APPENDIX D

DIRECT SHEAR INTERFACE TEST RESULTS





5 April 2009

Mr. David Steele Parsons 290 Elwood Davis Road, Suite 312 Liverpool, NY 13088

Subject: Laboratory Test Results Transmittal Interface Direct Shear Testing

Dear Mr. Barker,

SGI Testing Services, LLC (SGI) is pleased to present the attached results for the above-mentioned testing program. The note section below addresses sample preparation, sample disposal and a disclosure statement.

SGI appreciates the opportunity to provide laboratory testing services to Parsons. Should you have any questions regarding the attached document(s), or if you require additional information, please do not hesitate to contact the undersigned.

Sincerely,

Eding / fra

Zehong Yuan, Ph.D., P.E. Laboratory Manager

Attachments

Notes:

(1) Unless otherwise noted in the test results the sample(s)/specimen(s) were prepared in accordance with the applicable test standards or generally accepted sampling procedures.

(2) Contaminated/chemical samples and all related laboratory generated waste (i.e., test liquids, PPE, absorbents, etc.) will be returned to the client or designated representative(s), at the client's cost, within 60 days following the completion of the testing program, unless special arrangements for proper disposal are made with SGI. (3) Materials that are not contaminated will be discarded after test specimens and archived specimens are obtained. Archived specimens will be discarded 30 days after the completion of the testing program, unless long-term storage arrangements are specifically made with SGI.

(4) The reported results apply only to the materials and test conditions used in the laboratory testing program. The results do not necessarily apply to other materials or test conditions. The test results should not be used in engineering analysis unless the test conditions model the anticipated field conditions. The testing was performed in accordance with general engineering testing standards and requirements. The reported results are submitted for the exclusive use of the client to whom they are addressed.

SGI9002.REPORT.09.01

Mail To: SGI Testing Services, LLC

P.O. Box 2427 Lil bur n, Geor gia 30048-2427 Facil it y Location

4405 Inter national Boulevard Suite B-117 Nor cross, Georgia 30093

Web Site: www.interactionspecialists.com

Phone:770.931.8222 Fax:770.931.8240

ATTACHMENT A

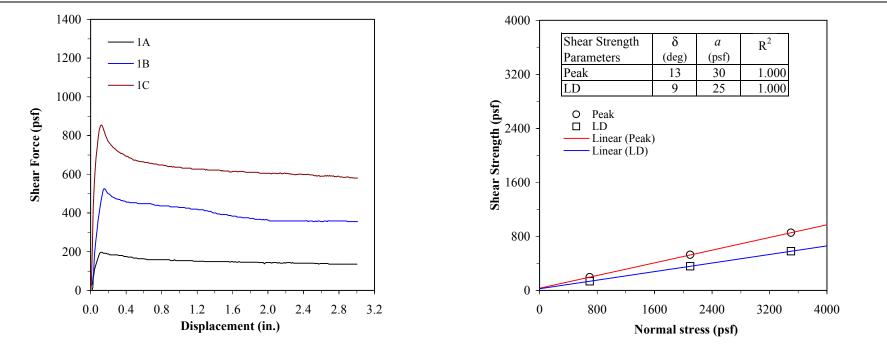
INTERFACE DIRECT SHEAR TEST RESULTS

Upper Shear Box: Concrete sand

TenCate S1600 (16 oz) nonwoven geotextile #000167745 with non heat-treated side down/

GSE 40-mil double smooth HDPE geomembrane # 101130132/

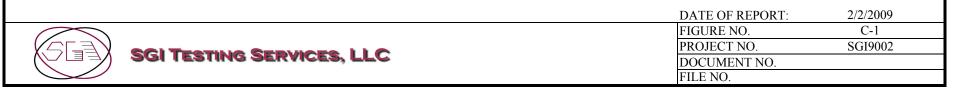
Lower Shear Box: Clay soil compacted to approximately 95% of max modified Proctor density at 3% wet of optimum moisture content



Test	Shear	Normal	Shear	GCL S	Soaking	Consol	idation		Clay Soil	l	τ	Jpper So	il	G	CL	Shear	Stress	Failure
No.	Box Size	Stress	Rate	Stress	Time	Stress	Time	$\gamma_{\rm d}$	ω_{i}	$\omega_{\rm f}$	$\gamma_{\rm d}$	ω	$\omega_{\rm f}$	ω _i	$\omega_{\rm f}$	$\tau_{\rm P}$	$\tau_{\rm LD}$	Mode
	(in. x in.)	(psf)	(in./min)	(psf)	(hour)	(psf)	(hour)	(pcf)	(%)	(%)	(pcf)	(%)	(%)	(%)	(%)	(psf)	(psf)	
1A	12 x 12	700	0.04	-	-	-	-	118.6	13.9	13.1	-	-	-	-	-	196	135	(1)
1B	12 x 12	2100	0.04	-	-	-	-	118.9	13.6	12.5	-	-	-	-	-	526	355	(1)
1C	12 x 12	3500	0.04	-	-	-	-	119.3	13.2	12.7	-	-	-	-	-	855	580	(1)

NOTES:

(1) Sliding (i.e., shear failure) occurred at the interface between the non heat-treated side of 16 oz nonwoven geotextile and geomembrane.

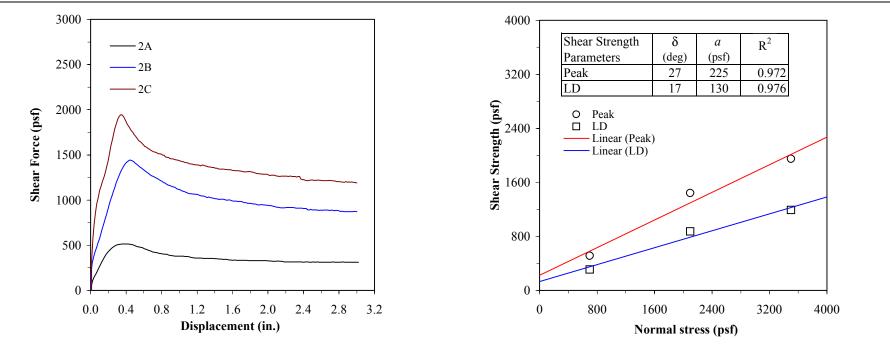


Upper Shear Box: Concrete sand

TenCate S1600 (16 oz) nonwoven geotextile #000167745 with non heat-treated side down/

GSE 40-mil double textured HDPE geomembrane # 105140273/

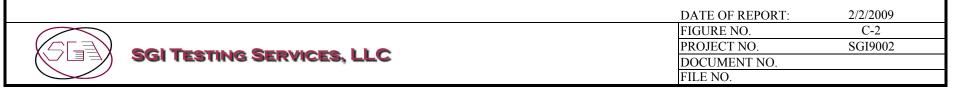
Lower Shear Box: Clay soil compacted to approximately 95% of max modified Proctor density at 3% wet of optimum moisture content



Test	Shear	Normal	Shear	GCL S	Soaking	Consol	idation		Clay Soi	l	τ	Jpper So	il	G	CL	Shear	Stress	Failure
No.	Box Size	Stress	Rate	Stress	Time	Stress	Time	$\gamma_{\rm d}$	ω _i	$\omega_{\rm f}$	$\gamma_{\rm d}$	ω	$\omega_{\rm f}$	ω _i	$\omega_{\rm f}$	$\tau_{\rm P}$	τ_{LD}	Mode
	(in. x in.)	(psf)	(in./min)	(psf)	(hour)	(psf)	(hour)	(pcf)	(%)	(%)	(pcf)	(%)	(%)	(%)	(%)	(psf)	(psf)	
2A	12 x 12	700	0.04	-	-	-	-	119.6	12.9	12.2	-	-	-	-	-	514	310	(1)
2B	12 x 12	2100	0.04	-	-	-	-	119.9	12.6	12.0	-	-	-	-	-	1441	870	(1)
2C	12 x 12	3500	0.04	-	-	-	-	118.9	13.6	12.9	-	-	-	-	-	1946	1189	(1)

NOTES:

(1) Sliding (i.e., shear failure) occurred at the interface between the non heat-treated side of 16 oz nonwoven geotextile and geomembrane.

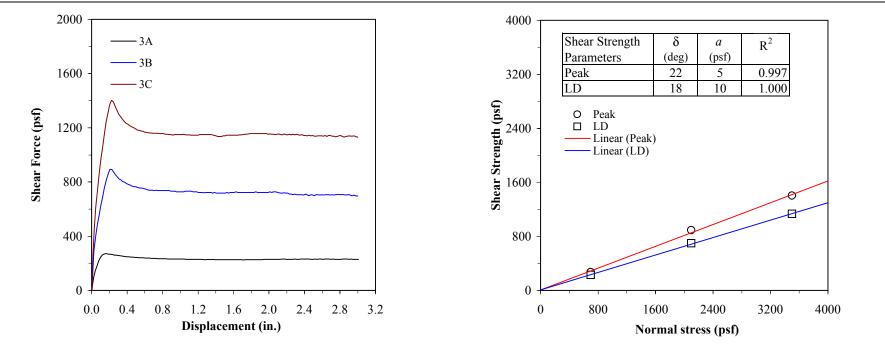


Upper Shear Box: Concrete sand

TenCate S1600 (16 oz) nonwoven geotextile #000167745 with non heat-treated side down/

40-mil EPDM geomembrane # AZ 12343/

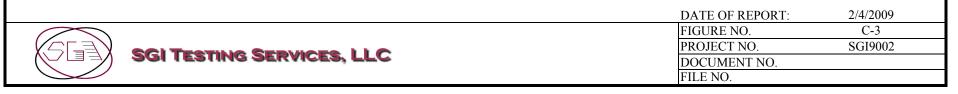
Lower Shear Box: Clay soil compacted to approximately 95% of max modified Proctor density at 3% wet of optimum moisture content



Test	Shear	Normal	Shear	GCL S	oaking	Consol	idation		Clay Soi	l	ι	Upper So	il	G	CL	Shear	Stress	Failure
No.	Box Size	Stress	Rate	Stress	Time	Stress	Time	$\gamma_{\rm d}$	ω _i	$\omega_{\rm f}$	$\gamma_{\rm d}$	ω	$\omega_{\rm f}$	ω_{i}	$\omega_{\rm f}$	$ au_{ m P}$	τ_{LD}	Mode
	(in. x in.)	(psf)	(in./min)	(psf)	(hour)	(psf)	(hour)	(pcf)	(%)	(%)	(pcf)	(%)	(%)	(%)	(%)	(psf)	(psf)	
3A	12 x 12	700	0.04	-	-	-	-	119.8	12.7	12.3	-	-	-	-	-	271	228	(1)
3B	12 x 12	2100	0.04	-	-	-	-	119.4	13.1	12.5	-	-	-	-	-	892	697	(1)
3C	12 x 12	3500	0.04	-	-	-	-	119.1	13.4	12.8	-	-	-	-	-	1402	1132	(1)

NOTES:

(1) Sliding (i.e., shear failure) occurred at the interface between the non heat-treated side of 16 oz nonwoven geotextile and geomembrane.

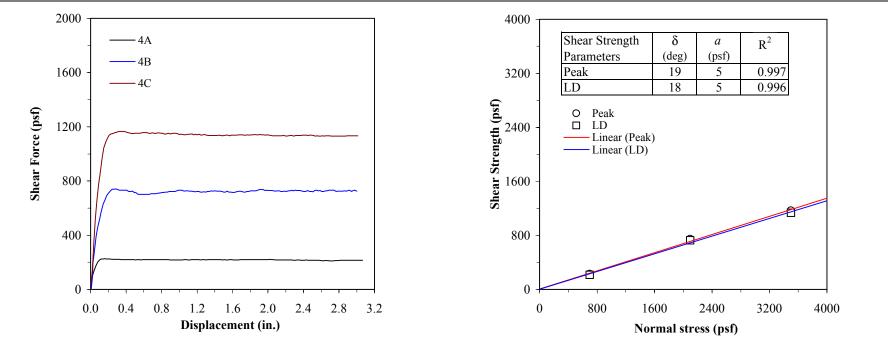


Upper Shear Box: Concrete sand

TenCate S1600 (16 oz) nonwoven geotextile #000167745 with non heat-treated side down/

40-mil PP geomembrane with rough side up to geotextile and smooth side down to clay soil/

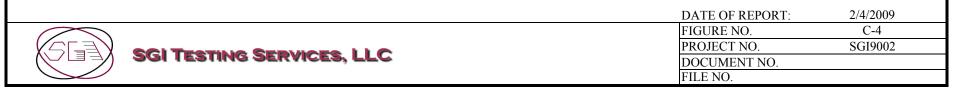
Lower Shear Box: Clay soil compacted to approximately 95% of max modified Proctor density at 3% wet of optimum moisture content



Test	Shear	Normal	Shear	GCL S	Soaking	Consol	idation		Clay Soi	1	τ	Upper So	il	G	CL	Shear	Stress	Failure
No.	Box Size	Stress	Rate	Stress	Time	Stress	Time	$\gamma_{\rm d}$	ω _i	$\omega_{\rm f}$	$\gamma_{\rm d}$	ω	$\omega_{\rm f}$	ω_{i}	$\omega_{\rm f}$	$ au_{ m P}$	τ_{LD}	Mode
	(in. x in.)	(psf)	(in./min)	(psf)	(hour)	(psf)	(hour)	(pcf)	(%)	(%)	(pcf)	(%)	(%)	(%)	(%)	(psf)	(psf)	
4A	12 x 12	700	0.04	-	-	-	-	118.6	13.9	13.3	-	-	-	-	-	226	215	(1)
4B	12 x 12	2100	0.04	-	-	-	-	119.0	13.5	12.9	-	-	-	-	-	742	726	(1)
4C	12 x 12	3500	0.04	-	-	-	-	118.8	13.7	12.5	-	-	-	-	-	1166	1133	(1)

NOTES:

(1) Sliding (i.e., shear failure) occurred at the interface between the non heat-treated side of 16 oz nonwoven geotextile and rough side of geomembrane.

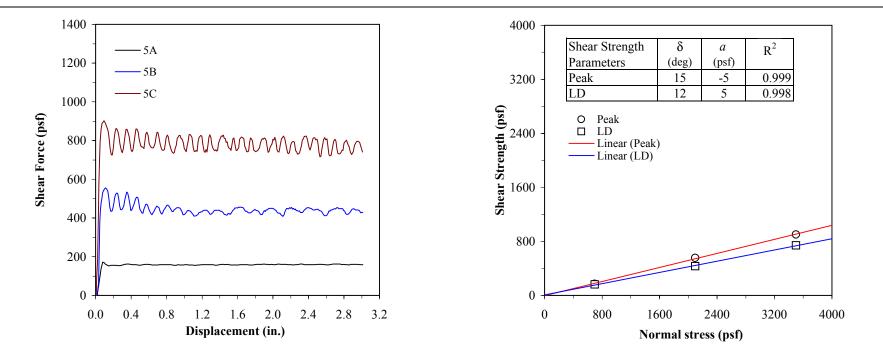


Upper Shear Box: Rigid substrate

TenCate GT500 geotextile #021812318 in the machine direction/

TenCate GT500 geotextile #021812318 in the machine direction

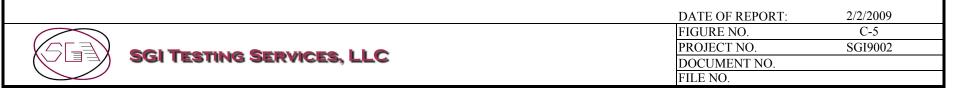
Lower Shear Box: Concrete sand



Test	Shear	Normal	Shear	GCL S	oaking	Consol	idation		Clay Soi	1	τ	Jpper So	il	G	CL	Shear	Stress	Failure
No.	Box Size	Stress	Rate	Stress	Time	Stress	Time	$\gamma_{\rm d}$	ω _i	$\omega_{\rm f}$	$\gamma_{\rm d}$	ω _i	$\omega_{\rm f}$	ω _i	$\omega_{\rm f}$	$\tau_{\rm P}$	$ au_{LD}$	Mode
	(in. x in.)	(psf)	(in./min)	(psf)	(hour)	(psf)	(hour)	(pcf)	(%)	(%)	(pcf)	(%)	(%)	(%)	(%)	(psf)	(psf)	
5A	12 x 12	700	0.04	-	-	-	-	-	-	-	-	-	-	-	-	172	159	(1)
5B	12 x 12	2100	0.04	-	-	-	-	-	-	-	-	-	-	-	-	555	429	(1)
5C	12 x 12	3500	0.04	-	-	-	-	-	-	-	-	-	-	-	-	902	741	(1)

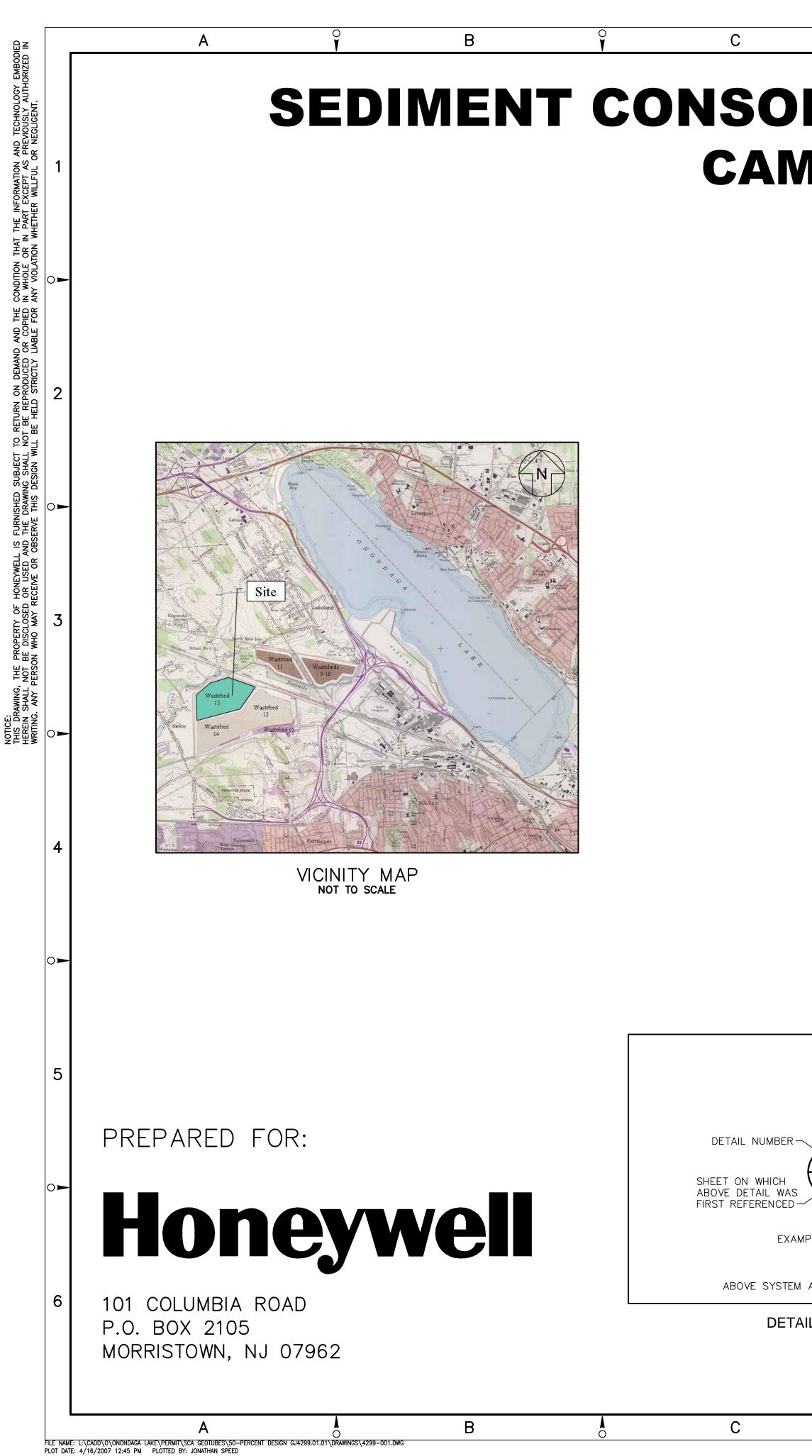
NOTES:

(1) Sliding (i.e., shear failure) occurred at the interface between the GT500 geotextile and GT500 geotextile.



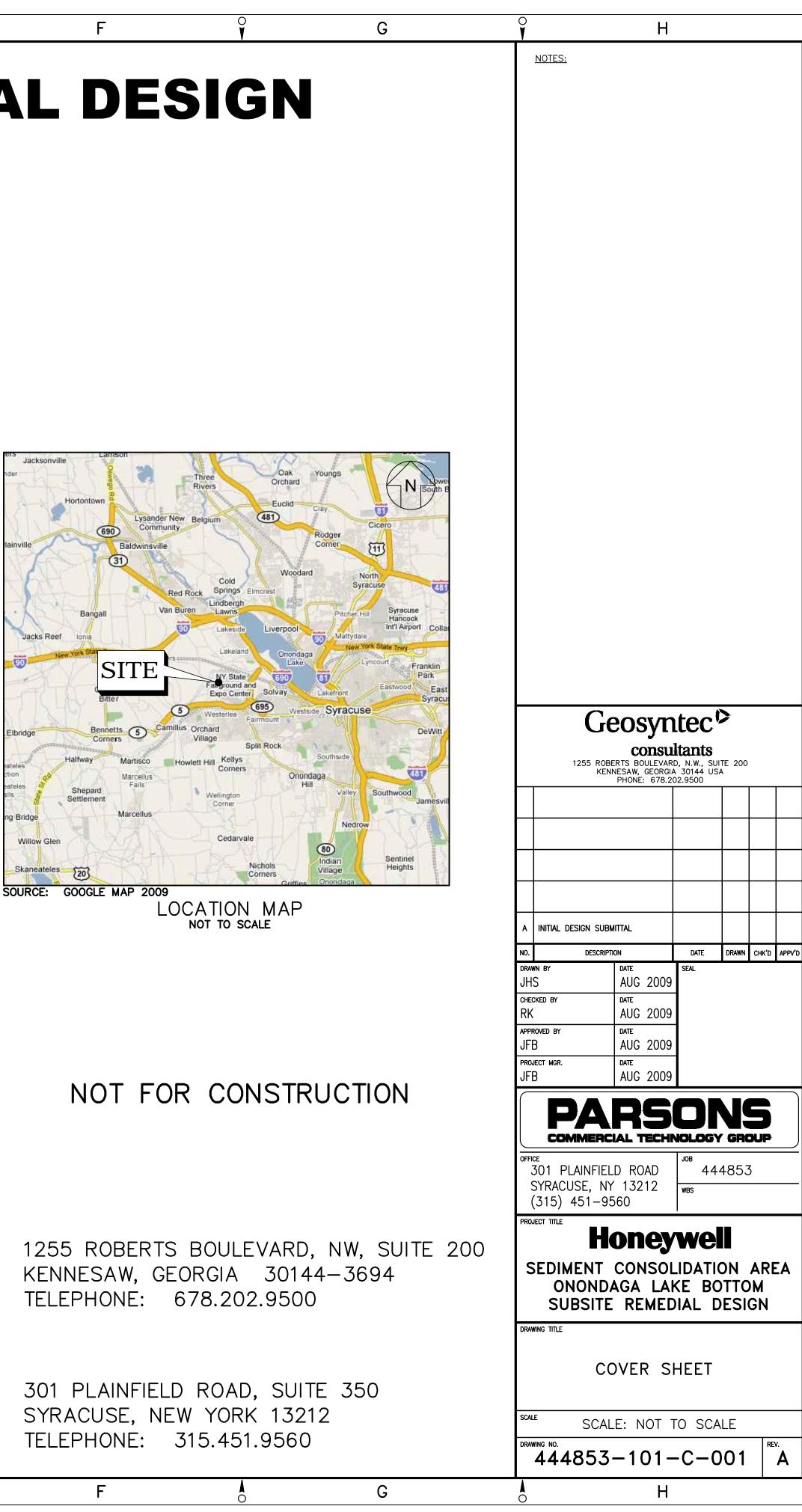
APPENDIX E

DRAWINGS



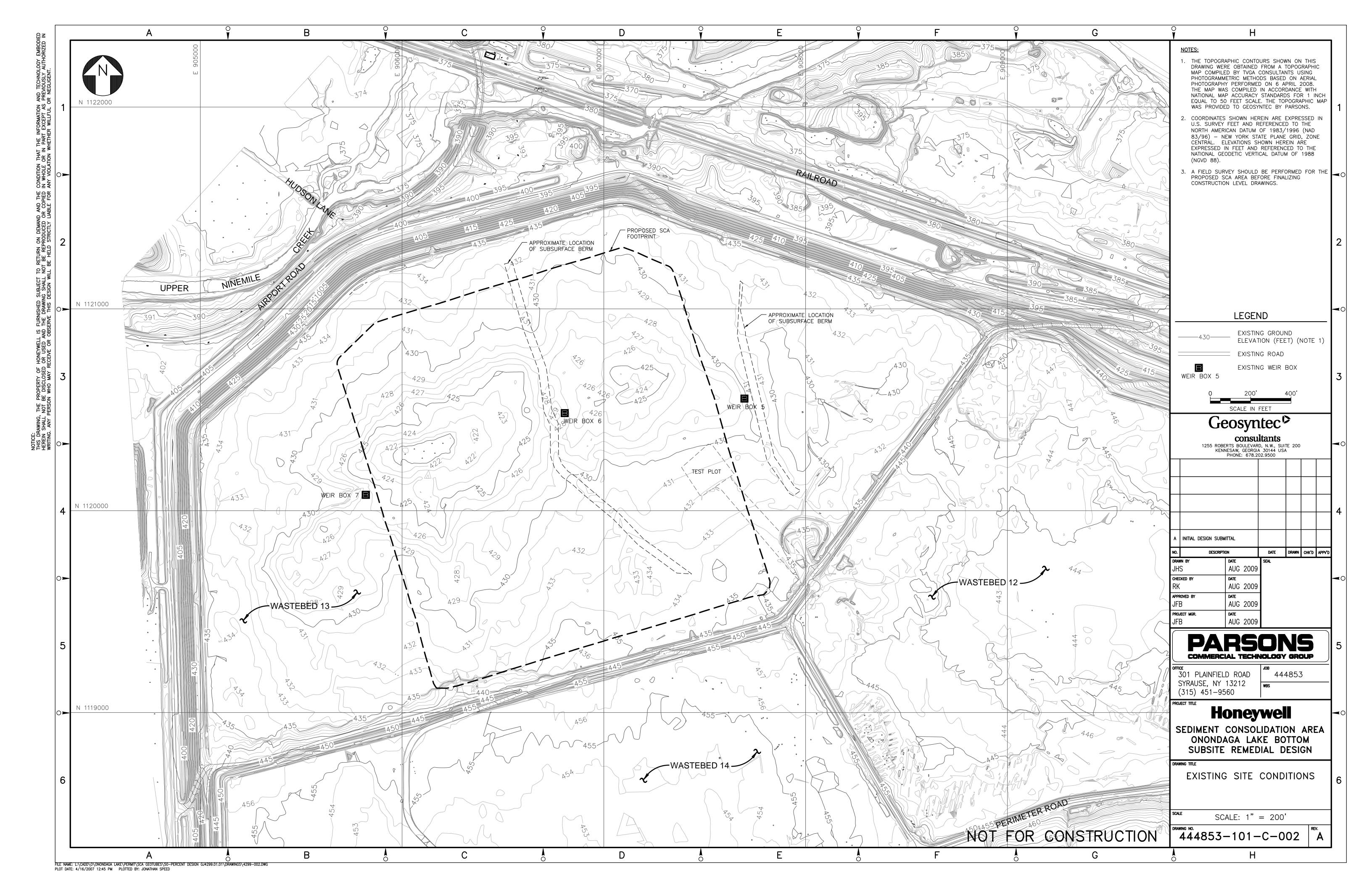
LIST OF DRAWINGS

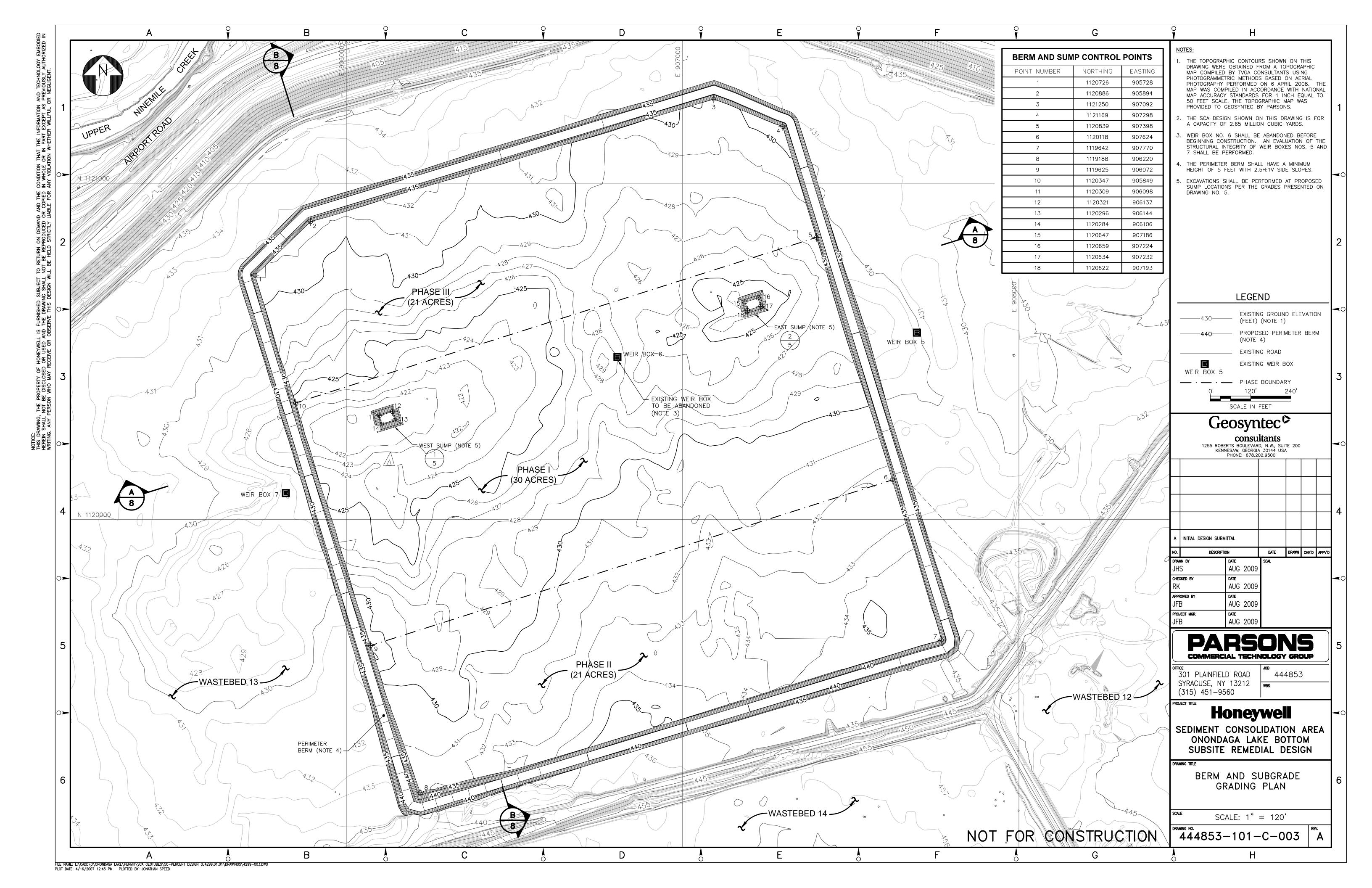
DRAWING NO.	DRAWING TITLE
1	COVER SHEET
2	EXISTING SITE CONDITIONS
3	BERM AND SUBGRADE GRADING PLAN
4	TOP OF LOW PERMEABILITY SOIL LINER
5	SUMP GRADING PLAN
6	TOP OF GRAVEL DRAINAGE LAYER
7	INSTRUMENTATION AND MONITORING PLAN
8	POST-SETTLEMENT CROSS SECTIONS
9	LINER SYSTEM DETAILS
10	LIQUIDS MANAGEMENT SYSTEM DETAILS
11	INSTRUMENTATION AND MONITORING DETAILS
12	CONCEPTUAL TOP OF GEOTEXTILE TUBES
13	CONCEPTUAL TOP OF FINAL COVER
14	CONCEPTUAL SURFACE WATER MANAGEMENT PLAN
15	OPTIONAL CONCEPTUAL TOP OF GEOTEXTILE TUBES
16	OPTIONAL CONCEPTUAL TOP OF FINAL COVER

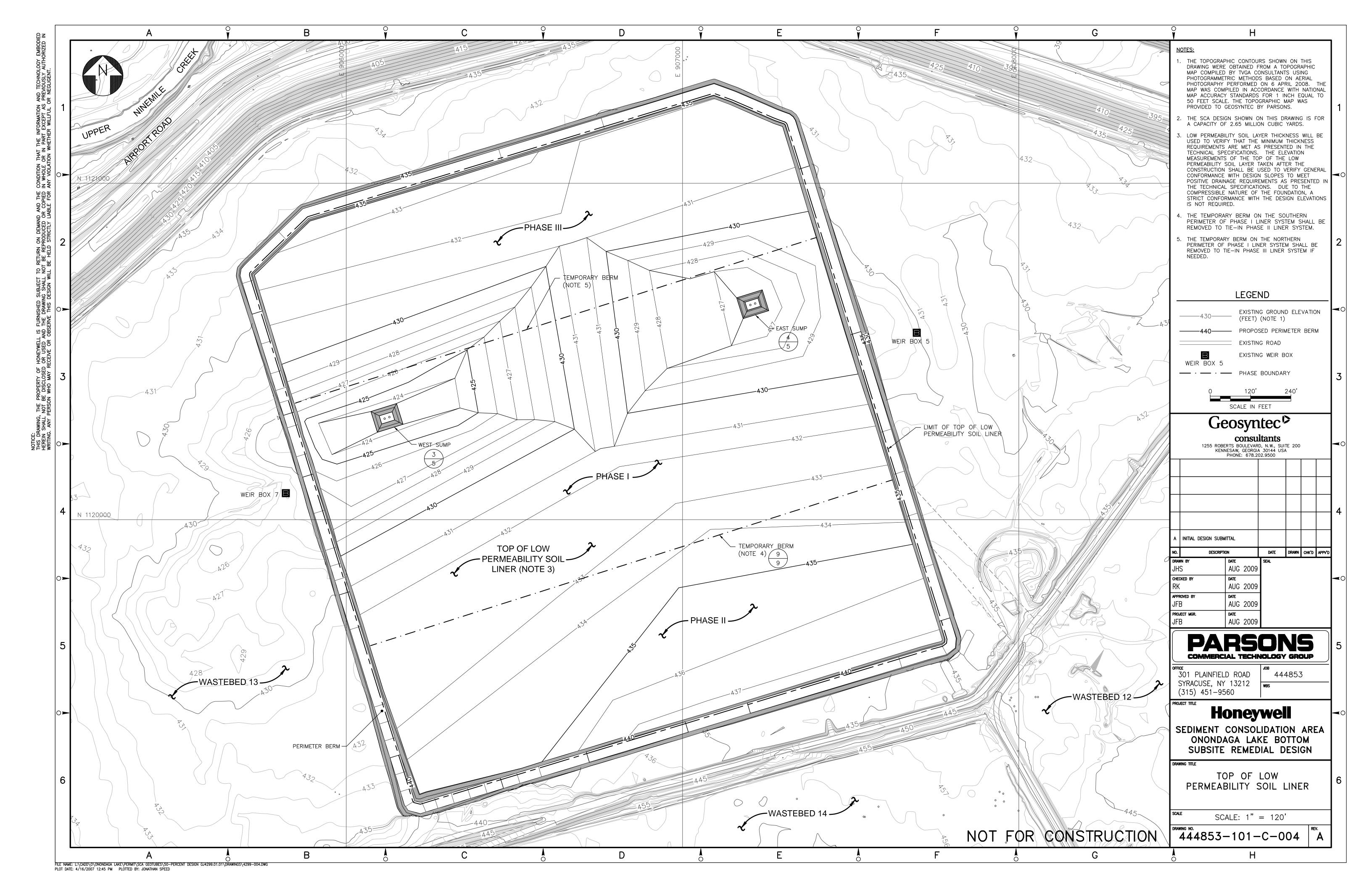


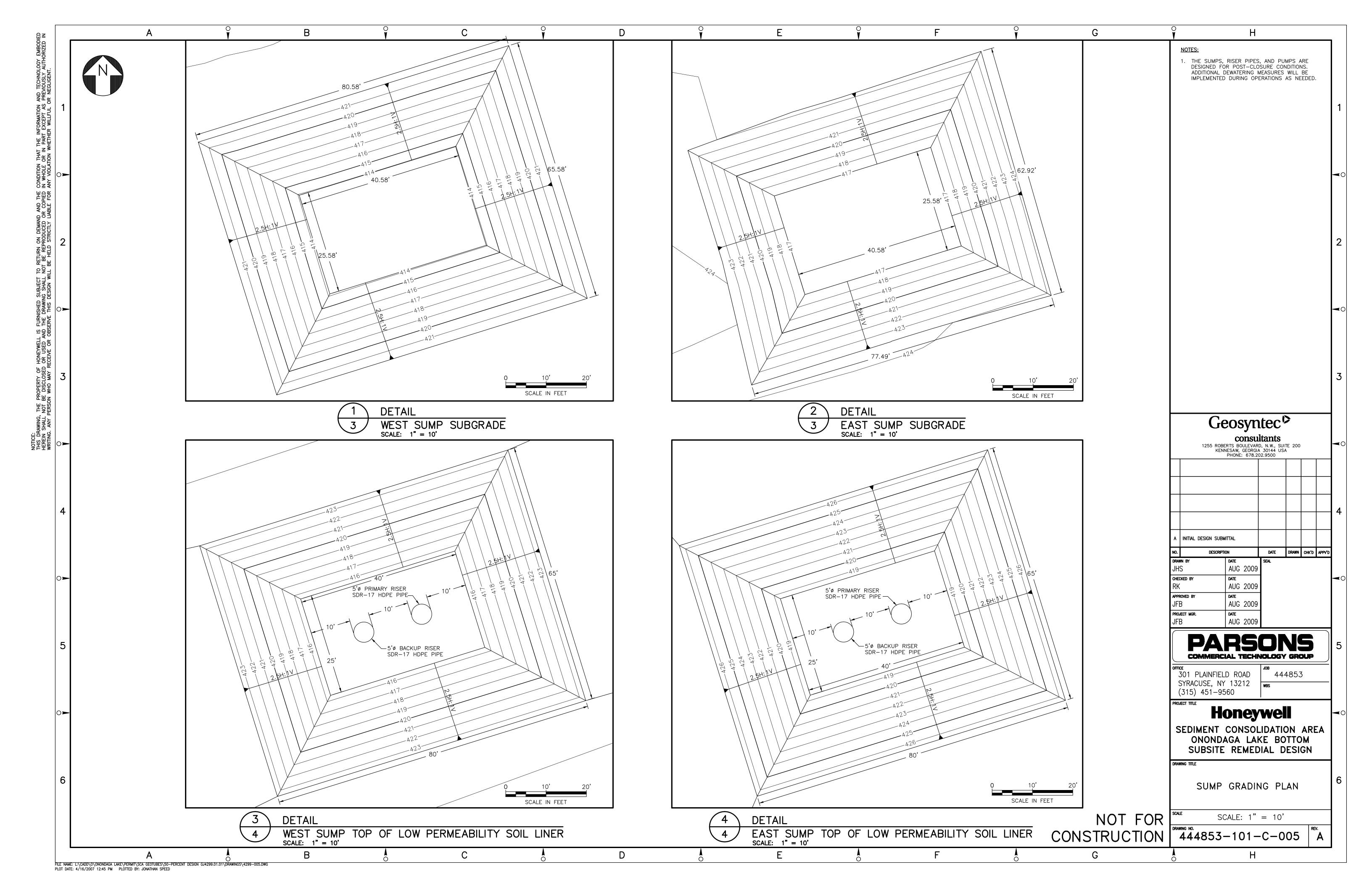
6

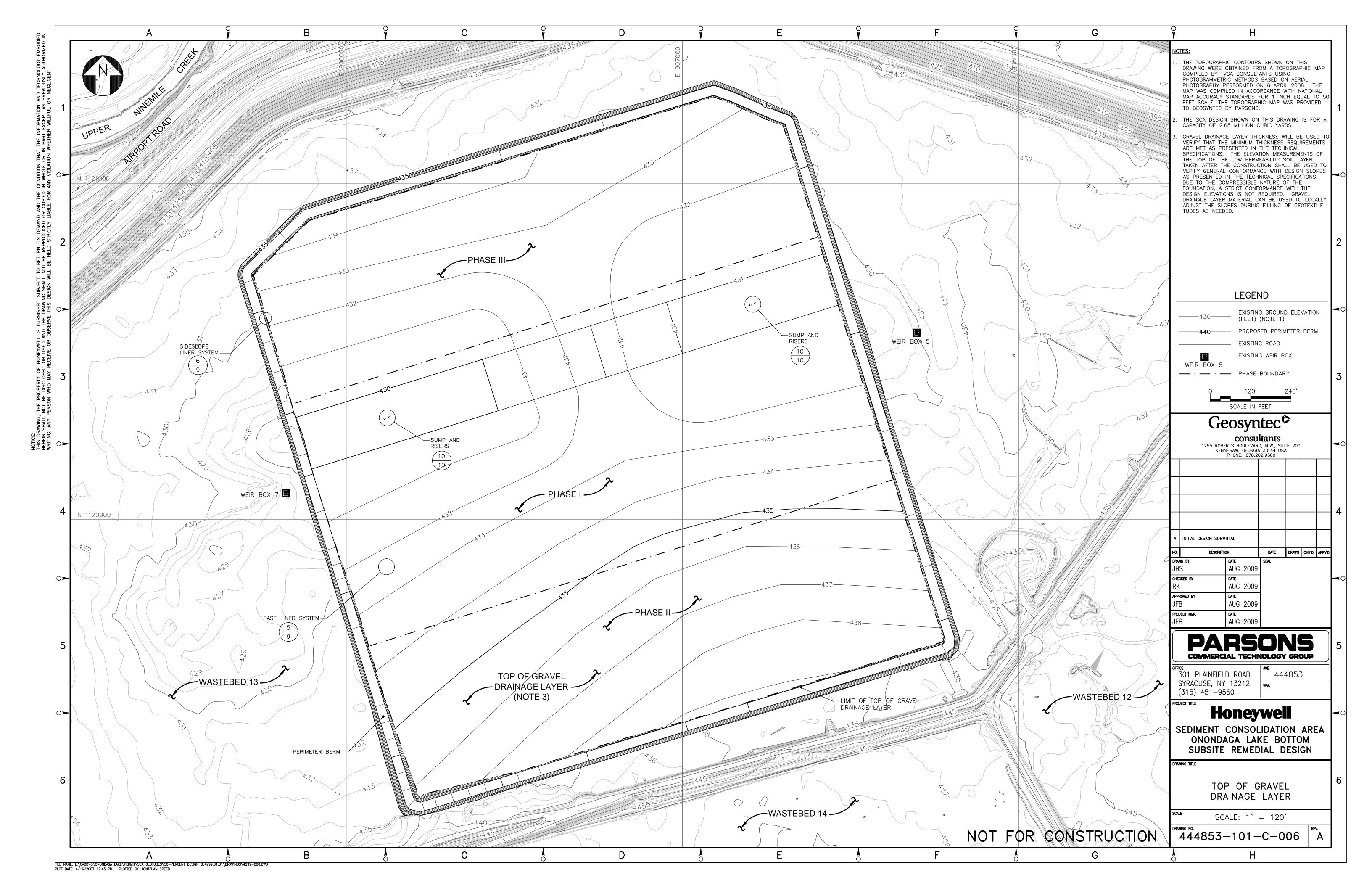
	7	
DETAIL NUMBER		NOT FOR CO
- SHEET ON WHICH ABOVE DETAIL IS PRESENTED		
4 DETAIL	PREPARED BY:	
3 TITLE OF DETAIL SCALE: 1"=2'	Geosyntec [▷]	1255 ROBERTS BOU KENNESAW, GEORGIA
MPLE: DETAIL NUMBER 4 PRESENTED ON SHEET NO. 6 WAS REFERENCED FOR THE FIRST TIME ON SHEET NO.3.	consultants	TELEPHONE: 678.2
1 ALSO APPLIES TO SECTION IDENTIFICATIONS.		
AIL IDENTIFICATION LEGEND	PARSONS	301 PLAINFIELD ROA SYRACUSE, NEW YOI TELEPHONE: 315.45
D	E Å	F

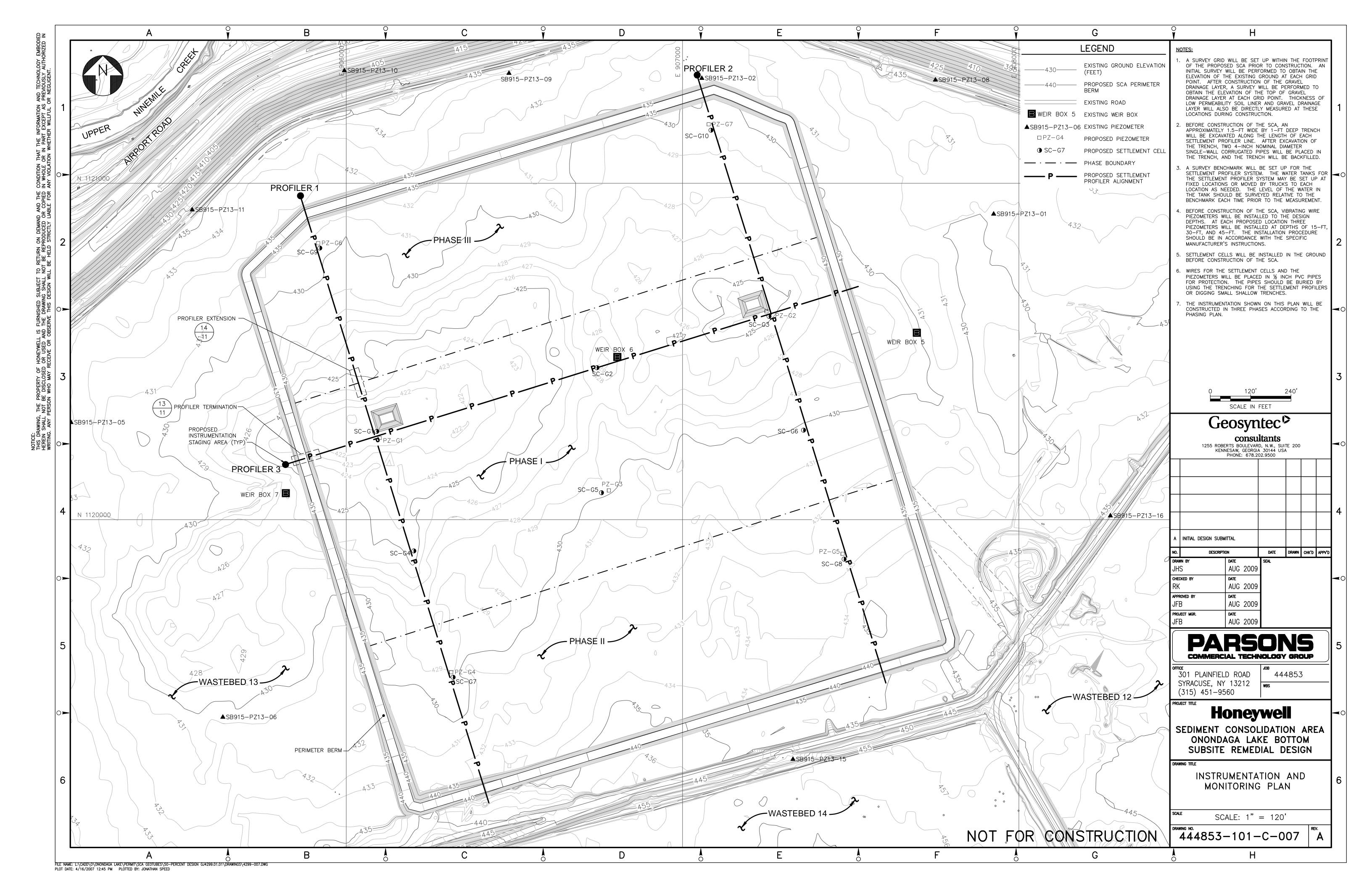


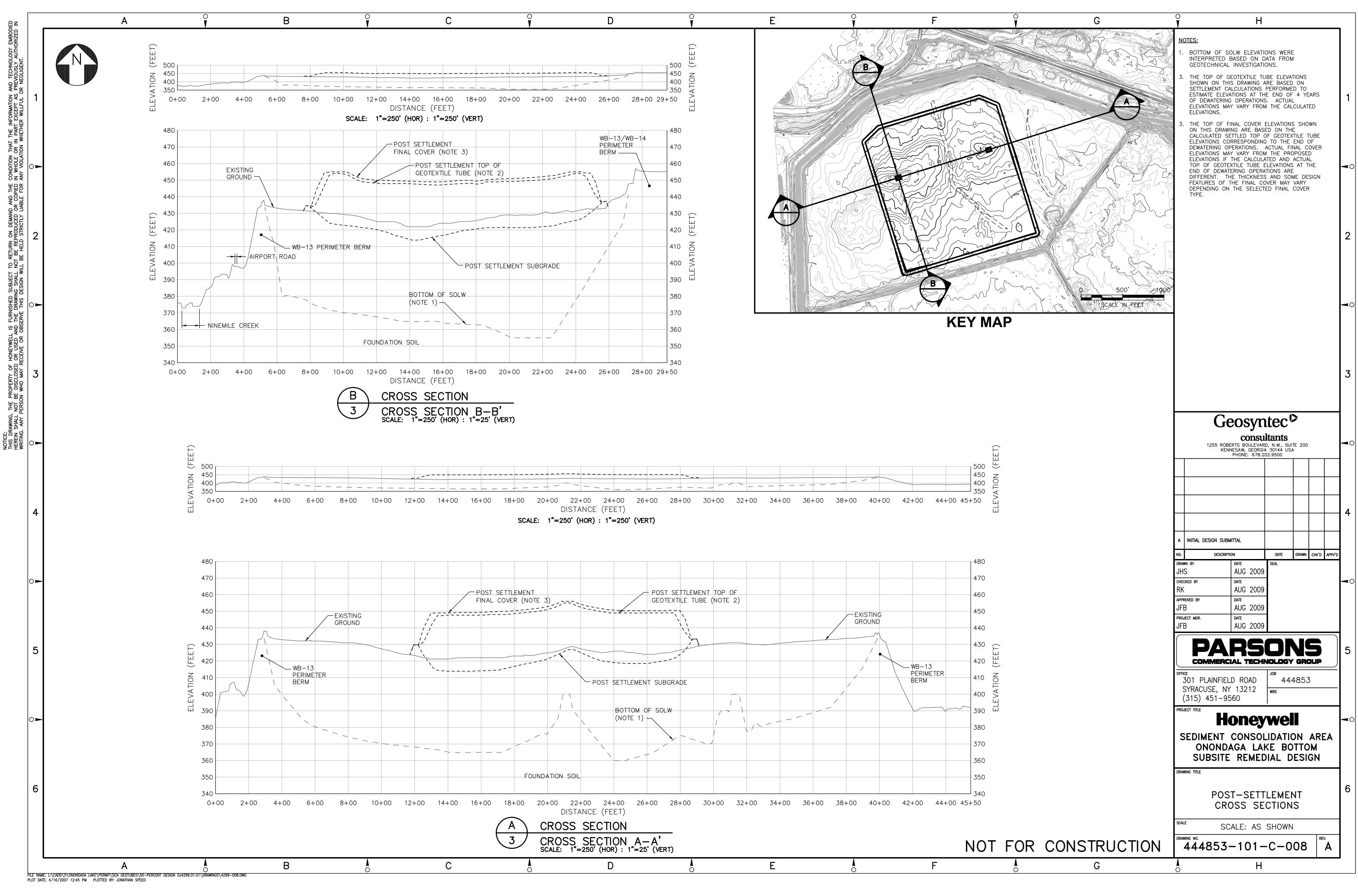


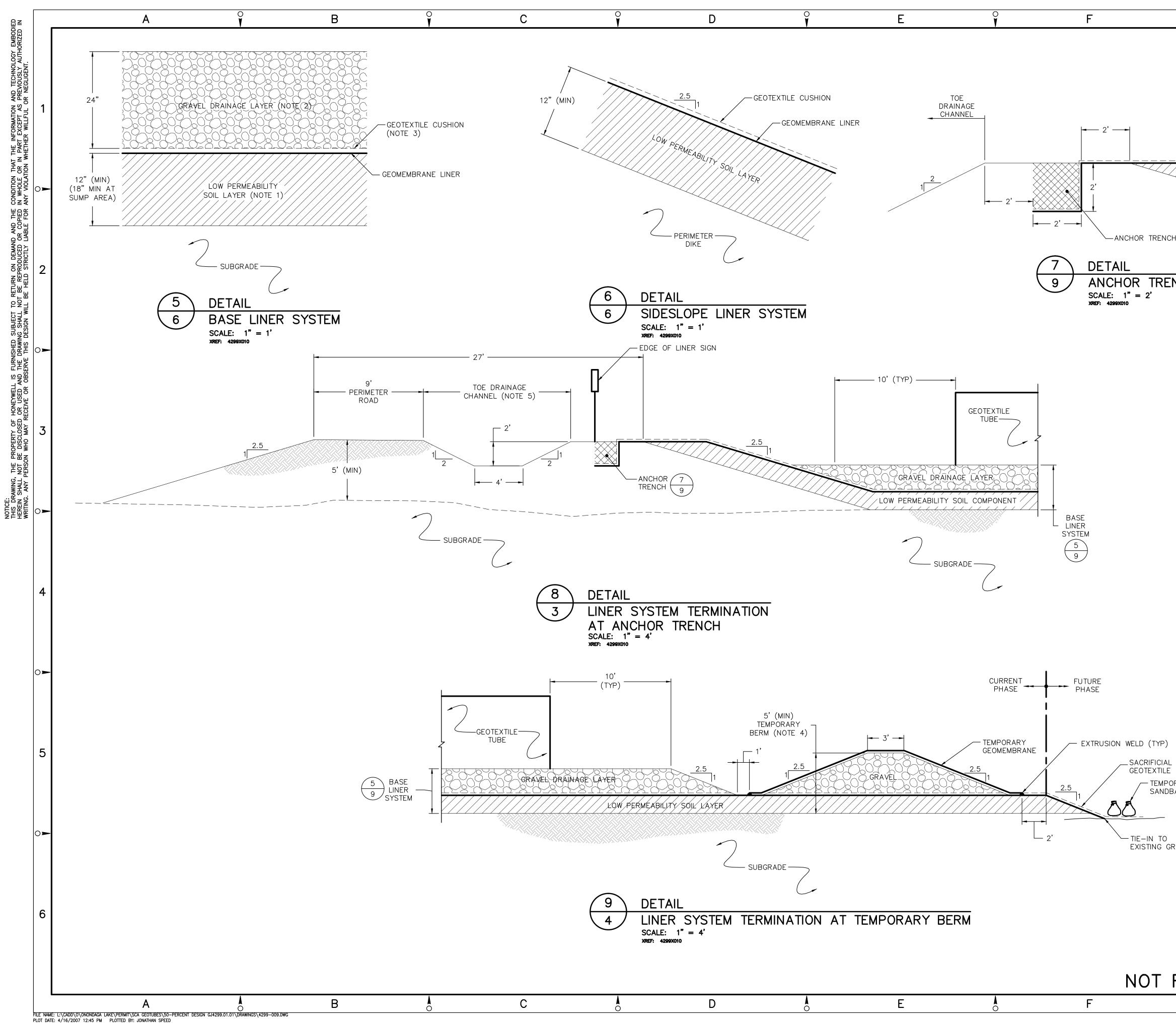




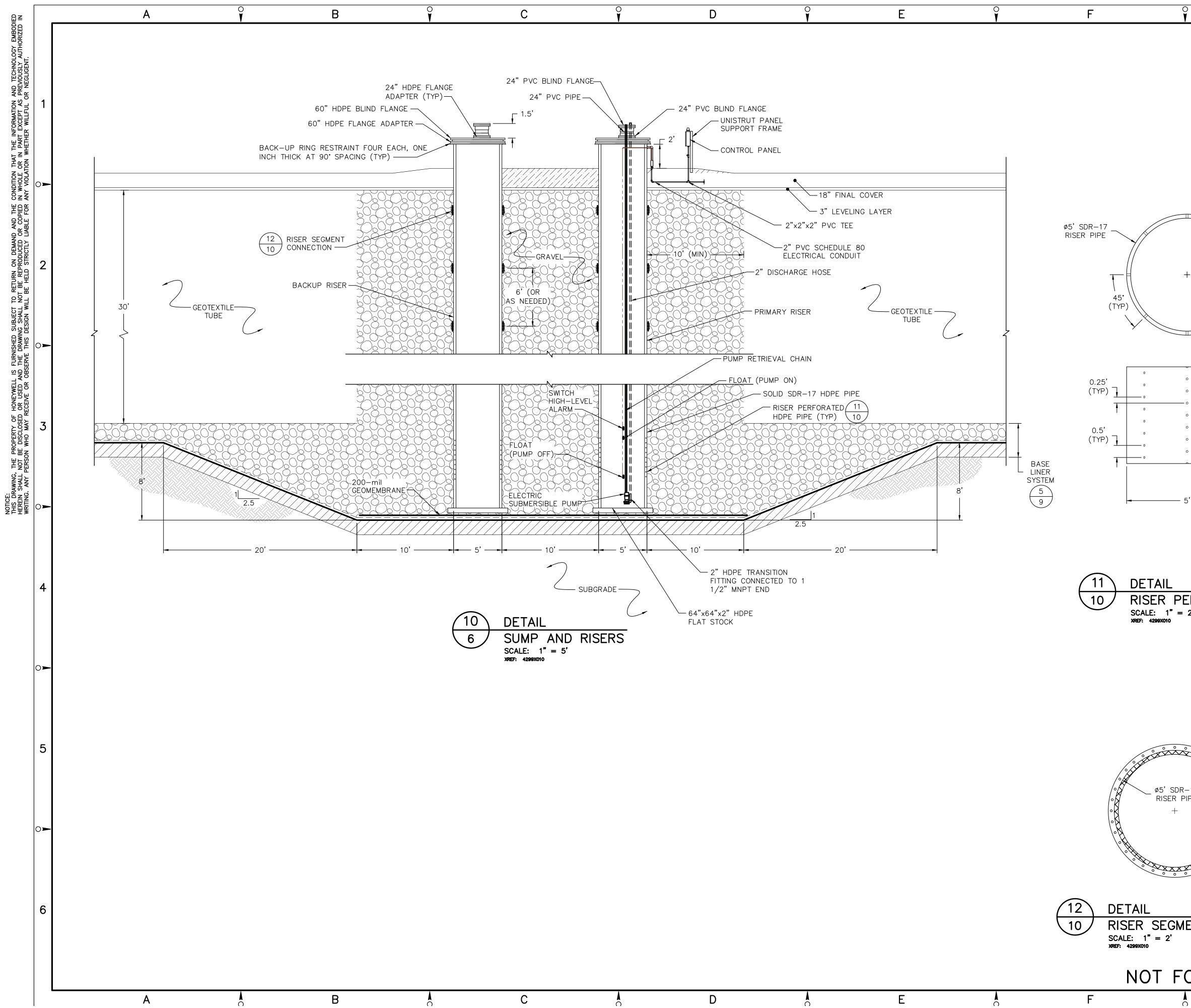






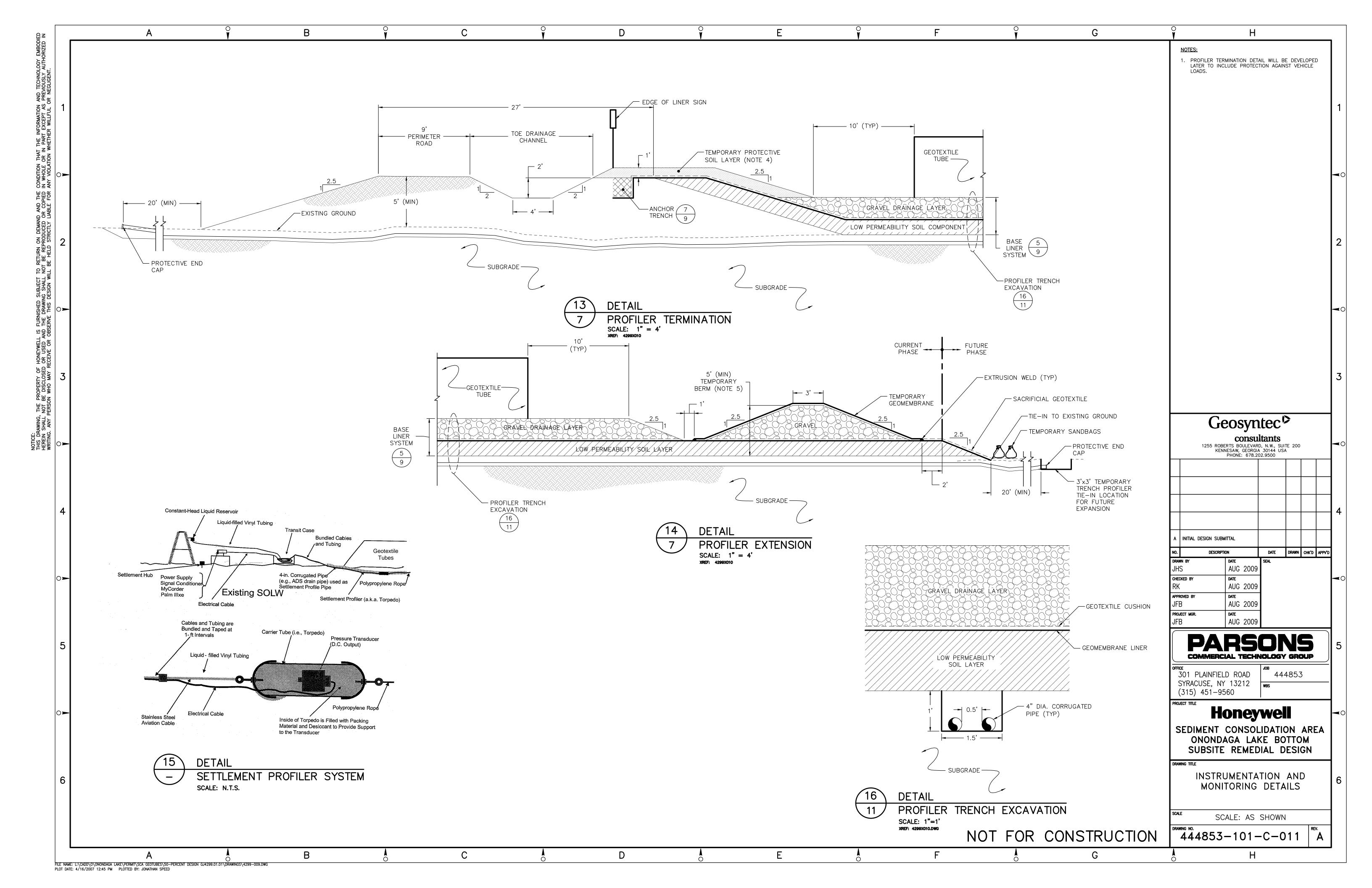


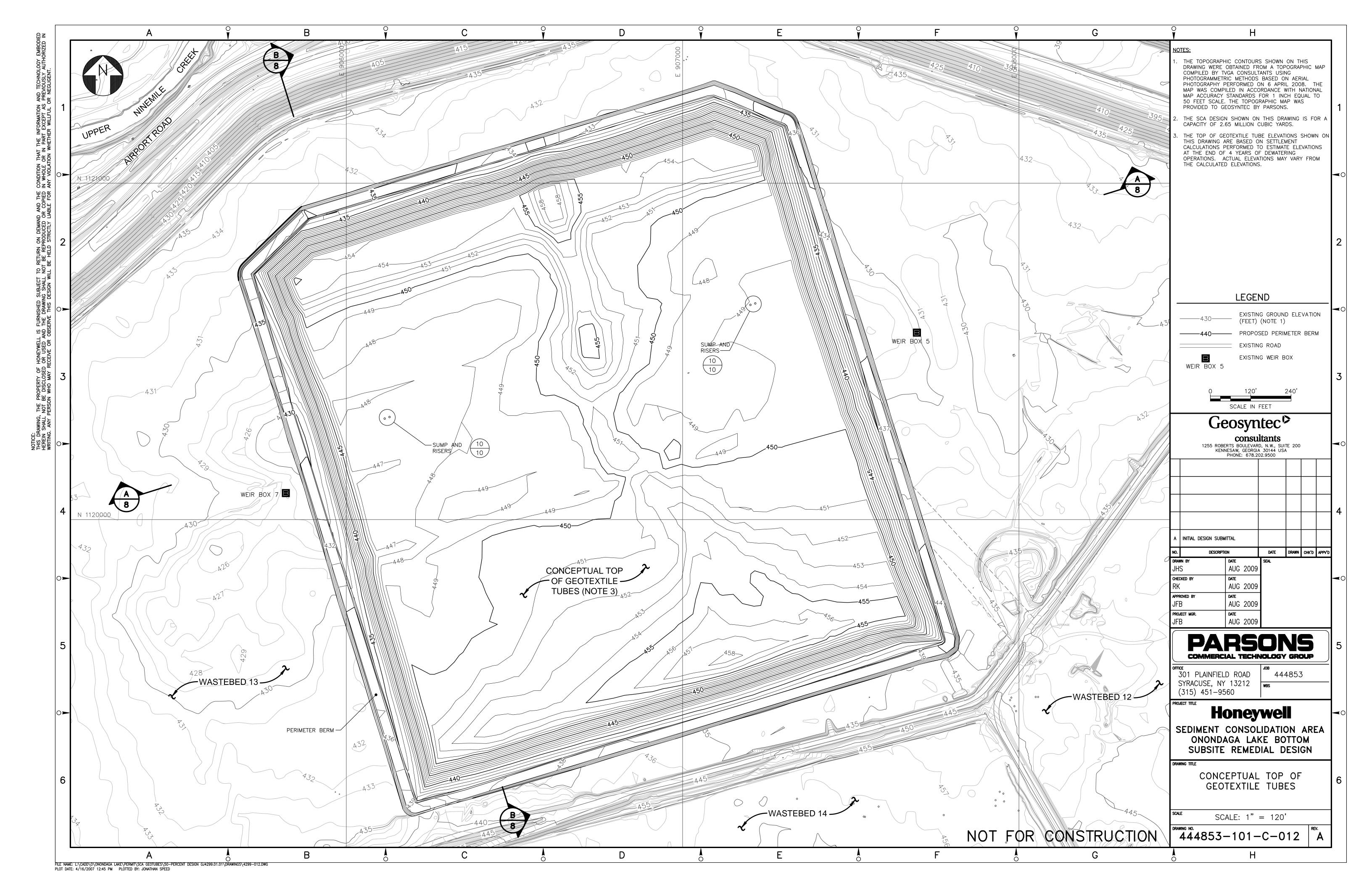
O ▼	G	ў Н
1	$\frac{1}{2.5}$ $\frac{5}{9}$ BASE LINER SYSTEM	 NOTES: 1. THE TOP SIX (6) INCHES OF THE LOW PERMEABILITY SOIL LAYER SHALL HAVE A HYDRAULIC CONDUCTIVITY NOT MORE THAN 1 X 10-6 CENTIMETER PER SECOND (CM/S) AND MEET ALL REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS. 2. THE GRAVEL DRAINAGE LAYER SHALL HAVE A HYDRAULIC CONDUCTIVITY NOT LESS THAN 10 CENTIMETER PER SECOND (CM/S) AND MEET ALL REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS. 3. THE REQUIRED MINIMUM DENSITY FOR THE GEOTEXTILE CUSHION WILL BE DETERMINED AFTER SPECIFIC GRAVEL SOURCE IS IDENTIFIED. 4. TEMPORARY BERM SHALL BE REMOVED TO TIE-IN LINER SYSTEM EXPANSION. 5. TOE DRAINAGE CHANNEL CAN BE INSTALLED AT THE TIME OF CLOSURE.
ICH	SYSTEM	2
		3
		Consultants 1255 ROBERTS BOULEVARD, N.W., SUITE 200 KENNESAW, GEORGIA 30144 USA PHONE: 678.202.9500
		A INITIAL DESIGN SUBMITTAL
		NO.DESCRIPTIONDATEDATEDRAWN BYDATESEALJHSAUG 2009CHECKED BYDATERKAUG 2009APPROVED BYDATEJFBAUG 2009PROJECT MGR.DATE
RY S		JFB AUG 2009 PARSONS 5 COMMERCIAL TECHNOLOGY GROUP 5 OFFICE 301 PLAINFIELD ROAD SYRACUSE, NY 13212 WBS
JND		(315) 451–9560 PROJECT TITLE HONEYWEII SEDIMENT CONSOLIDATION AREA ONONDAGA LAKE BOTTOM SUBSITE REMEDIAL DESIGN
		DRAWING TITLE LINER SYSTEM DETAILS SCALE SCALE: AS SHOWN
	CONSTRUCTION	DRAWING NO. 444853-101-C-009 A
OR		

