GRAIN SIZE DISTRIBUTION TEST DATA

5/19/2008

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: FORDYCE
Depth: NA **Sample Number:** C-144
Material Description: Brown Poorly Graded SAND (Mortar sand)
Date: 4/28/08 **Natural Moisture:** 5.1
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SP
Testing Remarks: SIEVE ANALYSIS ONLY
ND = NOT DETERMINED
Apparent Specific Gravity = 2.661 (ASTM C128-07)
Bulk Specific Gravity = 2.611
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
599.77	0.00	0.00	#4	0.00	100
			#10	10.06	98
103.89	0.00	0.00	#20	11.90	87
			#40	56.46	45
			#60	89.59	14
			#100	99.50	4
			#140	101.31	2
			#200	101.95	2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	0	0	2	53	43	98			2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2245	0.2592	0.2879	0.3413	0.4570	0.5277	0.7299	0.8093	0.9225	1.1331

Fineness Modulus	C_u	C_c
2.11	2.35	0.98

MACTEC, Inc.

MACTEC ENGINEERING CONSULTING, INC.

RALEIGH, NORTH CAROLINA

REPORT OF STANDARD TEST METHOD FOR
SPECIFIC GRAVITY AND ABSORPTION OF FINE AGGREGATE
Performed in General Accordance with ASTM C 128-07

PROJECT NAME: Exelon Texas COL (Victoria)

MACTEC PROJECT NUMBER: 6468-07-1777

DATE: 5-16-08

SAMPLE IDENTIFICATION:	Murphy Pit C-144

(A) WEIGHT OF OVEN-DRY TEST SAMPLE IN AIR (grams):	498.0
(S) WEIGHT OF SATURATED-SURFACE-DRY TEST SAMPLE IN AIR (grams):	501.6
(B) WEIGHT OF FLASK & WATER FILLED TO CALIBRATION MARK (grams):	656.4
(C) WEIGHT OF FLASK, SOIL & WATER FILLED TO CALIBRATION MARK (grams	967.2
BULK SPECIFIC GRAVITY:	2.611
BULK SPECIFIC GRAVITY (SATURATED-SURFACE-DRY BASIS):	2.630
APPARENT SPECIFIC GRAVITY:	2.661

PERCENTAGE OF ABSORPTION:	**0.72**

CALCULATIONS:

BULK: A / (B+S-C)

BULK (SSD BASIS): S / (B+S-C)

APPARENT: A / (B+A-C)

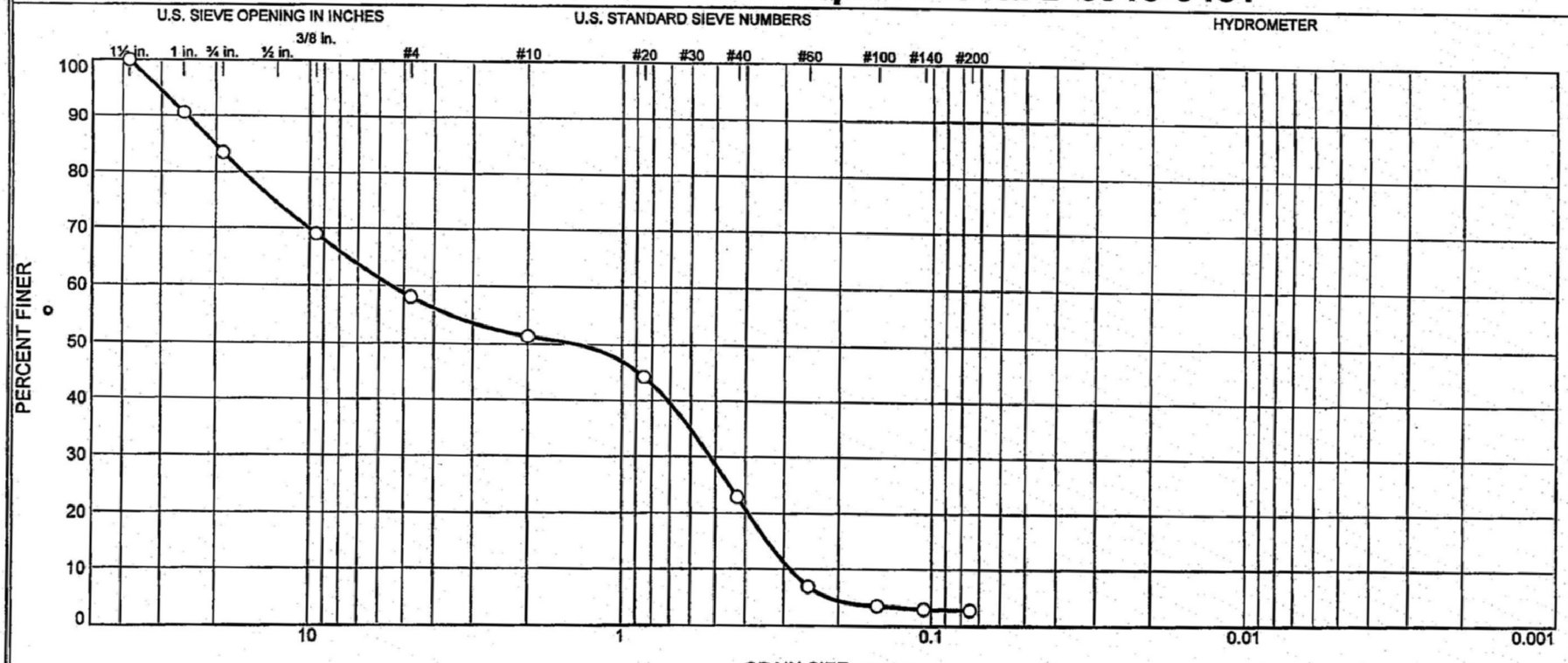
ABSORPTION (%): [(S-A) / A] x 100

REMARKS:

REVIEWED BY: [signature]

KAW 6/13/08

Particle Size Distribution Report/ ASTM D 6913-04e1



	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
O	17	25	7	28	20	3	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	Fordyce Briggs Pit	RAW	NA	4-28-2008	SW	Pale Brown Well Graded SAND with Gravel (Visual)	7.1	ND	ND

Client BECHTEL

Project Exelon Texas COL (Victoria)

Project No. 6468071777 Figure NA

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Raleigh, North Carolina

O. SIEVE ANALYSIS ONLY
Specific Gravity = 2.697 (ASTM 854-06)
ND = Not Determined
Sample obtained from Fordyce Briggs Pit

KAW 6/13/08

Tested By: AWH **Checked By:** LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/19/2008

Client: BECHTEL
Project: Exelon Texas COL (Victoria)
Project Number: 6468071777
Location: Fordyce Briggs Pit
Depth: NA **Sample Number:** RAW
Material Description: Pale Brown Well Graded SAND with Gravel (Visual)
Date: 4-28-2008 **Natural Moisture:** 7.1
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** SW
Testing Remarks: SIEVE ANALYSIS ONLY
Specific Gravity = 2.697 (ASTM 854-06)
ND = Not Determined
Sample obtained from Fordyce Briggs Pit
Tested by: AWH **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
600.74	0.00	0.00	1.5	0.00	100
			1	56.68	91
			.75	99.65	83
			.375	186.20	69
			#4	251.67	58
			#10	291.71	51
99.97	0.00	0.00	#20	13.85	44
			#40	55.45	23
			#60	86.45	7
			#100	93.18	3
			#140	94.28	3
			#200	94.62	3

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	17	25	42	7	28	20	55			3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2866	0.3390	0.3920	0.5184	1.3858	5.4884	16.4557	20.3258	24.8243	30.6032

Fineness Modulus	C_u	C_c
4.39	19.15	0.17

MACTEC, Inc.

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RALEIGH, NORTH CAROLINA

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

PROJECT NAME:EXELON COL PROJECT (VICTORIA)

PROJECT NUMBER: 6468071777

DATE: 5/16/08

SAMPLE IDENTIFICATION:Fordyce Briggs Pit Raw Material

(A) Mass of oven-dried soil, grams:	73.52
(B) Mass of pycnometer filled with water at test temperature (T), grams:	655.62
(C) Mass of pycnometer, water and soil, grams:	701.89
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:	22.4
(G) Specific Gravity at observed temperature: A / [B - (C - A)]	2.698
(F) ***Correction factor:***	0.99947
(G x F) **SPECIFIC GRAVITY @ 20°C:**	2.697

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

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

REMARKS: % Passing # 4 : 58

Well-Graded SAND with Gravel (SW)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER :5.1.01

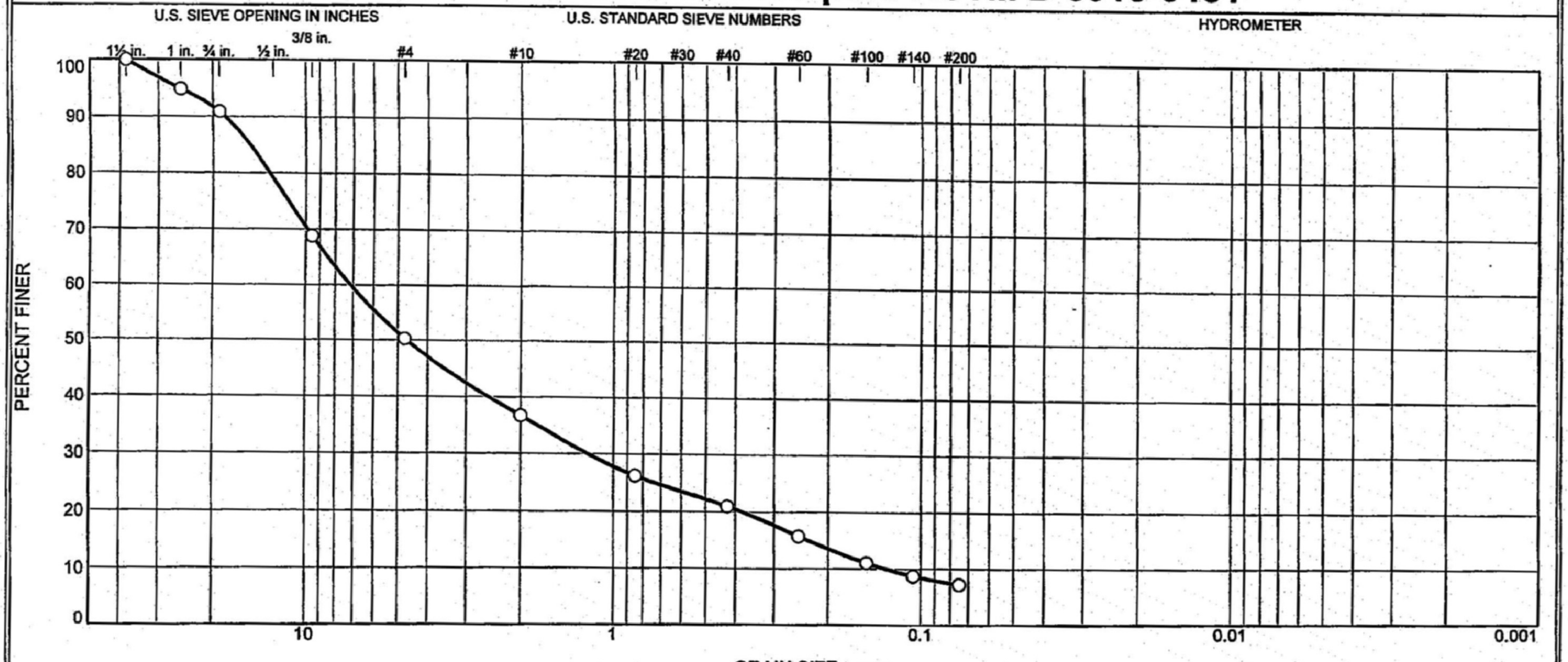
PYCNOMETER : P-3

TESTED BY: CS

REVIEWED BY: **Brian Johnson**

KAW 6/13/08

Particle Size Distribution Report/ ASTM D 6913-04e1



	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
O	9	41	13	16	14	7	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
O	CWA	CWA#4	NA	4-28-2008	GW-GC	Red Well Graded GRAVEL with Clay (Visual)	3.4	ND	ND

Client BECHTEL

Project EXELON TEXAS COL (Victoria)

Project No. 6468071777 Figure NA

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O ND=Not Determined
Specific Gravity = 2.669 (ASTM D 854-06)

KAW 6/13/08

Tested By: CS Checked By: LBJ

GRAIN SIZE DISTRIBUTION TEST DATA

5/19/2008

Client: BECHTEL
Project: EXELON TEXAS COL (Victoria)
Project Number: 6468071777
Location: CWA
Depth: NA **Sample Number:** CWA#4
Material Description: Red Well Graded GRAVEL with Clay (Visual)
Date: 4-28-2008 **Natural Moisture:** 3.4
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** GW-GC
Testing Remarks: ND=Not Determined
Specific Gravity = 2.669 (ASTM D 854-06)
Tested by: CS **Checked by:** LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
692.72	0.00	0.00	1.5	0.00	100
			1	35.11	95
			.75	62.95	91
			.375	215.99	69
			#4	344.36	50
			#10	438.74	37
100.84	0.00	0.00	#20	28.84	26
			#40	43.11	21
			#60	57.41	16
			#100	70.40	11
			#140	76.70	9
			#200	80.82	7

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	9	41	50	13	16	14	43			7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1297	0.2312	0.3799	1.2104	4.6823	7.1454	13.0542	15.1716	18.2443	25.5505

Fineness Modulus	C_u	C_c
4.69	55.08	1.58

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RALEIGH, NORTH CAROLINA

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

PROJECT NAME:EXELON COL PROJECT (VICTORIA)

PROJECT NUMBER: 6468071777

DATE: 5/16/08

SAMPLE IDENTIFICATION: CWA Grade 4

(A) Mass of oven-dried soil, grams:		76.57
(B) Mass of pycnometer filled with water at test temperature (T), grams:		656.47
(C) Mass of pycnometer, water and soil, grams:		704.36
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.9
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.670
(F)	***Correction factor:***	0.99959
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.669

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

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

REMARKS: % Passing # 4 : 50

Well - Graded GRAVEL with clay (GW-GC)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER :5.1.01

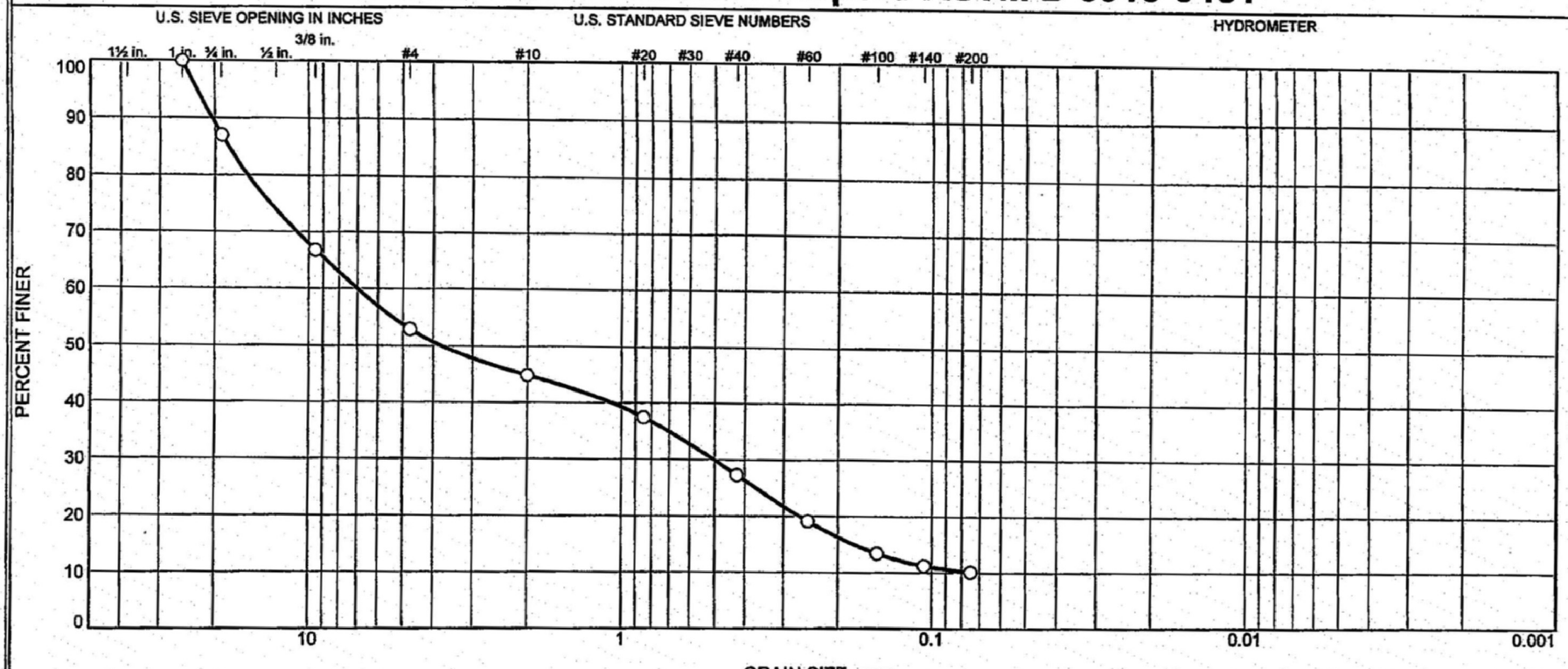
PYCNOMETER : P-6

TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 6/13/08

Particle Size Distribution Report/ ASTM D 6913-04e1



	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	13	34	8	18	17	10	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	CWA	CWA#6	ND	5-13-2008	GP-GC	Red Well-Graded Gravel With CLay (Visual)	4.6	ND	ND

Client BECHTEL

Project EXELON TEXAS COL (Victoria)

Project No. 6468071777 Figure NA

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○ ND=Not Determined
Specific Gravity = 2.659 (ASTM D-854-06)

KAW 6/13/08

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

GRAIN SIZE DISTRIBUTION TEST DATA

5/19/2008

Client: BECHTEL
Project: EXELON TEXAS COL (Victoria)
Project Number: 6468071777
Location: CWA
Depth: ND **Sample Number:** CWA#6
Material Description: Red Well-Graded Gravel With CLay (Visual)
Date: 5-13-2008 **Natural Moisture:** 4.6
Liquid Limit: ND **Plastic Limit:** ND **USCS Class.:** GP-GC
Testing Remarks: ND=Not Determined
Specific Gravity = 2.659 (ASTM D-854-06)
Tested by: CS **Checked by:** LBJ

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
684.29	0.00	0.00	1	0.00	100
			.75	89.00	87
			.375	227.30	67
			#4	321.75	53
			#10	377.59	45
97.88	0.00	0.00	#20	16.01	37
			#40	38.21	27
			#60	56.09	19
			#100	68.61	13
			#140	73.39	11
			#200	75.75	10

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	13	34	47	8	18	17	43			10

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.1779	0.2658	0.5023	3.7716	6.9956	15.7205	18.1107	20.4572	22.8468

Fineness Modulus
4.38

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RALEIGH, NORTH CAROLINA

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

PROJECT NAME:EXELON COL PROJECT (VICTORIA)

PROJECT NUMBER: 6468071777

DATE: 5/16/08

SAMPLE IDENTIFICATION: CWA Grade 6

(A) Mass of oven-dried soil, grams:		76.29
(B) Mass of pycnometer filled with water at test temperature (T), grams:		655.68
(C) Mass of pycnometer, water and soil, grams:		703.29
(T) Temperature of pycnometer, water and soil, °C when mass (C) determined:		21.9
(G) Specific Gravity at observed temperature:	A / [B - (C - A)]	2.660
(F)	***Correction factor:***	0.99959
(G x F)	**SPECIFIC GRAVITY @ 20°C:**	2.659

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

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

REMARKS: % Passing # 4 : 53

Well-Graded GRAVEL with Clay (GW-GC)

EQUIPMENT USED

SCALES : 3.1.99

OVEN : 5.1.16

THERMOMETER :5.1.01

PYCNOMETER : P-6

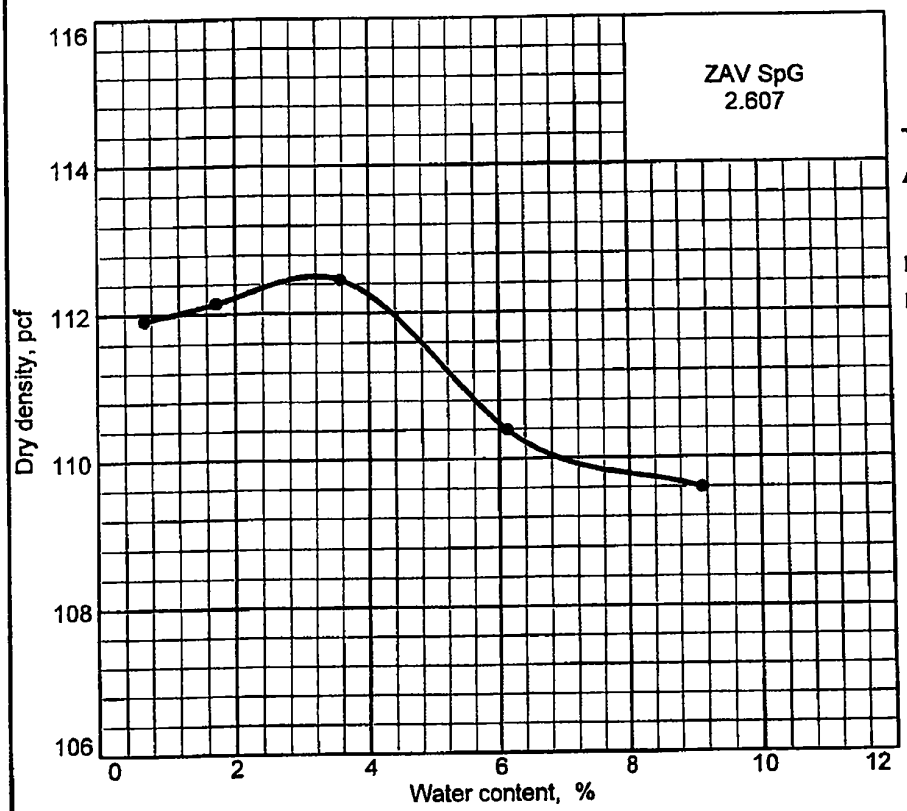
TESTED BY: CS

REVIEWED BY: Brian Johnson

KAW 6/13/08

Modified Proctor Test for Borrow Soils

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
Murphy C-33

Test Specification:
ASTM D 1557-02 Method A Modified

Preparation Method Dry
Hammer Wt. 10 lb.
Hammer Drop 18 in.(mechanical)
Number of Layers five
Blows per Layer 25
Mold Size .03317 cu.ft.
Test Performed on Material Passing No.4 **Sieve**

NM 4.2 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.607
%>No.4 0.0 **%<No.200** 1
USCS SP **AASHTO** A-1-b
Date Sampled 4/28/08
Date Tested 5/6/08
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	5928.1	5964.0	5974.3	6011.0	5907.1	
WM	4211.6	4211.6	4211.6	4211.6	4211.6	
WW + T #1	558.50	551.40	544.10	512.30	559.00	
WD + T #1	549.10	532.60	513.10	470.00	555.20	
TARE #1	6.90	6.80	6.90	6.70	6.90	
WW + T #2	N/A	N/A	N/A	N/A	N/A	
WD + T #2	N/A	N/A	N/A	N/A	N/A	
TARE #2	N/A	N/A	N/A	N/A	N/A	
MOISTURE	1.7	3.6	6.1	9.1	0.7	
DRY DENSITY	112.1	112.5	110.4	109.6	111.9	

TEST RESULTS

Maximum dry density = 112.5 pcf

Optimum moisture = 3.0 %

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

- **Location:** Fordyce Murphy Pit

MACTEC, Inc.
Raleigh, North Carolina

Material Description

Brown Poorly Graded SAND (Concrete Sand)

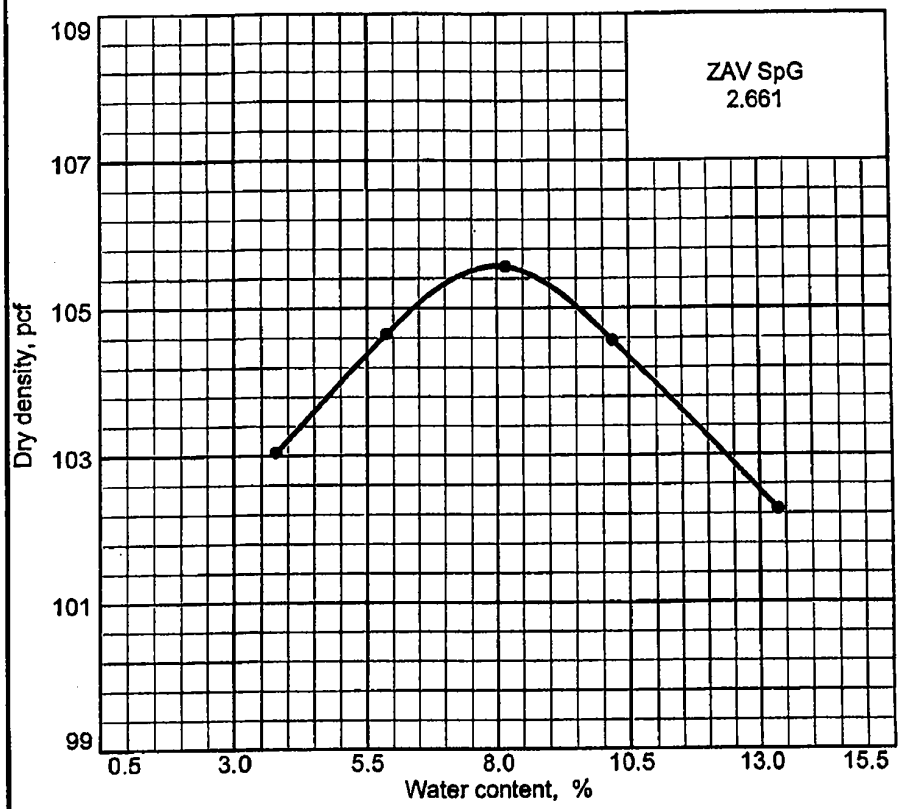
Remarks:
ND = Not Determined
Specific Gravity Determined by ASTM C-128-07

Checked by: LBJ
Title: LAB MANAGER

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
C-144

Test Specification:
ASTM D 1557-02 Method A Modified

Preparation Method DRY
Hammer Wt. 10 lb.
Hammer Drop 18 in.(mechanical)
Number of Layers five
Blows per Layer 25
Mold Size .03317 cu.ft.
Test Performed on Material Passing No.4 **Sieve**

NM 5.1 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.661
%>No.4 0.0 **%<No.200** 2
USCS SP **AASHTO** ND
Date Sampled 4/28/08
Date Tested 5/6/08
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	5929.5	5945.1	5955.6	5820.5	5878.7	
WM	4211.6	4211.6	4211.6	4211.6	4211.6	
WW + T #1	515.60	571.40	518.70	515.10	507.70	
WD + T #1	477.20	519.20	458.40	496.60	479.90	
TARE #1	6.60	6.60	6.90	6.80	6.80	
WW + T #2	N/A	N/A	N/A	N/A	N/A	
WD + T #2	N/A	N/A	N/A	N/A	N/A	
TARE #2	N/A	N/A	N/A	N/A	N/A	
MOISTURE	8.2	10.2	13.4	3.8	5.9	
DRY DENSITY	105.6	104.6	102.3	103.0	104.7	

TEST RESULTS

Maximum dry density = 105.5 pcf

Optimum moisture = 8.0 %

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

• **Source:** FORDYCE **Sample No.:** C-144 **Elev./Depth:** NA

MACTEC, Inc.
Raleigh, North Carolina

Material Description

Brown Poorly Graded SAND (Mortar sand)

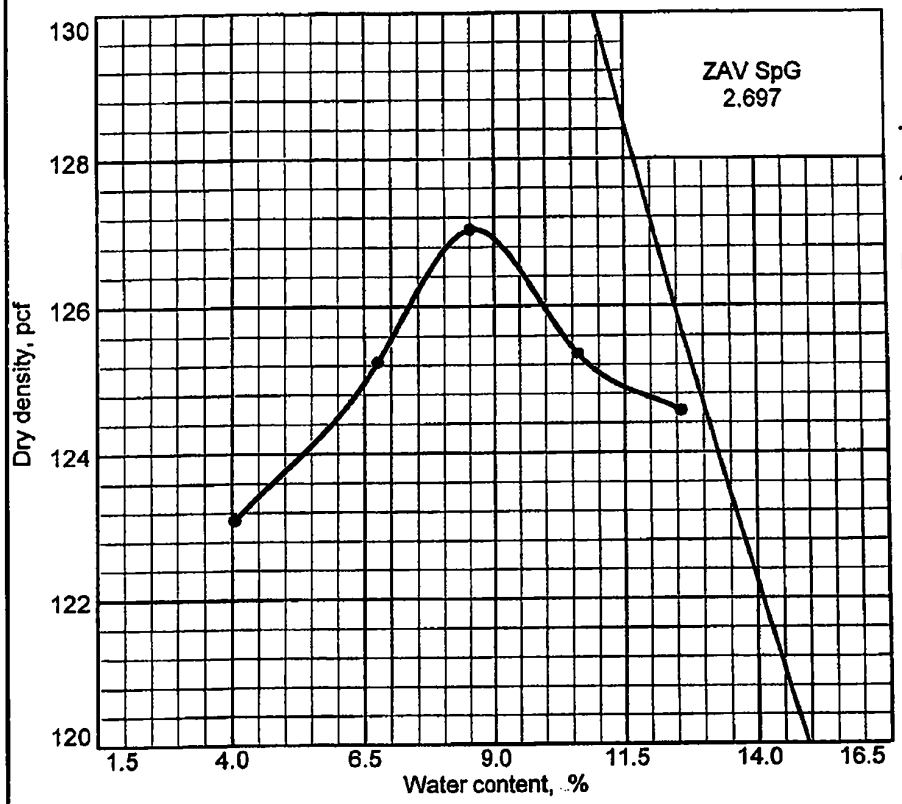
Remarks:
ND = Not Determined
Apparent Specific Gravity Determined By ASTM C-128-07

Checked by: LBJ
Title: LAB MANAGER

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
RAW-3/4

Test Specification:
ASTM D 1557-02 Method C Modified

Preparation Method DRY
Hammer Wt. 10
Hammer Drop 18 mechanical
Number of Layers 5
Blows per Layer 56
Mold Size .07499 cu.ft.

