APPENDIX A

DESIGN EVALUATIONS

A-1 Settlement Analyses for SCA Final Cover Design

A-2 Volume Calculations for SCA Final Cover Design

A-3 Evaluation of Hydraulic Performance for SCA Final Cover Design
(To be provided in a future submittal.)

A-4 Maximum Allowable Gas Pressure for SCA Final Cover System Veneer Stability (To be provided in a future submittal.)

A-5 Veneer Stability Analyses for SCA Final Cover Design
(To be provided in a future submittal.)

A-6 Slope Stability Analyses for SCA Final Cover Design

A-7 Gas Management System Design for SCA Final Cover System
(To be provided in a future submittal.)

A-8 Sump and Riser Calculations for SCA Final Cover Design
(To be provided in a future submittal.)

A-9 SCA Final Cover System Stormwater Management System
(To be provided in a future submittal.)

A-1

Settlement Analyses for SCA Final Cover Design

Beech and Bonaparte
engineering p.c.

an affiliate of Geosyntec Consultants

CALCULATION PACKAGE COVER SHEET

Client: Honeywell **Project:** Onondaga Lake SCA Final Cover Design **Project/Proposal #:** GD5497

TITLE OF COMPUTATIONS **SETTLEMENT ANALYSES FOR SCA FINAL COVER DESIGN**

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Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

SETTLEMENT ANALYSES FOR SCA FINAL COVER DESIGN

PURPOSE

This package was prepared in support of the final cover design for the Sediment Consolidation Area (SCA) as part of the Onondaga Lake remediation project. The SCA site has been constructed on Wastebed 13 (WB-13) in two phases (i.e., Phase I and Phase II), as shown in Figure 1. Dredged materials from Onondaga Lake have been transported to the SCA for dewatering and containment in geotextile tubes. Geotextile tube filling was completed in early November 2014.

Specifically, the purpose of this package is:

(i) to calculate primary settlement within the existing Solvay Waste (SOLW) underlying the SCA due to construction of the leveling layer to evaluate if positive drainage on the liner system towards the sumps is maintained before placement of the final cover;

(ii) to calculate primary settlement within the underlying SOLW and the dredge material inside the geotextile tubes due to construction of the leveling layer to evaluate regrading fill needed to achieve bottom of final cover design grades;

(iii) to calculate long-term (i.e., 30 years) primary and secondary settlement within the underlying SOLW due to placement of regrading fill and the final cover to estimate the post-settlement grades for the liner system and to evaluate if positive drainage towards the sumps is maintained 30 years after placement of the final cover; and

(iv) to calculate long-term (i.e., 30 years) primary and secondary settlement within the underlying SOLW and the dredge material inside the geotextile tubes due to placement of regrading fill and the final cover to estimate the post-settlement grades for the final cover system and to evaluate if positive drainage on the final cover is maintained 30 years after placement of the final cover.

METHODOLOGY

Consolidation Settlement

Settlement of the underlying SOLW and the dredge material inside the geotextile tubes is caused by:

- primary compression due to imposed loading (i.e., liner system, filling of geotextile tubes, and construction of the leveling layer and final cover system); and
- secondary compression due to sustained loading after primary compression is complete.

Settlement of the underlying SOLW and the dredge material inside the geotextile tubes was calculated using equations for conventional one-dimensional (1-D) consolidation theory used in geotechnical engineering [Holtz and Kovacs, 1981]. Due to the large area of loading, stress dissipation with depth was not considered in this analysis.

The general forms of the equations used for the settlement calculations are as follow:

Primary Settlement

$$S_p = C_{r\varepsilon}\, H \log\left(\frac{\sigma'_{vo} + \Delta\sigma'_v}{\sigma'_{vo}}\right) \quad \text{for } \sigma'_{vo} + \Delta\sigma'_v \le \sigma'_p \quad \text{.....(1)}$$

$$S_p = C_{r\varepsilon}\, H \log\left(\frac{\sigma'_p}{\sigma'_{vo}}\right) + C_{c\varepsilon}\, H \log\left(\frac{\sigma'_{vo} + \Delta\sigma'_v}{\sigma'_p}\right) \quad \text{for } \sigma'_{vo} \le \sigma'_p \text{ and } \sigma'_{vo} + \Delta\sigma'_v > \sigma'_p \quad \text{(2A)}$$

$$S_p = C_{c\varepsilon}\, H \log\left(\frac{\sigma'_{vo} + \Delta\sigma'_v}{\sigma'_{vo}}\right) \quad \text{for } \sigma'_{vo} \ge \sigma'_p \quad \text{.....(2B)}$$

Secondary Settlement

$$S_s = C_{\alpha\varepsilon}\, H \log\left(\frac{t_2}{t_1}\right) \quad \text{.....(3)}$$

Total Settlement

$$S = S_p + S_s \quad \text{.....(4)}$$

Where,

S_p = primary settlement;
S_s = secondary settlement;
S = total settlement;
$C_{c\varepsilon}$ = modified compression index;
$C_{r\varepsilon}$ = modified recompression index;
$C_{\alpha\varepsilon}$ = modified secondary compression index;
H = initial thickness of compressible layer;
σ'_{vo} = initial effective overburden stress;
σ'_p = preconsolidation pressure;
$\Delta\sigma'_v$ = increase in effective stress due to the loadings;
t_1 = time for completion of primary compression.
The time for completion of primary compression was estimated to range from several months (based on the pre-construction field settlement pilot study and measured settlements in the SCA) to several years (based on laboratory consolidation tests). For the purpose of this analysis, the time for completion of primary compression was assumed to be 1.0 year; and
t_2 = time when settlement due to secondary compression is computed (i.e., assuming secondary settlement assessment for 30 years after placement of the final cover).

Geotextile Tube Placement, Settlement Measurement, Calibration of Consolidation Parameters, and Assumptions

Geotextile tube filling started in the summer of 2012 in Phase I of the SCA and was completed in early November 2014. Due to varying slopes of the liner system in the SCA, the first layer of geotextile tubes in Phase I was a leveling layer to create a relatively horizontal surface with the top of the liner system in Phase II. For example, three layers of geotextile tubes in Phase I and two layers of geotextile tubes in Phase II created a relatively horizontal surface in the SCA. The final configuration of geotextile tubes was six layers of geotextile tubes in Phase I and five layers of geotextile tubes in Phase II.

The geometry of the SCA for the settlement calculations presented in this package was determined from a detailed topographic survey of the SCA taken on 7 December 2014. The topographic survey provides information on the configuration of geotextile tubes and delineation of the SCA sumps, berm, and debris management area (DMA).

During the past three years of operation, the settlement in the underlying SOLW was measured using 29 settlement cells (SCs) installed underneath the compacted clay liner. The locations of the SCs are shown in Figure 1. The SCs were monitored regularly. The SCA Geotechnical Monitoring Monthly Report (November 2014), after completion of geotextile tube filling, is appended to this calculation package. The measured settlement at the time of the survey was used to calibrate the SOLW consolidation parameters selected in the original SCA design. The settlement of the underlying SOLW after construction of the leveling layer and final cover system was calculated using the calibrated SOLW consolidation parameters.

To estimate the post-settlement grades of the top of clay liner and the top of final cover, several assumptions were made:

- no settlement occurs between the date of the survey and prior to placement of the leveling layer. This assumption was made to establish the leveling layer based on the detailed survey of the top of geotextile tubes conducted on 7 December 2014;
- the compacted clay liner, gravel layer, leveling fill, and final cover soil are assumed to be incompressible;
- the construction of the leveling layer and final cover system will occur over greater than one year. Therefore, the leveling layer grading was assumed to be constructed in two phases: (i) an initial leveling layer on top of the final layer of geotextile tubes to create a minimum 1% slope, and (ii) an additional leveling layer on top of the post-settlement surface of the initial leveling layer to achieve bottom of final cover design grades. It is assumed that primary settlement due to the initial leveling layer will be allowed to occur prior to the start of final cover system construction;
- the east and west sump areas will be filled at the beginning of construction of the initial leveling layer and then regraded to achieve design grades at the end of construction of the initial leveling layer. The estimated post-settlement elevations of the initial leveling layer shown later in this calculation package only include primary settlement due to regrading of the east and west sump areas; and

- the settlement from the additional leveling layer for regrading and from the 2-ft thick final cover system is calculated as one loading event.

Given these assumptions, the post-settlement elevations and contour maps shall be considered approximate.

Settlement Computation Model

Settlements were calculated using the surface settlement model (SSM) developed in EXCEL® spreadsheets by Beech and Bonaparte. The SSM calculated the underlying SOLW and dredge material settlements and estimated post-settlement elevations for selected calculation points. Post-settlement contour maps were produced using AutoCAD® Civil 3D® and were used to evaluate whether positive drainage is maintained on the clay liner and final cover system. A general summary of the steps used to perform the settlement calculations is:

Step 1. Approximately 900 calculation points were selected within the SCA footprint (i.e., Phases I and II) in order to produce the contour maps for the top of the clay liner and the final cover system. For each calculation point, the northing, easting, and the elevation were used.

Step 2. At each calculation point, the subsurface profile was identified and divided into distinct layers (i.e., sub-layers) of specific thickness and material properties, and the center elevation of each sub-layer was identified.

Step 3. The initial vertical effective stress, the increase in the vertical effective stress, and the final vertical effective stress were calculated at the center of each sub-layer.

Step 4. Using Equations 1 through 4, the settlements for each sub-layer were calculated. The total settlement at each calculation point was calculated by summing the calculated settlement from each sub-layer.

Step 5. Post-settlement elevations at each calculation point were estimated by subtracting the calculated settlement from the pre-settlement elevation.

Step 6. Post-settlement elevation contour maps were created using the estimated post-settlement elevations at the calculation points.

Secondary Settlement

The secondary settlement of the underlying SOLW and the dredge material inside geotextile tubes was calculated 30 years after construction of the final cover, and therefore, the t_2/t_1 ratio was assumed to be 30/1 (30).

ANALYSIS CASES

The following calculation cases were evaluated using the SSM.

CASE 1: Primary settlement of the underlying SOLW was calculated to estimate the post-settlement elevation of the clay liner after the placement of the initial leveling layer;

CASE 2: Primary settlement of the underlying SOLW and dredge material was calculated to estimate the post-settlement elevation of the initial leveling layer after placement;

CASE 3: Primary and secondary settlement of the underlying SOLW were calculated to estimate the post-settlement elevation of the clay liner 30 years after the placement of the final cover; and

CASE 4: Primary and secondary settlement of the underlying SOLW and dredge material were calculated to estimate the post-settlement elevation of the final cover 30 years after placement.

SUBSURFACE STRATIGRAPHY

Detailed information regarding the subsurface stratigraphy was presented in the NYSDEC approved calculation package titled "*Subsurface Stratigraphy Model of Wastebed 13 for the Design of Sediment Consolidation Area*" [Geosyntec, 2011a], referred to herein as the Data Package. In summary, the original subsurface stratigraphy consists primarily of three types of material: SOLW, dike soil, and foundation soil, as shown schematically in Figure 2. The dike soil and foundation soil were considered incompressible in this analysis. The groundwater table was assumed to be at elevation 375 ft, as presented in the Data Package.

MATERIAL PROPERTIES

The unit weights of the SOLW, compacted clay liner, gravel layer, dredge material, leveling fill, and final cover soil used in the settlement analysis are summarized in Table 1. The compression indices, $C_{c\varepsilon}$, of the SOLW presented in the Data Package were replaced with the calibrated $C_{c\varepsilon}$ obtained through back-calculation using the measured settlements at the SCA. The calibrated $C_{c\varepsilon}$ at each calculation point is presented in Figure 3.

The consolidation parameters of the dredge material were presented in the NYSDEC approved calculation package titled "*Settlement Analyses for SCA*" [Geosyntec, 2011b], and are included in Table 1.

SETTLEMENT CALCULATION SURFACES

The pre-settlement elevations of subsurface layers at the SCA were required as inputs to the SSM. These layers include from bottom to top: bottom of SOLW (assuming the layer beneath the underlying SOLW is incompressible), bottom of clay liner, top of clay liner, top of gravel, and the surveyed top of geotextile tubes. These layers are presented in Figures 4 through 8.

The surveyed top of geotextile tubes was used to develop the design grades of the initial leveling layer (Figure 9). The pre-settlement surface of the initial leveling layer was established by creating a minimum 1.0% slope with leveling fill above the top of geotextile tubes.

The pre-settlement surface of the final cover was estimated using the post-settlement elevation of the top of the initial leveling layer overlain by regrading fill (i.e., additional leveling layer) and a 2-ft thick final cover soil layer.

RESULTS

Given the assumptions noted previously, Cases 1 through 4 were evaluated, and those results are summarized in the paragraphs that follow.

CASE 1

The estimated post-settlement elevation contour map for the top of the clay liner after

placement of the initial leveling layer is shown in Figure 10. The estimated settlement calculated for this case consists of the primary settlement of the underlying SOLW due to the placement of the initial leveling layer. Figure 10 illustrates that the positive drainage path on the liner system appears to be maintained.

The spreadsheet output for settlement analysis for ten representative calculation points (i.e., 501 through 510) is presented in Attachment 1.

CASE 2

The estimated post-settlement elevation contour map for the top of the initial leveling layer after placement of the initial leveling layer is shown in Figure 11. The estimated settlement calculated for this case consists of the primary settlement of the underlying SOLW and dredge material in geotextile tubes due to the placement of the initial leveling layer. Figure 11 illustrates that the top of the initial leveling layer appears to maintain positive drainage of surface water towards the two collection sump areas. The estimated elevations shown in Figure 11 were used to establish the initial surface for the additional leveling layer and grading plan of the final cover. The design grading plan of the final cover is shown in Figure 12.

The spreadsheet output for settlement analysis for ten representative calculation points (i.e., 501 through 510) is presented in Attachment 2.

CASE 3

The estimated post-settlement elevation contour map for the top of the clay liner 30 years after placement of the additional leveling layer and final cover is shown in Figure 13. The estimated settlement for this case includes primary and secondary settlement of the underlying SOLW that occurred between placement of the final cover and 30 years afterwards. Figure 13 indicates that, in general, the positive grade of the liner system toward the east and west sumps can be maintained.

The spreadsheet output for settlement analysis for ten representative calculation points (i.e., 501 through 510) is presented in Attachment 3.

CASE 4

The estimated post-settlement elevation contour map for the top of the final cover 30 years after placement of the additional leveling layer and final cover is shown in Figure 14. The estimated settlement calculated for this case consists of: (i) the primary and secondary

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Client:	Honeywell	Project:	Onondaga Lake SCA Final Cover Design	Project/ Proposal No.:	GD5497	Task No.:	03

settlement of the underlying SOLW; and (ii) the primary and secondary settlement of the dredge material in geotextile tubes due to the placement of the additional leveling layer and final cover soil layer. Figure 14 indicates that, in general, the positive drainage slope from south to north of the SCA can be maintained.

The spreadsheet output for settlement analysis for ten representative calculation points (i.e., 501 through 510) is presented in Attachment 4.

CONCLUSIONS

The results of analyses presented in this report indicate that:

(i) the liner system is anticipated to maintain proper drainage slopes by allowing liquid to freely flow toward the east and west sumps during placement of the final cover and 30 years afterwards. The calculated settlement does not predict any grade reversal at the top of the liner or local liquid ponding in surrounding areas;

(ii) the east and the west sumps are anticipated to stay as the low points of the top of the liner system during placement of the final cover and 30 years afterwards; and

(iii) the proposed leveling layer and final cover are expected to maintain positive drainage slopes. Any unforeseen long-term development of local low points on the cover system will be addressed during the maintenance period.

As mentioned previously, the post-settlement elevations and contour maps should be considered approximations.

REFERENCES

Holtz, R.D., and Kovacs, W.D. "*An Introduction to Geotechnical Engineering*," Prentice-Hall Inc., Englewood Cliffs, N.J., 1981.

Geosyntec Consultants. "Appendix A: *Subsurface Stratigraphy Model of Wastebed 13 for the Design of Sediment Consolidation Area*," Onondaga Lake Sediment Consolidation Area Final Design, dated April 2011a.

Geosyntec Consultants. "Appendix H: *Settlement Analyses for SCA*," Onondaga Lake Sediment Consolidation Area Final Design, dated April 2011b.

Tables

Table 1. Summary of Material Properties for Settlement Calculation

Material	Total Unit Weight (γ_i, pcf)	Overconsolidation Ratio (OCR)	Compression Index ($C_{c\varepsilon}$)	Recompression Index ($C_{r\varepsilon}$)	Coefficient of Secondary Compression ($C_{\alpha\varepsilon}$)(1)
SOLW	82	1.0	From Figure 3	0.014	0.91%
Leveling Fill and Final Cover Soil	120	N/A	N/A	N/A	N/A
Dredge Material	86	1.0	0.291	0.0045	0.60%
Clay Liner and Gravel	120	N/A	N/A	N/A	N/A

Note: (1) $\sigma_v^{'} = \sigma_{v0}^{'} + \Delta\sigma_v^{'}$ is the final vertical effective stress; $\sigma_p^{'}$ is the pre-consolidation pressure.

Figures

Written by:	**Ray Wu / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**
Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**



Figure 1. Footprint of SCA Phase I and Phase II and Location of Settlement Cells (SC)
[Cross-Section A-A is shown in Figure 2]

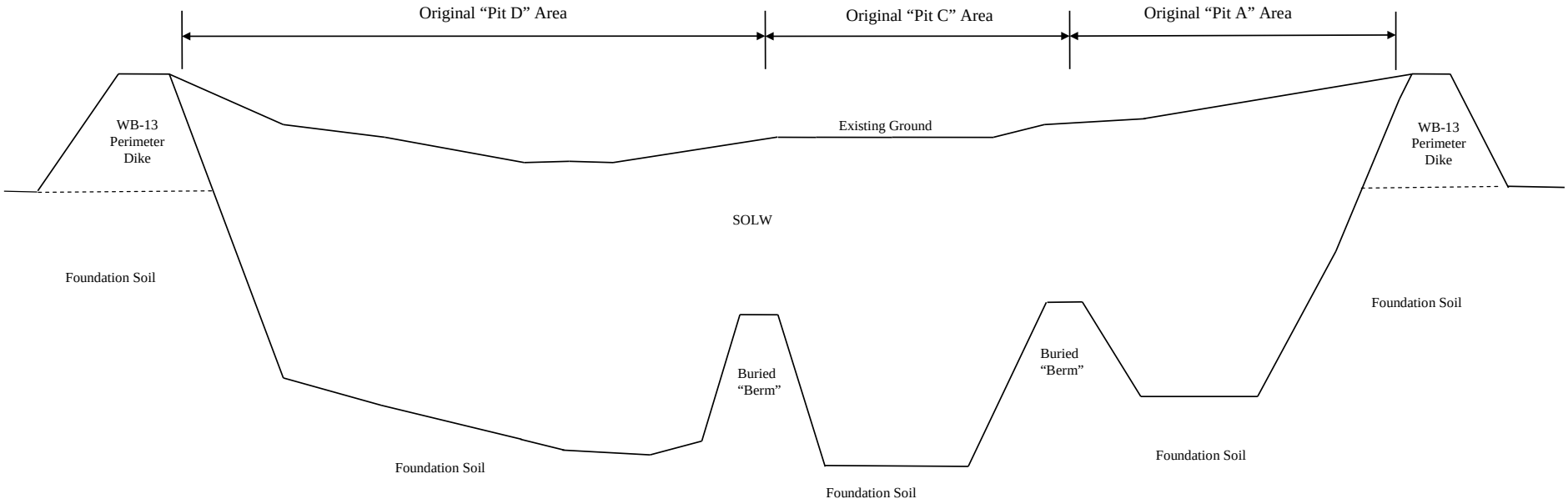

Figure 2. Schematic of the SCA Subsurface Profile (Cross-Section A-A shown in Figure 1)
[not to scale; for the purpose of showing subsurface stratigraphy only; Buried "berm" soil is considered part of the foundation soil]

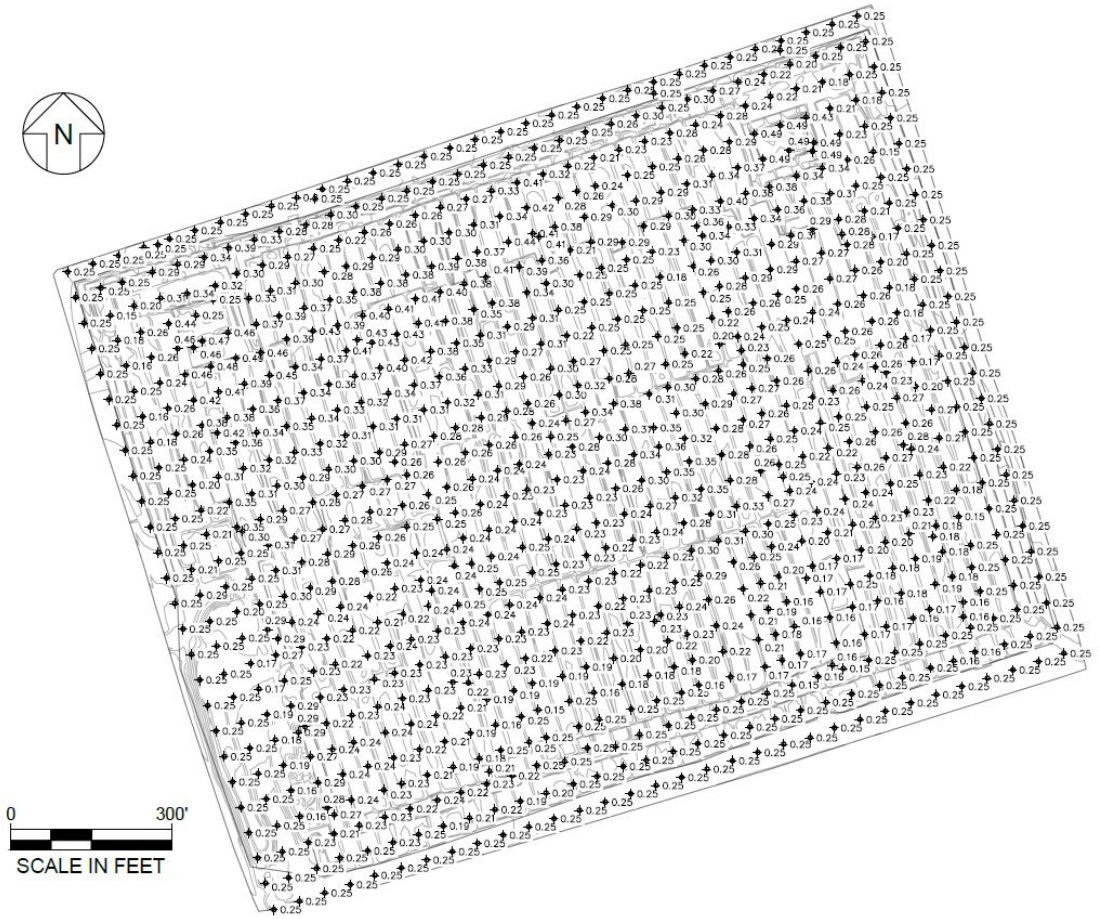

Figure 3. Calibrated C_{ce} of SOLW for each Calculation Point
[Contours are the top of geotextile tubes based on 7 December 2014 survey data; values are SOLW C_{ce}]

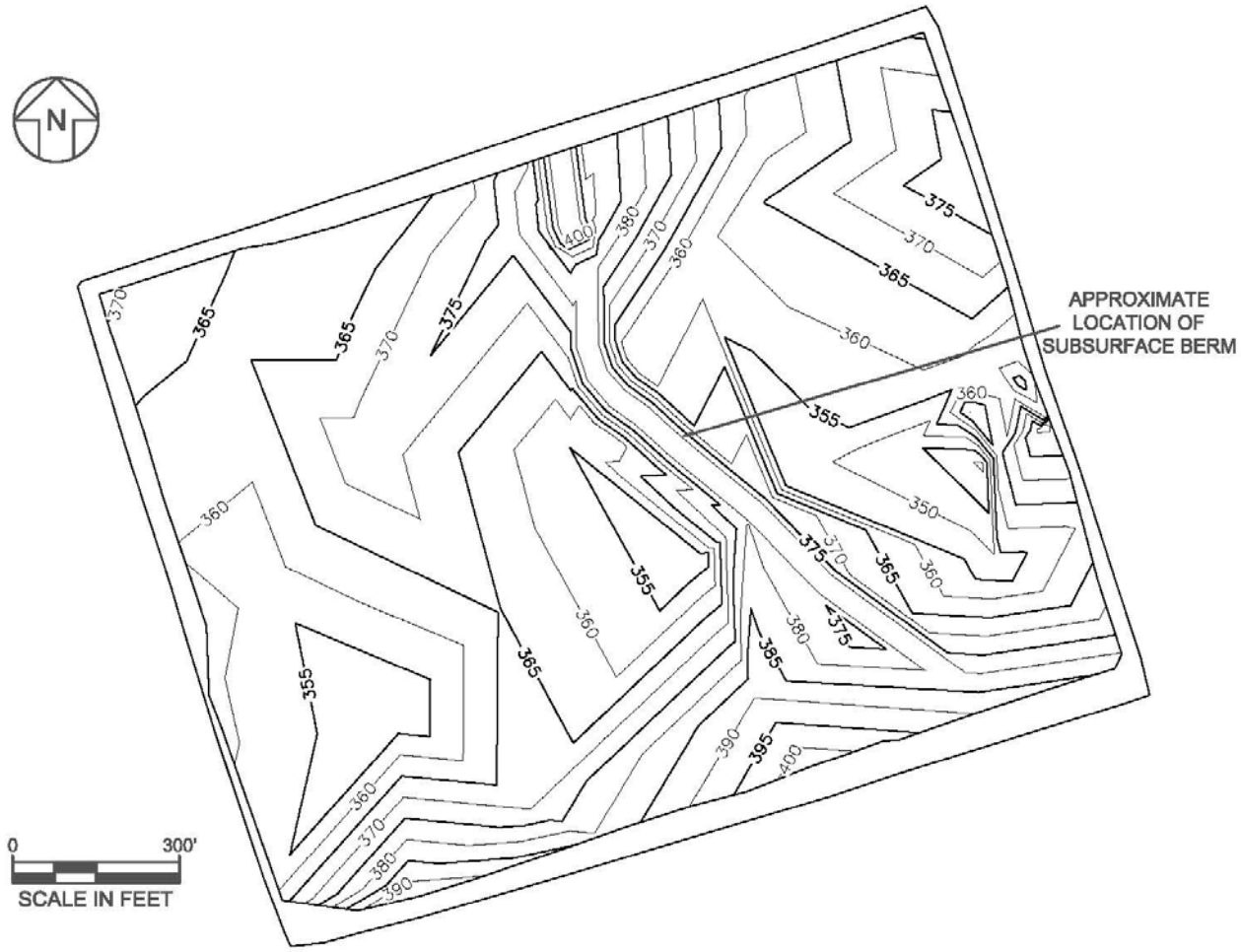

Figure 4. Elevations of the Bottom of SOLW at the SCA (i.e., top of incompressible foundation soil)

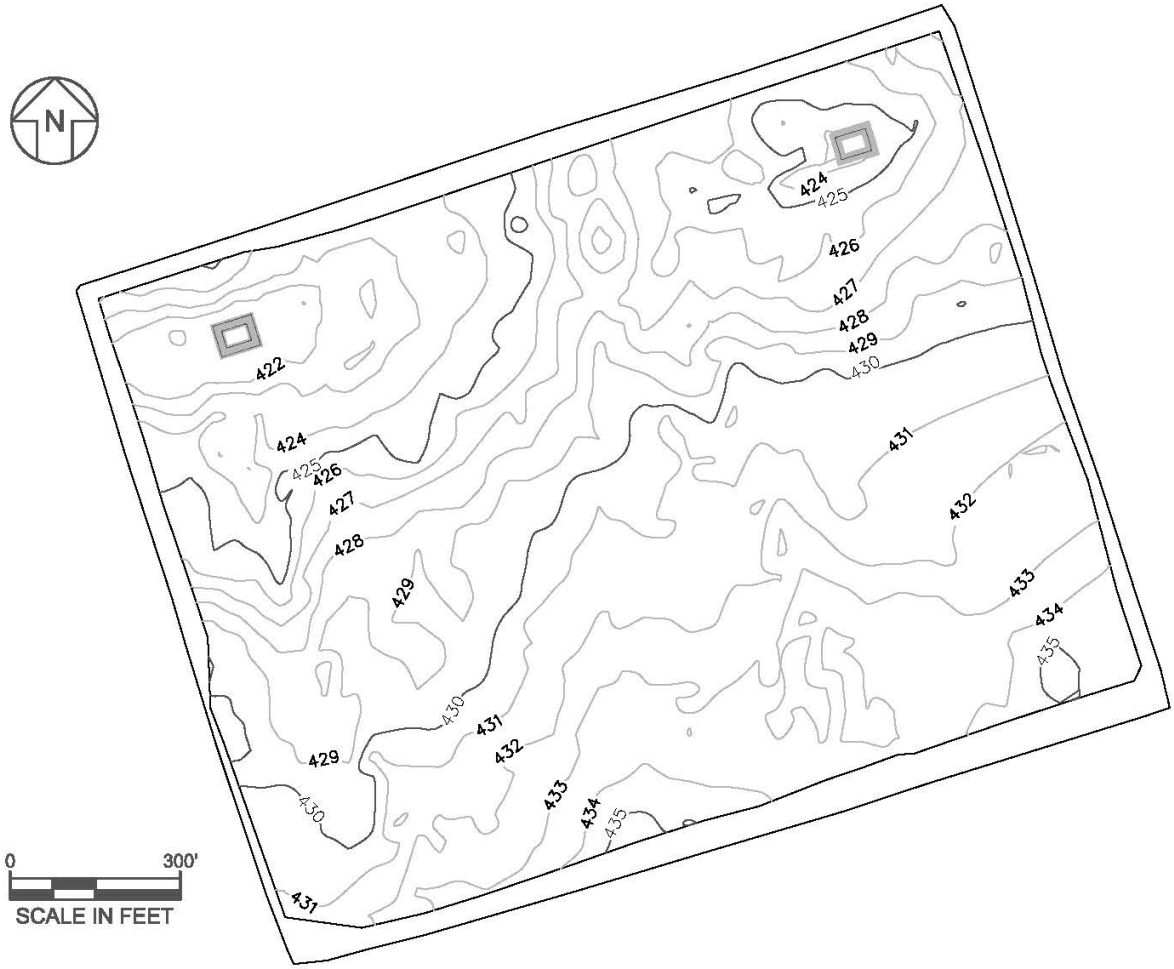

Figure 5. Bottom of Liner System Grading at the SCA (i.e., original grade before placement of liner system)

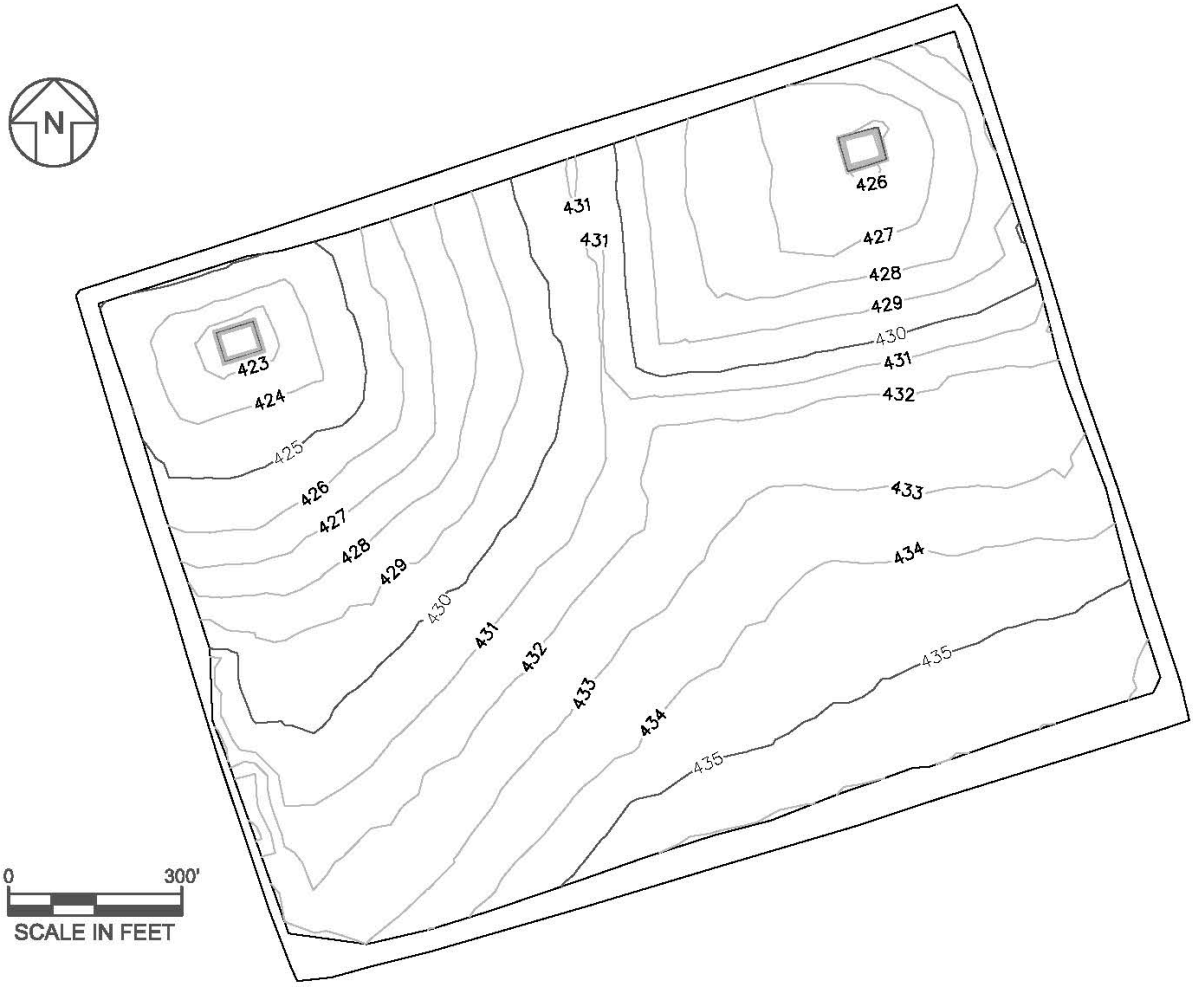

Figure 6. As-Built Elevations of the Top of Clay Liner at the SCA

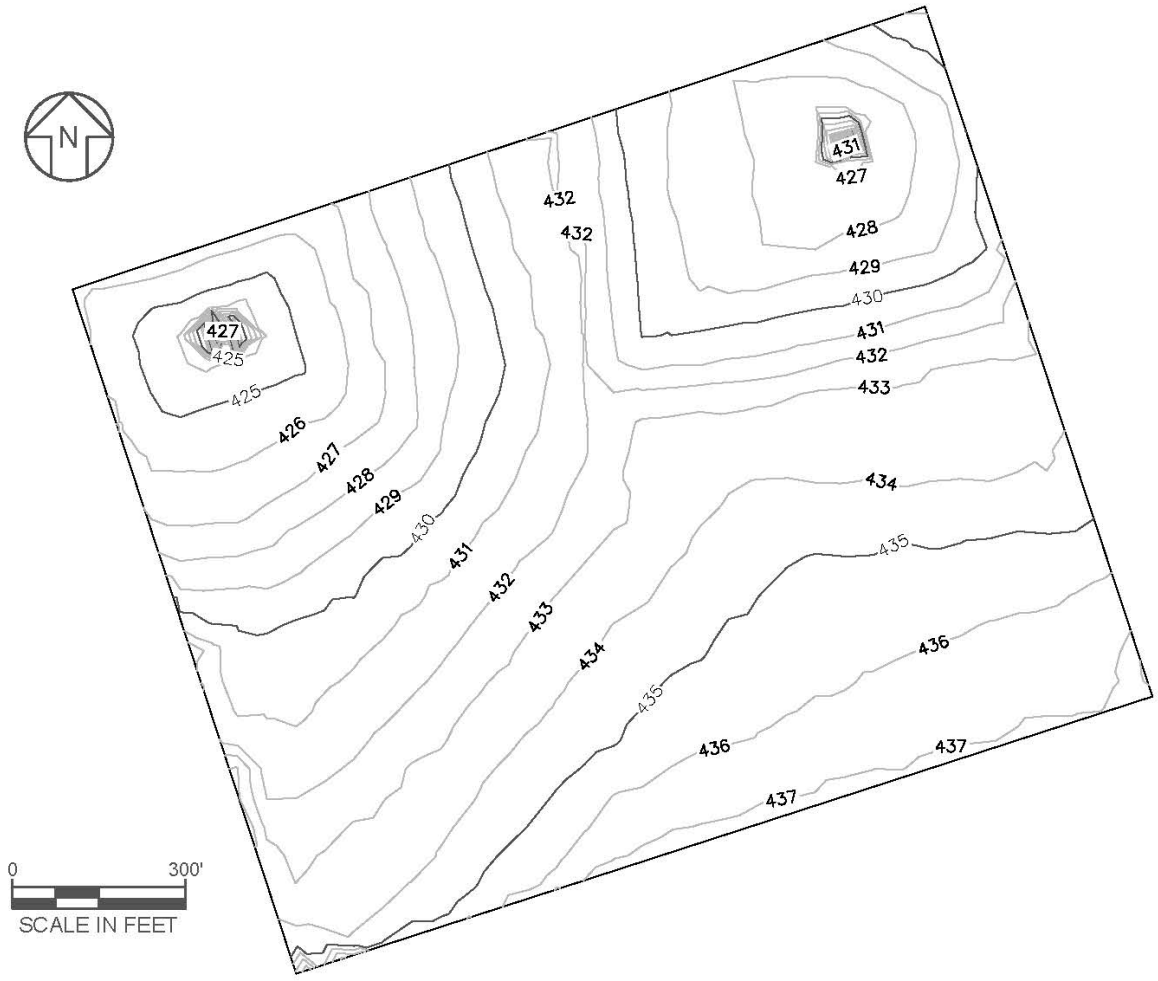

Figure 7. Estimated As-Built Elevations of the Top of Gravel at the SCA

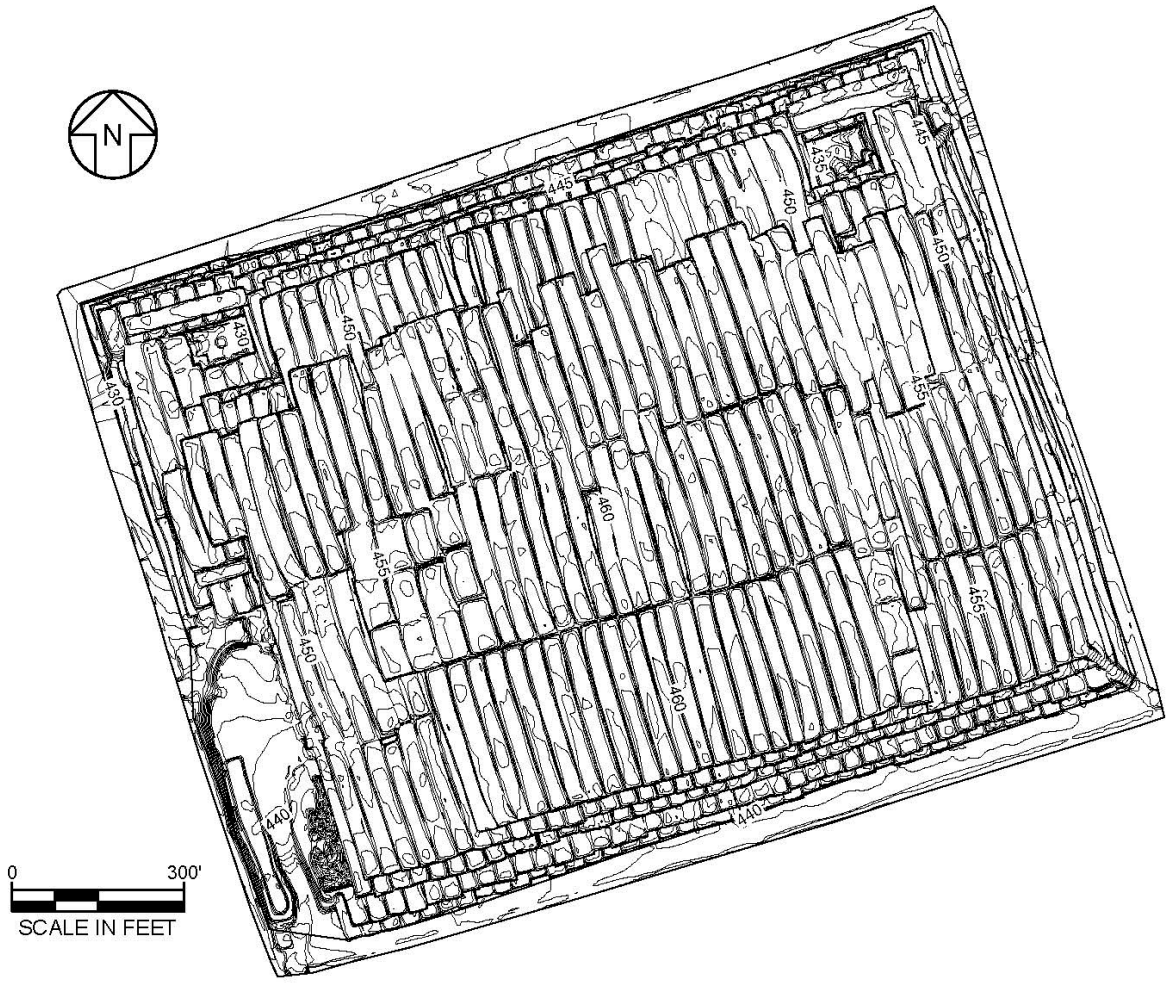

Figure 8. Surveyed Elevations of the Top of Geotextile Tubes

Notes:
1. Contours are based on 7 December 2014 survey data provided by Parsons.
2. These elevations are assumed to be the post-settlement elevations of the top of geotextile tubes (i.e., end of primary consolidation condition), prior to construction of leveling layer.

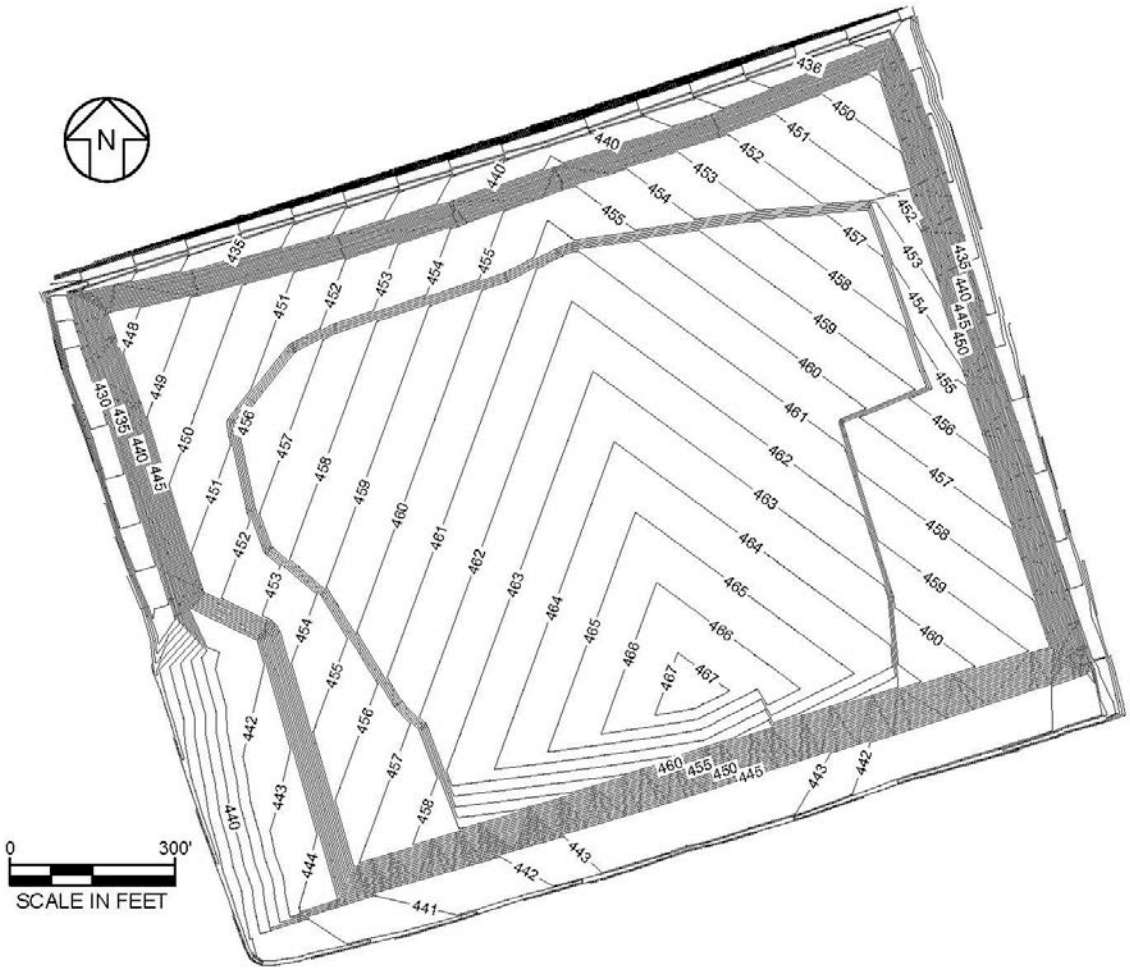

Figure 9. Design Grading Plan for the Initial Leveling Layer

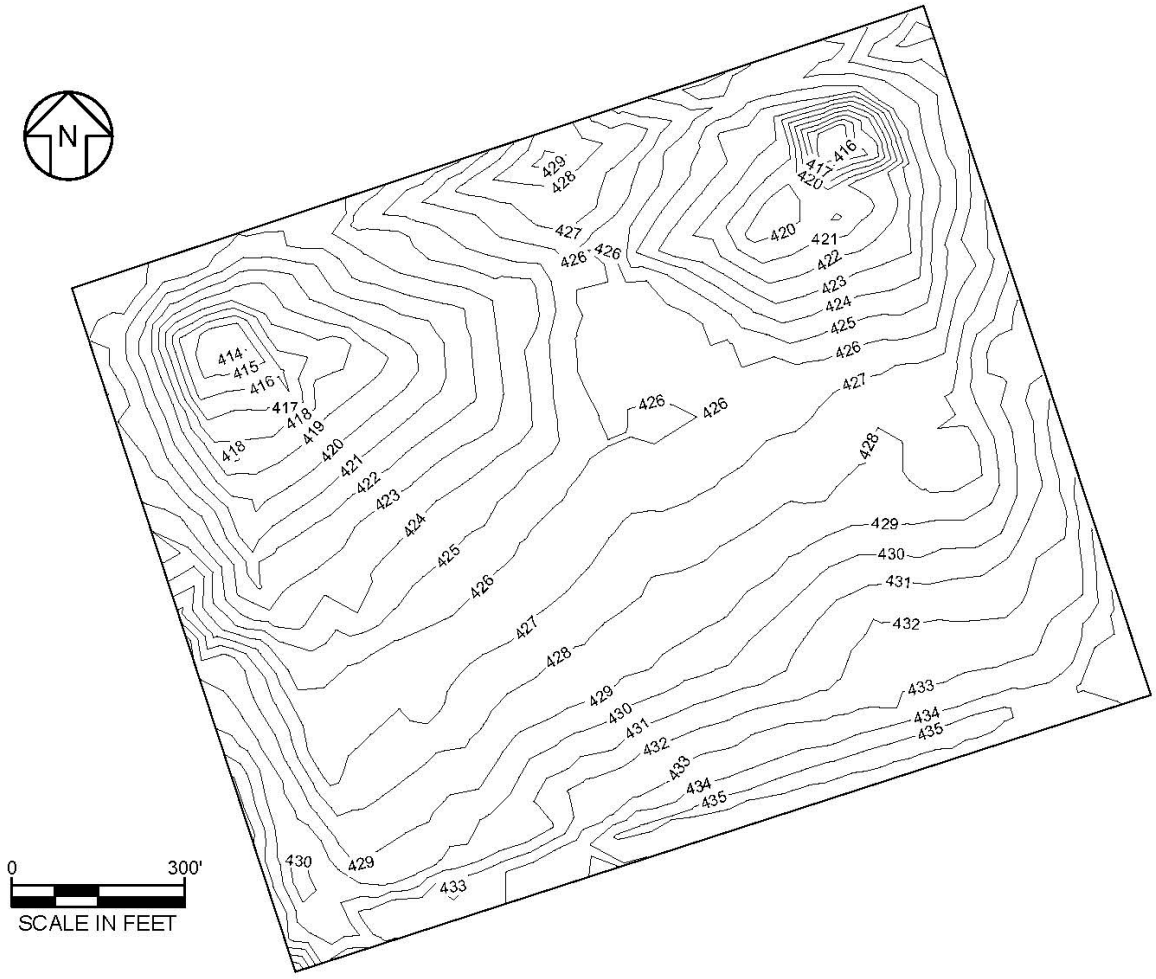

Figure 10. CASE 1: Estimated Post-Settlement Elevations of the Top of the Clay Liner after Placement of the Initial Leveling Layer

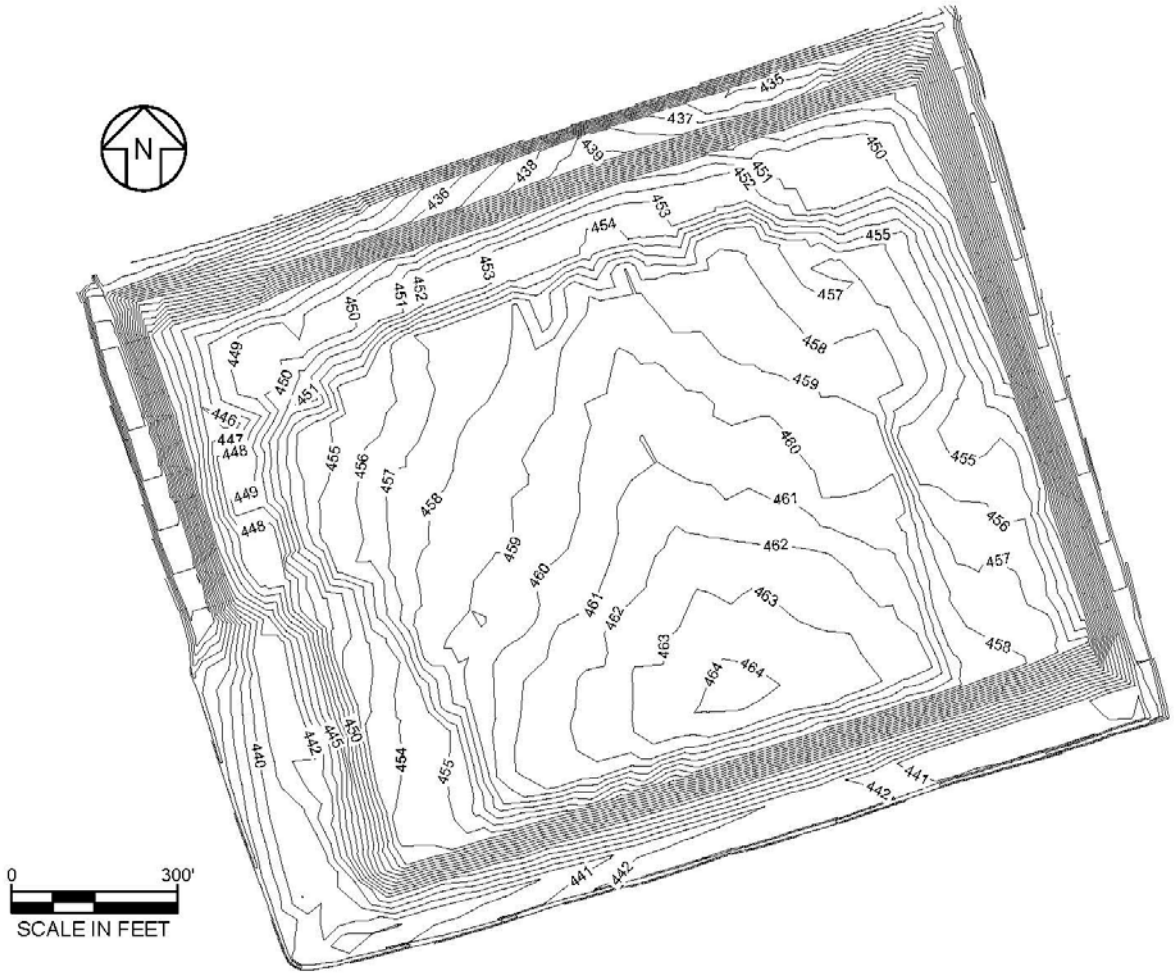

Figure 11. CASE 2: Estimated Post-Settlement Elevations of the Top of Initial Leveling Layer after Placement of the Initial Leveling Layer

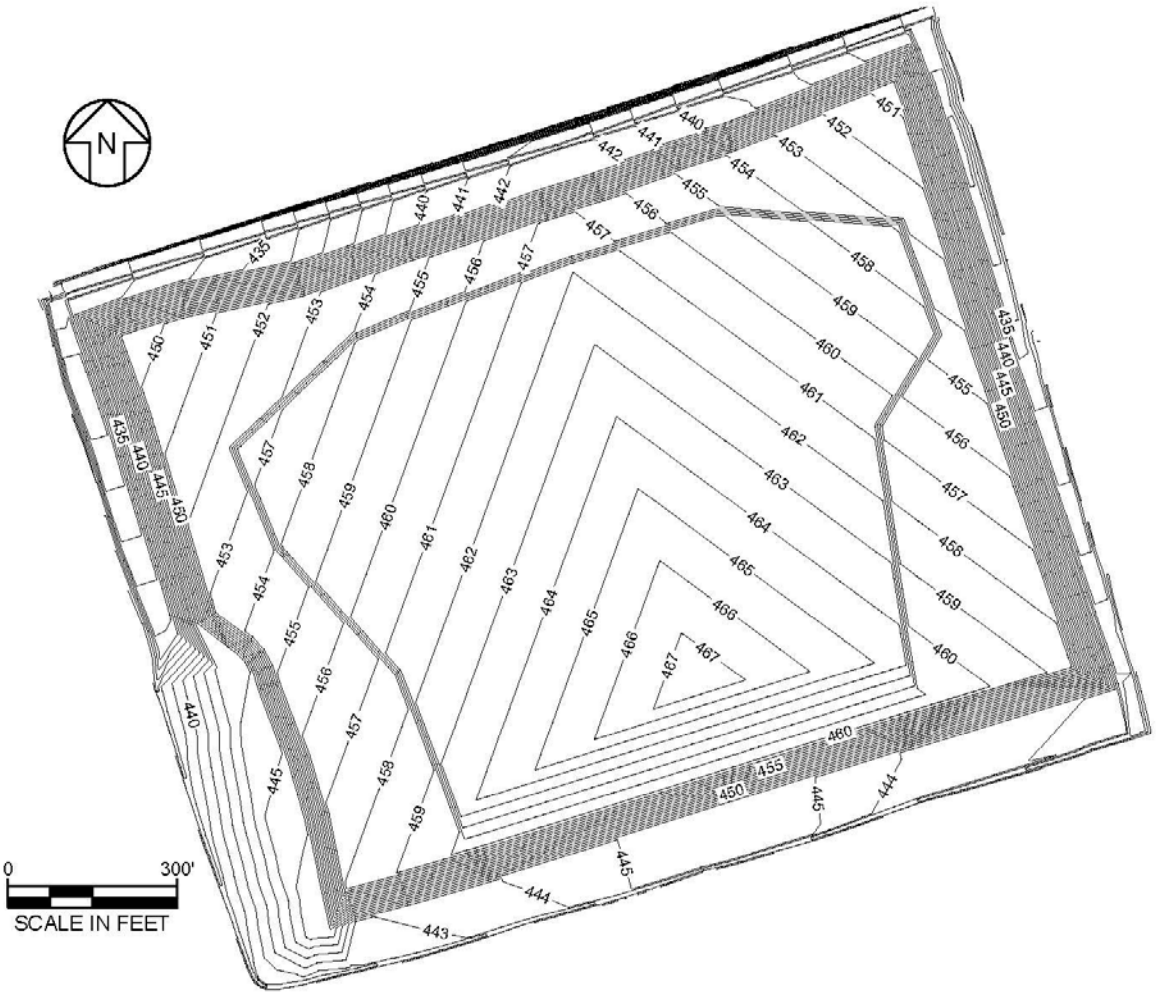

Figure 12. Design Grading Plan for the Final Cover

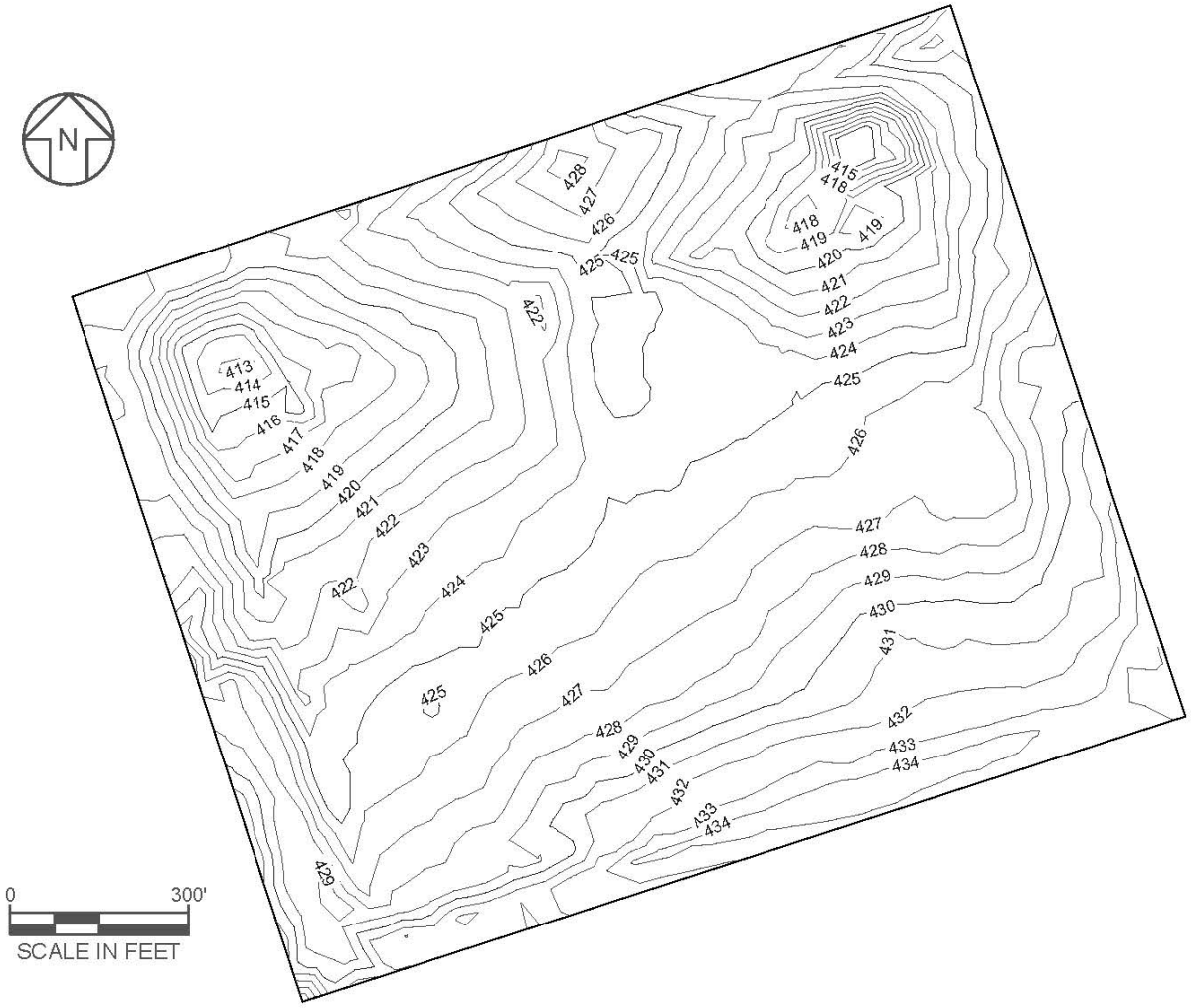

Figure 13. CASE 3: Estimated Post-Settlement Elevations of the Top of Clay Liner - 30 Years after Placement of the Final Cover

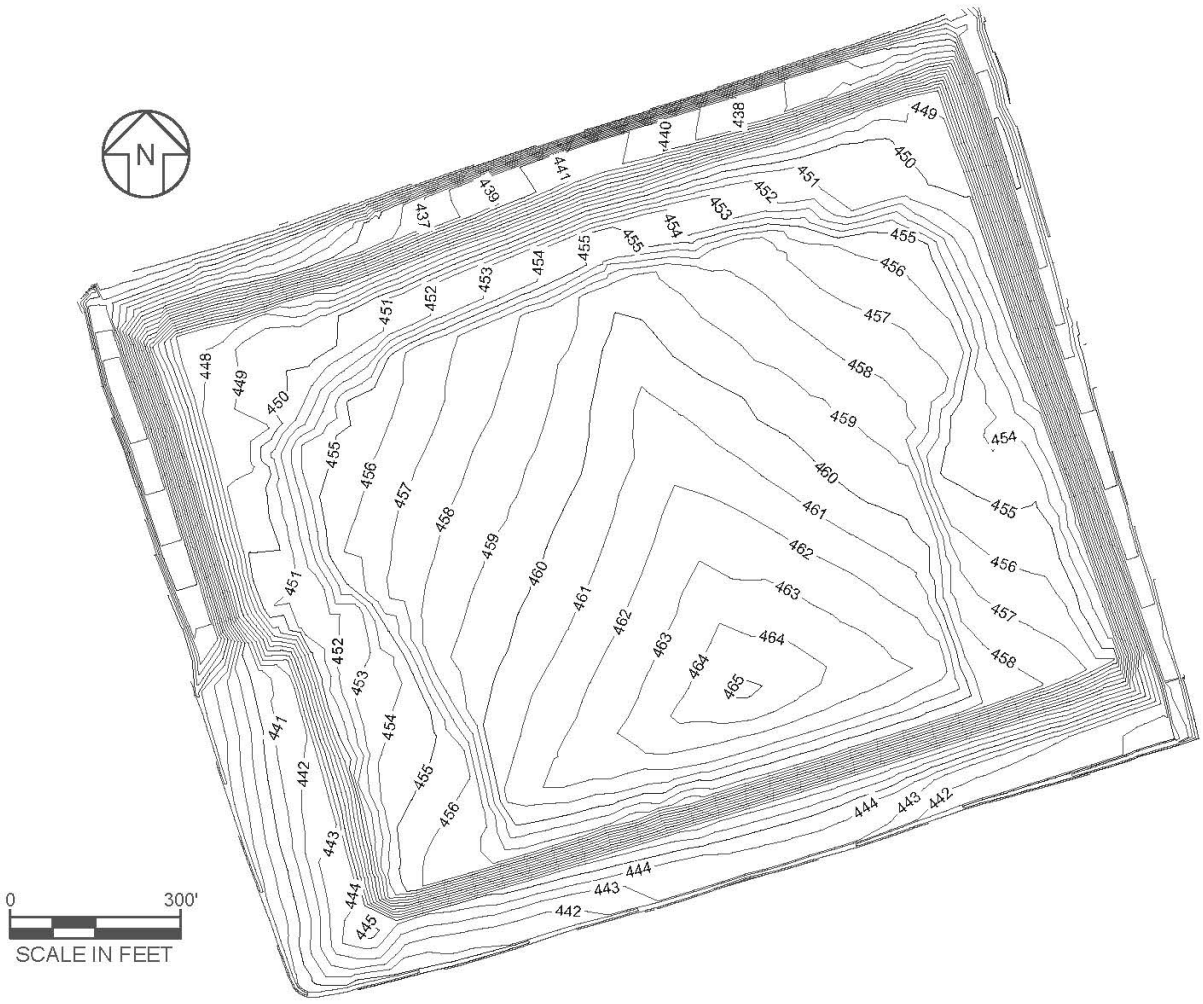

Figure 14. CASE 4: Estimated Post-Settlement Elevations of the Top of Final Cover - 30 Years after Placement of the Final Cover

Attachment 1

CASE 1: Settlement Analysis for the Top of Clay Liner after the Placement of the Initial Leveling Layer
(Points 501 to 510)

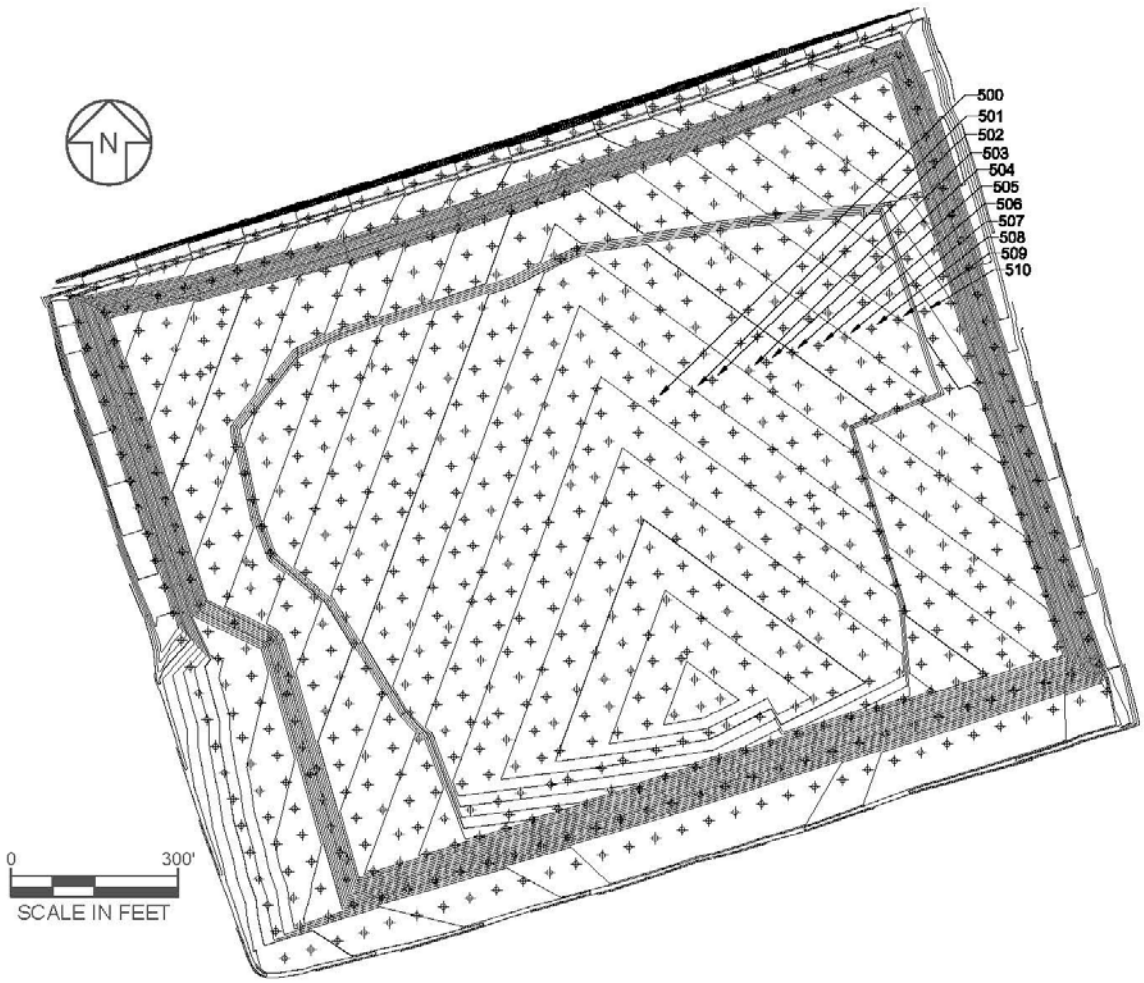

Figure 1-1. Calculation Points used for Settlement Analysis
[Contours are the Design Grading Plan for the Initial Leveling Layer]

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Settlement Prediction Model

Programmer: **Beech and Bonaparte Consultants**

Version Control V 2.00 1.12.2015

Project: **Onondaga Lake SCA Final**

S Notes:

E Unit: **ft / psf**

Average Compaction Effort = **1440.00** kPa or psf

Consider Compaction Effort = **N** yes or no

					501	502	503	504	505	506	507	508	509	510
Point #														
Distance (meter or ft)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELEVATION(M/FT)	Line	1	Top of Leveling Layer		462.05	461.58	460.91	460.53	460.01	459.55	459.04	458.53	458.03	454.34
	Line	2	Top of Dredge		458.56	457.83	457.58	457.61	457.06	457.56	457.91	456.03	454.72	453.01
	Line	3	Top of Gravel		427.71	427.71	427.70	426.99	426.89	426.83	426.71	426.58	426.87	428.30
	Line	4	Top of Clay		426.71	426.71	426.70	425.99	425.89	425.83	425.71	425.58	425.87	427.30
	Line	5	Top of Dike		425.00	425.62	425.29	424.29	423.99	423.91	423.88	424.01	424.45	425.95
	Line	6	Top of Subgrade		425.00	425.62	425.29	424.29	423.99	423.91	423.88	424.01	424.45	425.95
	Line	7			422.37	422.95	422.64	421.69	421.41	421.34	421.31	421.43	421.85	423.27
	Line	8			419.74	420.29	420.00	419.10	418.83	418.77	418.74	418.85	419.25	420.58
	Line	9			417.11	417.63	417.35	416.50	416.25	416.19	416.17	416.27	416.64	417.90
	Line	10			414.48	414.96	414.70	413.91	413.68	413.62	413.59	413.69	414.04	415.22
	Line	11			411.84	412.30	412.06	411.32	411.10	411.04	411.02	411.11	411.44	412.54
	Line	12			409.21	409.63	409.41	408.72	408.52	408.47	408.45	408.53	408.84	409.86
	Line	13			406.58	406.97	406.76	406.13	405.94	405.89	405.87	405.96	406.23	407.18
	Line	14			403.95	404.31	404.12	403.53	403.36	403.32	403.30	403.38	403.63	404.50
	Line	15			401.32	401.64	401.47	400.94	400.78	400.74	400.73	400.80	401.03	401.81
	Line	16			398.69	398.98	398.82	398.35	398.21	398.17	398.16	398.22	398.42	399.13
	Line	17			396.05	396.31	396.18	395.75	395.63	395.60	395.58	395.64	395.82	396.45
	Line	18			393.42	393.65	393.53	393.16	393.05	393.02	393.01	393.06	393.22	393.77
	Line	19			390.79	390.98	390.88	390.56	390.47	390.45	390.44	390.48	390.62	391.09
	Line	20			388.16	388.32	388.23	387.97	387.89	387.87	387.86	387.90	388.01	388.41
	Line	21			385.53	385.66	385.59	385.38	385.31	385.30	385.29	385.32	385.41	385.73
	Line	22			382.90	382.99	382.94	382.78	382.74	382.72	382.72	382.74	382.81	383.04
	Line	23			380.26	380.33	380.29	380.19	380.16	380.15	380.15	380.16	380.21	380.36
	Line	24			377.63	377.66	377.65	377.59	377.58	377.57	377.57	377.58	377.60	377.68
	Line	25	Bottom of SOLW Above GW		375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00
	Line	26			371.52	369.47	368.52	368.98	369.52	369.93	370.36	370.80	371.26	371.80
	Line	27			368.03	363.93	362.04	362.96	364.04	364.86	365.71	366.60	367.53	368.60
	Line	28	Top of Incompressible Layer		364.55	358.40	355.57	356.94	358.57	359.79	361.07	362.40	363.79	365.40
	Line	29	GND	for sigma_p	429.39	429.54	428.97	428.60	428.27	428.16	428.19	428.44	428.55	428.54
	Line	30	GW		375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00
	Line	31	ROCK		364.55	358.40	355.57	356.94	358.57	359.79	361.07	362.40	363.79	365.40
LAYER THICKNESS (M/FT)	Layer No.	From	To	Material										
	1	1	2	Leveling Layer	3.49	3.75	3.33	2.93	2.95	1.99	1.13	2.50	3.31	1.33
	2	2	3	Dredge	30.86	30.12	29.88	30.61	30.17	30.73	31.20	29.45	27.84	24.71
	3	3	4	Gravel	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	4	4	5	Clay	1.70	1.09	1.41	1.71	1.90	1.92	1.82	1.57	1.42	1.35
	5	5	6	Dike	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	6	7	Above-GW-1	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	7	7	8	Above-GW-2	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	8	8	9	Above-GW-3	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	9	9	10	Above-GW-4	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	10	10	11	Above-GW-5	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	11	11	12	Above-GW-6	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	12	12	13	Above-GW-7	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	13	13	14	Above-GW-8	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	14	14	15	Above-GW-9	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	15	15	16	Above-GW-10	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	16	16	17	Above-GW-11	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	17	17	18	Above-GW-12	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	18	18	19	Above-GW-13	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	19	19	20	Above-GW-14	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	20	20	21	Above-GW-15	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	21	21	22	Above-GW-16	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	22	22	23	Above-GW-17	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	23	23	24	Above-GW-1	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	24	24	25	Above-GW-2	2.63	2.66	2.65	2.59	2.58	2.57	2.57	2.58	2.60	2.68
	25	25	26	Below-GW-18	3.48	5.53	6.48	6.02	5.48	5.07	4.64	4.20	3.74	3.20
	26	26	27	Below-GW-19	3.48	5.53	6.48	6.02	5.48	5.07	4.64	4.20	3.74	3.20
	27	27	28	Below-GW-3	3.48	5.53	6.48	6.02	5.48	5.07	4.64	4.20	3.74	3.20
	28													
	29	29	30	Soil Above GW	54.39	54.54	53.97	53.60	53.27	53.16	53.19	53.44	53.55	53.54
	30	30	31	Soil Below GW	10.45	16.60	19.43	18.06	16.43	15.21	13.93	12.60	11.21	9.60
	Thickness Check													
	From Line		To Line	SUM	97.50	103.18	105.35	103.59	101.45	99.75	97.97	96.13	94.23	88.94
	1		28	Thickness =	97.50	103.18	105.35	103.59	101.45	99.75	97.97	96.13	94.23	88.94
				Thickness Check	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

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UNIT WEIGHT	Layer No.	Material										
	1	*Leveling Layer*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	2	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	3	*Gravel*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	4	*Clay*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	5	*Dike*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	6	*Above-GW-1*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	7	*Above-GW-2*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	8	*Above-GW-3*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	9	*Above-GW-4*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	10	*Above-GW-5*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	11	*Above-GW-6*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	12	*Above-GW-7*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	13	*Above-GW-8*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	14	*Above-GW-9*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	15	*Above-GW-10*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	16	*Above-GW-11*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	17	*Above-GW-12*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	18	*Above-GW-13*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	19	*Above-GW-14*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	20	*Above-GW-15*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	21	*Above-GW-16*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	22	*Above-GW-17*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	23	*Above-GW-1*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	24	*Above-GW-2*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	25	*Below-GW-18*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	26	*Below-GW-19*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	27	*Below-GW-3*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	28											
	29	*Soil Above GW*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	30	*Soil below GW*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	Layer No.	***1*** **Leveling Layer**										
		Initial Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
		Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	Midpoint Elevation, (m / ft)		460.30	459.70	459.25	459.07	458.54	458.56	458.47	457.28	456.37	453.67
	Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
	Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)= _____		Strain										
		Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, $C_{c\varepsilon}$												
Modified Recompression Index, $C_{r\varepsilon}$												
Modified Secondary Compression Index, C_α												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
		Elastic or Plastic (E/P)										
		Settlement of Layer 1 (m / ft)										

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Layer No. *2* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Midpoint Elevation, (m / ft)		443.13	442.77	442.64	442.30	441.98	442.20	442.31	441.31	440.80	440.65
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 2 (m / ft)											
Layer No. *3* **Gravel**											
Initial Stress Reference Layer (top of layer)		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Final Stress Reference Layer (top of layer)		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Midpoint Elevation, (m / ft)		427.21	427.21	427.20	426.49	426.39	426.33	426.21	426.08	426.37	427.80
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 3 (m / ft)											
Layer No. *4* **Clay**											
Initial Stress Reference Layer (top of layer)		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Final Stress Reference Layer (top of layer)		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Midpoint Elevation, (m / ft)		425.85	426.16	426.00	425.14	424.94	424.87	424.80	424.80	425.16	426.62
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 4 (m / ft)											

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Layer No. *5* **Dike**											
Initial Stress Reference Layer (top of layer)		*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
Final Stress Reference Layer (top of layer)		*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
Midpoint Elevation, (m / ft)		425.00	425.62	425.29	424.29	423.99	423.91	423.88	424.01	424.45	425.95
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 5 (m / ft)											
Layer No. *6* **Above-GW-1**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		423.69	424.29	423.97	422.99	422.70	422.63	422.60	422.72	423.15	424.61
Initial Effective Stress, σ'_i (kPa /psf)		3,085.74	2,950.46	2,967.21	3,063.90	3,048.75	3,098.64	3,127.36	2,946.58	2,791.85	2,516.87
Final Effective Stress, σ'_f (kPa/psf)		3,504.10	3,400.44	3,367.20	3,415.13	3,402.84	3,336.99	3,263.51	3,247.12	3,188.99	2,676.66
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		468	431	410	460	456	453	459	469	443	323
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.036	0.036	0.029	0.029	0.031	0.020	0.011	0.028	0.039	0.013
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.036	0.036	0.029	0.029	0.031	0.020	0.011	0.028	0.039	0.013
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 6 (m / ft)		0.036	0.036	0.029	0.029	0.031	0.020	0.011	0.028	0.039	0.013
Layer No. *7* **Above-GW-2**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		421.06	421.62	421.32	420.40	420.12	420.05	420.03	420.14	420.55	421.93
Initial Effective Stress, σ'_i (kPa /psf)		3,301.55	3,168.92	3,184.25	3,276.61	3,260.18	3,309.74	3,338.34	3,158.11	3,005.27	2,736.75
Final Effective Stress, σ'_f (kPa/psf)		3,719.90	3,618.90	3,584.25	3,627.84	3,614.27	3,548.09	3,474.49	3,458.65	3,402.41	2,896.54
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		684	649	627	672	668	665	670	680	656	543
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.034	0.034	0.027	0.028	0.029	0.019	0.011	0.026	0.036	0.012
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.034	0.034	0.027	0.028	0.029	0.019	0.011	0.026	0.036	0.012
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 7 (m / ft)		0.034	0.034	0.027	0.028	0.029	0.019	0.011	0.026	0.036	0.012

Layer No. *8* **Above-GW-3**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		418.42	418.96	418.67	417.80	417.54	417.48	417.45	417.56	417.94	419.24
Initial Effective Stress, σ'_i (kPa /psf)		3,517.35	3,387.38	3,401.30	3,489.32	3,471.61	3,520.84	3,549.31	3,369.63	3,218.69	2,956.63
Final Effective Stress, σ'_f (kPa/psf)		3,935.71	3,837.35	3,801.30	3,840.55	3,825.70	3,759.20	3,685.47	3,670.17	3,615.83	3,116.42
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		899	868	844	885	879	876	881	892	870	763
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.032	0.032	0.026	0.026	0.027	0.018	0.010	0.025	0.034	0.011
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.032	0.032	0.026	0.026	0.027	0.018	0.010	0.025	0.034	0.011
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 8 (m / ft)		0.032	0.032	0.026	0.026	0.027	0.018	0.010	0.025	0.034	0.011
Layer No. *9* **Above-GW-4**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		415.79	416.29	416.03	415.21	414.97	414.90	414.88	414.98	415.34	416.56
Initial Effective Stress, σ'_i (kPa /psf)		3,733.15	3,605.84	3,618.35	3,702.03	3,683.04	3,731.95	3,760.29	3,581.16	3,432.11	3,176.51
Final Effective Stress, σ'_f (kPa/psf)		4,151.51	4,055.81	4,018.34	4,053.26	4,037.13	3,970.30	3,896.44	3,881.70	3,829.25	3,336.30
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,115	1,086	1,061	1,098	1,091	1,087	1,092	1,103	1,083	983
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.030	0.030	0.024	0.025	0.026	0.017	0.010	0.023	0.032	0.010
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.030	0.030	0.024	0.025	0.026	0.017	0.010	0.023	0.032	0.010
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 9 (m / ft)		0.030	0.030	0.024	0.025	0.026	0.017	0.010	0.023	0.032	0.010
Layer No. *10* **Above-GW-5**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		413.16	413.63	413.38	412.61	412.39	412.33	412.31	412.40	412.74	413.88
Initial Effective Stress, σ'_i (kPa /psf)		3,948.96	3,824.29	3,835.40	3,914.74	3,894.47	3,943.05	3,971.27	3,792.69	3,645.53	3,396.38
Final Effective Stress, σ'_f (kPa/psf)		4,367.32	4,274.27	4,235.39	4,265.97	4,248.56	4,181.40	4,107.42	4,093.23	4,042.67	3,556.18
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,331	1,305	1,278	1,311	1,302	1,298	1,303	1,315	1,297	1,202
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.029	0.028	0.023	0.023	0.024	0.016	0.009	0.022	0.030	0.010
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.029	0.028	0.023	0.023	0.024	0.016	0.009	0.022	0.030	0.010
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 10 (m / ft)		0.029	0.028	0.023	0.023	0.024	0.016	0.009	0.022	0.030	0.010

Layer No. *11* **Above-GW-6**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		410.53	410.97	410.73	410.02	409.81	409.75	409.73	409.82	410.14	411.20
Initial Effective Stress, σ'_i (kPa /psf)		4,164.76	4,042.75	4,052.44	4,127.45	4,105.90	4,154.15	4,182.25	4,004.21	3,858.96	3,616.26
Final Effective Stress, σ'_f (kPa/psf)		4,583.12	4,492.73	4,452.44	4,478.68	4,459.98	4,392.51	4,318.40	4,304.75	4,256.10	3,776.06
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,547	1,523	1,495	1,523	1,513	1,509	1,514	1,526	1,510	1,422
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.027	0.027	0.022	0.022	0.023	0.015	0.009	0.021	0.029	0.009
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.027	0.027	0.022	0.022	0.023	0.015	0.009	0.021	0.029	0.009
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 11 (m / ft)		0.027	0.027	0.022	0.022	0.023	0.015	0.009	0.021	0.029	0.009
Layer No. *12* **Above-GW-7**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		407.90	408.30	408.09	407.43	407.23	407.18	407.16	407.24	407.53	408.52
Initial Effective Stress, σ'_i (kPa /psf)		4,380.57	4,261.21	4,269.49	4,340.16	4,317.33	4,365.26	4,393.22	4,215.74	4,072.38	3,836.14
Final Effective Stress, σ'_f (kPa/psf)		4,798.92	4,711.19	4,669.49	4,691.38	4,671.41	4,603.61	4,529.37	4,516.28	4,469.52	3,995.93
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,763	1,742	1,712	1,736	1,725	1,720	1,725	1,738	1,723	1,642
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.026	0.026	0.021	0.021	0.022	0.014	0.008	0.020	0.027	0.009
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.026	0.026	0.021	0.021	0.022	0.014	0.008	0.020	0.027	0.009
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 12 (m / ft)		0.026	0.026	0.021	0.021	0.022	0.014	0.008	0.020	0.027	0.009
Layer No. *13* **Above-GW-8**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		405.27	405.64	405.44	404.83	404.65	404.61	404.59	404.67	404.93	405.84
Initial Effective Stress, σ'_i (kPa /psf)		4,596	4,480	4,487	4,553	4,529	4,576	4,604	4,427	4,286	4,056
Final Effective Stress, σ'_f (kPa/psf)		5,015	4,930	4,887	4,904	4,883	4,815	4,740	4,728	4,683	4,216
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,978	1,960	1,929	1,949	1,936	1,931	1,936	1,949	1,937	1,862
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.025	0.024	0.020	0.020	0.021	0.014	0.008	0.019	0.026	0.008
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.025	0.024	0.020	0.020	0.021	0.014	0.008	0.019	0.026	0.008
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 13 (m / ft)		0.025	0.024	0.020	0.020	0.021	0.014	0.008	0.019	0.026	0.008

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *14* **Above-GW-9**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		402.63	402.97	402.79	402.24	402.07	402.03	402.02	402.09	402.33	403.16
Initial Effective Stress, σ'_i (kPa /psf)		4,812	4,698	4,704	4,766	4,740	4,787	4,815	4,639	4,499	4,276
Final Effective Stress, σ'_f (kPa/psf)		5,231	5,148	5,104	5,117	5,094	5,026	4,951	4,939	4,896	4,436
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,194	2,179	2,146	2,161	2,148	2,142	2,147	2,161	2,150	2,082
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.024	0.023	0.019	0.019	0.020	0.013	0.007	0.018	0.025	0.008
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.024	0.023	0.019	0.019	0.020	0.013	0.007	0.018	0.025	0.008
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 14 (m / ft)		0.024	0.023	0.019	0.019	0.020	0.013	0.007	0.018	0.025	0.008
Layer No. *15* **Above-GW-10**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		400.00	400.31	400.15	399.64	399.49	399.46	399.44	399.51	399.73	400.47
Initial Effective Stress, σ'_i (kPa /psf)		5,028	4,917	4,921	4,978	4,952	4,999	5,026	4,850	4,713	4,496
Final Effective Stress, σ'_f (kPa/psf)		5,446	5,367	5,321	5,330	5,306	5,237	5,162	5,151	5,110	4,656
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,410	2,397	2,363	2,374	2,359	2,353	2,358	2,372	2,364	2,302
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.023	0.022	0.018	0.018	0.019	0.012	0.007	0.018	0.024	0.007
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.023	0.022	0.018	0.018	0.019	0.012	0.007	0.018	0.024	0.007
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 15 (m / ft)		0.023	0.022	0.018	0.018	0.019	0.012	0.007	0.018	0.024	0.007
Layer No. *16* **Above-GW-11**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		397.37	397.65	397.50	397.05	396.92	396.88	396.87	396.93	397.12	397.79
Initial Effective Stress, σ'_i (kPa /psf)		5,244	5,135	5,138	5,191	5,163	5,210	5,237	5,062	4,926	4,716
Final Effective Stress, σ'_f (kPa/psf)		5,662	5,585	5,538	5,542	5,517	5,448	5,373	5,362	5,323	4,875
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,626	2,616	2,580	2,587	2,571	2,565	2,569	2,584	2,577	2,522
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.022	0.021	0.017	0.018	0.019	0.012	0.007	0.017	0.023	0.007
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.022	0.021	0.017	0.018	0.019	0.012	0.007	0.017	0.023	0.007
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 16 (m / ft)		0.022	0.021	0.017	0.018	0.019	0.012	0.007	0.017	0.023	0.007