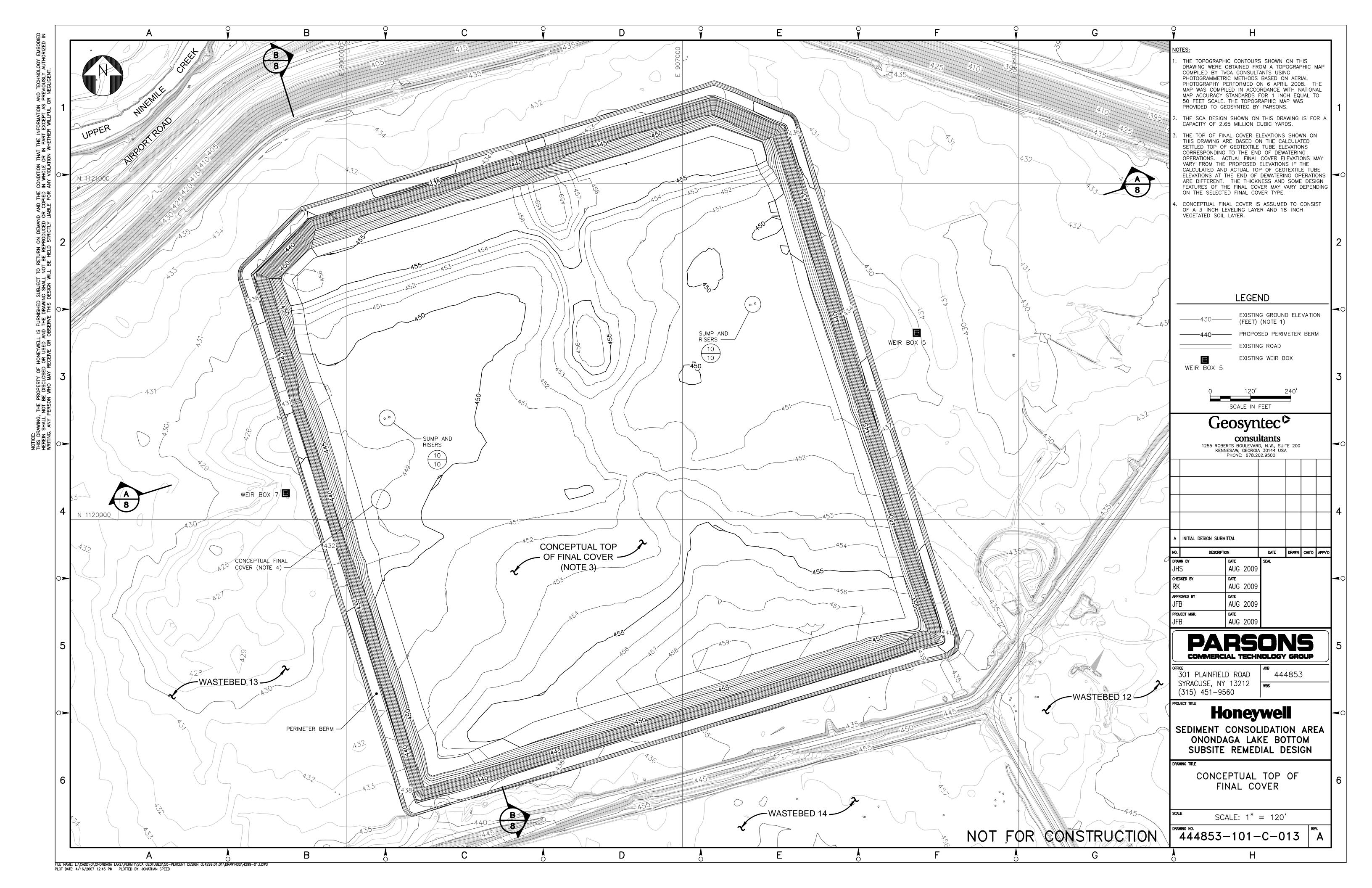


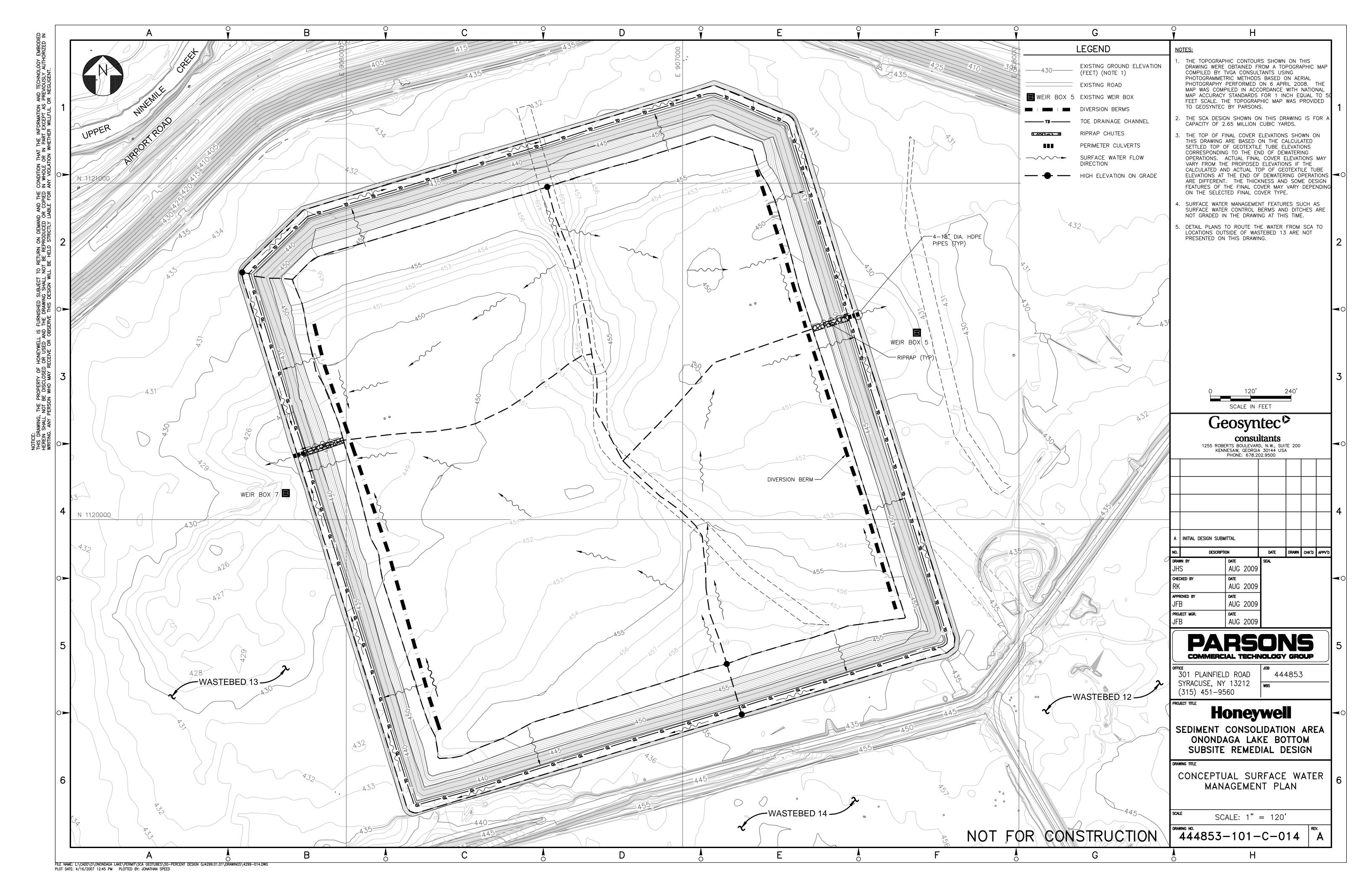
⊖ ▼	D	0 1	E	O ▼	F	O ▼	G	0 1	Н
		AME NEL 18" FINA	LING LAYER E : 80		¢5' SDR-17 RISER PIPE			 ADDITIONAL DEWATERII IMPLEMENTED DURING 2. THE LENGTHS OF RIS CHANGED BASED ON GEOTEXTILE TUBE FILL DEWATERED GEOTEXTIL 3. ELECTRICAL SUBMERS PROVIDED FOR EACH SYSTEM SHALL INCLU FLOAT SYSTEM WITH SWITCHES. THE SPEC USE 3-PHASE POWER SUMP SHALL BE CAP OF 30 GALLONS PER OF HEAD. PUMP FO BE CAPABLE OF PUM GALLONS PER MINUTE HEAD. ALTERNATE PI CONSIDERED BASED OF PARTICULAR PRODUCT SHALL BE PROVIDED EQUIVALENT DEVICE T 4. PUMPS NEED NOT BE UNDER NORMAL POST 5. DETAILS OF THE SUM OTHER COMPONENTS UPDATED AS PART OF SPECIFICS MAY BE CI FIELD CONDITIONS AN 	IPES, AND PUMPS ARE -CLOSURE CONDITIONS. NG MEASURES WILL BE OPERATIONS AS NEEDED. ER PIPE SEGMENTS CAN BE FIELD CONDITIONS SUCH AS ING SEQUENCE AND ACTUAL LE TUBE HEIGHTS ACHIEVED. IBLE PUMPS SHALL BE PRIMARY RISER PIPE. PUMP DE CONTROL PANEL AND THREE NTRINSICALLY SAFE RELAY CIFIC MODELS SELECTED MUST R. PUMP FOR THE WESTERN ABLE OF PUMPING AT A RATE MINUTE (GPM) WITH 50 FEET R THE EASTERN SUMP SHALL PING AT A RATE OF 20 C (GPM) WITH 50 FEET OF JMP CAPACITIES CAN BE ON SPECIFICATIONS FOR S. EACH PUMP SYSTEM WITH A COUNTER OR O RECORD TOTAL FLOW. C INSTALLED IN BACKUP RISERS -CLOSURE CONDITIONS, AND ARE PRELIMINARY AND WILL BE THE FINAL DESIGN. HANGED TO ACCOMMODATE D AVAILABLE PRODUCTS WHILE ERAL CONCEPTS PRESENTED
		EVAL CHAIN							
	FLOAT (PU	MP ON) DLID SDR—17 HDPE PI RISER PERFORATED	PE 11 10		0.25' (TYP) 0.5' (TYP) ASE		° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° °		vmtoo ^D
		2.5		8'	5 9 9	5'	_ _	cc	Seorgia 30144 USA 678.202.9500
SUBGRADE	2" HDPE TRANS FITTING CONNEC 1/2" MNPT END 64"x64"x2" HDPE FLAT STOCK	TED TO 1	- -		10 RI	ETAIL SER PERFOR/ ALE: 1" = 2' 4299X010	ATED HDPE PIPE	A INITIAL DESIGN SUBMITTAL	
RISERS								CHECKED BY DATE RK AUG APPROVED BY DATE JFB AUG PROJECT MGR. DATE	DATE DRAWN CHK'D АРРУ'D 2009 SEAL
						ø5' SDR-17 RISER PIPE +	66" DIA HDPE FLANGE	COMMERCIAL T OFFICE 301 PLAINFIELD RO SYRACUSE, NY 132 (315) 451-9560	
							1" DIA BOLT HOLES (NOTE 5)	SEDIMENT CON ONONDAGA SUBSITE RE	EYWEII SOLIDATION AREA LAKE BOTTOM MEDIAL DESIGN
					12 DETAI 10 RISER SCALE: XREF: 4299X0	SEGMENT C	ONNECTION	SYSTEM	MANAGEMENT M DETAILS
					randi o TZOGA U			SCALE:	AS SHOWN
					NI <i>t</i>		CONSTRUCTION	DRAWING NO. 444853-10)1-C-010 A

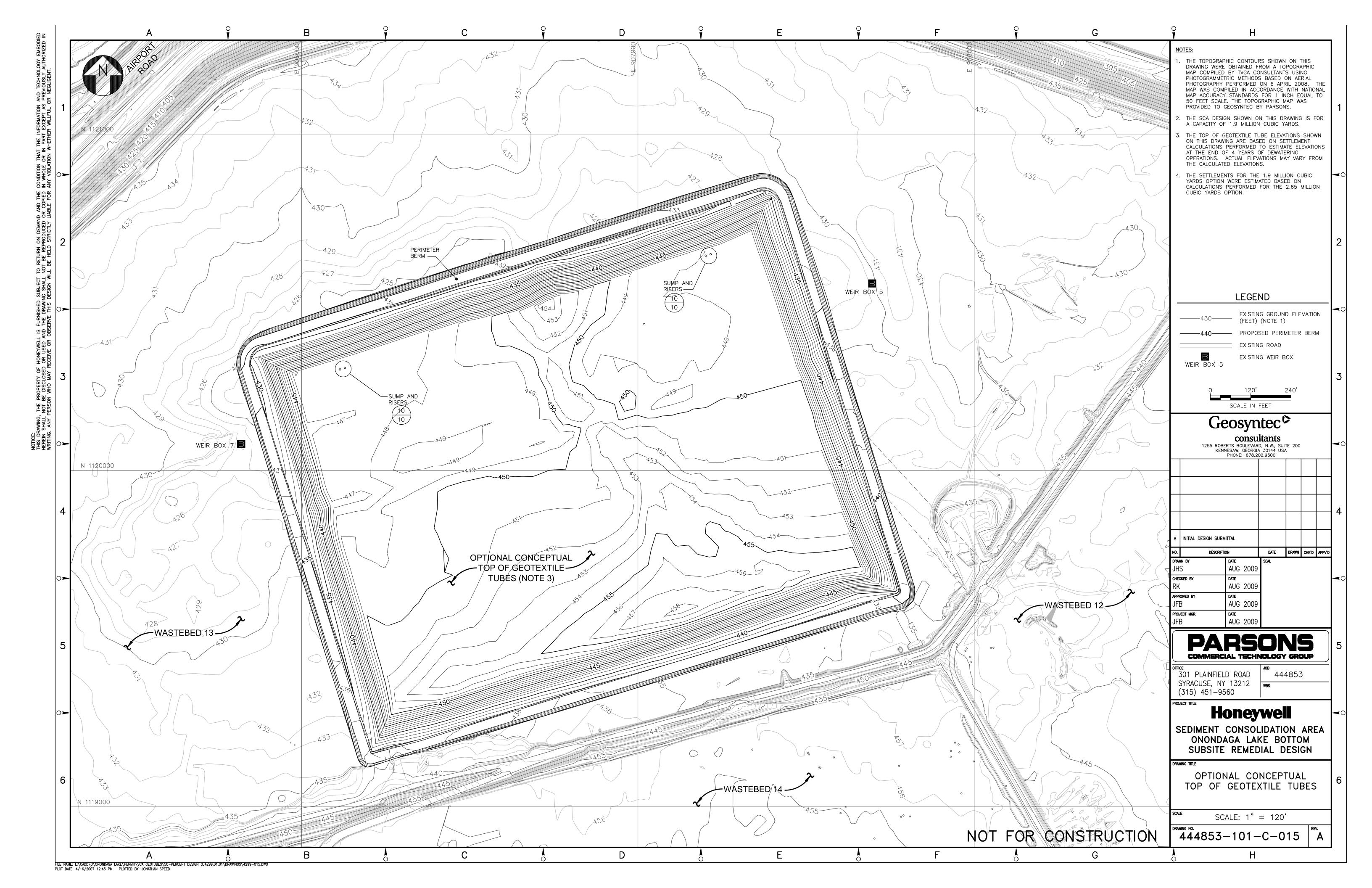
D	O ▼	E	⊖ ¥	F	O ▼	G	Р Н
	AME	G LAYER		Ø5' SDR-17 RISER PIPE	+		 NOTES: THE SUMPS, RISER PIPES, AND PUMPS ARE DESIGNED FOR POST-CLOSURE CONDITIONS, ADDITIONAL DEWATERING MEASURES WILL BE IMPLEMENTED DURING OPERATIONS AS NEEDED. THE LENGTHS OF RISER PIPE SEGMENTS CAN BE CHANGED BASED ON FIELD CONDITIONS SUCH AS GEOTEXTILE TUBE FILLING SEQUENCE AND ACTUAL DEWATERED GEOTEXTILE TUBE HEIGHTS ACHIEVED. ELECTRICAL SUBMERSIBLE PUMPS SHALL BE PROVIDED FOR EACH PRIMARY RISER PIPE. PUMP SYSTEM SHALL INCLUDE CONTROL PANEL AND THREE FLOAT SYSTEM WITH INTRINSICALLY SAFE RELAY SWITCHES. THE SPECIFIC MODELS SELECTED MUST USE 3-PHASE POWER. PUMP FOR THE WESTERN SUMP SHALL BE CAPABLE OF PUMPING AT A RATE OF 30 GALLONS PER MINUTE (GPM) WITH 50 FEET OF HEAD. PUMP FOR THE EASTERN SUMP SHALL BE CAPABLE OF PUMPING AT A RATE OF 20 GALLONS PER MINUTE (GPM) WITH 50 FEET OF HEAD. ALTERNATE PUMP CAPACITIES CAN BE CONSIDERED BASED ON SPECIFICATIONS FOR PARTICULAR PRODUCTS. EACH PUMP SYSTEM SHALL BE PROVIDED WITH A COUNTER OR EQUIVALENT DEVICE TO RECORD TOTAL FLOW. PUMPS NEED NOT BE INSTALLED IN BACKUP RISERS UNDER NORMAL POST-CLOSURE CONDITIONS. AND OTHER COMPONENTS ARE PRELIMINARY AND WILL BE UPDATED AS PART OF THE FINAL DESIGN. SPECIFICS MAY BE CHANGED TO ACCOMMODATE FLED CONDITIONS AND AVAILABLE PRODUCTS WHILE MAINTAINING THE GENERAL CONCEPTS PRESENTED HEREIN.
				C		o	
FLOAT (PU	MP ON) DLID SDR-17 HDPE PIPE RISER PERFORATED HDPE PIPE (TYP) 10			0.25' (TYP) 0.5' (TYP) ASE	0 0 0 0 0 0 0 0	• 1" DIA HOLE • 4'	3
			8'	ASE NER STEM 5 9	5'		Ceosyntec consultants 1255 ROBERTS BOULEVARD, N.W., SUITE 200 KENNESAW, GEORGIA 30144 USA PHONE: 678.202.9500 →
10' 2" HDPE TRANS FITTING CONNEC 1/2" MNPT END 64"x64"x2" HDPE FLAT STOCK	TED TO 1			10 RIS	TAIL SER PERFORA LE: 1" = 2' 4299X010	ATED HDPE PIPE	A INITIAL DESIGN SUBMITTAL
							NO. DESCRIPTION DATE DRAWN CHK'D APPV'D DRAWN BY DATE SEAL SE
					ø5' SDR-17 RISER PIPE +	66" DIA HDPE FLANGE	PARSONS 5 COMMERCIAL TECHNOLOGY GROUP 5 OFFICE 301 PLAINFIELD ROAD SYRACUSE, NY 13212 444853 (315) 451–9560 WBS
						1" DIA BOLT HOLES (NOTE 5)	PROJECT TITLE Honeywell SEDIMENT CONSOLIDATION AREA ONONDAGA LAKE BOTTOM SUBSITE REMEDIAL DESIGN
				12 DETAIL 10 RISER SCALE: 1 XREF: 4299X01	SEGMENT C	ONNECTION	DRAWING TITLE LIQUIDS MANAGEMENT SYSTEM DETAILS SCALE: AS SHOWN
				NC	OT FOR C	CONSTRUCTION	SCALE: AS SHOWN DRAWING NO. REV. 444853-101-C-010 A
D		E		F		G	H

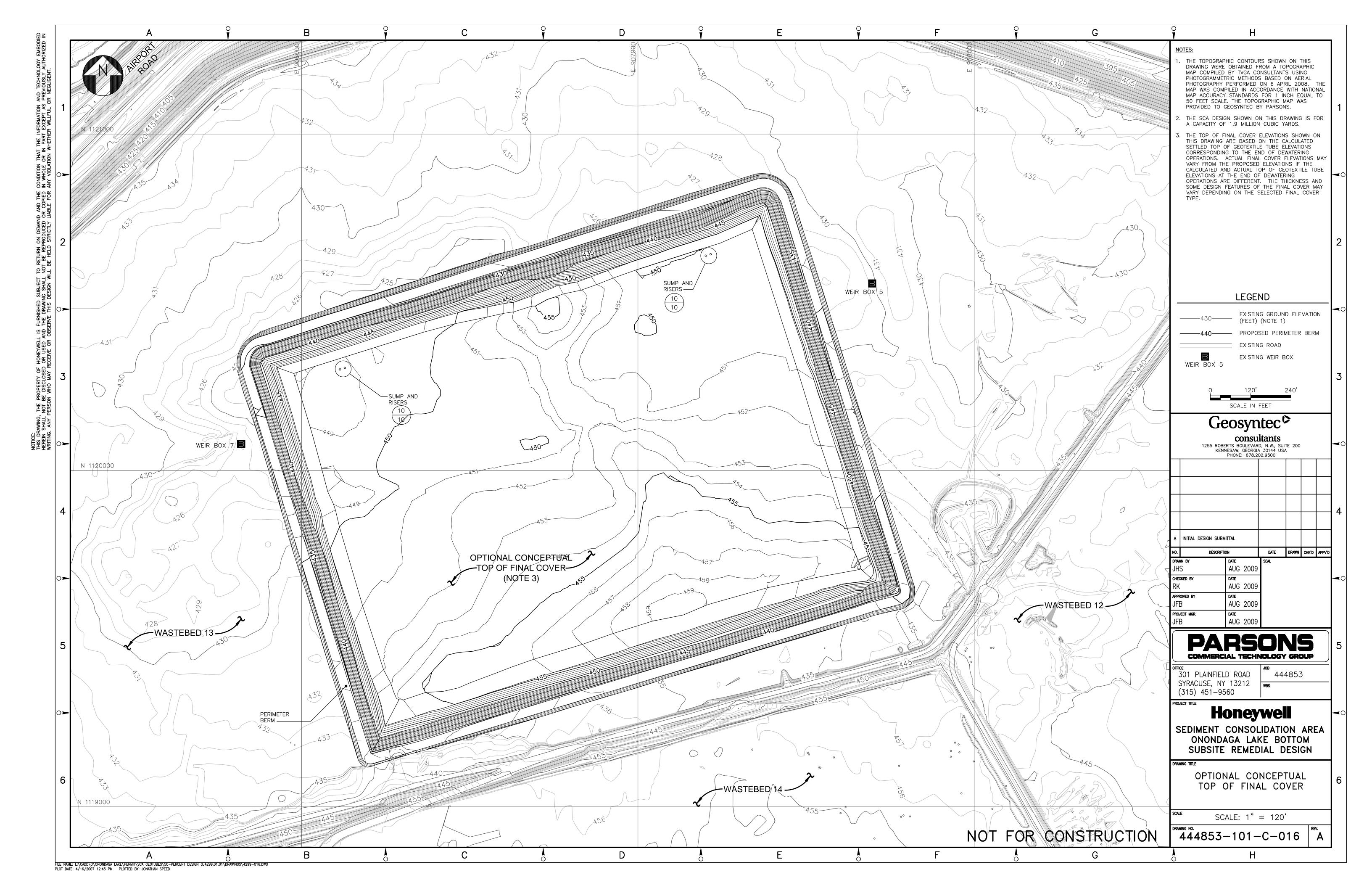












APPENDIX F

VOLUME CALCULATIONS FOR SCA DESIGN

GEOSYNTEC CONSULTANTS

COMPUTATION COVER SHEET

Client: <u>Honeywell</u> Project: <u>Onc</u>	ondaga Lake SCA IDS Project/Proposal #: Task #:
TITLE OF COMPUTATIONS	VOLUME CALCULATIONS FOR SCA DESIGN
COMPUTATIONS BY:	Signature M////////////////////////////////////
ASSUMPTIONS AND PROCEDURE CHECKED BY: (Peer Reviewer)	Signature R: Kulasingam Printed Name R. Kulasingam and Title Project Engineer
COMPUTATIONS CHECKED BY:	Signaturek-Kulaigan08/4/2009Printed NameR. Kulasingamand TitleProject Engineer
COMPUTATIONS BACKCHECKED BY: (Originator)	Signature Mail Mail Signature Printed Name Joseph Sura DATE and Title Staff Engineer
APPROVED BY: (PM or Designate) APPROVAL NOTES:	Signature Printed Name Jay Bocology Mo and Title Printed Name Arrincipal Printed Name Printed
REVISIONS (Number and initial all re	visions)
NO. SHEET DAT	

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				Page	1	of	25
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Client: Honeywell	Project:	Onondaga Lake SCA	IDS	Project/ Proposal No.:	GJ4299	Task No.:	03

VOLUME CALCULATIONS FOR SCA DESIGN

INTRODUCTION

This package was prepared in support of the design of the Sediment Consolidation Area (SCA) for the Onondaga Lake Bottom Site, which will be constructed on Wastebed 13 (WB-13). The primary goal of this package is to present capacity calculations for the proposed SCA. Calculations of the thicknesses and volume of the low permeability soil liner, gravel drainage layer, and SCA perimeter dike material are also presented.

CURRENT SCA DESIGN

The Consent Decree (CD) states that the Onondaga Lake remedy includes dredging of up to 2,653,000 cubic yards (cy) of material from Onondaga Lake. This calculation package presents a viable SCA footprint for two volume options: (i) consolidation of the upper bound dredge volume of 2,653,000 cy of material; and (ii) consolidation of an alternate volume of 1,900,000 cy of material.

The current SCA design includes a composite liner system, five layers of geotextile tubes (geo-tubes), and a final cover system, surrounded by a perimeter dike with a minimum height of five feet. Based on discussions with New York State Department of Environmental Conservation (NYSDEC), the low-permeability soil layer component of the composite liner system shall have a minimum thickness of 1 ft with a 1.5-ft thickness near the sump areas. A gravel drainage layer with an average thickness of approximately 2 ft will be placed above the low-permeability liner. The current design includes stacking of up to five layers of geo-tubes on top of the gravel drainage layer to result in a dewatered total geo-tube height of 30 ft. The geo-tubes are planned to be offset by a minimum distance of ten feet from the perimeter dike as needed to facilitate operations.

The area difference between the outside perimeter dike edge of the Option 1 (2,653,000 cy) and Option 2 (1,900,000 cy) footprints is approximately 21 acres (see Figure 1). The east-west dimension is the same for both options; therefore, the SCA is shorter in the north-south direction for Option 2 as compared to Option 1. This results in Option 2 having a greater buffer zone between the edge of the SCA and the exterior dike of WB-13.

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METHODOLOGY

The calculations presented in this package were computed using the proposed SCA grading plans and AutoCAD 2010. AutoCAD creates 3-D surfaces (Triangular Irregular Network surfaces) based on the contours on the grading plans and uses these surfaces to calculate the volume and thickness of each layer. The thicknesses are then graphed as isopachs, which are contours connecting points of equal thickness.

CALCULATIONS

The proposed grading plans for the berm and subgrade, low permeability soil liner, gravel drainage layer, and top of geo-tubes for Option 1 are provided in Attachment A, Figures A1 through A4. The calculated total dredge material capacity for Option 1 is calculated as the difference between the grades shown in Figures A4 and A3 and is shown in Figure 2. Isopachs of the low permeability soil liner (difference between Figures A2 and A1) and gravel drainage layer (difference between Figures A3 and A2) are shown in Figures 3 and 4, respectively. The calculated SCA perimeter dike volume for Option 1 is calculated as the difference between the existing grades and the proposed berm grading plan shown in Figure A1 and is shown in Figure 5.

The proposed grading plans for the berm and subgrade, low permeability soil liner, gravel drainage layer, and top of geo-tubes for Option 2 are provided in Attachment B, Figures B1 through B4. The calculated total dredge material capacity for Option 2 is calculated as the difference between the grades shown in Figures B4 and B3 and is shown in Figure 6. Isopachs of the low permeability soil liner (difference between Figures B2 and B1) and gravel drainage layer (difference between Figures B3 and B2) are shown in Figures 7 and 8, respectively. The calculated SCA perimeter dike volume for Option 1 is calculated as the difference between the existing grades and the proposed berm grading plan (Figure A1) and is shown in Figure 9.

RESULTS

The calculated SCA capacity for dredge material and volumes of low-permeability soil, gravel drainage material, and SCA perimeter dike material for Options 1 and 2 are shown in Table 1. The results indicate that the proposed SCA footprints for Options 1 and 2 meet their respective target capacities. For Option 1, the footprint areas to the outside and inside edges of the perimeter dike were estimated to be approximately 72 acres and 65

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acres, respectively. The average thicknesses of low permeability soil and gravel drainage material were calculated to be 2.5 ft and 2.0 ft, respectively. For Option 2, the footprint areas to the outside and inside edges of the perimeter dike were estimated to be approximately 51 acres and 47 acres, respectively. The average thicknesses of low permeability soil and gravel drainage material were calculated to be 2.5 ft and 2.1 ft, respectively. Review of Figures 3 and 7 (for Options 1 and 2, respectively) indicates that the low permeability soil layer has a minimum thickness of 1 ft in the SCA footprint with a thickness of at least 1.8 ft near the sump areas. Also the review of Figures 4 and 8 (for Options 1 and 2, respectively) indicates that the gravel drainage layer has a minimum thickness of at least 4 ft near the sump areas.

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Tables

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Client: Honeywell	Project:	Onondag	ga Lake SCA	50% Design	Project/ Proposal No.:	GJ4299	Task	No.: 03

Table 1: Calculated Volumes (cy)

	Geo-tube Capacity Clay		Gravel Drainage Material	Perimeter Dike
Option 1	2,720,222	263,723	207,409	57,053
Option 2	1,908,289	191,507	163,435	54,215

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Client: Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No	o.: 03

Figures

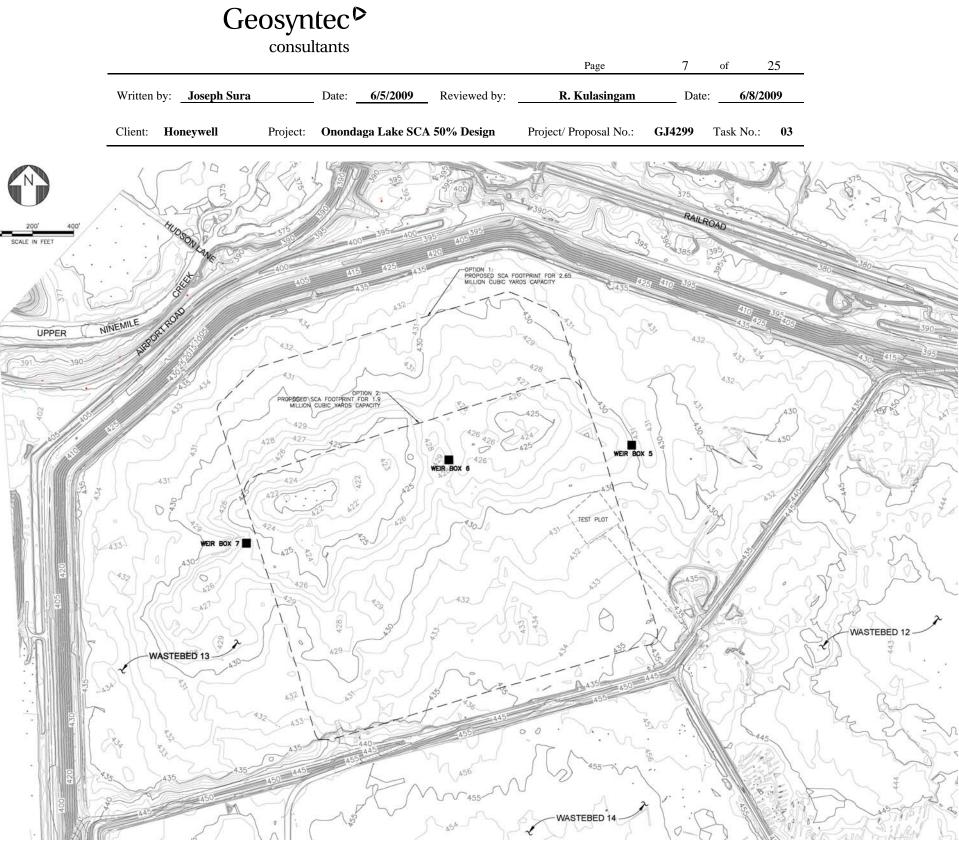


Figure 1: Proposed SCA footprints for Options 1 and 2

Geosyntec[▷]

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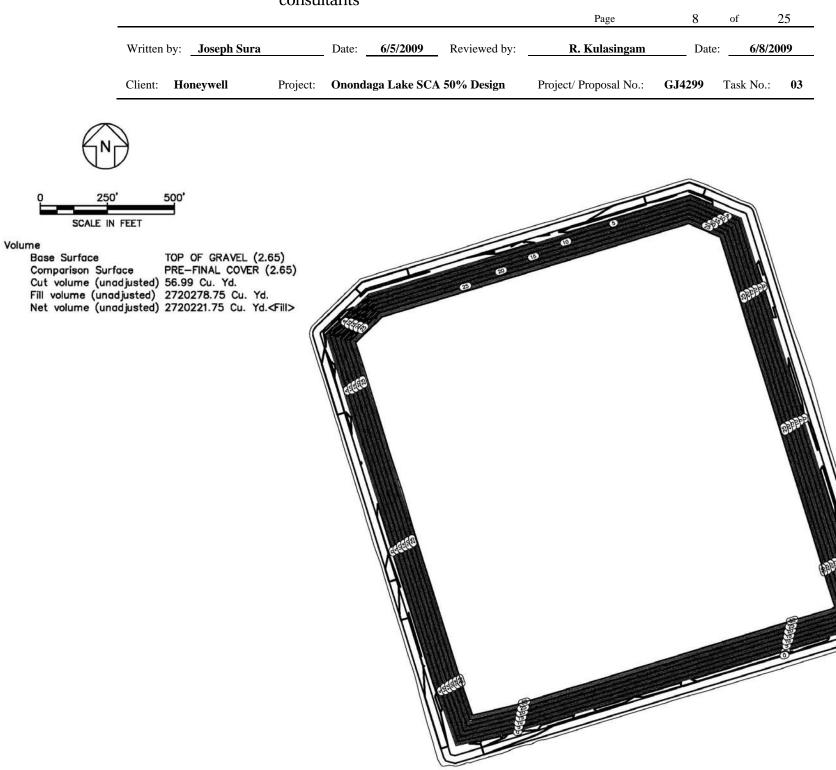


Figure 2: Total Capacity for Option 1 (2.65 million cy)



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	Client: Honeywell	Project:	Ononda	aga Lake SCA	50% Design	Project/ Proposal No.:	GJ4299	Task No.:	03
SCALE Volume Base Surface Comparison Net volume Cut volume Fill volume (Surface TOP OF LINER	(2.65) Yd.⊲Fill> Yd.							

Figure 3: Isopach of Low Permeability Soil Liner Thickness for Option 1 (2.65 million cy)



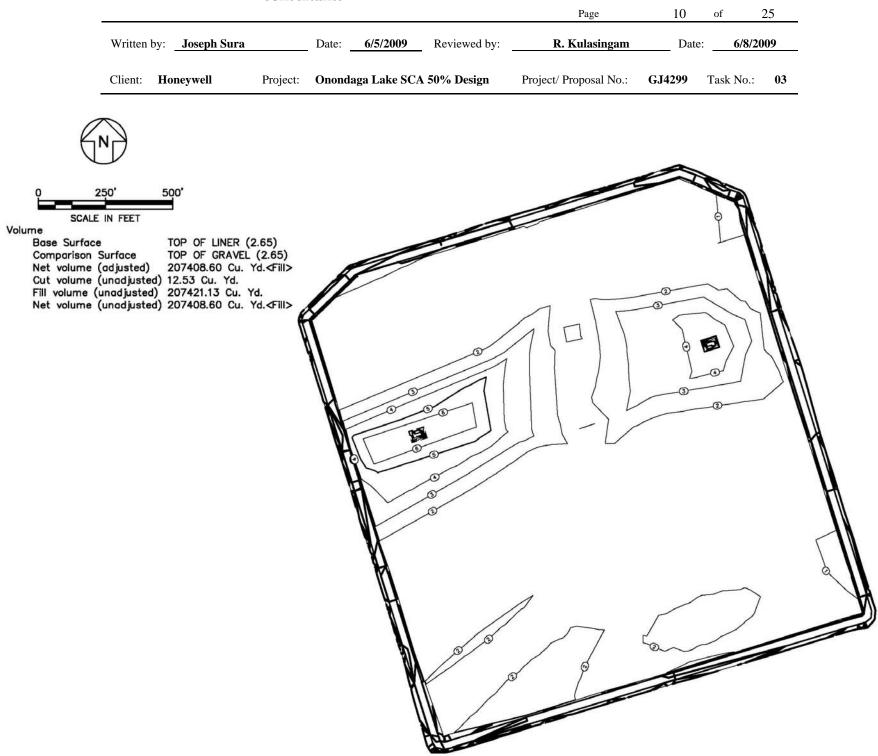
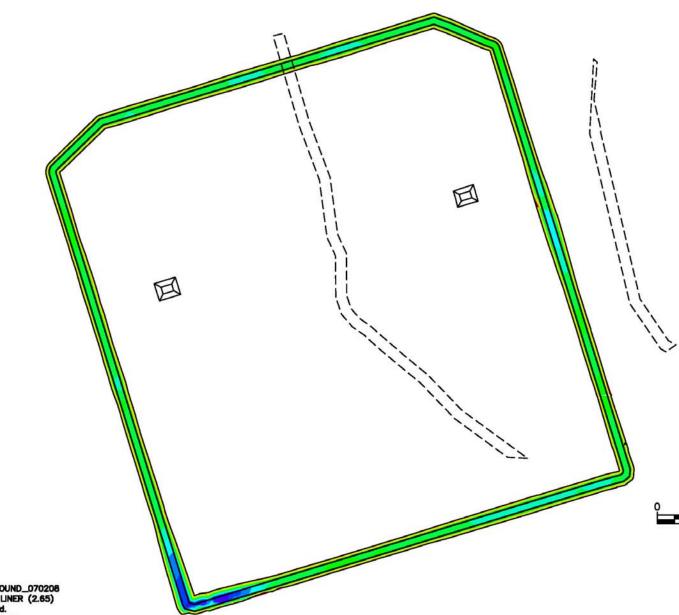


Figure 4: Isopach of Gravel Drainage Layer Thickness for Option 1 (2.65 million cy)

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	Elevation	s Table	
Number	Minimum Elevation	Maximum Elevation	Color
1	-2.797	-1.000	
2	-1.000	0.000	
3	0.000	1.000	
4	1.000	2.000	
5	2.000	3.000	
6	3.000	4.000	
7	4.000	5.000	
8	5.000	6.000	
9	6.000	7.000	
10	7.000	8.000	
11	8.000	9.000	
12	9.000	10.000	
13	10.000	11.000	
14	11.000	12.000	



ume Base Surface Comparison Surface Cut volume (unadjusted) 26.27 Cu. Yd. Fili volume (unadjusted) 57079.21 Cu. Yd. Net volume (unadjusted) 57052.94 Cu. Yd.

Figure 5: Isopach of Berm Thickness for Option 1 (2.65 million cy)



250' 500

SCALE IN FEET

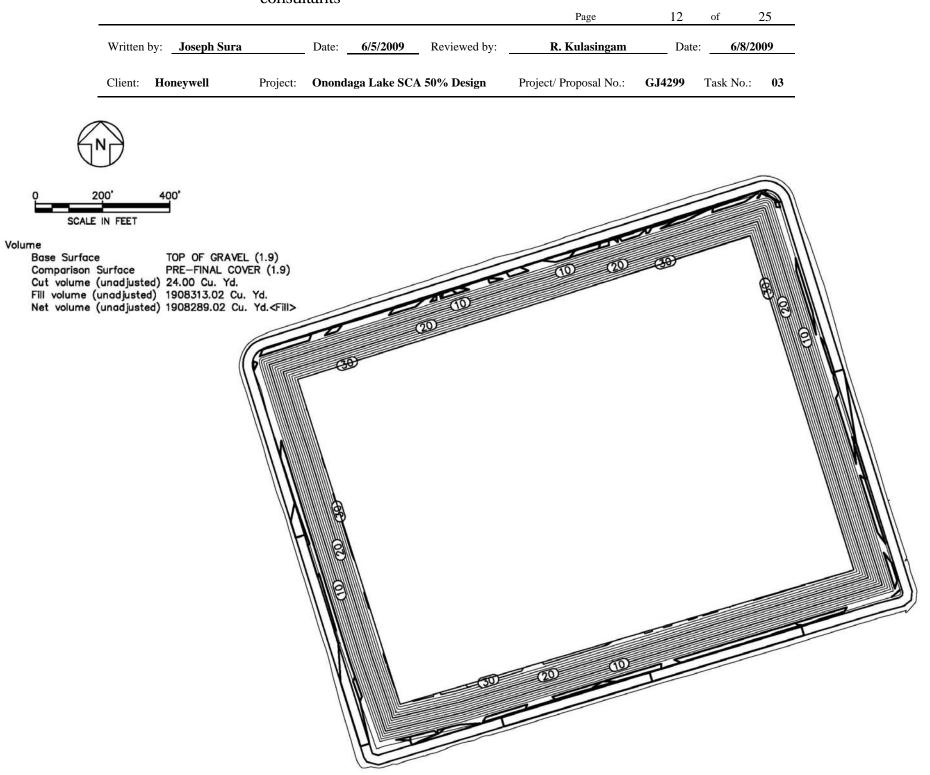


Figure 6: Total Capacity of Option 2 (1.9 million cy)

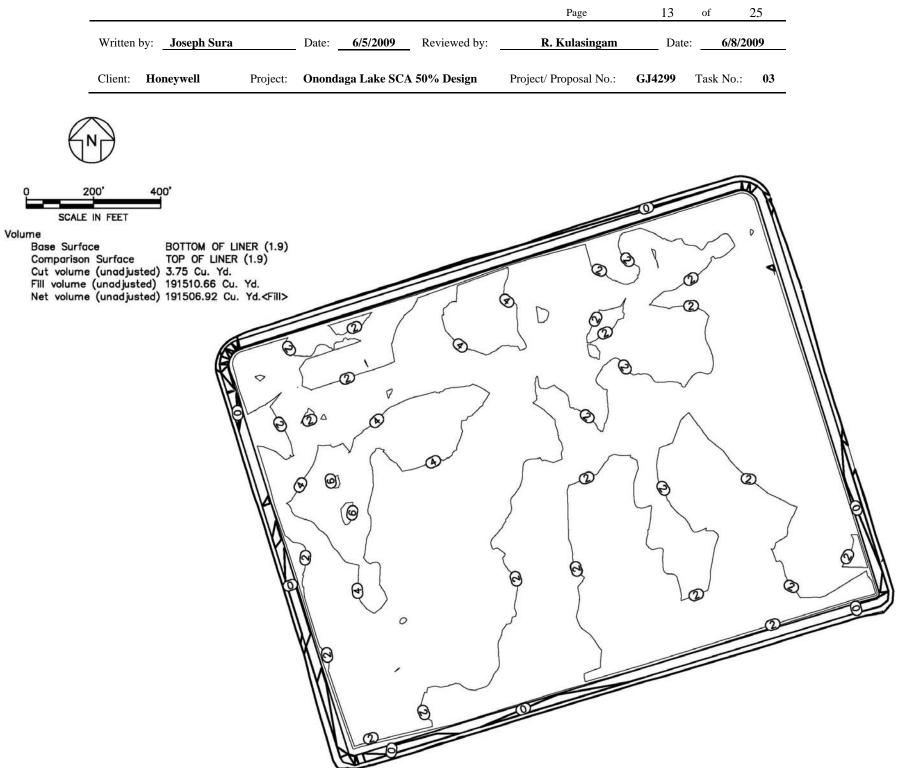


Figure 7: Isopach of Low Permeability Soil Liner Thickness for Option 2 (1.9 million cy)

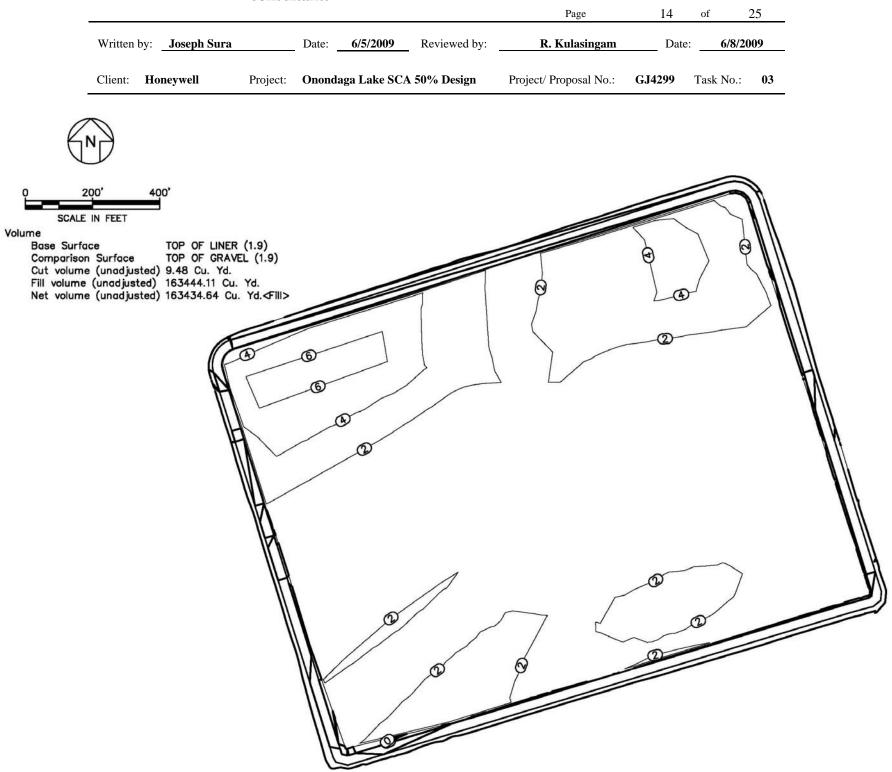


Figure 8: Isopach of Gravel Drainage Layer Thickness for Option 2 (1.9 million cy)

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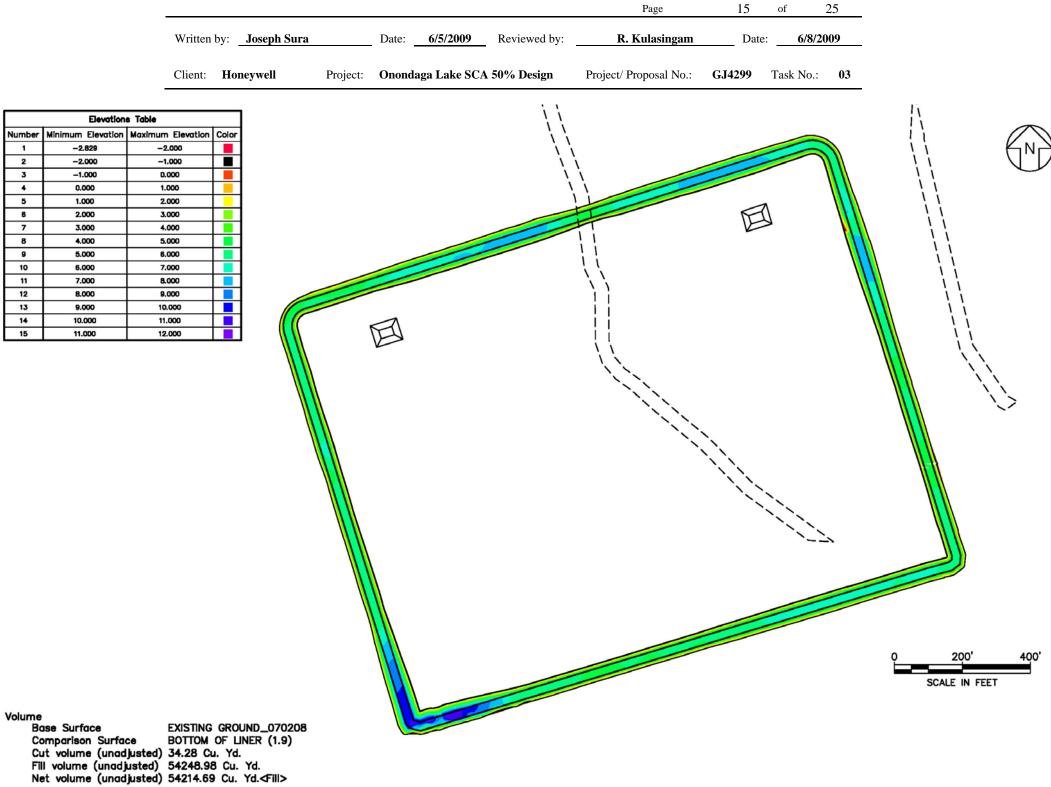


Figure 9: Isopach of Berm Thickness for Option 2 (1.9 million cy)

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Attachment A: Grading Plans for Option 1

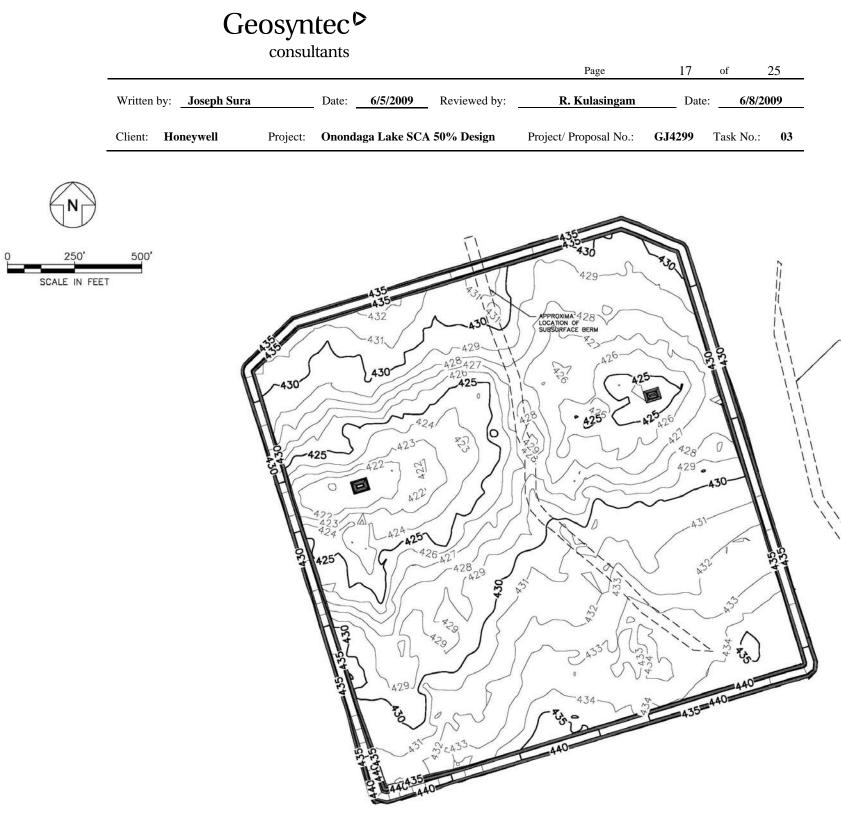


Figure A1: Proposed Berm and Subgrade Grading Plan for Option 1 (2.65 million cy)

- APPROXIMATE LOCATION OF SUBSURFACE BERM

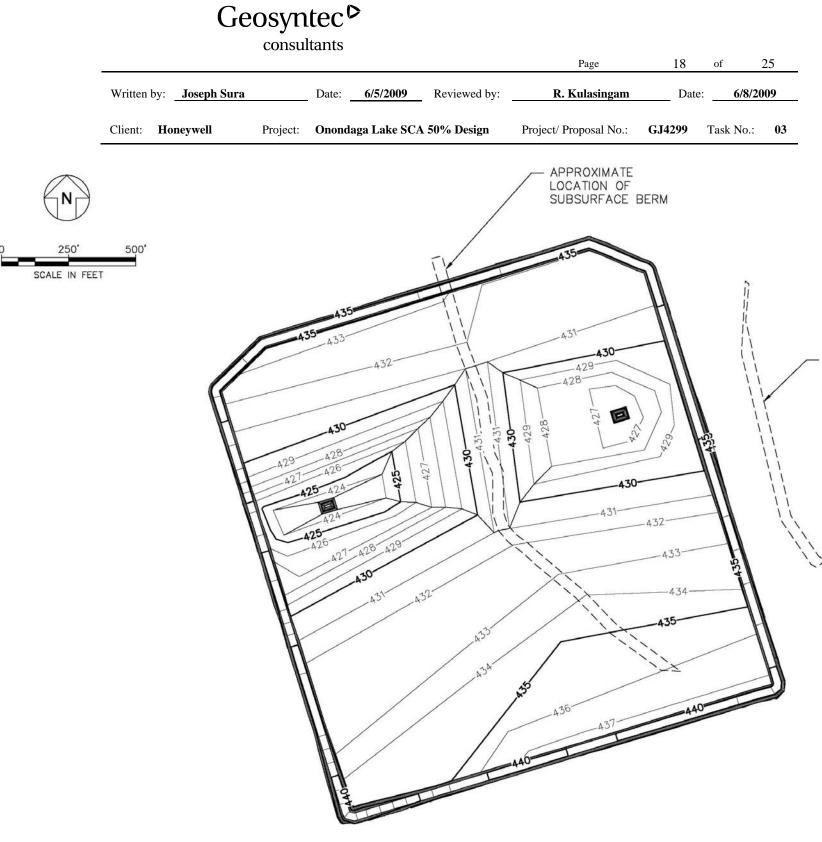


Figure A2: Proposed Low Permeability Soil Liner Grading Plan for Option 1 (2.65 million cy)

APPROXIMATE LOCATION OF SUBSURFACE BERM

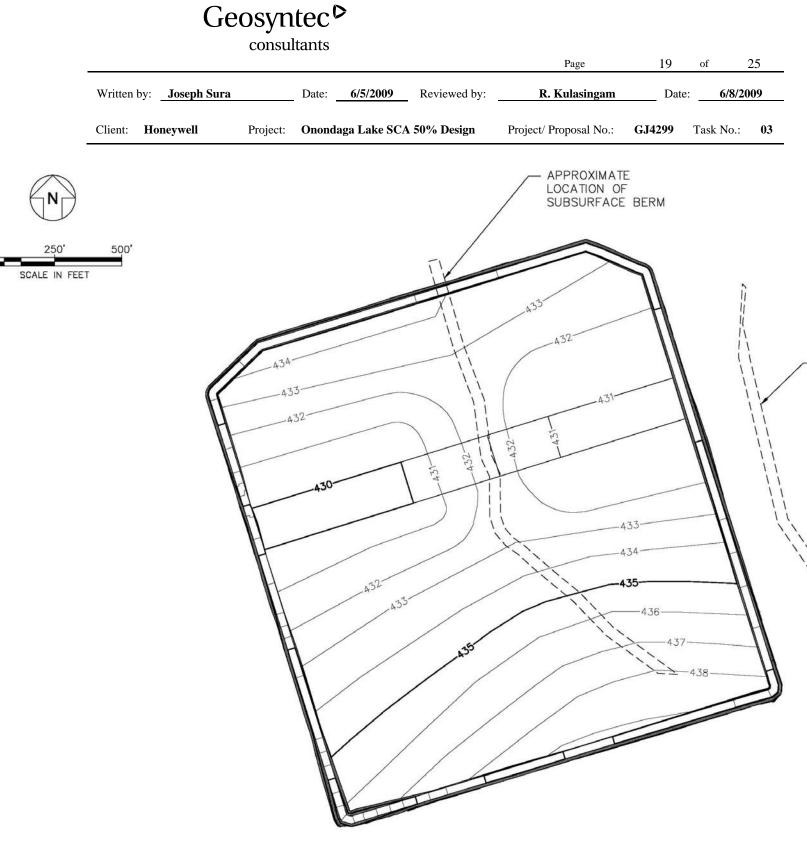


Figure A3: Proposed Gravel Drainage Layer Grading Plan for Option 1 (2.65 million cy)