Test Performed on Material Passing 3/4 in. **Sieve**

NM 7.1 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.697
%>3/4 in. 17.0 **%<No.200** 3
USCS SW **AASHTO** ND
Date Sampled 4-28-2008
Date Tested 5-9-2008
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	10086.6	10277.9	10418.9	10446.4	10500.6	
WM	5729.7	5729.7	5729.7	5729.7	5729.7	
WW + T #1	631.90	669.60	722.50	676.50	1050.40	
WD + T #1	607.60	627.70	666.40	612.30	933.80	
TARE #1	6.70	6.80	6.80	6.90	6.90	
WW + T #2	N/A	N/A	N/A	N/A	N/A	
WD + T #2	N/A	N/A	N/A	N/A	N/A	
TARE #2	N/A	N/A	N/A	N/A	N/A	
MOISTURE	4.0	6.7	8.5	10.6	12.6	
DRY DENSITY	123.1	125.2	127.0	125.4	124.6	

TEST RESULTS

Maximum dry density = 127.0 pcf

Optimum moisture = 8.5 %

Project No. 6468071777 **Client:** BECHTEL
Project: Exelon Texas COL (Victoria)

- **Location:** Fordyce Briggs Pit

MACTEC, Inc.
Raleigh, North Carolina

Material Description

Pale Brown Well Graded SAND with Gravel (Visual)

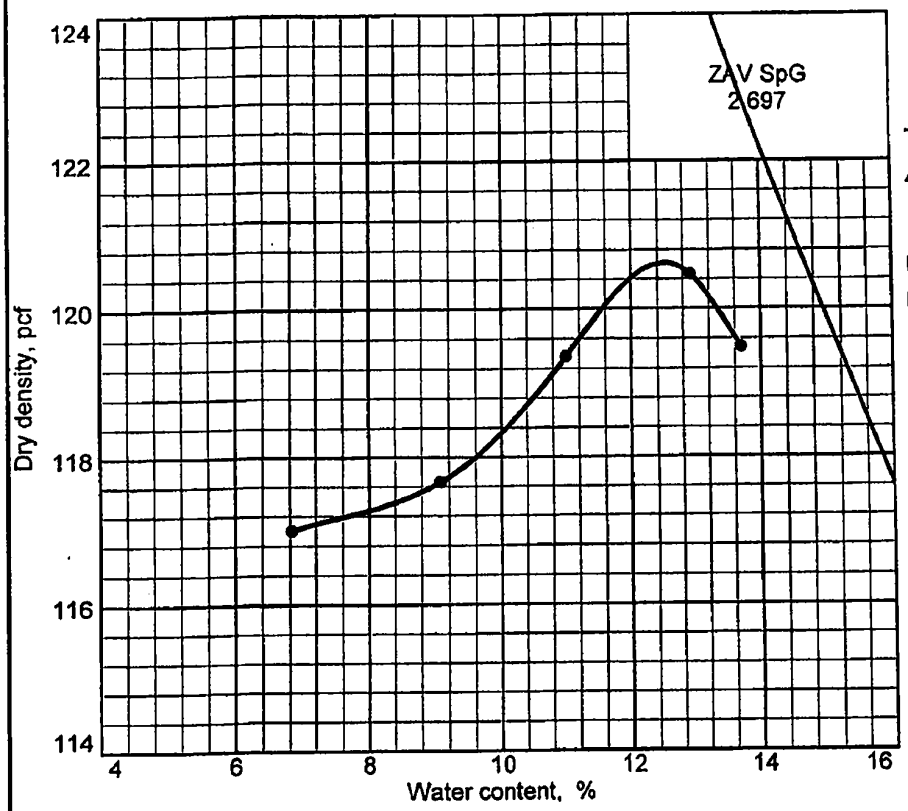
Remarks:
ND = Not Determined

Checked by: LBJ
Title: LAB MANAGER

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
Raw 3/8

Test Specification:
ASTM D 1557-02 Method B Modified

Preparation Method DRY
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Number of Layers five
Blows per Layer 25
Mold Size .03333 cu.ft.

Test Performed on Material Passing 3/8 in. **Sieve**

NM 7.1 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.697
%>3/8 in. 21.0 **%<No.200** 3
USCS SW **AASHTO** ND
Date Sampled 4/28/08
Date Tested 5/16/08
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	6100.9	6151.5	6214.1	6267.7	6265.2	
WM	4211.2	4211.2	4211.2	4211.2	4211.2	
WW + T #1	632.40	600.20	589.10	700.90	704.50	
WD + T #1	592.40	550.80	531.40	621.50	620.40	
TARE #1	6.80	6.70	6.60	6.80	6.80	
WW + T #2	N/A	N/A	N/A	N/A	N/A	
WD + T #2	N/A	N/A	N/A	N/A	N/A	
TARE #2	N/A	N/A	N/A	N/A	N/A	
MOISTURE	6.8	9.1	11.0	12.9	13.7	
DRY DENSITY	117.0	117.7	119.4	120.5	119.5	

TEST RESULTS

Maximum dry density = 120.5 pcf

Optimum moisture = 12.5 %

Material Description

Pale Brown Well Graded SAND with Gravel (Visual)

Remarks:
ND = Not Determined

Project No. 6468071777 **Client:** BECHTEL
Project: Exelon Texas COL (Victoria)

• **Source:** Fordyce Briggs Pit **Sample No.:** RAW-3/8 **Elev./Depth:** NA

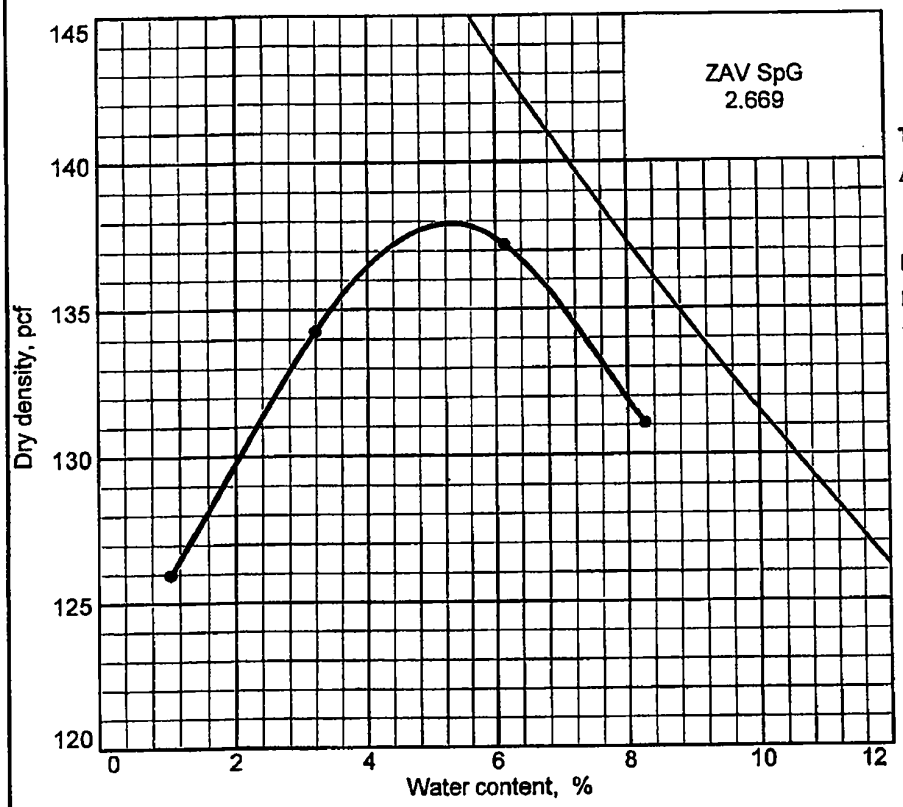
Checked by: LBJ
Title: LAB MANAGER

MACTEC, Inc.
Raleigh, North Carolina

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
CWA#4 3/4

Test Specification:
ASTM D 1557-02 Method C Modified

Preparation Method DRY
Hammer Wt. 10
Hammer Drop 18 mechanical
Number of Layers 5
Blows per Layer 56
Mold Size .07499 cu.ft.
Test Performed on Material
Passing 3/4 in. **Sieve**

NM 3.4 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.669
%>3/4 in. 9.0 **%<No.200** 7
USCS GW-GC **AASHTO** ND
Date Sampled 4-28-2008
Date Tested 5-13-2008
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	10060.6	10442.7	10684.0	10557.2		
WM	5729.7	5729.7	5729.7	5729.7		
WW + T #1	651.80	592.60	578.60	724.70		
WD + T #1	645.00	574.50	545.50	669.90		
TARE #1	6.80	6.80	6.80	7.00		
WW + T #2	N/A	N/A	N/A	N/A		
WD + T #2	N/A	N/A	N/A	N/A		
TARE #2	N/A	N/A	N/A	N/A		
MOISTURE	1.1	3.2	6.1	8.3		
DRY DENSITY	126.0	134.3	137.2	131.1		

TEST RESULTS

Maximum dry density = 138.0 pcf

Optimum moisture = 5.5 %

Material Description

Red Well Graded GRAVEL with Clay (Visual)

Remarks:
ND = Not Determined

Project No. 6468071777 **Client:** BECHTEL
Project: EXELON TEXAS COL (Victoria)

• **Source:** CWA **Sample No.:** CWA#4 **Elev./Depth:** NA

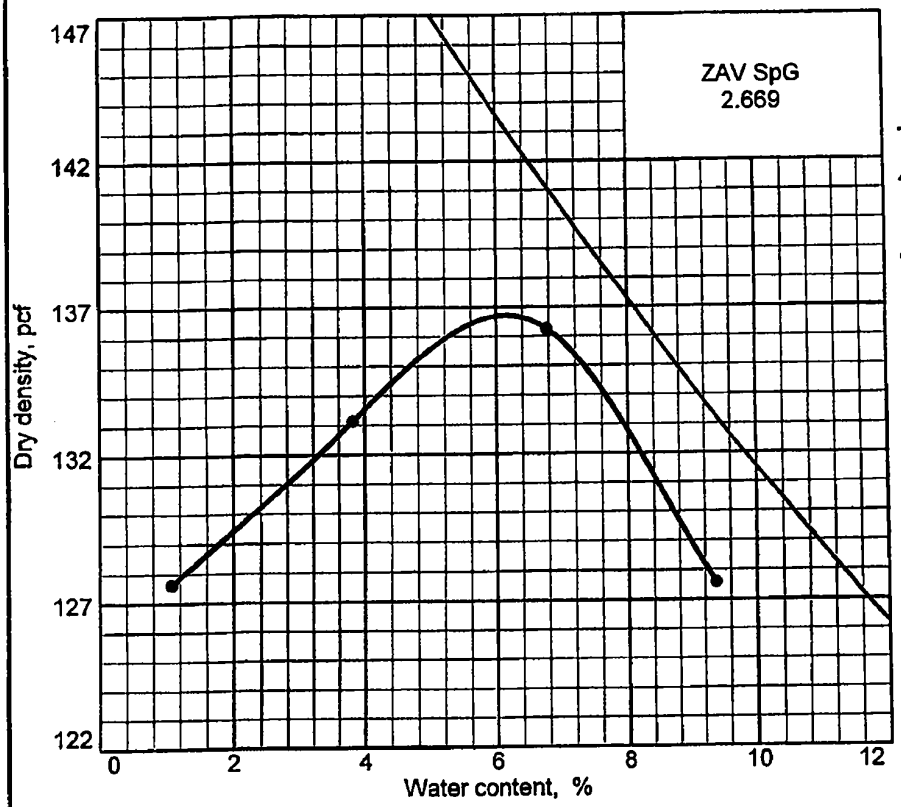
Checked by: LBJ
Title: LAB MANAGER

MACTEC, Inc.
Raleigh, North Carolina

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
CWA#4-3/8

Test Specification:
ASTM D 1557-02 Method A Modified

Preparation Method DRY
Hammer Wt. 10 lb.
Hammer Drop 18 in.(mechanical)
Number of Layers five
Blows per Layer 25
Mold Size .03317 cu.ft.
Test Performed on Material Passing 3/8 in. **Sieve**

NM 3.4 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.669
%>3/8 in. 9.0 **%<No.200** 7.0
USCS GW-GC **AASHTO** ND
Date Sampled 4-28-08
Date Tested 5-16-08
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	6151.9	6291.0	6400.0	6310.6		
WM	4211.2	4211.2	4211.2	4211.2		
WW + T #1	599.10	585.60	590.60	672.20		
WD + T #1	592.80	564.30	553.60	615.20		
TARE #1	6.90	7.00	7.00	7.00		
WW + T #2	N/A	N/A	N/A	N/A		
WD + T #2	N/A	N/A	N/A	N/A		
TARE #2	N/A	N/A	N/A	N/A		
MOISTURE	1.1	3.8	6.8	9.4		
DRY DENSITY	127.6	133.1	136.3	127.6		

TEST RESULTS

Maximum dry density = 136.5 pcf

Optimum moisture = 6.0 %

Material Description

Red Well Graded GRAVEL with Clay (Visual)

Remarks:
ND = Not Determined

Project No. 6468071777 **Client:** BECHTEL
Project: EXELON TEXAS COL (Victoria)

• **Source:** CWA **Sample No.:** CWA#4 3/8

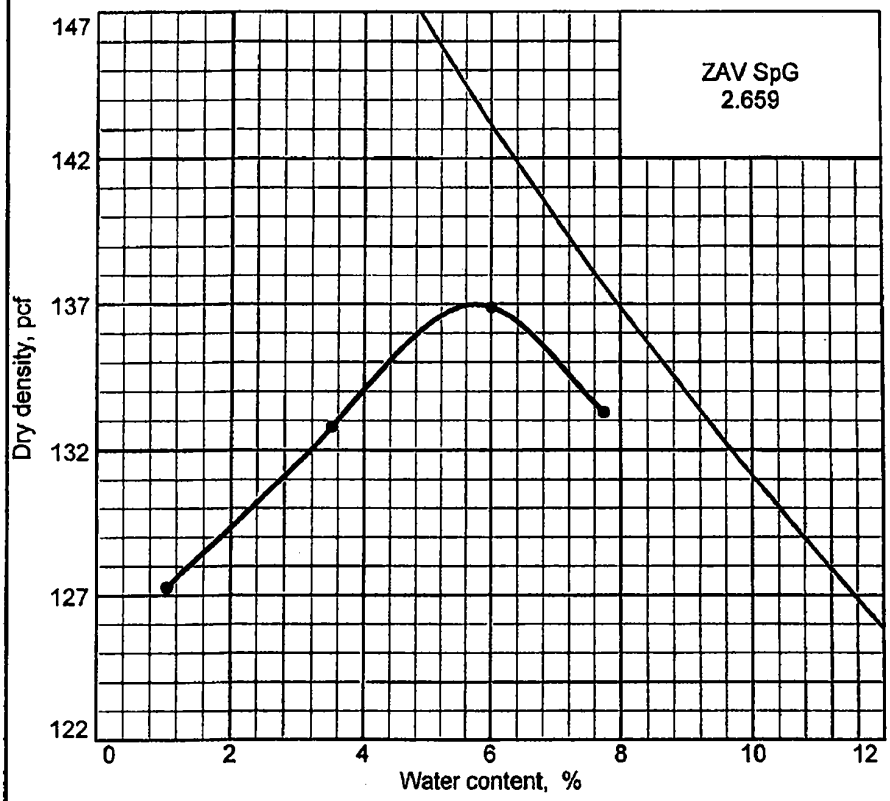
Checked by: LBJ
Title: LAB MANAGER

MACTEC, Inc.
Raleigh, North Carolina

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
CWA#6 3/4

Test Specification:
ASTM D 1557-02 Method C Modified

Preparation Method DRY
Hammer Wt. 10
Hammer Drop 18 mechanical
Number of Layers 5
Blows per Layer 56
Mold Size .07499 cu.ft.
Test Performed on Material Passing 3/4 in. **Sieve**

NM 4.6 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.659
%>3/4 in. 13.0 **%<No.200** 10
USCS GP-GC **AASHTO** ND
Date Sampled 5-13-2008
Date Tested 5-13-2008
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	10105.0	10405.4	10666.6	10615.5		
WM	5729.7	5729.7	5729.7	5729.7		
WW + T #1	679.30	547.10	648.80	650.60		
WD + T #1	672.30	528.80	612.40	604.30		
TARE #1	6.90	6.70	6.70	6.70		
WW + T #2	N/A	N/A	N/A	N/A		
WD + T #2	N/A	N/A	N/A	N/A		
TARE #2	N/A	N/A	N/A	N/A		
MOISTURE	1.1	3.5	6.0	7.7		
DRY DENSITY	127.3	132.8	136.9	133.3		

TEST RESULTS

Maximum dry density = 137.0 pcf

Optimum moisture = 6.0 %

Material Description

Red Well-Graded Gravel With CLay (Visual)

Remarks:
ND = Not Determined

Project No. 6468071777 **Client:** BECHTEL
Project: EXELON TEXAS COL (Victoria)

● **Source:** CWA **Sample No.:** CWA#6 **Elev./Depth:** ND

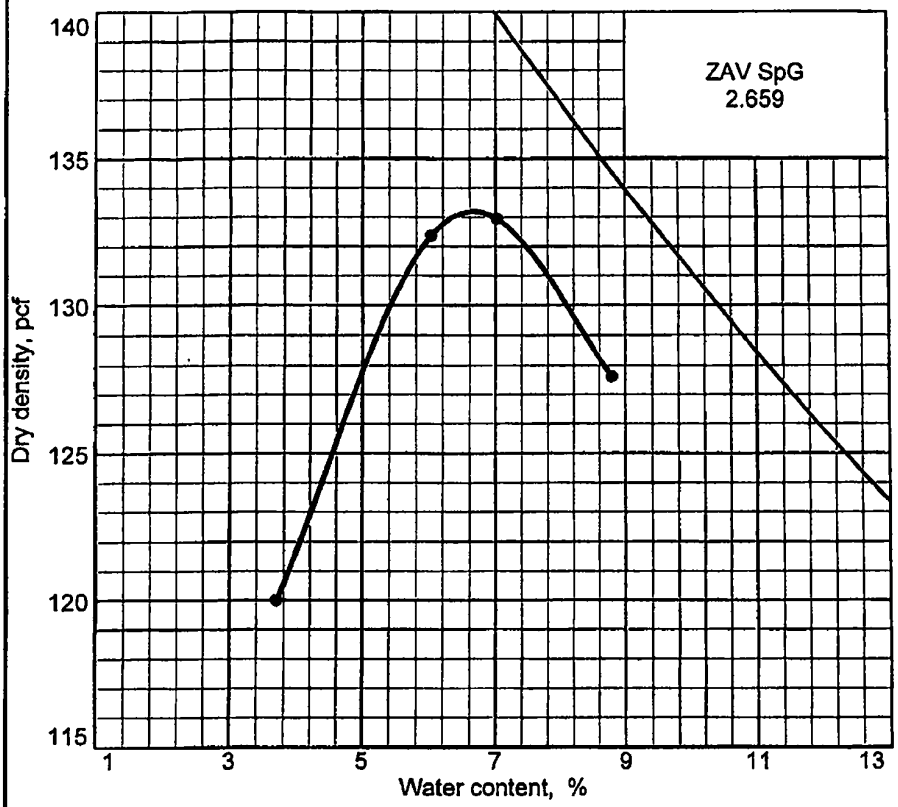
Checked by: LBJ
Title: LAB MANAGER

MACTEC, Inc.
Raleigh, North Carolina

Figure NA

KAW 6/13/08

COMPACTION TEST REPORT/ ASTM D 1557-02



Curve No.
CWA #6 3/8

Test Specification:
ASTM D 1557-02 Method A Modified

Preparation Method Dry
Hammer Wt. 10 lb.
Hammer Drop 18 in.(mechanical)
Number of Layers five
Blows per Layer 25
Mold Size .03317 cu.ft.
Test Performed on Material Passing 3/8 in. **Sieve**

NM 4.6 **LL** ND **PI** ND
Sp.G. (ASTM D 854) 2.659
%>3/8 in. 50.0 **%<No.200** 10
USCS GW-GC **AASHTO** ND
Date Sampled 4-28-08
Date Tested 5-16-08
Tested By AWH

TESTING DATA

	1	2	3	4	5	6
WM + WS	9962.7	10503.6	10569.7	10452.6		
WM	5729.3	5729.3	5729.3	5729.3		
WW + T #1	590.80	583.70	607.60	635.60		
WD + T #1	570.00	550.90	568.20	584.80		
TARE #1	6.70	6.70	6.90	6.90		
WW + T #2	N/A	N/A	N/A	N/A		
WD + T #2	N/A	N/A	N/A	N/A		
TARE #2	N/A	N/A	N/A	N/A		
MOISTURE	3.7	6.0	7.0	8.8		
DRY DENSITY	120.0	132.4	133.0	127.6		

TEST RESULTS

Maximum dry density = 133.0 pcf

Optimum moisture = 6.5 %

Material Description

Red Well Graded GRAVEL with Clay (Visual)

Remarks:
ND = Not Determined

Project No. 6468071777 **Client:** BECHTEL
Project: EXELON TEXAS COL (Victoria)

● **Source:** CWA **Sample No.:** CWA#6 3/8

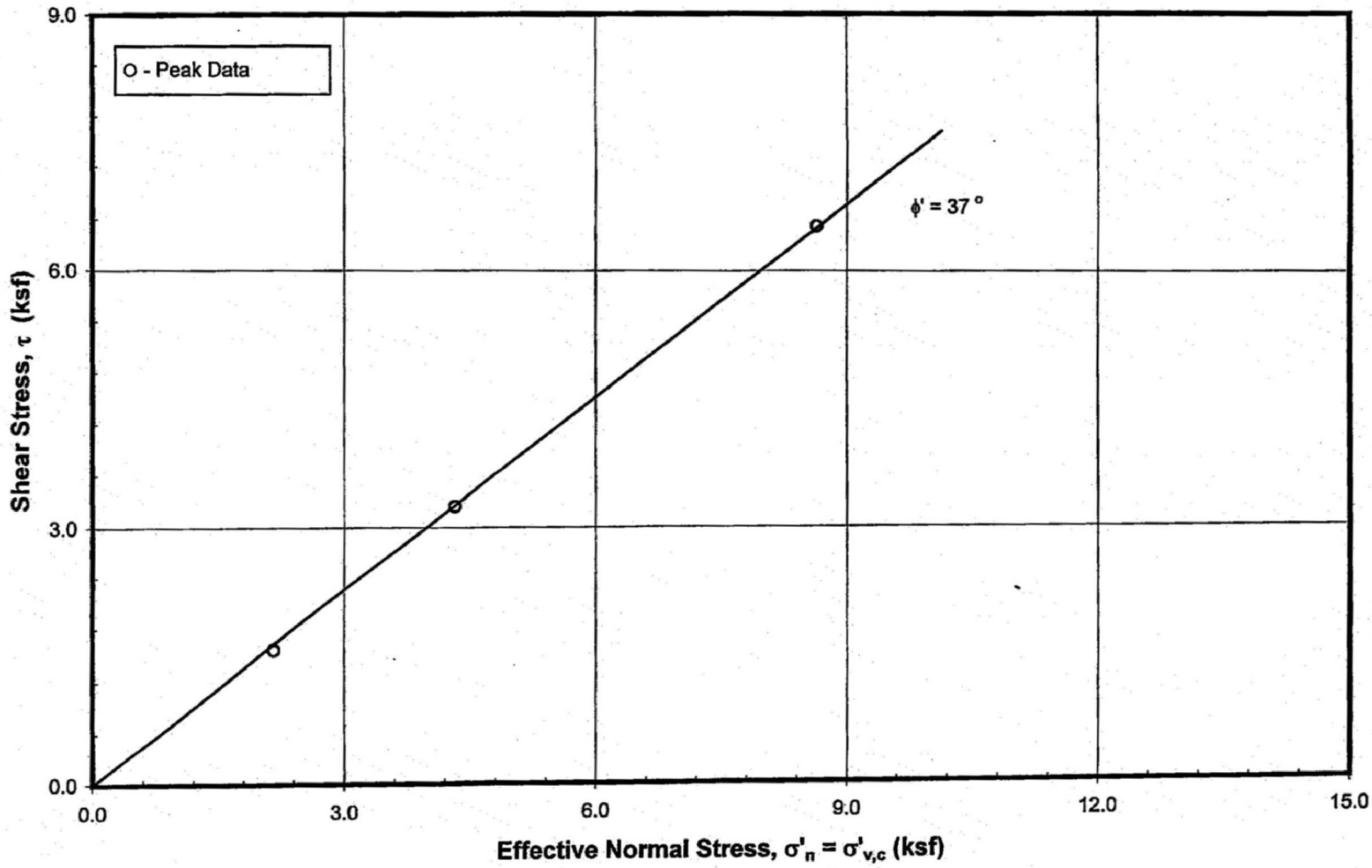
Checked by: LBJ
Title: Lab Manager

MACTEC, Inc.
Raleigh, North Carolina

Figure NA

KAW 6/13/08

Direct Shear Test
Borrow Soil



DRAINED DIRECT SHEAR TEST: Test Series - (Peak)
Soil - Soil Interface & OCR = Unkown
Source: Fordyce Murphy Pit, Sample No. Murphy C-33
Exelon (Victoria)

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: Fordyce_C33D
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.16 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.16 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.607 [ ] Assumed;
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded [ ] Liner [X] Recompacted [X] Tampling | [ ] Constant Effort: Blows/Tamps per Layer = 20
Boring No.: Fordyce [ ] Reconstituted [ ] Kneading | Rammer:Wgt.(lbf)= NA | Tamper: Force (lbf)= 4.5
Sample No.: C33 Compostite No.: N/A [ ] Inpact/Rammer | Drop(in.)= NA | Dia.(in.)= 1.5
Depth (ft): N/A Specimen No.: D [ ] Pluviated: | [X] Undercompaction: U_N (%) = 95 | Ref.Effort=
[ ] Spec. Selection by X - Ray; [ ] Geomarine Sample | No. Layers = 3 % Comp= ± Opt.= 0.5

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5600.00	NA
Container No.	4005			5	Mass Trimming Ring, etc.	5145.00	NA
Mass Moist Soil + Container (g)	132.47			635.00	Mass Moist Soil	455.00	NA
Mass Dry Soil + Container (g)	129.41			565.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	30.35			130.00	Container No.		
WATER CONTENT (%)	3.09			16.09	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	3.09	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)	0.00	

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 110.28	Dry, $\gamma_{d,o}$ (pcf)= 106.97

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porours inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Brown Poorly Graded SAND (Concrete Sand)

Trimming/Etc. Remarks:

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/17/2008 Date: 6/17/2008 Final Cal. By: HC Date: 6/17/2008
Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: Fordyce Type Test: DS
Task Number: N/A Sample No.: C33 Specific Gravitiy, G_s: 2.61
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:		Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial,	Top, W1	3.09	441.37	15.5
"	Bottom, W2			
"	Sides, W3			
"	Average, W4	3.09	441.37	15.5
"	Assumed, W	3.09	441.37	15.5
Final (After Test/Shear)		16.09		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04745
Final Selected	0.04745

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.44	NA	NA
Height after Consolidation, H_c	31.37	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	0.23	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	31.13	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.607		[ ] Assumed	[X] Measured				
Mass Dry Soil, Md (g)	441.37		[X] Based on average water content		[ ] Value based on one of the above values			
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	3.1	110.27	106.97	0.519	15.5	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	2.16	NA	NA	$\varepsilon_{a,c}$ (%)	1.40	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/17/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: Fordyce_C33D
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 2.16 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.37 (mm)
Vert. Strain During Consol.: 1.40 (%)

Boring No.: Fordyce
Sample No.: C33
Specimen No.: D
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
3.1	110.27	106.97	0.519	15.5

