.84	22.51				
Tare	15.47	11.08				
# Blows	30	30				
Moisture	43.4	42.5				



Liquid Limit= 44
Plastic Limit= 16
Plasticity Index= 28
Natural Moisture= 18.7
Liquidity Index= 0.1

Plastic Limit Data

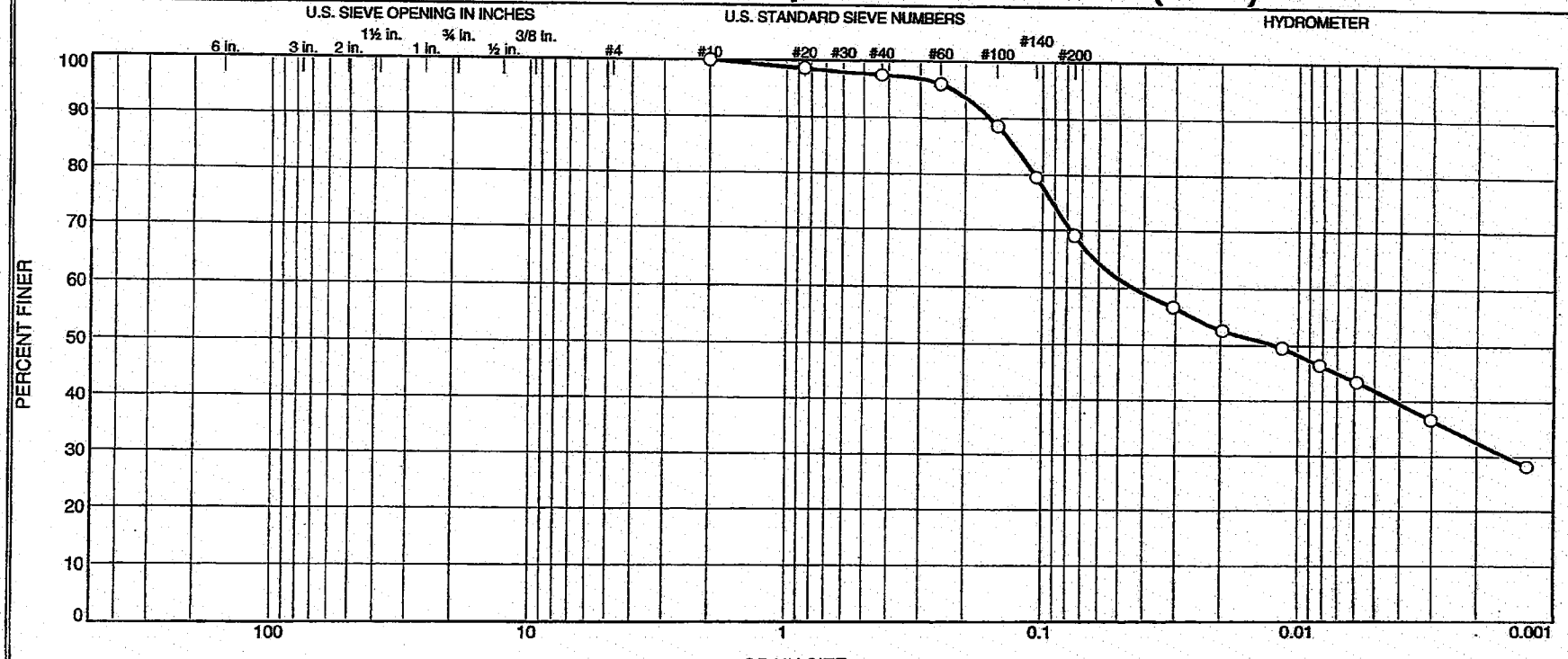
Run No.	1	2	3	4	
Wet+Tare	22.63	24.70			
Dry+Tare	21.67	23.48			
Tare	15.60	15.53			
Moisture	15.8	15.3			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
114.08	97.21	6.87	18.7

MACTEC, Inc.

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	2.5	28.4	27.2	41.9

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2359	SS-3	6-7.5	1-3-08	CL	Light Yellowish Brown Sandy Lean CLAY	19.0	38	13

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O Specific Gravity =2.680 (ASTM D854-06)
Organic Content = 1.5% (ASTM D2974-07)

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 6-7.5 **Sample Number:** SS-3
Material Description: Light Yellowish Brown Sandy Lean CLAY
Date: 1-3-08 **Natural Moisture:** 19.0
Liquid Limit: 38 **Plastic Limit:** 13 **USCS Class.:** CL
Testing Remarks: Specific Gravity =2.680 (ASTM D854-06)
Organic Content = 1.5% (ASTM D2974-07)
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
225.15	0.00	0.00	#10	0.00	100.0
50.17	0.00	0.00	#20	0.71	98.6
			#40	1.26	97.5
			#60	2.05	95.9
			#100	5.67	88.7
			#140	10.25	79.6
			#200	15.52	69.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =50.17
Hygroscopic moisture correction:
Moist weight and tare = 28.16
Dry weight and tare = 27.75
Tare weight = 15.58
Hygroscopic moisture = 3.4%
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 = 2.680
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	22.0	32.5	27.7	0.0132	33.5	10.8	0.0307	56.7
5.00	22.0	30.5	25.7	0.0132	31.5	11.1	0.0197	52.6
15.00	22.0	29.0	24.2	0.0132	30.0	11.4	0.0115	49.5
30.00	22.0	27.5	22.7	0.0132	28.5	11.6	0.0082	46.5
60.00	22.0	26.0	21.2	0.0132	27.0	11.9	0.0059	43.4
240.00	21.2	23.0	17.9	0.0133	24.0	12.4	0.0030	36.7
1440.00	20.8	19.0	13.8	0.0134	20.0	13.0	0.0013	28.2

MACTEC, Inc.

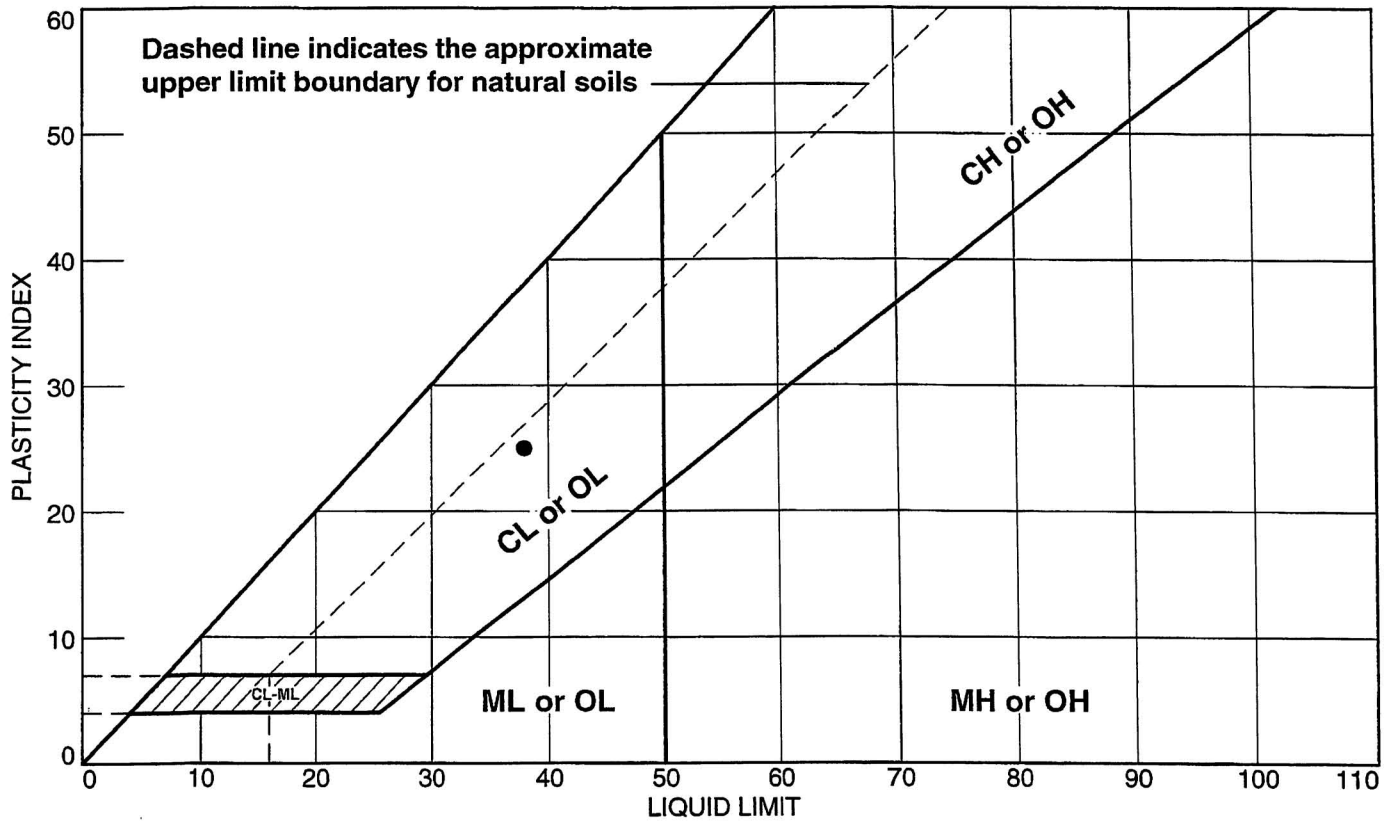
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.5	28.4	30.9	27.2	41.9	69.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0015	0.0123	0.0438	0.1075	0.1284	0.1598	0.2248

Fineness Modulus
0.17

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-2359	SS-3	6-7.5	19.0	13	38	25	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 2-27-08

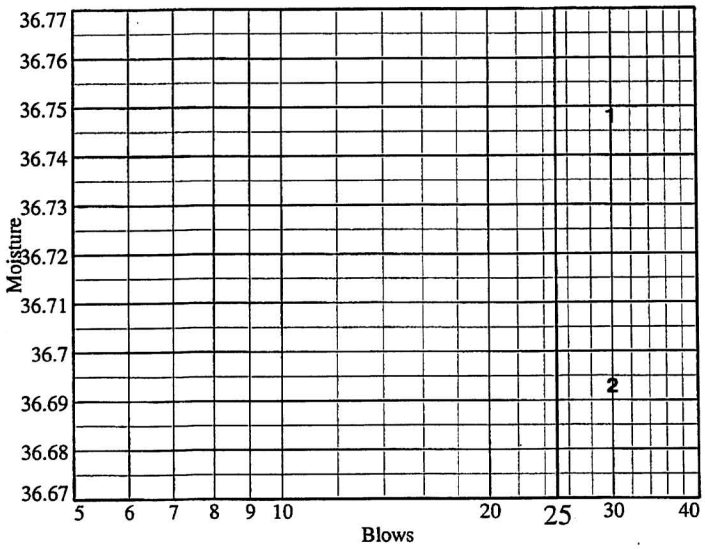
LIQUID AND PLASTIC LIMIT TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 6-7.5 **Sample Number:** SS-3
Material Description: Light Yellowish Brown Sandy Lean CLAY
USCS: CL **AASHTO:** A-6(15)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.25	36.27				
Dry+Tare	26.34	30.70				
Tare	15.70	15.52				
# Blows	30	30				
Moisture	36.7	36.7				



Liquid Limit= 38
Plastic Limit= 13
Plasticity Index= 25
Natural Moisture= 19.0
Liquidity Index= 0.2

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	24.68	24.38			
Dry+Tare	23.59	23.38			
Tare	15.28	15.65			
Moisture	13.1	12.9			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
176.88	149.74	6.99	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: 2/13/08

SAMPLE IDENTIFICATION: B-2359 SS-3

(A) Mass of oven-dried soil, grams:		52.03
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.74
(C) Mass of pycnometer, water and soil, grams:		688.36
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.4
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.681
(F)	***Correction factor:***	0.99970
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.680

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-3

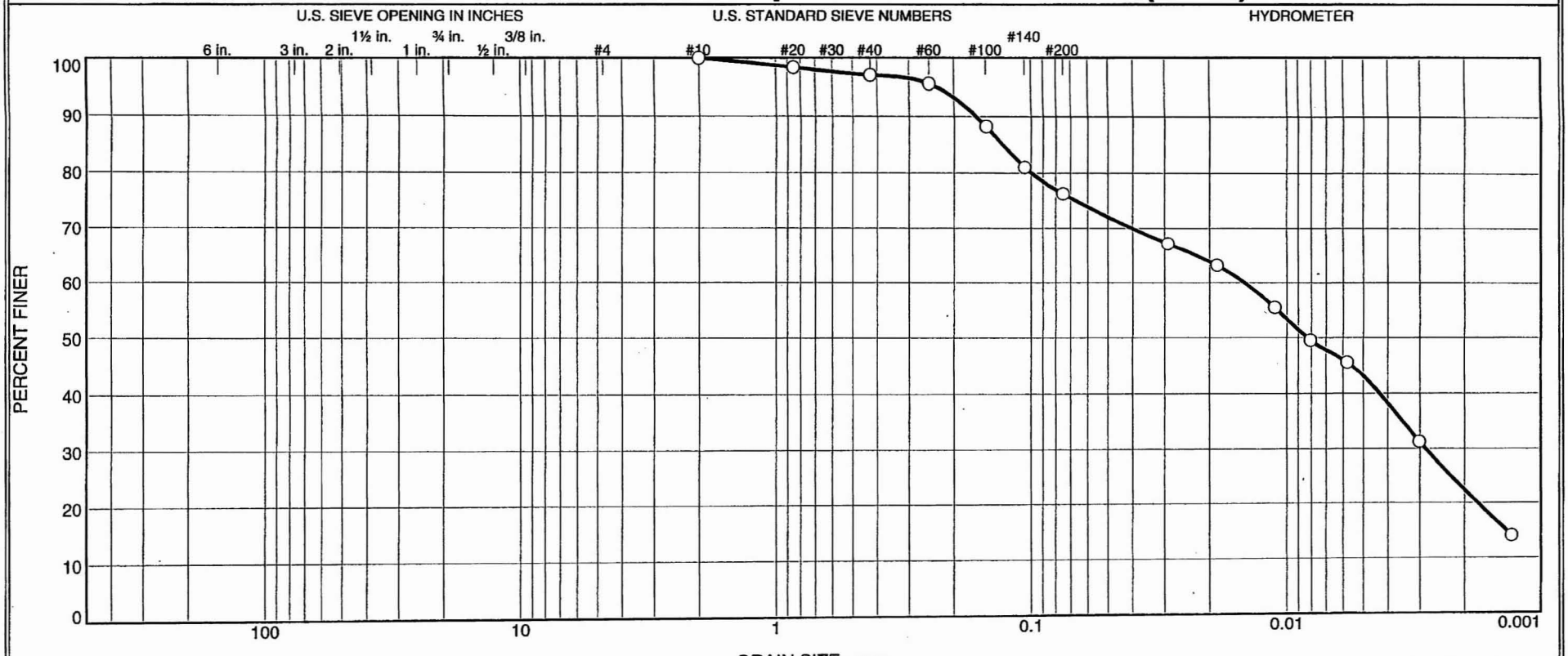
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 2-27-08

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	3.0	20.7	33.1	43.2

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-4	8.5-10.0	1-3-08	CL	Light Yellowish Brown Lean CLAY with sand	19.1	32	12

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 8.5-10.0 **Sample Number:** SS-4
Material Description: Light Yellowish Brown Lean CLAY with sand
Date: 1-3-08 **Natural Moisture:** 19.1
Liquid Limit: 32 **Plastic Limit:** 12 **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
245.33	0.00	0.00	#10	0.00	100.0
51.68	0.00	0.00	#20	0.83	98.4
			#40	1.53	97.0
			#60	2.29	95.6
			#100	6.04	88.3
			#140	9.79	81.1
			#200	12.23	76.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =51.68
Hygroscopic moisture correction:
Moist weight and tare = 28.96
Dry weight and tare = 28.55
Tare weight = 15.54
Hygroscopic moisture = 3.2%
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 = 2.700
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	39.0	34.0	0.0132	40.0	9.7	0.0291	67.2
5.00	21.5	37.0	32.0	0.0132	38.0	10.1	0.0187	63.2
15.00	21.7	33.0	28.1	0.0132	34.0	10.7	0.0111	55.5
30.00	21.7	30.0	25.1	0.0132	31.0	11.2	0.0080	49.6
60.00	21.7	28.0	23.1	0.0132	29.0	11.5	0.0058	45.6
240.00	22.4	20.5	15.9	0.0131	21.5	12.8	0.0030	31.3
1440.00	21.8	12.0	7.1	0.0131	13.0	14.2	0.0013	14.1

MACTEC, Inc.

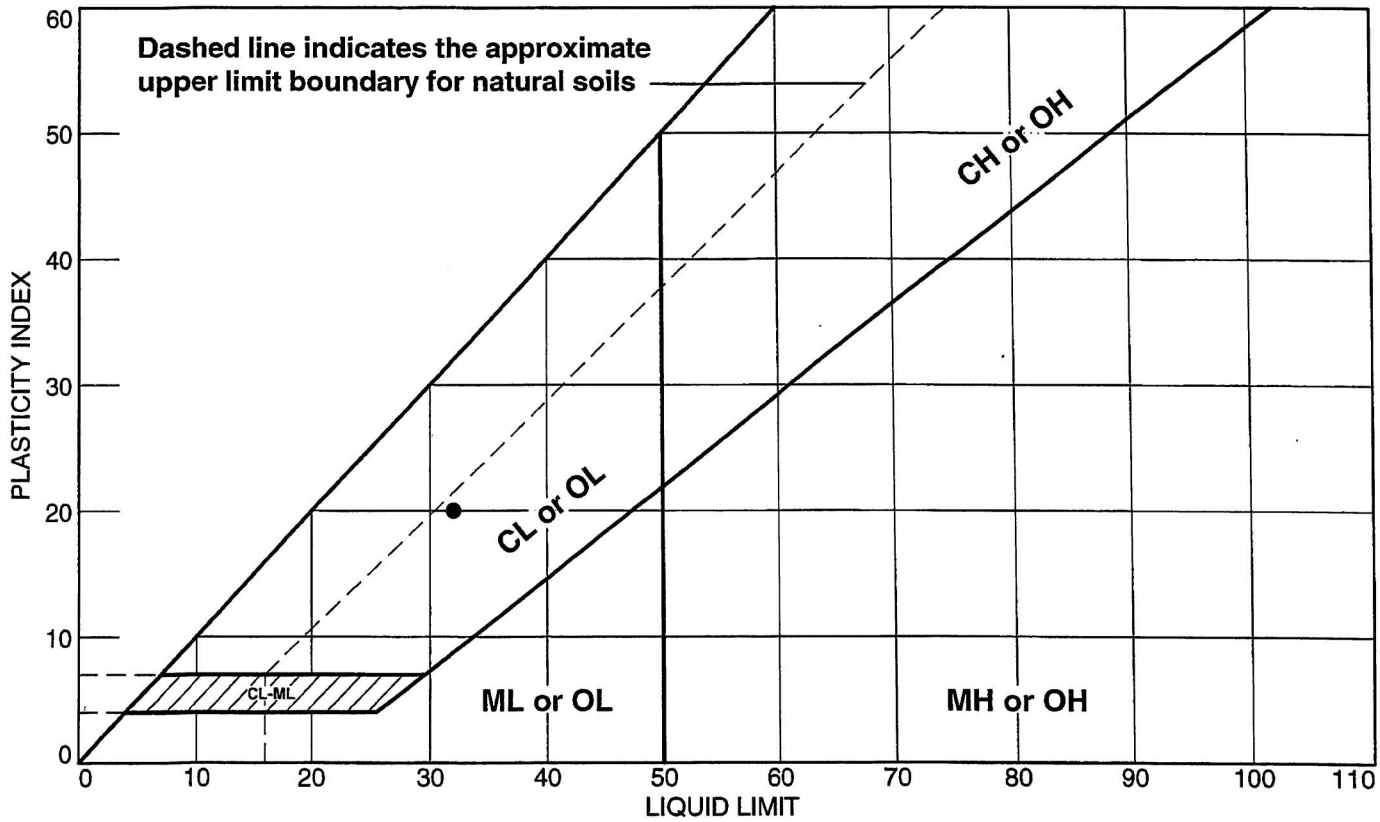
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	3.0	20.7	23.7	33.1	43.2	76.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0014	0.0018	0.0029	0.0083	0.0146	0.0996	0.1285	0.1636	0.2336

Fineness Modulus
0.18

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-2359	SS-4	8.5-10.0	19.1	12	32	20	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 2-27-08