- APPROXIMATE LOCATION OF SUBSURFACE BER

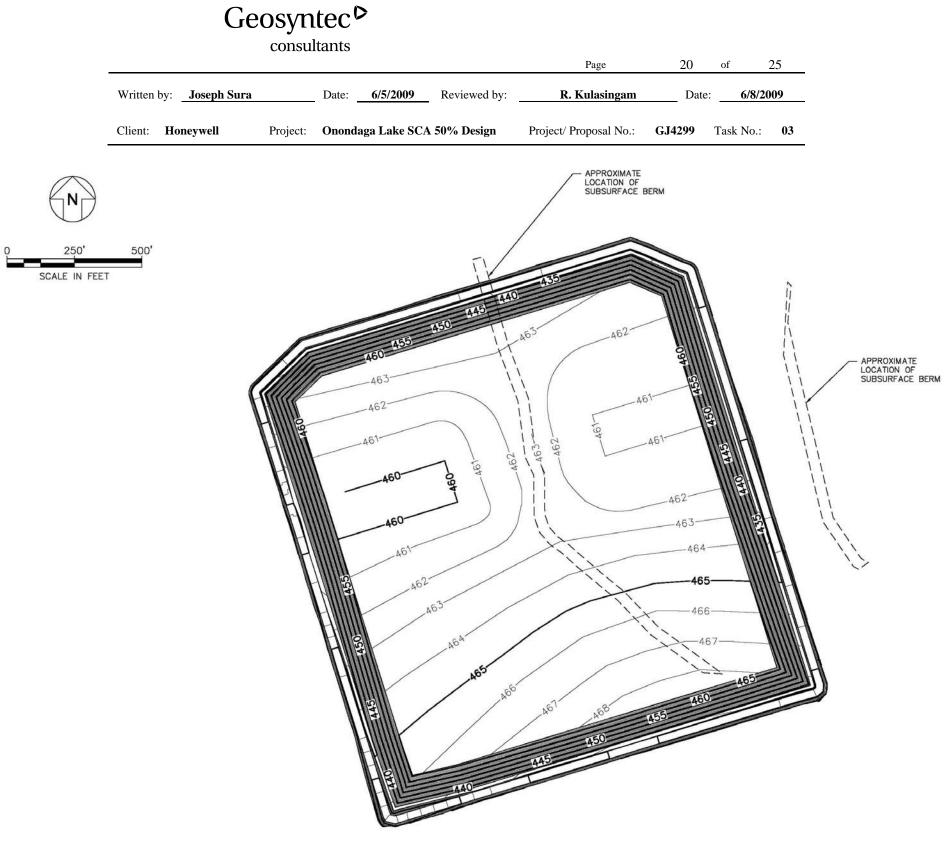


Figure A4: Proposed Top of Geo-tube Grading Plan for Option 1 (2.65 million cy)

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Attachment B: Grading Plans for Option 2

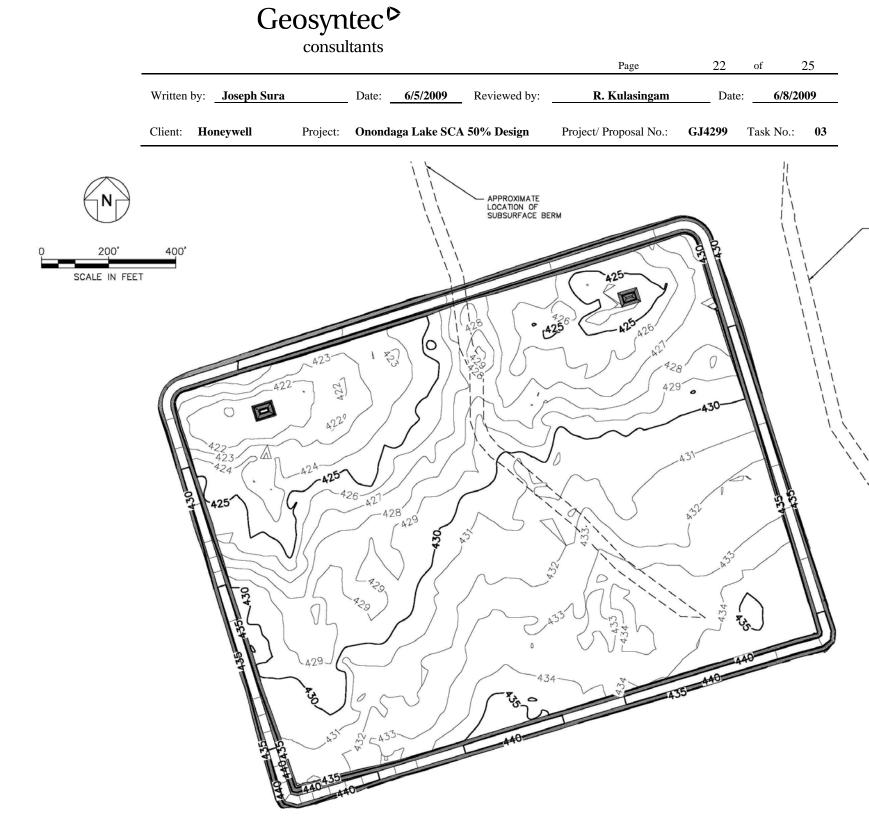


Figure B1: Proposed Berm and Subgrade Grading Plan for Option 2 (1.9 million cy)

- APPROXIMATE LOCATION OF SUBSURFACE BERM

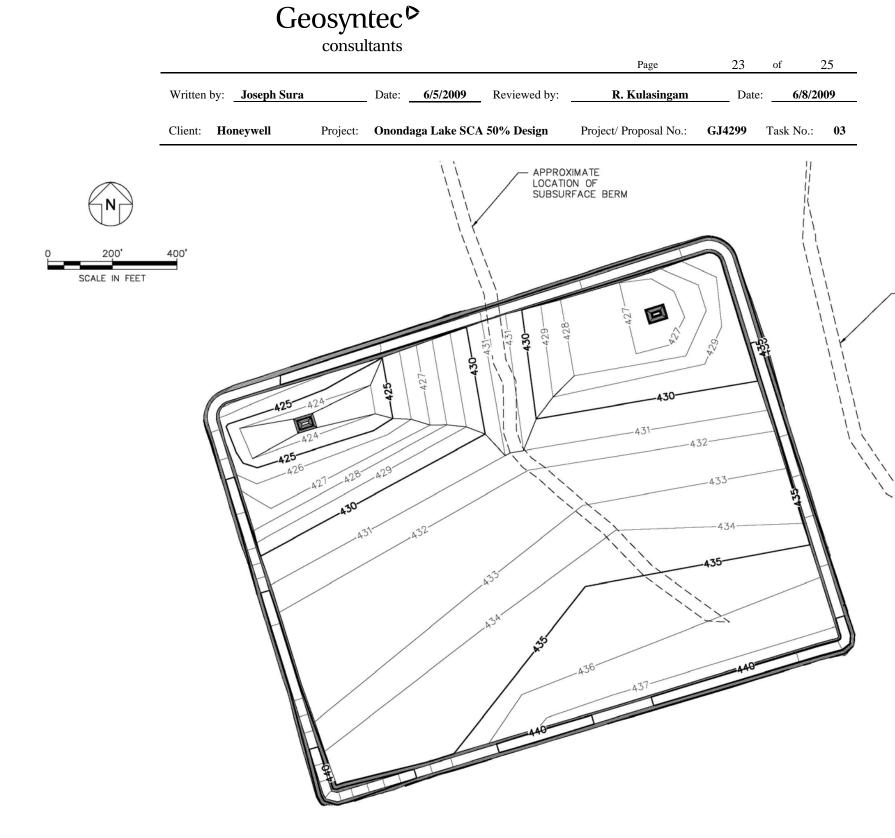


Figure B2: Proposed Low Permeability Soil Liner Grading Plan for Option 2 (1.9 million cy)

- APPROXIMATE LOCATION OF SUBSURFACE BERM

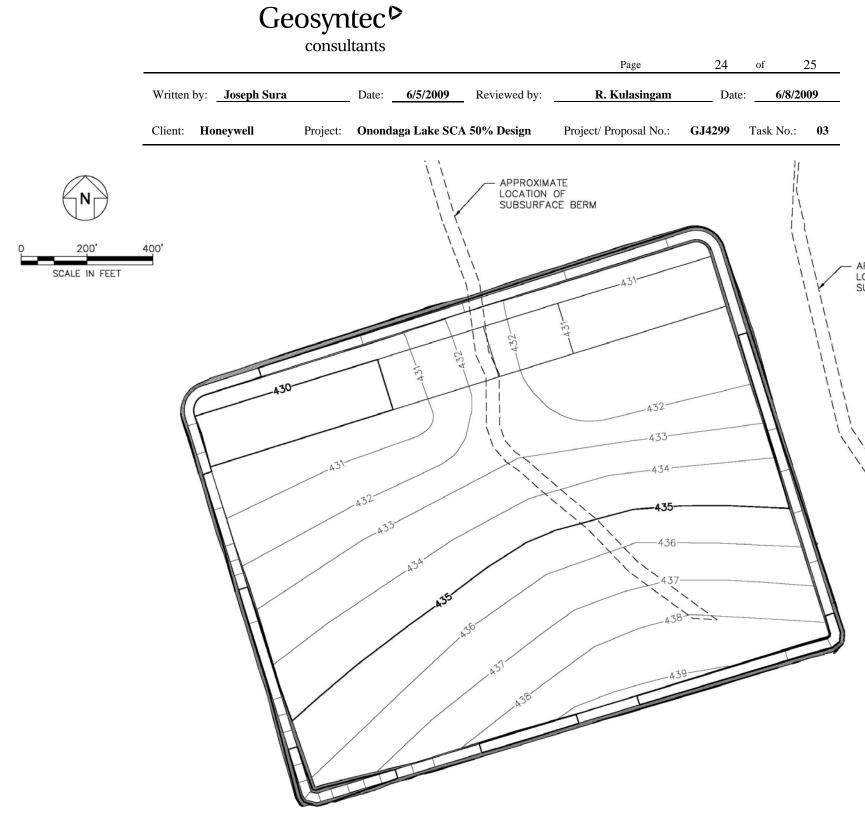


Figure B3: Proposed Gravel Drainage Layer Grading Plan for Option 2 (1.9 million cy)

APPROXIMATE LOCATION OF SUBSURFACE BERM



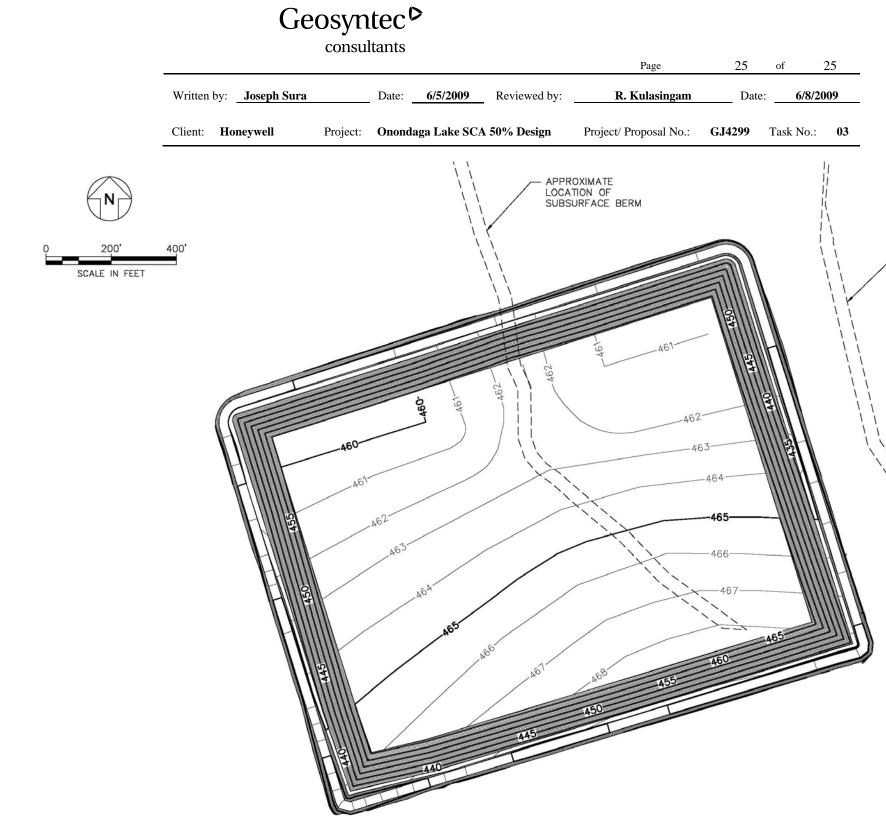


Figure B4: Proposed Top of Geo-tube Grading Plan for Option 2 (1.9 million cy)

– APPROXIMATE LOCATION OF SUBSURFACE BERM



APPENDIX G

SLOPE STABILITY ANALYSES FOR SCA DESIGN

GEOSYNTEC CONSULTANTS

COMPUTATION COVER SHEET

	Client: Honeywell Project: One	ondaga Lake SCA IDS Project/Proposal #:	GJ4299 Task #: 05
	TITLE OF COMPUTATIONS	SLOPE STABILITY ANALYS	SES
	COMPUTATIONS BY:	Signature Joseph Sura and Title Staff Engineer	<u>\$/4/2009</u> DATE
	ASSUMPTIONS AND PROCEDURE CHECKED BY: (Peer Reviewer)	Signature R. Kulasingam and Title Project Engineer	8/4/2009 DATE
	COMPUTATIONS CHECKED BY:	Signature Mitholas Application Printed Name Nicholas Yafrate and Title Senior Staff	<u>8/4/2009</u> DATE
	COMPUTATIONS BACKCHECKED BY: (Originator)	Signature Joseph Sura and Title Staff Engineer.	<u>8/4/2004</u> DATE
,	APPROVED BY: (PM or Designate) APPROVAL NOTES:	Signature Printed Name Jay Becerry 1998 and Title Pathcipal PROFESSION	4AU4 2009 DATE
	REVISIONS (Number and initial all re	evisions)	
	NO. SHEET DAT	ГЕ BY CHECKED BY	APPROVAL

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Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2	2009
Client:	Honeywell Projec	t: Ono	ondaga Lake	SCA IDS	Project/ Proposal No.:	GJ4299	Task No.:	05

SLOPE STABILITY ANALYSES FOR SCA DESIGN

INTRODUCTION

This package was prepared in support of the design of the Sediment Consolidation Area (SCA) for the Onondaga Lake Bottom Site, which will be constructed on Wastebed 13 (WB-13). Specifically, this package presents static slope stability analyses for the SCA, which will consist of geotextile tubes (geo-tubes) filled with dredged material surrounded by a perimeter dike (SCA perimeter dike). For purposes of this calculation package, the SCA perimeter dike refers to the dike that will be constructed around the geo-tubes within WB-13; whereas, the WB-13 perimeter dike refers to the exterior perimeter dike around WB-13.

Seismic slope stability analyses were not performed because the site is not located in a seismic impact zone, as defined by New York State Department of Environmental Conservation (NYSDEC) Regulations Section 360-2.7(b)(7). A detailed explanation regarding the seismic impact zone assessment is presented in Attachment 1 of this package.

METHODOLOGY

Static Slope Stability

Static slope stability analyses were performed using Janbu's method and Spencer's method, using the computer program SLIDE version 5.039 [Rocscience, 2006]. Four potential slip modes were evaluated in the analyses: (i) block slip mode along geo-tube interfaces; (ii) block slip mode along the liner system; (iii) circular slip surfaces through dredge material contained in geo-tubes and WB-13 foundation materials; and (iv) circular slip surfaces through existing WB-13 perimeter dikes.

Spencer's method [Spencer, 1973] satisfies both force and moment equilibrium and is therefore considered more rigorous than other methods, such as Janbu's method [Janbu, 1973] and the simplified Bishop method [Bishop, 1955]. However, Spencer's method often encounters numerical convergence difficulties when considering block slip surfaces. Therefore, Spencer's method was used for the circular slip surfaces, while Janbu's method was used for block slip surfaces.

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Client:	Honeywell Project	:: Ono	ndaga Lake	SCA IDS	Project/ Proposal No.:	GJ4299	Task No.:	05

Information required for the static slope stability analyses included the slope geometry, the subsurface soil stratigraphy, the groundwater table elevation, the material properties of the subsurface soils, dredge material, liner and cover system materials, and the external surface loading, if any, at the selected cross section locations.

Target Factor of Safety

Target factors of safety (FSs) were considered for slope stability of the proposed SCA, one for the interim condition and one for the long-term condition. The interim condition is the condition during the SCA construction and dredge operation period and shortly after the SCA is capped with the final cover system. The long-term condition is the condition a relatively long time after the SCA is capped. In addition, both peak and residual shear strengths were considered in identifying the appropriate FSs for interim and final conditions, as appropriate for geosynthetic materials.

The target FS corresponding to the peak shear strength was considered to be 1.3 for the interim condition and 1.5 for the long-term condition according to U.S. Army Engineer Waterways Experiment Station Technical Report D-77-9 [Hammer and Blackburn, 1977] and U.S. Army Corps of Engineers Engineering Manual 1110-2-1902 [USACE, 2003]. The target FS corresponding to large displacement (i.e., residual) shear strength was considered to be 1.1 for the interim condition and 1.3 for the long-term condition, consistent with general engineering practice.

SUBSURFACE STRATIGRAPHY

Detailed information regarding the subsurface stratigraphy was presented in a calculation package titled "Subsurface Stratigraphy Model of Wastebed 13 for the Design of Sediment Consolidation Area" (referred to as the Data Package). In summary, the subsurface stratigraphy consists primarily of three types of material: the Solvay waste (SOLW), the existing WB-13 perimeter dike soil, and the foundation soil, as shown schematically in Figure 1. The SOLW was divided into three zones (i.e., Zone 1, Zone 2, and Zone 3, as shown in the figure) based on its distinct characteristics.

The groundwater table was found to be approximately 50 ft below ground surface (bgs) of the wastebed (or at approximately El. 375 ft) as presented in the Data Package. However, it is noted that "perched" water zones exist in WB-13 according to the site investigation results presented in the Data Package. These "perched" water zones vary spatially and seasonally according to the piezometer data presented in the Data Package but have an average elevation of

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approximately 15 ft bgs. The slope stability analysis presented in this package conservatively assumes the "perched" water zones are connected to the groundwater table. The groundwater table was, therefore, modeled using a single groundwater table 15 ft bgs. Additionally, within the gravel drainage layer in the liner system, a second water table one foot above the top of the liner layer was assumed in the model. This represents the one foot maximum allowable head within the gravel drainage layer. It should be noted that this water table is confined by the liner system and will only affect the gravel drainage layer in the slope stability analysis.

ANALYZED CROSS-SECTIONS

The proposed SCA consists of a single containment cell surrounded by the SCA perimeter dike as shown in Figure 2. Two cross sections (i.e., Cross-Section A-A and B-B, as shown in Figure 3) were analyzed for static slope stability. As can be seen in Figure 3, Cross-Section A-A has significantly more vertical interfaces to consider than Cross-Section B-B because of geo-tube orientation. The design height of the proposed SCA perimeter dikes is 5 ft above the existing ground surface. The elevations of the dikes will vary, as the existing ground elevations vary along the perimeter. The SCA perimeter dikes are 25 ft wide at the top and have a 2.5 horizontal:1 vertical (2.5H:1V) side slope. There is a 10 ft setback distance between the edge of the lowest geo-tube layer and the dikes.

Cross-Section A-A

Cross-Section A-A was selected because it follows the direction of minimum overlap between the geo-tube stacks, which is expected to result in the lowest FS for block slip mode stability. Cross-Section A-A runs approximately north-south through WB-13. The geo-tubes are assumed to be 40 ft in width and between 250 ft to 320 ft in length. In the direction of Cross-Section A-A, each additional stack of geo-tubes will straddle geo-tubes that are already in place. This results in each stack of geo-tubes being offset approximately 20 feet from the layer below.

The existing ground below the liner at Cross-Section A-A (i.e., top of existing SOLW elevation) is naturally sloped. The thickness of the SOLW underneath the liner varies, but typically is between 50 and 60 ft. Cross-Section A-A was extended to include the existing WB-13 perimeter dike.

Cross-Section B-B

Cross-Section B-B runs approximately east-west through WB-13. In this direction, the geotubes are assumed to be between 250 ft and 320 ft long for purposes of this analysis. At the edge

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Client:	Honeywell Project	et: Ono	ndaga Lake	SCA IDS	Project/ Proposal No.:	GJ4299	Task No.:	05

of the geo-tube layers, tubes are offset approximately 20 ft. Through the interior of the SCA, the offsets between geo-tube layers vary because of the different lengths and number of geo-tubes per layer, but is planned to be a minimum of 20 ft. Cross-Section B-B has also been extended to analyze the stability of the WB-13 perimeter dike, as shown in Figure 4.

MATERIAL PROPERTIES

Table 1 summarizes the material properties (i.e., unit weights and shear strengths) of the SOLW, the dike soil, the foundation soil, the dredged material, the final cover soil, and geosynthetic materials used in the slope stability analyses. The unit weight and the shear strength of the SOLW in WB-13 were considered to be the same for Zone 1, Zone 2, and Zone 3 according to the Data Package. In the stability models presented in this package, the existing WB-13 perimeter dike soil was treated the same as the base foundation material based on previous investigations indicating that these existing WB-13 perimeter dikes were constructed using the native foundation material from beneath WB-13. The term "dike soil" as used in this package therefore refers only to the five foot SCA perimeter dikes that will be constructed. The interfaces between adjacent geo-tubes and between the bottom geo-tube and gravel drainage layer are modeled as thin layers of frictional material. Figures 5 and 6 show a representation of the layers included in the model.

Unit Weight

The unit weights of the SOLW, the dike soil, and the foundation soil were considered to be 82 pcf, 120 pcf, and 120 pcf, respectively, according to the Data Package. The unit weights of the proposed liner soil and gravel drainage layer were assumed to be 100 pcf and 120 pcf, respectively. The unit weight of the interface between the gravel drainage layer and the geo-tubes was assumed to have the same calculated unit weight as the dredge material (i.e., 86 pcf). The unit weight of the dredged material was calculated to be approximately 86 pcf as presented in Attachment 2 to the package titled "*Settlement Analysis for SCA*" (Appendix H of the IDS). The unit weights of the vertical and horizontal interfaces between geo-tubes were assumed to be 43 pcf and 86 pcf, respectively, based on the calculated unit weight of dredged material and the geometry of the tubes after deformation. The unit weight of the final cover soil was assumed to be 120 pcf.

Drained Shear Strength

The drained shear strength was used for the slope stability analyses under the long-term condition. The effective stress friction angles of the SOLW, the dike soil, and the foundation

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Client:	Honeywell Project	t: Ono	ndaga Lake	SCA IDS	Project/ Proposal No.:	GJ4299	Task No.:	05

soil were considered to be 34 degrees, 35 degrees, and 37 degrees, respectively, according to the Data Package. For the liner system, laboratory interface direct shear testing was performed on four liner types (i.e., smooth and textured high density polyethylene [HDPE], ethylene propylene diene monomer [EPDM], and polypropylene [PP]), and the results are included in Attachment 2. The peak effective stress friction angle of the proposed liner system varied depending on the type of geomembrane (GM) chosen. Based on these results, smooth HDPE GM is not being considered for use on this project. Among the remaining GM options tested, the peak effective stress friction angle varied from 19 degrees to 27 degrees; therefore, 19 degrees was conservatively assumed in Table 1. The effective stress friction angle of the gravel layer was assumed to be 38 degrees.

The effective stress friction angle for the interface between the bottom geo-tube layer and the gravel drainage layer was considered to be 24 degrees, based on data presented by Koerner [1994] for the interface between woven geotextiles and sand. The geotextiles composing the geo-tubes are modeled as two-end anchored geotextile sheets. The ultimate tensile strength was assumed to be 4800 lb/ft based on standard strength parameters for commercially available geo-tubes. A reduction factor of 3.0 [GRI, 1992] was then applied to result in a design tensile strength of 1600 lb/ft. Current information indicates the dredge material from the In Lake Waste Deposit (ILWD) has a drained friction angle of 37 degrees and, as indicated previously, the existing SOLW in WB-13 has a drained friction angle of 34 degrees. Considering the dredge material as remolded SOLW, the long-term drained effective stress friction angle of the dredge material was conservatively assumed to be 30 degrees. Under short-term conditions, the dredge material was assumed to have half of the drained effective stress friction angle of the material under long-term conditions (i.e., 15 degrees).

The effective stress friction angle of the vertical geo-tube/geo-tube interface was assumed to be negligible due to gaps between the geo-tubes. A value of 0.1 degrees was chosen for this interface to maintain numerical stability of the SLIDE program. Using representative geo-tube samples, the peak effective stress friction angle of the horizontal geo-tube/geo-tube interface was measured to be 15 degrees in laboratory interface direct shear testing (see Attachment 2 for results), which is the assumed value provided in Table 1. The effective stress friction angle for the final cover was assumed to be 30 degrees.

As indicated in the Analyzed Cases section of this calculation package, once the critical stability cases were established using the minimum value of liner system friction angle (both peak and residual) from laboratory testing, the critical cases were rerun using the maximum liner system friction angle (both peak and residual)_from laboratory testing. These analyses were

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performed to provide an approximate range of FS values that may be expected with the GM types currently under consideration. The range of calculated FS values based on the variability in test results is discussed further in Attachment 3.

The final liner system components will be selected based on the results of the chemical compatibility testing and stability analyses performed using the values established during the laboratory testing. Stability analyses were also performed to back-calculate the range in effective stress friction angles that would be acceptable for a given target FS, thus providing a range in values that can be used to establish the acceptability of actual geo-tube and liner system components based on laboratory testing, without needing to perform additional analyses. The back-calculation of this range in values is described further in Attachment 4. In cases involving the drained shear strength, the effective stress cohesion intercept was conservatively assumed to be zero.

Undrained Shear Strength

The undrained shear strength (S_u) of the WB-13 SOLW was used for the slope stability analyses under the interim condition. It is noted that undrained shear strengths were not assigned to the dike soil, the foundation soil, and the proposed gravel drainage layer because they primarily consist of coarse soil particles and drain relatively quickly under loading. Undrained shear strengths were also not assigned to the models used to represent the vertical and horizontal interfaces between geo-tubes because these interfaces are extremely thin and also drain quickly under loading. For these layers, the drained shear strengths were used for the interim condition as well.

The S_u of SOLW was developed using the SHANSEP (i.e., stress history and normalized soil engineering properties) method developed by Ladd and Foott [1974], based on the results of the laboratory consolidated-undrained (CU) triaxial compression tests and consolidation tests as presented in the Data Package. The SHANSEP method can be expressed using the following equation:

$$S_u = S \times \sigma'_{vc} \times OCR^m \tag{1}$$

where,

S = undrained shear strength ratio under normal consolidation, obtained from CU tests;

 $\sigma_{vc'}$ = effective vertical consolidation stress for a given loading;

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OCR = over-consolidation ratio, obtained from consolidation tests which is the ratio of the preconsolidation pressure (p_c') to the in-situ vertical effective stress (σ_v'); and

m =SHANSEP modeling parameter (m = 0.8 for most cohesive soils and typical applications [Ladd and DeGroot, 2003]).

As presented in the Data Package, an *S* of 0.3 was established from CU tests on the WB-13 SOLW samples. Data of p_c' , preconsolidation pressure, were obtained from the Data Package and are plotted in Figure 7 together with the profile of $\sigma_{v'}$, the effective in-situ vertical stress. An initial OCR profile was also developed in the Data Package for the SOLW, as shown in Figure 8.

Due to the effective stress increase $(\Delta \sigma_v)$ imposed by the liner system and geo-tubes, the SOLW will gain additional undrained shear strength as indicated by Equation 1. However, the undrained shear strength gain will occur gradually as the SOLW consolidates over time. To consider the shear strength gain of SOLW during the process of consolidation under the geo-tube load, three S_u profiles were calculated and are described below.

Initial S_u *profile*: This S_u profile represents the in-situ shear strength of the SOLW before construction of the SCA liner system. The S_u was calculated by Equation 1 using the in-situ effective stress $\sigma_{v, initial}$ in the SOLW. The calculated initial S_u profile is presented in Figure 9 along with the S_u measured by the UU tests.

 S_u profile for $U_{avg} = 75\%$: This S_u profile corresponds to the shear strength of the SOLW after it achieves an average degree of consolidation (U_{avg}) of 75%. The S_u in the SOLW at $U_{avg}=75\%$ ($\sigma_v'_{75\%}$) was calculated as a four-step process. The time factor T_v necessary to reach an average degree of consolidation of 75% is 0.477 [Das, 2005]. This time factor was used to calculate the variation of the consolidation ratio with depth (U_z) for an average consolidation ratio of $U_{avg}=75\%$, as shown in Figure 10 [Lambe and Whitman, 1969]. Next, $\sigma_v'_{75\%}$ was calculated using Equation 2.

$$\sigma'_{v75\%} = \sigma'_{v,initial} + U_z \times \Delta \sigma_v \tag{2}$$

Third, the OCR at $U_{avg} = 75\%$ was back-calculated using the original preconsolidation pressure p_c' and the current effective stress $\sigma_{v'75\%}$. Lastly, these OCR values are applied to the SHANSEP formula to derive the S_u profile when the SOLW achieves $U_{avg}=75\%$. Note that to calculate the S_u profile for $U_{avg} = 75\%$, the additional effective stress $\Delta \sigma_{v'}$ was based on three layers (18 ft) of dredged material in geo-tubes, 1 ft of gravel, and 1 ft of low permeability soil.

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The actual thicknesses of gravel and low permeability soil are greater or equal to 1 ft, however, with regards to shear strength gain, this assumption is conservative. The selection of three layers of geo-tubes as additional loading was based on the minimum number of geo-tube layers that would likely be placed the first year and the required time to consolidate, which is explained in detail below.

 S_u profile for $U_{avg} = 100\%$: This S_u profile corresponds to the shear strength of the SOLW after it reaches full consolidation under the same loading conditions as the $U_{avg} = 75\%$ condition (i.e., three layers [18 ft] of dredged material in geo-tubes, 1 ft of gravel, and 1 ft of low permeability soil). The effective stress after consolidation was calculated using Equation 3. Due to the large additional load of the geo-tubes, the OCR for SOLW when the soil is fully consolidated was assumed to be 1.0. The SHANSEP formula was applied to calculate the final S_u profile.

$$\sigma'_{v} = \sigma'_{v,initial} + \Delta \sigma_{v} \tag{3}$$

Vertical effective stress profiles for these three stages of consolidation are shown in Figure 11. The resulting undrained shear strength profiles are shown in Figure 12.

Consolidation Rate

The time to achieve a U_{avg} of 75% can be calculated using Equation 4 below [Das, 2005]:

$$t = \frac{T_v H_{dr}^2}{c_v} \tag{4}$$

where, c_v is the coefficient of consolidation, H_{dr} is the 50 ft distance to the drainage layer, and T_v is the time factor based on the required degree of consolidation. For U_{avg} of 75%, T_v equals 0.477 [Das, 2005]. Using a c_v of 0.009 cm²/sec from the laboratory consolidation tests and a c_v of 0.14 cm²/sec from the field test as presented in the Data Package, the time for the SOLW to achieve a U_{avg} of 75% was calculated to range from approximately 90 to 1420 days (3.9 years). As discussed in the Data Package, the consolidation rate in the field occurred at a much faster rate than in the lab due to lateral drainage. However, since the actual loaded area of the SCA is large enough that lateral drainage likely will not greatly affect the consolidation rate, the lab test

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rate of $c_v = 0.009 \text{ cm}^2/\text{sec}$ is considered more representative than the field test rate of actual conditions during SCA construction and operation. Therefore, it is conservatively assumed herein that the SOLW will require approximately 1420 days (3 years, 11 months) to reach the $U_{avg} = 75\%$ condition.

Based on the current phasing plan, the anticipated effective stress increase of the first year of construction was used to calculate the SOLW undrained shear strength at $U_{avg} = 75\%$. The consolidation due to the first year of geo-tube placement will have adequate time to consolidate to be at or near a $U_{avg} = 75\%$ condition after placement of the final cover. However, consolidation due to years 2, 3, and 4 of geo-tube construction may not have sufficient time to reach $U_{avg} = 75\%$ conditions, therefore the additional strength gain from these stages of construction was conservatively ignored in calculation of the $U_{avg} = 75\%$ profile. Additionally, the edges of the geo-tube loaded area will not have the full $\Delta\sigma_v'$ load calculated above. Therefore, in calculation of the $U_{avg} = 75\%$ profile, undrained shear strength gain in locations under the side slopes of the SCA was conservatively ignored. A potential first-year geo-tube phasing plan is shown in Figure 13.

In summary, the following items should be noted regarding the incorporation of the S_u profiles into the slope stability analyses:

- The groundwater table was considered to be at 50 feet bgs (or at approximately El. 375 ft) in the calculation of the undrained shear strength. However, in the SLIDE program, the effect of the perched water zones was taken into account and modeled as a single groundwater table at 15 feet bgs as previously discussed.
- The S_u profile for $U_{avg} = 100\%$ was not used in the analyses. The maximum undrained shear strength that the SOLW can achieve under loading was considered to be the S_u profile for $U_{avg} = 75\%$ under three stacks of geo-tube loading.
- The initial S_u profile as a function of depth was input directly into the SLIDE program and used for calculations with the exception of calculating global stability after placement of the final cover, for which the S_u profile for $U_{avg} = 75\%$ was used.
- In order to facilitate the calculations of the undrained shear strength, the initial stepwise S_u profile of SOLW and the OCR profile recommended in the Data Package have been slightly modified to be smooth curves in this package.

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- Due to the low permeability soil liner system, it was assumed that SOLW consolidation will occur in a single-drained state at the foundation soil layer at an average depth of 50 feet bgs.
- The computations for $U_{avg}=75\%$ and $U_{avg}=100\%$ are based on calculations of the expected required consolidation time. The actual field consolidation will be monitored through field instrumentation, and the construction will be adjusted accordingly if necessary.

ANALYZED CASES

Both Cross-Sections A-A and B-B were analyzed for conditions without the final cover and with the final cover for the four potential slip modes mentioned earlier. A more detailed discussion of the analyzed cases is presented below.

Geo-tube Slip Mode

The block slip of geo-tubes represents potential sliding within the interfaces between individual geo-tubes, resulting in multiple geo-tubes sliding off of the mass of geo-tubes. Computations were performed using short-term strength parameters, including the initial S_u profile (Figure 9) to represent the undrained shear strength of the underlying SOLW layer. Since the slip surfaces do not pass through the existing SOLW, the S_u values of SOLW do not affect the calculated FS. This mode was analyzed for 12 different cases for Cross-Section A-A and five different cases for Cross-Section B-B, as summarized on Tables 2 and 3, respectively. More cases were considered for Cross-Section A-A because of the higher number of vertical interfaces to be considered in that cross section, as compared to Cross-Section B-B, due to tube orientation/geometry. The number of stacks indicated in the tables represents the tiers, counting from the top downwards, involved in the potential slip. The number of columns represents the number of geo-tubes per stack involved in the potential slip.

As indicated previously, establishing a range in friction angles that would be considered acceptable for the geo-tube/geo-tube interface is also a goal of the stability analyses presented herein. Therefore, based on the initial analyses using the friction angles established through laboratory testing, which yielded acceptable FS values, the most critical case for geo-tube slip was identified (i.e., Top 4 stacks; 1 column, as indicated on Table 2). This critical case is illustrated in Figure 14 without a final cover and in Figure 15 with a final cover.

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In addition, this critical case was used to back-calculate the required effective stress friction angle of the horizontal geo-tube/geo-tube interface to achieve the target FS for both peak and residual conditions. This procedure was followed for Cross-Section A-A without the final cover (target peak FS=1.3, target residual FS=1.1) and for Cross-Section A-A with the final cover (target peak FS=1.5, target residual FS=1.3). Since the geo-tube slip mode is more critical for Cross-Section A-A due to the geometry involved (see results on Table 2 as compared to 3), the back-calculated values from Cross-Section A-A are also considered acceptable for Cross-Section B-B. This is discussed in more detail in Attachment 4.

Liner Stability

Block slip of the liner represents sliding along the proposed liner. Computations using this mode were performed using short-term strength parameters and the initial S_u profile (Figure 9) to represent the undrained shear strength of the SOLW layer. Since the slip surfaces do not pass through the existing SOLW, these S_u values do not affect the calculated FS.

Similar to the geo-tube slip mode analysis, first the most critical case for liner stability was identified using the minimum friction angle established during laboratory testing. For liner stability, the critical case involves the liner failing underneath the first column of geo-tubes, as illustrated in Figures 16 and 17 without and with final cover, respectively. Once the critical case was identified, the analysis was also performed using the maximum laboratory measured liner friction angle. Table 2 provides the results using the minimum liner friction angle established in the laboratory testing, and Attachment 3 provides the results (critical case only) using the maximum liner friction angle established in the laboratory testing.

As indicated previously, establishing a range in friction angles that would be considered acceptable for the liner system is also a goal of the stability analyses. Using the critical case identified above, the required effective stress friction angle of the proposed liner system to achieve the target FS could be back-calculated. To establish a range in friction angle values, the sensitivity of the liner friction angle to changes in the geo-tube/geo-tube horizontal interface friction angle was also evaluated. The geo-tube/geo-tube horizontal interface friction angle was changed, and the required liner friction angle to achieve the target FS against liner slip was back-calculated using SLIDE. Based on the results presented in Tables 2 and 3, the Cross-Section A-A geometry is considered to be more critical than the Cross-Section B-B geometry; therefore, the additional analyses were performed on Cross-Section A-A. The results of these calculations before and after placement of the final cover are shown and discussed further in Attachment 4.

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Global Stability (Circular slip surfaces)

Global stability of the proposed SCA was evaluated with circular potential slip surfaces. The global stability through the foundation material prior to placement of the final cover was evaluated using undrained strength parameters (the initial S_u profile shown in Figure 9) to represent the undrained shear strength of the SOLW layer. The global stability after placement of the final cover was evaluated for three cases: (i) Interim stability with the initial S_u profile; (ii) Interim stability with U_{avg} =75%; and (iii) Long-term stability.

The interim global stability case immediately after placement of the final cover was evaluated using the initial S_u profile to represent the undrained shear strength of the SOLW layer. The interim global stability case immediately after placement of the final cover was also evaluated using the S_u profile after consolidation to U_{avg} =75% to represent the undrained shear strength of the SOLW layer.

The long-term global stability after cover placement was evaluated using drained strength parameters. This long-term global stability evaluation was performed by assuming that the geotextile support of the geo-tubes will be degraded and therefore have no shear strength. The long-term evaluation was performed by also assuming the effective stress friction angle of the dredge material will increase to 30 degrees due to consolidation of the material (i.e., the long-term value provided in Table 1).

Global Stability of WB-13 Perimeter Dikes (Circular slip surfaces)

Potential global stability for slip surfaces through the SCA and existing WB-13 perimeter dike was evaluated for Cross-Sections A-A and B-B. This slip mode was analyzed for three cases: (i) Interim stability before final cover placement; (ii) Interim stability after final cover placement; and (iii) Long-term global stability.

In addition, global stability of the WB-13 perimeter dike was considered by focusing on potential slip surfaces through the dike. For these analyses, the WB-13 perimeter dike was modeled with a 2-ft thick crusty surficial layer with a cohesion intercept of 50 psf and a friction angle of 37 degrees to represent the effects of desiccation and roots. The inner portion of the WB-13 perimeter dike was modeled only with a friction angle of 37 degrees, consistent with the other cases analyzed. Two cases were considered to model the groundwater table within the WB-13 perimeter dike. The first case considered a water table that varies from the conservatively assumed 15 feet below ground level at the dike-SOLW interface to the ground surface level at the toe of the dike. The second case considered a water table that varies from 15

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feet below ground level at the dike-SOLW interface to a level at the outside dike face that is 10 feet above the ground surface level at the toe of the dike.

RESULTS AND DISCUSSION

Slope Stability Analysis

The results of the slope stability analyses for Cross-Sections A-A and B-B are summarized in Tables 2, 3, and 4. The results of the analyses for the most important cases are also shown graphically in Figures 18 through 38. The associated SLIDE runs are presented in Attachment 5 of this package.

The calculation results for Cross-Section A-A are summarized in Table 2 and indicate that the calculated FS values for cases without and with the final cover satisfy the target FS of 1.3 and 1.5, respectively, for the geo-tube slip mode, liner stability, and global stability. Since the global stability case using the initial S_u profile achieved the interim FS=1.3 criterion, a check of global stability using the $U_{avg} = 75\%$ profile was not performed for Cross-Section A-A.

The calculation results for Cross-Section B-B are summarized in Table 3 and indicate that the calculated FS values for cases without and with the final cover satisfy the target FS of 1.3 and 1.5, respectively, for the slip modes evaluated (i.e., geo-tubes slip mode, liner stability, and global stability). Slope stability analyses performed to evaluate a potential global slip mechanism resulted in a calculated FS satisfying the interim target FS of 1.3 using the initial S_u profile It is noted that the actual S_u profile will be greater than the initial due to consolidation of the foundation soils under the loading from the geo-tubes. When the $U_{avg} = 75\% S_u$ profile is used, the calculated FS is greater than when the initial S_u profile is used. The calculated FS for long-term global stability satisfies the target FS of 1.5.

Slope stability analyses performed to evaluate the potential global slip mechanisms through the SCA and existing WB-13 perimeter dikes resulted in FS values much greater than the target FS. Cross-Section A-A, as expected, has a lower factor of safety than for Cross-Section B-B with regards to global slip of existing WB-13 perimeter dikes, however, the calculated FS for Cross-Section A-A still greatly exceeds the target FS for both interim and long-term conditions.

Slope stability analyses were also performed for slip surfaces through the WB-13 perimeter dike that do not extend to the SCA (i.e., analyses focused on the dike only). For the case with the water table at the toe of the dike, minimum FS values of 3.2 for the critical global slip surface extending to the top of the WB-13 perimeter dike and 1.8 for the critical shallow slip surface within the slope were calculated, as shown in Figure 27a. For the case with the water table at 10 feet above the toe of the dike, minimum FS values of 1.7 for the critical global slip surface

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extending to the top of the WB-13 perimeter dike and 1.1 for the critical shallow slip surface within the slope were calculated, as shown in Figure 27b. This shallow slip surface is located near the toe under the estimated water table level within the WB-13 perimeter dike. A FS of 1.1 for shallow slip surfaces is indicative of the potential for surficial sloughing. During final design, the condition of the WB-13 perimeter dike surface will be evaluated and areas that are identified as needing restoration or erosion protection will be addressed.

FS values were also calculated using residual shear strengths for the geosynthetic components. For Cross-Section A-A, the critical geo-tube slip case of one column of four stacks of geo-tubes and the critical liner slip case of one column of geotubes before and after final cover placement were evaluated. The calculated FS values using residual shear strengths satisfy the target residual FS values for both interim and long-term conditions.

Additionally, the back-calculation presented in Attachment 4 indicates that the required values for the peak laboratory friction angles for the horizontal geo-tube/geo-tube interface and liner system are 13.9 degrees and 17.9 degrees, respectively, to meet the target FS values. The required values for the residual laboratory friction angles for the horizontal geo-tube/geo-tube interface and liner system are 11.7 degrees and 15.7 degrees, respectively, to meet the target FS values. The minimum required values of peak and residual effective stress friction angle to meet the target FS values are shown in Figures 39 and 40. It is recommended that site-specific testing be performed on the selected liner system to verify the strength parameters meet or exceed these back-calculated values.

SUMMARY AND CONCLUSIONS

This package evaluates the static slope stability of the proposed SCA. Four potential slip modes were evaluated using the computer computation program SLIDE: (i) block slip mode along geo-tube interfaces; (ii) block slip mode along the liner system, (iii) circular slip surfaces through dredge material contained in geo-tubes and WB-13 foundation materials; and (iv) circular slip surfaces through existing WB-13 perimeter dikes.

Analyses of two critical cross-sections indicate that the calculated FSs for the four potential slip modes meet the target FS for interim and long-term conditions. However, placement of five layers of geo-tubes and the final cover system within the same season results in a calculated FS that only slightly exceeds the target value, a limitation that should be considered during design of the phasing plan for geo-tube construction. Instrumentation to monitor the field consolidation is recommended to verify adequate strength gain occurs before placement of the final cover.

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Minimum required parameters for the interface between geo-tubes and the liner system have been back-calculated. In order to meet the target factor of safety values against block slip, the peak effective stress friction angle for the interface between geo-tubes should be at least 13.9 degrees and the peak effective stress friction angle for the liner system should be at least 17.9 degrees. In order to meet the target factor of safety values against block slip, the residual effective stress friction angle for the interface between geo-tubes should be at least 11.7 degrees and the peak effective stress friction angle for the liner system should be at least 11.7 degrees and the peak effective stress friction angle for the liner system should be at least 15.8 degrees. Laboratory testing indicates that these values are achievable with a variety of common commercially available geosynthetics. Testing of material delivered to the project during construction will be performed to verify components meet the specified strength.

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Tables

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Material	Unit Weight	Undrained Shear Strength	Drained Shear Strength						
Iviaterial	(pcf)	(psf)	Effective Stress Friction Angle (degree)						
SOLW	82	See Figures 8 through 11	34						
SCA Perimeter Dike Soil	120		35						
Foundation Soil									
(including WB-13	120		37						
perimeter dike)									
Liner	100		19 ^[1]						
Gravel Drainage	120		38						
Geo-tube/Gravel	86		$24^{[2]}$						
Interface	80		24						
Geo-tube		Design Tens	sile Strength = $1600 \text{ lb/ft}^{[3]}$						
Dredge Material (Short	86		15 ^[4]						
Term)	80		13						
Dredge Material (Long-	86		30						
Term)			50						
Geo-tube/Geo-tube	43 ^[5]		$0.1^{[6]}$						
Interface (Vertical)	43		0.1						
Geo-tube/Geo-tube	86		15 ^[1]						
Interface (Horizontal)	00		13						
Final Cover Soil	120		30						

Table 1. Summary of Material Properties for Slope Stability Analysis

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Table 1. Summary of Material Properties for Slope Stability Analysis (Continued)

- 1. The values presented in this table (i.e., 15 degrees and 19 degrees) are the measured peak effective friction angles for geo-tube/geo-tube interface and liner, respectively (see Attachment 2).
- 2. Taken from Koerner [1994]. A typical value of interface effective friction angle between woven geotextile and sand was assumed.
- 3. The design tensile strength was modeled using a two-end anchored geotextile sheet. Based on commercially available products, the ultimate tensile strength of geo-tubes was assumed to be 4800 lb/ft and a strength reduction factor of 3.0 was applied to calculate the design tensile strength, taking into account creep deformation, chemical degradation, and strength loss within seams, connections, and joints [GRI, 1992].
- 4. Under short-term conditions, the dredge material was assumed to have half of the friction angle of the material under long-term conditions.
- 5. The vertical interface was assumed to have a unit weight equal to half of the unit weight of the dredge material. This was based on the geometry of the geo-tubes after deformation. The volume of material in the vertical interface after deformation was assumed to be approximately half the total volume available if the geo-tubes could be placed in direct contact with each other along the entire interface.
- 6. The geo-tube/geo-tube vertical interface has insignificant side friction, but a small value of friction angle was necessary for numerical stability of the SLIDE calculation program.

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Table 2. Summary of Slope Stability Analysis: Cross-Section A-A

	Case		Without	Final Cover			With Final Cover		
		Calcula	ted FS ^[1]	Figuro	Target	Calculate	Calculated FS ^[1]		Target
		Spencer's Method ^[2]	Janbu's Method ^[2]	Figure Number		Spencer's Method ^[2]	Janbu's Method ^[2]	Figure Number	F.S.
	Top 1 stack; 1 column		8.57		1.30		11.95		1.50
	Top 1 stack; 2 columns		27.37		1.30		[5]		
	Top 2 stacks; 1 column		2.44		1.30		3.56		1.50
	Top 2 stacks; 2 columns	`	5.41		1.30		[5]		
	Top 3 stacks; 1 column		1.73		1.30		2.01		1.50
Slip of Geo-tubes	Top 3 stacks; 2 columns		3.51		1.30		4.00		1.50
(Block Mode)	Top 4 stacks; 1 column		1.52	18	1.30		1.61	22	1.50
	Top 4 stacks; 2 columns		2.44		1.30		2.86		1.50
	Top 4 stacks; 3 columns		3.90		1.30		[5]		
	5 stacks; 1 column		1.72		1.30		1.73		1.50
	5 stacks; 2 columns		2.69		1.30		2.94		1.50
	5 stacks; 3 columns		4.46		1.30		[5]		
Liner Stability	One column of geo-tubes		1.65	19	1.30		1.60	23	1.50
(Block Mode)	Two columns of geo-tubes		2.30		1.30		2.47		1.50
	Through Foundation Material (U _{avg} =0%) – Interim	1.68 ^[3]		20	1.30	1.48 ^[3]		24	1.30
Global Stability (Circular Mode)	Through Foundation Material (U _{avg} =75%) – Interim					[6]	[6]		
	Through Foundation Material – Long-Term					2.00 ^[7]		25	1.50
Global Stability	Through SCA and Existing WB-13 Perimeter Dike – Interim	3.95 ^[4]		21	1.30	3.25 ^[4]		26	1.30
(Circular Mode)	Through SCA and Existing WB-13 Perimeter Dike – Long Term					3.45		27	1.50

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Client:	Honeywell	Project:	Ononda	aga Lake SCA 50	% Design	Project/ Proposal No .:

Table 2. Summary of Slope Stability Analysis: Cross-Section A-A (Continued)

- 1. These values are calculated using the laboratory values of peak effective stress friction angle for the geo-tube/geo-tube horizontal interface (15 degrees) and the liner (19 degrees). The laboratory test data are shown in Figures 2-4 and 2-5 of Attachment 2.
- 2. Spencer's method is considered more rigorous than Janbu's method because Spencer's method satisfies both force and moment equilibrium. However, Spencer's method often encounters numerical convergence difficulty when complicated block slip surfaces are considered, as in this analysis. Therefore, Spencer's method was used for the circular mode analysis, while Janbu's method was used for the block mode analysis
- 3. This calculation uses the initial S_{μ} profile for the undrained shear strength of the existing SOLW.
- 4. This was modeled by forcing the slip circle to pass through the existing WB-13 perimeter dike.
- 5. This case was not analyzed due to the acceptable FS values found for similar cases.
- 6. The $U_{avg}=75\%$ case was not analyzed for Cross-Section A-A because the interim FS was acceptable using the initial S_u profile.
- 7. For long-term, the geotextile of the geo-tubes was assumed to be degraded and therefore have no shear strength. The dredge material was modeled with the long-term friction angle of 30 degrees.
- 8. Figures are only included for the most important cases.

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Table 3. Summary of Slope Stability Analysis: Cross-Section B-B

			Without Final Co	over		With Final Cover			
	Case		Calculated FS ^[1]		Target	Calculat	ed FS ^[1]	- Figure	Target
			Janbu's Method ^[2]	Figure F.S. Number		Spencer's Method ^[2]	Janbu's Method ^[2]	Number	F.S.
	Top 1 stack; 1 column		48.23		1.30		48.90		1.50
Slip of	Top 2 stacks; 1 column		15.52		1.30		14.99		1.50
Geo-tubes ^[3] (Block Mode)	Top 3 stacks; 1 column		10.25		1.30		10.23		1.50
	Top 4 stacks; 1 column		7.68	28	1.30		6.67	32	1.50
	5 stacks; 1 column		9.66		1.30		9.81		1.50
Liner Stability ^[3] (Block Mode)	One column of geo-tubes		2.06	29	1.30		1.93	33	1.50
Global	Through Foundation Material (U _{avg} =0%) – Interim	1.52 ^[3]		30	1.30	1.31 ^[3]		34	1.30
Stability (Circular	Through Foundation Material (U _{avg} =75%) – Interim					1.32 ^[4]		35	1.30
Mode)	Through Foundation Material – Long-Term ^[5]					1.94		36	1.50
Global Stability	Through SCA and Existing WB-13 Perimeter Dike – Interim	10.14		31	1.30	7.78		37	1.30
(Circular Mode)	Through SCA and Existing WB-13 Perimeter Dike – Long-Term					17.17		38	1.50

- 1. These values are calculated using the laboratory values of peak effective stress friction angle for the geo-tube/geo-tube horizontal interface (15 degrees) and the liner (19 degrees). The laboratory test data are shown in Figures 2-4 and 2-5 of Attachment 2.
- 2. Spencer's method is considered more rigorous than Janbu's method because Spencer's method satisfies both force and moment equilibrium. However, Spencer's method often encounters numerical convergence difficulty when complicated block slip surfaces are considered, as in this analysis. Therefore, Spencer's method was used for the circular mode analysis, while Janbu's method was used for the block mode analysis.
- 3. This calculation uses the initial S_u profile for the undrained shear strength of the existing SOLW.
- 4. This calculation uses the U_{avg} =75% profile for the undrained shear strength of the existing SOLW under the gravel, liner system, and three layers of geo-tubes.
- 5. For long-term, the geotextile of the geo-tubes was assumed to be degraded and therefore have no shear strength. The dredge material uses the long-term friction angle of 30 degrees.
- 6. Figures are only included for the most important cases.

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Client:	Honeywell	Project:	Ononda	ga Lake SCA 50%	% Design	Project/ Proposal No.:	GJ4299	Task N	o.: 05	

Table 4. Summary of Slope Stability Analysis: Residual Conditions for Cross-Section A-A

			Interim)	With Final Cover (Long-Term)		
Case		Calculated FS ^[1]	Torget ES	Calculated FS ^[1]	Town of EQ	
		Janbu's Method ^[2]	Target FS	Janbu's Method ^[2]	Target FS	
Slip of Geotubes (Block Mode)	Top 4 stacks; 1 column	1.21	1.10	1.33	1.30	
Liner Stability (Block Mode)	One column of geo-tubes	1.41	1.10	1.37	1.30	

- 1. These values are calculated using the laboratory values of residual effective stress friction angle for the geo-tube/geo-tube horizontal interface (12 degrees) and the liner (17 degrees). The laboratory test data are shown in Figures 2-2 and 2-5 of Attachment 2.
- 2. The Janbu method was used for the block mode analyses presented here because Spencer's method often encounters numerical convergence difficulty with these types of analyses.
- 3. The target residual FS is 1.1 for the interim condition and 1.3 for long-term conditions.

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Figures

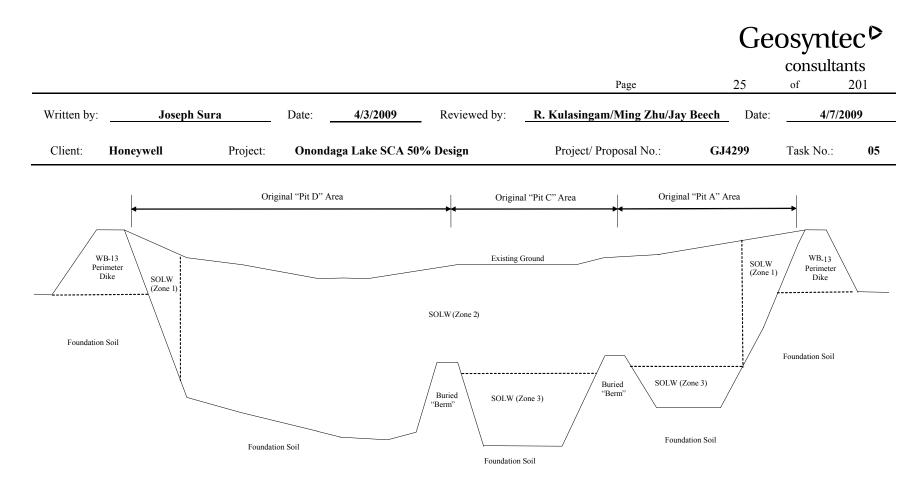
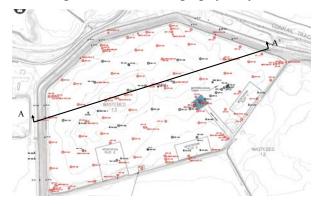


Figure 1. Schematic of Subsurface Profile

[not to scale; for purpose of showing subsurface stratigraphy only; location of the section is shown below]



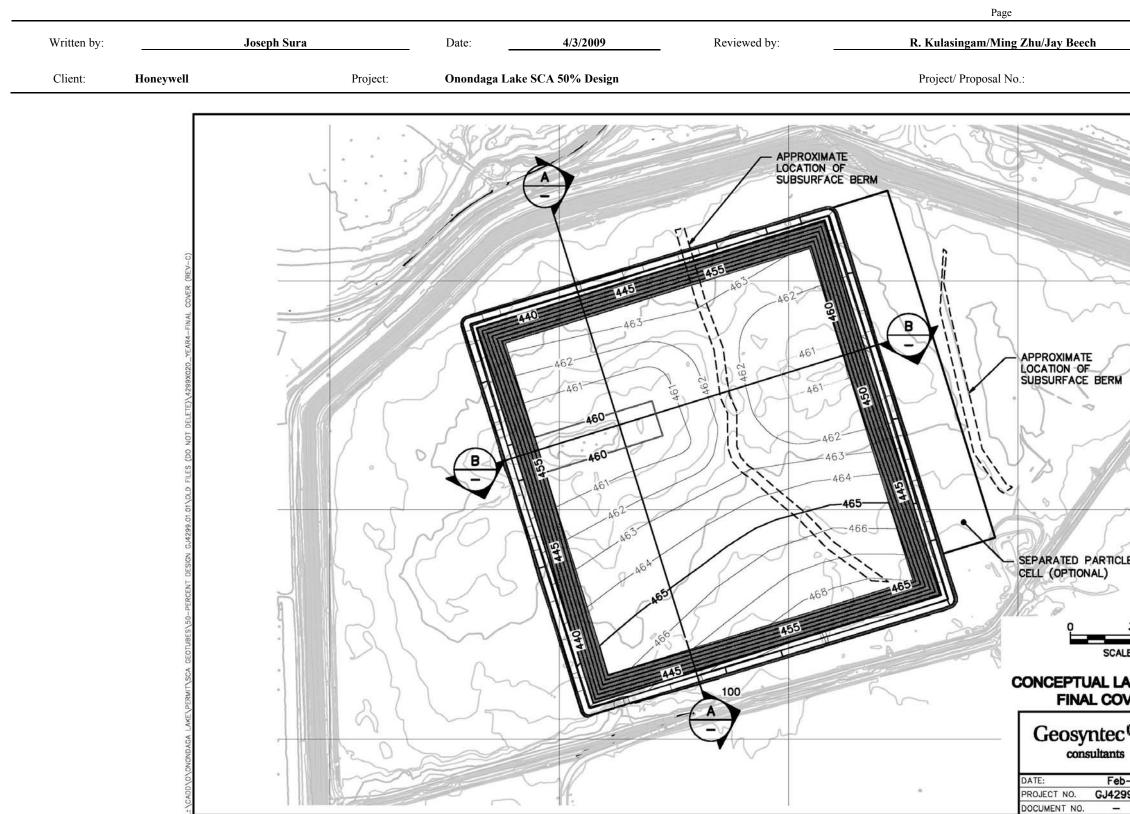


Figure 2. Locations of Analyzed Cross Sections

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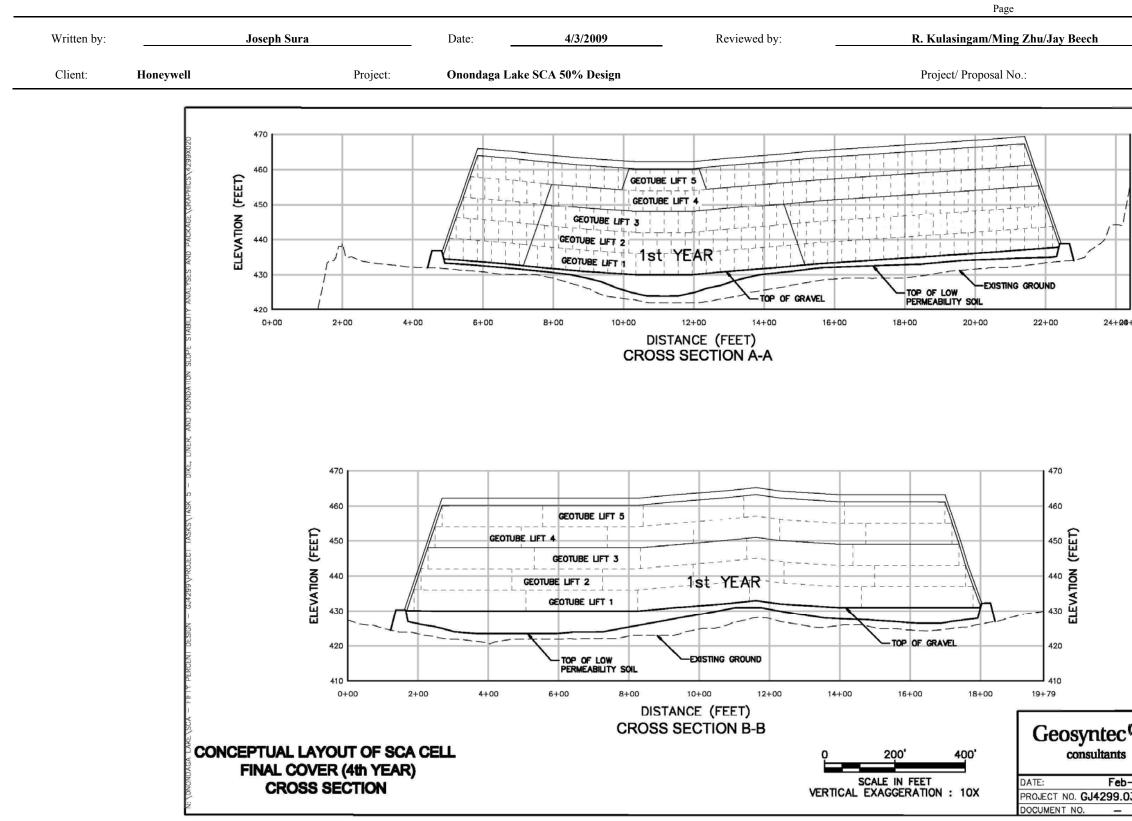


Figure 3. Layout of Cross-Sections A-A and B-B

Note: The geo-tube lift numbers and filling sequence presented in this figure are representative of a potential fill sequence for purposes of the evaluations provided herein.