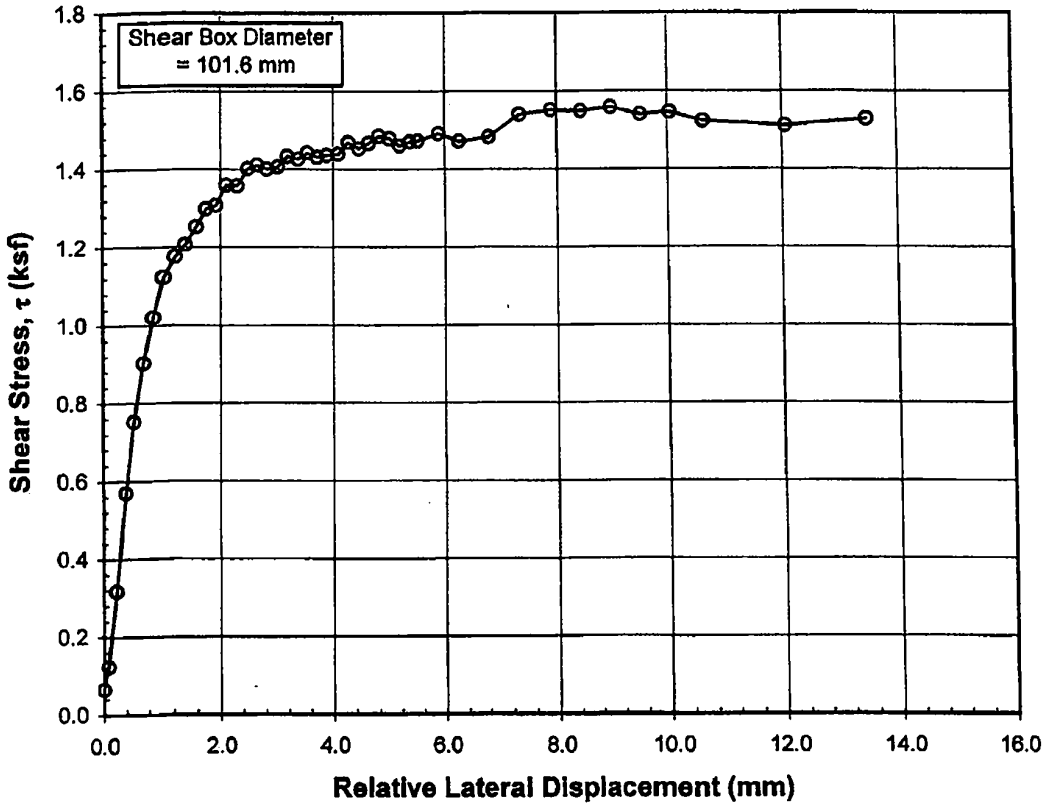
Peak Shear Stress, τ_f (ksf): 1.56

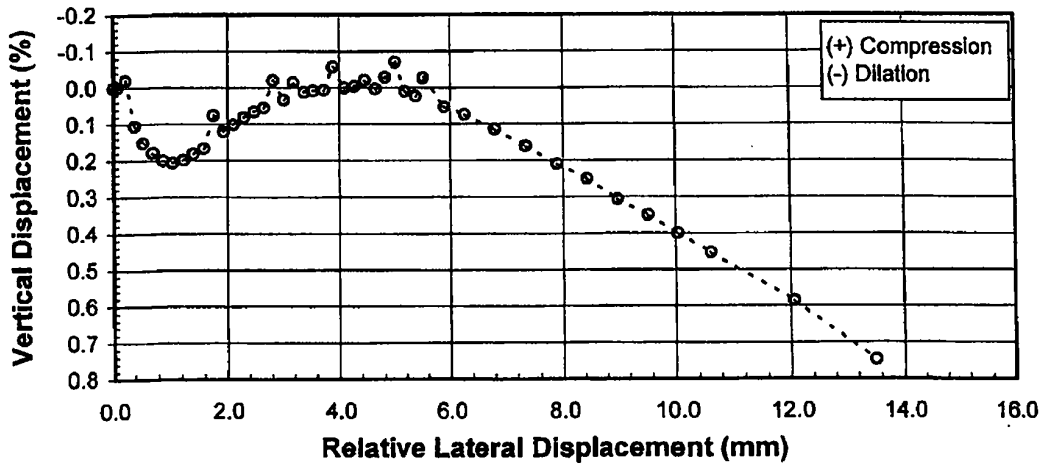
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00592

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	5.77	0.00	0.07
0.48	0.0798	10.76	0.00	0.12
0.98	0.2291	27.66	-0.02	0.32
1.48	0.3952	49.69	0.11	0.57
1.98	0.5442	65.54	0.15	0.75
2.48	0.7107	78.71	0.18	0.90
2.98	0.8840	88.97	0.20	1.02
3.48	1.0454	97.96	0.21	1.12
3.98	1.2315	102.56	0.20	1.18
4.48	1.3999	105.19	0.18	1.21
4.98	1.5864	109.16	0.17	1.25
5.48	1.7554	113.13	0.08	1.30
5.98	1.9294	113.97	0.12	1.31
6.48	2.1094	118.48	0.10	1.36
6.98	2.2992	118.37	0.08	1.36
7.48	2.4805	122.12	0.07	1.40
7.98	2.6536	122.99	0.06	1.41
8.48	2.8187	122.08	-0.02	1.40
8.98	3.0144	122.55	0.03	1.41
9.48	3.1871	124.91	-0.01	1.43
9.98	3.3797	124.34	0.01	1.43
10.48	3.5420	125.68	0.01	1.44
10.98	3.7265	124.69	0.01	1.43
11.48	3.8888	125.15	-0.06	1.44
11.98	4.0923	125.41	0.00	1.44
12.48	4.2738	127.98	0.00	1.47
12.98	4.4566	126.63	-0.02	1.45
13.48	4.6403	127.86	0.00	1.47
13.98	4.8149	129.38	-0.03	1.48
14.48	4.9954	128.85	-0.07	1.48
14.98	5.1751	127.22	0.01	1.46
15.48	5.3727	128.11	0.02	1.47
15.98	5.5130	128.28	-0.03	1.47
16.98	5.8962	129.90	0.05	1.49
17.98	6.2629	128.22	0.07	1.47
19.48	6.8058	129.21	0.11	1.48
20.98	7.3425	134.18	0.16	1.54
22.48	7.8971	135.25	0.21	1.55
23.98	8.4396	135.00	0.25	1.55
25.48	8.9938	135.78	0.31	1.56
26.98	9.5312	134.16	0.35	1.54
28.48	10.0432	134.75	0.40	1.55
29.98	10.6169	132.74	0.45	1.52
33.98	12.0672	131.71	0.59	1.51
37.98	13.4971	133.19	0.75	1.53

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 1st Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 2.16 ksf

Source: Fordyce Murphy Pit, Sample No. Murphy C-33

Exelon (Victoria)

Reviewed By: MP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: Fordyce_C33B
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 4.32 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 4.32 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.607 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: Fordyce	[ ] Reconstituted	[ ] Kneading	Rammer Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: C33	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: B	[ ] Pluviated:	[X] Undercompaction: U_{rl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 0.5

Water Content (WC);	Initial - Trimming Location			Final, W_{st}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5620.00	NA
Container No.	S1			2T	Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil + Container (g)	131.82			630.00	Mass Moist Soil	455.00	NA
Mass Dry Soil + Container (g)	128.84			555.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	30.17			140.00	Container No.		
WATER CONTENT (%)	3.02			18.07	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	3.02	Final W_{st}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 110.28	Dry, $\gamma_{d,o}$ (pcf)= 107.04

(1) Measured in trimming ring, not shear box.

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porours inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Brown Poorly Graded SAND (Concrete Sand)
Trimming/Etc. Remarks:

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/13/2008 Date: 6/13/2008 Final Cal. By: HC Date: 6/13/2008
Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: Fordyce Type Test: DS
Task Number: N/A Sample No.: C33 Specific Gravitly, G_s: 2.61
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	3.02	441.66	15.2
" Bottom, W2			
" Sides, W3			
" Average, W4	3.02	441.66	15.2
" Assumed, W	3.02	441.66	15.2
Final (After Test/Shear)	18.07		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04745
Final Selected	0.04745

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.83	NA	NA
Height after Consolidation, H_c	30.98	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	0.46	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	30.52	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.607		Assumed	X	Measured			
Mass Dry Soil, Md (g)	441.66		X	Based on average water content		Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	3.0	110.27	107.04	0.518	15.2	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	4.32	NA	NA	$\varepsilon_{a,c}$ (%)	2.62	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP
Date: 6/17/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: Fordyce_C33B
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 4.32 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 30.98 (mm)
Vert. Strain During Consol.: 2.62 (%)

Boring No.: Fordyce
Sample No.: C33
Specimen No.: B
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
3.0	110.27	107.04	0.518	15.2

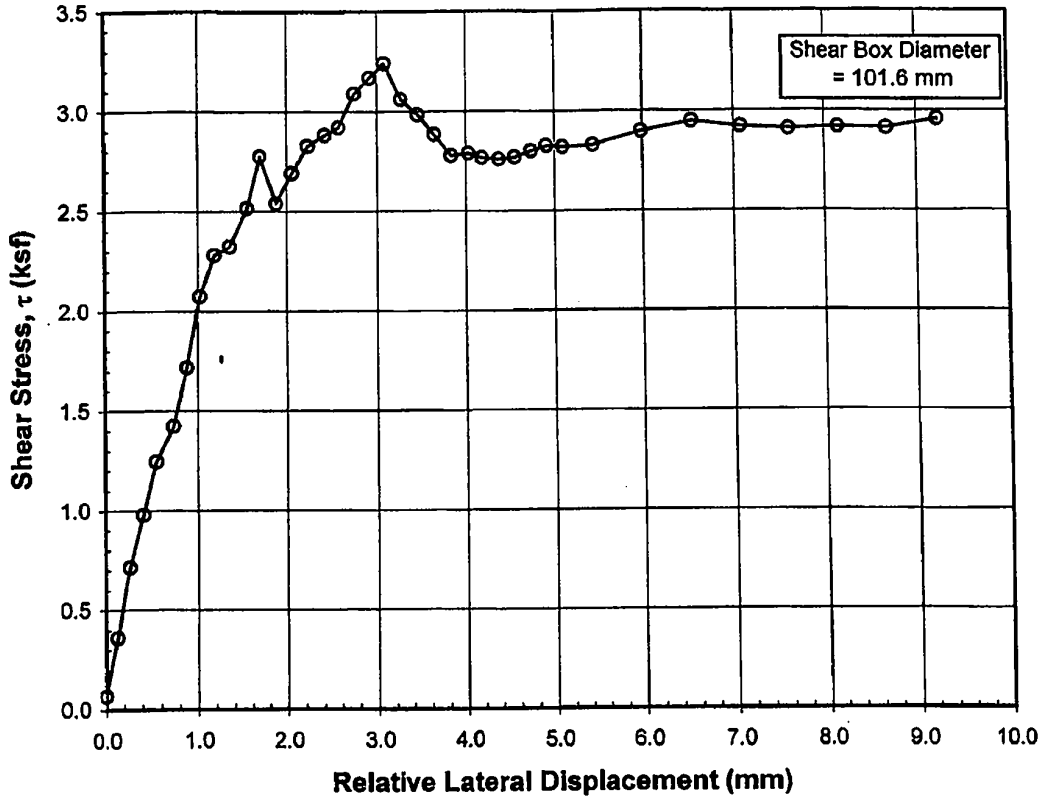
Peak Shear Stress, τ_f (ksf): 3.24

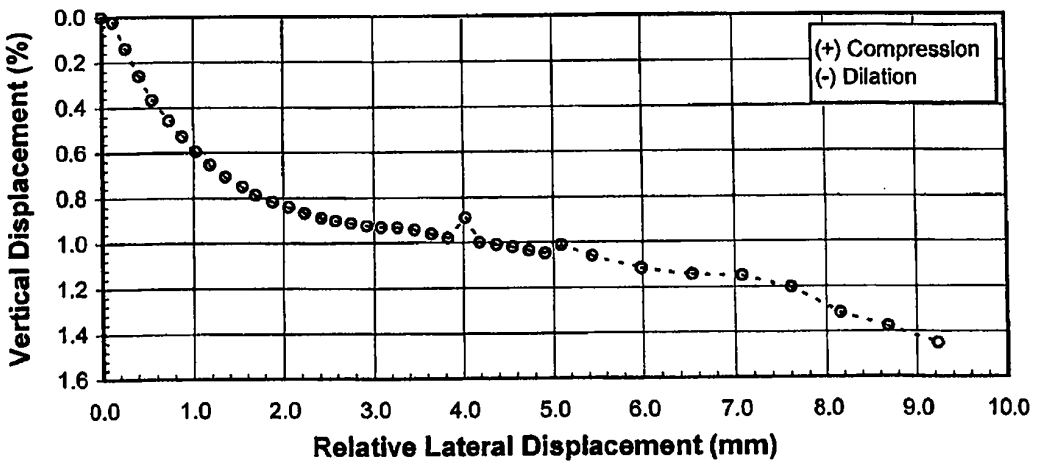
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00581

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	5.93	0.00	0.07
0.50	0.1274	31.60	0.02	0.36
1.00	0.2680	62.25	0.14	0.71
1.50	0.4141	85.35	0.26	0.98
2.00	0.5513	108.62	0.37	1.25
2.50	0.7340	124.08	0.46	1.42
3.00	0.8807	149.65	0.53	1.72
3.50	1.0273	180.88	0.59	2.08
4.00	1.1847	198.77	0.65	2.28
4.50	1.3529	202.38	0.71	2.32
5.00	1.5481	219.23	0.75	2.52
5.50	1.6984	242.02	0.79	2.78
6.00	1.8863	221.35	0.82	2.54
6.50	2.0592	234.47	0.84	2.69
7.00	2.2315	246.46	0.87	2.83
7.50	2.4211	251.21	0.89	2.88
8.00	2.5793	254.58	0.90	2.92
8.50	2.7531	269.16	0.91	3.09
9.00	2.9229	276.18	0.92	3.17
9.50	3.0799	282.51	0.93	3.24
10.00	3.2687	266.76	0.93	3.06
10.50	3.4624	260.18	0.94	2.98
11.00	3.6488	251.42	0.96	2.88
11.50	3.8320	242.22	0.98	2.78
12.00	4.0295	243.18	0.89	2.79
12.50	4.1865	241.15	1.00	2.77
13.00	4.3765	240.47	1.01	2.76
13.50	4.5574	241.28	1.02	2.77
14.00	4.7397	244.05	1.04	2.80
14.50	4.9115	246.28	1.05	2.83
15.00	5.0930	245.83	1.01	2.82
16.00	5.4422	246.55	1.06	2.83
17.50	5.9861	252.46	1.12	2.90
19.00	6.5336	256.88	1.14	2.95
20.50	7.0774	254.52	1.15	2.92
22.00	7.6036	253.47	1.20	2.91
23.50	8.1597	254.14	1.32	2.92
25.00	8.6871	253.85	1.38	2.91
26.50	9.2335	257.61	1.45	2.96

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 2nd Test In Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 4.32 ksf

Source: Fordyce Murphy Pit, Sample No. Murphy C-33

Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: Fordyce_C33C
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 8.64 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 8.64 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.607 [ ] Assumed;
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer = 20		
Boring No.: Fordyce	[ ] Reconstituted	[ ] Kneading	Rammer:Wgt.(lbf)= NA	Tamper: Force (lbf)= 4.5		
Sample No.: C33	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)= 1.5		
Depth (ft): N/A	Specimen No.: C	[ ] Pluviated:	[X] Undercompaction: U_{ni} (%) = 95	Ref.Effort=		
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 0.5	

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5615.00	NA
Container No.	5081			7A	Mass Trimming Ring, etc.	5160.00	NA
Mass Moist Soil + Container (g)	139.20			645.00	Mass Moist Soil	455.00	NA
Mass Dry Soil + Container (g)	136.00			575.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	30.63			140.00	Container No.		
WATER CONTENT (%)	3.04			16.09	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	3.04	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 110.28	Dry, $\gamma_{d,o}$ (pcf)= 107.03

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porours Inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Brown Poorly Graded SAND (Concrete Sand)

Trimming/Etc. Remarks:

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/13/2008 Date: 6/13/2008 Final Cal. By: HC Date: 6/13/2008
Reviewed By: HP HP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: Fordyce Type Test: DS
Task Number: N/A Sample No.: C33 Specific Gravitiy, G_s: 2.61
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved solids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:		Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial,	Top, W1	3.04	441.59	15.3
"	Bottom, W2			
"	Sides, W3			
"	Average, W4	3.04	441.59	15.3
"	Assumed, W	3.04	441.59	15.3
Final (After Test/Shear)		16.09		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04745
Final Selected	0.04745

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.94	NA	NA
Height after Consolidation, H_c	30.87	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	0.78	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	30.10	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.607		Assumed	X	Measured			
Mass Dry Soil, Md (g)	441.59		X	Based on average water content		Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	3.0	110.27	107.02	0.518	15.3	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	8.64	NA	NA	$\varepsilon_{a,c}$ (%)	2.94	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP
Date: 6/17/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: Fordyce_C33C
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 8.64 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 30.87 (mm)
Vert. Strain During Consol.: 2.94 (%)

Boring No.: Fordyce
Sample No.: C33
Specimen No.: C
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
3.0	110.27	107.02	0.518	15.3

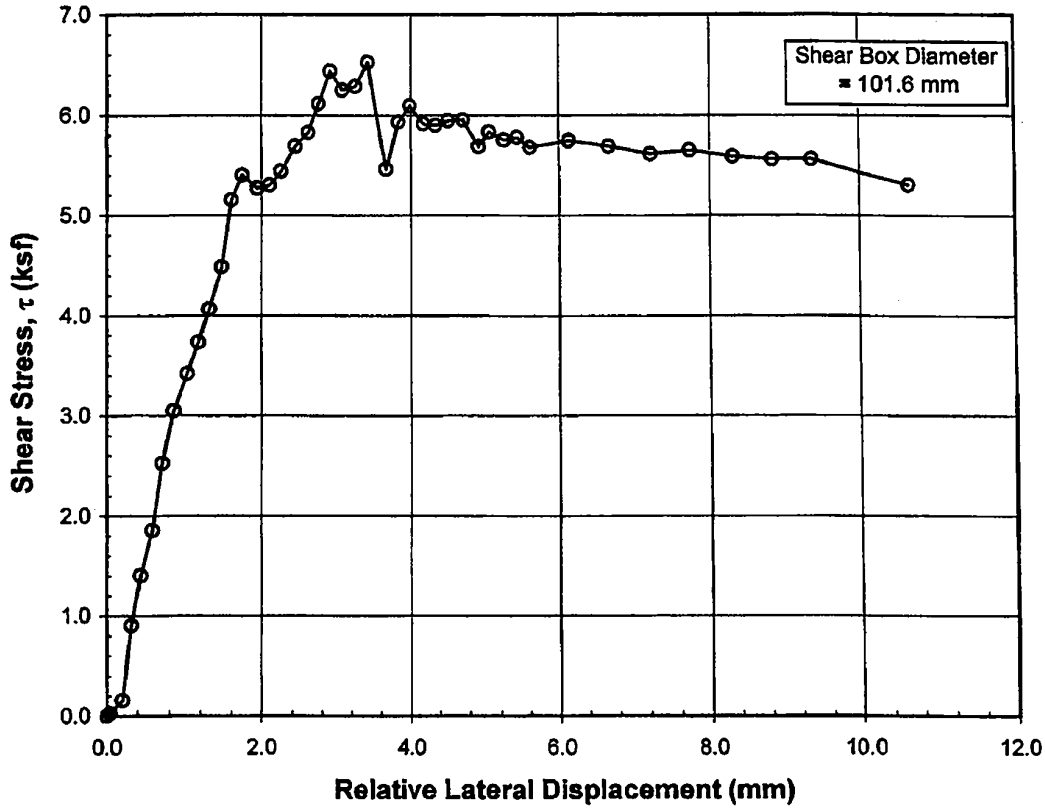
Peak Shear Stress, τ_f (ksf): 6.52

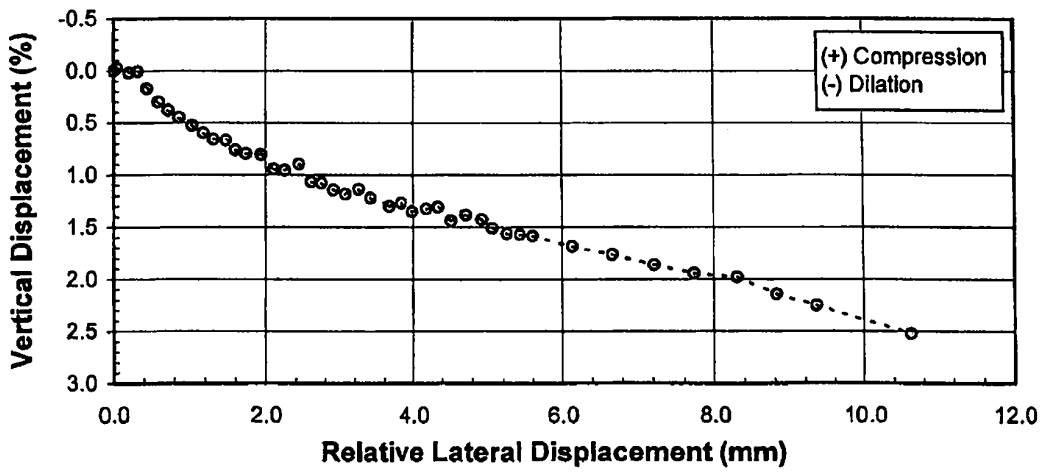
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00553

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-0.09	0.00	0.00
1.00	0.0440	2.37	-0.03	0.03
1.50	0.2062	13.72	0.02	0.16
2.00	0.3198	78.52	0.01	0.90
2.50	0.4393	122.31	0.17	1.40
3.00	0.5876	161.68	0.30	1.85
3.50	0.7142	220.04	0.38	2.52
4.00	0.8560	265.71	0.45	3.05
4.50	1.0246	298.00	0.53	3.42
5.00	1.1695	325.55	0.60	3.73
5.50	1.3075	354.43	0.66	4.07
6.00	1.4716	390.98	0.67	4.49
6.50	1.6011	449.29	0.76	5.15
7.00	1.7431	470.77	0.79	5.40
7.50	1.9440	459.62	0.81	5.27
8.00	2.1067	462.13	0.95	5.30
8.50	2.2560	474.22	0.96	5.44
9.00	2.4438	495.98	0.90	5.69
9.50	2.6148	507.98	1.07	5.83
10.00	2.7532	532.97	1.08	6.11
10.50	2.9137	560.87	1.14	6.43
11.00	3.0739	545.06	1.18	6.25
11.50	3.2542	548.05	1.14	6.29
12.00	3.4194	568.53	1.22	6.52
12.50	3.6664	476.19	1.30	5.46
13.00	3.8314	517.01	1.27	5.93
13.50	3.9879	531.01	1.35	6.09
14.00	4.1784	515.38	1.32	5.91
14.50	4.3424	514.11	1.31	5.90
15.00	4.5169	518.07	1.44	5.94
15.50	4.7148	519.03	1.38	5.95
16.00	4.9216	495.86	1.43	5.69
16.50	5.0604	508.50	1.51	5.83
17.00	5.2532	501.53	1.56	5.75
17.50	5.4272	504.01	1.57	5.78
18.00	5.6025	495.32	1.59	5.68
19.50	6.1329	501.09	1.68	5.75
21.00	6.6711	496.13	1.76	5.69
22.50	7.2187	489.38	1.86	5.61
24.00	7.7332	492.71	1.94	5.65
25.50	8.3109	487.14	1.98	5.59
27.00	8.8304	484.64	2.14	5.56
28.50	9.3544	484.70	2.25	5.56
32.00	10.6265	462.40	2.52	5.30



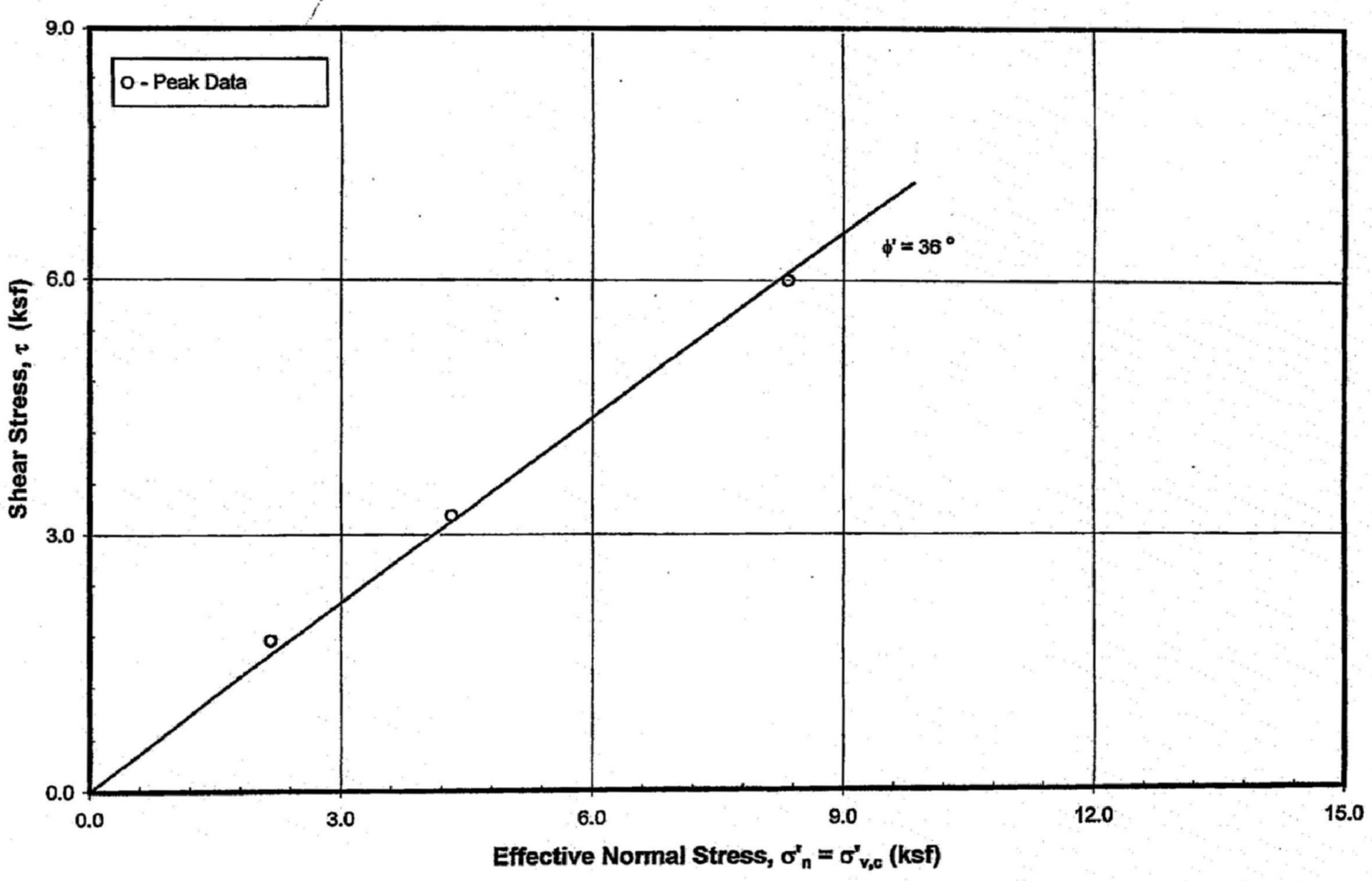


DRAINED DIRECT SHEAR TEST: 3rd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 8.64 ksf

Source: Fordyce Murphy Pit, Sample No. Murphy C-33
Exelon (Victoria)

Reviewed By: HP



DRAINED DIRECT SHEAR TEST: Test Series - (Peak)
Soil - Soil Interface & OCR = Unkown
Source:FORDYCE, Sample No. C-144
Exelon (Victoria)

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: Fordyce_C144A
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.16 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.16 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.661 [ ] Assumed; [X] Measured
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer = 20		
Boring No.: Fordyce	[ ] Reconstituted	[ ] Kneading	Rammer:Wgt.(lbf)= NA	Tamper: Force (lbf)= 4.5		
Sample No.: C-144	Compostite No.: N/A	[ ] Impact/Rammer	Drop(in.)= NA	Dia.(in.)= 1.5		
Depth (ft): N/A	Specimen No.: A	[ ] Pluviated:	[X] Undercompaction:	U_{rl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 0.5	

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5585.00	NA
Container No.	532			21	Mass Trimming Ring, etc.	5140.00	NA
Mass Moist Soil + Container (g)	132.58			615.00	Mass Moist Soil	445.00	NA
Mass Dry Soil + Container (g)	124.95			540.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	31.40			140.00	Container No.		
WATER CONTENT (%)	8.16			18.75	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	8.16	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)	0.00	

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 107.85	Dry, $\gamma_{d,o}$ (pcf)= 99.72

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Brown Poorly Graded SAND (Mortar Sand)

Trimming/Etc. Remarks:

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/16/2008 Date: 6/16/2008 Final Cal. By: HC Date: 6/16/2008
Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: Fordyce Type Test: DS
Task Number: N/A Sample No.: C-144 Specific Gravity, G_s: 2.66
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved solids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	8.16	411.44	32.7
" " Bottom, W2			
" Sides, W3			
" " Average, W4	8.16	411.44	32.7
" " Assumed, W	8.16	411.44	32.7
Final (After Test/Shear)	18.75		

Back-calculated Data Item	Value	Input Data for Back Calculation $S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04649
Final Selected	0.04649

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.34	NA	NA
Height after Consolidation, H_c	31.47	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.01	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	31.47	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.661		Assumed	X	Measured			
Mass Dry Soil, Md (g)	411.44	X	Based on average water content		Value based on one of the above values			
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	8.2	107.85	99.72	0.663	32.7	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	2.16	NA	NA	$\varepsilon_{a,c}$ (%)	1.08	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP
Date: 6/17/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: Fordyce_C144A
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 2.16 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.47 (mm)
Vert. Strain During Consol.: 1.08 (%)

Boring No.: Fordyce
Sample No.: C-144
Specimen No.: A
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
8.2	107.85	99.72	0.663	32.7