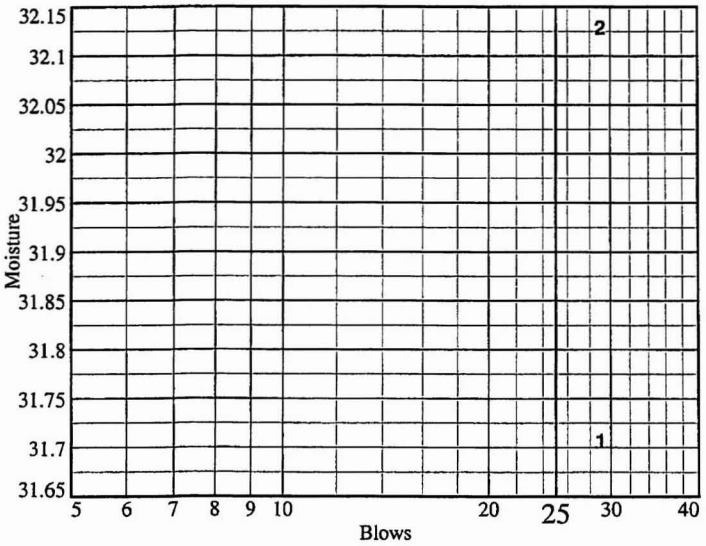
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 8.5-10.0 **Sample Number:** SS-4
Material Description: Light Yellowish Brown Lean CLAY with sand
USCS: CL **AASHTO:** A-6(13)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	34.40	36.99				
Dry+Tare	29.85	31.74				
Tare	15.50	15.40				
# Blows	29	29				
Moisture	31.7	32.1				



Liquid Limit= 32
Plastic Limit= 12
Plasticity Index= 20
Natural Moisture= 19.1
Liquidity Index= 0.4

Plastic Limit Data

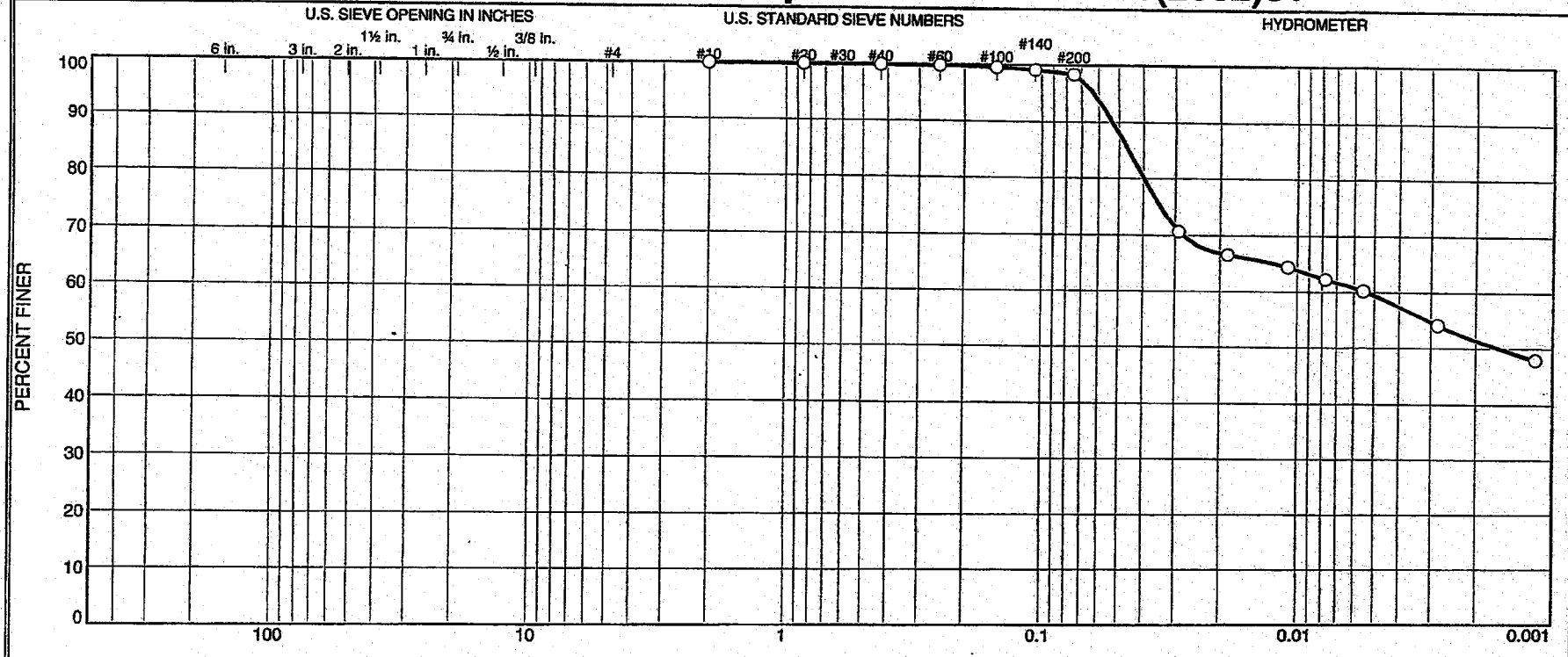
Run No.	1	2	3	4	
Wet+Tare	23.93	24.13			
Dry+Tare	23.03	23.23			
Tare	15.50	15.57			
Moisture	12.0	11.7			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
139.44	118.11	6.66	19.1

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	0.0	0.1	1.5	38.9	59.5

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2359	SS-5	11.0-12.5	1-3-08	CH	Light Greenish Gray Fat CLAY	17.7	51	17

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 11.0-12.5 **Sample Number:** SS-5
Material Description: Light Greenish Gray Fat CLAY
Date: 1-3-08 **Natural Moisture:** 17.7
Liquid Limit: 51 **Plastic Limit:** 17 **USCS Class.:** CH
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
256.63	0.00	0.00	#10	0.00	100.0
49.73	0.00	0.00	#20	0.02	100.0
			#40	0.04	99.9
			#60	0.07	99.9
			#100	0.23	99.5
			#140	0.43	99.1
			#200	0.80	98.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =49.73
Hygroscopic moisture correction:
Moist weight and tare = 26.61
Dry weight and tare = 26.18
Tare weight = 15.69
Hygroscopic moisture = 4.1%
Table of composite correction values:

Temp., deg. C:	12.9	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	39.0	34.2	0.0131	40.0	9.7	0.0290	70.7
5.00	21.8	37.0	32.2	0.0131	38.0	10.1	0.0187	66.6
15.00	21.7	36.0	31.1	0.0132	37.0	10.2	0.0109	64.4
30.00	21.6	35.0	30.1	0.0132	36.0	10.4	0.0078	62.3
60.00	21.7	34.0	29.1	0.0132	35.0	10.6	0.0055	60.3
240.00	21.8	31.0	26.2	0.0131	32.0	11.0	0.0028	54.2
1451.00	21.9	28.0	23.2	0.0131	29.0	11.5	0.0012	48.0

MACTEC, Inc.

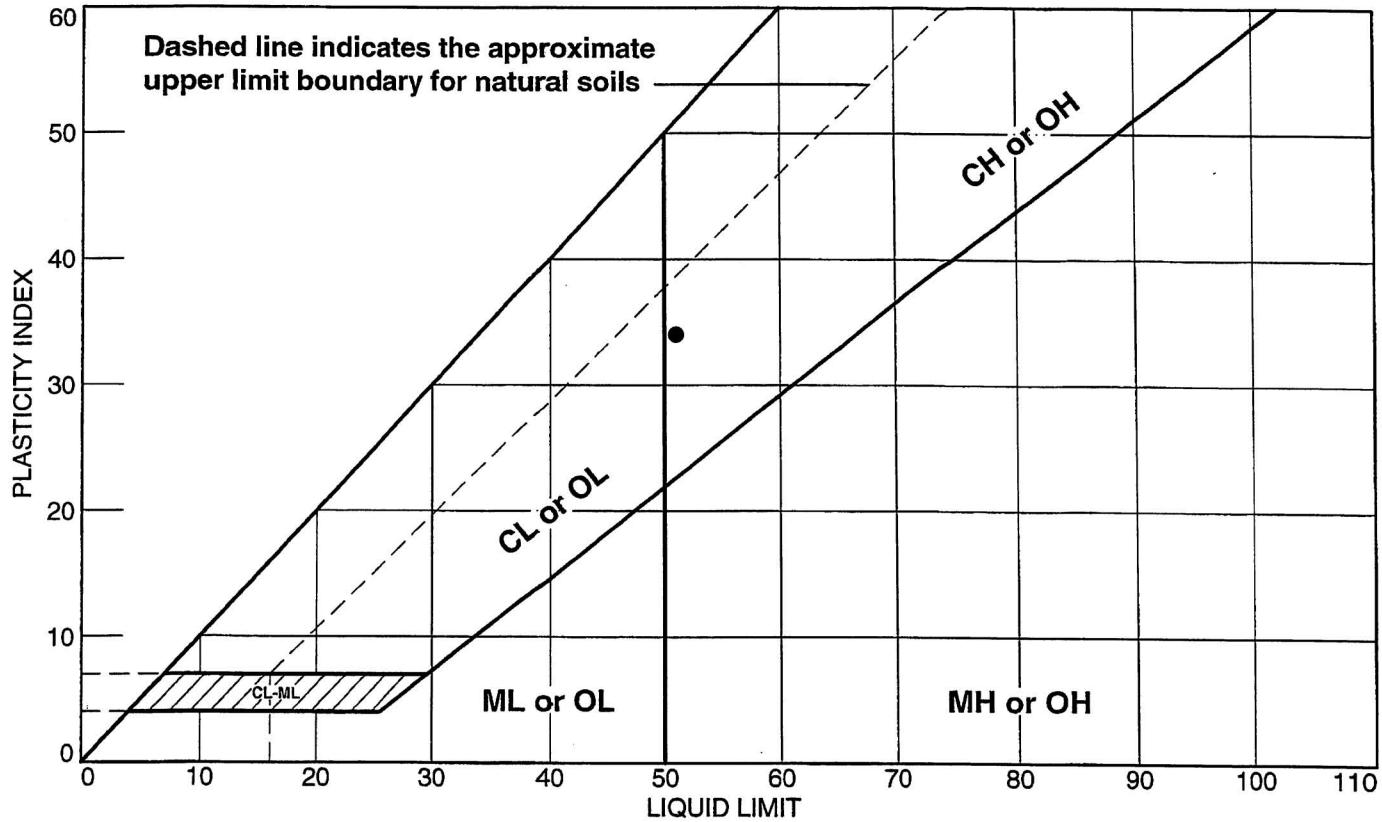
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	1.5	1.6	38.9	59.5	98.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0016	0.0053	0.0399	0.0459	0.0530	0.0627

Fineness Modulus
0.01

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-2359	SS-5	11.0-12.5	17.7	17	51	34	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 DSC 2-27-08

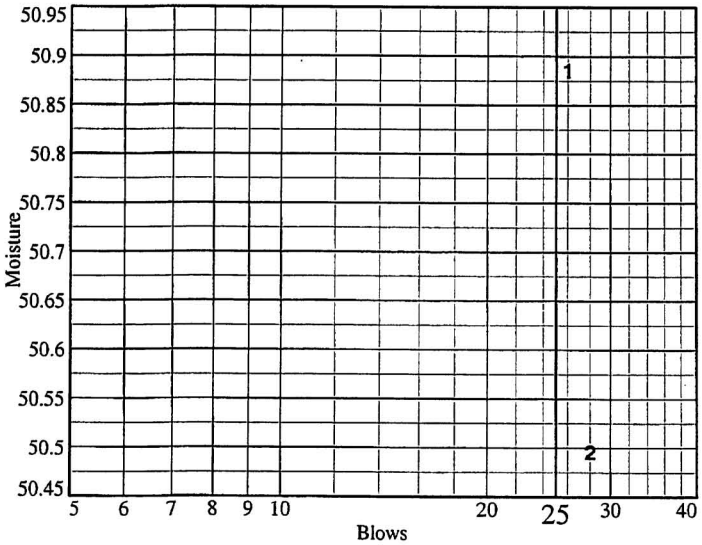
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 11.0-12.5 **Sample Number:** SS-5
Material Description: Light Greenish Gray Fat CLAY
USCS: CH **AASHTO:** A-7-6(36)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	34.36	29.07				
Dry+Tare	28.04	24.49				
Tare	15.62	15.42				
# Blows	26	28				
Moisture	50.9	50.5				



Liquid Limit= 51
Plastic Limit= 17
Plasticity Index= 34
Natural Moisture= 17.7
Liquidity Index= 0.0

Plastic Limit Data

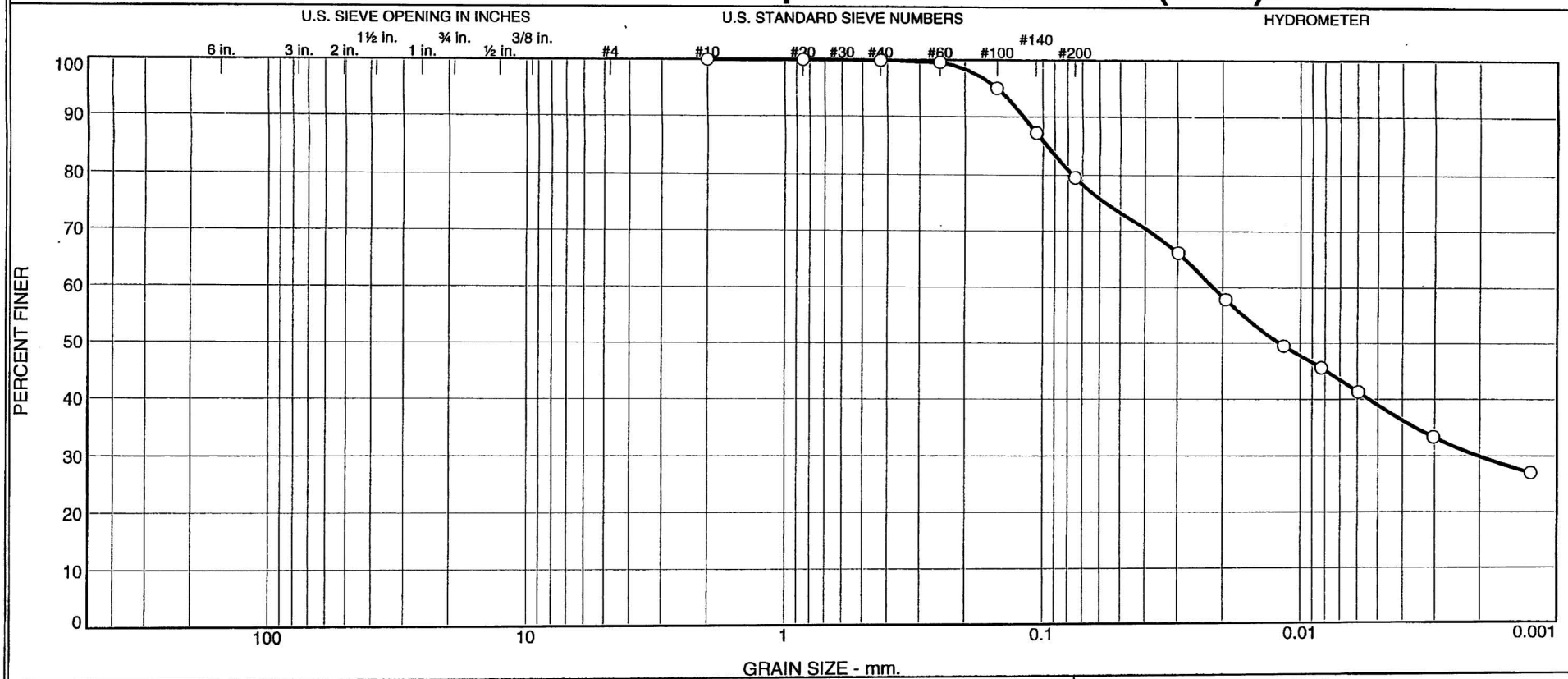
Run No.	1	2	3	4	
Wet+Tare	23.66	24.22			
Dry+Tare	22.45	23.01			
Tare	15.46	15.60			
Moisture	17.3	16.3			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
117.69	101.04	6.80	17.7

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	20.3	40.6	39.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-6	13.5-15.0	1-3-08	CL	Brownish Yellow Lean CLAY with sand	15.9	37	15

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 13.5-15.0 **Sample Number:** SS-6
Material Description: Brownish Yellow Lean CLAY with sand
Date: 1-3-08 **Natural Moisture:** 15.9
Liquid Limit: 37 **Plastic Limit:** 15 **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
234.73	0.00	0.00	#10	0.00	100.0
48.99	0.00	0.00	#20	0.00	100.0
			#40	0.04	99.9
			#60	0.21	99.6
			#100	2.52	94.9
			#140	6.18	87.4
			#200	10.00	79.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =48.99
Hygroscopic moisture correction:
Moist weight and tare = 27.92
Dry weight and tare = 27.57
Tare weight = 15.54
Hygroscopic moisture = 2.9%
Table of composite correction values:

Temp., deg. C:	12.9	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	20.9	37.0	31.8	0.0133	38.0	10.1	0.0298	66.1
5.00	20.9	33.0	27.8	0.0133	34.0	10.7	0.0195	57.8
15.00	20.9	29.0	23.8	0.0133	30.0	11.4	0.0116	49.5
30.00	21.2	27.0	21.9	0.0132	28.0	11.7	0.0083	45.6
60.00	21.0	25.0	19.9	0.0133	26.0	12.0	0.0059	41.3
240.00	21.5	21.0	16.1	0.0132	22.0	12.7	0.0030	33.3
1440.00	21.4	18.0	13.0	0.0132	19.0	13.2	0.0013	27.0

MACTEC, Inc.

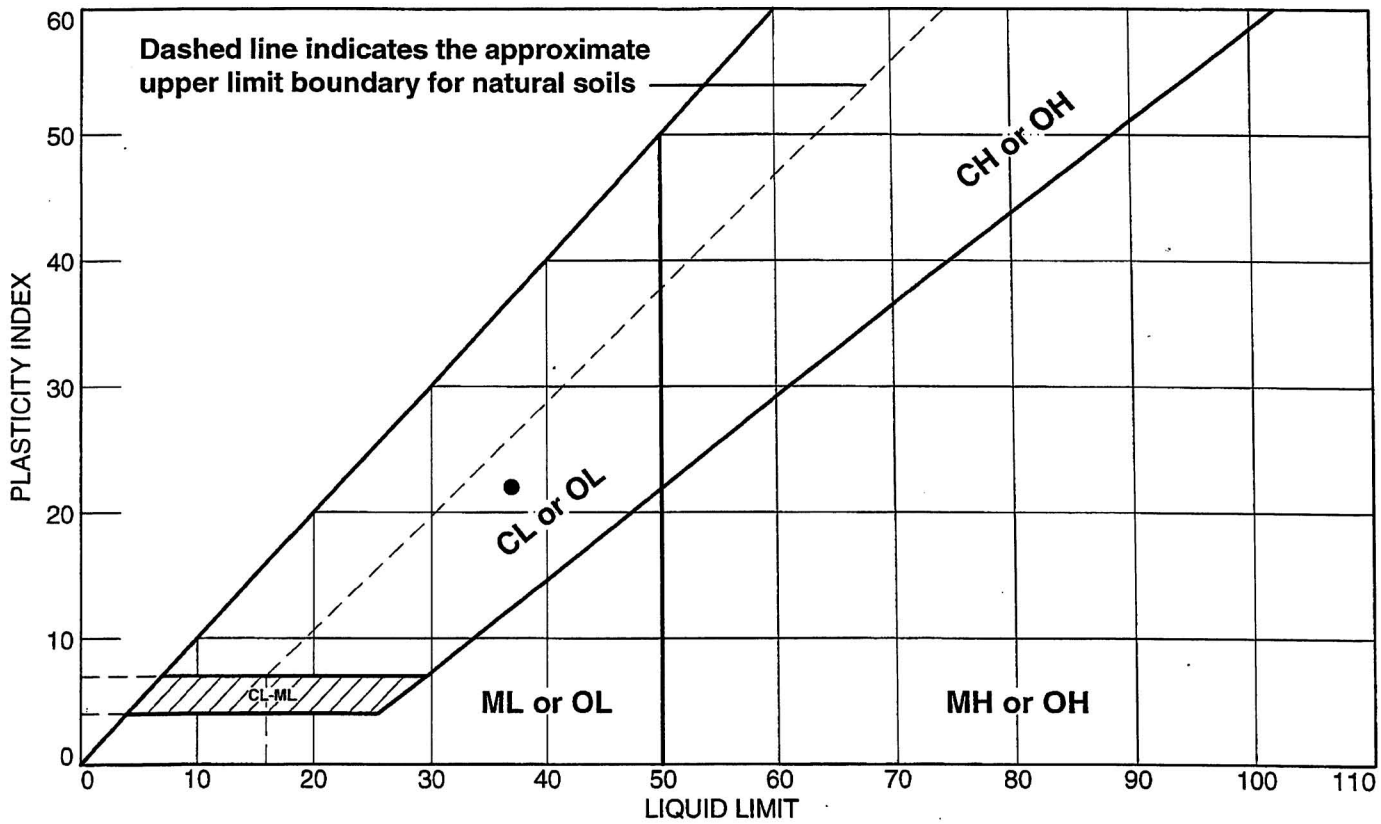
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	20.3	20.4	40.6	39.0	79.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0020	0.0120	0.0217	0.0766	0.0959	0.1184	0.1513

Fineness Modulus
0.05

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-2359	SS-6	13.5-15.0	15.9	15	37	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 2-27-08