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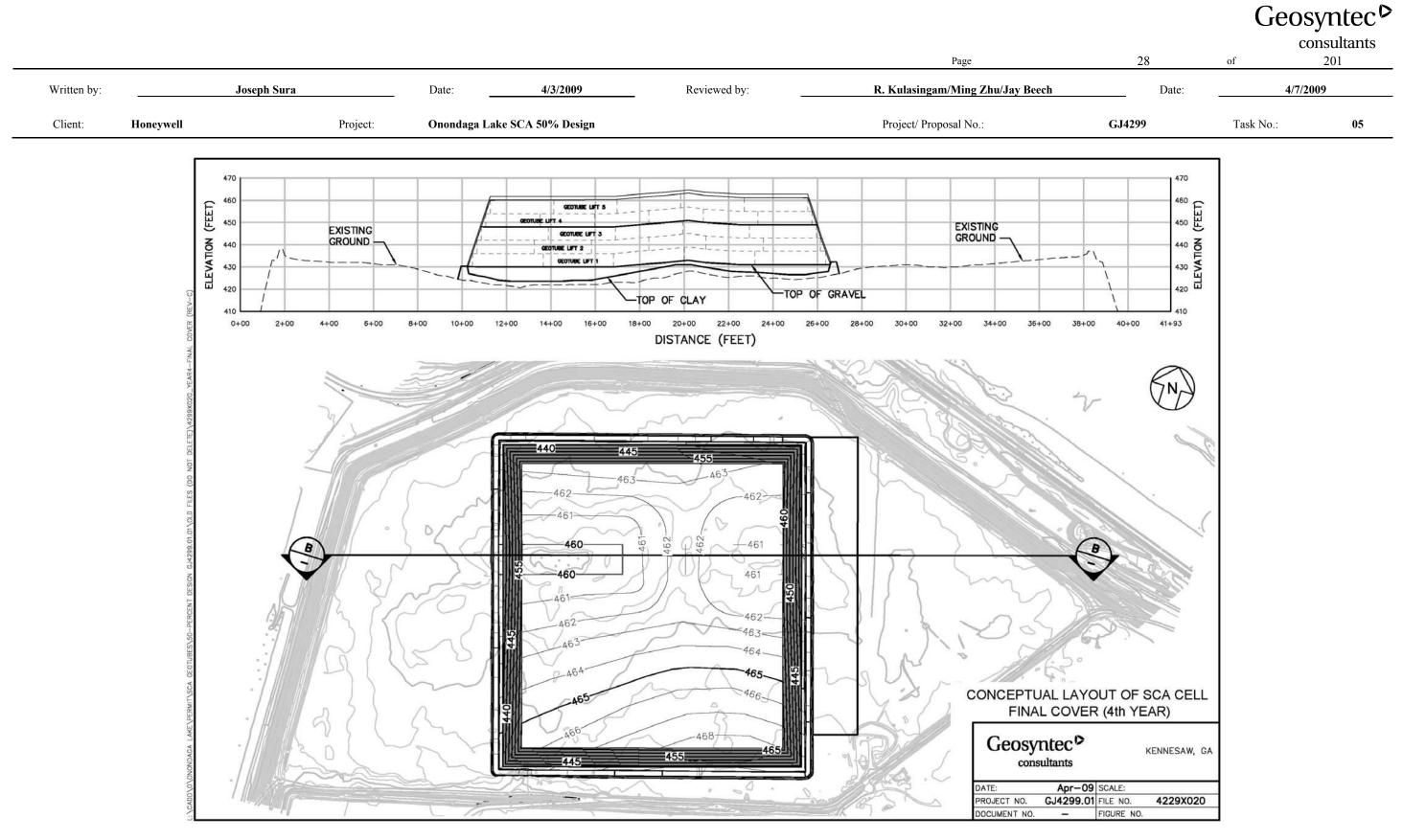


Figure 4. Cross-Section B-B including WB-13 Perimeter Dike Note: Cross-Section B-B shown here has the same geometry and location as in Figure 3, however the cross-section has been extended to show the existing WB-13 perimeter dike.

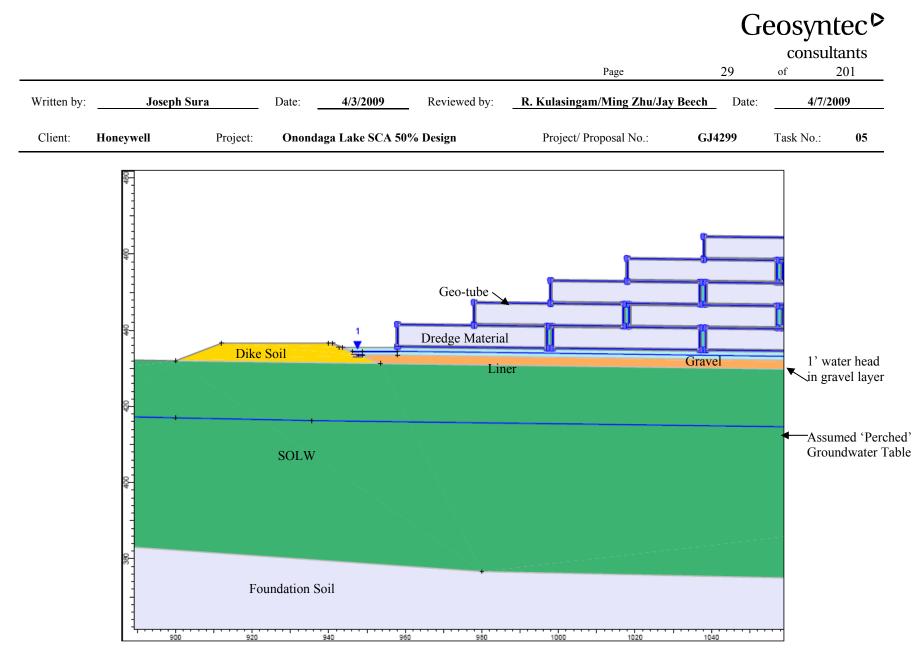


Figure 5. Layers included within the SLIDE Model

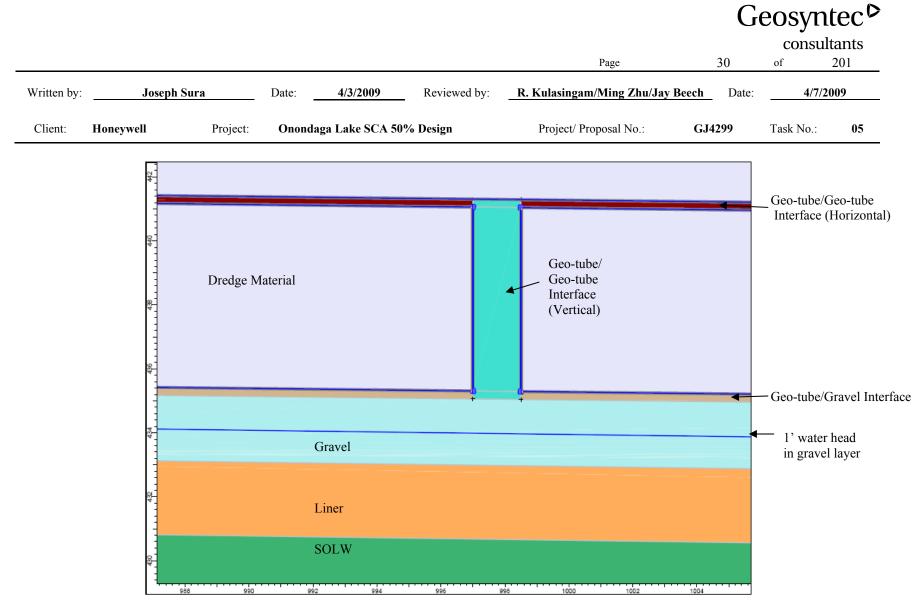


Figure 6. Close view of layers included within the SLIDE Model

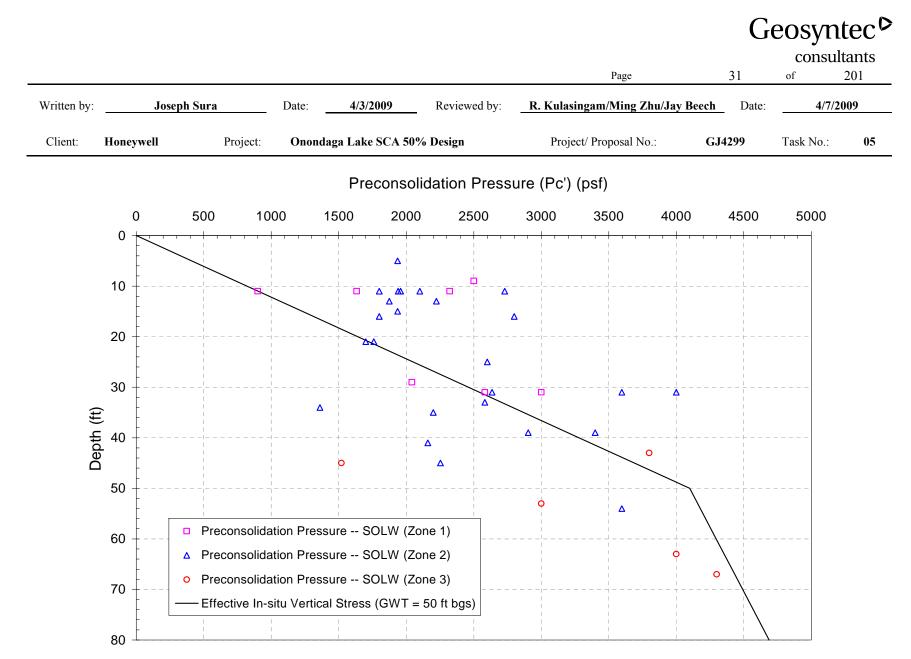


Figure 7. Preconsolidation Pressure of SOLW from Consolidation Tests

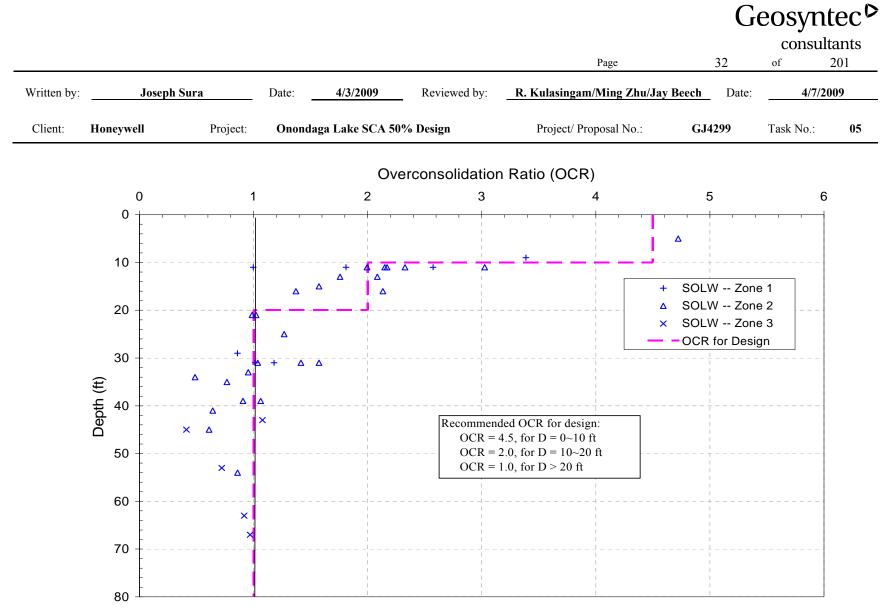
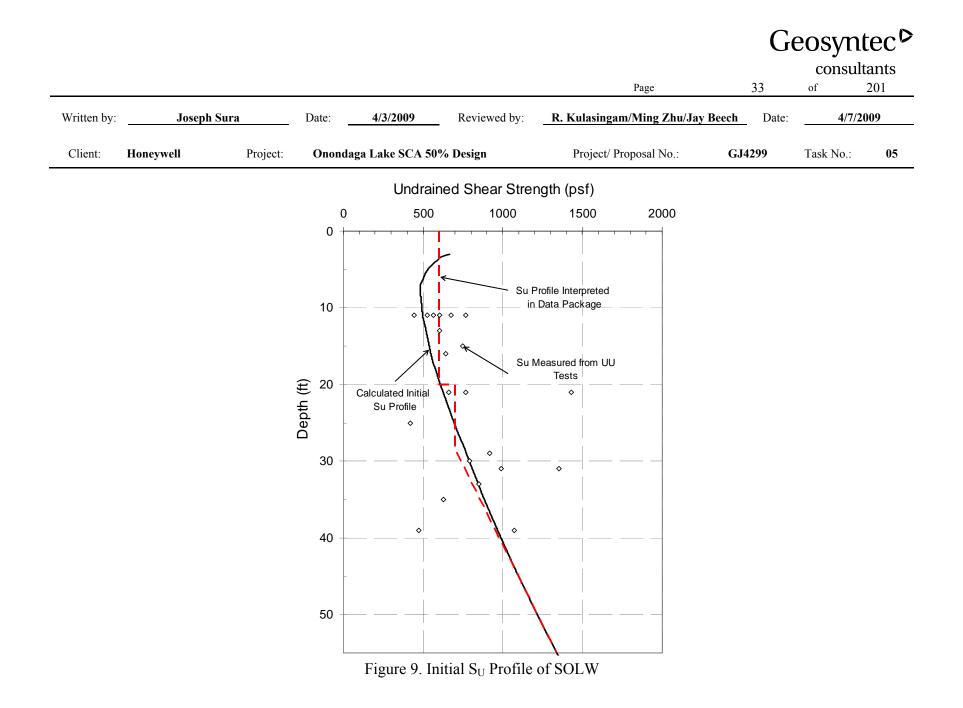


Figure 8. Overconsolidation Ratio of SOLW before Construction



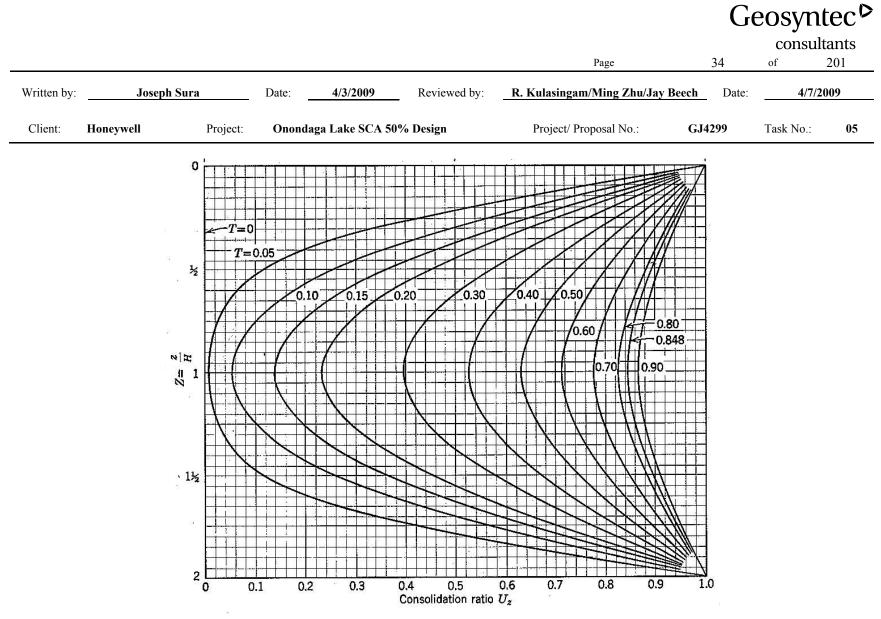
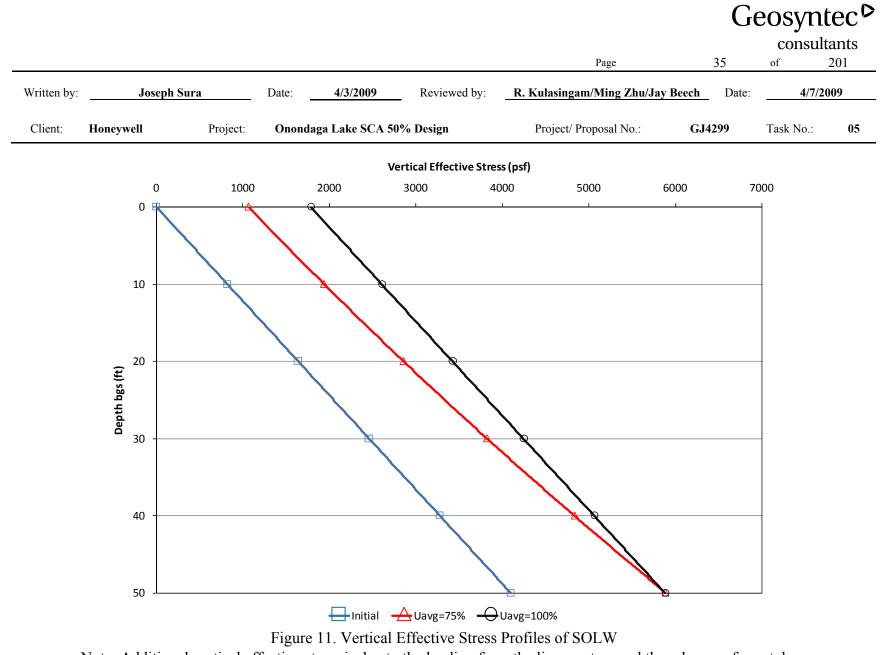
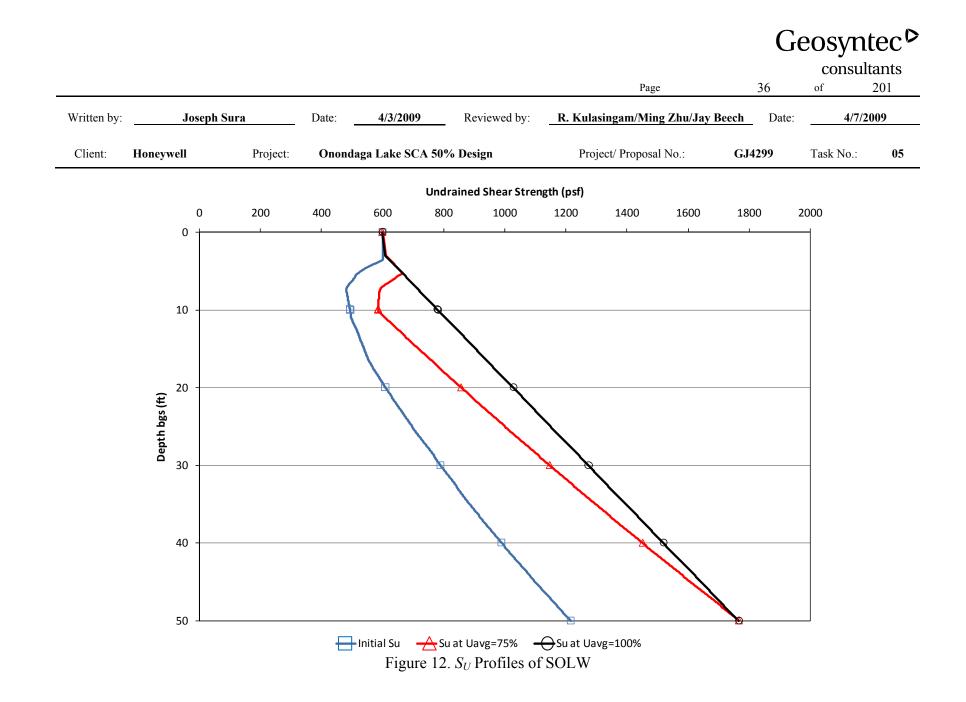


Figure 10. Consolidation Ratio as a Function of Depth [Lambe and Whitman, 1969] Note: The thickness of the layer was assumed to be 50 ft based on the average depth of the existing SOLW.

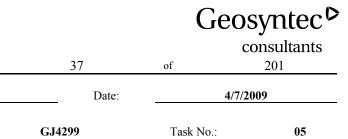


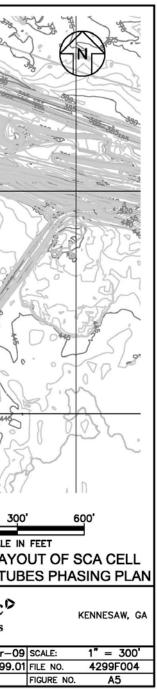
Note: Additional vertical effective stress is due to the loading from the liner system and three layers of geo-tubes.



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Figure 13: Potential First Year Geo-tube Phasing Plan





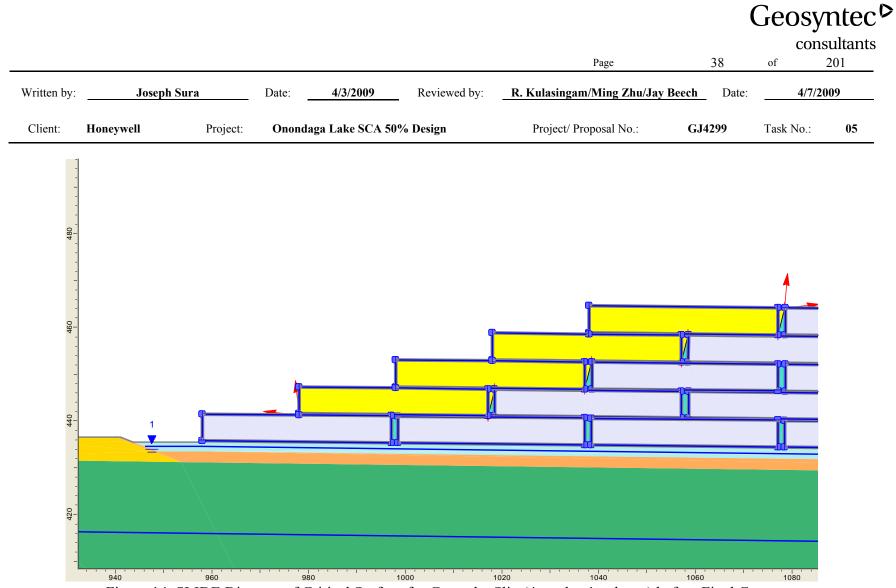


Figure 14. SLIDE Diagram of Critical Surface for Geo-tube Slip (4 stacks, 1 column) before Final Cover

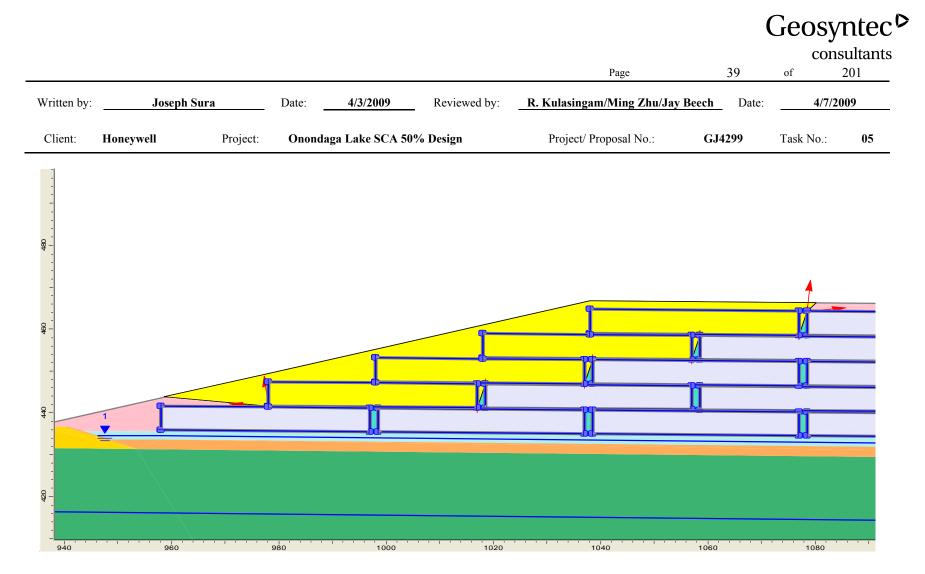


Figure 15. SLIDE Diagram of Critical Surface for Geo-tube Slip (4 stacks, 1 column) after Final Cover

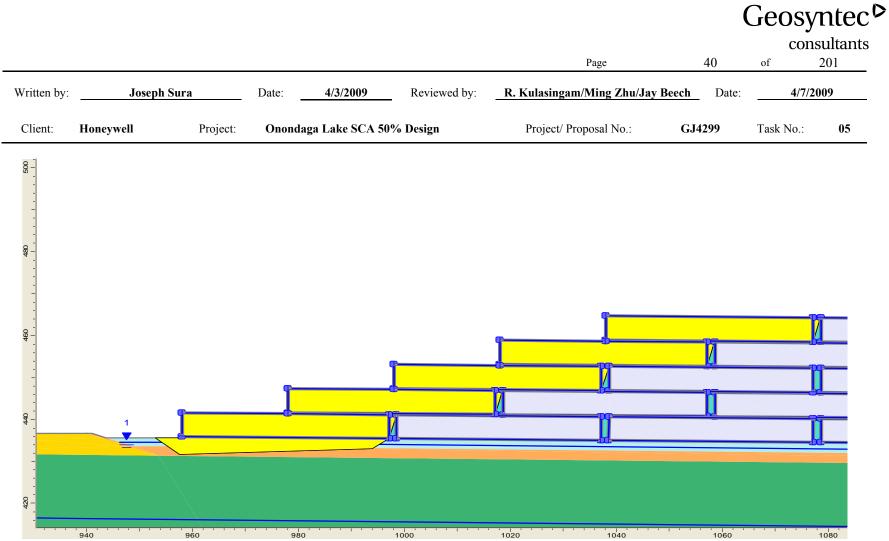


Figure 16. SLIDE Diagram of Critical Surface for Liner Stability (1 column) before Final Cover

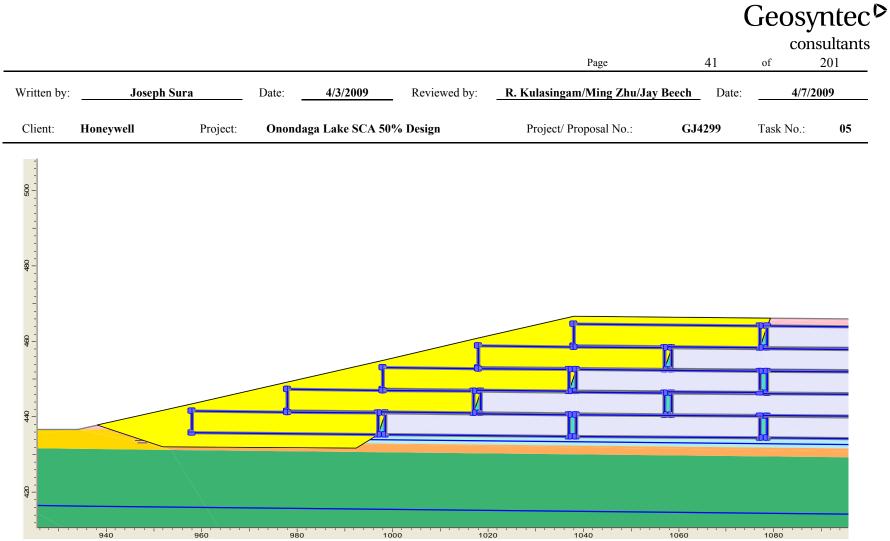


Figure 17. SLIDE Diagram of Critical Surface for Liner Stability (1 column) after Final Cover

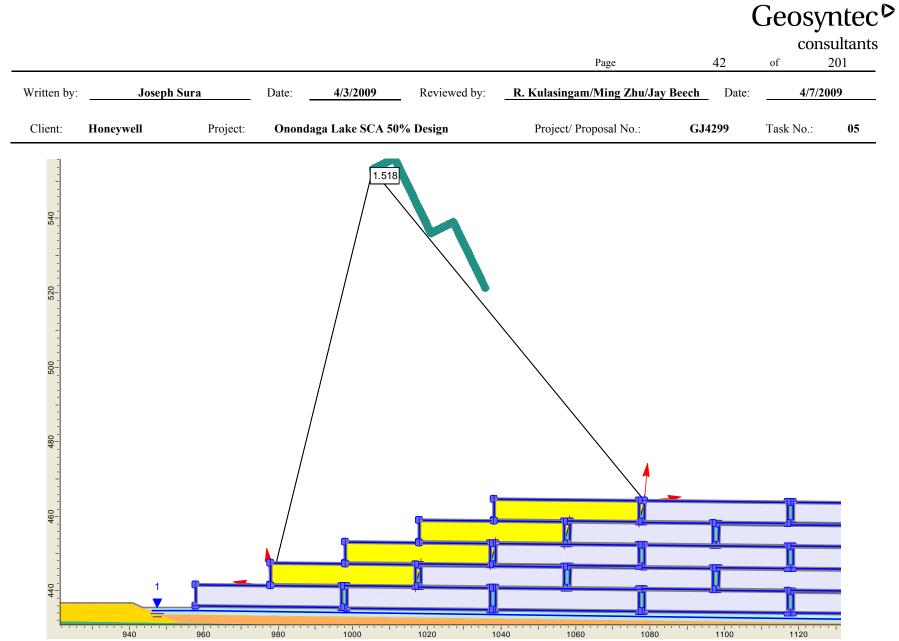


Figure 18. Slope Stability Analysis Result for Section A-A without Final Cover: NorthSide_NoCover_Tube_07_Lab

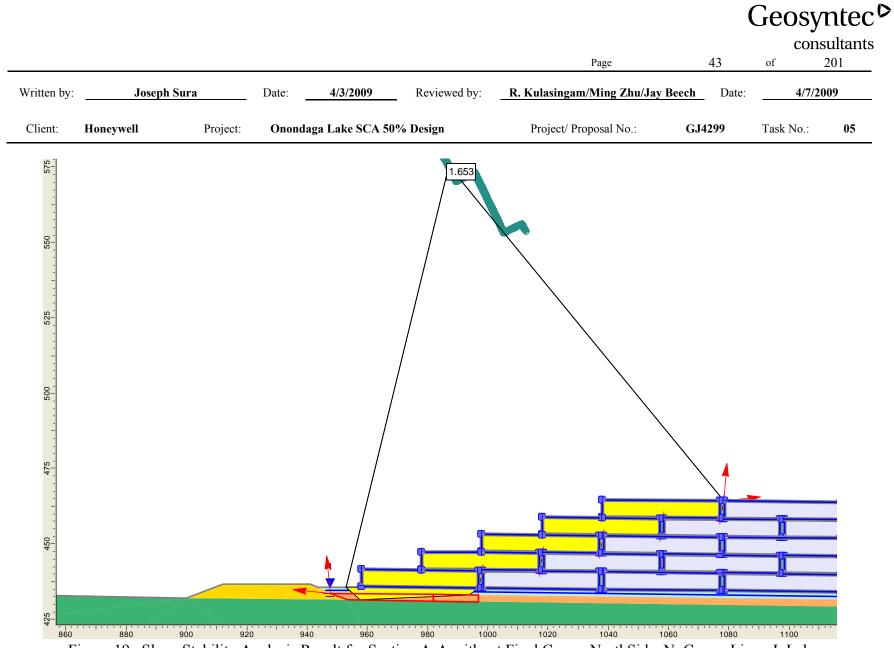


Figure 19. Slope Stability Analysis Result for Section A-A without Final Cover: NorthSide_NoCover_Liner_I_Lab

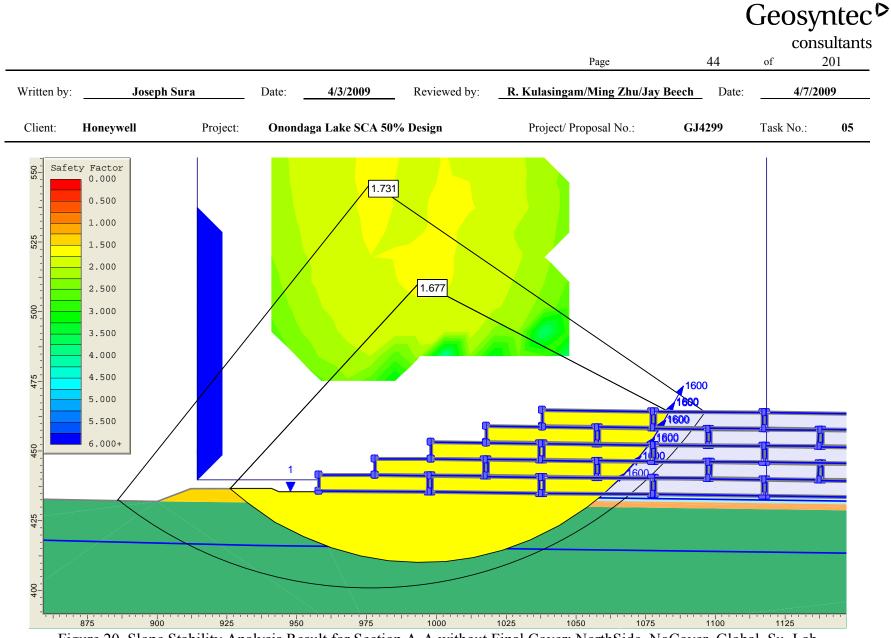


Figure 20. Slope Stability Analysis Result for Section A-A without Final Cover: NorthSide_NoCover_Global_Su_Lab Note: This Figure shows the FS calculated using Spencer's Method.

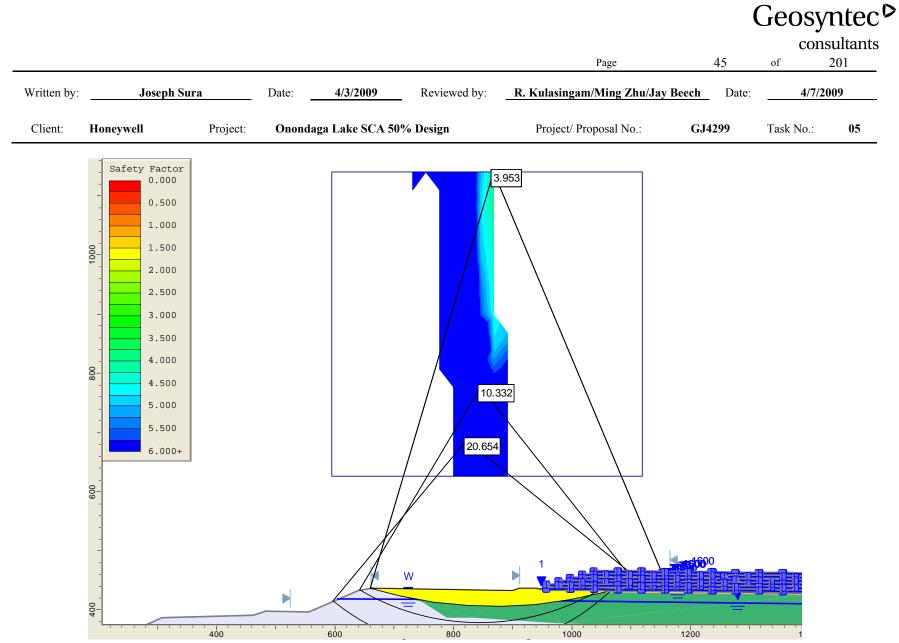


Figure 21. Slope Stability Analysis Result for Section A-A without Final Cover: NorthSide_NoCover_External_Lab Note: This Figure shows the FS calculated using Spencer's Method.

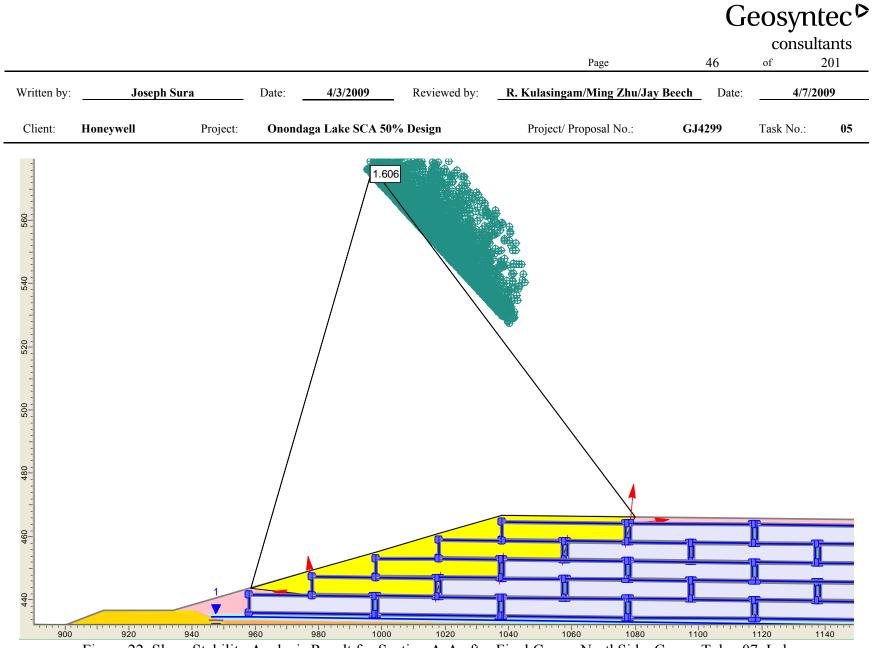


Figure 22. Slope Stability Analysis Result for Section A-A after Final Cover: NorthSide_Cover_Tube_07_Lab

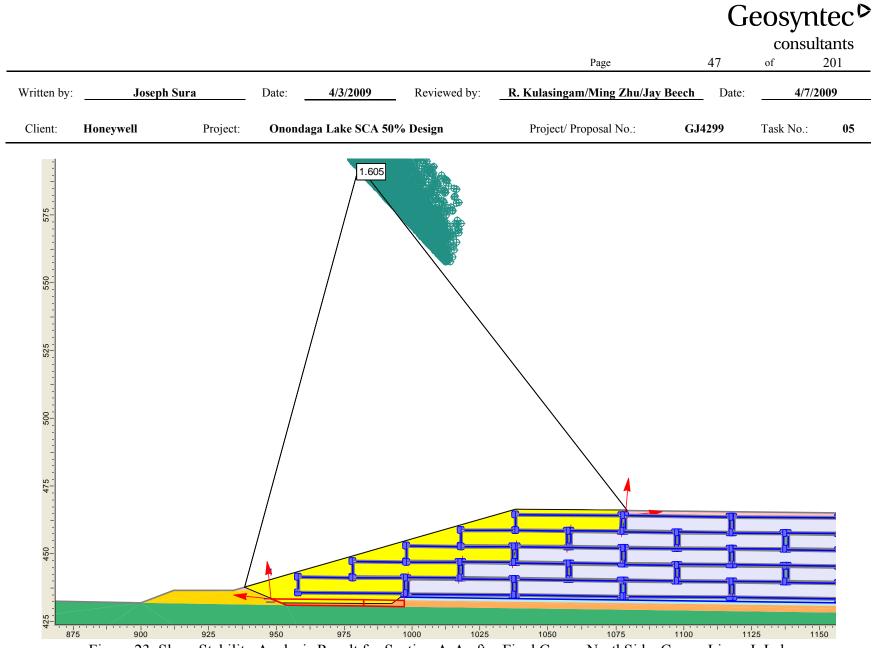


Figure 23. Slope Stability Analysis Result for Section A-A after Final Cover: NorthSide_Cover_Liner_I_Lab

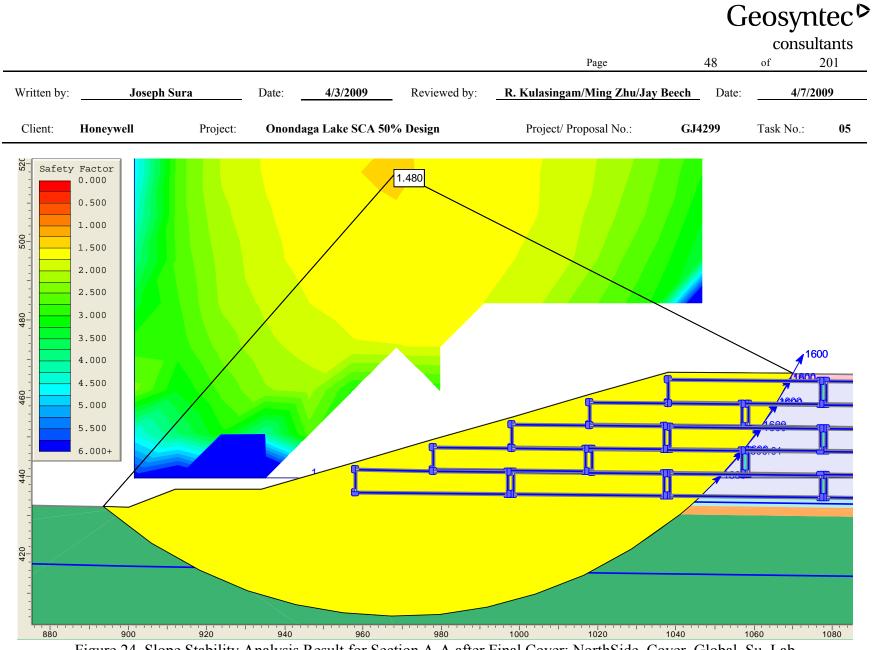
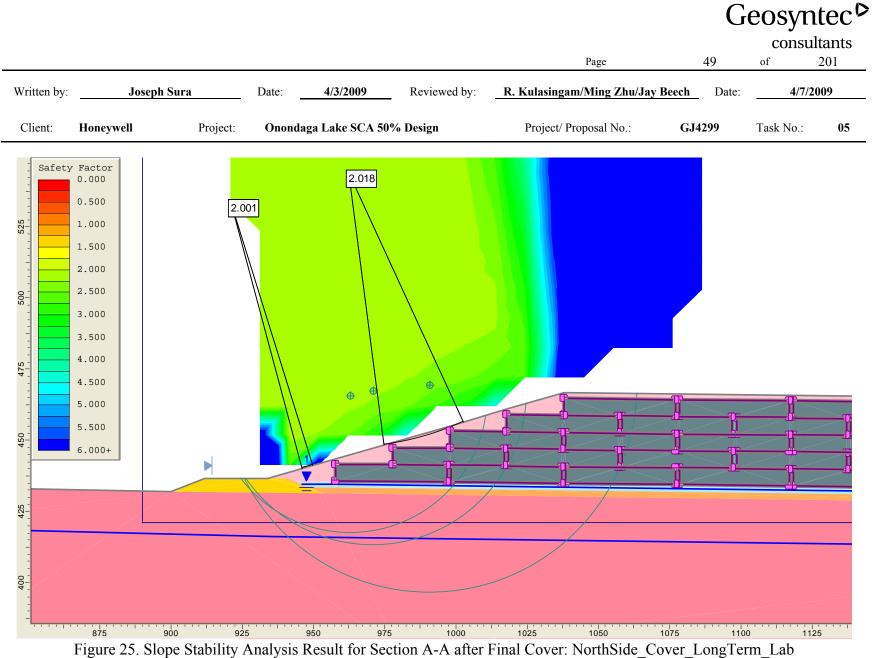


Figure 24. Slope Stability Analysis Result for Section A-A after Final Cover: NorthSide_Cover_Global_Su_Lab Note: This Figure shows the FS calculated using Spencer's Method.



Note: This Figure shows the FS calculated using Spencer's Method.

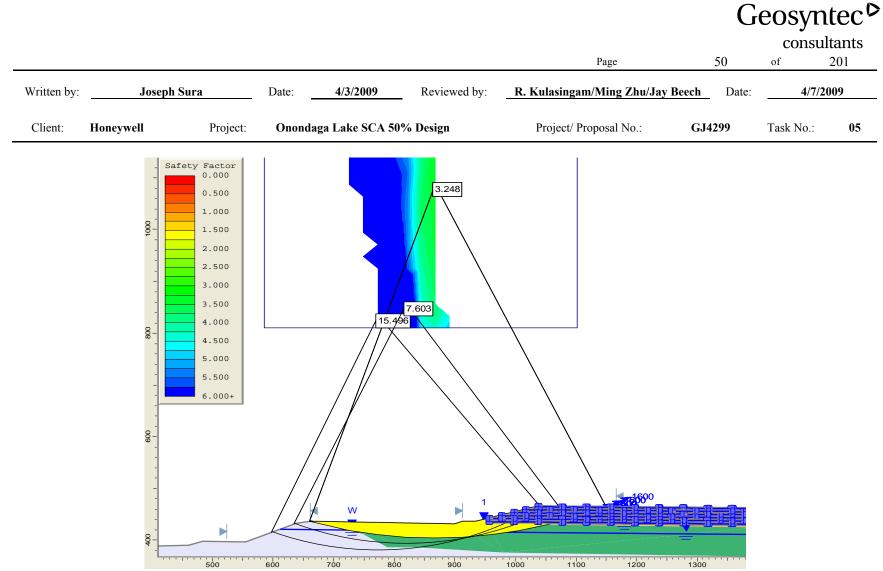


Figure 26. Slope Stability Analysis Result for Section A-A after Final Cover: NorthSide_Cover_Global_External_Lab Note: This Figure shows the FS calculated using Spencer's Method.

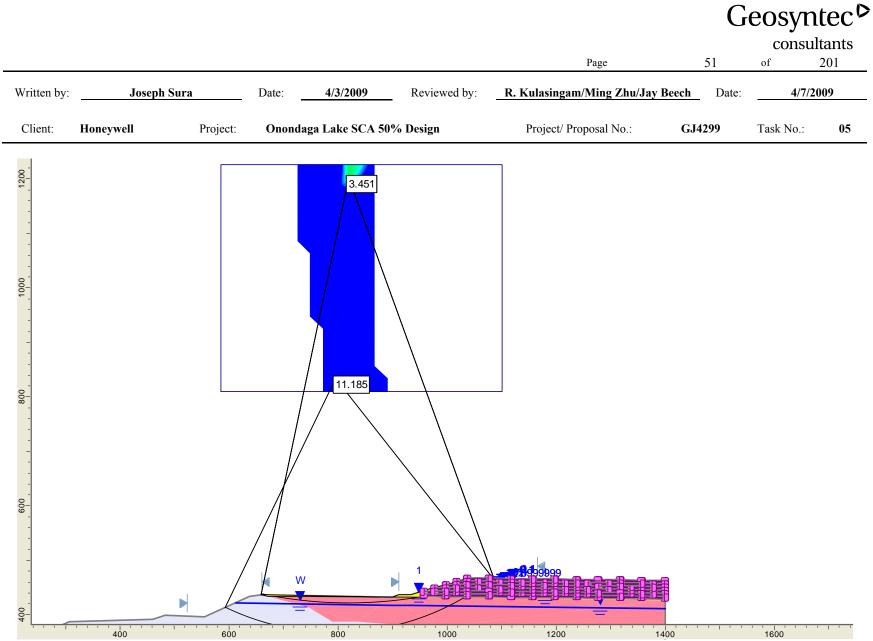
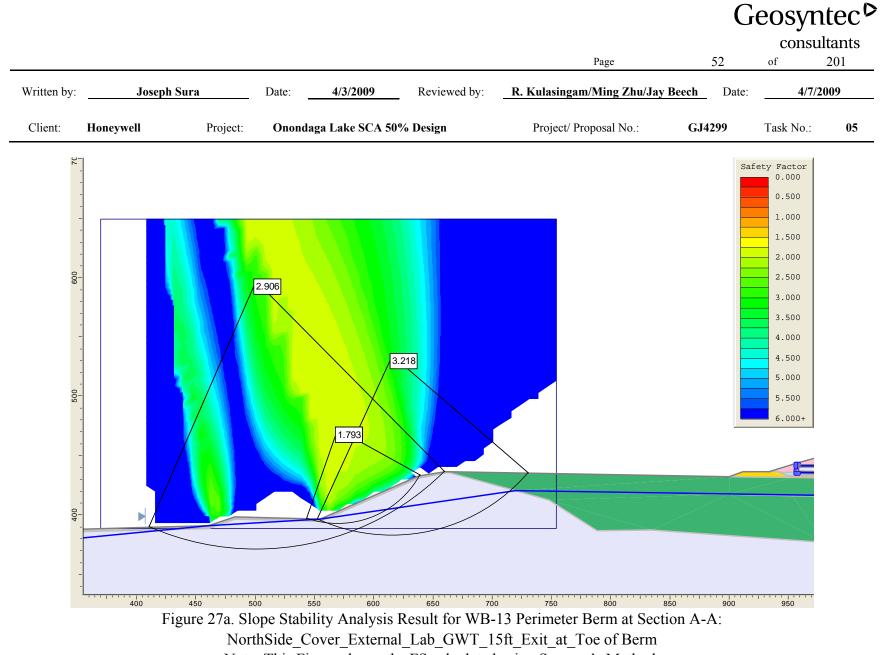
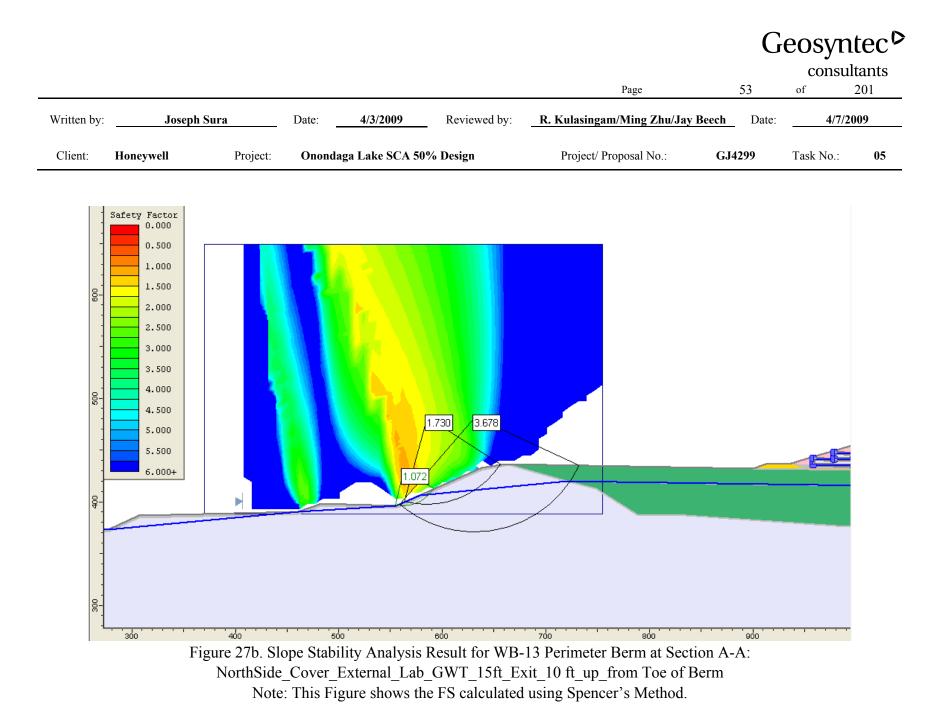


Figure 27. Slope Stability Analysis Result for Section A-A after Final Cover: NorthSide_Cover_Global_External_LongTerm_Lab Note: This Figure shows the FS calculated using Spencer's Method.



Note: This Figure shows the FS calculated using Spencer's Method.



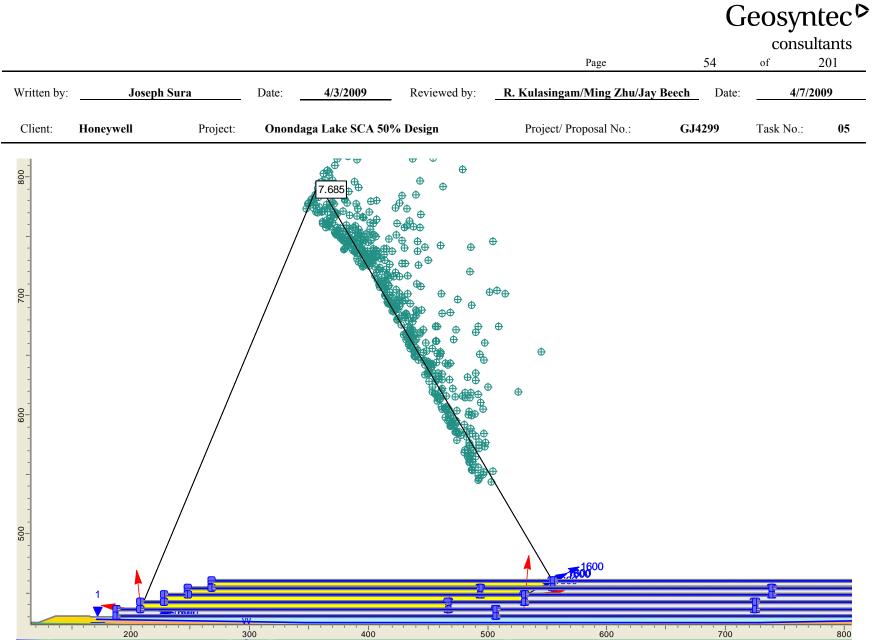


Figure 28. Slope Stability Analysis Result for Section B-B before Final Cover: EastWest_NoCover_Tube_04_Lab

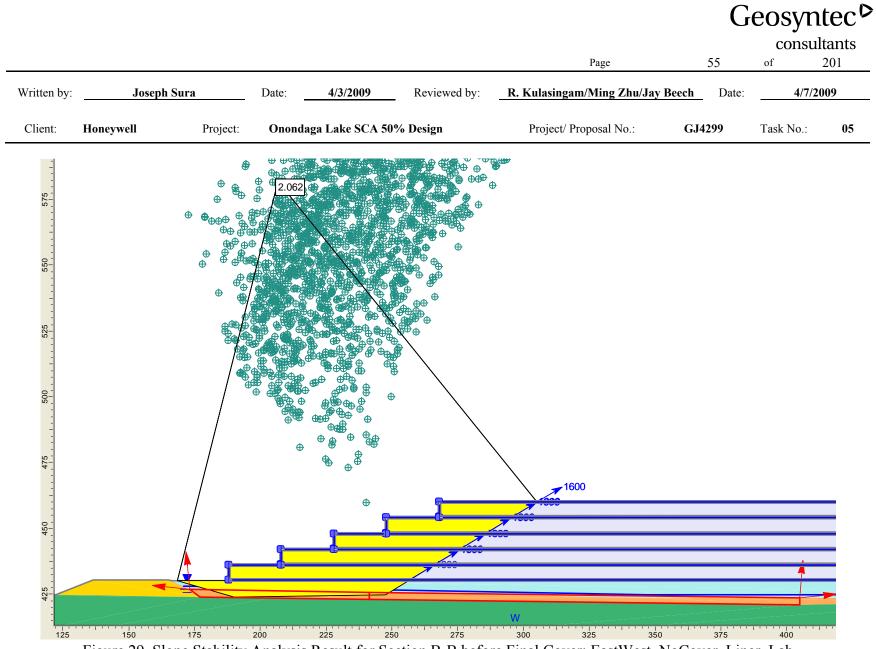
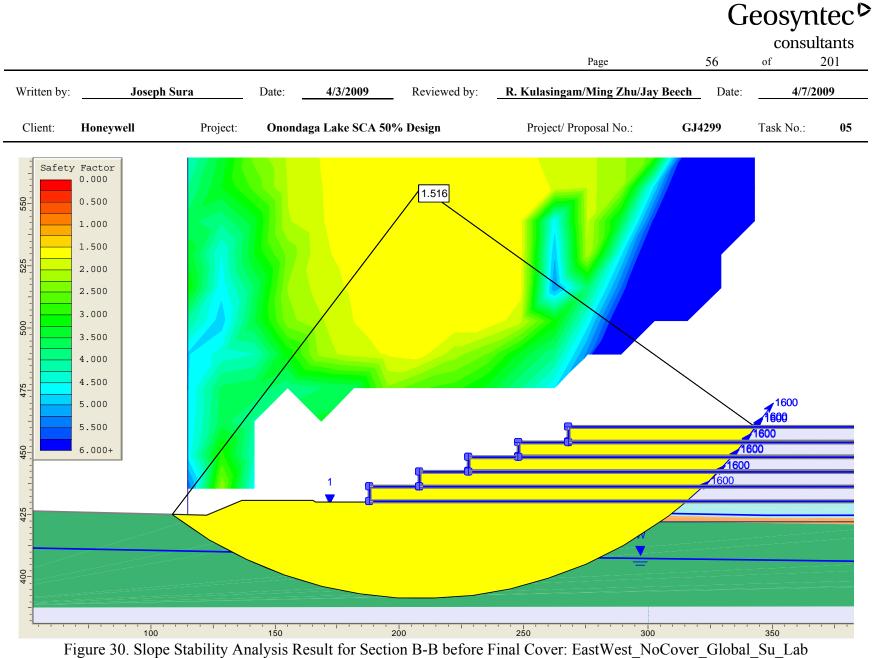


Figure 29. Slope Stability Analysis Result for Section B-B before Final Cover: EastWest_NoCover_Liner_Lab



Note: This Figure shows the FS calculated using Spencer's Method.

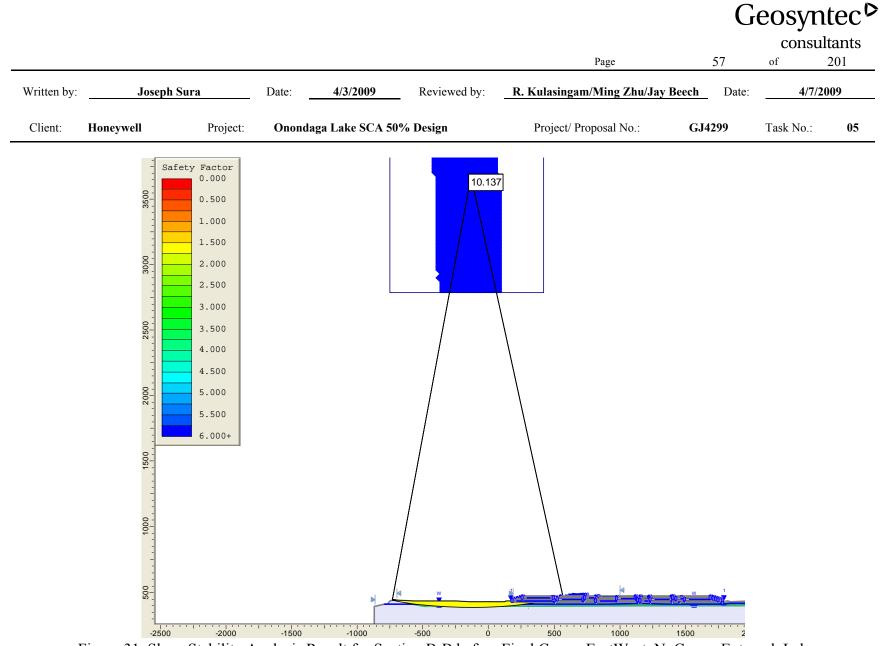


Figure 31. Slope Stability Analysis Result for Section B-B before Final Cover: EastWest_NoCover_External_Lab Note: This Figure shows the FS calculated using Spencer's Method.

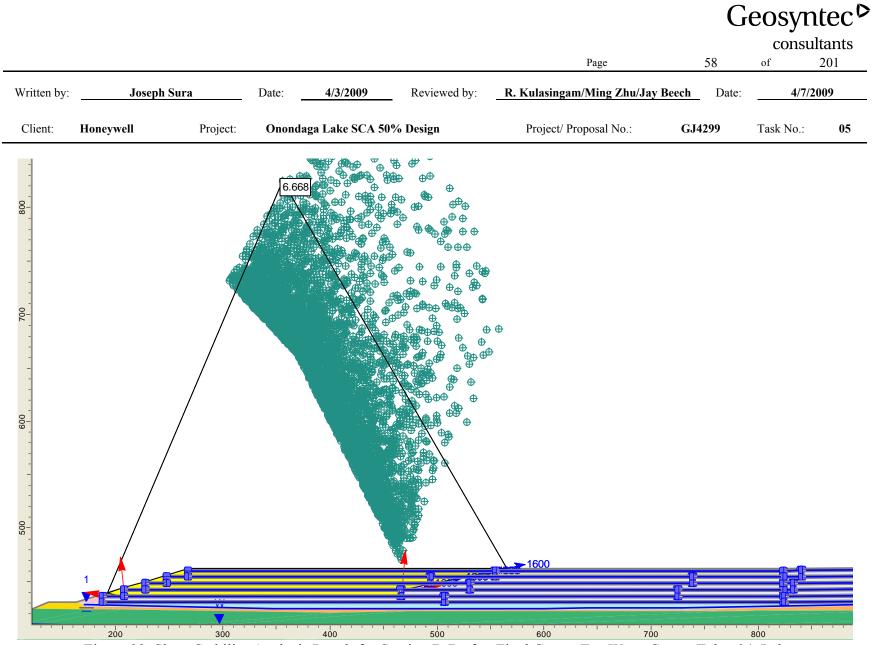


Figure 32. Slope Stability Analysis Result for Section B-B after Final Cover: EastWest_Cover_Tube_04_Lab

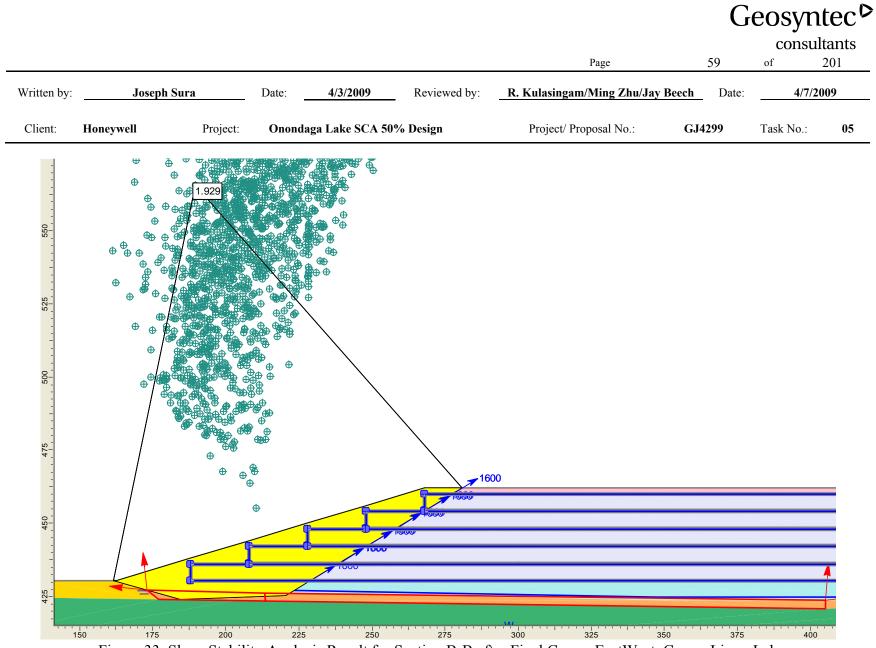
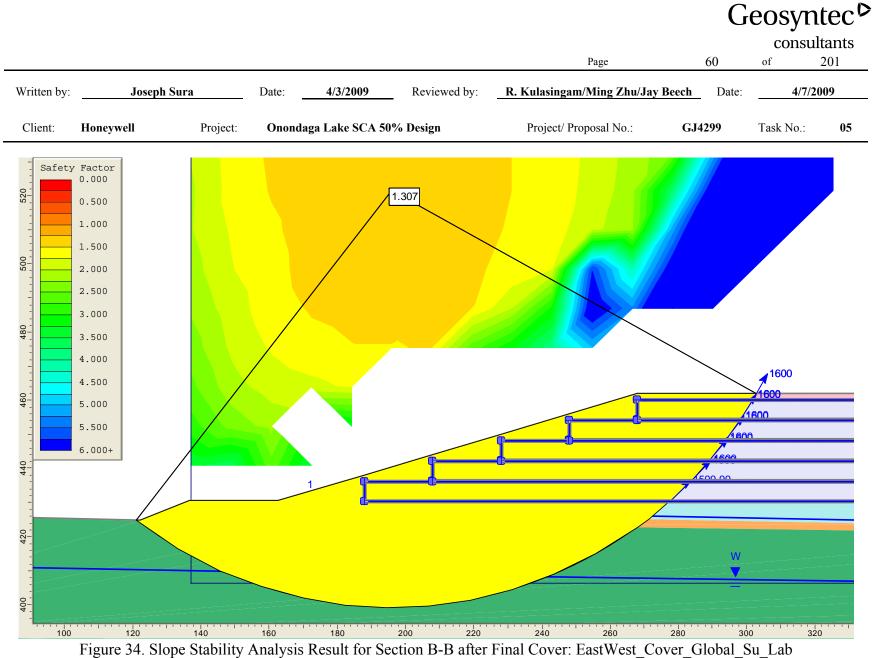
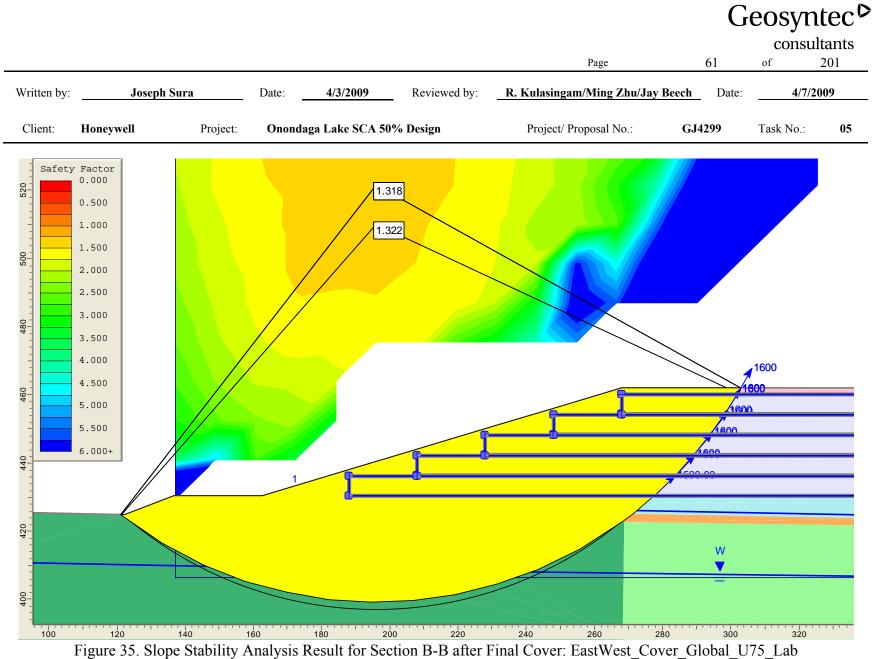


Figure 33. Slope Stability Analysis Result for Section B-B after Final Cover: EastWest_Cover_Liner_Lab

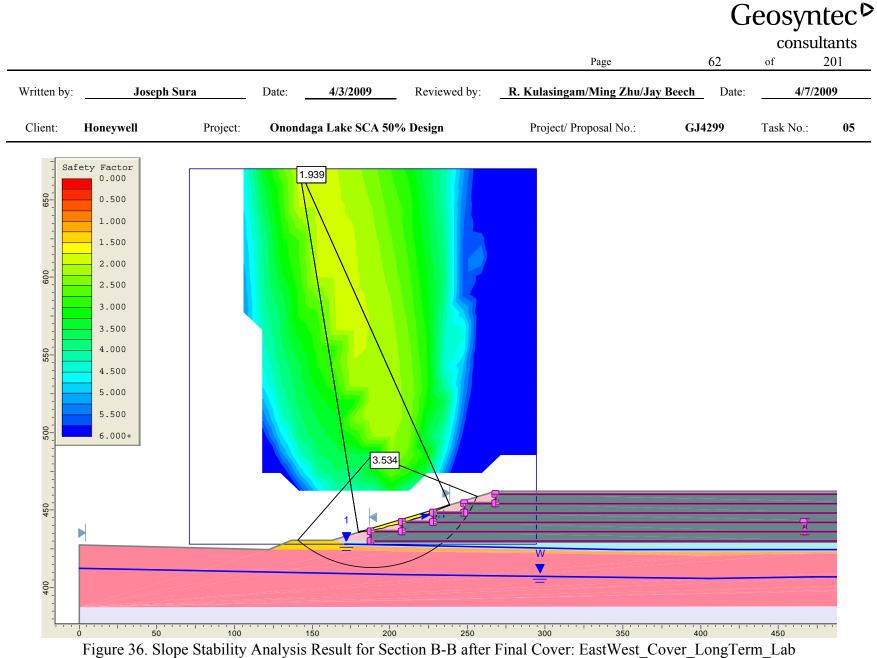


Note: This Figure shows the FS calculated using Spencer's Method.