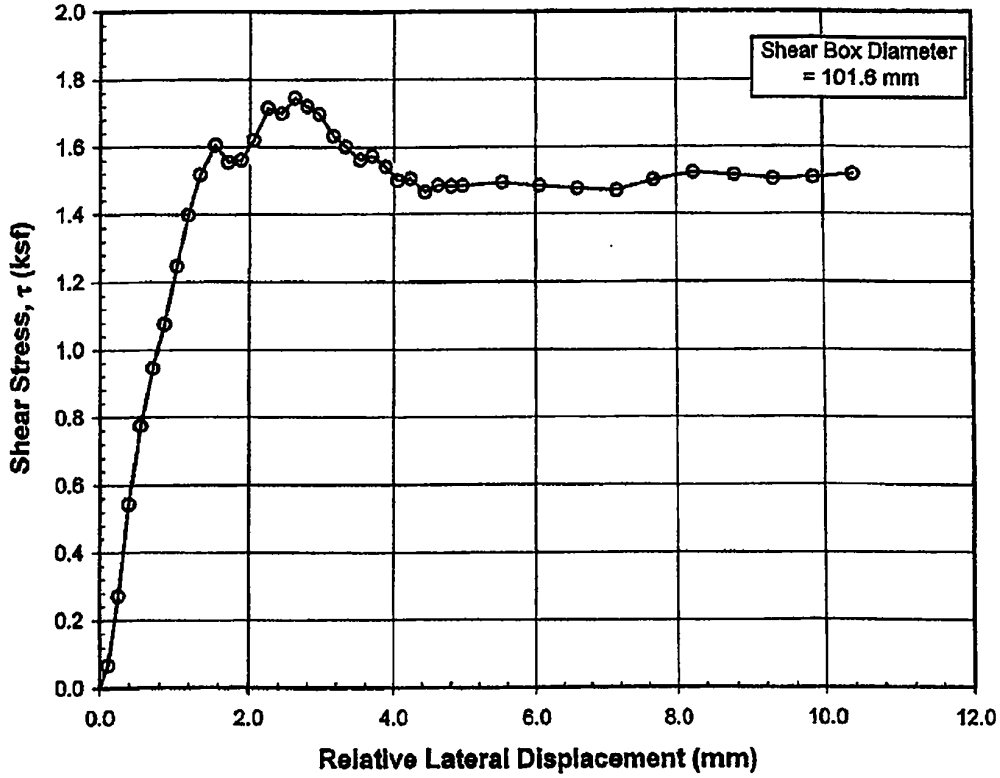
Peak Shear Stress, τ_f (ksf): 1.75

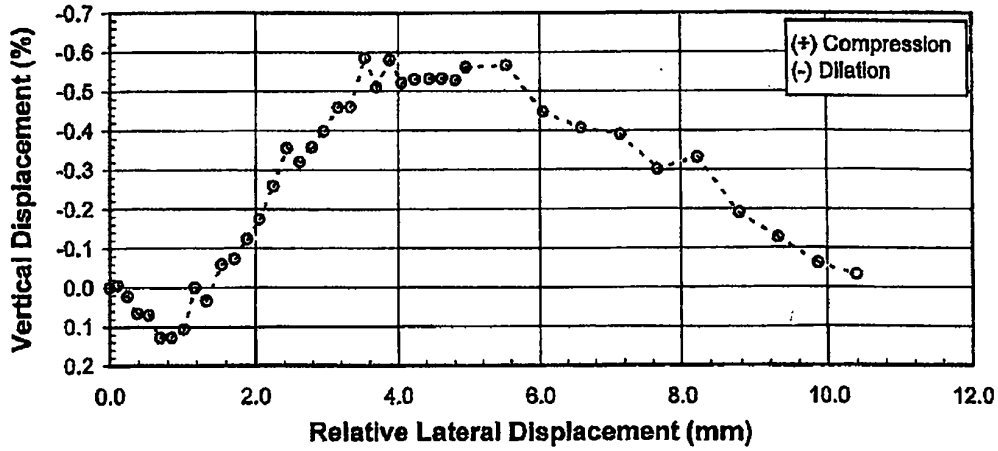
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00587

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-0.29	0.00	0.00
0.50	0.1117	5.87	-0.01	0.07
1.00	0.2469	23.67	0.02	0.27
1.50	0.3834	47.33	0.07	0.54
2.00	0.5397	67.53	0.07	0.77
2.50	0.7018	82.41	0.13	0.95
3.00	0.8604	93.74	0.13	1.08
3.50	1.0278	108.76	0.11	1.25
4.00	1.1831	121.82	0.00	1.40
4.50	1.3447	132.27	0.03	1.52
5.00	1.5435	139.97	-0.06	1.61
5.50	1.7179	135.54	-0.07	1.56
6.00	1.8901	136.10	-0.12	1.56
6.50	2.0569	141.28	-0.18	1.62
7.00	2.2517	149.57	-0.26	1.72
7.50	2.4380	148.16	-0.36	1.70
8.00	2.6172	152.14	-0.32	1.75
8.50	2.7882	150.01	-0.36	1.72
9.00	2.9560	148.04	-0.40	1.70
9.50	3.1548	142.40	-0.46	1.63
10.00	3.3276	139.61	-0.46	1.60
10.50	3.5299	136.18	-0.59	1.56
11.00	3.6976	137.17	-0.51	1.57
11.50	3.8906	134.36	-0.58	1.54
12.00	4.0555	130.77	-0.52	1.50
12.50	4.2393	131.20	-0.53	1.51
13.00	4.4414	127.76	-0.53	1.47
13.50	4.6216	129.50	-0.53	1.49
14.00	4.8085	129.27	-0.53	1.48
14.50	4.9662	129.40	-0.56	1.48
16.00	5.5357	130.24	-0.57	1.49
17.50	6.0551	129.36	-0.45	1.48
19.00	6.6006	128.64	-0.41	1.48
20.50	7.1543	128.10	-0.39	1.47
22.00	7.6764	130.81	-0.30	1.50
23.50	8.2341	132.77	-0.33	1.52
25.00	8.7844	132.16	-0.19	1.52
26.50	9.3163	131.13	-0.13	1.50
28.00	9.8660	131.53	-0.06	1.51
29.50	10.3930	132.45	-0.03	1.52

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 1st Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 2.16 ksf

Source:FORDYCE, Sample No. C-144

Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: Fordyce_C144B
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 4.32 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 4.32 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.661 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded | [ ] Liner [X] Recompacted | [X] Tampling | [ ] Constant Effort: Blows/Tamps per Layer = 20
Boring No.: Fordyce | [ ] Reconstituted | [ ] Kneading | Rammer:Wgt.(lbf)= NA | Tamper: Force (lbf)= 4.5
Sample No.: C-144 | Compostite No.: N/A | [ ] Inpact/Rammer | Drop(in.)= NA | Dia.(in.)= 1.5
Depth (ft): N/A | Specimen No.: B | [ ] Pluviated: | [X] Undercompaction: U_{rf} (%) = 95 | Ref.Effort=
[ ] Spec. Selection by X - Ray; [ ] Geomarine Sample | No. Layers = 3 | % Comp= | ± Opt.= 0.5

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5615.00	NA
Container No.	6071			7	Mass Trimming Ring, etc.	5170.00	NA
Mass Moist Soil + Container (g)	131.59			630.00	Mass Moist Soil	445.00	NA
Mass Dry Soil + Container (g)	124.14			545.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	31.57			140.00	Container No.		
WATER CONTENT (%)	8.05			20.99	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	8.05	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)	0.00	

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{spi}	without Spec., H_{spo}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 107.85	Dry, $\gamma_{d,o}$ (pcf)= 99.82

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Brown Poorly Graded SAND (Mortar Sand)

Trimming/Etc. Remarks:

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/16/2008 Date: 6/16/2008 Final Cal. By: HC Date: 6/16/2008
Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: Fordyce Type Test: DS
Task Number: N/A Sample No.: C-144 Specific Gravity, G_s: 2.66
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved solids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	8.05	411.85	32.4
" Bottom, W2			
" Sides, W3			
" Average, W4	8.05	411.85	32.4
" Assumed, W	8.05	411.85	32.4
Final (After Test/Shear)	20.99		

Back-calculated Data Item	Value	Input Data for Back Calculation $S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04649
Final Selected	0.04649

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.55	NA	NA
Height after Consolidation, H_o	31.26	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	0.33	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{sf}	30.93	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.661		Assumed	X	Measured			
Mass Dry Soil, Md (g)	411.85		X	Based on average water content		Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	8.0	107.85	99.82	0.661	32.4	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	4.32	NA	NA	$\varepsilon_{a,c}$ (%)	1.74	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP
Date: 6/17/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: Fordyce_C144B
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 8 DS
Consol. Stress, $\sigma'_{v,c}$: 4.32 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.26 (mm)
Vert. Strain During Consol.: 1.74 (%)

Boring No.: Fordyce
Sample No.: C-144
Specimen No.: B
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
8.0	107.85	99.82	0.661	32.4

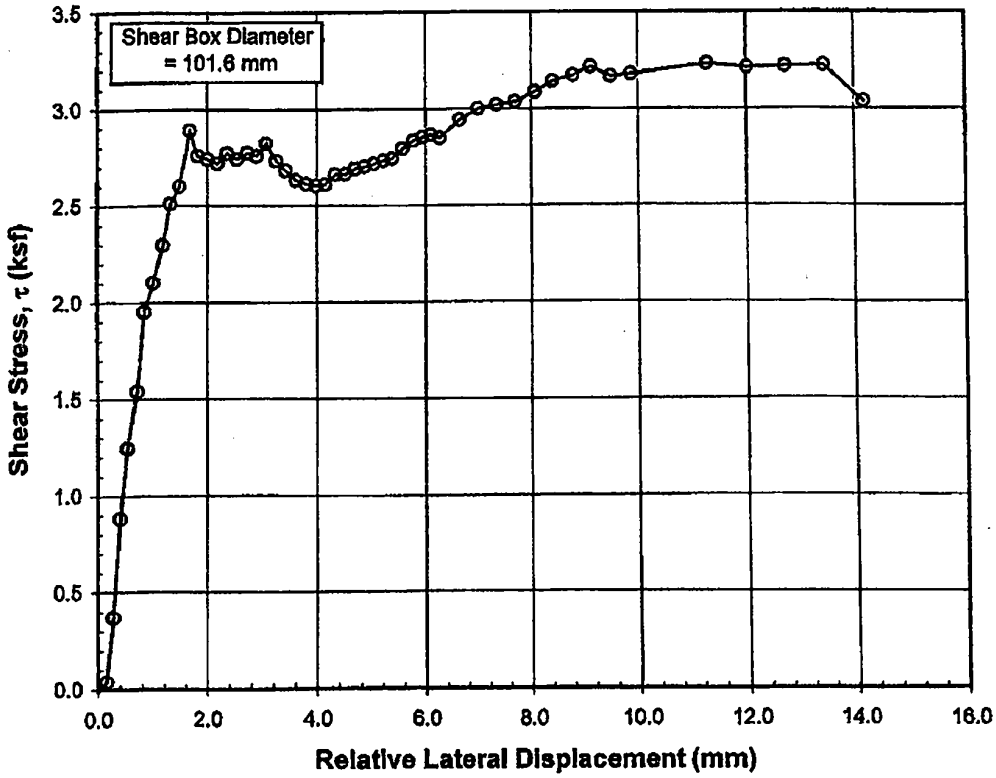
Peak Shear Stress, τ_f (ksf): 3.23

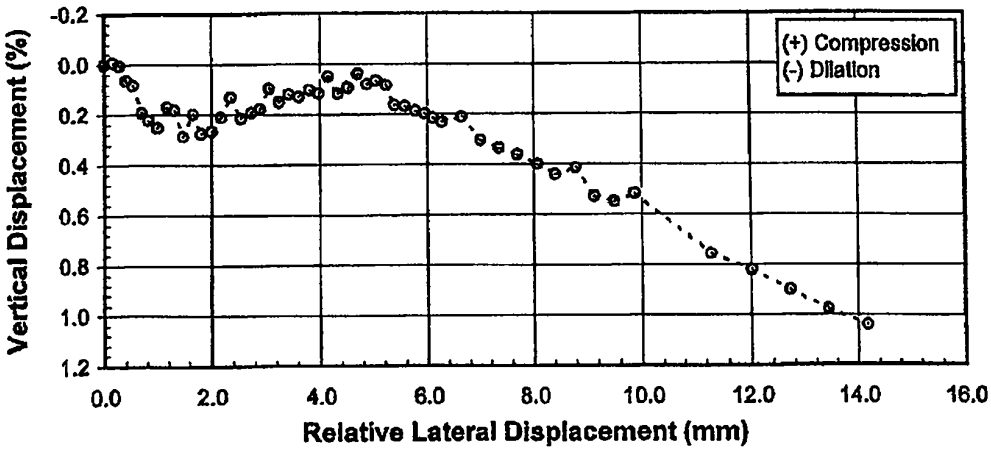
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00583

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-1.09	0.00	-0.01
0.50	0.1600	3.44	-0.01	0.04
1.00	0.2789	32.21	0.01	0.37
1.50	0.4030	76.93	0.06	0.88
2.00	0.5266	108.66	0.08	1.25
2.50	0.7012	134.24	0.19	1.54
3.00	0.8256	170.10	0.22	1.95
3.50	0.9890	183.24	0.25	2.10
4.00	1.1660	200.26	0.17	2.30
4.50	1.3053	218.85	0.18	2.51
5.00	1.4765	228.72	0.29	2.60
5.50	1.6679	252.08	0.20	2.89
6.00	1.8185	240.64	0.28	2.76
6.50	2.0046	238.93	0.27	2.74
7.00	2.1798	237.06	0.21	2.72
7.50	2.3559	241.63	0.13	2.77
8.00	2.5421	238.90	0.21	2.74
8.50	2.7320	241.81	0.19	2.77
9.00	2.8958	240.44	0.16	2.76
9.50	3.0681	246.10	0.10	2.82
10.00	3.2643	238.10	0.15	2.73
10.50	3.4306	233.70	0.12	2.68
11.00	3.6171	229.42	0.13	2.63
11.50	3.8070	227.65	0.10	2.61
12.00	3.9829	226.90	0.12	2.60
12.50	4.1511	227.39	0.05	2.61
13.00	4.3368	231.90	0.12	2.66
13.50	4.5194	232.04	0.09	2.66
14.00	4.7022	234.51	0.04	2.69
14.50	4.8761	235.51	0.08	2.70
15.00	5.0436	236.75	0.07	2.72
15.50	5.2217	238.20	0.08	2.73
16.00	5.3828	239.15	0.16	2.74
16.50	5.5716	243.51	0.17	2.79
17.00	5.7746	247.09	0.19	2.83
17.50	5.9449	248.58	0.20	2.85
18.00	6.1035	249.84	0.22	2.87
18.50	6.2739	248.40	0.23	2.85
19.50	6.6429	256.62	0.21	2.94
20.50	6.9988	261.58	0.30	3.00
21.50	7.3523	263.14	0.34	3.02
22.50	7.7011	264.61	0.36	3.04
23.50	8.0747	269.09	0.40	3.09
24.50	8.4110	273.84	0.44	3.14
25.50	8.8031	276.48	0.41	3.17
26.50	9.1353	280.42	0.53	3.22
27.50	9.5003	275.99	0.55	3.17
28.50	9.8711	277.03	0.52	3.18
32.50	11.2967	281.62	0.76	3.23
34.50	12.0219	280.01	0.82	3.21
36.50	12.7180	280.43	0.90	3.22
38.50	13.4523	280.85	0.98	3.22
40.50	14.1744	264.88	1.04	3.04





DRAINED DIRECT SHEAR TEST: 2nd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 4.32 ksf

Source:FORDYCE, Sample No. C-144

Exelon (Victoria)

Reviewed By: MP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: Fordyce_C144C
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 8.64 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 8.64 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.661 [ ] Assumed; [X] Measured
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: Fordyce	[ ] Reconstituted	[ ] Kneading	Rammer Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: C-144	Composite No.: N/A	[ ] Impact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: C	[ ] Pluviated:	[X] Undercompaction: U_{ni} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 0.5

Water Content (WC);	Initial - Trimming Location			Final, W_{sf}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5815.00	NA
Container No.	155			7a	Mass Trimming Ring, etc.	5170.00	NA
Mass Moist Soil + Container (g)	137.15			625.00	Mass Moist Soil	445.00	NA
Mass Dry Soil + Container (g)	129.44			545.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	29.95			140.00	Container No.		
WATER CONTENT (%)	7.75			19.75	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	7.75	Final W_{sf}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 107.85	Dry, $\gamma_{d,o}$ (pcf)= 100.10

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Brown Poorly Graded SAND (Mortar Sand)

Trimming/Etc. Remarks:

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/16/2008 Date: 6/16/2008 Final Cal. By: HC Date: 6/16/2008
Reviewed By: HP HP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: Fordyce Type Test: DS
Task Number: N/A Sample No.: C-144 Specific Gravitiy, G_s: 2.66
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved solids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:		Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial,	Top, W1	7.75	412.99	31.4
"	Bottom, W2			
"	Sides, W3			
"	Average, W4	7.75	412.99	31.4
"	Assumed, W	7.75	412.99	31.4
Final (After Test/Shear)		19.75		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_W \times A_{sb}$	
Estimated	0.04649
Final Selected	0.04649

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.86	NA	NA
Height after Consolidation, H_c	30.95	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	0.14	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{af}	30.81	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.661		[ ] Assumed	[X] Measured				
Mass Dry Soil, Md (g)	412.99		[X] Based on average water content			[ ] Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	7.7	107.85	100.09	0.657	31.4	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	8.64	NA	NA	$\varepsilon_{a,o}$ (%)	2.72	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/17/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: Fordyce_C144C
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 8.64 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 30.95 (mm)
Vert. Strain During Consol.: 2.72 (%)

Boring No.: Fordyce
Sample No.: C-144
Specimen No.: C
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
7.7	107.85	100.09	0.657	31.4

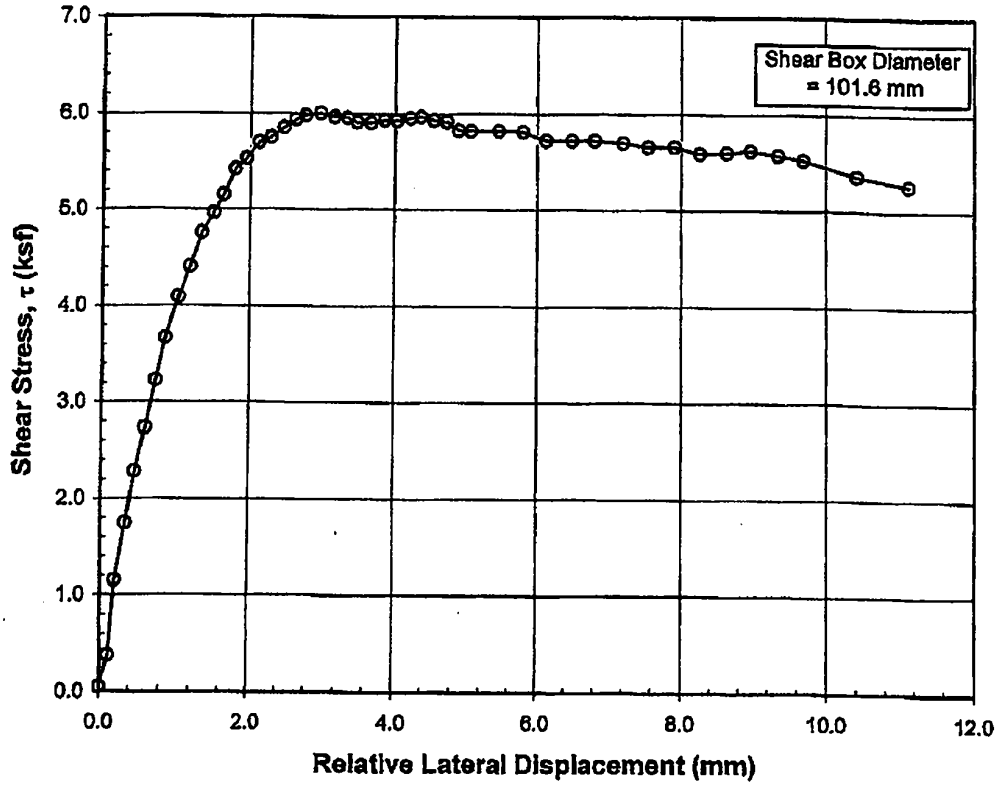
Peak Shear Stress, τ_f (ksf): 6.00

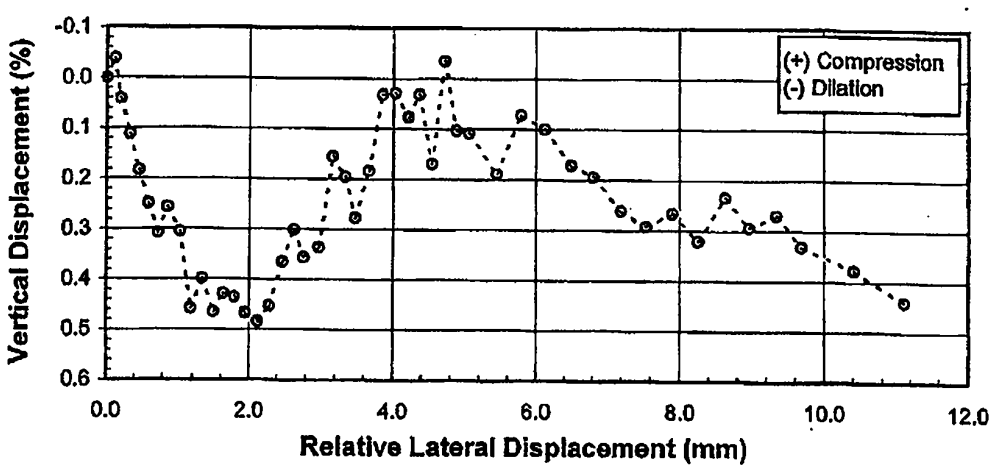
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00561

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	4.74	0.00	0.05
0.50	0.1149	33.17	-0.04	0.38
1.00	0.1963	100.56	0.04	1.15
1.50	0.3328	152.25	0.11	1.75
2.00	0.4554	198.79	0.18	2.28
2.50	0.5910	238.31	0.25	2.73
3.00	0.7256	281.40	0.31	3.23
3.50	0.8561	319.70	0.26	3.67
4.00	1.0202	356.52	0.31	4.09
4.50	1.1729	384.18	0.46	4.41
5.00	1.3329	414.76	0.40	4.76
5.50	1.4925	432.63	0.47	4.96
6.00	1.6292	449.05	0.43	5.15
6.50	1.7880	472.35	0.44	5.42
7.00	1.9507	482.02	0.47	5.53
7.50	2.1233	496.55	0.48	5.70
8.00	2.2928	501.21	0.45	5.75
8.50	2.4755	509.88	0.37	5.85
9.00	2.6348	517.00	0.30	5.93
9.50	2.7674	521.05	0.36	5.98
10.00	2.9760	523.10	0.34	6.00
10.50	3.1637	519.87	0.16	5.96
11.00	3.3387	519.14	0.20	5.96
11.50	3.4795	514.96	0.28	5.91
12.00	3.6591	514.37	0.18	5.90
12.50	3.8499	517.19	0.03	5.93
13.00	4.0249	516.61	0.03	5.93
13.50	4.2151	518.85	0.08	5.95
14.00	4.3673	519.94	0.03	5.97
14.50	4.5396	517.17	0.17	5.93
15.00	4.7166	515.50	-0.03	5.91
15.50	4.8834	507.98	0.10	5.83
16.00	5.0536	507.29	0.11	5.82
17.00	5.4454	507.51	0.19	5.82
18.00	5.7903	506.73	0.07	5.81
19.00	6.1258	498.92	0.10	5.72
20.00	6.4947	498.86	0.17	5.72
21.00	6.8119	498.86	0.19	5.72
22.00	7.1982	496.79	0.26	5.70
23.00	7.5458	493.27	0.29	5.66
24.00	7.9057	493.39	0.27	5.66
25.00	8.2590	487.33	0.32	5.59
26.00	8.6373	488.20	0.23	5.60
27.00	8.9686	490.11	0.29	5.62
28.00	9.3519	486.12	0.27	5.58
29.00	9.6935	481.73	0.33	5.53
31.00	10.4102	467.74	0.38	5.37
33.00	11.1138	458.73	0.44	5.26

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





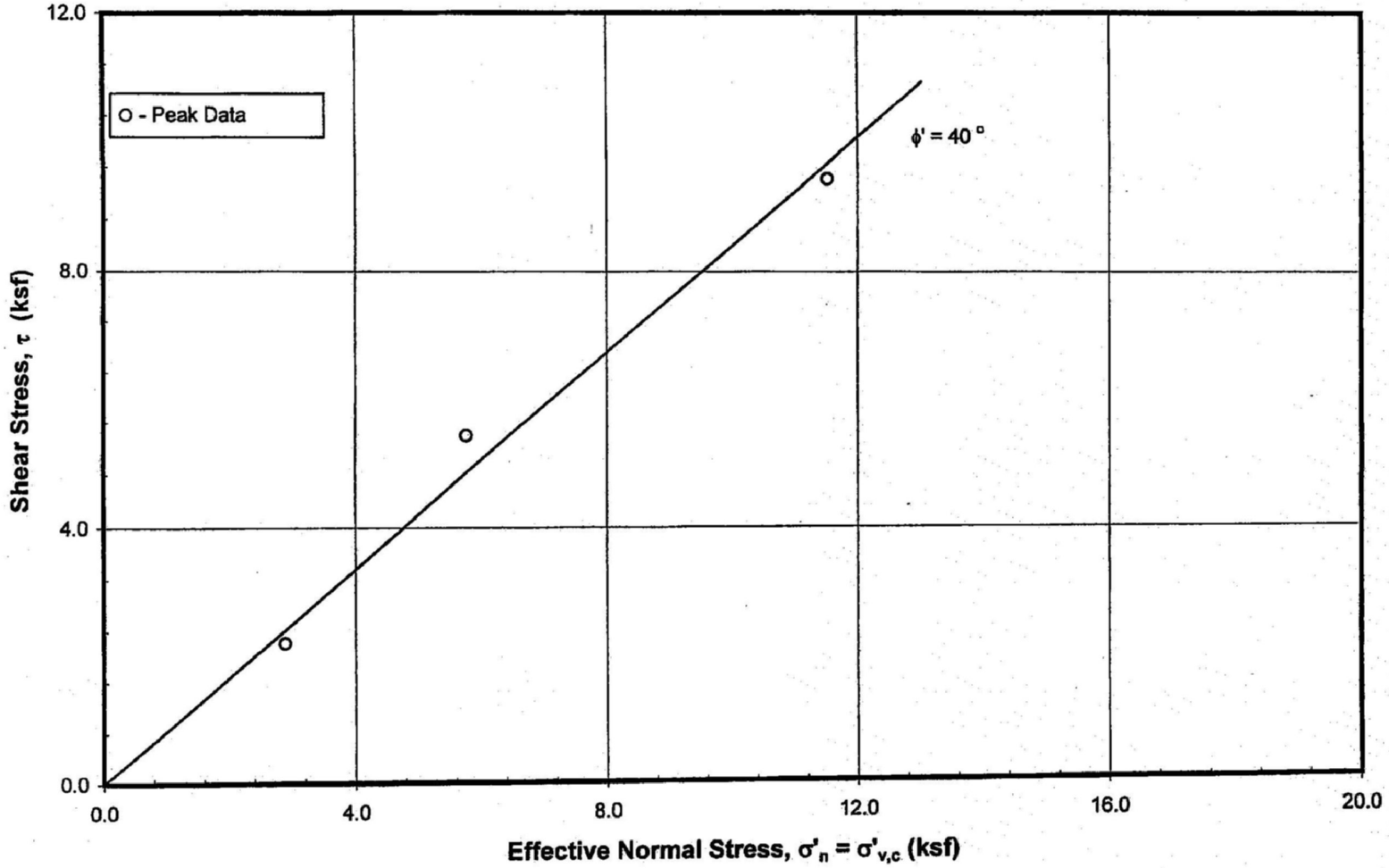
DRAINED DIRECT SHEAR TEST: 3rd Test In Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 8.64 ksf

Source:FORDYCE, Sample No. C-144

Exelon (Victoria)

Reviewed By: NP



DRAINED DIRECT SHEAR TEST: Test Series - (Peak)
Soil - Soil Interface & OCR = Unkown
Source: Fordyce Briggs, Sample No. RAW-3/8
Exelon (Victoria)

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: B-1_Fordyced
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.88 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.88 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.697 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: RAW-3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: d	[ ] Pluviated:	[X] Undercompaction: U_{nl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)
Container No.	3053			1
Mass Moist Soil + Container (g)	147.98			1044.75
Mass Dry Soil + Container (g)	138.14			988.85
Mass Container (g)	58.84			547.97
WATER CONTENT (%)	12.41			12.68
Avg. Initial WC, W4 (%)	12.41	Final W_{at}: Soil with free water trimmed away		
[ ] See attached data sheet(s) for additional water contents				

Soil and Ring Masses (g)	Initial	Final
Mass Moist Soil+Trimming Ring	5685.00	NA
Mass Trimming Ring, etc.	5155.00	NA
Mass Moist Soil	530.00	NA
Excess Dry Soil (soil not included in final water content)		
Container No.		
Mass Dry Soil + Cont. (g)		
Mass Container (g)		
Mass Excess Dry Soil (g)	0.00	

Soil Height: Measurements[1]	
Initial (mm)	
with Spec., H_{spl}	without Spec., H_{app}
31.81	
Block Used[2]:	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} [2]	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 128.45	Dry, $\gamma_{d,o}$ (pcf)= 114.27

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System[3] (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Pale Brown Well Graded SAND with gravel (visual)

Trimming/Etc. Remarks: RAW-3/8 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting[4]: Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/11/2008 Date: 6/11/2008 Final Cal. By: HC Date: 6/11/2008
Reviewed By: HP HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: RAW-3/8 Specific Gravitiy, G_s: 2.70
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved sollids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	12.41	471.49	71.1
" Bottom, W2			
" Sides, W3			
" Average, W4	12.41	471.49	71.1
" Assumed, W	12.41	471.49	71.1
Final (After Test/Shear)	12.68		