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *17* **Above-GW-12**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		394.74	394.98	394.85	394.46	394.34	394.31	394.30	394.35	394.52	395.11
Initial Effective Stress, σ'_i (kPa /psf)		5,460	5,353	5,355	5,404	5,374	5,421	5,448	5,273	5,139	4,936
Final Effective Stress, σ'_f (kPa/psf)		5,878	5,803	5,755	5,755	5,729	5,659	5,584	5,574	5,537	5,095
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,842	2,834	2,797	2,800	2,782	2,776	2,780	2,795	2,791	2,742
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.021	0.021	0.017	0.017	0.018	0.012	0.007	0.016	0.022	0.007
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.021	0.021	0.017	0.017	0.018	0.012	0.007	0.016	0.022	0.007
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 17 (m / ft)		0.021	0.021	0.017	0.017	0.018	0.012	0.007	0.016	0.022	0.007
Layer No. *18* **Above-GW-13**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		392.11	392.32	392.20	391.86	391.76	391.73	391.72	391.77	391.92	392.43
Initial Effective Stress, σ'_i (kPa /psf)		5,675	5,572	5,572	5,616	5,586	5,632	5,659	5,485	5,353	5,155
Final Effective Stress, σ'_f (kPa/psf)		6,094	6,022	5,972	5,968	5,940	5,870	5,795	5,785	5,750	5,315
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,057	3,052	3,014	3,012	2,993	2,987	2,991	3,007	3,004	2,961
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.020	0.020	0.016	0.016	0.017	0.011	0.006	0.016	0.021	0.006
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.020	0.020	0.016	0.016	0.017	0.011	0.006	0.016	0.021	0.006
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 18 (m / ft)		0.020	0.020	0.016	0.016	0.017	0.011	0.006	0.016	0.021	0.006
Layer No. *19* **Above-GW-14**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		389.47	389.65	389.56	389.27	389.18	389.16	389.15	389.19	389.31	389.75
Initial Effective Stress, σ'_i (kPa /psf)		5,891	5,790	5,789	5,829	5,797	5,843	5,870	5,696	5,566	5,375
Final Effective Stress, σ'_f (kPa/psf)		6,310	6,240	6,189	6,180	6,151	6,081	6,006	5,997	5,963	5,535
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,273	3,271	3,232	3,225	3,205	3,198	3,202	3,218	3,217	3,181
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.020	0.019	0.015	0.016	0.017	0.011	0.006	0.015	0.020	0.006
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.020	0.019	0.015	0.016	0.017	0.011	0.006	0.015	0.020	0.006
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 19 (m / ft)		0.020	0.019	0.015	0.016	0.017	0.011	0.006	0.015	0.020	0.006

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *20* **Above-GW-15**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		386.84	386.99	386.91	386.67	386.60	386.58	386.58	386.61	386.71	387.07
Initial Effective Stress, σ'_i (kPa /psf)		6,107	6,009	6,006	6,042	6,009	6,054	6,081	5,908	5,780	5,595
Final Effective Stress, σ'_f (kPa/psf)		6,525	6,459	6,406	6,393	6,363	6,292	6,217	6,208	6,177	5,755
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,489	3,489	3,449	3,438	3,416	3,409	3,413	3,430	3,431	3,401
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.019	0.018	0.015	0.015	0.016	0.010	0.006	0.014	0.020	0.006
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.019	0.018	0.015	0.015	0.016	0.010	0.006	0.014	0.020	0.006
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 20 (m / ft)		0.019	0.018	0.015	0.015	0.016	0.010	0.006	0.014	0.020	0.006
Layer No. *21* **Above-GW-16**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		384.21	384.32	384.26	384.08	384.02	384.01	384.01	384.03	384.11	384.39
Initial Effective Stress, σ'_i (kPa /psf)		6,323	6,227	6,223	6,255	6,220	6,265	6,292	6,119	5,993	5,815
Final Effective Stress, σ'_f (kPa/psf)		6,741	6,677	6,623	6,606	6,574	6,504	6,428	6,420	6,390	5,975
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,705	3,708	3,666	3,650	3,628	3,620	3,624	3,641	3,644	3,621
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.018	0.018	0.014	0.015	0.015	0.010	0.006	0.014	0.019	0.006
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.018	0.018	0.014	0.015	0.015	0.010	0.006	0.014	0.019	0.006
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 21 (m / ft)		0.018	0.018	0.014	0.015	0.015	0.010	0.006	0.014	0.019	0.006
Layer No. *22* **Above-GW-17**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		381.58	381.66	381.62	381.49	381.45	381.44	381.43	381.45	381.51	381.70
Initial Effective Stress, σ'_i (kPa /psf)		6,539	6,446	6,440	6,467	6,432	6,476	6,503	6,331	6,207	6,035
Final Effective Stress, σ'_f (kPa/psf)		6,957	6,896	6,840	6,818	6,786	6,715	6,639	6,632	6,604	6,195
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,921	3,926	3,883	3,863	3,839	3,831	3,834	3,853	3,858	3,841
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.018	0.017	0.014	0.014	0.015	0.010	0.006	0.014	0.018	0.005
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.018	0.017	0.014	0.014	0.015	0.010	0.006	0.014	0.018	0.005
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 22 (m / ft)		0.018	0.017	0.014	0.014	0.015	0.010	0.006	0.014	0.018	0.005

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *23* **Above-GW-1**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		378.95	379.00	378.97	378.89	378.87	378.86	378.86	378.87	378.90	379.02
Initial Effective Stress, σ'_i (kPa /psf)		6,754	6,664	6,657	6,680	6,643	6,687	6,714	6,543	6,420	6,255
Final Effective Stress, σ'_f (kPa/psf)		7,173	7,114	7,057	7,031	6,997	6,926	6,850	6,843	6,817	6,415
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		4,136	4,145	4,100	4,076	4,051	4,042	4,045	4,064	4,071	4,061
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.017	0.017	0.013	0.014	0.015	0.009	0.005	0.013	0.018	0.005
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.017	0.017	0.013	0.014	0.015	0.009	0.005	0.013	0.018	0.005
Elastic or Plastic (E/P)		p	p	p	p	p	p	p	p	p	p
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 23 (m / ft)		0.017	0.017	0.013	0.014	0.015	0.009	0.005	0.013	0.018	0.005
Layer No. *24* **Above-GW-2**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		376.32	376.33	376.32	376.30	376.29	376.29	376.29	376.29	376.30	376.34
Initial Effective Stress, σ'_i (kPa /psf)		6,970	6,883	6,874	6,893	6,854	6,898	6,925	6,754	6,633	6,475
Final Effective Stress, σ'_f (kPa/psf)		7,389	7,333	7,274	7,244	7,209	7,137	7,061	7,055	7,031	6,634
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		4,352	4,363	4,317	4,289	4,262	4,253	4,256	4,276	4,285	4,281
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.017	0.016	0.013	0.013	0.014	0.009	0.005	0.013	0.017	0.005
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.017	0.016	0.013	0.013	0.014	0.009	0.005	0.013	0.017	0.005
Elastic or Plastic (E/P)		p	p	p	p	p	p	p	p	p	p
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 24 (m / ft)		0.017	0.016	0.013	0.013	0.014	0.009	0.005	0.013	0.017	0.005
Layer No. *25* **Below-GW-18**											
Initial Stress Reference Layer (top of layer)		2	2	2	2	2	2	2	2	2	2
Final Stress Reference Layer (top of layer)		1	1	1	1	1	1	1	1	1	1
Midpoint Elevation, (m / ft)		373.26	372.23	371.76	371.99	372.26	372.47	372.68	372.90	373.13	373.40
Initial Effective Stress, σ'_i (kPa /psf)		7,112.27	7,046.17	7,046.07	7,058.01	7,013.88	7,053.72	7,075.93	6,900.96	6,776.76	6,615.97
Final Effective Stress, σ'_f (kPa/psf)		7,530.62	7,496.15	7,446.07	7,409.23	7,367.96	7,292.07	7,212.09	7,201.50	7,173.90	6,775.76
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		4,494	4,527	4,489	4,454	4,421	4,409	4,407	4,423	4,428	4,422
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements											
Primary Settlement, (m / ft)		0.022	0.033	0.031	0.030	0.029	0.018	0.009	0.020	0.024	0.006
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.022	0.033	0.031	0.030	0.029	0.018	0.009	0.020	0.024	0.006
Elastic or Plastic (E/P)											
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 25 (m / ft)		0.022	0.033	0.031	0.030	0.029	0.018	0.009	0.020	0.024	0.006

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *26* **Below-GW-19**										
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		369.77	366.70	365.28	365.97	366.78	367.40	368.04	368.70	369.40
Initial Effective Stress, σ'_i (kPa /psf)		7,180.55	7,154.65	7,173.04	7,175.99	7,121.24	7,153.06	7,166.93	6,983.26	6,849.98
Final Effective Stress, σ'_f (kPa/psf)		7,598.91	7,604.63	7,573.04	7,527.21	7,475.32	7,391.41	7,303.08	7,283.80	7,247.12
Elastic Method										
Modulus, E (kPa/psf)=	Strain									
	Settlement (m / ft)									
1-D Consolidation Theory (Plastic Method)										
Consolidation Properties										
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input										
Preconsolidation pressure, σ'_p (kPa / psf)		4,563	4,635	4,616	4,572	4,529	4,508	4,498	4,505	4,501
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements										
Primary Settlement, (m / ft)		0.021	0.032	0.031	0.030	0.029	0.017	0.009	0.020	0.024
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.021	0.032	0.031	0.030	0.029	0.017	0.009	0.020	0.024
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 26 (m / ft)		0.021	0.032	0.031	0.030	0.029	0.017	0.009	0.020	0.024
Layer No. *27* **Below-GW-3**										
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		366.29	361.16	358.80	359.95	361.31	362.33	363.39	364.50	365.66
Initial Effective Stress, σ'_i (kPa /psf)		7,248.83	7,263.13	7,300.02	7,293.96	7,228.60	7,252.40	7,257.93	7,065.56	6,923.20
Final Effective Stress, σ'_f (kPa/psf)		7,667.19	7,713.10	7,700.01	7,645.19	7,582.68	7,490.75	7,394.08	7,366.10	7,320.34
Elastic Method										
Modulus, E (kPa/psf)=	Strain									
	Settlement (m / ft)									
1-D Consolidation Theory (Plastic Method)										
Consolidation Properties										
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input										
Preconsolidation pressure, σ'_p (kPa / psf)		4,631	4,744	4,743	4,690	4,636	4,607	4,589	4,588	4,574
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Settlements										
Primary Settlement, (m / ft)		0.021	0.032	0.030	0.030	0.028	0.017	0.009	0.020	0.024
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.021	0.032	0.030	0.030	0.028	0.017	0.009	0.020	0.024
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 27 (m / ft)		0.021	0.032	0.030	0.030	0.028	0.017	0.009	0.020	0.024

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

	Layer No.	Material										
LAYER SETTLEMENT	1	*Leveling Layer*										
	2	*Dredge*										
	3	*Gravel*										
	4	*Clay*										
	5	*Dike*										
	6	*Above-GW-1*	0.036	0.036	0.029	0.029	0.031	0.020	0.011	0.028	0.039	0.013
	7	*Above-GW-2*	0.034	0.034	0.027	0.028	0.029	0.019	0.011	0.026	0.036	0.012
	8	*Above-GW-3*	0.032	0.032	0.026	0.026	0.027	0.018	0.010	0.025	0.034	0.011
	9	*Above-GW-4*	0.030	0.030	0.024	0.025	0.026	0.017	0.010	0.023	0.032	0.010
	10	*Above-GW-5*	0.029	0.028	0.023	0.023	0.024	0.016	0.009	0.022	0.030	0.010
	11	*Above-GW-6*	0.027	0.027	0.022	0.022	0.023	0.015	0.009	0.021	0.029	0.009
	12	*Above-GW-7*	0.026	0.026	0.021	0.021	0.022	0.014	0.008	0.020	0.027	0.009
	13	*Above-GW-8*	0.025	0.024	0.020	0.020	0.021	0.014	0.008	0.019	0.026	0.008
	14	*Above-GW-9*	0.024	0.023	0.019	0.019	0.020	0.013	0.007	0.018	0.025	0.008
	15	*Above-GW-10*	0.023	0.022	0.018	0.018	0.019	0.012	0.007	0.018	0.024	0.007
	16	*Above-GW-11*	0.022	0.021	0.017	0.018	0.019	0.012	0.007	0.017	0.023	0.007
	17	*Above-GW-12*	0.021	0.021	0.017	0.017	0.018	0.012	0.007	0.016	0.022	0.007
	18	*Above-GW-13*	0.020	0.020	0.016	0.016	0.017	0.011	0.006	0.016	0.021	0.006
	19	*Above-GW-14*	0.020	0.019	0.015	0.016	0.017	0.011	0.006	0.015	0.020	0.006
	20	*Above-GW-15*	0.019	0.018	0.015	0.015	0.016	0.010	0.006	0.014	0.020	0.006
	21	*Above-GW-16*	0.018	0.018	0.014	0.015	0.015	0.010	0.006	0.014	0.019	0.006
	22	*Above-GW-17*	0.018	0.017	0.014	0.014	0.015	0.010	0.006	0.014	0.018	0.005
	23	*Above-GW-1*	0.017	0.017	0.013	0.014	0.015	0.009	0.005	0.013	0.018	0.005
	24	*Above-GW-2*	0.017	0.016	0.013	0.013	0.014	0.009	0.005	0.013	0.017	0.005
	25	*Below-GW-18*	0.022	0.033	0.031	0.030	0.029	0.018	0.009	0.020	0.024	0.006
	26	*Below-GW-19*	0.021	0.032	0.031	0.030	0.029	0.017	0.009	0.020	0.024	0.006
	27	*Below-GW-3*	0.021	0.032	0.030	0.030	0.028	0.017	0.009	0.020	0.024	0.006
	28											
	29	*Soil Above GW*										
	30	*Soil Below GW*										
		TOTAL SETTLEMENT	**0.52**	**0.55**	**0.45**	**0.46**	**0.47**	**0.30**	**0.17**	**0.41**	**0.55**	**0.17**
POST-SETTLEMENT ELEVATION(M/FT)	Line	1	461.52	461.03	460.46	460.07	459.54	459.25	458.87	458.12	457.47	454.17
	Line	2	458.04	457.28	457.13	457.15	456.59	457.26	457.74	455.62	454.16	452.84
	Line	3	427.18	427.16	427.25	426.53	426.42	426.53	426.54	426.17	426.32	428.13
	Line	4	426.18	426.16	426.25	425.53	425.42	425.53	425.54	425.17	425.32	427.13
	Line	5	424.48	425.07	424.84	423.83	423.52	423.61	423.71	423.60	423.90	425.78
	Line	6	424.48	425.07	424.84	423.83	423.52	423.61	423.71	423.60	423.90	425.78
	Line	7	421.89	422.44	422.22	421.26	420.97	421.06	421.15	421.05	421.34	423.11
	Line	8	419.29	419.81	419.60	418.70	418.42	418.50	418.59	418.50	418.77	420.44
	Line	9	416.69	417.18	416.98	416.13	415.87	415.94	416.03	415.94	416.20	417.77
	Line	10	414.09	414.55	414.36	413.56	413.31	413.39	413.46	413.38	413.63	415.10
	Line	11	411.48	411.91	411.73	410.99	410.76	410.83	410.90	410.83	411.06	412.43
	Line	12	408.88	409.27	409.11	408.41	408.20	408.27	408.34	408.27	408.48	409.76
	Line	13	406.27	406.64	406.48	405.84	405.65	405.71	405.77	405.71	405.91	407.08
	Line	14	403.67	404.00	403.85	403.27	403.09	403.15	403.21	403.15	403.33	404.41
	Line	15	401.06	401.36	401.23	400.69	400.53	400.59	400.64	400.59	400.75	401.74
	Line	16	398.45	398.71	398.60	398.12	397.97	398.02	398.07	398.03	398.18	399.06
	Line	17	395.84	396.07	395.97	395.54	395.41	395.46	395.51	395.46	395.60	396.39
	Line	18	393.23	393.43	393.34	392.96	392.85	392.90	392.94	392.90	393.01	393.71
	Line	19	390.62	390.78	390.71	390.39	390.29	390.34	390.38	390.33	390.43	391.04
	Line	20	388.01	388.14	388.07	387.81	387.73	387.77	387.81	387.77	387.85	388.36
	Line	21	385.39	385.49	385.44	385.23	385.17	385.21	385.24	385.21	385.27	385.69
	Line	22	382.78	382.85	382.81	382.65	382.60	382.64	382.68	382.64	382.68	383.01
	Line	23	380.17	380.20	380.18	380.07	380.04	380.08	380.11	380.07	380.10	380.33
	Line	24	377.55	377.55	377.54	377.49	377.48	377.51	377.54	377.51	377.51	377.66
	Line	25	374.94	374.90	374.91	374.91	374.91	374.95	374.97	374.94	374.93	374.98
	Line	26	371.47	369.40	368.46	368.92	369.47	369.90	370.34	370.76	371.22	371.79
	Line	27	368.01	363.90	362.01	362.93	364.02	364.85	365.71	366.58	367.50	368.60
	Line	28	364.55	358.40	355.57	356.94	358.57	359.79	361.07	362.40	363.79	365.40
	Line	29										
	Line	30										
	Line	31										

Attachment 2

CASE 2: Settlement Analysis for the Top of Initial Leveling Layer after the Placement of the Initial Leveling Layer
(Points 501 to 510)

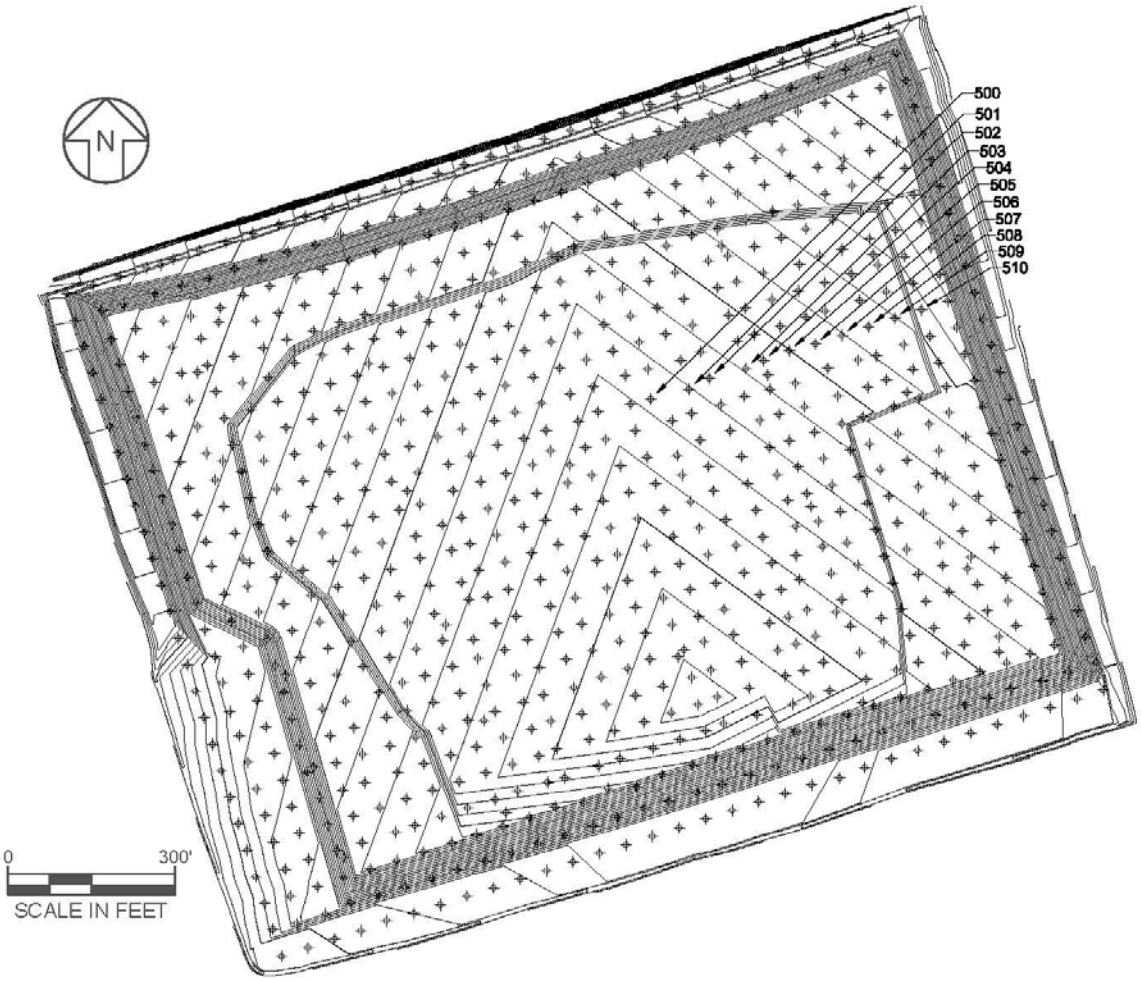

Figure 2-1. Calculation Points used for Settlement Analysis
[Contours are the Design Grading Plan for the Initial Leveling Layer]

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Settlement Prediction Model
Programmer: **Beech and Bonaparte**
Version Control V 2.00 01.28.2015

Project: **Onondaga Lake SCA Final**
S
Notes:
E
Unit: **ft / psf**
Average Compaction Effort = **1440.00** kPa or psf
Consider Compaction Effort = **N** yes or no

Point #					**501**	**502**	**503**	**504**	**505**	**506**	**507**	**508**	**509**	**510**
Distance (meter or ft)					*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
ELEVATION(M/FT)	Line	1		Top of Leveling Layer	*462.05*	*461.58*	*460.91*	*460.53*	*460.01*	*459.55*	*459.04*	*458.53*	*458.03*	*454.34*
	Line	2		Top of Dredge (Final Geotube)	*458.56*	*457.83*	*457.58*	*457.61*	*457.06*	*457.56*	*457.91*	*456.03*	*454.72*	*453.01*
	Line	3			*457.37*	*456.67*	*456.43*	*456.43*	*455.90*	*456.38*	*456.71*	*454.90*	*453.65*	*452.06*
	Line	4			*456.19*	*455.51*	*455.28*	*455.25*	*454.74*	*455.20*	*455.51*	*453.76*	*452.57*	*451.11*
	Line	5			*455.00*	*454.35*	*454.13*	*454.07*	*453.58*	*454.02*	*454.31*	*452.63*	*451.50*	*450.16*
	Line	6			*453.81*	*453.20*	*452.98*	*452.90*	*452.42*	*452.84*	*453.11*	*451.50*	*450.43*	*449.20*
	Line	7			*452.63*	*452.04*	*451.83*	*451.72*	*451.26*	*451.65*	*451.91*	*450.37*	*449.36*	*448.25*
	Line	8			*451.44*	*450.88*	*450.68*	*450.54*	*450.10*	*450.47*	*450.71*	*449.23*	*448.29*	*447.30*
	Line	9			*450.25*	*449.72*	*449.54*	*449.36*	*448.94*	*449.29*	*449.51*	*448.10*	*447.22*	*446.35*
	Line	10			*449.07*	*448.56*	*448.39*	*448.19*	*447.78*	*448.11*	*448.31*	*446.97*	*446.15*	*445.40*
	Line	11			*447.88*	*447.40*	*447.24*	*447.01*	*446.62*	*446.93*	*447.11*	*445.84*	*445.08*	*444.45*
	Line	12			*446.69*	*446.24*	*446.09*	*445.83*	*445.46*	*445.74*	*445.91*	*444.70*	*444.01*	*443.50*
	Line	13			*445.51*	*445.09*	*444.94*	*444.65*	*444.30*	*444.56*	*444.71*	*443.57*	*442.94*	*442.55*
	Line	14			*444.32*	*443.93*	*443.79*	*443.48*	*443.14*	*443.38*	*443.51*	*442.44*	*441.87*	*441.60*
	Line	15			*443.13*	*442.77*	*442.64*	*442.30*	*441.98*	*442.20*	*442.31*	*441.31*	*440.80*	*440.65*
	Line	16			*441.95*	*441.61*	*441.49*	*441.12*	*440.82*	*441.02*	*441.11*	*440.17*	*439.72*	*439.70*
	Line	17			*440.76*	*440.45*	*440.34*	*439.95*	*439.66*	*439.84*	*439.91*	*439.04*	*438.65*	*438.75*
	Line	18			*439.57*	*439.29*	*439.19*	*438.77*	*438.50*	*438.65*	*438.71*	*437.91*	*437.58*	*437.80*
	Line	19			*438.39*	*438.14*	*438.04*	*437.59*	*437.34*	*437.47*	*437.51*	*436.78*	*436.51*	*436.85*
	Line	20			*437.20*	*436.98*	*436.89*	*436.41*	*436.18*	*436.29*	*436.31*	*435.64*	*435.44*	*435.90*
	Line	21			*436.01*	*435.82*	*435.74*	*435.24*	*435.02*	*435.11*	*435.11*	*434.51*	*434.37*	*434.95*
	Line	22			*434.83*	*434.66*	*434.60*	*434.06*	*433.86*	*433.93*	*433.91*	*433.38*	*433.30*	*434.00*
	Line	23			*433.64*	*433.50*	*433.45*	*432.88*	*432.70*	*432.74*	*432.71*	*432.25*	*432.23*	*433.05*
	Line	24			*432.45*	*432.34*	*432.30*	*431.70*	*431.54*	*431.56*	*431.51*	*431.11*	*431.16*	*432.10*
	Line	25			*431.27*	*431.18*	*431.15*	*430.53*	*430.37*	*430.38*	*430.31*	*429.98*	*430.09*	*431.15*
	Line	26			*430.08*	*430.03*	*430.00*	*429.35*	*429.21*	*429.20*	*429.11*	*428.85*	*429.02*	*430.20*
	Line	27			*428.89*	*428.87*	*428.85*	*428.17*	*428.05*	*428.02*	*427.91*	*427.71*	*427.95*	*429.25*
	Line	28		Top of Gravel(Top of Incompre	*427.71*	*427.71*	*427.70*	*426.99*	*426.89*	*426.83*	*426.71*	*426.58*	*426.87*	*428.30*
	Line	29	GND	for sigma_p	*429.39*	*429.54*	*428.97*	*428.60*	*428.27*	*428.16*	*428.19*	*428.44*	*428.55*	*428.54*
	Line	30	GW		*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*
	Line	31	ROCK		*364.55*	*358.40*	*355.57*	*356.94*	*358.57*	*359.79*	*361.07*	*362.40*	*363.79*	*365.40*
LAYER THICKNESS (M/FT)	Layer No.	From	To	Material										
	1	*1*	*2*	*Leveling*	*3.49*	*3.75*	*3.33*	*2.93*	*2.95*	*1.99*	*1.13*	*2.50*	*3.31*	*1.33*
	2	*2*	*3*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	3	*3*	*4*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	4	*4*	*5*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	5	*5*	*6*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	6	*6*	*7*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	7	*7*	*8*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	8	*8*	*9*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	9	*9*	*10*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	10	*10*	*11*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	11	*11*	*12*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	12	*12*	*13*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	13	*13*	*14*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	14	*14*	*15*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	15	*15*	*16*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	16	*16*	*17*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	17	*17*	*18*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	18	*18*	*19*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	19	*19*	*20*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	20	*20*	*21*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	21	*21*	*22*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	22	*22*	*23*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	23	*23*	*24*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	24	*24*	*25*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	25	*25*	*26*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	26	*26*	*27*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	27	*27*	*28*	*Dredge*	*1.19*	*1.16*	*1.15*	*1.18*	*1.16*	*1.18*	*1.20*	*1.13*	*1.07*	*0.95*
	28													
	29													
	30													
	Thickness Check													
		From Line	To Line	SUM	*34.34*	*33.87*	*33.21*	*33.54*	*33.12*	*32.71*	*32.33*	*31.95*	*31.15*	*26.04*
		1	*28*	Thickness =	*34.34*	*33.87*	*33.21*	*33.54*	*33.12*	*32.71*	*32.33*	*31.95*	*31.15*	*26.04*
				Thickness Check	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

UNIT WEIGHT	Layer No.	Material										
	1	*Leveling*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	2	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	3	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	4	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	5	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	6	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	7	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	8	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	9	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	10	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	11	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	12	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	13	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	14	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	15	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	16	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	17	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	18	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	19	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	20	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	21	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	22	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	23	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	24	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	25	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	26	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	27	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	28											
	29		*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	30	*Soil below GW*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	Layer No.	***1*** **Leveling**										
		Initial Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
		Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	Midpoint Elevation, (m / ft)		460.30	459.70	459.25	459.07	458.54	458.56	458.47	457.28	456.37	453.67
	Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
	Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)=		Strain										
		Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, $C_{c\varepsilon}$												
Modified Recompression Index, $C_{r\varepsilon}$												
Modified Secondary Compression Index, C_α												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
		Elastic or Plastic (E/P)										
		Settlement of Layer 1 (m / ft)										

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *2* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		457.97	457.25	457.01	457.02	456.48	456.97	457.31	455.46	454.18	452.53
Initial Effective Stress, σ'_i (kPa /psf)		51.03	49.81	49.42	50.63	49.90	50.82	51.60	48.70	46.05	40.87
Final Effective Stress, σ'_f (kPa/psf)		469.39	499.79	449.41	401.85	403.98	289.18	187.75	349.24	443.19	200.66
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		51	50	49	51	50	51	52	49	46	41
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.333	0.338	0.321	0.309	0.307	0.260	0.196	0.282	0.307	0.191
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.333	0.338	0.321	0.309	0.307	0.260	0.196	0.282	0.307	0.191
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 2 (m / ft)		0.333	0.338	0.321	0.309	0.307	0.260	0.196	0.282	0.307	0.191
Layer No. *3* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		456.78	456.09	455.86	455.84	455.32	455.79	456.11	454.33	453.11	451.58
Initial Effective Stress, σ'_i (kPa /psf)		153.09	149.44	148.25	151.88	149.69	152.46	154.79	146.10	138.14	122.60
Final Effective Stress, σ'_f (kPa/psf)		571.45	599.42	548.24	503.11	503.77	390.81	290.94	446.64	535.28	282.39
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		153	149	148	152	150	152	155	146	138	123
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.198	0.204	0.190	0.178	0.178	0.141	0.096	0.160	0.184	0.100
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.198	0.204	0.190	0.178	0.178	0.141	0.096	0.160	0.184	0.100
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 3 (m / ft)		0.198	0.204	0.190	0.178	0.178	0.141	0.096	0.160	0.184	0.100
Layer No. *4* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		455.59	454.93	454.71	454.66	454.16	454.61	454.91	453.20	452.04	450.63
Initial Effective Stress, σ'_i (kPa /psf)		255.15	249.07	247.08	253.13	249.48	254.10	257.98	243.50	230.23	204.33
Final Effective Stress, σ'_f (kPa/psf)		673.51	699.04	647.07	604.36	603.56	492.45	394.14	544.04	627.37	364.12
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		255	249	247	253	249	254	258	244	230	204
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.146	0.151	0.140	0.130	0.130	0.099	0.064	0.115	0.136	0.069
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.146	0.151	0.140	0.130	0.130	0.099	0.064	0.115	0.136	0.069
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 4 (m / ft)		0.146	0.151	0.140	0.130	0.130	0.099	0.064	0.115	0.136	0.069

Layer No. *5* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		454.41	453.77	453.56	453.48	453.00	453.43	453.71	452.06	450.97	449.68
Initial Effective Stress, σ'_i (kPa /psf)		357.22	348.69	345.91	354.39	349.27	355.73	361.18	340.90	322.32	286.06
Final Effective Stress, σ'_f (kPa/psf)		775.57	798.67	745.90	705.61	703.35	594.09	497.33	641.44	719.46	445.85
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		357	349	346	354	349	356	361	341	322	286
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.116	0.121	0.112	0.103	0.103	0.077	0.049	0.091	0.109	0.053
Secondary Settlement (m / ft)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Settlement (m / ft)		0.116	0.121	0.112	0.103	0.103	0.077	0.049	0.091	0.109	0.053
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 5 (m / ft)		0.116	0.121	0.112	0.103	0.103	0.077	0.049	0.091	0.109	0.053
Layer No. *6* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		453.22	452.62	452.41	452.31	451.84	452.24	452.51	450.93	449.90	448.73
Initial Effective Stress, σ'_i (kPa /psf)		459.28	448.32	444.74	455.64	449.06	457.37	464.37	438.30	414.41	367.79
Final Effective Stress, σ'_f (kPa/psf)		877.63	898.29	844.73	806.87	803.14	695.73	600.52	738.84	811.55	527.58
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		459	448	445	456	449	457	464	438	414	368
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.097	0.102	0.093	0.085	0.085	0.063	0.039	0.075	0.091	0.043
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.097	0.102	0.093	0.085	0.085	0.063	0.039	0.075	0.091	0.043
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 6 (m / ft)		0.097	0.102	0.093	0.085	0.085	0.063	0.039	0.075	0.091	0.043
Layer No. *7* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		452.03	451.46	451.26	451.13	450.68	451.06	451.31	449.80	448.83	447.78
Initial Effective Stress, σ'_i (kPa /psf)		561.34	547.94	543.57	556.89	548.85	559.01	567.56	535.70	506.50	449.52
Final Effective Stress, σ'_f (kPa/psf)		979.69	997.92	943.57	908.12	902.93	797.37	703.72	836.24	903.64	609.31
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		561	548	544	557	549	559	568	536	507	450
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.084	0.088	0.080	0.073	0.073	0.053	0.033	0.064	0.078	0.037
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.084	0.088	0.080	0.073	0.073	0.053	0.033	0.064	0.078	0.037
Elastic or Plastic (E/P)											
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 7 (m / ft)		0.084	0.088	0.080	0.073	0.073	0.053	0.033	0.064	0.078	0.037

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *8* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		450.85	450.30	450.11	449.95	449.52	449.88	450.11	448.67	447.76	446.83
Initial Effective Stress, σ'_i (kPa /psf)		663.40	647.57	642.40	658.15	648.64	660.65	670.76	633.10	598.59	531.25
Final Effective Stress, σ'_f (kPa/psf)		1,081.76	1,097.55	1,042.40	1,009.38	1,002.72	899.01	806.91	933.64	995.73	691.04
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		663	648	642	658	649	661	671	633	599	531
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.073	0.077	0.070	0.064	0.064	0.046	0.028	0.056	0.069	0.032
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.073	0.077	0.070	0.064	0.064	0.046	0.028	0.056	0.069	0.032
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 8 (m / ft)		0.073	0.077	0.070	0.064	0.064	0.046	0.028	0.056	0.069	0.032
Layer No. *9* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		449.66	449.14	448.96	448.78	448.36	448.70	448.91	447.53	446.68	445.88
Initial Effective Stress, σ'_i (kPa /psf)		765.46	747.20	741.23	759.40	748.43	762.29	773.95	730.50	690.69	612.98
Final Effective Stress, σ'_f (kPa/psf)		1,183.82	1,197.17	1,141.23	1,110.63	1,102.51	1,000.64	910.10	1,031.04	1,087.83	772.77
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		765	747	741	759	748	762	774	731	691	613
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.065	0.069	0.063	0.057	0.057	0.041	0.025	0.049	0.062	0.028
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.065	0.069	0.063	0.057	0.057	0.041	0.025	0.049	0.062	0.028
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 9 (m / ft)		0.065	0.069	0.063	0.057	0.057	0.041	0.025	0.049	0.062	0.028
Layer No. *10* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		448.47	447.98	447.81	447.60	447.20	447.52	447.71	446.40	445.61	444.93
Initial Effective Stress, σ'_i (kPa /psf)		867.52	846.82	840.06	860.65	848.22	863.93	877.14	827.90	782.78	694.71
Final Effective Stress, σ'_f (kPa/psf)		1,285.88	1,296.80	1,240.06	1,211.88	1,202.31	1,102.28	1,013.30	1,128.44	1,179.92	854.50
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		868	847	840	861	848	864	877	828	783	695
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.059	0.062	0.057	0.051	0.051	0.036	0.022	0.044	0.056	0.025
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.059	0.062	0.057	0.051	0.051	0.036	0.022	0.044	0.056	0.025
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 10 (m / ft)		0.059	0.062	0.057	0.051	0.051	0.036	0.022	0.044	0.056	0.025

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *11* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		447.29	446.82	446.66	446.42	446.04	446.34	446.51	445.27	444.54	443.98
Initial Effective Stress, σ'_i (kPa /psf)		969.58	946.45	938.89	961.91	948.01	965.57	980.34	925.30	874.87	776.44
Final Effective Stress, σ'_f (kPa/psf)		1,387.94	1,396.42	1,338.89	1,313.14	1,302.10	1,203.92	1,116.49	1,225.84	1,272.01	936.23
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		970	946	939	962	948	966	980	925	875	776
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.054	0.057	0.052	0.046	0.047	0.033	0.020	0.040	0.051	0.023
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.054	0.057	0.052	0.046	0.047	0.033	0.020	0.040	0.051	0.023
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 11 (m / ft)		0.054	0.057	0.052	0.046	0.047	0.033	0.020	0.040	0.051	0.023
Layer No. *12* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		446.10	445.67	445.51	445.24	444.88	445.15	445.31	444.14	443.47	443.03
Initial Effective Stress, σ'_i (kPa /psf)		1,071.65	1,046.07	1,037.72	1,063.16	1,047.80	1,067.20	1,083.53	1,022.70	966.96	858.17
Final Effective Stress, σ'_f (kPa/psf)		1,490.00	1,496.05	1,437.72	1,414.39	1,401.89	1,305.56	1,219.68	1,323.24	1,364.10	1,017.96
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,072	1,046	1,038	1,063	1,048	1,067	1,084	1,023	967	858
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.049	0.052	0.047	0.043	0.043	0.030	0.018	0.037	0.047	0.021
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.049	0.052	0.047	0.043	0.043	0.030	0.018	0.037	0.047	0.021
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 12 (m / ft)		0.049	0.052	0.047	0.043	0.043	0.030	0.018	0.037	0.047	0.021
Layer No. *13* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		444.91	444.51	444.36	444.07	443.72	443.97	444.11	443.00	442.40	442.08
Initial Effective Stress, σ'_i (kPa /psf)		1,174	1,146	1,137	1,164	1,148	1,169	1,187	1,120	1,059	940
Final Effective Stress, σ'_f (kPa/psf)		1,592	1,596	1,537	1,516	1,502	1,407	1,323	1,421	1,456	1,100
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,174	1,146	1,137	1,164	1,148	1,169	1,187	1,120	1,059	940
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.046	0.049	0.044	0.039	0.039	0.028	0.016	0.034	0.043	0.019
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.046	0.049	0.044	0.039	0.039	0.028	0.016	0.034	0.043	0.019
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 13 (m / ft)		0.046	0.049	0.044	0.039	0.039	0.028	0.016	0.034	0.043	0.019

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *14* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		443.73	443.35	443.21	442.89	442.56	442.79	442.91	441.87	441.33	441.13
Initial Effective Stress, σ'_i (kPa /psf)		1,276	1,245	1,235	1,266	1,247	1,270	1,290	1,218	1,151	1,022
Final Effective Stress, σ'_f (kPa/psf)		1,694	1,695	1,635	1,617	1,601	1,509	1,426	1,518	1,548	1,181
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,276	1,245	1,235	1,266	1,247	1,270	1,290	1,218	1,151	1,022
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.043	0.045	0.041	0.036	0.037	0.026	0.015	0.032	0.040	0.017
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.043	0.045	0.041	0.036	0.037	0.026	0.015	0.032	0.040	0.017
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 14 (m / ft)		0.043	0.045	0.041	0.036	0.037	0.026	0.015	0.032	0.040	0.017
Layer No. *15* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		442.54	442.19	442.07	441.71	441.40	441.61	441.71	440.74	440.26	440.18
Initial Effective Stress, σ'_i (kPa /psf)		1,378	1,345	1,334	1,367	1,347	1,372	1,393	1,315	1,243	1,103
Final Effective Stress, σ'_f (kPa/psf)		1,796	1,795	1,734	1,718	1,701	1,610	1,529	1,615	1,640	1,263
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,378	1,345	1,334	1,367	1,347	1,372	1,393	1,315	1,243	1,103
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.040	0.042	0.038	0.034	0.034	0.024	0.014	0.029	0.038	0.016
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.040	0.042	0.038	0.034	0.034	0.024	0.014	0.029	0.038	0.016
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 15 (m / ft)		0.040	0.042	0.038	0.034	0.034	0.024	0.014	0.029	0.038	0.016
Layer No. *16* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		441.35	441.03	440.92	440.53	440.24	440.43	440.51	439.61	439.19	439.23
Initial Effective Stress, σ'_i (kPa /psf)		1,480	1,445	1,433	1,468	1,447	1,474	1,496	1,412	1,335	1,185
Final Effective Stress, σ'_f (kPa/psf)		1,898	1,895	1,833	1,819	1,801	1,712	1,632	1,713	1,732	1,345
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,480	1,445	1,433	1,468	1,447	1,474	1,496	1,412	1,335	1,185
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.037	0.040	0.036	0.032	0.032	0.022	0.013	0.028	0.035	0.015
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.037	0.040	0.036	0.032	0.032	0.022	0.013	0.028	0.035	0.015
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 16 (m / ft)		0.037	0.040	0.036	0.032	0.032	0.022	0.013	0.028	0.035	0.015

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *17* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		440.17	439.87	439.77	439.36	439.08	439.24	439.31	438.47	438.12	438.28
Initial Effective Stress, σ'_i (kPa /psf)		1,582	1,544	1,532	1,569	1,547	1,575	1,599	1,510	1,427	1,267
Final Effective Stress, σ'_f (kPa/psf)		2,000	1,994	1,932	1,921	1,901	1,814	1,736	1,810	1,825	1,427
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,582	1,544	1,532	1,569	1,547	1,575	1,599	1,510	1,427	1,267
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.035	0.037	0.034	0.030	0.030	0.021	0.012	0.026	0.033	0.014
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.035	0.037	0.034	0.030	0.030	0.021	0.012	0.026	0.033	0.014
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 17 (m / ft)		0.035	0.037	0.034	0.030	0.030	0.021	0.012	0.026	0.033	0.014
Layer No. *18* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		438.98	438.71	438.62	438.18	437.92	438.06	438.11	437.34	437.05	437.33
Initial Effective Stress, σ'_i (kPa /psf)		1,684	1,644	1,631	1,671	1,647	1,677	1,703	1,607	1,520	1,349
Final Effective Stress, σ'_f (kPa/psf)		2,102	2,094	2,031	2,022	2,001	1,915	1,839	1,908	1,917	1,508
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,684	1,644	1,631	1,671	1,647	1,677	1,703	1,607	1,520	1,349
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.033	0.035	0.032	0.028	0.029	0.020	0.012	0.025	0.031	0.013
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.033	0.035	0.032	0.028	0.029	0.020	0.012	0.025	0.031	0.013
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 18 (m / ft)		0.033	0.035	0.032	0.028	0.029	0.020	0.012	0.025	0.031	0.013
Layer No. *19* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		437.79	437.56	437.47	437.00	436.76	436.88	436.91	436.21	435.98	436.37
Initial Effective Stress, σ'_i (kPa /psf)		1,786	1,743	1,730	1,772	1,746	1,779	1,806	1,705	1,612	1,430
Final Effective Stress, σ'_f (kPa/psf)		2,204	2,193	2,130	2,123	2,100	2,017	1,942	2,005	2,009	1,590
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,786	1,743	1,730	1,772	1,746	1,779	1,806	1,705	1,612	1,430
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.032	0.034	0.030	0.027	0.027	0.019	0.011	0.023	0.030	0.013
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.032	0.034	0.030	0.027	0.027	0.019	0.011	0.023	0.030	0.013
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 19 (m / ft)		0.032	0.034	0.030	0.027	0.027	0.019	0.011	0.023	0.030	0.013

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *20* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		436.61	436.40	436.32	435.82	435.60	435.70	435.71	435.08	434.91	435.42
Initial Effective Stress, σ'_i (kPa /psf)		1,888	1,843	1,828	1,873	1,846	1,880	1,909	1,802	1,704	1,512
Final Effective Stress, σ'_f (kPa/psf)		2,306	2,293	2,228	2,224	2,200	2,119	2,045	2,102	2,101	1,672
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,888	1,843	1,828	1,873	1,846	1,880	1,909	1,802	1,704	1,512
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.030	0.032	0.029	0.026	0.026	0.018	0.010	0.022	0.028	0.012
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.030	0.032	0.029	0.026	0.026	0.018	0.010	0.022	0.028	0.012
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 20 (m / ft)		0.030	0.032	0.029	0.026	0.026	0.018	0.010	0.022	0.028	0.012
Layer No. *21* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		435.42	435.24	435.17	434.65	434.44	434.52	434.51	433.94	433.83	434.47
Initial Effective Stress, σ'_i (kPa /psf)		1,990	1,943	1,927	1,974	1,946	1,982	2,012	1,899	1,796	1,594
Final Effective Stress, σ'_f (kPa/psf)		2,409	2,393	2,327	2,326	2,300	2,220	2,148	2,200	2,193	1,754
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,990	1,943	1,927	1,974	1,946	1,982	2,012	1,899	1,796	1,594
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.029	0.031	0.027	0.024	0.025	0.017	0.010	0.021	0.027	0.011
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.029	0.031	0.027	0.024	0.025	0.017	0.010	0.021	0.027	0.011
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 21 (m / ft)		0.029	0.031	0.027	0.024	0.025	0.017	0.010	0.021	0.027	0.011
Layer No. *22* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		434.23	434.08	434.02	433.47	433.28	433.34	433.31	432.81	432.76	433.52
Initial Effective Stress, σ'_i (kPa /psf)		2,092	2,042	2,026	2,076	2,046	2,084	2,115	1,997	1,888	1,675
Final Effective Stress, σ'_f (kPa/psf)		2,511	2,492	2,426	2,427	2,400	2,322	2,252	2,297	2,285	1,835
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,092	2,042	2,026	2,076	2,046	2,084	2,115	1,997	1,888	1,675
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.027	0.029	0.026	0.023	0.023	0.016	0.009	0.020	0.026	0.011
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.027	0.029	0.026	0.023	0.023	0.016	0.009	0.020	0.026	0.011
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 22 (m / ft)		0.027	0.029	0.026	0.023	0.023	0.016	0.009	0.020	0.026	0.011

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *23* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		433.05	432.92	432.87	432.29	432.12	432.15	432.11	431.68	431.69	432.57
Initial Effective Stress, σ'_i (kPa /psf)		2,194	2,142	2,125	2,177	2,146	2,185	2,219	2,094	1,980	1,757
Final Effective Stress, σ'_f (kPa/psf)		2,613	2,592	2,525	2,528	2,500	2,424	2,355	2,395	2,377	1,917
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,194	2,142	2,125	2,177	2,146	2,185	2,219	2,094	1,980	1,757
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.026	0.028	0.025	0.022	0.022	0.015	0.009	0.019	0.025	0.010
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.026	0.028	0.025	0.022	0.022	0.015	0.009	0.019	0.025	0.010
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 23 (m / ft)		0.026	0.028	0.025	0.022	0.022	0.015	0.009	0.019	0.025	0.010
Layer No. *24* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		431.86	431.76	431.72	431.11	430.95	430.97	430.91	430.55	430.62	431.62
Initial Effective Stress, σ'_i (kPa /psf)		2,296	2,242	2,224	2,278	2,245	2,287	2,322	2,192	2,072	1,839
Final Effective Stress, σ'_f (kPa/psf)		2,715	2,692	2,624	2,629	2,599	2,525	2,458	2,492	2,469	1,999
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,296	2,242	2,224	2,278	2,245	2,287	2,322	2,192	2,072	1,839
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.025	0.027	0.024	0.021	0.021	0.015	0.009	0.018	0.024	0.010
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.025	0.027	0.024	0.021	0.021	0.015	0.009	0.018	0.024	0.010
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 24 (m / ft)		0.025	0.027	0.024	0.021	0.021	0.015	0.009	0.018	0.024	0.010
Layer No. *25* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		430.67	430.61	430.57	429.94	429.79	429.79	429.71	429.41	429.55	430.67
Initial Effective Stress, σ'_i (kPa /psf)		2,398.45	2,341.21	2,322.53	2,379.46	2,345.08	2,388.50	2,425.04	2,288.91	2,164.15	1,920.67
Final Effective Stress, σ'_f (kPa/psf)		2,816.80	2,791.19	2,722.52	2,730.68	2,699.17	2,626.86	2,561.20	2,589.45	2,561.29	2,080.46
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,398	2,341	2,323	2,379	2,345	2,389	2,425	2,289	2,164	1,921
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Settlements											
Primary Settlement, (m / ft)		0.024	0.026	0.023	0.021	0.021	0.014	0.008	0.018	0.023	0.010
Secondary Settlement (m / ft)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Settlement (m / ft)		0.024	0.026	0.023	0.021	0.021	0.014	0.008	0.018	0.023	0.010
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 25 (m / ft)		0.024	0.026	0.023	0.021	0.021	0.014	0.008	0.018	0.023	0.010

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *26* **Dredge**											
Initial Stress Reference Layer (top of layer)	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	
Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	
Midpoint Elevation, (m / ft)	429.49	429.45	429.42	428.76	428.63	428.61	428.51	428.28	428.48	429.72	
Initial Effective Stress, σ'_i (kPa /psf)	2,500.51	2,440.84	2,421.36	2,480.71	2,444.87	2,490.14	2,528.24	2,386.31	2,256.24	2,002.40	
Final Effective Stress, σ'_f (kPa/psf)	2,918.86	2,890.81	2,821.35	2,831.94	2,798.96	2,728.50	2,664.39	2,686.85	2,653.38	2,162.20	
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	
OCR Manual Input Value	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)	2,501	2,441	2,421	2,481	2,445	2,490	2,528	2,386	2,256	2,002	
Modified Primary Compression Index, $C_{c\varepsilon}$	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	
Modified Recompression Index, $C_{r\varepsilon}$	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	
ratio of t2 / t1	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	
Settlements											
Primary Settlement, (m / ft)	0.023	0.025	0.022	0.020	0.020	0.014	0.008	0.017	0.022	0.009	
Secondary Settlement (m / ft)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Total Settlement (m / ft)	0.023	0.025	0.022	0.020	0.020	0.014	0.008	0.017	0.022	0.009	
Elastic or Plastic (E/P)	P	P	P	P	P	P	P	P	P	P	
	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	
Settlement of Layer 26 (m / ft)	0.023	0.025	0.022	0.020	0.020	0.014	0.008	0.017	0.022	0.009	
Layer No. *27* **Dredge**											
Initial Stress Reference Layer (top of layer)	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	
Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	
Midpoint Elevation, (m / ft)	428.30	428.29	428.28	427.58	427.47	427.43	427.31	427.15	427.41	428.77	
Initial Effective Stress, σ'_i (kPa /psf)	2,602.57	2,540.46	2,520.19	2,581.96	2,544.66	2,591.78	2,631.43	2,483.71	2,348.33	2,084.13	
Final Effective Stress, σ'_f (kPa/psf)	3,020.92	2,990.44	2,920.18	2,933.19	2,898.75	2,830.14	2,767.58	2,784.25	2,745.47	2,243.93	
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	
OCR Manual Input Value	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)	2,603	2,540	2,520	2,582	2,545	2,592	2,631	2,484	2,348	2,084	
Modified Primary Compression Index, $C_{c\varepsilon}$	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	
Modified Recompression Index, $C_{r\varepsilon}$	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	
ratio of t2 / t1	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	
Settlements											
Primary Settlement, (m / ft)	0.022	0.024	0.021	0.019	0.019	0.013	0.008	0.016	0.021	0.009	
Secondary Settlement (m / ft)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Total Settlement (m / ft)	0.022	0.024	0.021	0.019	0.019	0.013	0.008	0.016	0.021	0.009	
Elastic or Plastic (E/P)	P	P	P	P	P	P	P	P	P	P	
	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	
Settlement of Layer 27 (m / ft)	0.022	0.024	0.021	0.019	0.019	0.013	0.008	0.016	0.021	0.009	

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

LAYER SETTLEMENT	Layer No.	Material										
	1	*Leveling*										
	2	*Dredge*	0.333	0.338	0.321	0.309	0.307	0.260	0.196	0.282	0.307	0.191
	3	*Dredge*	0.198	0.204	0.190	0.178	0.178	0.141	0.096	0.160	0.184	0.100
	4	*Dredge*	0.146	0.151	0.140	0.130	0.130	0.099	0.064	0.115	0.136	0.069
	5	*Dredge*	0.116	0.121	0.112	0.103	0.103	0.077	0.049	0.091	0.109	0.053
	6	*Dredge*	0.097	0.102	0.093	0.085	0.085	0.063	0.039	0.075	0.091	0.043
	7	*Dredge*	0.084	0.088	0.080	0.073	0.073	0.053	0.033	0.064	0.078	0.037
	8	*Dredge*	0.073	0.077	0.070	0.064	0.064	0.046	0.028	0.056	0.069	0.032
	9	*Dredge*	0.065	0.069	0.063	0.057	0.057	0.041	0.025	0.049	0.062	0.028
	10	*Dredge*	0.059	0.062	0.057	0.051	0.051	0.036	0.022	0.044	0.056	0.025
	11	*Dredge*	0.054	0.057	0.052	0.046	0.047	0.033	0.020	0.040	0.051	0.023
	12	*Dredge*	0.049	0.052	0.047	0.043	0.043	0.030	0.018	0.037	0.047	0.021
	13	*Dredge*	0.046	0.049	0.044	0.039	0.039	0.028	0.016	0.034	0.043	0.019
	14	*Dredge*	0.043	0.045	0.041	0.036	0.037	0.026	0.015	0.032	0.040	0.017
	15	*Dredge*	0.040	0.042	0.038	0.034	0.034	0.024	0.014	0.029	0.038	0.016
	16	*Dredge*	0.037	0.040	0.036	0.032	0.032	0.022	0.013	0.028	0.035	0.015
	17	*Dredge*	0.035	0.037	0.034	0.030	0.030	0.021	0.012	0.026	0.033	0.014
	18	*Dredge*	0.033	0.035	0.032	0.028	0.029	0.020	0.012	0.025	0.031	0.013
	19	*Dredge*	0.032	0.034	0.030	0.027	0.027	0.019	0.011	0.023	0.030	0.013
	20	*Dredge*	0.030	0.032	0.029	0.026	0.026	0.018	0.010	0.022	0.028	0.012
	21	*Dredge*	0.029	0.031	0.027	0.024	0.025	0.017	0.010	0.021	0.027	0.011
	22	*Dredge*	0.027	0.029	0.026	0.023	0.023	0.016	0.009	0.020	0.026	0.011
	23	*Dredge*	0.026	0.028	0.025	0.022	0.022	0.015	0.009	0.019	0.025	0.010
	24	*Dredge*	0.025	0.027	0.024	0.021	0.021	0.015	0.009	0.018	0.024	0.010
	25	*Dredge*	0.024	0.026	0.023	0.021	0.021	0.014	0.008	0.018	0.023	0.010
	26	*Dredge*	0.023	0.025	0.022	0.020	0.020	0.014	0.008	0.017	0.022	0.009
	27	*Dredge*	0.022	0.024	0.021	0.019	0.019	0.013	0.008	0.016	0.021	0.009
	28	*Additional Foundation Settlement*	0.523	0.546	0.453	0.460	0.475	0.303	0.171	0.412	0.552	0.168
	29	*Dredge Settlement*	1.748	1.826	1.678	1.541	1.543	1.161	0.754	1.362	1.634	0.813
	30											
		TOTAL SETTLEMENT	**2.27**	**2.37**	**2.13**	**2.00**	**2.02**	**1.46**	**0.93**	**1.77**	**2.19**	**0.98**
POST-SETTLEMENT ELEVATION(M/FT)	Line	1 Top of Leveling Layer	459.78	459.21	458.78	458.53	458.00	458.09	458.12	456.76	455.84	453.36
	Line	2 Top of Dredge (Final Geotube)	456.29	455.46	455.45	455.60	455.04	456.10	456.98	454.25	452.53	452.03
	Line	3	455.10	454.30	454.30	454.43	453.88	454.92	455.78	453.12	451.46	451.07
	Line	4	453.92	453.14	453.15	453.25	452.72	453.74	454.58	451.99	450.39	450.12
	Line	5	452.73	451.98	452.00	452.07	451.56	452.55	453.38	450.86	449.32	449.17
	Line	6	451.54	450.82	450.85	450.90	450.40	451.37	452.18	449.72	448.25	448.22
	Line	7	450.36	449.67	449.70	449.72	449.24	450.19	450.98	448.59	447.18	447.27
	Line	8	449.17	448.51	448.55	448.54	448.08	449.01	449.78	447.46	446.10	446.32
	Line	9	447.98	447.35	447.40	447.36	446.92	447.83	448.58	446.33	445.03	445.37
	Line	10	446.80	446.19	446.25	446.19	445.76	446.64	447.38	445.19	443.96	444.42
	Line	11	445.61	445.03	445.11	445.01	444.60	445.46	446.18	444.06	442.89	443.47
	Line	12	444.42	443.87	443.96	443.83	443.44	444.28	444.98	442.93	441.82	442.52
	Line	13	443.24	442.71	442.81	442.65	442.28	443.10	443.78	441.80	440.75	441.57
	Line	14	442.05	441.56	441.66	441.48	441.12	441.92	442.58	440.66	439.68	440.62
	Line	15	440.86	440.40	440.51	440.30	439.96	440.74	441.38	439.53	438.61	439.67
	Line	16	439.68	439.24	439.36	439.12	438.80	439.55	440.18	438.40	437.54	438.72
	Line	17	438.49	438.08	438.21	437.94	437.64	438.37	438.98	437.27	436.47	437.77
	Line	18	437.30	436.92	437.06	436.77	436.48	437.19	437.78	436.13	435.40	436.82
	Line	19	436.12	435.76	435.91	435.59	435.32	436.01	436.58	435.00	434.33	435.87
	Line	20	434.93	434.61	434.76	434.41	434.16	434.83	435.38	433.87	433.25	434.92
	Line	21	433.74	433.45	433.61	433.23	433.00	433.64	434.18	432.74	432.18	433.97
	Line	22	432.56	432.29	432.46	432.06	431.84	432.46	432.98	431.60	431.11	433.02
	Line	23	431.37	431.13	431.32	430.88	430.68	431.28	431.78	430.47	430.04	432.07
	Line	24	430.18	429.97	430.17	429.70	429.52	430.10	430.58	429.34	428.97	431.12
	Line	25	428.99	428.81	429.02	428.53	428.36	428.92	429.38	428.21	427.90	430.17
	Line	26	427.81	427.65	427.87	427.35	427.20	427.74	428.18	427.07	426.83	429.22
	Line	27	426.62	426.50	426.72	426.17	426.04	426.55	426.98	425.94	425.76	428.27
	Line	28 Top of Gravel(Top of Incompre	425.43	425.34	425.57	424.99	424.88	425.37	425.78	424.81	424.69	427.32
	Line	29										
	Line	30										
	Line	31										

Attachment 3

CASE 3: Settlement Analysis for the Top of Clay Liner
30 Years after Placement of the Final Cover
(Points 501 to 510)

Written by:	Ray Wu / Meena Viswanath	Date:	02/09/2015	Reviewed by:	Ali Ebrahimi / Jay Beech	Date:	02/09/2015

Client:	Honeywell	Project:	Onondaga Lake SCA Final Cover Design	Project/ Proposal No.:	GD5497	Task No.:	03

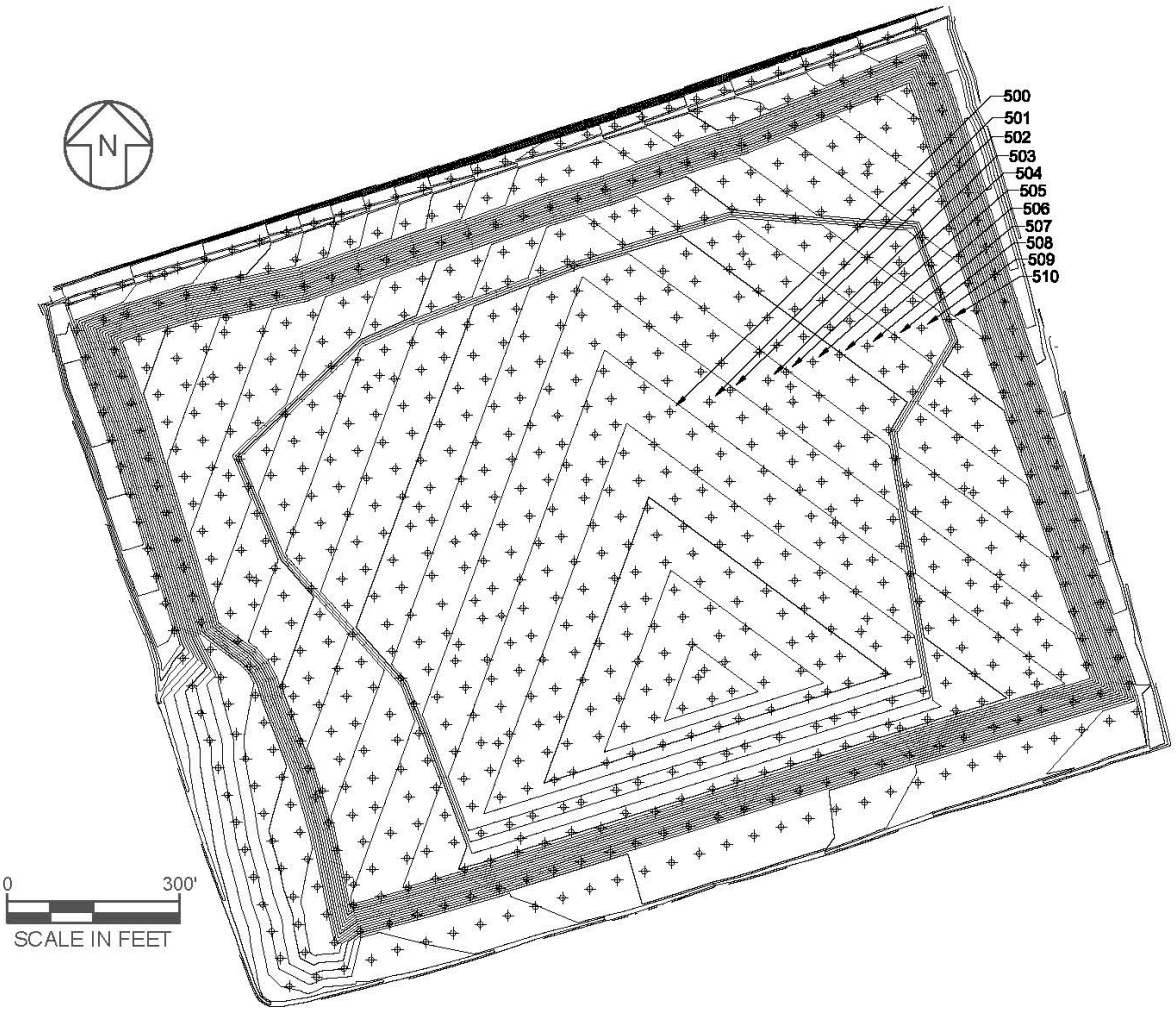

Figure 3-1. Calculation Points used for Settlement Analysis
[Contours are the Design Grading Plan for the Final Cover]

Written by:	**Ray Wu / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Settlement Prediction Model
Programmer: **Beech and Bonaparte**
Version Control V 2.00 1.12.2015

Project: **Onondaga Lake SCA Final**
S
Notes:
E
Unit: **ft / psf**
Average Compaction Effort = **1440.00** kPa or psf
Consider Compaction Effort = **N** yes or no

Point #				**501**	**502**	**503**	**504**	**505**	**506**	**507**	**508**	**509**	**510**
Distance (meter or ft)				*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
ELEVATION (M/FT)	Line	1	Top of Final Cover	*462.55*	*462.08*	*461.41*	*461.04*	*460.52*	*460.05*	*459.54*	*459.03*	*458.53*	*455.33*
	Line	2	Top of Leveling Layer	*459.78*	*459.21*	*458.78*	*458.53*	*458.00*	*458.09*	*458.12*	*456.76*	*455.84*	*453.36*
	Line	3	Top of Dredge	*458.04*	*457.28*	*457.13*	*457.15*	*456.59*	*457.26*	*457.74*	*455.62*	*454.16*	*452.84*
	Line	4	Top of Gravel	*427.18*	*427.16*	*427.25*	*426.53*	*426.42*	*426.53*	*426.54*	*426.17*	*426.32*	*428.13*
	Line	5	Top of Clay	*426.18*	*426.16*	*426.25*	*425.53*	*425.42*	*425.53*	*425.54*	*425.17*	*425.32*	*427.13*
	Line	6	Top of Dike	*424.48*	*425.07*	*424.84*	*423.82*	*423.52*	*423.61*	*423.72*	*423.60*	*423.90*	*425.78*
	Line	7	Top of Subgrade	*424.48*	*425.07*	*424.84*	*423.82*	*423.52*	*423.61*	*423.72*	*423.60*	*423.90*	*425.78*
	Line	8		*421.73*	*422.29*	*422.07*	*421.11*	*420.82*	*420.91*	*421.01*	*420.90*	*421.18*	*422.96*
	Line	9		*418.98*	*419.51*	*419.30*	*418.40*	*418.13*	*418.21*	*418.30*	*418.20*	*418.46*	*420.14*
	Line	10		*416.23*	*416.72*	*416.53*	*415.69*	*415.43*	*415.51*	*415.60*	*415.50*	*415.75*	*417.32*
	Line	11		*413.48*	*413.94*	*413.77*	*412.97*	*412.73*	*412.81*	*412.89*	*412.80*	*413.03*	*414.50*
	Line	12		*410.73*	*411.16*	*411.00*	*410.26*	*410.04*	*410.11*	*410.18*	*410.10*	*410.31*	*411.67*
	Line	13		*407.99*	*408.38*	*408.23*	*407.55*	*407.34*	*407.41*	*407.48*	*407.40*	*407.60*	*408.85*
	Line	14		*405.24*	*405.60*	*405.46*	*404.84*	*404.65*	*404.71*	*404.77*	*404.70*	*404.88*	*406.03*
	Line	15		*402.49*	*402.82*	*402.69*	*402.12*	*401.95*	*402.01*	*402.06*	*402.00*	*402.17*	*403.21*
	Line	16		*399.74*	*400.03*	*399.92*	*399.41*	*399.26*	*399.30*	*399.36*	*399.30*	*399.45*	*400.39*
	Line	17		*396.99*	*397.25*	*397.15*	*396.70*	*396.56*	*396.60*	*396.65*	*396.60*	*396.73*	*397.57*
	Line	18		*394.24*	*394.47*	*394.38*	*393.99*	*393.87*	*393.90*	*393.95*	*393.90*	*394.02*	*394.75*
	Line	19		*391.49*	*391.69*	*391.61*	*391.27*	*391.17*	*391.20*	*391.24*	*391.20*	*391.30*	*391.93*
	Line	20		*388.74*	*388.91*	*388.84*	*388.56*	*388.48*	*388.50*	*388.53*	*388.50*	*388.58*	*389.11*
	Line	21		*386.00*	*386.13*	*386.08*	*385.85*	*385.78*	*385.80*	*385.83*	*385.80*	*385.87*	*386.28*
	Line	22		*383.25*	*383.34*	*383.31*	*383.14*	*383.09*	*383.10*	*383.12*	*383.10*	*383.15*	*383.46*
	Line	23		*380.50*	*380.56*	*380.54*	*380.42*	*380.39*	*380.40*	*380.41*	*380.40*	*380.43*	*380.64*
	Line	24		*377.75*	*377.78*	*377.77*	*377.71*	*377.70*	*377.70*	*377.71*	*377.70*	*377.72*	*377.82*
	Line	25	Bottom of SOLW Above GW	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*
	Line	26		*371.52*	*369.47*	*368.52*	*368.98*	*369.52*	*369.93*	*370.36*	*370.80*	*371.26*	*371.80*
	Line	27		*368.03*	*363.93*	*362.04*	*362.96*	*364.04*	*364.86*	*365.71*	*366.60*	*367.53*	*368.60*
	Line	28	Top of Incompressible Layer	*364.55*	*358.40*	*355.57*	*356.94*	*358.57*	*359.79*	*361.07*	*362.40*	*363.79*	*365.40*
	Line	29	GND for sigma_p	*429.39*	*429.54*	*428.97*	*428.60*	*428.27*	*428.16*	*428.19*	*428.44*	*428.55*	*428.54*
	Line	30	GW	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*	*375.00*
	Line	31	ROCK	*364.55*	*358.40*	*355.57*	*356.94*	*358.57*	*359.79*	*361.07*	*362.40*	*363.79*	*365.40*

LAYER THICKNESS (M/FT)	Layer No.	From	To	Material									
	1	*1*	*2*	*Final Cover*	*2.77*	*2.87*	*2.63*	*2.51*	*2.52*	*1.96*	*1.42*	*2.27*	*2.69*	*1.97*
	2	*2*	*3*	*Leveling Layer*	*1.74*	*1.93*	*1.65*	*1.38*	*1.41*	*0.83*	*0.38*	*1.14*	*1.68*	*0.52*
	3	*3*	*4*	*Dredge*	*30.86*	*30.12*	*29.88*	*30.61*	*30.17*	*30.73*	*31.20*	*29.45*	*27.84*	*24.71*
	4	*4*	*5*	*Gravel*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
	5	*5*	*6*	*Clay*	*1.70*	*1.09*	*1.41*	*1.71*	*1.90*	*1.92*	*1.82*	*1.57*	*1.42*	*1.35*
	6	*6*	*7*	*Dike*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
	7	*7*	*8*	*Above-GW-1*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	8	*8*	*9*	*Above-GW-2*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	9	*9*	*10*	*Above-GW-3*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	10	*10*	*11*	*Above-GW-4*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	11	*11*	*12*	*Above-GW-5*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	12	*12*	*13*	*Above-GW-6*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	13	*13*	*14*	*Above-GW-7*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	14	*14*	*15*	*Above-GW-8*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	15	*15*	*16*	*Above-GW-9*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	16	*16*	*17*	*Above-GW-10*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	17	*17*	*18*	*Above-GW-11*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	18	*18*	*19*	*Above-GW-12*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	19	*19*	*20*	*Above-GW-13*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	20	*20*	*21*	*Above-GW-14*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	21	*21*	*22*	*Above-GW-15*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	22	*22*	*23*	*Above-GW-16*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	23	*23*	*24*	*Above-GW-17*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	24	*24*	*25*	*Above-GW-18*	*2.75*	*2.78*	*2.77*	*2.71*	*2.70*	*2.70*	*2.71*	*2.70*	*2.72*	*2.82*
	25	*25*	*26*	*Below-GW-1*	*3.48*	*5.53*	*6.48*	*6.02*	*5.48*	*5.07*	*4.64*	*4.20*	*3.74*	*3.20*
	26	*26*	*27*	*Below-GW-2*	*3.48*	*5.53*	*6.48*	*6.02*	*5.48*	*5.07*	*4.64*	*4.20*	*3.74*	*3.20*
	27	*27*	*28*	*Below-GW-3*	*3.48*	*5.53*	*6.48*	*6.02*	*5.48*	*5.07*	*4.64*	*4.20*	*3.74*	*3.20*
	28													
	29	*29*	*30*	Soil Above GW	*54.39*	*54.54*	*53.97*	*53.60*	*53.27*	*53.16*	*53.19*	*53.44*	*53.55*	*53.54*
	30	*30*	*31*	Soil Below GW	*10.45*	*16.60*	*19.43*	*18.06*	*16.43*	*15.21*	*13.93*	*12.60*	*11.21*	*9.60*
	Thickness Check													
		From Line	To Line	SUM	*98.00*	*103.68*	*105.85*	*104.09*	*101.95*	*100.25*	*98.47*	*96.63*	*94.73*	*89.93*
		1	*28*	Thickness =	*98.00*	*103.68*	*105.85*	*104.09*	*101.95*	*100.25*	*98.47*	*96.63*	*94.73*	*89.93*
				Thickness Check	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***	***OK***

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UNIT WEIGHT	Layer No.	Material										
	1	*Final Cover*	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
	2	*Leveling Layer*	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
	3	*Dredge*	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0	86.0
	4	*Gravel*	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
	5	*Clay*	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
	6	*Dike*	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
	7	*Above-GW-1*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	8	*Above-GW-2*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	9	*Above-GW-3*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	10	*Above-GW-4*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	11	*Above-GW-5*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	12	*Above-GW-6*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	13	*Above-GW-7*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	14	*Above-GW-8*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	15	*Above-GW-9*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	16	*Above-GW-10*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	17	*Above-GW-11*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	18	*Above-GW-12*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	19	*Above-GW-13*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	20	*Above-GW-14*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	21	*Above-GW-15*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	22	*Above-GW-16*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	23	*Above-GW-17*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	24	*Above-GW-18*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	25	*Below-GW-1*	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
	26	*Below-GW-2*	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
	27	*Below-GW-3*	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
	28											
	29	*Soil Above GW*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
	30	*Soil below GW*	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
	Layer No.	***1*** **Final Cover**										
		Initial Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
		Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	Midpoint Elevation, (m / ft)		461.16	460.64	460.10	459.78	459.26	459.07	458.83	457.90	457.18	454.35
	Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
	Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)=		Strain										
		Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, C_{cc}												
Modified Recompression Index, C_{rc}												
Modified Secondary Compression Index, C_α												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
		Elastic or Plastic (E/P)										
		Settlement of Layer 1 (m / ft)										

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Layer No. *2* **Leveling Layer**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Midpoint Elevation, (m / ft)		458.91	458.25	457.95	457.84	457.29	457.67	457.93	456.19	455.00	453.10
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 2 (m / ft)											
Layer No. *3* **Dredge**											
Initial Stress Reference Layer (top of layer)		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Final Stress Reference Layer (top of layer)		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Midpoint Elevation, (m / ft)		442.61	442.22	442.19	441.84	441.50	441.90	442.14	440.89	440.24	440.48
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 3 (m / ft)											
Layer No. *4* **Gravel**											
Initial Stress Reference Layer (top of layer)		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Final Stress Reference Layer (top of layer)		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Midpoint Elevation, (m / ft)		426.68	426.66	426.75	426.03	425.92	426.03	426.04	425.67	425.82	427.63
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)											
Settlement of Layer 4 (m / ft)											

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Layer No. *5* **Clay**												
Initial Stress Reference Layer (top of layer)		*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
Final Stress Reference Layer (top of layer)		*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
Midpoint Elevation, (m / ft)		425.33	425.61	425.55	424.68	424.47	424.57	424.63	424.38	424.61	426.46
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)=	Strain											
	Settlement (m / ft)											
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, $C_{c\varepsilon}$												
Modified Recompression Index, $C_{r\varepsilon}$												
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
Elastic or Plastic (E/P)												
Settlement of Layer 5 (m / ft)												
Layer No. *6* **Dike**												
Initial Stress Reference Layer (top of layer)		*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Final Stress Reference Layer (top of layer)		*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
Midpoint Elevation, (m / ft)		424.48	425.07	424.84	423.82	423.52	423.61	423.72	423.60	423.90	425.78
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)=	Strain											
	Settlement (m / ft)											
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, $C_{c\varepsilon}$												
Modified Recompression Index, $C_{r\varepsilon}$												
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
Elastic or Plastic (E/P)												
Settlement of Layer 6 (m / ft)												
Layer No. *7* **Above-GW-1**												
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		423.10	423.68	423.46	422.47	422.17	422.26	422.36	422.25	422.54	424.37
Initial Effective Stress, σ'_i (kPa /psf)		3,299.84	3,186.94	3,170.32	3,235.37	3,222.83	3,203.66	3,178.68	3,088.73	2,997.92	2,585.08
Final Effective Stress, σ'_f (kPa/psf)		3,631.88	3,531.11	3,486.45	3,535.99	3,524.72	3,438.41	3,349.14	3,361.46	3,320.15	2,821.56
Elastic Method												
Modulus, E (kPa/psf)=	Strain											
	Settlement (m / ft)											
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)		516	481	452	503	500	484	478	507	493	342
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements												
Primary Settlement, (m / ft)		0.029	0.027	0.023	0.025	0.026	0.020	0.015	0.026	0.031	0.019
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.066	0.065	0.060	0.062	0.062	0.056	0.051	0.062	0.068	0.057
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 7 (m / ft)		0.066	0.065	0.060	0.062	0.062	0.056	0.051	0.062	0.068	0.057

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Layer No. *8* **Above-GW-2**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		420.35	420.90	420.69	419.75	419.47	419.56	419.66	419.55	419.82	421.55
Initial Effective Stress, σ'_i (kPa /psf)		3,525.24	3,415.03	3,397.37	3,457.79	3,443.85	3,425.10	3,400.61	3,310.13	3,220.68	2,816.42
Final Effective Stress, σ'_f (kPa/psf)		3,857.28	3,759.20	3,713.50	3,758.40	3,745.73	3,659.85	3,571.07	3,582.86	3,542.90	3,052.89
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		741	709	679	725	721	705	700	729	716	574
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.027	0.026	0.021	0.024	0.025	0.019	0.014	0.024	0.029	0.018
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.064	0.063	0.059	0.060	0.061	0.055	0.050	0.060	0.066	0.056
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 8 (m / ft)		0.064	0.063	0.059	0.060	0.061	0.055	0.050	0.060	0.066	0.056
Layer No. *9* **Above-GW-3**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		417.61	418.11	417.92	417.04	416.78	416.86	416.95	416.85	417.11	418.73
Initial Effective Stress, σ'_i (kPa /psf)		3,750.64	3,643.12	3,624.42	3,680.20	3,664.87	3,646.54	3,622.54	3,531.53	3,443.43	3,047.75
Final Effective Stress, σ'_f (kPa/psf)		4,082.68	3,987.29	3,940.55	3,980.81	3,966.75	3,881.30	3,793.00	3,804.26	3,765.65	3,284.22
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		967	937	906	948	942	927	922	950	939	805
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.025	0.024	0.020	0.022	0.023	0.018	0.013	0.023	0.027	0.016
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.062	0.061	0.057	0.059	0.059	0.054	0.049	0.059	0.064	0.054
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 9 (m / ft)		0.062	0.061	0.057	0.059	0.059	0.054	0.049	0.059	0.064	0.054
Layer No. *10* **Above-GW-4**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		414.86	415.33	415.15	414.33	414.08	414.16	414.24	414.15	414.39	415.91
Initial Effective Stress, σ'_i (kPa /psf)		3,976.04	3,871.21	3,851.48	3,902.61	3,885.88	3,867.98	3,844.47	3,752.93	3,666.18	3,279.09
Final Effective Stress, σ'_f (kPa/psf)		4,308.08	4,215.38	4,167.61	4,203.22	4,187.77	4,102.74	4,014.93	4,025.66	3,988.41	3,515.56
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,192	1,165	1,133	1,170	1,163	1,148	1,144	1,171	1,161	1,036
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.024	0.023	0.019	0.021	0.022	0.017	0.012	0.021	0.026	0.015
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.061	0.060	0.056	0.057	0.058	0.053	0.049	0.058	0.062	0.053
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 10 (m / ft)		0.061	0.060	0.056	0.057	0.058	0.053	0.049	0.058	0.062	0.053

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *11* **Above-GW-5**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		412.11	412.55	412.38	411.62	411.39	411.46	411.54	411.45	411.67	413.09
Initial Effective Stress, σ'_i (kPa /psf)		4,201.44	4,099.30	4,078.53	4,125.02	4,106.90	4,089.43	4,066.40	3,974.33	3,888.93	3,510.42
Final Effective Stress, σ'_f (kPa/psf)		4,533.48	4,443.47	4,394.66	4,425.63	4,408.79	4,324.18	4,236.86	4,247.06	4,211.16	3,746.89
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,417	1,393	1,360	1,392	1,384	1,369	1,366	1,393	1,384	1,268
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.023	0.021	0.018	0.020	0.021	0.016	0.012	0.020	0.024	0.014
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.060	0.059	0.055	0.056	0.057	0.052	0.048	0.057	0.061	0.052
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 11 (m / ft)		0.060	0.059	0.055	0.056	0.057	0.052	0.048	0.057	0.061	0.052
Layer No. *12* **Above-GW-6**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		409.36	409.77	409.61	408.90	408.69	408.76	408.83	408.75	408.96	410.26
Initial Effective Stress, σ'_i (kPa /psf)		4,426.84	4,327.39	4,305.58	4,347.43	4,327.92	4,310.87	4,288.33	4,195.73	4,111.69	3,741.75
Final Effective Stress, σ'_f (kPa/psf)		4,758.88	4,671.56	4,621.71	4,648.04	4,629.80	4,545.62	4,458.79	4,468.46	4,433.91	3,978.22
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,643	1,621	1,587	1,615	1,605	1,591	1,588	1,614	1,607	1,499
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.022	0.020	0.017	0.019	0.020	0.015	0.011	0.019	0.023	0.014
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.059	0.058	0.054	0.055	0.056	0.051	0.047	0.055	0.060	0.051
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 12 (m / ft)		0.059	0.058	0.054	0.055	0.056	0.051	0.047	0.055	0.060	0.051
Layer No. *13* **Above-GW-7**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		406.61	406.99	406.84	406.19	406.00	406.06	406.12	406.05	406.24	407.44
Initial Effective Stress, σ'_i (kPa /psf)		4,652	4,555	4,533	4,570	4,549	4,532	4,510	4,417	4,334	3,973
Final Effective Stress, σ'_f (kPa/psf)		4,984	4,900	4,849	4,870	4,851	4,767	4,681	4,690	4,657	4,210
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,868	1,849	1,814	1,837	1,826	1,812	1,810	1,836	1,830	1,730
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.021	0.019	0.016	0.018	0.019	0.014	0.010	0.018	0.022	0.013
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.058	0.057	0.053	0.054	0.055	0.051	0.047	0.055	0.059	0.051
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 13 (m / ft)		0.058	0.057	0.053	0.054	0.055	0.051	0.047	0.055	0.059	0.051

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *14* **Above-GW-8**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		403.86	404.21	404.07	403.48	403.30	403.36	403.42	403.35	403.52	404.62
Initial Effective Stress, σ'_i (kPa /psf)		4,878	4,784	4,760	4,792	4,770	4,754	4,732	4,639	4,557	4,204
Final Effective Stress, σ'_f (kPa/psf)		5,210	5,128	5,076	5,093	5,072	4,989	4,903	4,911	4,879	4,441
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,094	2,077	2,041	2,060	2,047	2,034	2,032	2,057	2,052	1,962
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.020	0.018	0.015	0.017	0.018	0.014	0.010	0.017	0.021	0.012
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.057	0.056	0.053	0.054	0.054	0.050	0.046	0.054	0.057	0.050
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 14 (m / ft)		0.057	0.056	0.053	0.054	0.054	0.050	0.046	0.054	0.057	0.050
Layer No. *15* **Above-GW-9**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		401.11	401.43	401.30	400.77	400.61	400.65	400.71	400.65	400.81	401.80
Initial Effective Stress, σ'_i (kPa /psf)		5,103	5,012	4,987	5,015	4,991	4,975	4,954	4,860	4,780	4,436
Final Effective Stress, σ'_f (kPa/psf)		5,435	5,356	5,303	5,315	5,293	5,210	5,125	5,133	5,102	4,672
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,319	2,306	2,268	2,282	2,268	2,255	2,254	2,278	2,275	2,193
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.019	0.018	0.015	0.016	0.017	0.013	0.010	0.017	0.020	0.011
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.056	0.055	0.052	0.053	0.053	0.049	0.046	0.053	0.057	0.049
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 15 (m / ft)		0.056	0.055	0.052	0.053	0.053	0.049	0.046	0.053	0.057	0.049
Layer No. *16* **Above-GW-10**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		398.36	398.64	398.54	398.05	397.91	397.95	398.00	397.95	398.09	398.98
Initial Effective Stress, σ'_i (kPa /psf)		5,328	5,240	5,214	5,237	5,212	5,197	5,176	5,081	5,003	4,667
Final Effective Stress, σ'_f (kPa/psf)		5,660	5,584	5,530	5,538	5,514	5,431	5,347	5,354	5,325	4,904
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,544	2,534	2,495	2,504	2,489	2,477	2,476	2,500	2,498	2,424
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.018	0.017	0.014	0.016	0.016	0.012	0.009	0.016	0.019	0.011
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.055	0.054	0.051	0.052	0.053	0.049	0.046	0.052	0.056	0.049
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 16 (m / ft)		0.055	0.054	0.051	0.052	0.053	0.049	0.046	0.052	0.056	0.049

Layer No. *17* **Above-GW-11**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		395.62	395.86	395.77	395.34	395.22	395.25	395.30	395.25	395.37	396.16
Initial Effective Stress, σ'_i (kPa /psf)		5,554	5,468	5,441	5,459	5,433	5,418	5,398	5,303	5,225	4,898
Final Effective Stress, σ'_f (kPa/psf)		5,886	5,812	5,757	5,760	5,735	5,653	5,568	5,575	5,548	5,135
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,770	2,762	2,722	2,727	2,710	2,698	2,697	2,721	2,721	2,656
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.017	0.016	0.014	0.015	0.016	0.012	0.009	0.015	0.018	0.010
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.054	0.054	0.051	0.052	0.052	0.048	0.045	0.052	0.055	0.048
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 17 (m / ft)		0.054	0.054	0.051	0.052	0.052	0.048	0.045	0.052	0.055	0.048
Layer No. *18* **Above-GW-12**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		392.87	393.08	393.00	392.63	392.52	392.55	392.59	392.55	392.66	393.34
Initial Effective Stress, σ'_i (kPa /psf)		5,779	5,696	5,668	5,682	5,654	5,640	5,620	5,524	5,448	5,130
Final Effective Stress, σ'_f (kPa/psf)		6,111	6,040	5,984	5,983	5,956	5,874	5,790	5,797	5,770	5,366
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,995	2,990	2,949	2,949	2,931	2,920	2,919	2,943	2,943	2,887
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.017	0.016	0.013	0.015	0.015	0.011	0.008	0.015	0.018	0.010
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.054	0.053	0.050	0.051	0.051	0.048	0.045	0.051	0.054	0.048
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 18 (m / ft)		0.054	0.053	0.050	0.051	0.051	0.048	0.045	0.051	0.054	0.048
Layer No. *19* **Above-GW-13**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		390.12	390.30	390.23	389.92	389.82	389.85	389.89	389.85	389.94	390.52
Initial Effective Stress, σ'_i (kPa /psf)		6,005	5,924	5,895	5,904	5,875	5,861	5,842	5,746	5,671	5,361
Final Effective Stress, σ'_f (kPa/psf)		6,337	6,268	6,211	6,205	6,177	6,096	6,012	6,018	5,993	5,598
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,221	3,218	3,177	3,172	3,152	3,141	3,141	3,164	3,166	3,118
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.016	0.015	0.013	0.014	0.015	0.011	0.008	0.014	0.017	0.010
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.053	0.052	0.050	0.050	0.051	0.047	0.044	0.050	0.053	0.047
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 19 (m / ft)		0.053	0.052	0.050	0.050	0.051	0.047	0.044	0.050	0.053	0.047