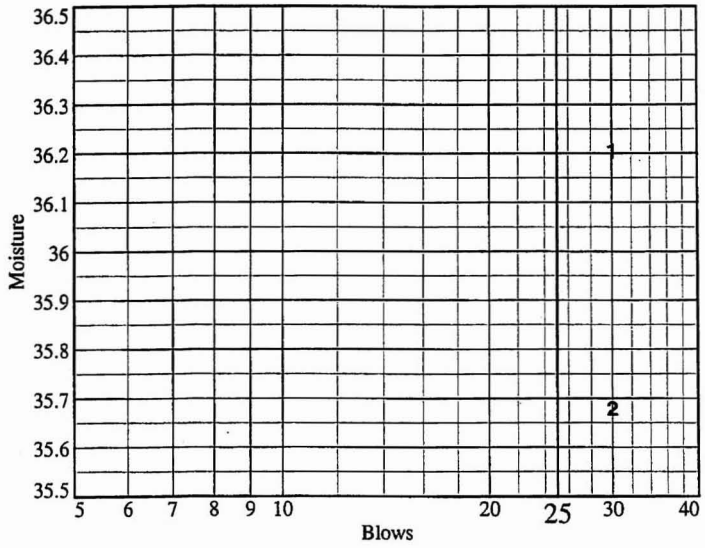
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 13.5-15.0 **Sample Number:** SS-6
Material Description: Brownish Yellow Lean CLAY with sand
USCS: CL **AASHTO:** A-6(16)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	33.50	35.52				
Dry+Tare	28.71	30.25				
Tare	15.48	15.48				
# Blows	30	30				
Moisture	36.2	35.7				



Liquid Limit= 37
Plastic Limit= 15
Plasticity Index= 22
Natural Moisture= 15.9
Liquidity Index= 0.0

Plastic Limit Data

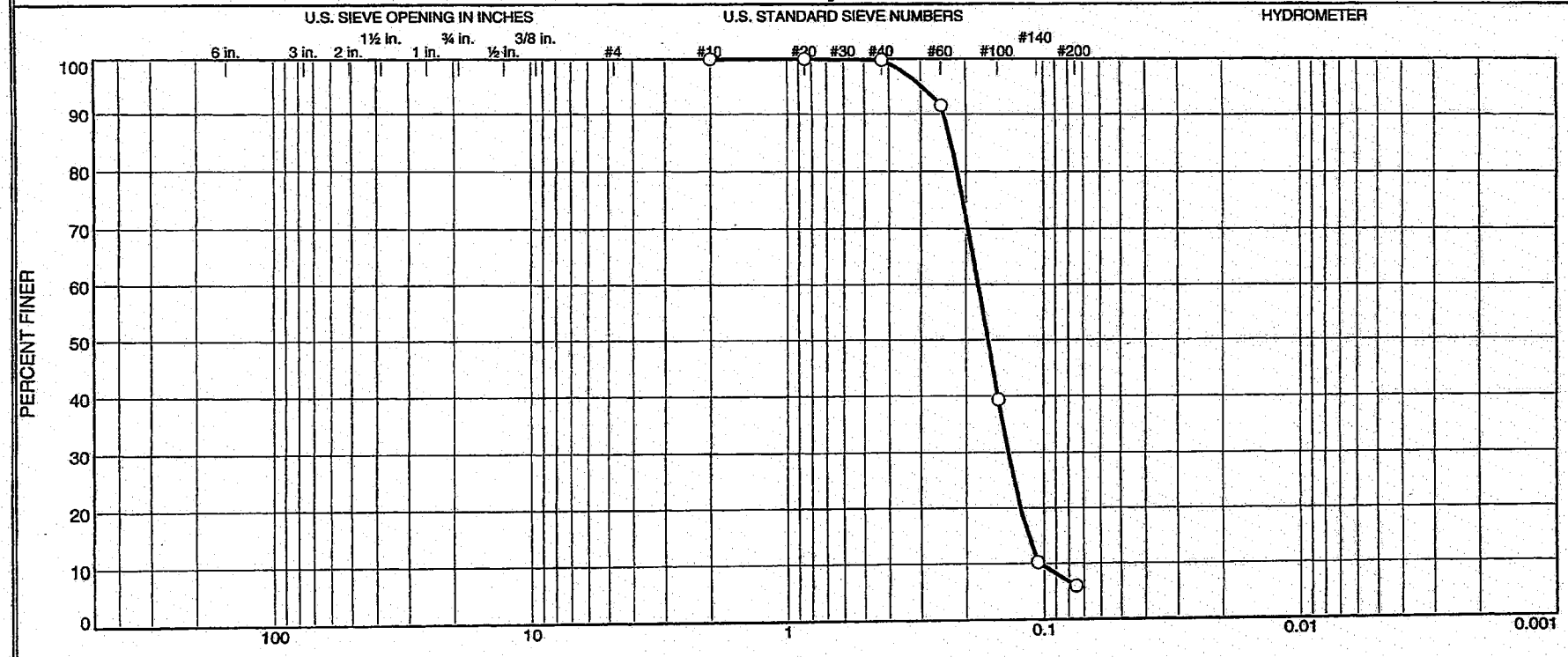
Run No.	1	2	3	4	
Wet+Tare	24.03	23.07			
Dry+Tare	22.90	22.06			
Tare	15.46	15.47			
Moisture	15.2	15.3			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
160.96	139.85	6.67	15.9

MACTEC, Inc.

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	0.2	93.7	6.1	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2359	SS-7	19.8-21.3	1-3-08	SP-SM	Light Brownish Gray Poorly Graded SAND with silt (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 | Figure NA

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Raleigh, North Carolina

O Specific Gravity = 2.658 (ASTM D854-06)
ND = Not Determined
SIEVE ANALYSIS ONLY

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 19.8-21.3 **Sample Number:** SS-7
Material Description: Light Brownish Gray Poorly Graded SAND with silt (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SP-SM
Testing Remarks: Specific Gravity = 2.658 (ASTM D854-06)
ND = Not Determined
SIEVE ANALYSIS ONLY
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
174.84	0.00	0.00	#10	0.00	100.0
101.49	0.00	0.00	#20	0.02	100.0
			#40	0.20	99.8
			#60	8.54	91.6
			#100	61.50	39.4
			#140	91.10	10.2
			#200	95.28	6.1

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	0.2	93.7	93.9			6.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1039	0.1153	0.1232	0.1373	0.1646	0.1795	0.2163	0.2287	0.2440	0.2966

Fineness Modulus	C_u	C_c
0.66	1.73	1.01

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: 2/12/08

SAMPLE IDENTIFICATION: B-2359 SS-7

(A) Mass of oven-dried soil, grams:		75.12
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.81
(C) Mass of pycnometer, water and soil, grams:		703.68
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.4
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.659
(F)	***Correction factor:***	0.99970
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.658

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

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

REMARKS: Estimated % Passing # 4 : 100

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

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER :5.1.01

PYCNOMETER : P-6

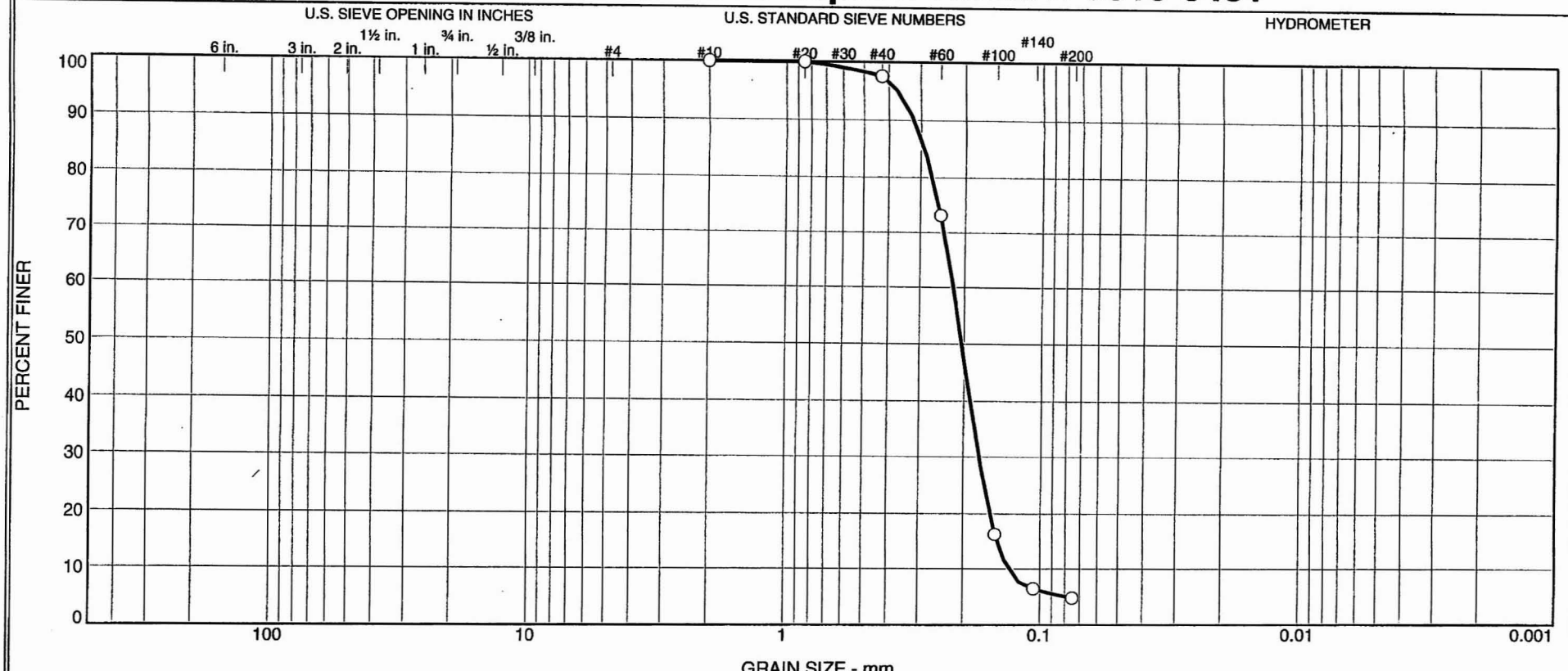
TESTED BY: CS

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

REVIEWED BY: Brian Johnson

DSC 2-27-08

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	2.4	92.7	4.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-8	24.8-26.3	1-3-08	SP	Light Brownish Gray Poorly Graded SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS Checked By: LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 24.8-26.3 **Sample Number:** SS-8
Material Description: Light Brownish Gray Poorly Graded SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SP
Testing Remarks: SIEVE ANALYSIS ONLY
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
217.58	0.00	0.00	#10	0.00	100.0
104.07	0.00	0.00	#20	0.06	99.9
			#40	2.54	97.6
			#60	27.88	73.2
			#100	87.10	16.3
			#140	97.33	6.5
			#200	99.02	4.9

Fractional Components

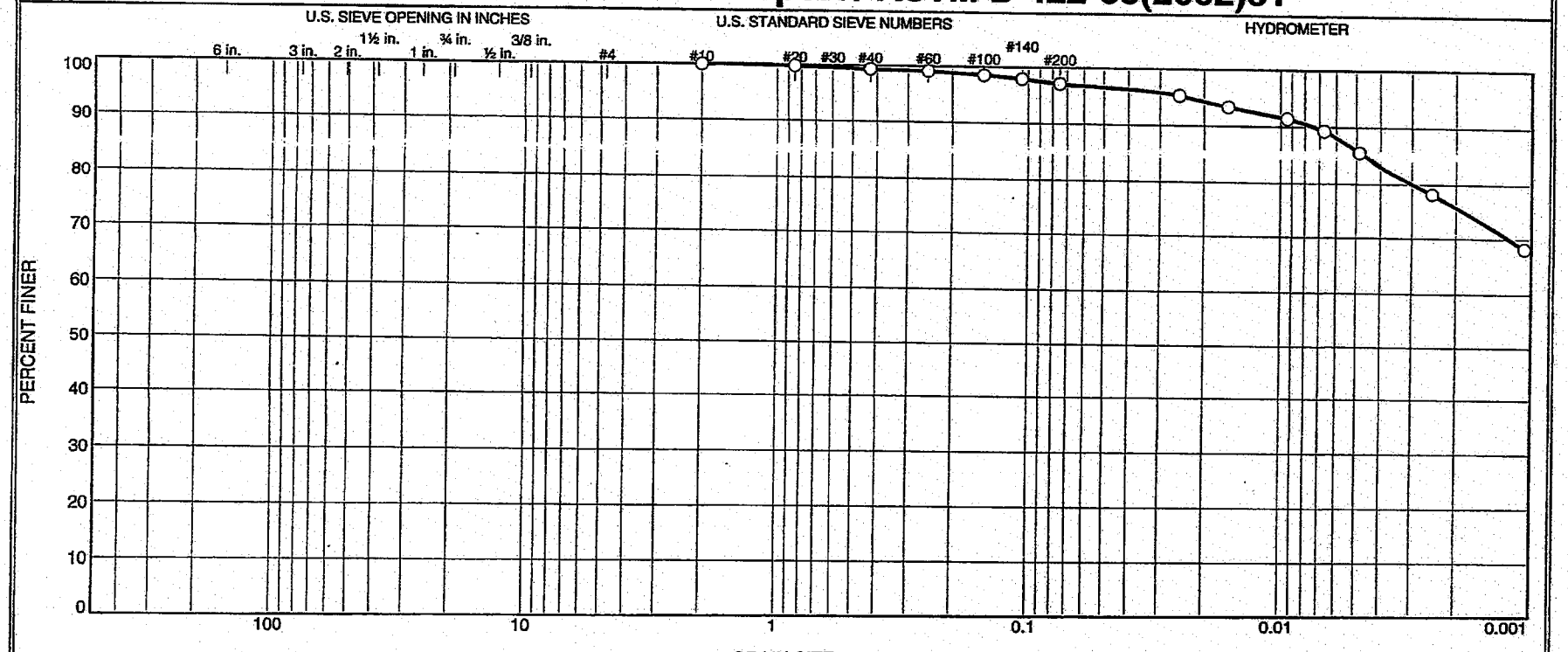
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.4	92.7	95.1			4.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1327	0.1471	0.1571	0.1736	0.2046	0.2218	0.2702	0.2903	0.3191	0.3701

Fineness Modulus	C_u	C_c
0.98	1.67	1.02

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	0.0	0.7	2.2	11.2	85.9

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2359	SS-9	29.8-31.3	1-3-08	CH	Light Greenish Gray with Reddish Yellow Fat CLAY	26.8	78	25

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 29.8-31.3 **Sample Number:** SS-9
Material Description: Light Greenish Gray with Reddish Yellow Fat CLAY
Date: 1-3-08 **Natural Moisture:** 26.8
Liquid Limit: 78 **Plastic Limit:** 25 **USCS Class.:** CH
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
226.56	0.00	0.00	#10	0.00	100.0
52.09	0.00	0.00	#20	0.09	99.8
			#40	0.34	99.3
			#60	0.47	99.1
			#100	0.79	98.5
			#140	1.11	97.9
			#200	1.52	97.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =52.09
Hygroscopic moisture correction:
Moist weight and tare = 28.56
Dry weight and tare = 28.29
Tare weight = 15.64
Hygroscopic moisture = 2.1%
Table of composite correction values:

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

Meniscus correction only = 1.0
Specific gravity of solids = 2.700
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	21.7	54.0	49.1	0.0132	55.0	7.3	0.0251	95.2
5.00	21.7	53.0	48.1	0.0132	54.0	7.4	0.0161	93.3
15.00	21.7	52.0	47.1	0.0132	53.0	7.6	0.0094	91.3
30.00	21.6	51.0	46.1	0.0132	52.0	7.8	0.0067	89.3
60.00	21.6	49.0	44.1	0.0132	50.0	8.1	0.0048	85.5
240.00	22.3	45.0	40.3	0.0131	46.0	8.8	0.0025	78.2
1450.00	22.0	40.0	35.2	0.0131	41.0	9.6	0.0011	68.3

MACTEC, Inc.

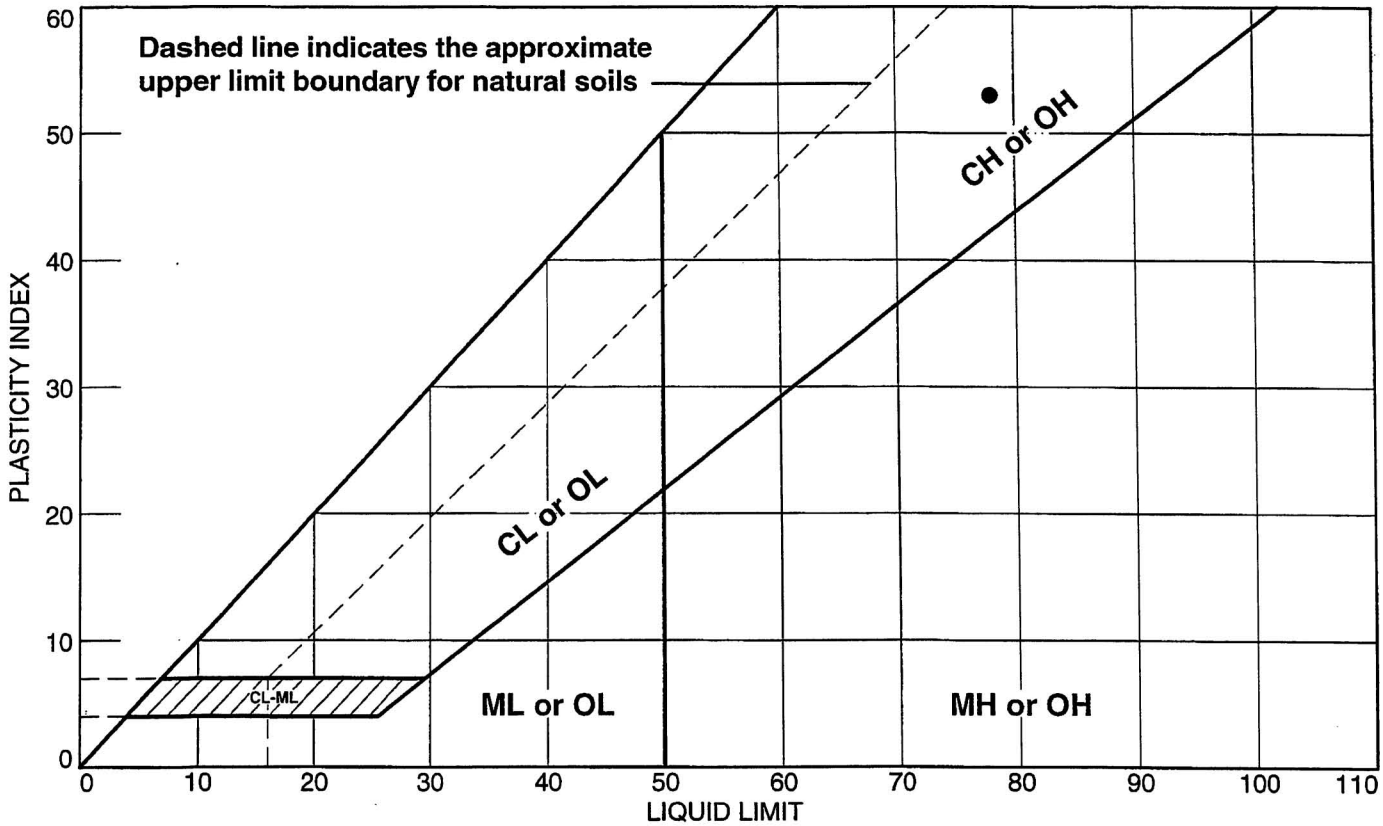
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.7	2.2	2.9	11.2	85.9	97.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.0030	0.0047	0.0073	0.0237

Fineness Modulus
0.03

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-2359	SS-9	29.8-31.3	26.8	25	78	53	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 DSC 2-27-08

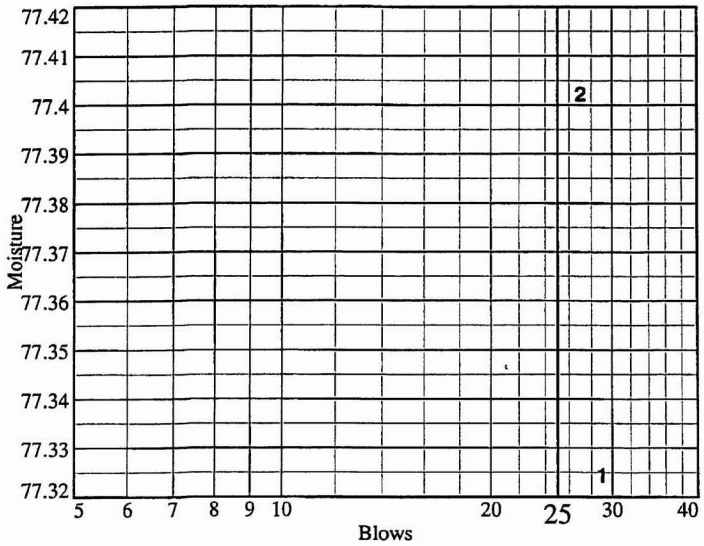
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 29.8-31.3 **Sample Number:** SS-9
Material Description: Light Greenish Gray with Reddish Yellow Fat CLAY
USCS: CH **AASHTO:** A-7-6(59)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	34.49	32.33				
Dry+Tare	26.34	25.00				
Tare	15.80	15.53				
# Blows	29	27				
Moisture	77.3	77.4				