Back-calculated Data Item	Value	Input Data for Back Calculation $S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04587
Final Selected	0.04587

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.04	NA	NA
Height after Consolidation, H_c	31.77	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.32	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{st}	32.09	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}: 80.977 , cm^2
Specific Gravity, G_s: 2.697 [ ] Assumed [X] Measured
Mass Dry Soil, Md (g): 471.49 [X] Based on average water content [ ] Value based on one of the above values

	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)
Initial:	12.4	128.45	114.27	0.471	71.1	31.81	257.59

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	2.88	NA	NA	$\varepsilon_{a,c}$ (%)	0.11	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/12/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: B-1_Fordyced
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 2.88 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.77 (mm)
Vert. Strain During Consol.: 0.11 (%)

Boring No.: N/A
Sample No.: RAW-3/8
Specimen No.: d
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
12.4	128.45	114.27	0.471	71.1

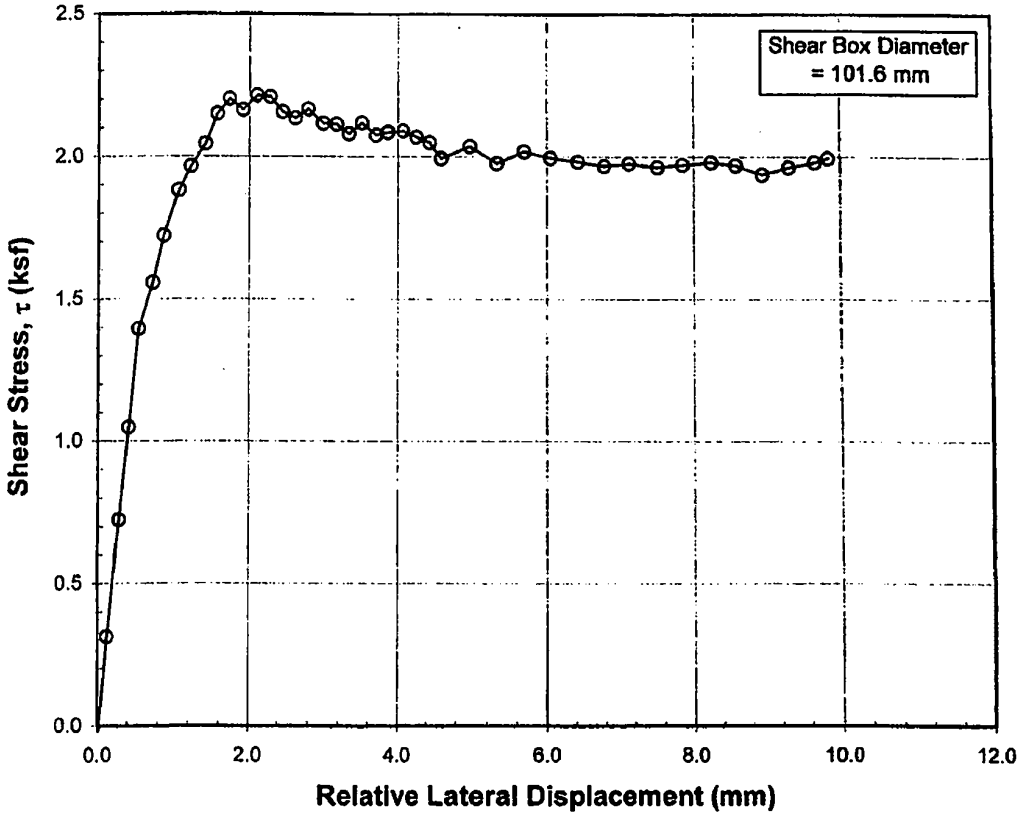
Peak Shear Stress, τ_f (ksf): 2.21

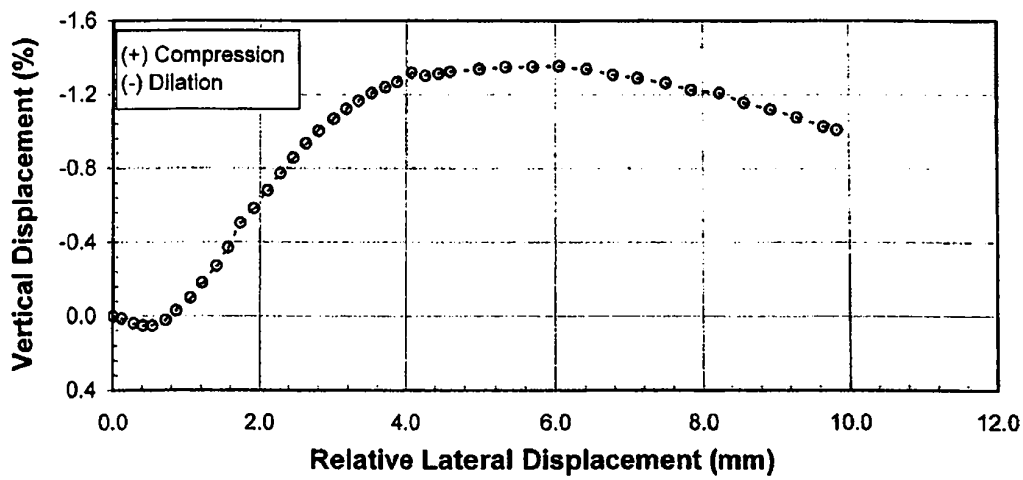
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00586

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-4.42	0.00	-0.05
0.50	0.1194	27.34	0.01	0.31
1.00	0.2817	63.13	0.04	0.72
1.50	0.4129	91.38	0.05	1.05
2.00	0.5410	121.59	0.05	1.39
2.50	0.7233	135.68	0.02	1.56
3.00	0.8658	150.07	-0.03	1.72
3.50	1.0573	163.99	-0.10	1.88
4.00	1.2130	171.27	-0.18	1.96
4.50	1.4099	178.17	-0.27	2.04
5.00	1.5668	187.39	-0.37	2.15
5.50	1.7348	191.98	-0.50	2.20
6.00	1.9173	188.54	-0.58	2.16
6.50	2.1068	193.02	-0.68	2.21
7.00	2.2857	192.58	-0.77	2.21
7.50	2.4562	187.91	-0.86	2.16
8.00	2.6288	185.99	-0.93	2.13
8.50	2.8007	188.81	-1.00	2.17
9.00	2.9992	184.50	-1.07	2.12
9.50	3.1695	184.21	-1.12	2.11
10.00	3.3371	181.28	-1.17	2.08
10.50	3.5142	184.87	-1.21	2.12
11.00	3.7050	180.91	-1.24	2.08
11.50	3.8653	181.77	-1.27	2.09
12.00	4.0779	182.21	-1.32	2.09
12.50	4.2677	180.25	-1.30	2.07
13.00	4.4485	178.61	-1.31	2.05
13.50	4.6055	173.70	-1.32	1.99
14.50	4.9802	177.46	-1.34	2.04
15.50	5.3321	172.28	-1.35	1.98
16.50	5.6953	175.92	-1.35	2.02
17.50	6.0486	173.93	-1.35	2.00
18.50	6.4218	172.85	-1.34	1.98
19.50	6.7819	171.46	-1.31	1.97
20.50	7.1234	172.24	-1.29	1.98
21.50	7.5064	171.08	-1.26	1.96
22.50	7.8478	171.83	-1.22	1.97
23.50	8.2378	172.67	-1.21	1.98
24.50	8.5818	171.70	-1.16	1.97
25.50	8.9460	168.84	-1.12	1.94
26.50	9.3068	170.99	-1.08	1.96
27.50	9.6613	172.60	-1.03	1.98
28.00	9.8366	173.86	-1.01	1.99

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 1st Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 2.88 ksf

Source: Fordyce Briggs, Sample No. RAW-3/8

Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: B-1_Fordycee
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 5.76 , ____ & ____ | Area - Shear Box, A_{sb} (cm^2): 80.977
Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 5.76 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.697 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer:Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: RAW-3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: e	[ ] Pluviated:	[X] Undercompaction: U_{pl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5695.00	NA
Container No.	3047			1	Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil + Container (g)	170.89			1068.66	Mass Moist Soil	530.00	NA
Mass Dry Soil + Container (g)	157.51			1006.94	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	49.42			547.97	Container No.		
WATER CONTENT (%)	12.38			13.45	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	12.38	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{spl}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 128.45	Dry, $\gamma_{d,o}$ (pcf)= 114.30

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porours inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Pale Brown Well Graded SAND with gravel (visual)

Trimming/Etc. Remarks: RAW-3/8 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/11/2008 Date: 6/11/2008 Final Cal. By: HC Date: 6/11/2008
Reviewed By: HP HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: RAW-3/8 Specific Gravitiy, G_s: 2.70
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	12.38	471.62	71.0
" Bottom, W2			
" Sides, W3			
" Average, W4	12.38	471.62	71.0
" Assumed, W	12.38	471.62	71.0
Final (After Test/Shear)	13.45		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04587
Final Selected	0.04587

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.05	NA	NA
Height after Consolidation, H_c	31.76	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.37	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	32.12	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.697			Assumed	X	Measured		
Mass Dry Soil, Md (g)	471.62		X	Based on average water content			Value based on one of the above values	
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	12.4	128.45	114.30	0.470	71.0	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	5.76	NA	NA	$\varepsilon_{a,c}$ (%)	0.17	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: B-1_Fordycee
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 5.76 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.76 (mm)
Vert. Strain During Consol.: 0.17 (%)

Boring No.: N/A
Sample No.: RAW-3/8
Specimen No.: e
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
12.4	128.45	114.30	0.470	71.0

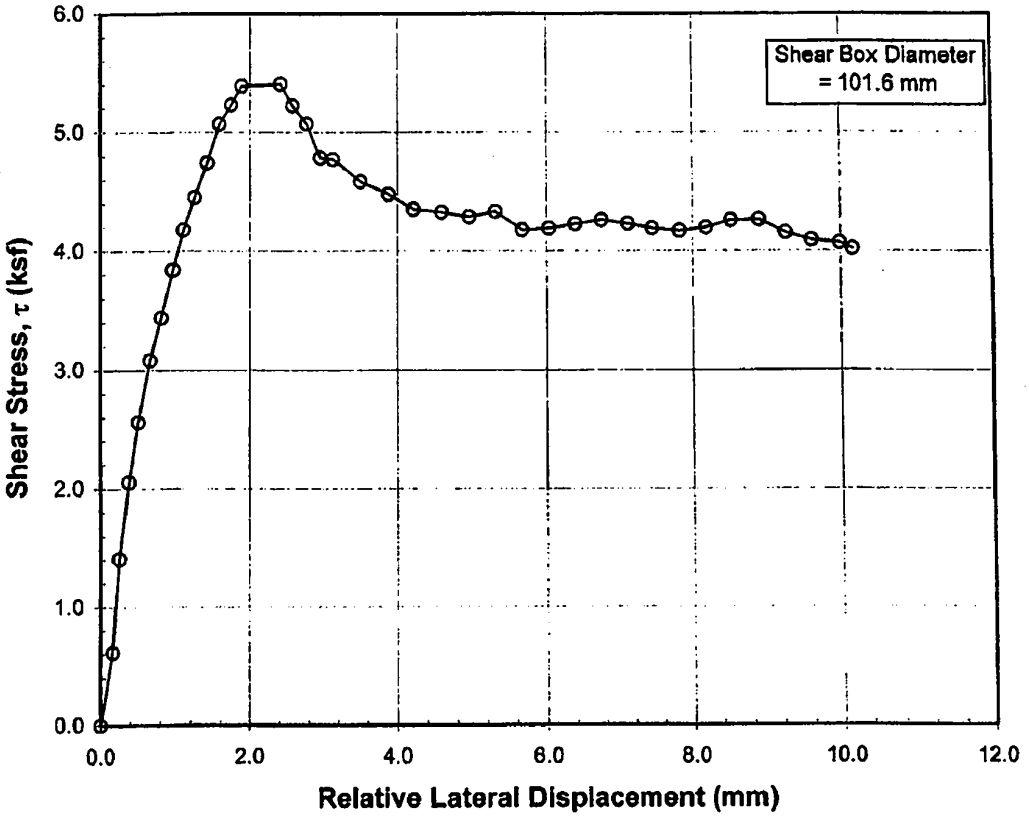
Peak Shear Stress, τ_f (ksf): 5.41

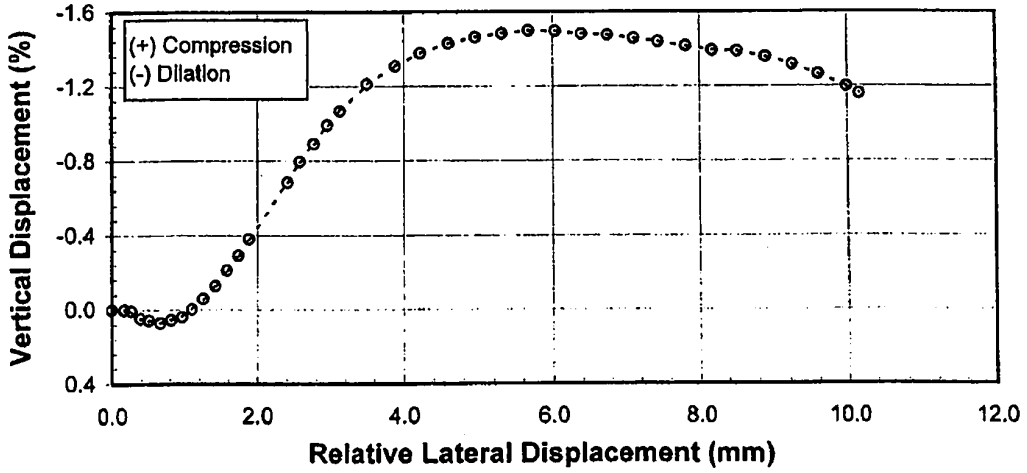
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00565

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	0.04	0.00	0.00
0.98	0.1679	53.56	0.00	0.61
1.48	0.2616	122.64	0.01	1.41
1.98	0.3886	179.26	0.05	2.06
2.48	0.5063	223.25	0.06	2.56
2.98	0.6654	268.73	0.07	3.08
3.48	0.8114	299.94	0.06	3.44
3.98	0.9613	334.82	0.04	3.84
4.48	1.0973	364.18	0.00	4.18
4.98	1.2471	388.00	-0.06	4.45
5.48	1.4143	413.47	-0.13	4.74
5.98	1.5768	441.84	-0.21	5.07
6.48	1.7408	456.04	-0.29	5.23
6.98	1.8862	469.63	-0.38	5.39
8.48	2.4092	471.24	-0.68	5.41
8.98	2.5753	455.42	-0.80	5.22
9.48	2.7677	442.17	-0.89	5.07
9.98	2.9540	417.25	-0.99	4.79
10.48	3.1284	416.01	-1.07	4.77
11.48	3.5016	399.72	-1.21	4.59
12.48	3.8847	390.39	-1.31	4.48
13.48	4.2208	379.15	-1.38	4.35
14.48	4.5929	377.09	-1.43	4.33
15.48	4.9557	373.67	-1.46	4.29
16.48	5.3151	377.63	-1.48	4.33
17.48	5.6744	364.10	-1.50	4.18
18.48	6.0325	365.38	-1.50	4.19
19.48	6.3862	368.53	-1.48	4.23
20.48	6.7440	371.33	-1.47	4.26
21.48	7.1108	368.78	-1.46	4.23
22.48	7.4483	365.33	-1.44	4.19
23.48	7.8236	363.44	-1.41	4.17
24.48	8.1812	365.88	-1.39	4.20
25.48	8.5248	371.08	-1.39	4.26
26.48	8.9040	371.64	-1.36	4.26
27.48	9.2550	362.11	-1.32	4.15
28.48	9.6019	356.78	-1.26	4.09
29.48	9.9880	354.48	-1.20	4.07
29.98	10.1610	350.16	-1.16	4.02

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 2nd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 5.76 ksf

Source: Fordyce Briggs, Sample No. RAW-3/8
Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: B-1_Fordycef
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 11.52 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 11.52 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.7 [ ] Assumed;
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: RAW-3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: f	[ ] Pluviated:	[X] Undercompaction: U_{nl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5695.00	NA
Container No.	3046			1	Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil + Container (g)	169.38			1068.97	Mass Moist Soil	530.00	NA
Mass Dry Soil + Container (g)	157.12			1006.86	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	58.84			547.96	Container No.		
WATER CONTENT (%)	12.47			13.53	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	12.47	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 128.45	Dry, $\gamma_{d,o}$ (pcf)= 114.21

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; Do not use filter paper over porours Inserts. Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Pale Brown Well Graded SAND with gravel (visual)

Trimming/Etc. Remarks: RAW-3/8 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/11/2008 Date: 6/11/2008 Final Cal. By: HC Date: 6/11/2008
Reviewed By: HP HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: RAW-3/8 Specific Gravitiy, G_s: 2.70
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	12.47	471.22	71.2
" Bottom, W2			
" Sides, W3			
" Average, W4	12.47	471.22	71.2
" Assumed, W	12.47	471.22	71.2
Final (After Test/Shear)	13.53		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04582
Final Selected	0.04582

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.07	NA	NA
Height after Consolidation, H_c	31.74	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	0.10	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{st}	31.64	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.700		[ ] Assumed	[X] Measured				
Mass Dry Soil, Md (g)	471.22		[X] Based on average water content		[ ] Value based on one of the above values			
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	12.5	128.45	114.20	0.473	71.2	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	11.52	NA	NA	$\varepsilon_{a,c}$ (%)	0.23	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: B-1_Fordycef
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 11.52 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.74 (mm)
Vert. Strain During Consol.: 0.23 (%)

Boring No.: N/A
Sample No.: RAW-3/8
Specimen No.: f
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
12.5	128.45	114.20	0.473	71.2

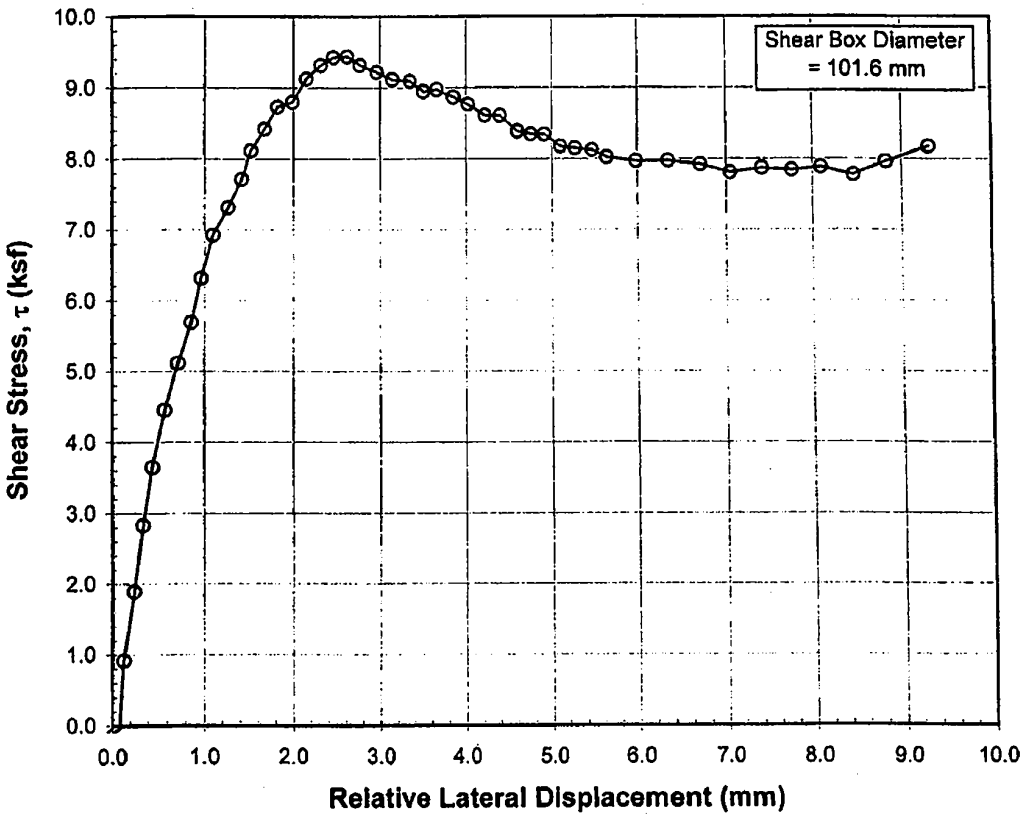
Peak Shear Stress, τ_f (ksf): 9.44

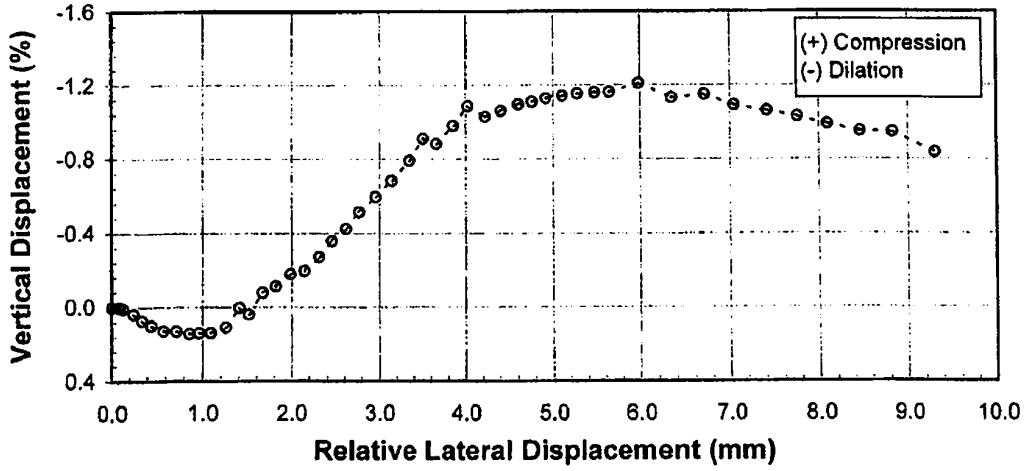
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00517

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-2.37	0.00	-0.03
0.48	-0.1775	-20.15	0.00	-0.23
0.98	-0.0663	-12.45	0.01	-0.14
1.48	0.0868	-3.83	0.00	-0.04
1.98	0.1299	80.00	0.01	0.92
2.48	0.2469	165.00	0.04	1.89
2.98	0.3443	246.46	0.07	2.83
3.48	0.4468	318.03	0.10	3.65
3.98	0.5778	387.79	0.13	4.45
4.48	0.7170	445.50	0.13	5.11
4.98	0.8569	496.04	0.14	5.69
5.48	0.9641	549.85	0.14	6.31
5.98	1.0918	603.41	0.14	6.92
6.48	1.2588	637.07	0.11	7.31
6.98	1.4109	672.11	0.00	7.71
7.48	1.5167	707.26	0.04	8.11
7.98	1.6716	733.75	-0.08	8.42
8.48	1.8190	761.02	-0.11	8.73
8.98	1.9878	766.94	-0.18	8.80
9.48	2.1475	795.10	-0.20	9.12
9.98	2.3132	811.65	-0.27	9.31
10.48	2.4577	821.40	-0.36	9.42
10.98	2.6168	822.59	-0.42	9.44
11.48	2.7643	812.08	-0.51	9.32
11.98	2.9578	803.40	-0.60	9.22
12.48	3.1424	794.27	-0.68	9.11
12.98	3.3478	792.29	-0.79	9.09
13.48	3.5098	779.61	-0.91	8.94
13.98	3.6627	781.95	-0.88	8.97
14.48	3.8549	773.07	-0.98	8.87
14.98	4.0231	764.15	-1.09	8.77
15.48	4.2252	750.57	-1.03	8.61
15.98	4.4044	750.18	-1.06	8.61
16.48	4.6047	731.03	-1.10	8.39
16.98	4.7599	727.51	-1.11	8.35
17.48	4.9165	727.13	-1.13	8.34
17.98	5.1057	712.58	-1.14	8.18
18.48	5.2768	710.16	-1.15	8.15
18.98	5.4774	707.91	-1.16	8.12
19.48	5.6476	699.11	-1.16	8.02
20.48	5.9850	694.35	-1.21	7.97
21.48	6.3498	694.98	-1.13	7.97
22.48	6.7097	690.33	-1.15	7.92
23.48	7.0481	680.44	-1.09	7.81
24.48	7.4167	685.86	-1.06	7.87
25.48	7.7590	683.60	-1.03	7.84
26.48	8.0973	687.01	-0.99	7.88
27.48	8.4663	677.73	-0.95	7.78
28.48	8.8275	694.16	-0.95	7.96
29.98	9.3054	712.56	-0.83	8.18

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards



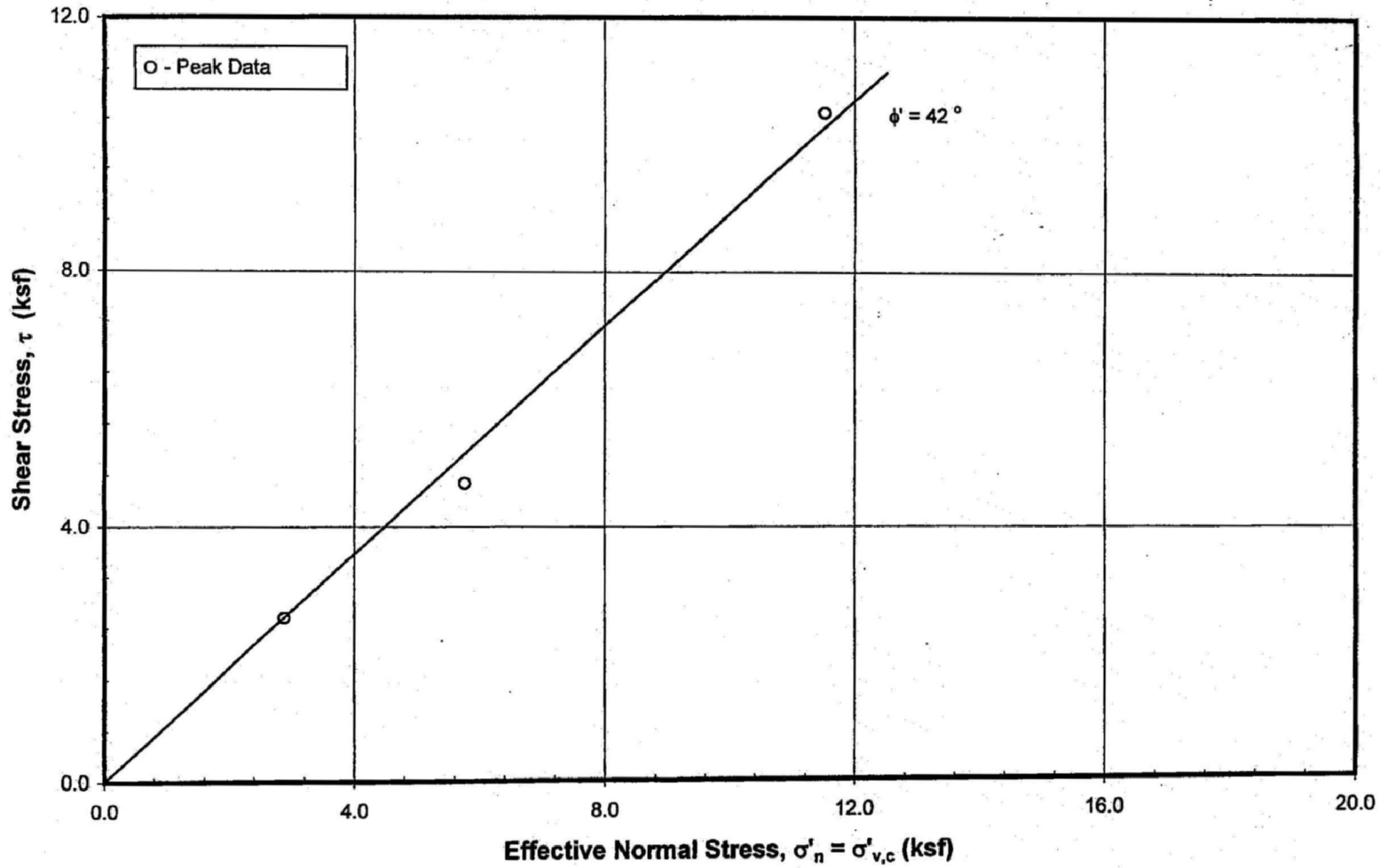


DRAINED DIRECT SHEAR TEST: 3rd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 11.52 ksf

Source: Fordyce Briggs, Sample No. RAW-3/8
Exelon (Victoria)

Reviewed By: HP



DRAINED DIRECT SHEAR TEST: Test Series - (Peak)
Soil - Soil Interface & OCR = Unkown
Source: CW&A, Sample No. CW&A #4 3/8
Exelon (Victoria)

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: CW&A Grade 4d
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.88 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.88 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.669 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: CW&A #4 3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: d	[ ] Pluviated:	[X] Undercompaction: U_{ni} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5705.00	NA
Container No.	764				Mass Trimming Ring, etc.	5135.00	NA
Mass Moist Soil + Container (g)	129.39				Mass Moist Soil	570.00	NA
Mass Dry Soil + Container (g)	124.05				Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	31.65				Container No.		
WATER CONTENT (%)	5.78				Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	5.78	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{spl}	without Spec., H_{spp}
31.81	
Block Used (2):	[ ] Yes ; [X] No

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight			
Total, $\gamma_{t,o}$ (pcf)=	138.15	Dry, $\gamma_{d,o}$ (pcf)=	130.60

(1) Measured in trimming ring, not shear box.