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *20* **Above-GW-14**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		387.37	387.52	387.46	387.21	387.13	387.15	387.18	387.15	387.22	387.70
Initial Effective Stress, σ'_i (kPa /psf)		6,230	6,152	6,122	6,127	6,096	6,082	6,064	5,967	5,894	5,592
Final Effective Stress, σ'_f (kPa/psf)		6,562	6,496	6,438	6,427	6,398	6,317	6,234	6,240	6,216	5,829
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,446	3,446	3,404	3,394	3,373	3,362	3,363	3,385	3,389	3,350
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.015	0.014	0.012	0.014	0.014	0.011	0.008	0.014	0.016	0.009
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.052	0.052	0.049	0.050	0.050	0.047	0.044	0.050	0.053	0.047
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 20 (m / ft)		0.052	0.052	0.049	0.050	0.050	0.047	0.044	0.050	0.053	0.047
Layer No. *21* **Above-GW-15**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		384.62	384.74	384.69	384.49	384.43	384.45	384.47	384.45	384.51	384.87
Initial Effective Stress, σ'_i (kPa /psf)		6,455	6,380	6,349	6,349	6,317	6,304	6,286	6,188	6,116	5,824
Final Effective Stress, σ'_f (kPa/psf)		6,787	6,724	6,665	6,650	6,619	6,539	6,456	6,461	6,439	6,060
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,671	3,674	3,631	3,616	3,594	3,584	3,585	3,607	3,612	3,581
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.015	0.014	0.012	0.013	0.014	0.010	0.008	0.013	0.016	0.009
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.052	0.051	0.049	0.050	0.050	0.047	0.044	0.049	0.052	0.047
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 21 (m / ft)		0.052	0.051	0.049	0.050	0.050	0.047	0.044	0.049	0.052	0.047
Layer No. *22* **Above-GW-16**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		381.87	381.95	381.92	381.78	381.74	381.75	381.77	381.75	381.79	382.05
Initial Effective Stress, σ'_i (kPa /psf)		6,681	6,608	6,576	6,572	6,538	6,525	6,508	6,410	6,339	6,055
Final Effective Stress, σ'_f (kPa/psf)		7,013	6,952	6,892	6,872	6,840	6,760	6,678	6,682	6,661	6,292
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		3,897	3,902	3,858	3,839	3,815	3,805	3,807	3,828	3,834	3,812
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.014	0.013	0.011	0.013	0.013	0.010	0.007	0.013	0.015	0.008
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.051	0.051	0.049	0.049	0.049	0.046	0.044	0.049	0.052	0.046
Elastic or Plastic (E/P)		p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D	p 1-D
Settlement of Layer 22 (m / ft)		0.051	0.051	0.049	0.049	0.049	0.046	0.044	0.049	0.052	0.046

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *23* **Above-GW-17**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		379.12	379.17	379.15	379.07	379.04	379.05	379.06	379.05	379.07	379.23
Initial Effective Stress, σ'_i (kPa /psf)		6,906	6,836	6,803	6,794	6,759	6,747	6,730	6,631	6,562	6,286
Final Effective Stress, σ'_f (kPa/psf)		7,238	7,181	7,119	7,095	7,061	6,981	6,900	6,904	6,884	6,523
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		4,122	4,130	4,085	4,061	4,036	4,027	4,029	4,050	4,057	4,044
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.014	0.013	0.011	0.012	0.013	0.010	0.007	0.012	0.015	0.008
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.051	0.050	0.048	0.049	0.049	0.046	0.043	0.049	0.051	0.046
Elastic or Plastic (E/P)		p	p	p	p	p	p	p	p	p	p
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 23 (m / ft)		0.051	0.050	0.048	0.049	0.049	0.046	0.043	0.049	0.051	0.046
Layer No. *24* **Above-GW-18**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		376.37	376.39	376.38	376.36	376.35	376.35	376.35	376.35	376.36	376.41
Initial Effective Stress, σ'_i (kPa /psf)		7,132	7,064	7,030	7,016	6,980	6,968	6,951	6,853	6,785	6,518
Final Effective Stress, σ'_f (kPa/psf)		7,464	7,409	7,346	7,317	7,282	7,203	7,122	7,125	7,107	6,754
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		4,348	4,358	4,312	4,284	4,257	4,248	4,251	4,271	4,280	4,275
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.014	0.013	0.011	0.012	0.012	0.009	0.007	0.012	0.014	0.008
Secondary Settlement (m / ft)		0.037	0.037	0.037	0.036	0.036	0.036	0.036	0.036	0.037	0.038
Total Settlement (m / ft)		0.051	0.050	0.048	0.048	0.049	0.046	0.043	0.048	0.051	0.046
Elastic or Plastic (E/P)		p	p	p	p	p	p	p	p	p	p
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 24 (m / ft)		0.051	0.050	0.048	0.048	0.049	0.046	0.043	0.048	0.051	0.046
Layer No. *25* **Below-GW-1**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		373.26	372.23	371.76	371.99	372.26	372.47	372.68	372.90	373.13	373.40
Initial Effective Stress, σ'_i (kPa /psf)		7,278.48	7,232.77	7,207.24	7,186.56	7,144.32	7,128.57	7,107.95	7,004.37	6,932.71	6,664.77
Final Effective Stress, σ'_f (kPa/psf)		7,610.52	7,576.94	7,523.37	7,487.17	7,446.20	7,363.32	7,278.41	7,277.11	7,254.94	6,901.25
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		4,494	4,527	4,489	4,454	4,421	4,409	4,407	4,423	4,428	4,422
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*
Modified Recompression Index, $C_{r\varepsilon}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Settlements											
Primary Settlement, (m / ft)		0.017	0.025	0.024	0.026	0.025	0.017	0.011	0.018	0.019	0.009
Secondary Settlement (m / ft)		0.047	0.074	0.087	0.081	0.074	0.068	0.062	0.056	0.050	0.043
Total Settlement (m / ft)		0.064	0.099	0.111	0.107	0.098	0.085	0.074	0.075	0.069	0.052
Elastic or Plastic (E/P)											
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 25 (m / ft)		0.064	0.099	0.111	0.107	0.098	0.085	0.074	0.075	0.069	0.052

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *26* **Below-GW-2**												
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		369.77	366.70	365.28	365.97	366.78	367.40	368.04	368.70	369.40	370.20	
Initial Effective Stress, σ'_i (kPa /psf)		7,346.76	7,341.24	7,334.21	7,304.54	7,251.68	7,227.91	7,198.95	7,086.67	7,005.93	6,727.48	
Final Effective Stress, σ'_f (kPa/psf)		7,678.80	7,685.41	7,650.34	7,605.15	7,553.56	7,462.66	7,369.41	7,359.41	7,328.16	6,963.95	
Elastic Method												
Modulus, E (kPa/psf)=	Strain											
	Settlement (m / ft)											
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)		4,563	4,635	4,616	4,572	4,529	4,508	4,498	4,505	4,501	4,485	
Modified Primary Compression Index, $C_{cε}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*	
Modified Recompression Index, $C_{rε}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	
Modified Secondary Compression Index, $C_{αε}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	
Settlements												
Primary Settlement, (m / ft)		0.017	0.024	0.024	0.025	0.024	0.017	0.011	0.018	0.019	0.009	
Secondary Settlement (m / ft)		0.047	0.074	0.087	0.081	0.074	0.068	0.062	0.056	0.050	0.043	
Total Settlement (m / ft)		0.064	0.099	0.111	0.106	0.098	0.085	0.074	0.074	0.069	0.052	
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	
Settlement of Layer 26 (m / ft)		0.064	0.099	0.111	0.106	0.098	0.085	0.074	0.074	0.069	0.052	
Layer No. *27* **Below-GW-3**												
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	
Midpoint Elevation, (m / ft)		366.29	361.16	358.80	359.95	361.31	362.33	363.39	364.50	365.66	367.00	
Initial Effective Stress, σ'_i (kPa /psf)		7,415.05	7,449.72	7,461.18	7,422.52	7,359.04	7,327.25	7,289.95	7,168.97	7,079.16	6,790.18	
Final Effective Stress, σ'_f (kPa/psf)		7,747.09	7,793.89	7,777.31	7,723.13	7,660.92	7,562.00	7,460.41	7,441.71	7,401.38	7,026.65	
Elastic Method												
Modulus, E (kPa/psf)=	Strain											
	Settlement (m / ft)											
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	*MS*	
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)		4,631	4,744	4,743	4,690	4,636	4,607	4,589	4,588	4,574	4,547	
Modified Primary Compression Index, $C_{cε}$		*0.250*	*0.220*	*0.200*	*0.240*	*0.250*	*0.240*	*0.240*	*0.260*	*0.260*	*0.180*	
Modified Recompression Index, $C_{rε}$		*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	
Modified Secondary Compression Index, $C_{αε}$		*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	*0.91%*	
ratio of t2 / t1		*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	
Settlements												
Primary Settlement, (m / ft)		0.017	0.024	0.023	0.025	0.024	0.017	0.011	0.018	0.019	0.009	
Secondary Settlement (m / ft)		0.047	0.074	0.087	0.081	0.074	0.068	0.062	0.056	0.050	0.043	
Total Settlement (m / ft)		0.063	0.098	0.110	0.106	0.098	0.085	0.074	0.074	0.069	0.052	
Elastic or Plastic (E/P)		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	
Settlement of Layer 27 (m / ft)		0.063	0.098	0.110	0.106	0.098	0.085	0.074	0.074	0.069	0.052	

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

	Layer No.	Material										
LAYER SETTLEMENT	1	*Final Cover*										
	2	*Leveling Layer*										
	3	*Dredge*										
	4	*Gravel*										
	5	*Clay*										
	6	*Dike*										
	7	*Above-GW-1*	0.066	0.065	0.060	0.062	0.062	0.056	0.051	0.062	0.068	0.057
	8	*Above-GW-2*	0.064	0.063	0.059	0.060	0.061	0.055	0.050	0.060	0.066	0.056
	9	*Above-GW-3*	0.062	0.061	0.057	0.059	0.059	0.054	0.049	0.059	0.064	0.054
	10	*Above-GW-4*	0.061	0.060	0.056	0.057	0.058	0.053	0.049	0.058	0.062	0.053
	11	*Above-GW-5*	0.060	0.059	0.055	0.056	0.057	0.052	0.048	0.057	0.061	0.052
	12	*Above-GW-6*	0.059	0.058	0.054	0.055	0.056	0.051	0.047	0.055	0.060	0.051
	13	*Above-GW-7*	0.058	0.057	0.053	0.054	0.055	0.051	0.047	0.055	0.059	0.051
	14	*Above-GW-8*	0.057	0.056	0.053	0.054	0.054	0.050	0.046	0.054	0.057	0.050
	15	*Above-GW-9*	0.056	0.055	0.052	0.053	0.053	0.049	0.046	0.053	0.057	0.049
	16	*Above-GW-10*	0.055	0.054	0.051	0.052	0.053	0.049	0.046	0.052	0.056	0.049
	17	*Above-GW-11*	0.054	0.054	0.051	0.052	0.052	0.048	0.045	0.052	0.055	0.048
	18	*Above-GW-12*	0.054	0.053	0.050	0.051	0.051	0.048	0.045	0.051	0.054	0.048
	19	*Above-GW-13*	0.053	0.052	0.050	0.050	0.051	0.047	0.044	0.050	0.053	0.047
	20	*Above-GW-14*	0.052	0.052	0.049	0.050	0.050	0.047	0.044	0.050	0.053	0.047
	21	*Above-GW-15*	0.052	0.051	0.049	0.050	0.050	0.047	0.044	0.049	0.052	0.047
	22	*Above-GW-16*	0.051	0.051	0.049	0.049	0.049	0.046	0.044	0.049	0.052	0.046
	23	*Above-GW-17*	0.051	0.050	0.048	0.049	0.049	0.046	0.043	0.049	0.051	0.046
	24	*Above-GW-18*	0.051	0.050	0.048	0.048	0.049	0.046	0.043	0.048	0.051	0.046
	25	*Below-GW-1*	0.064	0.099	0.111	0.107	0.098	0.085	0.074	0.075	0.069	0.052
	26	*Below-GW-2*	0.064	0.099	0.111	0.106	0.098	0.085	0.074	0.074	0.069	0.052
	27	*Below-GW-3*	0.063	0.098	0.110	0.106	0.098	0.085	0.074	0.074	0.069	0.052
	28											
	29	*Soil Above GW*										
	30	*Soil Below GW*										
		TOTAL SETTLEMENT	**1.20**	**1.30**	**1.28**	**1.28**	**1.26**	**1.15**	**1.05**	**1.19**	**1.24**	**1.05**
POST-SETTLEMENT ELEVATION(M/FT)	Line	1	461.34	460.78	460.14	459.75	459.25	458.90	458.49	457.85	457.29	454.28
	Line	2	458.58	457.91	457.50	457.25	456.74	456.94	457.07	455.57	454.60	452.31
	Line	3	456.83	455.99	455.85	455.87	455.32	456.11	456.68	454.43	452.93	451.78
	Line	4	425.98	425.87	425.97	425.25	425.15	425.38	425.48	424.98	425.09	427.08
	Line	5	424.98	424.86	424.97	424.25	424.16	424.38	424.49	423.98	424.08	426.08
	Line	6	423.27	423.77	423.56	422.54	422.25	422.46	422.66	422.41	422.66	424.73
	Line	7	423.27	423.77	423.56	422.54	422.25	422.46	422.66	422.41	422.66	424.73
	Line	8	420.52	420.99	420.79	419.83	419.56	419.76	419.96	419.71	419.94	421.91
	Line	9	417.78	418.21	418.03	417.12	416.86	417.06	417.25	417.01	417.23	419.08
	Line	10	415.03	415.43	415.26	414.40	414.17	414.36	414.54	414.31	414.51	416.26
	Line	11	412.28	412.65	412.49	411.69	411.47	411.66	411.84	411.61	411.79	413.44
	Line	12	409.53	409.86	409.72	408.98	408.77	408.96	409.13	408.91	409.08	410.62
	Line	13	406.78	407.08	406.95	406.27	406.08	406.26	406.42	406.21	406.36	407.80
	Line	14	404.03	404.30	404.18	403.56	403.38	403.56	403.72	403.51	403.64	404.98
	Line	15	401.28	401.52	401.41	400.84	400.69	400.86	401.01	400.81	400.93	402.16
	Line	16	398.53	398.74	398.64	398.13	397.99	398.16	398.30	398.11	398.21	399.34
	Line	17	395.79	395.96	395.87	395.42	395.30	395.45	395.60	395.41	395.49	396.52
	Line	18	393.04	393.17	393.11	392.71	392.60	392.75	392.89	392.71	392.78	393.69
	Line	19	390.29	390.39	390.34	389.99	389.91	390.05	390.19	390.01	390.06	390.87
	Line	20	387.54	387.61	387.57	387.28	387.21	387.35	387.48	387.31	387.35	388.05
	Line	21	384.79	384.83	384.80	384.57	384.52	384.65	384.77	384.61	384.63	385.23
	Line	22	382.04	382.05	382.03	381.86	381.82	381.95	382.07	381.91	381.91	382.41
	Line	23	379.29	379.27	379.26	379.14	379.13	379.25	379.36	379.21	379.20	379.59
	Line	24	376.54	376.48	376.49	376.43	376.43	376.55	376.65	376.51	376.48	376.77
	Line	25	373.80	373.70	373.72	373.72	373.74	373.85	373.95	373.81	373.76	373.95
	Line	26	370.31	368.17	367.24	367.70	368.26	368.78	369.30	369.62	370.03	370.75
	Line	27	366.83	362.63	360.77	361.68	362.78	363.71	364.66	365.42	366.29	367.55
	Line	28	363.34	357.10	354.29	355.66	357.30	358.65	360.02	361.22	362.55	364.35
	Line	29										
	Line	30										
	Line	31										

Attachment 4

CASE 4: Settlement Analysis for Top of Final Cover
30 Years after Placement of the Final Cover
(Points 501 to 510)

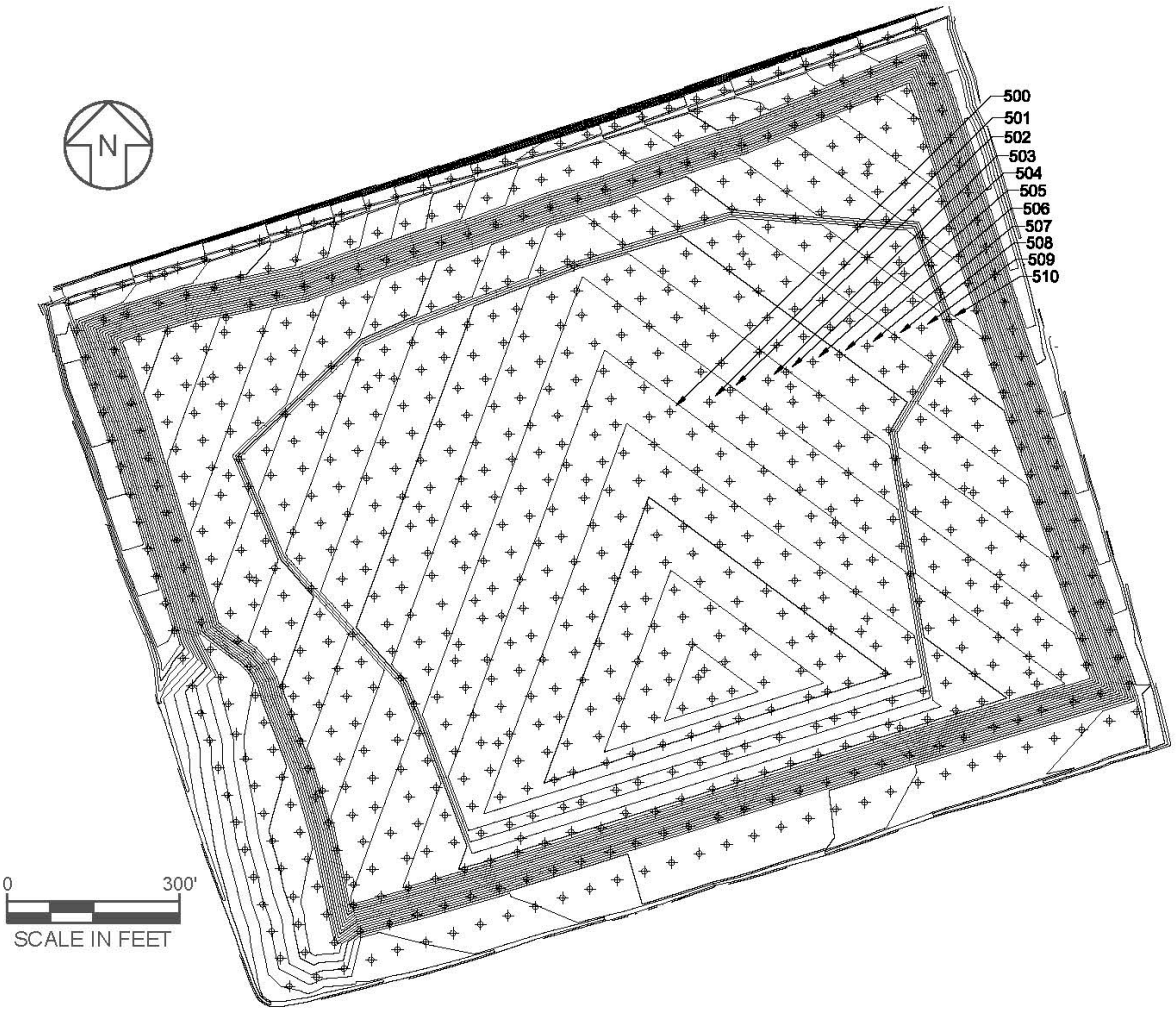

Figure 4-1. Calculation Points used for Settlement Analysis
[Contours are the Design Grading Plan for the Final Cover]

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Settlement Prediction Model
Programmer: **Beech and Bonaparte**
Version Control V 2.00 1.28.2015

Project: **Onondaga Lake SCA Final**
S
Notes:
E
Unit: **ft / psf**
Average Compaction Effort = **1440.00** kPa or psf
Consider Compaction Effort = **N** yes or no

Point #				501	502	503	504	505	506	507	508	509	510
Distance (meter or ft)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ELEVATION (M/FT)	Line	1	Top of Final Cover	462.55	462.08	461.41	461.04	460.52	460.05	459.54	459.03	458.53	455.33
	Line	2	Top of Leveling	459.78	459.21	458.78	458.53	458.00	458.09	458.12	456.76	455.84	453.36
	Line	3	Top of Dredge	458.04	457.28	457.13	457.15	456.59	457.26	457.74	455.62	454.16	452.84
	Line	4		456.80	456.08	455.93	455.92	455.38	456.03	456.49	454.44	453.05	451.85
	Line	5		455.57	454.87	454.74	454.70	454.17	454.80	455.24	453.26	451.94	450.86
	Line	6		454.34	453.67	453.54	453.47	452.97	453.57	453.99	452.08	450.82	449.87
	Line	7		453.10	452.46	452.35	452.25	451.76	452.34	452.74	450.90	449.71	448.88
	Line	8		451.87	451.26	451.15	451.02	450.55	451.11	451.50	449.73	448.60	447.90
	Line	9		450.63	450.05	449.96	449.80	449.35	449.89	450.25	448.55	447.48	446.91
	Line	10		449.40	448.85	448.76	448.57	448.14	448.66	449.00	447.37	446.37	445.92
	Line	11		448.16	447.64	447.56	447.35	446.93	447.43	447.75	446.19	445.25	444.93
	Line	12		446.93	446.44	446.37	446.13	445.73	446.20	446.50	445.02	444.14	443.94
	Line	13		445.70	445.24	445.17	444.90	444.52	444.97	445.26	443.84	443.03	442.95
	Line	14		444.46	444.03	443.98	443.68	443.31	443.74	444.01	442.66	441.91	441.97
	Line	15		443.23	442.83	442.78	442.45	442.11	442.51	442.76	441.48	440.80	440.98
	Line	16		441.99	441.62	441.59	441.23	440.90	441.28	441.51	440.30	439.69	439.99
	Line	17		440.76	440.42	440.39	440.00	439.69	440.05	440.26	439.13	438.57	439.00
	Line	18		439.53	439.21	439.20	438.78	438.49	438.82	439.02	437.95	437.46	438.01
	Line	19		438.29	438.01	438.00	437.55	437.28	437.59	437.77	436.77	436.35	437.02
	Line	20		437.06	436.80	436.81	436.33	436.07	436.36	436.52	435.59	435.23	436.04
	Line	21		435.82	435.60	435.61	435.11	434.87	435.14	435.27	434.41	434.12	435.05
	Line	22		434.59	434.39	434.42	433.88	433.66	433.91	434.02	433.24	433.00	434.06
	Line	23		433.35	433.19	433.22	432.66	432.45	432.68	432.78	432.06	431.89	433.07
	Line	24		432.12	431.98	432.03	431.43	431.25	431.45	431.53	430.88	430.78	432.08
	Line	25		430.89	430.78	430.83	430.21	430.04	430.22	430.28	429.70	429.66	431.09
	Line	26		429.65	429.57	429.64	428.98	428.83	428.99	429.03	428.53	428.55	430.11
	Line	27		428.42	428.37	428.44	427.76	427.63	427.76	427.79	427.35	427.44	429.12
	Line	28	Top of Gravel(Top of Incompres	427.18	427.16	427.25	426.53	426.42	426.53	426.54	426.17	426.32	428.13
	Line	29	GND for sigma_p	429.39	429.54	428.97	428.60	428.27	428.16	428.19	428.44	428.55	428.54
	Line	30	GW	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00	375.00
	Line	31	ROCK	364.55	358.40	355.57	356.94	358.57	359.79	361.07	362.40	363.79	365.40
LAYER THICKNESS (M/FT)	Layer No.	From	To	Material									
	1	1	2	Cover	2.77	2.87	2.63	2.51	2.52	1.96	1.42	2.27	2.69	1.97
	2	2	3	Leveling	1.74	1.93	1.65	1.38	1.41	0.83	0.38	1.14	1.68	0.52
	3	3	4	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	4	4	5	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	5	5	6	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	6	6	7	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	7	7	8	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	8	8	9	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	9	9	10	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	10	10	11	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	11	11	12	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	12	12	13	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	13	13	14	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	14	14	15	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	15	15	16	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	16	16	17	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	17	17	18	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	18	18	19	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	19	19	20	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	20	20	21	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	21	21	22	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	22	22	23	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	23	23	24	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	24	24	25	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	25	25	26	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	26	26	27	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	27	27	28	Dredge	1.23	1.20	1.20	1.22	1.21	1.23	1.25	1.18	1.11	0.99
	28													
	29													
	30													
	Thickness Check													
	From Line		To Line	SUM	35.36	34.91	34.17	34.50	34.10	33.51	33.00	32.86	32.20	27.20
	1		28	Thickness =	35.36	34.91	34.17	34.50	34.10	33.51	33.00	32.86	32.20	27.20
				Thickness Check	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

UNIT WEIGHT	Layer No.	Material										
	1	*Cover*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	2	*Leveling*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	3	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	4	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	5	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	6	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	7	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	8	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	9	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	10	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	11	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	12	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	13	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	14	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	15	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	16	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	17	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	18	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	19	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	20	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	21	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	22	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	23	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	24	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	25	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	26	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	27	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	28											
	29		*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	30	*Soil below GW*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	Layer No.	***1*** **Cover**										
		Initial Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
		Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	Midpoint Elevation, (m / ft)		461.16	460.64	460.10	459.78	459.26	459.07	458.83	457.90	457.18	454.35
	Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
	Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)=		Strain										
		Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, $C_{c\varepsilon}$												
Modified Recompression Index, $C_{r\varepsilon}$												
Modified Secondary Compression Index, C_α												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
		Elastic or Plastic (E/P)										
		Settlement of Layer 1 (m / ft)										

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

UNIT WEIGHT	Layer No.	Material										
	1	*Cover*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	2	*Leveling*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*	*120.0*
	3	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	4	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	5	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	6	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	7	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	8	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	9	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	10	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	11	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	12	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	13	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	14	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	15	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	16	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	17	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	18	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	19	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	20	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	21	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	22	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	23	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	24	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	25	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	26	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	27	*Dredge*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*	*86.0*
	28											
	29		*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*	*82.0*
	30	*Soil below GW*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*	*19.6*
	Layer No.	***1*** **Cover**										
		Initial Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
		Final Stress Reference Layer (top of layer)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	Midpoint Elevation, (m / ft)		462.57	455.54	461.95	461.54	460.03	460.26	462.72	462.90	460.11	462.79
	Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
	Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method												
Modulus, E (kPa/psf)=		Strain										
		Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)												
Consolidation Properties												
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)												
OCR Manual Input Value												
OCR Computation Input												
Preconsolidation pressure, σ'_p (kPa / psf)												
Modified Primary Compression Index, $C_{c\varepsilon}$												
Modified Recompression Index, $C_{r\varepsilon}$												
Modified Secondary Compression Index, C_α												
ratio of t2 / t1												
Settlements												
Primary Settlement, (m / ft)												
Secondary Settlement (m / ft)												
Total Settlement (m / ft)												
		Elastic or Plastic (E/P)										
		Settlement of Layer 1 (m / ft)										

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Layer No. *2* **Leveling**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Midpoint Elevation, (m / ft)		458.91	458.25	457.95	457.84	457.29	457.67	457.93	456.19	455.00	453.10
Initial Effective Stress, σ'_i (kPa /psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Final Effective Stress, σ'_f (kPa/psf)		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)											
OCR Manual Input Value											
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)											
Modified Primary Compression Index, $C_{c\varepsilon}$											
Modified Recompression Index, $C_{r\varepsilon}$											
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$											
ratio of t2 / t1											
Settlements											
Primary Settlement, (m / ft)											
Secondary Settlement (m / ft)											
Total Settlement (m / ft)											
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
Settlement of Layer 2 (m / ft)											
Layer No. *3* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		457.42	456.68	456.53	456.53	455.98	456.65	457.11	455.03	453.61	452.34
Initial Effective Stress, σ'_i (kPa /psf)		262.03	283.02	249.86	218.76	221.29	152.46	99.82	187.89	248.99	105.11
Final Effective Stress, σ'_f (kPa/psf)		594.07	627.19	565.99	519.38	523.17	387.21	270.28	460.63	571.21	341.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		262	283	250	219	221	152	100	188	249	105
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.128	0.121	0.124	0.134	0.131	0.145	0.157	0.134	0.117	0.147
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.139	0.132	0.134	0.145	0.142	0.156	0.168	0.144	0.127	0.156
Elastic or Plastic (E/P)		P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D
Settlement of Layer 3 (m / ft)		0.139	0.132	0.134	0.145	0.142	0.156	0.168	0.144	0.127	0.156
Layer No. *4* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		456.19	455.48	455.33	455.31	454.78	455.42	455.86	453.85	452.49	451.36
Initial Effective Stress, σ'_i (kPa /psf)		368.18	386.63	352.64	324.07	325.07	258.16	207.14	289.19	344.77	190.11
Final Effective Stress, σ'_f (kPa/psf)		700.22	730.80	668.77	624.68	626.96	492.92	377.60	561.92	666.99	426.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		368	387	353	324	325	258	207	289	345	190
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.100	0.097	0.097	0.102	0.100	0.101	0.095	0.099	0.093	0.101
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.111	0.108	0.107	0.113	0.111	0.111	0.106	0.109	0.103	0.110
Elastic or Plastic (E/P)		P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D	P 1-D
Settlement of Layer 4 (m / ft)		0.111	0.108	0.107	0.113	0.111	0.111	0.106	0.109	0.103	0.110

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Layer No. *5* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		454.95	454.27	454.14	454.08	453.57	454.19	454.62	452.67	451.38	450.37
Initial Effective Stress, σ'_i (kPa /psf)		474.32	490.24	455.43	429.37	428.86	363.86	314.46	390.48	440.54	275.11
Final Effective Stress, σ'_f (kPa/psf)		806.36	834.41	771.56	729.98	730.74	598.62	484.92	663.22	762.76	511.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		474	490	455	429	429	364	314	390	441	275
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.083	0.081	0.080	0.082	0.081	0.077	0.068	0.079	0.077	0.078
Secondary Settlement (m / ft)		0.01094	0.01068	0.01059	0.01085	0.01070	0.01089	0.01106	0.01044	0.00987	0.00876
Total Settlement (m / ft)		0.094	0.092	0.090	0.093	0.092	0.088	0.079	0.089	0.087	0.086
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 5 (m / ft)		0.094	0.092	0.090	0.093	0.092	0.088	0.079	0.089	0.087	0.086
Layer No. *6* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		453.72	453.07	452.94	452.86	452.36	452.96	453.37	451.49	450.27	449.38
Initial Effective Stress, σ'_i (kPa /psf)		580.46	593.85	558.21	534.67	532.64	469.57	421.78	491.78	536.32	360.11
Final Effective Stress, σ'_f (kPa/psf)		912.50	938.02	874.34	835.29	834.52	704.32	592.24	764.52	858.54	596.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		580	594	558	535	533	470	422	492	536	360
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.071	0.070	0.068	0.069	0.069	0.063	0.054	0.066	0.066	0.063
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.082	0.080	0.078	0.080	0.079	0.074	0.065	0.076	0.076	0.072
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 6 (m / ft)		0.082	0.080	0.078	0.080	0.079	0.074	0.065	0.076	0.076	0.072
Layer No. *7* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		452.48	451.86	451.75	451.64	451.16	451.73	452.12	450.32	449.15	448.39
Initial Effective Stress, σ'_i (kPa /psf)		686.61	697.46	661.00	639.98	636.42	575.27	529.10	593.08	632.09	445.11
Final Effective Stress, σ'_f (kPa/psf)		1,018.65	1,041.63	977.12	940.59	938.30	810.03	699.56	865.81	954.32	681.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		687	697	661	640	636	575	529	593	632	445
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.062	0.061	0.059	0.060	0.059	0.053	0.044	0.056	0.058	0.053
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.073	0.072	0.070	0.071	0.070	0.064	0.055	0.067	0.068	0.062
Elastic or Plastic (E/P)											
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 7 (m / ft)		0.073	0.072	0.070	0.071	0.070	0.064	0.055	0.067	0.068	0.062

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Layer No. *8* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		451.25	450.66	450.55	450.41	449.95	450.50	450.87	449.14	448.04	447.40
Initial Effective Stress, σ'_i (kPa /psf)		792.75	801.07	763.78	745.28	740.20	680.98	636.42	694.37	727.87	530.11
Final Effective Stress, σ'_f (kPa/psf)		1,124.79	1,145.24	1,079.91	1,045.89	1,042.09	915.73	806.88	967.11	1,050.09	766.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		793	801	764	745	740	681	636	694	728	530
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.055	0.054	0.052	0.053	0.052	0.046	0.037	0.049	0.052	0.046
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.066	0.065	0.063	0.063	0.063	0.057	0.049	0.060	0.062	0.055
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 8 (m / ft)		0.066	0.065	0.063	0.063	0.063	0.057	0.049	0.060	0.062	0.055
Layer No. *9* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		450.02	449.45	449.36	449.19	448.74	449.27	449.62	447.96	446.93	446.41
Initial Effective Stress, σ'_i (kPa /psf)		898.89	904.68	866.56	850.58	843.99	786.68	743.75	795.67	823.64	615.11
Final Effective Stress, σ'_f (kPa/psf)		1,230.93	1,248.86	1,182.69	1,151.20	1,145.87	1,021.44	914.21	1,068.41	1,145.87	851.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		899	905	867	851	844	787	744	796	824	615
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.049	0.049	0.047	0.047	0.047	0.041	0.033	0.044	0.047	0.041
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.060	0.060	0.058	0.058	0.057	0.052	0.044	0.054	0.056	0.049
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 9 (m / ft)		0.060	0.060	0.058	0.058	0.057	0.052	0.044	0.054	0.056	0.049
Layer No. *10* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		448.78	448.25	448.16	447.96	447.54	448.04	448.38	446.78	445.81	445.43
Initial Effective Stress, σ'_i (kPa /psf)		1,005.04	1,008.29	969.35	955.89	947.77	892.38	851.07	896.97	919.42	700.11
Final Effective Stress, σ'_f (kPa/psf)		1,337.08	1,352.47	1,285.48	1,256.50	1,249.65	1,127.14	1,021.53	1,169.70	1,241.64	936.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,005	1,008	969	956	948	892	851	897	919	700
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.045	0.045	0.043	0.042	0.042	0.036	0.029	0.040	0.042	0.036
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.056	0.055	0.053	0.053	0.053	0.047	0.040	0.050	0.052	0.045
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 10 (m / ft)		0.056	0.055	0.053	0.053	0.053	0.047	0.040	0.050	0.052	0.045

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *11* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		447.55	447.04	446.97	446.74	446.33	446.81	447.13	445.60	444.70	444.44
Initial Effective Stress, σ'_i (kPa /psf)		1,111.18	1,111.91	1,072.13	1,061.19	1,051.55	998.09	958.39	998.26	1,015.19	785.11
Final Effective Stress, σ'_f (kPa/psf)		1,443.22	1,456.08	1,388.26	1,361.80	1,353.43	1,232.84	1,128.85	1,271.00	1,337.42	1,021.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,111	1,112	1,072	1,061	1,052	998	958	998	1,015	785
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.041	0.041	0.039	0.039	0.039	0.033	0.026	0.036	0.039	0.033
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.052	0.052	0.050	0.049	0.049	0.044	0.037	0.046	0.049	0.042
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 11 (m / ft)		0.052	0.052	0.050	0.049	0.049	0.044	0.037	0.046	0.049	0.042
Layer No. *12* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		446.31	445.84	445.77	445.51	445.12	445.58	445.88	444.43	443.58	443.45
Initial Effective Stress, σ'_i (kPa /psf)		1,217.33	1,215.52	1,174.92	1,166.50	1,155.33	1,103.79	1,065.71	1,099.56	1,110.97	870.11
Final Effective Stress, σ'_f (kPa/psf)		1,549.37	1,559.69	1,491.04	1,467.11	1,457.22	1,338.55	1,236.17	1,372.29	1,433.19	1,106.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,217	1,216	1,175	1,166	1,155	1,104	1,066	1,100	1,111	870
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.038	0.038	0.036	0.036	0.035	0.030	0.023	0.033	0.036	0.030
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.049	0.049	0.047	0.046	0.046	0.041	0.034	0.043	0.046	0.039
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 12 (m / ft)		0.049	0.049	0.047	0.046	0.046	0.041	0.034	0.043	0.046	0.039
Layer No. *13* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		445.08	444.63	444.58	444.29	443.92	444.35	444.63	443.25	442.47	442.46
Initial Effective Stress, σ'_i (kPa /psf)		1,323	1,319	1,278	1,272	1,259	1,209	1,173	1,201	1,207	955
Final Effective Stress, σ'_f (kPa/psf)		1,656	1,663	1,594	1,572	1,561	1,444	1,343	1,474	1,529	1,192
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,323	1,319	1,278	1,272	1,259	1,209	1,173	1,201	1,207	955
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.035	0.035	0.033	0.033	0.033	0.028	0.021	0.031	0.033	0.028
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.046	0.046	0.044	0.044	0.044	0.038	0.032	0.041	0.043	0.036
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 13 (m / ft)		0.046	0.046	0.044	0.044	0.044	0.038	0.032	0.041	0.043	0.036

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *14* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		443.85	443.43	443.38	443.06	442.71	443.13	443.38	442.07	441.36	441.47
Initial Effective Stress, σ'_i (kPa /psf)		1,430	1,423	1,380	1,377	1,363	1,315	1,280	1,302	1,303	1,040
Final Effective Stress, σ'_f (kPa/psf)		1,762	1,767	1,697	1,678	1,665	1,550	1,451	1,575	1,625	1,277
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,430	1,423	1,380	1,377	1,363	1,315	1,280	1,302	1,303	1,040
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.033	0.033	0.031	0.031	0.031	0.026	0.020	0.028	0.031	0.026
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.044	0.044	0.042	0.041	0.041	0.036	0.031	0.039	0.041	0.034
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 14 (m / ft)		0.044	0.044	0.042	0.041	0.041	0.036	0.031	0.039	0.041	0.034
Layer No. *15* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		442.61	442.22	442.19	441.84	441.50	441.90	442.14	440.89	440.24	440.48
Initial Effective Stress, σ'_i (kPa /psf)		1,536	1,526	1,483	1,482	1,467	1,421	1,388	1,403	1,398	1,125
Final Effective Stress, σ'_f (kPa/psf)		1,868	1,871	1,799	1,783	1,769	1,656	1,558	1,676	1,721	1,362
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,536	1,526	1,483	1,482	1,467	1,421	1,388	1,403	1,398	1,125
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.031	0.031	0.029	0.029	0.029	0.024	0.018	0.026	0.029	0.024
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.042	0.042	0.040	0.039	0.039	0.035	0.029	0.037	0.039	0.033
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 15 (m / ft)		0.042	0.042	0.040	0.039	0.039	0.035	0.029	0.037	0.039	0.033
Layer No. *16* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		441.38	441.02	440.99	440.62	440.30	440.67	440.89	439.72	439.13	439.50
Initial Effective Stress, σ'_i (kPa /psf)		1,642	1,630	1,586	1,588	1,570	1,527	1,495	1,505	1,494	1,210
Final Effective Stress, σ'_f (kPa/psf)		1,974	1,974	1,902	1,888	1,872	1,761	1,665	1,777	1,816	1,447
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,642	1,630	1,586	1,588	1,570	1,527	1,495	1,505	1,494	1,210
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.029	0.029	0.027	0.027	0.027	0.022	0.017	0.025	0.028	0.022
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.040	0.040	0.038	0.038	0.038	0.033	0.028	0.035	0.037	0.031
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 16 (m / ft)		0.040	0.040	0.038	0.038	0.038	0.033	0.028	0.035	0.037	0.031

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *17* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		440.14	439.81	439.80	439.39	439.09	439.44	439.64	438.54	438.02	438.51
Initial Effective Stress, σ'_i (kPa /psf)		1,748	1,734	1,689	1,693	1,674	1,632	1,602	1,606	1,590	1,295
Final Effective Stress, σ'_f (kPa/psf)		2,080	2,078	2,005	1,994	1,976	1,867	1,773	1,879	1,912	1,532
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,748	1,734	1,689	1,693	1,674	1,632	1,602	1,606	1,590	1,295
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.027	0.028	0.026	0.025	0.025	0.021	0.016	0.023	0.026	0.021
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.038	0.038	0.037	0.036	0.036	0.032	0.027	0.034	0.036	0.030
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 17 (m / ft)		0.038	0.038	0.037	0.036	0.036	0.032	0.027	0.034	0.036	0.030
Layer No. *18* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		438.91	438.61	438.60	438.17	437.88	438.21	438.39	437.36	436.90	437.52
Initial Effective Stress, σ'_i (kPa /psf)		1,854	1,837	1,792	1,798	1,778	1,738	1,710	1,707	1,686	1,380
Final Effective Stress, σ'_f (kPa/psf)		2,186	2,181	2,108	2,099	2,080	1,973	1,880	1,980	2,008	1,617
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,854	1,837	1,792	1,798	1,778	1,738	1,710	1,707	1,686	1,380
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.026	0.026	0.025	0.024	0.024	0.020	0.015	0.022	0.025	0.020
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.037	0.037	0.035	0.035	0.035	0.031	0.026	0.033	0.035	0.029
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 18 (m / ft)		0.037	0.037	0.035	0.035	0.035	0.031	0.026	0.033	0.035	0.029
Layer No. *19* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		437.67	437.40	437.41	436.94	436.68	436.98	437.14	436.18	435.79	436.53
Initial Effective Stress, σ'_i (kPa /psf)		1,960	1,941	1,894	1,904	1,882	1,844	1,817	1,809	1,781	1,465
Final Effective Stress, σ'_f (kPa/psf)		2,292	2,285	2,211	2,204	2,184	2,078	1,987	2,081	2,104	1,702
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		1,960	1,941	1,894	1,904	1,882	1,844	1,817	1,809	1,781	1,465
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.024	0.025	0.023	0.023	0.023	0.019	0.014	0.021	0.023	0.019
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.035	0.036	0.034	0.034	0.033	0.030	0.025	0.031	0.033	0.027
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 19 (m / ft)		0.035	0.036	0.034	0.034	0.033	0.030	0.025	0.031	0.033	0.027

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *20* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		436.44	436.20	436.21	435.72	435.47	435.75	435.90	435.00	434.68	435.54
Initial Effective Stress, σ'_i (kPa /psf)		2,066	2,044	1,997	2,009	1,986	1,949	1,924	1,910	1,877	1,550
Final Effective Stress, σ'_f (kPa/psf)		2,399	2,389	2,313	2,310	2,287	2,184	2,095	2,183	2,199	1,787
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,066	2,044	1,997	2,009	1,986	1,949	1,924	1,910	1,877	1,550
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.023	0.024	0.022	0.022	0.022	0.018	0.013	0.020	0.022	0.018
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.034	0.034	0.033	0.032	0.032	0.029	0.024	0.030	0.032	0.027
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 20 (m / ft)		0.034	0.034	0.033	0.032	0.032	0.029	0.024	0.030	0.032	0.027
Layer No. *21* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		435.21	434.99	435.02	434.49	434.26	434.52	434.65	433.83	433.56	434.55
Initial Effective Stress, σ'_i (kPa /psf)		2,173	2,148	2,100	2,114	2,089	2,055	2,032	2,011	1,973	1,635
Final Effective Stress, σ'_f (kPa/psf)		2,505	2,492	2,416	2,415	2,391	2,290	2,202	2,284	2,295	1,872
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,173	2,148	2,100	2,114	2,089	2,055	2,032	2,011	1,973	1,635
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.022	0.023	0.021	0.021	0.021	0.017	0.013	0.019	0.021	0.017
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.033	0.033	0.032	0.031	0.031	0.028	0.024	0.029	0.031	0.026
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 21 (m / ft)		0.033	0.033	0.032	0.031	0.031	0.028	0.024	0.029	0.031	0.026
Layer No. *22* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		433.97	433.79	433.82	433.27	433.06	433.29	433.40	432.65	432.45	433.56
Initial Effective Stress, σ'_i (kPa /psf)		2,279	2,252	2,203	2,220	2,193	2,161	2,139	2,113	2,069	1,720
Final Effective Stress, σ'_f (kPa/psf)		2,611	2,596	2,519	2,520	2,495	2,396	2,309	2,385	2,391	1,957
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,279	2,252	2,203	2,220	2,193	2,161	2,139	2,113	2,069	1,720
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.021	0.022	0.020	0.020	0.020	0.016	0.012	0.018	0.020	0.016
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.032	0.032	0.031	0.031	0.030	0.027	0.023	0.029	0.030	0.025
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 22 (m / ft)		0.032	0.032	0.031	0.031	0.030	0.027	0.023	0.029	0.030	0.025

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *23* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		432.74	432.59	432.63	432.04	431.85	432.06	432.15	431.47	431.33	432.58
Initial Effective Stress, σ'_i (kPa /psf)		2,385	2,355	2,306	2,325	2,297	2,267	2,246	2,214	2,164	1,805
Final Effective Stress, σ'_f (kPa/psf)		2,717	2,699	2,622	2,625	2,599	2,501	2,417	2,487	2,487	2,042
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,385	2,355	2,306	2,325	2,297	2,267	2,246	2,214	2,164	1,805
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.020	0.021	0.019	0.019	0.019	0.015	0.012	0.017	0.020	0.015
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.031	0.031	0.030	0.030	0.030	0.026	0.023	0.028	0.029	0.024
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 23 (m / ft)		0.031	0.031	0.030	0.030	0.030	0.026	0.023	0.028	0.029	0.024
Layer No. *24* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		431.50	431.38	431.43	430.82	430.64	430.83	430.91	430.29	430.22	431.59
Initial Effective Stress, σ'_i (kPa /psf)		2,491	2,459	2,408	2,430	2,401	2,372	2,354	2,315	2,260	1,890
Final Effective Stress, σ'_f (kPa/psf)		2,823	2,803	2,724	2,731	2,703	2,607	2,524	2,588	2,582	2,127
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,491	2,459	2,408	2,430	2,401	2,372	2,354	2,315	2,260	1,890
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.020	0.020	0.019	0.018	0.018	0.015	0.011	0.017	0.019	0.015
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.030	0.031	0.029	0.029	0.029	0.026	0.022	0.027	0.029	0.024
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 24 (m / ft)		0.030	0.031	0.029	0.029	0.029	0.026	0.022	0.027	0.029	0.024
Layer No. *25* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		430.27	430.18	430.23	429.60	429.44	429.60	429.66	429.11	429.11	430.60
Initial Effective Stress, σ'_i (kPa /psf)		2,597.20	2,562.46	2,511.11	2,535.44	2,504.50	2,477.94	2,460.88	2,416.41	2,356.04	1,975.11
Final Effective Stress, σ'_f (kPa/psf)		2,929.24	2,906.63	2,827.24	2,836.05	2,806.39	2,712.70	2,631.34	2,689.15	2,678.27	2,211.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,597	2,562	2,511	2,535	2,505	2,478	2,461	2,416	2,356	1,975
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.019	0.019	0.018	0.017	0.017	0.014	0.011	0.016	0.018	0.014
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.030	0.030	0.029	0.028	0.028	0.025	0.022	0.026	0.028	0.023
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 25 (m / ft)		0.030	0.030	0.029	0.028	0.028	0.025	0.022	0.026	0.028	0.023

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

Layer No. *26* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		429.03	428.97	429.04	428.37	428.23	428.38	428.41	427.94	427.99	429.61
Initial Effective Stress, σ'_i (kPa /psf)		2,703.34	2,666.07	2,613.89	2,640.75	2,608.29	2,583.65	2,568.20	2,517.71	2,451.82	2,060.11
Final Effective Stress, σ'_f (kPa/psf)		3,035.38	3,010.24	2,930.02	2,941.36	2,910.17	2,818.40	2,738.66	2,790.44	2,774.04	2,296.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,703	2,666	2,614	2,641	2,608	2,584	2,568	2,518	2,452	2,060
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.018	0.019	0.017	0.017	0.017	0.014	0.010	0.015	0.017	0.014
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.029	0.029	0.028	0.028	0.027	0.024	0.021	0.026	0.027	0.022
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 26 (m / ft)		0.029	0.029	0.028	0.028	0.027	0.024	0.021	0.026	0.027	0.022
Layer No. *27* **Dredge**											
Initial Stress Reference Layer (top of layer)		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Final Stress Reference Layer (top of layer)		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Midpoint Elevation, (m / ft)		427.80	427.77	427.84	427.15	427.02	427.15	427.16	426.76	426.88	428.62
Initial Effective Stress, σ'_i (kPa /psf)		2,809.49	2,769.68	2,716.68	2,746.05	2,712.07	2,689.35	2,675.53	2,619.00	2,547.59	2,145.11
Final Effective Stress, σ'_f (kPa/psf)		3,141.53	3,113.86	3,032.81	3,046.66	3,013.95	2,924.11	2,845.99	2,891.74	2,869.82	2,381.59
Elastic Method											
Modulus, E (kPa/psf)=	Strain										
	Settlement (m / ft)										
1-D Consolidation Theory (Plastic Method)											
Consolidation Properties											
OCR Manual or Auto Input (MW/MS: Manual waste/soil, A:Automatic)		*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*	*MW*
OCR Manual Input Value		*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
OCR Computation Input											
Preconsolidation pressure, σ'_p (kPa / psf)		2,809	2,770	2,717	2,746	2,712	2,689	2,676	2,619	2,548	2,145
Modified Primary Compression Index, $C_{c\varepsilon}$		*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*	*0.291*
Modified Recompression Index, $C_{r\varepsilon}$		*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Modified Secondary Compression Index, $C_{\alpha\varepsilon}$		*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*	*0.60%*
ratio of t2 / t1		*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*	*30.00*
Settlements											
Primary Settlement, (m / ft)		0.017	0.018	0.017	0.016	0.016	0.013	0.010	0.015	0.017	0.013
Secondary Settlement (m / ft)		0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.009
Total Settlement (m / ft)		0.028	0.029	0.027	0.027	0.027	0.024	0.021	0.025	0.027	0.022
Elastic or Plastic (E/P)		P	P	P	P	P	P	P	P	P	P
		1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D	1-D
Settlement of Layer 27 (m / ft)		0.028	0.029	0.027	0.027	0.027	0.024	0.021	0.025	0.027	0.022

Written by: **Ray Wu / Meena Viswanath** Date: **02/09/2015** Reviewed by: **Ali Ebrahimi / Jay Beech** Date: **02/09/2015**

Client: **Honeywell** Project: **Onondaga Lake SCA Final Cover Design** Project/ Proposal No.: **GD5497** Task No.: **03**

LAYER SETTLEMENT	Layer No.	Material										
	1	*Cover*										
	2	*Leveling*										
	3	*Dredge*	0.139	0.132	0.134	0.145	0.142	0.156	0.168	0.144	0.127	0.156
	4	*Dredge*	0.111	0.108	0.107	0.113	0.111	0.111	0.106	0.109	0.103	0.110
	5	*Dredge*	0.094	0.092	0.090	0.093	0.092	0.088	0.079	0.089	0.087	0.086
	6	*Dredge*	0.082	0.080	0.078	0.080	0.079	0.074	0.065	0.076	0.076	0.072
	7	*Dredge*	0.073	0.072	0.070	0.071	0.070	0.064	0.055	0.067	0.068	0.062
	8	*Dredge*	0.066	0.065	0.063	0.063	0.063	0.057	0.049	0.060	0.062	0.055
	9	*Dredge*	0.060	0.060	0.058	0.058	0.057	0.052	0.044	0.054	0.056	0.049
	10	*Dredge*	0.056	0.055	0.053	0.053	0.053	0.047	0.040	0.050	0.052	0.045
	11	*Dredge*	0.052	0.052	0.050	0.049	0.049	0.044	0.037	0.046	0.049	0.042
	12	*Dredge*	0.049	0.049	0.047	0.046	0.046	0.041	0.034	0.043	0.046	0.039
	13	*Dredge*	0.046	0.046	0.044	0.044	0.044	0.038	0.032	0.041	0.043	0.036
	14	*Dredge*	0.044	0.044	0.042	0.041	0.041	0.036	0.031	0.039	0.041	0.034
	15	*Dredge*	0.042	0.042	0.040	0.039	0.039	0.035	0.029	0.037	0.039	0.033
	16	*Dredge*	0.040	0.040	0.038	0.038	0.038	0.033	0.028	0.035	0.037	0.031
	17	*Dredge*	0.038	0.038	0.037	0.036	0.036	0.032	0.027	0.034	0.036	0.030
	18	*Dredge*	0.037	0.037	0.035	0.035	0.035	0.031	0.026	0.033	0.035	0.029
	19	*Dredge*	0.035	0.036	0.034	0.034	0.033	0.030	0.025	0.031	0.033	0.027
	20	*Dredge*	0.034	0.034	0.033	0.032	0.032	0.029	0.024	0.030	0.032	0.027
	21	*Dredge*	0.033	0.033	0.032	0.031	0.031	0.028	0.024	0.029	0.031	0.026
	22	*Dredge*	0.032	0.032	0.031	0.031	0.030	0.027	0.023	0.029	0.030	0.025
	23	*Dredge*	0.031	0.031	0.030	0.030	0.030	0.026	0.023	0.028	0.029	0.024
	24	*Dredge*	0.030	0.031	0.029	0.029	0.029	0.026	0.022	0.027	0.029	0.024
	25	*Dredge*	0.030	0.030	0.029	0.028	0.028	0.025	0.022	0.026	0.028	0.023
	26	*Dredge*	0.029	0.029	0.028	0.028	0.027	0.024	0.021	0.026	0.027	0.022
	27	*Dredge*	0.028	0.029	0.027	0.027	0.027	0.024	0.021	0.025	0.027	0.022
	28	*Additional Foundation Settlement*	1.204	1.297	1.277	1.280	1.264	1.149	1.053	1.186	1.237	1.054
	29	*Dredge Settlement*	1.309	1.296	1.258	1.274	1.263	1.177	1.056	1.210	1.224	1.128
	30											
		TOTAL SETTLEMENT	**2.51**	**2.59**	**2.54**	**2.55**	**2.53**	**2.33**	**2.11**	**2.40**	**2.46**	**2.18**
POST-SETTLEMENT ELEVATION(M/FT)	Line	1 Top of Final Cover	460.03	459.48	458.88	458.48	457.99	457.72	457.43	456.64	456.06	453.15
	Line	2 Top of Leveling	457.27	456.62	456.24	455.98	455.47	455.76	456.01	454.36	453.38	451.18
	Line	3 Top of Dredge	455.53	454.69	454.59	454.59	454.06	454.93	455.63	453.22	451.70	450.66
	Line	4	454.29	453.49	453.40	453.37	452.85	453.70	454.38	452.04	450.59	449.67
	Line	5	453.06	452.28	452.20	452.14	451.65	452.48	453.13	450.86	449.48	448.68
	Line	6	451.82	451.08	451.01	450.92	450.44	451.25	451.88	449.69	448.36	447.69
	Line	7	450.59	449.87	449.81	449.69	449.23	450.02	450.63	448.51	447.25	446.70
	Line	8	449.35	448.67	448.62	448.47	448.03	448.79	449.39	447.33	446.13	445.71
	Line	9	448.12	447.46	447.42	447.25	446.82	447.56	448.14	446.15	445.02	444.73
	Line	10	446.89	446.26	446.22	446.02	445.61	446.33	446.89	444.98	443.91	443.74
	Line	11	445.65	445.05	445.03	444.80	444.41	445.10	445.64	443.80	442.79	442.75
	Line	12	444.42	443.85	443.83	443.57	443.20	443.87	444.39	442.62	441.68	441.76
	Line	13	443.18	442.64	442.64	442.35	441.99	442.64	443.15	441.44	440.57	440.77
	Line	14	441.95	441.44	441.44	441.12	440.79	441.41	441.90	440.26	439.45	439.78
	Line	15	440.71	440.23	440.25	439.90	439.58	440.18	440.65	439.09	438.34	438.80
	Line	16	439.48	439.03	439.05	438.67	438.37	438.96	439.40	437.91	437.23	437.81
	Line	17	438.25	437.82	437.86	437.45	437.17	437.73	438.16	436.73	436.11	436.82
	Line	18	437.01	436.62	436.66	436.22	435.96	436.50	436.91	435.55	435.00	435.83
	Line	19	435.78	435.41	435.47	435.00	434.75	435.27	435.66	434.37	433.88	434.84
	Line	20	434.54	434.21	434.27	433.78	433.55	434.04	434.41	433.20	432.77	433.85
	Line	21	433.31	433.00	433.08	432.55	432.34	432.81	433.16	432.02	431.66	432.87
	Line	22	432.08	431.80	431.88	431.33	431.13	431.58	431.92	430.84	430.54	431.88
	Line	23	430.84	430.59	430.69	430.10	429.93	430.35	430.67	429.66	429.43	430.89
	Line	24	429.61	429.39	429.49	428.88	428.72	429.12	429.42	428.49	428.32	429.90
	Line	25	428.37	428.18	428.30	427.65	427.51	427.89	428.17	427.31	427.20	428.91
	Line	26	427.14	426.98	427.10	426.43	426.30	426.66	426.92	426.13	426.09	427.92
	Line	27	425.90	425.78	425.91	425.20	425.10	425.43	425.68	424.95	424.98	426.94
	Line	28 Top of Gravel(Top of Incompre	424.67	424.57	424.71	423.98	423.89	424.21	424.43	423.77	423.86	425.95
	Line	29										
	Line	30										
	Line	31										

Appendix

SCA Geotechnical Monitoring Monthly Summary Report
November 2014

Geosyntec consultants

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Memorandum

Date: 18 December 2014

To: Tom Drachenberg, P.E.
Parsons

From: Meena Viswanath, EIT, Ali Ebrahimi, Ph.D., P.E., Ming Zhu, Ph.D., P.E., and Jay Beech, Ph.D., P.E.
Geosyntec Consultants

Subject: Geotechnical Monitoring Data Summary (with data through November 30, 2014)
Sediment Consolidation Area, Onondaga Lake, Syracuse, NY

This memorandum was prepared by Geosyntec Consultants (Geosyntec) to update the previous Geotechnical Monitoring Data Summary for the Sediment Consolidation Area (SCA) dated 1 December 2014 with data through October 31, 2014 (hereafter referred to as the October 2014 Data Summary). Specifically, this memorandum summarizes the monitoring data collected from the instruments including inclinometers, piezometers, settlement cells, and settlement monuments through November 30, 2014.

Results of the monitoring data collected through November 30, 2014 indicate that the inclinometers, piezometers, and settlement cells installed in the SCA are in general functioning as intended. The data collected automatically by the data logger system have been recovered almost 100% for processing, except for occasional system downtimes due to power outages. Evaluation of the measured lateral ground deformation, equivalent water levels, and settlement indicates performance of the SCA during the monitoring period through November 30, 2014 was in general as expected, including: (1) the lateral ground movement measured by the inclinometers appears to be within an acceptable range; (2) the piezometers have shown expected responses to loading from geotextile tubes and precipitation; (3) the measured settlement of the foundation materials appears to be generally within the range of prediction; and (4) except for the localized area between SC-G16 and SC-G27 that is slightly reversed with a drainage slope of -0.47%, there is no indication of grade reversal of the SCA liner based on the settlement measured as of November 30, 2014. The localized grade reversal does not appear to impact the overall drainage of the SCA liner.

MONITORING DATA

The as-built locations of inclinometers, piezometers, settlement cells, and settlement monuments installed in the SCA are shown in Figure 1. The general timeline of geotextile tube filling is presented in Table 1. The site was under winter shutdown conditions from November 19, 2012 through April 8, 2013 and November 22, 2013 through April 7, 2014. Geotextile tube filling was finished early November 2014 and the winter shutdown schedule of geotechnical monitoring started on November 26, 2014.

Inclinometer Data

The inclinometers installed in the SCA include one automated inclinometer (i.e., ShapeAccelArray or SAA) and five manual inclinometers. One of the manual inclinometers (i.e., SI-G1) was abandoned in March 2013. The SAA is connected to an adjacent data logger and monitored automatically at a frequency of one reading per hour. The collected SAA data are transmitted by radio to the central data logger in the instrumentation trailer. The manual inclinometers are read twice a week during active SCA operations and quarterly during winter shutdowns using a portable inclinometer probe and readout unit.

The SAA data collected as of November 30, 2014 are plotted in Figure 2. The manual inclinometer data collected as of November 25, 2014 are plotted in Figures 3 through 7. The following observations are for the inclinometer data. It is noted that the deformation reported below is the resultant of the deformations measured in the two perpendicular directions presented as the A and B axes.

- The deformation at ground surface measured by the automatic inclinometer (i.e., SI-G3-SAA) was about 0.8 inches between September 30, 2011 and November 30, 2014.
- SI-G1 was abandoned on March 14, 2013 in order to allow for the placement of geotextile tubes between Phase I and Phase II. The last reading taken at SI-G1 before it was abandoned showed a deformation at ground surface of about 0.4 inches between May 25, 2012 and November 30, 2012.
- SI-G2R showed a deformation of about 1.7 inches at ground surface between June 4, 2012 and November 25, 2014.
- SI-G3 showed a deformation of about 0.3 inches at ground surface between July 7, 2011 and April 2, 2012 (before extension) and about 1.6 inches between May 11, 2012 and November 25, 2014 (after extension).
- SI-G4 showed a deformation of about 1.1 inches at ground surface between July 7, 2011 and November 25, 2014. The deformation was limited to the top five feet of the ground.

- SI-G5 showed a deformation of about 0.1 inches at ground surface between July 6, 2011 and November 25, 2014. The deformation was limited to the top five feet of the ground.

The data indicate that the inclinometers installed in SCA appear to be functioning as intended. The measured lateral deformation from the inclinometers appears to be within an acceptable range.

Piezometer Data

Piezometers PZ-G1 through PZ-G7 are located in Phases I, II, and III. At each piezometer location, there are three vibrating wire sensors at depths of 15, 30, and 45 ft below the original ground surface (i.e., top of Solvay waste), respectively. Piezometers PZ-G8 and PZ-G9 are located in the northern perimeter dike of WB-13 and each has one vibrating wire sensor at a depth of 50 ft below the ground surface. All the piezometers are monitored automatically at a frequency of one reading per hour. In addition, there are 13 manually monitored piezometers (with a total of 16 vibrating wire sensors and 4 standpipe piezometers) installed previously by Parsons outside the SCA footprint and currently monitored by Geosyntec using a handheld unit.

The piezometer readings for PZ-G1 through PZ-G9 collected between September 1, 2011 and November 30, 2014 were converted to the equivalent water level elevations and are plotted in Figures 8 through 11 with the recorded precipitation. The piezometer data indicate higher water levels at shallow depths and deeper water levels at greater depths, which is generally consistent with earlier readings recorded prior to the SCA construction. The following observations are for the piezometer data:

- PZ-G1 (near the Western Sump), PZ-G2 (near the Eastern Sump), and PZ-G3 (in the middle of Phase I on the southern side) showed clear responses to the loading from the geotextile tubes during active operations in 2012 and 2013, as discussed in previous reports. PZ-G1, PZ-G2, and PZ-G3 showed up to approximately 10 ft of increase in measured water levels between mid-March 2014 and early April 2014, which was likely in response to ponded water and change of the groundwater (or perched water) table as a result of snow melting and precipitation events. The measured water levels of PZ-G1 had generally been dissipating through the end of June 2014, except for a slight rise and fall likely in response to precipitation again between May 18 and 21, 2014.
- Through the end of November 2014, the measured water levels of PZ-G1 and PZ-G2 were generally dissipating. The measured water levels of PZ-G3 continued to dissipate through the end of November 2014, after reaching peaks in mid-October due to loading from the final layer of geotextile tubes.

- PZ-G4 (on the western side of Phase II) and PZ-G5 (on the eastern side of Phase II) showed clear responses to loading from the geotextile tubes placed in Phase II during active operations in 2013, as discussed in previous reports. PZ-G4 and PZ-G5 showed up to approximately 8 ft of increase in measured water levels between mid-March 2014 and early April 2014, which was likely in response to change of the groundwater (or perched water) table as a result of snow melting and precipitation events. The measured water levels of PZ-G4 and PZ-G5 continued to dissipate as of the end of November 2014.
- PZ-G6 through PZ-G9 are not located in the active operation zone and the readings from these piezometers are generally steady, except that PZ-G6 and PZ-G7 showed up to approximately 6 ft of increase in measured water levels between mid-March 2014 and early April 2014, which was likely in response to change of the groundwater (or perched water) table as a result of snow melting and precipitation events. The measured water levels had been generally steady as of the end of November 2014.
- The piezometers previously installed by Parsons outside the SCA footprint are monitored manually by Geosyntec. The readings collected between June 27, 2011 and November 25, 2014 are presented in Attachment A. The readings collected in 2014 (as of November 25) are consistent with the historical readings collected in 2011, 2012, and 2013.

The piezometer data appear to be in general reasonable and the responses of the piezometers under the loading from geotextile tubes are consistent with the operational activities at the site.

Settlement Cell Data

The settlement cells installed in Phases I and II (i.e., SC-G1 through SC-G29) are connected to the central data logger in the instrumentation trailer by cables and are monitored automatically at a frequency of one reading per hour. In addition, four "control" settlement cells (i.e., SC-GT1(1), SC-GT1(2), SC-GT2(1), and SC-GT2(2)) installed outside the SCA footprint are connected to the central data logger by a radio network and are monitored automatically at a frequency of one reading per hour as well. The settlement of the foundation Solvay waste was interpreted from the readings collected from the settlement cells. The results through November 30, 2014 are plotted in Figures 12 and 13. It is noted that:

- The readings from the settlement cells connected to Legs 1 and 2 in Phase I have been corrected for systematic error using readings from the "control" settlement cells (i.e., SC-GT1(2) and SC-GT1(1), respectively) located outside the SCA footprint, which were monitored periodically (i.e., twice a week or daily) through the end of September and hourly since October 4, 2012.

- The readings from the settlement cells connected to Legs 3 and 4 in Phase II were corrected for systematic error using readings from "unaffected" settlement cells (i.e., SC-G22 and SC-G26, respectively) located outside of the active loading area in Phase II, which were monitored hourly, through July 1, 2013, when the active loading area reached SC-G22 and SC-G26. The readings from Leg 3 and Leg 4 are currently corrected for systematic error using readings from the "control" settlement cells (i.e., SC-GT2(1) and SC-GT2(2), respectively) located outside the SCA footprint.
- The readings from all the settlement cells have been corrected for temperature effects as described in previous reports.

The full-scale operations of geotextile tubes started in late July 2012 and as of November 30, 2014, 25 settlement cells have shown clear responses to the geotextile tube loading. The locations of these 25 "affected" settlement cells are circled in Figure 14. The settlement cell data indicate that twelve settlement cells (i.e., SC-G2 through SC-G4, SC-G6 through SC-G9, SC-G11, SC-G12, and SC-G14 through SC-G16) connected to Leg 1 and Leg 2 in Phase I have shown a clear trend of settlement under the loading from the geotextile tubes after July 23, 2012. Loading in Phase II started around April 2013. The settlement cell data indicate that all 13 settlement cells (i.e., SC-G17 through SC-G29) connected to Leg 3 and Leg 4 in Phase II have shown a clear trend of settlement under the loading from the geotextile tubes in Phase II since early May 2013.

To better view the settlement due to the geotextile tubes, the settlement data after July 23, 2012 are re-plotted in Figure 15 for the 25 "affected" settlement cells connected to Legs 1, 2, 3, and 4. It is noted that the data presented in Figure 15 were re-zeroed to the date of July 23, 2012 in order to compare the settlement caused by geotextile tubes. The data indicate that, as of November 30, 2014, settlement cells SC-G3, SC-G4, SC-G6 through SC-G9, SC-G11, SC-G12, and SC-G14 through SC-G16 in Phase I as well as SC-G17 and SC-G20 through SC-G29 in Phase II were re-activated due to geotextile tube filling during 2014 operations. The measured settlement due to loading from geotextile tubes ranges approximately from 1.8 ft to 7.4 ft in Phases I and II.

Figure 16 shows the contours of the as-built top of clay liner and the post-settlement elevations of the top of clay liner at the locations of the settlement cells. The post-settlement elevations were calculated by subtracting the total settlement measured by the settlement cells on November 30, 2014 from the as-built top of clay liner. Figures 17 through 19 show three cross-sections cut across the Eastern Sump and/or Western Sump with the as-built top of clay liner and the post-settlement top of clay liner. The results indicate that the grade between SC-G16 and SC-G27 is slightly reversed with a drainage slope of -0.47%. Compared to the monitoring results provided in the October 2014 Data Summary, the grade reversal between

SC-G16 and SC-G27 has slightly decreased during November 2014. The localized grade reversal does not appear to impact the overall drainage of the SCA liner.

The data indicate that the settlement cells installed in the SCA appear to be generally functioning as intended and are consistent with the geotextile tube filling operational activities at the site. As reported previously, a leakage located inside the SCA footprint was detected on the hydraulic line of Leg 1 after the SCA liner system was constructed. The leakage rate has been monitored by Geosyntec. The records show that the leakage rate has dropped significantly since the SCA operations started in July 2012. The measured leakage rate in Leg 1 ranged between 0 and 0.25 gallons per month during January 2013 through November 2014. In November 2014, no glycol was added to the Leg 1 hydraulic line.

Settlement Monument Data

Sixty (60) settlement monuments (SMs) had been installed above the SCA liner system during the operations of geotextile tubes by Parsons in Phases I and II, as shown in Figure 1. In June 2013, the method of surveying changed from a handheld GPS to an automated motorized total station. This automated total station system (including the total station, two control points, and prisms mounted on each settlement monument) was installed on May 29, 2013. The locations of the total station and control points are shown in Figure 1.

To take a reading, the total station is set up on a portable tripod and a pre-loaded program is activated. The total station then automatically turns to take readings from two control points and the prisms mounted on top of the settlement monuments. These control points are currently set up on portable tripods. The first set of readings surveyed by the total station was reported on June 12, 2013.

The settlement monuments are being surveyed at a frequency of twice a week during regular operations. A total of twenty-eight settlement monuments (twenty in Phase I and eight in Phase II) had been repaired as of November 25, 2014, but had lost over one month of data. The locations of these repaired settlement monuments are labeled as purple in both Figure 1 and Figure 20a. A total of eleven settlement monuments (nine in Phase I and two in Phase II) were non-functional during operations as of November 25, 2014. The locations of these non-functional settlement monuments are labeled as red in both Figure 1 and Figure 20a. Due to the relocation or repair of some of the settlement monuments during the operations, the corresponding baselines were re-established. Parsons is continuing to address the unsurveyable settlement monuments.

Attachment B presents the settlement monument data collected through November 25, 2014. Figure 20a shows the estimated original top of gravel elevation and measured settlement on

November 25, 2014 at each settlement monument location. Figure 20b shows the calculated post-settlement top of gravel elevation and change in measured settlement over the past month at each settlement monument location as of November 25, 2014. The maximum settlement measured by actively monitored settlement monuments in Phase I on November 25, 2014 is approximately 6.1 ft at the location of SM-45 (Phase IA) and 6.2 ft at the location of SM-17 (Phase IB). The maximum settlement measured by actively monitored settlement monuments in Phase II on November 25, 2014 is approximately 3.8 ft at the location of SM-48 (Phase IIA) and 5.3 ft at the location of SM-46 (Phase IIB).

The settlement measured by the settlement monuments appears to be generally consistent with the settlement measured by the settlement cells.

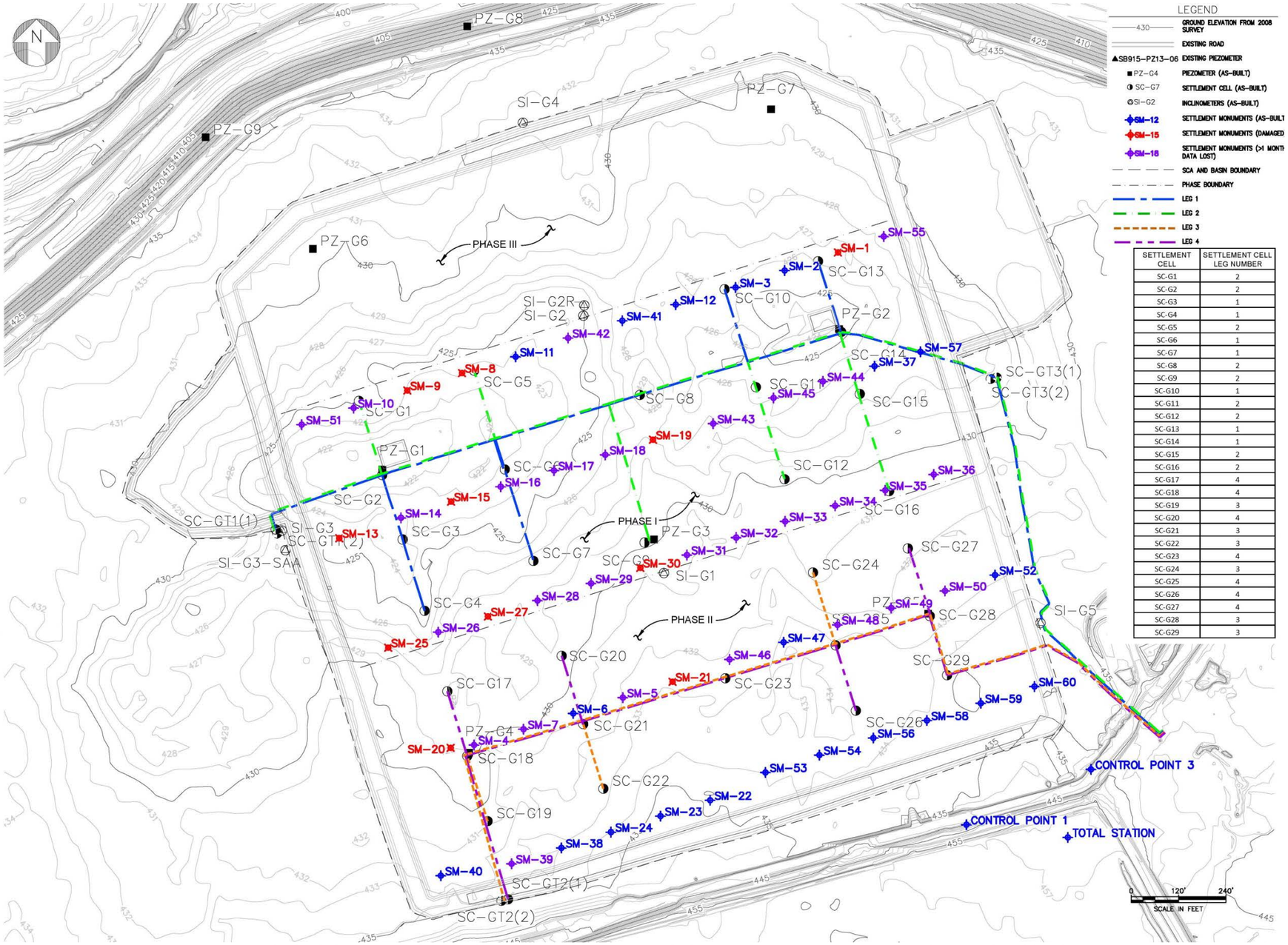
TABLE

Table 1. General Timeline of Geotextile Tube Filling

Year	Date	Sitewide	Phase I	Phase II
2012	July 2012	Operations start	Layer 1 filling starts[1]	---
	October 2012	---	Layer 1 filling ends Layer 2 filling starts	---
	November 2012	Winter shutdown starts	---	---
2013	April 2013	Operations resume	---	Layer 1 filling starts[1]
	June 2013	---	Layer 2 filling ends	---
	July 2013	---	---	Layer 1 filling ends Layer 2 filling starts
	September 2013	---	Layer 3 filling starts	Layer 2 filling ends
	October 2013	---	---	Layer 3 filling starts
	November 2013	Winter shutdown starts	Layer 3 filling ends	---
2014	April 2014	Operations resume	---	Layer 3 filling resumes
	May 2014	---	Layer 4 filling starts	---
	June 2014	---	---	Layer 3 filling ends Layer 4 filling starts
	July 2014	---	Layer 4 filling ends	---
	August 2014	---	Layer 5 filling starts	Layer 4 filling ends
	September 2014	---	Layer 5 filling ends	Layer 6 filling starts
	October 2014	---	Layer 6 filling starts	Layer 6 filling ends
	November 2014	Winter shutdown starts; Geotextile tube filling finished	Layer 6 filling ends	---

Note: Layer 1 is the first layer of geotextile tubes placed in both Phase I and Phase II.

FIGURES



SETTLEMENT CELL	SETTLEMENT CELL LEG NUMBER
SC-G1	2
SC-G2	2
SC-G3	1
SC-G4	1
SC-G5	2
SC-G6	1
SC-G7	1
SC-G8	2
SC-G9	2
SC-G10	1
SC-G11	2
SC-G12	2
SC-G13	1
SC-G14	1
SC-G15	2
SC-G16	2
SC-G17	4
SC-G18	4
SC-G19	3
SC-G20	4
SC-G21	3
SC-G22	3
SC-G23	4
SC-G24	3
SC-G25	4
SC-G26	4
SC-G27	4
SC-G28	3
SC-G29	3

Figure 1. As-built locations of geotechnical instrumentation including settlement monuments as of November 30, 2014

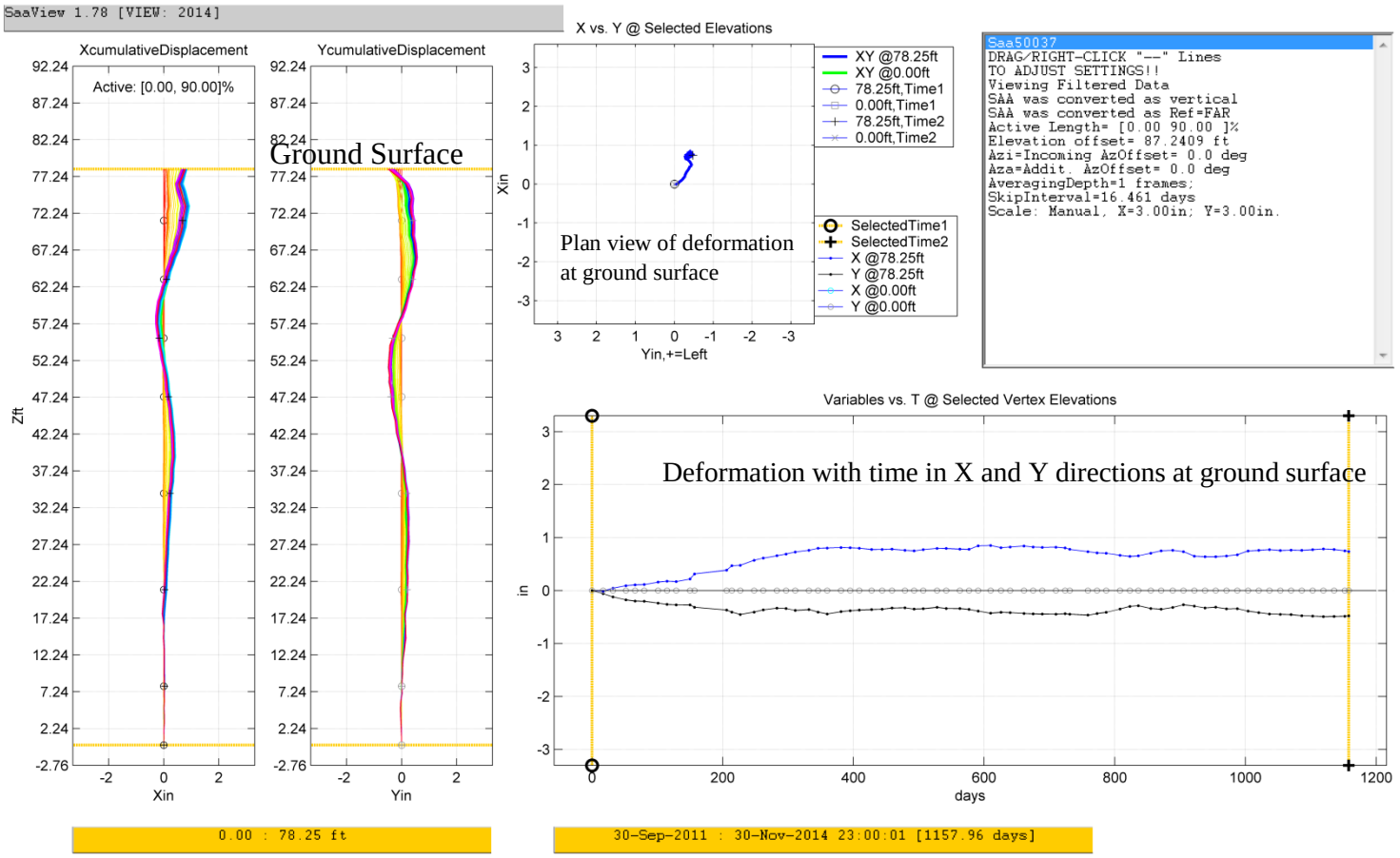


Figure 2. Monitoring data for the automatic inclinometer (SI-G3-SAA)
(Data through November 30, 2014; Initial reading on September 30, 2011)

Note: The SAA has a stick-up of approximately 8 ft above ground. The deformation graph (in the top-middle) shows the deformation at the ground surface, as marked with the yellow line on the left graph. The data gap between September 20 and October 18, 2013 was due to a communication issue associated with the SAA232 interface unit and data cable.

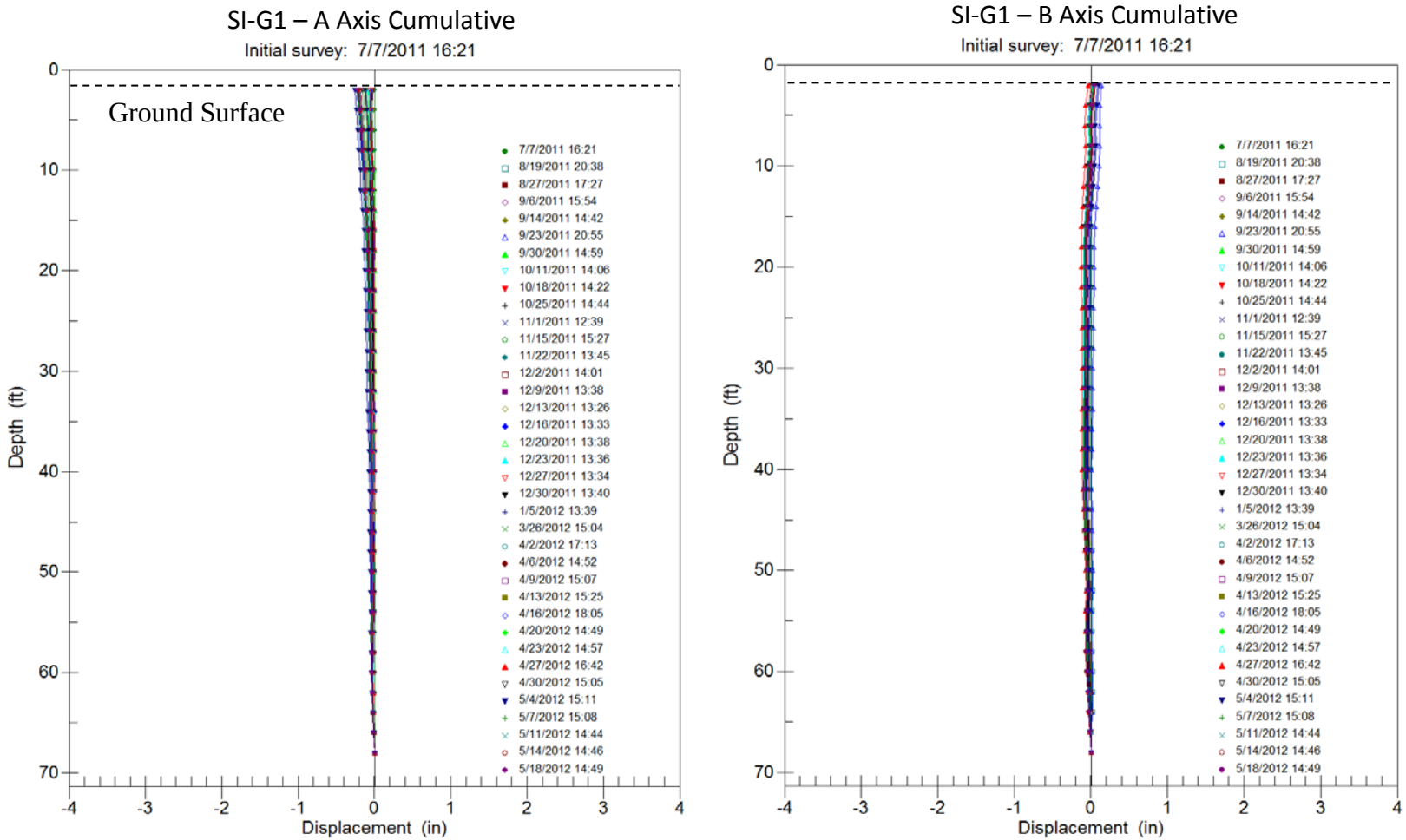


Figure 3a. Readings from manual inclinometer SI-G1 (before extension)
(Data through May 18, 2012; Initial reading on July 07, 2011)

Notes: (1) Inclinometer SI-G1 was extended by approximately 4 ft in the week of May 21, 2012; (2) The inclinometer data were plotted on selected dates between the initial and last readings; (3) The "A" axis is perpendicular to the Phase I and II boundary and positive toward Phase II; (4) SI-G1 was successfully abandoned on March 14, 2013 in order to allow for placement of geotextile tubes between Phase I and Phase II.