Liquid Limit= 78
Plastic Limit= 25
Plasticity Index= 53
Natural Moisture= 26.8
Liquidity Index= 0.0

Plastic Limit Data

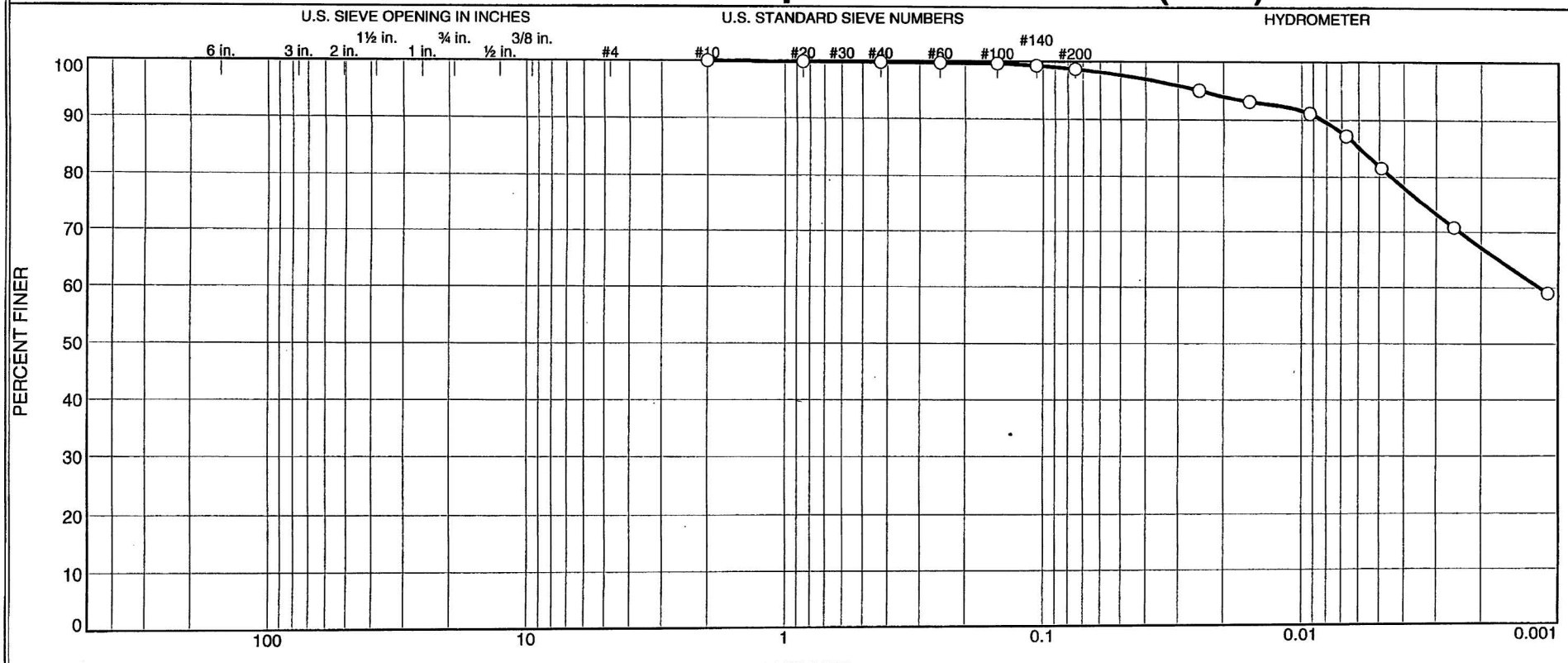
Run No.	1	2	3	4	
Wet+Tare	24.27	22.69			
Dry+Tare	22.52	21.27			
Tare	15.49	15.52			
Moisture	24.9	24.7			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
102.67	82.37	6.56	26.8

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	0.2	1.1	16.7	82.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-10	34.8-36.3	1-3-08	CH	Brownish Yellow Fat CLAY	25.3	70	16

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity = 2.698 (ASTM D854-06)

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 34.8-36.3 **Sample Number:** SS-10
Material Description: Brownish Yellow Fat CLAY
Date: 1-3-08 **Natural Moisture:** 25.3
Liquid Limit: 70 **Plastic Limit:** 16 **USCS Class.:** CH
Testing Remarks: Specific Gravity = 2.698 (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
201.83	0.00	0.00	#10	0.00	100.0
53.22	0.00	0.00	#20	0.08	99.8
			#40	0.10	99.8
			#60	0.16	99.7
			#100	0.19	99.6
			#140	0.39	99.3
			#200	0.71	98.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =53.22
Hygroscopic moisture correction:
Moist weight and tare = 28.63
Dry weight and tare = 28.39
Tare weight = 15.48
Hygroscopic moisture = 1.9%
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 = 2.698
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	55.0	50.1	0.0132	56.0	7.1	0.0248	94.9
5.00	21.8	54.0	49.1	0.0132	55.0	7.3	0.0159	93.0
15.00	21.7	53.0	48.1	0.0132	54.0	7.4	0.0093	91.1
30.00	21.6	51.0	46.1	0.0132	52.0	7.8	0.0067	87.2
60.00	21.6	48.0	43.1	0.0132	49.0	8.3	0.0049	81.6
240.00	22.5	42.0	37.4	0.0130	43.0	9.2	0.0026	70.8
1455.00	22.0	36.0	31.2	0.0131	37.0	10.2	0.0011	59.1

MACTEC, Inc.

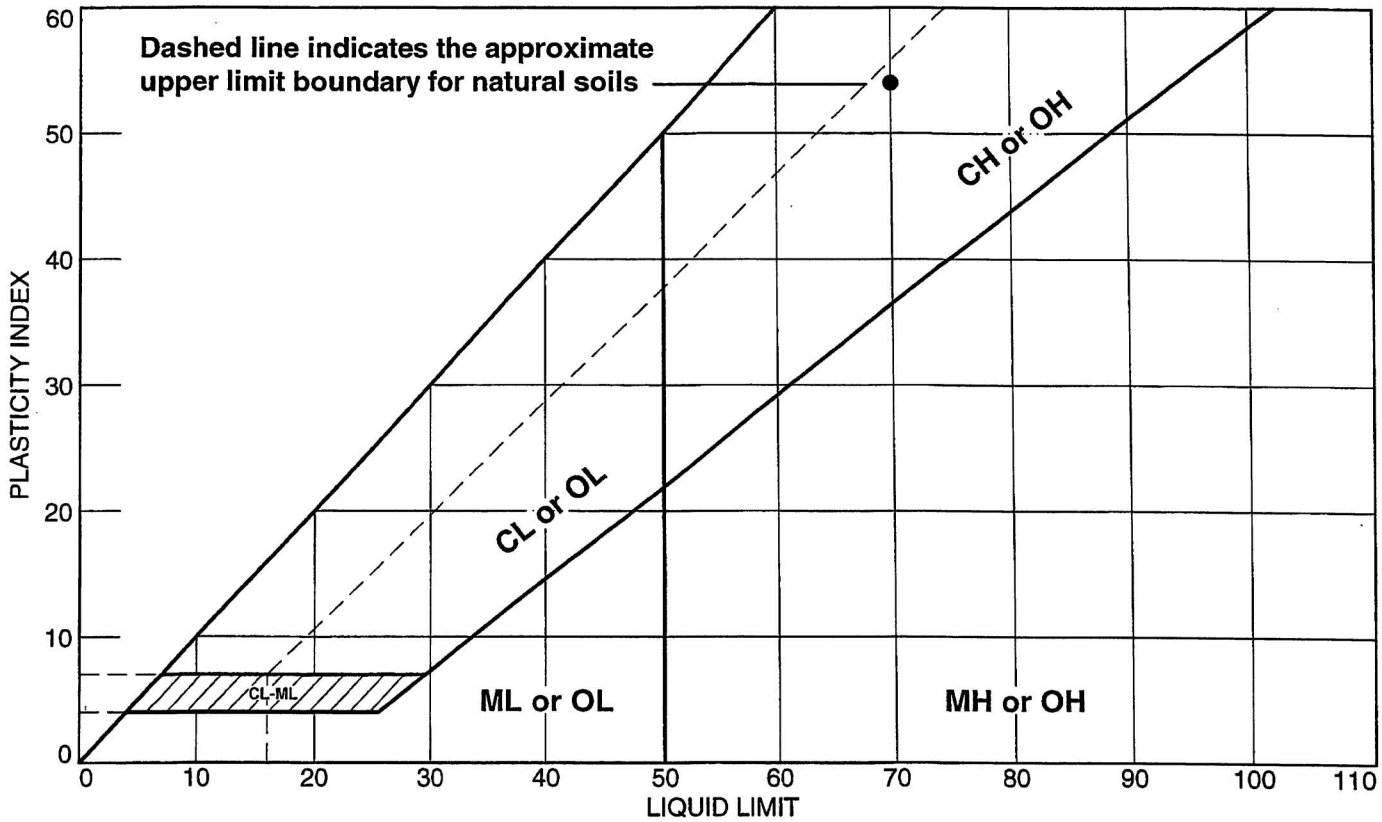
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.2	1.1	1.3	16.7	82.0	98.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0012	0.0045	0.0059	0.0082	0.0251

Fineness Modulus
0.01

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-2359	SS-10	34.8-36.3	25.3	16	70	54	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 DSC 2-27-08

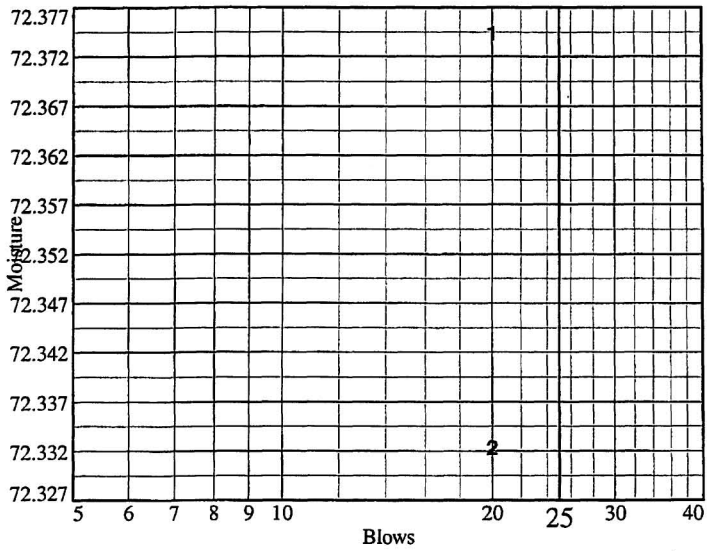
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 34.8-36.3 **Sample Number:** SS-10
Material Description: Brownish Yellow Fat CLAY
USCS: CH **AASHTO:** A-7-6(59)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	30.56	33.69				
Dry+Tare	24.22	26.03				
Tare	15.46	15.44				
# Blows	20	20				
Moisture	72.4	72.3				



Liquid Limit= 70
Plastic Limit= 16
Plasticity Index= 54
Natural Moisture= 25.3
Liquidity Index= 0.2

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	23.21	24.84			
Dry+Tare	22.11	23.56			
Tare	15.28	15.60			
Moisture	16.1	16.1			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
141.57	114.87	9.42	25.3

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: 2/13/08

SAMPLE IDENTIFICATION: B-2359 SS-10

(A) Mass of oven-dried soil, grams:		51.90
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.86
(C) Mass of pycnometer, water and soil, grams:		689.53
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		20.8
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.699
(F)	***Correction factor:***	0.99983
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.698

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-3

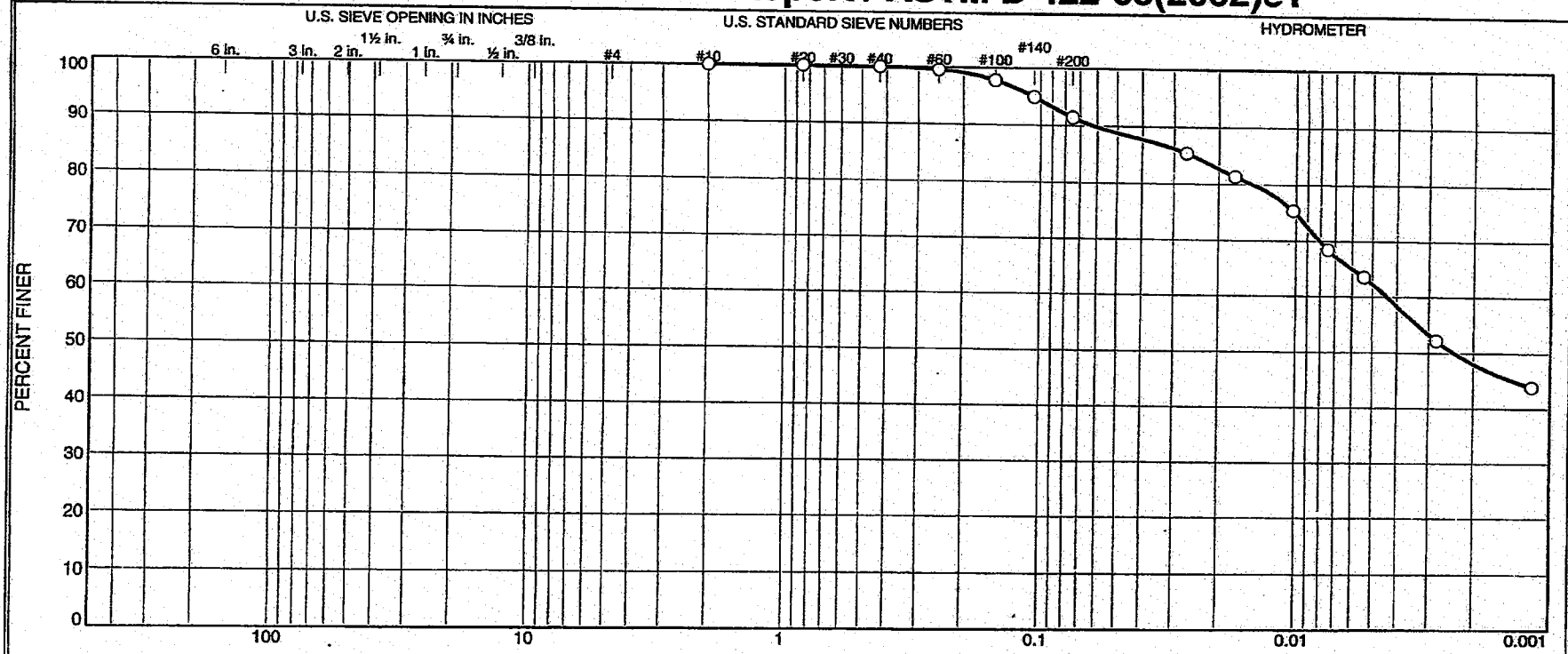
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 2-27-08

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	0.1	8.5	29.1	62.3

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-11	39.8-41.3	1-3-08	CH	Brownish Yellow Fat CLAY	25.3	53	22

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 39.8-41.3 **Sample Number:** SS-11
Material Description: Brownish Yellow Fat CLAY
Date: 1-3-08 **Natural Moisture:** 25.3
Liquid Limit: 53 **Plastic Limit:** 22 **USCS Class.:** CH
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
207.79	0.00	0.00	#10	0.00	100.0
50.59	0.00	0.00	#20	0.01	100.0
			#40	0.05	99.9
			#60	0.23	99.5
			#100	1.15	97.7
			#140	2.60	94.9
			#200	4.35	91.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =50.59
Hygroscopic moisture correction:
Moist weight and tare = 28.38
Dry weight and tare = 28.21
Tare weight = 15.58
Hygroscopic moisture = 1.3%
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 = 2.700
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	21.7	48.0	43.1	0.0132	49.0	8.3	0.0268	85.4
5.00	21.6	46.0	41.1	0.0132	47.0	8.6	0.0173	81.4
15.00	21.6	43.0	38.1	0.0132	44.0	9.1	0.0103	75.4
30.00	21.6	39.5	34.6	0.0132	40.5	9.7	0.0075	68.5
60.00	21.6	37.0	32.1	0.0132	38.0	10.1	0.0054	63.5
240.00	22.4	31.0	26.4	0.0131	32.0	11.0	0.0028	52.2
1444.00	21.9	27.0	22.2	0.0131	28.0	11.7	0.0012	43.9

MACTEC, Inc.

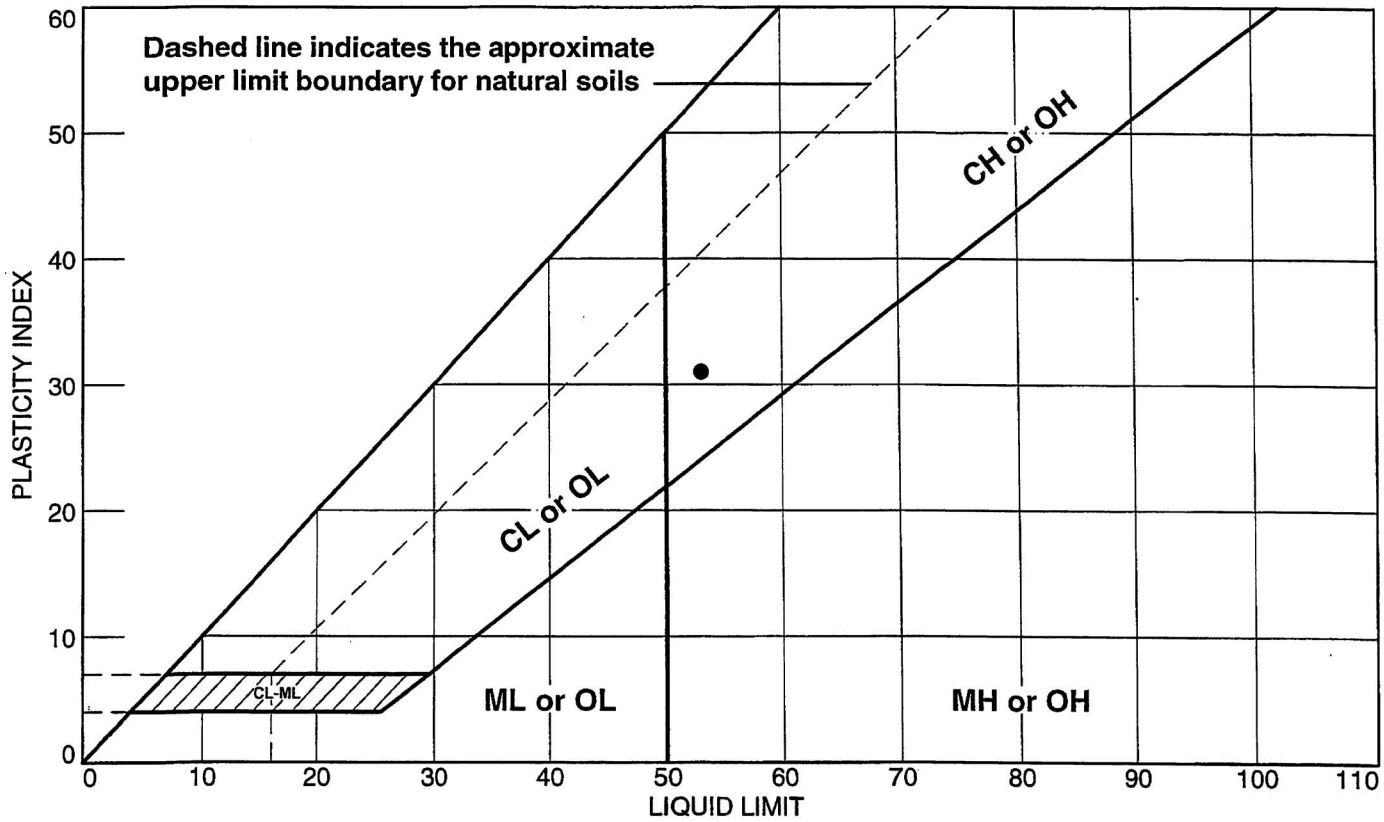
Fractional Components

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	8.5	8.6	29.1	62.3	91.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0024	0.0044	0.0147	0.0255	0.0621	0.1075

Fineness Modulus
0.03

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-2359	SS-11	39.8-41.3	25.3	22	53	31	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 DSC 2-27-08

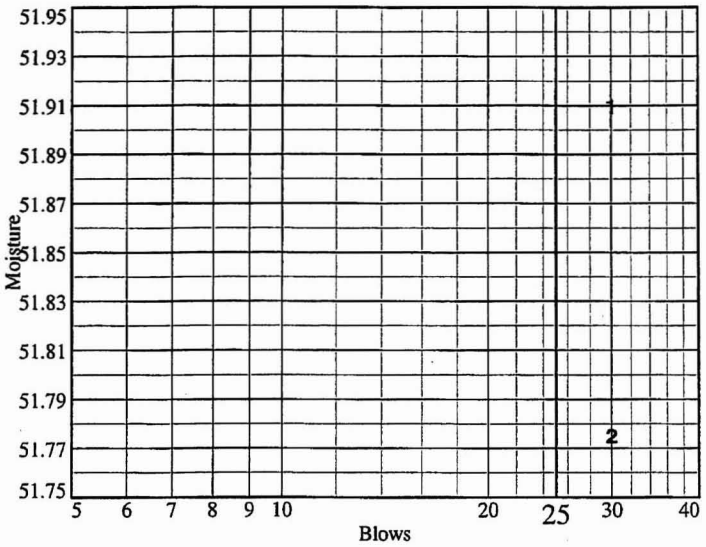
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 39.8-41.3 **Sample Number:** SS-11
Material Description: Brownish Yellow Fat CLAY
USCS: CH **AASHTO:** A-7-6(31)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	33.04	35.94				
Dry+Tare	27.06	28.94				
Tare	15.54	15.42				
# Blows	30	30				
Moisture	51.9	51.8				