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.

(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porours inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No

Final Visual Description: Red Well Graded GRAVEL with clay (visual)

Trimming/Etc. Remarks: CW&A TxDOT Grade 4 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/10/2008 Date: 6/10/2008 Final Cal. By: HC Date: 6/10/2008
Reviewed By: HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: CW&A #4 3/8 Specific Gravitiy, G_s: 2.67
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:		Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial,	Top, W1	5.78	538.86	56.4
"	Bottom, W2			
"	Sides, W3			
"	Average, W4	5.78	538.86	56.4
"	Assumed, W	5.78	538.86	56.4
Final (After Test/Shear)				

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04635
Final Selected	0.04635

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.06	NA	NA
Height after Consolidation, H_c	31.75	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.86	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	32.61	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.669			Assumed	X	Measured		
Mass Dry Soil, Md (g)	538.86		X	Based on average water content		Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	5.8	138.14	130.60	0.274	56.4	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	2.88	NA	NA	$\varepsilon_{a,c}$ (%)	0.18	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: 3-1_CW&A Grade 4d
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 2.88 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.75 (mm)
Vert. Strain During Consol.: 0.18 (%)

Boring No.: N/A
Sample No.: CW&A #4 3/8
Specimen No.: d
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
5.8	138.14	130.60	0.274	56.4

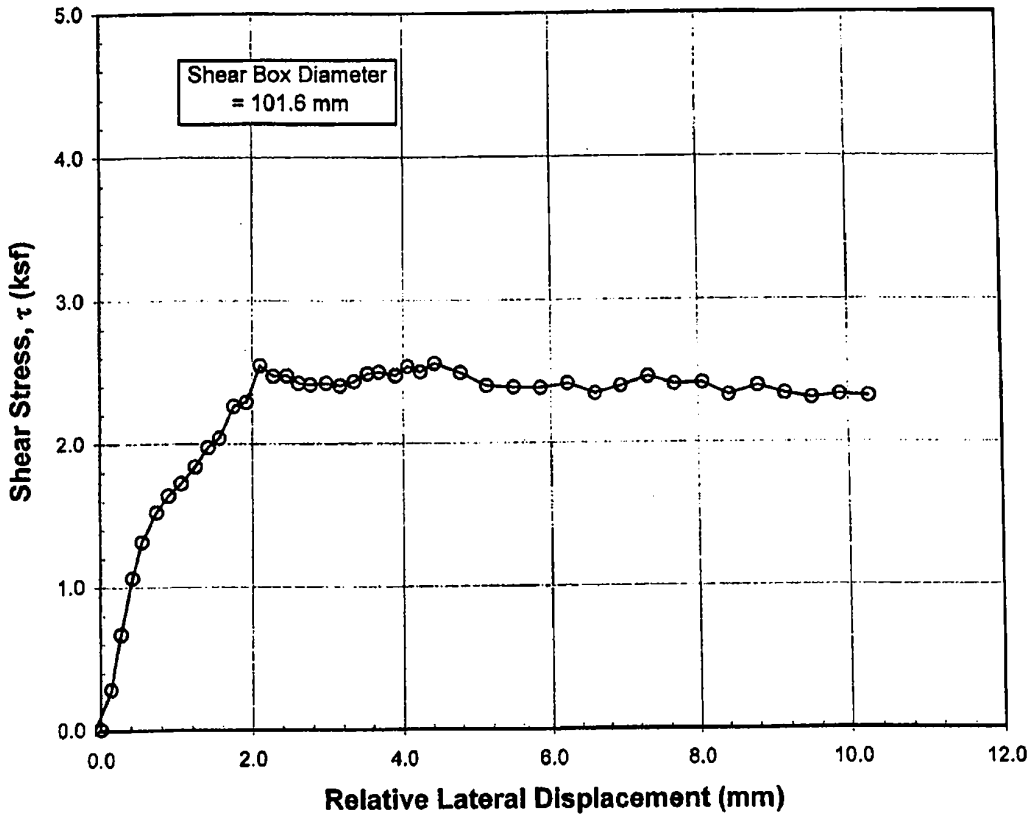
PeakShear Stress, τ_f (ksf): 2.56

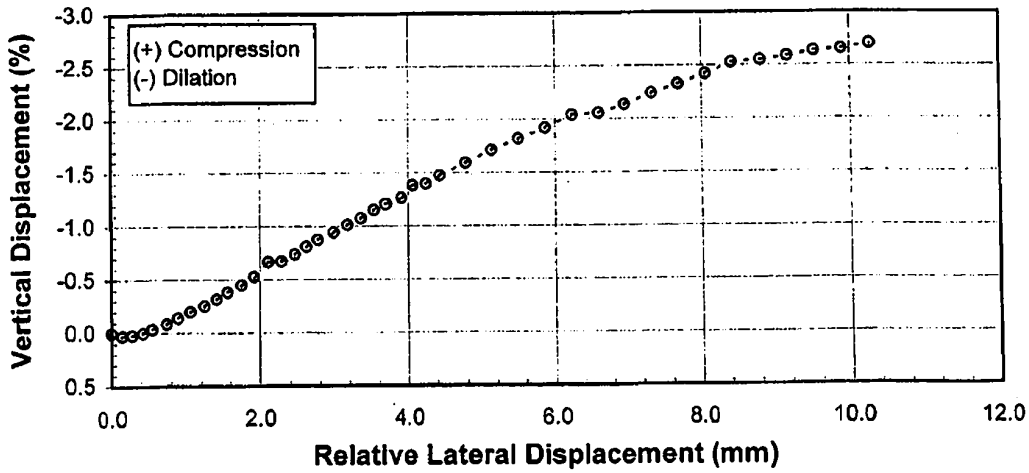
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00571

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	0.65	0.00	0.01
0.50	-0.1317	-4.23	0.01	-0.05
1.00	-0.0047	8.12	0.02	0.09
1.50	0.1435	24.92	0.03	0.29
2.00	0.2785	58.43	0.02	0.67
2.50	0.4272	92.70	0.00	1.06
3.00	0.5519	114.84	-0.04	1.32
3.50	0.7444	132.80	-0.08	1.52
4.00	0.8955	142.97	-0.14	1.64
4.50	1.0611	150.15	-0.20	1.72
5.00	1.2449	160.38	-0.25	1.84
5.50	1.4105	171.96	-0.32	1.97
6.00	1.5586	177.74	-0.38	2.04
6.50	1.7513	197.16	-0.45	2.26
7.00	1.9252	199.59	-0.53	2.29
7.50	2.1091	221.87	-0.67	2.55
8.00	2.2835	215.51	-0.67	2.47
8.50	2.4609	215.66	-0.74	2.47
9.00	2.6154	211.08	-0.81	2.42
9.50	2.7705	210.07	-0.88	2.41
10.00	2.9820	211.12	-0.94	2.42
10.50	3.1657	209.49	-1.01	2.40
11.00	3.3511	212.12	-1.07	2.43
11.50	3.5289	216.76	-1.15	2.49
12.00	3.6845	217.69	-1.21	2.50
12.50	3.9028	215.62	-1.26	2.47
13.00	4.0604	221.26	-1.38	2.54
13.50	4.2429	217.76	-1.40	2.50
14.00	4.4337	223.01	-1.47	2.56
15.00	4.7803	217.23	-1.59	2.49
16.00	5.1287	209.16	-1.71	2.40
17.00	5.4949	208.20	-1.82	2.39
18.00	5.8627	207.74	-1.92	2.38
19.00	6.2309	210.41	-2.04	2.41
20.00	6.6041	204.29	-2.05	2.34
21.00	6.9613	208.79	-2.13	2.40
22.00	7.3304	214.49	-2.24	2.46
23.00	7.6843	209.88	-2.32	2.41
24.00	8.0584	210.53	-2.42	2.42
25.00	8.4203	203.07	-2.53	2.33
26.00	8.8109	208.72	-2.55	2.39
27.00	9.1620	204.03	-2.58	2.34
28.00	9.5201	201.13	-2.63	2.31
29.00	9.8922	203.17	-2.65	2.33
30.00	10.2701	201.98	-2.70	2.32

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 1st Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 2.88 ksf

Source: CW&A, Sample No. CW&A #4 3/8

Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686
Task Number: N/A
Project Name: Exelon (Victoria)

Apparatus No.: 6 DS
Assign. Units: [X] ksf; or Other: ____
Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 5.76 , ____
" ____ & ____
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 5.76 ; NA ; & NA
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA

File Name: CW&A Grade 4e
Ring No.: 1
Area - Shear Box, A_{sb} (cm^2): 80.977
Height - Shear Box, H_{sb} (mm):
Shear Box: [X] Circular [ ] Square
Specific Gravity: 2.669 [ ] Assumed; [X] Measured

Multistage: [X] No; [ ] Yes
Residual/Multishearing: [X] No; [ ] Yes
Precut Failure Plane [X] No; [ ] Yes
Assign. Remarks: ____

[ ] Tube [ ] Field Extruded [ ] Liner [X] Recompacted
Boring No.: N/A [ ] Reconstituted
Sample No.: CW&A #4 3/8 Compostite No.: N/A
Depth (ft): N/A Specimen No.: e
[ ] Spec. Selection by X - Ray; [ ] Geomarine Sample

[X] Tampling
[ ] Kneading
[ ] Inpact/Rammer
[ ] Pluviated:

[ ] Constant Effort: Blows/Tamps per Layer = 20
Rammer:Wgt.(lbf)= NA Tamper: Force (lbf)= 4.5
Drop(in.)= NA Dia.(in.)= 1.5
[X] Undercompaction: U_{ni} (%) = 95 Ref.Effort= ____
No. Layers = 3 % Comp= ± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)
Container No.	4159			77A
Mass Moist Soil + Container (g)	115.87			720.00
Mass Dry Soil + Container (g)	111.25			665.00
Mass Container (g)	30.47			135.00
WATER CONTENT (%)	5.72			10.38
Avg. Initial WC, W4 (%)	5.72	Final W_{at}: Soil with free water trimmed away		

[ ] See attached data sheet(s) for additional water contents

Soil and Ring Masses (g)	Initial	Final
Mass Moist Soil+Trimming Ring	5735.00	NA
Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil	570.00	NA
Excess Dry Soil (soil not included in final water content)		
Container No.		
Mass Dry Soil + Cont. (g)		
Mass Container (g)		
Mass Excess Dry Soil (g)	0.00	

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight			
Total, $\gamma_{t,o}$ (pcf)=	138.15	Dry, $\gamma_{d,o}$ (pcf)=	130.67

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:

Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porours inserts.** Free to Rotate: [ ] Yes ; [X] No:
Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Red Well Graded GRAVEL with clay (visual)

Trimming/Etc. Remarks: CW&A TxDOT Grade 4 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/10/2008 Date: 6/10/2008 Final Cal. By: HC Date: 6/10/2008
Reviewed By: HP HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: CW&A #4 3/8 Specific Gravitiy, G_s: 2.67
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	5.72	539.16	55.9
" Bottom, W2			
" Sides, W3			
" Average, W4	5.72	539.16	55.9
" Assumed, W	5.72	539.16	55.9
Final (After Test/Shear)	10.38		

Back-calculated Data Item	Value	Input Data for Back Calculation $S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04635
Final Selected	0.04635

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.05	NA	NA
Height after Consolidation, H_c	31.76	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.27	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	32.03	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.669			Assumed	X	Measured		
Mass Dry Soil, Md (g)	539.16		X	Based on average water content		Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	5.7	138.14	130.67	0.273	55.9	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	5.76	NA	NA	$\varepsilon_{a,c}$ (%)	0.14	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: 3-1_CW&A Grade 4e
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 5.76 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.76 (mm)
Vert. Strain During Consol.: 0.14 (%)

Boring No.: N/A
Sample No.: CW&A #4 3/8
Specimen No.: e
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
5.7	138.14	130.67	0.273	55.9

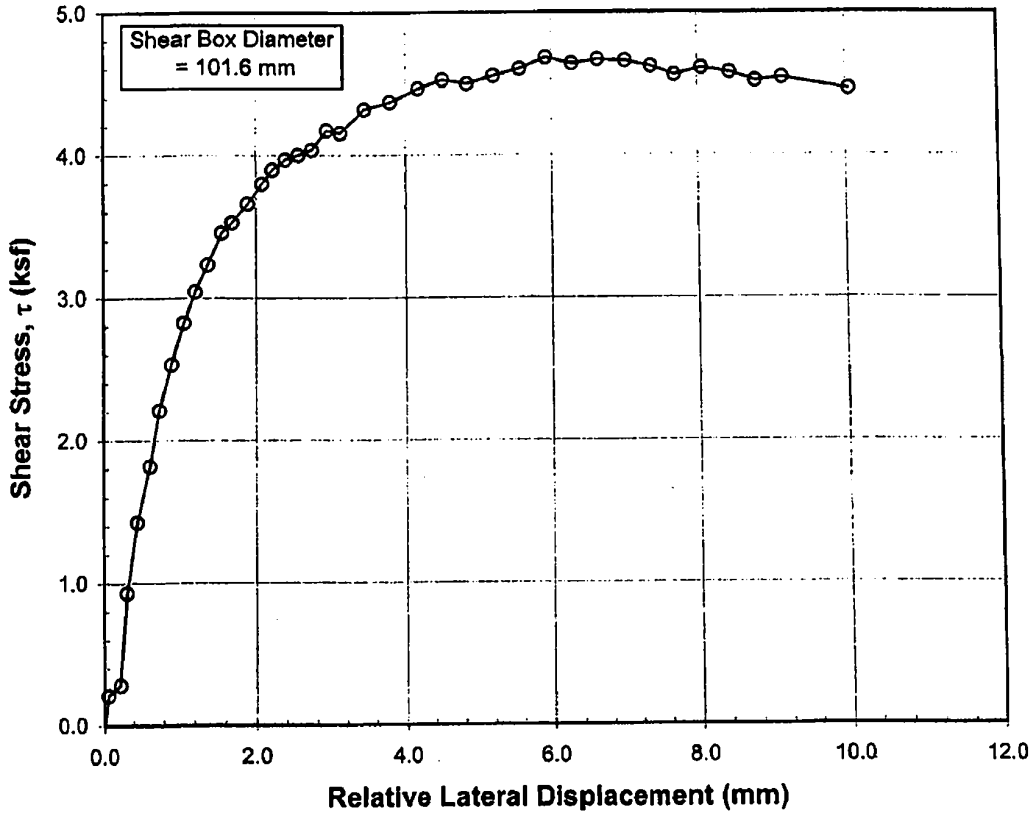
Peak Shear Stress, τ_f (ksf): 4.68

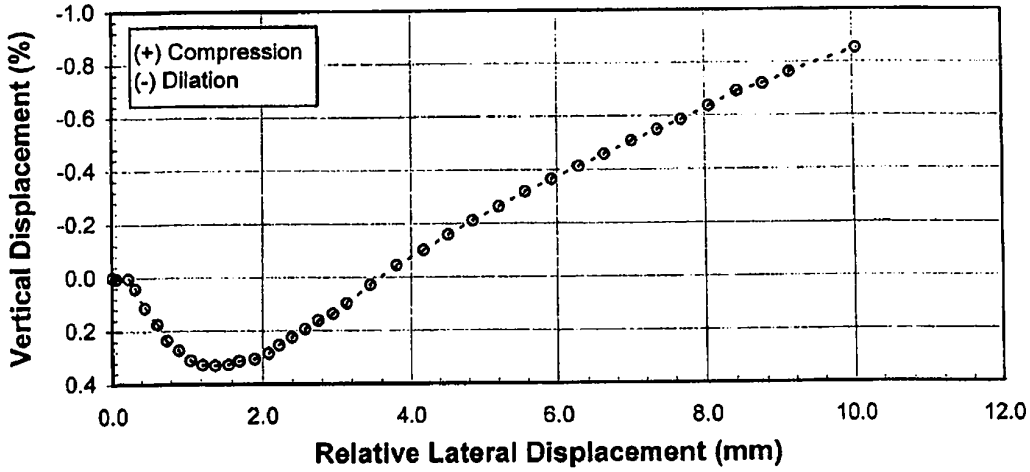
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00568

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-4.56	0.00	-0.05
0.50	0.0561	18.33	0.00	0.21
1.00	0.2201	24.62	0.00	0.28
1.50	0.3120	81.14	0.04	0.93
2.00	0.4494	124.32	0.11	1.43
2.50	0.6237	158.45	0.17	1.82
3.00	0.7508	192.49	0.23	2.21
3.50	0.9105	220.62	0.27	2.53
4.00	1.0659	246.19	0.31	2.82
4.50	1.2177	265.33	0.33	3.04
5.00	1.3807	281.59	0.33	3.23
5.50	1.5579	301.08	0.33	3.45
6.00	1.6961	307.46	0.31	3.53
6.50	1.8969	318.83	0.31	3.66
7.00	2.0823	331.05	0.28	3.80
7.50	2.2189	339.54	0.25	3.90
8.00	2.3924	345.74	0.22	3.97
8.50	2.5676	348.55	0.19	4.00
9.00	2.7473	351.63	0.16	4.03
9.50	2.9456	363.61	0.14	4.17
10.00	3.1300	362.18	0.10	4.16
11.00	3.4496	376.52	0.03	4.32
12.00	3.8004	380.87	-0.04	4.37
13.00	4.1786	389.11	-0.10	4.46
14.00	4.5143	394.30	-0.16	4.52
15.00	4.8461	392.05	-0.21	4.50
16.00	5.2053	396.79	-0.26	4.55
17.00	5.5675	401.06	-0.32	4.60
18.00	5.9265	407.85	-0.36	4.68
19.00	6.2872	404.09	-0.41	4.64
20.00	6.6306	406.66	-0.46	4.67
21.00	7.0094	405.82	-0.51	4.66
22.00	7.3682	402.40	-0.55	4.62
23.00	7.6939	397.08	-0.59	4.56
24.00	8.0585	401.35	-0.64	4.60
25.00	8.4344	398.73	-0.69	4.57
26.00	8.7779	393.64	-0.72	4.52
27.00	9.1351	395.56	-0.76	4.54
29.50	10.0494	388.58	-0.85	4.46

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 2nd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 5.76 ksf

Source: CW&A, Sample No. CW&A #4 3/8
Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: CW&A Grade 4f
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 11.52 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 11.52 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.669 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded [ ] Liner [X] Recompacted | [X] Tampling | [ ] Constant Effort: Blows/Tamps per Layer = 20
Boring No.: N/A [ ] Reconstituted | [ ] Kneading | Rammer Wgt.(lbf)= NA | Tamper: Force (lbf)= 4.5
Sample No.: CW&A #4 3/8 Compostite No.: N/A | [ ] Inpact/Rammer | Drop(in.)= NA | Dia.(in.)= 1.5
Depth (ft): N/A Specimen No.: f | [ ] Pluviated: | [X] Undercompaction: U_{nl} (%) = 95 | Ref.Effort=
[ ] Spec. Selection by X - Ray; [ ] Geomarine Sample | No. Layers = 3 % Comp= ± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)
Container No.	981			7A
Mass Moist Soil + Container (g)	137.88			725.00
Mass Dry Soil + Container (g)	132.18			670.00
Mass Container (g)	32.22			145.00
WATER CONTENT (%)	5.70			10.48
Avg. Initial WC, W4 (%)	5.70	Final W_{at}: Soil with free water trimmed away		
[ ] See attached data sheet(s) for additional water contents				

Soil and Ring Masses (g)	Initial	Final
Mass Moist Soil+Trimming Ring	5735.00	NA
Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil	570.00	NA
Excess Dry Soil (soil not included in final water content)		
Container No.		
Mass Dry Soil + Cont. (g)		
Mass Container (g)		
Mass Excess Dry Soil (g)	0.00	

Soil Height: Measurements[1] Initial (mm)	
with Spec., H_{spl}	without Spec., H_{spp}
31.81	
Block Used [2]: [ ] Yes ; [X] No	

(1) Measured in trimming ring, not shear box.

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} [2]	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 138.15	Dry, $\gamma_{d,o}$ (pcf)= 130.69

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:
- Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 | Dead Wgt. of Loading System[3] (lbf)= 2.64
- Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: | Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
- Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** | Free to Rotate: [ ] Yes ; [X] No:
- Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
- Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Red Well Graded GRAVEL with clay (visual)

Trimming/Etc. Remarks: CW&A TxDOT Grade 4 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting[4]: Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/10/2008 Date: 6/10/2008 Final Cal. By: HC Date: 6/10/2008
Reviewed By: HP HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: CW&A #4 3/8 Specific Gravitiy, G_s: 2.67
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	5.70	539.25	55.8
" Bottom, W2			
" Sides, W3			
" Average, W4	5.70	539.25	55.8
" Assumed, W	5.70	539.25	55.8
Final (After Test/Shear)	10.48		

Back-calculated Data Item	Value	Input Data for Back Calculation $S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04635
Final Selected	0.04635

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.88	NA	NA
Height after Consolidation, H_c	30.93	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.60	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	31.53	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.669			Assumed	X	Measured		
Mass Dry Soil, Md (g)	539.25		X	Based on average water content		Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	5.7	138.14	130.69	0.273	55.8	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	11.52	NA	NA	$\varepsilon_{a,c}$ (%)	2.78	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: B-1_CW&A Grade 4f
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 11.52 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 30.93 (mm)
Vert. Strain During Consol.: 2.78 (%)

Boring No.: N/A
Sample No.: CW&A #4 3/8
Specimen No.: f
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
5.7	138.14	130.69	0.273	55.8

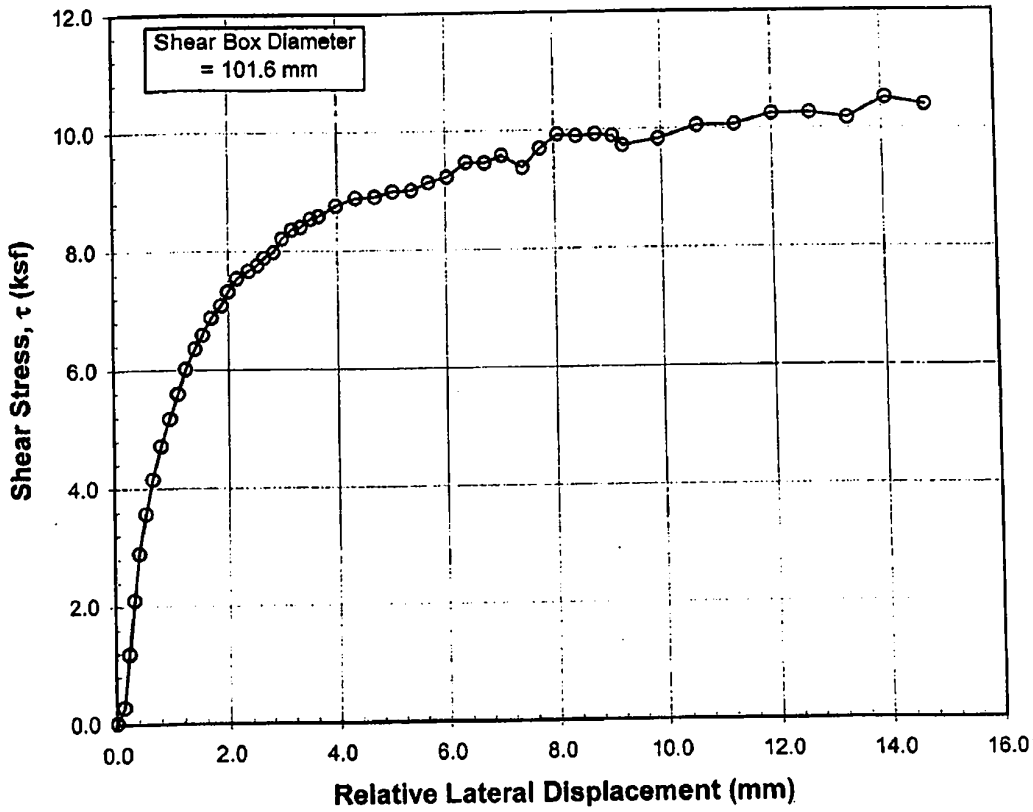
Peak Shear Stress, τ_f (ksf): 10.51

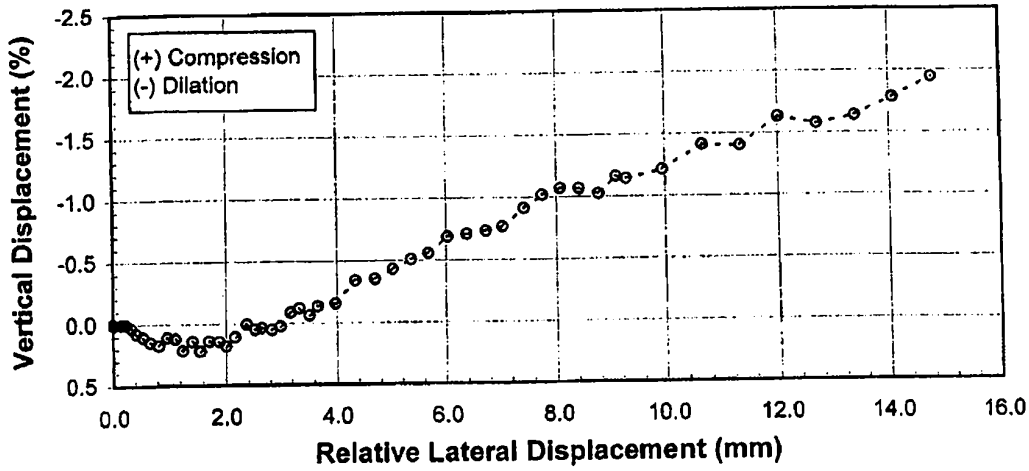
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00535

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-0.56	0.00	-0.01
0.48	-0.0366	-10.41	0.01	-0.12
0.98	0.0136	1.24	0.01	0.01
1.48	0.1358	24.23	0.00	0.28
1.98	0.2278	103.58	0.01	1.19
2.48	0.3254	183.65	0.03	2.11
2.98	0.4168	252.51	0.08	2.90
3.48	0.5438	311.54	0.11	3.57
3.98	0.6704	362.39	0.15	4.16
4.48	0.8201	411.78	0.17	4.72
4.98	0.9715	451.57	0.11	5.18
5.48	1.1119	487.91	0.12	5.60
5.98	1.2452	524.38	0.22	6.02
6.48	1.4176	553.85	0.14	6.35
6.98	1.5544	573.97	0.22	6.59
7.48	1.7077	599.46	0.14	6.88
7.98	1.8792	617.61	0.14	7.09
8.48	1.9997	638.09	0.18	7.32
8.98	2.1591	657.35	0.11	7.54
9.48	2.3700	668.27	0.01	7.67
9.98	2.5228	676.15	0.05	7.76
10.48	2.6485	687.20	0.04	7.88
10.98	2.8316	695.42	0.05	7.98
11.48	2.9855	715.46	0.03	8.21
11.98	3.1692	728.74	-0.08	8.36
12.48	3.3293	732.27	-0.12	8.40
12.98	3.5143	744.18	-0.06	8.54
13.48	3.6612	748.17	-0.13	8.58
14.48	3.9810	763.40	-0.16	8.76
15.48	4.3401	774.46	-0.34	8.89
16.48	4.6974	776.17	-0.35	8.90
17.48	5.0192	783.65	-0.43	8.99
18.48	5.3625	785.08	-0.51	9.01
19.48	5.6876	796.36	-0.56	9.14
20.48	6.0269	804.09	-0.69	9.23
21.48	6.3765	825.50	-0.71	9.47
22.48	6.7206	824.47	-0.73	9.46
23.48	7.0368	835.35	-0.77	9.58
24.48	7.4234	817.30	-0.91	9.38
25.48	7.7500	844.94	-1.02	9.69
26.48	8.0706	865.06	-1.07	9.92
27.48	8.4162	862.35	-1.07	9.89
28.48	8.7709	864.88	-1.02	9.92
29.48	9.0919	862.19	-1.16	9.89
29.98	9.2831	848.24	-1.14	9.73
31.98	9.9502	857.35	-1.21	9.84
33.98	10.6506	876.05	-1.41	10.05
35.98	11.3275	877.58	-1.40	10.07
37.98	12.0091	893.37	-1.63	10.25
39.98	12.7049	894.32	-1.57	10.26
41.98	13.3900	886.25	-1.63	10.17
43.98	14.0677	916.35	-1.78	10.51
45.98	14.7627	905.80	-1.94	10.39

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





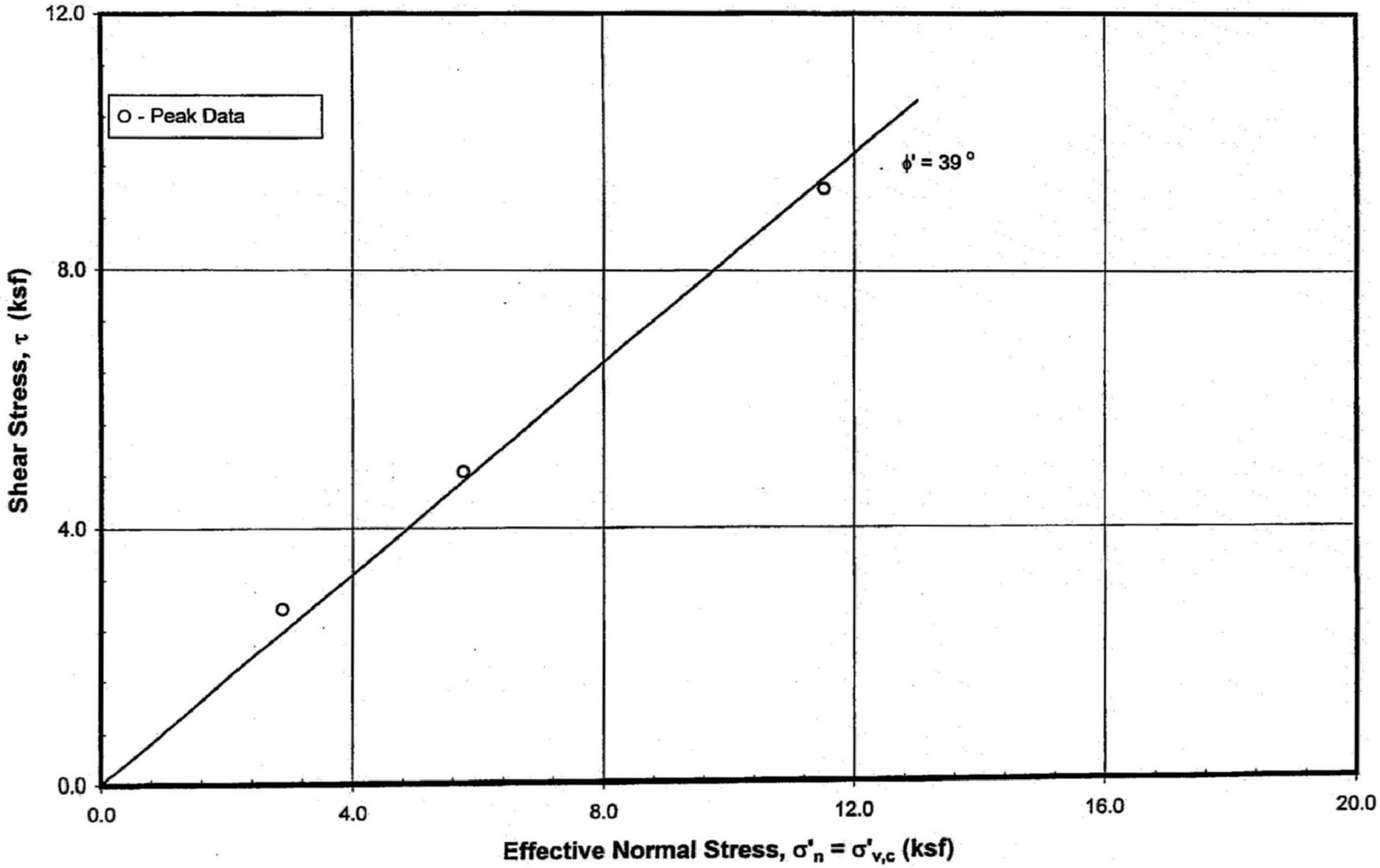
DRAINED DIRECT SHEAR TEST: 3rd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 11.52 ksf

Source: CW&A, Sample No. CW&A #4 3/8

Exelon (Victoria)

Reviewed By: HF



DRAINED DIRECT SHEAR TEST: Test Series - (Peak)
Soil - Soil Interface & OCR = Unkown
Source: CW&A, Sample No. CW&A #6 3/8
Exelon (Victoria)

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: CW&A Grade 6d
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.88 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 2.88 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.659 [ ] Assumed;
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer:Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: CW&A #6 3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: d	[ ] Pluviated:	[X] Undercompaction: U_{pl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5720.00	NA
Container No.	5000			7	Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil + Container (g)	132.69			710.00	Mass Moist Soil	555.00	NA
Mass Dry Soil + Container (g)	126.79			655.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	30.76			140.00	Container No.		
WATER CONTENT (%)	6.14			10.68	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	6.14	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	Yes ; [X] No

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 134.51	Dry, $\gamma_{d,o}$ (pcf)= 126.73

(1) Measured in trimming ring, not shear box.