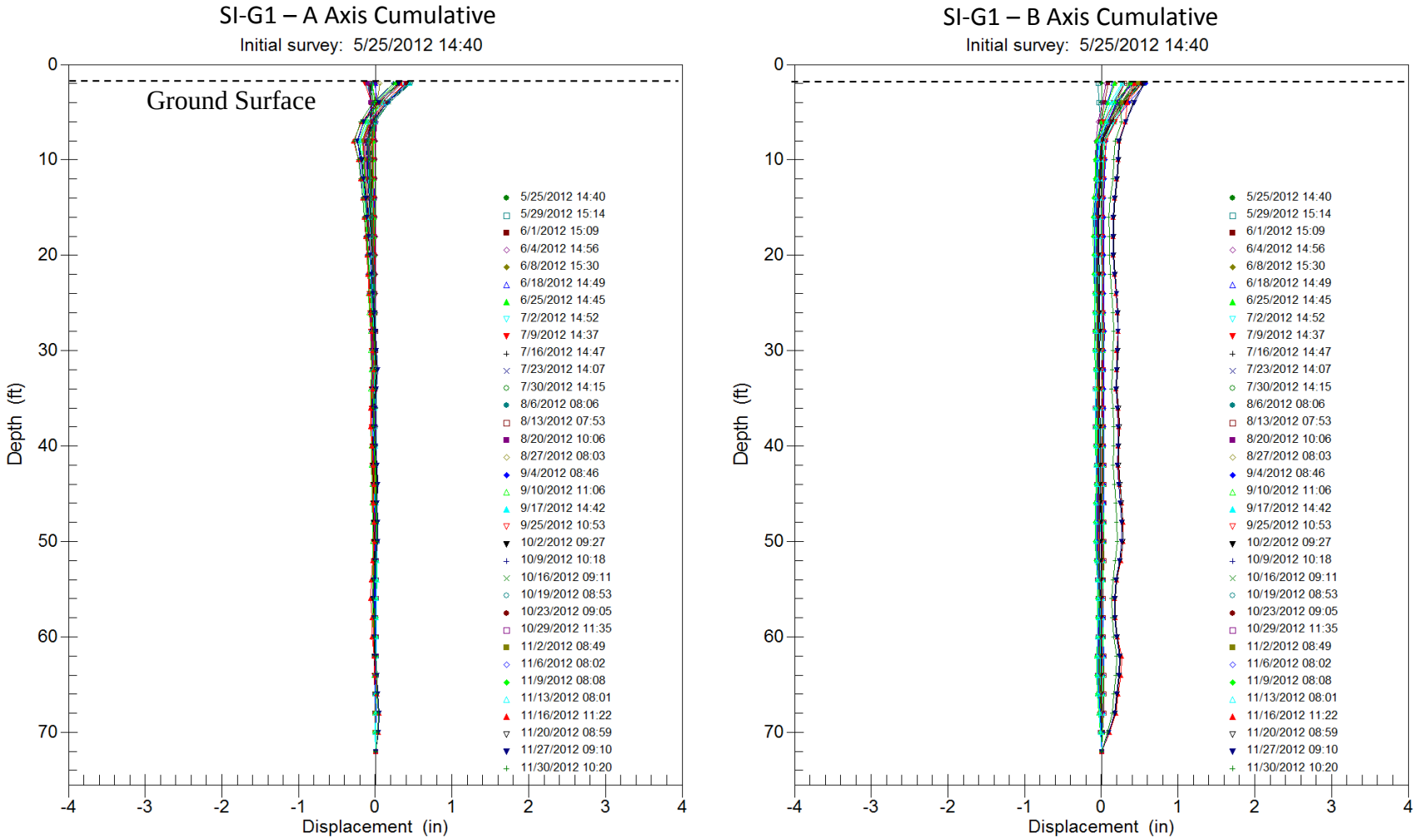


Figure 3b. Readings from manual inclinometer SI-G1 (after extension)

(Data through November 30, 2012; Initial reading on May 25, 2012; Abandoned on March 14, 2013)

Notes: (1) The inclinometer data were plotted on selected dates between the initial and last readings; (2) The "A" axis is perpendicular to the Phase I and II boundary and positive toward Phase II; (3) The readings between 11/20/2012 and 11/30/2012 were taken with a different probe.

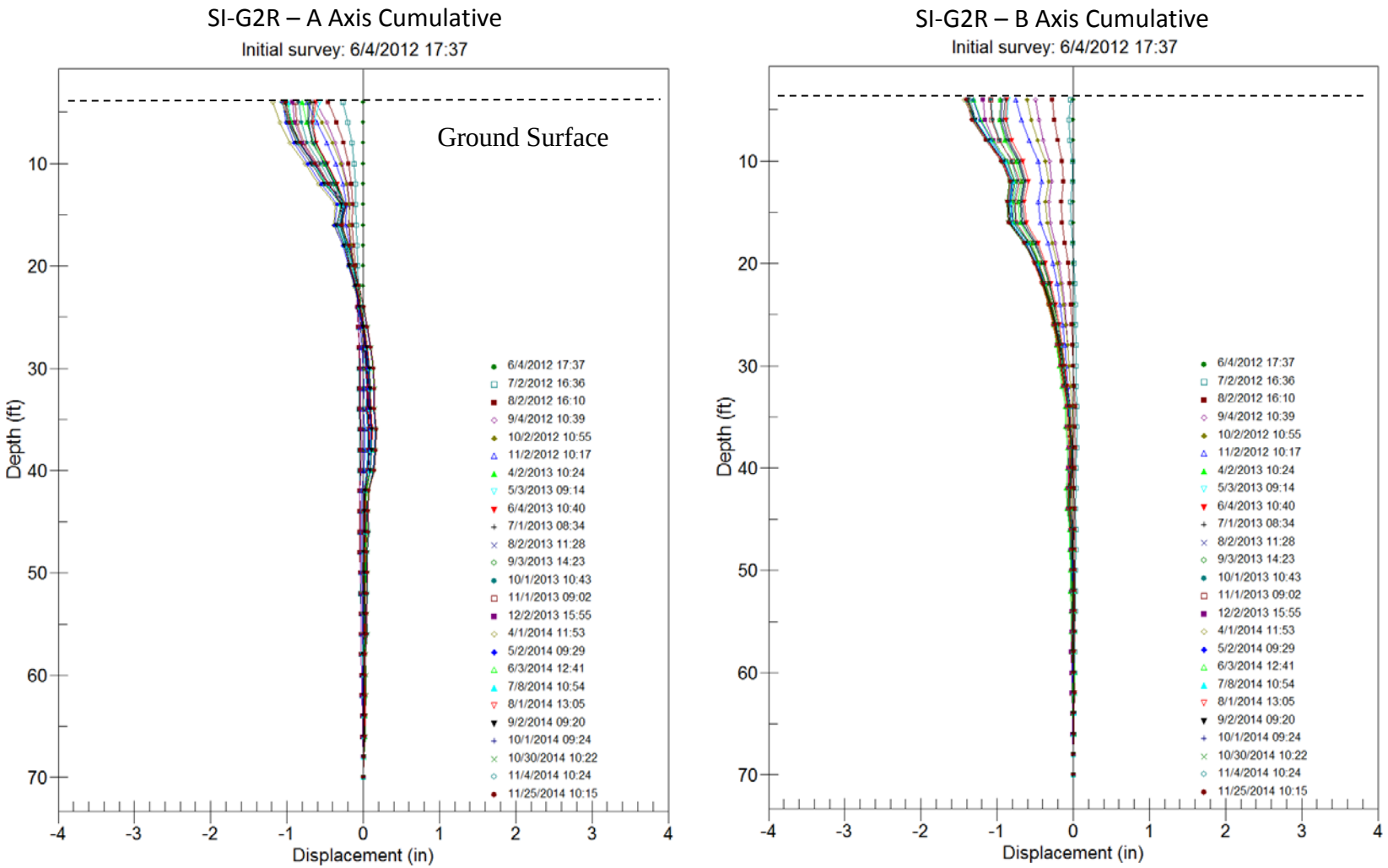


Figure 4. Readings from manual inclinometer SI-G2R (Data through November 25, 2014; Initial reading on June 04, 2012)

Notes: (1) Inclinometer SI-G2R was installed in the week of May 21, 2012 to replace inclinometer SI-G2 that was damaged during the liner construction; (2) The inclinometer data were plotted on selected dates between the initial and last readings; (3) The "A" axis is perpendicular to the Phase I and III boundary and positive toward Phase III.

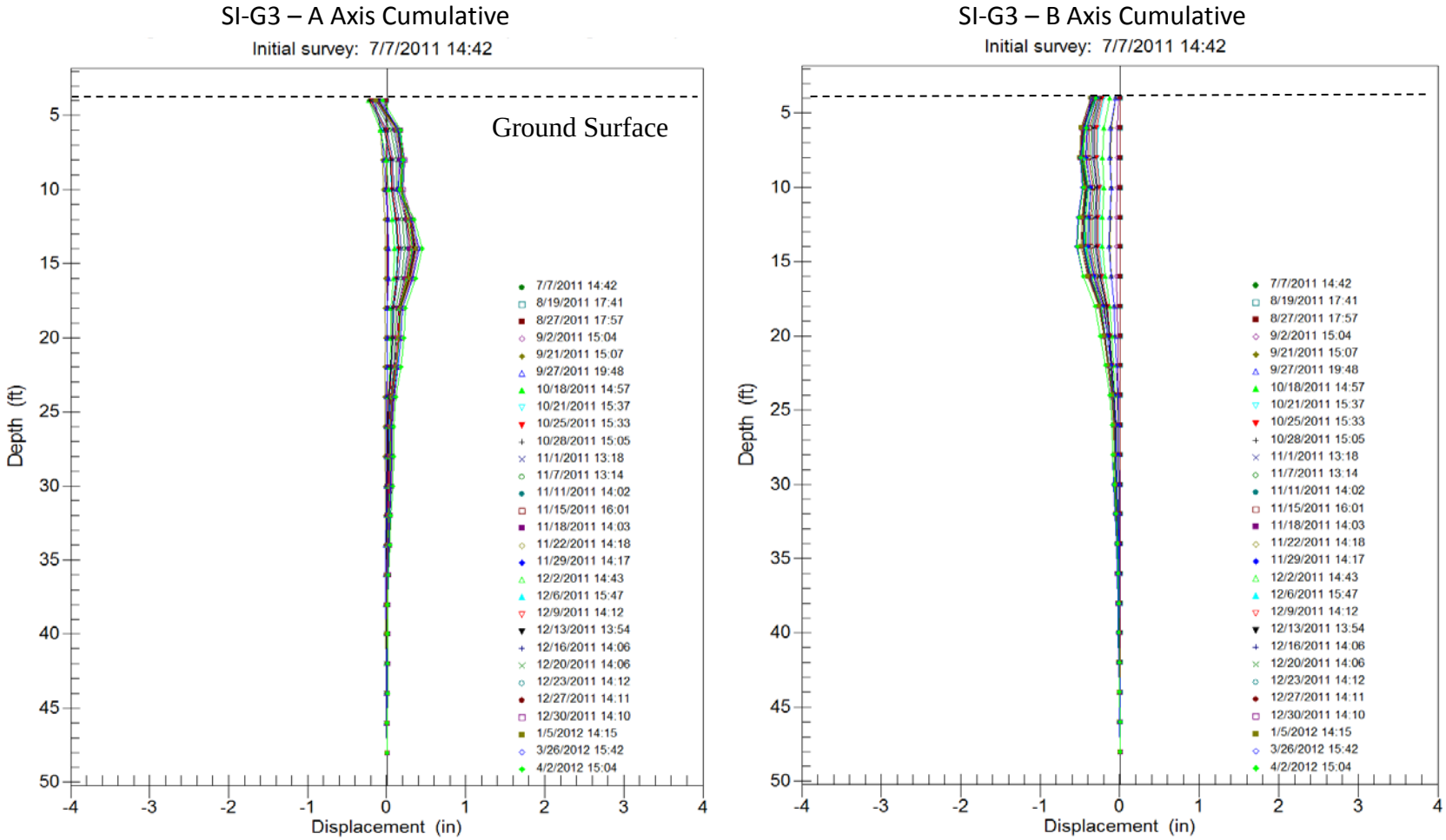


Figure 5a. Readings from manual inclinometer SI-G3 (before extension)
(Data through April 2, 2012; Initial reading on July 7, 2011)

Notes: (1) Inclinometer SI-G3 was extended by approximately 10 ft in the week of April 9, 2012 and backfilled on May 11, 2012; (2) The inclinometer data were plotted on selected dates between the initial and last readings; (3) The "A" axis is perpendicular to the Phase I boundary and positive toward Phase I.

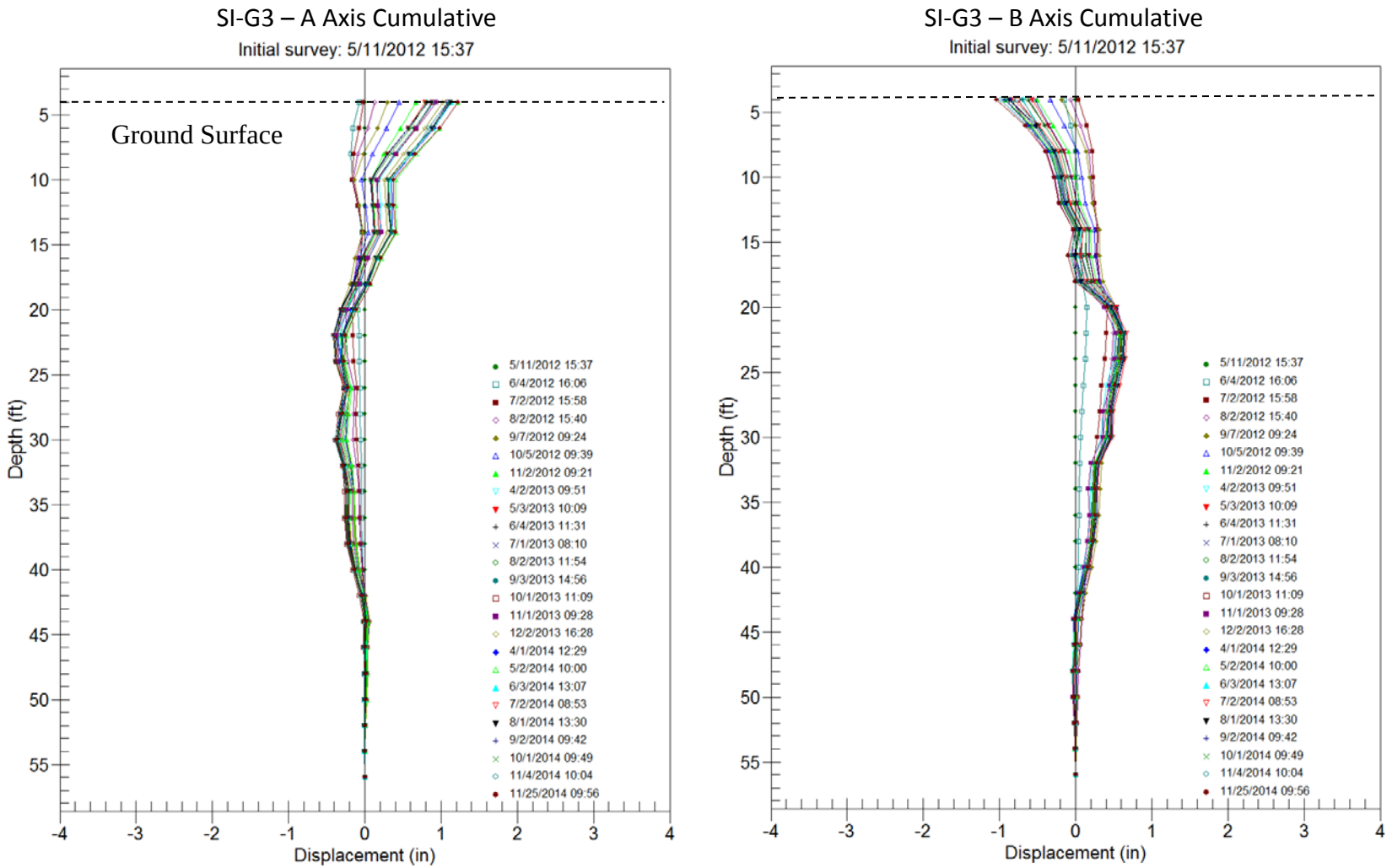


Figure 5b. Readings from manual inclinometer SI-G3 (after extension)
(Data through November 25, 2014; Initial reading on May 11, 2012)

Notes: (1) The inclinometer data were plotted on selected dates between the initial and last readings; (2) The "A" axis is perpendicular to the Phase I boundary and positive toward Phase I.

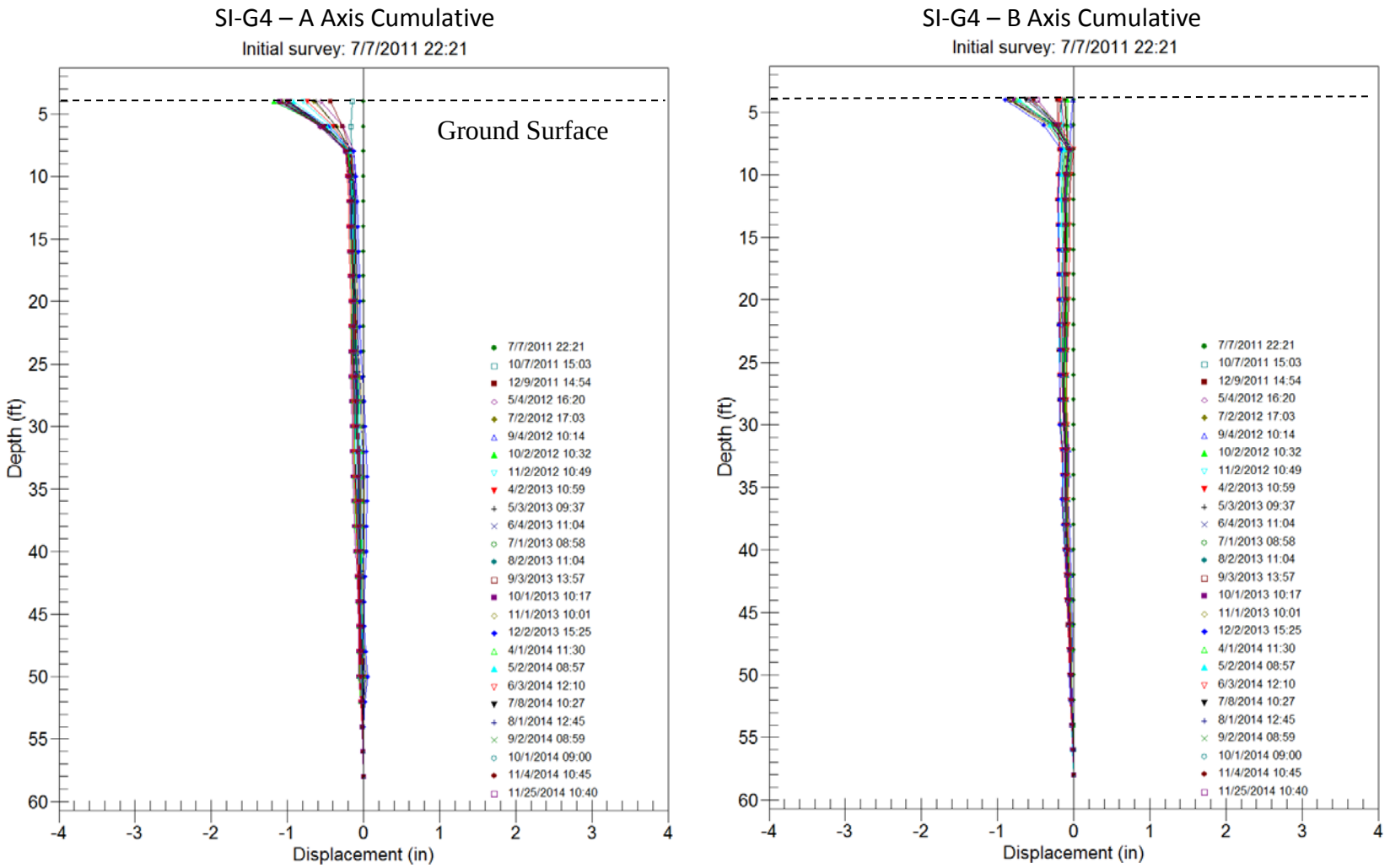


Figure 6. Readings from manual inclinometer SI-G4
(Data through November 25, 2014; Initial reading on July 07, 2011)

Notes: (1) The inclinometer data were plotted on selected dates between the initial and last readings; (2) The "A" axis is perpendicular to the Phase III boundary and positive away from Phase III.

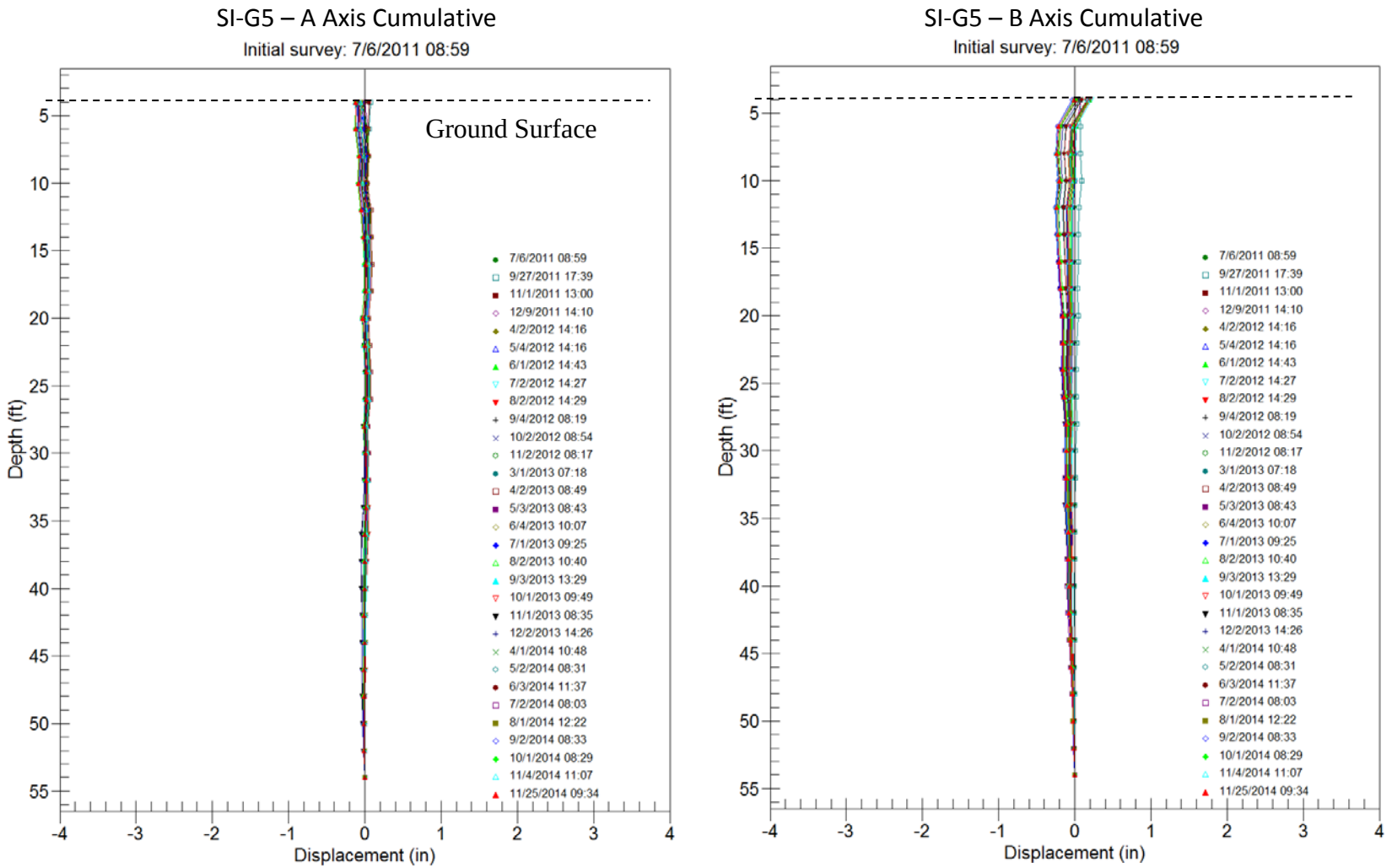


Figure 7. Readings from manual inclinometer SI-G5
(Data through November 25, 2014; Initial reading on July 06, 2011)

Notes: (1) The inclinometer data were plotted on selected dates between the initial and last readings; (2) The "A" axis is perpendicular to the Phase II boundary and positive away from Phase II.

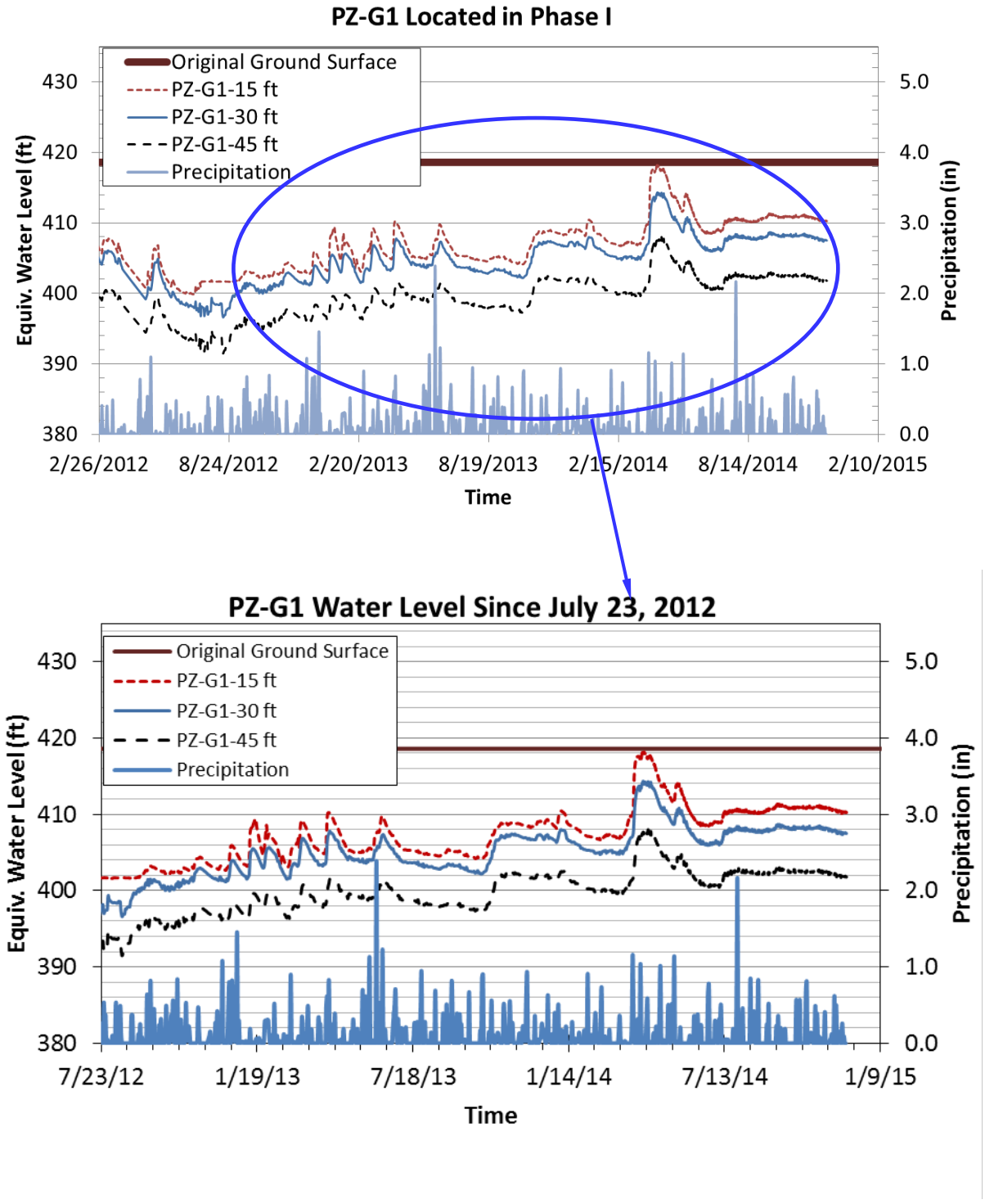


Figure 8a. Piezometer data from PZ-G1 in Phase I
(Data through November 30, 2014; See Table 1 for general timeline of geotextile tube filling)

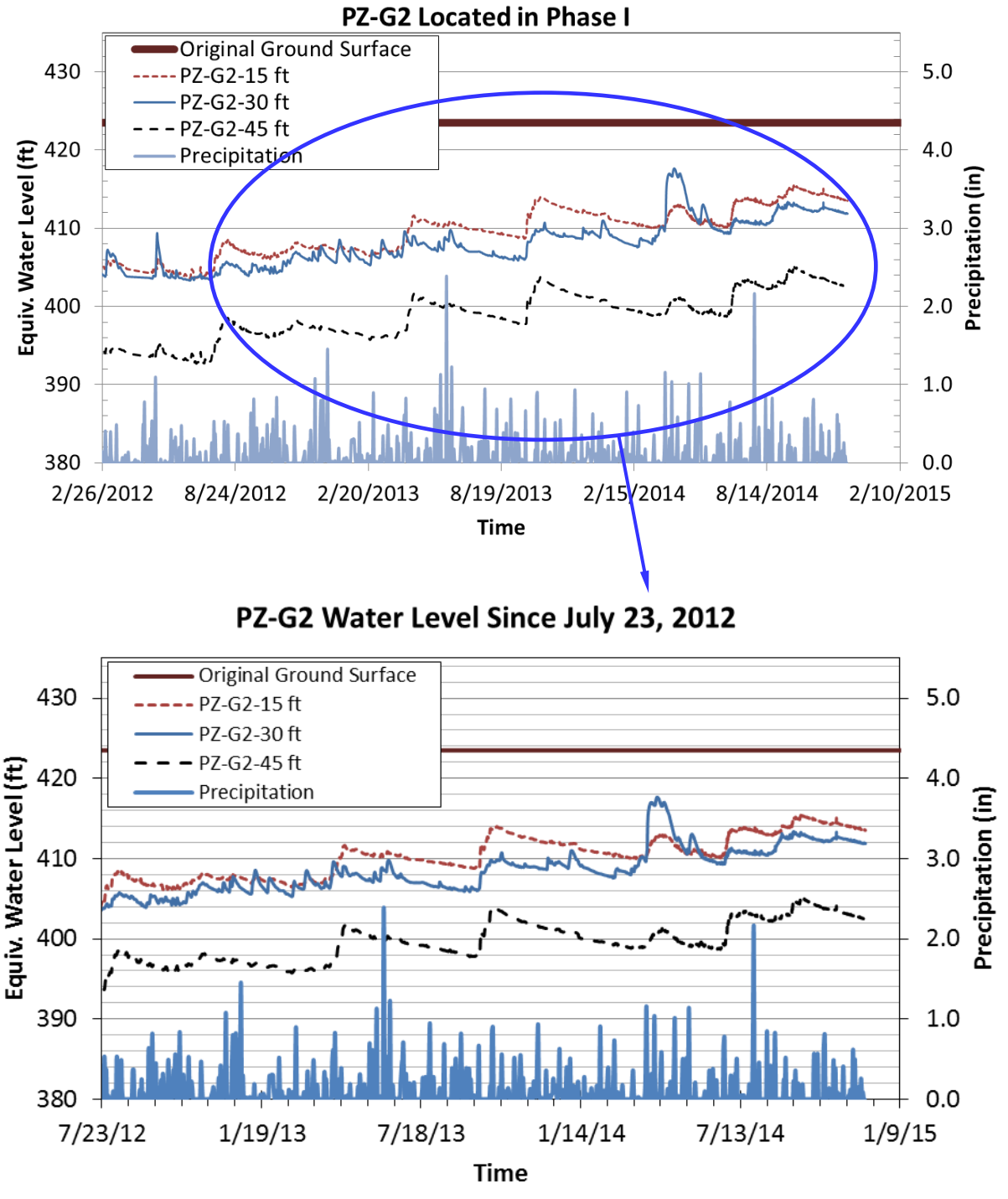


Figure 8b. Piezometer data from PZ-G2 in Phase I
(Data through November 30, 2014; See Table 1 for general timeline of geotextile tube filling)

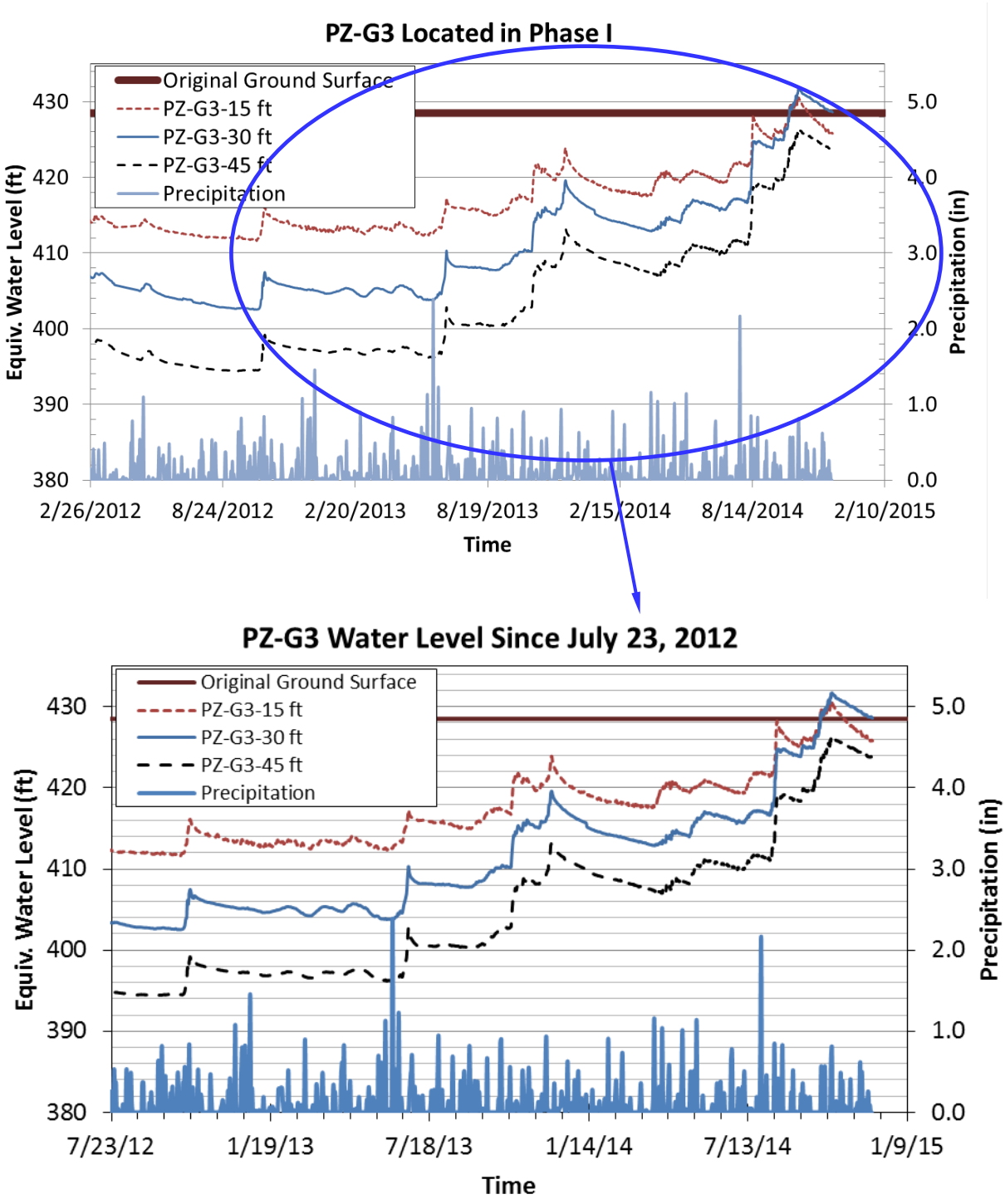


Figure 8c. Piezometer data from PZ-G3 in Phase I
(Data through November 30, 2014; See Table 1 for general timeline of geotextile tube filling)

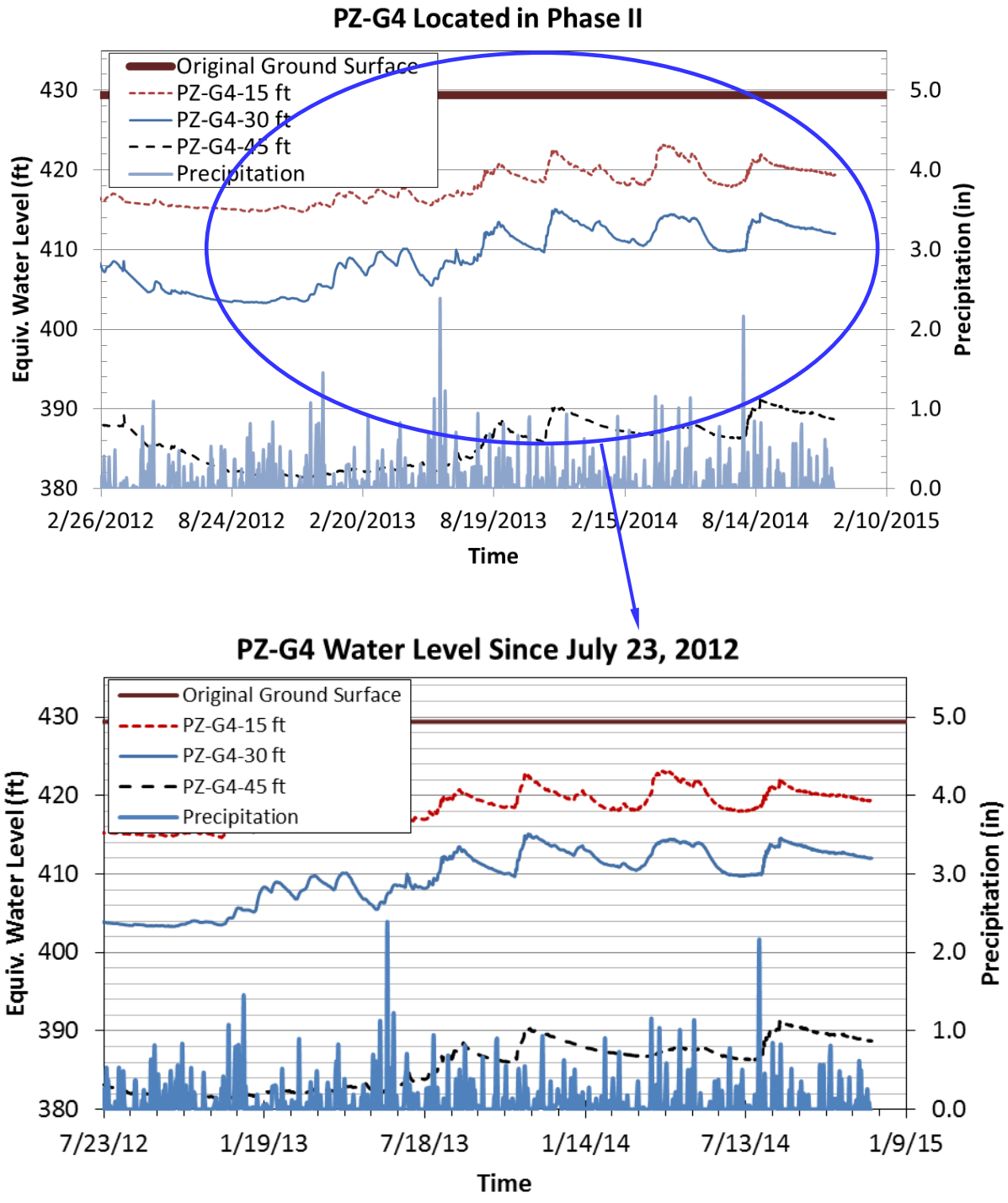


Figure 9a. Piezometer data from PZ-G4 in Phase II
(Data through November 30, 2014; See Table 1 for general timeline of geotextile tube filling)

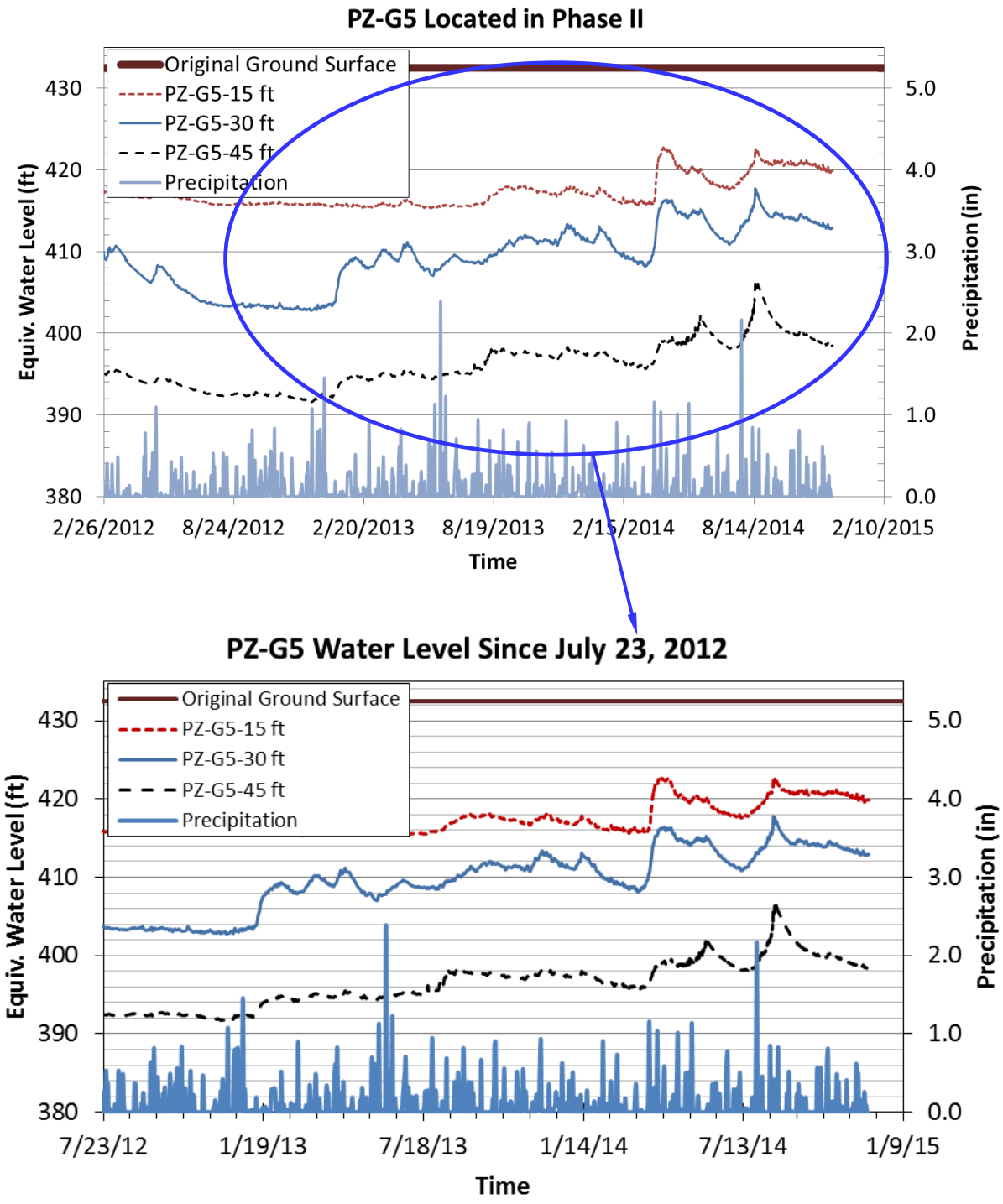
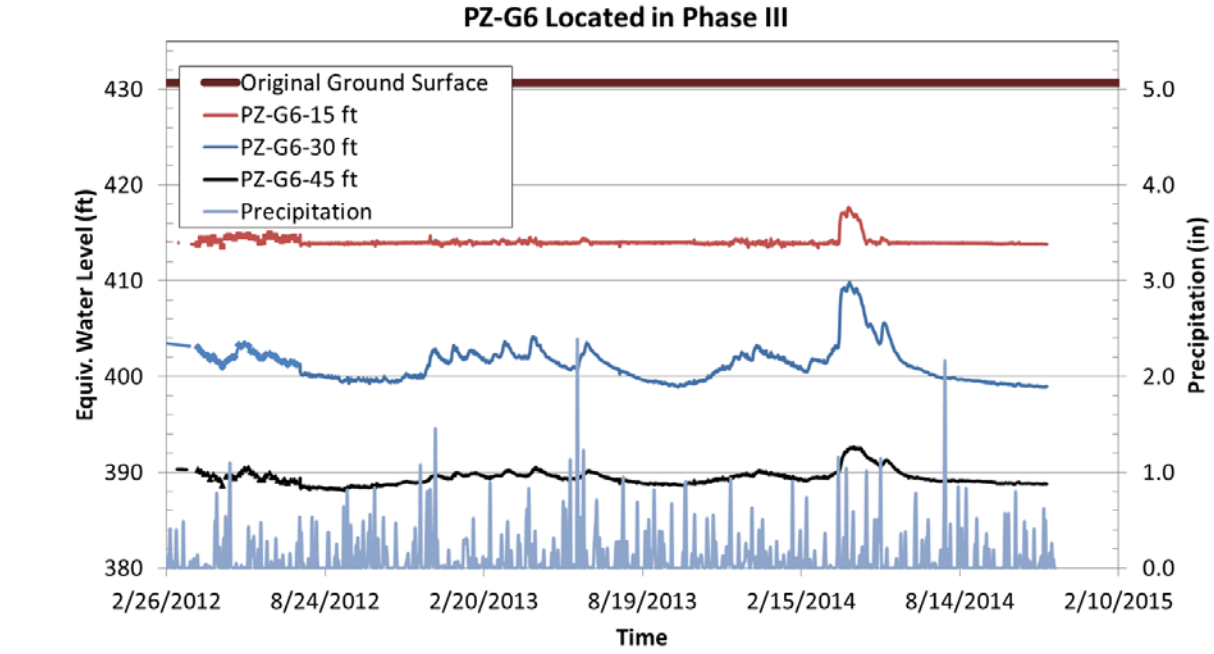


Figure 9b. Piezometer data from PZ-G5 in Phase II
(Data through November 30, 2014; See Table 1 for general timeline of geotextile tube filling)



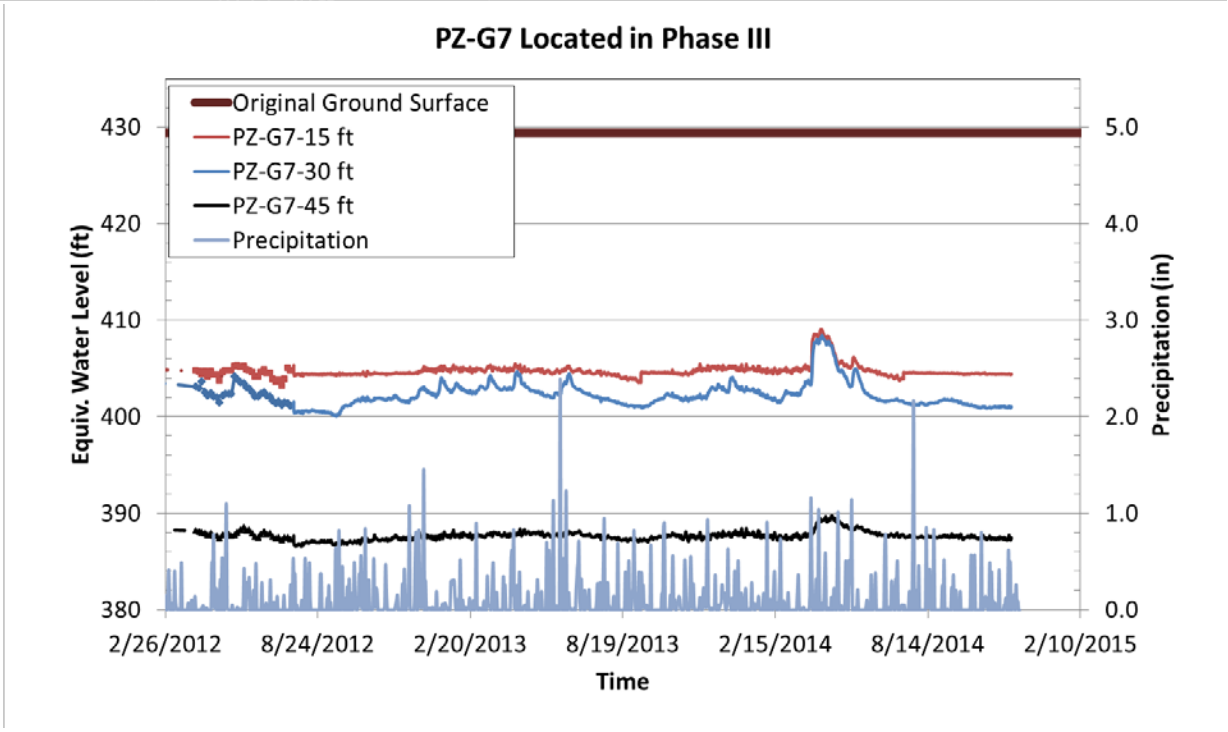


Figure 10. Piezometer data from PZ-G6 and PZ-G7 in Phase III
(Data through November 30, 2014)

Notes: (1) The data were collected manually before July 29, 2012 and automatically thereafter.
(2) No manual monitoring was performed between January 05, 2012 and April 04, 2012, when there was no construction on the site.

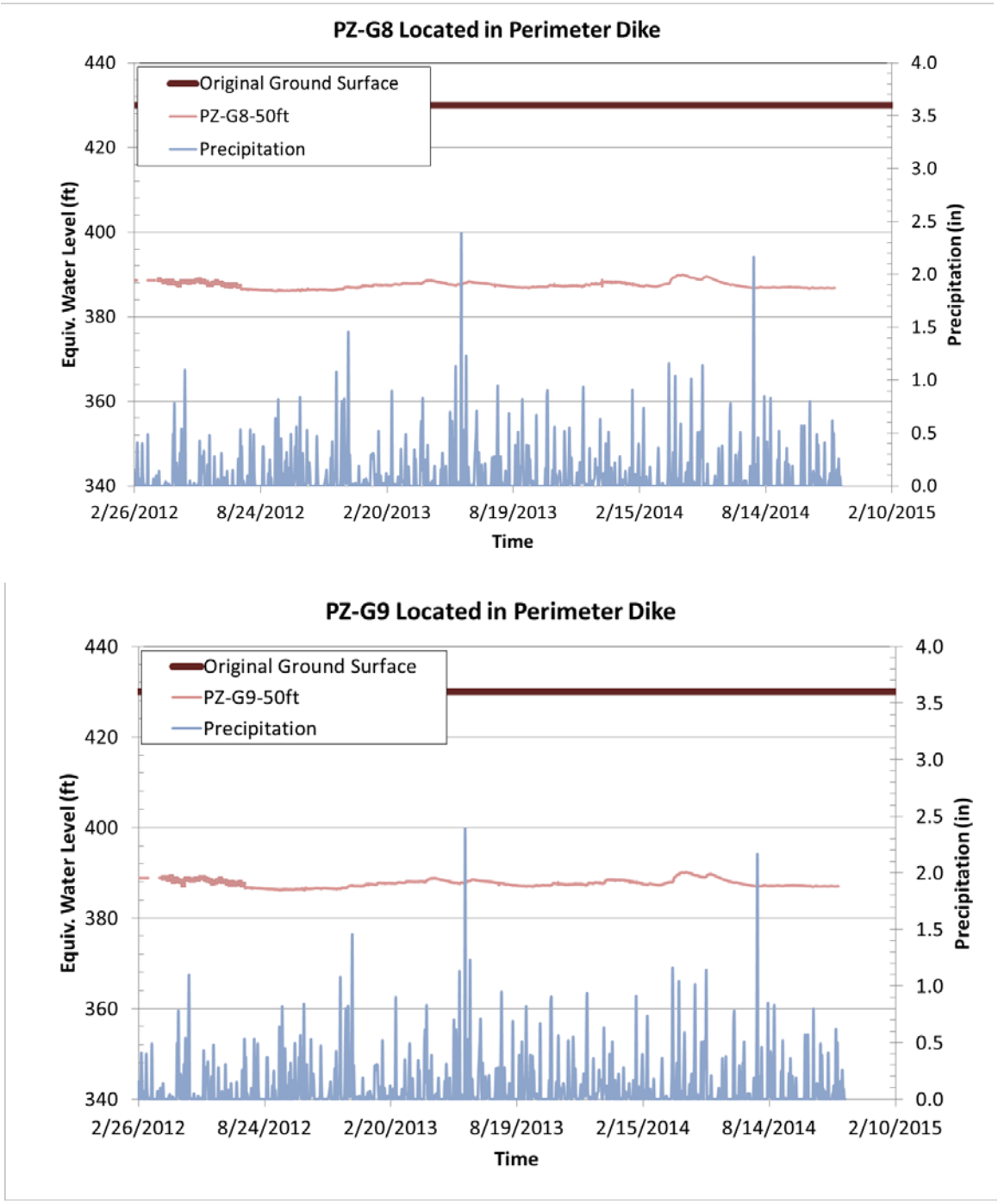


Figure 11. Piezometer data from PZ-G8 and PZ-G9 in Northern Perimeter Dike of WB-13 (Data through November 30, 2014)

Notes: (1) The data were collected manually before July 29, 2012 and automatically thereafter.
(2) No manual monitoring was performed between January 05, 2012 and April 06, 2012, when there was no construction on the site.

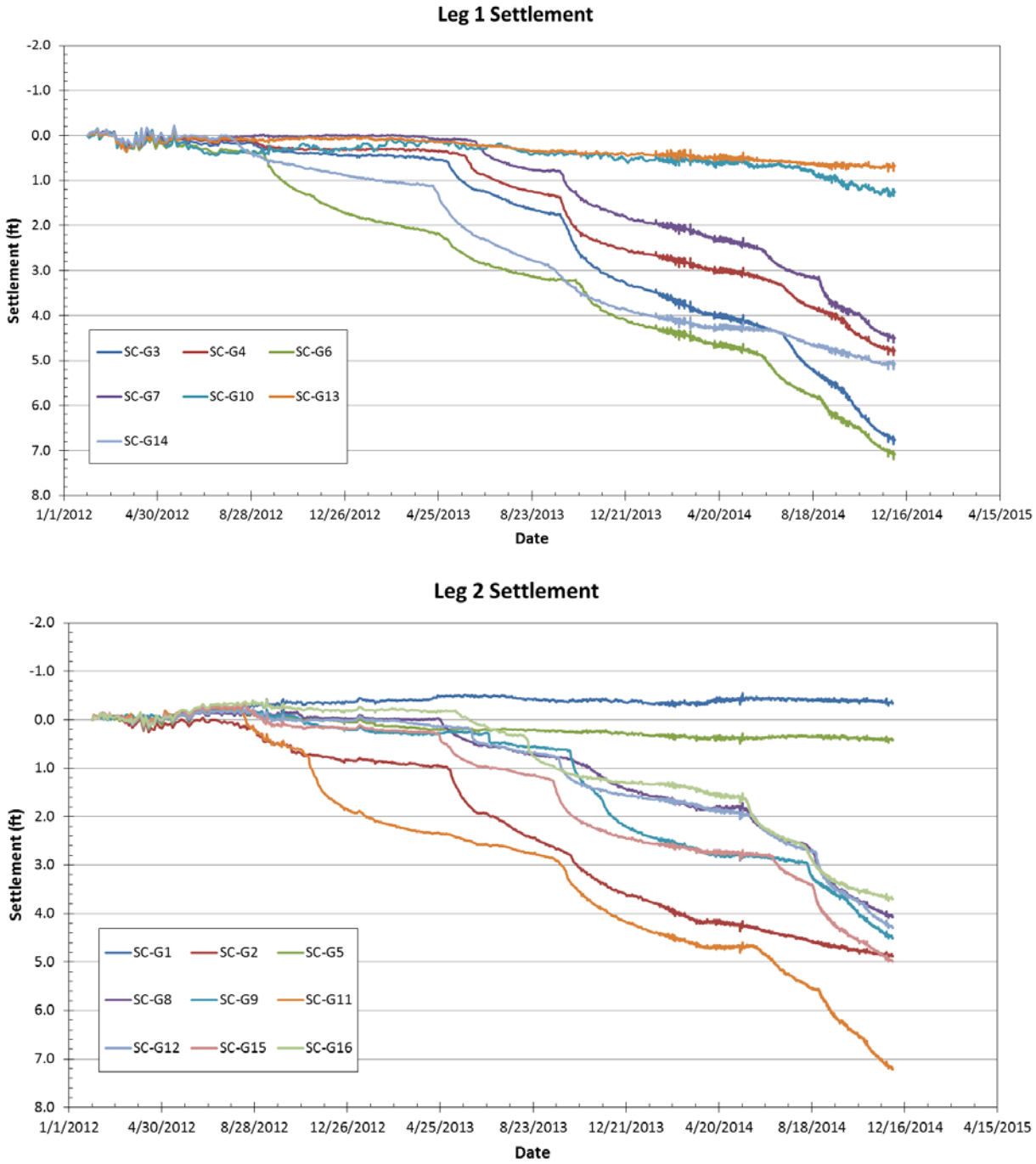
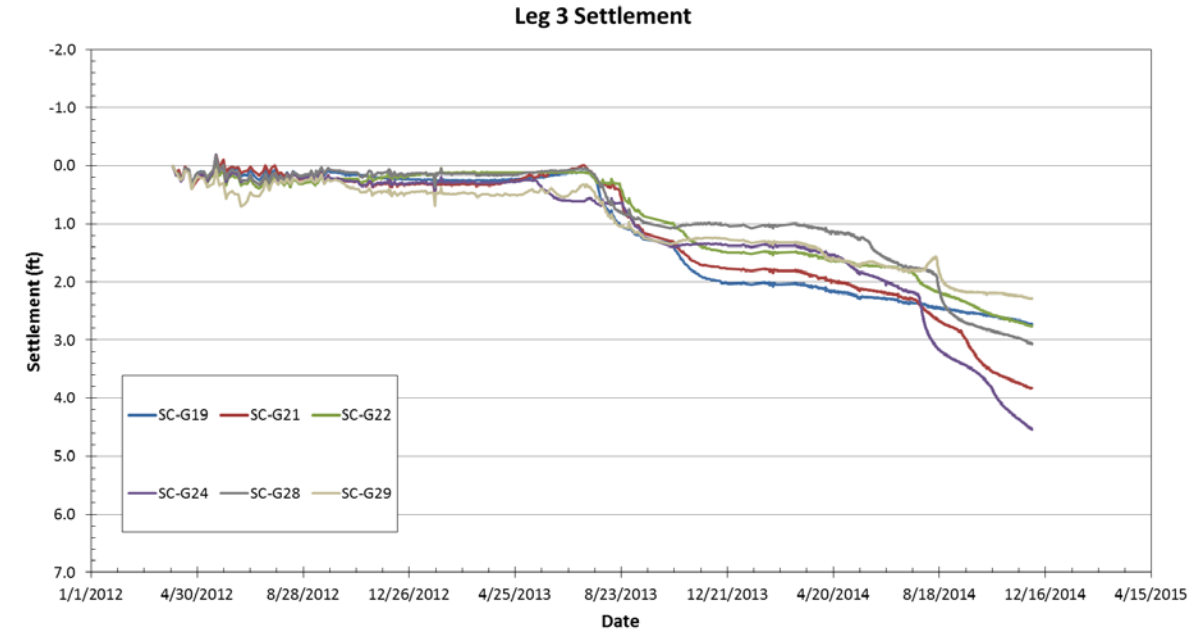


Figure 12. Settlement cell data in Phase I

(Data between January 31, 2012 and November 30, 2014 for Legs 1 and 2)

Notes: (1) The data from Legs 1 and 2 were corrected using the "control" settlement cells as described in the text; (2) The settlement cell data were corrected for temperature impact as described in the Data Summary Memorandum dated September 12, 2012.



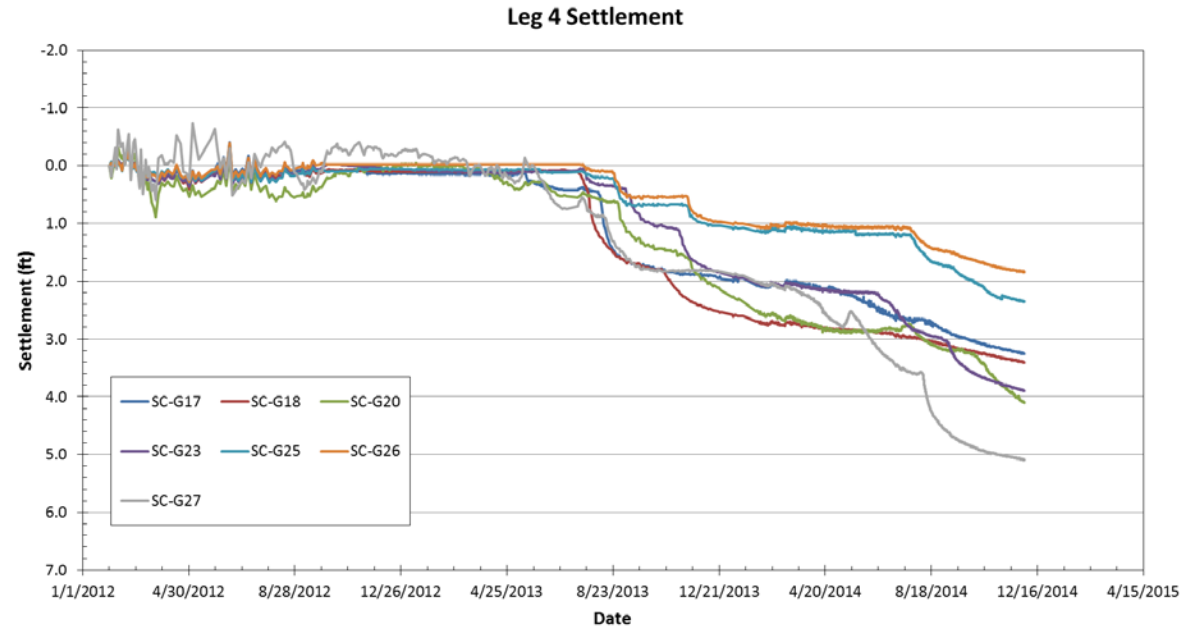


Figure 13. Settlement cell data in Phase II
(Data between January 1, 2012 and November 30, 2014 for Leg 3;
Data between April 2, 2012 and November 30, 2014 for Leg 4)

Notes: (1) The data from Legs 3 and 4 were corrected using "unaffected" settlement cells through July 1, 2013; (2) The data from Leg 3 and Leg 4 were corrected using a "control" settlement cell thereafter; (3) The settlement cell data were corrected for temperature impact as described in the Data Summary Memorandum dated September 12, 2012; (4) The data gap in Leg 3 between September 19 and October 15, 2013 was due to air bubbles in the hydraulic line.

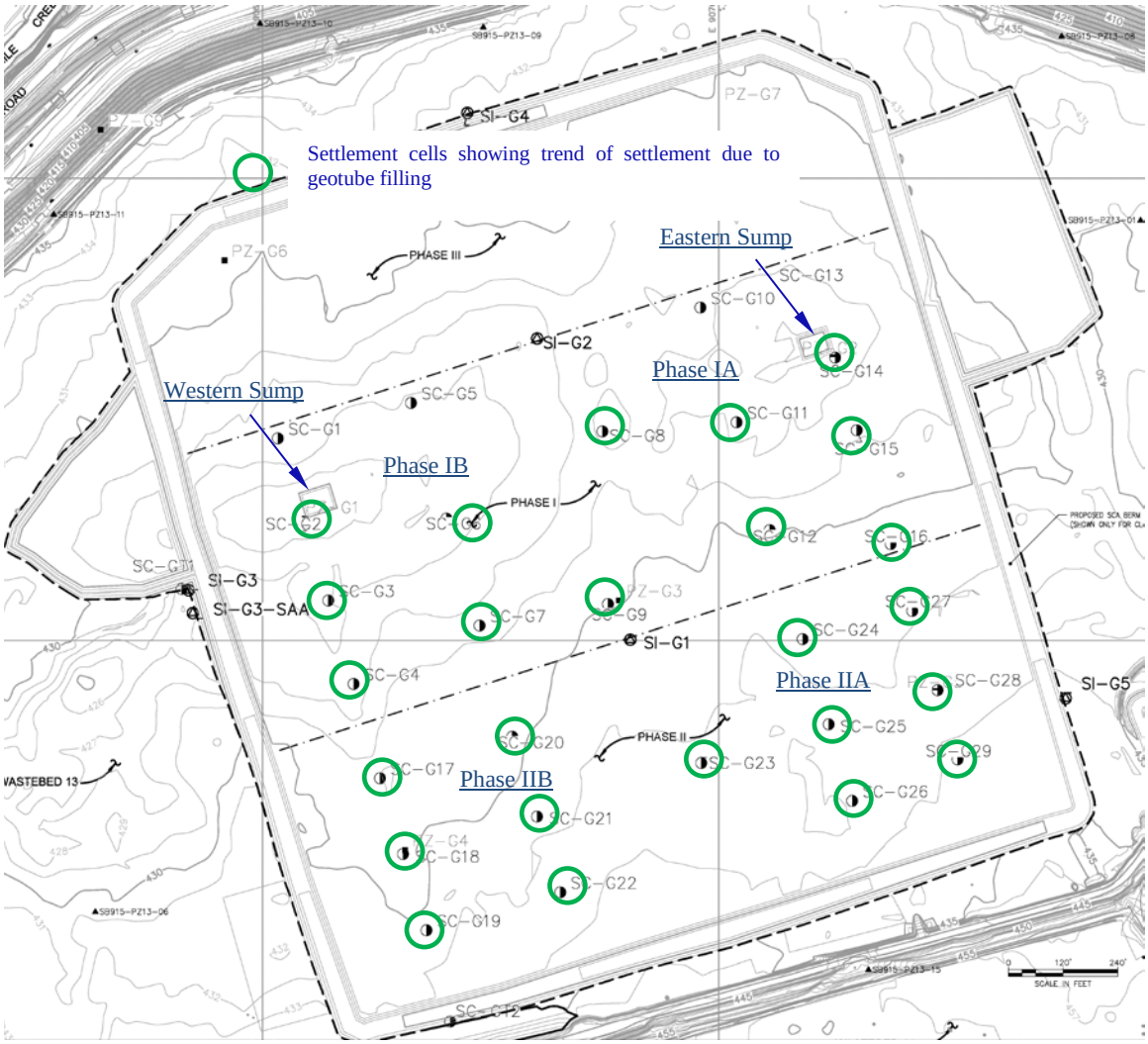


Figure 14. Locations of settlement cells affected by loading from geotextile tubes (as of November 30, 2014)

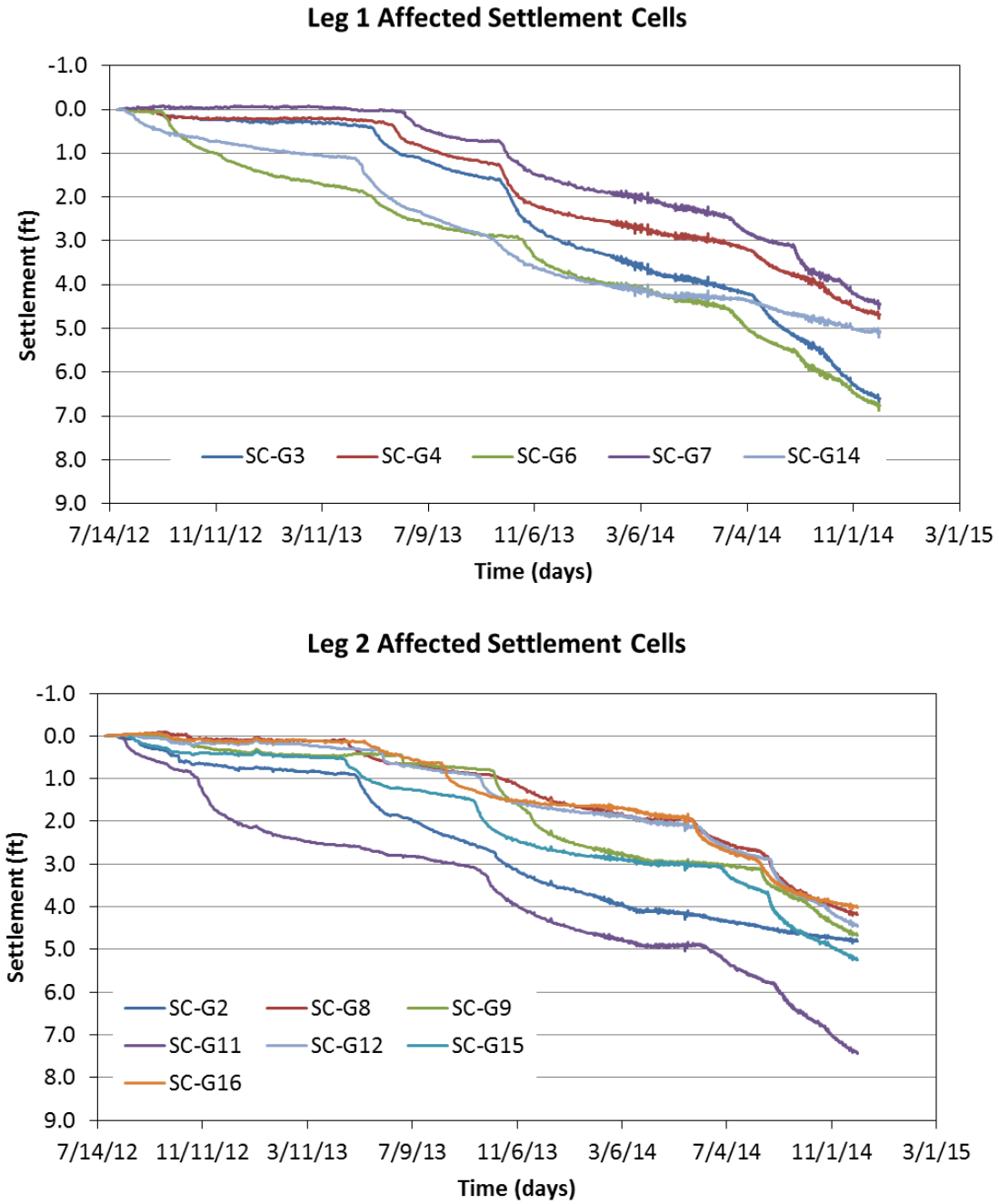


Figure 15a. Measured settlement due to geotextile tubes in Phase I
(Data between July 23, 2012 and November 30, 2014)

Notes: (1) Leg 1 readings were corrected by the periodic readings (i.e., twice a week or daily) from the "control" settlement cell SC-GT1(2) until the end of September and the hourly readings since October 4, 2012; (2) Leg 2 readings were corrected using the "unaffected" settlement cell SC-G9 until October 4, 2012 and using the "control" settlement cell SC-GT1(1) thereafter.

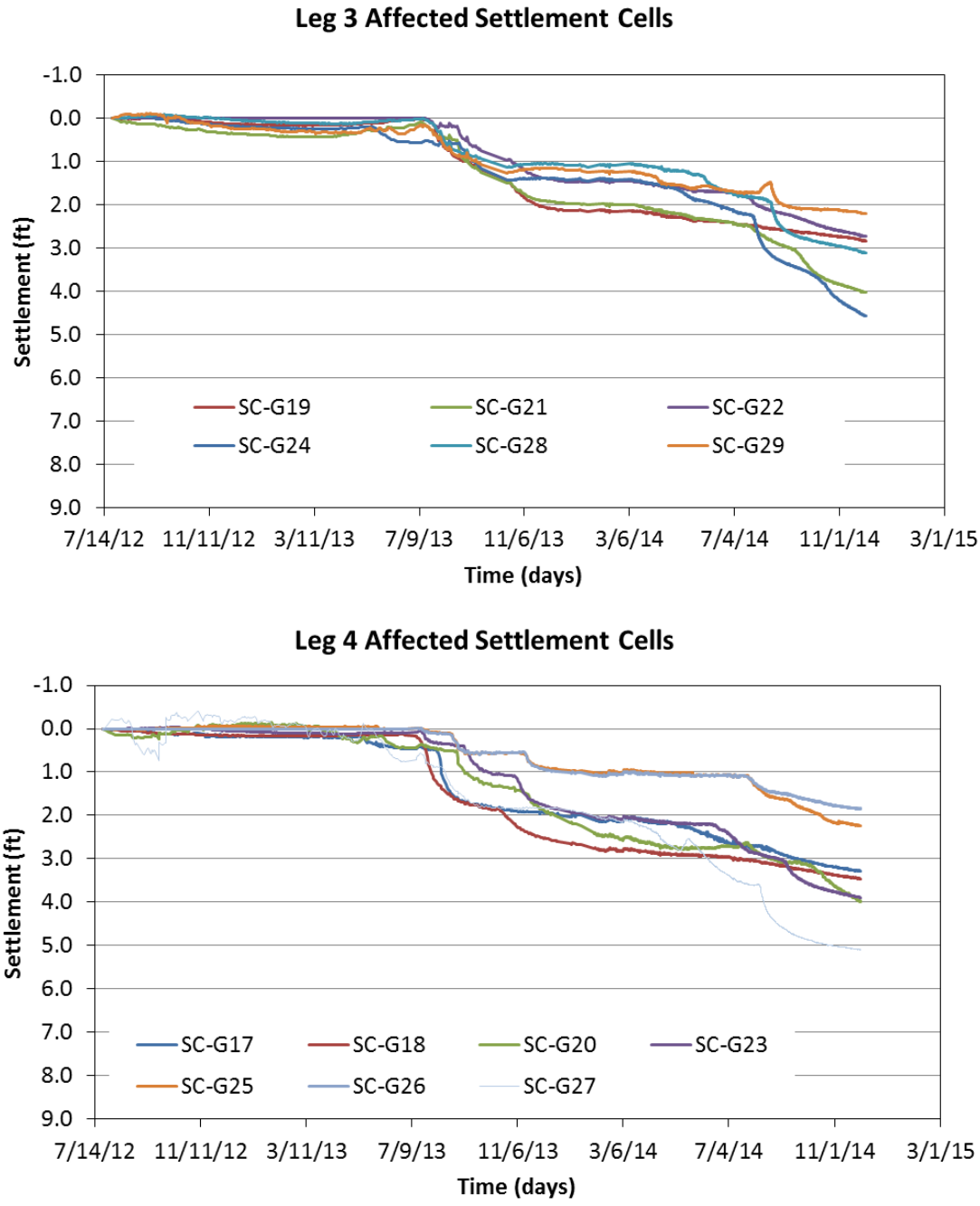


Figure 15b. Measured settlement due to geotextile tubes in Phase II
(Data between July 23, 2012 and November 30, 2014)

Notes: (1) Leg 3 readings were corrected using the "unaffected" settlement cell SC-G22 through July 1, 2013 and using the "control" settlement cell after October 16, 2013; (2) Leg 4 readings were corrected using the "unaffected" settlement cell SC-G26 through July 1, 2013 and using the "control" settlement cell thereafter; (3) The data gap in Leg 3 between September 19 and October 15, 2013 was due to air bubbles in the hydraulic line.

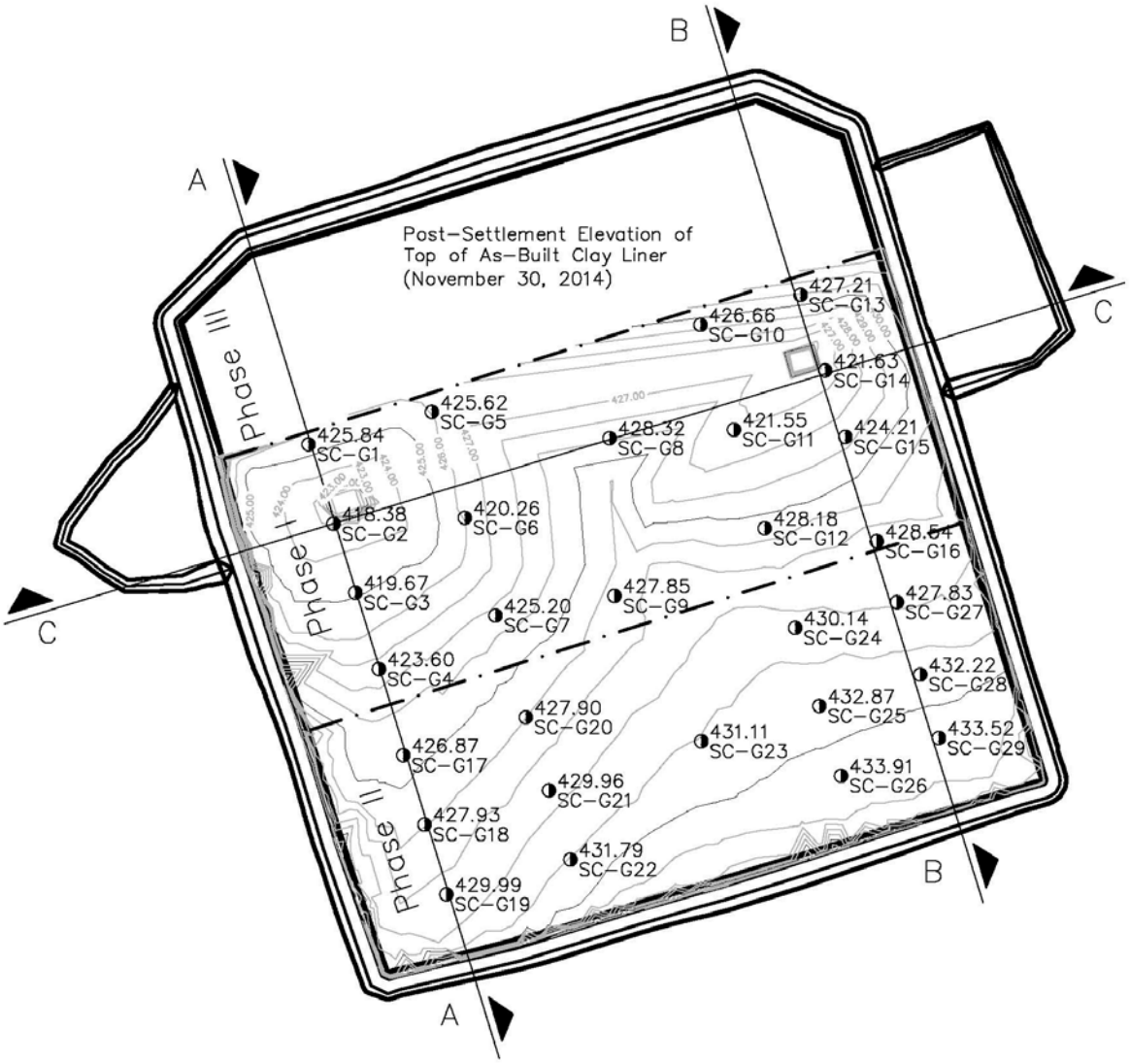


Figure 16. Contours of as-built top of clay liner and post-settlement elevations of top of as-built clay liner at the locations of settlement cells (on November 30, 2014)

Notes:

1. The post-settlement elevations of the top of as-built clay liner at the locations of the settlement cells were calculated based on the as-built top of clay liner and measured settlement on November 30, 2014.
2. The as-built top of clay liner in Phase I was surveyed by Parsons on November 17, 2011 and provided to Geosyntec by Parsons.
3. The as-built top of clay liner in Phase II was surveyed by Parsons on June 21, 2012 and provided to Geosyntec by Parsons.