Liquid Limit= 53
Plastic Limit= 22
Plasticity Index= 31
Natural Moisture= 25.3
Liquidity Index= 0.1

Plastic Limit Data

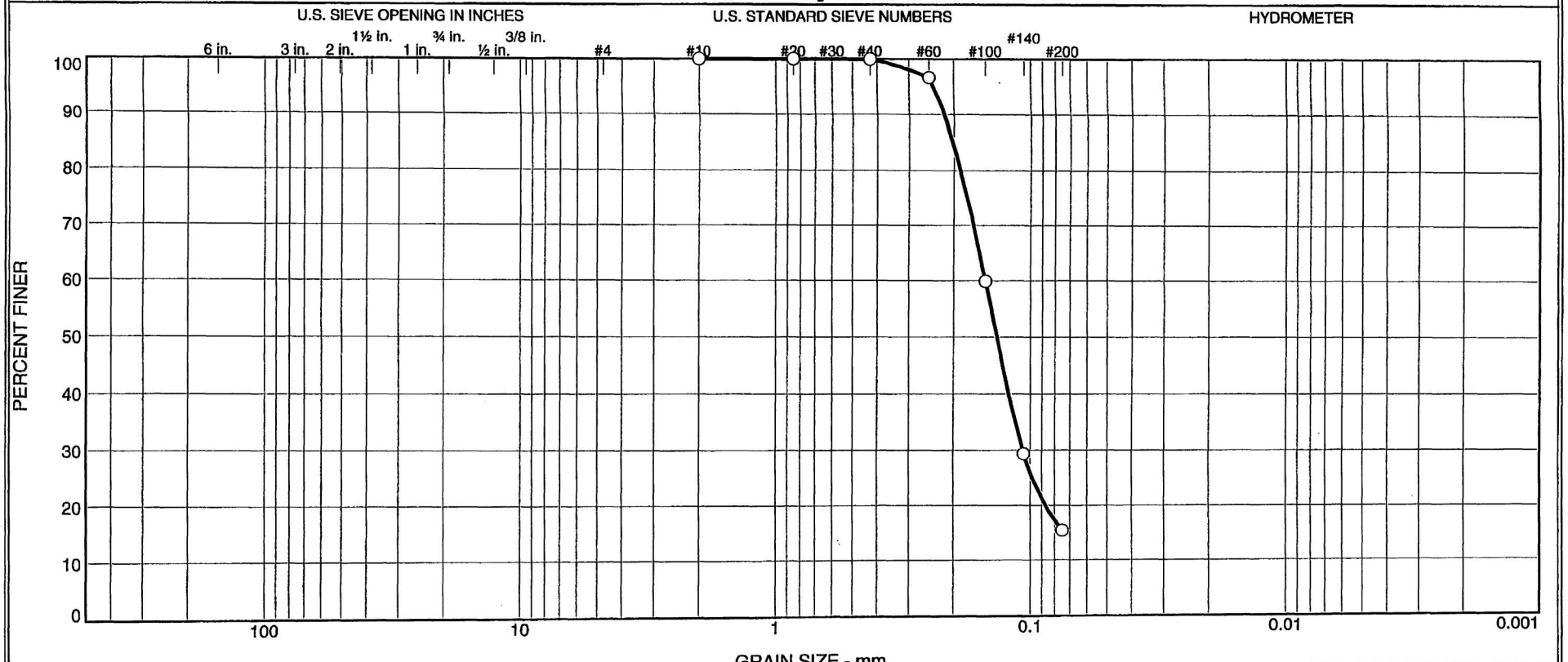
Run No.	1	2	3	4	
Wet+Tare	22.60	23.75			
Dry+Tare	21.32	22.30			
Tare	15.48	15.54			
Moisture	21.9	21.4			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
105.63	85.70	6.87	25.3

MACTEC, Inc.

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	0.0	84.5	15.5	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-12	44.8-46.3	1-3-08	SM	Olive Yellow Silty SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined
Specific Gravity = 2.656 (ASTM D854-06)

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 44.8-46.3 **Sample Number:** SS-12
Material Description: Olive Yellow Silty SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SM
Testing Remarks: SIEVE ANALYSIS ONLY
ND = Not Determined
Specific Gravity = 2.656 (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
211.09	0.00	0.00	#10	0.00	100.0
102.05	0.00	0.00	#20	0.01	100.0
			#40	0.04	100.0
			#60	3.47	96.6
			#100	40.89	59.9
			#140	72.06	29.4
			#200	86.23	15.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =
Hygroscopic moisture correction:
Moist weight and tare = 29.15
Dry weight and tare = 28.92
Tare weight = 15.74
Hygroscopic moisture = 1.7%
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 = 2.700
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

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	0.0	84.5	84.5			15.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0872	0.1070	0.1353	0.1501	0.1886	0.2018	0.2181	0.2402

Fineness Modulus
0.42

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: 2/13/08

SAMPLE IDENTIFICATION: B-2359 SS-12

(A) Mass of oven-dried soil, grams:		74.83
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.68
(C) Mass of pycnometer, water and soil, grams:		702.35
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.9
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.657
(F)	***Correction factor:***	0.99959
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.656

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

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

REMARKS: Estimated % Passing # 4 : 100

Silty SAND (SM) - Visual

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER :5.1.01

PYCNOMETER : P-3

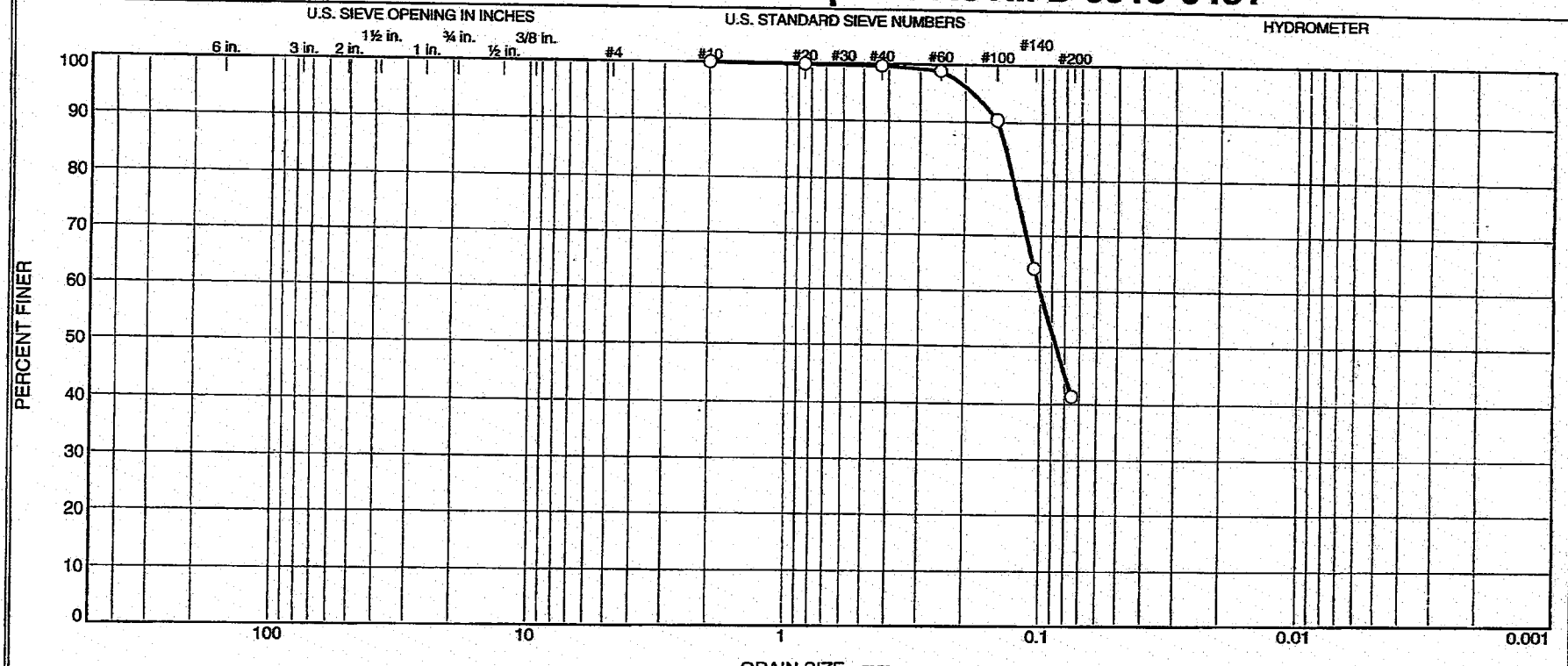
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 2-27-08

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	0.4	58.2	41.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-13	49.8-51.3	1-3-08	SC	Light Gray Clayey SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure N/A

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 49.8-51.3 **Sample Number:** SS-13
Material Description: Light Gray Clayey SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
192.20	0.00	0.00	#10	0.00	100.0
105.44	0.00	0.00	#20	0.18	99.8
			#40	0.41	99.6
			#60	1.24	98.8
			#100	10.09	90.4
			#140	37.83	64.1
			#200	61.78	41.4

Fractional Components

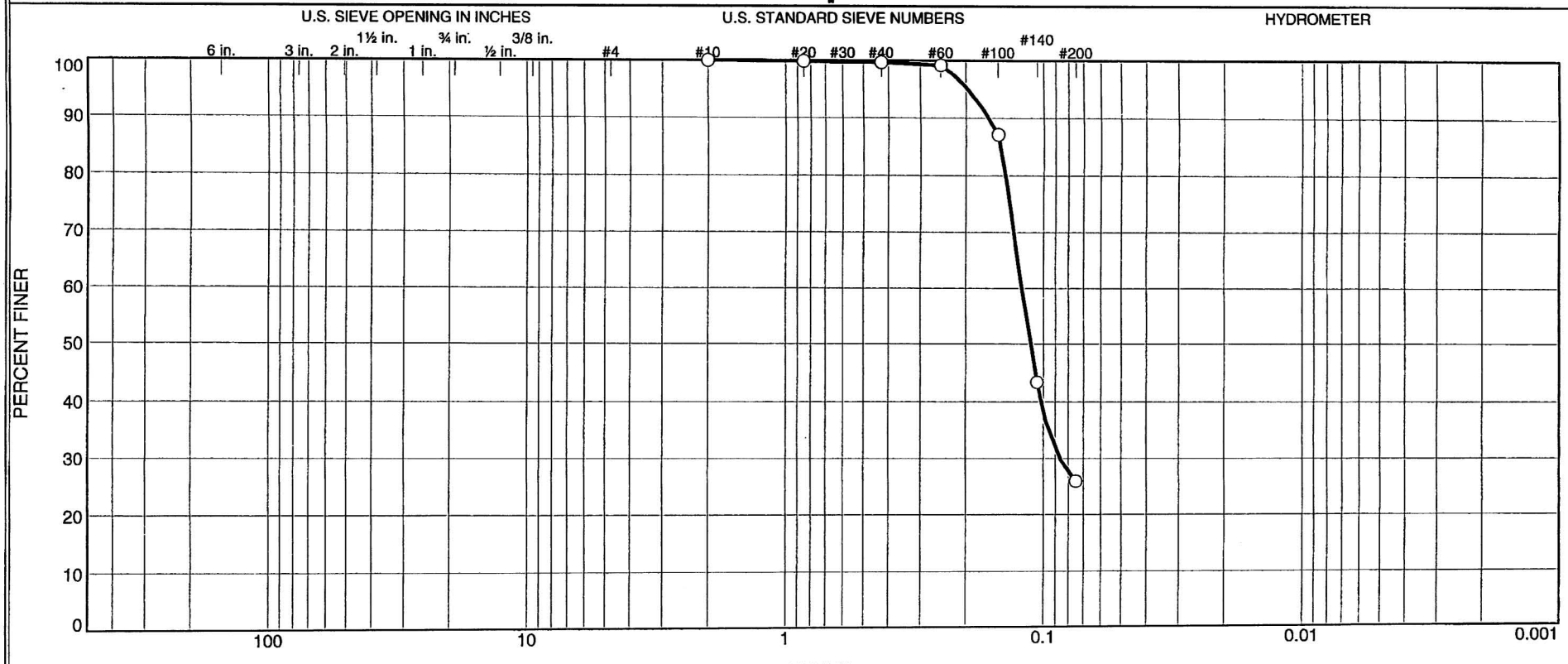
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.4	58.2	58.6			41.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0864	0.1003	0.1289	0.1377	0.1488	0.1873

Fineness Modulus
0.11

MACTEC, Inc.

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	0.3	73.8	25.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-14	54.8-56.3	1-3-08	SC	Brownish Yellow Clayey SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 54.8-56.3 **Sample Number:** SS-14
Material Description: Brownish Yellow Clayey SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
137.36	0.00	0.00	#10	0.00	100.0
101.11	0.00	0.00	#20	0.14	99.9
			#40	0.34	99.7
			#60	0.85	99.2
			#100	12.94	87.2
			#140	57.15	43.5
			#200	74.91	25.9

Fractional Components

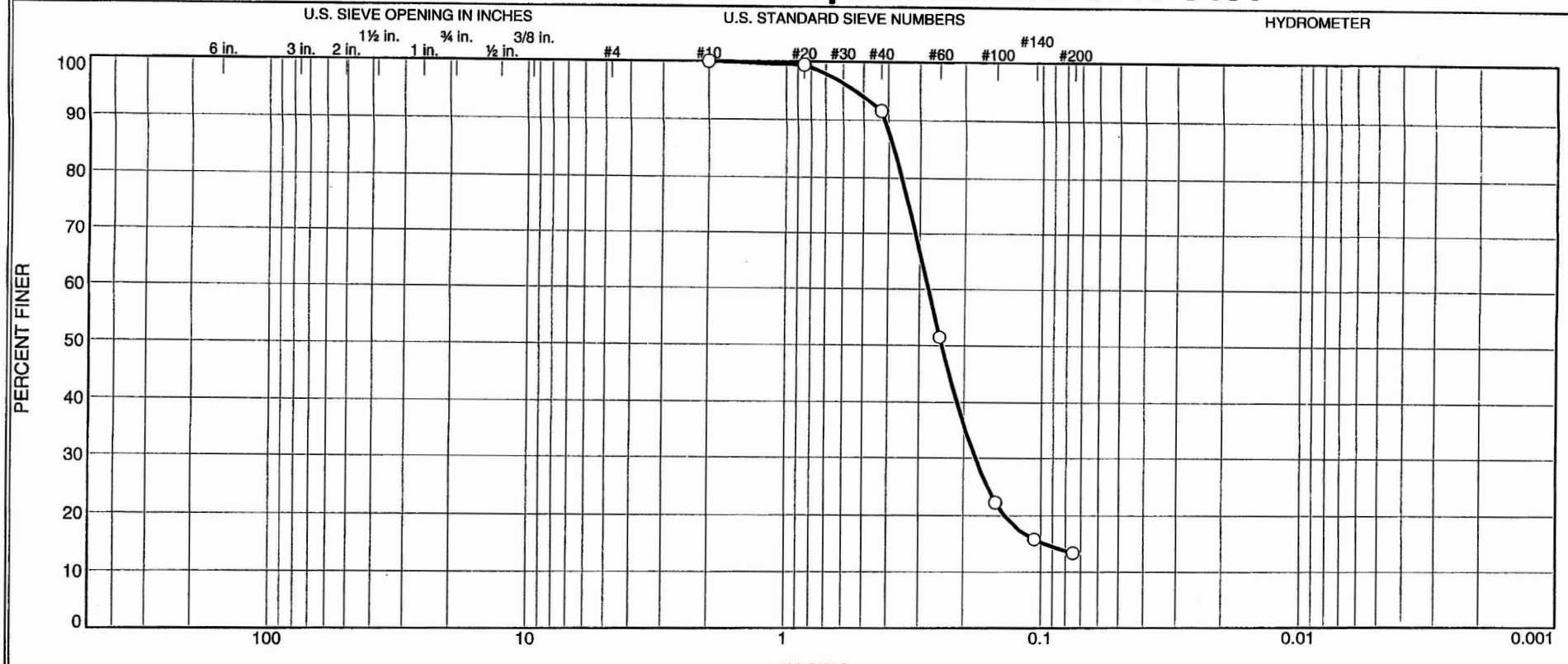
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.3	73.8	74.1			25.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0862	0.1123	0.1212	0.1406	0.1468	0.1635	0.1972

Fineness Modulus
0.14

MACTEC, Inc.

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	8.4	78.2	13.4	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-15A	59.8-60.7	1-3-08	SC	Pale Yellow Clayey SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 59.8-60.7 **Sample Number:** SS-15A
Material Description: Pale Yellow Clayey SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
289.44	0.00	0.00	#10	0.00	100.0
103.17	0.00	0.00	#20	0.53	99.5
			#40	8.68	91.6
			#60	49.99	51.5
			#100	80.18	22.3
			#140	86.84	15.8
			#200	89.36	13.4

Fractional Components

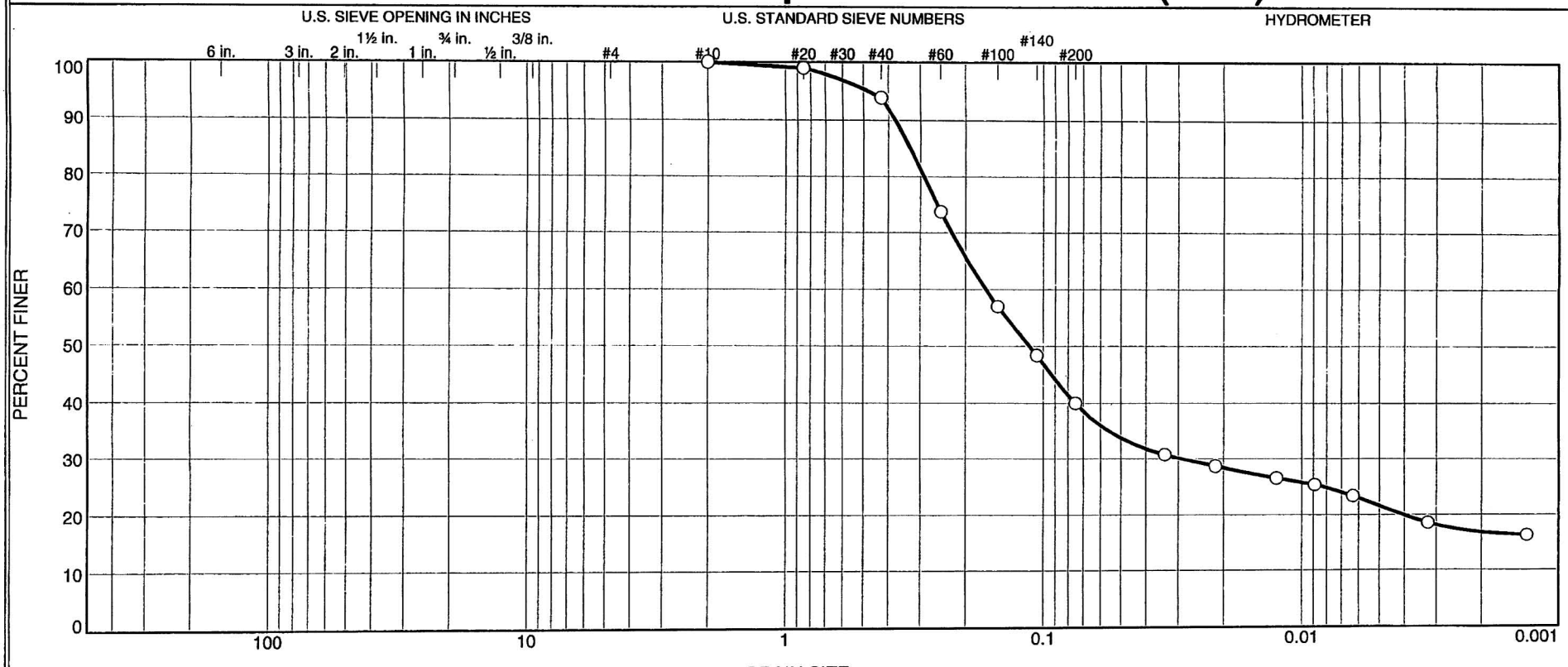
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	8.4	78.2	86.6			13.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0963	0.1384	0.1801	0.2451	0.2773	0.3545	0.3802	0.4124	0.5369

Fineness Modulus
1.15

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	6.1	53.9	18.4	21.6

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-16	64.8-66.3	1-3-08	SC	Olive Yellow Clayey SAND	22.8	23	13

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity = 2.659 (ASTM D854-06)