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Red Well Graded GRAVEL with clay (visual)

Trimming/Etc. Remarks: CW&A TxDOT Grade 6 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: DBN Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/10/2008 Date: 6/10/2008 Final Cal. By: HC Date: 6/10/2008
Reviewed By: HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: CW&A #6 3/8 Specific Gravitiy, G_s: 2.66
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	6.14	522.88	53.1
" Bottom, W2			
" Sides, W3			
" Average, W4	6.14	522.88	53.1
" Assumed, W	6.14	522.88	53.1
Final (After Test/Shear)	10.68		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04653
Final Selected	0.04653

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.10	NA	NA
Height after Consolidation, H_c	31.71	NA	NA
Change in Height During **Initial** Shear (+ compression, - dilation)	-0.57	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	32.27	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2			
Specific Gravity, G_s	2.659	[ ] Assumed	[X] Measured	
Mass Dry Soil, Md (g)	522.88	[X] Based on average water content	[ ] Value based on one of the above values	

	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)
Initial:	6.1	134.51	126.72	0.308	53.1	31.81	257.59

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	2.88	NA	NA	$\varepsilon_{a,c}$ (%)	0.33	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: 3-1_CW&A Grade 6d
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 2.88 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.71 (mm)
Vert. Strain During Consol.: 0.33 (%)

Boring No.: N/A
Sample No.: CW&A #6 3/8
Specimen No.: d
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
6.1	134.51	126.72	0.308	53.1

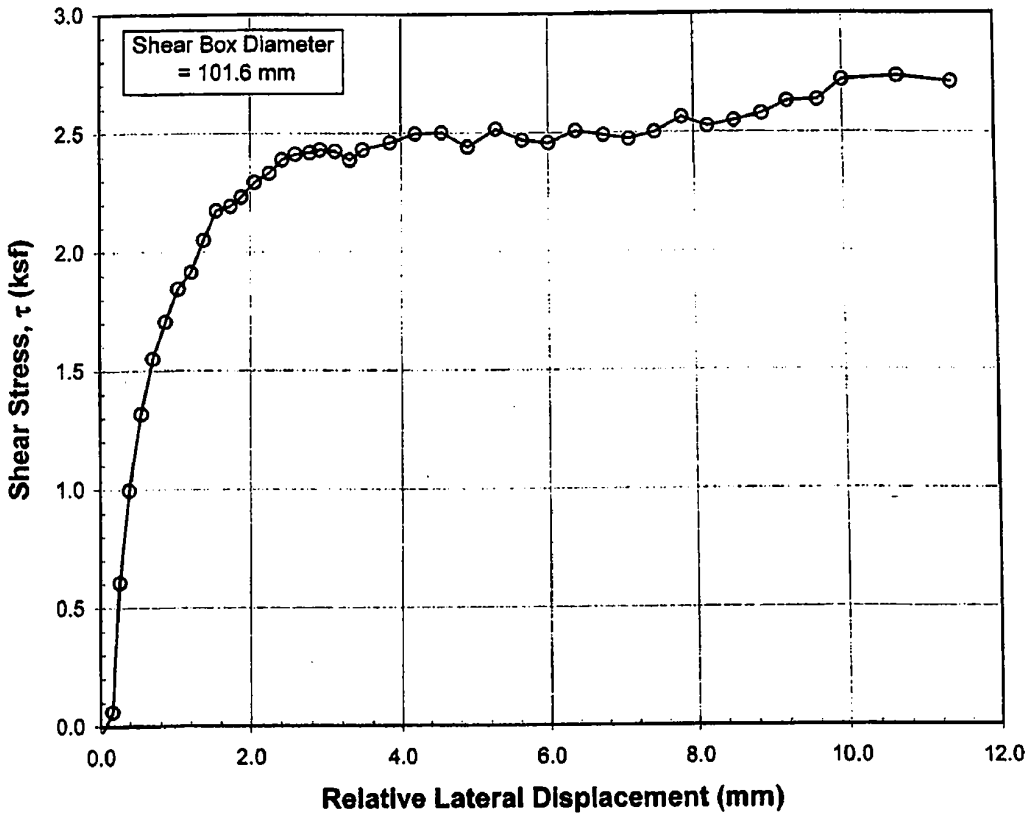
Peak Shear Stress, τ_f (ksf): 2.73

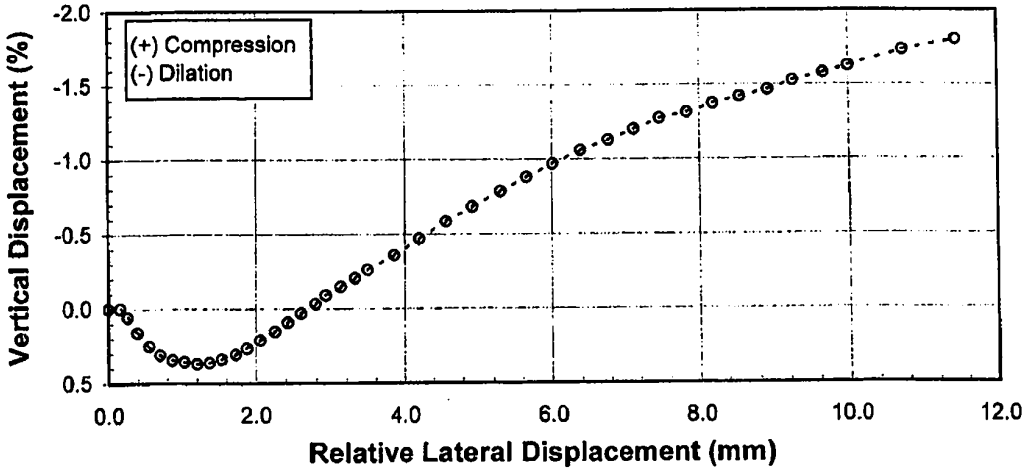
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00586

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-3.81	0.00	-0.04
0.50	0.1622	5.29	0.00	0.06
1.00	0.2611	52.86	0.06	0.61
1.50	0.3906	86.78	0.16	1.00
2.00	0.5479	114.79	0.25	1.32
2.50	0.6987	135.12	0.31	1.55
3.00	0.8644	148.72	0.34	1.71
3.50	1.0290	160.89	0.36	1.85
4.00	1.2007	166.85	0.37	1.91
4.50	1.3680	178.75	0.36	2.05
5.00	1.5370	189.60	0.34	2.18
5.50	1.7324	191.21	0.31	2.19
6.00	1.8812	194.63	0.27	2.23
6.50	2.0586	199.97	0.21	2.29
7.00	2.2539	203.34	0.15	2.33
7.50	2.4235	208.30	0.09	2.39
8.00	2.5996	210.25	0.03	2.41
8.50	2.7921	210.80	-0.03	2.42
9.00	2.9247	211.92	-0.09	2.43
9.50	3.1231	211.46	-0.15	2.43
10.00	3.3159	208.20	-0.21	2.39
10.50	3.4865	211.94	-0.26	2.43
11.50	3.8515	214.50	-0.36	2.46
12.50	4.2040	217.76	-0.47	2.50
13.50	4.5676	218.10	-0.58	2.50
14.50	4.9184	212.84	-0.68	2.44
15.50	5.2921	219.21	-0.78	2.51
16.50	5.6489	215.26	-0.88	2.47
17.50	6.0067	214.18	-0.97	2.46
18.50	6.3832	218.45	-1.06	2.51
19.50	6.7654	217.05	-1.13	2.49
20.50	7.1138	215.50	-1.20	2.47
21.50	7.4628	218.00	-1.27	2.50
22.50	7.8347	223.43	-1.31	2.56
23.50	8.1878	220.09	-1.37	2.53
24.50	8.5523	222.03	-1.42	2.55
25.50	8.9152	224.61	-1.46	2.58
26.50	9.2494	229.18	-1.53	2.63
27.50	9.6600	229.73	-1.58	2.64
28.50	9.9971	236.80	-1.62	2.72
30.50	10.7129	238.27	-1.73	2.73
32.50	11.4244	236.18	-1.80	2.71

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 1st Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 2.88 ksf

Source: CW&A, Sample No. CW&A #6 3/8

Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: CW&A Grade 6e
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 5.76 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 5.76 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.659 [ ] Assumed;
Multistage: [X] No; [ ] Yes Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: CW&A #6 3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: e	[ ] Pluviated:	[X] Undercompaction: U_{N1} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)
Container No.	6042			22
Mass Moist Soil + Container (g)	143.43			730.00
Mass Dry Soil + Container (g)	136.95			675.00
Mass Container (g)	31.72			160.00
WATER CONTENT (%)	6.16			10.68
Avg. Initial WC, W4 (%)	6.16	Final W_{at}: Soil with free water trimmed away		
[ ] See attached data sheet(s) for additional water contents				

Soil and Ring Masses (g)	Initial	Final
Mass Moist Soil+Trimming Ring	5720.00	NA
Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil	555.00	NA
Excess Dry Soil (soil not included in final water content)		
Container No.		
Mass Dry Soil + Cont. (g)		
Mass Container (g)		
Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 134.51	Dry, $\gamma_{d,o}$ (pcf)= 126.71

(1) Measured in trimming ring, not shear box.

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; **Do not use filter paper over porous inserts.** Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Red Well Graded GRAVEL with clay (visual)

Trimming/Etc. Remarks: CW&A TxDOT Grade 6 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: YR Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/10/2008 Date: 6/10/2008 Final Cal. By: HC Date: 6/10/2008
Reviewed By: HP HP

KAW 6/13/08

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: CW&A #6 3/8 Specific Gravitiy, G_s: 2.66
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	6.16	522.81	53.2
" Bottom, W2			
" Sides, W3			
" Average, W4	6.16	522.81	53.2
" Assumed, W	6.16	522.81	53.2
Final (After Test/Shear)	10.68		

Back-calculated Data Item	Value	Input Data for Back Calculation $S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04653
Final Selected	0.04653

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing 2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.16	NA	NA
Height after Consolidation, H_c	31.65	NA	NA
Change in Height During **Initial** Shear (+ compression, - dilation)	-0.42	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{at}	32.07	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2		
Specific Gravity, G_s	2.659	[ ] Assumed	[X] Measured
Mass Dry Soil, Md (g)	522.81	[X] Based on average water content	[ ] Value based on one of the above values

	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)
Initial:	6.2	134.51	126.71	0.308	53.2	31.81	257.59

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	5.76	NA	NA	$\varepsilon_{a,c}$ (%)	0.50	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: 3-1_CW&A Grade 6e
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 5.76 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.65 (mm)
Vert. Strain During Consol.: 0.50 (%)

Boring No.: N/A
Sample No.: CW&A #6 3/8
Specimen No.: e
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
6.2	134.51	126.71	0.308	53.2

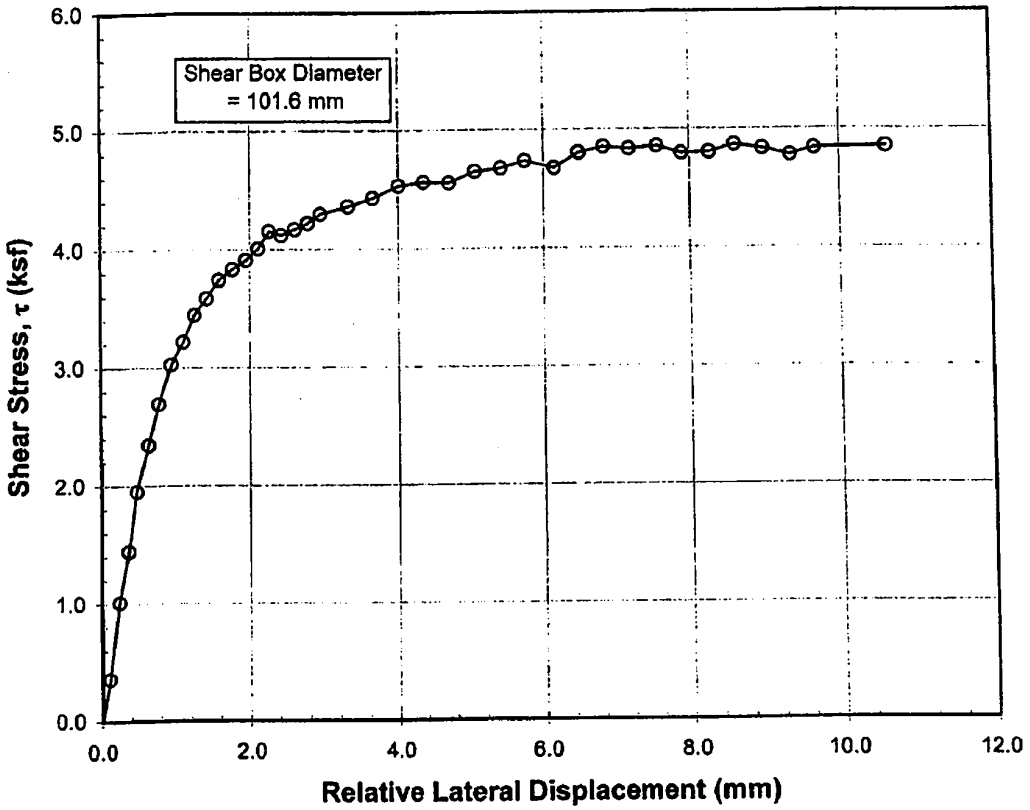
Peak Shear Stress, τ_f (ksf): 4.87

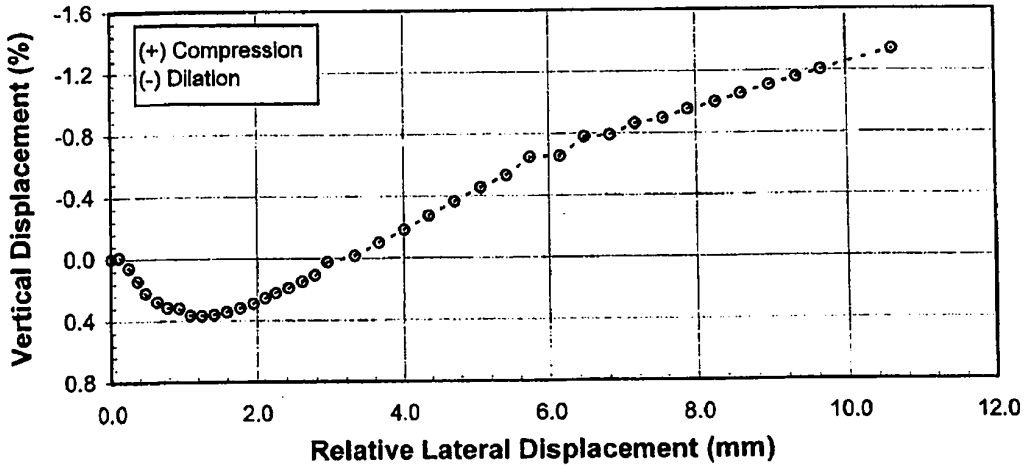
Shearing Data For:
[X] Intact - Without Repeated Shearing (Peak Data)
[ ] Intact - Before Repeated Shearing (Peak Data)
[ ] After Rapid Repeated Shearing (Residual Data)
[ ] Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00571

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-0.53	0.00	-0.01
0.50	0.1048	31.20	-0.01	0.36
1.00	0.2406	88.20	0.06	1.01
1.50	0.3655	125.93	0.14	1.44
2.00	0.4787	169.99	0.22	1.95
2.50	0.6405	204.49	0.28	2.35
3.00	0.7776	234.59	0.32	2.69
3.50	0.9393	263.71	0.32	3.03
4.00	1.0968	280.34	0.37	3.22
4.50	1.2529	300.33	0.37	3.45
5.00	1.4193	312.45	0.36	3.58
5.50	1.5865	326.06	0.35	3.74
6.00	1.7700	333.99	0.32	3.83
6.50	1.9508	340.53	0.29	3.91
7.00	2.1130	349.11	0.26	4.01
7.50	2.2605	361.92	0.22	4.15
8.00	2.4323	358.88	0.19	4.12
8.50	2.6111	363.29	0.15	4.17
9.00	2.7812	367.52	0.11	4.22
9.50	2.9525	374.37	0.03	4.30
10.50	3.3218	380.00	-0.02	4.36
11.50	3.6579	385.99	-0.10	4.43
12.50	4.0074	394.85	-0.18	4.53
13.50	4.3580	397.60	-0.27	4.56
14.50	4.7122	397.03	-0.37	4.56
15.50	5.0838	405.55	-0.45	4.65
16.50	5.4170	407.87	-0.53	4.68
17.50	5.7442	413.01	-0.65	4.74
18.50	6.1471	407.74	-0.65	4.68
19.50	6.4771	418.76	-0.78	4.80
20.50	6.8179	423.02	-0.79	4.85
21.50	7.1653	421.48	-0.86	4.84
22.50	7.5576	423.34	-0.89	4.86
23.50	7.8940	417.91	-0.95	4.79
24.50	8.2597	418.62	-1.00	4.80
25.50	8.6027	424.31	-1.05	4.87
26.50	8.9734	421.38	-1.10	4.83
27.50	9.3386	416.44	-1.16	4.78
28.50	9.6708	421.48	-1.20	4.84
31.00	10.6138	422.85	-1.34	4.85

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards





DRAINED DIRECT SHEAR TEST: 2nd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 5.76 ksf

Source: CW&A, Sample No. CW&A #6 3/8

Exelon (Victoria)

Reviewed By: HP

DIRECT SHEAR TEST (ASTM D 3080-04): Setup / Take Down

Project Number: 0411-08-1686 | Apparatus No.: 6 DS | File Name: CW&A Grade 6f
Task Number: N/A | Assign. Units: [X] ksf; or Other: | Ring No.: 1
Project Name: Exelon (Victoria) | Series $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 11.52 , | Area - Shear Box, A_{sb} (cm^2): 80.977
" & | Height - Shear Box, H_{sb} (mm):
This Test $\sigma'_{v,c}$ or $\sigma'_{n,c}$: 11.52 ; NA ; & NA | Shear Box: [X] Circular [ ] Square
Induced OCR: NA ; Max. $\sigma'_{v,max}$: NA | Specific Gravity: 2.659 [ ] Assumed;
Multistage: [X] No; [ ] Yes | Residual/Multishearing: [X] No; [ ] Yes | Precut Failure Plane [X] No; [ ] Yes [X] Measured
Assign. Remarks:

[ ] Tube [ ] Field Extruded	[ ] Liner [X] Recompacted	[X] Tampling	[ ] Constant Effort:	Blows/Tamps per Layer =	20
Boring No.: N/A	[ ] Reconstituted	[ ] Kneading	Rammer:Wgt.(lbf)= NA	Tamper: Force (lbf)=	4.5
Sample No.: CW&A #6 3/8	Compostite No.: N/A	[ ] Inpact/Rammer	Drop(in.)= NA	Dia.(in.)=	1.5
Depth (ft): N/A	Specimen No.: f	[ ] Pluviated:	[X] Undercompaction: U_{rl} (%) = 95	Ref.Effort=	
[ ] Spec. Selection by X - Ray;	[ ] Geomarine Sample		No. Layers = 3	% Comp=	± Opt.= 1

Water Content (WC);	Initial - Trimming Location			Final, W_{at}	Soil and Ring Masses (g)	Initial	Final
	Top (W1)	Bottom (W2)	Sides (W3)	(see below)	Mass Moist Soil+Trimming Ring	5720.00	NA
Container No.	4087			3003	Mass Trimming Ring, etc.	5165.00	NA
Mass Moist Soil + Container (g)	135.74			705.00	Mass Moist Soil	555.00	NA
Mass Dry Soil + Container (g)	129.48			655.00	Excess Dry Soil (soil not included in final water content)		
Mass Container (g)	31.01			135.00	Container No.		
WATER CONTENT (%)	6.36			9.62	Mass Dry Soil + Cont. (g)		
Avg. Initial WC, W4 (%)	6.36	Final W_{at}: Soil with free water trimmed away			Mass Container (g)		
[ ] See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Soil Height: Measurements(1)	
Initial (mm)	
with Spec., H_{soil}	without Spec., H_{app}
31.81	
Block Used (2):	[ ] Yes ; [X] No

Soil Height/Volume: Calc., (mm)	Initial
Height of Gauge Block, H_{gb} (2)	NA
Reading on Gauge Block, R_{gb}	NA
Avg. Reading on Soil, H_{soil}	31.81
Avg. Reading on Apparatus without Specimen, H_{app}	0.00
Soil Height, $H = H_{soil} - H_{app} + H_{gb} - R_{gb}$	31.81
Initial Soil Volume, V_o (cm^3)	257.59

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (pcf)= 134.51	Dry, $\gamma_{d,o}$ (pcf)= 126.47

(1) Measured in trimming ring, not shear box.

(2) Req. block ht. to set bench comparator so the initial soil ht. can be determined directly by the diff. between the reading with and without spec. Enter value for H_{gb} and d_{gb} only when these values have to be included in the determination of the soil height.
(3) Equals wgt. top cap, loading hanger and Bellofram piston (if used). (4) Reduced value if soil will dilate during shear.

Apparatus Information:	
	Wgt. of Top Shear Ring, M_{sb} (lbf) = 4.99 Dead Wgt. of Loading System(3) (lbf)= 2.64
	Top Shear Ring Supported by Counter Force: [X] Yes ; [ ] No: Shear Ring Free to Move Up & Down: [X] Yes ; [ ] No:
	Porous Inserts: [X] Stone; [ ] Metal; Do not use filter paper over porous inserts. Free to Rotate: [ ] Yes ; [X] No:
	Porous Inserts with Additional Shear Transfer Features: [X] None; [ ] Pins; [ ] Grid Plate; [ ] Waffle Stone; [ ] Other:
	Apparatus deformation under consolidation load determined: [X] Yes ; [ ] No

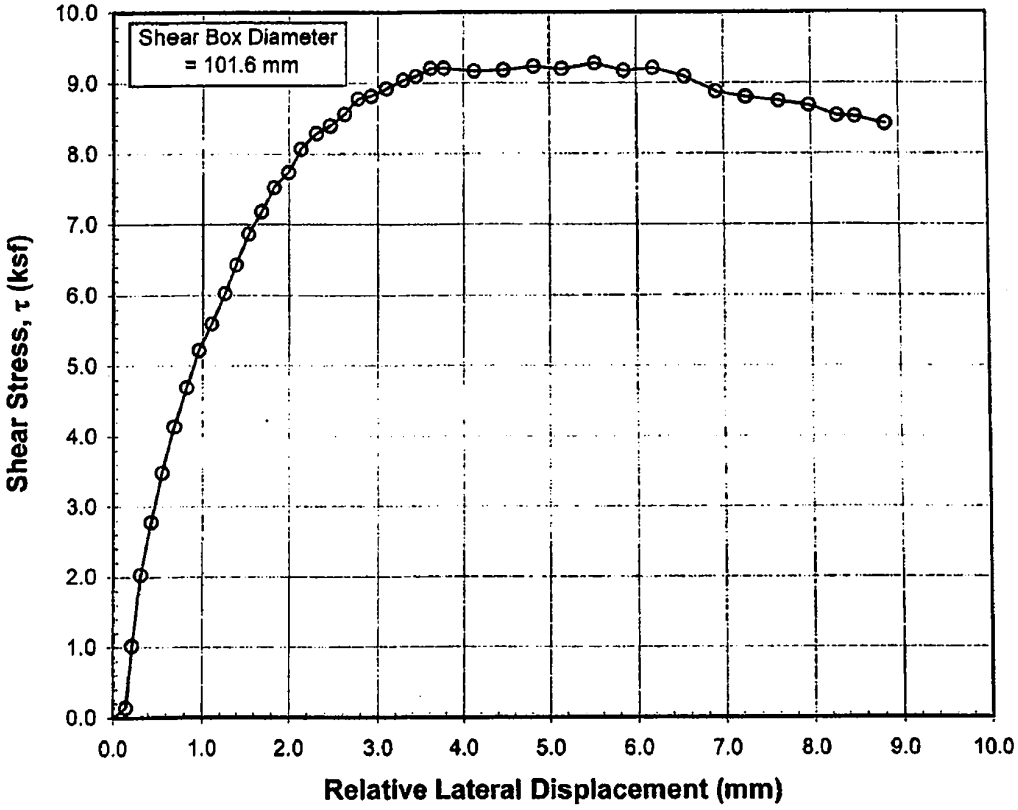
Photo taken of Sliced Test Specimen: [ ] Yes ; [X] No
Final Visual Description: Red Well Graded GRAVEL with clay (visual)

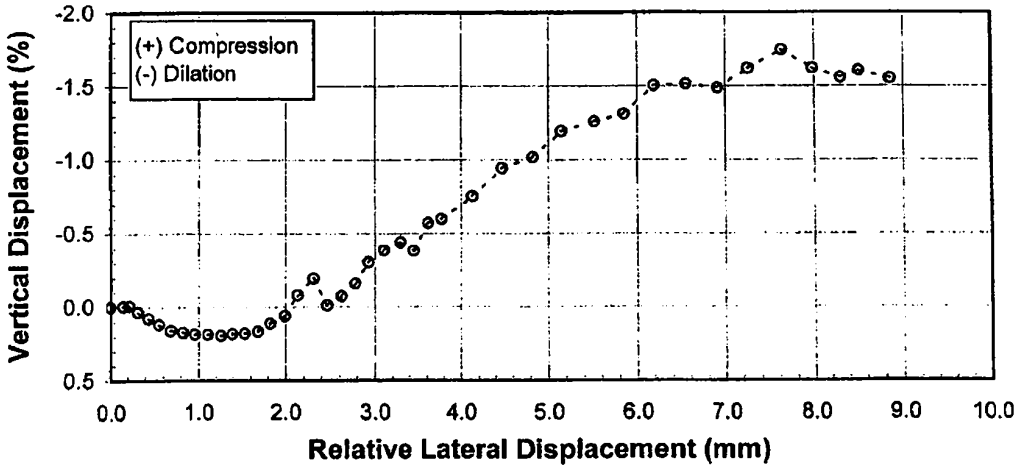
Trimming/Etc. Remarks: CW&A TxDOT Grade 6 Passing 3/8-inch Sieve