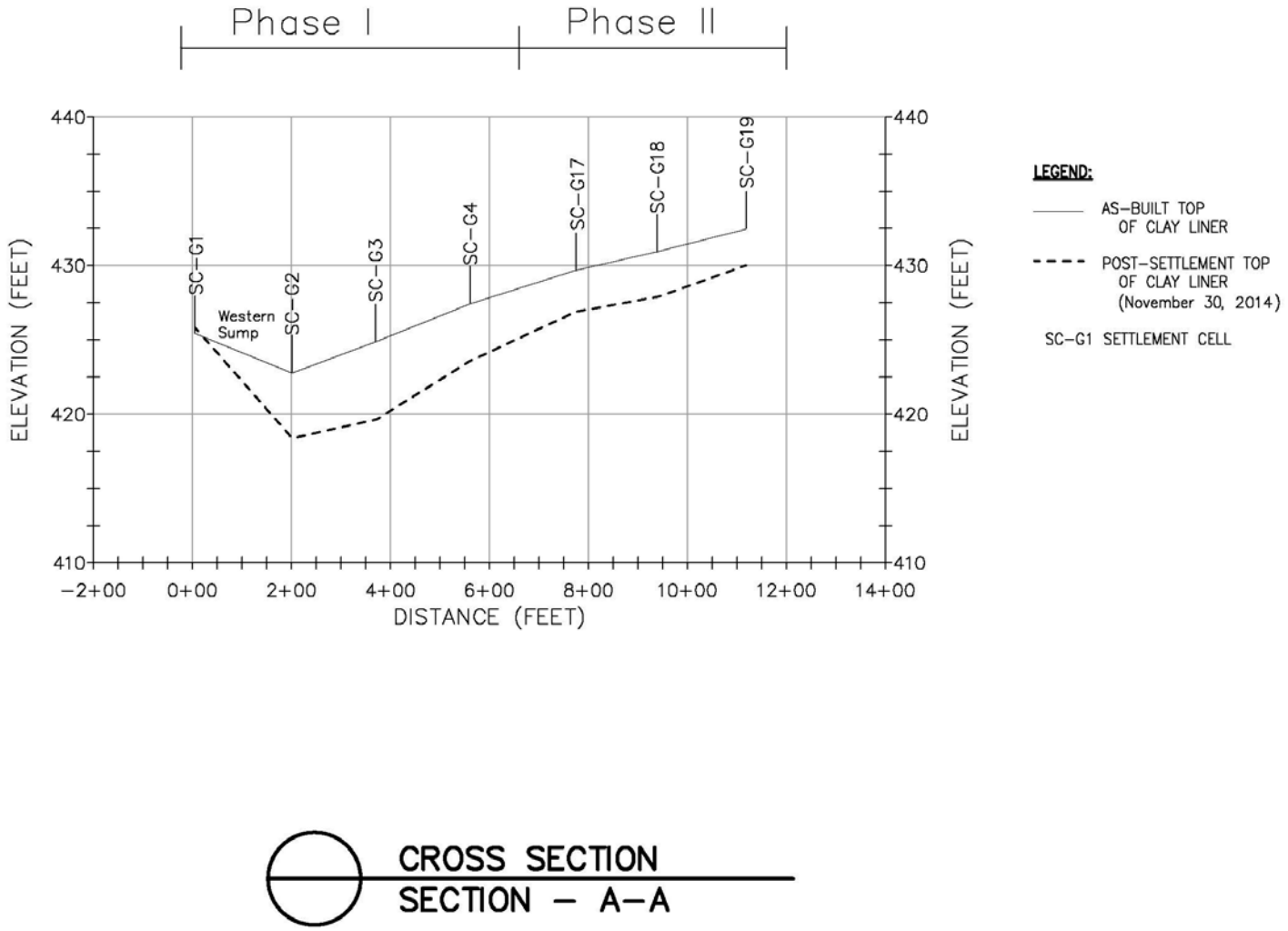


Figure 17. Cross-section A-A showing the as-built and post-settlement top of clay liner (on November 30, 2014)

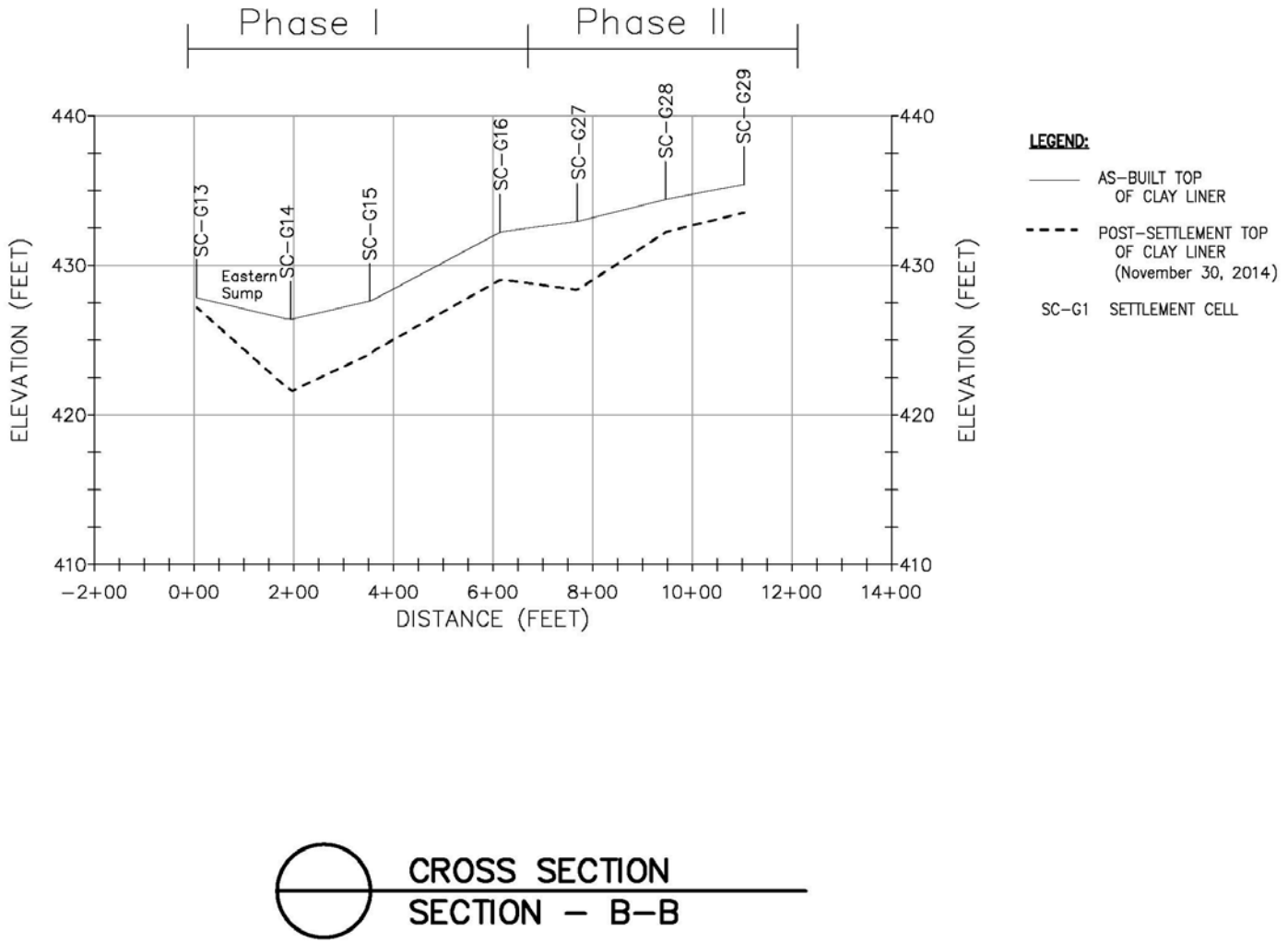


Figure 18. Cross-section B-B showing the as-built and post-settlement top of clay liner (on November 30, 2014)

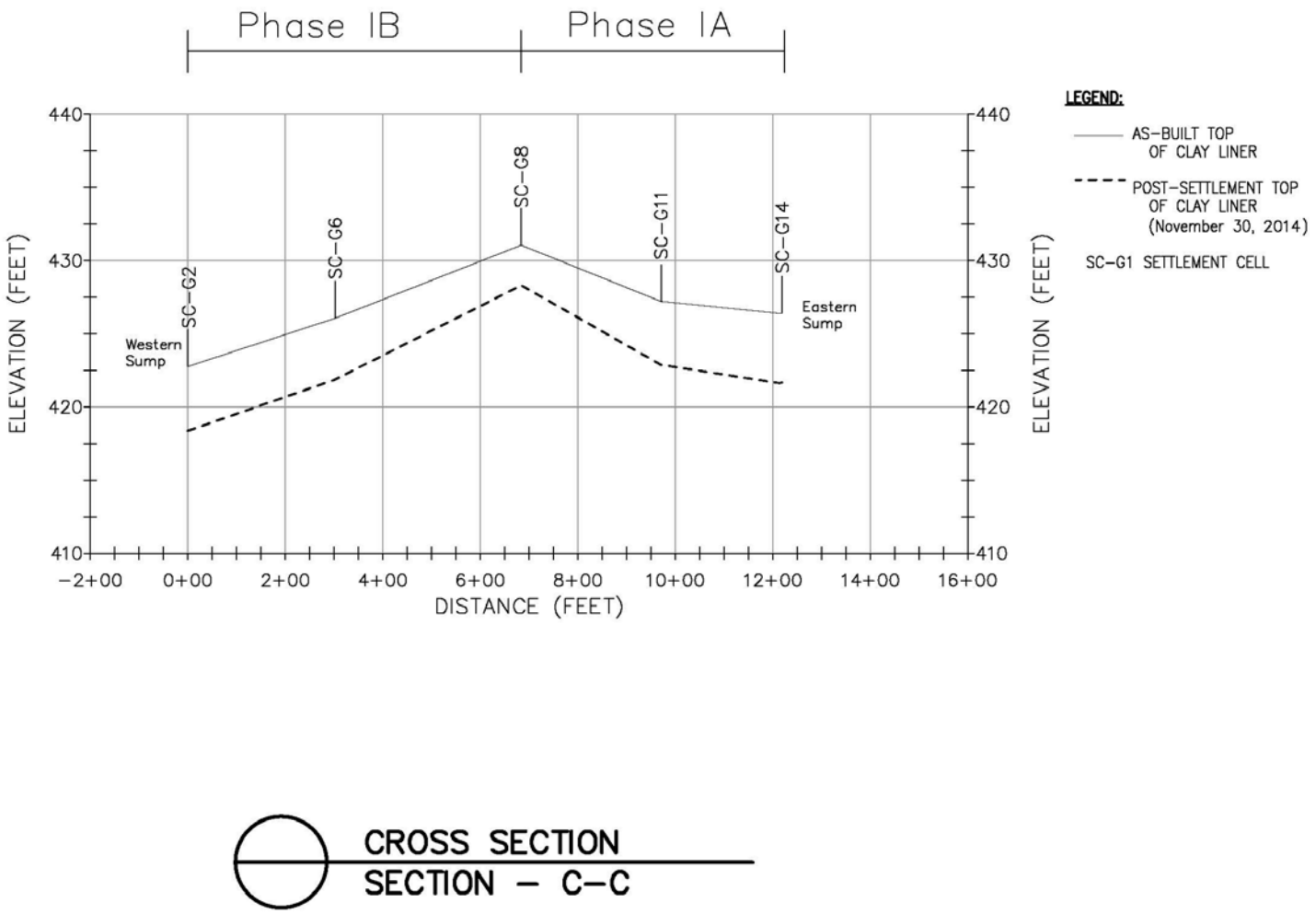


Figure 19. Cross-section C-C showing the as-built and post-settlement top of clay liner (on November 30, 2014)

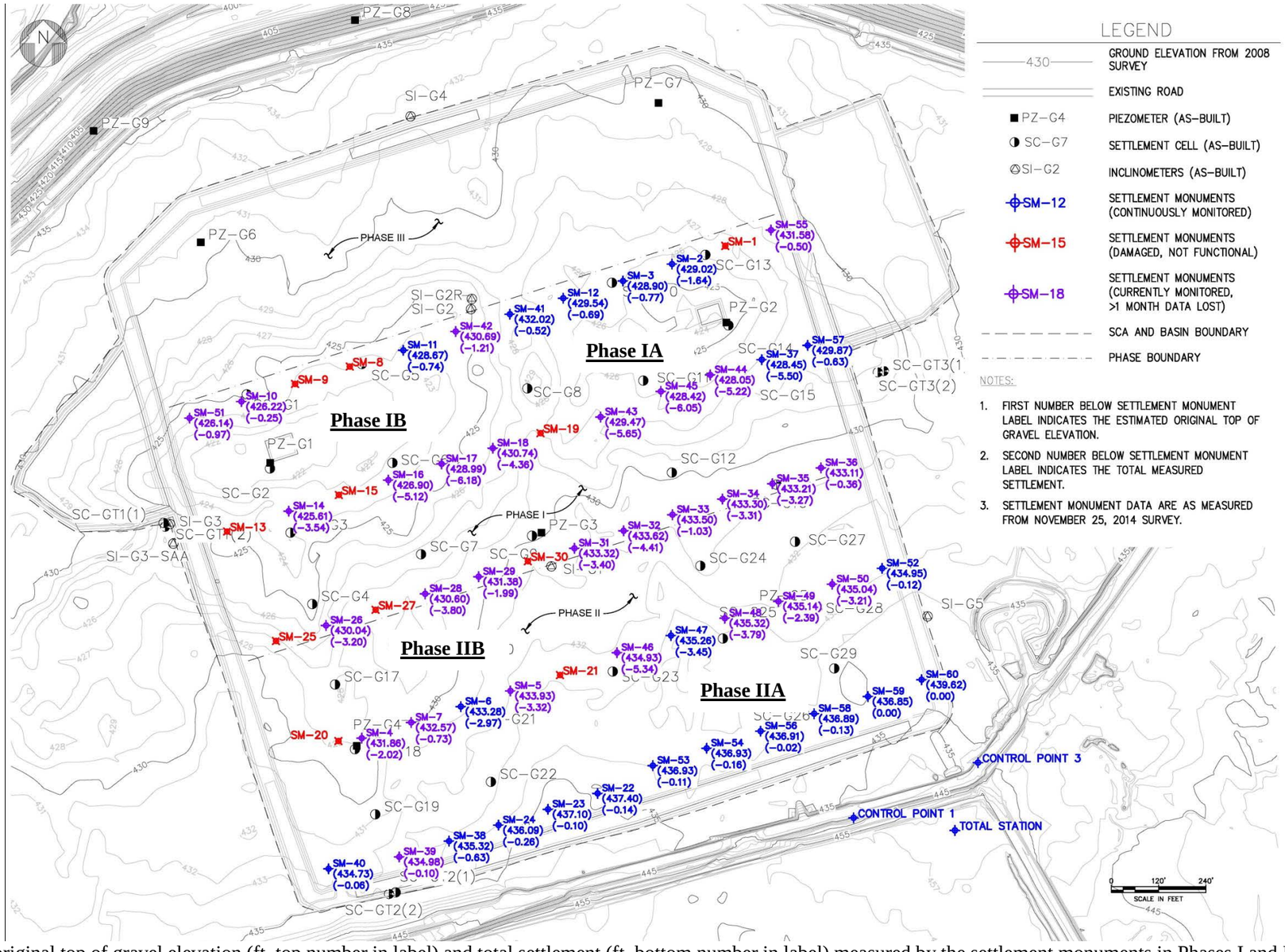


Figure 20a. Estimated original top of gravel elevation (ft, top number in label) and total settlement (ft, bottom number in label) measured by the settlement monuments in Phases I and II (as of November 25, 2014)

Notes: (1) Settlement in feet is shown in parentheses for each settlement monument; (2) the negative value stands for settlement and the positive value stands for heave; (3) SM-1, SM-8, SM-9, SM-13, SM-15, SM-19, SM-20, SM-21, SM-25, SM-27, and SM-30 are non-functional and were not monitored as of November 25, 2014; (4) SM-4, SM-5, SM-7, SM-10, SM-14, SM-16, SM-17, SM-18, SM-26, SM-28, SM-29, SM-31, SM-32, SM-33, SM-34, SM-35, SM-36, SM-39, SM-42, SM-43, SM-44, SM-45, SM-46, SM-48, SM-49, SM-50, SM-51, and SM-55 were damaged during operations and lost over one month of data, but have been repaired and are currently monitored.

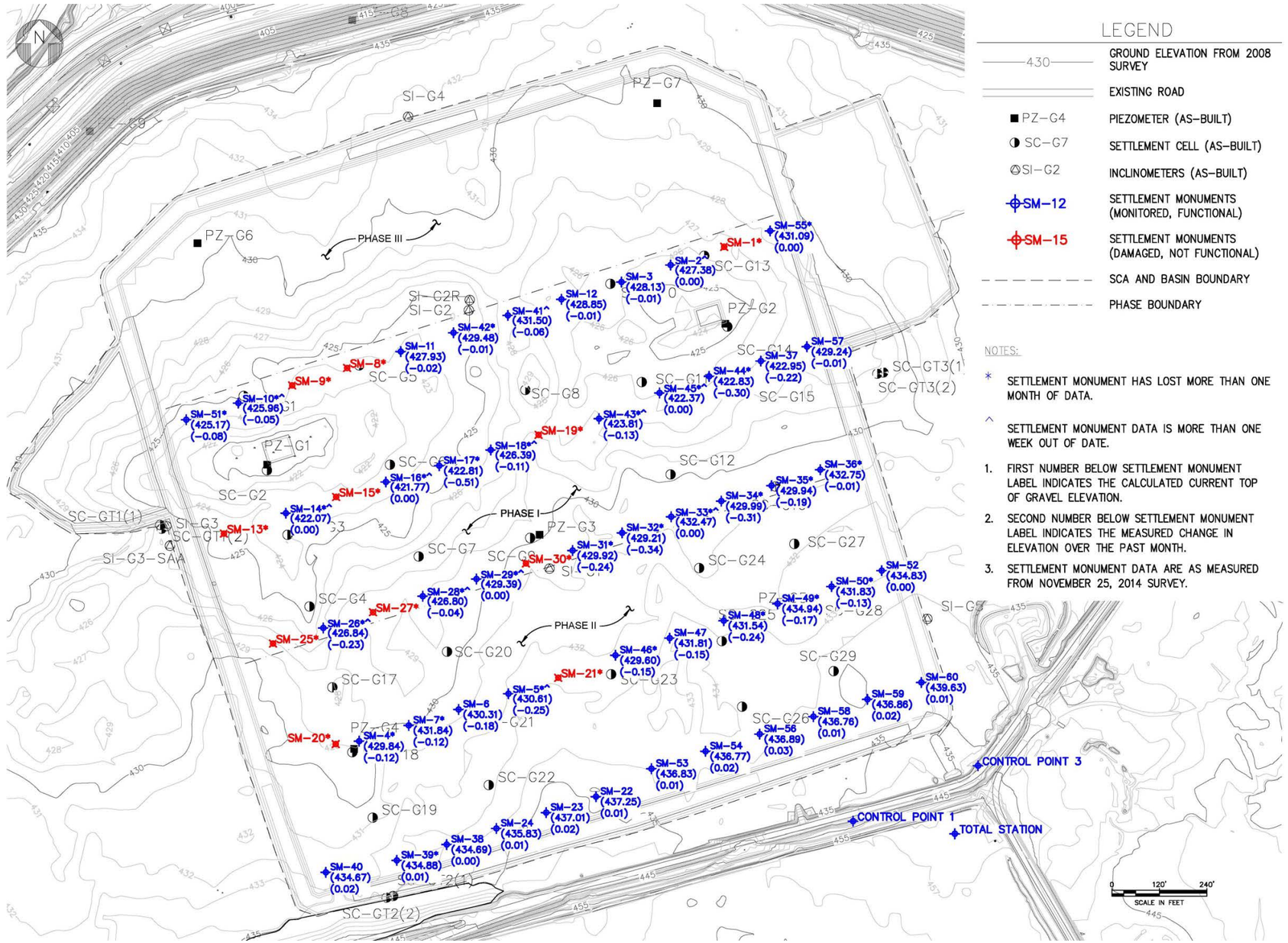


Figure 20b. Calculated post-settlement top of gravel elevations (ft, top number in label) and change in measured settlement over the past month (ft per month, bottom number in label) by the settlement monuments in Phases I and II (as of November 25, 2014)

Attachment A

Data collected from manual piezometers installed outside the SCA footprint (installed by Parsons and monitored by Geosyntec)

Piezometer Name	PZ Tip Elevation (ft)	PZ Depth (ft bgs)	Equivalent Water Elevation (ft)																				
			6/27/11	9/20/11	10/20/11	12/7/11	4/2/12	5/14/12	6/4/12	6/8/12	6/25/12	7/2/12	7/13/12	7/26/12	8/9/12	8/16/12	8/31/12	9/13/12	9/28/12	10/12/12	10/29/12	11/13/12	11/16/12	11/30/12
SB915-PZ13-01S	411.39	19.5	418.2	410.3	409.8	410.8	409.6	411.3			405.2				409.8				410.0	410.1	409.2	410.2	410.3	410.3
SB915-PZ13-01D	391.39	39.5	398.4	389.7	389.1	390.2	390.0	390.0			388.3				387.2				386.9	387.7	387.1	388.1	388.1	388.3
SB915-PZ13-01N	367.39	63.5	364.5	370.6	370.5	371.5	371.3	371.4			370.1				369.5				369.4	369.6	368.8	369.9	370.0	369.8
SB915-PZ13-05S	418.14	14.8	416.1	415.6	414.8	415.6	415.2				415.0				410.3				415.2	415.2	414.9	415.5	415.5	415.4
SB915-PZ13-05I	397.94	35	402.8	397.0	396.3	397.1	396.7	396.8			396.4				396.3				396.2	396.2	396.1	396.0	396.1	396.1
SB915-PZ13-05N	376.94	56	379.3	374.4	373.2	374.2	374.2	374.1			373.6				378.1				373.1	372.9	372.2	372.8	372.9	372.7
SB915-PZ13-06S	410.5	19.5	416.7	409.2	411.2	413.2	411.2	413.1	409.3	409.3	408.8	409.1	409.2	408.7	408.9	408.9	408.9	409.3	409.1	N/A[2]	N/A[2]	N/A[2]	N/A[2]	409.5
SB915-PZ13-06I	395.5	34.5	419.8	394.0	398.0	405.1	400.5	405.3	393.0	393.1	393.1	393.2	393.3	393.2	393.3	393.4	393.5	394.0	393.7	N/A[2]	N/A[2]	N/A[2]	N/A[2]	394.1
SB915-PZ13-06D	380.5	49.5	391.4	392.8	396.2	403.3	399.3	403.8	392.4	391.6	389.5	389.0	387.8	386.1	385.1	384.7	384.1	384.1	383.6	N/A[2]	N/A[2]	N/A[2]	N/A[2]	383.8
SB915-PZ13-06N	366	64	380.5	373.7	373.6	374.9	374.7	374.7	373.7	373.8	373.1	373.2	373.2	372.4	372.5	372.5	372.3	372.6	372.3	N/A[2]	N/A[2]	N/A[2]	N/A[2]	372.8
SB915-PZ13-07	384.23	54	386.1	385.5	384.8	386.7	385.5	385.7			385.3				384.9				384.9				385.0	
SB915-PZ13-08 (Standpipe)	391.35	40	< BH depth[1]	356.4	< BH depth[1]	< BH depth[1]	< BH depth[1]	< BH depth[1]			< BH depth[1]				< BH depth[1]				< BH depth[1]				< BH depth[1]	
SB915-PZ13-09	395.98	36.5	394.8	395.0	394.1	394.9	394.7	394.9			394.4				394.2				395.0				395.4	
SB915-PZ13-10 (Standpipe)	365.45	32	334.5	337.9	338.8	339.1	339.2	339.2			337.9				< BH depth				N/A[3]	N/A[3]	339.1	337.2	337.1	336.9
SB915-PZ13-11	391.44	41	390.2	390.4	389.5	390.4	390.2	390.4			390.0				390.1				390.3				390.6	
SB915-PZ13-12 (Standpipe)	406.51	32.7	< BH depth[1]	< BH depth[1]	< BH depth[1]	< BH depth[1]	< BH depth[1]	< BH depth[1]			< BH depth[1]				< BH depth[1]				< BH depth[1]				< BH depth[1]	
SB915-PZ13-13	404.26	30	407.5	405.6	405.1	411.5	406.0	406.0			404.6				404.2				404.2				404.5	
SB915-PZ13-14	413.67	30	429.6	425.9	427.3	430.9	427.7	427.5	425.4	425.1	423.4	423.2	422.4	421.2	420.7	420.3	419.7	419.5	418.8				420.5	421.0
SB915-PZ13-15	416.56	30	424.4	420.3	420.9	424.0	421.7	421.0			418.9				417.1				416.5				417.4	
SB915-PZ13-16 (Standpipe)	411.08	30	407.9	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken

Notes:

[1]. “<BH depth” indicates that the water level is below the bottom of borehole (for standpipe piezometers).

[2]. Piezometers SB915-PZ13-06S/I/D/N were temporarily inaccessible due to overgrown weeds from 10/12/2012 to 11/16/2012 and on 7/16/2013.

[3]. Piezometer SB915-PZ13-10 was temporarily inaccessible because the well cover was locked from 9/28/2012 to 10/12/2012.

Piezometer Name	PZ Tip Elevation (ft)	PZ Depth (ft bgs)	Equivalent Water Elevation (ft)																	
			4/2/13	4/16/13	5/3/13	5/17/13	6/4/13	6/21/13	7/3/13	7/16/13	8/16/13	9/3/13	9/20/13	10/8/13	10/25/13	11/15/13	12/5/13	4/1/14	4/18/14	5/2/14	5/20/14
SB915-PZ13-01S	411.39	19.5	410.5	412.6	410.2	409.2	409.9	410.8	409.7	409.6	409.8	409.4	409.6	409.9	409.7	409.6	410.1	416.2	415.8	411.6	412.1
SB915-PZ13-01D	391.39	39.5	390.6	391.1	391.1	389.9	389.1	390.8	390.3	389.5	388.3	387.5	387.3	387.5	387.4	387.5	388.5	392.1	396.7	394.2	393.4
SB915-PZ13-01N	367.39	63.5	371.1	371.9	371.8	371.1	370.8	371.7	371.3	371.2	370.3	369.8	369.9	371.0	370.5	370.5	370.3	372.3	373.6	372.0	372.7
SB915-PZ13-05S	418.14	14.8	410.7	415.2	415.0	414.5	414.5	414.9	414.6	414.7	414.4	413.9	414.2	414.2	414.1	414.3	414.1	414.6	416.0	414.4	414.7
SB915-PZ13-05I	397.94	35	396.6	397.2	397.2	396.4	396.3	397.4	396.6	396.4	396.2	396.2	396.2	396.2	392.8	396.2	396.2	397.5	400.9	399.2	399.1
SB915-PZ13-05N	376.94	56	378.0	374.2	374.6	373.9	373.6	374.0	373.9	373.9	373.6	373.0	373.2	373.2	387.5	372.8	372.6	374.4	376.2	373.9	< PZ Depth
SB915-PZ13-06S	410.5	19.5	413.1	414.7	412.7	409.9	411.9	412.9	411.5	N/A[2]	409.1	408.7	408.8	409.5	396.8	411.7	411.8	419.1	418.8	415.3	415.3
SB915-PZ13-06I	395.5	34.5	404.8	407.4	403.4	397.3	400.8	404.8	400.3	N/A[2]	393.4	393.0	393.3	393.5	404.6	395.0	400.1	411.0	411.6	407.8	408.3
SB915-PZ13-06D	380.5	49.5	403.8	406.3	383.0	396.7	400.1	403.9	399.7	N/A[2]	390.3	388.5	386.9	386.1	388.5	393.2	399.2	409.7	410.6	406.8	407.5
SB915-PZ13-06N	366	64	374.3	375.3	375.3	374.4	374.0	375.0	374.6	N/A[2]	373.3	372.7	373.0	373.7		373.6	373.5	375.7	377.7	375.8	376.8
SB915-PZ13-07	384.23	54	386.1		386.8		386.3		386.5			385.7		385.5		385.4	385.5	386.3		386.2	
SB915-PZ13-08 (Standpipe)	391.35	40	< BH depth[1]		< BH depth[1]		< BH depth[1]	391.4	< BH depth[1]	391.4		< BH depth[1]		< BH depth[1]		< BH depth[1]	< BH depth[1]	< BH depth		< BH depth	
SB915-PZ13-09	395.98	36.5	394.8		395.1		394.9		394.9			394.5		395.1		394.6	394.5	394.8		394.3	
SB915-PZ13-10 (Standpipe)	365.45	32	338.7	339.8	339.4	338.8	338.6	339.3	339.1	338.8	337.7	338.2	337.9	338.3	338.1	338.1	338.0	338.7	341.0	340.5	340.5
SB915-PZ13-11	391.44	41	390.1		390.5		390.2		390.2			389.8		391.1		390.1		390.1		389.6	
SB915-PZ13-12 (Standpipe)	406.51	32.7	< BH depth[1]		< BH depth[1]		< BH depth[1]	406.5	< BH depth[1]	406.5		< BH depth[1]		< BH depth[1]		< BH depth[1]		< BH depth		< BH depth	
SB915-PZ13-13	404.26	30	407.4		407.1		405.7		406.4			404.4		404.4		404.4		410.0		408.4	
SB915-PZ13-14	413.67	30	430.6	432.4	430.3	427.3	426.7	430.7	429.3	427.7	424.3	422.2	421.3	420.7	421.2	423.5	426.6	434.0	434.5	433.2	433.0
SB915-PZ13-15	416.56	30	424.5		424.3		420.8		422.9			418.0		417.1		418.2		428.4		427.9	
SB915-PZ13-16 (Standpipe)	411.08	30	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken

Piezometer Name	PZ Tip Elevation (ft)	PZ Depth (ft bgs)	Equivalent Water Elevation (ft)																		
			6/3/14	6/20/14	7/15/14	7/29/14	8/7/14	8/15/14	9/5/14	9/19/14	10/4/14	10/21/14	11/4/14	11/25/14							
SB915-PZ13-01S	411.39	19.5	409.0	409.4	409.0	409.2	409.3	409.2	409.3	409.7	409.0	409.1	409.3	409.1							
SB915-PZ13-01D	391.39	39.5	391.1	389.3	387.9	387.6	387.5	387.2	387.1	387.3	386.3	385.9	385.9	386.0							
SB915-PZ13-01N	367.39	63.5	371.4	370.7	369.5	370.2	369.8	369.6	369.8	370.2	369.5	369.5	369.6	369.5							
SB915-PZ13-05S	418.14	14.8	413.9	413.8	413.4	413.3	413.5	413.4	413.6	413.7	413.5	413.4	413.5	413.1							
SB915-PZ13-05I	397.94	35	398.4	396.4	395.9	395.9	395.9	396.0	396.0	396.0	395.9	395.7	395.9	395.9							
SB915-PZ13-05N	376.94	56	374.6	375.1	374.9	373.5	374.7	374.6	374.5	362.7	374.2	373.8	373.8	373.6							
SB915-PZ13-06S	410.5	19.5	411.5	409.3	408.5	408.7	408.8	408.7	408.8	409.2	408.5	408.7	408.8	408.6							
SB915-PZ13-06I	395.5	34.5	402.6	395.3	392.9	393.0	393.0	393.0	393.3	393.6	393.0	393.0	393.2	393.0							
SB915-PZ13-06D	380.5	49.5	402.1	395.0	389.8	388.4	387.6	386.6	385.3	385.0	383.9	383.5	383.6	383.4							
SB915-PZ13-06N	366	64	375.3	374.2	372.8	372.6	373.0	372.7	372.9	373.4	372.7	372.6	372.8	372.7							
SB915-PZ13-07	384.23	54	386.7		386.1		386.0		385.8		385.4		385.3								
SB915-PZ13-08 (Standpipe)	391.35	40	< BH depth		< BH depth		< BH depth		< BH depth		< BH depth		< BH depth								
SB915-PZ13-09	395.98	36.5	394.3		394.2		394.6		394.6		394.3		394.6								
SB915-PZ13-10 (Standpipe)	365.45	32	339.6	338.6	337.9	339.0	336.7	337.7	338.5	336.7	337.7	336.6	337.6	337.9							
SB915-PZ13-11	391.44	41	389.7		389.6		389.9		389.9		389.6		389.9								
SB915-PZ13-12 (Standpipe)	406.51	32.7	< BH depth		< BH depth		< BH depth		< BH depth		< BH depth		< BH depth								
SB915-PZ13-13	404.26	30	406.2		404.4		404.5		404.1		403.7		404.0								
SB915-PZ13-14	413.67	30	429.5	426.6	423.5	422.4	422.0	421.4	420.7	420.2	422.6	417.7	418.1	417.9							
SB915-PZ13-15	416.56	30	423.5		418.8		418.2		417.1				416.0								
SB915-PZ13-16 (Standpipe)	411.08	30	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken	Broken							

Attachment B

Data collected from settlement monuments installed in Phase I and Phase II (installed and maintained by Parsons)

	SM-1			SM-2			SM-3			SM-4			SM-5			SM-6		
	Phase IA, Northeast			Phase IA, Northeast			Phase IA, North			Phase IIB, West			Phase IIB, East			Phase IIB, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012							1120725.93	906987.30	428.15									
8/9/2012							-1.61	-1.15	-0.02									
8/13/2012																		
8/15/2012	1120814.27	907245.62	429.72	1120768.28	907111.23	428.12	1.41	-1.25	-0.05									
8/23/2012	-0.24	0.35	-0.03	-0.08	-1.64	-0.06	-0.97	-1.59	-0.01									
8/28/2012	-0.50	1.26	-0.16	-0.28	0.30	-0.06	-0.70	-1.58	-0.22									
9/1/2012	-0.58	0.75	-0.01	0.25	-0.14	-0.01	-1.39	-0.93	-0.04									
9/5/2012	-0.63	0.84	-0.07	-0.08	0.20	-0.06	-0.92	-0.64	-0.10									
9/12/2012	-0.33	1.39	-0.03	-0.38	0.40	-0.05	-1.37	0.17	-0.08									
9/15/2012	-0.89	1.84	-0.11	0.82	-0.38	-0.03	-0.48	-2.04	-0.03									
9/21/2012	-0.79	1.14	-0.11	-0.26	-0.18	-0.03	-1.15	0.38	-0.02									
9/25/2012	-1.28	1.60	-0.06	-0.55	0.65	-0.13	-1.48	0.31	-0.12									
9/28/2012	-0.88	0.73	-0.13	-0.21	0.23	-0.11	-1.04	-0.31	-0.22									
10/3/2012	-1.09	1.59	-0.09	1.02	0.33	-0.05	-0.54	-2.02	-0.11									
10/9/2012	-1.19	1.56	-0.06	-0.68	0.77	-0.12	-1.39	0.30	0.02									
10/13/2012	-0.89	1.30	-0.16	0.02	-0.69	-0.14				1119566.09	906324.82	431.98	1119685.93	906701.96	433.96	1119646.09	906576.13	433.26
10/16/2012	-0.95	1.44	-0.10	-0.57	0.64	-0.14	-1.38	0.18	-0.13									
10/19/2012	-0.87	1.42	0.03															
10/24/2012	-0.87	1.00	-0.06	-0.71	0.47	-0.07	-1.35	0.27	-0.07									
10/27/2012	-1.05	1.46	-0.10	-0.80	0.68	-0.32	-1.44	0.36	-0.14									
10/29/2012	-0.95	1.57	0.04	-0.86	0.77	0.04	-1.37	-0.10	-0.07									
11/3/2012	-0.83	1.34	-0.17	-1.10	0.80	-0.22	-1.37	0.15	-0.15									
11/9/2012	-0.95	1.54	-0.09	0.16	-0.66	-0.13												
11/13/2012	-1.61	2.13	0.00	-0.86	1.13	-0.24	-1.43	0.05	-0.16									
11/16/2012	-0.62	1.09	-0.04	-1.03	0.74	-0.17	-1.51	0.27	-0.18									
11/21/2012	-0.96	1.55	-0.06	-0.98	0.75	-0.21	-1.51	0.27	-0.19	2.96	-1.42	0.00						
12/1/2012	-0.81	1.24	-0.01	-0.86	0.41	-0.30	-1.28	0.36	-0.16	3.03	-1.42	-0.02						
12/6/2012	-1.33	1.60	-0.11	-1.10	0.90	-0.21	-1.45	0.05	-0.13	3.07	-1.41	0.06						
12/8/2012	-1.35	1.63	-0.14	-0.99	0.62	-0.33	-1.94	0.62	0.11	2.90	-1.48	0.10						
12/13/2012	-1.76	1.21	-0.16	-1.26	0.93	-0.34	-1.44	0.20	-0.24	2.98	-1.41	0.14						
12/21/2012	-1.28	1.63	-0.10							2.96	-1.46	0.06						
1/25/2013	-1.34	1.62	-0.06	-1.33	0.94	-0.24	-1.71	0.41	-0.15	3.24	-1.34	0.07						
2/15/2013	-0.89	0.70	-0.18							3.03	-2.32	-0.01						
2/28/2013				-1.36	1.16	-0.38	-1.82	0.53	-0.30									
4/4/2013	-0.87	1.19	-0.26	-1.28	0.19	-0.34	-2.15	-0.54	-0.27	2.79	-1.74	0.07	2.80	0.32	0.06	2.73	-1.39	0.19
4/12/2013	-2.50	1.41	-0.16	0.87	0.30	-0.30	-1.40	-0.94	-0.27	2.35	-2.45	0.04	2.57	0.77	0.06	2.03	-0.74	0.05
4/23/2013	-1.30	0.70	-0.18	-1.22	0.06	-0.32	-1.40	0.18	-0.29									
4/26/2013	-1.62	0.65	-0.33	-1.49	0.02	-0.46	-2.23	-0.46	-0.39									
5/28/2013	-1.35	0.70	-0.41	0.93	1.03	-0.45	-0.66	1.27	-0.39									
5/31/2013	-1.47	1.81	-0.26	-0.82	0.05	-0.67	-1.66	0.30	-0.47									
6/12/2013	1120813.05	907246.94	445.10	1120766.07	907111.84	443.77	1120724.02	906986.83	443.51	1119567.86	906289.39	442.01	1119696.48	906700.70	444.32	0.00	0.00	0.05
6/14/2013	0.00	-0.05	-0.27	0.01	-0.02	-0.95	0.03	0.01	-0.49	0.09	-0.02	0.00	0.03	-0.02	0.06	0.07	-0.01	0.04
6/21/2013	0.00	-0.10	-0.24				0.00	-0.07	-0.48	-0.01	-0.04	-0.01	-0.02	-0.04	0.08	0.00	-0.03	0.01
6/25/2013	-0.01	-0.11	-0.27	-0.02	-0.10	-1.17	-0.02	-0.08	-0.39	-0.02	-0.09	0.00	-0.04	-0.04	0.06	-0.02	-0.03	0.05
6/28/2013	-0.04	-0.19	-0.25	-0.05	-0.19	-1.17	-0.08	-0.17	-0.49	-0.13	-0.08	0.00	-0.11	-0.05	0.05	-0.11	-0.03	0.05
7/1/2013	-0.04	-0.12	-0.24	-0.04	-0.15	-1.15				0.01	-0.03	0.00	-0.13	-0.07	0.06			
7/3/2013	-0.07	-0.26	-0.27	-0.07	-0.25	-1.18	-0.10	-0.19	-0.51	BROKEN	BROKEN	BROKEN	-0.16	-0.09	0.06			
7/9/2013	-0.07	-0.23	-0.26	-0.06	-0.21	-1.17	-0.10	-0.15	-0.49				0.55	-0.48	0.06	1119646.07	906545.41	443.38
7/12/2013	-0.03	-0.14	-0.27	-0.03	-0.14	-1.17	-0.05	-0.08	-0.50				1119687.42	906674.41	444.23	0.07	0.03	0.04
7/16/2013	-0.02	-0.07	-0.29	-0.01	-0.09	-1.20	-0.06	-0.06	-0.52				0.07	-0.02	0.00	0.17	0.05	-0.08
7/19/2013	-0.04	-0.11	-0.29	-0.03	-0.09	-1.20	-0.05	-0.04	-0.54				0.04	-0.03	-0.07	0.11	0.03	-0.13
7/23/2013	-0.08	-0.21	-0.28	-0.06	-0.16	-1.20	-0.11	-0.12	-0.52				0.00	-0.01	-0.11	0.12	0.04	-0.18
7/25/2013	-0.04	-0.19	-0.27	-0.05	-0.19	-1.16	-0.10	-0.14	-0.52				0.03	0.00	-0.12	0.04	0.03	-0.20

Note: This table presents the initial surveyed Northing, Easting, and Elevation at each settlement monument and any re-established baselines (gray cells). The changes in Northing and Easting were calculated with respect to the most recent baseline. The measured settlement was calculated with respect to the most recent baseline, added to any measured settlement before the most recent baseline. All measurements are reported in feet.

	SM-1			SM-2			SM-3			SM-4			SM-5			SM-6		
	Phase IA, Northeast			Phase IA, Northeast			Phase IA, North			Phase IIB, West			Phase IIB, East			Phase IIB, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013	-0.07	-0.22	-0.28	-0.05	-0.17	-1.19	-0.09	-0.10	-0.53				0.02	-0.01	-0.17	0.05	0.03	-0.23
8/2/2013	-0.09	-0.27	-0.30	-0.10	-0.25	-1.21	-0.17	-0.21	-0.53				-0.06	-0.07	-0.19	-0.03	0.02	-0.25
8/6/2013	-0.06	-0.14	-0.30	-0.06	-0.13	-1.20	-0.12	-0.09	-0.54				0.01	-0.05	-0.22	0.06	0.04	-0.28
8/9/2013	-0.04	-0.07	-0.28	-0.03	-0.06	-1.20	-0.08	-0.02	-0.54				0.06	-0.03	-0.21	0.11	0.06	-0.28
8/13/2013	-0.09	-0.20	-0.29	-0.10	-0.18	-1.21	-0.15	-0.10	-0.55				-0.03	-0.05	-0.24	0.01	0.02	-0.15
8/16/2013	-0.05	-0.09	-0.33	-0.05	-0.07	-1.24	-0.10	-0.02	-0.59				0.00	-0.17	-0.07	0.13	0.01	-0.18
8/19/2013	-0.09	-0.21	-0.32	-0.09	-0.20	-1.25	-0.15	-0.12	-0.57				-0.03	-0.19	-0.05	0.04	0.02	-0.24
8/22/2013	-0.08	-0.19	-0.31	-0.08	-0.17	-1.23	-0.16	-0.12	-0.56				-0.03	-0.17	-0.05	-0.07	-0.03	-0.29
8/27/2013	-0.09	-0.20	-0.31	-0.09	-0.15	-1.24	-0.17	-0.10	-0.58				-0.12	-0.18	-0.09	-0.92	-0.07	-0.53
8/30/2013	-0.06	-0.12	-0.32	-0.06	-0.10	-1.26	-0.13	-0.04	-0.58				-0.14	-0.19	-0.17	-1.10	-0.16	-0.66
9/3/2013	-0.08	-0.15	-0.33	-0.09	-0.12	-1.26	-0.17	-0.07	-0.60				-0.20	-0.21	-0.24	-1.10	-0.17	-0.74
9/6/2013	-0.08	-0.20	-0.31	-0.07	-0.15	-1.25	-0.15	-0.06	-0.60				-0.17	-0.19	-0.29	-1.05	-0.19	-0.77
9/10/2013	-0.11	-0.22	-0.32	-0.11	-0.18	-1.26	-0.20	-0.10	-0.62				-0.16	-0.23	-0.43	-1.12	-0.19	-0.82
9/11/2013	-0.10	-0.18	-0.31	-0.06	-0.14	-1.24	-0.17	-0.03	-0.57									
9/12/2013	-0.12	-0.23	-0.31	-0.68	0.26	-1.24	-0.20	-0.23	-0.57									
9/13/2013	-0.13	-0.21	-0.32	-0.64	0.33	-1.26	-0.17	-0.14	-0.59				-0.04	-0.21	-0.47	-0.99	-0.16	-0.83
9/17/2013	-0.09	-0.19	-0.33	-0.48	0.29	-1.25	-0.23	-0.21	-0.68				0.00	-0.21	-0.51	-0.90	-0.15	-0.88
9/20/2013	-0.04	-0.06	-0.33	-0.28	0.36	-1.25							-0.04	-0.22	-0.55	-0.84	-0.14	-0.90
9/24/2013	-0.76	-2.17	-0.33	-1.15	-1.60	-1.24							-0.72	-0.41	-0.58	-1.77	-0.33	-0.92
9/27/2013	0.04	0.11	-0.33	-0.05	0.63	-1.25	0.03	0.25	-0.57				-0.08	-0.22	-0.60	-0.76	-0.14	-0.92
10/1/2013	-0.11	-0.23	-0.33	-0.11	0.33	-1.24	-0.22	-0.14	-0.60				-0.03	-0.21	-0.60	-0.91	-0.17	-0.93
10/4/2013	0.02	0.16	-0.32	0.07	0.70	-1.23							0.27	-0.15	-0.62	-0.56	-0.09	-0.94
10/8/2013	-0.03	-0.04	-0.32	0.00	0.52	-1.23	-0.13	0.04	-0.59				0.11	-0.20	-0.62	-0.77	-0.14	-0.94
10/11/2013	-0.18	-0.38	-0.31	-0.18	0.19	-1.22	-0.32	-0.26	-0.57				-0.12	-0.26	-0.63	-1.08	-0.20	-0.95
10/15/2013	-0.10	-0.22	-0.32	-0.08	0.34	-1.24	-0.22	-0.13	-0.60	FIXED	FIXED	FIXED	0.04	-0.21	-0.69	-0.97	-0.17	-1.02
10/18/2013				0.55	-0.49	-1.24	-0.42	0.44	-0.60	-1.35	0.71	-0.57	-0.59	-2.18	-0.69	-1.70	-0.56	-1.02
10/22/2013				0.44	-0.63	-1.23	-0.54	0.29	-0.60	-1.44	0.77	-0.65	-0.52	-3.32	-0.83			
10/25/2013				0.51	-0.49	-1.24	-0.43	0.45	-0.61	-1.27	0.81	-0.73	-0.47	-2.99	-0.80			
10/29/2013				0.64	-0.26	-1.24	-0.29	0.65	-0.60	-1.41	0.10	-0.94	-0.05	-2.78	-0.80			
11/5/2013	-0.71	1.46	-0.32	0.50	-0.54	-1.25	-0.42	0.41	-0.62				0.00	-4.93	-1.49			
11/8/2013	-0.75	1.43	-0.33	0.46	-0.56	-1.27	-0.50	0.34	-0.62	-1.62	0.10	-1.06	-0.09	-4.90	-1.56			
11/12/2013	-0.84	1.36	-0.39	0.37	-0.61	-1.33	-0.55	0.34	-0.68	-1.78	-0.16	-1.05	-0.16	-4.89	-1.47	1119642.27	906534.27	458.88
11/15/2013	-0.84	1.31	-0.32	0.37	-0.64	-1.27	-0.55	0.32	-0.62				-0.06	-4.91	-1.68	-0.06	-0.04	-1.01
11/19/2013	-0.86	1.30	-0.31	0.33	-0.64	-1.26	-0.62	0.28	-0.60	-1.69	-0.09	-1.09	-0.07	-4.91	-1.70	-0.08	-0.06	-1.02
11/22/2013	-0.84	1.41	-0.33	0.37	-0.51	-1.28				-1.57	-0.05	-1.09	0.04	-4.87	-1.76	0.06	-0.06	-1.09
11/26/2013	-0.84	1.39	-0.33	0.35	-0.53	-1.27	-0.56	0.41	-0.62	-1.64	-0.03	-1.10	0.03	-4.86	-1.78	0.03	-0.12	-1.13
12/2/2013	-0.80	1.51	-0.33	0.39	-0.41	-1.29	-0.50	0.52	-0.63	-1.52	0.00	-1.14	0.14	-4.84	-1.83	0.12	-0.19	-1.21
12/5/2013	-0.85	1.42	-0.33	0.37	-0.50	-1.27	-0.56	0.41	-0.63	-1.63	0.08	-1.14	0.04	-4.85	-1.84	0.00	-0.22	-1.24
1/20/2014	-0.89	1.36	-0.34	0.19	-0.37	-1.33												
1/30/2014	-0.81	1.31	-0.35	0.38	-0.47	-1.34	-0.62	0.48	-0.68	-1.57	0.13	-1.39	0.05	-4.99	-2.13	0.02	-0.50	-1.64
2/28/2014				0.14	-0.39	-1.36	-0.84	0.48	-0.69	-1.68	0.11	-1.51	-0.04	-5.00	-2.24	-0.10	-0.57	-1.80
4/1/2014				0.07	-0.30	-1.37	-0.82	0.55	-0.67	-1.54	0.21	-1.62				-0.07	-0.62	-1.98
4/4/2014				0.06	-0.42	-1.35	-0.79	0.47	-0.65									
4/5/2014				0.08	-0.32	-1.37	-0.82	0.51	-0.70	-1.76	0.26	-1.65				-0.15	-0.64	-1.97
4/8/2014				0.10	-0.34	-1.33	-0.85	0.50	-0.64	-1.60	0.31	-1.59				-0.12	-0.63	-1.96
4/11/2014				0.04	-0.34	-1.33	-0.86	0.50	-0.64	-1.56	0.36	-1.60				-0.13	-0.64	-1.97
4/14/2014	-2.16	2.03	-0.40	0.15	-0.31	-1.36	-0.73	0.50	-0.66	-1.53	0.38	-1.65	-0.15	-5.06	-2.39	-0.08	-0.64	-2.01
4/18/2014	-1.24	1.75	-0.41	0.07	-0.33	-1.39	-0.76	0.51	-0.68	-1.51	0.38	-1.67	-0.10	-5.06	-2.42	-0.13	-0.64	-2.00
4/22/2014	-1.28	1.71	-0.39	0.03	-0.38	-1.35	-0.83	0.49	-0.66				-0.16	-5.07	-2.38			
4/25/2014	-1.27	1.77	-0.41	0.03	-0.34	-1.38	-0.82	0.54	-0.69				-0.12	-5.06	-2.47			
4/29/2014	-1.18	1.70	-0.41	0.08	-0.47	-1.38	-0.79	0.48	-0.68	-1.44	0.39	-1.65	-0.13	-5.07	-2.40	-0.19	-0.66	-2.06
5/2/2014				0.08	-0.27	-1.42	-0.77	0.58	-0.75	-1.50	0.39	-1.66	-0.09	-5.05	-2.45	-0.12	-0.64	-2.07
5/7/2014	-2.88	2.48	-0.48	0.06	-0.32	-1.40	-0.82	0.52	-0.79	-1.55	0.37	-1.66	-0.13	-5.08	-2.42	-0.13	-0.65	-2.03
5/9/2014	-2.46	1.70	-0.50	0.03	-0.38	-1.43	-0.81	0.52	-0.73	-1.53	0.38	-1.70	-0.12	-5.07	-2.44	-0.10	-0.65	-2.06
5/13/2014	-2.46	1.67	-0.47	0.05	-0.35	-1.39	-0.81	0.52	-0.72	-1.50	0.38	-1.66	-0.10	-5.07	-2.43	-0.11	-0.66	-2.04
5/17/2014				0.03	-0.39	-1.44	-0.78	0.60	-0.74	-1.49	0.40	-1.68	-0.07	-5.03	-2.43	-0.04	-0.63	-2.06

	SM-1			SM-2			SM-3			SM-4			SM-5			SM-6		
	Phase IA, Northeast			Phase IA, Northeast			Phase IA, North			Phase IIB, West			Phase IIB, East			Phase IIB, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014							-0.72	0.68	-0.62	-1.40	0.39	-1.68	-0.03	-5.06	-2.43	-0.04	-0.65	-2.06
5/23/2014				0.08	-0.22	-1.41	-0.77	0.69	-0.71				-0.05	-5.04	-2.43	0.00	-0.63	-2.06
5/27/2014				-0.59	-1.46	-1.41	-1.57	-0.54	-0.72	-1.66	0.38	-1.69	-0.24	-5.10	-2.34	-0.24	-0.69	-2.07
5/30/2014				0.11	-0.24	-1.39	-0.74	0.66	-0.68	-1.40	0.40	-1.66	0.00	-5.04	-2.37	-0.01	-0.66	-2.07
6/4/2014	-3.06	0.95	-0.52	0.03	-0.35	-1.45	-0.84	0.55	-0.75	-1.51	0.40	-1.71	-0.16	-5.06	-2.54	-0.17	-0.69	-2.09
6/6/2014	-3.05	0.96	-0.54	0.05	-0.32	-1.46	-0.81	0.58	-0.72	-1.49	0.40	-1.73	-0.11	-5.06	-2.47	-0.10	-0.69	-2.11
6/10/2014	-3.04	0.96	-0.51	0.05	-0.36	-1.43	-0.82	0.55	-0.75				-0.14	-5.08	-2.45	-0.13	-0.72	-2.09
6/17/2014				0.76	0.15	-1.49	-0.77	0.65	-0.78	-1.42	0.40	-1.75				-0.04	-0.70	-2.13
6/20/2014				0.48	0.10	-1.55	3.66	-1.56	-0.74	-1.54	0.37	-1.80	-0.12	-5.11	-2.55	-0.13	-0.72	-2.18
6/23/2014				0.55	0.19	-1.50	3.72	-1.48	-0.67	-1.50	0.38	-1.75	-0.04	-5.08	-2.49	-0.06	-0.71	-2.14
6/27/2014				0.54	0.17	-1.50	3.69	-1.53	-0.67	-1.46	0.37	-1.78	-0.10	-5.08	-2.57	-0.06	-0.73	-2.12
7/8/2014				0.56	0.23	-1.52	3.71	-1.49	-0.67	-1.45	0.37	-1.78	1119688.78	906672.94	465.97			
7/11/2014				0.51	0.12	-1.51				-1.53	0.37	-1.80	-0.30	-0.52	-2.56			
7/15/2014				0.50	0.15	-1.52				-1.54	0.37	-1.81	-0.51	-0.46	-2.60			
7/18/2014	1120814.01	907247.81	455.10	0.48	0.07	-1.49	3.61	-1.65	-0.67				-0.47	-0.47	-2.63	1119646.18	906541.65	458.55
7/22/2014	0.06	0.25	-0.51	0.54	0.22	-1.52	3.70	-1.48	-0.70				-0.50	-0.46	-2.68	0.07	0.00	-2.16
7/25/2014	0.08	0.31	-0.54	0.58	0.26	-1.55	3.73	-1.44	-0.69				-0.46	-0.47	-2.73	0.08	-0.01	-2.19
7/29/2014	0.09	0.36	-0.55	0.58	0.28	-1.56							-0.47	-0.53	-2.79	0.11	-0.01	-2.23
8/1/2014	0.08	0.36	-0.53	0.59	0.32	-1.53	3.76	-1.36	-0.70				-0.42	-0.51	-2.81	0.18	0.04	-2.13
8/5/2014	-0.02	0.13	-0.54	0.47	0.10	-1.56							-0.56	-0.56	-2.87	0.03	0.00	-2.27
8/10/2014	0.05	0.34	-0.60										-0.51	-0.53	-2.84			
8/12/2014	0.01	0.23	-0.53	0.52	0.17	-1.55	3.64	-1.51	-0.68	-1.56	0.08	-1.79	-0.58	-0.56	-2.99	0.19	-0.05	-2.27
8/15/2014	0.00	0.24	-0.55	0.49	0.17	-1.56				-1.46	0.09	-1.81	-0.57	-0.56	-2.95	0.24	-0.05	-2.30
8/19/2014	0.07	0.41	-0.59	0.57	0.33	-1.67	3.73	-1.36	-0.87	-1.41	0.12	-1.83	-0.49	-0.53	-2.97	0.28	-0.03	-2.33
8/22/2014				0.43	0.07	-1.63	3.78	-2.30	-0.71	-1.47	0.10	-1.83	-0.60	-0.58	-2.99	0.19	-0.08	-2.34
8/26/2014				0.48	0.16	-1.67	3.87	-2.33	-0.73	-1.40	0.15	-1.87	-0.51	-0.55	-3.03	0.27	-0.06	-2.40
8/29/2014							3.57	-2.14	-0.71	-1.47	0.14	-1.87	-0.60	-0.58	-3.03			
9/2/2014				0.43	0.03	-1.67	3.64	-2.22	-0.73	-1.55	0.16	-1.90	-0.66	-0.60	-3.06			
9/5/2014				0.52	0.26	-1.64	3.81	-2.26	-0.72	-1.40	0.20	-1.90	0.04	-0.97	-3.07			
9/9/2014				0.43	0.03	-1.56	3.57	-2.14	-0.71	-1.56	0.18	-1.90						
9/12/2014				0.52	0.19	-1.66	3.64	-2.19	-0.73									
9/16/2014							3.78	-2.26	-0.72									
9/19/2014				0.61	0.34	-1.71	3.44	-2.04	-0.73							1119645.50	906534.21	467.00
9/23/2014				0.62	0.43	-1.61	3.65	-2.11	-0.74							0.01	-0.09	-2.48
9/26/2014				0.60	0.33	-1.63	3.63	-2.18	-0.73							-0.03	-0.06	-2.53
9/29/2014				0.45	0.09	-1.63	3.50	-2.02	-0.72							-0.13	-0.11	-2.59
10/3/2014				0.56	0.25	-1.64	3.69	-2.20	-0.73							-0.04	-0.06	-2.63
10/7/2014				0.51	0.10	-1.66	3.64	-2.10	-0.75							-0.13	-0.06	-2.68
10/10/2014				0.42	-0.04	-1.60	3.61	-2.15	-0.68							-0.17	-0.07	-2.71
10/14/2014				0.52	0.08	-1.64	3.76	-2.18	-0.72							-0.15	-0.03	-2.74
10/17/2014				0.48	0.17	-1.62	3.56	-2.11	-0.70							-0.08	-0.01	-2.75
10/21/2014				0.53	0.30	-1.60	3.77	-2.23	-0.76							0.00	0.02	-2.76
10/24/2014				0.57	0.35	-1.64	5.44	-3.13	-0.76	1119564.21	906318.28	464.21				-0.01	0.04	-2.78
10/28/2014							5.47	-3.17	-0.71							0.01	0.03	-2.80
10/30/2014							5.28	-3.05	-0.76	0.03	0.00	-1.90				0.00	0.02	-2.81
11/4/2014							5.25	-3.04	-0.75	-0.08	-0.01	-1.94				-0.09	0.00	-2.86
11/7/2014							5.31	-3.08	-0.76	-0.02	0.09	-1.96	1119676.99	906675.85	471.01	-0.04	0.01	-2.89
11/11/2014							5.47	-3.13	-0.76	-0.23	0.06	-1.99	-0.14	0.01	-3.15	-0.21	-0.04	-2.91
11/14/2014							5.26	-3.06	-0.77	-0.15	0.07	-1.99	-0.09	0.02	-3.19	-0.14	-0.04	-2.93
11/18/2014							5.26	-3.06	-0.77	-0.15	0.07	-1.99	-0.09	0.02	-3.19	-0.14	-0.04	-2.93
11/21/2014							5.26	-3.04	-0.78	0.01	0.03	-2.00	-0.03	-0.17	-3.25	-0.04	-0.04	-2.97
11/25/2014							5.29	-3.05	-0.77	-0.02	0.09	-2.02	0.17	0.08	-3.32	0.01	-0.01	-2.97

	SM-7			SM-8			SM-9			SM-10			SM-11			SM-12		
	Phase IIB, West			Phase IB, Northeast			Phase IB, North			Phase IB, Northwest			Phase IB, Northeast			Phase IA, Northwest		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																1120679.12	906835.80	429.48
8/13/2012																		
8/15/2012																0.04	0.12	-0.01
8/23/2012				1120509.81	906290.17	426.08	1120463.73	906154.40	425.87	1120420.12	906017.30	426.06	1120549.82	906428.00	428.28	3.00	-0.11	0.01
8/28/2012				-2.39	4.74	0.11	-0.54	2.50	-0.07	-0.54	2.39	-0.08	-0.32	0.83	-0.13	2.61	-0.12	-0.07
9/1/2012				-2.97	3.86	0.11	-0.42	2.34	-0.07	-0.68	2.33	-0.04	-0.44	1.73	-0.04	2.25	-0.52	0.02
9/5/2012				-2.07	3.89	0.19	-0.81	2.53	-0.08	-0.83	2.84	0.04	-0.25	1.83	-0.03	2.09	-0.32	-0.09
9/12/2012				-2.00	4.36	0.21	-0.83	2.25	0.01	-0.84	2.18	0.03	-0.75	1.89	-0.04	1.96	0.35	0.03
9/15/2012				-1.01	2.52	0.23	0.48	0.61	0.02	2.04	0.97	-0.05	-0.69	1.76	-0.07	2.08	0.04	-0.03
9/21/2012				-2.09	4.43	0.18	-1.24	2.19	-0.08	-1.11	2.74	0.04	1.21	0.49	-0.19	1.75	0.47	0.00
9/25/2012				-2.20	4.57	0.22	-0.10	1.12	0.07	-0.79	2.38	0.02	-0.81	2.04	-0.09	1.48	0.33	0.03
9/28/2012													-0.28	1.50	-0.09	1.97	0.30	-0.08
10/3/2012				-1.60	3.86	0.15	1.01	1.54	0.04	-0.89	2.08	0.11	-0.32	1.90	-0.09	1.66	0.59	-0.06
10/9/2012				-2.33	3.68	0.13	-0.22	1.29	0.07	-1.08	2.13	-0.02	-0.39	1.90	-0.10	2.11	-0.06	-0.13
10/13/2012	1119605.93	906450.28	432.64	-1.78	3.94	0.14	-0.01	1.12	-0.05	-0.92	2.12	-0.10	-0.98	2.05	-0.37	2.08	-0.11	-0.24
10/16/2012				-1.95	4.21	0.18	-0.09	1.18	-0.02	-1.15	2.14	0.02	-1.01	1.90	-0.03	2.05	0.10	-0.09
10/19/2012				-1.86	4.14	0.20	0.06	1.15	0.01	-0.94	1.99	0.03	-0.80	1.77	-0.20	1.93	-0.36	-0.15
10/24/2012				-1.97	3.98	0.20	-0.16	1.11	0.02	-0.85	2.16	0.07	-0.89	1.84	0.03	1.95	0.21	0.01
10/27/2012				-2.13	4.26	0.13	-0.12	1.25	-0.04	-1.06	2.43	-0.17	-0.91	2.12	0.01	1.90	0.28	-0.23
10/29/2012				-1.98	3.98	0.18	-0.99	2.42	0.42	-0.90	2.12	0.02	-0.93	1.98	-0.08	1.78	0.34	-0.01
11/3/2012				-1.81	4.19	0.17	-0.90	2.17	-0.07	-1.02	2.42	-0.03	-0.92	1.92	-0.25	1.99	0.22	-0.13
11/9/2012				-2.02	4.05	0.13	-1.01	2.28	-0.06	-1.29	2.52	-0.03	-0.91	1.92	-0.18	2.08	-0.10	-0.09
11/13/2012				-2.44	4.31	0.15	-0.94	2.17	0.00	-1.26	2.48	-0.01	-1.33	2.27	-0.21	1.76	0.35	-0.07
11/16/2012				-1.84	3.91	0.20	-0.51	1.63	-0.23	-1.46	2.61	-0.05	-1.02	2.18	0.00	1.73	0.35	-0.22
11/21/2012	2.64	-2.30	-0.09	-1.70	3.99	-0.03	-0.91	2.24	0.03	-1.20	2.50	0.01	-1.03	2.26	-0.24	2.08	0.50	-0.21
12/1/2012	2.50	-2.59	0.11	-2.07	4.49	0.17	-0.90	2.32	0.01	-0.61	2.26	0.08	-0.88	1.77	-0.29	1.68	0.65	-0.13
12/6/2012	2.49	-2.55	-0.02	-2.38	4.64	0.14	-1.17	2.29	0.02	-0.69	3.47	-0.21	-1.03	2.21	-0.21	1.71	0.37	0.00
12/8/2012	2.58	-2.42	-0.04	-2.47	4.49	0.18	-0.98	2.75	-0.06	-1.19	2.64	0.04	-1.24	2.28	-0.23	1.87	0.28	-0.08
12/13/2012	2.66	-2.42	0.02	-2.44	4.41	0.18	-1.01	2.21	-0.01	-1.36	2.59	0.05	-1.33	2.28	-0.27	1.31	0.39	-0.09
12/21/2012	2.42	-2.65	0.04	-2.69	4.31	0.10	-1.10	2.27	0.05	-0.95	2.30	-0.04	-1.74	2.33	-0.16	1.91	-0.60	-0.06
1/25/2013	2.49	-2.59	-0.06	-1.82	4.37	0.13	-1.09	2.32	0.08	-1.17	2.61	0.09	-1.36	2.33	-0.19	1.66	0.40	-0.06
2/15/2013	2.34	-2.68	-0.05										-1.62	2.34	-0.38	1.59	-0.62	-0.14
2/28/2013							-0.92	2.66	-0.09	-1.25	2.56	-0.01						
4/4/2013	1.57	-2.00	0.02	-2.59	4.20	0.16	-0.82	1.44	-0.02	-1.44	1.80	0.03	-1.12	1.77	-0.42	2.00	-0.25	-0.21
4/12/2013	-6.22	-31.55	-0.17	-2.67	5.08	0.02	-2.08	3.35	-0.01	-0.35	2.03	0.03	-2.30	0.65	-0.30	2.17	-1.71	-0.14
4/23/2013				-2.46	4.30	0.04	-0.75	1.27	0.02	-0.82	2.19	0.02	-1.24	1.62	-0.28	1.61	0.41	-0.07
4/26/2013				-2.61	4.17	-0.06	-1.18	1.27	-0.11	-1.15	1.67	0.05	-1.85	1.31	-0.41			
5/28/2013				-2.57	4.31	-0.08	-0.84	1.21	-0.17	-0.29	2.11	-0.06	-2.29	1.03	-0.40	1.89	-1.37	-0.24
5/31/2013				-2.27	3.98	-0.24	0.15	2.16	-0.31				-2.43	1.25	-0.65	0.76	0.09	-0.49
6/12/2013	1119609.32	906425.02	442.69	BROKEN	BROKEN	BROKEN	1120462.83	906157.05	441.90	1120417.57	906018.31	441.56	1120547.33	906430.12	443.41	1120680.60	906835.84	444.92
6/14/2013	0.10	-0.01	-0.17				-0.01	-0.05	-0.82	-0.03	-0.06	-0.09	0.03	-0.01	-0.59	0.06	0.03	-0.47
6/21/2013	0.01	-0.03	-0.14				-0.03	-0.07	-0.86	-0.09	-0.11	-0.09	0.00	-0.05	-0.57	-0.02	-0.07	-0.46
6/25/2013	BROKEN	BROKEN	BROKEN				-0.03	-0.06	-0.80	-0.07	-0.08	-0.08	-0.04	-0.08	-0.65	-0.02	-0.09	-0.48
6/28/2013							-0.17	-0.13	-0.80	-0.20	-0.15	-0.08	-0.15	-0.16	-0.64	-0.09	-0.17	-0.47
7/1/2013																-0.06	-0.09	-0.46
7/3/2013							-0.16	-0.15	-0.82	-0.25	-0.19	-0.11	-0.11	-0.14	-0.67	-0.07	-0.14	-0.50
7/9/2013							-0.20	-0.15	-0.82	-0.25	-0.17	-0.09	-0.13	-0.13	-0.65	-0.07	-0.12	-0.48
7/12/2013							-0.07	-0.07	-0.83	-0.13	-0.11	-0.10	-0.04	-0.05	-0.65	-0.02	-0.05	-0.49
7/16/2013							0.02	-0.01	-0.84	-0.01	-0.04	-0.11	0.00	-0.01	-0.68	-0.01	-0.03	-0.50
7/19/2013				FIXED	FIXED	FIXED	-0.03	-0.03	-0.83	-0.09	-0.08	-0.11	0.00	-0.01	-0.69	0.01	0.00	-0.51
7/23/2013				-1.51	-0.14	-0.27	-0.20	-0.15	-0.83	-0.26	-0.17	-0.11	-0.17	-0.15	-0.67	-0.06	-0.08	-0.49
7/25/2013				-1.48	-0.14	-0.27	-0.14	-0.12	-0.83	-0.16	-0.13	-0.08	-0.14	-0.13	-0.68	-0.07	-0.12	-0.50

	SM-7			SM-8			SM-9			SM-10			SM-11			SM-12		
	Phase IIB, West			Phase IB, Northeast			Phase IB, North			Phase IB, Northwest			Phase IB, Northeast			Phase IA, Northwest		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013				-1.52	-0.17	-0.27	-0.20	-0.16	-0.81	-0.22	-0.18	-0.10	-0.16	-0.15	-0.68	-0.05	-0.09	-0.51
8/2/2013				-1.52	-0.16	-0.28	-0.19	-0.15	-0.83	-0.22	-0.17	-0.13	-0.17	-0.15	-0.70	-0.12	-0.17	-0.52
8/6/2013				-1.41	-0.08	-0.28	-0.06	-0.05	-0.83	-0.10	-0.09	-0.12	-0.09	-0.06	-0.69	-0.06	-0.07	-0.52
8/9/2013				-1.35	-0.02	-0.27	0.00	0.00	-0.83	-0.04	-0.05	-0.09	-0.03	0.01	-0.68	-0.02	-0.01	-0.50
8/13/2013				-1.50	-0.12	-0.28	-0.16	-0.10	-0.84	-0.21	-0.13	-0.11	-0.13	-0.07	-0.69	-0.08	-0.08	-0.51
8/16/2013				-1.36	-0.02	-0.34	0.01	0.02	-0.88	-0.03	-0.03	-0.16	-0.05	0.00	-0.73	-0.02	-0.01	-0.56
8/19/2013				-1.42	-0.08	-0.28	-0.02	-0.02	-0.86	-0.07	-0.07	-0.14	-0.06	-0.03	-0.72	-0.06	-0.09	-0.54
8/22/2013				-1.44	-0.09	-0.30	-0.04	-0.03	-0.86	-0.10	-0.09	-0.13	-0.12	-0.07	-0.70	-0.08	-0.10	-0.53
8/27/2013				-1.46	-0.10	-0.30	-0.12	-0.08	-0.84	-0.18	-0.13	-0.12	-0.12	-0.06	-0.72	-0.08	-0.08	-0.53
8/30/2013				-1.39	-0.05	-0.32	-0.05	-0.04	-0.86	-0.07	-0.07	-0.12	-0.11	-0.05	-0.73	-0.05	-0.06	-0.54
9/3/2013				-1.43	-0.07	-0.33	-0.10	-0.05	-0.86	-0.14	-0.09	-0.15	-0.11	-0.04	-0.74	-0.07	-0.07	-0.55
9/6/2013				-1.47	-0.13	-0.34	-0.14	-0.11	-0.87	-0.18	-0.15	-0.14	-0.13	-0.09	-0.73	-0.03	-0.05	-0.58
9/10/2013				-1.58	-0.17	-0.34	-0.17	-0.10	-0.88	-0.20	-0.12	-0.17	-0.22	-0.13	-0.75	-0.12	-0.12	-0.55
9/11/2013				-1.49	-0.09	-0.30	-0.15	-0.07	-0.84	-0.21	-0.13	-0.06	-0.14	-0.04	-0.71	-0.08	-0.04	-0.52
9/12/2013				-1.94	-0.13	-0.30	-0.22	-0.09	-0.84	-0.01	-0.09	-0.06	0.01	0.12	-0.47	-0.16	0.24	-0.52
9/13/2013				-1.90	-0.10	-0.31	-0.18	-0.06	-0.85	0.05	-0.05	-0.08	0.03	0.15	-0.49	-0.12	0.32	-0.53
9/17/2013				-1.82	-0.05	-0.34	-0.09	-0.03	-0.89	0.12	-0.03	-0.14	0.13	0.21	-0.54	-0.07	0.36	-0.55
9/20/2013				-1.74	0.03	-0.35	0.00	0.04	-0.89	0.21	0.05	-0.14	0.17	0.26	-0.51	0.01	0.47	-0.58
9/24/2013				-2.86	-0.81	-0.37	-1.18	-0.74	-0.91	-1.05	-0.69	-0.12	-0.83	-0.60	-0.53	-0.70	-0.54	-0.55
9/27/2013				-1.63	0.13	-0.37	0.21	0.18	-0.90	0.42	0.14	-0.13	0.31	0.38	-0.51	0.10	0.58	-0.56
10/1/2013							-0.15	-0.03	-0.88	0.06	-0.06	-0.11	0.02	0.15	-0.51	-0.12	0.33	-0.55
10/4/2013							0.20	0.23	-0.88	0.43	0.19	-0.12	0.34	0.46	-0.53	0.10	0.67	-0.54
10/8/2013							0.08	0.15	-0.84	0.31	0.11	-0.08	0.21	0.33	-0.50	-0.01	0.48	-0.52
10/11/2013							-0.26	-0.08	-0.84	-0.11	-0.09	-0.08	-0.06	0.12	-0.50	-0.22	0.22	-0.51
10/15/2013				-1.19	3.50	-0.30	-0.15	-0.01	-0.86	0.07	-0.06	-0.10	0.01	0.15	-0.53	-0.13	0.30	-0.53
10/18/2013				-0.44	2.88	-0.30	-0.65	-1.19	-0.86	-0.29	0.18	-0.10	-0.32	0.18	-0.52	-0.34	0.63	-0.53
10/22/2013							-0.86	-1.32	-0.86	-0.50	0.07	-0.09	-0.50	0.07	-0.52	-0.45	0.53	-0.51
10/25/2013							-0.75	-1.25	-0.87	-0.33	0.15	-0.10	-0.41	0.14	-0.53	-0.34	0.68	-0.52
10/29/2013							-0.53	-1.13	-0.83	-0.11	0.23	-0.09	-0.12	0.37	-0.52	-0.15	0.90	-0.54
11/5/2013				-3.06	-0.67	-0.45	-0.78	-1.36	-0.87	-0.36	0.08	-0.11	-0.43	0.07	-0.54	-0.35	0.61	-0.54
11/8/2013				-3.10	-0.69	-0.45	-0.84	-1.36	-0.88	-0.41	0.08	-0.12				-0.41	0.56	-0.54
11/12/2013				-3.16	-0.66	-0.53	-0.93	-1.35	-0.92	-0.48	0.08	-0.17	-0.51	0.10	-0.63	-0.47	0.56	-0.60
11/15/2013				-3.22	-0.69	-0.45	-0.97	-1.37	-0.87	-0.57	0.04	-0.11				-0.48	0.54	-0.53
11/19/2013				-3.22	-0.69	-0.43	-0.97	-1.48	-0.89	-0.56	0.05	-0.10	-0.57	0.06	-0.52	-0.51	0.53	-0.52
11/22/2013				-3.18	-0.67	-0.44	-0.91	-1.46	-0.86	-0.47	0.10	-0.09	-0.53	0.10	-0.55	-0.43	0.64	-0.54
11/26/2013				-3.21	-0.69	-0.42	-0.94	-1.49	-0.84	-0.48	0.09	-0.07	-0.56	0.08	-0.53	-0.45	0.61	-0.53
12/2/2013				-3.09	-0.57	-0.43	-0.79	-1.42	-0.85	-0.29	0.18	-0.09	-0.53	0.12	-0.54	-0.37	0.71	-0.52
12/5/2013				-3.14	-0.60	-0.43	-0.96	-1.50	-0.85	-0.40	0.12	-0.07	-0.54	0.13	-0.54	-0.46	0.60	-0.52
1/20/2014													-0.62	0.14	-0.57	-0.49	0.63	-0.51
1/30/2014				-3.21	-0.63	-0.50	-0.89	-1.49	-0.93	-0.22	0.18	-0.16	-0.52	0.14	-0.61	-0.44	0.62	-0.52
2/28/2014				-3.24	-0.48	-0.51	-0.92	-1.41	-0.90	-0.39	0.20	-0.13	-0.65	0.14	-0.60	-0.66	0.60	-0.51
4/1/2014				-3.46	-0.73	-0.52	-1.19	-1.58	-0.91	-0.40	0.14	-0.11	-0.63	0.18	-0.61	-0.67	0.57	-0.51
4/4/2014																		
4/5/2014				-3.47	-0.74	-0.51	-1.19	-1.53	-0.88	-0.41	0.12	-0.10	-0.70	0.12	-0.60	-0.56	0.60	-0.53
4/8/2014				-3.47	-0.76	-0.45	-1.17	-1.53	-0.82	-0.41	0.14	-0.04	-0.68	0.16	-0.56	-0.56	0.58	-0.51
4/11/2014				-3.50	-0.78	-0.47	-1.21	-1.57	-0.83	-0.44	0.11	-0.08	-0.68	0.15	-0.58	-0.57	0.58	-0.50
4/14/2014				-3.56	-0.83	-0.48	-0.43	-0.55	-0.80	-0.48	0.06	-0.06	-0.72	0.09	-0.59	-0.47	0.60	-0.53
4/18/2014				-3.52	-0.81	-0.53	-0.50	-0.63	-0.86	-0.47	0.05	-0.13	-0.70	0.12	-0.63	-0.51	0.65	-0.55
4/22/2014				-3.55	-0.80	-0.46				-0.50	0.06	-0.04	-0.69	0.14	-0.57	-0.56	0.60	-0.51
4/25/2014				-3.49	-0.76	-0.52	-0.41	-0.46	-0.88	-0.38	0.13	-0.09				-0.54	0.64	-0.53
4/29/2014				-3.49	-0.81	-0.51	-0.41	-0.64	-0.85	-0.39	0.04	-0.09				-0.55	0.57	-0.54
5/2/2014				-3.52	-0.75	-0.56	-0.41	-0.45	-0.91	-0.40	0.14	-0.14	-0.68	0.17	-0.67	-0.54	0.65	-0.57
5/7/2014				-3.53	-0.80	-0.55	-0.44	-0.49	-0.94	-0.43	0.10	-0.16	-0.61	0.18	-0.67	-0.57	0.57	-0.55
5/9/2014				-3.56	-0.83	-0.56	-0.50	-0.56	-0.91	-0.48	0.06	-0.15	-0.66	0.14	-0.66	-0.53	0.62	-0.58
5/13/2014				-3.64	-0.88	-0.55	-0.53	-0.56	-0.88	-0.53	0.02	-0.15	-0.75	0.07	-0.64	-0.55	0.60	-0.56
5/17/2014				-3.57	-0.79	-0.58				-0.46	0.11	-0.17	-0.68	0.18	-0.66	-0.52	0.67	-0.58

	SM-7			SM-8			SM-9			SM-10			SM-11			SM-12		
	Phase IIB, West			Phase IB, Northeast			Phase IB, North			Phase IB, Northwest			Phase IB, Northeast			Phase IA, Northwest		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014				-3.45	-0.78	-0.53				-0.36	0.09	-0.17	-0.56	0.20	-0.67	-0.46	0.69	-0.56
5/23/2014				-3.43	-0.70	-0.54				-0.33	0.18	-0.12	-0.57	0.27	-0.64	-0.48	0.76	-0.55
5/27/2014				-3.52	-0.79	-0.59				-0.41	0.11	-0.15	-0.66	0.17	-0.66	-0.55	0.63	-0.58
5/30/2014				-3.48	-0.80	-0.55				-0.34	0.12	-0.10	-0.60	0.18	-0.63	-0.45	0.73	-0.55
6/4/2014				-3.59	-0.82	-0.58	-1.51	-0.37	-0.92	-0.47	0.09	-0.17	-0.68	0.16	-0.69	-0.57	0.61	-0.60
6/6/2014							-1.52	-0.40	-0.95	-0.48	0.07	-0.20	-0.68	0.14	-0.71	-0.54	0.63	-0.61
6/10/2014							-1.48	-0.39	-0.88	-0.40	0.09	-0.15	-0.64	0.16	-0.66	-0.55	0.59	-0.58
6/17/2014				-3.60	-0.85	-0.62	-1.50	-0.41	-0.95	-0.40	0.11	-0.22	-0.69	0.17	-0.72	-0.51	0.67	-0.63
6/20/2014							-1.64	-0.50	-0.99	-0.56	0.00	-0.25	-0.76	0.06	-0.76	-0.58	0.54	-0.65
6/23/2014				-3.70	-0.92	-0.59	-1.45	-0.37	-0.97	-0.46	0.07	-0.22	-0.69	0.12	-0.79	-0.51	0.63	-0.60
6/27/2014				-3.67	-0.90	-0.64	-1.61	-0.49	-0.94	-0.55	-0.01	-0.21	-0.75	0.07	-0.71	-0.59	0.52	-0.58
7/8/2014				-3.63	-0.84	-0.65	-1.49	-0.40	-0.93	-0.41	0.08	-0.19	-0.67	0.15	-0.69	-0.51	0.64	-0.60
7/11/2014							-1.63	-0.50	-0.96	-0.53	-0.01	-0.26	-0.80	0.04	-0.71	-0.60	0.53	-0.62
7/15/2014				-3.75	-0.88	-0.56							-0.75	0.12	-0.71	-0.62	0.55	-0.61
7/18/2014													-0.82	0.01	-0.67	-0.48	0.68	-0.63
7/22/2014													-0.64	0.19	-0.73	-0.51	0.67	-0.62
7/25/2014																-0.49	0.68	-0.65
7/29/2014																-0.50	0.68	-0.64
8/1/2014																		
8/5/2014																		
8/10/2014																		
8/12/2014	1119607.91	906423.64	461.73													-0.62	0.54	-0.62
8/15/2014	-0.08	0.03	-0.20													-0.59	0.62	-0.66
8/19/2014	-0.04	0.05	-0.25										1120549.33	906428.38	453.34	-0.56	0.82	-0.67
8/22/2014	-0.11	0.01	-0.28										0.29	-0.23	-0.68	-0.44	0.68	-0.64
8/26/2014	-0.04	0.03	-0.36										0.43	-0.30	-0.71	-0.33	0.63	-0.66
8/29/2014										0.35	-0.18	-0.26	-0.24	0.01	-0.69	-0.73	0.84	-0.66
9/2/2014										0.57	-0.33	-0.27	-0.09	-0.10	-0.71	-0.64	0.76	-0.66
9/5/2014										1.08	-0.49	-0.26	0.29	-0.22	-0.72	-0.41	0.70	-0.65
9/9/2014													-0.25	0.00	-0.71	-0.74	0.83	-0.64
9/12/2014										0.58	-0.31	-0.26	-0.07	-0.11	-0.71	-0.64	0.77	-0.67
9/16/2014										1.03	-0.47	-0.23	0.24	-0.23	-0.69	-0.46	0.68	-0.66
9/19/2014	-0.58	-0.10	-0.46							-0.19	0.03	-0.28	-0.62	0.14	-0.70	-0.92	0.95	-0.66
9/23/2014	-0.63	-0.09	-0.46										-0.08	-0.04	-0.73	-0.63	0.84	-0.67
9/26/2014	-0.73	-0.11	-0.49										-0.14	-0.09	-0.70	-0.67	0.78	-0.66
9/29/2014	-0.83	-0.13	-0.51										-0.47	0.11	-0.70	-0.86	0.95	-0.66
10/3/2014	-0.76	-0.12	-0.53							0.63	-0.32	-0.26	-0.02	-0.14	-0.71	-0.59	0.75	-0.67
10/7/2014	-0.89	-0.14	-0.54							0.52	-0.21	-0.29	-0.10	-0.06	-0.74	-0.66	0.84	-0.68
10/10/2014	-0.92	-0.13	-0.57							0.40	-0.21	-0.21	-0.18	-0.07	-0.66	-0.70	0.81	-0.61
10/14/2014	-0.91	-0.14	-0.59							0.79	-0.31	-0.21	0.12	-0.14	-0.69	-0.52	0.77	-0.65
10/17/2014	-0.84	-0.12	-0.58							0.37	-0.19	-0.20	-0.22	-0.04	-0.67	-0.75	0.84	-0.62
10/21/2014	-0.84	-0.12	-0.58										0.23	-0.24	-0.72	-0.47	0.70	-0.68
10/24/2014	-0.80	-0.10	-0.61							1120424.16	906015.72	451.52	4.16	-1.85	-0.72	1.79	-0.40	-0.68
10/28/2014	-0.80	-0.10	-0.61							0.25	-0.11	-0.20	4.34	-1.95	-0.68	1.87	-0.45	-0.64
10/30/2014	-0.77	-0.10	-0.62							-0.38	0.13	-0.25	3.89	-1.75	-0.73	1.60	-0.32	-0.69
11/4/2014	-0.88	-0.12	-0.66										3.80	-1.72	-0.72	1.55	-0.30	-0.68
11/7/2014	-0.81	-0.11	-0.67										3.99	-1.80	-0.73	1.65	-0.35	-0.68
11/11/2014	-1.00	-0.14	-0.69							0.14	-0.07	-0.26	4.27	-1.90	-0.74	1.84	-0.42	-0.68
11/14/2014	-0.94	-0.13	-0.71										3.90	-1.78	-0.75	1.59	-0.32	-0.70
11/18/2014	-0.94	-0.13	-0.71										3.90	-1.78	-0.75	1.56	-0.30	-0.70
11/21/2014	-0.81	-0.11	-0.73							-0.47	0.14	-0.27	3.67	-1.71	-0.73	1.29	-0.23	-0.65
11/25/2014	-0.79	-0.12	-0.73							-0.30	0.08	-0.25	3.94	-1.76	-0.74	1.62	-0.30	-0.69

	SM-13			SM-14			SM-15			SM-16			SM-17			SM-18		
	Phase IB, West			Phase IB, West			Phase IB, Center			Phase IB, East			Phase IB, East			Phase I high point, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012																		
8/23/2012																		
8/28/2012																		
9/1/2012				1120137.52	906140.92	430.51												
9/5/2012	1120088.74	905983.00	425.86	0.60	-0.38	-0.10												
9/12/2012	0.88	-0.14	-0.10	3.34	-1.04	-0.62	1120180.52	906266.99	429.71									
9/15/2012	0.61	0.05	0.01	3.27	-1.11	-0.68	0.30	0.07	-0.15									
9/21/2012	0.80	0.36	-0.03	2.89	-1.37	-0.55	1.08	-0.13	-0.45	1120219.45	906392.75	430.92				1120292.52	906655.97	429.95
9/25/2012	0.59	0.32	0.04	3.33	-1.42	-0.52	1.14	-0.16	-0.40	-0.21	-0.29	0.07				0.17	-0.10	-0.04
9/28/2012	0.74	0.22	0.02	3.42	-1.04	-0.56	1.15	-0.19	-0.69	-0.01	-0.09	-0.03				0.34	-0.03	-0.10
10/3/2012	0.53	0.22	-0.10	3.46	-1.18	-0.58	1.42	-0.02	-0.55	0.07	-0.29	-0.38				0.08	-0.05	-0.07
10/9/2012	0.54	0.29	-0.14	3.13	-0.99	-0.83	1.14	0.18	-0.88	0.05	-0.06	-0.49				-0.03	0.10	-0.14
10/13/2012	0.58	0.27	-0.10	2.95	-1.15	-0.62	1.12	-0.07	-0.74	0.20	-0.03	-0.31	1120260.30	906527.52	432.38	5.14	3.22	0.05
10/16/2012	0.66	0.34	-0.06	3.33	-1.23	-0.66	0.89	-0.07	-0.70	0.28	-0.07	-0.54	0.40	-0.14	-0.20	5.26	2.39	-0.03
10/19/2012	0.74	0.21	-0.15	3.25	-1.33	-0.65	1.10	0.09	-0.79	0.21	-0.03	-0.61	0.30	-0.07	-0.39	7.84	1.55	-0.57
10/24/2012	0.78	0.28	-0.16	3.50	-1.15	-0.97	1.18	-0.48	-1.01	0.18	-0.40	-0.74	0.48	-0.27	-0.57	8.08	1.27	-0.85
10/27/2012	0.78	0.30	-0.17	3.46	-1.25	-0.93	1.43	-0.20	-1.05	0.34	-0.38	-0.82	0.47	-0.21	-0.59	8.04	1.48	-0.78
10/29/2012	0.95	0.23	-0.18	2.92	-1.25	-0.86				0.41	-0.49	-0.86	0.41	-0.28	-0.62	8.01	1.59	-0.79
11/3/2012	0.77	0.26	-0.13	3.43	-1.32	-0.88	1.54	0.03	-1.14	0.86	-0.18	-0.96	0.69	-0.19	-0.83	8.26	1.73	-0.87
11/9/2012	0.77	0.29	-0.21	3.03	-1.14	-0.95	1.27	0.54	-1.08	-0.41	-0.02	-0.82	0.44	-0.18	-0.65	9.56	1.54	-1.23
11/13/2012	0.95	0.36	-0.15	3.31	-1.31	-1.05				-0.51	0.21	-0.94	-0.17	-0.16	-0.65	BROKEN	BROKEN	BROKEN
11/16/2012	0.69	0.14	0.04	2.94	-0.83	-0.77	0.53	-0.64	-1.48	0.06	0.73	-1.02	0.14	-0.13	-0.68			
11/21/2012	0.59	0.16	-0.15	3.04	-0.80	-1.01	1.21	-1.00	-1.59	-0.01	0.60	-1.08	0.14	0.05	-0.74			
12/1/2012	0.75	0.24	-0.18	2.79	-0.82	-0.99	0.71	-0.80	-1.72	0.24	0.34	-1.27	0.46	-0.19	-0.79			
12/6/2012	0.70	0.19	-0.19	3.09	-0.76	-1.02	1.06	-0.52	-1.79	0.07	0.49	-1.22	-0.06	-0.21	-0.85			
12/8/2012	0.76	0.36	-0.22	2.95	-0.94	-0.95	0.66	-0.63	-1.82	-0.22	0.34	-1.29	-0.06	0.36	-0.79			
12/13/2012	0.65	0.15	-0.22	3.00	-0.68	-1.01	0.85	-0.58	-1.87	0.13	0.27	-1.32	-0.23	0.42	-0.80			
12/21/2012	0.76	0.27	-0.32	2.86	-1.24	-1.06	0.81	-0.60	-1.97	0.14	0.06	-1.41	-0.30	0.07	-0.85			
1/25/2013	0.68	0.41	-0.18	3.26	-0.79	-1.19	1.06	-0.67	-2.17	0.22	0.18	-1.61	0.18	0.32	-1.06			
2/15/2013	0.82	0.33	-0.27	2.74	-1.21	-1.02	0.81	-0.53	-2.32	0.01	0.41	-1.77	-0.19	0.11	-1.20			
2/28/2013																		
4/4/2013	0.37	-0.28	-0.27	3.62	0.34	-0.92												
4/12/2013	0.42	-0.24	-0.19	0.54	-0.67	-0.44	0.91	0.39	-1.97	0.05	0.04	-1.89	0.37	-0.09	-1.25			
4/23/2013	0.19	-0.03	-0.25	3.75	-0.15	-0.93	0.57	-0.45	-2.52	0.14	0.08	-1.86	0.24	-0.06	-1.24			
4/26/2013	0.73	-0.37	-0.46	2.96	0.42	-1.03	5.81	-2.97	-2.14	0.09	0.56	-1.98	-0.59	-0.42	-1.40			
5/28/2013	0.45	-0.32	-0.42	3.74	1.03	-1.76	1.40	-1.29	-1.97	-0.59	0.58	-2.19	-1.16	-2.28	-1.49			
5/31/2013	0.02	-0.21		3.80	1.07	-1.82	1.45	-1.04	-2.49	-0.11	1.07	-2.09						
6/12/2013	1120087.95	905977.72	445.55	BROKEN	BROKEN	BROKEN	1120183.24	906266.30	447.15	1120220.14	906393.86	449.37	1120259.32	906523.29	450.12			
6/14/2013	0.08	0.04	0.02				0.07	-0.01	-2.48	0.06	0.01	-2.60	0.05	0.00	-1.51			
6/21/2013	-0.02	0.01	0.03				0.01	-0.04	-2.48	0.01	-0.04	-2.62	0.02	-0.04	-1.57			
6/25/2013	0.08	0.08	0.03				0.07	-0.04	-3.03	0.04	-0.03	-2.63	0.02	-0.04	-1.57			
6/28/2013	-0.06	0.05	0.02				-0.05	-0.09	-3.05	-0.06	-0.07	-2.65	-0.08	-0.11	-1.59			
7/1/2013										0.01	-0.05	-2.64						
7/3/2013	-0.08	0.04	0.00				-0.06	-0.15	-3.08	-0.07	-0.11	-2.68	-0.06	-0.13	-1.61			
7/9/2013	-0.06	0.09	0.00				-0.03	-0.14	-3.10	-0.09	-0.10	-2.69	-0.05	-0.13	-1.64			
7/12/2013	0.04	0.13	0.00				0.08	-0.10	-3.13	0.04	-0.06	-2.69	0.05	-0.07	-1.65			
7/16/2013	0.16	0.19	-0.01				0.19	-0.06	-3.14	0.12	-0.02	-2.72	0.12	-0.02	-1.67			
7/19/2013	0.09	0.18	-0.02				0.12	-0.09	-3.16	0.08	-0.07	-2.73	0.11	-0.03	-1.69			
7/23/2013	-0.02	0.13	-0.04				-0.01	-0.16	-3.18	-0.05	-0.15	-2.74	-0.04	-0.14	-1.70			
7/25/2013	0.06	0.17	-0.02				0.08	-0.12	-3.21	0.04	-0.13	-2.74	0.04	-0.11	-1.71			