Note: This Figure shows the FS calculated using Spencer's Method.

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Note: This Figure shows the FS calculated using Spencer's Method.

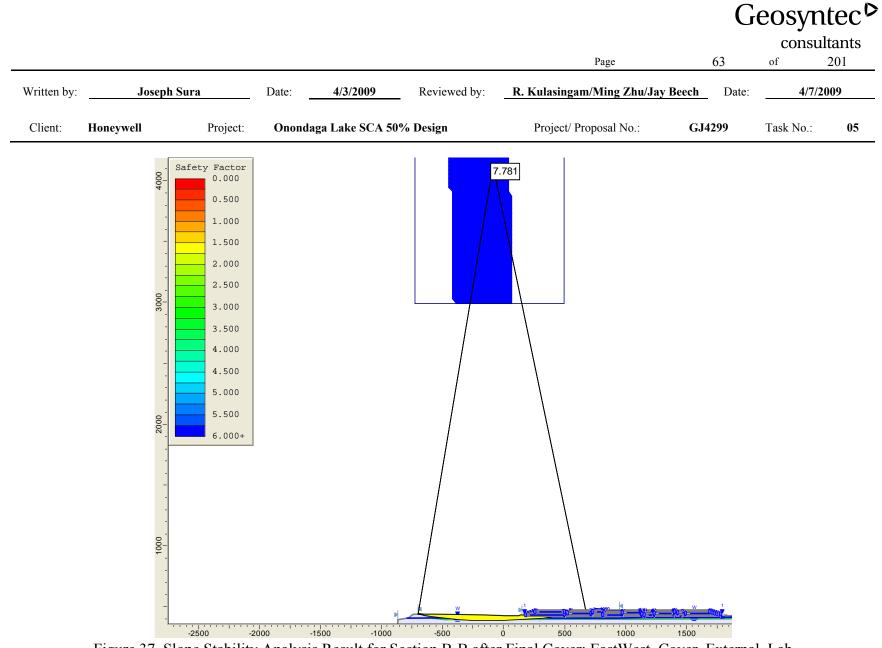
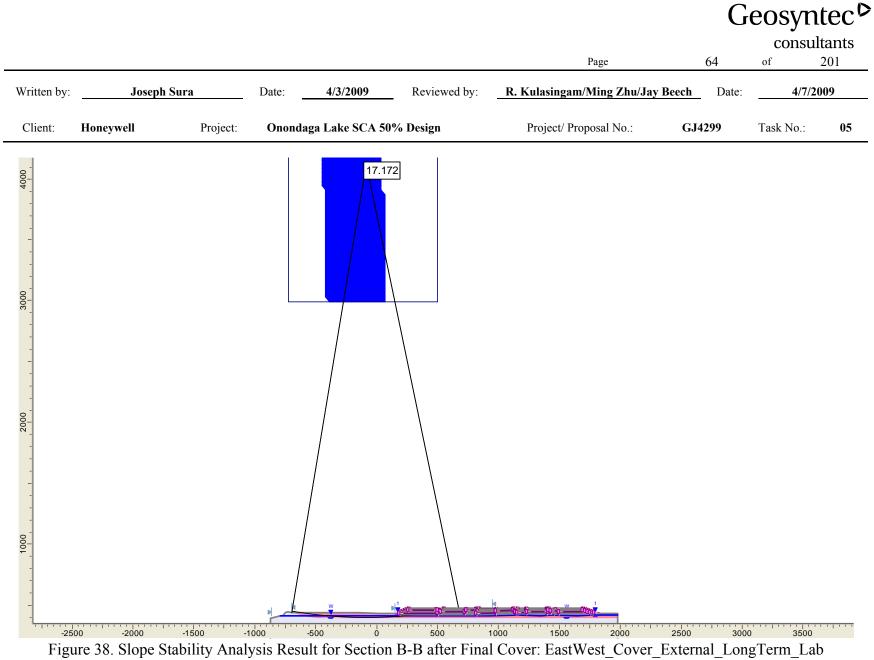


Figure 37. Slope Stability Analysis Result for Section B-B after Final Cover: EastWest_Cover_External_Lab Note: This Figure shows the FS calculated using Spencer's Method



Note: This Figure shows the FS calculated using Spencer's Method

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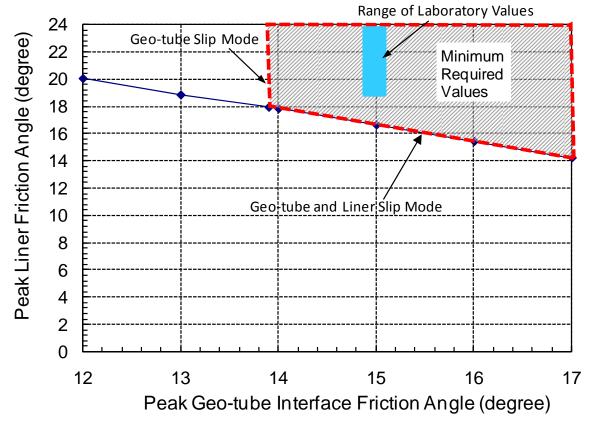
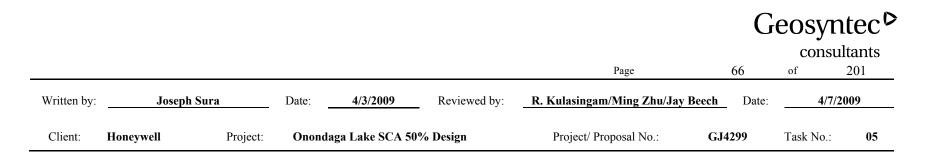


Figure 39. Sensitivity Analysis of Peak Liner Friction Angle: Minimum required values



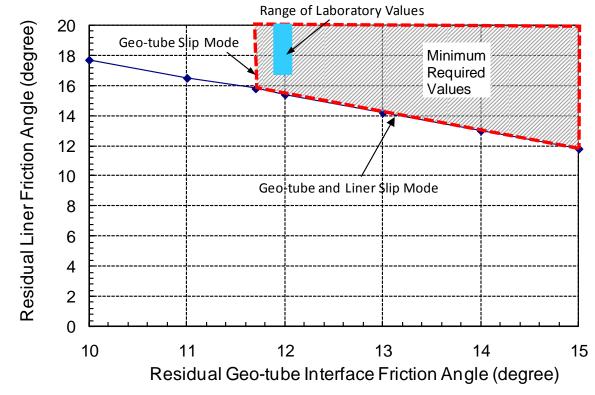


Figure 40. Sensitivity Analysis of Residual Liner Friction Angle: Minimum required values

Geosyntec[▷] consultants Page 67 of 201 Written Reviewed R. Kulasingam/Ming Joseph Sura Date: 4/3/2009 Date: 4/7/2009 by: Zhu/Jay Beech by: **Onondaga Lake SCA 50%** Project/ Proposal Task Client: GJ4299 05 Honeywell Project: Design No.: No.:

Attachment 1 Seismic Impact Zone

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NYSDEC Regulations Section 360-2.7(b)(7) states that a seismic analysis is required "for new landfills, lateral expansions of existing landfills, and subsequent development of any landfill permitted pursuant to these provisions located in a seismic impact zone." The seismic impact zone is defined as "an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 250 years."

According to the 2008 USGS National Seismic Hazard Map [Petersen et al, 2008], the SCA site falls within an area characterized by a peak ground acceleration (i.e., maximum horizontal acceleration in lithified earth material) of 0.0784g with 2 percent probability of exceedance in 50 years, which is approximately equivalent to 10 percent of exceedance in 250 years. The USGS Seismic Hazard Curves and Uniform Response Spectra computer analysis program was also used to calculate the peak ground acceleration with 10 percent of exceedance in 250 years directly, resulting in an estimated peak ground acceleration of 0.0765g. Table 1-1 presents the peak ground acceleration, as calculated by the software, and Figure 1-1 shows the location of the SCA on the USGS National Seismic Hazard Map.

Therefore, based on the maximum horizontal acceleration, the SCA is not located in a seismic impact zone as defined by NYSDEC Regulations. As a result, a seismic slope stability analysis is not required.

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Table 1-1. Peak Ground Accelerations Based on SCA Site Location

Hazard Curve for PGA, Latitude = 43.0600, Longitude = -76.2500

PGA (%g)	%PE	Time
7.84	2%	50 years
7.65	10%	250 years

Seismic Hazard Curves and Uniform Response Spectra. USGS, October 2008.

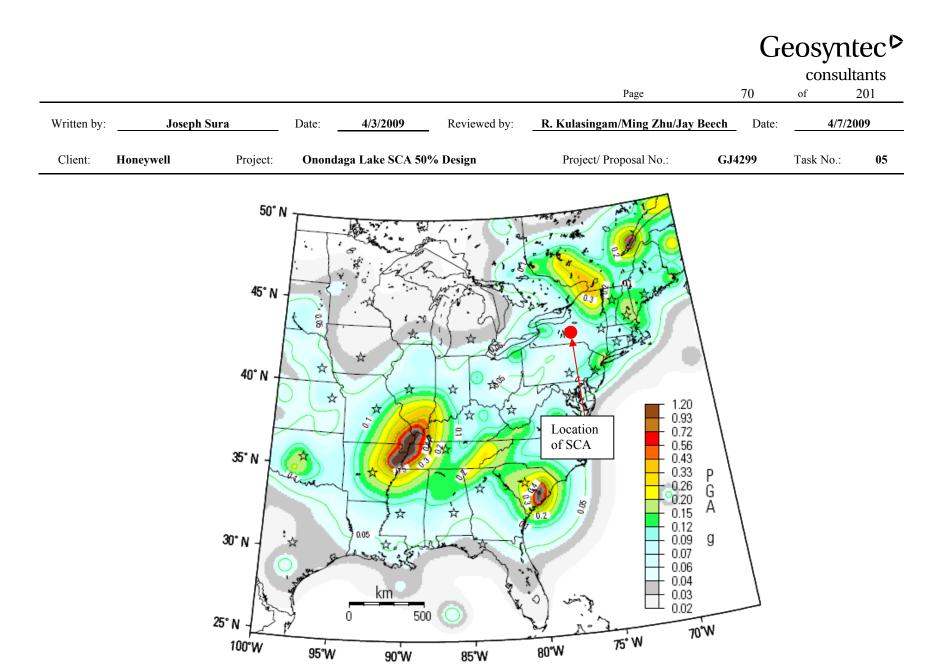


Figure 1-1. Location of the SCA on the USGS National Seismic Hazard Map

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Attachment 2 Interface Direct Shear Testing (Results provided to Geosyntec by Parsons)

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Attachment 2 Notes:

This attachment contains a summary of interface direct shear tests performed by SGI Testing Services at the request of Parsons. These tests focus on measuring shear strengths for several possible slip interfaces.

Test	Figure	Upper Shear Box	Top Liner	Bottom Liner	Lower Shear Box	Φ' _{PEAK} (°) ^[1]	c′ _{PEAK} (psf) ^[2]	Φ'_{RESIDUAL} (°) ^[1]	c' _{residual} (psf) ^[2]	Figure Number
C-1	2-1	Concrete Sand	Non-Woven Geotextile	Smooth HDPE Geomembrane	Compacted Clay	13 ^[3]	30 ^[3]	9	25	2-1
C-2	2-2	Concrete Sand	Non-Woven Geotextile	Textured HDPE Geomembrane	Compacted Clay	27	225	17	130	2-2
C-3	2-3	Concrete Sand	Non-Woven Geotextile	EPDM Geomembrane	Compacted Clay	22	5	18	10	2-3
C-4	2-4	Concrete Sand	Non-Woven Geotextile	PP Geomembrane	Compacted Clay	19 ^[4]	5	18	5	2-4
C-5	2-5	Rigid Substrate	Geo-tube Geotextile	Geo-tube Geotextile	Concrete Sand	15 ^[5]	-5 ^[6]	12	5	2-5

1. This is the friction angle. The laboratory designated the friction angle as δ , however in this table, it has been labeled Φ ' for consistency with the rest of this package.

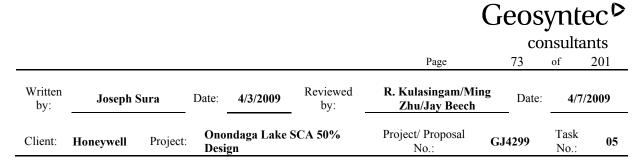
2. This is the cohesion intercept. The laboratory designated the cohesion intercept as α, however in this table, it has been labeled c' for consistency with the rest of this package. In stability calculations, this value was conservatively modeled to be zero.

3. Smooth HDPE Geomembrane is not considered for use in this project.

4. This peak effective stress friction angle between the geomembrane and compacted clay layer was used in the analyses presented herein because it had the lowest value of the three geomembrane types under consideration for this project. This liner friction angle value was input into SLIDE. Final selection of geomembrane will be made based on the results of ongoing chemical compatibility testing.

5. This peak effective stress friction angle for the geo-tube/geo-tube interface was input into SLIDE for calculation of FS values.

6. This negative value is due to the linear interpolation method used to interpret strength parameters.



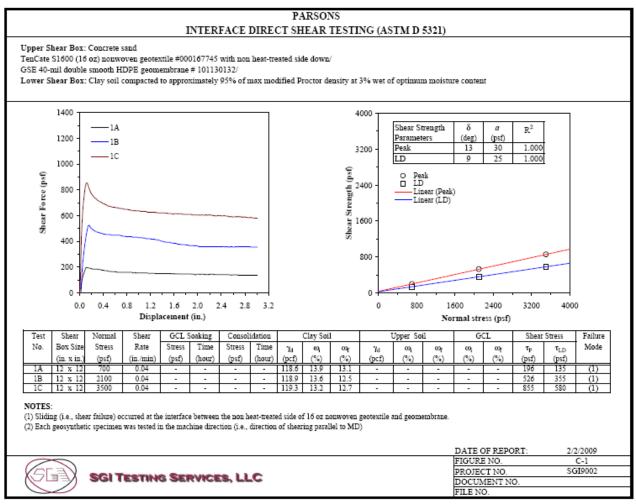


Figure 2-1: Direct Shear Testing of Geotextile/Smooth HDPE Geomembrane Interface

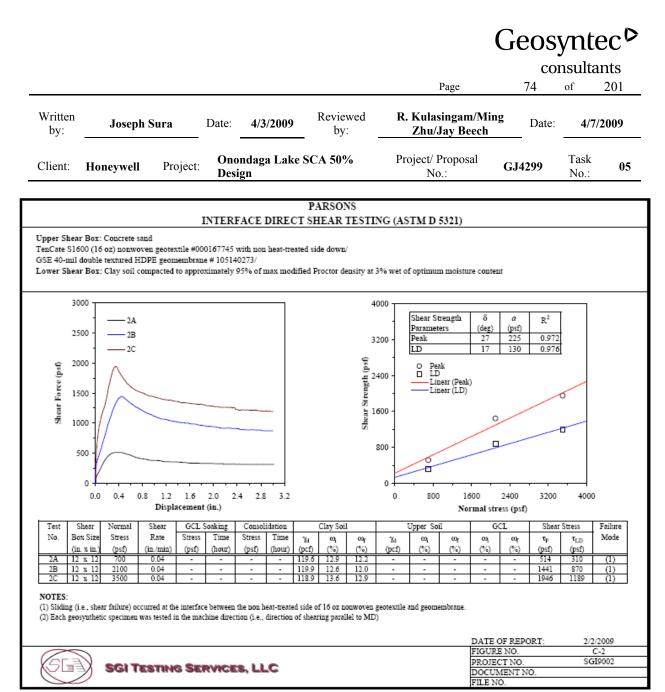


Figure 2-2: Direct Shear Testing of Geotextile/Textured HDPE Geomembrane Interface

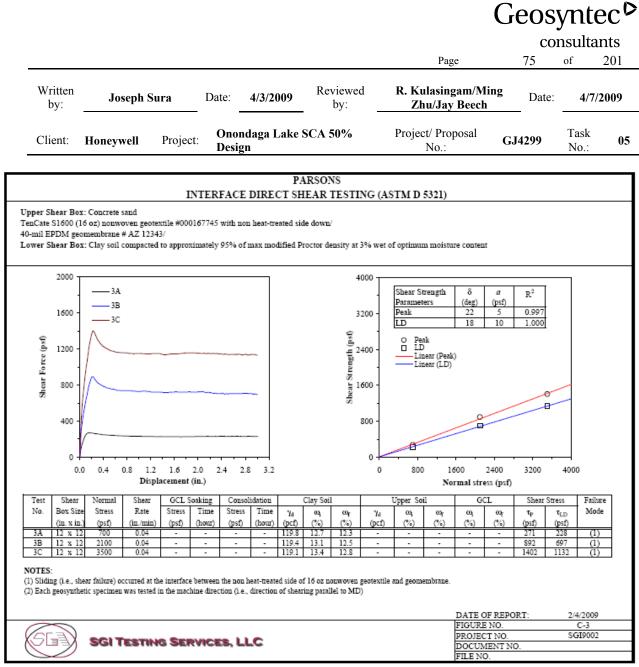


Figure 2-3: Direct Shear Testing of Geotextile/EPDM Geomembrane Interface

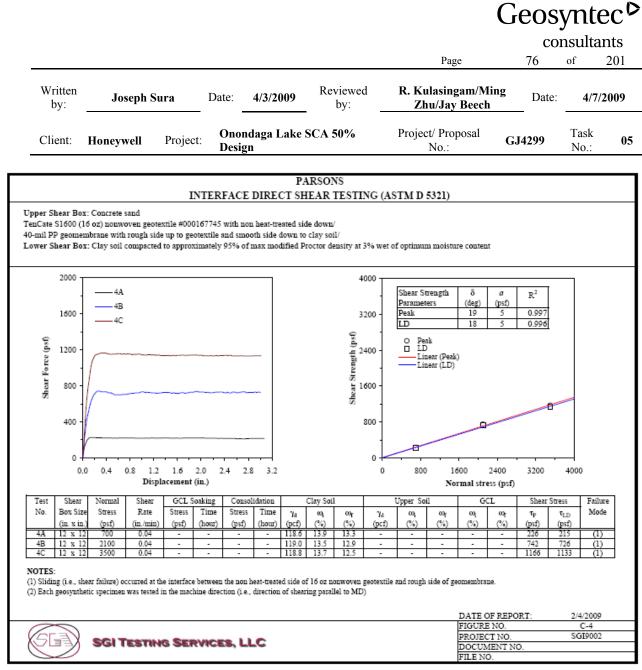


Figure 2-4: Direct Shear Testing of Geotextile/PP Geomembrane Interface

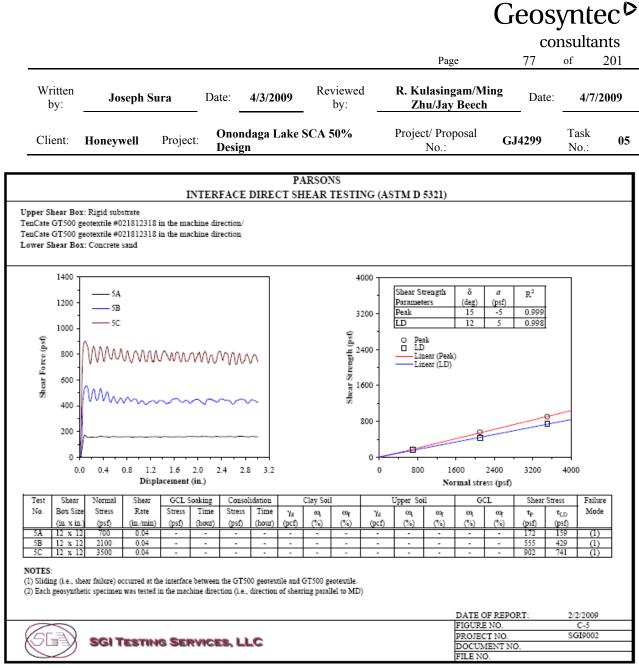


Figure 2-5: Direct Shear Testing of Geo-tube/Geo-tube Interface

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Attachment 3 Slope Stability Analyses Using the Maximum Laboratory Measured Liner Friction Angles

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Slope stability analyses were performed for the critical cases of Cross-Section A-A using the maximum friction angles found from laboratory testing of possible liner system materials. This is intended to show an expected range of calculated FS values based on the laboratory variability in effective stress friction angle. The maximum liner effective stress peak and residual friction angles found in laboratory testing are 27 degrees and 18 degrees, respectively.

It is noted that the horizontal geo-tube/geo-tube interface has been modeled with peak and residual effective stress friction angles of 15 degrees and 12 degrees, respectively, in the following analyses, and other material properties are modeled as discussed in the main text.

Table 3-1 on the following page shows the FS for the critical liner case of one column of the liner slipping under one column geo-tubes. This case was evaluated using Janbu's method for peak and residual shear strengths before and after construction of the final cover. These cases can be compared with the equivalent Cross-Section A-A case from Table 2 for the minimum measured peak friction angle.

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 Table 3-1: Critical Liner Case for Cross-Section A-A using the Maximum Laboratory Effective

 Stress Friction Angle

Case	Calculated FS	Target FS
Peak Friction Angle, without Final Cover ^[1]	1.97	1.3
Residual Friction Angle, without Final Cover ^[2]	1.44	1.1
Peak Friction Angle, with Final Cover ^[1]	1.96	1.5
Residual Friction Angle, with Final Cover ^[2]	1.41	1.3

Notes:

- 1. These FS values are calculated using the laboratory values of peak effective stress friction angle for the geo-tube/geo-tube horizontal interface (15 degrees) and maximum peak effective stress friction angle for the liner system (27 degrees). The laboratory test data are shown in Figures 2-2 and 2-5 of Attachment 2.
- 2. These FS values are calculated using the laboratory values of residual effective stress friction angle for the geo-tube/geo-tube horizontal interface (12 degrees) and maximum residual effective stress friction angle for the liner system (18 degrees). The laboratory test data are shown in Figures 2-4 and 2-5 of Attachment 2.
- 3. This table calculates the FS for the critical liner case of one column of geo-tubes.

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Attachment 4 Back-Calculation of Required Geo-tube\Geo-tube and Liner System Interface Shear Strengths

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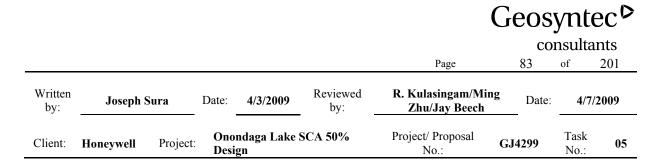
Notes:

The stability analyses discussed in the Results and Discussion section of this package were performed using friction angles from laboratory testing on materials that will likely be used for the geo-tubes and liner. Since the required FS values were met, the ability to achieve adequate stability using typical construction materials has been established. However, the use of different materials may be preferred; therefore, development of a range of acceptable parameters is required.

As described in the Analyzed Cases section, once the critical cases were identified for geo-tube and liner stability slip modes, peak and residual effective stress friction angles for the geo-tube interface and the proposed liner could be back-calculated. Since Cross-Section A-A was the more critical cross section of the two, the back-calculations were only performed on that cross section. These back-calculations indicated the following:

- For the interim condition before final cover placement, peak effective stress friction angles of 12.9 degrees for the horizontal geo-tube interface and 12.8 degrees for the proposed liner are required. In addition, residual effective stress friction angles of 11 degrees for the horizontal geo-tube interface and 10.3 degrees for the proposed liner are required.
- For the final condition after final cover placement, peak effective stress friction angles of 13.9 degrees for the horizontal geo-tube interface and 17.9 degrees for the proposed liner are required. In addition, residual effective stress friction angles of 11.7 degrees for the horizontal geo-tube interface and 15.8 degrees for the proposed liner are required.
- Therefore, the minimum required peak effective stress friction angles to meet the target FS values for both interim and final conditions are 13.9 degrees for the horizontal geo-tube interface and 17.9 degrees for the proposed liner system. The minimum required residual effective stress friction angles to meet the target FS values for both the interim and final conditions are 11.7 degrees for the horizontal geo-tube interface and 15.8 degrees for the proposed liner.

These back-calculated friction angles for interim and final conditions are plotted in Figures 4-1 through 4-6. The blue boxes indicate the friction angles found from the laboratory testing of commercially available products, as shown in Attachment 2. The combinations of horizontal geo-tube and liner interface friction angles required to reach the target FS are shown in Tables 4-1 through 4-4. The calculated FS values using the back-calculated friction angles are shown in Tables 4-5 and 4-6.



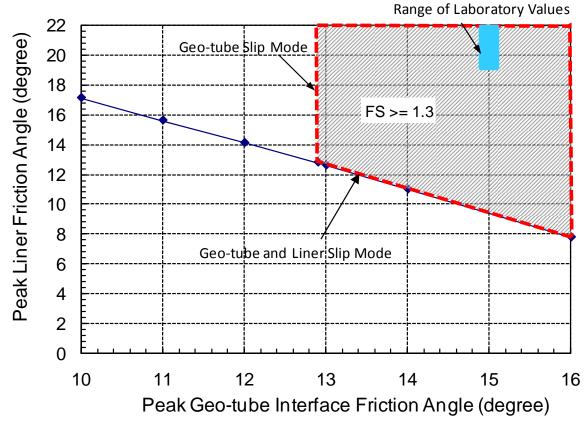


Figure 4-1: Sensitivity Analysis of Liner Interface Friction Angle Without Final Cover, using Peak Strengths

Geosyntec[▷] consultants Page 84 of 201 Written Reviewed R. Kulasingam/Ming 4/3/2009 4/7/2009 **Joseph Sura** Date: Date: Zhu/Jay Beech by: by: Project/ Proposal **Onondaga Lake SCA 50%** Task Client: GJ4299 05 Honeywell Project: Design No.: No.:

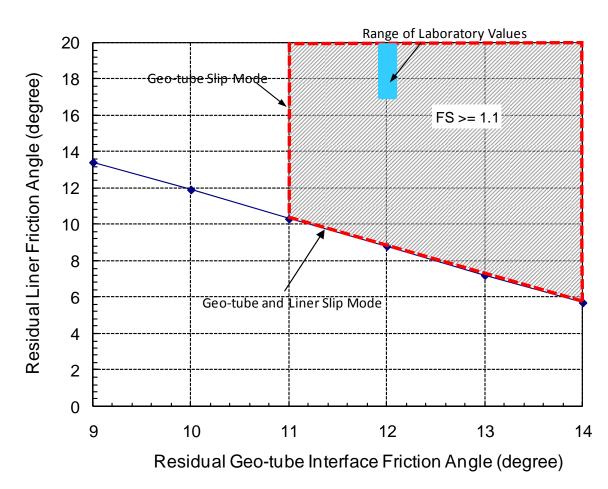


Figure 4-2: Sensitivity Analysis of Liner Interface Friction Angle Without Final Cover, using Residual Strengths

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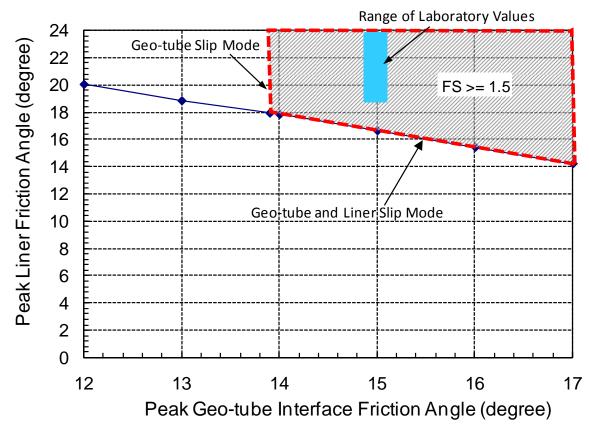


Figure 4-3: Sensitivity Analysis of Liner Interface Friction Angle after Final Cover Placement, using Peak Strengths

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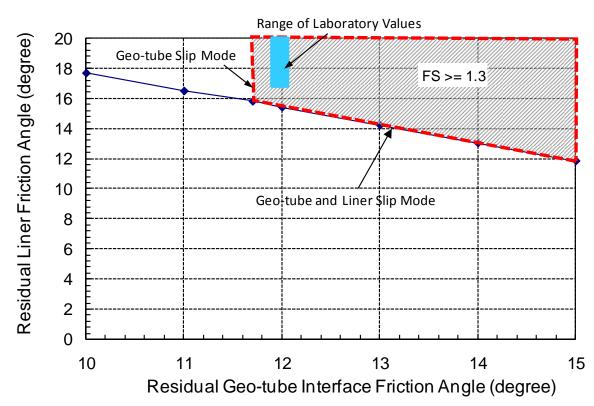


Figure 4-4: Sensitivity Analysis of Liner Interface Friction Angle after Final Cover Placement, using Residual Strengths

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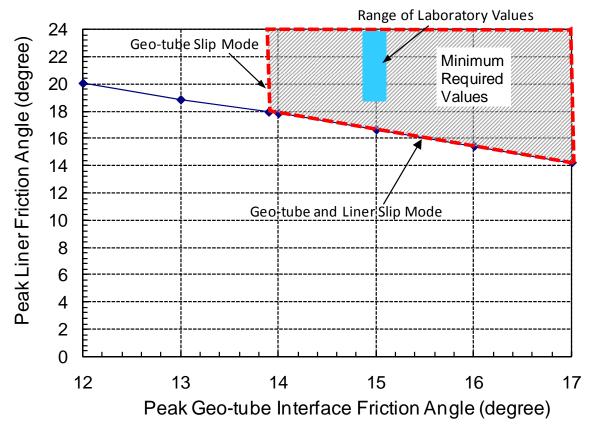


Figure 4-5: Sensitivity Analysis of Peak Liner Friction Angle: Minimum Required Values

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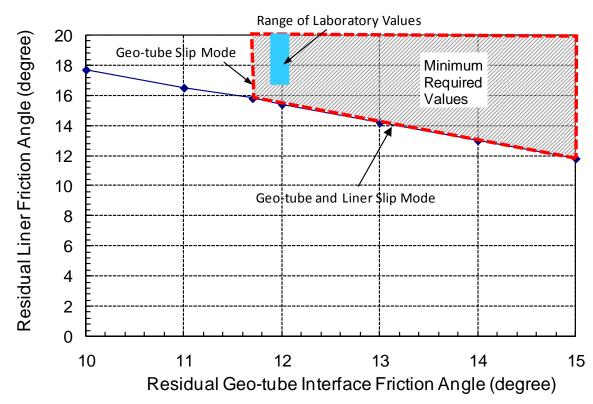


Figure 4-6: Sensitivity Analysis of Residual Liner Friction Angle: Minimum Required Values

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Table 4-1. Sensitivity Analysis of Liner Interface Friction Angle Without Final Cover, using Peak Strengths

Geo-tube interface friction angle (degree)	Liner friction angle (degree)
10	17.1
11	15.6
12	14.1
12.9	12.8
13	12.6
14	11
16	7.8

Notes:

- 1. For peak shear strengths, this table presents the minimum required liner friction angles and corresponding geo-tube/geo-tube interface friction angles to achieve the target FS of 1.3 for the liner slip mode.
- 2. These values were calculated using Cross-Section A-A without cover for the most critical liner slip case involving one column of geo-tubes.
- 3. These values are plotted graphically in Figure 4-1.
- 4. For peak shear strengths, in order to achieve the target FS of 1.3 for the geo-tube slip mode, the minimum required geo-tube/geo-tube horizontal interface friction angle was back-calculated to be 12.9 degrees, which corresponds to a minimum liner friction angle of 12.8 degrees.

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Table 4-2. Sensitivity Analysis of Liner Interface Friction Angle Without Final Cover, using Residual Strengths

Geo-tube interface friction angle (degree)	Liner friction angle (degree)
9	13.4
10	11.9
11	10.3
12	8.8
13	7.2
14	5.7

Notes:

- 1. For residual strengths, this table presents the minimum required liner friction angles and corresponding geo-tube/geo-tube interface friction angles to achieve the target FS of 1.1 for the liner slip mode.
- 2. These values were calculated using Cross-Section A-A without cover for the most critical liner slip case involving one column of geo-tubes.
- 3. These values are plotted graphically in Figure 4-2.
- 4. For residual strengths, in order to achieve the target FS of 1.1 for the geo-tube slip mode, the minimum required geo-tube/geo-tube horizontal interface friction angle was back-calculated to be 11.0 degrees, which corresponds to a minimum liner friction angle of 10.3 degrees.

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Table 4-3. Sensitivity Analysis of Liner Interface Friction Angle after Final Cover Placement, using Peak Strengths

Geo-tube interface friction angle (degree)	Liner friction angle (degree)
12	20
13	18.8
13.9	17.9
14	17.9
15	16.6
16	15.4
17	14.2

Notes:

- 1. For peak shear strengths, this table presents the minimum required liner friction angles and corresponding geo-tube/geo-tube interface friction angles to achieve the target FS of 1.5 for the liner slip mode.
- 2. These values were calculated using Cross-Section A-A without cover for the most critical liner slip case involving one column of geo-tubes.
- 3. These values are plotted graphically in Figure 4-3.
- 4. For peak shear strengths, in order to achieve the target FS of 1.5 for the geo-tube slip mode, the minimum required geo-tube/geo-tube horizontal interface friction angle was back-calculated to be 13.9 degrees, which corresponds to a minimum liner friction angle of 17.9 degrees.

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Table 4-4. Sensitivity Analysis of Liner Interface Friction Angle after Final Cover Placement, using Residual Strengths

Geo-tube interface friction angle (degree)	Liner friction angle (degree)
	,
10	17.7
11	16.5
11.7	15.8
12	15.4
13	14.2
14	13
15	11.8

Notes:

- 1. For residual strengths, this table presents the minimum required liner friction angles and corresponding geo-tube/geo-tube interface friction angles to achieve the target FS of 1.3 for the liner slip mode.
- 2. These values were calculated using Cross-Section A-A without cover for the most critical liner slip case involving one column of geo-tubes.
- 3. These values are plotted graphically in Figure 4-4.
- 4. For residual strengths, in order to achieve the target FS of 1.3 for the geo-tube slip mode, the minimum required geo-tube/geo-tube horizontal interface friction angle was back-calculated to be 11.7 degrees, which corresponds to a minimum liner friction angle of 15.8 degrees.

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Project:

Design

Client: Honeywell

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Table 4-5. Summary of Slope Stability Analysis using Back-Calculated Friction Angles: Cross-Section A-A

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		Without Final Cover	With Final Cover		
	Case	Calculated FS ^[1]	Calculated FS ^[1]		
		Janbu's Method ^[2]	Janbu's Method ^[2]		
	Top 1 stack; 1 column	7.33	11.44		
	Top 1 stack; 2 columns	23.40	[4]		
	Top 2 stacks; 1 column	2.09	3.36		
	Top 2 stacks; 2 columns	4.63	[4]		
	Top 3 stacks; 1 column	1.48	1.89		
Slip of	Top 3 stacks; 2 columns	3.00	3.74		
Geo-tubes (Block Mode)	Top 4 stacks; 1 column	1.30	1.50		
(,	Top 4 stacks; 2 columns	2.09	2.67		
	Top 4 stacks; 3 columns	3.33	[4]		
	5 stacks; 1 column	1.58	1.67		
	5 stacks; 2 columns	2.55	2.87		
	5 stacks; 3 columns	4.31	[4]		
Liner Stability	One column of geo-tubes	1.30	1.50		
(Block Mode)	Two columns of geo-tubes	1.73	2.32		

Notes:

1. The calculated FS values without final cover utilize back-calculated values of peak effective stress friction angle for the geo-tube/geo-tube horizontal interface (12.9 degrees) and liner (12.8 degrees) for the critical case with 4 stacks and 1 column.

2. The Janbu method was used for the block mode analyses presented here because Spencer's method often encounters numerical convergence difficulty with these types of analyses.

3. The calculated FS values with final cover utilize back-calculated values of peak effective stress friction angle for the geo-tube/geo-tube horizontal interface (13.9 degrees) and liner (17.9 degrees) for the critical case with 4 stacks and 1 column.

4. This case was not analyzed due to the acceptable FS values found for similar cases.

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Table 4-6. Summary of Slope Stability Analysis using Back-Calculated Friction Angles: Cross-Section B-B

		Without Final Cover	With Final Cover		
	Case	Calculated FS ^[1]	Calculated FS ^[1]		
		Janbu's Method ^[2]	Janbu's Method ^[2]		
Slip of	Top 1 stack; 1 column	41.23	42.43		
	Top 2 stacks; 1 column	14.77	12.94		
Geo-tubes	Top 3 stacks; 1 column	9.96	8.96		
(Block Mode)	Top 4 stacks; 1 column	6.65	5.86		
	5 stacks; 1 column	9.66	9.81		
Liner Stability (Block Mode)	One column of geo-tubes	1.74	2.79		

Notes:

1. The calculated FS values in this table utilize the back-calculated values of peak effective stress friction angle from Cross-Section A-A without cover for the geo-tube/geo-tube horizontal interface (12.9 degrees) and liner (12.8 degrees) for the critical case with 4 stacks and 1 column.

2. The Janbu method was used for the block mode analyses presented here because Spencer's method often encounters numerical convergence difficulty with these types of analyses.

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Attachment 5 SLIDE Output Files

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Notes

- 1.) The error messages in the output files are a result of invalid slip surfaces generated by the SLIDE program during the automatic search for the most critical slip surface. The invalid slip surfaces included surfaces that are beyond the defined model boundaries, surfaces that are kinematically not feasible, and surfaces that mathematically do not converge to a solution. The invalid slip surfaces do not affect the valid slip surfaces from which the critical slip surface is identified. A list of error codes identifying the meaning of each message is included immediately after this notes page.
- 2.) In the SLIDE output files, the model boundaries and definitions are only included twice for each Cross-Section: once before placement of cover and once after the final cover placement, to avoid redundancy.

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Client: Ho	neywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task	No.: 05	

List of Error Codes

-101 = Only one (or zero) surface/slope interactions.

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.

-105 = More than two surface / slope intersections with no valid slip surface.

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-110 = The water table or a piezoline does not span the slip region for a given slip surface, when Water Surfaces is specified as the method of pore pressure calculation. If this error occurs, check that the water table or piezoline(s) span the appropriate soil cells.

-111 = safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F)< 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-113 = Surface intersects outside slope limits.

-116 = Not enough slices to analyze the surface. Increase the number of slices in the job control in the modeler.

-1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

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Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/20	09	
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Cross-Section A-A: Before Placement of Final Cover

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Slide Analysis Information

Document Name

File Name: NorthSide_NoCover_Tube_07_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 5000 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

<u>Material: Dredge Material</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1

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ritten by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date	e:	4/7/20	09
ient: Honeywell Project:	Onond	aga Lake SC	A 50% Design	Project/ Proposal No.:	GJ4299	Task	No.:	05
Material: Tube-Gravel Interf	ace		Driv	ving Moment=1.37841e-	+006 lb-ft			
Strength Type: Mohr-Coulor	nb							
Unit Weight: 86 lb/ft3				thod: janbu simplified				
Cohesion: 0 psf				1.518390	52 121			
Friction Angle: 24 degrees Water Surface: Water Table				s Location: 1005.379, 5 t Slip Surface Endpoint:		441 3	315	
Custom Hu value: 1				ht Slip Surface Endpoint.				4
				t Slope Intercept: 978.00				
Material: Liner				ht Slope Intercept: 1078				
Strength Type: Mohr-Coulor	nb		Re	sisting Horizontal Force	=20291.2	lb		
Unit Weight: 100 lb/ft3			Driv	ving Horizontal Force=1	3363.6 lb			
Cohesion: 0 psf								
Friction Angle: 19 degrees				thod: spencer				
Water Surface: Water Table				2.321740	50 050			
Custom Hu value: 1				s Location: 1005.633, 5 t Slip Surface Endpoint:		111 6	568	
Material: Foundation				ht Slip Surface Endpoint.				ł
Strength Type: Mohr-Coulor	nb			t Slope Intercept: 978.00			4.100	
Unit Weight: 120 lb/ft3				ht Slope Intercept: 1078				
Cohesion: 0 psf				sisting Moment=2.56875				
Friction Angle: 37 degrees				ving Moment=1.10639e-				
Water Surface: Water Table				sisting Horizontal Force				
Custom Hu value: 1			Driv	ving Horizontal Force=1	0181.1 lb			
Support Properties			<u>Va</u>	lid / Invalid Surface	<u>əs</u>			
Support: Geotube			Me	thod: bishop simplified				
Geotube			Nu	mber of Valid Surfaces:	3900			
Support Type: GeoTextile				mber of Invalid Surfaces	: 1100			
Force Application: Passive		-		or Codes:	4000		_	
Force Orientation: Tangent	to Slip S	Surface		or Code -108 reported for			es	
Anchorage: Both Ends Shear Strength Model: Lines	ər			or Code -112 reported for	or z suria	Jes		
Strip Coverage: 100 percent			Me	thod: janbu simplified				
Tensile Strength: 1600 lb/ft				mber of Valid Surfaces:	3859			
Pullout Strength Adhesion:	5 lb/ft2			mber of Invalid Surfaces				
Pullout Strength Friction Ang	gle: 40	degrees	Err	or Codes:				
				or Code -108 reported for			es	
<u>Global Minimums</u>			Err	or Code -112 reported for	or 2 surfa	ces		
Method: bishop simplified				thod: spencer				
FS: 1.554620				mber of Valid Surfaces:				
Axis Location: 1005.379, 55				mber of Invalid Surfaces	: 2214			
Left Slip Surface Endpoint:			_	or Codes:	or 0176 e	urfoor	NC	
Right Slip Surface Endpoint				or Code -108 reported for or Code -111 reported for			:5	
Left Slope Intercept: 978.00 Right Slope Intercept: 1078.				or Code -112 reported for				

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Page 101 of Written by: Joseph Sura Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Zhu/Jay Beech Date: Date: Client: Honeywell Project: Onondaga Lake SCA 50% Design Project/Proposal No.: GJ4299 Task	201
Written by: Joseph Sura Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Zhu/Jay Beech Date: Client: Honeywell Project: Onondaga Lake SCA 50% Design Project/ Proposal No.: GJ4299 Task	
	4/7/2009
List of All Coordinates 1278 513 438 124	No.: 05
1296.975 437.915	
Piezo Line 1298.469 437.899	
946.230 434.500 1317.013 437.689	
948.793 434.500 1318.507 437.672	
958.000 434.500 1336.969 437.463	
1400.000 428.700 1338.469 437.446	
1357.000 437.236	
Water Table 1358.510 437.219	
715.262 421.594 1376.969 437.011	
900.000 417.000 1378.475 436.993	
935.504 416.272 1400.000 436.750	
1400.000 410.200	
Material Boundary	
Material Boundary 998.000 447.048	
948.793 433.500 1017.014 446.832	
958.000 433.500 1018.514 446.815	
1400.000 427.700 1037.015 446.606	
1038.521 446.589	
Material Boundary 1057.021 446.380	
978.000 441.524 1058.520 446.363	
997.000 441.309 1077.016 446.154	
998.500 441.292 1078.515 446.137	
1017.009 441.083 1097.005 445.928	
1018.508 441.066 1098.523 445.910	
1037.000 440.856 1117.022 445.701	
1038.500 440.839 1118.509 445.684	
1057.015 440.630 1137.023 445.475	
1058.509 440.613 1138.511 445.458	
1096.999 440.178 1157.009 445.249	
1098.506 440.161 1158.509 445.232	
1117.012 439.951 1177.011 445.023	
1118.512 439.934 1178.494 445.006	
1137.006 439.725 1197.022 444.796	
1138.505 439.708 1198.509 444.779	
1157.006 439.499 1217.011 444.570	
1158.500 439.482 1218.511 444.553	
1176.999 439.273 1237.016 444.344	
1258.509 438.351 1318.515 443.422 1277 010 141 1326 081 443 213	
1277.013 438.141 1336.981 443.213	

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Written	by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Page Kulasingam/Ming Khu/Jay Beech	102 Date	of : 4/7	201 7/2009	
Client:	Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project	Proposal No.:	GJ4299	Task No	.:	05
	1338.481	443.196									
	1357.016	442.986			Mat	erial Bou	Indary				
	1358.516	442.969				18.000	452.821				
	1376.981	442.760				37.021	452.606				
	1378.481	442.743				38.521	452.589				
	1400.000	442.500				57.007	452.380				
						58.501	452.363				
<u>IV</u>	<u>Aaterial Bou</u>					77.021	452.154				
	998.000	447.298				78.527	452.137				
	1017.014	447.082				96.995	451.928				
	1018.514	447.066				98.501	451.911				
	1037.016	446.856				17.028	451.701				
	1038.521	446.839				18.527	451.684				
	1057.021	446.630				37.001	451.475				
	1058.521	446.613			11	38.501	451.458				
	1077.016	446.404			11	57.027	451.249				
	1078.516	446.387			11	58.521	451.232				
	1097.005	446.178			11	76.995	451.023				
	1098.524	446.160			11	78.495	451.006				
	1117.022	445.951			11	97.028	450.796				
	1118.510	445.934			11	98.521	450.779				
	1137.024	445.725				17.001	450.570				
	1138.511	445.708				18.501	450.553				
	1157.010	445.499				37.022	450.344				
	1158.510	445.482				38.515	450.327				
	1177.011	445.273				57.007	450.118				
	1178.494	445.256				58.501	450.101				
	1197.022	445.046				77.021	449.891				
	1198.510	445.029				78.521	449.874				
	1217.011	444.820				97.001	449.665				
	1218.511	444.803				98.501	449.648				
	1237.016	444.594				17.028	449.439				
	1238.509	444.577				18.521	449.422				
	1257.016	444.368				37.008	449.213				
	1258.515	444.351				38.501	449.196				
	1256.515	444.331				57.022	448.986				
	1278.516	444.124				58.521	448.969				
	1296.975	443.915				77.008	448.760				
	1298.475	443.898				78.508	448.743				
	1317.016	443.689			14	00.000	448.500				
	1318.516	443.672									
	1336.981	443.463				erial Bou					
	1338.481	443.446				18.000	453.071				
	1357.016	443.236				37.022	452.856				
	1358.516	443.219				38.521	452.839				
	1376.981	443.010				57.007	452.630				
	1378.481	442.993			10	58.501	452.613				
	1400.000	442.750				77.022	452.404				

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Client:	Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project	Proposal No.:	GJ4299	Task No	.: 0)5
	1078.528	452.387			11	178.518	457.006				
	1096.996	452.178				97.005	456.796				
	1098.501	452.161				198.498	456.779				
	1117.028	451.951				217.007	456.570				
	1118.528	451.934				218.501	456.553				
		451.725					456.344				
	1137.002					237.005	456.327				
	1138.501	451.708				238.511					
	1157.028	451.499				257.007	456.118				
	1158.522	451.482				258.507	456.101				
	1176.996	451.273				277.005	455.891				
	1178.496	451.256				278.505	455.874				
	1197.028	451.046				297.013	455.665				
	1198.522	451.029				298.513	455.648				
	1217.001	450.820				317.005	455.439				
	1218.501	450.803			13	318.505	455.422				
	1237.022	450.594			13	337.014	455.213				
	1238.515	450.577			13	338.507	455.196				
	1257.007	450.368			13	357.006	454.986				
	1258.501	450.351				858.511	454.969				
	1277.022	450.141				377.021	454.760				
	1278.522	450.124				378.513	454.743				
	1297.002	449.915				400.000	454.500				
	1298.502	449.898				100.000	101.000				
	1317.028	449.689			Mat	erial Bou	ndarv				
	1318.522	449.672				038.000	458.845				
	1337.008	449.463)57.013	458.630				
	1338.502	449.446)58.513	458.613				
	1357.022	449.236				077.006	458.404				
	1358.522	449.219				078.505	458.387				
	1377.008	449.010				097.013	458.178				
	1378.508	448.993				098.513	458.161				
	1400.000	448.750				117.011	457.951				
-						18.499	457.934				
<u>N</u>	Material Bou					37.020	457.725				
	1038.000	458.595				38.507	457.708				
	1057.013	458.380				57.005	457.499				
	1058.512	458.363				158.499	457.482				
	1077.005	458.154			11	177.013	457.273				
	1078.505	458.137			11	178.519	457.255				
	1097.013	457.928			11	97.006	457.046				
	1098.513	457.911			11	98.499	457.029				
	1117.011	457.701			12	217.007	456.820				
	1118.498	457.685				218.501	456.803				
	1137.019	457.475				237.006	456.594				
	1138.507	457.458				238.511	456.577				
	1157.005	457.249				257.007	456.368				
	1158.498	457.232				258.507	456.351				
	1177.013	457.023				277.005	456.141				
	117.010	101.020			12						

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Written b	oy: Joseph	Sura	Date: 4/3/	2009 Reviewed b		Kulasingam/Ming Zhu/Jay Beech	g Date	: 4/7	7/2009
Client:	Honeywell	Project:	Onondaga La	ıke SCA 50% Design	Project	/ Proposal No.:	GJ4299	Task No	o.: 05
	1278.505	456.124			1078.494	440 407			
						440.137			
	1297.014	455.915			1096.999	439.928			
	1298.514	455.898			1098.505	439.911			
	1317.005	455.689			1117.012	439.701			
	1318.505	455.672			1118.511	439.684			
	1337.014	455.463			1137.005	439.475			
	1338.507	455.446			1138.505	439.458			
	1357.006	455.236			1157.006	439.249			
	1358.511	455.219			1158.500	439.232			
	1377.021	455.010			1176.999	439.023			
	1378.514	454.993			1178.492	439.006			
	1400.000	454.750			1197.012	438.796			
					1198.512	438.779			
M	aterial Bou	ndarv			1217.005	438.570			
	958.000	435.500			1218.499	438.553			
	997.000	435.059			1237.000	438.344			
	998.500	435.042			1238.506	438.327			
	1037.000	434.606			1257.009	438.118			
	1038.494	434.589			1258.509	438.101			
	1077.000	434.154			1277.013	437.891			
	1078.500	434.137			1278.512	437.874			
	1117.000	433.701			1296.975	437.665			
	1118.494	433.684			1298.469	437.649			
	1156.994	433.249			1317.013	437.439			
	1158.494	433.232			1318.507	437.422			
	1197.006	432.796			1336.969	437.213			
	1198.500	432.779			1338.469	437.196			
	1236.994	432.344			1357.000	436.986			
	1238.494	432.327			1358.510	436.969			
	1277.007	431.891			1376.969	436.761			
	1278.507	431.874			1378.475	436.743			
	1317.007	431.439			1400.000	436.500			
	1318.507	431.422							
	1357.000	430.986		Ν	laterial Bou	undarv			
	1358.499	430.969		<u></u>	958.000	435.750			
	1400.000	430.500			997.000	435.309			
	1100.000	100.000			998.500	435.292			
M	aterial Bou	ndarv			1037.000	434.856			
	978.000	441.274			1037.000	434.839			
	997.000	441.059			1077.000	434.404			
	998.500	441.042			1078.500	434.387			
	1017.008	440.832			1117.001	433.951			
	1018.508	440.816			1118.494	433.934			
	1037.000	440.606			1156.994	433.499			
	1038.500	440.589			1158.494	433.482			
	1057.015	440.380			1197.007	433.046			
	1058.508	440.363			1198.500	433.029			
	1077.006	440.154			1236.994	432.594			

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Written by: Jose	eph Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Min Zhu/Jay Beech	g Dat	te: 4/7/	2009
Client: Honeyw	ell Project:	Ononda	aga Lake SCA	50% Design	Project	/ Proposal No.:	GJ4299	Task No.	: 0:
1238.49	4 432.577			12	78.512	437.874			
1277.00					78.513	438.124			
1278.50				12	10.010	400.124			
1317.00				Mate	erial Bou	Indany			
1318.50					17.007	431.439			
						431.689			
1357.00					17.007				
1358.50				-	17.013	437.439			
1400.00	0 430.750			13	17.013	437.689			
Material E					erial Bou				
900.000					18.507	431.422			
953.504	431.272			13	18.507	431.672			
1400.00	0 425.200			13	18.507	437.422			
				13	18.507	437.672			
Material B									
661.000					erial Bou				
748.000					77.000	434.154			
789.000					77.000	434.404			
835.000				10	77.006	440.154			
980.000	376.600								
1400.00	0 367.800				erial Bou	<u>indary</u>			
				10	78.494	440.137			
Material E	oundary			10	78.500	434.387			
942.667	435.500			10	78.500	434.137			
947.793	433.500								
953.504	431.272			Mate	erial Bou	Indary			
					17.000	433.701			
Material E	oundarv				17.001	433.951			
1357.00					17.012	439.701			
1357.00					17.012	439.951			
1357.00						1001001			
1357.00				Mate	erial Bou	Indary			
1007.00	0 407.200				18.494	433.684			
Material B	oundary				18.494	433.934			
1358.49					18.511	439.684			
1358.50					18.512	439.934			
1358.51					10.512	433.334			
				Mate	vial Day	un al num i			
1358.51	0 437.219				<u>erial Bou</u> 56.994	433.249			
Material B	oundary				56.994	433.499			
1277.00					57.006	439.249			
1277.00					57.000	439.499			
1277.00				11	000.10	400.400			
				N / - + -	vial Bar	undon/			
1277.01	3 438.141				erial Bou				
Material	ounder:				58.494	433.232			
Material E					58.494	433.482			
1278.50 1278.50					58.500	439.232			
					58.500	439.482			

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Written by	7: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	g Date	:	4/7/20	09
Client: I	Honeywell	Project:	Ononda	ga Lake SC	A 50% Design	Project/	Proposal No.:	GJ4299	Task	No.:	05
Ма	iterial Bou	ndarv			Mate	erial Bou	Indary				
	197.006	432.796				96.975	437.665				
	197.007	433.046				96.975	437.915				
	197.012	438.796				96.975	443.665				
	197.013	439.046				96.975	443.915				
	iterial Bou					erial Bou					
	198.500	432.779				98.469	437.649				
	198.500	433.029				98.469	437.899				
	198.512	438.779				98.475	443.648				
1	198.512	439.029			12	98.475	443.898				
Ma	terial Bou	<u>ndary</u>			Mate	erial Bou	indary				
1	236.994	432.344			13	36.969	437.213				
1	236.994	432.594			13	36.969	437.463				
1	237.000	438.344			13	36.981	443.213				
1	237.000	438.594			13	36.981	443.463				
Ma	terial Bou	ndary			Mate	erial Bou	Indary				
1	238.494	432.327			13	38.469	437.196				
1	238.494	432.577			13	38.469	437.446				
1	238.506	438.327			13	38.481	443.196				
1	238.506	438.577			13	38.481	443.446				
Ма	terial Bou	ndary			Mate	erial Bou	Indary				
	97.000	435.059				76.969	436.761				
9	97.000	435.309			13	76.969	437.011				
9	97.000	441.059			13	76.981	442.760				
9	97.000	441.309			13	76.981	443.010				
Ма	terial Bou	ndarv			Mate	erial Bou	Indarv				
	98.500	435.042				78.475	436.743				
9	98.500	435.292			13	78.475	436.993				
9	98.500	441.042			13	78.481	442.743				
	98.500	441.292				78.481	442.993				
Ma	terial Bou	ndarv			Mate	erial Bou	Indarv				
	037.000	434.606				57.009	438.118				
	037.000	434.856				57.010	438.368				
	037.000	440.606				57.015	444.117				
	037.000	440.856				57.016	444.368				
Ma	iterial Bou	ndarv			Mate	erial Bou	Indary				
	038.494	434.589				58.509	438.101				
	038.494	434.839				58.509	438.351				
	038.500	434.839 440.589				58.515	436.351 444.101				
	038.500	440.589 440.839				58.515	444.101 444.351				
	000.000	440.039			12	00.010	444.301				

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							Page	107	of	201
Written b	y: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	g Date	: 4/7/	2009
Client:	Honeywell	Project:	Onond	aga Lake SC	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.	: 05
					•• •	5				
	aterial Bou					erial Bou				
	1096.999	439.928				17.008	440.832			
	1096.999	440.178				17.009	441.083			
	1097.005	445.928				17.014	446.832			
	1097.005	446.178			10	17.014	447.082			
	aterial Bou					erial Bou				
	1098.505	439.911			10	18.508	440.816			
	1098.506	440.161			10	18.508	441.066			
	1098.523	445.910			10	18.514	446.815			
	1098.524	446.160			10	18.514	447.066			
Ma	aterial Bou	ndarv			Mat	erial Bou	ndarv			
	1137.005	439.475				57.015	440.380			
	1137.006	439.725				57.015	440.630			
	1137.023	445.475				57.021	446.380			
	1137.024	445.725				57.021	446.630			
M	aterial Bou	ndarv			Mat	erial Bou	ndarv			
	1138.505	439.458				58.508	440.363			
	1138.505	439.708				58.509	440.613			
	1138.511	445.458				58.520	446.363			
	1138.511	445.458 445.708				58.520 58.521	446.613			
					N 4 - 4					
	aterial Bou					erial Bou				
	1176.999	439.023				37.015	446.606			
	1176.999	439.273				37.016	446.856			
	1177.011	445.023				37.021	452.606			
	1177.011	445.273			10	37.022	452.856			
	aterial Bou					erial Bou				
	1178.492	439.006				38.521	446.589			
	1178.492	439.256			10	38.521	446.839			
	1178.494	445.006			10	38.521	452.589			
	1178.494	445.256			10	38.521	452.839			
Ма	aterial Bou	ndary			Mate	erial Bou	ndary			
	1217.005	438.570				77.016	446.154			
	1217.005	438.820				77.016	446.404			
	1217.011	444.570				77.021	452.154			
	1217.011	444.820				77.022	452.404			
M	aterial Bou	ndarv			Mət	erial Bou	ndarv			
	1218.499	438.553				78.515	446.137			
	1218.499	438.803				78.515	446.387			
	1218.511	430.003 444.553				78.527	440.307 452.137			
	1218.511	444.553 444.803				78.527	452.137 452.387			
	1210.011	444.003			Ĩ	10.020	402.307			

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							Page	108	of	20	01
Written by:	Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	Date	:	4/7/200	09
Client: H	loneywell	Project:	Ononda	aga Lake SC.	A 50% Design	Project/	Proposal No.:	GJ4299	Task	No.:	05
Mot	orial Rou	ndany			Mate	erial Bou	ndany				
	<u>erial Bou</u> 117.022	445.701				77.009	443.891				
	117.022	445.951				77.010	444.141				
	117.022	451.701				77.021	449.891				
	117.028	451.951				77.022	450.141				
	erial Bou					rial Bou					
	118.509	445.684				78.515	443.874				
	118.510	445.934				78.516	444.124				
	118.527 118.528	451.684 451.934				78.521 78.522	449.874 450.124				
Mat	erial Bou	ndarv			Mate	erial Bou	ndarv				
	157.009	445.249				17.016	443.439				
11	157.010	445.499			13	17.016	443.689				
11	157.027	451.249			13	17.028	449.439				
11	157.028	451.499			13	17.028	449.689				
	erial Bou					rial Bou					
	158.509	445.232				18.515	443.422				
	158.510	445.482				18.516	443.672				
	158.521	451.232				18.521	449.422				
1.	158.522	451.482			13	18.522	449.672				
Mat	erial Bou	<u>ndary</u>			Mate	rial Bou	<u>ndary</u>				
	197.022	444.796			13	57.016	442.986				
	197.022	445.046				57.016	443.236				
	197.028	450.796				57.022	448.986				
1'	197.028	451.046			13	57.022	449.236				
	<u>erial Bou</u> 198.509	<u>ndary</u> 444.779				<u>rial Bou</u> 58.516	<u>ndary</u> 442.969				
							442.969 443.219				
	198.510	445.029				58.516	443.219 448.969				
	198.521 198.522	450.779 451.029				58.521 58.522	448.969 449.219				
Mat	erial Bou	ndary			Mate	erial Bou	ndary				
	237.016	444.344				57.007	452.380				
	237.016	444.594				57.007	452.630				
	237.022	450.344				57.013	458.380				
12	237.022	450.594				57.013	458.630				
	erial Bou					rial Bou					
	238.509	444.327				58.501	452.363				
	238.509	444.577				58.501	452.613				
	238.515	450.327				58.512	458.363				
12	238.515	450.577			10	58.513	458.613				