Tested By: CS **Checked By:** LBJ DSC 4-1-08

GRAIN SIZE DISTRIBUTION TEST DATA

4/1/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 64.8-66.3 **Sample Number:** SS-16
Material Description: Olive Yellow Clayey SAND
Date: 1-3-08 **Natural Moisture:** 22.8
Liquid Limit: 23 **Plastic Limit:** 13 **USCS Class.:** SC
Testing Remarks: Specific Gravity = 2.659 (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
251.34	0.00	0.00	#10	0.00	100.0
48.49	0.00	0.00	#20	0.50	99.0
			#40	2.97	93.9
			#60	12.70	73.8
			#100	20.84	57.0
			#140	25.02	48.4
			#200	29.10	40.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =48.49
Hygroscopic moisture correction:
Moist weight and tare = 29.60
Dry weight and tare = 29.31
Tare weight = 15.64
Hygroscopic moisture = 2.1%
Table of composite correction values:

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

Meniscus correction only = 1.0
Specific gravity of solids = 2.659
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	19.5	14.6	0.0133	20.5	12.9	0.0338	30.8
5.00	21.9	18.5	13.7	0.0133	19.5	13.1	0.0215	28.7
15.00	21.9	17.5	12.7	0.0133	18.5	13.3	0.0125	26.6
30.00	21.7	17.0	12.1	0.0133	18.0	13.3	0.0089	25.4
60.00	21.8	16.0	11.1	0.0133	17.0	13.5	0.0063	23.4
240.00	20.9	14.0	8.8	0.0135	15.0	13.8	0.0032	18.5
1440.00	20.7	13.0	7.8	0.0135	14.0	14.0	0.0013	16.3

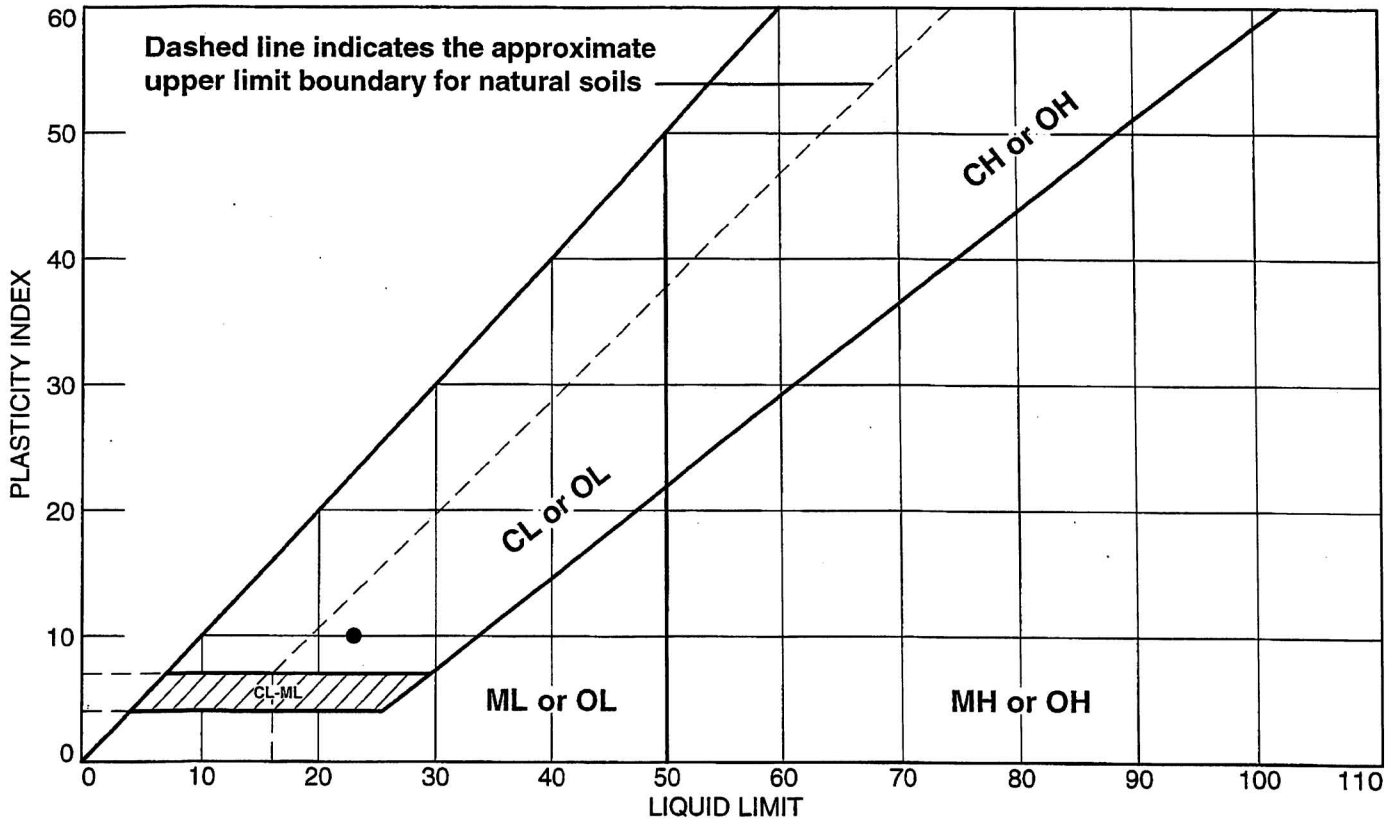
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	6.1	53.9	60.0	18.4	21.6	40.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0040	0.0290	0.1131	0.1669	0.2904	0.3278	0.3743	0.4776

Fineness Modulus
0.65

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-2359	SS-16	64.8-66.3	22.8	13	23	10	SC

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 4-1-08

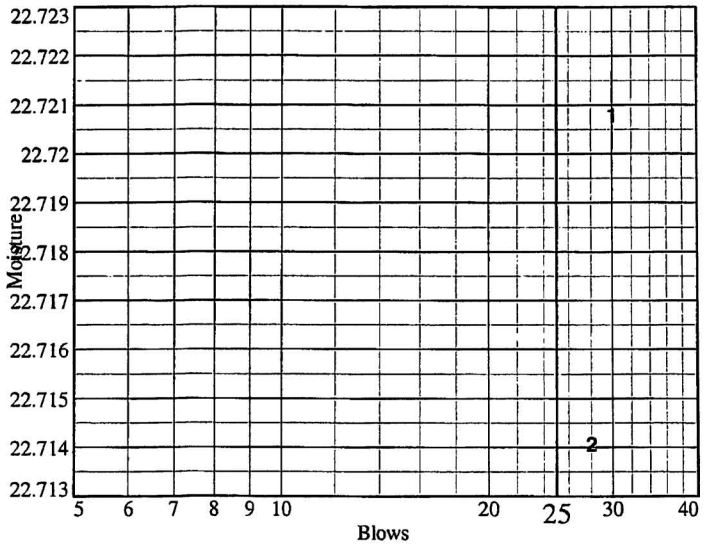
LIQUID AND PLASTIC LIMIT TEST DATA

4/1/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 64.8-66.3 **Sample Number:** SS-16
Material Description: Olive Yellow Clayey SAND
USCS: SC **AASHTO:** A-4(1)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	32.71	32.40				
Dry+Tare	29.52	29.27				
Tare	15.48	15.49				
# Blows	30	28				
Moisture	22.7	22.7				



Liquid Limit= 23
Plastic Limit= 13
Plasticity Index= 10
Natural Moisture= 22.8
Liquidity Index= 1.0

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	24.89	23.79			
Dry+Tare	23.76	22.87			
Tare	15.45	15.64			
Moisture	13.6	12.7			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
146.54	120.57	6.67	22.8

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: 2/12/08

SAMPLE IDENTIFICATION: B-2359 SS-16

(A) Mass of oven-dried soil, grams:		73.13
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.83
(C) Mass of pycnometer, water and soil, grams:		702.46
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.0
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.659
(F)	***Correction factor:***	0.99957
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.659

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

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

REMARKS: Estimated % Passing # 4 : 100
Clayey SAND (SC)

EQUIPMENT USED
SCALES : 3.1.99
OVEN : 5.1.16
THERMOMETER :5.1.01
PYCNOMETER : P-6

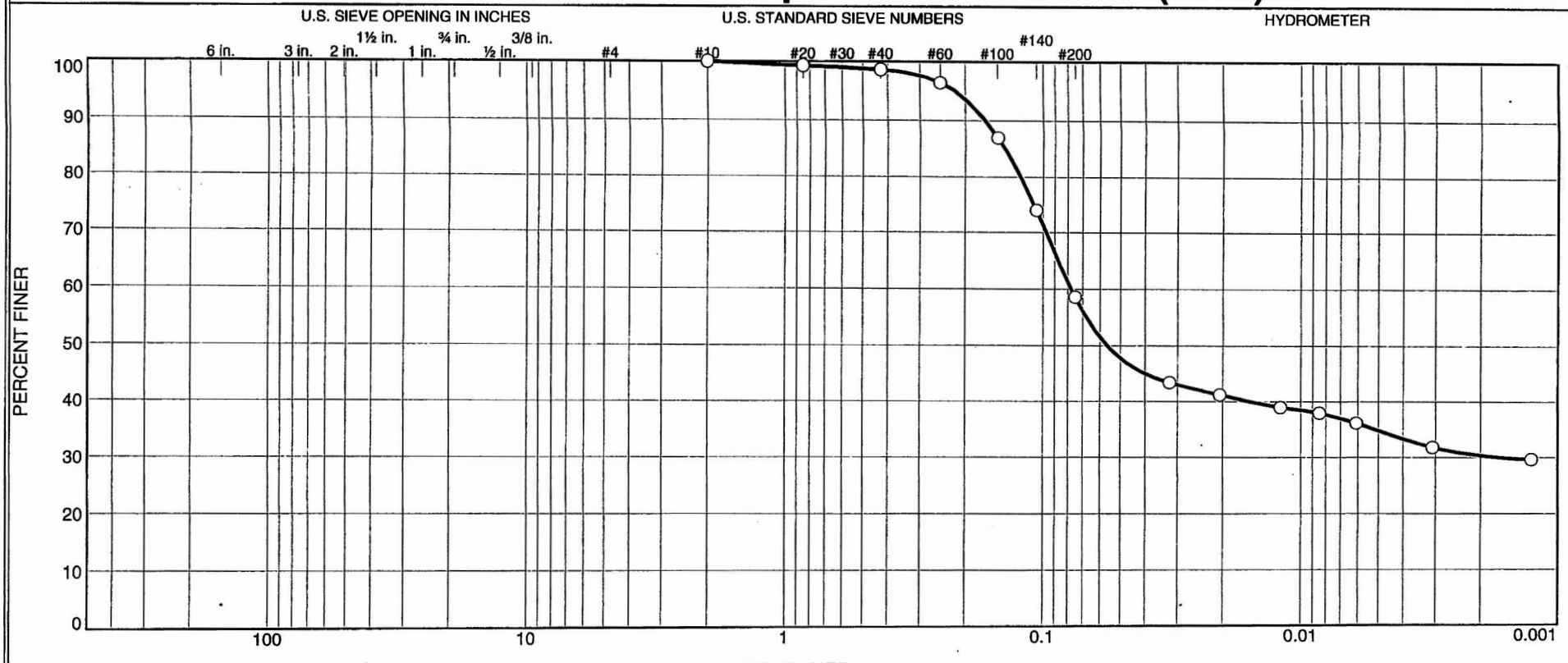
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 2-27-08

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



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.4	40.1	23.7	34.8

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-17	69.8-71.3	1-3-08	CL	Greenish Gray Sandy Lean CLAY	15.8	37	15

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure N4

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity is assumed

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 69.8-71.3 **Sample Number:** SS-17
Material Description: Greenish Gray Sandy Lean CLAY
Date: 1-3-08 **Natural Moisture:** 15.8
Liquid Limit: 37 **Plastic Limit:** 15 **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
210.88	0.00	0.00	#10	0.00	100.0
47.56	0.00	0.00	#20	0.34	99.3
			#40	0.65	98.6
			#60	1.71	96.4
			#100	6.13	87.1
			#140	12.33	74.1
			#200	19.72	58.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =47.56
Hygroscopic moisture correction:
Moist weight and tare = 28.12
Dry weight and tare = 27.68
Tare weight = 15.28
Hygroscopic moisture = 3.5%
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 = 2.700
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	21.9	25.0	20.2	0.0131	26.0	12.0	0.0322	43.4
5.00	21.8	24.0	19.1	0.0131	25.0	12.2	0.0205	41.2
15.00	21.7	23.0	18.1	0.0132	24.0	12.4	0.0119	39.0
30.00	21.8	22.5	17.6	0.0131	23.5	12.4	0.0085	38.0
60.00	20.8	22.0	16.8	0.0133	23.0	12.5	0.0061	36.1
240.00	20.8	20.0	14.8	0.0133	21.0	12.9	0.0031	31.8
1440.00	20.8	19.0	13.8	0.0133	20.0	13.0	0.0013	29.7

MACTEC, Inc.

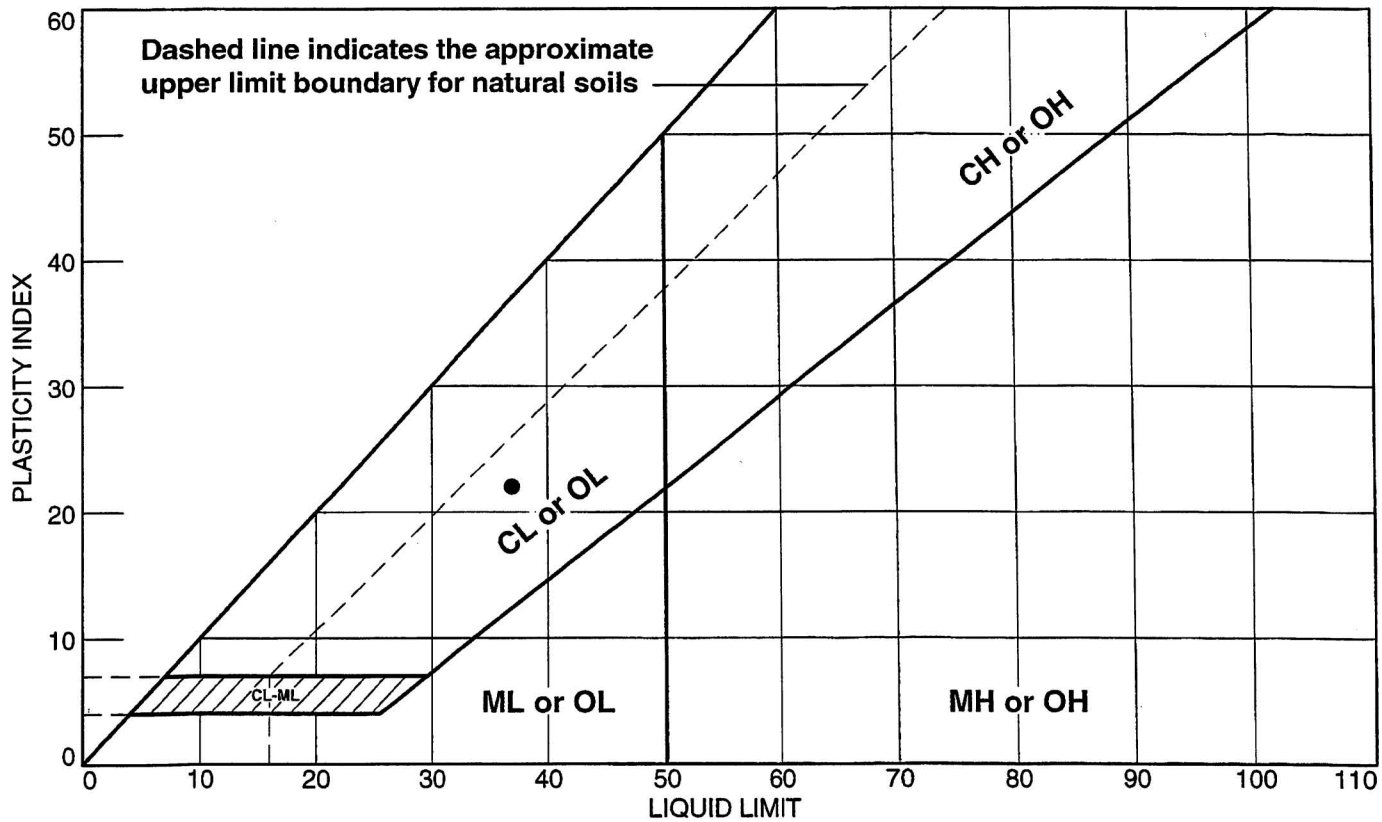
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.4	40.1	41.5	23.7	34.8	58.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0016	0.0562	0.0778	0.1220	0.1402	0.1672	0.2201

Fineness Modulus
0.17

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-2359	SS-17	69.8-71.3	15.8	15	37	22	CL

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 2-27-08

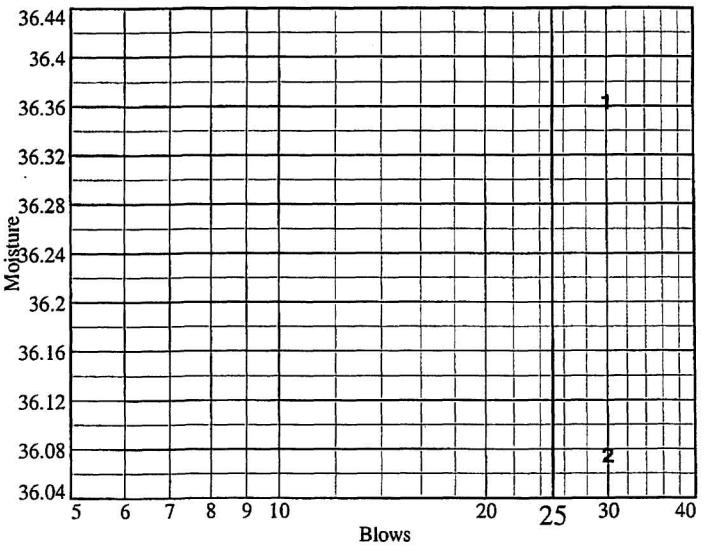
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 69.8-71.3 **Sample Number:** SS-17
Material Description: Greenish Gray Sandy Lean CLAY
USCS: CL **AASHTO:** A-6(9)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	28.87	31.34				
Dry+Tare	25.31	27.13				
Tare	15.52	15.46				
# Blows	30	30				
Moisture	36.4	36.1				



Liquid Limit= 37
Plastic Limit= 15
Plasticity Index= 22
Natural Moisture= 15.8
Liquidity Index= 0.0

Plastic Limit Data

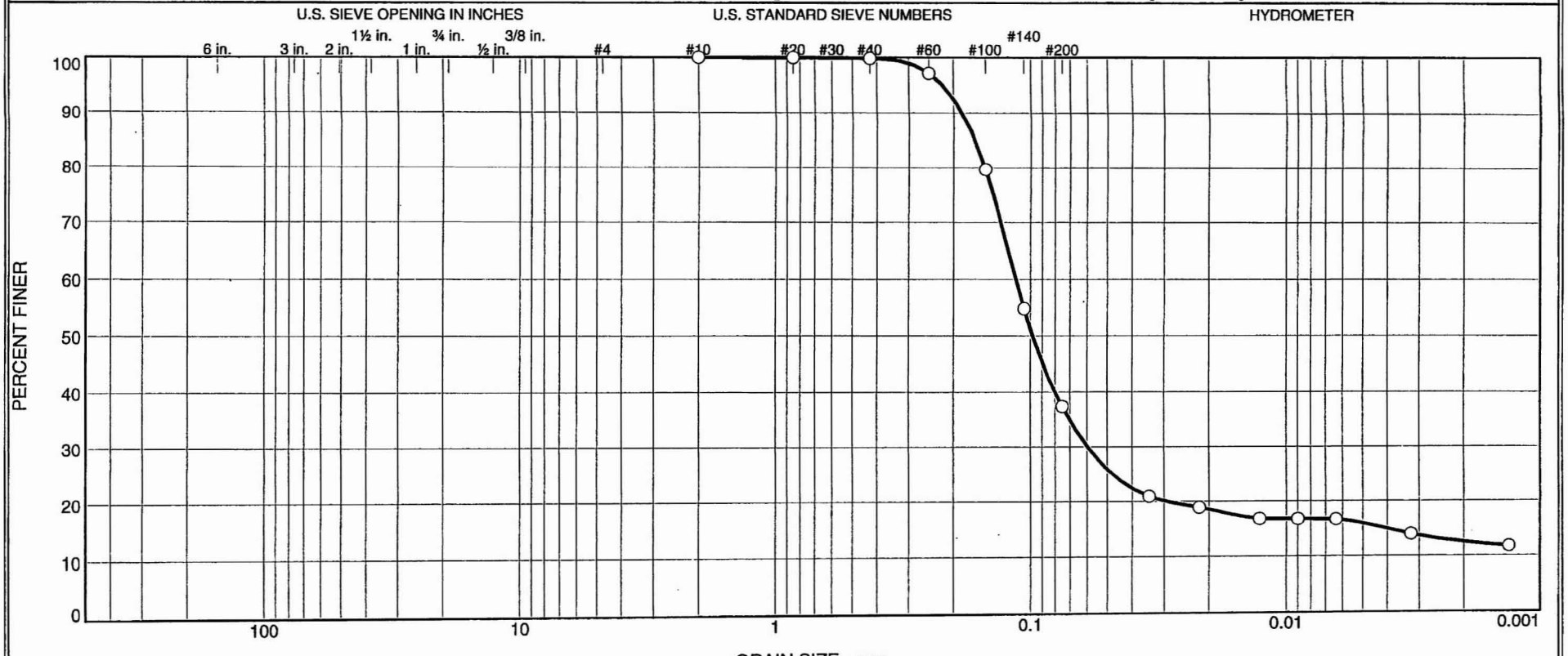
Run No.	1	2	3	4	
Wet+Tare	23.52	24.37			
Dry+Tare	22.50	23.25			
Tare	15.46	15.54			
Moisture	14.5	14.5			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
155.24	134.95	6.53	15.8

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	0.2	62.4	21.4	16.0

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-18A	74.8-76.1	1-3-08	SC-SM	Light Olive Gray Silty, Clayey SAND	18.3	24	19

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 74.8-76.1 **Sample Number:** SS-18A
Material Description: Light Olive Gray Silty, Clayey SAND
Date: 1-3-08 **Natural Moisture:** 18.3
Liquid Limit: 24 **Plastic Limit:** 19 **USCS Class.:** SC-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
240.03	0.00	0.00	#10	0.00	100.0
49.06	0.00	0.00	#20	0.03	99.9
			#40	0.09	99.8
			#60	1.40	97.1
			#100	9.98	79.7
			#140	22.16	54.8
			#200	30.73	37.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =49.06
Hygroscopic moisture correction:
Moist weight and tare = 28.44
Dry weight and tare = 28.23
Tare weight = 15.39
Hygroscopic moisture = 1.6%
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 = 2.700
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	22.0	15.0	10.2	0.0131	16.0	13.7	0.0343	20.9
5.00	22.0	14.0	9.2	0.0131	15.0	13.8	0.0218	18.9
15.00	22.0	13.0	8.2	0.0131	14.0	14.0	0.0127	16.8
30.00	21.9	13.0	8.2	0.0131	14.0	14.0	0.0090	16.8
60.00	21.8	13.0	8.1	0.0131	14.0	14.0	0.0064	16.7
240.00	20.9	12.0	6.8	0.0133	13.0	14.2	0.0032	14.0
1440.00	20.7	11.0	5.8	0.0133	12.0	14.3	0.0013	11.8

MACTEC, Inc.