	SM-13			SM-14			SM-15			SM-16			SM-17			SM-18		
	Phase IB, West			Phase IB, West			Phase IB, Center			Phase IB, East			Phase IB, East			Phase I high point, Center		
	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.
7/30/2013	0.01	0.15	-0.03	FIXED	FIXED	FIXED	0.01	-0.18	-3.22	-0.01	-0.16	-2.76	-0.02	-0.15	-1.73			
8/2/2013	-0.04	0.13	-0.06	1120146.21	906142.82	441.81	0.01	-0.19	-3.25	-0.01	-0.17	-2.79	-0.01	-0.15	-1.76			
8/6/2013	0.09	0.21	-0.08	0.14	0.07	-1.86	0.13	-0.12	-3.26	0.09	-0.10	-2.81	0.10	-0.07	-1.78			
8/9/2013	0.17	0.24	-0.04	0.18	0.11	-1.86	0.19	-0.07	-3.26	0.16	-0.06	-2.80	0.14	-0.04	-1.78			
8/13/2013	0.00	0.18	-0.04	0.03	0.06	-1.89	0.02	-0.16	-3.28	0.02	-0.13	-2.81	0.03	-0.11	-1.80			
8/16/2013	0.17	0.26	-0.11	0.20	0.12	-1.93	0.20	-0.05	-3.32	0.19	-0.04	-2.86	0.15	-0.04	-1.83			
8/19/2013	0.13	0.23	-0.07	0.16	0.09	-1.93	0.16	-0.10	-3.32	0.15	-0.09	-2.85	0.14	-0.08	-1.84			
8/22/2013	0.15	0.25	-0.06	0.19	0.10	-1.94	0.14	-0.11	-3.33	0.12	-0.10	-2.85	0.14	-0.07	-1.85			
8/27/2013	0.03	0.20	-0.05	0.09	0.07	-1.96	0.07	-0.17	-3.35	0.08	-0.12	-2.87	0.07	-0.10	-1.86			
8/30/2013	0.15	0.25	-0.08	0.20	0.11	-1.98	0.17	-0.12	-3.35	0.14	-0.10	-2.89	0.13	-0.06	-1.87			
9/3/2013	0.08	0.22	-0.08	0.13	0.09	-2.00	0.13	-0.16	-3.39	0.12	-0.11	-2.89	0.12	-0.07	-1.89			
9/6/2013	0.06	0.20	-0.05	0.11	0.04	-2.02	0.09	-0.19	-3.37	0.07	-0.17	-2.89	0.08	-0.12	-1.88			
9/10/2013	0.07	0.24	-0.09	0.10	0.08	-2.05	0.10	-0.18	-3.42	0.08	-0.14	-2.92	0.05	-0.13	-1.89			
9/11/2013	-0.05	0.20	-0.04	0.00	0.03	-2.03	-0.01	-0.24	-3.38	-0.03	-0.20	-2.87	-0.01	-0.17	-1.87			
9/12/2013	0.13	0.26	-0.03	0.18	0.11	-2.01	0.17	-0.14	-3.38	0.15	-0.09	-2.89	0.14	-0.07	-1.88			
9/13/2013	0.24	0.30	-0.07	2.80	0.65	-2.03	0.72	0.00	-3.38	0.32	0.16	-2.89	-0.08	-0.88	-1.88			
9/17/2013	0.28	0.32	-0.12	BROKEN	BROKEN	BROKEN	0.81	0.01	-3.42	0.39	0.18	-2.93	0.01	-0.85	-1.91			
9/20/2013	0.43	0.39	-0.13				0.94	0.03	-3.45	0.52	0.26	-2.95	0.09	-0.82	-1.92			
9/24/2013	-0.91	-0.13	-0.13				0.12	-0.68	-3.48	-0.47	-0.35	-2.97	-0.30	-1.85	-1.98			
9/27/2013	0.56	0.44	-0.12				2.19	-0.37	-3.58	0.71	0.35	-2.96	0.77	-1.10	-1.99			
10/1/2013	0.27	0.33	-0.11				2.42	-0.81	-3.68	0.41	0.19	-2.97	0.51	-1.30	-1.99			
10/4/2013	0.68	0.50	-0.10				2.76	-0.65	-3.71	0.70	0.39	-2.98	0.75	-1.09	-2.00			
10/8/2013	0.48	0.40	-0.08				2.55	-0.66	-3.70	0.54	0.34	-2.98	0.94	-1.42	-2.04			
10/11/2013	0.04	0.18	-0.10				-1.39	0.12	-3.47	0.24	0.16	-3.00	0.68	-1.59	-2.05			
10/15/2013	0.26	0.39	-0.08				-1.37	-0.28	-3.55	0.35	0.24	-3.04	0.76	-1.53	-2.09			
10/18/2013	BROKEN	BROKEN	BROKEN				-1.82	-0.88	-3.71	0.67	-0.54	-3.04	-1.51	-0.40	-2.05			
10/22/2013							-1.99	-1.35	-3.81	0.53	-0.63	-3.10	-1.50	-0.56	-2.09			
10/25/2013							-2.02	-1.46	-3.90	0.63	-0.57	-3.15	-1.41	-0.54	-2.14			
10/29/2013							BROKEN	BROKEN	BROKEN	0.84	-0.52	-3.27	-1.25	-0.42	-2.19			
11/5/2013										0.75	-0.68	-3.39	-0.90	-0.80	-2.34			
11/8/2013										0.75	-0.68	-3.45	-0.86	-0.87	-2.41			
11/12/2013										0.67	-0.67	-3.54	-1.04	-0.92	-2.56			
11/15/2013										0.64	-0.69	-3.50	-0.88	-1.03	-2.49			
11/19/2013										0.76	-0.65	-3.52	-0.79	-1.03	-2.53			
11/22/2013										0.77	-0.66	-3.57	-0.74	-1.00	-2.58			
11/26/2013										0.76	-0.67	-3.58	-0.94	-1.05	-2.61			
12/2/2013										0.87	-0.59	-3.63	-0.85	-0.97	-2.67			
12/5/2013	FIXED	FIXED	FIXED							0.78	-0.62	-3.65	-0.88	-1.00	-2.69			
1/20/2014	0.23	0.77	-0.16							0.80	-0.71	-3.92	-0.88	-1.15	-3.02			
1/30/2014	0.35	0.74	-0.44							0.93	-0.71	-4.02	-0.92	-1.22	-3.14			
2/28/2014	0.17	0.72	-0.42							0.84	-0.77	-4.13	-0.85	-1.41	-3.28			
4/1/2014	0.32	0.90	-0.45							0.93	-0.78	-4.29	-0.60	-1.39	-3.43			
4/4/2014																		
4/5/2014	0.33	1.00	-0.34							0.90	-0.80	-4.28	-0.59	-1.34	-3.40			
4/8/2014	0.34	1.07	-0.25							0.91	-0.79	-4.26	-0.56	-1.34	-3.38	6.77	-2.14	-1.62
4/11/2014	0.38	1.15	-0.30	3.19	-1.42	-3.27				0.89	-0.79	-4.28	-0.49	-1.35	-3.39	6.91	-2.09	-1.62
4/14/2014	0.44	1.19	-0.35	3.22	-1.42	-3.30				0.91	-0.81	-4.32	-0.51	-1.35	-3.43	6.96	-2.02	-1.65
4/18/2014	0.45	1.19	-0.49	3.13	-1.45	-3.35				0.87	-0.80	-4.36	-0.51	-1.34	-3.46	6.91	-2.10	-1.66
4/22/2014	0.35	1.13	-0.22	3.20	-1.41	-3.26				0.84	-0.79	-4.28	-0.55	-1.35	-3.40	6.95	-2.00	-1.63
4/25/2014	0.44	1.15	-0.35	3.20	-1.41	-3.31				0.92	-0.75	-4.34	-0.50	-1.31	-3.45	6.94	-2.05	-1.67
4/29/2014	0.42	1.13	-0.40	3.21	-1.43	-3.31				0.92	-0.78	-4.34	-0.50	-1.36	-3.45	7.02	-2.16	-1.67
5/2/2014	0.47	1.15	-0.43	3.22	-1.39	-3.36				0.91	-0.75	-4.38	-0.52	-1.31	-3.50	6.98	-1.98	-1.71
5/7/2014	0.44	1.14	-0.72	3.21	-1.37	-3.41				0.93	-0.76	-4.40	-0.51	-1.38	-3.50	6.92	-2.08	-1.71
5/9/2014	0.39	1.13	-0.57	3.12	-1.40	-3.39				0.86	-0.80	-4.41	-0.54	-1.39	-3.51	6.96	-2.04	-1.72
5/13/2014				3.12	-1.41	-3.39				0.82	-0.82	-4.39	-0.52	-1.37	-3.48	6.64	-2.95	-1.89
5/17/2014				3.18	-1.38	-3.44				0.88	-0.77	-4.42				6.69	-2.90	-2.03

	SM-13			SM-14			SM-15			SM-16			SM-17			SM-18		
	Phase IB, West			Phase IB, West			Phase IB, Center			Phase IB, East			Phase IB, East			Phase I high point, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014				3.27	-1.37	-3.41				0.94	-0.75	-4.44				6.77	-2.85	-2.07
5/23/2014	0.52	1.20	-0.39	3.29	-1.33	-3.38				1.90	-1.21	-4.47				6.78	-2.81	-2.11
5/27/2014	0.39	1.15	-0.49	3.18	-1.39	-3.42				3.26	-1.96	-4.72	-0.57	-0.83	-3.43	6.71	-2.89	-2.22
5/30/2014	0.56	1.20	-0.55	3.14	-1.42	-3.49				4.86	-2.69	-5.08	-0.72	-2.46	-3.86	6.76	-2.86	-2.25
6/4/2014				3.15	-1.41	-3.45				4.91	-2.70	-5.20	-0.99	-3.04	-4.13	6.67	-2.91	-2.36
6/6/2014				3.18	-1.40	-3.49				5.04	-2.62	-5.22	-1.00	-3.07	-4.21	6.71	-2.83	-2.40
6/10/2014				3.19	-1.43	-3.43										6.73	-2.87	-2.42
6/17/2014				3.26	-1.38	-3.54										6.76	-2.73	-2.61
6/20/2014																6.68	-2.80	-2.68
6/23/2014																6.72	-2.77	-2.68
6/27/2014																6.81	-2.90	-2.75
7/8/2014																6.79	-2.79	-2.88
7/11/2014																		
7/15/2014																		
7/18/2014																6.50	-2.90	-2.95
7/22/2014																6.71	-2.71	-3.02
7/25/2014																6.71	-2.72	-3.05
7/29/2014																6.76	-2.72	-3.10
8/1/2014																6.73	-2.74	-3.09
8/5/2014																6.58	-2.89	-3.13
8/10/2014										1120222.54	906388.95	460.28	1120261.09	906524.15	465.04	6.67	-2.94	-3.20
8/12/2014	1120088.71	905980.48	455.82							-0.08	-0.06	-5.07	-0.02	-0.07	-4.28	6.63	-2.98	-3.19
8/15/2014	0.02	0.04	-0.67							-0.04	-0.01	-5.12	-0.02	-0.11	-4.24	6.62	-3.00	-3.38
8/19/2014	0.09	0.08	-0.81										0.16	0.01	-4.32	6.68	-2.90	-3.54
8/22/2014	-0.12	-0.03	-0.70										0.06	-0.13	-4.39	6.60	-3.00	-3.63
8/26/2014	0.09	0.05	-0.74										1.37	-0.21	-4.66	6.60	-2.97	-3.75
8/29/2014													1.35	-0.18	-4.69	6.57	-3.03	-3.80
9/2/2014													1.21	-0.22	-4.82	6.50	-3.05	-3.88
9/5/2014													1.43	-0.05	-4.84	6.68	-2.90	-3.93
9/9/2014													1.32	-0.15	-4.91	6.57	-2.99	-3.97
9/12/2014													1.47	-0.05	-5.10			
9/16/2014													1.40	-0.10	-4.99	6.67	-2.89	-4.07
9/19/2014													1120263.52	906524.61	469.33	1120299.07	906652.94	472.40
9/23/2014													-0.04	0.02	-5.01	0.07	0.01	-4.10
9/26/2014													-0.13	-0.06	-5.03	-0.03	-0.06	-4.16
9/29/2014													-0.29	-0.16	-5.07	-0.99	0.16	-4.19
10/3/2014													0.59	-1.02	-5.16	-1.01	0.26	-4.24
10/7/2014													0.37	-1.08	-5.20	-1.06	0.11	-4.31
10/10/2014													0.32	-1.12	-5.22	-1.06	0.08	-4.36
10/14/2014													0.30	-1.13	-5.25			
10/17/2014													-0.11	-4.48	-5.35			
10/21/2014													0.57	-3.58	-5.48			
10/24/2014													0.94	-3.33	-5.67			
10/28/2014													0.91	-3.42	-5.76			
10/30/2014													0.94	-3.42	-5.80			
11/4/2014													0.81	-3.55	-5.89			
11/7/2014													0.87	-3.52	-5.95			
11/11/2014													0.72	-3.66	-6.02			
11/14/2014													0.85	-3.58	-6.07			
11/18/2014													0.85	-3.58	-6.07			
11/21/2014													0.88	-3.58	-6.15			
11/25/2014													0.93	-3.56	-6.18			

	SM-19			SM-20			SM-21			SM-22			SM-23			SM-24		
	Phase IA, West			Phase IIB, West			Phase II high point, Center			Phase II high point, South			Phase IIB, Southeast			Phase IIB, South		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012																		
8/23/2012																		
8/28/2012																		
9/1/2012																		
9/5/2012																		
9/12/2012																		
9/15/2012																		
9/21/2012																		
9/25/2012																		
9/28/2012																		
10/3/2012																		
10/9/2012																		
10/13/2012							1119726.15	906827.96	434.39	1119426.00	906923.19	437.29	1119385.81	906797.38	436.84	1119345.67	906671.72	436.00
10/16/2012																		
10/19/2012																		
10/24/2012	1120338.77	906778.29	434.47															
10/27/2012																		
10/29/2012	-0.40	-0.25	-0.02															
11/3/2012	-0.62	0.60	0.16															
11/9/2012	-0.54	0.43	0.05															
11/13/2012	BROKEN	BROKEN	BROKEN															
11/16/2012																		
11/21/2012																		
12/1/2012																		
12/6/2012																		
12/8/2012																		
12/13/2012																		
12/21/2012																		
1/25/2013																		
2/15/2013																		
2/28/2013																		
4/4/2013							2.40	-2.65	0.17									
4/12/2013							1.78	-1.78	0.21									
4/23/2013																		
4/26/2013																		
5/28/2013																		
5/31/2013																		
6/12/2013				1119558.72	906265.54	442.22	1119739.17	906835.98	444.91	1119453.06	906927.40	447.54	1119410.30	906791.12	447.17	1119366.69	906654.16	446.03
6/14/2013				0.05	-0.02	0.00	0.02	-0.03	0.21	0.06	-0.02	0.00	0.07	-0.02	0.00	0.07	-0.02	0.00
6/21/2013				0.06	0.02	0.02	-0.03	-0.10	0.19									
6/25/2013				0.25	0.09	-0.03	0.00	-0.06	0.21									
6/28/2013				0.07	0.05	-0.05	-0.05	-0.06	0.20									
7/1/2013				BROKEN	BROKEN	BROKEN	0.00	-0.05	0.21									
7/3/2013							-0.14	-0.14	0.21									
7/9/2013							-0.67	-0.49	0.24	1119441.80	906949.42	447.82	1119406.68	906815.33	447.37	1119388.19	906740.47	446.89
7/12/2013							-0.61	-0.47	0.24	0.06	0.00	0.00	0.06	-0.01	0.00	0.00	0.00	0.00
7/16/2013							BROKEN	BROKEN	BROKEN	-0.13	-0.42	-0.04	0.00	0.00	0.00	0.01	-0.05	-0.01
7/19/2013										-0.17	-0.44	-0.05	0.03	0.00	0.00	0.03	-0.05	-0.03
7/23/2013										-0.34	-0.50	-0.04	-0.04	-0.01	0.00	-0.08	-0.07	-0.03
7/25/2013										-0.26	-0.61	-0.03	0.06	0.17	0.00	-0.04	-0.05	-0.04

	SM-19			SM-20			SM-21			SM-22			SM-23			SM-24		
	Phase IA, West			Phase IIB, West			Phase II high point, Center			Phase II high point, South			Phase IIB, Southeast			Phase IIB, South		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013										-0.18	-0.60	-0.04	0.08	0.16	-0.01	-0.02	-0.08	-0.04
8/2/2013										-0.21	-0.62	-0.05	0.05	0.15	-0.01	-0.04	-0.07	-0.05
8/6/2013										-0.16	-0.62	-0.05	0.10	0.15	-0.02	0.02	-0.07	-0.06
8/9/2013										-0.12	-0.62	-0.05	0.14	0.16	0.00	0.07	-0.07	-0.05
8/13/2013										-0.17	-0.61	-0.06	0.10	0.16	-0.02	0.01	-0.06	-0.06
8/16/2013										-0.12	-0.61	-0.08	0.12	0.16	-0.05	0.06	-0.06	-0.09
8/19/2013										-0.15	-0.63	-0.06	0.12	0.15	-0.04	0.02	-0.07	-0.08
8/22/2013										-0.15	-0.63	-0.06	0.11	0.14	-0.03	0.03	-0.08	-0.07
8/27/2013										-0.14	-0.62	-0.07	0.13	0.15	-0.03	0.03	-0.09	-0.08
8/30/2013										-0.05	-0.42	-0.07	0.14	0.15	-0.05	0.06	-0.09	-0.10
9/3/2013										-0.05	-0.40	-0.06	0.13	0.15	-0.04	0.08	-0.09	-0.09
9/6/2013										-0.02	-0.41	-0.05	0.17	0.14	-0.03	0.11	-0.11	-0.10
9/10/2013										-0.08	-0.40	-0.06	0.10	0.15	-0.04	0.03	-0.10	-0.11
9/11/2013																		
9/12/2013																		
9/13/2013										-0.01	-0.40	-0.06	0.19	0.15	-0.03	0.13	-0.10	-0.10
9/17/2013										0.09	-0.39	-0.07	0.31	0.14	-0.04	0.30	-0.10	-0.13
9/20/2013										0.07	-0.38	-0.07	0.28	0.14	-0.06	0.23	-0.10	-0.13
9/24/2013										-0.53	-0.41	-0.06	-0.40	0.13	-0.05	-0.51	-0.08	-0.13
9/27/2013										0.10	-0.39	-0.07	0.32	0.13	-0.05	0.28	-0.11	-0.14
10/1/2013										0.00	-0.39	-0.07	0.21	0.12	-0.05	0.16	-0.11	-0.13
10/4/2013										0.10	-0.44	-0.06	0.34	0.13	-0.05	0.30	-0.11	-0.14
10/8/2013										0.09	-0.45	-0.05	0.34	0.12	-0.03	0.31	-0.12	-0.11
10/11/2013										-0.05	-0.46	-0.04	0.19	0.12	-0.02	0.14	-0.11	-0.11
10/15/2013										-0.01	-0.46	-0.06	0.23	0.12	-0.04	0.18	-0.12	-0.13
10/18/2013										0.06	-0.43	-0.06	0.28	0.13	-0.03	0.25	-0.11	-0.13
10/22/2013										0.01	-0.42	-0.06	0.21	0.13	-0.03	0.16	-0.10	-0.13
10/25/2013										0.10	-0.42	-0.07	0.29	0.12	-0.04	0.25	-0.11	-0.14
10/29/2013										0.19	-0.42	-0.07	0.36	0.12	-0.04	0.32	-0.11	-0.13
11/5/2013										0.10	-0.43	-0.08	0.25	0.11	-0.05	0.19	-0.11	-0.14
11/8/2013										0.09	-0.44	-0.08	0.23	0.10	-0.06	0.18	-0.12	-0.15
11/12/2013										0.10	-0.40	-0.14	0.24	0.14	-0.12	0.19	-0.09	-0.21
11/15/2013										0.08	-0.41	-0.08	0.21	0.13	-0.05	0.16	-0.09	-0.15
11/19/2013										0.07	-0.41	-0.06	0.20	0.13	-0.03	0.15	-0.09	-0.12
11/22/2013										0.14	-0.41	-0.09	0.26	0.13	-0.06	0.21	-0.09	-0.16
11/26/2013										0.11	-0.40	-0.08	0.22	0.13	-0.05	0.18	-0.09	-0.15
12/2/2013										0.19	-0.40	-0.10	0.31	0.13	-0.06	0.22	-0.09	-0.15
12/5/2013										0.11	-0.39	-0.09	0.24	0.14	-0.05	0.20	-0.08	-0.15
1/20/2014										0.22	-0.39	-0.09	0.32	0.13	-0.06	0.27	-0.07	-0.17
1/30/2014										0.22	-0.43	-0.09	0.29	0.10	-0.07	0.23	-0.12	-0.19
2/28/2014										0.21	-0.43	-0.11	0.29	0.13	-0.09	0.26	-0.10	-0.21
4/1/2014										0.21	-0.75	-0.13	0.36	0.13	-0.11	0.33	-0.09	-0.24
4/4/2014													0.33	0.11	-0.08			
4/5/2014													0.28	0.12	-0.10	0.24	-0.09	-0.23
4/8/2014													0.31	0.12	-0.08	0.28	-0.09	-0.20
4/11/2014	-3.04	-3.00	-1.58										0.30	0.11	-0.08	0.27	-0.10	-0.21
4/14/2014	-3.05	-3.02	-1.61							0.23	-0.76	-0.15	0.31	0.11	-0.14	0.29	-0.09	-0.27
4/18/2014	-3.02	-2.99	-1.63							0.18	-0.09	-0.14	0.33	0.11	-0.14	0.28	-0.10	-0.27
4/22/2014	-3.04	-3.01	-1.59							0.16	-0.08	-0.12	0.31	0.11	-0.08	0.27	-0.09	-0.22
4/25/2014	-3.01	-2.96	-1.62							0.18	-0.07	-0.13	0.35	0.11	-0.11	0.32	-0.09	-0.24
4/29/2014	-3.03	-3.02	-1.61							0.15	-0.08	-0.13	0.32	0.11	-0.10	0.28	-0.10	-0.23
5/2/2014	-3.04	-3.01	-1.65							0.16	-0.07	-0.15	0.31	0.11	-0.12	0.28	-0.09	-0.25
5/7/2014										0.15	-0.08	-0.14	0.33	0.10	-0.11	0.29	-0.10	-0.25
5/9/2014										0.18	-0.07	-0.15	0.33	0.11	-0.13	0.30	-0.09	-0.26
5/13/2014										0.17	-0.08	-0.13	0.32	0.10	-0.10	0.28	-0.10	-0.23
5/17/2014										0.18	-0.06	-0.14	0.35	0.12	-0.11	0.31	-0.08	-0.25

	SM-19			SM-20			SM-21			SM-22			SM-23			SM-24		
	Phase IA, West			Phase IIB, West			Phase II high point, Center			Phase II high point, South			Phase IIB, Southeast			Phase IIB, South		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014										0.22	-0.08	-0.13	0.38	0.10	-0.11	0.35	-0.10	-0.24
5/23/2014										0.22	-0.07	-0.14	0.40	0.12	-0.11	0.37	-0.09	-0.24
5/27/2014										0.13	-0.08	-0.13	0.30	0.11	-0.11	0.26	-0.09	-0.25
5/30/2014										0.22	-0.08	-0.13	0.38	0.10	-0.11	0.35	-0.10	-0.23
6/4/2014										0.15	-0.07	-0.15	0.31	0.11	-0.12	0.28	-0.10	-0.25
6/6/2014										0.27	-0.36	-0.15	0.34	0.11	-0.13	0.30	-0.09	-0.27
6/10/2014										0.26	-0.38	-0.13	0.32	0.09	-0.11	0.29	-0.12	-0.24
6/17/2014										0.27	-0.39	-0.16	0.34	0.10	-0.13	0.31	-0.10	-0.26
6/20/2014										0.20	-0.40	-0.20	0.27	0.09	-0.17	0.23	-0.11	-0.31
6/23/2014										0.25	-0.40	-0.15	0.33	0.10	-0.11	0.31	-0.10	-0.26
6/27/2014										0.27	-0.40	-0.13	0.35	0.09	-0.11	0.32	-0.11	-0.26
7/8/2014										0.25	-0.41	-0.14	0.34	0.09	-0.11	0.31	-0.12	-0.25
7/11/2014										0.19	-0.40	-0.15	0.27	0.10	-0.13	0.25	-0.11	-0.25
7/15/2014										0.17	-0.39	-0.16	0.27	0.10	-0.12	0.24	-0.10	-0.26
7/18/2014										0.25	-0.40	-0.16	0.35	0.09	-0.14	0.32	-0.11	-0.27
7/22/2014										0.25	-0.39	-0.16	0.36	0.10	-0.12	0.33	-0.10	-0.26
7/25/2014										0.24	-0.39	-0.16	0.34	0.09	-0.12	0.31	-0.11	-0.26
7/29/2014										0.28	-0.40	-0.15	0.40	0.08	-0.12	0.38	-0.13	-0.26
8/1/2014										0.28	-0.39	-0.14	0.40	0.09	-0.11	0.36	-0.11	-0.24
8/5/2014										0.21	-0.39	-0.15	0.32	0.09	-0.11	0.26	-0.11	-0.25
8/10/2014										0.23	-0.39	-0.18	0.34	0.10	-0.12	0.29	-0.11	-0.27
8/12/2014										0.17	-0.39	-0.16	0.27	0.09	-0.12	0.23	-0.11	-0.26
8/15/2014										0.22	-0.39	-0.17	0.34	0.09	-0.13	0.28	-0.11	-0.28
8/19/2014										0.24	-0.38	-0.16	0.35	0.10	-0.13	0.31	-0.10	-0.27
8/22/2014										0.21	-0.40	-0.16	0.33	0.08	-0.12	0.28	-0.12	-0.25
8/26/2014										0.24	-0.39	-0.17	0.35	0.09	-0.13	0.31	-0.11	-0.25
8/29/2014										0.20	-0.40	-0.16	0.31	0.08	-0.13	0.26	-0.13	-0.28
9/2/2014										0.16	-0.40	-0.16	0.25	0.08	-0.13	0.20	-0.12	-0.28
9/5/2014										0.24	-0.39	-0.17	0.34	0.09	-0.10	0.32	-0.12	-0.27
9/9/2014										0.15	-0.40	-0.15	0.25	0.08	-0.11	0.22	-0.12	-0.26
9/12/2014										0.25	-0.39	-0.15	0.37	0.08	-0.11	0.34	-0.12	-0.26
9/16/2014										0.21	-0.39	-0.14	0.31	0.08	-0.11	0.27	-0.12	-0.25
9/19/2014										0.36	-0.39	-0.16	0.47	0.08	-0.13	0.45	-0.13	-0.27
9/23/2014										0.33	-0.39	-0.14	0.46	0.08	-0.11	0.44	-0.13	-0.26
9/26/2014										0.29	-0.39	-0.16	0.40	0.08	-0.13	0.37	-0.12	-0.27
9/29/2014										0.23	-0.40	-0.17	0.34	0.07	-0.13	0.29	-0.13	-0.28
10/3/2014										0.28	-0.39	-0.17	0.40	0.08	-0.13	0.36	-0.12	-0.28
10/7/2014										0.21	-0.40	-0.16	0.30	0.07	-0.13	0.26	-0.13	-0.28
10/10/2014										0.21	-0.40	-0.18	0.31	0.06	-0.14	0.27	-0.13	-0.29
10/14/2014										0.20	-0.40	-0.17	0.28	0.07	-0.13	0.24	-0.13	-0.29
10/17/2014										0.26	-0.39	-0.16	0.37	0.06	-0.12	0.34	-0.13	-0.27
10/21/2014										0.30	-0.39	-0.15	0.42	0.07	-0.10	0.38	-0.13	-0.26
10/24/2014										0.29	-0.39	-0.15	0.40	0.07	-0.11	0.37	-0.13	-0.27
10/28/2014										0.29	-0.39	-0.15	0.39	0.06	-0.11	0.36	-0.13	-0.26
10/30/2014										0.29	-0.39	-0.14	0.40	0.07	-0.10	0.35	-0.13	-0.25
11/4/2014										0.37	-0.37	-0.16	0.34	0.07	-0.12	0.31	-0.13	-0.27
11/7/2014										0.42	-0.37	-0.16	0.39	0.06	-0.12	0.37	-0.13	-0.28
11/11/2014										0.32	-0.39	-0.17	0.27	0.06	-0.13	0.24	-0.14	-0.29
11/14/2014										0.36	-0.38	-0.16	0.32	0.06	-0.11	0.31	-0.14	-0.27
11/18/2014										0.36	-0.38	-0.16	0.32	0.06	-0.11	0.31	-0.14	-0.27
11/21/2014										0.43	-0.37	-0.14	0.42	0.05	-0.10	0.38	-0.14	-0.26
11/25/2014										0.42	-0.37	-0.14	0.37	0.05	-0.10	0.35	-0.14	-0.26

	SM-25			SM-26			SM-27			SM-28			SM-29			SM-30		
	Phase IB, Southwest			Phase IB, Southwest			Phase IB, South			Phase IB, Southeast			Phase IB, Southeast			Phase I high point, South		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012																		
8/23/2012																		
8/28/2012	1119812.87	906108.66	429.99	1119852.81	906233.40	429.28	1119892.27	906359.45	429.93	1119932.93	906485.47	430.46				1120013.84	906737.97	432.10
9/1/2012	-0.79	0.52	0.04	-0.89	1.49	-0.01	-0.22	1.14	-0.01	-1.48	1.30	0.05				0.21	-0.15	-0.01
9/5/2012	-1.07	-1.00	-0.18	-0.69	1.25	0.01	-0.30	0.69	0.00	-0.12	0.52	-0.03				-0.20	0.06	-0.08
9/12/2012	-0.22	-1.40	-0.13	-0.74	0.84	-0.02	-0.24	0.52	0.01	-0.55	0.20	-0.07				-0.35	0.13	0.04
9/15/2012				-0.75	0.19	-0.01	-0.12	1.05	-0.04	-0.55	0.42	-0.07				-0.52	0.22	-0.10
9/21/2012	-0.31	-1.06	-0.17	-0.87	0.83	-0.05	-0.39	0.55	-0.10	-0.91	0.44	-0.10	1119975.59	906621.57	431.45	-0.24	0.00	-0.11
9/25/2012	0.13	-0.86	-0.10	-0.64	1.46	0.04	-0.85	0.45	-0.01	-0.83	0.53	0.00	0.03	-0.22	-0.11	-1.23	-0.19	-0.05
9/28/2012	-0.17	-0.92	-0.07	-1.01	1.10	0.02	-0.76	0.67	0.09	-1.05	0.59	-0.04	-0.09	-0.06	-0.04	-1.06	-1.14	0.06
10/3/2012				-0.33	1.28	-0.03	-0.33	-0.29	-0.11	-0.98	0.28	0.02	0.09	-0.09	-0.10	0.10	-0.10	0.06
10/9/2012	-0.48	-1.22	-0.03	-0.86	0.87	-0.08	-0.86	0.41	-0.03	-0.80	0.18	-0.14	-0.29	-0.08	-0.07	-1.12	0.03	-0.04
10/13/2012	-0.22	-1.36	-0.17	-0.67	0.80	-0.09	-0.72	0.48	-0.09	-0.85	0.08	-0.09	-0.56	-0.43	-0.13	0.88	8.28	0.02
10/16/2012	-0.25	-1.12	-0.15	-0.72	0.81	-0.08	-0.70	0.57	0.10	-0.81	0.19	-0.09	-0.24	-0.28	-0.08	0.89	8.29	0.09
10/19/2012	-0.31	-1.22	-0.08	-0.89	0.79	-0.04	-0.66	0.57	-0.02	-0.86	0.06	-0.08	-0.19	-0.19	-0.11	0.76	8.51	0.10
10/24/2012	-0.13	-1.43	-0.19	-0.79	0.80	-0.15	-0.68	0.46	-0.01	-0.98	0.06	-0.04	-0.23	-0.22	-0.13	0.50	8.21	0.03
10/27/2012	-0.33	-1.35	-0.11	-0.89	0.77	-0.02	-0.74	0.49	0.06	-0.96	0.13	-0.01	-0.14	-0.27	-0.11	0.96	8.34	0.10
10/29/2012	-0.05	-1.23	-0.18	-0.56	0.84	-0.16	-0.57	0.63	-0.03	-0.85	0.03	-0.03	-0.04	-0.26	-0.18	0.82	8.20	0.01
11/3/2012	-0.02	-1.33	-0.05	-0.55	0.95	-0.04	-0.53	0.62	0.05	-1.24	0.17	-0.01	-0.15	-0.10	-0.16	0.90	8.26	0.10
11/9/2012	-0.43	-1.08	-0.07	-0.74	0.77	-0.08	-0.84	0.44	-0.01	-0.86	0.00	-0.09	-0.39	0.22	-0.20	0.84	8.21	-0.01
11/13/2012	-0.32	-1.58	-0.17	-0.72	0.28	0.03	-0.81	0.88	-0.04	-0.95	0.10	-0.10	-0.49	-0.40	-0.19	0.78	8.13	-0.11
11/16/2012	-0.45	-2.36	-0.20	-0.85	0.50	-0.17	-0.87	-0.28	-0.07	-0.99	-0.13	-0.20	-0.29	-0.31	-0.12	0.75	8.12	-0.02
11/21/2012	-0.31	-1.50	-0.18	-0.62	0.08	-0.03	-0.66	-0.34	0.04	-0.75	0.27	-0.04	-0.33	-0.21	-0.15	0.73	8.13	0.00
12/1/2012	-0.24	-1.59	0.00	-0.49	0.08	-0.13	0.05	0.58	0.00	-0.96	0.01	0.01	-0.34	-0.31	-0.14	0.78	8.13	-0.06
12/6/2012	-0.52	-1.10	-0.04	-0.97	0.27	-0.17	-0.28	-0.29	-0.05	-0.75	0.10	-0.22	-0.30	-0.22	-0.19	0.90	8.18	-0.21
12/8/2012	-0.33	-1.76	-0.10	-0.93	0.19	-0.09	-0.24	-0.30	-0.09	-1.04	0.02	-0.03	-0.40	-0.34	-0.14	0.78	8.09	-0.02
12/13/2012	-0.22	-1.55	-0.04	-0.88	1.52	-0.10	-0.26	-0.33	-0.01	-0.90	0.20	0.02	-0.39	-0.35	-0.12	0.75	8.31	0.02
12/21/2012	-0.29	-1.60	-0.08	-0.58	0.14	-0.38	-0.09	-0.24	-0.18	-0.90	-0.06	-0.13	-0.25	-0.31	-0.19	0.47	8.37	0.03
1/25/2013	-0.58	-1.59	-0.09	0.26	1.64	-0.31	0.04	0.06	-0.05	-1.54	-0.17	-0.08	-0.64	-0.09	-0.08	0.25	8.19	-0.11
2/15/2013	-0.47	-1.16	-0.15	-0.65	0.90	-0.21	0.04	0.15	-0.14	-1.15	0.22	-0.14	-0.40	-0.08	-0.27	0.05	8.24	-0.16
2/28/2013																		
4/4/2013				-0.41	1.00	0.12	-0.58	-0.34	-0.09	-1.37	-0.77	-0.12	0.05	-1.48	0.01	0.22	7.02	-0.12
4/12/2013	-1.36	-1.03	-0.06	-1.08	0.11	-0.12	0.01	-0.23	-0.01	-1.77	-0.45	-0.10	0.34	-1.50	-0.17	0.75	9.51	-0.08
4/23/2013	-0.36	-1.41	-0.13	-0.79	0.34	-0.21	-1.83	0.77	-0.40	-1.03	0.91	0.48	-0.34	0.28	-0.14	0.08	6.30	-0.21
4/26/2013	-0.22	-0.29	-0.29	-0.90	0.21	-0.42	-0.26	-0.35	-0.19	-0.89	1.52	-0.03	-0.18	-2.09	-0.22	0.04	7.30	-0.49
5/28/2013							BROKEN	BROKEN	BROKEN	-0.69	-1.24	-0.05	-0.23	-1.86	-0.49	0.01	7.53	-0.39
5/31/2013													-0.04	-1.70	-1.14	-0.13	7.24	-0.37
6/12/2013				1119852.52	906233.85	444.46				1119923.96	906486.45	443.32	1119981.77	906623.09	445.31	1120015.45	906745.61	447.47
6/14/2013	1119812.86	906106.69	445.34	0.11	0.00	-0.45				0.16	-0.16	0.03	0.21	-1.63	-1.08	0.01	0.00	-0.36
6/21/2013	-0.14	-0.04	-0.29	0.00	-0.08	-0.45							0.14	-1.77	-1.04	-0.05	-0.04	-0.38
6/25/2013	0.03	0.02	-0.29	0.09	-0.06	-0.46							0.22	-1.79	-1.20	BROKEN	BROKEN	BROKEN
6/28/2013	-0.09	-0.01	-0.30	-0.03	-0.08	-0.47							0.14	-1.80	-1.23			
7/1/2013				0.02	-0.08	-0.46							0.20	-1.77	-1.25			
7/3/2013	-0.07	-0.02	-0.31	-0.01	-0.12	-0.49							0.16	-1.83	-1.29			
7/9/2013	-0.04	0.00	-0.33	0.01	-0.11	-0.50							0.17	-1.79	-1.33			
7/12/2013	0.05	0.02	-0.32	0.10	-0.10	-0.50							0.26	-1.79	-1.34			
7/16/2013	0.12	0.04	-0.36	0.16	-0.09	-0.53							0.34	-1.77	-1.37			
7/19/2013	0.12	0.05	-0.35	0.16	-0.09	-0.53							0.31	-1.77	-1.40			
7/23/2013	0.03	0.02	-0.36	0.08	-0.12	-0.53							0.24	-1.81	-1.40			
7/25/2013	0.06	0.03	-0.36	0.12	-0.12	-0.53							0.28	-1.85	-1.38			

	SM-25			SM-26			SM-27			SM-28			SM-29			SM-30		
	Phase IB, Southwest			Phase IB, Southwest			Phase IB, South			Phase IB, Southeast			Phase IB, Southeast			Phase I high point, South		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013	0.07	0.02	-0.37	0.10	-0.14	-0.54							0.23	-1.88	-1.41			
8/2/2013	-0.03	0.00	-0.39	0.17	-0.20	-0.57							0.23	-1.87	-1.43			
8/6/2013	0.10	0.03	-0.40	0.20	-0.15	-0.58							0.34	-1.78	-1.46			
8/9/2013	0.17	0.06	-0.39	0.26	-0.13	-0.58							0.36	-1.75	-1.45			
8/13/2013	0.03	0.03	-0.40	1.99	-0.50	-0.63							BROKEN	BROKEN	BROKEN			
8/16/2013	0.16	0.07	-0.46	2.12	-0.66	-0.74												
8/19/2013	0.13	0.04	-0.41	2.67	-0.93	-0.87												
8/22/2013	0.13	0.05	-0.41	2.58	-0.91	-0.89												
8/27/2013	0.08	0.03	-0.43	2.48	-0.91	-0.94				BROKEN	BROKEN	BROKEN						
8/30/2013	0.32	0.10	-0.44	2.54	-0.87	-0.98												
9/3/2013	0.11	0.05	-0.44	2.44	-0.89	-0.99												
9/6/2013				2.45	-0.89	-0.98												
9/10/2013	0.10	0.05	-0.46	2.41	-0.88	-1.04												
9/11/2013	0.02	0.04	-0.44	2.31	-0.90	-1.03												
9/12/2013	0.23	-0.07	-0.44	2.43	-0.87	-1.03							FIXED	FIXED	FIXED			
9/13/2013	0.36	-0.04	-0.45	2.54	-0.84	-1.04							4.28	-2.46	-1.45			
9/17/2013	0.45	-0.02	-0.49	2.56	-0.83	-1.08												
9/20/2013	0.54	0.02	-0.49	2.64	-0.79	-1.12												
9/24/2013	-0.71	-0.30	-0.50	1.51	-1.14	-1.14							BROKEN	BROKEN	BROKEN			
9/27/2013	0.64	0.04	-0.50	2.73	-0.80	-1.15												
10/1/2013	0.40	-0.02	-0.50	2.01	-0.81	-1.18												
10/4/2013	0.79	0.08	-0.49	2.47	-0.70	-1.23												
10/8/2013	0.56	0.02	-0.49	2.20	-0.76	-1.26												
10/11/2013	0.28	-0.06	-0.48	1.53	-0.85	-1.25												
10/15/2013	0.49	-0.02	-0.51	1.67	-0.86	-1.33				FIXED	FIXED	FIXED				FIXED	FIXED	FIXED
10/18/2013	0.59	0.01	-0.53	2.74	-1.24	-1.33				0.12	-0.70	-1.01				-1.54	2.27	-0.25
10/22/2013	0.51	0.02	-0.54	2.70	-1.27	-1.36				0.00	-0.72	-1.04				-1.62	2.23	-0.29
10/25/2013	0.74	0.06	-0.56	2.52	-1.16	-1.36				0.15	-0.67	-1.05				-1.48	2.21	-0.33
10/29/2013	0.80	0.07	-0.58	2.38	-1.17	-1.36				0.18	-0.66	-1.07				-1.36	2.29	-0.37
11/5/2013	0.72	0.05	-0.55	2.43	-1.24	-1.43				0.14	-0.74	-1.10				-1.49	2.19	-0.43
11/8/2013	0.65	0.02	-0.59	2.36	-1.27	-1.46				0.11	-0.76	-1.13				-1.48	2.17	-0.47
11/12/2013	0.60	0.05	-0.69	2.31	-1.26	-1.56				0.03	-0.77	-1.22				-1.43	2.26	-0.64
11/15/2013	0.56	0.05	-0.58	2.28	-1.30	-1.49				-0.02	-0.82	-1.14				-0.94	3.85	-0.74
11/19/2013	0.55	0.04	-0.59	2.29	-1.30	-1.48				-2.16	-6.83	-2.18						
11/22/2013	0.75	0.10	-0.58	2.50	-1.27	-1.52				-2.17	-7.31	-2.52						
11/26/2013	0.72	0.10	-0.56	2.47	-1.27	-1.53				-2.14	-7.33	-2.59				3.12	12.46	-1.01
12/2/2013	0.88	0.14	-0.47	2.63	-1.25	-1.56				-2.00	-7.23	-2.65						
12/5/2013	0.72	0.12	-0.55	2.50	-1.28	-1.57				-2.07	-7.20	-2.66						
1/20/2014	0.87	0.24	-0.62	2.64	-1.35	-1.74				-2.05	-7.19	-2.95						
1/30/2014	0.94	0.24	-0.69	2.64	-1.36	-1.77				-1.99	-7.24	-3.03						
2/28/2014	0.87	0.24	-0.77	2.51	-1.40	-1.89												
4/1/2014	0.99	0.29	-0.79	2.73	-1.35	-2.02												
4/4/2014																		
4/5/2014	0.87	0.25	-0.76	2.69	-1.37	-2.00												
4/8/2014	0.89	0.26	-0.72	2.70	-1.35	-1.98												
4/11/2014	0.88	0.24	-0.77	2.69	-1.37	-1.99												
4/14/2014	0.94	0.25	-0.77	2.76	-1.35	-2.02												
4/18/2014	0.93	0.26	-0.83	2.76	-1.37	-2.06				-2.18	-7.36	-3.41						
4/22/2014	0.88	0.22	-0.74	2.67	-1.41	-1.96												
4/25/2014	0.95	0.25	-0.79	2.74	-1.41	-2.03				-2.25	-7.38	-3.41						
4/29/2014	0.93	0.22	-0.79	2.57	-2.17	-2.07				-2.18	-7.33	-3.41						
5/2/2014	1.00	0.24	-0.83	0.81	-6.56	-2.86				-2.07	-7.28	-3.42						
5/7/2014	1.03	0.24	-0.84							-2.10	-7.33	-3.47						
5/9/2014	1.03	0.24	-0.85							-2.15	-7.32	-3.46						
5/13/2014	1.04	0.23	-0.80							-2.16	-7.31	-3.45						
5/17/2014	1.06	0.25	-0.86							-2.12	-7.28	-3.46						

	SM-25			SM-26			SM-27			SM-28			SM-29			SM-30		
	Phase IB, Southwest			Phase IB, Southwest			Phase IB, South			Phase IB, Southeast			Phase IB, Southeast			Phase I high point, South		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014	1.11	0.23	-0.84							-2.06	-7.28	-3.47						
5/23/2014	1.12	0.26	-0.80							-2.05	-7.24	-3.47						
5/27/2014	0.95	0.21	-0.85							-2.14	-7.28	-3.48						
5/30/2014	1.16	0.23	-0.82							-2.04	-7.24	-3.46						
6/4/2014										-2.17	-7.28	-3.51						
6/6/2014										-2.15	-7.27	-3.52						
6/10/2014										-2.14	-7.31	-3.51						
6/17/2014										-2.09	-7.26	-3.55						
6/20/2014																		
6/23/2014																		
6/27/2014																		
7/8/2014										1119921.14	906477.77	460.00						
7/11/2014										-0.10	0.01	-3.56						
7/15/2014																		
7/18/2014																		
7/22/2014																		
7/25/2014																		
7/29/2014										1.36	-0.29	-3.74	1119982.51	906621.50	460.55			
8/1/2014										1.50	-0.29	-3.76	-0.15	-0.05	-1.47			
8/5/2014										1.48	-0.38	-3.80	-0.18	-0.07	-1.47			
8/10/2014				1119853.34	906232.50	461.20							0.00	-0.22	-1.49			
8/12/2014				-0.14	-0.06	-2.82							-0.08	-0.24	-1.50			
8/15/2014				-0.04	-0.03	-2.86							-0.04	-0.19	-1.53			
8/19/2014				-0.02	-0.01	-2.92							0.05	-0.12	-1.56			
8/22/2014				-0.23	0.01	-2.97							-0.05	-0.27	-1.60			
8/26/2014				-0.14	0.13	-3.06							0.11	-0.15	-1.68			
8/29/2014													0.02	-0.26	-1.72			
9/2/2014				-0.42	0.09	-3.20							-0.07	-0.32	-1.80			
9/5/2014													0.18	-0.18	-1.82			
9/9/2014													0.05	-0.28	-1.83			
9/12/2014													-0.04	-1.24	-1.99			
9/16/2014																		
9/19/2014																		
9/23/2014																		
9/26/2014																		
9/29/2014																		
10/3/2014																		
10/7/2014																		
10/10/2014																		
10/14/2014																		
10/17/2014																		
10/21/2014																		
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10/28/2014																		
10/30/2014																		
11/4/2014																		
11/7/2014																		
11/11/2014																		
11/14/2014																		
11/18/2014																		
11/21/2014																		
11/25/2014																		

	SM-31			SM-32			SM-33			SM-34			SM-35			SM-36		
	Phase IA, Southwest			Phase IA, Southwest			Phase IA, South			Phase IA, South			Phase IA, Southeast			Phase IA, Southeast		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012																		
8/23/2012																		
8/28/2012	1120052.96	906863.60	433.27	1120091.66	906989.80	433.80	1120131.38	907113.86	433.56	1120171.92	907239.67	433.29	1120211.33	907366.06	433.21	1120252.47	907489.14	433.27
9/1/2012	-0.18	-0.37	0.04	-1.24	-0.24	-0.01	1.00	-0.10	-0.07	0.31	-0.17	0.05	0.25	0.87	0.01	-1.07	0.63	0.09
9/5/2012	-0.17	-0.33	-0.05	-0.79	-0.46	0.02	0.93	-0.17	-0.05	-0.17	0.47	0.04	0.06	0.69	-0.01	-0.84	0.45	0.00
9/12/2012	-0.60	-0.23	0.01	-0.93	-0.23	0.03	0.85	-0.53	-0.16	-0.30	0.14	0.15	-0.61	0.61	0.04	-0.88	0.28	0.10
9/15/2012	-0.51	-0.16	0.08	-0.86	-0.23	0.01	0.84	0.01	-0.12	-0.22	0.24	0.08	-0.22	0.93	0.00	-0.78	0.61	0.09
9/21/2012	-0.25	-0.12	-0.10	-1.00	-0.41	-0.07	0.93	-0.47	-0.20	-0.21	0.17	-0.06	-0.36	0.79	-0.16	-1.19	0.55	-0.08
9/25/2012	-0.77	-0.19	-0.06	-0.90	-0.37	-0.01	0.69	-0.56	-0.06	-0.41	0.44	0.03	-0.75	0.83	-0.03	-1.29	0.85	0.06
9/28/2012	-0.72	0.19	-0.08	-0.80	-0.46	-0.10	0.57	-0.64	-0.12	-0.57	0.42	0.01	-0.63	0.97	-0.04	-0.54	0.39	0.10
10/3/2012	-0.77	-0.08	-0.11	-0.53	-0.44	-0.04	0.66	-0.12	-0.08	-0.58	0.27	-0.05	-0.58	0.54	0.01	-0.48	0.11	0.14
10/9/2012	-0.59	-0.20	0.03	-0.39	-0.46	-0.04	0.55	-0.56	-0.11	-0.66	0.30	0.07	-0.82	0.84	-0.03	-1.30	0.64	0.00
10/13/2012	-1.15	-0.29	-0.06	-0.36	-0.52	-0.09	0.72	-0.33	-0.04	-0.63	0.24	-0.03	-0.70	0.62	-0.06	-1.67	0.69	0.04
10/16/2012	-0.61	-0.19	-0.08	-0.38	-0.41	-0.05	0.89	-0.68	-0.15	-0.49	0.25	0.03	-0.83	0.76	-0.06	-1.51	0.59	0.00
10/19/2012	-0.71	-0.17	0.00	-0.41	-0.44	-0.03	1.02	-0.54	-0.08	-0.53	0.26	0.01	-0.94	0.79	-0.02	-1.34	0.56	0.06
10/24/2012	-5.23	0.65	0.00	-0.43	-0.36	0.03	0.59	-0.75	-0.15	-0.57	0.26	0.12	-0.96	0.74	-0.01	-1.03	0.46	-0.02
10/27/2012	-5.50	0.71	-0.07	-0.47	-0.53	-0.05	0.64	-0.73	-0.12	-0.32	0.22	-0.06	-0.79	0.66	-0.24	-1.63	0.86	0.09
10/29/2012	-5.17	0.74	-0.03	-0.32	-0.49	-0.09	0.90	-0.66	-0.17	-0.31	0.17	0.06	-1.07	-0.29	-0.09	-1.37	0.58	0.05
11/3/2012	-5.20	0.73	0.10	-0.45	-0.48	0.01	0.67	-0.75	0.01	-0.08	-0.10	0.00	-0.74	0.61	-0.07	-1.36	0.52	0.06
11/9/2012	-4.97	0.72	-0.07	-0.71	-0.06	0.04	0.65	-0.83	-0.15	-0.71	0.20	-0.04	-0.89	0.70	-0.05	-1.34	0.50	0.03
11/13/2012	-5.22	0.64	-0.11	-0.53	-0.44	0.00	0.69	-0.89	-0.28	-0.42	0.23	0.07	-0.64	0.74	0.05	-1.86	0.74	0.30
11/16/2012	-4.99	0.80	0.13	-0.44	-0.42	0.10	0.63	-0.85	-0.15	-0.61	0.22	0.03	-0.76	0.69	-0.06	-1.37	0.49	0.09
11/21/2012	-5.33	0.63	-0.06	-0.58	-0.49	-0.03	1.06	-0.67	-0.10	-0.50	0.21	0.01	-0.62	0.58	-0.11	-1.88	0.32	-0.04
12/1/2012	-5.89	0.12	-0.04	-0.61	-0.41	0.03	0.82	-0.69	-0.10	-0.60	0.26	-0.07	-0.99	0.77	-0.05	-1.61	0.47	0.12
12/6/2012	-5.48	0.80	-0.07	-0.59	-0.51	-0.07	0.57	-0.91	-0.19	-0.51	0.28	-0.01	-0.91	0.78	-0.01	-1.66	0.47	0.07
12/8/2012	-5.54	0.94	-0.01	-0.42	-0.43	-0.02	0.75	-0.69	-0.12	-0.61	0.24	-0.03	-1.21	0.80	0.02	-1.65	0.48	0.07
12/13/2012	-5.46	0.59	-0.02	-0.60	-0.63	-0.09	0.52	-0.97	-0.06	-0.67	0.22	-0.03	-0.98	0.75	-0.11	-1.63	0.45	0.15
12/21/2012	-5.48	0.18	0.05	-0.56	-0.47	0.00	0.57	-0.89	-0.16	-0.83	0.14	-0.05	-0.80	0.68	-0.17	-1.58	0.49	0.18
1/25/2013	-5.36	0.39	-0.06	-0.66	-0.53	-0.09	0.50	-0.47	-0.13	-0.76	0.24	0.07	-0.74	0.68	-0.10	-1.44	0.67	0.13
2/15/2013	-5.76	0.52	-0.16	-0.63	-0.46	-0.12	0.35	-0.67	-0.21	-0.60	0.33	-0.10	-0.56	0.66	-0.10	-1.45	0.67	-0.01
2/28/2013																		
4/4/2013	-5.34	-0.71	-0.14	-0.37	-1.56	0.13	-0.38	-0.62	-0.13	-1.30	-0.31	0.03	1.29	-1.53	-0.06	-2.51	0.66	-0.02
4/12/2013																		
4/23/2013	-5.89	-0.87	0.05	-0.45	0.20	-0.04	1.39	-0.31	-0.13	-0.73	0.01	-0.18	-0.80	0.05	0.04	-0.89	0.89	0.14
4/26/2013	-5.75	-0.84	-0.22	0.37	0.18	-0.13	1.01	-2.51	-0.29	5.93	0.29	-0.22	6.56	-2.95	-0.26	5.90	-0.83	-0.26
5/28/2013	-5.45	-1.14	-0.25	BROKEN	BROKEN	BROKEN	BROKEN	BROKEN	BROKEN	4.00	-0.56	-0.48	7.07	-1.77	-0.50	BROKEN	BROKEN	BROKEN
5/31/2013										5.62	-1.51	-0.68						
6/12/2013																		
6/14/2013	1120048.48	906863.87	448.71							1120177.70	907238.47	448.52	0.00	0.00	-0.50			
6/21/2013	BROKEN	BROKEN	BROKEN							-0.06	-0.05	-0.70	-0.02	-0.07	-0.51			
6/25/2013										-0.04	-0.05	-0.73	0.00	-0.08	-0.57			
6/28/2013										-0.06	-0.09	-0.74	-0.02	-0.12	-0.57			
7/1/2013										-0.06	-0.06	-0.74	-0.02	-0.08	-0.57			
7/3/2013										-0.07	-0.12	-0.75	-0.04	-0.18	-0.59			
7/9/2013										-0.06	-0.09	-0.76	-0.03	-0.15	-0.60			
7/12/2013										-0.03	-0.06	-0.77	-0.01	-0.12	-0.60			
7/16/2013										-0.04	-0.05	-0.79	0.00	-0.10	-0.63			
7/19/2013										-0.03	-0.04	-0.80	0.01	-0.11	-0.63			
7/23/2013										-0.05	-0.07	-0.81	-0.01	-0.13	-0.64			
7/25/2013										-0.07	-0.12	-0.79	0.01	-0.15	-0.63	FIXED	FIXED	FIXED

	SM-31			SM-32			SM-33			SM-34			SM-35			SM-36		
	Phase IA, Southwest			Phase IA, Southwest			Phase IA, South			Phase IA, South			Phase IA, Southeast			Phase IA, Southeast		
	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.
7/30/2013										-0.04	-0.08	-0.81	-0.01	-0.14	-0.66	1120282.82	907545.20	443.68
8/2/2013										-0.10	-0.16	-0.82	-0.04	-0.19	-0.66	-0.02	0.02	-0.26
8/6/2013										-0.05	-0.07	-0.84	0.00	-0.12	-0.68	-0.01	0.09	-0.27
8/9/2013										-0.04	-0.04	-0.83	0.11	-0.17	-0.69	0.00	0.15	-0.26
8/13/2013										-0.06	-0.08	-0.85	0.96	-0.63	-0.80	-0.05	0.09	-0.28
8/16/2013										0.26	-0.04	-0.89	0.99	-0.55	-0.95	0.30	1.40	-0.28
8/19/2013										0.33	-0.15	-0.91	1.05	-0.74	-1.01	0.29	1.32	-0.27
8/22/2013										0.26	-0.16	-1.02	1.07	-0.73	-1.04	0.29	1.35	-0.27
8/27/2013										0.19	-0.13	-1.13	1.07	-0.77	-1.10	0.28	1.34	-0.27
8/30/2013										0.16	-0.08	-1.15	1.07	-0.72	-1.12	0.30	1.39	-0.27
9/3/2013										0.13	0.05	-1.19	1.04	-0.74	-1.14	0.28	1.37	-0.27
9/6/2013										0.08	0.04	-1.22	1.03	-0.76	-1.13	0.29	1.33	-0.25
9/10/2013										0.03	-0.01	-1.27	0.99	-0.77	-1.16	0.28	1.35	-0.27
9/11/2013										0.04	0.04	-1.31	0.97	-0.80	-1.17	0.27	1.32	-0.27
9/12/2013										0.38	0.12	-1.31	1.68	-0.93	-1.17	0.39	1.71	-0.27
9/13/2013										0.41	0.07	-1.32	1.71	-0.90	-1.17	0.41	1.77	-0.27
9/17/2013										0.44	0.13	-1.40	1.66	-0.86	-1.23	0.44	1.81	-0.28
9/20/2013										0.46	0.21	-1.44	1.61	-0.75	-1.28	0.49	1.88	-0.28
9/24/2013										0.05	-0.41	-1.46	1.07	-2.00	-1.34	0.26	0.63	-0.27
9/27/2013										0.51	0.27	-1.48	1.70	-0.67	-1.37	0.57	2.05	-0.29
10/1/2013										0.40	0.13	-1.50	1.61	-0.86	-1.41	0.48	1.87	-0.27
10/4/2013										0.53	0.32	-1.51	1.70	-0.67	-1.42	0.52	2.09	-0.27
10/8/2013										0.47	0.20	-1.53	1.69	-0.74	-1.45	0.52	2.00	-0.26
10/11/2013										0.36	0.03	-1.54	1.60	-0.95	-1.46	0.47	1.79	-0.26
10/15/2013	FIXED	FIXED	FIXED	FIXED	FIXED	FIXED				0.41	0.09	-1.56	1.66	-0.86	-1.49	0.52	1.88	-0.27
10/18/2013	7.14	22.50	-0.16	11.39	29.73	-0.09				0.43	0.12	-1.57	1.67	-0.84	-1.50	0.75	2.06	-0.28
10/22/2013										0.37	0.05	-1.58	1.63	-0.92	-1.52	0.51	1.83	-0.27
10/25/2013										0.44	0.13	-1.60	1.68	-0.84	-1.54	0.55	1.90	-0.27
10/29/2013	7.32	22.54	-0.16	10.89	29.92	-0.09				0.53	0.25	-1.61	1.75	-0.71	-1.55	0.59	2.05	-0.26
11/5/2013	7.19	22.39	-0.21	10.75	29.74	-0.12				0.43	0.11	-1.64	1.69	-0.86	-1.59	0.61	1.90	-0.28
11/8/2013	7.18	22.37	-0.24	10.75	29.69	-0.16				0.41	0.06	-1.66	1.69	-0.90	-1.60	0.64	1.91	-0.29
11/12/2013	7.17	22.37	-0.31	10.82	29.87	-0.23				0.37	0.11	-1.72	1.64	-0.92	-1.66	0.50	1.82	-0.34
11/15/2013	7.13	22.35	-0.25	10.79	29.83	-0.18				0.35	0.05	-1.67	1.62	-0.97	-1.62	0.66	1.89	-0.28
11/19/2013	7.21	22.33	-0.33	10.97	29.97	-0.28				0.63	0.46	-1.69	1.62	-0.97	-1.61	0.51	1.84	-0.26
11/22/2013	7.08	20.64	-0.73	10.99	29.95	-0.36				0.69	0.53	-1.73				0.42	1.78	-0.29
11/26/2013	7.08	20.58	-0.85	10.95	29.89	-0.38				0.68	0.52	-1.72	1.65	-0.90	-1.66	0.49	1.83	-0.28
12/2/2013	7.17	20.70	-0.95	11.00	29.91	-0.45				0.74	0.59	-1.75	1.70	-0.83	-1.68	0.51	1.91	-0.29
12/5/2013	7.11	20.71	-0.98	10.92	29.84	-0.47				0.68	0.51	-1.75	1.66	-0.90	-1.68	0.55	1.89	-0.29
1/20/2014	7.12	20.91	-1.26	10.89	29.69	-0.67				0.71	0.52	-1.84	1.66	-0.91	-1.77	0.54	1.91	-0.29
1/30/2014	7.17	20.86	-1.31	10.96	29.70	-0.70				0.76	0.52	-1.86	1.70	-0.94	-1.79	0.65	1.80	-0.28
2/28/2014	7.09	20.82	-1.43	10.88	29.65	-0.82				0.71	0.49	-1.92	1.65	-0.97	-1.85	0.56	1.83	-0.29
4/1/2014	7.14	20.93	-1.55	10.96	29.65	-0.92				0.73	0.58	-2.00	1.67	-0.94	-1.94	0.66	2.05	-0.33
4/4/2014	7.14	20.92	-1.52	10.95	29.62	-0.91				0.71	0.51	-1.99				0.70	2.07	-0.32
4/5/2014	7.12	20.90	-1.54	10.92	29.59	-0.93				0.70	0.49	-2.00	1.66	-0.97	-1.94	0.71	2.03	-0.38
4/8/2014	7.11	20.92	-1.53	10.92	29.61	-0.91				0.68	0.46	-1.99	1.64	-1.00	-1.93	0.74	2.07	-0.32
4/11/2014	7.12	20.92	-1.54	10.92	29.60	-0.91				0.68	0.46	-1.98	1.64	-1.00	-1.92	0.71	2.05	-0.31
4/14/2014	7.12	20.92	-1.57	10.94	29.65	-0.95				0.86	0.57	-2.03	1.67	-0.97	-1.96	0.76	2.05	-0.35
4/18/2014	7.13	20.92	-1.58	10.95	29.67	-0.95				0.90	0.61	-2.04	1.68	-0.97	-1.95	0.73	2.04	-0.33
4/22/2014	7.16	20.90	-1.57	10.99	29.71	-0.94				0.92	0.70	-2.03	1.64	-1.01	-1.94	0.72	2.03	-0.32
4/25/2014	7.14	20.90	-1.58	10.97	29.71	-0.96				1.06	0.77	-2.06	1.69	-1.04	-1.96	0.72	2.08	-0.33
4/29/2014	7.11	20.78	-1.59	10.96	29.67	-0.96							1.77	-0.79	-1.95	0.74	2.06	-0.32
5/2/2014	7.10	20.75	-1.63	10.95	29.67	-1.00							2.00	-0.62	-2.00	0.74	2.09	-0.35
5/7/2014	7.11	20.77	-1.63	10.97	29.65	-1.01										0.74	2.08	-0.35
5/9/2014	7.08	20.76	-1.65	10.99	29.68	-1.03										0.72	2.03	-0.35
5/13/2014	7.05	20.75	-1.63	10.93	29.62	-1.02										0.72	2.02	-0.33
5/17/2014	7.08	20.78	-1.64	10.97	29.70	-1.05										0.75	2.08	-0.35

	SM-31			SM-32			SM-33			SM-34			SM-35			SM-36		
	Phase IA, Southwest			Phase IA, Southwest			Phase IA, South			Phase IA, South			Phase IA, Southeast			Phase IA, Southeast		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014	7.14	20.81	-1.65	11.03	29.72	-1.06										0.75	2.12	-0.34
5/23/2014	7.15	20.84	-1.66	11.02	29.76	-1.07										0.72	2.14	-0.34
5/27/2014	7.11	20.81	-1.66	10.98	29.70	-1.09										0.73	2.10	-0.34
5/30/2014	7.15	20.83	-1.65	11.03	29.74	-1.08										0.74	2.10	-0.33
6/4/2014	7.09	20.80	-1.68	10.95	29.68	-1.11										0.72	2.07	-0.35
6/6/2014	7.10	20.81	-1.68	10.97	29.70	-1.12										0.73	2.06	-0.35
6/10/2014	7.12	20.79	-1.68	10.99	29.69	-1.03										0.74	2.07	-0.33
6/17/2014	7.12	20.81	-1.70	10.98	29.70	-1.16										0.73	2.08	-0.35
6/20/2014	7.04	20.73	-1.75	10.92	29.65	-1.21										0.72	2.01	-0.39
6/23/2014	7.10	20.78	-1.70	10.97	29.70	-1.16										0.74	2.06	-0.34
6/27/2014	7.13	20.34	-1.77	10.78	29.85	-1.20										0.73	2.04	-0.33
7/8/2014	7.15	20.34	-1.81	10.78	29.87	-1.25										0.73	2.05	-0.34
7/11/2014	7.07	20.29	-1.84	10.72	29.82	-1.27										0.73	2.01	-0.34
7/15/2014	7.09	20.30	-1.87	10.69	29.83	-1.30										0.75	2.06	-0.36
7/18/2014	7.11	20.34	-1.92	11.96	29.85	-1.31	1120139.41	907107.32	458.84	1120177.47	907238.39	458.11	1120219.11	907362.05	462.76	0.75	2.06	-0.35
7/22/2014	7.08	20.37	-1.97	13.61	29.99	-1.54	0.00	0.02	-0.33	0.02	0.04	-2.08	0.06	-0.01	-2.03	0.76	2.10	-0.35
7/25/2014	7.08	20.36	-2.00	14.00	30.05	-1.70	-0.01	0.00	-0.35	0.02	0.04	-2.10	-0.12	-0.45	-2.04	0.76	2.10	-0.35
7/29/2014	7.09	20.39	-2.05	14.39	30.15	-1.90	-0.06	-0.06	-0.47	0.09	-0.01	-2.15				0.78	2.15	-0.35
8/1/2014	7.05	20.39	-2.06	14.37	30.19	-1.94	-0.09	-0.01	-0.51				-0.11	-0.57	-2.04	0.77	2.13	-0.33
8/5/2014	6.91	20.35	-2.09	14.27	30.14	-2.00	-0.21	-0.10	-0.59	0.12	-0.06	-2.21				0.73	2.00	-0.35
8/10/2014	6.97	20.01	-2.12	15.12	30.40	-2.16	-0.11	-0.20	-0.65	0.18	-0.17	-2.32	0.82	-1.01	-2.20	0.77	2.12	-0.37
8/12/2014	6.87	19.93	-2.14	15.03	30.34	-2.19	-0.17	-0.26	-0.67	0.21	-0.21	-2.32	0.84	-1.11	-2.25	0.75	2.06	-0.36
8/15/2014	6.93	19.97	-2.25	15.05	30.39	-2.22	-0.17	-0.25	-0.71	0.17	-0.18	-2.36	0.91	-1.15	-2.33	0.75	2.08	-0.37
8/19/2014	6.96	20.02	-2.19				-0.16	-0.18	-0.73	0.22	-0.13	-2.38				0.78	2.17	-0.34
8/22/2014	6.92	19.93	-2.22				-0.21	-0.25	-0.75	0.18	-0.22	-2.41				0.75	2.03	-0.35
8/26/2014	6.97	19.92	-2.29				-0.10	-0.27	-0.84	0.29	-0.17	-2.48	0.99	-1.24	-2.62	0.76	2.07	-0.36
8/29/2014	6.97	19.88	-2.31	14.35	30.66	-2.36	-0.05	-0.33	-0.89	0.33	-0.24	-2.52				0.76	2.00	-0.35
9/2/2014	6.91	19.83	-2.35				-0.05	-0.38	-0.94	0.33	-0.28	-2.58				0.74	1.96	-0.36
9/5/2014	7.08	19.97	-2.37	14.32	30.73	-2.48	0.03	-0.31	-0.98	0.39	-0.20	-2.60	1.03	-1.21	-2.74	0.76	2.13	-0.35
9/9/2014	7.00	19.89	-2.39	14.34	30.63	-2.56	-0.01	-0.42	-1.01	0.35	-0.30	-2.62	0.98	-1.32	-2.78	0.74	2.00	-0.35
9/12/2014	1120057.42	906887.71	466.79	14.20	30.78	-2.55	0.09	-0.31	-1.03	0.41	-0.22	-2.64	1.02	-1.23	-2.81	0.77	2.10	-0.35
9/16/2014	-0.25	-0.40	-2.53	14.34	30.90	-2.64				0.39	-0.23	-2.66	0.99	-1.27	-2.83	0.74	2.05	-0.34
9/19/2014	0.06	-0.41	-2.63	1120107.08	907022.64	466.47				0.61	-0.07	-2.70	1.10	-1.10	-2.88	0.82	2.18	-0.37
9/23/2014	0.23	-0.45	-2.71							0.61	-0.09	-2.71	1.08	-1.08	-2.89	0.81	2.23	-0.34
9/26/2014	0.26	-0.43	-2.80							0.63	-0.14	-2.75	1.07	-1.11	-2.93	0.81	2.16	-0.36
9/29/2014	0.16	-0.62	-2.86	0.39	0.79	-3.39				0.55	-0.30	-2.77	0.98	-1.30	-2.96	0.76	2.01	-0.37
10/3/2014	0.27	-0.49	-2.93	0.46	0.80	-3.54				0.67	-0.21	-2.79	1.04	-1.16	-2.98	0.81	2.14	-0.36
10/7/2014	0.17	-0.57	-2.99	0.44	0.87	-3.72				0.65	-0.33	-2.82	1.00	-1.26	-3.00	0.79	2.02	-0.35
10/10/2014	0.13	-0.60	-3.04	0.41	0.79	-3.79				0.61	-0.38	-2.85	0.96	-1.34	-3.04	0.75	1.92	-0.38
10/14/2014	0.17	-0.59	-3.08	0.49	0.94	-3.91				0.69	-0.33	-2.86	1.01	-1.28	-3.05	0.81	1.96	-0.36
10/17/2014	0.28	-0.52	-3.09	0.56	1.03	-3.96				0.81	-0.28	-2.89	1.02	-1.24	-3.05	0.76	2.06	-0.36
10/21/2014	0.33	-0.51	-3.12	0.61	1.11	-4.02				0.50	0.44	-2.92	1.05	-1.15	-3.05	0.77	2.14	-0.35
10/24/2014	0.32	-0.52	-3.16	0.61	1.12	-4.06				0.35	0.58	-3.00	1.06	-1.13	-3.08	0.81	2.17	-0.35
10/28/2014	0.28	-0.57	-3.17	0.60	1.09	-4.11				0.27	0.60	-3.05	1.04	-1.14	-3.09	0.77	2.09	-0.35
10/30/2014	0.31	-0.54	-3.18	0.64	1.14	-4.12				0.28	0.61	-3.07	1.02	-1.15	-3.09	0.76	2.10	-0.34
11/4/2014	0.31	-0.56	-3.25	0.59	1.10	-4.20				0.26	0.49	-3.14	1.03	-1.27	-3.15	0.75	2.01	-0.36
11/7/2014	0.38	-0.51	-3.28							0.29	0.52	-3.17	1.04	-1.24	-3.17	0.71	2.04	-0.36
11/11/2014	0.30	-0.59	-3.33	0.55	1.06	-4.29				0.23	0.38	-3.22	0.99	-1.37	-3.21			
11/14/2014	0.42	-0.51	-3.35	0.63	1.13	-4.32				0.29	0.44	-3.24	0.99	-1.29	-3.22			
11/18/2014	0.42	-0.51	-3.35	0.63	1.13	-4.32				0.29	0.44	-3.24	0.99	-1.29	-3.22			
11/21/2014	0.48	-0.47	-3.39	0.69	1.18	-4.36				0.34	0.49	-3.28	1.02	-1.27	-3.24			
11/25/2014	0.52	-0.46	-3.40	0.70	1.20	-4.41				0.36	0.49	-3.31	1.04	-1.23	-3.27			

	SM-37			SM-38			SM-39			SM-40			SM-41			SM-42		
	Phase IA, East			Phase IIB, Southwest			Phase IIB, Southwest			Phase IIB, West			Phase IA, Northwest			Phase I high point, North		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012																		
8/23/2012	1120525.44	907339.62	428.11													1120597.47	906563.48	430.04
8/28/2012	0.23	0.16	-0.10													-0.56	-0.46	-0.09
9/1/2012	0.04	0.41	0.05													-0.54	-0.22	-0.08
9/5/2012	0.38	-0.02	-0.17													-0.36	-1.01	-0.06
9/12/2012	-0.01	0.46	-0.09										1120640.20	906700.40	431.70	-0.76	-0.14	0.01
9/15/2012	0.08	0.33	-0.09										0.31	-0.12	-0.02	-0.41	-0.75	-0.13
9/21/2012	-0.26	0.30	-0.07										0.32	-0.07	0.03	-0.79	-0.15	0.00
9/25/2012	-0.19	0.44	-0.04										0.08	-0.06	0.01	-0.69	-0.13	0.02
9/28/2012	-0.27	0.27	-0.07										0.63	-0.55	-0.02	-0.61	-0.62	-0.06
10/3/2012	-0.16	0.38	-0.09										0.28	-0.37	0.07	-0.90	-0.23	-0.09
10/9/2012	-0.12	0.37	-0.20										0.02	-0.27	0.02	-0.85	-0.43	-0.11
10/13/2012	-0.01	-0.05	-0.24	1119305.78	906546.11	435.29	1119265.74	906420.08	434.96				-0.20	-0.06	0.01	-0.68	-0.75	-0.33
10/16/2012	0.17	-0.08	-0.19										0.05	-0.22	-0.06	-0.96	-0.27	-0.04
10/19/2012	-0.03	0.10	-0.26										0.14	-0.24	-0.10	-0.83	-0.30	-0.17
10/24/2012	-0.15	0.30	-0.20										0.17	0.23	0.03	-0.61	-0.73	-0.18
10/27/2012	-0.22	0.21	-0.22										0.17	0.26	-0.25	-0.97	-0.26	-0.19
10/29/2012	-0.20	0.35	-0.20										0.22	0.26	0.04	-0.89	-0.31	-0.09
11/3/2012	-0.09	0.26	-0.20										-0.11	0.39	-0.11	-0.94	-0.34	-0.20
11/9/2012	-0.21	0.31	-0.17										0.27	0.39	-0.02	-0.84	-0.39	-0.20
11/13/2012	-0.29	0.15	-0.20										-0.18	0.35	-0.14	-1.39	-0.22	-0.13
11/16/2012	-0.09	0.31	-0.09										0.11	0.39	-0.18	-0.99	-0.27	-0.20
11/21/2012	-0.15	0.21	-0.29										0.01	0.42	-0.09	-0.85	-0.36	-0.15
12/1/2012	-0.11	0.30	-0.25										0.25	0.98	-0.16	-0.93	-0.25	-0.24
12/6/2012	-0.20	0.28	-0.25													-1.29	-0.28	-0.21
12/8/2012	-0.13	-0.10	-0.29										-0.20	0.47	-0.09	-1.15	-0.14	-0.04
12/13/2012	-0.19	0.41	-0.22										-0.46	0.52	-0.10	-1.34	-0.23	-0.22
12/21/2012	-0.21	0.22	-0.30										-0.05	0.39	-0.10	-0.88	-0.26	0.01
1/25/2013	-0.25	0.31	-0.35										-0.19	0.47	-0.12	-0.93	-0.21	-0.19
2/15/2013	-0.96	0.48	-0.57										0.00	0.60	-0.14	-1.24	0.06	-0.31
2/28/2013																		
4/4/2013													0.27	-0.15	-0.24	-0.84	-0.58	-0.49
4/12/2013													-0.04	-1.32	-0.18	-0.34	-0.49	-0.38
4/23/2013	-0.18	-0.13	-0.74										0.87	-0.26	-0.13	-0.89	-0.47	-0.49
4/26/2013	-0.53	0.04	-0.93										-0.15	-0.57	-0.19	-1.42	-1.14	-0.48
5/28/2013	-0.56	0.12	-1.50										-0.26	-1.61	-0.28	-0.38	-0.09	-0.41
5/31/2013	0.01	1.24	-1.78										-0.26	-1.61	-0.28	0.00	0.01	-0.71
6/12/2013	1120526.41	907339.22	447.35	1119323.33	906518.06	445.42	1119279.93	906381.83	444.61				1120639.56	906700.39	447.08	1120596.08	906562.71	445.16
6/14/2013	0.02	0.00	-1.78	0.05	-0.02	-0.02	0.06	-0.03	0.00	1119235.50	906240.60	448.24	0.08	0.05	-0.28	0.07	0.02	-0.71
6/21/2013										-0.02	-0.01	0.00	0.03	-0.03	-0.29	0.04	-0.01	-0.72
6/25/2013							0.00	0.00	0.00	0.01	0.01	0.02	-0.02	-0.09	-0.28	-0.03	-0.09	-0.70
6/28/2013							-0.10	0.07	-0.02	-0.06	0.04	0.01	-0.10	-0.16	-0.27	-0.12	-0.16	-0.70
7/1/2013													-0.05	-0.10	-0.26			
7/3/2013										-0.02	-0.05	0.00	-0.05	-0.13	-0.28	-0.07	-0.12	-0.71
7/9/2013				1119340.46	906564.99	445.69				-0.02	-0.04	0.01	-0.05	-0.11	-0.28	-0.08	-0.11	-0.72
7/12/2013	-0.31	-0.30	-1.91	0.08	0.01	-0.02	1119259.29	906335.74	445.36	0.09	-0.05	0.01	0.01	-0.05	-0.28	-0.01	-0.04	-0.72
7/16/2013	-0.29	-0.22	-1.95	0.03	0.08	-0.08	0.06	0.03	-0.04	0.14	-0.07	0.00	0.03	-0.02	-0.29	0.02	-0.01	-0.73
7/19/2013	-0.32	-0.26	-1.96				0.06	0.03	-0.05	0.05	-0.05	0.01	0.04	0.00	-0.30	0.02	0.00	-0.76
7/23/2013	-0.34	-0.34	-1.98	-0.11	0.10	-0.10	-0.06	0.05	-0.04	-0.05	-0.04	0.00	-0.07	-0.12	-0.30	-0.13	-0.14	-0.74
7/25/2013	-0.31	-0.32	-1.97	-0.07	0.14	-0.10	-0.02	0.05	-0.06	0.02	-0.05	0.01	-0.07	-0.16	-0.30	-0.12	-0.15	-0.75

	SM-37			SM-38			SM-39			SM-40			SM-41			SM-42		
	Phase IA, East			Phase IIB, Southwest			Phase IIB, Southwest			Phase IIB, West			Phase IA, Northwest			Phase I high point, North		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013	-0.32	-0.35	-2.00	-0.02	0.17	-0.10	-0.02	0.05	-0.04	0.00	-0.05	0.02	-0.05	-0.12	-0.30	-0.10	-0.13	-0.75
8/2/2013	-0.34	-0.39	-2.02	-0.03	0.17	-0.11	-0.05	0.06	-0.05	0.00	-0.05	0.02	-0.09	-0.18	-0.31	-0.14	-0.16	-0.77
8/6/2013	-0.30	-0.29	-2.05	0.02	0.13	-0.12	0.04	0.05	-0.05	0.07	-0.06	0.01	-0.03	-0.09	-0.30	-0.07	-0.07	-0.77
8/9/2013	-0.29	-0.26	-2.05	0.08	0.11	-0.12	0.13	0.05	-0.04	0.16	-0.06	0.01	0.01	-0.03	-0.30	-0.01	0.00	-0.76
8/13/2013	-0.34	-0.32	-2.07	0.02	0.13	-0.15	0.00	0.07	-0.05	0.01	-0.03	0.00	-0.05	-0.09	-0.31	-0.10	-0.07	-0.77
8/16/2013	-0.31	-0.22	-2.10	0.08	0.12	-0.20	0.08	0.06	-0.10	0.09	-0.05	-0.04	0.00	-0.04	-0.35	-0.03	-0.01	-0.82
8/19/2013	-0.34	-0.33	-2.11	0.05	0.04	-0.21	0.00	0.06	-0.06	0.01	-0.06	-0.01	-0.02	-0.09	-0.34	-0.06	-0.06	-0.79
8/22/2013	-0.31	-0.30	-2.11	0.07	0.03	-0.21	0.02	0.07	-0.05	0.05	-0.06	0.00	-0.06	-0.13	-0.32	-0.09	-0.09	-0.79
8/27/2013	-0.31	-0.33	-2.13	0.12	0.04	-0.25	0.03	0.07	-0.07	0.05	-0.05	-0.01	-0.04	-0.10	-0.33	-0.09	-0.07	-0.80
8/30/2013	-0.27	-0.24	-2.16	0.16	0.05	-0.28	0.09	0.06	-0.07	0.10	-0.06	-0.01	-0.02	-0.09	-0.34	-0.08	-0.06	-0.82
9/3/2013	-0.29	-0.29	-2.18	0.20	0.09	-0.28	0.07	0.07	-0.07	0.09	-0.06	-0.01	-0.03	-0.09	-0.34	-0.08	-0.05	-0.82
9/6/2013	-0.28	-0.32	-2.17	0.23	0.08	-0.28				0.11	-0.07	-0.02	-0.02	-0.11	-0.33	-0.08	-0.09	-0.82
9/10/2013	-0.31	-0.34	-2.19	0.14	0.09	-0.30				0.01	-0.04	-0.01	-0.11	-0.18	-0.34	-0.18	-0.14	-0.83
9/11/2013	-0.33	-0.36	-2.19										-0.04	-0.09	-0.31	-0.11	-0.05	-0.81
9/12/2013	-0.30	-0.25	-2.18										-0.19	-0.29	-0.31	-0.13	-0.18	-0.81
9/13/2013	-0.08	-0.55	-2.18	0.25	0.09	-0.29				0.13	-0.05	0.01	-0.16	-0.25	-0.33	-0.10	-0.16	-0.83
9/17/2013	-0.09	-0.55	-2.22	0.44	0.08	-0.32				0.36	-0.08	-0.02	-0.08	-0.19	-0.35	0.01	-0.08	-0.86
9/20/2013	-0.01	-0.60	-2.26	0.36	0.09	-0.34				0.22	-0.07	-0.04	-0.04	-0.09	-0.37	0.03	-0.04	-0.86
9/24/2013	-0.73	-2.20	-2.31	-0.49	0.14	-0.34				-0.86	0.10	-0.03	-0.85	-1.06	-0.37	-0.87	-0.95	-0.89
9/27/2013	-0.17	-0.31	-2.47	0.41	0.08	-0.34				0.32	-0.07	-0.02	0.07	0.03	-0.35	0.15	0.07	-0.88
10/1/2013	-0.03	-0.66	-2.60	0.28	0.09	-0.35				0.13	-0.07	-0.01	-0.20	-0.21	-0.36	-0.11	-0.16	-0.86
10/4/2013	0.12	-0.33	-2.69	0.44	0.08	-0.36				0.29	-0.03	0.00	0.07	0.14	-0.36	0.20	0.17	-0.86
10/8/2013	0.08	-0.49	-2.77	0.46	0.07	-0.32				0.36	-0.04	0.02	-0.58	0.00	-0.31	0.06	0.02	-0.83
10/11/2013	-0.01	-0.77	-2.81	0.25	0.09	-0.34				0.08	0.02	0.04	-0.79	-0.22	-0.30	-0.16	-0.20	-0.84
10/15/2013	0.05	-0.67	-2.88	0.30	0.09	-0.37				0.17	0.00	0.01	-0.74	-0.17	-0.33	-0.10	-0.17	-0.86
10/18/2013	0.07	-0.61	-2.92	0.36	0.04	-0.37	2.03	-0.07	-0.03	0.24	0.00	0.02	1.73	4.23	-0.33	-0.50	-0.01	-0.86
10/22/2013	0.00	-0.69	-2.96	0.27	0.08	-0.36	1.93	-0.06	-0.03	0.10	0.04	0.02	1.56	4.06	-0.33	-0.67	-0.14	-0.84
10/25/2013	0.04	-0.60	-3.00	0.38	0.07	-0.37	2.00	-0.05	-0.04	0.19	0.02	0.02	1.60	4.12	-0.33	-0.55	-0.04	-0.86
10/29/2013	0.11	-0.42	-3.05	0.46	0.07	-0.37	2.09	-0.06	-0.04	0.30	0.01	0.00	1.82	4.35	-0.33	-0.27	0.20	-0.85
11/5/2013	0.05	-0.63	-3.12	0.33	0.07	-0.38	1.91	-0.04	-0.05	0.10	0.03	0.00	1.51	4.06	-0.35	-0.54	-0.14	-0.86
11/8/2013	0.04	-0.67	-3.15	0.32	0.05	-0.39	1.90	0.30	-0.02	0.10	0.01	0.00	1.45	4.04	-0.36	-0.60	-0.16	-0.88
11/12/2013	0.00	-0.70	-3.24	0.33	0.08	-0.46	1.90	0.34	-0.10	0.10	0.06	-0.08	1.42	4.08	-0.42	-0.63	-0.10	-0.94
11/15/2013	0.00	-0.73	-3.20	0.31	0.09	-0.40	1.87	0.34	-0.03	0.07	0.06	0.01	1.39	4.04	-0.34	-0.65	-0.13	-0.86
11/19/2013	-0.01	-0.74	-3.21	0.30	0.08	-0.37	1.85	0.34	0.01	0.05	0.05	0.04	1.37	4.03	-0.33	-0.67	-0.12	-0.85
11/22/2013	0.00	-0.67	-3.26	0.37	0.09	-0.41	1.92	0.34	-0.02	0.12	0.04	0.01	1.43	4.10	-0.36			
11/26/2013	0.03	-0.67	-3.27	0.33	0.09	-0.40	1.89	0.34	0.00	0.06	0.03	0.03	1.40	4.07	-0.34	-0.66	-0.10	-0.86
12/2/2013	0.07	-0.56	-3.32	0.44	0.04	-0.42	2.00	0.33	0.00	0.07	0.14	0.01	1.49	4.18	-0.34	-0.56	-0.02	-0.86
12/5/2013	0.05	-0.66	-3.33	0.38	0.10	-0.40	1.91	0.36	0.02	-0.01	0.18	0.04	1.38	4.08	-0.34	-0.66	-0.13	-0.87
1/20/2014	0.03	-0.68	-3.54	0.44	0.08	-0.45				-0.02	0.20	0.02	1.39	4.08	-0.36			
1/30/2014	0.00	-0.69	-3.57	0.37	-0.01	-0.47	1.86	0.30	-0.02	-0.15	0.15	0.01	1.45	4.10	-0.37			
2/28/2014	0.05	-0.73	-3.68	0.41	0.01	-0.52				-0.03	0.18	0.00	1.31	4.00	-0.39			
4/1/2014	0.03	-0.75	-3.79	0.49	0.05	-0.54	2.00	0.34	-0.05	0.03	0.23	-0.02	1.38	4.10	-0.38			
4/4/2014							1.98	0.33	-0.01	0.45	0.19	0.02						
4/5/2014	0.04	-0.79	-3.82	0.41	0.12	-0.57	1.87	0.35	-0.08	-0.14	0.24	-0.04	1.32	4.02	-0.41			
4/8/2014	0.03	-0.78	-3.78	0.47	0.14	-0.50	1.96	0.35	0.01	-0.05	0.25	0.04	1.34	3.98	-0.35			
4/11/2014	0.04	-0.77	-3.77	0.49	0.12	-0.51	1.96	0.33	-0.02	-0.06	0.23	0.01	1.31	3.98	-0.35			
4/14/2014	0.07	-0.78	-3.82	0.50	0.12	-0.58	1.91	0.34	-0.06	-0.06	0.23	-0.06	1.33	3.95	-0.39	-1.59	-1.43	-0.93
4/18/2014	0.06	-0.77	-3.81	0.48	0.11	-0.56	1.93	0.33	-0.10	-0.09	0.25	-0.10	1.37	4.02	-0.42	-1.56	-1.40	-0.98
4/22/2014	0.04	-0.81	-3.79	0.48	0.12	-0.51	1.95	0.34	-0.01	-0.09	0.26	0.03	1.33	4.00	-0.36	-1.60	-1.40	-0.94
4/25/2014	0.05	-0.76	-3.81	0.54	0.11	-0.54	2.01	0.33	-0.05	-0.01	0.25	-0.02	1.35	4.04	-0.39	-1.56	-1.34	-0.96
4/29/2014	0.07	-0.78	-3.82	0.50	0.11	-0.54	1.97	0.33	-0.05	-0.10	0.26	-0.02	1.35	3.97	-0.38	-1.56	-1.42	-0.98
5/2/2014	0.08	-0.73	-3.85	0.49	0.12	-0.56	1.96	0.34	-0.06	-0.08	0.27	-0.04	1.33	4.03	-0.42	-1.61	-1.36	-1.01
5/7/2014	0.08	-0.77	-3.83	0.51	0.08	-0.56	1.97	0.33	-0.07	-0.05	0.23	-0.04	1.30	3.97	-0.41	-1.60	-1.41	-1.02
5/9/2014	0.06	-0.81	-3.87	0.51	0.12	-0.57	1.98	0.33	-0.07	-0.06	0.24	-0.03	1.32	3.99	-0.41	-1.59	-1.40	-1.02
5/13/2014	0.07	-0.79	-3.84	0.50	0.11	-0.54	1.93	0.33	-0.05	-0.11	0.23	-0.02	1.28	3.95	-0.39	-1.63	-1.43	-0.99
5/17/2014	0.08	-0.75	-3.86	0.52	0.13	-0.59	1.99	0.33	-0.08	-0.09	0.26	-0.05	1.33	4.05	-0.45			