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							consulta	ants	
						Page	109	of	201
Written by: Joseph	Sura	Date: 4/3	3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	g Date	: 4/	/7/2009
Client: Honeywell	Project:	Onondaga I	ake SCA	50% Design	Project/	Proposal No.:	GJ4299	Task N	io.: 0 5
Matarial Da					del De				
Material Bour 1098.501	<u>ndary</u> 451.911				<u>erial Bou</u> 57.007	<u>ndary</u> 450.118			
1098.501	451.911 452.161				57.007	450.118			
1098.501	457.911				57.007 57.007	456.118			
1098.513	457.911 458.161				57.007	456.368			
1090.013	450.101			12	57.007	450.500			
Material Bour					rial Bou				
1096.995	451.928				58.501	450.101			
1096.996	452.178				58.501	450.351			
1097.013	457.928				58.507	456.101			
1097.013	458.178			12	58.507	456.351			
Material Bour	<u>ndary</u>			Mate	rial Bou	<u>ndary</u>			
1137.001	451.475			12	97.001	449.665			
1137.002	451.725			12	97.002	449.915			
1137.019	457.475			12	97.013	455.665			
1137.020	457.725			12	97.014	455.915			
Material Bou	ndarv			Mate	rial Bou	ndarv			
1138.501	451.458				98.501	449.648			
1138.501	451.708			12	98.502	449.898			
1138.507	457.458			12	98.513	455.648			
1138.507	457.708			12	98.514	455.898			
Material Bou	ndarv			Mate	erial Bou	ndarv			
1176.995	451.023				37.008	449.213			
1176.996	451.273				37.008	449.463			
1177.013	457.023				37.014	455.213			
1177.013	457.273				37.014	455.463			
Material Bour	adany			Moto	erial Bou	ndony			
1178.495	451.006				38.501	449.196			
1178.496	451.256				38.502	449.446			
1178.518	457.006				38.50Z	455.196			
1178.519	457.255				38.507	455.446			
Material Bour	adon			N / - + -	erial Bou	ndon			
1217.001	450.570				77.008	448.760			
1217.001	450.820				77.008	449.010			
1217.001	450.820 456.570				77.008	449.010 454.760			
1217.007	456.570 456.820				77.021	454.760 455.010			
Motorial Daw	adon			N A - + -		ndon			
Material Bour					rial Bou				
1218.501	450.553				78.508	448.743			
1218.501	450.803				78.508	448.993			
1218.501	456.553				78.513 78.514	454.743 454.993			
1218.501	456.803			40		767 002			

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						Page	110	of	2	201
Written by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Min Zhu/Jay Beech	g Date	:	4/7/20)09
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project	/ Proposal No.:	GJ4299	Task	No.:	0
				12	38.511	456.577				
Material Bou	ndarv				38.517	462.327				
1077.005	458.154									
1077.006	458.404			Mate	erial Bou	undarv				
1077.017	464.154				77.005	455.891				
	1011101				77.005	456.141				
Material Bou	ndarv				77.011	461.891				
1078.505	458.137			12		101.001				
1078.505	458.387			Mat	erial Bou	undarv				
1078.517	464.137				78.505	455.874				
107 0.017	101.107				78.505	456.124				
Material Bou	ndarv				78.505	461.874				
1117.011	457.701			12		101.071				
1117.011	457.951			Mat	erial Bou	Indary				
1117.011	463.701				17.005	455.439				
1117.011	400.701				17.005	455.689				
Material Bou	adany				17.003	461.439				
1118.498	457.685			10	017.011	401.439				
1118.499	457.934			Mot	arial Ray	Indony				
1118.511	463.684				<u>erial Βοι</u> 18.505	455.422				
1110.311	403.004				18.505	455.672				
Matorial Bou	adany				18.517	461.422				
<u>Material Bou</u> 1157.005	457.249			10	10.517	401.422				
1157.005	457.499			Mot	erial Bou	Indony				
1157.011	463.249				57.006	454.986				
1157.011	403.249				57.006	455.236				
Material Bou	adany				57.008	460.986				
1158.498	457.232			10	57.017	400.900				
1158.498	457.482			Mot	arial Day	undon.				
1158.511	463.232				<u>erial Βοι</u> 58.511	454.969				
1150.511	403.232				58.511	455.219				
Material Bou	adany				58.511	460.969				
1197.005	456.796			10	50.511	400.909				
1197.005	457.046			Mot	arial Day	undors/				
1197.008	462.796				erial Bou	435.500				
1197.017	402.790				3.667 8.793	435.500 433.500				
Motorial Day	adam			94	0.795	433.300				
<u>Material Bou</u> 1198.498	456.779			Mot	erial Bou	undors (
1198.498	457.029				0.000	436.600				
1198.517	462.779				2.667	435.500				
1190.017	402.779			94	2.007	455.500				
Material Bou	ndarv			Fyte	ernal Bou	Indary				
1237.005	456.344				0.000	436.600				
1237.005	456.594				2.000	436.600				
1237.024	462.344				0.000	432.000				
1201.024	TUL.UTT				51.000	436.500				
Material Bou	ndarv				8.000	430.500				
iviaterial DOU										
1238.511	456.327			55	5.000	396.200				

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								consult			
							D			2	0.1
							Page	111	of	2	.01
Written	by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	Date		4/7/20	09
Client:	Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project	/ Proposal No.:	GJ4299	Task	No.:	05
	483.000	398.300			Q	78.000	441.274				
	461.000	390.500				58.000	441.500				
	307.000	386.700				58.000	435.750				
	277.000	373.000				58.000	435.500				
	1.726	374.590				43.667	435.500				
	1.726	167.800			9	41.000	436.600				
	1400.000	167.800			-	(D)	o				
	1400.000	367.800					Search Line				
	1400.000	425.200				038.000	458.616				
	1400.000	427.700			1	077.037	458.372				
	1400.000	430.500			_						
	1400.000	430.750					Search Point				
	1400.000	436.500			1	077.037	458.372				
	1400.000	436.750									
	1400.000	442.500					Search Point				
	1400.000	442.750			1	078.405	464.138				
	1400.000	448.500									
	1400.000	448.750			Su	pport					
	1400.000	454.500			1	358.511	460.969				
	1400.000	454.750			1	400.000	460.500				
	1400.000	460.500									
	1358.511	460.969			Su	pport					
	1357.017	460.986				400.000	454.750				
	1318.517	461.422				400.000	460.500				
	1317.011	461.439				1001000	1001000				
	1278.505	461.874			Su	pport					
	1277.011	461.891				400.000	454.750				
	1238.517	462.327				358.511	455.219				
					I	330.311	455.219				
	1237.024 1198.517	462.344			S	anart					
		462.779				pport	455 040				
	1197.017	462.796				358.511	455.219				
	1158.511	463.232			1	358.511	460.969				
	1157.011	463.249			0						
	1118.511	463.684				<u>oport</u>					
	1117.011	463.701				378.513	454.743				
	1078.517	464.137			1	378.508	448.993				
	1077.017	464.154									
	1038.000	464.595				oport					
	1038.000	458.845			1	378.508	448.993				
	1038.000	458.595			1	400.000	448.750				
	1018.000	458.821									
	1018.000	453.071			Su	oport					
	1018.000	452.821				400.000	448.750				
	998.000	453.048				400.000	454.500				
	998.000	447.298									
	998.000	447.048			<u>Su</u>	oport					
	978.000	447.274				400.000	454.500				
	978.000	441.524				378.513	454.743				
	570.000	-171.027			I	010.010					

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						Page	112	of	201
Written by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Culasingam/Ming Chu/Jay Beech	g Date	4/7/2	2009
Client: Honeywell	Project:	Onond	aga Lake SC	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.:	05
Support	449.500			Sup		407 044			
1400.000 1400.000	448.500 442.750				376.969 376.981	437.011 442.760			
<u>Support</u>									
1400.000 1358.516	442.750 443.219								
Support									
1358.516 1358.521	443.219 448.969								
Support	449.000								
1358.521 1400.000	448.969 448.500								
Support	440 500								
1400.000 1400.000	442.500 436.750								
<u>Support</u> 1400.000	436.750								
1378.475	436.993								
<u>Support</u> 1378.475	436.993								
1378.481	442.743								
<u>Support</u> 1378.481	442.743								
1400.000	442.500								
<u>Support</u> 1400.000	430.750								
1400.000	436.500								
<u>Support</u> 1400.000	436.500								
1358.510	436.969								
<u>Support</u> 1358.510	426.060								
1358.510	436.969 431.219								
Support	121 210								
1358.500 1400.000	431.219 430.750								

					R Kulasingam/Ming					
					Page	113	of	201		
Written by: Joseph Sura	ritten by: Joseph Sura		4/3/2009	Reviewed by:	<u> </u>			4/7/2009		
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.: G	J4299	Task	No.: 0 :		

Slide Analysis Information

Document Name

File Name: NorthSide_NoCover_Liner_i_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 5000 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Gravel Interface

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				Page	114	of	201
Vritten by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Date	e: 4/7/	2009
ient: Honeywell Pro	ject: Ononda	ga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.	: (
Strength Type: Mohr-C	oulomb		FS:	1.653050			
Unit Weight: 86 lb/ft3			Axis	Location: 987.056, 57	75.241		
Cohesion: 0 psf			Left	Slip Surface Endpoint	: 952.983,	435.500	
Friction Angle: 24 degre				nt Slip Surface Endpoi			38
Water Surface: Water T	Table			isting Horizontal Force		lb	
Custom Hu value: 1			Driv	ing Horizontal Force=2	20486 lb		
Material: Liner				hod: spencer			
Strength Type: Mohr-C	oulomb			2.766000	70 400		
Unit Weight: 100 lb/ft3				Location: 984.930, 57		105 500	
Cohesion: 0 psf				Slip Surface Endpoint			20
Friction Angle: 19 degre Water Surface: Water 1			•	nt Slip Surface Endpoin			30
Custom Hu value: 1	able			isting Moment=4.9358 ing Moment=1.784486		-11	
Custom nu value. 1				isting Horizontal Force		lh	
Material: Foundation				ing Horizontal Force=		ID O	
Strength Type: Mohr-C	oulomb		Dirv		12112.010		
Unit Weight: 120 lb/ft3	oulonib		\/al	id / Invalid Surfac	205		
Cohesion: 0 psf			vai		.63		
Friction Angle: 37 degre	ees		Met	hod: bishop simplified			
Water Surface: Water 1				hber of Valid Surfaces	3832		
Custom Hu value: 1				ber of Invalid Surface			
				r Codes:	0. 1100		
Support Propertie	s			r Code -108 reported	for 74 surf	aces	
	<u> </u>			r Code -110 reported			
Support: Geotube				r Code -111 reported			
Geotube				r Code -112 reported			
Support Type: GeoText	tile						
Force Application: Pass			Met	hod: janbu simplified			
Force Orientation: Tang		urface		nber of Valid Surfaces	3766		
Anchorage: Both Ends			Nun	nber of Invalid Surface	s: 1234		
Shear Strength Model:	Linear		Erro	r Codes:			
Strip Coverage: 100 pe	rcent		Erro	r Code -108 reported	for 77 surfa	aces	
Tensile Strength: 1600				r Code -110 reported			
Pullout Strength Adhes				r Code -111 reported			
Pullout Strength Friction	n Angle: 40 d	egrees	Errc	r Code -112 reported	for 1100 st	urfaces	
<u>Global Minimums</u>				hod: spencer			
				hber of Valid Surfaces			
Method: bishop simplifi	<u>ed</u>			hber of Invalid Surface	s: 2996		
FS: 1.708060				r Codes:	(a. 000 -	4	
Axis Location: 987.056				r Code -108 reported			
Left Slip Surface Endpo			_	r Code -110 reported			
Right Slip Surface End				r Code -111 reported			
Resisting Moment=4.58		-tt	Errc	r Code -112 reported	101 1 152 SL	inaces	
Driving Moment=2.681	48e+006 lb-ft						
Mathematica in the state							
Method: janbu simplifie	a						

					R Kulasingam/Ming			
					Page	115	of 201	
Written by: Jos	Vritten by: Joseph Sura		te: 4/3/2009	Reviewed by:	8 8	Date:	4/7/2009	
Client: Honeyw	ell Pro	ject: On	ondaga Lake SC	CA 50% Design	Project/ Proposal No.: G	J4299	Task No.: 05	

Slide Analysis Information

Document Name

File Name: NorthSide_NoCover_Global_Su_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

<u>Material: Dredge Material</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Gravel Interface Strength Type: Mohr-Coulomb

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Written by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	Page R. Kulasingam/Ming			
written by.			- Date.	4/3/2009	Reviewed by:	Zhu/Jay Beech	Date.	. 4///2	009
Client: Ho	neywell	Project:	Ononda	aga Lake SCA	50% Design	Project/ Proposal No.:	GJ4299	Task No.:	
Unit \	Weight: 86 lb/	ft3			FS:	1.686150			
	sion: 0 psf				Cen	ter: 976.451, 546.228			
	on Angle: 24 o	degrees			Rad	ius: 145.729			
Wate	r Surface: Wa	ater Table			Left	Slip Surface Endpoint:	885.616,	432.271	
Custo	om Hu value:	1			Righ	nt Slip Surface Endpoin	t: 1096.71	8, 463.93	1
						isting Horizontal Force		C	
	<u>rial: Liner</u>				Driv	ing Horizontal Force=8	3035.9 lb		
	igth Type: Mo		ıb						
	Weight: 100 lb	o/ft3				hod: spencer			
	sion: 0 psf					1.676630			
	on Angle: 19 o er Surface: Wa					ter: 994.208, 510.713 ius: 100.625			
	om Hu value:						026 145	126 600	
Cusic		1				Slip Surface Endpoint: nt Slip Surface Endpoin			2
Mate	rial: Foundatio	n				isting Moment=1.09866			2
	igth Type: Mo		h			ing Moment=6.55279e			
	Weight: 120 lb					isting Horizontal Force		b	
	esion: 0 psf	,				ing Horizontal Force=5		~	
	on Angle: 37	degrees				5			
	er Surface: Wa				Val	id / Invalid Surface	es		
Custo	om Hu value:	1							
0						hod: bishop simplified			
<u>Sup</u>	port Prope	rties				nber of Valid Surfaces:			
0						nber of Invalid Surfaces	5: 1898		
	ort: Geotube					or Codes:		-	
Geot		Tautila				or Code -105 reported for			
	ort Type: Geo					or Code -106 reported for or Code -107 reported for			
	e Application: e Orientation:		n Clin C	Surface		or Code -107 reported for			
	orage: Both E		o Silp S	bunace		or Code -110 reported for			
	r Strength Mc		r			or Code -112 reported for			
	Coverage: 10					or Code -113 reported for			
	ile Strength: 1					or Code -116 reported for			
	ut Strength A		lb/ft2						
	ut Strength Fr			degrees	Met	hod: janbu simplified			
	U U			U		nber of Valid Surfaces:	2360		
Glob	bal M inimu	ms			Nun	nber of Invalid Surfaces	: 2392		
						or Codes:			
Meth	<u>od: bishop sir</u>	<u>nplified</u>				or Code -105 reported for			
FS: 1	.671880	-				or Code -106 reported for			
	er: 994.208, 5	10.713				or Code -107 reported for			
	us: 100.625					or Code -108 reported for			
	Slip Surface E				_	or Code -110 reported for			
	Slip Surface					or Code -111 reported for			
	sting Moment=					or Code -112 reported for			
Drivir	ng Moment=6	.55279e+(006 lb-f	t		or Code -113 reported for or Code -116 reported for			
N / - + -	odu jonhu olim	plified			EIIC		51 55 SUID	1000	
weth	<u>od: janbu sim</u>	pilled							

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	Honeywell Proje <u>Method: spencer</u> Number of Valid Surface					Page	117	of	201
Written by:	Honeywell Project: Or <u>Method: spencer</u> Number of Valid Surfaces: 768 Number of Invalid Surfaces: 398	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	g Date	: 4/7	/2009	
Client: Hor	ıeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No	.: 05
Numb Numb Error Error Error Error Error Error Error Error	er of Valid S er of Invalid Codes: Code -105 re Code -106 re Code -107 re Code -108 re	Surfaces: ported fo ported fo ported fo ported fo ported fo ported fo ported fo ported fo	3984 r 1 surfa r 237 su r 882 su r 556 su r 21 sur r 1509 su r 720 su r 5 surfa	urfaces urfaces urfaces faces surfaces urfaces aces					

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			consult		
		Page	118	of	201
Written by: Joseph Sura Date: 4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Date	e: 4/7	/2009
Client: Honeywell Project: Onondaga Lake SCA	50% Design	Project/ Proposal No.:	GJ4299	Task No	.: 05
Slide Analysis Information	Wate	ion Angle: 35 degrees er Surface: Water Tab			
Document Name	Cusi	tom Hu value: 1			
File Name: NorthSide_NoCover_External_Lab.sli	Stre Unit	e <u>rial: Gravel</u> ngth Type: Mohr-Could Weight: 120 lb/ft3 esion: 0 psf	omb		
Project Settings Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left	Frict Wate	ion Angle: 38 degrees er Surface: Piezometri tom Hu value: 1			
Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off	Stre Unit Wate	erial: SOLW (undrained ngth Type: Discrete fu Weight: 82 lb/ft3 er Surface: Water Tab tom Hu value: 1	nction		
Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3	Stre Unit Coh	erial: Dredge Material ngth Type: Mohr-Could Weight: 86 lb/ft3 esion: 0 psf			
<u>Analysis Methods</u> Analysis Methods used: Bishop simplified	Wate	ion Angle: 15 degrees er Surface: Water Tab tom Hu value: 1			
Janbu simplified Spencer	Stre	e <u>rial: Tube-Tube Interf</u> a ngth Type: Mohr-Could Weight: 86 lb/ft3		<u>contal)</u>	
Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50	Frict Wate	esion: 0 psf ion Angle: 15 degrees er Surface: Water Tab tom Hu value: 1			
Surface Options Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined	Stre Unit Coh Frict Wate	erial: Tub-Tube Interfac ngth Type: Mohr-Could Weight: 43 lb/ft3 esion: 0 psf ion Angle: 0.1 degrees er Surface: Water Tab tom Hu value: 1	omb S	<u>al)</u>	
<u>Material Properties</u> <u>Material: Dike Soil</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf	Stre Unit Coh Frict	erial: Tube-Gravel Inten ngth Type: Mohr-Could Weight: 86 lb/ft3 esion: 0 psf ion Angle: 24 degrees er Surface: Water Tab	omb		

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						Page	consult 119	of	201
Written by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	P Kulasingam/Mi			/2009
Client: Ho	oneywell	Project:	Onond	aga Lake SC.	– A 50% Design	Project/ Proposal No.:	GJ4299	Task No.	.: 0
Cust	om Hu value: 1	1			Dri	ving Horizontal Force	=77457.1 lb		
Mate	erial: Liner				Μα	ethod: spencer			
	ngth Type: Mol	nr-Coulor	nh			: 3.953430			
	Weight: 100 lb					nter: 867.694, 1138.89	96		
	esion: 0 psf	110				dius: 732.909			
	ion Angle: 19 d	learees				ft Slip Surface Endpoir	nt: 659 311	436 236	
	er Surface: Wa					ght Slip Surface Endpo			
	om Hu value: 1					sisting Moment=2.193			•••
						ving Moment=5.54816			
Mate	erial: Foundatio	n				sisting Horizontal Ford			
	ngth Type: Mol		nb			ving Horizontal Force			
	Weight: 120 lb					0			
	esion: 0 psf				Va	alid / Invalid Surfa	ces		
Fricti	ion Angle: 37 d	legrees				thod: bishop simplified			
Wate	er Surface: Wa	ter Table				mber of Valid Surface			
Cust	om Hu value: 1	1				mber of Invalid Surfac			
						or Codes:			
Sup	port Prope	rties				or Code -101 reported	l for 11 surf	aces	
	port: Geotube					or Code -107 reported			
Geot						or Code -110 reported			
Supp	port Type: Geo	Textile				or Code -113 reported			
	e Application: I					or Code -1000 reporte			
	e Orientation: ⁻		to Slip \$	Surface		·			
	norage: Both E				Me	thod: janbu simplified			
Shea	ar Strength Mo	del: Linea	ar		Nu	mber of Valid Surface	s: 763		
Strip	Coverage: 10	0 percent	t		Nu	mber of Invalid Surfac	es: 3989		
Tens	sile Strength: 1	600 lb/ft			Erı	or Codes:			
Pullo	out Strength Ad	lhesion: {	5 lb/ft2		Eri	or Code -101 reported	I for 11 surf	aces	
Pullo	out Strength Fri	iction Ang	gle: 40	degrees		or Code -107 reported			
						or Code -108 reported			
<u>Glo</u>	<u>bal Minimu</u>	<u>ms</u>				or Code -110 reported			
Meth	od: bishop sim	plified				or Code -113 reported			
FS: 3	3.951600				En	or Code -1000 reporte	ed for 2849	surfaces	
	er: 867.694, 1	138.896							
	us: 732.909					ethod: spencer			
	Slip Surface Er					mber of Valid Surface			
	t Slip Surface I					mber of Invalid Surfac	es: 4136		
	sting Moment=					or Codes:	for 11 ourf		
Drivi	ng Moment=5.	54816e+	007 lb-	rt		or Code -101 reported			
						or Code -107 reported			
	nod: janbu simp	Diffied				or Code -108 reported or Code -110 reported			
	3.988630					or Code -111 reported			
	ter: 867.694, 10	J78.515				or Code -113 reported			
	us: 675.141	adaolati (126.000		or Code -113 reported			
	Slip Surface Er						2043	50110003	
					4				
Righ	t Slip Surface I sting Horizonta	Endpoint	1145.9	934, 463.37				Sundoos	

					Geos	synt	ec⊳	
						onsulta		
					Page	120	of	201
Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date	4/7	7/2009
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.: G	J4299	Task No	o.: 05

Cross-Section A-A: After Placement of Final Cover

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		consultants
	Page	121 of 201
Written by: Joseph Sura Date: 4/3/2009 Rev	wed by: R. Kulasingam/M Zhu/Jay Beecl	
Client: Honeywell Project: Onondaga Lake SCA 50%	esign Project/ Proposal No.	: GJ4299 Task No.: 05
Slide Analysis Information	Strength Type: Mohr-Co Unit Weight: 120 lb/ft3 Cohesion: 0 psf	bulomb
Document Name	Friction Angle: 30 degre Water Surface: Water Ta Custom Hu value: 1	
File Name: NorthSide_Cover_Tube_07_Lab.sli		
Project Settings Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces	<u>Material: Dike Soil</u> Strength Type: Mohr-Co Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degre Water Surface: Water Ta Custom Hu value: 1	es
Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3	<u>Material: Gravel</u> Strength Type: Mohr-Co Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degre Water Surface: Piezome Custom Hu value: 1	es

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 5000 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil

<u>Material: SOLW (undrained)</u> Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

<u>Material: Dredge Material</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3

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								consulta		
						Page		122	of	201
Written by:	Joseph Sura	D	ate:	4/3/2009	Reviewed by:	R. Kulasinga Zhu/Jay		Date	: 4/7/2	2009
Client: Hone	eywell	Project: O	nonda	iga Lake SCA	50% Design	Project/ Proposa	l No.:	GJ4299	Task No.:	
Cohes	ion: 0 psf				Re	sisting Moment=4	4.84653	e+006 lb-	ft	
	n Angle: 0.1 c	degrees				iving Moment=2.9				
	Surface: Wat					0				
Custor	m Hu value: 1					ethod: janbu simp	lified			
					FS	: 1.606060				
	al: Tube-Grav		<u>•</u>			is Location: 996.9				
	th Type: Moh					ft Slip Surface En				
	/eight: 86 lb/ft	:3				ght Slip Surface E				18
	ion: 0 psf	0.010.00				sisting Horizontal			D	
	n Angle: 24 d Surface: Wat				Dr	iving Horizontal F	orce=2	001.4 ID		
	m Hu value: 1				Ν/c	ethod: spencer				
Gusiol						5: 1.842680				
Materi	al: Liner					is Location: 996.2	295. 578	3.528		
	ith Type: Moh	r-Coulomb				ft Slip Surface En			443.272	
	/eight: 100 lb/					ght Slip Surface E				08
Cohes	ion: 0 psf				Re	sisting Moment=	5.41614	e+006 lb-		
	n Angle: 19 d					iving Moment=2.9				
	Surface: Wat					sisting Horizonta			b	
Custor	m Hu value: 1				Dri	iving Horizontal F	orce=2	1648.6 lb		
-	al: Foundatio				Va	alid / Invalid S	urface	es		
	th Type: Moh					ethod: bishop sim				
	/eight: 120 lb/	′ft3				mber of Valid Su		3980		
	ion: 0 psf					mber of Invalid S	urfaces	: 1020		
	n Angle: 37 d					ror Codes:				
	Surface: Wat					ror Code -107 rep				
Custor	m Hu value: 1					ror Code -108 rep				
Quinn	ort P roper	tion				ror Code -111 rep				
	ort: Geotube	1103			Eri	ror Code -112 rep		ກ ວ70 Suff	aces	
<u>Geotul</u>					Me	ethod: janbu simp	lified			
	ort Type: Geo ⁻	Textile				mber of Valid Su		3937		
	Application: F					mber of Invalid S				
	Orientation: T		Slip S	urface		ror Codes:				
Ancho	rage: Both Er	nds	•		Eri	ror Code -107 rep				
Shear	Strength Mod	del: Linear				ror Code -108 rep				
	Coverage: 100	•				ror Code -111 rep				
	e Strength: 16		1400		Eri	ror Code -112 rep	orted fo	or 358 surf	taces	
	t Strength Ad				N 4 -					
Pullou	t Strength Fri	ction Angle:	40 c	legrees		ethod: spencer	foc	0000		
		~ ~				Imber of Valid Su Imber of Invalid S				
	<u>al Minimur</u>					ror Codes:	unaces	. 2002		
	d: bishop sim	pilfied				ror Code -107 rep	orted fo	n 70 curfo	ICAS	
	659040 acation: 006 (100 E76 00	7			ror Code -108 rep				
	ocation: 996.9 ip Surface Er			113 603		ror Code -111 rep				
	Surface Er				_	ror Code -112 rep				
Nght	Sup Sunace E			50, +00.110	,					

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								consulta	ants	
							Page	123		201
Written b	by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	g Date	4/7/2	009
Client:	Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.:	0
L	ist of All	Coordinate	<u>s</u>							
5.4	latarial Dav	n do n i				<u>erial Bou</u> 8.000	<u>ndary</u> 447.048			
	laterial Bou					17.014	446.832			
	948.793	433.500				18.514	446.815			
	958.000	433.500				37.015	446.606			
	1400.000	427.700				38.521	446.589			
Ν.4	latarial Day	ndon				57.021	446.380			
	laterial Bou					58.520	446.363			
	978.000	441.524				77.016	446.154			
	997.000	441.309				78.515	446.137			
	998.500	441.292				97.005	445.928			
	1017.009	441.083				98.523	445.910			
	1018.508	441.066				17.022	445.701			
	1037.000	440.856				18.509	445.684			
	1038.500	440.839				37.023	445.475			
	1057.015	440.630				38.511	445.458			
	1058.509	440.613								
	1096.999	440.178				57.009	445.249			
	1098.506	440.161				58.509	445.232			
	1117.012	439.951				77.011	445.023			
	1118.512	439.934				78.494	445.006			
	1137.006	439.725				97.022	444.796			
	1138.505	439.708				98.509	444.779			
	1157.006	439.499				17.011	444.570			
	1158.500	439.482				18.511	444.553			
	1176.999	439.273				37.016	444.344			
	1178.492	439.256				38.509	444.327			
	1197.013	439.046				57.015	444.117			
	1198.512	439.029				58.515	444.101			
	1217.005	438.820				77.009	443.891			
	1218.499	438.803				78.515	443.874			
	1237.000	438.594				96.975	443.665			
	1238.506	438.577				98.475	443.648			
	1257.010	438.368				17.016	443.439			
	1258.509	438.351				18.515	443.422			
	1277.013	438.141				36.981	443.213			
	1278.513	438.124				38.481	443.196			
	1296.975	437.915				57.016	442.986			
	1298.469	437.899				58.516	442.969			
	1317.013	437.689				76.981	442.760			
	1318.507	437.672			13	78.481	442.743			
	1336.969	437.463			14	00.000	442.500			
	1338.469	437.446								
	1357.000	437.236			Mate	erial Bou	<u>ndary</u>			
	1358.510	437.219				000.8	447.298			
	1376.969	437.011			10	17.014	447.082			
	1378.475	436.993			10	18.514	447.066			

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							Page	124	of	20	01	
Written	Written by: Joseph Sura		Date: 4/3/2009		Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech					7/2009	
Client:	Honeywell	Project:	Ononda	nga Lake SC	A 50% Design	Project/	Proposal No.:	GJ4299	Task 1	No.:	05	
	1038.521	446.839				118.527	451.684					
	1057.021	446.630				137.001	451.475					
	1058.521	446.613				138.501	451.458					
	1077.016	446.404				157.027	451.249					
	1078.516	446.387				158.521	451.232					
	1097.005	446.178			1 [.]	176.995	451.023					
	1098.524	446.160			1 <i>1</i>	178.495	451.006					
	1117.022	445.951			1 <i>'</i>	197.028	450.796					
	1118.510	445.934			11	198.521	450.779					
	1137.024	445.725			12	217.001	450.570					
	1138.511	445.708			12	218.501	450.553					
	1157.010	445.499				237.022	450.344					
	1158.510	445.482				238.515	450.327					
	1177.011	445.273				257.007	450.118					
	1178.494	445.256				258.501	450.101					
	1197.022	445.046				277.021	449.891					
	1198.510	445.029				278.521	449.874					
	1217.011	444.820				297.001	449.665					
	1218.511	444.803				298.501	449.648					
	1237.016	444.594				317.028	449.439					
	1238.509	444.577				318.521	449.422					
	1257.016	444.368				337.008	449.213					
	1258.515	444.351				338.501	449.196					
	1277.010	444.141				357.022	448.986					
	1278.516	444.124				358.521	448.969					
	1296.975	443.915				377.008	448.760					
	1298.475	443.898			1:	378.508	448.743					
	1317.016	443.689			14	400.000	448.500					
	1318.516	443.672										
	1336.981	443.463			Mat	erial Bou	ndary					
	1338.481	443.446			1(018.000	453.071					
	1357.016	443.236			1(037.022	452.856					
	1358.516	443.219				038.521	452.839					
	1376.981	443.010				057.007	452.630					
	1378.481	442.993				058.501	452.613					
	1400.000	442.750				077.022	452.404					
	1001000	1121100				078.528	452.387					
N	Aaterial Bou	ndarv				096.996	452.178					
<u>IV</u>	1018.000	452.821				098.501	452.161					
	1037.021	452.606				117.028	451.951					
	1038.521	452.589				118.528	451.934					
	1057.007	452.380				137.002	451.725					
	1058.501	452.363				138.501	451.708					
	1077.021	452.154				157.028	451.499					
	1078.527	452.137				158.522	451.482					
	1096.995	451.928				176.996	451.273					
	1098.501	451.911				178.496	451.256					
	1117.028	451.701			1 <i>'</i>	197.028	451.046					

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							Page	125	of	20	1	
Written by: Joseph Su		Sura	Date:	e: 4/3/2009	Reviewed by:		R. Kulasingam/Min Zhu/Jay Beech		e: 4	4/7/2009		
Client:	Honeywell	Project:	Onond	aga Lake SCA	50% Design	Project/	Proposal No.:	GJ4299	Task N	lo.:	05	
	4400 500	454 000			4	200 542	455 040					
	1198.522	451.029				298.513	455.648					
	1217.001	450.820				317.005	455.439					
	1218.501	450.803				318.505	455.422					
	1237.022	450.594				337.014	455.213					
	1238.515	450.577				338.507	455.196					
	1257.007	450.368				357.006	454.986					
	1258.501	450.351				358.511	454.969					
	1277.022	450.141				377.021	454.760					
	1278.522	450.124				378.513	454.743					
	1297.002	449.915			14	400.000	454.500					
	1298.502	449.898										
	1317.028	449.689			Mat	erial Bou	ndary					
	1318.522	449.672			1(038.000	458.845					
	1337.008	449.463				057.013	458.630					
	1338.502	449.446				058.513	458.613					
	1357.022	449.236				077.006	458.404					
	1358.522	449.219				078.505	458.387					
	1377.008	449.010				097.013	458.178					
	1378.508	448.993				098.513	458.161					
	1400.000	448.750				117.011	457.951					
	1400.000	440.750										
	Matarial Day	ndon				118.499	457.934					
<u>I</u>	Material Bou					137.020	457.725					
	1038.000	458.595				138.507	457.708					
	1057.013	458.380				157.005	457.499					
	1058.512	458.363				158.499	457.482					
	1077.005	458.154				177.013	457.273					
	1078.505	458.137				178.519	457.255					
	1097.013	457.928				197.006	457.046					
	1098.513	457.911			11	198.499	457.029					
	1117.011	457.701			12	217.007	456.820					
	1118.498	457.685			12	218.501	456.803					
	1137.019	457.475			12	237.006	456.594					
	1138.507	457.458			12	238.511	456.577					
	1157.005	457.249			12	257.007	456.368					
	1158.498	457.232				258.507	456.351					
	1177.013	457.023				277.005	456.141					
	1178.518	457.006				278.505	456.124					
	1197.005	456.796				297.014	455.915					
	1198.498	456.779				298.514	455.898					
	1217.007	456.570				317.005	455.689					
	1217.007	456.553				318.505	455.672					
	1237.005	456.344				337.014	455.463					
	1238.511	456.327				338.507	455.446					
	1257.007	456.118				357.006	455.236					
	1258.507	456.101				358.511	455.219					
	1277.005	455.891				377.021	455.010					
	1278.505	455.874				378.514	454.993					
	1297.013	455.665			14	400.000	454.750					

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Written by: Joseph	Sura	Date: 4/3/2009	Reviewed by:		Culasingam/Ming Chu/Jay Beech		: 4/7 /	2009	
Client: Honeywell	Project:	Onondaga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.:	: 05	
			11	98.512	438.779				
Material Bour	ndarv			17.005	438.570				
958.000	435.500			18.499	438.553				
997.000	435.059			37.000	438.344				
998.500	435.042			38.506	438.327				
1037.000	434.606			57.009	438.118				
1038.494	434.589			58.509	438.101				
1077.000	434.154			77.013	437.891				
1078.500	434.137			78.512	437.874				
1117.000	433.701			96.975	437.665				
1118.494	433.684			98.469	437.649				
1156.994	433.249			17.013	437.439				
1158.494	433.232			18.507	437.439				
	433.232 432.796				437.213				
1197.006				36.969					
1198.500	432.779			38.469	437.196				
1236.994	432.344			57.000	436.986				
1238.494	432.327			58.510	436.969				
1277.007	431.891			76.969	436.761				
1278.507	431.874			78.475	436.743				
1317.007	431.439		14	00.000	436.500				
1318.507	431.422								
1357.000	430.986			erial Bou					
1358.499	430.969			8.000	435.750				
1400.000	430.500			7.000	435.309				
				8.500	435.292				
Material Bour				37.000	434.856				
978.000	441.274			38.494	434.839				
997.000	441.059			77.000	434.404				
998.500	441.042		10	78.500	434.387				
1017.008	440.832			17.001	433.951				
1018.508	440.816		11	18.494	433.934				
1037.000	440.606		11	56.994	433.499				
1038.500	440.589		11	58.494	433.482				
1057.015	440.380		11	97.007	433.046				
1058.508	440.363		11	98.500	433.029				
1077.006	440.154		12	36.994	432.594				
1078.494	440.137		12	38.494	432.577				
1096.999	439.928		12	77.007	432.141				
1098.505	439.911		12	78.507	432.124				
1117.012	439.701		13	17.007	431.689				
1118.511	439.684			18.507	431.672				
1137.005	439.475			57.000	431.236				
1138.505	439.458			58.500	431.219				
1157.006	439.249			00.000	430.750				
1158.500	439.232								
1176.999	439.023		Mate	erial Bou	ndarv				
1178.492	439.006		90	0.000	432.000				

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							Page	127	of	20	01
Written b	oy: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech			/7/200	
Client:	Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task N	0.:	05
	1400.000	425.200			13	318.507	437.422				
					13	818.507	437.672				
	laterial Bou				N.4 (
	661.000	436.500				erial Bou					
	748.000	412.600				77.000	434.154				
	789.000	386.700			10	77.000	434.404				
}	835.000	386.800			10	77.006	440.154				
	980.000	376.600									
	1400.000	367.800			Mat	erial Bou	indary				
					10	78.494	440.137				
М	laterial Bou	ndarv			10	78.500	434.387				
	942.667	435.500			10	78.500	434.137				
	947.793	433.500									
	953.504	431.272			Mat	erial Bou	Indary				
	000.004	401.272				17.000	433.701				
Ν.	laterial Bou	ndon				17.000	433.951				
	1357.000	430.986				17.012	439.701				
	1357.000	431.236			11	17.012	439.951				
	1357.000	436.986									
	1357.000	437.236				erial Bou					
						18.494	433.684				
	laterial Bou					18.494	433.934				
	1358.499	430.969				18.511	439.684				
	1358.500	431.219			11	18.512	439.934				
	1358.510	436.969									
	1358.510	437.219			Mat	erial Bou	indary				
					11	56.994	433.249				
M	laterial Bou	ndary			11	56.994	433.499				
	1277.007	431.891			11	57.006	439.249				
	1277.007	432.141				57.006	439.499				
	1277.013	437.891									
	1277.013	438.141			Mat	erial Bou	Indarv				
						58.494	433.232				
М	laterial Bou	ndarv				58.494	433.482				
	1278.507	431.874				58.500	439.232				
	1278.507	432.124				58.500	439.482				
	1278.512	437.874				30.300	403.402				
	1278.512				Mot	arial Day	ndon				
	12/0.013	438.124				<u>erial Bou</u> 97.006	432.796				
5.4	latarial Day	a da n i									
	laterial Bou					97.007	433.046				
	1317.007	431.439				97.012	438.796				
	1317.007	431.689			11	97.013	439.046				
	1317.013	437.439									
	1317.013	437.689				erial Bou					
					11	98.500	432.779				
M	laterial Bou	<u>ndary</u>			11	98.500	433.029				
	1318.507	431.422			11	98.512	438.779				
	1318.507	431.672			11						

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Written by:	Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	g Date:	4/	7/2009	1
Client: H	loneywell	Project:	Onond	aga Lake SC	A 50% Design	Project/	Proposal No.:	GJ4299	Task N	o.: 0	05
Mot	orial Pau	adan			Mote		undors (
	<u>erial Bou</u> 236.994	432.344				<u>erial Bou</u> 36.969	437.213				
	236.994	432.594				36.969	437.463				
	237.000	438.344				36.981	443.213				
14	237.000	438.594			13	36.981	443.463				
Mat	erial Bou	ndary			Mate	erial Bou	Indary				
12	238.494	432.327			13	38.469	437.196				
12	238.494	432.577			13	38.469	437.446				
12	238.506	438.327			13	38.481	443.196				
12	238.506	438.577			13	38.481	443.446				
Mat					Mate						
	erial Bou					erial Bou					
	97.000	435.059				76.969	436.761				
	97.000	435.309				76.969	437.011				
	97.000	441.059				76.981	442.760				
99	97.000	441.309			13	76.981	443.010				
Mat	erial Bou	ndary			Mate	erial Bou	Indary				
	98.500	435.042				78.475	436.743				
99	98.500	435.292			13	78.475	436.993				
	98.500	441.042				78.481	442.743				
	98.500	441.292				78.481	442.993				
N.4 - 1					N.A (
	erial Bou					erial Bou					
	037.000	434.606				57.009	438.118				
	037.000	434.856				57.010	438.368				
	037.000	440.606				57.015	444.117				
10	037.000	440.856			12	57.016	444.368				
Mat	erial Bou	ndarv			Mate	erial Bou	Indarv				
	038.494	434.589				58.509	438.101				
1(038.494	434.839				58.509	438.351				
	038.500	440.589				58.515	444.101				
	038.500	440.839				58.515	444.351				
	erial Bou					erial Bou					
	296.975	437.665				96.999	439.928				
	296.975	437.915				96.999	440.178				
	296.975	443.665				97.005	445.928				
12	296.975	443.915			10	97.005	446.178				
Mat	erial Bou	ndarv			Mate	erial Bou	Indary				
	298.469	437.649				98.505	439.911				
	298.469	437.899				98.506	440.161				
	298.475	443.648				98.523	445.910				
	298.475	443.898				98.523 98.524	446.160				
		-TTU.UUU			10						

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								Page	129	of	201
Written	ı by:	Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	Date	: 4/7	7/2009
Client:	Hor	neywell	Project:	Onond	laga Lake SC.	A 50% Design	Project/	Proposal No.:	GJ4299	Task No	o.: 0 :
						NA-4					
<u>N</u>		<u>ial Bou</u> 7.005	439.475				<u>erial Bou</u>)57.015	440.380			
		7.005	439.725				57.015	440.630			
		7.023	445.475				57.013	446.380			
		7.023	445.725				57.021	446.630			
	110	1.024	440.720				07.021	440.000			
N		ial Bou					erial Bou				
		8.505	439.458				58.508	440.363			
		8.505	439.708				58.509	440.613			
		8.511	445.458				58.520	446.363			
	113	8.511	445.708			10	58.521	446.613			
Ν	Mater	ial Bou	ndarv			Mat	erial Bou	Indary			
<u></u>		6.999	439.023)37.015	446.606			
		6.999	439.273				37.016	446.856			
		7.011	445.023				37.021	452.606			
		7.011	445.273				37.022	452.856			
Ν	Mator	ial Bou	ndarv			Mat	erial Bou	Indary			
<u>11</u>		8.492	439.006)38.521	446.589			
		8.492	439.256				38.521	446.839			
		8.494	445.006				38.521	452.589			
		8.494	445.256				38.521	452.839			
Ν	Viotor		ndon			Mot	erial Bou	undors (
<u>I</u>		<u>ial Bou</u> 7.005	438.570				077.016	446.154			
		7.005	438.820				77.016	446.404			
		7.005	444.570				77.021	452.154			
		7.011	444.820				77.021	452.404			
<u>N</u>		ial Bou					erial Bou				
		8.499	438.553				78.515	446.137			
		8.499	438.803				78.516	446.387			
		8.511 8.511	444.553 444.803)78.527)78.528	452.137 452.387			
N		ial Bou					erial Bou				
		7.008	440.832				17.022	445.701			
		7.009	441.083				17.022	445.951			
		7.014 7.014	446.832 447.082				17.028 17.028	451.701 451.951			
-											
N		ial Bou					erial Bou				
		8.508	440.816				18.509	445.684			
		8.508	441.066				18.510	445.934			
		8.514	446.815				18.527	451.684			
	101	8.514	447.066			11	18.528	451.934			

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Written by: Jose	eph Sura	Date: 4/3/2009	Reviewed by:		lasingam/Ming u/Jay Beech	Date	: <u>4</u> ,	/7/2009
Client: Honeywo	ell Project:	Onondaga Lake SC.	A 50% Design	Project/ P	Proposal No.:	GJ4299	Task N	io.: 05
Material B	oundary		Mate	erial Boun	darv			
1157.00				17.016	443.439			
1157.01	0 445.499		13	17.016	443.689			
1157.02	7 451.249		13		449.439			
1157.02	8 451.499		13	17.028	449.689			
Material B				erial Boun				
1158.50				18.515	443.422			
1158.51					443.672			
1158.52					449.422			
1158.52	2 451.482		13	18.522	449.672			
Material B				erial Boun				
1197.02				57.016	442.986			
1197.02				57.016	443.236			
1197.02				57.022	448.986			
1197.02	8 451.046		13	57.022	449.236			
Material B				rial Boun	<u>dary</u>			
1198.50				58.516	442.969			
1198.51					443.219			
1198.52					448.969			
1198.52	2 451.029		13	58.522	449.219			
Material B			Mate	rial Boun	<u>dary</u>			
1237.01				57.007	452.380			
1237.01				57.007	452.630			
1237.02				57.013	458.380			
1237.02	2 450.594		10	57.013	458.630			
Material B			Mate	erial Boun				
1238.50	9 444.327				452.363			
1238.50					452.613			
1238.51					458.363			
1238.51	5 450.577		10	58.513	458.613			
Material B	oundary		Mate	erial Boun	dary			
1277.00					451.911			
1277.01	0 444.141		10	98.501	452.161			
1277.02					457.911			
1277.02	2 450.141		10	98.513	458.161			
Material B	oundary		Mate	erial Boun	dary			
1278.51					451.928			
1278.51					452.178			
1278.52					457.928			
1278.52					458.178			

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					Page	131	of	201
Written by: Josep	h Sura	Date: 4/3/2009	Reviewed by:		Culasingam/Ming Chu/Jay Beech	Date	4/7	7/2009
Client: Honeywell	Project:	Onondaga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task No	o.: 05
Material Bo	undarv		Mate	erial Bou	ndarv			
1137.001	451.475			97.001	449.665			
1137.002	451.725		12	97.002	449.915			
1137.019	457.475		12	97.013	455.665			
1137.020	457.725		12	97.014	455.915			
Material Bo				erial Bou				
1138.501	451.458			98.501	449.648			
1138.501	451.708			98.502	449.898			
1138.507	457.458			98.513	455.648			
1138.507	457.708		12	98.514	455.898			
Material Bo	undary		Mate	erial Bou	ndary			
1176.995	451.023		13	37.008	449.213			
1176.996	451.273		13	37.008	449.463			
1177.013	457.023		13	37.014	455.213			
1177.013	457.273		13	37.014	455.463			
Material Bo	undary		Mate	erial Bou	ndary			
1178.495	451.006		13	38.501	449.196			
1178.496	451.256		13	38.502	449.446			
1178.518	457.006		13	38.507	455.196			
1178.519	457.255		13	38.507	455.446			
Material Bo	undarv		Mate	erial Bou	ndarv			
1217.001	450.570			77.008	448.760			
1217.001	450.820			77.008	449.010			
1217.007	456.570		13	77.021	454.760			
1217.007	456.820		13	77.021	455.010			
Material Bo	undary		Mate	erial Bou	ndarv			
1218.501	450.553			78.508	448.743			
1218.501	450.803			78.508	448.993			
1218.501	456.553			78.513	454.743			
1218.501	456.803			78.514	454.993			
Material Bo	undary		Mate	erial Bou	ndarv			
1257.007				77.005	458.154			
1257.007				77.006	458.404			
1257.007				77.017	464.154			
1257.007			10					
			Mate	erial Bou	<u>ndary</u>			
Material Bo	undary			78.505	458.137			
1258.501	450.101		10	78.505	458.387			
1258.501	450.351		10	78.517	464.137			
1258.507								
1258.507	456.351		Mate	erial Bou	ndarv			

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Written by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Min Zhu/Jay Beech	g Date	e: 4/7/	/2009
Client: Honeywell	Project:	Ononda	nga Lake SCA	A 50% Design	Project	/ Proposal No.:	GJ4299	Task No.	.: 05
4447.044	457 704								
1117.011	457.701			Moto	wiel Dev	un do mi			
1117.011 1117.011	457.951 463.701				<u>erial Βοι</u> 17.005	455.439			
1117.011	403.701				17.005	455.689			
Motorial Pau	ndon								
Material Bou 1118.498	457.685			13	17.011	461.439			
1118.499	457.934			Moto	erial Bou	undon/			
1118.511	463.684				18.505 18.505	455.422 455.672			
Motorial Day	ndon				18.517	400.072			
Material Bou 1157.005	457.249			13	10.017	401.422			
1157.005	457.499			Moto	erial Bou	undon.			
1157.005	463.249				57.006	454.986			
1157.011	403.249				57.006	454.986			
Motorial Pau	ndon								
<u>Material Bou</u> 1158.498	457.232			10	57.017	460.986			
				Moto	wiel Dev	un al n m i			
1158.499	457.482				erial Bou				
1158.511	463.232				58.511	454.969			
Material Da					58.511	455.219			
Material Bou				13	58.511	460.969			
1197.005	456.796			Mate	al Day				
1197.006	457.046				erial Bou				
1197.017	462.796				3.667	435.500			
Motorial Day	ndon			94	8.793	433.500			
Material Bou 1198.498	456.779			Moto	vial Pau	undon/			
1198.499	457.029				<u>erial Bou</u> 0.000	436.600			
1198.517	457.029 462.779				0.000 2.667	436.600 435.500			
1190.517	402.779			94.	2.007	435.500			
Material Bou	ndarv			Mate	erial Bou	undarv			
1237.005	456.344				3.667	435.500			
1237.006	456.594				8.000	435.500			
1237.024	462.344				8.000	435.750			
					8.000	441.500			
Material Bou	ndarv				8.000	441.274			
1238.511	456.327				8.000	441.524			
1238.511	456.577				8.000	447.274			
1238.517	462.327				8.000	447.048			
					8.000	447.298			
Material Bou	ndary				8.000	453.048			
1277.005	455.891				18.000	452.821			
1277.005	456.141				18.000	453.071			
1277.011	461.891				18.000	458.821			
					38.000	458.595			
Material Bou	ndarv				38.000	458.845			
1278.505	455.874				38.000	464.595			
1278.505	456.124				77.017	464.154			
1278.505	461.874				78.517	464.137			
1210.000	1011014			10		10 1.107			

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								consulta			
							Page	133	of	2	01
Written	1117.011 1118.511 1157.011 1158.511 1197.017 1198.517 1237.024 1238.517 1277.011 1278.505 1317.011 1318.517 1357.017 1358.511 1400.000 941.000 941.000 943.667 <u>External Bou</u> 934.093 940.000 941.000 943.667 <u>External Bou</u> 934.093 912.000 900.000 661.000 661.000 638.000 555.000 483.000 555.000 483.000 1.726 1.726 1.726 1.400.000 1400.000	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	g Date	::	4/7/20	09
Client:	Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task 1	No.:	05
	1117 011	463.701			14	400.000	454.750				
		463.684				400.000	460.500				
		463.249				400.000	462.500				
		463.232)38.000	466.595				
		462.796				018.000	460.821				
		462.779				98.000	455.048				
		462.344				78.000	449.274				
		462.344				58.000	443.500				
		461.891			93	000.000	445.500				
					Die	- Line					
		461.874				<u>zo Line</u>	40.4 500				
		461.439				16.230	434.500				
		461.422				18.793	434.500				
		460.986				58.000	434.500				
		460.969			14	400.000	428.700				
	1400.000	460.500									
						er Table					
N						15.262	421.594				
		436.600				00.000	417.000				
	940.000	436.600			93	35.504	416.272				
	941.000	436.600			14	400.000	410.200				
	943.667	435.500									
					Foc	us/Block	Search Line				
E	External Bou	ndary			1(038.000	458.625				
	934.093	436.600			1()77.014	458.394				
	912.000	436.600									
	900.000	432.000			Foc	us/Block	Search Point				
	661.000	436.500)78.516	464.136				
		432.900									
		396.200			Foc	us/Block	Search Point				
		398.300				077.014	458.394				
		390.500									
		386.700			Sur	port					
		373.000				858.511	460.969				
		374.590				400.000	460.500				
		167.800			1-	+00.000	400.000				
		167.800			C	nort					
						port	454 750				
		367.800				100.000	454.750				
		425.200			14	100.000	460.500				
		427.700			0						
		430.500				port					
		430.750				400.000	454.750				
		436.500			1:	858.511	455.219				
		436.750									
		442.500				port					
		442.750				858.511	455.219				
	1400.000	448.500			13	858.511	460.969				
	1400.000	448.750									
	1400.000	454.500			<u>Sup</u>	port					
					<u> </u>	-					

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						Page	134	of	201
Written	by: Joseph	Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date	4/7/2	2009
Client:	Honeywell	Project:	Onond	aga Lake SC	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.:	0
	1378.513	454.743							
	1378.508	448.993							
S	upport								
	1378.508	448.993							
	1400.000	448.750							
S	upport								
<u> </u>	1400.000	448.750							
	1400.000	454.500							
	1100.000	101.000							
<u>S</u>	upport								
	1400.000	454.500							
	1378.513	454.743							
S	upport								
	1400.000	448.500							
	1400.000	442.750							
S	upport								
<u> </u>	1400.000	442.750							
	1358.516	443.219							
c	<u>upport</u>								
<u> </u>	1358.516	443.219							
	1358.521	448.969							
	1000.021	440.000							
<u>S</u>	upport								
	1358.521	448.969							
	1400.000	448.500							
S	upport								
	1400.000	442.500							
	1400.000	436.750							
S	upport								
-	1400.000	436.750							
	1378.475	436.993							
S	upport								
<u> </u>	1378.475	436.993							
	1378.481	442.743							
<u> </u>	upport								
<u>S</u>	<u>upport</u> 1378.481	442.743							
	1400.000	442.743 442.500							

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				Page	135	of	201
Written by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Dat	e: 4/	7/2009
Client: Honeywell Project	t: Onond	laga Lake SC.	A 50% Design	Project/ Proposal No.:	GJ4299	Task No	o.: 05
Slide Analysis Inf	ormati	ion		Weight: 120 lb/ft3			
••••• , •••• ,	••••••	•••		esion: 0 psf			
				ion Angle: 30 degrees			
<u>Document Name</u>				er Surface: Water Tab	le		
File Name: NorthSide_Co	wor Linou	r I I ab eli	Cus	tom Hu value: 1			
The Marile. NorthSide_Co			Mate	erial: Dike Soil			
Project Settings				ngth Type: Mohr-Could	omb		
Project Title: SLIDE - An	Interactive	Slope		Weight: 120 lb/ft3	01110		
Stability Program	meractive	e olope		esion: 0 psf			
Failure Direction: Right to	Left			ion Angle: 35 degrees			
Units of Measurement: In		its	Wat	er Surface: Water Tab	le		
Pore Fluid Unit Weight: 6			Cus	tom Hu value: 1			
Groundwater Method: Wa	ater Surfa	ces					
Data Output: Standard				erial: Gravel			
Calculate Excess Pore Pr	ressure: C	Off		ngth Type: Mohr-Could	omb		
Allow Ru with Water Surf	aces or G	rids: Off	Unit	Weight: 120 lb/ft3			

Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 5000 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Cohesion: 0 psf

Custom Hu value: 1

Unit Weight: 82 lb/ft3

Custom Hu value: 1

Friction Angle: 38 degrees

Material: SOLW (undrained)

Water Surface: Water Table

Strength Type: Discrete function

Water Surface: Piezometric Line 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tub-Tube Interface (Vertical)</u> Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf

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						Page	consult 136	of	20	01
ritten by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Mir Zhu/Jay Beech	ng Date	:: 4	/7/200	09
ient: Ho	oneywell	Project:	Onond	aga Lake SCA	- A 50% Design	Project/ Proposal No.:	GJ4299	Task N	lo.:	(
Fricti	on Angle: 0.1	degrees			Driv	ving Moment=5.18808	e+006 lb-ft			
Wate	er Surface: Wa	ater Table				-				
Cust	om Hu value:	1				hod: janbu simplified				
Moto	rial Tuba Or	aval Interf				1.604750	02 074			
	rial: Tube-Gra ngth Type: Mc					s Location: 980.377, 5 Slip Surface Endpoin		437 77	7	
	Weight: 86 lb/					ht Slip Surface Endpoi				
	esion: 0 psf					sisting Horizontal Force			_	
	on Angle: 24				Driv	ving Horizontal Force=	34799.1 lb			
	er Surface: Wa									
Cust	om Hu value:	1				hod: spencer				
Mate	rial: Liner					2.184250 s Location: 968.036, 6	17 483			
	ngth Type: Mc	hr-Coulor	nb			Slip Surface Endpoin		436.60	00	
	Weight: 100 II					ht Slip Surface Endpoi				
	esion: 0 psf					sisting Moment=1.2094		-ft		
	on Angle: 19					ving Moment=5.53732				
	er Surface: Wa om Hu value:					sisting Horizontal Force		ID		
Cusi	om nu value.	I				ving Horizontal Force=	50271.510			
Mate	rial: Foundati	on			Va	lid / Invalid Surfac	ces			
	ngth Type: Mo		nb			hod: bishop simplified				
	Weight: 120 II	o/ft3				nber of Valid Surfaces				
	esion: 0 psf on Angle: 37	dograac				nber of Invalid Surface	es: 1332			
	er Surface: Wa					or Codes:	for 51 ourf	2000		
	om Hu value:					or Code -108 reported or Code -110 reported				
						or Code -111 reported				
<u>Sup</u>	port Prope	erties				or Code -112 reported				
	ort: Geotube									
Geot		—				hod: janbu simplified				
	ort Type: Ge					nber of Valid Surfaces				
	e Application: e Orientation:		o Slin S	Surface		nber of Invalid Surface or Codes:	3. 1370			
	orage: Both E			Junaoo		or Code -108 reported	for 52 surfa	aces		
	ar Strength Mo		ar			or Code -110 reported				
Strip	Coverage: 10	00 percent				or Code -111 reported				
	ile Strength:				Erre	or Code -112 reported	for 1232 su	urfaces		
	ut Strength A			doarooo	Ma	had: anonaar				
Fullo	ut Strength F		yıe. 40	uegrees		<u>hod: spencer</u> nber of Valid Surfaces	2845			
GIA	bal M inimu	ims				nber of Invalid Surfaces				
	od: bishop sir					or Codes:				
	1.672370					or Code -108 reported				
	Location: 980					or Code -110 reported				
	Slip Surface E t Slip Surface				_	or Code -111 reported or Code -112 reported				
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					CO	onsulta	nts
					Page	137	of 201
Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2009
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.: G	J4299	Task No.: 05

Slide Analysis Information

Document Name

File Name: NorthSide_Cover_Global_Su_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Dike Soil</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

<u>Material: SOLW (undrained)</u> Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tub-Tube Interface (Vertical)</u> Strength Type: Mohr-Coulomb

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						Page	2	138	of	2	01
Written by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasing Zhu/Jay		Date	: ·	4/7/20	09
Client: Ho	oneywell	Project:	Onond	aga Lake SCA	50% Design	Project/ Propos	al No.:	GJ4299	Task	No.:	0
Unit	Weight: 43 lb	/ft3			Ce	nter: 968.528, 5 [,]	17.918				
	esion: 0 psf					dius: 113.858					
	ion Angle: 0.1	dearees				t Slip Surface Er	ndpoint:	893.681.	432.1	19	
	er Surface: W					ht Slip Surface I					
	om Hu value:					sisting Moment=				0.200	
Cuot						ving Moment=1.					
	rial: Tube-Gr										
	ngth Type: Mo		טר			thod: janbu simp	olified				
	Weight: 86 lb	/ft3				: 1.416210					
	esion: 0 psf					nter: 968.528, 5	17.918				
	ion Angle: 24					dius: 113.858					
	er Surface: W					t Slip Surface Er					
Cust	om Hu value:	1				ht Slip Surface I				5.233	
						sisting Horizonta			0		
	rial: Liner				Dri	ving Horizontal F	orce=79	9415.4 lb			
	ngth Type: Mo		۱b								
	Weight: 100 l	b/ft3				thod: spencer					
	esion: 0 psf					1.480300					
	ion Angle: 19					nter: 968.528, 5	17.918				
	er Surface: W					dius: 113.858					
Cust	om Hu value:	1				t Slip Surface Er					
						ht Slip Surface I				5.233	
	rial: Foundati					sisting Moment=			ft		
	ngth Type: Mo		Ŋ			ving Moment=1.					
	Weight: 120 l	b/ft3				sisting Horizonta			0		
	esion: 0 psf				Dri	ving Horizontal F	-orce=/5	5840.8 lb			
	ion Angle: 37										
	er Surface: W				Va	<u>lid / Invalid S</u>	Surface	<u>es</u>			
Cust	om Hu value:	1									
0						thod: bishop sim					
<u>Sup</u>	oport P rope	erties				mber of Valid Su					
0						mber of Invalid S	Surfaces	: 2111			
	<u>oort: Geotube</u>					or Codes:				_	
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	oort Type: Ge					or Code -108 re					
	e Application:					or Code -110 re					
	e Orientation:		o Siip s	Surface		or Code -112 rep					
	norage: Both I		-			or Code -113 re					
	ar Strength M				EII	or Code -116 re	soned to	or 93 Suria	ices		
	Coverage: 10				Ма	thad ionhu aimr	lified				
	sile Strength:		lh/#0			<u>thod: janbu simp</u> mber of Valid Su		010E			
	out Strength A			dograca							
Pullo	out Strength F	neuon Ang	jie. 40 (Legrees		mber of Invalid S	burraces	. 2201			
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<u>GI0</u>	bal M inimu	ins				or Code -107 report Code -108 rep				5	
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FS: 1	1.483420				211			n o sullat	62		

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						Page	139	of	2	01
Written by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date	e: 4	4/7/20	09
Client: Ho	neywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task 1	No.:	05
Error <u>Meth</u> Num Error Error Error Error Error Error Error	Code -113 re Code -116 re Der of Valid Si Der of Valid Si Der of Invalid Si Codes: Code -107 re Code -108 re Code -110 re Code -111 re Code -112 re Code -113 re Code -116 re	ported for urfaces: 1 Surfaces: ported for ported for ported for ported for ported for ported for ported for ported for	r 93 sur 244 3508 r 1452 s r 204 su r 204 su r 51 sur r 1178 s r 477 su r 53 sur	faces surfaces irfaces faces surfaces irfaces faces						