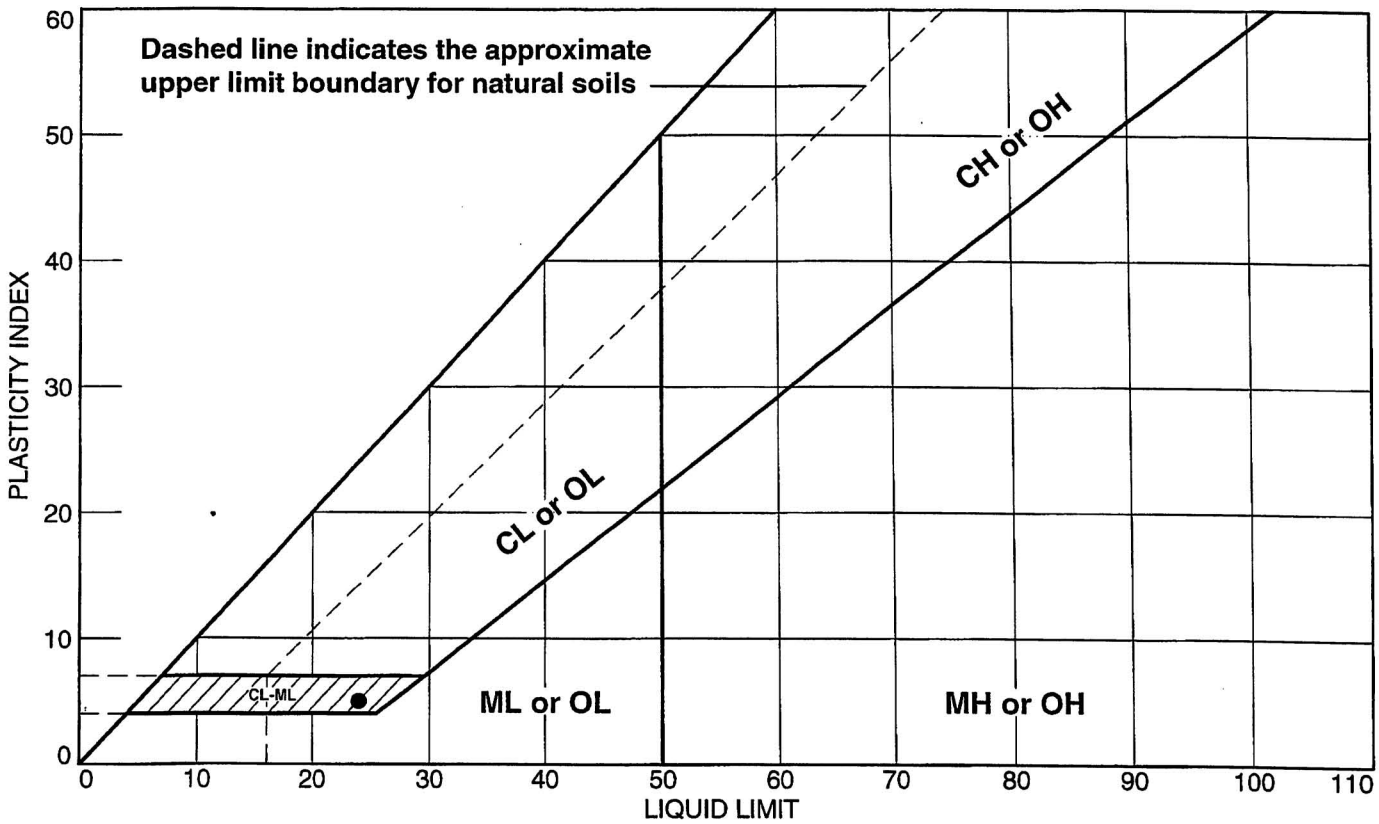
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.2	62.4	62.6	21.4	16.0	37.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0040	0.0295	0.0597	0.0981	0.1141	0.1508	0.1651	0.1856	0.2211

Fineness Modulus
0.22

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-2359	SS-18A	74.8-76.1	18.3	19	24	5	SC-SM

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 2-27-08

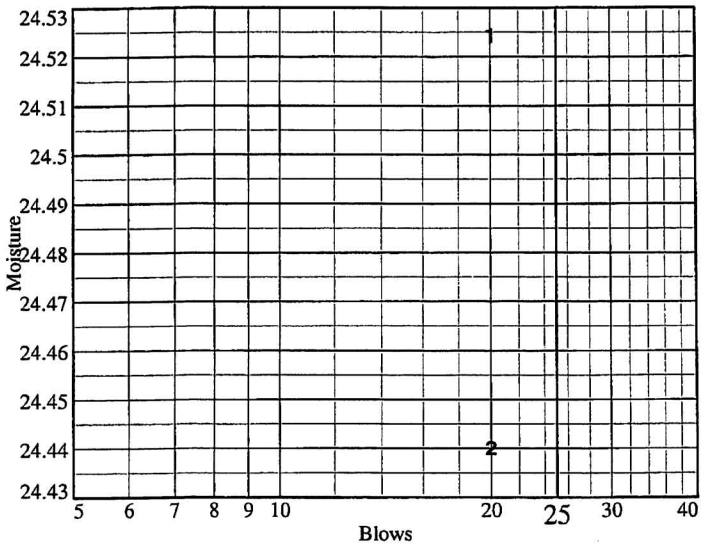
LIQUID AND PLASTIC LIMIT TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 74.8-76.1 **Sample Number:** SS-18A
Material Description: Light Olive Gray Silty, Clayey SAND
USCS: SC-SM **AASHTO:** A-4(0)
Tested by: CS **Checked by:** LBJ

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	33.93	34.93				
Dry+Tare	30.32	31.11				
Tare	15.60	15.48				
# Blows	20	20				
Moisture	24.5	24.4				



Liquid Limit= 24
Plastic Limit= 19
Plasticity Index= 5
Natural Moisture= 18.3
Liquidity Index= -0.1

Plastic Limit Data

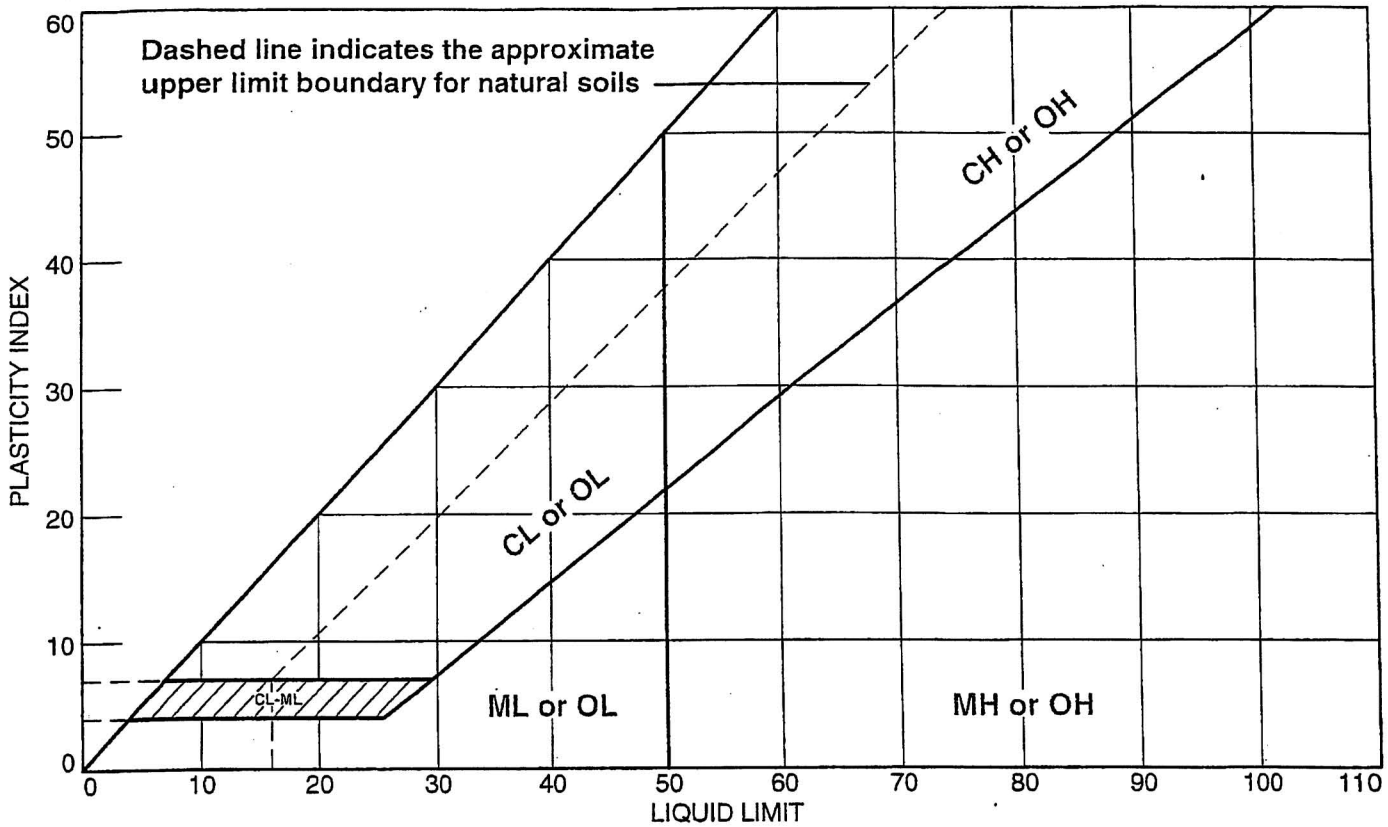
Run No.	1	2	3	4	
Wet+Tare	23.22	24.96			
Dry+Tare	22.08	23.45			
Tare	15.75	15.52			
Moisture	18.0	19.0			

Natural Moisture Data

Wet+Tare	Dry+Tare	Tare	Moisture
101.24	86.60	6.67	18.3

MACTEC, Inc.

LIQUID AND PLASTIC LIMITS TEST REPORT ASTM D4318 (05)



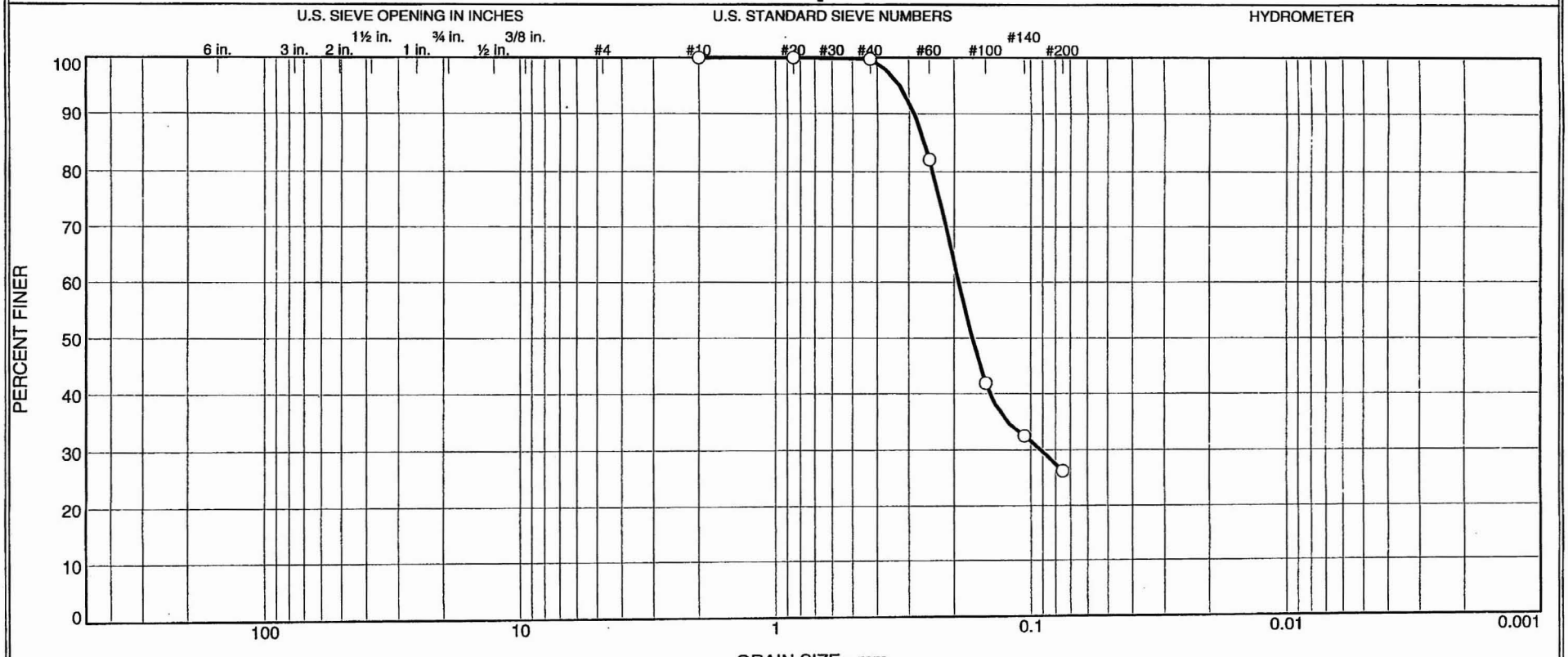
SOIL DATA

	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Boring B-2359	SS-18B	76.1-76.3	27.3	ND	ND	ND	ND

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 2-27-08

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	0.3	73.4	26.3	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-19	79.8-81.3	1-3-08	SC	Pale Brown Clayey SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 79.8-81.3 **Sample Number:** SS-19
Material Description: Pale Brown Clayey SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
282.93	0.00	0.00	#10	0.00	100.0
99.29	0.00	0.00	#20	0.02	100.0
			#40	0.25	99.7
			#60	17.76	82.1
			#100	57.74	41.8
			#140	67.02	32.5
			#200	73.15	26.3

Fractional Components

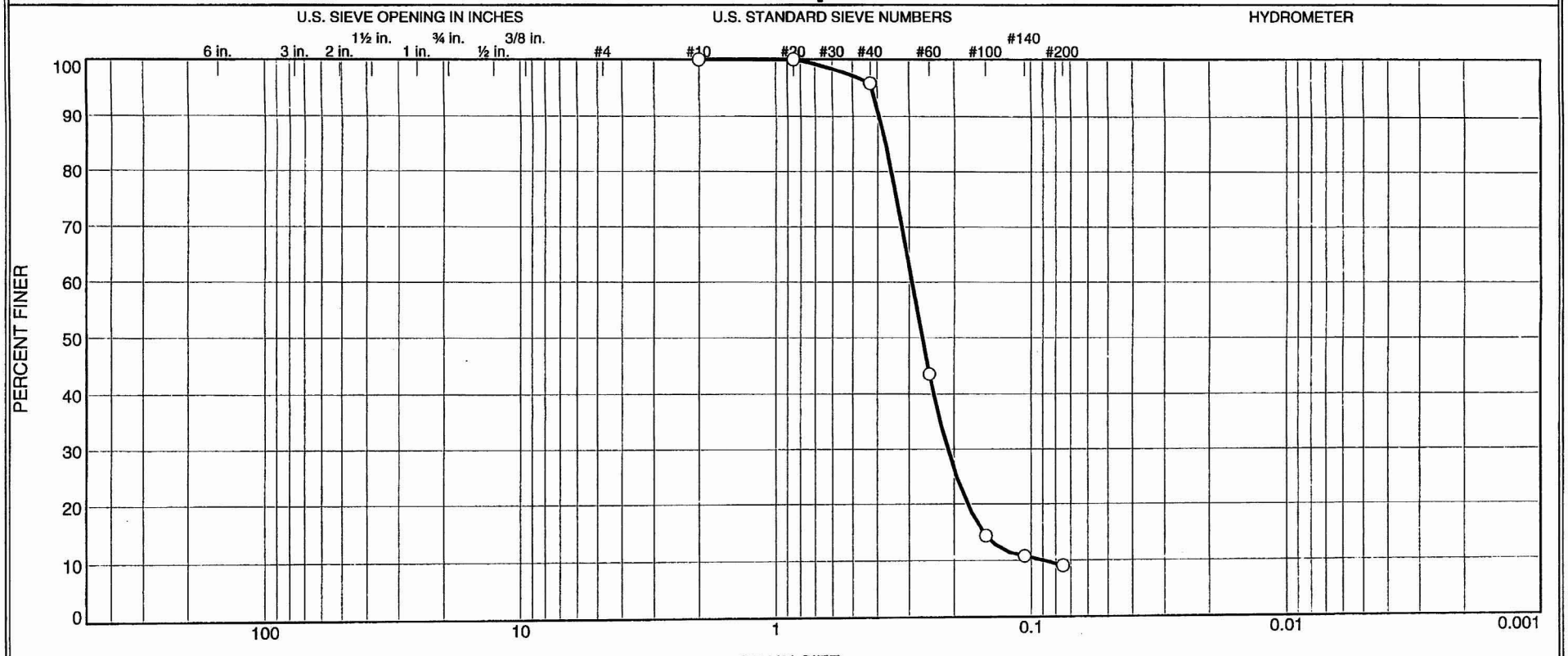
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.3	73.4	73.7			26.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0913	0.1697	0.1915	0.2427	0.2614	0.2869	0.3275

Fineness Modulus
0.66

MACTEC, Inc.