	SM-37			SM-38			SM-39			SM-40			SM-41			SM-42		
	Phase IA, East			Phase IIB, Southwest			Phase IIB, Southwest			Phase IIB, West			Phase IA, Northwest			Phase I high point, North		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014	0.11	-0.68	-3.86	0.56	0.11	-0.55				0.00	0.22	-0.02	1.39	4.06	-0.41			
5/23/2014	0.09	-0.69	-3.85	0.60	0.11	-0.55	2.09	0.31	-0.05	0.05	0.23	-0.02	1.38	4.14	-0.40			
5/27/2014	0.08	-0.74	-3.87	0.47	0.12	-0.56				-0.10	0.24	-0.04	1.31	4.02	-0.43			
5/30/2014	0.11	-0.69	-3.86	0.56	0.11	-0.55				0.00	0.22	-0.02	1.41	4.09	-0.39			
6/4/2014	0.06	-0.81	-3.88	0.50	0.12	-0.57				-0.08	0.24	-0.05	1.28	4.00	-0.43	-1.85	-2.74	-1.07
6/6/2014	0.08	-0.79	-3.91	0.51	0.12	-0.59	1.98	0.32	-0.11	-0.09	0.24	-0.08	1.31	4.01	-0.45	-1.83	-2.77	-1.08
6/10/2014	0.08	-0.82	-3.88	0.51	0.09	-0.56	1.98	0.29	-0.03	-0.08	0.21	-0.02	1.31	4.00	-0.41	-1.82	-2.78	-1.05
6/17/2014	0.10	-0.76	-3.91	0.52	0.11	-0.62	2.03	0.31	-0.10	-0.06	0.24	-0.05	1.33	4.03	-0.44	-1.84	-2.79	-1.12
6/20/2014	0.07	-0.85	-3.96	0.45	0.11	-0.63	1.92	0.31	-0.13				1.24	3.90	-0.50	-1.92	-2.90	-1.13
6/23/2014	0.42	0.02	-3.89	0.51	0.11	-0.60	2.00	0.31	-0.11	-0.06	0.24	-0.08	1.32	4.00	-0.43	-1.85	-2.81	-1.07
6/27/2014				0.53	0.10	-0.59	2.04	0.30	-0.08				1.33	4.00	-0.45	-1.82	-2.79	-1.09
7/8/2014				0.52	0.09	-0.58	2.00	0.30	-0.08	-0.07	0.23	-0.04	1.33	4.01	-0.44	-1.83	-2.79	-1.08
7/11/2014				0.43	0.10	-0.60				-0.18	0.25	-0.06	1.24	3.91	-0.44	-1.94	-2.91	-1.07
7/15/2014				0.45	0.11	-0.60				-0.13	0.25	-0.07	1.22	3.93	-0.45	-1.92	-2.85	-1.11
7/18/2014				0.52	0.08	-0.64	2.03	0.29	-0.15	-0.05	0.23	-0.06	1.34	4.02	-0.46	-1.80	-2.77	-1.08
7/22/2014				0.54	0.09	-0.60	1.92	0.31	-0.06	-0.07	0.24	-0.06	1.36	4.05	-0.46	-1.80	-2.75	-1.10
7/25/2014				0.54	0.09	-0.60	2.05	0.29	-0.10				1.36	4.05	-0.47	-1.78	-2.75	-1.14
7/29/2014	1120528.57	907344.57	459.48	0.61	0.07	-0.61	2.14	0.28	-0.12				1.36	4.06	-0.50	-1.77	-2.72	-1.24
8/1/2014	0.04	0.10	-3.91	0.58	0.09	-0.58	2.09	0.30	-0.07	0.01	0.22	-0.03	1.39	4.09	-0.48			
8/5/2014	-0.09	-0.11	-3.96	0.48	0.10	-0.60				-0.11	0.23	-0.05	1.25	3.93	-0.47			
8/10/2014				0.51	0.11	-0.61				-0.09	0.24	-0.06	1.29	4.02	-0.55			
8/12/2014	-0.03	-0.03	-4.03	0.44	0.11	-0.60	1.94	0.31	-0.09	-0.16	0.25	-0.05	1.24	3.91	-0.44			
8/15/2014	-0.08	-0.05	-4.07	0.51	0.11	-0.62	2.00	0.30	-0.11	-0.09	0.24	-0.07	1.27	3.99	-0.48			
8/19/2014	2.60	-1.20	-4.16	0.54	0.12	-0.63	2.05	0.30	-0.12	0.02	0.24	-0.07	1.72	3.71	-0.49	-1.79	-2.72	-1.23
8/22/2014	2.52	-1.30	-4.26	0.50	0.10	-0.61	1.99	0.29	-0.11	-0.10	0.24	-0.07	1.84	3.59	-0.47	-1.16	-3.75	-1.13
8/26/2014	2.47	-1.19	-4.38	0.54	0.10	-0.63	2.04	0.29	-0.13	-0.05	0.25	-0.08	1.95	3.55	-0.49	-1.04	-3.80	-1.16
8/29/2014	2.29	-1.28	-4.40	0.48	0.09	-0.62	1.96	0.29	-0.13	-0.13	0.23	-0.06	1.46	3.78	-0.48	-1.63	-3.52	-1.16
9/2/2014	2.22	-1.30	-4.47	0.41	0.10	-0.64	1.87	0.31	-0.14	-0.22	0.25	-0.10	1.56	3.70	-0.50	-1.51	-3.62	-1.17
9/5/2014	2.27	-1.13	-4.51	0.54	0.10	-0.62	2.03	0.29	-0.12				1.83	3.61	-0.49	-1.18	-3.72	-1.16
9/9/2014	2.20	-1.29	-4.58	0.43	0.09	-0.63	1.91	0.30	-0.13	-0.21	0.25	-0.08	1.45	3.78	-0.47	-1.66	-3.52	-1.16
9/12/2014	2.24	-1.17	-4.65	0.57	0.09	-0.61	2.02	0.29	-0.11	-0.02	0.24	-0.07	1.57	3.71	-0.49	-1.50	-3.60	-1.17
9/16/2014	2.22	-1.25	-4.71	0.50	0.09	-0.61	2.12	0.30	-0.11	-0.09	0.26	-0.06	1.80	3.61	-0.49	-1.23	-3.71	-1.16
9/19/2014	2.28	-0.92	-4.82	0.67	0.07	-0.64	2.17	0.27	-0.15	0.09	0.21	-0.09	1.21	3.91	-0.49	-1.96	-3.37	-1.17
9/23/2014	2.30	-0.87	-4.87	0.69	0.07	-0.61	2.20	0.27	-0.11	0.14	0.20	-0.07	1.57	3.78	-0.50	-1.52	-3.53	-1.18
9/26/2014	2.31	-0.92	-4.95	0.60	0.09	-0.63				0.01	0.23	-0.09	1.52	3.72	-0.49	-1.57	-3.59	-1.17
9/29/2014	2.23	-1.20	-5.00	0.53	0.08	-0.63				-0.09	0.24	-0.09	1.31	3.90	-0.48	-1.85	-3.40	-1.17
10/3/2014	2.29	-1.04	-5.06	0.61	0.09	-0.65	2.08	0.29	-0.15	0.01	0.25	-0.12	1.61	3.67	-0.50	-1.46	-3.65	-1.18
10/7/2014	2.26	-1.18	-5.12	0.48	0.07	-0.66	1.89	0.30	-0.15	-0.12	0.24	-0.12	1.56	3.77	-0.51	-1.55	-3.54	-1.19
10/10/2014	2.22	-1.31	-5.16	0.50	0.08	-0.65	1.96	0.29	-0.12	-0.13	0.25	-0.09	1.51	3.74	-0.44	-1.61	-3.56	-1.13
10/14/2014	2.26	-1.26	-5.20	0.44	0.08	-0.67	1.99	0.30	-0.18	-0.23	0.27	-0.13	1.74	3.71	-0.47	-1.32	-3.61	-1.16
10/17/2014	2.27	-1.17	-5.21	0.56	0.07	-0.62				-0.06	0.25	-0.06	1.46	3.78	-0.45	-1.65	-3.53	-1.14
10/21/2014	2.31	-1.06	-5.24	0.64	0.07	-0.62	2.16	0.29	-0.15	0.03	0.24	-0.06	1.80	3.61	-0.51	-1.24	-3.71	-1.19
10/24/2014	2.33	-1.04	-5.28	0.61	0.07	-0.63	2.10	0.29	-0.11	0.01	0.25	-0.08				2.14	-5.14	-1.20
10/28/2014	2.32	-1.09	-5.30	0.58	0.07	-0.63	2.04	0.29	-0.10	-0.06	0.25	-0.06				2.28	-5.22	-1.15
10/30/2014	2.31	-1.09	-5.31	0.59	0.07	-0.62	2.05	0.29	-0.10	-0.08	0.25	-0.05				1.89	-5.04	-1.19
11/4/2014	2.28	-1.22	-5.36	0.52	0.08	-0.63	1.96	0.30	-0.11	-0.15	0.26	-0.08				1.81	-5.02	-1.19
11/7/2014	2.29	-1.17	-5.38							-0.04	0.25	-0.07				1.99	-5.09	-1.19
11/11/2014	2.24	-1.31	-5.42	0.46	0.08	-0.65	1.90	0.30	-0.14	-0.19	0.26	-0.10				2.22	-5.18	-1.20
11/14/2014	2.27	-1.21	-5.43	0.54	0.08	-0.64	2.00	0.30	-0.12	-0.11	0.25	-0.07				1.86	-5.05	-1.21
11/18/2014	2.27	-1.21	-5.43	0.54	0.08	-0.64	2.00	0.30	-0.12	-0.11	0.25	-0.07				1.86	-5.05	-1.21
11/21/2014	2.29	-1.19	-5.47	0.60	0.05	-0.63	2.08	0.29	-0.10	-0.03	0.22	-0.06	4.44	2.44	-0.52	1.86	-5.01	-1.21
11/25/2014	2.31	-1.12	-5.50	0.59	0.08	-0.63	2.05	0.29	-0.10	-0.06	0.24	-0.06	4.43	2.43	-0.52	1.94	-5.07	-1.21

	SM-43			SM-44			SM-45			SM-46			SM-47			SM-48		
	Phase IA, West			Phase IA, East			Phase IA, Center			Phase IIA, West			Phase IIA, West			Phase IIA, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012				1120486.08	907209.80	427.72												
8/23/2012	1120379.40	906930.40	428.74	0.38	-0.61	-0.26	1120444.39	907083.95	428.06									
8/28/2012	0.20	0.20	-0.02	0.41	-0.64	-0.26	0.27	-0.07	-0.54									
9/1/2012	0.32	0.43	-0.07	0.47	-0.43	-0.28	0.22	0.40	-0.65									
9/5/2012	0.72	0.40	-0.21	0.67	-0.67	-0.42	0.31	0.36	-0.82									
9/12/2012	1.60	-3.02		0.23	-0.26	-0.40	0.12	0.14	-0.76									
9/15/2012	0.60	-0.10	-0.23	0.59	-0.88	-0.38	0.25	-0.32	-0.83									
9/21/2012	0.20	0.40	-0.15	0.17	-0.38	-0.39	0.06	0.24	-0.75									
9/25/2012	0.03	0.35	-0.01	0.17	-0.38	-0.34	0.07	0.22	-0.75									
9/28/2012	0.18	0.38	-0.17	0.15	-0.41	-0.32	0.02	0.33	-0.73									
10/3/2012	0.48	-0.15	-0.23	0.05	-0.29	-0.35	-0.10	0.20	-0.73									
10/9/2012	0.24	-0.06	-0.34	0.14	-0.36	-0.48	0.09	0.20	-0.85									
10/13/2012	0.16	0.42	-0.12	0.38	-0.77	-0.41	0.27	-0.11	-0.86									
10/16/2012	0.11	0.29	-0.02	0.37	-0.62	-0.43	0.13	-0.12	-0.86									
10/19/2012	0.14	0.33	-0.29	0.51	-0.89	-0.63	0.40	-0.07	-0.95									
10/24/2012	0.33	-0.22	-0.44	0.18	-0.43	-0.54	0.32	-0.27	-1.03									
10/27/2012																		
10/29/2012	0.29	0.33	-0.28	0.43	-0.41	-0.78												
11/3/2012	0.89	1.25	-0.50	0.36	-0.38	-0.80												
11/9/2012	1.51	3.34	-1.14	-0.52	-0.19	-0.97	-0.19	-3.12	-1.95									
11/13/2012	2.06	3.34	-1.49	-0.47	-2.32	-1.30	-0.64	-1.76	-2.06									
11/16/2012	3.24	3.29	-1.75				-0.75	-2.18	-1.90									
11/21/2012	2.81	3.42	-1.85				-0.45	-1.66	-1.96									
12/1/2012	2.98	3.12	-1.81				-0.22	-1.45	-2.11									
12/6/2012	2.94	3.33	-1.91	0.33	-0.82	-1.59	-0.19	-1.63	-2.15									
12/8/2012	2.55	2.97	-1.86	0.46	-0.59	-1.61	-0.32	-1.44	-2.18									
12/13/2012	3.24	3.57	-2.01	0.44	-0.37	-1.67	-0.33	-1.52	-2.25									
12/21/2012	2.74	2.88	-1.94	0.23	-0.67	-1.75	-0.12	-1.83	-2.33									
1/25/2013	3.60	3.61	-2.37	0.80	-0.82	-1.98	-0.25	-1.69	-2.59									
2/15/2013	2.77	2.91	-3.00	0.15	-0.69	-2.06	-0.11	-1.29	-2.78									
2/28/2013																		
4/4/2013				0.12	-0.55	-2.23												
4/12/2013	2.15	3.86	-2.59	-0.07	-0.51	-2.21	-0.36	-1.47	-2.92									
4/23/2013	2.05	2.96	-2.55	-0.28	-0.67	-2.20	0.19	-1.73	-2.95									
4/26/2013	2.09	3.10	-2.66	0.04	-0.66	-2.23	-0.34	-1.36	-3.01									
5/28/2013	BROKEN	BROKEN	BROKEN	-0.58	-3.22	-2.69	-0.84	-1.23	-3.30									
5/31/2013							-0.54	-0.84	-3.39									
6/12/2013				1120487.37	907208.91	445.98				1119782.89	906972.40	445.56	1119826.21	907109.31	445.90	1119870.33	907245.93	445.93
6/14/2013				0.05	0.03	-2.69	1120444.02	907082.42	445.50	-0.11	1.18	0.02	-0.01	-0.03	-0.01	0.01	-0.01	0.00
6/21/2013				0.04	-0.04	-2.68	-0.04	-0.07	-3.39				0.00	-0.03	-0.02	0.03	-0.01	0.01
6/25/2013				0.05	-0.05	-2.71	-0.06	-0.10	-3.42	-0.11	1.28	0.00	0.00	-0.02	-0.02	0.02	-0.04	0.00
6/28/2013				0.02	-0.13	-2.71	-0.15	-0.19	-3.43	-0.17	1.26	-0.01	-0.03	-0.04	-0.03	-0.09	-0.05	-0.01
7/1/2013				0.05	-0.08	-2.71	-0.13	-0.15	-3.43	-0.16	1.27	0.00	0.06	-0.03	-0.02	-0.08	-0.03	-0.01
7/3/2013							-0.14	-0.20	-3.45	-0.20	1.23	-0.01	0.08	-0.05	-0.03	-0.07	-0.05	-0.01
7/9/2013							-0.13	-0.18	-3.46	-0.20	1.24	-0.01	0.07	-0.04	-0.03	0.40	0.16	-0.02
7/12/2013				0.09	-0.09	-2.74	-0.09	-0.14	-3.47	-0.14	1.26	-0.01	0.12	-0.01	-0.03	-1.38	-4.27	-0.02
7/16/2013				0.13	-0.03	-2.77	-0.07	-0.10	-3.50	1119786.94	906983.72	445.59	0.14	-0.02	-0.05			
7/19/2013				0.14	-0.14	-2.78	-0.07	-0.11	-3.51	0.06	0.21	-0.06	0.21	0.15	-0.14			
7/23/2013				0.11	-0.20	-2.79	-0.11	-0.18	-3.52	1.43	2.55	-0.58	0.13	0.10	-0.16	-1.41	-4.45	-0.12
7/25/2013				0.14	-0.21	-2.77	-0.10	-0.20	-3.50	1.45	2.58	-0.60	0.17	0.12	-0.17	-1.40	-4.45	-0.12

	SM-43			SM-44			SM-45			SM-46			SM-47			SM-48		
	Phase IA, West			Phase IA, East			Phase IA, Center			Phase IIA, West			Phase IIA, West			Phase IIA, Center		
	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.
7/30/2013				0.13	-0.20	-2.80	-0.09	-0.19	-3.54	1.41	2.54	-0.64	0.14	0.06	-0.19			
8/2/2013				0.09	-0.28	-2.81	-0.15	-0.26	-3.55	1.38	2.48	-0.65	0.12	0.04	-0.21			
8/6/2013				0.14	-0.18	-2.82	-0.10	-0.19	-3.56	1.43	2.50	-0.67	0.15	0.04	-0.23	-1.40	-4.42	-0.15
8/9/2013				0.14	-0.11	-2.82	-0.07	-0.15	-3.56	1.46	2.53	-0.67	0.18	0.06	-0.22	-1.36	-4.38	-0.15
8/13/2013				0.11	-0.20	-2.84	-0.11	-0.21	-3.59	1.38	2.51	-0.71	0.12	0.03	-0.24	-1.39	-4.67	0.04
8/16/2013				0.17	-0.14	-2.87	-0.08	-0.15	-3.62	2.33	3.79	-0.75	0.36	0.01	-0.06	-1.31	-4.62	0.02
8/19/2013				0.10	-0.21	-2.87	-0.11	-0.23	-3.63	2.32	3.78	-0.74	0.34	-0.02	-0.05	-1.29	-4.55	0.02
8/22/2013				0.11	-0.19	-2.87	-0.11	-0.23	-3.62	2.31	3.78	-0.75	0.32	-0.06	-0.06	-1.54	-4.48	0.01
8/27/2013				0.10	-0.22	-2.89	-0.07	-0.23	-3.64	2.27	3.76	-0.77	0.33	-0.07	-0.06			
8/30/2013				0.17	-0.19	-2.91	0.05	-0.04	-3.67	2.25	3.85	-0.77	2.36	-0.93	-0.40	-5.30	-3.32	-0.82
9/3/2013				0.13	-0.19	-2.92	-0.06	-0.20	-3.68	2.24	3.86	-0.80	2.29	-0.86	-0.46	-5.34	-3.33	-0.91
9/6/2013				0.12	-0.21	-2.90	-0.03	-0.19	-3.66	2.29	3.81	-0.80	2.13	-0.82	-0.47	-5.36	-3.32	-0.93
9/10/2013				0.10	-0.25	-2.94	-0.10	-0.26	-3.70	2.25	3.87	-0.86	2.11	-0.80	-0.54	-5.52	-3.24	-1.03
9/11/2013				0.08	-0.27	-2.92	-0.10	-0.28	-3.70									
9/12/2013				0.15	-0.19	-2.92	-0.04	-0.18	-3.69									
9/13/2013				0.71	-0.33	-2.92	-0.20	-0.22	-3.69	2.36	3.89	-0.89				-5.44	-3.20	-1.03
9/17/2013				-0.20	-0.53	-2.93	BROKEN	BROKEN	BROKEN	2.16	4.02	-0.99				-5.39	-3.19	-1.06
9/20/2013				0.03	-0.26	-2.99				1.65	4.27	-1.05	2.14	-0.73	-0.66	-5.38	-3.18	-1.07
9/24/2013				-0.49	-1.83	-3.05				1.52	4.20	-1.15	1.67	-1.06	-0.68			
9/27/2013				-0.11	-0.06	-3.06				1.57	4.32	-1.20	2.21	-0.70	-0.71			
10/1/2013				-0.02	-0.36	-3.11				1.53	4.19	-1.26	2.08	-0.80	-0.72			
10/4/2013				0.13	-0.09	-3.15				1.72	4.29	-1.29	2.23	-0.70	-0.73			
10/8/2013				0.03	-0.18	-3.15				1.62	4.26	-1.31	2.18	-0.75	-0.74			
10/11/2013				-0.10	-0.43	-3.16				1.45	4.18	-1.33	2.05	-0.84	-0.75	-5.45	-3.24	-1.12
10/15/2013				0.00	-0.32	-3.21				1.52	4.20	-1.37	2.08	-0.82	-0.77	-5.43	-3.23	-1.14
10/18/2013				0.00	-0.28	-3.22							2.12	-0.79	-0.77	-5.41	-3.20	-1.14
10/22/2013				-0.04	-0.36	-3.24							2.06	-0.81	-0.79			
10/25/2013				0.07	-0.25	-3.27							2.10	-0.79	-0.79			
10/29/2013				0.15	-0.08	-3.28				0.89	2.05	-1.37	2.18	-0.74	-0.80	-8.54	-2.59	-1.14
11/5/2013				0.08	-0.28	-3.32				0.39	0.36	-1.47	2.12	-0.57	-0.84	-8.75	-2.53	-1.20
11/8/2013				0.12	-0.33	-3.35				1.55	3.71	-1.88				-8.77	-2.70	-1.22
11/12/2013				0.02	-0.36	-3.43							5.48	2.72	-0.84			
11/15/2013				0.06	-0.41	-3.39							5.57	2.62	-0.93			
11/19/2013				0.05	-0.40	-3.38				1119790.34	906995.66	460.99	5.78	3.29	-1.23	-10.18	-3.20	-2.11
11/22/2013										0.09	0.21	-2.10	5.93	3.47	-1.42			
11/26/2013				0.08	-0.30	-3.44				0.15	0.33	-2.29	6.01	3.56	-1.51	-10.36	-3.08	-2.36
12/2/2013				0.13	-0.21	-3.47				0.27	0.49	-2.54	6.15	3.66	-1.62			
12/5/2013				0.08	-0.30	-3.47				0.23	0.52	-2.60	6.12	3.66	-1.65	-10.48	-3.02	-2.50
1/20/2014				0.03	-0.30	-3.63				0.48	1.07	-3.68	6.31	3.77	-1.94			
1/30/2014				0.00	-0.33	-3.67				0.60	1.08	-3.81	6.41	3.80	-2.00			
2/28/2014				0.03	-0.40	-3.76				0.63	1.24	-4.20	6.44	3.91	-2.13			
4/1/2014				0.15	-0.32	-3.87				1119792.80	906996.31	458.46	6.50	3.94	-2.23			
4/4/2014				0.16	-0.35	-3.86							6.49	3.93	-2.21			
4/5/2014				0.16	-0.36	-3.92							6.49	3.92	-2.22			
4/8/2014				0.15	-0.38	-3.86							6.48	3.93	-2.21			
4/11/2014	1.64	-2.11	-3.98	0.16	-0.37	-3.86												
4/14/2014	1.65	-2.12	-4.02	0.23	-0.33	-3.90	-0.66	0.29	-3.69									
4/18/2014	1.68	-2.08	-4.04	0.24	-0.33	-3.91	-0.74	-0.02	-3.69									
4/22/2014	1.66	-2.09	-4.00	0.21	-0.38	-3.88	-1.50	0.31	-3.67									
4/25/2014	1.67	-2.07	-4.03	0.22	-0.33	-3.90	-1.25	0.50	-3.69									
4/29/2014	1.66	-2.11	-4.03	0.24	-0.34	-3.90	-0.48	0.15	-3.70									
5/2/2014	1.65	-2.08	-4.07				1.74	-0.21	-3.89				6.47	3.77	-2.21			
5/7/2014	1.66	-2.09	-4.08				1.54	-0.18	-3.88									
5/9/2014	1.70	-2.03	-4.10															
5/13/2014	1.75	-1.90	-4.12															
5/17/2014	2.11	-0.94	-4.32				1.35	-0.11	-3.90				6.42	3.67	-2.18			

	SM-43			SM-44			SM-45			SM-46			SM-47			SM-48		
	Phase IA, West			Phase IA, East			Phase IA, Center			Phase IIA, West			Phase IIA, West			Phase IIA, Center		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014	2.21	-0.92	-4.37										6.47	3.69	-2.18			
5/23/2014	2.20	-0.79	-4.47				1.29	-0.02	-3.87				6.47	3.72	-2.19			
5/27/2014	2.11	-0.89	-4.58				1.33	-0.17	-3.90				6.45	3.70	-2.20			
5/30/2014	2.19	-0.83	-4.60				1.53	-0.08	-3.89				6.49	3.72	-2.20			
6/4/2014	2.08	-1.02	-4.68				1.33	-0.19	-3.93				6.45	3.70	-2.23			
6/6/2014	2.11	-1.00	-4.74				1.44	-0.12	-3.95				6.46	3.71	-2.24			
6/10/2014	2.11	-1.01	-4.78				1.45	-0.19	-3.95				6.48	3.70	-2.22			
6/17/2014	2.12	-0.99	-4.92										6.48	3.72	-2.25			
6/20/2014	2.06	-1.07	-4.99				1.92	1.29	-4.33				6.43	3.68	-2.29			
6/23/2014	2.12	-0.99	-4.97				2.26	2.05	-4.49				6.48	3.72	-2.26			
6/27/2014							2.38	2.54	-4.69				6.48	3.70	-2.24			
7/8/2014							1120446.47	907085.48	454.63	1119789.93	906992.86	460.42						
7/11/2014							-0.05	0.17	-4.87	-0.08	-0.03	-4.24						
7/15/2014							-0.04	0.14	-4.87									
7/18/2014	1120381.70	906929.91	463.87				0.02	0.20	-4.92	-0.15	-0.10	-4.33	1119825.99	907109.59	461.82	1119870.64	907245.56	463.46
7/22/2014	0.11	0.14	-4.98				0.04	0.22	-4.94	-0.06	-0.05	-4.47	-0.30	0.15	-2.29	0.03	-0.08	-2.51
7/25/2014	0.14	0.18	-5.06				0.02	0.16	-5.00	-0.03	-0.06	-4.52	-0.32	0.20	-2.36	0.24	-0.04	-2.53
7/29/2014				1120487.65	907207.17	457.06	0.05	0.17	-5.05	-0.01	-0.07	-4.58	-0.82	0.41	-2.49	0.24	-0.06	-2.61
8/1/2014	0.12	0.18	-5.10	0.01	0.06	-3.92				-0.08	-0.09	-4.57	-0.83	0.42	-2.52	0.26	-0.06	-2.69
8/5/2014				-0.07	-0.11	-3.95				-0.11	-0.11	-4.63	-0.88	0.38	-2.57	0.25	-0.08	-2.78
8/10/2014				-0.03	-0.03	-3.99										0.29	-0.06	-2.87
8/12/2014	0.17	0.34	-5.24	-0.06	-0.09	-4.01	0.92	1.09	-5.13	-0.32	-0.30	-4.63	-1.38	0.45	-2.60	0.27	-0.08	-2.91
8/15/2014	0.20	0.41	-5.29	-0.03	-0.05	-4.05	0.95	1.14	-5.17	-0.28	-0.28	-4.65	-1.34	0.48	-2.62			
8/19/2014	0.33	0.32	-5.29	-0.05	0.05	-4.11	1.00	1.27	-5.22	-0.24	-0.24	-4.66	-1.31	0.52	-2.63	0.36	0.00	-2.98
8/22/2014	0.28	0.24	-5.30	-0.17	-0.08	-4.13	0.94	1.11	-5.23	-0.32	-0.32	-4.67	-1.36	0.46	-2.64	0.35	-0.04	-3.01
8/26/2014				-0.22	0.06	-4.24	1.03	1.23	-5.33	-0.27	-0.27	-4.71	-1.35	0.49	-2.67	0.35	-0.02	-3.05
8/29/2014				-0.27	-0.05	-4.27	1.00	1.22	-5.40							0.36	-0.04	-3.06
9/2/2014				-0.30	-0.06	-4.37	0.97	1.18	-5.52							0.33	-0.05	-3.09
9/5/2014				-0.23	0.08	-4.40	1.01	1.27	-5.55				-1.34	0.49	-2.71	0.40	0.02	-3.10
9/9/2014				-0.30	-0.07	-4.45	0.90	1.10	-5.64				-0.97	2.26	-2.84			
9/12/2014							1120448.26	907087.80	463.60									
9/16/2014				-0.24	0.03	-4.49	-0.02	-0.07	-5.69	-0.97	-1.76	-4.82						
9/19/2014	1120389.59	906926.43	460.84	-0.09	0.25	-4.56	0.15	0.08	-5.75	-0.84	-1.69	-4.88	1119827.14	907118.40	469.47	1119871.48	907249.07	467.74
9/23/2014	-0.06	-0.03	-5.35	-0.09	0.27	-4.60	0.15	0.09	-5.75	-0.84	-1.73	-4.92	-0.04	0.06	-2.89	-0.01	0.03	-3.12
9/26/2014	-0.07	-0.09	-5.45	-0.10	0.24	-4.66	0.13	0.01	-5.86	-0.86	-1.75	-4.98	-0.05	0.18	-3.02	-0.02	0.02	-3.17
9/29/2014	-0.14	-0.25	-5.48	-0.21	0.00	-4.70	0.02	-0.18	-5.90	-0.98	-1.82	-5.02	-0.10	0.25	-3.14	-0.10	-0.08	-3.19
10/3/2014	-0.04	-0.12	-5.52	-0.12	0.16	-4.74	0.11	-0.08	-5.94	-0.89	-1.78	-5.05	-0.05	0.30	-3.17	-0.04	0.00	-3.22
10/7/2014	-0.12	-0.27	-5.60	-0.18	0.03	-4.78	0.05	-0.23	-5.98	-0.97	-1.84	-5.08	-0.12	0.22	-3.20	-0.03	0.01	-3.26
10/10/2014	-0.10	-0.32	-5.65	-0.23	-0.07	-4.82	-0.01	-0.31	-6.02	-1.05	-1.85	-5.13	-0.14	0.27	-3.28	-0.05	-0.01	-3.31
10/14/2014				-0.17	0.01	-4.85	0.06	-0.24	-6.05	-1.01	-1.87	-5.14	-0.13	0.26	-3.30	0.01	0.00	-3.34
10/17/2014				-0.16	0.07	-4.86				-0.96	-1.84	-5.16				0.04	0.07	-3.42
10/21/2014				-0.10	0.18	-4.88				-0.89	-1.79	-5.17				0.10	0.17	-3.49
10/24/2014				-0.08	0.20	-4.91				-0.90	-1.78	-5.19				0.11	0.13	-3.54
10/28/2014				-0.09	0.17	-4.95				-0.92	-1.81	-5.21				0.11	0.13	-3.59
10/30/2014				-0.10	0.17	-4.96				-0.92	-1.80	-5.21				0.13	0.15	-3.60
11/4/2014				-0.17	0.04	-5.03				-1.00	-1.83	-5.25				0.10	0.12	-3.67
11/7/2014				-0.16	0.09	-5.04				-0.96	-1.81	-5.27	-0.07	0.28	-3.42	0.14	0.16	-3.70
11/11/2014				-0.26	-0.08	-5.11				-1.06	-1.86	-5.29	-0.16	0.20	-3.43	0.07	0.09	-3.73
11/14/2014				-0.21	0.01	-5.12				-0.98	-1.81	-5.30	-0.09	0.23	-3.43	0.13	0.14	-3.74
11/18/2014				-0.21	0.01	-5.12				-0.98	-1.81	-5.30	-0.09	0.23	-3.43	0.13	0.14	-3.74
11/21/2014				-0.20	0.05	-5.17				-0.96	-1.80	-5.32	-0.08	0.24	-3.45	0.17	0.16	-3.76
11/25/2014				-0.18	0.11	-5.22				-0.90	-1.77	-5.34	-0.07	0.23	-3.45	0.17	0.17	-3.79

	SM-49			SM-50			SM-51			SM-52			SM-53			SM-54		
	Phase IIA, Center			Phase IIA, East			Phase IB, Northwest			Phase IIA, East			Phase IIA, Southwest			Phase IIA, Southwest		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012																		
8/13/2012																		
8/15/2012																		
8/23/2012							1120377.41	905886.48	426.08									
8/28/2012							-0.01	1.18	-0.05									
9/1/2012							-0.13	1.45	-0.01									
9/5/2012							-0.07	1.02	0.03									
9/12/2012							-0.76	1.34	-0.02									
9/15/2012							1.24	0.41	-0.02									
9/21/2012							-0.78	1.54	-0.11									
9/25/2012							-0.63	1.29	0.01									
9/28/2012																		
10/3/2012							0.31	0.26	0.05									
10/9/2012							-0.71	0.73	-0.02									
10/13/2012							-0.97	1.42	-0.01									
10/16/2012							-0.70	1.25	-0.06									
10/19/2012							-1.22	1.38	-0.03									
10/24/2012							-0.62	0.76	-0.02									
10/27/2012							-0.46	1.65	-0.04									
10/29/2012							-0.75	1.29	-0.03									
11/3/2012							-0.81	1.33	-0.10									
11/9/2012							-0.90	1.56	-0.10									
11/13/2012							-0.88	1.36	-0.05									
11/16/2012							-0.87	1.40	-0.10									
11/21/2012							-0.77	1.35	-0.03									
12/1/2012							-0.77	1.31	-0.07									
12/6/2012							-1.07	1.37	-0.04									
12/8/2012							-0.95	1.48	-0.05									
12/13/2012							-1.12	1.44	-0.06									
12/21/2012							-1.02	1.44	-0.06									
1/25/2013							-0.63	0.96	0.05									
2/15/2013																		
2/28/2013							-0.82	1.41	-0.07									
4/4/2013							-1.10	0.46	-0.05									
4/12/2013							-0.46	0.15	0.01									
4/23/2013							-0.70	0.43	-0.02									
4/26/2013							-0.77	0.07	-0.07									
5/28/2013							-0.61	0.22	-0.19									
5/31/2013							-1.51	1.83	-0.24									
6/12/2013	1119912.94	907381.90	445.60	1119956.36	907518.32	445.65	1120374.82	905888.22	442.04	1119996.65	907645.17	445.33	1119496.43	907063.31	447.50	1119540.49	907199.96	447.48
6/14/2013	0.01	-0.01	0.02	-0.01	-0.04	0.00	0.00	0.00	-0.24	0.00	-0.02	0.01	0.01	-0.02	0.00	-0.01	-0.03	0.00
6/21/2013	0.02	-0.02	0.02	0.01	-0.04	-0.01	0.03	-0.04	-0.20	0.01	-0.03	0.01						
6/25/2013	0.01	-0.03	0.00	0.02	-0.03	0.00	-0.01	-0.05	-0.72	0.03	-0.02	0.00						
6/28/2013	-0.01	-0.06	0.00	0.00	-0.04	-0.01	-0.17	-0.12	-0.72	0.00	-0.06	0.00						
7/1/2013										-0.02	-0.04	0.00						
7/3/2013							-0.22	-0.17	-0.72	-0.01	-0.09	0.00						
7/9/2013	1119903.81	907373.58	445.58	1119933.93	907434.31	445.60	-0.23	-0.15	-0.72	1.72	-0.10	-0.04	1119480.42	907088.54	447.72	1119517.82	907219.75	447.81
7/12/2013	0.02	0.01	0.00	0.02	0.05	-0.01	-0.08	-0.08	-0.73	1.73	-0.06	-0.04	0.03	0.00	0.01	0.03	0.00	0.01
7/16/2013	-0.18	-1.19	-0.13	0.01	0.07	-0.10	0.03	-0.02	-0.76	1.72	-0.03	-0.05	0.59	-0.40	-0.02	-0.16	-0.06	-0.06
7/19/2013	-0.21	-1.24	-0.18	0.01	0.08	-0.13	-0.07	-0.07	-0.75	2.25	2.41	0.00	0.61	-0.40	-0.02	-0.19	-0.08	-0.07
7/23/2013	-0.21	-1.17	-0.19	0.00	0.05	-0.15	-0.22	-0.14	-0.74	2.24	2.35	0.00	0.57	-0.41	-0.02	-0.22	-0.09	-0.07
7/25/2013	-0.28	-1.30	-0.20	0.01	0.06	-0.14	-0.12	-0.11	-0.75	2.27	2.36	0.01	0.52	-0.40	-0.02	-0.12	-0.19	-0.06

	SM-49			SM-50			SM-51			SM-52			SM-53			SM-54		
	Phase IIA, Center			Phase IIA, East			Phase IB, Northwest			Phase IIA, East			Phase IIA, Southwest			Phase IIA, Southwest		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013	BROKEN	BROKEN	BROKEN	0.01	0.05	-0.17	-0.20	-0.14	-0.74	2.25	2.34	0.00	0.54	-0.40	-0.02	-0.13	-0.17	-0.07
8/2/2013				0.00	0.03	-0.19	-0.22	-0.15	-0.76	2.25	2.33	0.00	0.50	-0.41	-0.03	-0.17	-0.19	-0.07
8/6/2013							-0.06	-0.06	-0.76	2.25	2.37	-0.01	0.54	-0.41	-0.03	-0.13	-0.18	-0.08
8/9/2013							0.00	-0.01	-0.73	2.25	2.39	0.00	0.58	-0.40	-0.03	-0.11	-0.17	-0.08
8/13/2013				-0.11	0.01	-0.21				2.25	2.46	-0.02	0.53	-0.39	-0.03	-0.15	-0.17	-0.08
8/16/2013				-0.47	-0.15	-0.33				2.21	2.81	-0.02	0.57	-0.39	-0.05	-0.11	-0.17	-0.09
8/19/2013				-0.39	-0.17	-0.41				2.20	2.76	-0.01	0.56	-0.41	-0.04	-0.12	-0.18	-0.09
8/22/2013				-0.52	-0.22	-0.49				2.20	2.77	-0.01	0.55	-0.41	-0.04	-0.12	-0.18	-0.09
8/27/2013				-0.50	-0.23	-0.59	-0.14	-0.08	-0.77	2.20	2.77	-0.01	0.55	-0.40	-0.04	-0.13	-0.18	-0.09
8/30/2013				-0.47	-0.20	-0.62	-0.02	-0.02	-0.77	2.21	2.80	-0.01	0.57	-0.40	-0.04	-0.10	-0.18	-0.09
9/3/2013				-0.45	-0.22	-0.65	-0.10	-0.06	-0.78	2.20	2.80	-0.02	0.56	-0.40	-0.04	-0.13	-0.18	-0.09
9/6/2013				-0.43	-0.21	-0.65	-0.15	-0.11	-0.77	2.21	2.77	0.00	0.59	-0.40	-0.02	-0.10	-0.17	-0.07
9/10/2013				-0.46	-0.24	-0.68	-0.15	-0.07	-0.81	2.20	2.75	-0.01	0.54	-0.40	-0.04	-0.13	-0.17	-0.08
9/11/2013							-0.20	-0.08	-0.72									
9/12/2013							-0.19	0.02	-0.72									
9/13/2013				-0.40	-0.17	-0.69	-0.17	0.05	-0.78	2.21	2.82	-0.01	0.60	-0.39	-0.03	-0.07	-0.15	-0.09
9/17/2013				-0.39	-0.15	-0.72				2.22	2.86	-0.02	0.66	-0.39	-0.05	-0.05	-0.16	-0.10
9/20/2013				-0.36	-0.11	-0.73	0.10	0.19	-0.80	2.23	2.88	-0.02	0.67	-0.38	-0.04	-0.01	-0.15	-0.09
9/24/2013				-0.80	-0.91	-0.73	-1.32	-0.54	-0.83	2.11	1.99	0.00	0.18	-0.44	-0.04	-0.41	-0.24	-0.09
9/27/2013				-0.32	-0.06	-0.75	0.31	0.31	-0.84	2.25	2.96	-0.02	0.70	-0.38	-0.05	0.02	-0.15	-0.10
10/1/2013				-0.39	-0.18	-0.75	-0.08	0.12	-0.80	2.21	2.82	-0.01	0.64	-0.35	-0.03	-0.11	-0.32	-0.10
10/4/2013				-0.31	-0.04	-0.76	0.33	0.35	-0.81	2.24	2.99	-0.01	0.84	-0.32	-0.03	0.04	-0.27	-0.09
10/8/2013				-0.35	-0.11	-0.75	0.18	0.26	-0.78	2.23	2.91	0.00	0.73	-0.34	-0.02	-0.05	-0.30	-0.08
10/11/2013				-0.42	-0.23	-0.76	-0.22	0.05	-0.76	2.20	2.78	0.00	0.61	-0.35	-0.01	-0.16	-0.32	-0.08
10/15/2013				-0.38	-0.18	-0.77	-0.07	0.11	-0.81	2.23	2.82	0.00	0.65	-0.36	-0.02	-0.11	-0.32	-0.09
10/18/2013				-0.38	-0.16	-0.78	0.03	0.45	-0.81	2.23	2.86	0.00	0.39	-3.25	0.00	-0.09	-0.31	-0.08
10/22/2013							-0.20	0.36	-0.80	2.20	2.80	0.00	0.34	-3.25	-0.01	-0.13	-0.32	-0.09
10/25/2013							-0.04	0.44	-0.81	2.22	2.84	0.00	0.41	-3.25	-0.01	-0.06	-0.31	-0.08
10/29/2013							0.10	0.48	-0.80	2.25	2.96	0.00	0.45	-3.24	0.01	-0.05	-0.31	-0.08
11/5/2013							-0.10	0.37	-0.81	2.24	2.90	-0.01	0.38	-3.28	-0.02	-0.08	-0.32	-0.09
11/8/2013							-0.21	0.35	-0.83	2.24	2.90	-0.03	0.36	-3.29	-0.03	-0.09	-0.35	-0.10
11/12/2013							-0.44	0.28	-0.72	2.20	2.90	-0.06	0.36	-3.25	-0.07	-0.11	-0.32	-0.14
11/15/2013							-0.35	0.31	-0.81	2.20	2.89	-0.01	0.33	-3.26	-0.02	-0.13	-0.33	-0.09
11/19/2013				-0.63	-0.42	-0.78	-0.35	0.32	-0.82	2.21	2.93	0.00	0.32	-3.26	0.01	-0.13	-0.33	-0.07
11/22/2013				-0.60	-0.42	-0.79	-0.25	0.38	-0.80	2.21	2.93	-0.03	0.40	-3.26	-0.03	-0.06	-0.33	-0.11
11/26/2013				-0.62	-0.42	-0.79	-0.26	0.35	-0.78	2.21	2.95	-0.03	0.38	-3.26	-0.02	-0.08	-0.32	-0.10
12/2/2013				-0.60	-0.39	-0.81	-0.16	0.47	-0.77	2.23	3.00	-0.04	0.45	-3.26	-0.04	-0.02	-0.33	-0.11
12/5/2013				-0.62	-0.45	-0.81	-0.20	0.41	-0.76	2.22	2.98	-0.03	0.38	-3.25	-0.03	-0.07	-0.33	-0.11
1/20/2014				-0.63	-0.44	-0.86				2.17	2.96	-0.04	0.42	-3.25	-0.04	-0.04	-0.34	-0.11
1/30/2014				-0.58	-0.48	-0.88	-0.13	0.41	-0.86	2.21	2.81	0.00	0.47	-3.29	-0.04	0.00	-0.38	-0.11
2/28/2014				-0.64	-0.49	-0.91	-0.08	0.40	-0.84	2.18	2.85	-0.01	0.41	-3.29	-0.06	-0.02	-0.38	-0.11
4/1/2014							-0.38	0.32	-0.84	2.23	2.99	-0.07	0.50	-3.28	-0.08	-0.01	-0.35	-0.11
4/4/2014										2.27	3.09	-0.09	0.46	-3.28	-0.08			
4/5/2014							-0.46	0.26	-0.81	2.27	3.09	-0.09	0.42	-3.27	-0.09	-0.06	-0.38	-0.12
4/8/2014							-0.37	0.31	-0.74	2.27	3.07	-0.08	0.42	-3.27	-0.07	-0.07	-0.39	-0.12
4/11/2014							-0.38	0.29	-0.76	2.26	3.09	-0.08	0.41	-3.28	-0.07	-0.08	-0.37	-0.13
4/14/2014				-0.67	-0.46	-1.00	-0.37	0.28	-0.77	2.28	3.07	-0.11	0.46	-3.27	-0.11	-0.02	-0.36	-0.17
4/18/2014				-0.60	-0.47	-0.99	-0.33	0.29	-0.83	2.28	3.09	-0.10	0.45	-3.28	-0.10	-0.05	-0.36	-0.16
4/22/2014				-0.61	-0.43	-0.99	-0.45	0.25	-0.74	2.27	3.08	-0.09	0.42	-3.27	-0.09	-0.07	-0.37	-0.15
4/25/2014				-0.62	-0.35	-1.00	-0.35	0.29	-0.81	2.26	3.11	-0.10	0.44	-3.27	-0.10	-0.06	-0.36	-0.16
4/29/2014				-0.53	-0.19	-0.99	-0.34	0.24	-0.80	2.29	3.09	-0.09	0.43	-3.28	-0.09	-0.06	-0.37	-0.15
5/2/2014				-0.38	0.23	-1.02				2.28	3.11	-0.11	0.44	-3.27	-0.11	-0.04	-0.36	-0.17
5/7/2014				0.08	1.21	-1.06	-0.33	0.30	-0.88	2.29	3.11	-0.10	0.43	-3.28	-0.11	-0.06	-0.37	-0.16
5/9/2014				0.22	1.49	-1.09				2.28	3.09	-0.11	0.45	-3.27	-0.12	-0.05	-0.36	-0.17
5/13/2014				0.26	1.65	-1.12	-0.46	0.23	-0.85	2.28	3.08	-0.10	0.45	-3.28	-0.10	-0.04	-0.37	-0.16
5/17/2014				0.32	1.81	-1.18				2.29	3.13	-0.11	0.46	-3.26	-0.10	-0.04	-0.34	-0.16

	SM-49			SM-50			SM-51			SM-52			SM-53			SM-54		
	Phase IIA, Center			Phase IIA, East			Phase IB, Northwest			Phase IIA, East			Phase IIA, Southwest			Phase IIA, Southwest		
	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.	Northing	Easting	Elev.
5/20/2014				0.32	1.70	-1.17	-0.34	0.30	-0.89	2.29	3.14	-0.10	0.48	-3.28	-0.10	-0.02	-0.36	-0.16
5/23/2014				0.34	1.91	-1.22	-0.92	0.54	-0.83	2.27	3.16	-0.11	0.48	-3.26	-0.10	-0.03	-0.35	-0.16
5/27/2014				0.36	1.93	-1.28	-1.01	0.47	-0.87	2.28	3.14	-0.10	0.42	-3.28	-0.10	-0.07	-0.36	-0.17
5/30/2014				0.37	1.92	-1.32	-0.87	0.47	-0.84	2.29	3.14	-0.10	0.49	-3.27	-0.10	-0.01	-0.35	-0.17
6/4/2014				0.45	2.13	-1.47	-1.02	0.45	-0.88	2.27	3.10	-0.11	0.42	-3.28	-0.11	-0.08	-0.36	-0.18
6/6/2014				0.47	2.15	-1.52	-1.02	0.42	-0.91	2.27	3.10	-0.11	0.46	-3.27	-0.12	-0.05	-0.36	-0.18
6/10/2014				0.45	2.11	-1.56	-0.96	0.43	-0.85	2.28	3.11	-0.11	0.43	-3.29	-0.10	-0.06	-0.37	-0.17
6/17/2014				0.45	2.11	-1.64	-0.95	0.46	-0.92	2.28	3.11	-0.11	0.48	-3.27	-0.11	-0.02	-0.36	-0.18
6/20/2014				0.42	2.05	-1.71	-1.09	0.36	-0.96	2.27	3.07	-0.16	0.42	-3.29	-0.16	-0.07	-0.37	-0.22
6/23/2014				0.44	2.07	-1.68	-0.97	0.43	-0.90	2.29	3.11	-0.11	0.46	-3.28	-0.11	-0.03	-0.36	-0.17
6/27/2014				0.43	2.06	-1.71	-1.06	0.41	-0.88	2.29	3.10	-0.10	0.46	-3.29	-0.10	-0.03	-0.37	-0.15
7/8/2014				0.43	2.03	-1.79	-1.19	0.69	-0.89	2.29	3.09	-0.11	0.48	-3.29	-0.11	-0.02	-0.37	-0.17
7/11/2014				0.39	2.00	-1.81	-1.36	0.54	-0.97	2.26	3.05	-0.11	0.43	-3.28	-0.11	-0.07	-0.37	-0.17
7/15/2014				0.39	1.99	-1.84				2.28	3.09	-0.12	0.41	-3.28	-0.12	-0.07	-0.37	-0.18
7/18/2014				0.37	1.95	-1.84				2.26	3.01	-0.12	0.44	-3.29	-0.11	-0.02	-0.37	-0.17
7/22/2014				0.41	2.03	-1.86				2.28	3.12	-0.11	0.47	-3.28	-0.11	-0.03	-0.36	-0.17
7/25/2014				0.42	2.03	-1.86				2.28	3.11	-0.11	0.48	-3.29	-0.11	-0.02	-0.36	-0.17
7/29/2014				0.48	2.12	-1.91				2.30	3.14	-0.12	0.50	-3.30	-0.12	-0.01	-0.38	-0.17
8/1/2014				0.40	2.11	-1.92				2.28	3.07	-0.12	0.47	-3.29	-0.11	-0.03	-0.37	-0.17
8/5/2014				0.35	1.96	-1.95				2.27	3.04	-0.12	0.45	-3.29	-0.11	-0.05	-0.37	-0.17
8/10/2014				0.39	1.89	-2.11				2.28	3.09	-0.12	0.46	-3.28	-0.12	-0.04	-0.36	-0.18
8/12/2014				0.36	1.82	-2.17				2.28	3.07	-0.13	0.43	-3.29	-0.13	-0.06	-0.37	-0.18
8/15/2014				0.37	1.82	-2.27				2.28	3.09	-0.13	0.47	-3.29	-0.13	-0.03	-0.37	-0.19
8/19/2014							-1.30	0.78	-1.20	2.29	3.15	-0.11	0.48	-3.28	-0.11	-0.02	-0.35	-0.17
8/22/2014				0.34	1.84	-2.52	-0.04	-0.41	-0.93	2.27	3.06	-0.15	0.45	-3.30	-0.12	-0.06	-0.38	-0.17
8/26/2014				0.38	1.93	-2.63	0.20	-0.49	-0.99	2.28	3.08	-0.13	0.49	-3.29	-0.13	-0.02	-0.36	-0.18
8/29/2014				0.37	1.89	-2.67	-0.82	-0.11	-0.96	2.29	3.04	-0.12	0.45	-3.30	-0.11	-0.06	-0.38	-0.17
9/2/2014				0.38	1.93	-2.74	-0.60	-0.25	-0.98	2.27	3.01	-0.12	0.42	-3.30	-0.12	-0.09	-0.39	-0.18
9/5/2014				0.42	2.01	-2.77	0.00	-0.42	-0.96	2.28	3.11	-0.12	0.49	-3.28	-0.12	-0.01	-0.36	-0.17
9/9/2014				0.39	1.94	-2.82	-0.89	-0.09	-0.97	2.27	3.02	-0.12	0.41	-3.30	-0.11	-0.08	-0.39	-0.17
9/12/2014				1119934.56	907436.83	462.97	-0.60	-0.22	-0.95	2.28	3.10	-0.11	0.48	-3.29	-0.11	-0.03	-0.37	-0.17
9/16/2014				-0.02	-0.03	-2.85	-0.10	-0.43	-0.95	2.27	3.07	-0.11	0.45	-3.29	-0.10	-0.05	-0.37	-0.16
9/19/2014				0.08	0.11	-2.89	-1.46	0.11	-1.01	2.31	3.15	-0.13	0.58	-3.29	-0.13	0.05	-0.36	-0.18
9/23/2014				0.07	0.11	-2.91	-0.60	-0.18	-0.97	2.30	3.17	-0.11	0.56	-3.29	-0.10	0.04	-0.36	-0.16
9/26/2014				0.07	0.10	-2.94	-0.70	-0.19	-0.95	2.30	3.13	-0.13	0.53	-3.29	-0.12	0.02	-0.37	-0.18
9/29/2014				0.01	-0.01	-2.97	-1.16	0.05	-0.94	2.28	3.03	-0.14	0.47	-3.30	-0.13	-0.04	-0.38	-0.19
10/3/2014				0.06	0.07	-2.99	-0.56	-0.26	-0.96	2.30	3.11	-0.13	0.51	-3.29	-0.12	-0.01	-0.36	-0.18
10/7/2014				0.02	0.00	-3.06	-0.58	-0.20	-0.99	2.29	3.02	-0.12	0.45	-3.31	-0.12	-0.05	-0.38	-0.18
10/10/2014				-0.01	-0.05	-3.05	-0.74	-0.20	-0.93	2.27	2.96	-0.15	0.45	-3.31	-0.14	-0.07	-0.39	-0.21
10/14/2014				0.04	-0.01	-3.05	-0.28	-0.33	-0.93	2.29	2.98	-0.13	0.46	-3.31	-0.13	-0.05	-0.38	-0.19
10/17/2014				0.02	0.01	-3.06	-0.72	-0.21	-0.89	2.28	3.05	-0.14	0.49	-3.30	-0.13	-0.03	-0.38	-0.19
10/21/2014	1119903.43	907402.71	467.37	0.05	0.06	-3.07				2.28	3.10	-0.12	0.53	-3.29	-0.11	0.01	-0.36	-0.17
10/24/2014	0.01	0.00	-2.22	0.03	0.02	-3.08				2.29	3.12	-0.12	0.53	-3.30	-0.11	0.00	-0.37	-0.18
10/28/2014	0.00	-0.01	-2.25	0.00	-0.02	-3.09				2.28	3.05	-0.12	0.54	-3.30	-0.12	0.01	-0.37	-0.18
10/30/2014	0.00	-0.01	-2.27	0.00	-0.02	-3.11	5.66	-2.69	-1.00	2.28	3.07	-0.11	0.54	-3.30	-0.10	0.01	-0.37	-0.16
11/4/2014	-0.03	-0.06	-2.33	-0.01	-0.05	-3.14	5.47	-2.62	-0.98	2.27	3.00	-0.13	0.49	-3.30	-0.12	-0.03	-0.36	-0.18
11/7/2014	-0.01	-0.03	-2.32	0.00	-0.04	-3.15	5.74	-2.72	-0.97	2.26	3.03	-0.14	0.54	-3.30	-0.13	0.03	-0.37	-0.18
11/11/2014	-0.07	-0.14	-2.40	-0.04	-0.11	-3.20	6.21	-2.89	-0.98	2.27	2.96	-0.14	0.44	-3.32	-0.13	-0.05	-0.39	-0.18
11/14/2014	-0.04	-0.07	-2.36	-0.05	-0.12	-3.18				2.28	3.01	-0.13	0.48	-3.31	-0.12	-0.01	-0.38	-0.18
11/18/2014	-0.04	-0.07	-2.36	-0.05	-0.12	-3.18				2.28	3.01	-0.13	0.48	-3.31	-0.12	-0.01	-0.38	-0.18
11/21/2014	0.02	-0.07	-2.33	-0.08	-0.09	-3.19	5.53	-2.65	-0.98	2.27	3.00	-0.11	0.54	-3.29	-0.09	0.01	-0.36	-0.15
11/25/2014	0.02	-0.03	-2.39	-0.04	-0.09	-3.21	5.73	-2.71	-0.97	2.29	3.05	-0.12	0.54	-3.30	-0.11	0.04	-0.37	-0.16

	SM-55			SM-56			SM-57			SM-58			SM-59			SM-60		
	Phase IA, Northeast			Phase IIA, South			Phase IIA, Southwest			Phase IIA, South			Phase IIA, East			Phase IIA, East		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/18/2012																		
7/24/2012																		
7/27/2012																		
7/30/2012																		
8/9/2012							1120559.62	907453.90	429.90									
8/13/2012							0.30	0.10	0.17									
8/15/2012	1120852.24	907363.63	430.56				-0.31	0.17	0.13									
8/23/2012	2.18	-0.30	-0.09				1.04	3.25	0.12									
8/28/2012	1.03	0.73	-0.12				1.62	3.67	0.04									
9/1/2012	1.46	0.57	-0.10				1.82	2.78	0.08									
9/5/2012	1.91	-0.03	-0.14				2.19	3.68	0.00									
9/12/2012	1.28	-0.25	-0.12				1.97	2.43	0.05									
9/15/2012	1.50	-0.10	-0.02				1.87	2.24	0.00									
9/21/2012	1.38	-0.23	-0.11				1.94	2.35	0.12									
9/25/2012	0.99	0.00	-0.17				1.92	2.37	0.09									
9/28/2012	1.87	-0.75	-0.06				2.24	2.36	0.03									
10/3/2012	1.08	-0.29	-0.19				1.91	2.06	0.06									
10/9/2012	1.48	-0.28	0.02				1.90	2.26	0.00									
10/13/2012	1.71	-0.39	-0.09				1.89	2.23	-0.07									
10/16/2012	1.28	-0.22	0.06				1.81	2.30	0.14									
10/19/2012	1.08	-0.25	0.01				1.89	2.29	-0.03									
10/24/2012	1.07	-0.18	-0.05				1.70	2.64	0.25									
10/27/2012	0.90	-0.43	-0.06				1.82	2.21	0.02									
10/29/2012	1.71	-0.44	-0.05				1.93	2.44	0.11									
11/3/2012	1.22	-0.23	-0.11				1.95	2.31	0.01									
11/9/2012	-1.25	1.56	-0.12				1.91	2.33	0.02									
11/13/2012	0.83	-0.40	-0.05				1.85	2.16	-0.04									
11/16/2012	1.62	-0.31	-0.15				1.96	2.17	0.06									
11/21/2012	1.06	-0.25	-0.08				1.87	2.40	-0.03									
12/1/2012	1.02	-0.31	-0.08				1.88	2.44	-0.01									
12/6/2012	0.77	-0.20	-0.04				1.60	3.04	0.00									
12/8/2012	1.04	-0.28	-0.14				1.47	2.84	-0.05									
12/13/2012	0.87	-0.48	-0.08				1.32	3.25	0.02									
12/21/2012	0.92	-0.37	-0.03				1.68	3.35	-0.02									
1/25/2013	0.86	-0.43	-0.12				1.25	2.80	-0.04									
2/15/2013	0.53	-0.46	-0.15				1.33	3.27	-0.10									
2/28/2013																		
4/4/2013	1.03	-0.27	-0.18															
4/12/2013	-0.24	-0.16	-0.10															
4/23/2013	1.17	-0.12	-0.14															
4/26/2013	0.55	-0.52	-0.21				0.73	2.89	-0.08									
5/28/2013	-0.29	-0.85	-0.31				1.33	3.18	-0.40									
5/31/2013	0.19	-0.66	-0.29				0.44	2.59	-0.33									
6/12/2013										1119628.17	907472.64	447.46				1119714.18	907745.20	446.95
6/14/2013	1120853.15	907362.93	446.07	1119583.91	907336.85	447.43	1120561.03	907456.05	445.40	0.01	-0.02	-0.09	1119671.77	907609.07	447.30	0.00	-0.01	0.01
6/21/2013	0.00	-0.08	-0.25				0.00	-0.05	-0.31							0.01	-0.02	0.00
6/25/2013	0.01	-0.03	-0.30				0.01	-0.05	-0.35							0.03	0.00	0.00
6/28/2013	-0.01	-0.13	-0.30				-0.02	-0.14	-0.34							0.03	-0.02	0.00
7/1/2013	-0.01	-0.05	-0.29				-0.02	-0.07	-0.33							0.00	-0.01	0.00
7/3/2013	-0.03	-0.19	-0.31				-0.03	-0.18	-0.35							0.02	-0.03	0.00
7/9/2013	-0.03	-0.17	-0.30	1119562.16	907365.47	447.66	-0.04	-0.19	-0.34	1119604.60	907495.33	447.48	1119650.03	907631.51	447.50	0.02	-0.01	0.00
7/12/2013	0.00	-0.06	-0.30	0.08	0.12	0.00	-0.01	-0.09	-0.35	0.02	0.04	-0.09	0.01	0.00	0.01	0.02	0.01	0.01
7/16/2013	0.01	0.01	-0.32	0.07	0.22	-0.02	0.00	-0.04	-0.35	0.02	0.05	-0.10	-0.10	-0.01	0.00	0.01	0.01	0.00
7/19/2013	0.00	-0.03	-0.33	0.13	0.20	-0.02	-0.01	-0.08	-0.36	0.02	0.04	-0.10	-0.09	-0.01	0.00	0.02	0.01	0.00
7/23/2013	-0.03	-0.15	-0.32	0.13	0.17	-0.03	-0.04	-0.20	-0.37	-0.01	0.01	-0.10				0.02	-0.03	0.00
7/25/2013	0.00	-0.12	-0.30	0.14	0.20	-0.02	-0.01	-0.18	-0.35	-0.13	-0.04	-0.08				0.04	-0.03	0.01

	SM-55			SM-56			SM-57			SM-58			SM-59			SM-60		
	Phase IA, Northeast			Phase IIA, South			Phase IIA, Southwest			Phase IIA, South			Phase IIA, East			Phase IIA, East		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
7/30/2013	-0.02	-0.17	-0.32	0.04	0.39	0.00	-0.03	-0.22	-0.37	-0.18	0.00	-0.09				0.03	-0.02	0.01
8/2/2013	-0.03	-0.18	-0.31	0.02	0.38	-0.01	-0.04	-0.24	-0.38	-0.18	-0.02	-0.10	-5.35	-2.89	0.01	0.02	-0.04	0.01
8/6/2013	-0.01	-0.07	-0.32	0.05	0.39	-0.02	-0.03	-0.16	-0.38	-0.17	0.00	-0.10	-5.31	-2.83	0.00	0.02	-0.02	0.00
8/9/2013	0.01	0.02	-0.31	0.07	0.40	-0.01	-0.02	-0.10	-0.37	-0.16	0.01	-0.10	-5.30	-2.80	0.00	0.02	0.01	0.01
8/13/2013	-0.01	-0.11	-0.32	0.02	0.39	-0.02	-0.05	-0.21	-0.38	-0.18	0.00	-0.11	-5.30	-2.79	0.00	0.02	-0.01	0.00
8/16/2013	0.01	-0.02	-0.36	0.10	0.39	-0.03	-0.03	-0.14	-0.41	-0.16	0.01	-0.12	-5.28	-2.78	-0.01	0.03	-0.01	-0.01
8/19/2013	-0.01	-0.14	-0.33	0.11	0.38	-0.03	-0.04	-0.25	-0.40	-0.16	-0.01	-0.11	-5.28	-2.80	-0.01	0.03	-0.03	0.00
8/22/2013	0.00	-0.09	-0.33	0.11	0.38	-0.03	-0.04	-0.22	-0.40	-0.17	-0.01	-0.11	-5.28	-2.79	-0.01	0.03	-0.02	0.00
8/27/2013	-0.01	-0.13	-0.33	0.11	0.36	-0.03	-0.05	-0.24	-0.40	-0.17	-0.01	-0.12	-5.27	-2.79	-0.02	0.03	-0.02	-0.01
8/30/2013	0.02	-0.02	-0.34	0.16	0.37	-0.03	-0.03	-0.18	-0.41	-0.16	-0.01	-0.12	-5.25	-2.77	-0.01	0.03	-0.01	-0.01
9/3/2013	0.01	-0.06	-0.34	0.13	0.38	-0.03	-0.04	-0.21	-0.41	-0.16	-0.01	-0.12	-5.25	-2.78	-0.01	0.03	-0.01	0.00
9/6/2013	0.68	0.05	-0.39	0.13	0.37	-0.01	-0.04	-0.27	-0.40	-0.16	-0.02	-0.10	-5.25	-2.78	0.01	0.04	-0.02	0.02
9/10/2013	0.67	0.02	-0.41	0.12	0.40	-0.03	-0.06	-0.29	-0.41	-0.18	-0.02	-0.11	-5.26	-2.78	0.00	0.03	-0.04	0.01
9/11/2013	0.68	0.06	-0.37				-0.07	-0.31	-0.40									
9/12/2013	0.75	0.28	-0.37				-0.14	-0.34	-0.40									
9/13/2013	0.79	0.31	-0.38	0.17	0.41	-0.03	-0.12	-0.26	-0.41	-0.15	0.00	-0.11	-5.24	-2.75	0.00	0.03	0.00	0.01
9/17/2013	0.83	0.33	-0.39	0.18	0.40	-0.04	-0.09	-0.22	-0.41	-0.13	0.01	-0.12	-4.94	-1.55	0.01	0.03	0.01	0.00
9/20/2013	0.86	0.44	-0.40	0.21	0.42	-0.03	-0.07	-0.16	-0.42	-0.12	0.02	-0.11	-4.93	-1.52	0.01	0.04	0.03	0.00
9/24/2013	0.32	-1.72	-0.38	-0.07	0.29	-0.02	-0.47	-1.88	-0.41	-0.30	-0.13	-0.10	-5.07	-1.90	0.03	0.06	-0.45	0.02
9/27/2013	0.93	0.61	-0.40	0.26	0.42	-0.03	-0.02	-0.01	-0.42	-0.09	0.04	-0.12	-4.91	-1.50	0.01	0.04	0.07	0.00
10/1/2013	0.82	0.26	-0.38	0.18	0.35	-0.03	-0.11	-0.28	-0.40	-0.06	-0.10	-0.11	-5.01	-1.78	0.00	0.03	0.00	0.01
10/4/2013	0.92	0.62	-0.38	0.23	0.41	-0.02	-0.04	0.02	-0.41	0.01	-0.04	-0.11	-4.98	-1.72	0.00	0.03	0.10	0.01
10/8/2013	0.90	0.45	-0.38	0.19	0.39	-0.01	-0.06	-0.11	-0.39	-0.02	-0.07	-0.10	-4.99	-1.74	0.01	0.03	0.05	0.02
10/11/2013	0.79	0.10	-0.36	0.12	0.34	-0.01	-0.15	-0.39	-0.40	-0.07	-0.10	-0.10	-5.02	-1.80	0.01	0.03	-0.02	0.02
10/15/2013	0.87	0.25	-0.38	0.16	0.35	-0.02	-0.08	-0.28	-0.40	-0.05	-0.10	-0.10	-5.00	-1.78	0.01	0.04	-0.01	0.02
10/18/2013	1.37	0.98	-0.38	0.18	0.37	-0.01	-0.09	-0.25	-0.40	-0.03	-0.08	-0.10	-4.99	-1.77	0.01	0.04	0.01	0.02
10/22/2013	1.30	0.86	-0.38	0.14	0.36	-0.02	-0.14	-0.38	-0.41	-0.08	-0.07	-0.10	-5.01	-1.79	0.01	0.03	-0.02	0.02
10/25/2013	1.34	0.97	-0.39	0.18	0.37	-0.01	-0.11	-0.29	-0.41	-0.06	-0.06	-0.09	-4.99	-1.77	0.01	0.03	0.00	0.02
10/29/2013	1.44	1.26	-0.38	0.20	0.38	-0.01	-0.03	-0.09	-0.41	-0.01	-0.02	-0.09	-4.97	-1.72	0.02	0.04	0.06	0.03
11/5/2013	1.36	0.95	-0.39	0.17	0.36	-0.02	-0.11	-0.36	-0.43	-0.07	-0.07	-0.10	-5.00	-1.77	0.01	0.03	-0.03	0.02
11/8/2013	1.31	0.92	-0.40	0.17	0.34	-0.03	-0.13	-0.38	-0.43	-0.07	-0.08	-0.11	-5.00	-1.78	0.00	0.03	-0.09	0.01
11/12/2013	1.24	0.86	-0.47	0.14	0.36	-0.06	-0.19	-0.43	-0.48	-0.08	-0.06	-0.14	-5.03	-1.79	-0.02	-0.05	-0.19	0.00
11/15/2013	1.24	0.82	-0.39	0.12	0.36	-0.02	-0.20	-0.49	-0.42	-0.10	-0.08	-0.10	-5.04	-1.80	0.01	-0.01	-0.06	0.02
11/19/2013	1.22	0.82	-0.37	0.12	0.37	0.00	-0.21	-0.47	-0.41	-0.09	-0.07	-0.08	-5.03	-1.80	0.03	-0.03	-0.13	0.05
11/22/2013	1.23	0.89	-0.41	0.16	0.37	-0.04				-0.08	-0.08	-0.12	-5.02	-1.79	-0.01	-0.02	-0.12	0.01
11/26/2013	1.22	0.87	-0.39	0.14	0.39	-0.03	-0.19	-0.44	-0.44	-0.10	-0.07	-0.11	-5.02	-1.78	0.00	-0.07	-0.23	0.03
12/2/2013	1.26	1.01	-0.40	0.18	0.39	-0.04	-0.17	-0.34	-0.44	-0.06	-0.06	-0.12	-5.00	-1.76	-0.01	-0.04	-0.15	0.01
12/5/2013	1.24	0.93	-0.40	0.15	0.40	-0.04	-0.19	-0.41	-0.44	-0.09	-0.06	-0.11	-5.02	-1.77	-0.01	-0.03	-0.10	0.01
1/20/2014				0.14	0.38	-0.02	-0.26	-0.57	-0.48	-0.07	-0.05	-0.10	-5.05	-1.78	0.01	-0.08	-0.25	0.03
1/30/2014				0.19	0.35	-0.01	-0.19	-0.64	-0.48	-0.02	-0.07	-0.09	-5.01	-1.81	0.02	0.05	-0.12	0.05
2/28/2014				0.16	0.36	-0.01	-0.21	-0.56	-0.50	-0.07	-0.07	-0.08	-5.06	-1.81	0.02	0.00	0.00	0.00
4/1/2014				0.16	0.35	-0.01	-0.23	-0.56	-0.52	0.12	0.07	-0.09	-5.05	-1.79	0.01	-0.02	-0.02	-0.01
4/4/2014				0.15	0.34	-0.01				0.13	0.07	-0.09	-5.05	-1.80	0.02	-0.01	-0.05	0.00
4/5/2014				0.15	0.35	-0.02	-0.24	-0.61	-0.52	0.13	0.07	-0.10	-5.04	-1.80	0.00	-0.01	-0.07	-0.01
4/8/2014				0.14	0.35	-0.02	-0.26	-0.63	-0.50	0.12	0.07	-0.10	-5.04	-1.80	0.00	-0.01	-0.05	0.00
4/11/2014				0.13	0.33	-0.03	-0.27	-0.63	-0.49	0.12	0.05	-0.10	-5.05	-1.80	0.01	-0.01	-0.04	0.01
4/14/2014	1.51	0.18	-0.37	0.17	0.35	-0.06	-0.24	-0.65	-0.53	0.14	0.05	-0.14	-5.03	-1.78	-0.02	0.00	-0.03	-0.02
4/18/2014	1.50	0.24	-0.40	0.14	0.33	-0.05	-0.25	-0.64	-0.53	0.13	0.04	-0.13	-5.03	-1.79	-0.01	0.00	-0.04	-0.01
4/22/2014	1.48	0.22	-0.38	0.13	0.33	-0.05	-0.27	-0.66	-0.51	0.12	0.04	-0.13	-5.04	-1.80	-0.01	0.00	-0.03	-0.01
4/25/2014	1.48	0.28	-0.40	0.15	0.35	-0.06	-0.27	-0.60	-0.53	0.13	0.05	-0.13	-5.05	-1.79	-0.02	-0.02	-0.03	-0.01
4/29/2014	1.53	0.26	-0.39	0.16	0.34	-0.05	-0.25	-0.63	-0.52	0.14	0.04	-0.13	-5.03	-1.80	-0.01	0.00	-0.03	-0.01
5/2/2014	1.51	0.34	-0.43	0.18	0.35	-0.07	-0.25	-0.59	-0.55	0.13	0.04	-0.14	-5.03	-1.79	-0.03	0.00	-0.03	-0.02
5/7/2014	1.54	0.35	-0.41	-0.26	0.62	-0.05	-0.24	-0.61	-0.54	0.14	0.03	-0.13	-5.03	-1.80	-0.01	0.01	-0.03	-0.01
5/9/2014	1.51	0.27	-0.43	-0.28	0.62	-0.06	-0.26	-0.66	-0.57	0.13	0.04	-0.14	-5.03	-1.80	-0.03	0.01	-0.03	-0.02
5/13/2014	1.51	0.27	-0.41	-0.29	0.61	-0.04	-0.26	-0.67	-0.54	0.12	0.02	-0.13	-5.03	-1.80	-0.01	0.01	-0.04	-0.01
5/17/2014				-0.28	0.64	-0.04	-0.25	-0.62	-0.56	0.13	0.05	-0.13	-5.03	-1.77	-0.01	0.01	0.00	-0.01

	SM-55			SM-56			SM-57			SM-58			SM-59			SM-60		
	Phase IA, Northeast			Phase IIA, South			Phase IIA, Southwest			Phase IIA, South			Phase IIA, East			Phase IIA, East		
	Northing	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**	**Northing**	**Easting**	**Elev.**
5/20/2014				-0.26	0.63	-0.04	-0.23	-0.56	-0.55	0.15	0.04	-0.13	-5.02	-1.77	-0.01	0.01	0.00	-0.01
5/23/2014				-0.17	0.78	-0.04	-0.26	-0.54	-0.54	0.25	0.05	-0.14	-5.04	-1.77	-0.02	-0.02	0.02	-0.01
5/27/2014				-0.19	0.76	-0.04	-0.25	-0.59	-0.54	0.25	0.03	-0.14	-5.04	-1.79	-0.02	-0.01	0.00	-0.01
5/30/2014				-0.16	0.77	-0.05	-0.24	-0.58	-0.53	0.26	0.04	-0.14	-5.01	-1.77	-0.02	0.00	0.00	-0.01
6/4/2014	1.40	0.02	-0.41	-0.19	0.76	-0.06	-0.27	-0.65	-0.56	0.24	0.03	-0.15	-5.04	-1.80	-0.03	-0.01	-0.01	-0.02
6/6/2014	1.41	0.01	-0.43	-0.17	0.76	-0.06	-0.26	-0.65	-0.57	0.25	0.03	-0.15	-5.03	-1.79	-0.03	0.00	-0.01	-0.02
6/10/2014	1.44	0.03	-0.40	-0.17	0.75	-0.05	-0.25	-0.65	-0.55	0.25	0.02	-0.14	-5.03	-1.80	-0.02	0.00	-0.01	-0.01
6/17/2014	1.46	0.05	-0.43	-0.16	0.76	-0.06	-0.25	-0.64	-0.56	0.25	0.02	-0.14	-5.02	-1.79	-0.03	0.00	-0.02	-0.02
6/20/2014	1.43	-0.08	-0.47	-0.19	0.74	-0.10	-0.27	-0.72	-0.62	0.23	0.00	-0.19	-5.03	-1.81	-0.07	0.00	-0.04	-0.06
6/23/2014	1.47	0.03	-0.41	-0.16	0.75	-0.05	-0.24	-0.64	-0.55	0.25	0.01	-0.14	-5.02	-1.79	-0.02	0.01	-0.02	-0.01
6/27/2014	1.46	-0.01	-0.42	-0.17	0.75	-0.04	-0.25	-0.68	-0.57	0.25	0.01	-0.13	-5.02	-1.80	-0.01	0.01	-0.02	0.00
7/8/2014	1.45	0.01	-0.42	-0.15	0.75	-0.05	-0.26	-0.67	-0.57	0.26	0.01	-0.14	-5.01	-1.80	-0.02	0.01	-0.01	-0.01
7/11/2014	1.41	-0.09	-0.41	-0.19	0.74	-0.05	-0.29	-0.76	-0.56	0.22	0.00	-0.14	-5.04	-1.81	-0.02	-0.01	-0.05	-0.01
7/15/2014	1.42	0.00	-0.44	-0.17	0.75	-0.06	-0.28	-0.71	-0.57	0.24	0.01	-0.15	-5.03	-1.81	-0.03	0.00	-0.03	-0.02
7/18/2014	1.38	-0.24	-0.42	-0.17	0.75	-0.05	-0.32	-0.88	-0.57	0.25	0.01	-0.13	-5.03	-1.81	-0.02	0.00	-0.03	-0.01
7/22/2014	1.45	0.06	-0.44	-0.16	0.75	-0.05	-0.27	-0.67	-0.58	0.25	0.03	-0.13	-5.03	-1.79	-0.02	0.00	0.00	-0.01
7/25/2014	1.47	0.07	-0.43	-0.14	0.76	-0.05	-0.26	-0.66	-0.57	0.26	0.02	-0.14	-5.02	-1.79	-0.02	0.00	-0.02	-0.01
7/29/2014	1.49	0.17	-0.46	-0.12	0.75	-0.05	-0.24	-0.61	-0.60	0.28	0.02	-0.14	-5.01	-1.80	-0.02	0.01	-0.01	-0.01
8/1/2014	1.44	-0.02	-0.45	-0.16	0.75	-0.05	-0.28	-0.75	-0.59	0.24	0.01	-0.14	-5.03	-1.80	-0.02	0.00	-0.03	-0.01
8/5/2014	1.40	-0.10	-0.43	-0.18	0.74	-0.05	-0.31	-0.81	-0.59	0.24	0.00	-0.14	-5.04	-1.82	-0.02	0.00	-0.05	-0.01
8/10/2014	1.44	0.02	-0.42	-0.16	0.75	-0.07	-0.29	-0.75	-0.58	0.24	0.01	-0.15	-5.03	-1.80	-0.03	0.00	-0.03	-0.02
8/12/2014	1.40	-0.03	-0.44	-0.17	0.74	-0.07	-0.29	-0.76	-0.59	0.23	0.00	-0.15	-5.03	-1.81	-0.03	0.00	-0.04	-0.02
8/15/2014	1.43	0.05	-0.45	-0.15	0.75	-0.07	-0.30	-0.74	-0.60	0.24	0.01	-0.15	-5.02	-1.80	-0.03	0.00	-0.03	-0.03
8/19/2014	1.48	0.18	-0.44	-0.13	0.77	-0.06	-0.26	-0.63	-0.60	0.25	0.04	-0.14	-5.02	-1.77	-0.02	0.00	0.00	-0.01
8/22/2014	1.34	-2.92	-0.46	-0.17	0.73	-0.06	-0.30	-0.80	-0.58	0.24	-0.01	-0.14	-5.04	-1.83	-0.02	0.00	-0.04	-0.02
8/26/2014	1.38	-2.94	-0.48	-0.14	0.76	-0.06	-0.28	-0.75	-0.61	0.24	0.00	-0.15	-5.03	-1.80	-0.03	0.00	-0.03	-0.02
8/29/2014	1.34	-2.83	-0.47	-0.18	0.73	-0.05	-0.28	-0.85	-0.59	0.24	-0.01	-0.14	-5.03	-1.83	-0.02	0.01	-0.04	-0.01
9/2/2014	1.34	-2.89	-0.47	-0.20	0.72	-0.06	-0.31	-0.90	-0.60	0.22	-0.02	-0.15	-5.04	-1.83	-0.02	0.00	-0.07	-0.02
9/5/2014	1.37	-2.90	-0.46	-0.13	0.76	-0.05	-0.27	-0.70	-0.61	0.25	0.01	-0.14	-5.02	-1.80	-0.02	0.00	-0.02	-0.01
9/9/2014	1.35	-2.85	-0.45	-0.18	0.73	-0.05	-0.31	-0.87	-0.59	0.23	-0.01	-0.14	-5.03	-1.84	-0.02	0.00	-0.06	-0.01
9/12/2014	1.40	-2.89	-0.48	-0.14	0.75	-0.05	-0.27	-0.72	-0.58	0.27	0.01	-0.13	-5.02	-1.81	-0.01	0.00	-0.02	0.00
9/16/2014	1.42	-2.94	-0.46	-0.16	0.74	-0.04	-0.31	-0.80	-0.59	0.25	0.01	-0.13	-5.03	-1.82	-0.01	0.00	-0.03	0.00
9/19/2014	1.41	-2.83	-0.47	-0.08	0.76	-0.06	-0.22	-0.62	-0.61	0.32	0.04	-0.15	-4.99	-1.77	-0.03	0.02	0.01	-0.02
9/23/2014	1.41	-2.84	-0.48	-0.09	0.77	-0.04	-0.23	-0.58	-0.59	0.29	0.04	-0.13	-5.00	-1.77	-0.01	0.00	0.02	0.00
9/26/2014	1.41	-2.91	-0.47	-0.09	0.76	-0.06	-0.24	-0.66	-0.62	0.28	0.02	-0.15	-4.99	-1.78	-0.03	0.01	-0.01	-0.02
9/29/2014	1.42	-2.80	-0.46	-0.16	0.73	-0.07	-0.31	-0.87	-0.62	0.25	0.00	-0.15	-5.03	-1.84	-0.04	0.00	-0.05	-0.03
10/3/2014	1.45	-2.93	-0.47	-0.11	0.75	-0.06	-0.25	-0.71	-0.61	0.28	0.02	-0.14	-5.01	-1.79	-0.02	0.01	0.00	-0.02
10/7/2014	1.42	-2.83	-0.49	-0.15	0.73	-0.06	-0.28	-0.87	-0.62	0.25	-0.01	-0.14	-5.02	-1.83	-0.02	0.01	-0.06	-0.01
10/10/2014	1.43	-2.88	-0.42	-0.18	0.72	-0.09	-0.34	-0.99	-0.63	0.23	-0.02	-0.17	-5.04	-1.86	-0.05	0.00	-0.08	-0.04
10/14/2014	1.48	-2.87	-0.45	-0.17	0.72	-0.06	-0.29	-0.96	-0.62	0.24	-0.02	-0.15	-5.01	-1.83	-0.03	0.02	-0.07	-0.02
10/17/2014	1.38	-2.85	-0.44	-0.15	0.73	-0.07	-0.32	-0.83	-0.62	0.26	0.00	-0.16	-5.02	-1.82	-0.04	0.00	-0.03	-0.02
10/21/2014	1.39	-2.91	-0.49	-0.11	0.75	-0.05	-0.29	-0.72	-0.61	0.27	0.02	-0.14	-5.02	-1.79	-0.02	0.00	-0.01	0.00
10/24/2014	1.53	-3.30	-0.49	-0.11	0.75	-0.05	-0.27	-0.69	-0.62	0.28	0.02	-0.14	-5.01	-1.79	-0.02	0.00	0.00	-0.01
10/28/2014	1.50	-3.32	-0.45	-0.12	0.74	-0.06	-0.31	-0.79	-0.61	0.26	0.01	-0.14	-5.01	-1.79	-0.02	0.00	-0.03	-0.01
10/30/2014	1.46	-3.25	-0.50	-0.13	0.74	-0.04	-0.31	-0.78	-0.60	0.27	0.02	-0.13	-5.01	-1.79	-0.01	0.00	-0.01	0.01
11/4/2014	1.43	-3.19	-0.49	-0.18	0.64	-0.04	-0.34	-0.91	-0.62	0.23	0.02	-0.14	-5.06	-1.79	-0.02	0.00	-0.05	-0.02
11/7/2014	1.42	-3.22	-0.49	-0.17	0.69	-0.04	-0.33	-0.85	-0.64	0.21	0.03	-0.15	-4.98	-1.79	-0.02	-0.01	-0.04	-0.02
11/11/2014	1.48	-3.25	-0.49	-0.22	0.66	-0.04	-0.33	-1.00	-0.63	0.17	0.00	-0.15	-5.00	-1.82	-0.02	0.00	-0.07	-0.02
11/14/2014	1.42	-3.22	-0.51	-0.18	0.68	-0.03	-0.31	-0.89	-0.63	0.20	0.02	-0.14	-4.98	-1.80	-0.01	-0.02	-0.07	-0.01
11/18/2014	1.42	-3.22	-0.51	-0.18	0.68	-0.03	-0.31	-0.89	-0.63	0.20	0.02	-0.14	-4.98	-1.80	-0.01	-0.02	-0.07	-0.01
11/21/2014	1.44	-3.21	-0.51	-0.18	0.71	-0.02	-0.32	-0.88	-0.63	0.21	0.04	-0.12	-4.98	-1.77	0.01	-0.01	-0.07	0.02
11/25/2014	1.42	-3.20	-0.50	-0.14	0.68	-0.02	-0.29	-0.80	-0.63	0.21	0.03	-0.13	-4.97	-1.77	0.00	0.00	-0.04	0.00

A-3

Evaluation of Hydraulic Performance for SCA Final Cover Design

(To be provided in a future submittal.)