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				Page	140	of	201	1
Written by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Date	: 4/7	/2009	9
Client: Honeywell Project:	Onond	laga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No	.:	0
Slide Analysis Infor	matie	on		Weight: 120 lb/ft3				
				esion: 0 psf tion Angle: 30 degrees				
<u>Document Name</u>				er Surface: Water Tab				
			Cus	tom Hu value: 1				
File Name: NorthSide_Cover_LongTerm_	l ah sli							
				<u>erial: Dike Soil</u>	1			
Project Settings				ngth Type: Mohr-Could Weight: 120 lb/ft3	amo			
Project Title: SLIDE - An Int	eractive	e Slope		esion: 0 psf				
Stability Program				tion Angle: 35 degrees				
Failure Direction: Right to L				er Surface: Water Tab				
Units of Measurement: Impe		its	Cus	tom Hu value: 1				
Pore Fluid Unit Weight: 62.4								
Groundwater Method: Wate Data Output: Standard	i Suna	Ces		<u>erial: Gravel</u>	l-			
Calculate Excess Pore Pres	ssure: C)ff		ngth Type: Mohr-Could Weight: 120 lb/ft3	amo			
Allow Ru with Water Surfac				esion: 0 psf				
Random Numbers: Pseudo-	randon	n Seed		tion Angle: 38 degrees				
Random Number Seed: 101			Wat	er Surface: Piezometri				
Random Number Generatio Miller v.3	n Meth	od: Park and	d Cus	tom Hu value: 1				
Willer V.S			Mat	erial: SOLW (Drained)				
<u>Analysis Methods</u>				ngth Type: Mohr-Could	omb			
				Weight: 82 lb/ft3				
Analysis Methods used:			Coh	esion: 0 psf				
Bishop simplified				tion Angle: 34 degrees				
Janbu simplified				er Surface: Water Tab	le			
Spencer			Cus	tom Hu value: 1				
Number of slices: 25			Mat	erial: Dredge Material	(Long)			
Tolerance: 0.005			Stre	ngth Type: Mohr-Could	omb			
Maximum number of iteration	ons: 50			Weight: 86 lb/ft3				
				esion: 0 psf				
<u>Surface Options</u>				tion Angle: 30 degrees er Surface: Water Tab				
Surface Type: Circular				tom Hu value: 1				
Surface Type: Circular Search Method: Grid Searc	h		040					
Radius increment: 10			Mat	erial: Tube-Tube Interfa	ace (Horizo	ontal)		
Composite Surfaces: Disab	led			ngth Type: Mohr-Could	omb			
Reverse Curvature: Create	Tensior	n Crack		Weight: 86 lb/ft3				
Minimum Elevation: Not De				esion: 0 psf				
Minimum Depth: Not Define	d			tion Angle: 15 degrees er Surface: Water Tab				
Material Proportion				tom Hu value: 1				
Material Properties								
Material: Final Cover Soil				erial: Tub-Tube Interfa		<u>I)</u>		
			O1	ngth Type: Mohr-Could				

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									consulta			
							Page		141	of	2	01
Written b	ру: _	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam Zhu/Jay Be		Date		4/7/20	09
Client:	Hon	neywell	Project:	Onond	aga Lake SC	A 50% Design	Project/ Proposal N	lo.: (GJ4299	Task	No.:	0
U	nit V	Veight: 43 lb	/ft3			Cer	nter: 920.957, 533.	689				
		sion: 0 psf					dius: 96.944					
		on Angle: 0.1	degrees				t Slip Surface Endp	oint: 9	45.977, 4	440.0)30	
		· Surface: W					ht Slip Surface End					
С	usto	m Hu value:	1				sisting Moment=31			,		
-							ving Moment=159.					
M	ater	ial: Tube-Gra	avel Interfa	ace			5					
		gth Type: Mo				Me	thod: janbu simplifi	ed				
		Veight: 86 lb					1.996180					
		sion: 0 psf					nter: 962.317, 543.	934				
		n Angle: 24	dearees				dius: 112.424					
		· Surface: W				Lef	t Slip Surface Endp	oint: 9	28.872,	436.6	600	
C	usto	m Hu value:	1			Rig	ht Slip Surface End	dpoint:	1043.84	9, 46	6.529	
							sisting Horizontal F					
M	ater	ial: Liner					ing Horizontal For					
St	treng	gth Type: Mo	ohr-Coulon	nb			-					
		Veight: 100 l				Me	thod: spencer					
C	ohes	sion: 0 psf				FS:	2.000720					
Fr	rictio	on Angle: 19	degrees			Cer	nter: 920.957, 533.	689				
W	/ater	Surface: W	ater Table			Rad	dius: 96.944					
C	usto	m Hu value:	1			Lef	t Slip Surface Endp	ooint: 9	45.977, 4	440.0)30	
						Rig	ht Slip Surface End	dpoint:	949.691	, 441	.102	
		<u>ial: Foundati</u>				Res	sisting Moment=31	9.949	lb-ft			
St	treng	gth Type: Mo	ohr-Coulon	nb			ving Moment=159.9					
Ui	nit V	Veight: 120 l	b/ft3			Res	sisting Horizontal F	orce=3	3.17091 l	b		
C	ohes	sion: 0 psf				Driv	ing Horizontal For	ce=1.5	8488 lb			
Fr	rictio	on Angle: 37	degrees									
W	/ater	Surface: W	ater Table			Va	lid / Invalid Su	rfaces	S			
C	usto	m Hu value:	1									
						Me	thod: bishop simpli	fied				
<u>S</u>	upp	<u>port Prope</u>	<u>erties</u>			Nur	mber of Valid Surfa	ces: 1	985			
						Nur	mber of Invalid Sur	faces:	3067			
		ort: Geotube		<u>m)</u>		Erro	or Codes:					
		ibe (Long Te				Erro	or Code -106 repor	ted for	9 surfac	es		
		ort Type: Ge					or Code -107 repor				s	
		Application:					or Code -108 repor					
		Orientation:		o Slip 🕄	Surface		or Code -110 repor					
		orage: Both I					or Code -112 repor					
		Strength Mo					or Code -113 repor					
		Coverage: 10					or Code -116 repor					
		le Strength:				Erro	or Code -1000 repo	orted fo	or 561 su	rface	s	
		ut Strength A				. -						
Pu	ullou	ut Strength F	riction Ang	gle: 40	degrees		thod: janbu simplifi					
~							nber of Valid Surfa					
<u>G</u>	ilob	al M inimu	ims				mber of Invalid Sur	faces:	3056			
							or Codes:		.			
M		<u>od: bishop si</u> .000700	mplified				or Code -106 repor or Code -107 repor					

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							consult	ants	
						Page	142	of	201
Written by:	Joseph Sura	1	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date	: 4/7/	2009
Client: H	oneywell	Project:	Onone	laga Lake SC.	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.:	: 05
Erro Erro Erro Erro	or Code -110 or Code -111 or Code -112 or Code -113 or Code -116 or Code -1000	reported fo reported fo reported fo reported fo	r 1 surl r 670 s r 203 s r 94 su	ace urfaces urfaces rfaces					
Nun Nun	hod: spencer nber of Valid nber of Invalio or Codes:	Surfaces: 1							
	or Code -106 or Code -107	•							

1 surfaces reported Error Code -108 reported for 111 surfaces

Error Code -110 reported for 46 surfaces Error Code -111 reported for 3 surfaces

Error Code -112 reported for 697 surfaces

Error Code -113 reported for 203 surfaces Error Code -116 reported for 94 surfaces

Error Code -1000 reported for 561 surfaces

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				Page	consult	tants of	2	201
ritten by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech		te:	4/7/20	
ient: Honeywell Proje	ct: Onond	aga Lake SCA	- A 50% Design	Project/ Proposal No.:	GJ4299	Task	x No.:	05
Clide Analysis Int	io vroceti		Linit	Weight: 120 lb/ft3				
Slide Analysis Inf	ormatio	חכ	Coh	esion: 0 psf				
Document Name				ion Angle: 30 degrees er Surface: Water Tab				
				om Hu value: 1				
File Name: NorthSide_C	over_Exte	rnal_Lab.sli	.					
Project Settings				e <u>rial: Dike Soil</u> ngth Type: Mohr-Coul	omh			
				Weight: 120 lb/ft3	51110			
Project Title: SLIDE - An	Interactive	e Slope	Coh	esion: 0 psf				
Stability Program	o l off			ion Angle: 35 degrees				
Failure Direction: Right to Units of Measurement: In		ite		er Surface: Water Tab	e			
Pore Fluid Unit Weight: 6		115	Cusi	om Hu value: 1				
Groundwater Method: W		ces	Mate	erial: Gravel				
Data Output: Standard				ngth Type: Mohr-Coul	omb			
Calculate Excess Pore F			Unit	Weight: 120 lb/ft3				
Allow Ru with Water Sur				esion: 0 psf				
Random Numbers: Pseu Random Number Seed:		n Seed		ion Angle: 38 degrees				
Random Number Seed.		nd [.] Park and	1	er Surface: Piezometri	c Line 1			
Miller v.3			Cusi	om Hu value: 1				
				erial: SOLW (undraine				
<u>Analysis Methods</u>				ngth Type: Discrete fu	nction			
Analysia Mathada yaadu				Weight: 82 lb/ft3 er Surface: Water Tab				
Analysis Methods used: Bishop simplified				om Hu value: 1	le			
Janbu simplified			Cusi					
Spencer			Mate	erial: Dredge Material				
				ngth Type: Mohr-Coul	omb			
Number of slices: 25				Weight: 86 lb/ft3				
Tolerance: 0.005				esion: 0 psf				
Maximum number of iter	ations: 50			ion Angle: 15 degrees er Surface: Water Tab				
Surface Options				om Hu value: 1	le			
Surface Type: Circular				erial: Tube-Tube Interf		<u>zontal</u>)	2	
Search Method: Grid Se	arch			ngth Type: Mohr-Coul Weight: 86 lb/ft3	amc			
Radius increment: 10	ablad			esion: 0 psf				
Composite Surfaces: Dis Reverse Curvature: Crea		Crack		ion Angle: 15 degrees				
Minimum Elevation: Not				er Surface: Water Tab				
Minimum Depth: Not Del			Cust	om Hu value: 1				
Material Properties			Mate	erial: Tub-Tube Interfa	<u>ce (</u> Vertic	al)		
			Stre	ngth Type: Mohr-Coul				
Material: Final Cover So	il			Weight: 43 lb/ft3 esion: 0 psf				

						Ge	osynt	tec ⁽	>	
							consult	ants		
						Page	144	of	2	01
Written by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	ng Date	e: 4	4/7/20	09
Client: Ho	oneywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task 1	No.:	0
Frict	ion Angle: 0.1	dearees			Left	Slip Surface Endpoin	t: 659.492.	436.2	64	
	er Surface: W					ht Slip Surface Endpo				,
Cust	om Hu value:	1				sisting Moment=2.167				
					Driv	ving Moment=6.67182	e+007 lb-ft			
	erial: Tube-Gra									
	ngth Type: Mo		nb			hod: janbu simplified				
	Weight: 86 lb/ esion: 0 psf	/ft3				3.255920	·0			
	ion Angle: 24	dearees				nter: 866.814, 1086.36 dius: 682.354	U			
	er Surface: Wa					Slip Surface Endpoin	t [.] 659 492	436.2	64	
	om Hu value:					ht Slip Surface Endpoi	,			
0.00						sisting Horizontal Force				
Mate	erial: Liner					ving Horizontal Force=				
Strei	ngth Type: Mo	hr-Coulor	nb			-				
	Weight: 100 II	b/ft3				hod: spencer				
	esion: 0 psf					3.248080	-			
	ion Angle: 19					nter: 866.814, 1086.36	0			
	er Surface: Wa com Hu value:					dius: 682.354	+ 650 402	126.2	61	
Cusi	om nu value.	I				Slip Surface Endpoin ht Slip Surface Endpo				
Mate	erial: Foundati	on				sisting Moment=2.167				
	ngth Type: Mo		nb			ving Moment=6.67182				
	Weight: 120 I					sisting Horizontal Forc				
Cohe	esion: 0 psf				Driv	ving Horizontal Force=	95512.4 lb			
	ion Angle: 37									
	er Surface: W				Va	<u>lid / Invalid Surfa</u>	ces			
Cust	om Hu value:	1								
•						hod: bishop simplified				
Sup	oport P rope	erties				nber of Valid Surfaces				
C						nber of Invalid Surface	es: 3939			
<u>Supp</u> Geot	<u>port: Geotube</u>					or Codes: or Code -101 reported	for 4 surfa	000		
	coort Type: Ge	oTextile				or Code -107 reported				
	e Application:					or Code -110 reported			S	
	e Orientation:		o Slip :	Surface		or Code -113 reported				
Anch	norage: Both E	Ends				or Code -1000 reporte			es	
	ar Strength Mo									
	Coverage: 10					hod: janbu simplified	o o =			
	sile Strength:		· IL /4:0			nber of Valid Surfaces				
	out Strength A			dograca		nber of Invalid Surface	es: 3940			
Pullo	out Strength F	ncuon An(jie: 40	uegrees		or Codes: or Code -101 reported	for A surfa	CQ5		
Clo	hal Minimu	Ime				or Code -107 reported				
<u>GI0</u>	bal M inimu	1112				or Code -108 reported				
Math	nod: bishop sii	molified				or Code -110 reported			S	
	3.248820	npinicu				or Code -113 reported				
	ter: 866.814, 1	1086.360				or Code -1000 reporte			es	
	us: 682.354									

Written by: Joseph Sura Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Date: 4/7/20
Written by: Joseph Sura Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Date: 4/7/20
Client: Honeywell Project: Onondaga Lake SCA 50% Design Project/ Proposal No.: GJ4299 Task No.:

Error Codes: Error Code -101 reported for 4 surfaces Error Code -107 reported for 67 surfaces Error Code -108 reported for 3 surfaces Error Code -110 reported for 1060 surfaces Error Code -111 reported for 130 surfaces Error Code -113 reported for 3 surfaces Error Code -1000 reported for 2805 surfaces

					Geos	Synte onsultar	
					Page	146	of 201
Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2009
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.: G	J4299 T	ask No.: 05

Slide Analysis Information

Document Name

File Name: NorthSide_Cover_External_LongTerm_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (Drained) Strength Type: Mohr-Coulomb Unit Weight: 82 lb/ft3 Cohesion: 0 psf Friction Angle: 34 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Dredge Material (Long)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

					Geo	osynte consulta		
					Page	147	of 20)1
Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech			
Client: Ho	neywell Project	Onond	aga Lake SCA	50% Design	Project/ Proposal No.:	GJ4299	Task No.:	0
Mate	rial: Tub-Tube Interfa	ce (Vertic	al)	Met	hod: bishop simplified			
	ngth Type: Mohr-Coul				3.438800			
	Weight: 43 lb/ft3				ter: 819.842, 1201.710)		
	esion: 0 psf				lius: 782.304			
	on Angle: 0.1 degree	S			Slip Surface Endpoint	: 658.815, 4	436.158	
	er Surface: Water Tab				nt Slip Surface Endpoir			
Custo	om Hu value: 1				isting Moment=1.0067			
					ing Moment=2.92773e			
Mate	rial: Tube-Gravel Inte	rface			0			
Stren	ngth Type: Mohr-Coul	omb		Met	hod: janbu simplified			
Unit \	Weight: 86 lb/ft3			FS:	3.391630			
Cohe	esion: 0 psf			Cen	ter: 819.842, 1201.710)		
Fricti	on Angle: 24 degrees			Rad	lius: 782.304			
	er Surface: Water Tab	le		Left	Slip Surface Endpoint	: 658.815, 4	436.158	
Custo	om Hu value: 1				nt Slip Surface Endpoir			
					isting Horizontal Force)	
	rial: Liner			Driv	ing Horizontal Force=3	37161.1 lb		
	ngth Type: Mohr-Coul	omb						
	Weight: 100 lb/ft3				hod: spencer			
	esion: 0 psf				3.451200			
	on Angle: 19 degrees			Cen	ter: 819.842, 1201.710)		
Wate	er Surface: Water Tab	le			ius: 782.304			
Custo	om Hu value: 1				Slip Surface Endpoint			
					nt Slip Surface Endpoir			
	rial: Foundation				isting Moment=1.0104		ft	
	ngth Type: Mohr-Coul	omb			ing Moment=2.92773e			
	Weight: 120 lb/ft3				isting Horizontal Force)	
	esion: 0 psf			Driv	ing Horizontal Force=3	36668.8 lb		
	on Angle: 37 degrees							
	er Surface: Water Tab	le		Val	<u>id / Invalid Surfac</u>	es		
Custo	om Hu value: 1							
•					hod: bishop simplified			
<u>Sup</u>	port Properties				nber of Valid Surfaces:			
_					nber of Invalid Surface	s: 3939		
	ort: Geotube (Long T	<u>erm)</u>			or Codes:			
	ube (Long Term)				or Code -101 reported f			
	ort Type: GeoTextile				or Code -107 reported f			
	e Application: Passive				r Code -110 reported f			
	e Orientation: Tangen	t to Slip S	Surface		r Code -113 reported f			
	orage: Both Ends			Erro	or Code -1000 reported	tor 2805 s	urfaces	
	ar Strength Model: Lin							
	Coverage: 100 perce	nt			hod: janbu simplified	000		
	ile Strength: 0.1 lb/ft				nber of Valid Surfaces:			
	ut Strength Adhesion				nber of Invalid Surface	s: 3939		
Pullo	ut Strength Friction A	ngie: 40 d	legrees		or Codes:	or 1 confe-	~~	
					or Code -101 reported f			
Glob	bal M inimums				or Code -107 reported f			
				Erro	or Code -110 reported f	or 1060 su	naces	

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					Page	148	of	201
Written by: Joseph Sura	Joseph Sura Date: 4/3/2009 Reviewed by: Revi	/7/2009						
Client: Honeywell	Project:	Onond	aga Lake SC	A 50% Design	Project/ Proposal No.:	GJ4299	Task N	lo.: 05

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Error Code -113 reported for 3 surfaces Error Code -1000 reported for 2805 surfaces

Method: spencer Number of Valid Surfaces: 867 Number of Invalid Surfaces: 3940 Error Codes: Error Code -101 reported for 4 surfaces Error Code -107 reported for 67 surfaces Error Code -108 reported for 1 surface Error Code -110 reported for 1060 surfaces Error Code -113 reported for 3 surfaces Error Code -1000 reported for 2805 surfaces

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					C	onsulta	nts	
					Page	149	of 2	01
Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/20	09
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.: G	J4299	Task No.:	05

Cross-Section B-B: Before Placement of Final Cover

					Geo	synte consulta	
					Page	150	of 20
Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/200
Client: Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.: (GJ4299	Task No.:

Slide Analysis Information

Document Name

File Name: EastWest_NoCover_Tube_04_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 500 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

Material: Gravel

Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical)

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							consult	tants		
						Page	151	of	2	01
vritten by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Mir Zhu/Jay Beech	ng Dat	e:	4/7/20	09
lient: Ho	oneywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task	No.:	0
Stren	ngth Type: M	obr-Coulor	mh		ما	ft Slip Surface Endpoin	t: 208 000	436 5	63	
	Weight: 43 lb					ght Slip Surface Endpoi				
	esion: 0 psf	/10				ft Slope Intercept: 208.			.000	
	on Angle: 0.1	l dearees				ght Slope Intercept: 554				
	er Surface: W		•			sisting Moment=5.896				
	om Hu value:		•			iving Moment=8.09165				
Ouon					Di					
	rial: Tube-Gr					ethod: janbu simplified				
	ngth Type: Mo		מח			: 7.684780	04 745			
	Weight: 86 lb	/113				is Location: 357.794, 7		400 5		
	esion: 0 psf	dogrado				ft Slip Surface Endpoin				
	on Angle: 24 er Surface: W					ght Slip Surface Endpoi			.000	
	om Hu value		;			ft Slope Intercept: 208.				
Cusic		. I				ght Slope Intercept: 554 sisting Horizontal Forc				
Mate	rial: Liner					iving Horizontal Force=				
	ngth Type: M	obr-Coulor	mh			iving nonzontari orce-	21100.110			
	Weight: 100		ΠD		Me	ethod: spencer				
	esion: 0 psf	10/110				sisting Moment=0 lb-ft				
	on Angle: 19	dearees				iving Moment=0 lb-ft				
	er Surface: W		•			sisting Horizontal Force	e=0 lb			
	om Hu value:					iving Horizontal Force=				
Mate	rial: Foundat	ion			Ve	alid / Invalid Curfe				
	ngth Type: M		mh			alid / Invalid Surfa				
	Weight: 120		ΠD			ethod: bishop simplified				
	esion: 0 psf	10/110				mber of Valid Surfaces				
	on Angle: 37	dearees				Imber of Invalid Surface ror Codes:	es: 423			
	er Surface: W		•			ror Code -107 reported	for 287 su	rfaces		
	om Hu value:					ror Code -108 reported				
						ror Code -112 reported				
Sup	port P rop	erties								
	ort: Geotube				Me	ethod: janbu simplified				
Geot		-				mber of Valid Surfaces	59			
	ort Type: Ge	oTextile				mber of Invalid Surface				
	e Application					ror Codes:				
	e Orientation		to Slip S	Surface		ror Code -107 reported	for 287 su	rfaces		
	orage: Both					ror Code -108 reported				
	ar Strength M		ar			ror Code -112 reported				
	Coverage: 1									
Tens	ile Strength:	1600 lb/ft				ethod: spencer				
	ut Strength A		5 lb/ft2			mber of Valid Surfaces	s: 0			
	ut Strength F			degrees		mber of Invalid Surface	es: 500			
	hal Minim	Ime				ror Codes: ror Code -107 reported	for 287 eu	rfaces		
	<u>bal Minim</u> u od: bishop si					ror Code -108 reported				
	od: bishop si	mpillied				ror Code -111 reported				
	7.286630	7 704 704	71E			ror Code -112 reported				
AXIS	Location: 35	1.194, 194	.740		L11					

						Geo	osynte	ec ⁽	>	
							consulta			
						Page	152	of	2	01
ritten by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	Date:		4/7/20	09
lient: Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task 1	No.:	0:
				82	4.000	430.000				
List of All	Coordinate	c			61.000	433.000				
		<u> </u>			36.000	432.000				
Material Bou	ndarv				00.000	431.000				
0.000	427.500				78.100	431.000				
122.000	424.650									
122.359	424.645			Mate	erial Bou	ndary				
177.171	423.910			18	8.000	430.250				
204.000	423.550			50	6.200	430.250				
405.000	420.750				7.700	430.250				
472.000	422.050				4.000	430.250				
768.000	422.250				4.200	430.252				
805.000	423.150				5.700	430.265				
925.000	423.250				42.148	433.082				
1165.000	428.350				43.812	433.097				
1347.000	425.150				61.000	433.250				
1436.000	426.150				36.000	432.250				
1642.000	424.450				00.000	431.250				
1786.163	426.261				60.199	431.250				
1841.000	426.950				61.784	431.250				
1841.123	426.953			17	78.100	431.250				
Material Bou	ndary				erial Bou					
122.000	424.500				8.000	436.000				
122.359	424.645				6.200	436.000				
					7.700	436.000				
Material Bou	<u>ndary</u>				4.000	436.000				
166.176	430.000				4.200	436.002				
173.133	426.959				5.700	436.015				
347.000	423.600				42.148	438.832				
600.000	423.600				43.812	438.847				
640.000	424.000				61.000	439.000				
728.000	424.000				36.000	438.000				
1102.000	431.000				00.000	437.000				
1176.000	431.000				60.199 61.784	437.000				
1356.000	428.000				58.000	437.000 437.000				
1474.000	427.500			17	56.000	437.000				
1619.000	426.500			Mat	erial Bou	ndarv				
1689.000	426.500				8.000	436.250				
1790.000	428.000				6.200	436.250				
1798.000	431.000				7.700	436.250				
Motorial Day	ndon				4.201	436.250				
Material Bou					5.697	436.250				
1827.000	432.300				4.000	436.250				
1841.123	426.953				2.197	437.658				
Motorial Bass	ndony				3.718	437.672				
Material Bou 188.000	<u>ndary</u> 430.000				61.000	439.250				
100.000	430.000				2					

						Geo	osynt consulta		
						Page	153	of	201
Written	by: Josepl	ı Sura	Date: 4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech			
Client:	Honeywell	Project:	Onondaga Lake SC.	A 50% Design	Project	Proposal No.:	GJ4299	Task No.:	05
	1236.000	438.250		83	3.715	448.086			
	1240.193	438.224			34.188	450.761			
	1241.724	438.215			35.719	450.775			
	1400.000	437.250			61.000	451.000			
	1498.182	437.250			236.000	450.000			
	1499.766	437.250			00.000	449.000			
		437.250			36.205	449.000			
	1758.000	437.230							
	Actorial Day	un dom (37.780	449.000			
<u> </u>	<u>Material Bou</u> 228.000			17	18.000	449.000			
		442.000		Mat					
	466.200	442.000			erial Bou				
	467.700	442.000			8.000	448.250			
	724.201	442.000			3.200	448.250			
	725.697	442.000			4.700	448.250			
	824.000	442.000			8.195	448.250			
	982.197	443.408			89.701	448.250			
	983.718	443.422		82	24.000	448.250			
	1161.000	445.000		98	3.182	449.667			
	1236.000	444.000		98	84.724	449.681			
	1240.193	443.974		11	61.000	451.250			
	1241.724	443.965		12	28.192	450.354			
	1400.000	443.000		12	29.723	450.334			
	1498.182	443.000			36.000	450.250			
	1499.766	443.000			00.000	449.250			
	1738.000	443.000			73.204	449.250			
					74.788	449.250			
Ν	Material Bou	Indary			18.000	449.250			
<u> </u>	228.000	442.250			10.000	440.200			
	530.200	442.250		Mat	erial Bou	ndary			
	531.700	442.250			611 <u>111100</u>	454.000			
		442.250				454.000			
	824.000 832.191)3.200)4.700	454.000			
		442.323							
	833.715	442.336			8.195	454.000			
	1134.188	445.011			9.701	454.000			
	1135.719	445.025			4.000	454.000			
	1161.000	445.250			3.182	455.417			
	1236.000	444.250			84.724	455.431			
	1400.000	443.250			61.000	457.000			
	1436.205	443.250			28.192	456.104			
	1437.780	443.250		12	29.723	456.084			
	1738.000	443.250			36.000	456.000			
ĸ	Antorial Da	undors /			00.000	455.000			
<u>N</u>	Material Bou				73.204	455.000			
	248.000	448.000			74.788	455.000			
	530.200	448.000		16	698.000	455.000			
	531.700	448.000							
	824.000	448.000			<u>erial Bou</u> 8.000	<u>ndary</u> 454.250			
	832.191	448.073		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					

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itten	by: Jose	eph Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	g Date	: 4	/7/200)9
ent:	Honeywe	ell Proj	ect: Onond	laga Lake SC	A 50% Design	Project	t/ Proposal No.:	GJ4299	Task N	lo.:	0
	554.200	454.250			55	4.200	460.000				
	555.700										
	824.000	454.250			Mate	erial Bou	undary				
	840.193	454.394			55	5.700	454.250				
	841.706	454.408			55	5.700	460.000				
	1126.17	8 456.940									
	1127.70	7 456.954			Mate	erial Bou	<u>undary</u>				
	1161.00					4.200	430.252				
	1236.00				82	4.200	436.002				
	1400.00										
	1412.19					erial Bou					
	1413.74					5.700	430.265				
	1698.00	0 455.250			82	5.700	436.015				
N	/laterial B				Mate	erial Bou					
	506.200					4.201	436.250				
	506.200	436.000			72	4.201	442.000				
Ν	/laterial B	oundary			Mate	erial Bou	undary				
	507.700					5.697	436.250				
	507.700	436.000			72	5.697	442.000				
N	/laterial B	oundary			Mate	erial Bou	undary				
_	466.200					8.195	448.250				
	466.200	442.000			73	8.195	454.000				
Ν	/laterial B	oundary			Mat	erial Bou	undary				
	467.700					9.701	448.250				
	467.700	442.000			73	9.701	454.000				
N	/laterial B	oundary			Mate	erial Bou	undary				
	530.200					0.193	454.394				
	530.200	448.000			84	0.193	460.144				
N	/laterial B	oundary			Mate	erial Bou	undary				
	531.700	442.250				1.706	454.408				
	531.700	448.000			84	1.706	460.158				
N	/laterial B	oundary			Mate	erial Bou	undary				
	493.200					2.191	442.323				
	493.200	454.000			83	2.191	448.073				
N	/laterial B	oundary			Mate	erial Bou	undary				
	494.700				83	3.715	442.336				
	494.700	454.000			83	3.715	448.086				
N	/laterial B	oundary			Mate	erial Bou	undary				
	554.200					2.197	437.658				

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Written by:	Joseph	Sura	Date:	4/3/2009	Reviewed by:		ulasingam/Min hu/Jay Beech	g Date	: , 	4/7/20	09
Client: Hone	eywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task	No.:	05
982.1	197	443.408			12	28.192	456.104				
Materia	al Boui	ndary			Mate	erial Bou	ndary				
983.1	182	449.667			12	29.723	450.334				
983.1	182	455.417			12	29.723	456.084				
Materia	al Bou	ndary			Mate	erial Bou	ndary				
983.7		437.672				40.193	438.224				
983.7	718	443.422			12	40.193	443.974				
Materia		ndary			Mate	erial Bou	ndary				
984.7		449.681				41.724	438.215				
984.7	724	455.431			12	41.724	443.965				
Materia	al Bou	<u>ndary</u>			Mate	erial Bou	ndary				
1134	.188	445.011				12.195	455.250				
1134	.188	450.761			14	12.195	461.000				
Materia	al Boui	ndary			Mate	erial Bou	ndary				
1135		445.025				13.743	455.250				
1135	.719	450.775			14	13.743	461.000				
Materia	al Boui	ndary			Mate	erial Bou	ndary				
1436	.205	443.250				60.199	431.250				
1436	.205	449.000			14	60.199	437.000				
Materia	al Boui	ndary			Mate	erial Bou	ndary				
1437		443.250			14	61.784	431.250				
1437	.780	449.000			14	61.784	437.000				
Materia	al Boui	ndary			Mate	erial Bou	ndary				
1126		456.940				98.182	437.250				
1126	.178	462.690			14	98.182	443.000				
Materia	al Boui	ndary				erial Bou	ndary				
		456.954			14	99.766	437.250				
1127	.707	462.704			14	99.766	443.000				
Materia	al Boui	ndary			Mate	erial Bou	<u>ndary</u>				
	.148	433.082				73.204					
1142	.148	438.832			14	73.204	455.000				
Materia	<u>al Bou</u> i	<u>ndary</u>			<u>M</u> ate	erial Bou	ndary				
1143	.812	433.097			14	74.788	449.250				
1143	.812	438.847			14	74.788	455.000				
Materia	al Boui	ndary			Mate	erial Bou	ndary				
		450.354				5.176	430.000				

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Written by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	Date	e: 4/7/	/2009
Client: Honeywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.	: 05
177.171	423.910				68.000 68.000	454.250 454.000			
Material Bou	ndary				48.000	454.000			
0.000	387.500				48.000	448.250			
1979.000	390.050			2	48.000	448.000			
Material Bou	ndarv				28.000 28.000	448.000 442.250			
1786.163	426.261				28.000	442.000			
1799.372	431.000				08.000	442.000			
1100.012	401.000				08.000	436.250			
Material Bou	ndarv				08.000	436.000			
164.400	430.400				88.000	436.000			
165.176	430.000				88.000	430.250			
100.170	400.000				88.000	430.000			
Material Bou	ndarv				66.176	430.000			
1799.372	431.000				65.257	430.401			
1803.000	432.300				64.400	430.400			
1000.000	402.000				36.600	430.400			
External Bou	Indary				22.359	424.645			
1798.000	431.000				.000	427.500			
1778.100	431.000				.000	387.500			
1778.100	431.250				.000	347.500			
1778.100	437.000				979.000	350.000			
1758.000	437.000				979.000	390.050			
1758.000	437.250				979.000	430.050			
1758.000	443.000				841.123	426.953			
1738.000	443.000				841.000	427.000			
1738.000	443.250				827.000	432.300			
1738.000	449.000				803.000	432.300			
1718.000	449.000				803.000	432.300			
1718.000	449.250			I	001.401	452.501			
1718.000	455.000			Die	zo Line				
1698.000	455.000				70.846	427.959			
1698.000	455.250 461.000				73.133	427.959			
1698.000 1413.743	461.000				47.000 00.000	424.600 424.600			
1413.743									
	461.000				40.000	425.000			
1400.000	461.000				28.000	425.000			
1236.000	462.000				102.000	432.000			
1161.000	463.000				176.000	432.000			
1127.707	462.704				356.000	429.000			
1126.178	462.690				474.000	428.500			
841.706	460.158				619.000	427.500			
840.193	460.144				689.000	427.500			
824.000	460.000				790.000	429.000			
555.700	460.000			1	792.668	429.000			
554.200	460.000				4 a a T - 1 1				
268.000	460.000			<u>vva</u>	<u>iter Table</u>				

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							Page	157	of	201
Written	by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech	g Date	: 4/7/2	009
Client:	Honeywell	Project:	Onond	aga Lake SC	A 50% Design	Project	t/ Proposal No.:	GJ4299	Task No.:	05
	0.000	412.500								
	204.000	408.550			Sup	port				
	405.000	405.750				3.200	454.000			
	472.000	407.050				3.200	448.250			
	557.156	407.108			48	5.200	440.250			
					Sun	nort				
	768.000	407.250				port	400.000			
	805.000	408.150				600.8	460.000			
	925.000	408.250			26	600.88	454.250			
	1165.000	413.350			-					
	1347.000	410.150				port				
	1436.000	411.150				600.88	454.250			
	1642.000	409.450			55	64.200	454.250			
	1768.160	411.260								
	1841.123	411.953			<u>Sup</u>	port				
	1979.000	415.050			55	5.700	454.250			
					55	5.700	460.000			
F	ocus/Block	Search Line								
_	268.000	454.014			Sup	port				
	554.268	454.169				5.700	460.000			
	0011200					4.000	460.000			
F	ocus/Block	Search Point			02		100.000			
<u>-</u>	555.549	460.000			<u>Sup</u>	nort				
	000.040	400.000				24.000	460.000			
F		Search Point				0.193	460.144			
<u> </u>	554.268	454.169			0-	0.135	400.144			
	554.200	454.103			Sup	nort				
г		Search Point				port	460 4 4 4			
<u> </u>						0.193	460.144			
	268.276	454.014			84	0.193	454.394			
~					0					
<u>5</u>	Support	454.050				port	454.004			
	554.200	454.250			-	0.193	454.394			
	554.200	460.000			82	4.000	454.250			
<u>S</u>	Support					<u>port</u>				
	554.200	460.000				4.000	454.250			
	268.000	460.000			55	5.700	454.250			
<u>S</u>	<u>Support</u>					port				
	268.000	454.000			73	8.195	454.000			
	248.000	454.000			73	8.195	448.250			
S	Support				Sup	port				
	248.000	454.000				9.701	454.000			
	248.000	448.250				9.701	448.250			
5	Support				Sun	port				
<u>-</u>	248.000	448.250				8.195	454.000			
	493.200	448.250				4.700	454.000			

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					Page	158		01
Written by: Joseph	ı Sura	Date: 4/3/2009	Reviewed by:		Kulasingam/Ming Zhu/Jay Beech			
Client: Honeywell	Project:	Onondaga Lake SCA	A 50% Design	Project	/ Proposal No.:	GJ4299	Task No.:	05
<u>Support</u> 494.700 494.700	454.000 448.250			<u>bort</u> 8.000 8.000	436.250 442.000			
<u>Support</u> 494.700 738.195	448.250 448.250			<u>bort</u> 8.000 8.000	442.000 442.000			
<u>Support</u> 724.201 724.201	442.000 436.250			<u>oort</u> 8.000 6.200	442.000 442.000			
<u>Support</u> 724.201 467.700	436.250 436.250			<u>bort</u> 6.200 6.200	442.000 436.250			
<u>Support</u> 467.700 467.700	436.250 442.000			<u>oort</u> 6.200 8.000	436.250 436.250			
<u>Support</u> 467.700 724.201	442.000 442.000			<u>oort</u> 8.000 8.000	430.250 436.000			
<u>Support</u> 228.000 228.000	448.000 442.250			<u>bort</u> 8.000 8.000	436.000 436.000			
<u>Support</u> 248.000 530.200	448.000 448.000			<u>bort</u> 8.000 6.200	436.000 436.000			
<u>Support</u> 530.200 530.200	448.000 442.250			<u>port</u> 7.700 7.700	436.000 430.250			
<u>Support</u> 531.700 531.700	442.250 448.000			<u>bort</u> 6.200 6.200	436.000 430.250			
<u>Support</u> 530.200 228.000	442.250 442.250			<u>bort</u> 6.200 8.000	430.250 430.250			
<u>Support</u> 228.000 248.000	448.000 448.000			<u>port</u> 7.700 4.200	430.250 430.252			

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					Page	159		201
Written by: Joseph	Sura	Date: 4/3/20	009 Reviewed by:		ulasingam/Ming hu/Jay Beech	Date:	4/7/20	009
Client: Honeywell	Project:	Onondaga Lak	xe SCA 50% Design	Project/	Proposal No.:	GJ4299	Task No.:	05
<u>Support</u> 824.200 824.200	430.252 436.002			<u>port</u> 4.000 2.197	436.250 437.658			
<u>Support</u> 824.200 507.700	436.002 436.000			<u>port</u> 2.197 2.197	437.658 443.408			
<u>Support</u> 832.191 832.191	442.323 448.073			<u>port</u> 2.197 4.000	443.408 442.000			
<u>Support</u> 833.715 833.715	442.336 448.086			<u>port</u> 4.000 5.697	442.000 442.000			
<u>Support</u> 832.191 824.000	448.073 448.000			<u>port</u> 9.701 4.000	448.250 448.250			
<u>Support</u> 824.000 531.700	448.000 448.000			<u>port</u> 4.000 3.182	448.250 449.667			
<u>Support</u> 531.700 824.000	442.250 442.250			<u>port</u> 3.182 3.182	449.667 455.417			
<u>Support</u> 824.000 832.191	442.250 442.323			<u>port</u> 3.182 4.000	455.417 454.000			
<u>Support</u> 841.706 841.706	460.158 454.408			<u>port</u> 4.000 9.701	454.000 454.000			
<u>Support</u> 825.700 825.700	436.015 430.265			<u>port</u> 1.706 26.178	454.408 456.940			
<u>Support</u> 725.697 725.697	442.000 436.250			<u>port</u> 26.178 26.178	456.940 462.690			
<u>Support</u> 725.697 824.000	436.250 436.250			<u>port</u> 26.178 1.706	462.690 460.158			

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Written by: Joseph	Sura	Date:	4/3/2009	Reviewed by:		ulasingam/Ming hu/Jay Beech	Date:	4/7/20)09
Client: Honeywell	Project:	Onondag	a Lake SCA	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.:	05
<u>Support</u> 833.715 1134.188	448.086 450.761				<u>port</u> 40.193 36.000	443.974 444.000			
<u>Support</u> 1134.188 1134.188	450.761 445.011				<u>port</u> 36.000 61.000	444.000 445.000			
<u>Support</u> 1134.188 833.715	445.011 442.336				<u>oort</u> 61.000 3.718	445.000 443.422			
<u>Support</u> 825.700 1142.148	436.015 438.832				<u>oort</u> 4.724 61.000	455.431 457.000			
<u>Support</u> 1142.148 1142.148	438.832 433.082				<u>oort</u> 61.000 28.192	457.000 456.104			
<u>Support</u> 1142.148 825.700	433.082 430.265				<u>port</u> 28.192 28.192	456.104 450.354			
<u>Support</u> 984.724 984.724	455.431 449.681				<u>port</u> 28.192 61.000	450.354 451.250			
<u>Support</u> 983.718 983.718	443.422 437.672				<u>oort</u> 61.000 4.724	451.250 449.681			
<u>Support</u> 983.718 1161.000	437.672 439.250				<u>oort</u> 8.000 3.200	454.000 454.000			
<u>Support</u> 1161.000 1236.000	439.250 438.250				<u>port</u> 27.707 27.707	462.704 456.954			
<u>Support</u> 1236.000 1240.193	438.250 438.224				<u>port</u> 27.707 61.000	462.704 463.000			
<u>Support</u> 1240.193 1240.193	438.224 443.974				<u>oort</u> 61.000 36.000	463.000 462.000			

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Written by: Joseph	Sura	Date: 4/3/2	Reviewed by:		Kulasingam/Ming Khu/Jay Beech	Date:	4/7/20)09
Client: Honeywell	Project:	Onondaga Lak	ke SCA 50% Design	Project	Proposal No.:	GJ4299	Task No.:	05
<u>Support</u> 1236.000 1400.000	462.000 461.000			<u>port</u> 00.000 -36.205	443.250 443.250			
<u>Support</u> 1400.000 1412.195	461.000 461.000			<u>port</u> 36.205 36.205	443.250 449.000			
<u>Support</u> 1412.195 1412.195	461.000 455.250			<u>port</u> 37.780 37.780	449.000 443.250			
<u>Support</u> 1412.195 1400.000	455.250 455.250			<u>port</u> 36.205 00.000	449.000 449.000			
<u>Support</u> 1400.000 1236.000	455.250 456.250			<u>port</u> 00.000 36.000	449.000 450.000			
<u>Support</u> 1236.000 1161.000	456.250 457.250			<u>port</u> 36.000 61.000	450.000 451.000			
<u>Support</u> 1161.000 1127.707	457.250 456.954			<u>port</u> 29.723 29.723	456.084 450.334			
<u>Support</u> 1135.719 1135.719	450.775 445.025			<u>port</u> 29.723 36.000	450.334 450.250			
<u>Support</u> 1135.719 1161.000	450.775 451.000			<u>port</u> 36.000 29.723	456.000 456.084			
<u>Support</u> 1161.000 1135.719	445.250 445.025			<u>port</u> 36.000 00.000	456.000 455.000			
<u>Support</u> 1161.000 1236.000	445.250 444.250			<u>port</u> 00.000 73.204	455.000 455.000			
<u>Support</u> 1236.000 1400.000	444.250 443.250			port 73.204 73.204	455.000 449.250			

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					Page	consulta 162		201
Written by: Joseph	Sura	Date: 4/3/2009	Reviewed by:		Tulasingam/Ming Chu/Jay Beech			
Client: Honeywell	Project:	Onondaga Lake SC	A 50% Design	Project/	Proposal No.:	GJ4299	Task No.:	05
<u>Support</u> 1474.788 1474.788	449.250 455.000			<u>port</u> 60.199 00.000	431.250 431.250			
<u>Support</u> 1473.204 1400.000	449.250 449.250			<u>port</u> 00.000 36.000	431.250 432.250			
<u>Support</u> 1400.000 1236.000	449.250 450.250			<u>port</u> 36.000 61.000	432.250 433.250			
<u>Support</u> 1241.724 1241.724	438.215 443.965			<u>port</u> 41.724 00.000	438.215 437.250			
<u>Support</u> 1143.812 1143.812	438.847 433.097			<u>port</u> 00.000 98.182	437.250 437.250			
<u>Support</u> 1143.812 1161.000	433.097 433.250			<u>port</u> 98.182 98.182	443.000 437.250			
<u>Support</u> 1161.000 1143.812	439.000 438.847			<u>port</u> 99.766 99.766	437.250 443.000			
<u>Support</u> 1161.000 1236.000	439.000 438.000			<u>port</u> 98.182 00.000	443.000 443.000			
<u>Support</u> 1236.000 1400.000	438.000 437.000			<u>port</u> 00.000 41.724	443.000 443.965			
<u>Support</u> 1400.000 1460.199	437.000 437.000			<u>port</u> 13.743 13.743	461.000 455.250			
<u>Support</u> 1460.199 1460.199	437.000 431.250			<u>port</u> 13.743 98.000	461.000 461.000			
<u>Support</u> 1461.784 1461.784	431.250 437.000			<u>port</u> 98.000 98.000	461.000 455.250			

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							Page	consulta 163	nts of	201
Written by:	Joseph S	Sura	Date:	4/3/2009	Reviewed by:		ulasingam/Ming hu/Jay Beech			2009
Client: Hon	eywell	Project:	Ononda	aga Lake SCA	50% Design	Project/	Proposal No.:	GJ4299	Task No.:	05
	<u>ort</u> 3.000 3.743	455.250 455.250				<u>port</u> 738.000 199.766	443.000 443.000			
	<u>ort</u> 4.788 3.000	449.250 449.250				<u>port</u> 718.000 698.000	455.000 455.000			
	<u>ort</u> 3.000 3.000	449.250 455.000				<u>port</u> 718.000 738.000	449.000 449.000			
	<u>ort</u> 3.000 4.788	455.000 455.000				<u>port</u> ′38.000 ′58.000	443.000 443.000			
	<u>ort</u> 1.784 3.100	431.250 431.250				<u>port</u> 758.000 778.100	437.000 437.000			
	o <u>rt</u> 3.100 3.100	431.250 437.000								
	<u>ort</u> 3.000 1.784	437.000 437.000								
	<u>ort</u> 7.780 3.000	443.250 443.250								
	o <u>rt</u> 3.000 3.000	443.250 449.000								
	o <u>rt</u> 3.000 7.780	449.000 449.000								
	<u>ort</u> 9.766 3.000	437.250 437.250								
	<u>ort</u> 3.000 3.000	437.250 443.000								

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				Page	164			201
Written by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Mir Zhu/Jay Beech	ng Da	ate:	4/7/20	009
Client: Honeywell Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Tas	k No.:	05
Slide Analysis Infor	matio	on	Wat	ion Angle: 30 degrees er Surface: Water Tab				
Document Name			Cus	tom Hu value: 1				
File Name: EastWest_NoCo	over_Lir	ner_Lab.sli	Mat	erial: Dike Soil				
				ngth Type: Mohr-Cou	lomb			
Project Settings				Weight: 120 lb/ft3				
Project Title: SLIDE - An Inte	eractive	e Slope		esion: 0 psf				
Stability Program				ion Angle: 35 degrees	5			
Failure Direction: Right to Le			Wat	er Surface: Water Tak	ole			
Units of Measurement: Impe		its	Cus	tom Hu value: 1				
Pore Fluid Unit Weight: 62.4								
Groundwater Method: Water	r Surfac	ces		erial: Gravel				
Data Output: Standard Calculate Excess Pore Pres		ff		ngth Type: Mohr-Cou	lomb			
Allow Ru with Water Surface				Weight: 120 lb/ft3				
Random Numbers: Pseudo-				esion: 0 psf				
Random Number Seed: 101		10000		ion Angle: 38 degrees er Surface: Piezometr				
Random Number Generation		od: Park and		tom Hu value: 1				
Miller v.3			Ous					
			Mate	erial: SOLW (undraine	ed)			
<u>Analysis Methods</u>				ngth Type: Discrete fu				
Analysis Methods used:			Unit	Weight: 82 lb/ft3				
Bishop simplified				er Surface: Water Tab	ole			
Janbu simplified			Cus	tom Hu value: 1				
Spencer				del Davida e Matadal				
Number of allocate OF				erial: Dredge Material				
Number of slices: 25 Tolerance: 0.005				ngth Type: Mohr-Cou	amo			
Maximum number of iteratio	ne: 50			Weight: 86 lb/ft3 esion: 0 psf				
	115. 50			ion Angle: 15 degrees	2			
Surface Options				er Surface: Water Tat				
Surface Type: Non-Circular	Block S	Search		tom Hu value: 1				
Number of Surfaces: 5000	DIOORC							
Pseudo-Random Surfaces:	Enable	d		erial: Tube-Tube Inter		izonta	l)	
Convex Surfaces Only: Disa	abled			ngth Type: Mohr-Cou	lomb			
Left Projection Angle (Start A				Weight: 86 lb/ft3				
Left Projection Angle (End A				esion: 0 psf				
Right Projection Angle (Star				ion Angle: 15 degrees				
Right Projection Angle (End		: 85		er Surface: Water Tat tom Hu value: 1	ne			
Minimum Elevation: Not Def			Cus	iom nu value. I				
Minimum Depth: Not Define	u		Mate	erial: Tub-Tube Interfa	ice (Vertie	cal)		
Motorial Properties				ngth Type: Mohr-Cou		July		
<u>Material Properties</u> Material: Final Cover Soil				Weight: 43 lb/ft3				
	nh		Coh	esion: 0 pst				
Strength Type: Mohr-Coulor	nb			esion: 0 psf ion Angle: 0.1 degree	S			
	nb		Frict					

				Ge	osynt		
				Page	consulta		201
Written by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech			
Client: Honeywell Project:	Onond	laga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.:	05
Custom Hu value: 1				hod: janbu simplified 2.062140			
Material: Tube-Gravel Interfa	ace			Location: 206.790, 58	31.778		
Strength Type: Mohr-Coulor				Slip Surface Endpoint		430.000	
Unit Weight: 86 lb/ft3				nt Slip Surface Endpoir			
Cohesion: 0 psf			Res	isting Horizontal Force	=75770.2	lb	
Friction Angle: 24 degrees			Driv	ing Horizontal Force=3	36743.5 lb		
Water Surface: Water Table							
Custom Hu value: 1				hod: spencer			
				2.007080			
Material: Liner				Location: 206.790, 58			
Strength Type: Mohr-Coulor	nb			Slip Surface Endpoint			
Unit Weight: 100 lb/ft3				nt Slip Surface Endpoir			
Cohesion: 0 psf				isting Moment=1.2919		-ft	
Friction Angle: 19 degrees Water Surface: Water Table				ing Moment=6.43674e		lh	
Custom Hu value: 1				isting Horizontal Force ing Horizontal Force=3		a	
Custom nu value. 1					<i>3112</i> 1.0 ID		
Material: Foundation			Val	id / Invalid Surfac	es		
Strength Type: Mohr-Coulor	nb			hod: bishop simplified			
Unit Weight: 120 lb/ft3			Nun	nber of Valid Surfaces:	3194		
Cohesion: 0 psf			Nun	nber of Invalid Surface	s: 1806		
Friction Angle: 37 degrees				or Codes:			
Water Surface: Water Table				or Code -107 reported f			
Custom Hu value: 1				or Code -108 reported f			
				or Code -110 reported f			
Support Properties				or Code -111 reported f			
Support: Geotube			Erro	or Code -112 reported f	or 622 sur	taces	
Geotube			Mot	had ianhy simplified			
Support Type: GeoTextile Force Application: Passive				<u>hod: janbu simplified</u> nber of Valid Surfaces:	3004		
Force Orientation: Tangent t	o Slin	Surface		nber of Invalid Surfaces.			
Anchorage: Both Ends		Sunace		or Codes:	5. 1330		
Shear Strength Model: Linea	ar			or Code -107 reported f	for 449 sur	faces	
Strip Coverage: 100 percent				or Code -108 reported f			
Tensile Strength: 1600 lb/ft				or Code -110 reported f			
Pullout Strength Adhesion: 5	5 lb/ft2			or Code -111 reported f			
Pullout Strength Friction Ang	gle: 40	degrees	Erro	or Code -112 reported f	or 546 sur	faces	
Clobal Minimuma			Mot	hod: spencer			
Global Minimums				nber of Valid Surfaces:	522		
Method: bishop simplified FS: 2.021260				nber of Invalid Surfaces.			
Axis Location: 206.790, 581	778			or Codes:			
Left Slip Surface Endpoint: 1		1 430 000		or Code -107 reported f	for 449 sur	faces	
Right Slip Surface Endpoint:			_	or Code -108 reported f			
Resisting Moment=1.288326				or Code -110 reported f			
Driving Moment=6.37384e+				or Code -111 reported f			
		-		or Code -112 reported f			

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				consult	ants		
			Page	166	of	20	1
Written by: Joseph Sura D	ate: 4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Date	e:	4/7/2009	9
Client: Honeywell Project: O	nondaga Lake SC.	A 50% Design	Project/ Proposal No.:	GJ4299	Task	No.:	05
Slide Analysis Inform	ation		ngth Type: Mohr-Coul	omb			
			Weight: 120 lb/ft3 esion: 0 psf				
Document Name		Frict	ion Angle: 30 degrees				
File Name:			er Surface: Water Tab	le			
EastWest NoCover Global Su	Lab.sli	Cus	tom Hu value: 1				
	-	Mate	erial: Dike Soil				
Project Settings			ngth Type: Mohr-Coul	omb			
		Unit	Weight: 120 lb/ft3				
Project Title: SLIDE - An Intera	ictive Slope		esion: 0 psf				
Stability Program Failure Direction: Right to Left			ion Angle: 35 degrees er Surface: Water Tab				
Units of Measurement: Imperia	I Units		tom Hu value: 1	le			
Pore Fluid Unit Weight: 62.4 lb	/ft3	Cuo					
Groundwater Method: Water S	urfaces		erial: Gravel				
Data Output: Standard Calculate Excess Pore Pressu	ro: Off		ngth Type: Mohr-Coul	omb			
Allow Ru with Water Surfaces			Weight: 120 lb/ft3 esion: 0 psf				
Random Numbers: Pseudo-rar			ion Angle: 38 degrees				
Random Number Seed: 10116			er Surface: Piezometri				
Random Number Generation N	lethod: Park and	d Cus	tom Hu value: 1				
Miller v.3		Mat	rial, COLM/ (undraina	۹۱)			
Analysis Methods			<u>erial: SOLW (undraine</u> ngth Type: Discrete fu				
- maryere methode			Weight: 82 lb/ft3	notion			
Analysis Methods used:			er Surface: Water Tab	le			
Bishop simplified		Cus	tom Hu value: 1				
Janbu simplified Spencer		Mot	erial: Dredge Material				
Spencer			ngth Type: Mohr-Coul	omb			
Number of slices: 25			Weight: 86 lb/ft3	•••••			
Tolerance: 0.005			esion: 0 psf				
Maximum number of iterations	: 50		ion Angle: 15 degrees er Surface: Water Tab				
Surface Options			tom Hu value: 1	le			
		N/ot	erial: Tube-Tube Interf	aca (Horiz	ontal)		
Surface Type: Circular Search Method: Grid Search			ngth Type: Mohr-Coul		.onai)		
Radius increment: 10		Unit	Weight: 86 lb/ft3				
Composite Surfaces: Disabled			esion: 0 psf				
Reverse Curvature: Create Ter			ion Angle: 15 degrees er Surface: Water Tab				
Minimum Elevation: Not Define Minimum Depth: Not Defined	d		tom Hu value: 1	le			
Material Properties		Stre	erial: Tub-Tube Interfa ngth Type: Mohr-Coul		<u>al)</u>		
Material: Final Cover Soil		Unit	Weight: 43 lb/ft3				

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							consult		
						Page	167	of 2	201
Written by:	Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Mi Zhu/Jay Beech	ng Date	± 4/7/20	009
Client: Ho	neywell	Project:	Onond	laga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.:	0
Cohe	esion: 0 psf				Ra	dius: 84.874			
	on Angle: 0.1	dearees				t Slip Surface Endpoin	t: 174.838.	430.000	
	r Surface: Wa					ht Slip Surface Endpo			
Custo	om Hu value:	1				sisting Moment=8.472			
						ving Moment=5.59976			
	<u>rial: Tube-Gra</u>					-			
	igth Type: Mo		ıb			thod: janbu simplified			
	Weight: 86 lb/1	ft3				: 1.451530			
	sion: 0 psf					nter: 208.705, 543.147	*		
	on Angle: 24 o					dius: 155.107			
	r Surface: Wa					t Slip Surface Endpoin			
Cusic	om Hu value:					ht Slip Surface Endpo			
Mata	rial: Liner					sisting Horizontal Forc ving Horizontal Force=		D	
	ngth Type: Mo	hr-Coulom	h		ווס	ving holizonial Force=	109229 10		
	Weight: 100 lb				Me	thod: spencer			
	esion: 0 psf	,110				: 1.516370			
	on Angle: 19 d	dearees				nter: 208.705, 556.595	5		
	r Surface: Wa					dius: 165.435			
	om Hu value:					t Slip Surface Endpoin	t: 108.489,	424.969	
						ht Slip Surface Endpo			
	rial: Foundation				Re	sisting Moment=2.875	6e+007 lb-f	t	
	igth Type: Mo		ıb			ving Moment=1.89637			
	Weight: 120 lb	o/ft3				sisting Horizontal Forc		b	
	sion: 0 psf				Dri	ving Horizontal Force=	:102057 lb		
	on Angle: 37 o								
	er Surface: Wa om Hu value:				Va	<u>lid / Invalid Surfa</u>	<u>ces</u>		
					Ме	thod: bishop simplified			
Sup	port Prope	rties				mber of Valid Surfaces			
					Nu	mber of Invalid Surface	es: 3595		
	ort: Geotube					or Codes:			
Geot						or Code -103 reported			
	ort Type: Geo					or Code -106 reported			
	e Application:			~ ′		or Code -107 reported			
	e Orientation:		Slip	Surface		or Code -108 reported			
	orage: Both E r Strength Mo		r			or Code -110 reported or Code -112 reported			
	Coverage: 10		I			or Code -112 reported			
	ile Strength: 1				L11		101 155 501	laces	
	ut Strength Ad		lb/ft2		Me	thod: janbu simplified			
	ut Strength Fr			dearees		mber of Valid Surfaces	s: 1062		
						mber of Invalid Surface			
Glob	bal M inimu	ms				or Codes:	-		
<u></u>					Err	or Code -103 reported	for 2769 su	urfaces	
Meth	od: bishop sin	nplified			Err	or Code -106 reported	for 109 sur	faces	
	.513050					or Code -107 reported			
Cente	er: 235.509, 4	89.351			Err	or Code -108 reported	for 270 sur	faces	

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				Page	168	of	201
Written by: Joseph Sura	Date: 4/3			R. Kulasingam/Ming Zhu/Jay Beech		-	2009
Client: Honeywell Project:	Onondaga L	ake SCA	50% Design	Project/ Proposal No.:	GJ4299	Task No.	: 05
Error Code -110 reported for Error Code -111 reported for Error Code -112 reported for Error Code -116 reported for <u>Method: spencer</u> Number of Valid Surfaces: 6 Number of Invalid Surfaces: Error Code -103 reported for Error Code -106 reported for Error Code -107 reported for Error Code -108 reported for Error Code -110 reported for Error Code -111 reported for Error Code -111 reported for Error Code -112 reported for Error Code -116 reported for Error Code -116 reported for	r 3 surfaces r 249 surface r 153 surface 528 : 4234 r 2769 surface r 109 surface r 325 surface r 34 surfaces r 377 surface r 254 surface	es es ces es es es es es es es es es					

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					consult	tants		
				Page	169	of	2	201
Written by: Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Dat	e:	4/7/20)09
Client: Honeywell Project: (Onondag	ga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task	No.:	(
Slide Analysis Inform	natio	n		ngth Type: Mohr-Coul Weight: 120 lb/ft3	omb			
Document Name			Coh	esion: 0 psf				
Doodmont Hamo				tion Angle: 30 degrees				
File Name:				er Surface: Water Tab tom Hu value: 1	ne			
EastWest_NoCover_External_L	_ab.sli		Cus					
			Mat	erial: Dike Soil				
Project Settings				ngth Type: Mohr-Coul	omb			
				Weight: 120 lb/ft3				
Project Title: SLIDE - An Inter	actives	Slope		esion: 0 psf				
Stability Program Failure Direction: Right to Left	+			tion Angle: 35 degrees				
Units of Measurement: Imperi				er Surface: Water Tab tom Hu value: 1	le			
Pore Fluid Unit Weight: 62.4 I		,	Cus	iom nu value. T				
Groundwater Method: Water S		S	Mat	erial: Gravel				
Data Output: Standard				ngth Type: Mohr-Coul	omb			
Calculate Excess Pore Pressu				Weight: 120 lb/ft3				
Allow Ru with Water Surfaces				esion: 0 psf				
Random Numbers: Pseudo-ra		Seed		tion Angle: 38 degrees				
Random Number Seed: 1011 Random Number Generation		I. Dark and		er Surface: Piezometr	ic Line 1			
Miller v.3	Method	. F aik aik	us Cus	tom Hu value: 1				
			Mat	erial: SOLW (undraine	d)			
<u>Analysis Methods</u>			Stre	ngth Type: Discrete fu	Inction			
				Weight: 82 lb/ft3				
Analysis Methods used:				er Surface: Water Tab	le			
Bishop simplified			Cus	tom Hu value: 1				
Janbu simplified Spencer			Mat	erial: Dredge Material				
Spencer				ngth Type: Mohr-Coul	omb			
Number of slices: 25				Weight: 86 lb/ft3	onno			
Tolerance: 0.005				esion: 0 psf				
Maximum number of iterations	s: 50			tion Angle: 15 degrees				
				er Surface: Water Tab	le			
<u>Surface Options</u>			Cus	tom Hu value: 1				
Surface Type: Circular			Mat	erial: Tube-Tube Interf	ace (Horiz	zontal)		
Search Method: Grid Search				ngth Type: Mohr-Coul			-	
Radius increment: 10				Weight: 86 lb/ft3				
Composite Surfaces: Disabled				esion: 0 psf				
Reverse Curvature: Create Te		Crack		tion Angle: 15 degrees				
Minimum Elevation: Not Defin	led			er Surface: Water Tab tom Hu value: 1	ne			
Minimum Depth: Not Defined			Cus	tom nu value. I				
Material Properties				erial: Tub-Tube Interfa		<u>al)</u>		
				ngth Type: Mohr-Coul Weight: 43 lb/ft3	amo			
Material: Final Cover Soil			Unit					

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		Page	170	of	201
Written by: Joseph Sura Date: 4/3/20	09 Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	g Date	: 4/7/2	2009
lient: Honeywell Project: Onondaga Lake	e SCA 50% Design	Project/ Proposal No .:	GJ4299	Task No.:	(
Cohesion: 0 psf	Rac	lius: 3285.601			
Friction Angle: 0.1 degrees		Slip Surface Endpoint:	-731.846.	438.406	
Water Surface: Water Table		nt Slip Surface Endpoir			
Custom Hu value: 1		isting Moment=3.0862			
		ring Moment=3.04492e			
Material: Tube-Gravel Interface		0			
Strength Type: Mohr-Coulomb	Met	hod: janbu simplified			
Unit Weight: 86 lb/ft3	FS:	10.148100			
Cohesion: 0 psf	Cer	ter: -135.799, 3669.49	1		
Friction Angle: 24 degrees		lius: 3285.601			
Water Surface: Water Table		Slip Surface Endpoint:			
Custom Hu value: 1		nt Slip Surface Endpoir)
		isting Horizontal Force		b	
Material: Liner	Driv	ring Horizontal Force=9	2021.8 lb		
Strength Type: Mohr-Coulomb	N				
Unit Weight: 100 lb/ft3		hod: spencer			
Cohesion: 0 psf		10.136500	1		
Friction Angle: 19 degrees Water Surface: Water Table		nter: -135.799, 3669.49 lius: 3285.601	I		
Custom Hu value: 1		Slip Surface Endpoint:	721 9/6	129 106	
		nt Slip Surface Endpoint.			
Material: Foundation		isting Moment=3.0864			,
Strength Type: Mohr-Coulomb		ring Moment=3.04492e			
Unit Weight: 120 lb/ft3		isting Horizontal Force		b	
Cohesion: 0 psf		ring Horizontal Force=9			
Friction Angle: 37 degrees		0			
Water Surface: Water Table	Va	id / Invalid Surfac	es		
Custom Hu value: 1					
		hod: bishop simplified			
Support Properties		nber of Valid Surfaces:			
		nber of Invalid Surfaces	s: 11950		
Support: Geotube		or Codes:			
Geotube Support Type: GeoTextile		or Code -107 reported f			
Force Application: Passive		or Code -110 reported f or Code -113 reported f			
Force Orientation: Tangent to Slip Surface		or Code -1000 reported			
Anchorage: Both Ends	Line			Sunaces	
Shear Strength Model: Linear	Met	hod: janbu simplified			
Strip Coverage: 100 percent		nber of Valid Surfaces:	6537		
Tensile Strength: 1600 lb/ft		nber of Invalid Surfaces			
Pullout Strength Adhesion: 5 lb/ft2	Erro	or Codes:			
Pullout Strength Friction Angle: 40 degrees		or Code -107 reported f			
	Erro	or Code -108 reported f			
<u>Global Minimums</u>		or Code -110 reported f			
		or Code -113 reported f			
Method: bishop simplified	Erro	or Code -1000 reported	tor 9845 s	surfaces	
FS: 10.135800	B.# .	had an an ar			
Center: -135.799, 3669.491	Met	hod: spencer			