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	4.2	86.7	9.1	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-20	84.8-86.3	1-3-08	SP-SC	Pale Yellow Poorly Graded SAND with clay (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

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 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 84.8-86.3 **Sample Number:** SS-20
Material Description: Pale Yellow Poorly Graded SAND with clay (Visual)
Date: 1-3-08 **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
235.66	0.00	0.00	#10	0.00	100.0
99.15	0.00	0.00	#20	0.00	100.0
			#40	4.16	95.8
			#60	55.98	43.5
			#100	84.82	14.5
			#140	88.47	10.8
			#200	90.13	9.1

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	4.2	86.7	90.9			9.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0898	0.1533	0.1770	0.2116	0.2669	0.2930	0.3528	0.3714	0.3929	0.4198

Fineness Modulus	C_u	C_c
1.25	3.26	1.70

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: 2/06/08

SAMPLE IDENTIFICATION: B-2359 SS-20

(A) Mass of oven-dried soil, grams:		76.03
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.67
(C) Mass of pycnometer, water and soil, grams:		703.08
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		22.0
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.657
(F)	***Correction factor:***	0.99957
(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-3

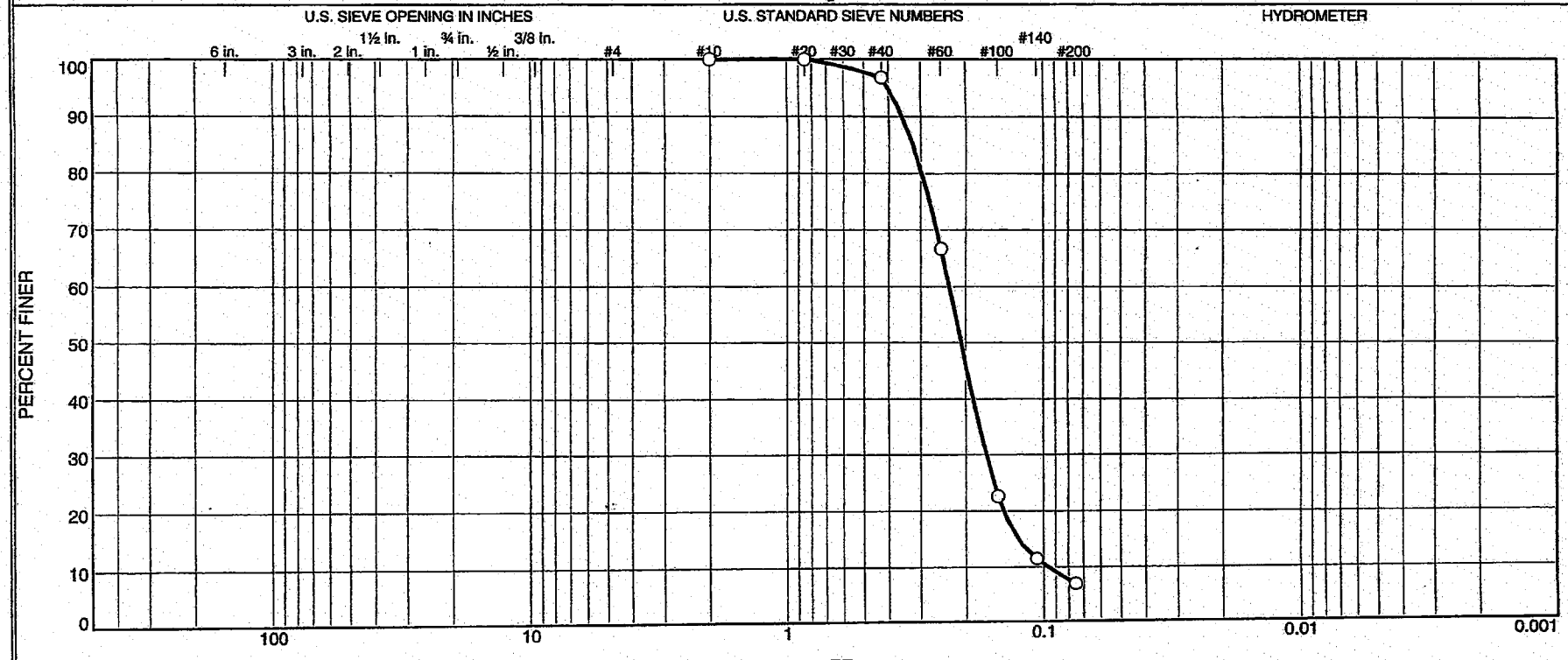
TESTED BY: CS

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

REVIEWED BY: **Brian Johnson**

DSC 2-27-08

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	3.2	89.8	7.0	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Boring B-2359	SS-21	89.8-91.3	1-3-08	SP-SC	Light Yellowish Brown Poorly Graded SAND with clay (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

O SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/27/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 89.8-91.3 **Sample Number:** SS-21
Material Description: Light Yellowish Brown Poorly Graded SAND with clay (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SP-SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
239.58	0.00	0.00	#10	0.00	100.0
102.67	0.00	0.00	#20	0.03	100.0
			#40	3.30	96.8
			#60	34.12	66.8
			#100	79.45	22.6
			#140	90.82	11.5
			#200	95.49	7.0

Fractional Components

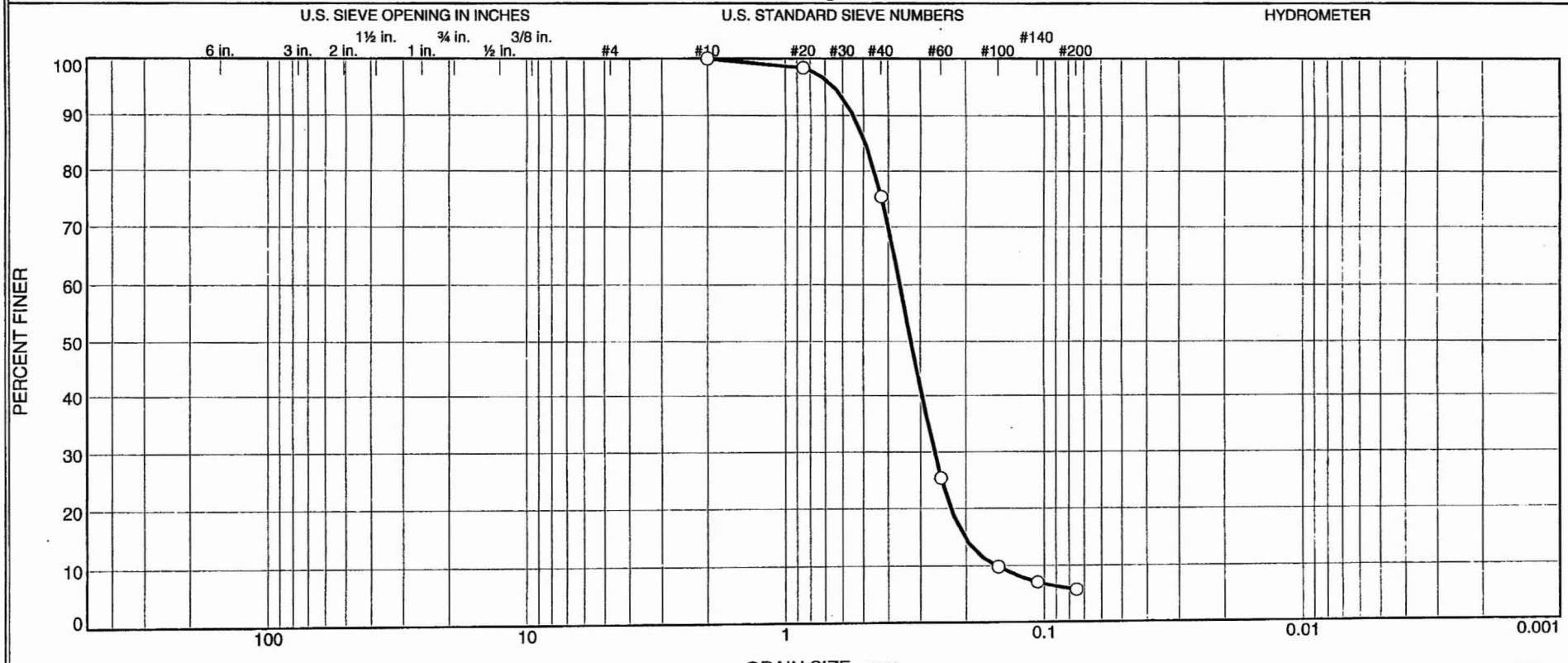
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	3.2	89.8	93.0			7.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0956	0.1251	0.1429	0.1669	0.2086	0.2318	0.2974	0.3223	0.3545	0.4010

Fineness Modulus	C_u	C_c
0.98	2.42	1.26

MACTEC, Inc.

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	24.6	69.8	5.6	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-22	94.8-96.3	1-3-08	SP-SC	Light Yellowish Brown Poorly Graded SAND with clay (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 94.8-96.3 **Sample Number:** SS-22
Material Description: Light Yellowish Brown Poorly Graded SAND with clay (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SP-SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
247.98	0.00	0.00	#10	0.00	100.0
95.67	0.00	0.00	#20	1.57	98.4
			#40	23.57	75.4
			#60	71.35	25.4
			#100	86.27	9.8
			#140	88.92	7.1
			#200	90.27	5.6

Fractional Components

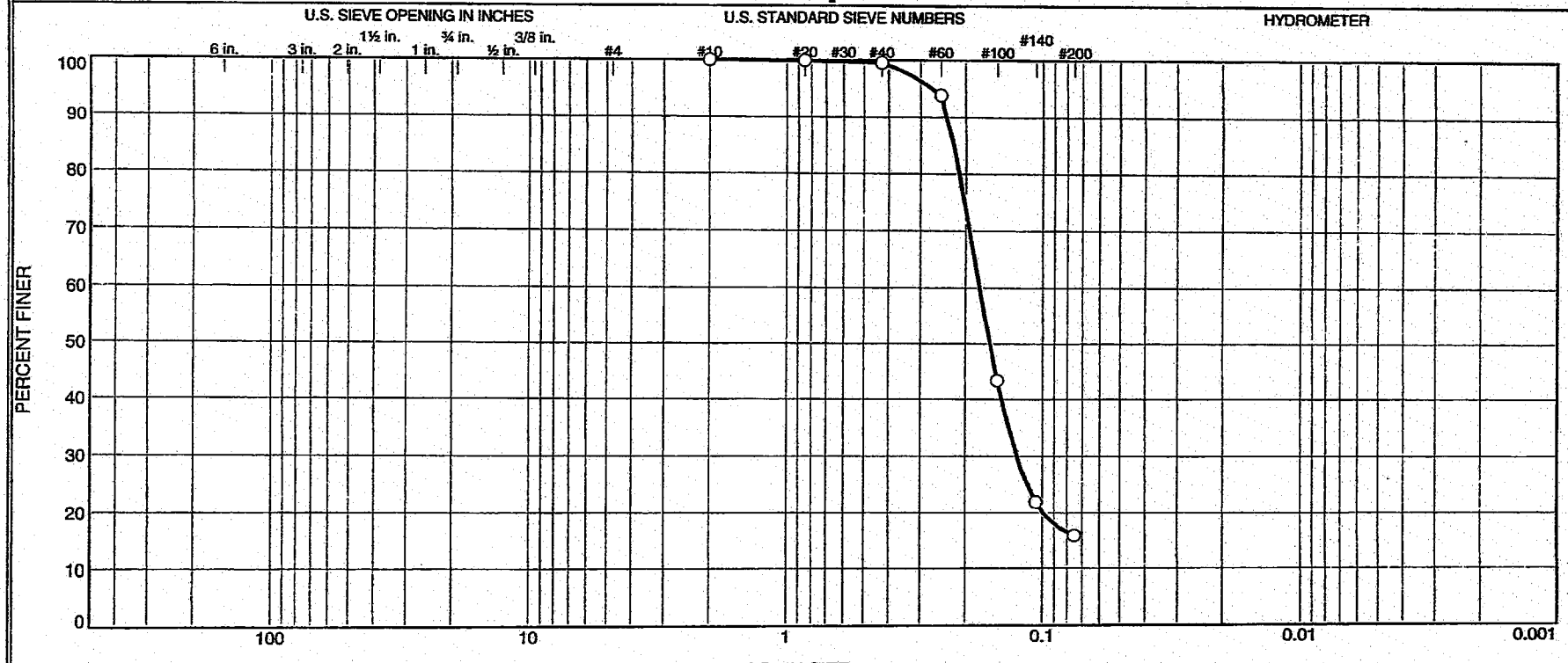
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	24.6	69.8	94.4			5.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1527	0.2024	0.2287	0.2653	0.3267	0.3600	0.4524	0.4907	0.5460	0.6466

Fineness Modulus	C_u	C_c
1.57	2.36	1.28

MACTEC, Inc.

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	83.6	15.9	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-23	99.8-101.3	1-3-08	SC	Light Brownish Gray Clayey SAND (Visual)	ND	ND	ND

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ SIEVE ANALYSIS ONLY
ND = Not Determined

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 99.8-101.3 **Sample Number:** SS-23
Material Description: Light Brownish Gray Clayey SAND (Visual)
Date: 1-3-08 **Natural Moisture:** ND
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SC
Testing Remarks: SIEVE ANALYSIS ONLY
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
260.19	0.00	0.00	#10	0.00	100.0
100.10	0.00	0.00	#20	0.11	99.9
			#40	0.48	99.5
			#60	6.15	93.9
			#100	56.70	43.4
			#140	78.13	21.9
			#200	84.15	15.9

Fractional Components

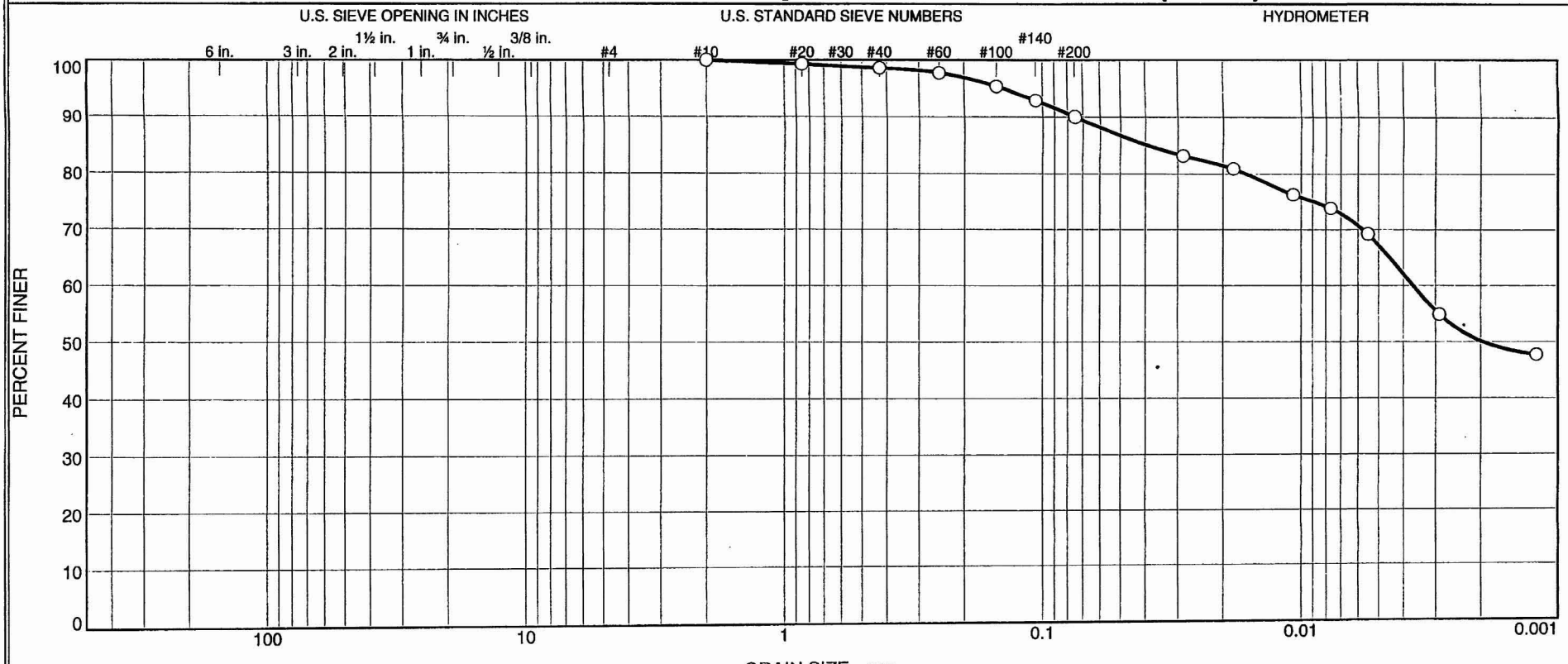
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.5	83.6	84.1			15.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0992	0.1259	0.1605	0.1761	0.2118	0.2231	0.2366	0.2706

Fineness Modulus
0.61

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	1.4	8.6	22.7	67.3

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	Boring B-2359	SS-24	109.8-111.3	1-3-08	CH	Brownish Yellow Fat CLAY	26.6	63	19

Client Bechtel

Project Exelon Texas COL (Victoria Reservoir)

Project No. 6468071777 Figure NA

MACTEC, Inc.

Raleigh, North Carolina

○ Specific Gravity = 2.688 (ASTM D854-06)

Tested By: CS **Checked By:** LBJ DSC 2-27-08

GRAIN SIZE DISTRIBUTION TEST DATA

2/26/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria Reservoir)
Project Number: 6468071777
Location: Boring B-2359
Depth: 109.8-111.3 **Sample Number:** SS-24
Material Description: Brownish Yellow Fat CLAY
Date: 1-3-08 **Natural Moisture:** 26.6
Liquid Limit: 63 **Plastic Limit:** 19 **USCS Class.:** CH
Testing Remarks: Specific Gravity = 2.688 (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
174.18	0.00	0.00	#10	0.00	100.0
45.37	0.00	0.00	#20	0.32	99.3
			#40	0.64	98.6
			#60	1.02	97.8
			#100	2.13	95.3
			#140	3.26	92.8
			#200	4.53	90.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =45.36
Hygroscopic moisture correction:
Moist weight and tare = 28.18
Dry weight and tare = 27.56
Tare weight = 15.41
Hygroscopic moisture = 5.1%
Table of composite correction values:

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

Meniscus correction only = 1.0
Specific gravity of solids = 2.688
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	22.0	41.0	36.2	0.0132	42.0	9.4	0.0285	83.2
5.00	22.0	40.0	35.2	0.0132	41.0	9.6	0.0182	80.9
15.00	22.0	38.0	33.2	0.0132	39.0	9.9	0.0107	76.3
30.00	21.8	37.0	32.1	0.0132	38.0	10.1	0.0076	73.8
60.00	21.8	35.0	30.1	0.0132	36.0	10.4	0.0055	69.2
240.00	21.1	29.0	23.9	0.0133	30.0	11.4	0.0029	54.9
1440.00	20.8	26.0	20.8	0.0134	27.0	11.9	0.0012	47.8

MACTEC, Inc.

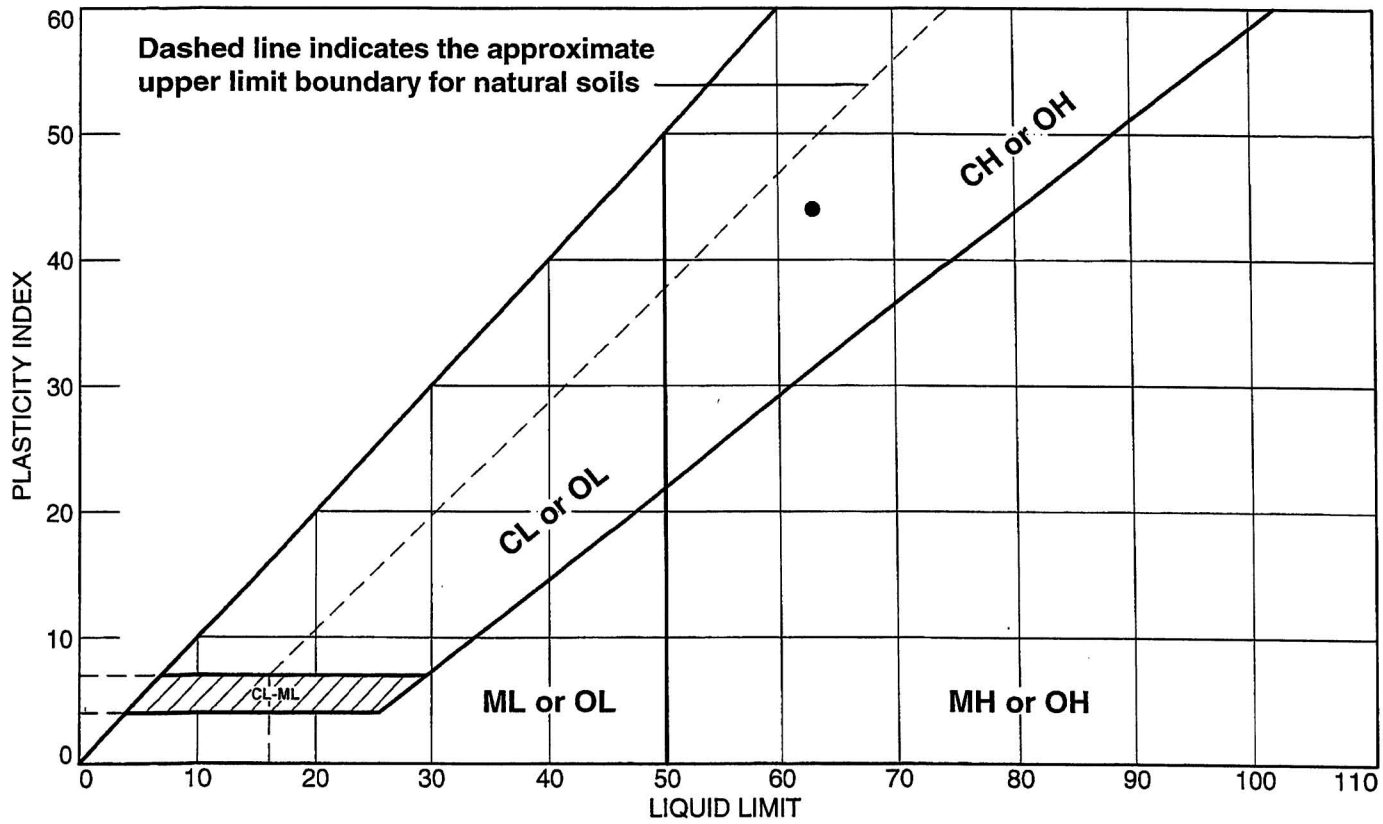
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.4	8.6	10.0	22.7	67.3	90.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0020	0.0037	0.0162	0.0390	0.0749	0.1431

Fineness Modulus
0.08

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-2359	SS-24	109.8-111.3	26.6	19	63	44	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 DSC 2-27-08