Method of trimming periphery: [ ] "Casagrande" Lathe ; [ ] Cutting Shoe ; [ ] Wire Saw; [ ] Other
Method of trimming ends: [ ] Wire Saw & Sharp (knife) Straight Edge; [ ] Wire Saw & Straight Edge; [ ] Wire Saw; [ ] Other
For soils containig sand, ~100 % passes sieve size: [ ] #4 (4.75 mm); [ ] #10 (2.0 mm); [ ] #20 (0.85 mm) or; [ ] #40 (0.425 mm)
Shear Box Gap Setting(4): Clays, 0.50 to 0.65 mm; Sands,1 mm to sieve size (mm) for 100 % passing

Trim./Recon. By: YR Set up By: HC Prelim. Cal. By: HC Taken Down By: HC
Date: 6/10/2008 Date: 6/10/2008 Final Cal. By: HC Date: 6/10/2008
Reviewed By: HP HP

KAW 6/13/08





DRAINED DIRECT SHEAR TEST: 3rd Test in Test Series

Soil - Soil Interface $\sigma'_{v,c}$ = 11.52 ksf

Source: CW&A, Sample No. CW&A #6 3/8

Exelon (Victoria)

Reviewed By: WP

DIRECT SHEAR TEST (ASTM D 3080-04): SPECIMEN CALCULATIONS & SUMMARY

Project Number: 0411-08-1686 Boring/Exploration No.: N/A Type Test: DS
Task Number: N/A Sample No.: CW&A #6 3/8 Specific Gravitiy, G_s: 2.66
Project Name: Exelon (Victoria) Penetration/Depth (ft): N/A
Calculations Corrected for Salt (dissolved soilids): [X] No or, [ ] Yes, with salinity, S_{ppt} : _____ ppt

Water Content Copied/Derived From:	Water Content, $W_{o,n}$ (%)	Mass Dry Soil, $M_{do,n}$ (g)	Degree of Sat., $S_{o,n}$ (%)
Initial, Top, W1	6.36	521.83	54.5
" Bottom, W2			
" Sides, W3			
" Average, W4	6.36	521.83	54.5
" Assumed, W	6.36	521.83	54.5
Final (After Test/Shear)	9.62		

Back-calculated Data		Input Data for Back Calculation	
Item	Value	$S_{o,n}$ (%)	
Initial Mass Dry Soil, $M_{d,o}$			G_s
Specific Gravity, G_s			$M_{d,o}$ (g)

Calculation Constant: = (unit conversion) / $G_s \times \rho_w \times A_{sb}$	
Estimated	0.04653
Final Selected	0.04653

Soil Height: Final by Dial Change During Test (mm)		For Multistage Testing	
		2nd Stage	3rd Stage
Initial Height, H_o	31.81		
Change in Height During Consol.(not corrected for apparatus flexability)	0.09	NA	NA
Height after Consolidation, H_c	31.72	NA	NA
Change in Height During Initial Shear (+ compression, - dilation)	-0.49	NA	NA
Change in Height During Repeated/Residual Shear	NA	NA	NA
Change in Height During Consol. to Max. Consol. Stress	NA	NA	NA
Final Soil Height (After Test/Shear), H_{sf}	32.21	NA	NA

Summary of Specimen Physical Properties: Initial Conditions

Area, A_{sb}	80.977 , cm^2							
Specific Gravity, G_s	2.659		[ ] Assumed	[X] Measured				
Mass Dry Soil, Md (g)	521.83		[X] Based on average water content			[ ] Value based on one of the above values		
	Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)	Height, H (mm)	Volume, V (cm^3)	
Initial:	6.4	134.51	126.47	0.310	54.5	31.81	257.59	

Consolidation Summary: Stress Units = (ksf)	Stage:	1st	2nd	3rd		1st	2nd	3rd
	$\sigma'_{n,c}$ or $\sigma'_{v,c}$	11.52	NA	NA	$\varepsilon_{a,c}$ (%)	0.28	NA	NA
	$\sigma'_{v,max}$	NA	NA	NA	$\varepsilon_{a,max}$ (%)	NA	NA	NA
	OCR	NA	NA	NA	t_c (days)	0.01	NA	NA

Remarks: Gapping was about 0.7 mm between Top and Bottom Shear Box
NA - Not Applicable

Calculated by: HP Reviewed by: HP HP
Date: 6/11/2008

DRAINED DIRECT SHEAR TEST: Test Results

Project Number: 0411-08-1686
Task No.: N/A
Project Name: Exelon (Victoria)
File Name: B-1_CW&A Grade 6f
Shear Box Dia./Width: 101.6 (mm)
Shear Box: [X] Circular [ ] Square

App. No.: 6 DS
Consol. Stress, $\sigma'_{v,c}$: 11.52 (ksf)
Induced OCR: NA
$\sigma'_{v,max}$: NA (ksf)
Specimen Ht.: 31.72 (mm)
Vert. Strain During Consol.: 0.28 (%)

Boring No.: N/A
Sample No.: CW&A #6 3/8
Specimen No.: f
Depth (ft): N/A

Part of Test Series: [X] No; [ ] Yes If yes, Test: NA of NA
Multistage: [X] No; [ ] Yes If yes, Test Stage No.: NA
Residual/Multishearing: [X] No; [ ] Yes Precut Failure Plane [X] No; [ ] Yes

Initial Test Conditions:				
Water Content, w (%)	Total Unit Weight, γ_t (pcf)	Dry Unit Weight, γ_d (pcf)	Void Ratio, e	Degree of Saturation, S (%)
6.4	134.51	126.47	0.310	54.5

Peak Shear Stress, τ_f (ksf): 9.28

Shearing Data For:		
	X	Intact - Without Repeated Shearing (Peak Data)
		Intact - Before Repeated Shearing (Peak Data)
		After Rapid Repeated Shearing (Residual Data)
		Continuous Shearing: Forwards & Backwards (Peak & Residual Data)

Avg. Lat. Displacement Rate (mm/h): 0.00537

Elapsed Time (min)	Rel. Lateral Displacement (mm)	Horiz. Force (lbf)	Vert. Displacement (%)	Shear Stress, τ (kips/ft^2)
0.00	0.0000	-0.17	0.00	0.00
0.50	0.1486	12.10	-0.01	0.14
1.00	0.2184	88.80	-0.01	1.02
1.50	0.3167	176.72	0.04	2.03
2.00	0.4331	242.13	0.08	2.78
2.50	0.5540	303.36	0.12	3.48
3.00	0.6848	360.48	0.16	4.14
3.50	0.8182	408.74	0.17	4.69
4.00	0.9568	454.64	0.18	5.22
4.50	1.1047	487.32	0.18	5.59
5.00	1.2578	524.97	0.19	6.02
5.50	1.3914	560.22	0.18	6.43
6.00	1.5349	598.19	0.18	6.86
6.50	1.6839	625.97	0.16	7.18
7.00	1.8279	655.58	0.11	7.52
7.50	1.9907	674.22	0.06	7.74
8.00	2.1318	703.37	-0.08	8.07
8.50	2.3074	722.54	-0.20	8.29
9.00	2.4612	731.81	-0.01	8.40
9.50	2.6239	745.92	-0.07	8.56
10.00	2.7779	765.05	-0.16	8.78
10.50	2.9262	768.31	-0.30	8.81
11.00	3.0989	777.72	-0.39	8.92
11.50	3.2929	787.98	-0.44	9.04
12.00	3.4448	792.50	-0.38	9.09
12.50	3.6161	802.07	-0.57	9.20
13.00	3.7746	802.28	-0.60	9.20
14.00	4.1288	798.86	-0.75	9.17
15.00	4.4748	800.06	-0.94	9.18
16.00	4.8249	804.48	-1.02	9.23
17.00	5.1459	801.55	-1.19	9.20
18.00	5.5169	808.60	-1.26	9.28
19.00	5.8526	799.34	-1.31	9.17
20.00	6.1924	802.55	-1.50	9.21
21.00	6.5538	792.15	-1.51	9.09
22.00	6.9134	773.79	-1.49	8.88
23.00	7.2589	766.82	-1.62	8.80
24.00	7.6264	762.10	-1.75	8.74
25.00	7.9811	756.49	-1.62	8.68
26.00	8.3057	743.64	-1.56	8.53
26.50	8.5139	742.64	-1.60	8.52
27.50	8.8551	734.08	-1.55	8.42

Sign Convention:
(+) Compression or Fowards
(-) Dilation or Backwards

Soil Chemical Tests – Borrow Soils

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

REVISED

PROJECT NO. 6468-07-1777

TEXAS COL PROJECT-Victoria

Lot #: F8E100185

Kathryn White

MACTEC ENGINEERING & CONSULTIN
1540 N. 107TH EAST AVENUE
TULSA, OK 74116

TESTAMERICA LABORATORIES, INC.

Ivan Vania
Project Manager

May 19, 2008

KAW 6/13/08

Case Narrative
LOT NUMBER: F8E100185 – Revision 1

This report contains the analytical results for the five samples received under chain of custody by TestAmerica St. Louis on May 10, 2008. These samples are associated with your TEXAS COL PROJECT project.

The analytical results included in this report meet all applicable quality control procedure requirements.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by TestAmerica St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Method 9045C is listed on the results report due to a limitation of the laboratory's data reporting system. However, method 9045D was used for the analysis of pH. This can be verified by observation of the lab bench worksheets in the raw data package.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

There were no nonconformances or observations noted with any analysis on this lot.

METHODS SUMMARY

F8E100185

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Chloride	MCAWW 300.0A	MCAWW 300.0A
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Soil and Waste pH	SW846 9045C	SW846 DI-LEACHA
Sulfate	MCAWW 300.0A	MCAWW 300.0A

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

F8E100185

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
KM1E1	001	MURPHY PIT C-33	05/08/08	
KM1E2	002	MURPHY PIT C-144	05/08/08	
KM1E3	003	BRIGGS RAW MATERIAL	05/08/08	
KM1E4	004	CW&A TEXAS DOT GRADE 4	05/08/08	
KM1E5	005	CW&A TEXAS DOT GRADE 6	05/08/08	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

MACTEC Engineering and Consulting Inc

Client Sample ID: MURPHY PIT C-33

General Chemistry

Lot-Sample #...: F8E100185-001 Work Order #...: KM1E1 Matrix.....: SOLID
Date Sampled...: 05/08/08 Date Received..: 05/10/08
% Moisture.....: 3.8

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	9.3	0.10	No Units	SW846 9045C	05/12/08	8133304
		Dilution Factor: 1		Analysis Time..: 00:00		
Chloride	0.84 B	2.1	mg/kg	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1		Analysis Time..: 06:27		
Percent Moisture	3.8	0.10	%	MCAWW 160.3 MOD	05/12-05/14/08	8133235
		Dilution Factor: 1		Analysis Time..: 00:00		
Sulfate	5.6	5.2	mg/kg	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1		Analysis Time..: 06:27		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

MACTEC Engineering and Consulting Inc

Client Sample ID: MURPHY PIT C-144

General Chemistry

Lot-Sample #...: F8E100185-002 Work Order #...: KM1E2 Matrix.....: SOLID
Date Sampled...: 05/08/08 Date Received..: 05/10/08
% Moisture.....: 4.4

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	9.4	0.10	No Units	SW846 9045C	05/12/08	8133304
		Dilution Factor: 1		Analysis Time..: 00:00		
Chloride	4.4	2.1	mg/kg	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1		Analysis Time..: 06:39		
Percent Moisture	4.4	0.10	%	MCAWW 160.3 MOD	05/12-05/14/08	8133235
		Dilution Factor: 1		Analysis Time..: 00:00		
Sulfate	4.7 B	5.2	mg/kg	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1		Analysis Time..: 06:39		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

MACTEC Engineering and Consulting Inc

Client Sample ID: BRIGGS RAW MATERIAL

General Chemistry

Lot-Sample #...: F8E100185-003 Work Order #...: KM1E3 Matrix.....: SOLID
Date Sampled...: 05/08/08 Date Received..: 05/10/08
% Moisture.....: 5.7

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	9.4	0.10	No Units	SW846 9045C	05/12/08	8133304
		Dilution Factor: 1		Analysis Time..: 00:00		
Chloride	7.9	2.1	mg/kg	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1		Analysis Time..: 06:51		
Percent Moisture	5.7	0.10	%	MCAWW 160.3 MOD	05/12-05/14/08	8133235
		Dilution Factor: 1		Analysis Time..: 00:00		
Sulfate	10.2	5.3	mg/kg	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1		Analysis Time..: 06:51		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

MACTEC Engineering and Consulting Inc

Client Sample ID: CW&A TEXAS DOT GRADE 4

General Chemistry

Lot-Sample #...: F8E100185-004 Work Order #...: KM1E4 Matrix.....: SOLID
Date Sampled...: 05/08/08 Date Received..: 05/10/08
% Moisture.....: 3.4

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	5.7	0.10	No Units	SW846 9045C	05/12/08	8133304
		Dilution Factor: 1		Analysis Time..: 00:00		
Chloride	1.4 B	2.1	mg/kg	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1		Analysis Time..: 07:03		
Percent Moisture	3.4	0.10	%	MCAWW 160.3 MOD	05/12-05/14/08	8133235
		Dilution Factor: 1		Analysis Time..: 00:00		
Sulfate	5.6	5.2	mg/kg	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1		Analysis Time..: 07:03		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

MACTEC Engineering and Consulting Inc

Client Sample ID: CW&A TEXAS DOT GRADE 6

General Chemistry

Lot-Sample #...: F8E100185-005 Work Order #...: KM1E5 Matrix.....: SOLID
Date Sampled...: 05/08/08 Date Received..: 05/10/08
% Moisture.....: 4.5

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	8.1	0.10	No Units	SW846 9045C	05/12/08	8133304
		Dilution Factor: 1		Analysis Time..: 00:00		
Chloride	2.3	2.1	mg/kg	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1		Analysis Time..: 07:16		
Percent Moisture	4.5	0.10	%	MCAWW 160.3 MOD	05/12-05/14/08	8133235
		Dilution Factor: 1		Analysis Time..: 00:00		
Sulfate	11.8	5.2	mg/kg	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1		Analysis Time..: 07:16		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F8E100185 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: KM9HD1AA		MB Lot-Sample #:	F8E150000-223	
	ND	2.0	mg/kg	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1				
		Analysis Time..: 06:10				
Sulfate		Work Order #: KM9HE1AA		MB Lot-Sample #:	F8E150000-224	
	ND	5.0	mg/kg	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1				
		Analysis Time..: 06:10				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F8E100185 Matrix.....: SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)		Work Order #: KM2MN1AA	LCS Lot-Sample#: F8E120000-304		
	100	(99 - 101)	SW846 9045C	05/12/08	8133304
		Dilution Factor: 1	Analysis Time..: 00:00		
Chloride		Work Order #: KM9HD1AC	LCS Lot-Sample#: F8E150000-223		
	97	(90 - 110)	MCAWW 300.0A	05/14/08	8136223
		Dilution Factor: 1	Analysis Time..: 05:58		
Sulfate		Work Order #: KM9HE1AC	LCS Lot-Sample#: F8E150000-224		
	97	(90 - 110)	MCAWW 300.0A	05/14/08	8136224
		Dilution Factor: 1	Analysis Time..: 05:58		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F8E100185 Matrix.....: SOLID
Date Sampled...: 05/08/08 Date Received..: 05/10/08

Percnt Moisture: 28

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	106	Work Order #...: KM1E11AG (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F8E100185-001 05/14/08	8136223
		Dilution Factor: 1	Analysis Time..: 06:27		
Sulfate	99	Work Order #...: KM1E11AJ (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F8E100185-001 05/14/08	8136224
		Dilution Factor: 1	Analysis Time..: 06:27		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F8E100185 Work Order #...: KMV85-SMP KMV85-DUP Matrix.....: SOLID

Date Sampled...: 05/08/08 14:00 Date Received..: 05/09/08

% Moisture.....: 8.2

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture						SD Lot-Sample #:	F8E090147-004	
	8.2	8.0	%	3.3	(0-30)	MCAWW 160.3 MOD	05/12-05/14/08	8133235

Dilution Factor: 1 Analysis Time..: 00:00

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F8E100185 Work Order #...: KM1D7-SMP KM1D7-DUP Matrix.....: SOLID

Date Sampled...: 05/09/08 08:00 Date Received..: 05/10/08

% Moisture.....: 28

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)						SD Lot-Sample #:	F8E100179-001	
	7.9	8.0	No Units	1.0	(0-0.0)	SW846 9045C	05/12/08	8133304

Dilution Factor: 1 Analysis Time..: 00:00

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F8E100185 Work Order #...: KM1E1-SMP KM1E1-DUP Matrix.....: SOLID

Date Sampled...: 05/08/08 Date Received..: 05/10/08

% Moisture.....: 3.8

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride						SD Lot-Sample #:	F8E100185-001	
	0.84 B	0.83 B	mg/kg	2.1	(0-20)	MCAWW 300.0A	05/14/08	8136223
			Dilution Factor: 1			Analysis Time..: 06:27		
Sulfate						SD Lot-Sample #:	F8E100185-001	
	5.6	4.8 B	mg/kg	15	(0-20)	MCAWW 300.0A	05/14/08	8136224
			Dilution Factor: 1			Analysis Time..: 06:27		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

F8E100185 CLIENT ANALYSIS SUMMARY

Storage Loc: 3-115
Date Received: 2008-05-10
Analytical Due Date: 2008-05-15
Report Due Date: 2008-05-15
Report Type: W
EDD Code: 00

Project Manager: IV
Project: 6468-07-1777
PO#: 2008086614
Client: 373886 MACTEC Engineering and Consulting Inc

Quote #: 71966 SDG:
TEXAS COL PROJECT
Report to: Kathryn White

RUSH

#SMPS in LOT: 5

Cation Exchange capacity - Run B, Ca, Mg, Na, K, Bicarbonate and Carbonate alkalinity, Chloride and Sulfate.

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
1	MURPHY PIT C-33			2008-05-08 / 0	KM1E1	SOLID

SAMPLE COMMENTS:

	XX ZV		RAD SCREEN	SOLID, RAD SCREEN, RAD SCREEN, Special L	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT:A	WRK LOC	06
	XX CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX OZ	SW846	9045C	SOLID, 9045C, pH (9045C) - Non-Aqueous	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX WM	MCAW W	160.3 MOD	SOLID, 160.3 MOD, Percent Moisture	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT:Z	WRK LOC	06
S	XX CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
S	XX CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
X	XX CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
X	XX CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
2	MURPHY PIT C-144			2008-05-08 / 0	KM1E2	SOLID

SAMPLE COMMENTS:

	XX ZV		RAD SCREEN	SOLID, RAD SCREEN, RAD SCREEN, Special L	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT:A	WRK LOC	06
	XX CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX OZ	SW846	9045C	SOLID, 9045C, pH (9045C) - Non-Aqueous	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX WM	MCAW W	160.3 MOD	SOLID, 160.3 MOD, Percent Moisture	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT:Z	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
3	BRIGGS RAW MATERIAL			2008-05-08 / 0	KM1E3	SOLID

SAMPLE COMMENTS:

	XX ZV		RAD SCREEN	SOLID, RAD SCREEN, RAD SCREEN, Special L	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT:A	WRK LOC	06
	XX CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX OZ	SW846	9045C	SOLID, 9045C, pH (9045C) - Non-Aqueous	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX WM	MCAW W	160.3 MOD	SOLID, 160.3 MOD, Percent Moisture	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT:Z	WRK LOC	06

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
4	CW&A TEXAS DOT GRADE 4			2008-05-08 / 0	KM1E4	SOLID

SAMPLE COMMENTS:

	XX ZV		RAD SCREEN	SOLID, RAD SCREEN, RAD SCREEN, Special L	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT:A	WRK LOC	06
	XX CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX OZ	SW846	9045C	SOLID, 9045C, pH (9045C) - Non-Aqueous	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
	XX WM	MCAW W	160.3 MOD	SOLID, 160.3 MOD, Percent Moisture	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT:Z	WRK LOC	06

F8E100185

CLIENT ANALYSIS SUMMARY

Storage Loc: 3-115
Date Received: 2008-05-10
Analytical Due Date: 2008-05-15
Report Due Date: 2008-05-15
Report Type: W
EDD Code: 00

Project Manager: IV
Quote #: 71966 SDG:
Project: 6468-07-1777 TEXAS COL PROJECT
PO#: 2008086614 Report to: Kathryn White
Client: 373886 MACTEC Engineering and Consulting Inc

RUSH

#SMPS in LOT: 5

Cation Exchange capacity - Run B, Ca, Mg, Na, K, Bicarbonate and Carbonate alkalinity, Chloride and Sulfate.

SAMPLE #	CLIENT SAMPLE ID	Site ID	Client Matrix	DATE/TIME SAMPLED	WORKORDER	A
5	CW&A TEXAS DOT GRADE 6			2008-05-08 / 0	KM1E5	SOLID

SAMPLE COMMENTS:

XX	ZV		RAD SCREEN	SOLID, RAD SCREEN, RAD SCREEN, Special L	RA	IN-HOUSE RAD SCREEN	01	STANDARD TEST SET	PROT:A	WRK LOC	06
XX	CX	MCAW W	300.0A	SOLID, 300.0A, Chloride	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
XX	CY	MCAW W	300.0A	SOLID, 300.0A, Sulfate	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
XX	OZ	SW846	9045C	SOLID, 9045C, pH (9045C) - Non-Aqueous	82	LEACHATE, DI (Routine)	01	STANDARD TEST SET	PROT:B	WRK LOC	06
XX	WM	MCAW W	160.3 MOD	SOLID, 160.3 MOD, Percent Moisture	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT:Z	WRK LOC	06

CWL 3201

CHAIN OF CUSTODY RECORD
EXELON COL VICTORIA SITE; GEOLOGIC/GEOTECHNICAL EXPLORATION
MACTEC JOB NO. 6468-07-1777

No. V23

SAMPLE DESIGNATION	SAMPLE TYPE	TAKEN BY	DATE TAKEN	INTENDED USE	REMARKS
				CHEMICAL ANALYSIS	199.89#
MURPHY PIT C-33	FINE AGGREGATE	C.D.	5/8/08	1206 ea	
					177.19#
MURPHY PIT C-144	MORTAR SAND				
BRIGGS RAW MATERIAL					221.08#
CW+A (TEXAS DOT GRADE 4)	SOIL				286.75
CW+A (TEXAS DOT GRADE 6)	SOIL				197.95

Relinquished by:	Date/Time	Received by:	Relinquished by:	Received by:	Date/Time
C. Dawanapridi (signature)	5/8/08 11:00 AM	5/10/08 0900 (signature)	(signature)	(signature)	
Relinquished by: (signature)	**Date/Time**	**Received by:** (signature)	**Relinquished by:** (signature)	**Received at Laboratory** (signature)	**Date/Time**

Remarks: If relinquishing to a common carrier or Fed Ex – write freight bill or tracking number here.

Taken Samples From Bulk Samples TRK # 791898559272
Total 5 JARS

Receiving Laboratory: Please return original form after signing for receipt of samples; keep copy for your records. Retain all portions of unused samples in labeled containers.

DCN No. EXE 751

GEOTECHNICAL LABORATORY TEST ASSIGNMENT

Date 4/21/2008 Job Name Exelon Texas COL (Victoria) Job No. 25352 Requested By D. Gerken

Lab Assignment 16 Victoria (POWER BLOCK STRUCTURAL FILL/ COOLING BASIN EMBANKMENT DRAINAGE MATERIALS)

SAMPLE LOCATION						PHYSICAL PROPERTIES										STRENGTH & PERMEABILITY TESTS									COM-PACTION			CONSOLIDATION
Boring No.	Sample Type (Tube Sample Length)	Top of Sample/Core Run Depth, Ft	Sample/Run Number	Field Classification	Recovery (ft)	Moisture Content	Unit Weight	Specific Gravity	Atterberg Limits	Grain Size Analysis: Sieve Only	Grain Size Analysis: Sieve + Hydrometer	Chemical Analysis (pH, chloride, sulphate)	Organic Content			Unconsolidated-Undrained Triaxial	Consolidated-Undrained Triaxial (3-stage w/pore-pressure meas.)	Unconfined Compression (Soil)	Confining Pressures (psi)	Direct Shear (DS)	DS Normal Stress (psi)	Direct Simple Shear (DSS)	DSS Normal Stress (psi)	TSRC	Standard (A, B, C, D)	Modified (A, B, C, D)	CBR	NOTE: Stress increments and rebound cycles, ksf.
CW&A	Bulk*	N/A	TBA	TBA	N/A	X	X	X		X		X														X		
(Texas DOT	Recompacted**	N/A	TBA	TBA	N/A															X	20							
Grade 4)	Recompacted**	N/A	TBA	TBA	N/A															X	40							
	Recompacted**	N/A	TBA	TBA	N/A															X	80							
CW&A	Bulk*	N/A	TBA	TBA	N/A	X	X	X		X		X														X		
(Texas DOT	Recompacted**	N/A	TBA	TBA	N/A															X	20							
Grade 6)	Recompacted**	N/A	TBA	TBA	N/A															X	40							
	Recompacted**	N/A	TBA	TBA	N/A															X	80							
Fordyce	Bulk*	N/A	TBA	TBA	N/A	X	X	X		X		X														X		
(Raw Material	Recompacted**	N/A	TBA	TBA	N/A															X	20							
at Conveyor)	Recompacted**	N/A	TBA	TBA	N/A															X	40							
Briggs	Recompacted**	N/A	TBA	TBA	N/A															X	80							
Fordyce	Bulk*	N/A	TBA	TBA	N/A	X	X	X		X		X														X		

Contact Donald Gerken of Bechtel if there are any questions: Mobile Phone (415) 999-7073; E-mail DEGERKEN@BECHTEL.COM.

08/094

GEOTECHNICAL LABORATORY TEST ASSIGNMENT

Date 4/21/2008 Job Name Exelon Texas COL (Victoria) Job No. 25352 Requested By D. Gerken

Lab Assignment 16 Victoria (POWER BLOCK STRUCTURAL FILL/ COOL[illegible]ASIN EMBANKMENT DRAINAGE MATERIALS)

SAMPLE LOCATION						PHYSICAL PROPERTIES										STRENGTH & PERMEABILITY TESTS									COM-PACTION			CONSOLIDATION
										Grain Size Analysis																		
Boring No.	Sample Type (Tube Sample Length)	Top of Sample/Core Run Depth, Ft	Sample/Run Number	Field Classification	Recovery (ft)	Moisture Content	Unit Weight	Specific Gravity	Atterberg Limits	Sieve Only	Sieve + Hydrometer	Chemical Analysis (pH, chloride, sulphate)	Organic Content			Unconsolidated-Undrained Triaxial	Consolidated-Undrained Triaxial (3-stage w/pore-pressure meas.)	Unconfined Compression (Soil)	Confining Pressures (psi)	Direct Shear (DS)	DS Normal Stress (psi)	Direct Simple Shear (DSS)	DSS Normal Stress (psi)	TSRC	Standard (A, B, C, D)	Modified (A, B, C, D)	CBR	NOTE: Stress increments and rebound cycles, ksf.
(ASTM C33	Recompacted**	N/A	TBA	TBA	N/															X	15							
Rice Aggregate)	Recompacted**	N/A	TBA	TBA	N/															X	30		15					
[illegible]	Recompacted**	N/A	TBA	TBA	N/															X	60							
Fordyce	Bulk*	N/A	TBA	TBA	N/	X	X	X		X		X														X		
(ASTM C144	Recompacted**	N/A	TBA	TBA	N/															X	15							
Mortar Sand)	Recompacted**	N/A	TBA	TBA	N/															X	30		15					
[illegible]	Recompacted**	N/A	TBA	TBA	N/															X	60							
FORDYCE, LTD., 120 MAIN PLACE, VICTORIA, TEXAS 77901 (TEL., 36[illegible]-4309)																												
CW&A, INC., 2204 SOUTHWEST MOODY STREET, VICTORIA, TEXAS [illegible]1 (TEL., 361-573-3236)																												

Contact Donald G[illegible] of Bechtel if there are any questions: Mobile Phone (415) 999-7073; E-mail DEGERKEN@BECHTEL.COM.

08/094

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Lot #(s): F8E100185 BD 5/10
- 3201 -

Condition Upon Receipt Form

Client: Mackie COC/RFA No: 123 Date: 5/10/08
Quote No: ~~28576~~ 71946 PO 5/10 Initiated By: bd Time: 0900

Shipping Information

Shipper Name: FE

Shipping # (s):*
1. 7918 9855 9272
2.
3.
4.
5.
6.
7.
8.
9.
10.

Multiple Packages Y (N)

Sample Temperature (s):**
1. ambient
2.
3.
4.
5.
6.
7.
8.
9.
10.

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y (N)	Are there custody seals present on the cooler?	8.	Y (N)	Are there custody seals present on bottles?
2.	Y N (N/A)	Do custody seals on cooler appear to be tampered with?	9.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
3.	(Y) N	Were contents of cooler frisked after opening, but before unpacking?	10.	Y N (N/A)	Was sample received with proper pH[1]? (If not, make note below)
4.	(Y) N	Sample received with Chain of Custody?	11.	Y N	If N/A- Was pH taken by original TestAmerica lab?
5.	(Y) N N/A	Does the Chain of Custody match sample ID's on the container(s)?	12.	(Y) N	Sample received in proper containers?
6.	Y (N)	Was sample received broken?	13.	Y N (N/A)	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)
7.	(Y) N	Is sample volume sufficient for analysis?	14.	Y N	Was Internal COC/Workshare received?

[1] For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Corrective Action:
- ☐ Client Contact Name: Informed by:
- ☐ Sample(s) processed "as is"
- ☐ Sample(s) on hold until: If released, notify:

Project Management Review: Date: 5-14-08

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

ADMIN-0004, REVISED 08/06/07\\Slsvr01\QA\FORMS\ST-LOUIS\ADMIN\Admin004 rev11.doc