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Written by:	Joseph Sura Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Zhu/Jay Beech Date: 4 eywell Project: Onondaga Lake SCA 50% Design Project/ Proposal No.: GJ4299 Task N er of Valid Surfaces: 6168 er of Invalid Surfaces: 12323	e: 4/7/20)09						
Client: Ho	oneywell	Project:	Onond	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.:	05
Numl Error Error Error	ber of Invalid Codes: Code -107 re Code -108 re	Surfaces: eported fo eported fo	12323 r 53 sur r 30 sur	faces					
Error	Code -110 re	eported fo	r 1627 s	surfaces					

GA090175/SCA Stability

Error Code -111 reported for 343 surfaces Error Code -113 reported for 425 surfaces Error Code -1000 reported for 9845 surfaces

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					Page	172	of 201
Written by: Joseph Sura		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date	4/7/2009
Client: Honeywell	Project:	Ononda	aga Lake SCA	A 50% Design	Project/ Proposal No.:	GJ4299	Task No.: 05

Cross-Section B-B: After Placement of Final Cover

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						со	nsulta	nts
					Page	173	of	201
Written by:	Joseph Sura	eph Sura Date: 4/3/2009 Reviewed by:			R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/	2009
Client:	Honeywell Pro	oject: Ono Desi	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Document Name

File Name: EastWest_Cover_Tube_04_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 5000 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical)

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			Page	174		201
Written by: Joseph Sura	Date: 4/3/2009	Reviewed			4/7/20	
Client: Honeywell Project	Onondaga Lake Design	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05
Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1			FS: 6.343380 Axis Location: 324.95 Left Slip Surface End Right Slip Surface En Resisting Moment=5. Driving Moment=9.14	point: 190.0 dpoint: 505 80387e+00	649, 438 5.669, 46 07 lb-ft	
Material: Tube-Gravel Interface Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 24 degrees Water Surface: Water Table Custom Hu value: 1			Method: janbu simplif FS: 6.668040 Axis Location: 355.72 Left Slip Surface End Right Slip Surface En Resisting Horizontal Fo	27, 824.205 point: 191. dpoint: 565 Force=1854	775, 439 5.414, 46 122 lb	
Material: Liner Strength Type: Mohr-Coulomb Unit Weight: 100 lb/ft3 Cohesion: 0 psf Friction Angle: 19 degrees Water Surface: Water Table Custom Hu value: 1			Method: spencer Resisting Moment=0 Driving Moment=0 lb- Resisting Horizontal Fo Driving Horizontal Fo Valid / Invalid Su	ft Force=0 lb rce=0 lb		
Material: Foundation Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 37 degrees Water Surface: Water Table Custom Hu value: 1			Method: bishop simpl Number of Valid Surfa Number of Invalid Su Error Codes: Error Code -107 repo Error Code -108 repo Error Code -112 repo	aces: 810 rfaces: 419 rted for 21 ⁻ rted for 209	14 surfac 50 surfac	ces
Support Properties Support: Geotube Geotube Support Type: GeoTextile Force Application: Passive Force Orientation: Tangent to S Anchorage: Both Ends Shear Strength Model: Linear Strip Coverage: 100 percent Tensile Strength: 1600 lb/ft	lip Surface		Method: janbu simplif Number of Valid Surfa Number of Invalid Su Error Codes: Error Code -107 repo Error Code -108 repo Error Code -112 repo Method: spencer Number of Valid Surfa Number of Invalid Su	aces: 675 rfaces: 432 rted for 21 rted for 218 rted for 22 aces: 0	14 surfac 39 surfac surfaces	ces
Pullout Strength Adhesion: 5 lb. Pullout Strength Friction Angle:			Error Codes: Error Code -107 repo Error Code -108 repo	rted for 21	14 surfac	
<u>Global Minimums</u>			Error Code -111 repo Error Code -112 repo	rted for 49	5 surface	es
Method: bishop simplified			····			

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							-	nsulta	
					D				
					Р	age	175	of	201
Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:		ngam/Ming ay Beech	Date:	4/7/2	2009
Client:	Honeywell Project	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Pr No.	^	GJ4299	Task No.:	05
List of A l	Il Coordinates				1161.000 1236.000	433.000 432.000			
Material Bo	undary				1400.000	431.000			
0.000	427.500				1778.100	431.000			
122.000	424.650								
122.359	424.645				Material Bou	ndary			
177.171	423.910				188.000	430.250			
204.000	423.550				506.200	430.250			
405.000	420.750				507.700	430.250			
472.000	422.050				824.000	430.250			
768.000	422.250				824.200	430.252			
805.000	423.150				825.700	430.265			
925.000	423.250				1142.148	433.082			
1165.000					1143.812	433.097			
1347.000	425.150				1161.000	433.250			
1436.000	426.150				1236.000	432.250			
1642.000	424.450				1400.000	431.250			
1786.163	426.261				1460.199	431.250			
1841.000	426.950				1461.784	431.250			
1841.123	426.953				1778.100	431.250			
Material Bo	oundary				Material Bou	ndary			
122.000	424.500				208.000	436.000			
122.359	424.645				506.200	436.000			
					507.700	436.000			
Material Bo	oundary				824.000	436.000			
166.176	430.000				824.200	436.002			
173.133	426.959				825.700	436.015			
347.000	423.600				1142.148	438.832			
600.000	423.600				1143.812	438.847			
640.000	424.000				1161.000	439.000			
728.000	424.000				1236.000	438.000			
1102.000					1400.000	437.000			
1176.000					1460.199	437.000			
1356.000					1461.784	437.000			
1474.000					1758.000	437.000			
1619.000					Material Da				
1689.000					Material Bou	<u>ndary</u> 436.250			
1790.000					208.000				
1798.000	431.000				466.200	436.250			
Maria					467.700 724.201	436.250 436.250			
Material Bo					724.201 725.697	436.250			
1827.000					824.000	436.250			
1841.123	426.953				982.197	430.250			
Motorial D-	undon				983.718	437.672			
Material Bo					1161.000	439.250			
188.000 824.000	430.000 430.000				1236.000	439.250			
024.000	430.000				00.000				

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Written by:	Joseph S	lura	Date:	4/3/2009	Reviewed by:		ngam/Ming ay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Pr No.	· ·	GJ4299	Task No.:	05
1040 100	420.224					1124 100	450 764			
1240.193						1134.188	450.761			
1241.724						1135.719	450.775			
1400.000						1161.000	451.000			
1498.182						1236.000	450.000			
1499.766						1400.000	449.000			
1758.000	437.250					1436.205	449.000			
						1437.780	449.000			
Material Bo	oundary					1718.000	449.000			
228.000	442.000									
466.200	442.000					Material Bou	ndary_			
467.700	442.000					248.000	448.250			
724.201	442.000					493.200	448.250			
725.697	442.000					494.700	448.250			
824.000	442.000					738.195	448.250			
982.197	443.408					739.701	448.250			
983.718	443.422					824.000	448.250			
1161.000						983.182	449.667			
1236.000						984.724	449.681			
1240.193						1161.000	451.250			
1240.193						1228.192	450.354			
1400.000						1220.192	450.334			
1498.182						1236.000	450.250			
1499.766						1400.000	449.250			
1738.000	443.000					1473.204	449.250			
						1474.788	449.250			
Material Bo						1718.000	449.250			
228.000	442.250									
530.200	442.250					Material Bou				
531.700	442.250					268.000	454.000			
824.000	442.250					493.200	454.000			
832.191	442.323					494.700	454.000			
833.715	442.336					738.195	454.000			
1134.188	445.011					739.701	454.000			
1135.719	445.025					824.000	454.000			
1161.000						983.182	455.417			
1236.000						984.724	455.431			
1400.000						1161.000	457.000			
1436.205						1228.192	456.104			
1437.780						1229.723	456.084			
1738.000						1236.000	456.000			
1730.000	443.230					1400.000	455.000			
Motorial Pa	undon					1400.000	455.000			
Material Bo										
248.000	448.000					1474.788	455.000			
530.200	448.000					1698.000	455.000			
531.700	448.000									
824.000	448.000					Material Bou				
832.191	448.073					268.000	454.250			
833.715	448.086					554.200	454.250			

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							Page	177	of	201
Written by:	Joseph S	ura	Date:	4/3/2009	Reviewed by:	R. Kulas	ingam/Ming Jay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ I Nc	-	GJ4299	Task No.:	05
	454.050									
555.700	454.250					Matarial Day				
824.000	454.250					Material Bou				
840.193	454.394					555.700	454.250			
841.706	454.408					555.700	460.000			
1126.178	456.940									
1127.707	456.954					Material Bou				
1161.000	457.250					824.200	430.252			
1236.000	456.250					824.200	436.002			
1400.000	455.250									
1412.195	455.250					Material Bou	undary			
1413.743	455.250					825.700	430.265			
1698.000	455.250					825.700	436.015			
Material Bo	undary					Material Bou	undary			
506.200	430.250					724.201	436.250			
506.200	436.000					724.201	442.000			
Material Bo	undary					Material Bou	undary			
507.700	430.250					725.697	436.250			
507.700	436.000					725.697	442.000			
Motorial Day	un do mi					Motorial Day	un al a m i			
Material Bo						Material Bou				
466.200	436.250					738.195	448.250			
466.200	442.000					738.195	454.000			
Material Bo	undary					Material Bou	undary			
467.700	436.250					739.701	448.250			
467.700	442.000					739.701	454.000			
10111-00	1121000					1001101	10 11000			
Material Bo	<u>undary</u>					Material Bou	undary			
530.200	442.250					840.193	454.394			
530.200	448.000					840.193	460.144			
Material Bo	undary					Material Bou	Indary			
531.700	442.250					841.706	454.408			
531.700	442.230					841.706	460.158			
Material Bo						Material Bou				
493.200	448.250					832.191	442.323			
493.200	454.000					832.191	448.073			
Material Bo	undarv					Material Bou	Indary			
494.700	448.250					833.715	442.336			
494.700 494.700	446.250					833.715	442.336			
Material Bo						Material Bou				
554.200	454.250					982.197	437.658			
554.200	460.000					982.197	443.408			
A090175/SC	A Stability									

Client: Joseph Sura Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Zhavlay Beech Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Zhavlay Beech Date: 4/7/2009 Client: Honeywell Project: Onondaga Lake SCA 50% Project/ Proposal No: GJ4299 No: 0 Waterial Boundary 983.182 449.667 1229.723 456.084 447.224 983.182 449.667 1229.723 456.084 443.422 1240.193 443.974 983.718 437.672 1240.193 443.974 443.422 1240.193 443.974 Waterial Boundary Material Boundary Material Boundary 984.724 436.681 1241.724 433.974 Waterial Boundary Material Boundary Material Boundary 1413.743 455.250 1133.719 450.775 1413.743 455.250 1135.719 445.025 1413.743 451.200 1460.199 437.200 Waterial Boundary Material Boundary 1461.784 437.000 1461.784 437.200 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>(</th> <th>Geos</th> <th>ynte</th> <th>ec^o</th>								(Geos	ynte	ec ^o
Page 178 of 201 Written by: Joseph Sura by: Date: 4/3/2009 Reviewed by: R. Kulasingam/Ming Zhu/Jay Recch Date: 4/7/2009 Client: Honeywell Project: Onondaga Lake SCA 50% Design Project Proposal No.: GJ4299 Task No.: 0 Material Boundary 983.182 449.667 1229.723 450.334 9 0 Material Boundary 983.718 437.672 1240.193 433.624 9 0 983.718 437.472 1240.193 433.624 9 9 1241.724 438.215 983.718 433.422 1240.193 433.624 9 9 1241.724 438.215 984.724 49.681 1241.724 438.215 1241.724 438.215 1134.184 445.011 1412.195 455.250 1413.743 461.000 Material Boundary Material Boundary 1413.743 465.025 1413.743 450.250 1135.719 450.205 1443.743 450.205 1446										-	
by: Joseph Sura Date: 4/3/209 by: Zhu/Jay Beech Date: 4/7/209 Client: Honeywell Project: Onondaga Lake SCA 50% Project/ Proposal GJ4299 Task 0 Waterial Boundary 983.182 449.667 1229.723 450.334 983.182 455.417 1229.723 450.084 Material Boundary 983.718 437.672 1240.193 438.224 983.718 433.974 Material Boundary 983.718 443.422 1240.193 438.224 983.718 443.422 1240.193 438.224 984.724 449.681 924.724 449.681 924.724 449.681 924.724 449.681 924.724 449.681 924.724 449.655 1413.743 455.250 1413.743 455.250 1134.188 450.761 1412.195 455.250 1413.743 455.250 1413.743 455.250 1413.743 455.250 1413.743 455.250 1413.743 455.250 1400.09 431.250 1436.205 449.000							I	Page			
Clean: Honeyweii Project: Design No.: CH299 No.: U Vaterial Boundary 983.182 449.667 1229.723 450.334 983.182 449.667 1229.723 450.334 983.182 449.667 1229.723 450.334 1240.193 438.224 983.718 437.672 1240.193 438.224 1240.193 438.224 983.718 443.422 1241.724 438.215 1241.724 438.215 984.724 445.831 1241.724 438.215 1241.724 438.215 984.724 455.431 1241.724 438.215 1412.195 455.250 1134.188 450.761 1412.195 455.250 1135.719 445.025 1413.743 461.000 Waterial Boundary Material Boundary Material Boundary 1436.025 443.250 1460.199 431.250 1436.205 443.250 1461.784 431.250 14461.784 431.250 1436.205 443.000 1461.784 437.000		Joseph S	ura	Date:	4/3/2009				Date:	4/7/2	009
983.182 449.667 1229.723 450.334 983.718 455.417 1229.723 450.084 Material Boundary Material Boundary 983.718 443.974 983.718 443.422 1240.193 443.974 Material Boundary Material Boundary 984.724 449.681 1241.724 438.224 984.724 449.681 1241.724 438.255 1141.724 443.965 Material Boundary Material Boundary 1412.195 461.000 Material Boundary Material Boundary 1134.188 450.761 1413.743 455.250 1135.719 445.025 1413.743 461.000 455.250 1135.719 450.775 1413.743 461.000 Material Boundary Material Boundary 1437.000 1460.199 431.250 1436.205 449.000 1461.784 431.250 1437.000 Material Boundary Material Boundary 1437.000 1461.784 437.250 1437.780 449.260 1498.182 443.000 1461.784 437.250 1126.178 456.940	Client:	Honeywell	Project:			SCA 50%	•	-	GJ4299		05
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983.182 449.667 1229.723 450.334 983.182 455.417 1229.723 450.084 Material Boundary Material Boundary 983.718 443.974 983.718 443.422 1240.193 443.974 Material Boundary Material Boundary 984.724 449.681 1241.724 438.215 984.724 449.681 1241.724 439.655 11412.195 461.000 Material Boundary Material Boundary 1412.195 461.000 Material Boundary Material Boundary 1134.188 455.250 1134.188 450.761 1413.743 455.250 1135.719 450.275 1413.743 451.200 1135.719 450.025 1413.743 451.200 1135.719 450.025 1413.743 451.200 1136.205 443.250 1460.199 431.250 1436.205 443.250 1461.784 431.250 1437.780 443.250 1461.784 437.250 1437.780 449.000 1461.784 437.250 1126.178 456.940	Material Bo	oundary					Material Bou	undary			
Material Boundary Material Boundary 983.718 437.672 1240.193 438.224 983.718 443.422 1240.193 438.224 983.718 443.422 1240.193 438.224 983.718 443.422 1240.193 438.224 983.718 443.422 1241.724 439.65 Material Boundary 1241.724 439.965 Material Boundary 1241.724 443.965 Material Boundary 1412.195 455.250 1134.188 450.761 1412.195 461.000 Material Boundary Material Boundary 1413.743 455.250 1135.719 445.025 1413.743 455.250 1135.719 445.025 1413.743 451.000 Material Boundary 1460.199 431.250 1436.205 443.250 1460.199 437.000 Material Boundary 1461.784 437.000 Material Boundary 1481.784 437.000 Material Boundary 1498.182 437.250 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td></td> <td></td>									4		
983.718 437.672 1240.193 438.224 983.718 443.422 1240.193 443.974 Material Boundary 984.724 449.681 1241.724 438.215 984.724 449.681 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.4511 1241.724 438.215 1134.188 450.761 1412.195 455.250 1135.719 445.025 1413.743 455.250 1135.719 445.025 1413.743 451.250 1436.205 443.250 1460.199 431.250 1436.205 443.250 1461.784 431.250 1437.780 443.250 1461.784 437.000 Material Boundary 1461.784 437.000 1461.784 437.000 Material Boundary 1498.182 437.250 1126.178 462.690 1498.182 <t< td=""><td>983.182</td><td>455.417</td><td></td><td></td><td></td><td></td><td>1229.723</td><td>456.08</td><td>4</td><td></td><td></td></t<>	983.182	455.417					1229.723	456.08	4		
983.718 437.672 1240.193 438.224 983.718 443.422 1240.193 443.974 Material Boundary 984.724 449.681 1241.724 438.215 984.724 449.681 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.431 1241.724 438.215 984.724 445.4511 1241.724 438.215 1134.188 450.761 1412.195 455.250 1135.719 445.025 1413.743 455.250 1135.719 445.025 1413.743 451.250 1432.025 443.250 1460.199 431.250 1432.025 443.000 1461.784 431.250 1432.025 449.000 1461.784 437.000 Material Boundary 1461.784 437.000 1461.784 437.000 Material Boundary 1461.784 437.250 1461.784 437.250 112	Material Bo	oundarv					Material Bou	Indary			
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984.724 449.681 1241.724 438.215 984.724 455.431 1241.724 438.215 984.724 455.431 1241.724 443.965 Material Boundary 1412.195 455.250 1134.188 445.011 1412.195 461.000 Material Boundary 1413.743 455.250 1135.719 445.025 1413.743 455.250 1135.719 450.775 1413.743 455.250 1135.719 450.775 1413.743 455.250 1436.205 443.250 1460.199 431.250 1437.780 443.250 1460.199 437.000 Material Boundary Material Boundary 1486.182 437.000 Material Boundary 1486.182 437.250 1461.784 431.250 1126.178 456.940 1498.182 437.250 1426.178 452.950 1126.178 452.954 1499.766 437.250 1429.766 437.250 1127.707 456.954 1499.766 437.250 <td></td>											
984.724 449.681 1241.724 438.215 984.724 455.431 1241.724 443.965 Material Boundary 1412.195 455.250 1134.188 445.011 1412.195 455.250 1134.188 450.761 1412.195 451.000 Material Boundary 1413.743 455.250 1135.719 445.025 1413.743 455.250 1135.719 450.775 1413.743 455.250 1135.719 450.775 1413.743 455.250 1436.205 443.250 1460.199 431.250 1437.780 443.250 1460.199 437.000 Material Boundary Material Boundary 1487.700 1487.700 Material Boundary 1488.182 437.000 1461.784 437.250 1126.178 456.940 1498.182 437.250 1126.178 452.954 1499.766 437.250 1127.707 456.954 1499.766 437.250 1127.707 452.954 1499.766 437.250	Material Bo	oundary					Material Bou	Indary			
984.724 455.431 1241.724 443.965 Material Boundary 1341.2195 455.250 1134.188 450.761 1412.195 455.250 1135.719 445.025 1413.743 455.250 1135.719 445.025 1413.743 455.250 1135.719 450.775 1413.743 461.000 Material Boundary Material Boundary 1436.205 443.250 1436.205 443.250 1460.199 431.250 1436.205 443.250 1460.199 431.250 1437.780 443.000 1461.784 431.250 1437.780 443.000 1461.784 431.250 1437.780 443.000 1461.784 437.250 1437.780 443.000 1461.784 437.250 1126.178 456.940 1498.182 437.250 1126.178 456.940 1498.182 437.250 1127.707 462.704 1499.766 437.250 1142.148 438.832 1473.204 449.250 1142.148 438.832 1473.204 449.250 <									5		
1134.188 445.011 1412.195 455.250 1134.188 450.761 1412.195 461.000 Material Boundary 1413.743 455.250 1135.719 445.025 1413.743 455.250 1135.719 450.775 1413.743 455.250 1135.719 450.775 1413.743 455.250 1136.205 443.250 1460.199 431.250 1436.205 443.250 1460.199 431.250 1437.780 443.250 1461.784 431.250 1437.780 443.250 1461.784 437.000 Material Boundary Material Boundary 1426.1784 437.000 Material Boundary 1498.182 443.000 1461.784 437.250 1126.178 456.940 1498.182 443.000 1498.182 443.000 Material Boundary 1499.766 443.000 1499.766 443.000 Material Boundary 1499.766 443.000 1499.766 443.000 Material Boundary 1499.766 443.000 1499.766 443.000 1472.148 438.032											
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1437.780 449.000 1461.784 437.000 Material Boundary Material Boundary 1498.182 437.250 1126.178 456.940 1498.182 433.020 Material Boundary Material Boundary 1498.182 443.000 Material Boundary Material Boundary 1499.766 437.250 1127.707 456.954 1499.766 437.250 1127.707 456.954 1499.766 443.000 Material Boundary Material Boundary 1473.204 449.250 1142.148 438.832 1473.204 449.250 1142.148 438.832 1473.204 455.000 Material Boundary 1474.788 449.250 1143.812 433.097 1474.788 449.250 1143.812 438.847 1474.788 449.250 1143.812 438.847 1474.788 455.000 Material Boundary 1474.788 455.000 Material Boundary 1474.788 455.000 Material Boundary 1474.788 455.000 1143.812 438.847 1474.788 455									0		
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1126.178 462.690 1498.182 443.000 Material Boundary Material Boundary 1499.766 437.250 1127.707 456.954 1499.766 437.250 1127.707 462.704 1499.766 443.000 Material Boundary Material Boundary 1499.766 443.000 Material Boundary Material Boundary 1473.204 449.250 1142.148 438.832 1473.204 455.000 Material Boundary 1474.788 449.250 1143.812 433.097 1474.788 449.250 1143.812 438.847 1474.788 455.000 Material Boundary 1474.788 455.000 Material Boundary 1474.788 450.000 128.192 450.354 165.176 430.000									0		
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1127.707 462.704 1499.766 443.000 Material Boundary Material Boundary 1473.204 449.250 1142.148 438.832 1473.204 455.000 Material Boundary Material Boundary 1474.788 449.250 1143.812 433.097 1474.788 449.250 1143.812 438.847 1474.788 455.000 Material Boundary 1474.788 455.000 1143.812 438.847 1474.788 455.000 Material Boundary 1474.788 455.000 1143.812 438.847 1474.788 450.000 Material Boundary 1474.788 450.000 1228.192 450.354 145.176 430.000									0		
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1142.148 433.082 1473.204 449.250 1142.148 438.832 1473.204 455.000 Material Boundary Material Boundary Material Boundary 1143.812 433.097 1474.788 449.250 1143.812 438.847 1474.788 455.000 Material Boundary 1474.788 455.000 Material Boundary 1474.788 450.000 Material Boundary 1474.788 450.000 Material Boundary 1476.776 430.000	Material Bo	oundary					Material Bou	undary			
Material Boundary Material Boundary 1143.812 433.097 1474.788 449.250 1143.812 438.847 1474.788 455.000 Material Boundary Material Boundary 1228.192 450.354 165.176 430.000									0		
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Written by:	Joseph S	ura	Date:	4/3/2009	Reviewed by:		ngam/Ming ay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Pr No.		GJ4299	Task No.:	05
						1161 000	463.000			
Material Bo	undary					1161.000 1236.000	462.000			
0.000	387.500					1400.000	461.000			
1979.000						1412.195	461.000			
10101000	0001000					1413.743	461.000			
Material Bo	oundarv					1698.000	461.000			
1786.163										
1799.372						Material Bou	ndarv			
						1698.000	463.000			
Material Bo	oundary					1698.000	461.000			
164.400	430.400					1698.000	455.250			
165.176	430.000					1698.000	455.000			
						1718.000	455.000			
Material Bo	undary					1718.000	449.250			
1799.372	431.000					1718.000	449.000			
1803.000	432.300					1738.000	449.000			
						1738.000	443.250			
Material Bo	undary					1738.000	443.000			
162.619	430.400					1758.000	443.000			
164.400	430.400					1758.000	437.250			
165.257	430.401					1758.000	437.000			
166.176	430.000					1778.100	437.000			
188.000	430.000					1778.100	431.250			
188.000	430.250					1778.100	431.000			
188.000	436.000					1798.000	431.000			
208.000	436.000					1801.461	432.301			
208.000	436.250									
208.000	442.000					External Bou				
228.000	442.000					1698.000	463.000			
228.000	442.250					1400.000	463.000			
228.000	448.000					1236.000	464.000			
248.000	448.000					1161.000	465.000			
248.000	448.250					824.000	462.000			
248.000	454.000					268.000	462.000			
268.000	454.000					248.000	456.000			
268.000	454.250					228.000	450.000			
268.000	460.000					208.000	444.000			
Material De						188.000	438.000			
Material Bo						162.619	430.400			
268.000 268.000	462.000 460.000					136.600 122.359	430.400 424.645			
208.000 554.200						0.000				
554.200 555.700	460.000 460.000					0.000	427.500 387.500			
824.000	460.000					0.000	347.500			
840.193	460.000					1979.000	350.000			
840.193 841.706	460.144					1979.000	390.000			
1126.178						1979.000	430.050			
1120.170						1841.123	426.953			
	102.104					1011120	120.000			

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							Page	180	of	201
Written by:	Joseph S	ura	Date:	4/3/2009	Reviewed by:		singam/Ming Jay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ I No		GJ4299	Task No.:	05
				8						
1841.000	427.000									
1827.000	432.300					Focus/Block				
1803.000	432.300					555.691	459.992			
1801.461	432.301									
1778.100	439.000					Support				
1758.000	445.000					554.200	454.250			
1738.000	451.000					554.200	460.000			
1718.000	457.000									
						<u>Support</u>				
<u>Piezo Line</u>						554.200	460.000			
170.846	427.959					268.000	460.000			
173.133	427.959					200.000	400.000			
347.000	424.600					Support				
600.000	424.600					268.000	454.000			
640.000	425.000					248.000	454.000			
728.000	425.000					240.000	454.000			
						Support				
1102.000	432.000					Support	454 000			
1176.000	432.000					248.000	454.000			
1356.000	429.000					248.000	448.250			
1474.000	428.500					0				
1619.000	427.500					Support	440.050			
1689.000	427.500					248.000	448.250			
1790.000	429.000					493.200	448.250			
1792.668	429.000					A				
						Support				
Water Table						493.200	454.000			
0.000	412.500					493.200	448.250			
204.000	408.550									
405.000	405.750					<u>Support</u>				
472.000	407.050					268.000	460.000			
557.156	407.108					268.000	454.250			
768.000	407.250									
805.000	408.150					<u>Support</u>				
925.000	408.250					268.000	454.250			
1165.000	413.350					554.200	454.250			
1347.000	410.150									
1436.000	411.150					Support				
1642.000	409.450					555.700	454.250			
1768.160	411.260					555.700	460.000			
1841.123	411.953									
1979.000	415.050					Support				
-	_					555.700	460.000			
Focus/Block	Search Lin	е				824.000	460.000			
268.000	454.014	_								
554.211	454.235					Support				
						824.000	460.000			
Focus/Block	Search Poi	int				840.193	460.144			
554.211	454.235									

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Written by:	Joseph S	bura	Date:	4/3/2009	Reviewed by:		ingam/Ming Iay Beech	Date:	4/7/	/2009
Client:	Honeywell	Project:	Onc Des	ondaga Lake ign	SCA 50%	Project/ I Nc		GJ4299	Task No.:	05
Support						Support				
840.193	460.144					228.000	448.000			
840.193	454.394					228.000	442.250			
Support						Support				
840.193	454.394					248.000	448.000			
824.000	454.250					530.200	448.000			
0						0				
Support	454.050					Support	440.000			
824.000	454.250					530.200	448.000			
555.700	454.250					530.200	442.250			
Support						Support				
738.195	454.000					531.700	442.250			
738.195	448.250					531.700	448.000			
Support						Support				
739.701	454.000					530.200	442.250			
739.701	448.250					228.000	442.250			
Support						Support				
Support 738.195	454.000					<u>Support</u> 228.000	448.000			
494.700	454.000					228.000	448.000			
•										
Support	454.000					Support	400.050			
494.700	454.000					208.000	436.250			
494.700	448.250					208.000	442.000			
Support						Support				
494.700	448.250					208.000	442.000			
738.195	448.250					228.000	442.000			
Support						Support				
724.201	442.000					228.000	442.000			
724.201	436.250					466.200	442.000			
Support						Support				
724.201	436.250					466.200	442.000			
467.700	436.250					466.200	436.250			
Cummant						Cupa art				
Support	126 250					Support 466.200	126 250			
467.700	436.250						436.250			
467.700	442.000					208.000	436.250			
Support						Support				
467.700	442.000					188.000	430.250			
724.201	442.000					188.000	436.000			

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Written by:	Joseph S	bura	Date:	4/3/2009	Reviewed by:		ingam/Ming ay Beech	Date:	4/7/	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ F No		GJ4299	Task No.:	05
Support						<u>Support</u>				
188.000	436.000					531.700	442.250			
208.000	436.000					824.000	442.250			
Support						Support				
208.000	436.000					824.000	442.250			
506.200	436.000					832.191	442.323			
Support						Support				
507.700	436.000					841.706	460.158			
507.700	430.250					841.706	454.408			
007.700	400.200					041.700	404.400			
<u>Support</u>						<u>Support</u>				
506.200	436.000					825.700	436.015			
506.200	430.250					825.700	430.265			
Support						Support				
506.200	430.250					725.697	442.000			
188.000	430.250					725.697	436.250			
Support						Support				
507.700	430.250					725.697	436.250			
824.200	430.252					824.000	436.250			
Support						Support				
824.200	430.252					824.000	436.250			
824.200	436.002					982.197	437.658			
	1001002						1011000			
Support						<u>Support</u>				
824.200	436.002					982.197	437.658			
507.700	436.000					982.197	443.408			
Support						Support				
832.191	442.323					982.197	443.408			
832.191	448.073					824.000	442.000			
Support						Support				
833.715	442.336					824.000	442.000			
833.715	448.086					725.697	442.000			
Support						Support				
832.191	448.073					739.701	448.250			
824.000	448.000					824.000	448.250			
						Ourse and				
Support	440.000					Support	440.050			
824.000	448.000					824.000	448.250			
531.700	448.000					983.182	449.667			

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						l	Page	183	of	201
Written by:	Joseph S	Sura	Date:	4/3/2009	Reviewed by:		ingam/Ming ay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ P No		GJ4299	Task No.:	05
Support						Support				
983.182	449.667					984.724	455.431			
983.182	455.417					984.724	449.681			
_						_				
Support	AEE 447					Support	440 400			
983.182	455.417					983.718	443.422			
824.000	454.000					983.718	437.672			
Support						Support				
824.000	454.000					983.718	437.672			
739.701	454.000					1161.000	439.250			
•						. .				
Support						Support				
841.706	454.408					1161.000	439.250			
1126.178	456.940					1236.000	438.250			
Support						Support				
1126.178	456.940					1236.000	438.250			
1126.178						1240.193	438.224			
Cummont						Cummont				
Support	400.000					Support	400 004			
1126.178 841.706	462.690 460.158					1240.193 1240.193	438.224 443.974			
041.700	400.150					1240.193	443.974			
Support						Support				
833.715	448.086					1240.193	443.974			
1134.188	450.761					1236.000	444.000			
Cummont						Cummont				
Support 1134.188	450 764					Support 1236.000	444 000			
1134.188						1230.000	444.000 445.000			
1134.100	445.011					1101.000	445.000			
Support						Support				
1134.188	445.011					1161.000	445.000			
833.715	442.336					983.718	443.422			
O						Querra a est				
Support	100.01-					Support				
825.700	436.015					984.724	455.431			
1142.148	438.832					1161.000	457.000			
Support						Support				
1142.148	438.832					1161.000	457.000			
1142.148						1228.192	456.104			
Cumment						Quancit				
Support	400.000					Support	450 404			
1142.148						1228.192	456.104			
825.700	430.265					1228.192	450.354			

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Written by:	Joseph S	bura	Date:	4/3/2009	Reviewed		ngam/Ming ay Beech	Date:	4/7/	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ P No.		GJ4299	Task No.:	05
Support						Support				
1228.192	450.354					1161.000	457.250			
1161.000						1127.707	456.954			
Support	454.050					Support	450 775			
1161.000						1135.719	450.775			
984.724	449.681					1135.719	445.025			
Support						Support				
268.000	454.000					1135.719	450.775			
493.200	454.000					1161.000	451.000			
493.200	454.000					1101.000	451.000			
Support						Support				
1127.707	462.704					1161.000	445.250			
1127.707						1135.719	445.025			
o <i>i</i>						• •				
Support						Support				
1127.707	462.704					1161.000	445.250			
1161.000	463.000					1236.000	444.250			
Support						Support				
1161.000	463.000					1236.000	444.250			
1236.000						1400.000	443.250			
Support						Support				
Support	400.000					Support	440.050			
1236.000						1400.000	443.250			
1400.000	461.000					1436.205	443.250			
Support						Support				
1400.000	461.000					1436.205	443.250			
1412.195	461.000					1436.205	449.000			
Support						Support				
1412.195	461.000					1437.780	449.000			
1412.195						1437.780				
1412.195	400.200					1437.700	443.250			
Support						Support				
1412.195	455.250					1436.205	449.000			
1400.000	455.250					1400.000	449.000			
Support						Support				
1400.000	455.250					1400.000	449.000			
1236.000						1236.000	449.000			
00.000						00.000				
Support						Support				
1236.000						1236.000	450.000			
1161.000	457.250					1161.000	451.000			

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						Р	age	185	of	201
Written by:	Joseph S	ura	Date:	4/3/2009	Reviewed by:		ngam/Ming ay Beech	Date:	4/7/	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Pr No.		GJ4299	Task No.:	05
<u>Support</u> 1229.723 1229.723	456.084 450.334					<u>Support</u> 1161.000 1143.812	439.000 438.847			
<u>Support</u> 1229.723 1236.000	450.334 450.250					<u>Support</u> 1161.000 1236.000	439.000 438.000			
<u>Support</u> 1236.000 1229.723	456.000 456.084					<u>Support</u> 1236.000 1400.000	438.000 437.000			
<u>Support</u> 1236.000 1400.000	456.000 455.000					<u>Support</u> 1400.000 1460.199	437.000 437.000			
<u>Support</u> 1400.000 1473.204	455.000 455.000					<u>Support</u> 1460.199 1460.199	437.000 431.250			
<u>Support</u> 1473.204 1473.204	455.000 449.250					<u>Support</u> 1461.784 1461.784	431.250 437.000			
<u>Support</u> 1474.788 1474.788	449.250 455.000					<u>Support</u> 1460.199 1400.000	431.250 431.250			
<u>Support</u> 1473.204 1400.000	449.250 449.250					<u>Support</u> 1400.000 1236.000	431.250 432.250			
<u>Support</u> 1400.000 1236.000						<u>Support</u> 1236.000 1161.000	432.250 433.250			
<u>Support</u> 1241.724 1241.724						<u>Support</u> 1241.724 1400.000	438.215 437.250			
<u>Support</u> 1143.812 1143.812						<u>Support</u> 1400.000 1498.182	437.250 437.250			
<u>Support</u> 1143.812 1161.000						<u>Support</u> 1498.182 1498.182	443.000 437.250			

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Written by:	Joseph S	ura	Date:	4/3/2009	Reviewed		ngam/Ming ay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Pr No.		GJ4299	Task No.:	05
Support						<u>Support</u>				
1499.766	437.250					1758.000	437.000			
1499.766						1461.784	437.000			
_						-				
Support	442.000					Support	440.050			
1498.182						1437.780	443.250			
1400.000	443.000					1738.000	443.250			
Support						Support				
1400.000	443.000					1738.000	443.250			
1241.724	443.965					1738.000	449.000			
Support						Support				
1413.743	461.000					1718.000	449.000			
1413.743						1437.780	449.000			
1413.743	400.200					1437.700	449.000			
Support						Support				
1413.743	461.000					1499.766	437.250			
1698.000	461.000					1758.000	437.250			
Support						Support				
1698.000	461.000					1758.000	437.250			
1698.000						1758.000	443.000			
•						•				
Support	455 050					Support	4.40.000			
1698.000						1738.000	443.000			
1413.743	455.250					1499.766	443.000			
Support						Support				
1474.788	449.250					1718.000	455.000			
1718.000	449.250					1698.000	455.000			
Support						Support				
1718.000	449.250					1718.000	449.000			
1718.000						1738.000	449.000			
17 10.000	455.000					1738.000	449.000			
Support						Support				
1698.000						1738.000	443.000			
1474.788	455.000					1758.000	443.000			
Support						Support				
1461.784	431.250					1758.000	437.000			
1778.100						1778.100	437.000			
1770.100	101.200					1110.100	101.000			
Support										
1778.100										
1778.100	437.000									

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					CO	nts			
						Page	187	of	201
Written by:	Loconh Surg		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Document Name

File Name: EastWest_Cover_Liner_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Non-Circular Block Search Number of Surfaces: 5000 Pseudo-Random Surfaces: Enabled Convex Surfaces Only: Disabled Left Projection Angle (Start Angle): 95 Left Projection Angle (End Angle): 175 Right Projection Angle (Start Angle): 5 Right Projection Angle (End Angle): 85 Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

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Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained)

Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material

Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal)

Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table

						Geos	ynte nsultar	
					Page	188		201
Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/M Zhu/Jay Beech	- Dale	4/7/2	009
Client:	Honeywell Project:	Ono Desi	ndaga Lake S gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05
Custom Hu <u>Material: Tr</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Li</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Fo</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Fo</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Support: G</u> Geotube Support Ty Force Appl Force Orien Anchorage Shear Stren Pullout Stren Pullout Stren	value: 1 <u>ube-Gravel Interface</u> vpe: Mohr-Coulomb t: 86 lb/ft3 0 psf gle: 24 degrees ace: Water Table value: 1 <u>ner</u> vpe: Mohr-Coulomb t: 100 lb/ft3 0 psf gle: 19 degrees ace: Water Table value: 1 <u>pundation</u> vpe: Mohr-Coulomb t: 120 lb/ft3 0 psf gle: 37 degrees ace: Water Table value: 1 <u>Properties</u> eotube pe: GeoTextile ication: Passive ntation: Tangent to S : Both Ends ngth Model: Linear rage: 100 percent ength: 1600 lb/ft ength Adhesion: 5 lb/ ength Friction Angle:	Desi lip Sur ft2	gn	SCA 50%	No.: Method: janbu simp FS: 1.928540 Axis Location: 189.6 Left Slip Surface En Right Slip Surface En Resisting Horizontal Driving Horizontal F Method: spencer FS: 1.906510 Axis Location: 189.6 Left Slip Surface En Right Slip Surface En Right Slip Surface En Right Slip Surface En Right Slip Surface En Resisting Moment=5.2 Resisting Horizontal Driving Horizontal F Valid / Invalid S Method: bishop simp Number of Invalid Su Number of Invalid Su Error Code -107 rep Error Code -110 rep Error Code -111 rep Error Code -112 rep Method: janbu simp Number of Invalid Su Number of Invalid Su Error Code -107 rep Error Code -110 rep Error Code -110 rep Error Code -110 rep Error Code -110 rep Error Code -107 rep Error Code -110 rep Error Code -111 rep Error Code -111 rep Error Code -112 rep	lified 339, 565.563 dpoint: 161. indpoint: 280 iForce=667 orce=34586 339, 565.563 dpoint: 161. indpoint: 161. indpoint: 161. indpoint: 161. indpoint: 161. indpoint: 161. indpoint: 280 1.01013e+00 19833e+006 iorce=34946 Urfaces orce=34946 urfaces: 3284 urfaces: 3284 urfaces: 3284 urfaces: 3171 orted for 40 orted for 58 orted for 41 orted for 58 orted for 67 lified rfaces: 3112 urfaces: 188 orted for 40 orted for 40 orted for 41 orted for 41	No.: 557, 430 0.920, 40 0.8 lb .2 lb 557, 430 0.920, 40 07 lb-ft lb-ft 25 lb .1 lb 6 3 surface surface surface surface surface surface surface surface surface	0.400 62.000 0.400 62.000 62.000 es es s s es s s s s s
Method: bis FS: 1.9140 Axis Locati Left Slip Su Right Slip S Resisting N	linimums shop simplified 70 on: 189.639, 565.563 urface Endpoint: 161. Surface Endpoint: 28 foment=1.01028e+0 ment=5.27817e+006	557, 4 0.920, 07 lb-ft	462.000		Method: spencer Number of Valid Sur Number of Invalid S Error Codes: Error Code -107 rep Error Code -108 rep Error Code -110 rep Error Code -111 rep Error Code -112 rep	orted for 40 orted for 40 orted for 12 orted for 41 orted for 17	3 surfac 76 surfa surface 31 surfa	ces s ces

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							consultants			
						Page	189	of	201	
Written by:	¹ Joseph Sura		Sura Date: 4/3/2009 Reviewed by:		R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7,	/2009		
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05	

Document Name

File Name: EastWest_Cover_Global_Su_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

Ceosynter[®]

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

Material: Gravel

Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf

				Page	190	of	201			
Written Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Mir Zhu/Jay Beech	ng Date:	4/7/2	2009			
Client: Honeywell Project	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299 Task 05 No.: 05					
Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1				Left Slip Surface Endpoint: 121.090, 424.675 Right Slip Surface Endpoint: 302.849, 462.000 Resisting Moment=1.55928e+007 lb-ft Driving Moment=1.18844e+007 lb-ft						
Material: Tube-Gravel Interface Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 24 degrees Water Surface: Water Table Custom Hu value: 1	2			Method: janbu simplit FS: 1.233240 Center: 195.928, 509 Radius: 113.333 Left Slip Surface End Right Slip Surface Er	fied 9.946 Ipoint: 121.2 Idpoint: 298	280, 424 3.619, 4				
<u>Material: Liner</u> Strength Type: Mohr-Coulomb Unit Weight: 100 lb/ft3 Cohesion: 0 psf Friction Angle: 19 degrees Water Surface: Water Table Custom Hu value: 1				Resisting Horizontal Force=108264 lb Driving Horizontal Force=87787.9 lb <u>Method: spencer</u> FS: 1.306740 Center: 195.928, 521.455 Radius: 122.340 Left Slip Surface Endpoint: 121.090, 424.675						
Material: Foundation Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 37 degrees Water Surface: Water Table				Right Slip Surface Endpoint: 302.849, 462.000 Resisting Moment=1.55298e+007 lb-ft Driving Moment=1.18844e+007 lb-ft Resisting Horizontal Force=108610 lb Driving Horizontal Force=83115.2 lb						
Custom Hu value: 1 <u>Support Properties</u>				<u>Valid / Invalid Surfaces</u> <u>Method: bishop simplified</u> Number of Valid Surfaces: 2295 Number of Invalid Surfaces: 2545						
Support: Geotube Geotube Support Type: GeoTextile Force Application: Passive Force Orientation: Tangent to S Anchorage: Both Ends Shear Strength Model: Linear	Slip Surf	ace		Error Codes: Error Code -103 reported for 2126 surfaces Error Code -107 reported for 18 surfaces Error Code -108 reported for 52 surfaces Error Code -110 reported for 34 surfaces Error Code -112 reported for 281 surfaces Error Code -116 reported for 34 surfaces						
Strip Coverage: 100 percentTensile Strength: 1600 lb/ftMethod: janbu simplifiedPullout Strength Adhesion: 5 lb/ft2Number of Valid SurfacePullout Strength Friction Angle: 40 degreesNumber of Invalid SurfaceError Codes:Error Codes:										
<u>Global Minimums</u> <u>Method: bishop simplified</u> FS: 1.312040 Center: 195.928, 521.455 Radius: 122.340				Error Code -107 repo Error Code -108 repo Error Code -110 repo Error Code -111 repo	de -103 reported for 2126 surfaces de -107 reported for 18 surfaces de -108 reported for 165 surfaces de -110 reported for 34 surfaces de -111 reported for 7 surfaces de -112 reported for 284 surfaces					

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			CO	nsultar	nts		
				Page	191	of	201
Written by:	Joseph Sura	Date: 4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2	:009
Client:	Honeywell Project	et: Onondaga Lak Design	xe SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Error Code -116 reported for 34 surfaces

Method: spencer Number of Valid Surfaces: 1531 Number of Invalid Surfaces: 3309 Error Codes: Error Code -103 reported for 2126 surfaces Error Code -107 reported for 18 surfaces Error Code -108 reported for 227 surfaces Error Code -110 reported for 34 surfaces Error Code -111 reported for 578 surfaces Error Code -112 reported for 292 surfaces Error Code -116 reported for 34 surfaces

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						cons			nts
						Page	192	of	201
Written by:	¹ Joseph Sura		Date: 4/3/2009 Reviewed by:			R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2	2009
Client:	Honeywell	Project:	Onondaga Lake SCA 50% Design		SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Document Name

File Name: EastWest_Cover_Global_U75_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

Coostator

Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

Material: Gravel

Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained) Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf

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					Page		193		201
Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:			Date:	4/7/2	
Client: Hone	well Project:	Ono Desi	ndaga Lake S gn	SCA 50%	Project/ Propo No.:	osal GJ	4299	Task No.:	05
Friction Angle: 0. Water Surface: V Custom Hu value	Vater Table				<u>Global Minin</u> <u>Method: bishop</u>		l		
Material: Tube-G Strength Type: M Unit Weight: 86 I Cohesion: 0 psf Friction Angle: 24 Water Surface: W Custom Hu value	1ohr-Coulomb b/ft3 4 degrees Vater Table				FS: 1.322850 Center: 195.928 Radius: 122.340 Left Slip Surface Right Slip Surface Resisting Moment Driving Moment	3, 521.455) e Endpoin ce Endpo ent=1.572	; it: 121.(int: 302 12e+00	849, 4 7 lb-ft	
Material: Liner Strength Type: M Unit Weight: 100 Cohesion: 0 psf Friction Angle: 19 Water Surface: V Custom Hu value	lb/ft3 9 degrees Vater Table				Method: janbu s FS: 1.246300 Center: 195.928 Radius: 113.333 Left Slip Surface Right Slip Surface Resisting Horizon Driving Horizon	3, 509.946 3 e Endpoin ce Endpo ontal Forc	it: 121.2 int: 298 e=1090	6.619, 4 084 lb	
Material: Founda Strength Type: M Unit Weight: 120 Cohesion: 0 psf Friction Angle: 3 Water Surface: V Custom Hu value	Nohr-Coulomb Ib/ft3 7 degrees Vater Table e: 1				Method: spence FS: 1.317790 Center: 195.928 Radius: 122.340 Left Slip Surface Right Slip Surface Resisting Moment Driving Moment	3, 521.455) e Endpoin ce Endpo ent=1.566 ≔1.18844	it: 121.0 int: 302 11e+00 e+007	849, 4 7 lb-ft lb-ft	
Material: SOLW Strength Type: D Unit Weight: 82 I Water Surface: V	Discrete functior b/ft3 Vater Table	1			Resisting Horizon Driving Horizont Valid / Invalio	tal Force=	83072.		
Custom Hu value Support Prop Support: Geotub Geotube Support Type: G Force Application Force Orientation Anchorage: Both Shear Strength M Strip Coverage: T Tensile Strength Pullout Strength Pullout Strength	ecties eoTextile n: Passive n: Tangent to S n Ends Model: Linear 100 percent : 1600 lb/ft Adhesion: 5 lb/	ft2			Method: bishop Number of Valic Number of Inval Error Codes: Error Code -103 Error Code -107 Error Code -108 Error Code -110 Error Code -112 Error Code -116 Method: janbu s Number of Valic Number of Inval Error Codes:	d Surfaces lid Surface reported reported reported reported reported reported simplified Surfaces	: 2288 es: 255 for 212 for 18 for 52 for 34 for 282 for 40 s: 2168	26 surfa surface surface surface 2 surface surface	s s s es

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						со	nsulta	nts	
						Page	194	of	201
Written by:	Joseph Surg		Date:	4/3/2009	Reviewed by:	R. Kulasingam/Min Zhu/Jay Beech	g Date:	4/7/	/2009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Error Code -103 reported for 2126 surfaces Error Code -107 reported for 18 surfaces Error Code -108 reported for 163 surfaces Error Code -110 reported for 34 surfaces Error Code -111 reported for 7 surfaces Error Code -112 reported for 284 surfaces Error Code -116 reported for 40 surfaces

Method: spencer Number of Valid Surfaces: 1536 Number of Invalid Surfaces: 3304 Error Codes: Error Code -103 reported for 2126 surfaces Error Code -107 reported for 18 surfaces Error Code -108 reported for 220 surfaces Error Code -110 reported for 34 surfaces Error Code -111 reported for 574 surfaces Error Code -112 reported for 292 surfaces

Error Code -116 reported for 40 surfaces

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						CO	nsulta	nts
					Page	195	of	201
Written by:	Joseph Sura	Date: 4/3/2009		Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/2	2009
Client:	Honeywell Projec	t: Ono Desi	ondaga Lake ign	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Document Name

File Name: EastWest_Cover_LongTerm_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1 Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (Drained)

Strength Type: Mohr-Coulomb Unit Weight: 82 lb/ft3 Cohesion: 0 psf Friction Angle: 34 degrees Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material (Long) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical) Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1

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						Page	196	of	201
Written by:	Joseph S	Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/M Zhu/Jay Beech		4/7/2	009
Client:	Honeywell	Project:	Ono Desi	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05
Strength Ty Jnit Weigh Cohesion: (Friction Ang	0 psf gle: 24 degre ace: Water T	ees				Method: janbu simpl FS: 1.931940 Center: 141.584, 66 Radius: 237.350 Left Slip Surface En Right Slip Surface E Resisting Horizontal Driving Horizontal F	9.770 dpoint: 179 ndpoint: 23 Force=527	8.781, 4 7.77 lb	
Unit Weigh Cohesion: (Friction Ang	/pe: Mohr-Co t: 100 lb/ft3 0 psf gle: 19 degre ace: Water T value: 1	ees				Method: spencer FS: 1.934590 Center: 141.584, 66 Radius: 237.350 Left Slip Surface En Right Slip Surface E Resisting Moment=7 Driving Moment=67 Resisting Horizontal	dpoint: 179 ndpoint: 23 1.30697e+0 5582 lb-ft	8.781, 4 06 lb-ft	
Unit Weigh Cohesion: (Friction Ang	gle: 37 degre ace: Water T	ees				Driving Horizontal F Valid / Invalid S Method: bishop simp Number of Valid Sun Number of Invalid S	urfaces olified faces: 2608	3	
<u>Support: G</u> Geotube (L Support Ty	pe: GeoText	<u>g)</u> tile				Error Codes: Error Code -103 rep Error Code -110 rep Error Code -112 rep Error Code -1000 re	orted for 42 orted for 13	surface 4 surfac	s es
Force Orier Anchorage Shear Strei Strip Cover Fensile Stre Pullout Stre Pullout Stre	ication: Pass ntation: Tang Both Ends ngth Model: age: 100 pe ength: 0.1 lb ength Adhes ength Friction	gent to Sl Linear rcent /ft ion: 5 lb/i	ft2			Method: janbu simpl Number of Valid Sur Number of Invalid S Error Codes: Error Code -103 rep Error Code -110 rep Error Code -112 rep Error Code -1000 re	faces: 2630 urfaces: 22 orted for 11 orted for 42 orted for 11	10 43 surfa surface 2 surfac	s es
Method: bis S: 1.9390 Center: 141 Radius: 23 Left Slip Su Right Slip S Resisting M	1.584, 669.7	70 bint: 179. boint: 238 le+006 lk	8.781,			Method: spencer Number of Valid Sur Number of Invalid S Error Codes: Error Code -103 rep Error Code -110 rep Error Code -111 rep Error Code -112 rep Error Code -1000 re	urfaces: 223 orted for 11 orted for 42 orted for 1 s orted for 13	34 43 surfa surface surface 5 surfac	s es

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						CO	nsulta	nts
					Page	197	of	201
Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/Ming Zhu/Jay Beech	Date:	4/7/	/2009
Client:	Honeywell Projec	t: Ono	ndaga Lake gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05

Document Name

File Name: EastWest_Cover_External_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1 Material: Dike Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Gravel</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (undrained)

Strength Type: Discrete function Unit Weight: 82 lb/ft3 Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material

Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Tube Interface (Horizontal) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tub-Tube Interface (Vertical)

Strength Type: Mohr-Coulomb Unit Weight: 43 lb/ft3 Cohesion: 0 psf Friction Angle: 0.1 degrees Water Surface: Water Table Custom Hu value: 1

Material: Tube-Gravel Interface

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Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/M Zhu/Jay Beec		4/7/2	2009
Client:	Honeywell Project:	Ono Desi	ndaga Lake S gn	SCA 50%	Project/ Proposal No.:	GJ4299	Task No.:	05
Unit Weigh Cohesion: (Friction Ang Water Surfa Custom Hu <u>Material: Lii</u> Strength Ty Unit Weigh Cohesion: (Friction Ang Water Surfa Custom Hu <u>Material: Fo</u> Strength Ty Unit Weigh Cohesion: (Friction Ang Water Surfa Custom Hu <u>Material: Fo</u> Strength Ty Unit Weigh Cohesion: (Friction Ang Water Surfa Custom Hu <u>Support: Go</u> Geotube Support Ty Force Appli Force Orier Anchorage: Shear Stren Strip Cover Tensile Stren Stren Strip Stren Strip Stren Strip Stren Strenter: -82 Radius: 37 Left Slip Su Resisting M	D psf gle: 24 degrees ace: Water Table value: 1 <u>ner</u> /pe: Mohr-Coulomb t: 100 lb/ft3 D psf gle: 19 degrees ace: Water Table value: 1 <u>Dundation</u> /pe: Mohr-Coulomb t: 120 lb/ft3 D psf gle: 37 degrees ace: Water Table value: 1 Properties eotube pe: GeoTextile ication: Passive intation: Tangent to S is Both Ends ngth Model: Linear age: 100 percent ength: 1600 lb/ft ength Adhesion: 5 lb/ ength Friction Angle: <u>inimums</u> shop simplified 20 .847, 4119.349 34.560 urface Endpoint: -697 Surface Endpoint: 677 loment=3.7689e+00 ment=4.84345e+008	ft2 40 deg 7.422, 4 2.625, 9 9 lb-ft	rees 35.704		Center: -82.847, 41 Radius: 3734.560 Left Slip Surface Er Right Slip Surface E Resisting Horizontal F <u>Method: spencer</u> FS: 7.780860 Center: -82.847, 41 Radius: 3734.560 Left Slip Surface Er Right Slip Surface E Resisting Moment= Driving Moment=4.3 Resisting Horizontal F <u>Valid / Invalid S</u> <u>Method: bishop sim</u> Number of Valid Su Number of Invalid S Error Code -107 rej Error Code -110 rej Error Code -1000 re <u>Method: janbu simp</u> Number of Invalid S Error Code -1000 re <u>Method: spencer</u> Number of Invalid S Error Code -1000 re <u>Method: spencer</u> Number of Invalid Su Error Code -1000 re Error Code -1000 re	adpoint: -697 Endpoint: 67 I Force=1.0 Force=12911 19.349 adpoint: -697 Endpoint: -697 Endpoint: -697 Endpoint: -697 Endpoint: 67 3.76862e+08 I Force=1.00 Force=129000 Force=12900 Force=129000 Force=12900 Force=12900 Force=129000 Forc	2.625, 4 0.385e+0 10 lb 7.422, 43 2.625, 4 0.9 lb-ft 3.10-ft 0.379e+0 0.7 lb 3.993 2. surface 0.395 su 3.993 2. surface 0.395 su 3.993 2. surface 0.395 su 3.993 2. surface 0.395 su 3.993 2. surface 0.395 su 3.993 3. surface 0.395 su 3. surface 0.395 su 3. surface 0.395 su 3. surface 0.395 su 3. surface 0.395 su 3. surface 0.395 su 3. surface 0.395 su 5. surface 5. surface	62.000 06 lb 35.704 62.000 06 lb s ces s rfaces s rfaces s s ces s rfaces

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						Page	199	of	201	
Written by:	Joseph Sura		Date:	4/3/2009	Reviewed R. Kulasingam/Ming by: Zhu/Jay Beech		g Date:	4/7/2009		
Client:	Honeywell	Project:	Project: Onondaga Lake SCA 50% Design			Project/ Proposal No.:	GJ4299	Task No.:	05	

Slide Analysis Information

Document Name

File Name: EastWest_Cover_External_LongTerm_Lab.sli

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program Failure Direction: Right to Left Units of Measurement: Imperial Units Pore Fluid Unit Weight: 62.4 lb/ft3 Groundwater Method: Water Surfaces Data Output: Standard Calculate Excess Pore Pressure: Off Allow Ru with Water Surfaces or Grids: Off Random Numbers: Pseudo-random Seed Random Number Seed: 10116 Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used: Bishop simplified Janbu simplified Spencer

Number of slices: 25 Tolerance: 0.005 Maximum number of iterations: 50

Surface Options

Surface Type: Circular Search Method: Grid Search Radius increment: 10 Composite Surfaces: Disabled Reverse Curvature: Create Tension Crack Minimum Elevation: Not Defined Minimum Depth: Not Defined

Material Properties

Material: Final Cover Soil Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Dike Soil</u> Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 35 degrees Water Surface: Water Table

Custom Hu value: 1

Material: Gravel Strength Type: Mohr-Coulomb Unit Weight: 120 lb/ft3 Cohesion: 0 psf Friction Angle: 38 degrees Water Surface: Piezometric Line 1 Custom Hu value: 1

Material: SOLW (Drained) Strength Type: Mohr-Coulomb Unit Weight: 82 lb/ft3 Cohesion: 0 psf Friction Angle: 34 degrees Water Surface: Water Table Custom Hu value: 1

Material: Dredge Material (Long) Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 30 degrees Water Surface: Water Table Custom Hu value: 1

<u>Material: Tube-Tube Interface (Horizontal)</u> Strength Type: Mohr-Coulomb Unit Weight: 86 lb/ft3 Cohesion: 0 psf Friction Angle: 15 degrees Water Surface: Water Table Custom Hu value: 1

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Written by:	Joseph Sura	Date:	4/3/2009	Reviewed by:	R. Kulasingam/ Zhu/Jay Bee		Date:	4/7/2	009
Client:	Client: Honeywell Project:		ndaga Lake (gn	SCA 50%	Project/ Proposal No.: G		14299	Task No.:	05
Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Tre</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Li</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Fo</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Material: Fo</u> Strength Ty Unit Weigh Cohesion: C Friction An Water Surfa Custom Hu <u>Support: G</u> Geotube (L Support: G Geotube (L Support: Strength Ty Force Appl Force Orien Anchorage Shear Streng Strength Strength Streng Strength Ty Force Appl Force Orien Anchorage Shear Streng Strength Strength Strength Streng Strength Ty Force Appl Force Orien Anchorage	0 psf gle: 0.1 degrees ace: Water Table value: 1 <u>ube-Gravel Interface</u> /pe: Mohr-Coulomb t: 86 lb/ft3 0 psf gle: 24 degrees ace: Water Table value: 1 <u>ner</u> /pe: Mohr-Coulomb t: 100 lb/ft3 0 psf gle: 19 degrees ace: Water Table value: 1 <u>pundation</u> /pe: Mohr-Coulomb t: 120 lb/ft3 0 psf gle: 37 degrees ace: Water Table value: 1 <u>pundation</u> /pe: Mohr-Coulomb t: 120 lb/ft3 0 psf gle: 37 degrees ace: Water Table value: 1 <u>Properties</u> <u>eotube (Long)</u> .ong) pe: GeoTextile ication: Tangent to S : Both Ends ngth Model: Linear rage: 100 percent ength: 0.1 lb/ft ength Adhesion: 5 lb/		Method: bishop sir FS: 17.167300 Center: -82.847, 4 Radius: 3734.560 Left Slip Surface E Right Slip Surface E Resisting Moment=4 Method: janbu sim FS: 17.035700 Center: -52.324, 2 Radius: 2636.429 Left Slip Surface E Right Slip Surface E Right Slip Surface E Resisting Horizontal Method: spencer FS: 17.171900 Center: -82.847, 4 Radius: 3734.560 Left Slip Surface E Right Slip Surface I Number of Valid S Number of Invalid Error Code -107 re Error Code -107 re Error Code -110 re Error Code -110 re Error Code -113 re Error Code -110 re Error Code -113 re Error Code -110 re Error Code -113 re	119.34 indpoir Endpo =8.314 .84345 plified 991.99 indpoir Endpo al Force= 119.34 indpoir Endpo =8.317 .84345 al Force= Surfa indpoir Endpo es.317 .84345 al Force= Surfa ported eported eported ported ported surfaces Surfac	9 11: -697 . 12: -697 . 13: -697 . 12: -697 . 13: -697 . 14: -697 . 14: -697 . 15: -697 . 14: -697 . 15: -797 . 1	422, 43 .625, 46 1b-ft lb-ft 422, 43 .227, 46 013e+0 5 lb 422, 43 .625, 46 9 lb-ft lb-ft 562e+0 5 lb 93 surfaces 0395 surfaces 0395 surface	62.000 55.704 62.000 06 lb 55.704 62.000 06 lb 06 lb		
	ength Friction Angle: linimums	40 aeg	jrees		Error Code -107 reported for 22 surfaces Error Code -110 reported for 1555 surfaces Error Code -113 reported for 21 surfaces Error Code -1000 reported for 10395 surfaces				

Geosyntec[▷] consultants Page 201 of 201 Written Reviewed R. Kulasingam/Ming 4/3/2009 Date: 4/7/2009 Joseph Sura Date: Zhu/Jay Beech by: by: Project/ Proposal **Onondaga Lake SCA 50%** Task Client: Project: GJ4299 05 Honeywell Design No.: No.:

Method: spencer

Number of Valid Surfaces: 6498 Number of Invalid Surfaces: 11993 Error Codes: Error Code -107 reported for 22 surfaces Error Code -110 reported for 1555 surfaces Error Code -113 reported for 21 surfaces Error Code -1000 reported for 10395 surfaces