A-4

Maximum Allowable Gas Pressure for SCA Final Cover System Veneer Stability

(To be provided in a future submittal.)

A-5

Veneer Stability Analyses for SCA Final Cover Design

(To be provided in a future submittal.)

A-6

Slope Stability Analyses for SCA Final Cover Design

Beech and Bonaparte
engineering p.c.

an affiliate of Geosyntec Consultants

CALCULATION PACKAGE COVER SHEET

Client: Honeywell **Project:** Onondaga Lake SCA Final Cover Design **Project/Proposal #:** GD5497

TITLE OF COMPUTATIONS **SLOPE STABILITY ANALYSES FOR SCA FINAL COVER DESIGN**

COMPUTATIONS BY:	Signature	Mustafa Erten	02/09/15
	Printed Name and Title	Mustafa Erten, Ph.D. Senior Staff Engineer	DATE
ASSUMPTIONS AND PROCEDURES CHECKED BY:	Signature	Ali Ebrahimi	02/09/15
	Printed Name and Title	Ali Ebrahimi, Ph.D., P.E. Project Engineer	DATE
COMPUTATIONS CHECKED BY:	Signature	Meena Viswanath / Ray Wu	02/09/15
	Printed Name and Title	Meena Viswanath / Ray Wu Senior Staff Engineer / Staff Engineer	DATE
COMPUTATIONS BACKCHECKED BY:	Signature	Mustafa Erten	02/09/15
	Printed Name and Title	Mustafa Erten, Ph.D. Senior Staff Engineer	DATE
APPROVED BY:	Signature	J.F.B	04/10/15
	Printed Name and Title	Jay Beech, Ph.D., P.E. Principal	DATE

STATE OF NEW YORK · JOHN F. BEECH · No. 066337 · LICENSED PROFESSIONAL ENGINEER

APPROVAL NOTES:

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

SLOPE STABILITY ANALYSES FOR SCA FINAL COVER DESIGN

INTRODUCTION

This package was prepared in support of the design of the Sediment Consolidation Area (SCA) final cover for the Onondaga Lake remediation project. The SCA was constructed on Wastebed 13 (WB-13) as shown in Figure 1. Specifically, this package presents static slope stability analyses for the SCA site after placement of the final cover system when geotextile tube filling is completed and the final cover is constructed. For purposes of this calculation package, the SCA perimeter dike refers to the dike constructed between 2011 and 2012 around the containment and dewatering area, whereas the WB-13 perimeter dike refers to the historical exterior perimeter dike around WB-13.

Based on New York State Department of Environmental Conservation (NYSDEC) Regulations Section 360-2.7(b)(7) [NYSDEC, 1988], the SCA is not located in a seismic impact zone, therefore, seismic slope stability analyses were not performed. A detailed explanation regarding the seismic impact zone assessment was presented in Attachment 1 of the NYSDEC approved calculation package titled "*Slope Stability Analyses for SCA Design*" [Geosyntec, 2011b].

METHODOLOGY

Static Slope Stability

Static slope stability analyses were performed using Janbu's method [Janbu, 1973] and Spencer's method [Spencer, 1973] in the computer program SLIDE version 6.029 [Rocscience, 2014]. Two potential slip modes were evaluated in the analyses: (i) block slip mode within the interface of the liner system; and (ii) circular slip surfaces through dredge material contained in geotextile tubes and the foundation materials.

Spencer's method [Spencer, 1973] satisfies both force and moment equilibrium and is therefore considered more rigorous than Janbu's method [Janbu, 1973]. However, Spencer's method often encounters numerical convergence difficulties when considering block slip surfaces. Therefore, Spencer's method was used for the circular slip surface analysis and Janbu's method was used for block slip surface analysis.

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

Two target factors of safety (FSs) were considered for slope stability of the SCA site, one for the interim condition and one for the long-term condition. The interim condition is the condition shortly after completion of geotextile tube filling and construction of the final cover system. The long-term condition is the condition after placement of the final cover system of the SCA when increased excess porewater pressure due to geotextile tube filling and the final cover has been dissipated. In addition, both peak and residual interface shear strengths for geosynthetic layers were considered to calculate the FSs for liner stability in the final condition.

The target FS for the block and circular slip surface analyses corresponding to the peak interface shear strength and peak strength properties of subsurface materials was considered to be 1.3 for the interim condition and 1.5 for the long-term condition (in accordance with 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 for the block slip surface analysis corresponding to large displacement (i.e., residual) interface shear strength was considered to be 1.3 for the long-term condition, which is consistent with general engineering practice.

SUBSURFACE STRATIGRAPHY

Detailed information regarding the subsurface stratigraphy was presented in the NYSDEC approved calculation package titled "*Subsurface Stratigraphy Model of Wastebed 13 for the Design of Sediment Consolidation Area*" [Geosyntec, 2011a], referred to herein 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 2.

The groundwater table was estimated to be approximately 50 ft below the pre-construction ground surface (bgs) of WB-13 (or approximately at El. 375 ft) as presented in the Data Package. However, according to the site investigation results presented in the Data Package, "perched"

water zones exist in WB-13. These "perched" water zones vary spatially and seasonally according to the piezometer data presented in the Data Package but have an average elevation of 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 at 15 ft bgs (see Figure 3). Additionally, within the gravel drainage layer above the geomembrane liner, a second water table of one foot above the top of the geomembrane liner was assumed in the slope stability models (see Figure 4). This represents the one-foot maximum allowable head within the gravel drainage layer. This water table is confined by the geomembrane liner.

ANALYZED CROSS-SECTIONS

The SCA is surrounded by the SCA perimeter dike as shown in Figure 1. The as-built heights of the SCA perimeter dikes vary from 2 ft to 10 ft above the existing ground surface and were used in slope stability analysis. The maximum dike height is approximately 10 ft, located near the western sump area. The SCA perimeter dike is approximately 2 ft wide at the top along the northern side and approximately 28 ft wide at the top along the eastern, western, and southern sides. The side slopes of the SCA perimeter dike are 2.5 horizontal:1 vertical (2.5H:1V). The setback distance between the edge of the lowest geotextile tube layer and the dikes varies from 10 ft to 60 ft. Two cross sections (i.e., Cross-Section A-A and B-B; see Figure 1) were selected for static slope stability analysis because they are considered representative of the most critical cross sections at the SCA. These cross sections were developed based on: (1) the survey of the SCA site conducted on 7 December 2014 after geotextile tube filling was completed; and (2) the final cover design grading plan.

Cross-Section A-A

Cross-Section A-A runs approximately west-east. In the direction of Cross-Section A-A, each additional stack of geotextile tubes straddles geotextile tubes that are already in place. The geotextile tubes are approximately 36 ft wide. This results in each stack of geotextile tubes being offset approximately 18 ft from the layer below. Cross-Section A-A was selected because it follows the direction of minimum overlap between the geotextile tube stacks, which is expected to result in the lowest FS for block slip surface slope stability analysis. The analyses were performed at both the east and the west slopes of Cross-Section A-A.

The modeled ground surface below the liner at Cross-Section A-A is the post-settlement top of SOLW. The thickness of the SOLW underneath the liner varies, but typically is between 50 ft and 60 ft. Cross-Section A-A was extended to include the constructed SCA perimeter dike, as shown in Figure 1.

Cross-Section B-B

Cross-Section B-B runs approximately north-south through WB-13. In this direction, the geotextile tubes are approximately 210 ft to 360 ft long. Based on the survey data provided by Parsons, it is estimated that there is an offset of approximately 7 ft to 30 ft between the edges of the first five layers of geotextile tubes. An offset of 85 ft was measured based on the SCA topographic survey dated 7 December 2014 after the final layer of geotextile tubes was filled at the north side of the SCA.

The thickness of the SOLW underneath the liner varies, but is typically between 30 ft and 70 ft. The slope stability analyses were performed at both the north and the south slopes of Cross-Section B-B.

MATERIAL PROPERTIES

The material properties used in the slope stability analyses were presented in the NYSDEC approved calculation package titled "*Slope Stability Analyses for SCA Design*" [Geosyntec, 2011b] and are also summarized in Table 1.

ANALYZED CASES

Both Cross-Sections A-A and B-B were analyzed for interim and final conditions as discussed below.

Block Stability (Liner and Geotextile Tube Interface Slip Surfaces) – Janbu's Method

Block stability of the SCA after completion of geotextile tube filling and construction of the final cover was evaluated using potential liner/geotextile tube interface slip surfaces. For block stability, the critical case was assumed to be when the liner interface fails underneath the edge of the stacked geotextile tubes. The analysis was performed using the laboratory-measured (i) peak liner interface shear strength for interim and long-term cases, and (ii) residual liner interface

shear strength for the long-term case presented in Attachment 4 of the NYSDEC approved calculation package titled "*Slope Stability Analyses for SCA Design*" [Geosyntec, 2011b]. The shear strengths assumed for the liner and geotextile tube interfaces are shown in Table 1.

Global Stability (Circular Slip Surfaces) – Spencer's Method

Global stability of the SCA after completion of geotextile tube filling and construction of the final cover was evaluated with potential circular slip surfaces. The global slope stability through the foundation material in the interim condition was evaluated using undrained shear strength parameters (recommended design s_u profile shown in Figure 5) to represent the undrained shear strength of the SOLW layer. The global slope stability in the long-term condition was evaluated using drained shear strength parameters. The long-term global stability evaluation was performed assuming that the geotextile support of the geotextile tubes will be degraded and therefore have no shear strength. The long-term evaluation was also performed assuming the effective friction angle of the dredge materials will increase to 30 degrees due to consolidation of the dredge materials (i.e., the long-term value provided in Table 1).

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 selected cases are also shown graphically in Figures 6 through 25. The associated SLIDE runs are presented in Attachment 1 of this package.

The calculated slope stability FS for Cross-Section A-A (summarized in Table 2) and Cross-Section B-B (summarized in Table 3) indicate that the calculated FSs for the interim and long-term cases satisfy the target FS of 1.3 and 1.5, respectively.

The calculated slope stability FS using the residual interface shear strengths within the geosynthetic components of the liner system are summarized in Table 4 and indicate that the calculated FS values meet the required target FS of 1.3.

SUMMARY AND CONCLUSIONS

This package evaluates the static slope stability of the SCA after completion of geotextile tube filling and construction of the final cover system. Two potential slip modes were evaluated

using the computer program SLIDE: (i) block slip mode for liner and geotextile tube interfaces; and (ii) circular slip mode through dredge material and WB-13 foundation materials.

Analyses of two critical cross-sections indicate that the calculated FSs for the two potential slip modes meet the target FSs for interim and long-term conditions.

REFERENCES

Geosyntec Consultants, "Appendix A: *Subsurface Stratigraphy Model of Wastebed 13 for the Design of Sediment Consolidation Area*," Onondaga Lake Sediment Consolidation Area Final Design, April 2011a.

Geosyntec Consultants, "Appendix G: *Slope Stability Analyses for SCA Design*," Onondaga Lake Sediment Consolidation Area Final Design, April 2011b.

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Spencer, E., "The Thrust Line Criterion in Embankment Stability Analysis," *Géotechnique*, Vol. 23, No. 1, pp. 85-100, March 1973.

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Tables

Table 1. Summary of Material Properties for Slope Stability Analysis

Material	Total Unit Weight (pcf)	Undrained Shear Strength (psf)	Drained Shear Strength Effective Stress Friction Angle (degree)
SOLW	82	From Figure 5	34
SCA Perimeter Dike Soil	120	---	35
Foundation Soil (including WB-13 perimeter dike)	120	---	37
Liner Interface (peak strength)	100	---	19
Liner Interface (residual strength)	100	--	17
Gravel Drainage	120	---	38
Geotextile tube-Gravel Interface	86	---	24[1]
Geotextile tube	---	Design Tensile Strength = 1600 lb/ft[2]	
Dredge Material (Short Term)	86	---	15[3]
Dredge Material (Long-Term)	86	---	30
Geotextile tube-Geotextile tube Interface (Vertical)	43[4]	---	0.1[5]
Geotextile tube-Geotextile tube Interface (Horizontal)	86	---	15[6]
Final Cover Soil	120	---	30

Notes:

1. A typical value of interface effective friction angle between woven geotextile and sand was assumed using Koerner [1994].
2. The design tensile strength was modeled using a two-end anchored geotextile sheet. Based on commercially available products, the ultimate tensile strength of geotextile tubes was assumed to be 4800-lb/ft and a strength reduction factor of 3.0 was applied to calculate the design tensile strength. This reduction factor takes into account creep deformation, chemical degradation, and strength loss within seams, connections, and joints [GRI, 1992].
3. Under short-term conditions, the dredge material was assumed to have half of the effective friction angle of the dredge material under long-term conditions.
4. 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 geotextile 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 geotextile tubes could be placed in direct contact with each other along the entire interface.
5. The geotextile tube-geotextile tube vertical interface has insignificant side friction resistance, but a small value of friction angle was necessary for numerical stability of the SLIDE calculation program.
6. The value presented in this table (i.e., 15 degrees) is the measured peak effective friction angles for the geotextile tube-geotextile tube horizontal interface from [Geosyntec, 2011b].

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

Case	Slope Direction	Interim Condition				Long-Term Condition[3]			
		Calculated FS[1]		Figure Number	Target FS	Calculated FS[1]		Figure Number	Target FS
		Spencer's Method[2]	Janbu's Method[2]			Spencer's Method[2]	Janbu's Method[2]		
Foundation Stability (Circular Mode)	East	1.78	--	6	1.30	1.93	--	10	1.50
Liner Stability (Block Mode)	East	--	2.13	7	1.30	--	1.93	11	1.50
Foundation Stability (Circular Mode)	West	1.78	--	8	1.30	1.96	--	12	1.50
Liner Stability (Block Mode)	West	--	2.05	9	1.30	--	1.72	13	1.50

Notes:

1. The calculated FS are calculated using the peak effective stress friction angle for the geotextile tube-geotextile tube horizontal interface (15 degrees) and the liner (19 degrees) reported in Geosyntec [2011b].
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. For long-term, the geotextile of the geotextile 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.

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

Case	Slope Direction	Interim Condition				Long-Term Condition[3]			
		Calculated FS[1]		Figure Number	Target FS	Calculated FS[1]		Figure Number	Target FS
		Spencer's Method[2]	Janbu's Method[2]			Spencer's Method[2]	Janbu's Method[2]		
Foundation Stability (Circular Mode)	North	2.05	--	14	1.30	2.78	--	18	1.50
Liner Stability (Block Mode)	North	--	3.12	15	1.30	--	2.83	19	1.50
Foundation Stability (Circular Mode)	South	1.77	--	16	1.30	2.14	--	20	1.50
Liner Stability (Block Mode)	South	--	2.26	17	1.30	--	2.10	21	1.50

Notes:

1. The calculated FS are calculated using the peak effective stress friction angle for the geotextile tube-geotextile tube horizontal interface (15 degrees) and the liner (19 degrees) reported in Geosyntec [2011b].
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. For long-term, the geotextile of the geotextile 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.

Table 4. Summary of Slope Stability Analysis: Residual Conditions

Case		Slope Direction	Long-Term Condition[3]		
			Calculated FS[1] Janbu's Method[2]	Figure Number	Target FS
Liner Stability (Block Mode)	Cross-Section A-A	East	1.85	22	1.30
	Cross-Section A-A	West	1.61	23	1.30
Liner Stability (Block Mode)	Cross-Section B-B	North	2.67	24	1.30
	Cross-Section B-B	South	1.99	25	1.30

Notes:

1. The calculated FS are calculated using the residual effective stress friction angle for the geotextile tube-geotextile tube horizontal interface (12 degrees) and the liner (17 degrees) reported in Geosyntec [2011b].
2. Janbu's method was used for the block mode analyses presented here because Spencer's method often encounters numerical convergence difficulty with these types of analyses.

Figures

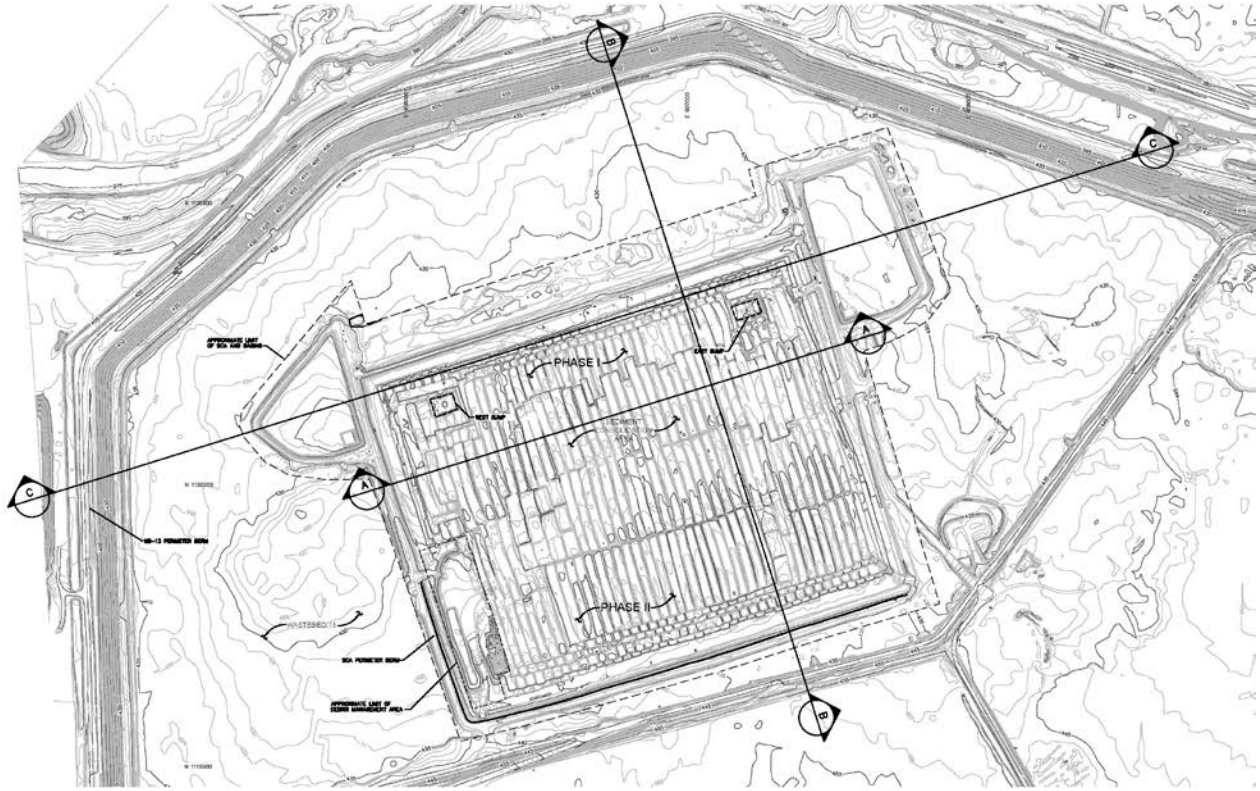

Figure 1. Footprint of the SCA Site

Note: Cross Sections A-A and B-B were used for the slope stability analyses. Cross Section C-C is shown in Figure 2.

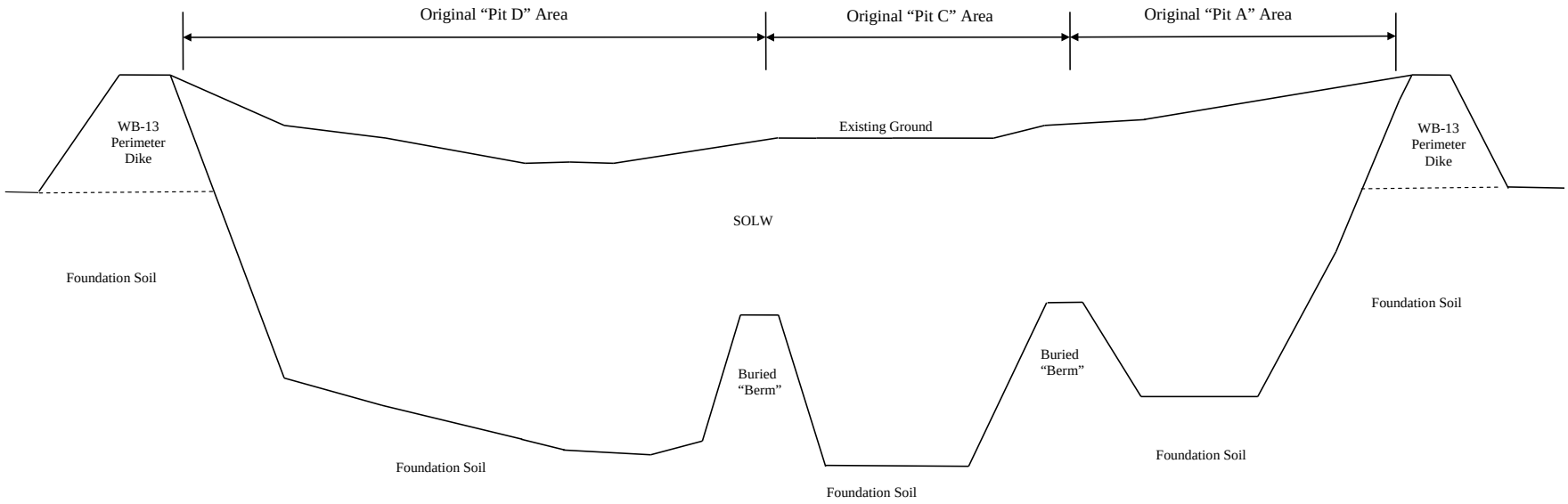

Figure 2. Schematic of Subsurface Profile at Cross Section C-C (See Figure 1 for location of this cross section)
[not to scale; for purpose of showing subsurface stratigraphy only]

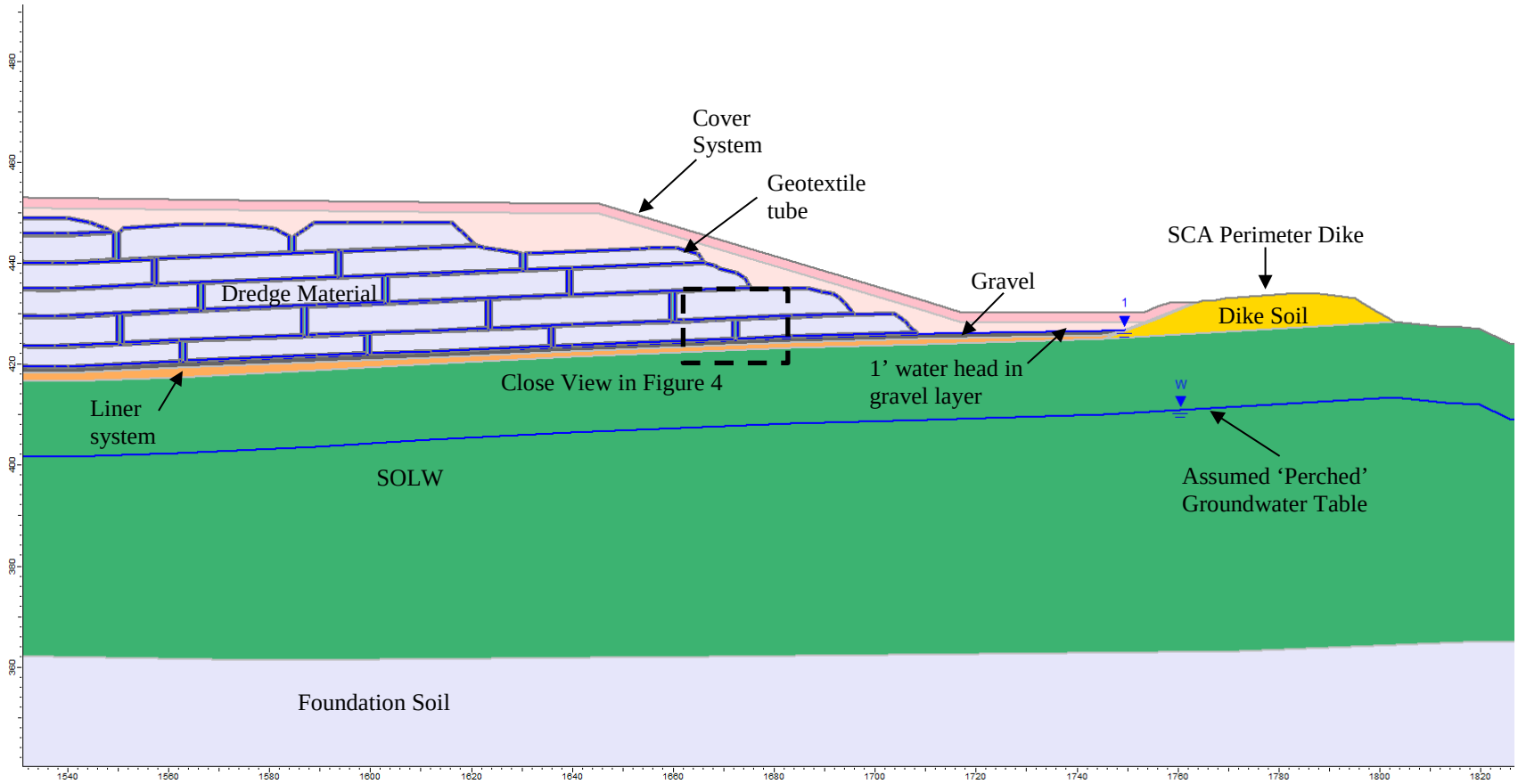

Figure 3. Geometry and Subsurface Materials Used in the Slope Stability Analysis (SLIDE Model)

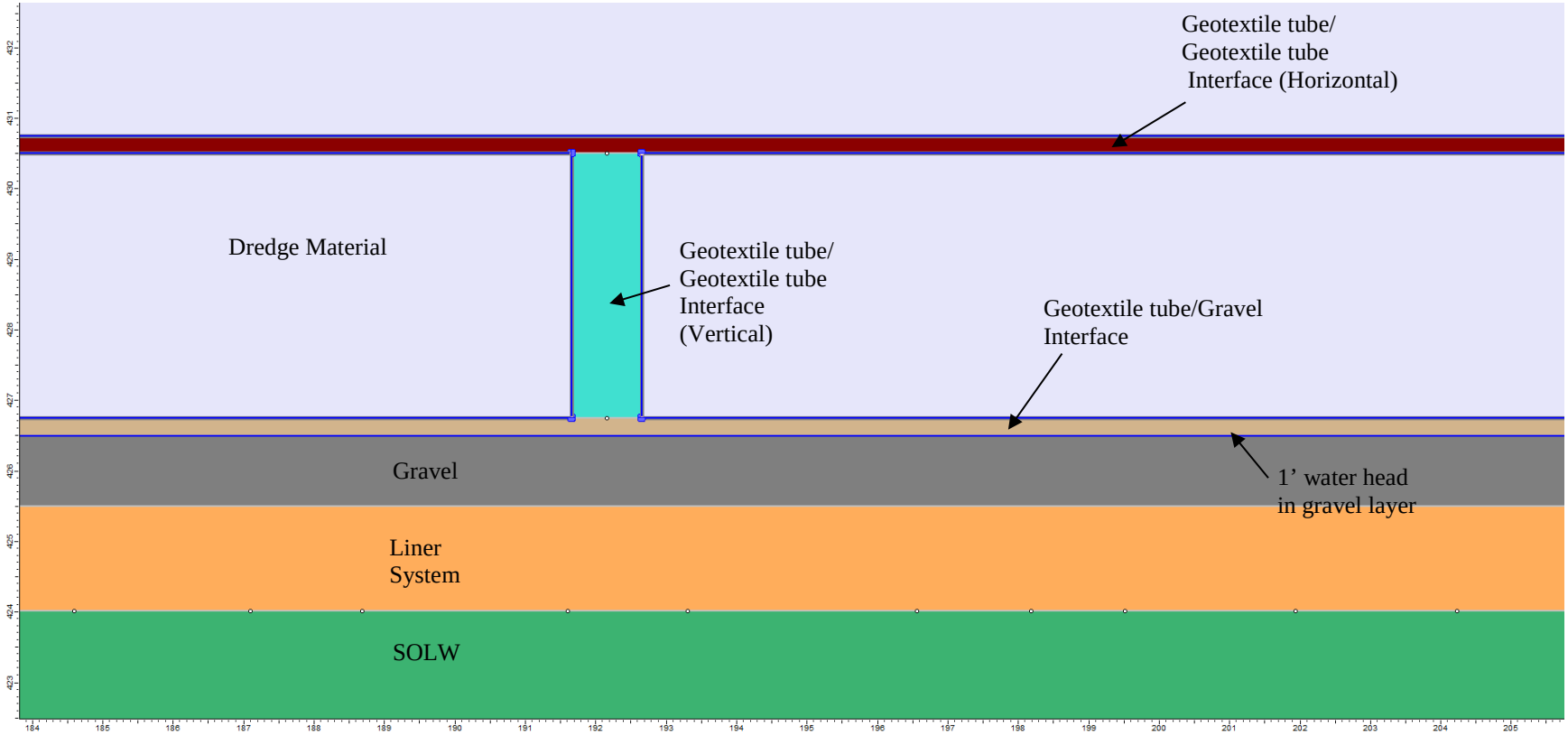

Figure 4. Close View of Layers included in Slope Stability Analysis Model (SLIDE Model)

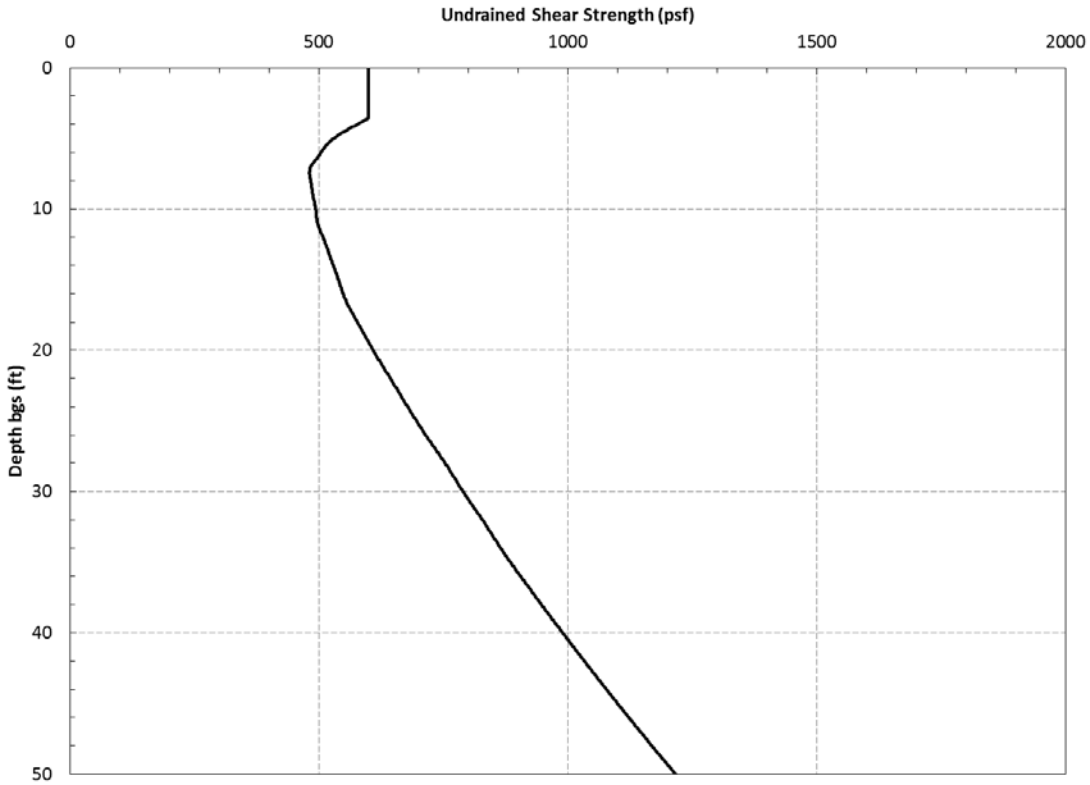

Figure 5. Recommended Design s_u Profile for SOLW Foundation (the strength gain due to consolidation under the weight of geotextile tubes is not considered in this profile)

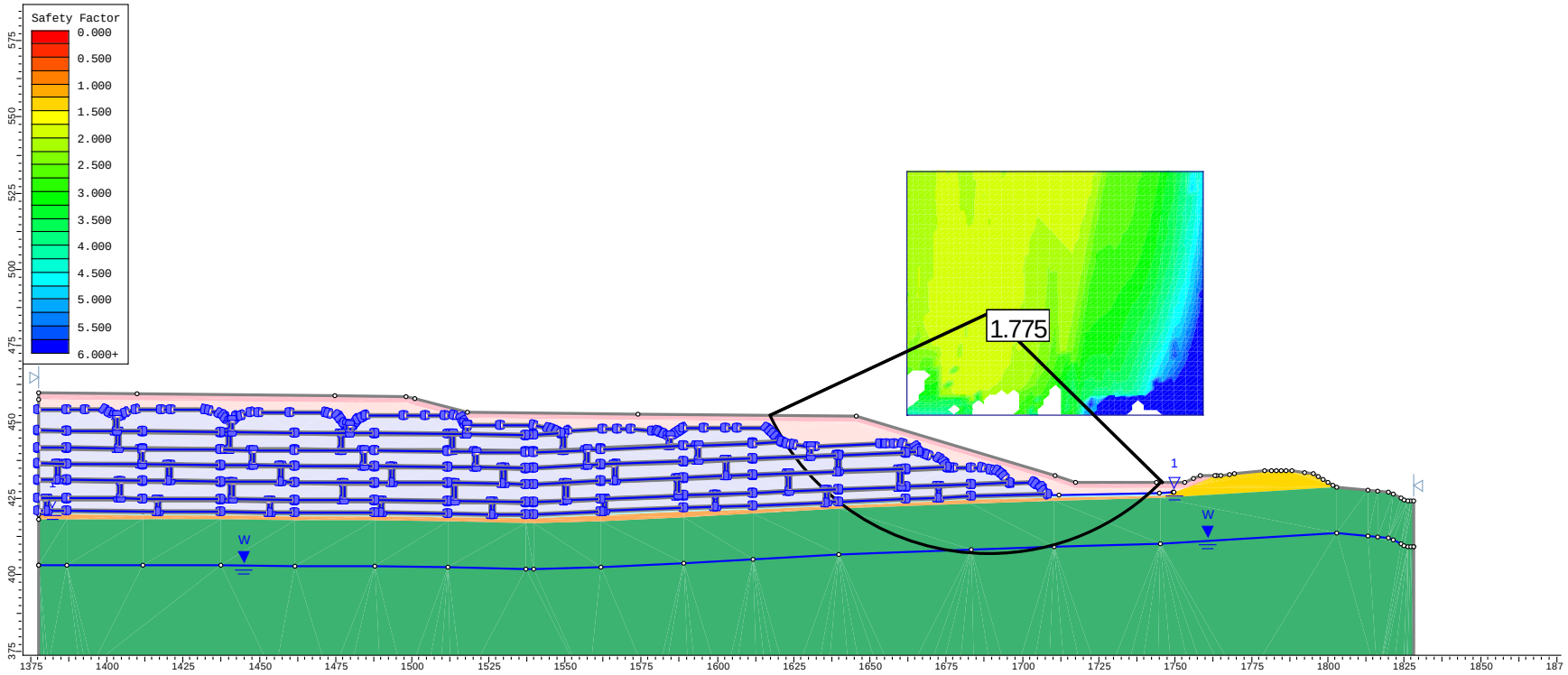

Figure 6. Calculated FS for Circular Slope Stability Analysis in Cross Section A-A – East Slope – Interim Condition
Note: This figure shows the FS calculated using Spencer's Method.

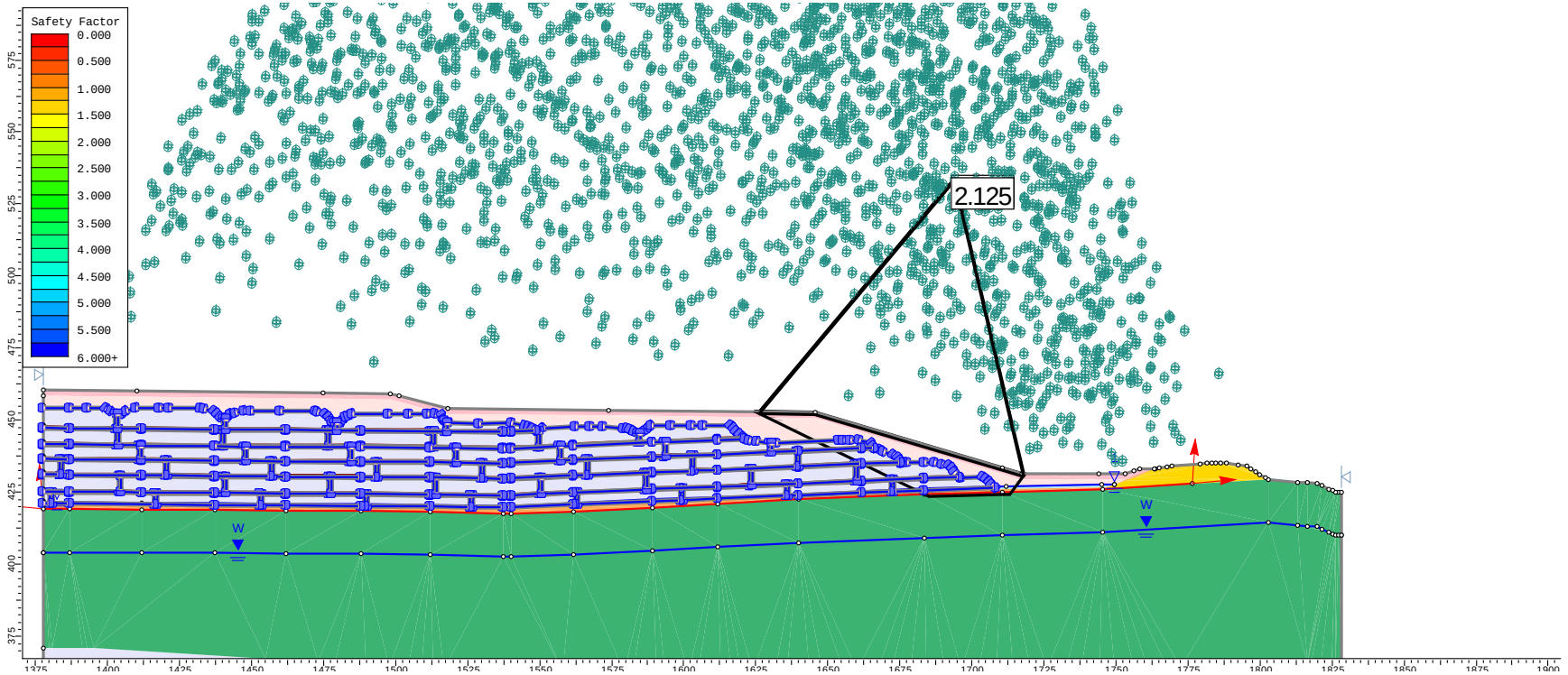

Figure 7. Calculated FS for Block Slope Stability Analysis in Cross Section A-A – East Slope – Interim Condition
Note: This figure shows the FS calculated using Janbu's Method.

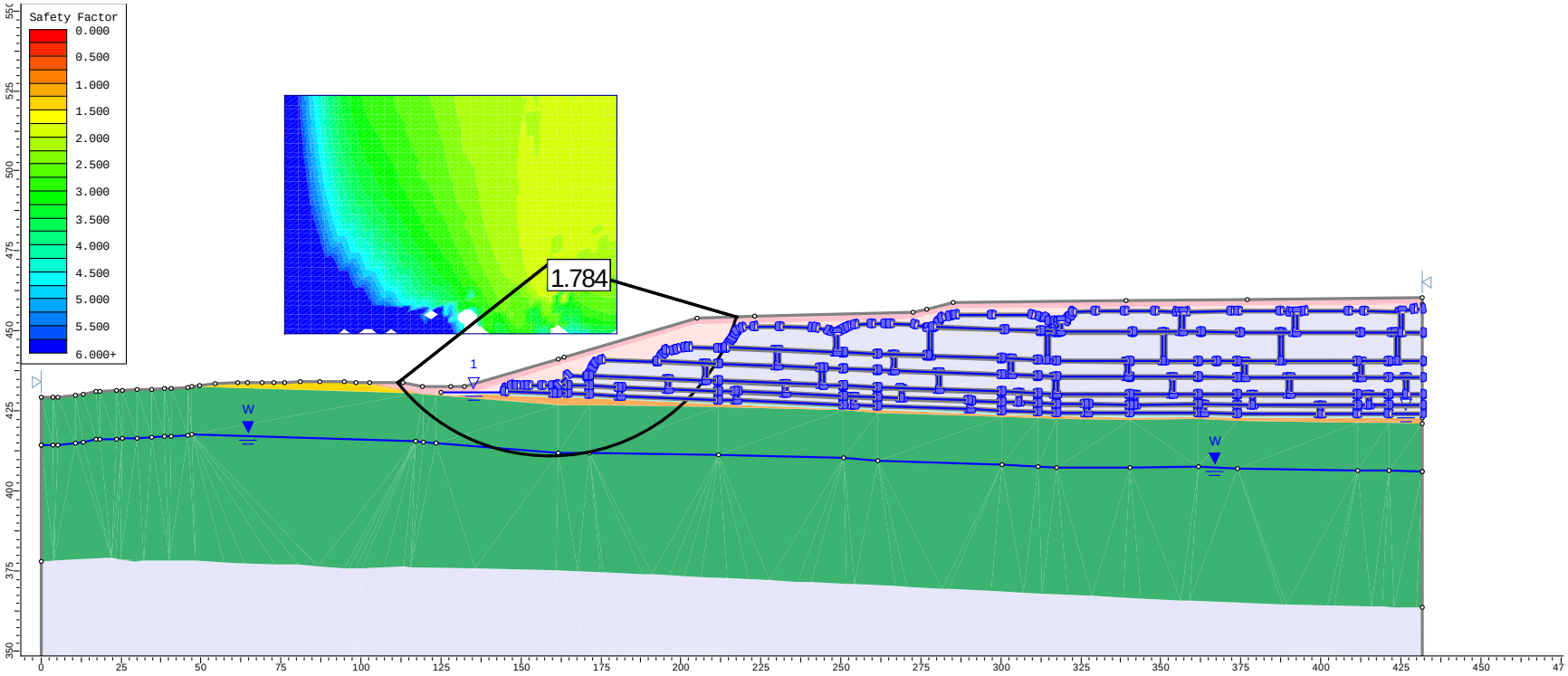

Figure 8. Calculated FS for Circular Slope Stability Analysis in Cross Section A-A – West Slope – Interim Condition
Note: This figure shows the FS calculated using Spencer's Method.

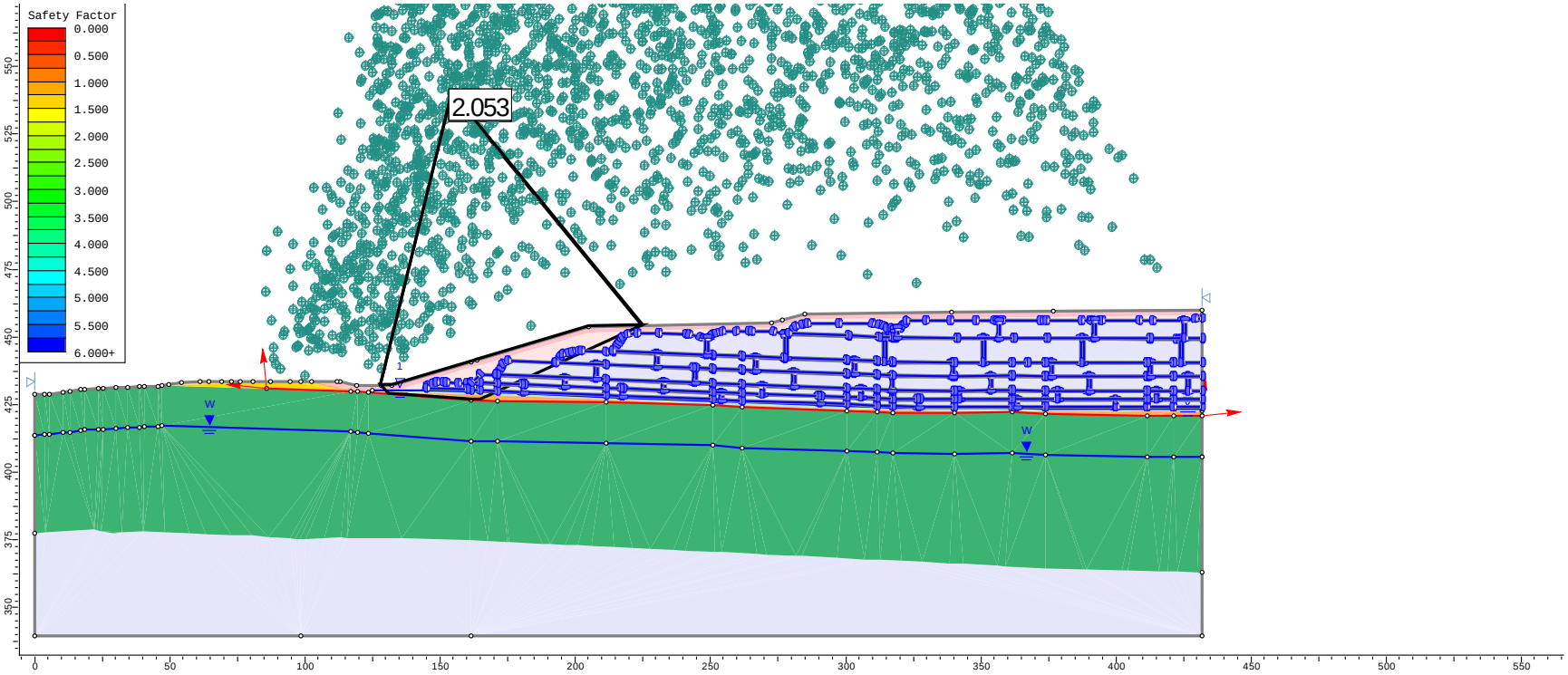

Figure 9. Calculated FS for Block Slope Stability Analysis in Cross Section A-A – West Slope – Interim Condition
Note: This figure shows the FS calculated using Janbu's Method.

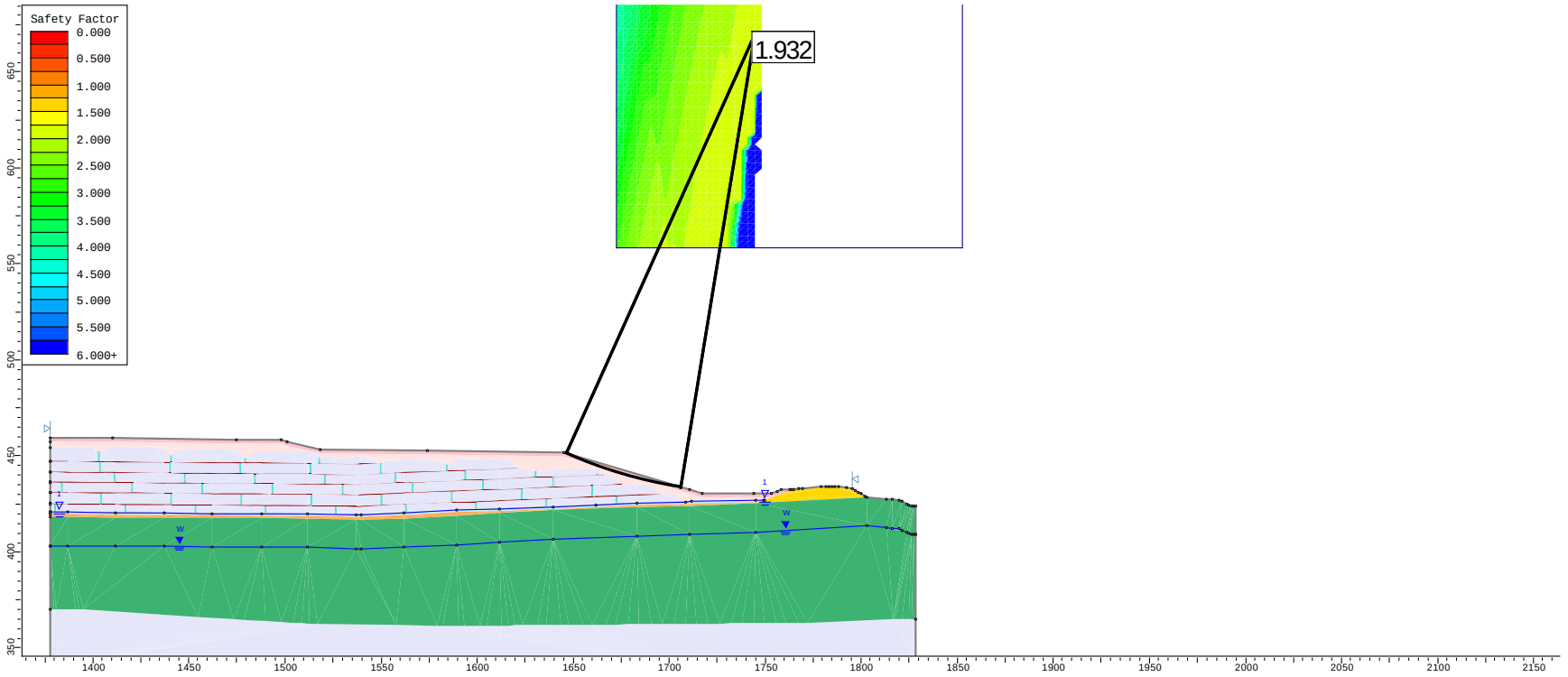

Figure 10. Calculated FS for Circular Slope Stability Analysis in Cross Section A-A – East Slope – Long Term Condition
Note: This figure shows the FS calculated using Spencer's Method.

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Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

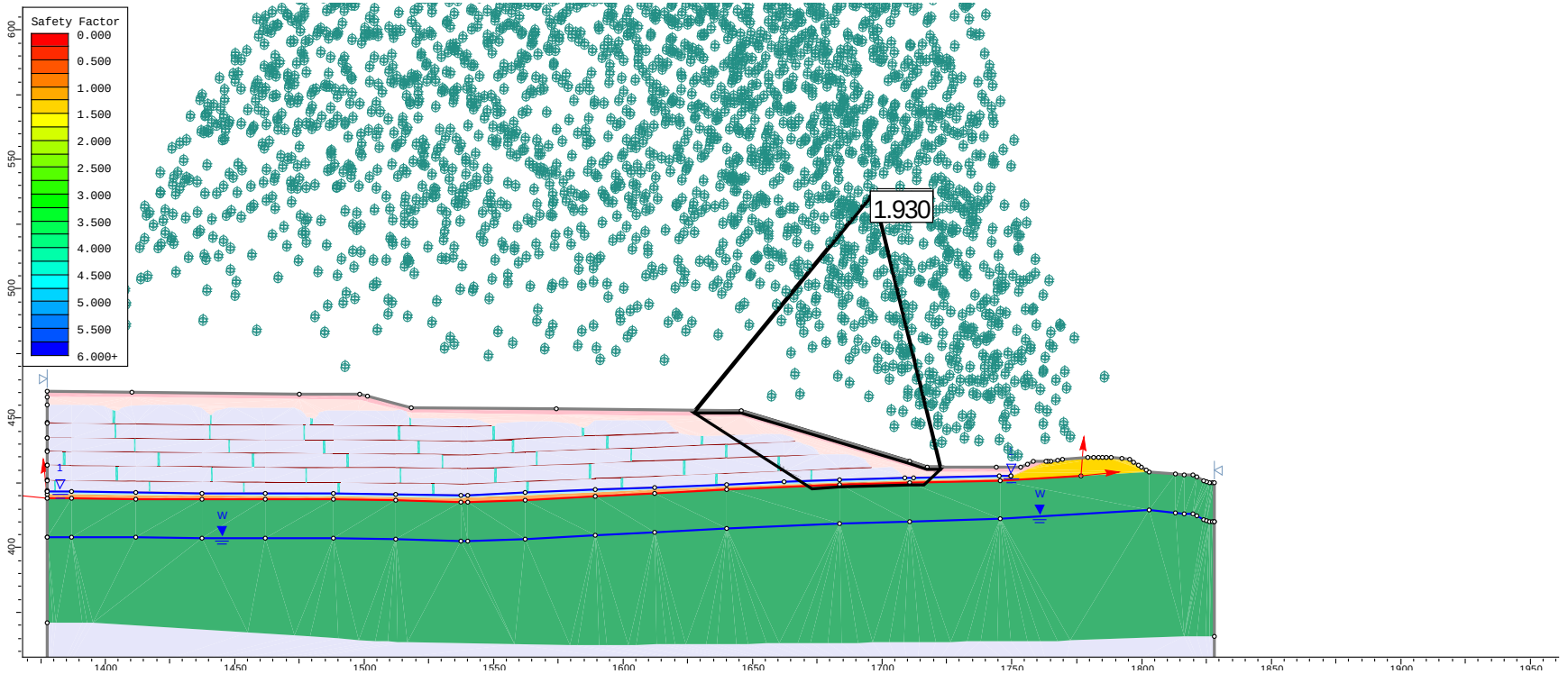

Figure 11. Calculated FS for Block Slope Stability Analysis in Cross Section A-A – East Slope – Long Term Condition
Note: This figure shows the FS calculated using Janbu's Method.

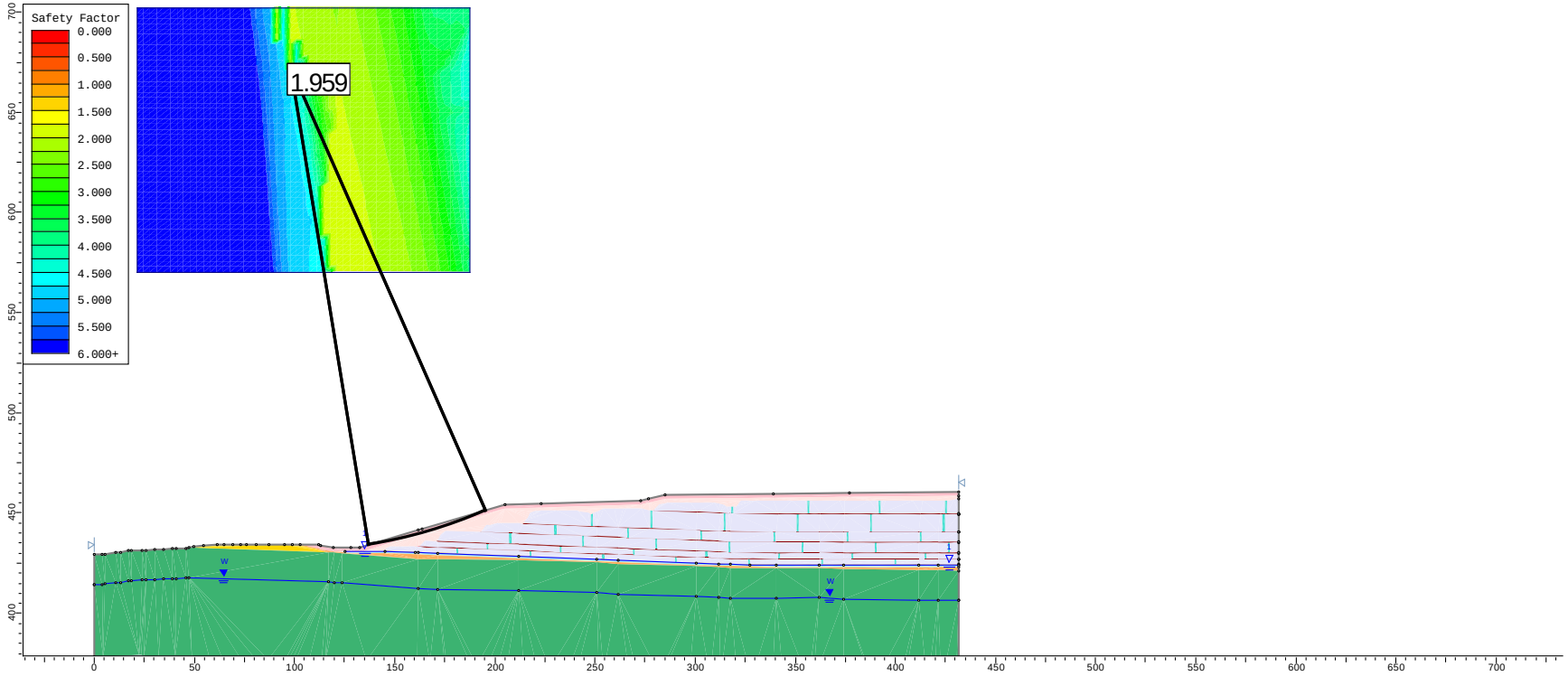

Figure 12. Calculated FS for Circular Slope Stability Analysis in Cross Section A-A – West Slope – Long Term Condition
Note: This figure shows the FS calculated using Spencer's Method.

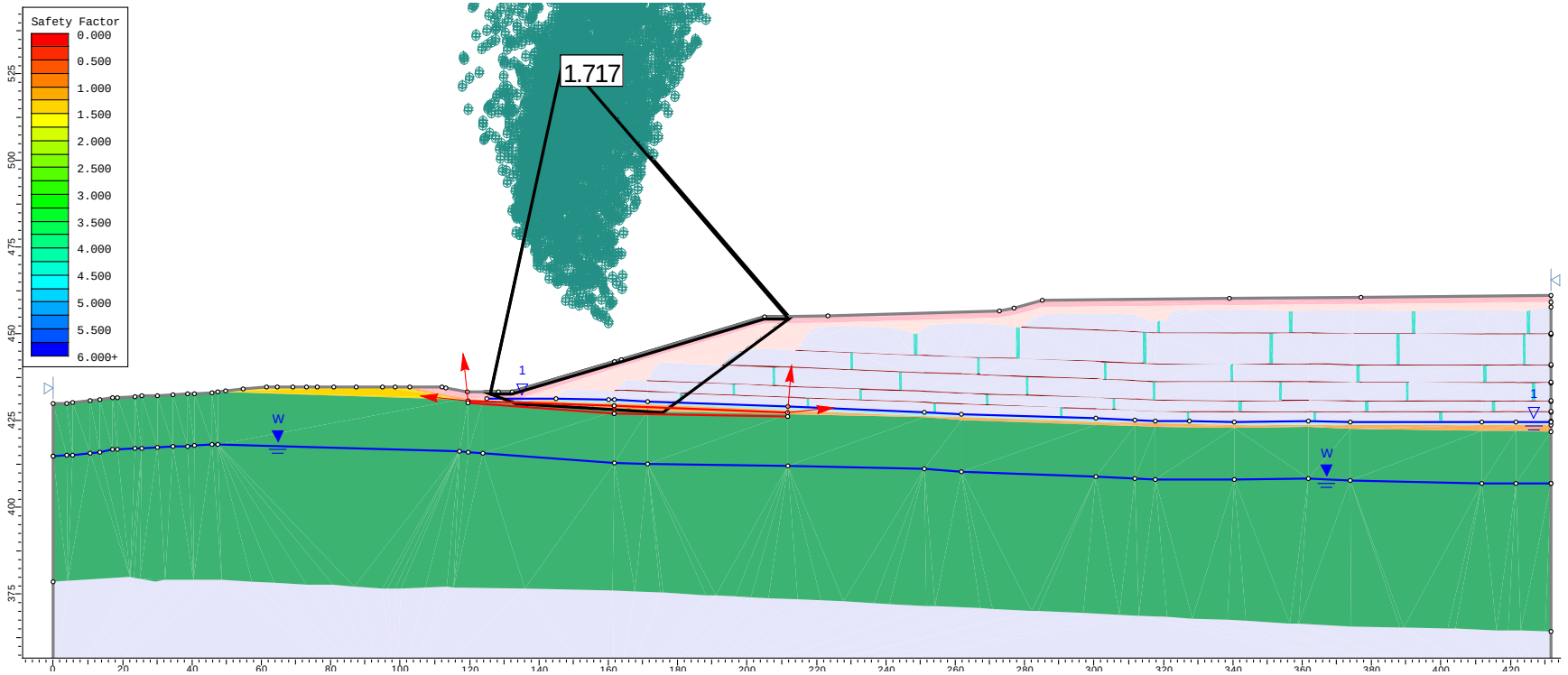

Figure 13. Calculated FS for Block Slope Stability Analysis in Cross Section A-A – West Slope – Long Term Condition
Note: This figure shows the FS calculated using Janbu's Method.

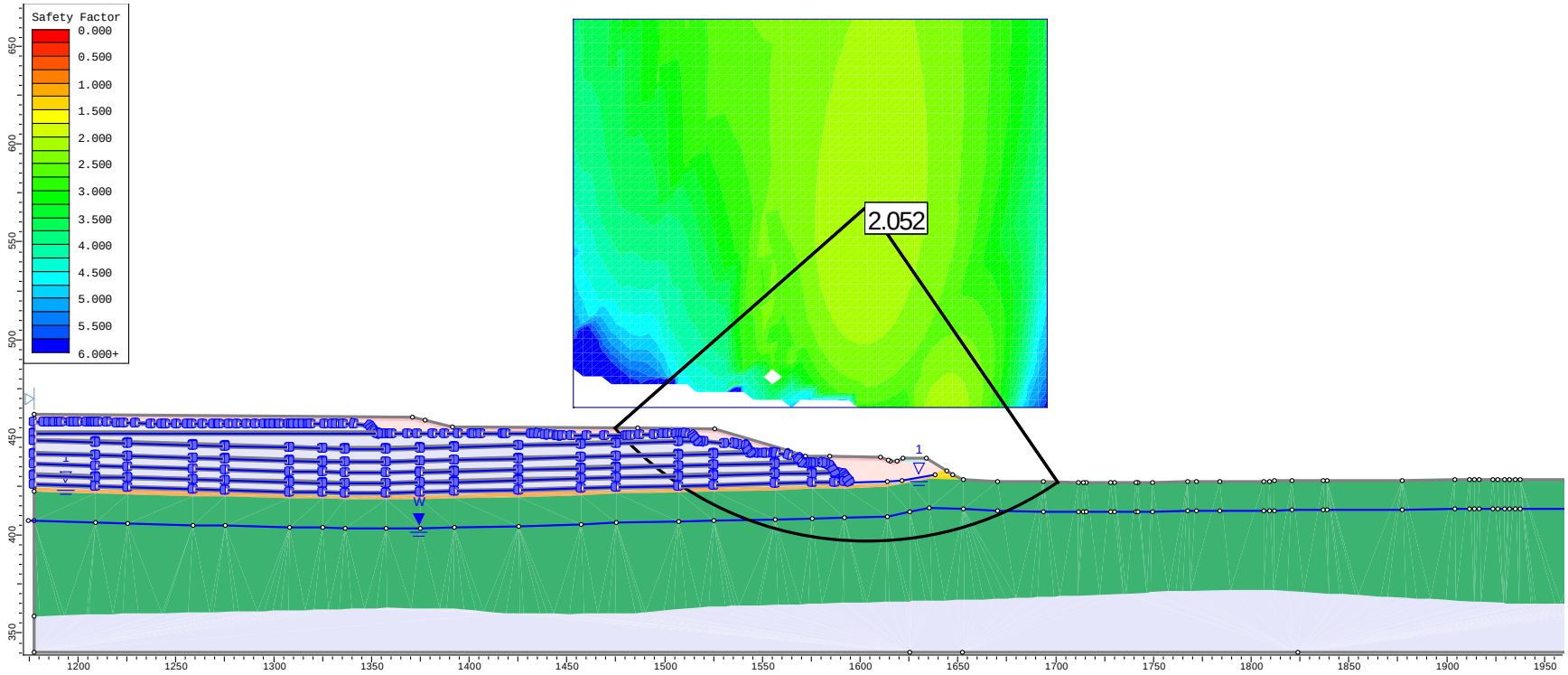

Figure 14. Calculated FS for Circular Slope Stability Analysis in Cross Section B-B – North Slope – Interim Condition
Note: This figure shows the FS calculated using Spencer's Method.

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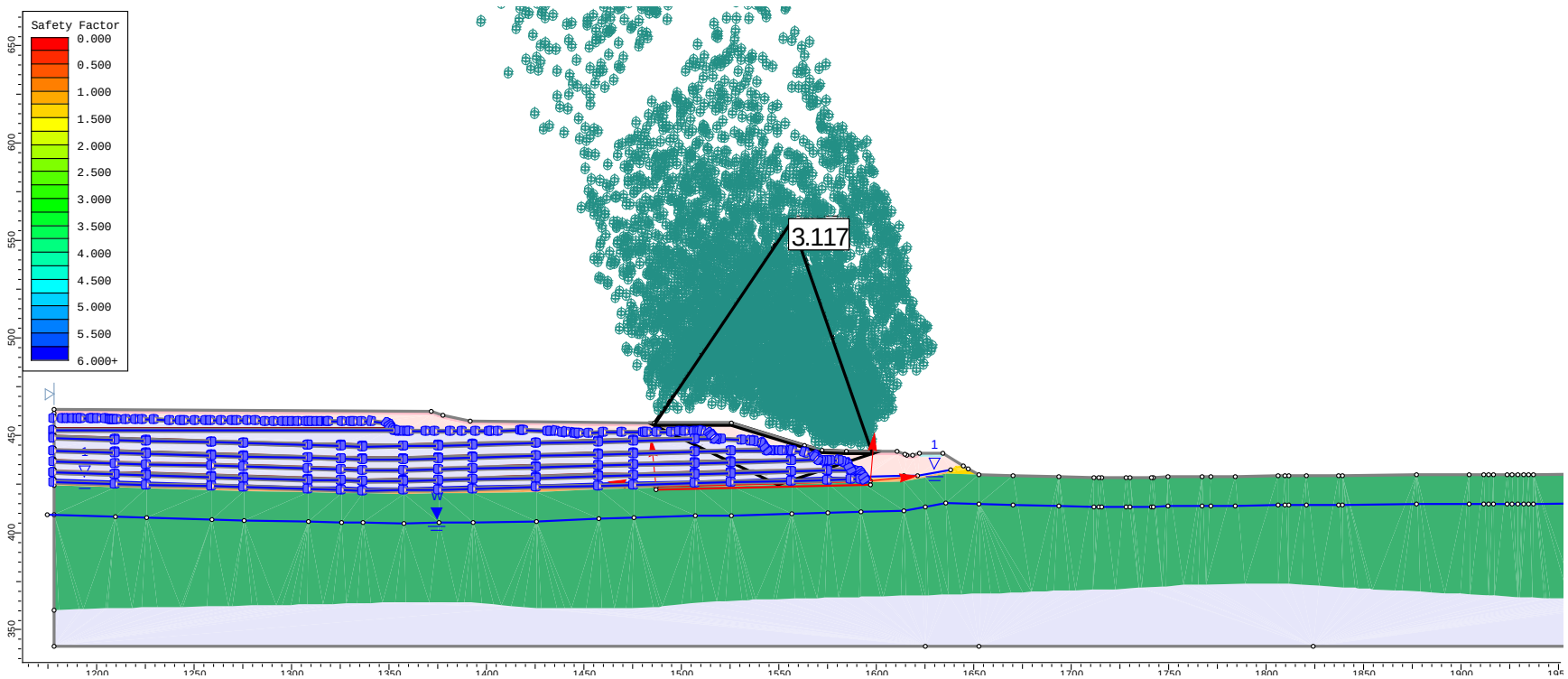

Figure 15. Calculated FS for Block Slope Stability Analysis in Cross Section B-B – North Slope – Interim Condition
Note: This figure shows the FS calculated using Janbu's Method.

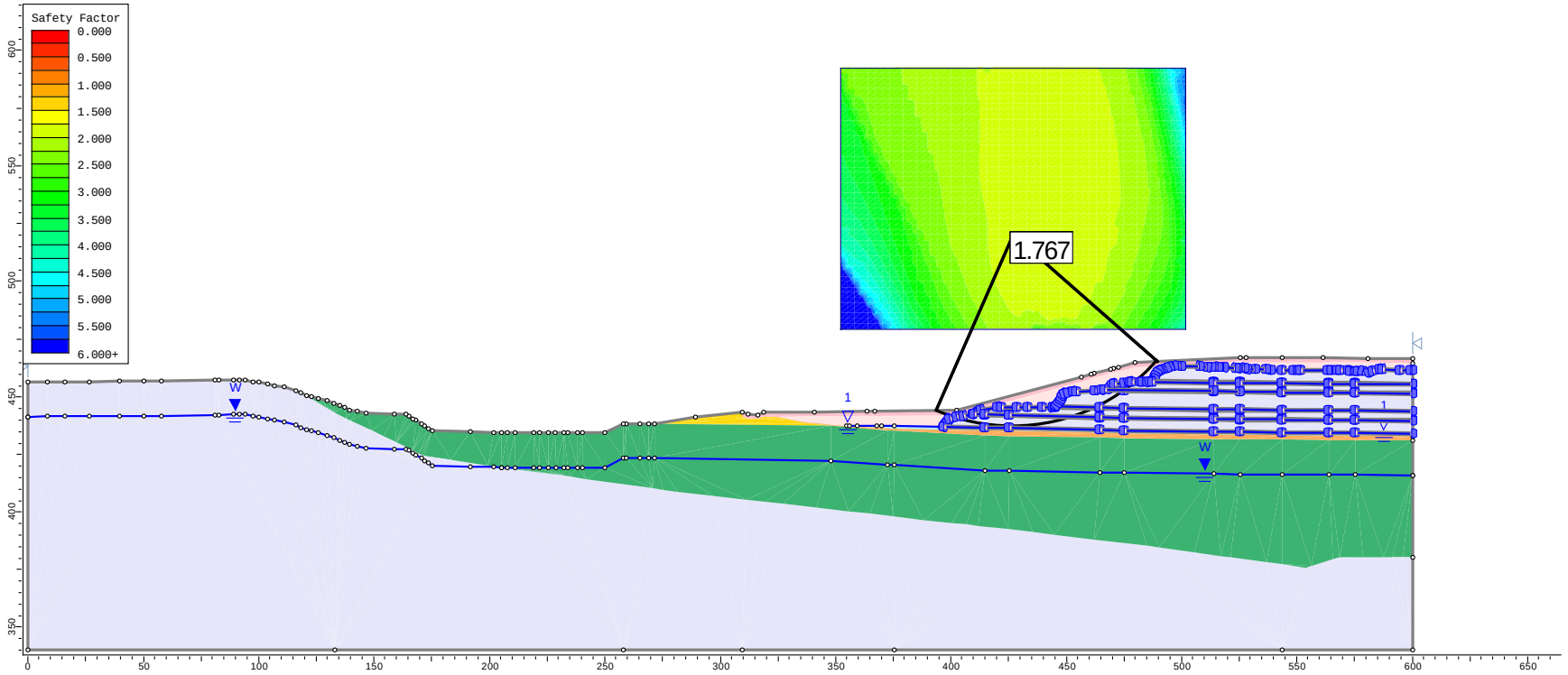

Figure 16. Calculated FS for Circular Slope Stability Analysis in Cross Section B-B – South Slope – Interim Condition
Note: This figure shows the FS calculated using Spencer's Method.

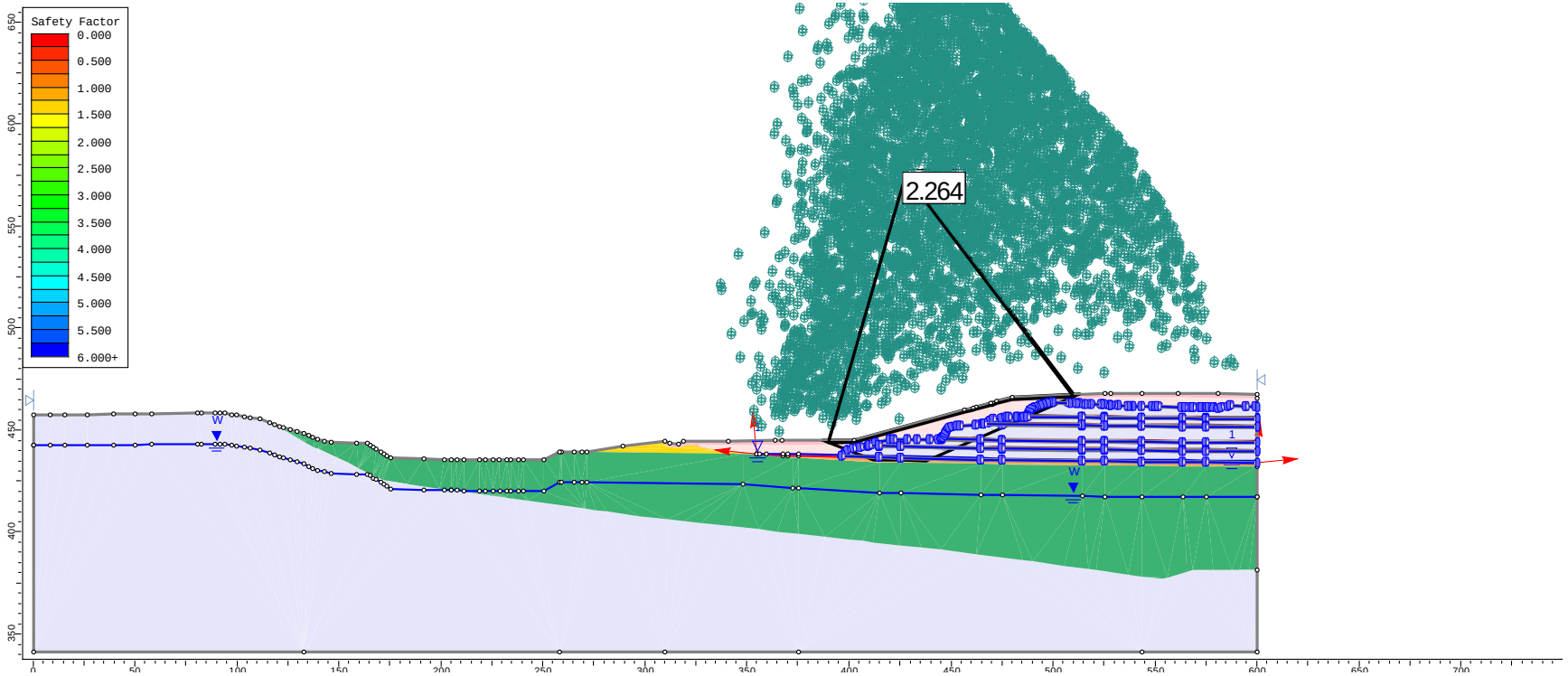

Figure 17. Calculated FS for Block Slope Stability Analysis in Cross Section B-B – South Slope – Interim Condition
Note: This figure shows the FS calculated using Janbu's Method.

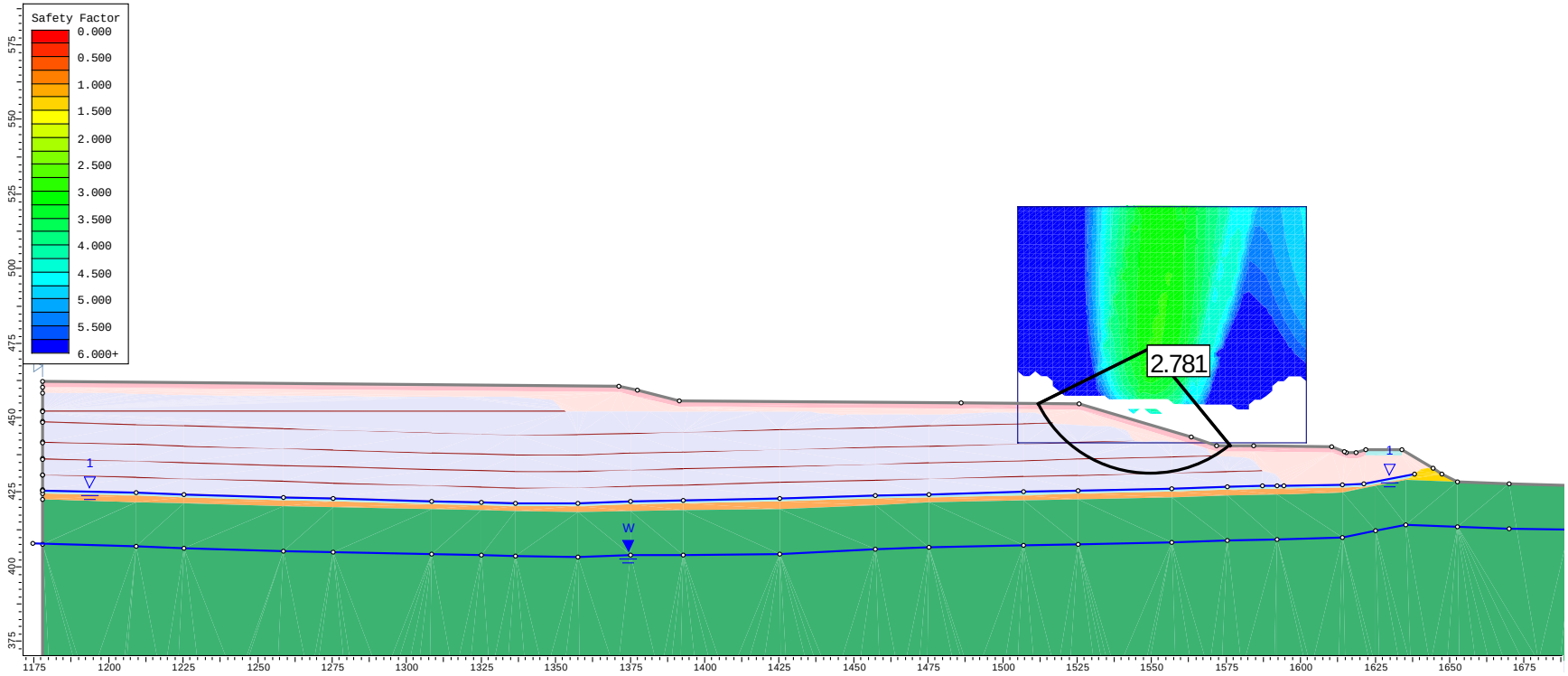

Figure 18. Calculated FS for Circular Slope Stability Analysis in Cross Section B-B – North Slope – Long Term Condition
Note: This figure shows the FS calculated using Spencer's Method.

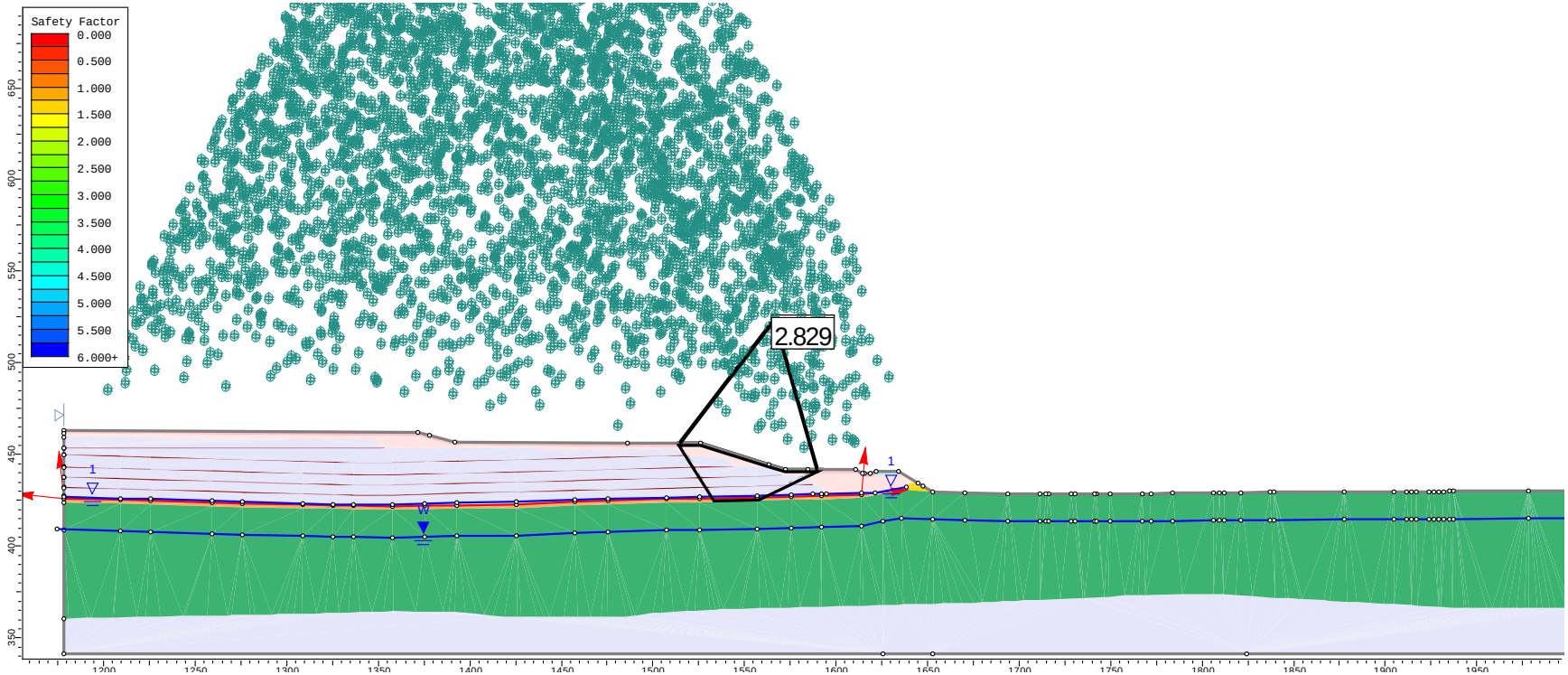

Figure 19. Calculated FS for Block Slope Stability Analysis in Cross Section B-B – North Slope – Long Term Condition
Note: This figure shows the FS calculated using Janbu's Method.

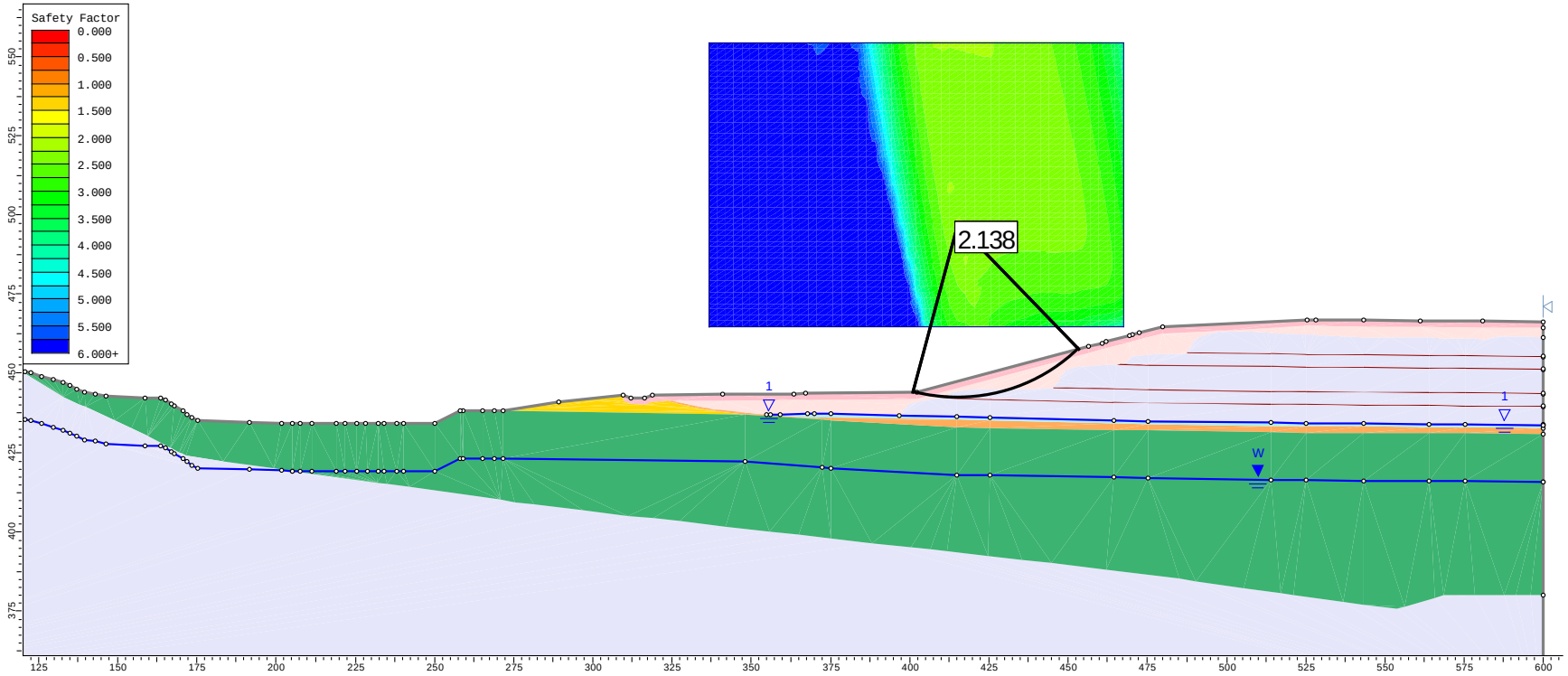

Figure 20. Calculated FS for Circular Slope Stability Analysis in Cross Section B-B – South Slope – Long Term Condition
Note: This figure shows the FS calculated using Spencer's Method.

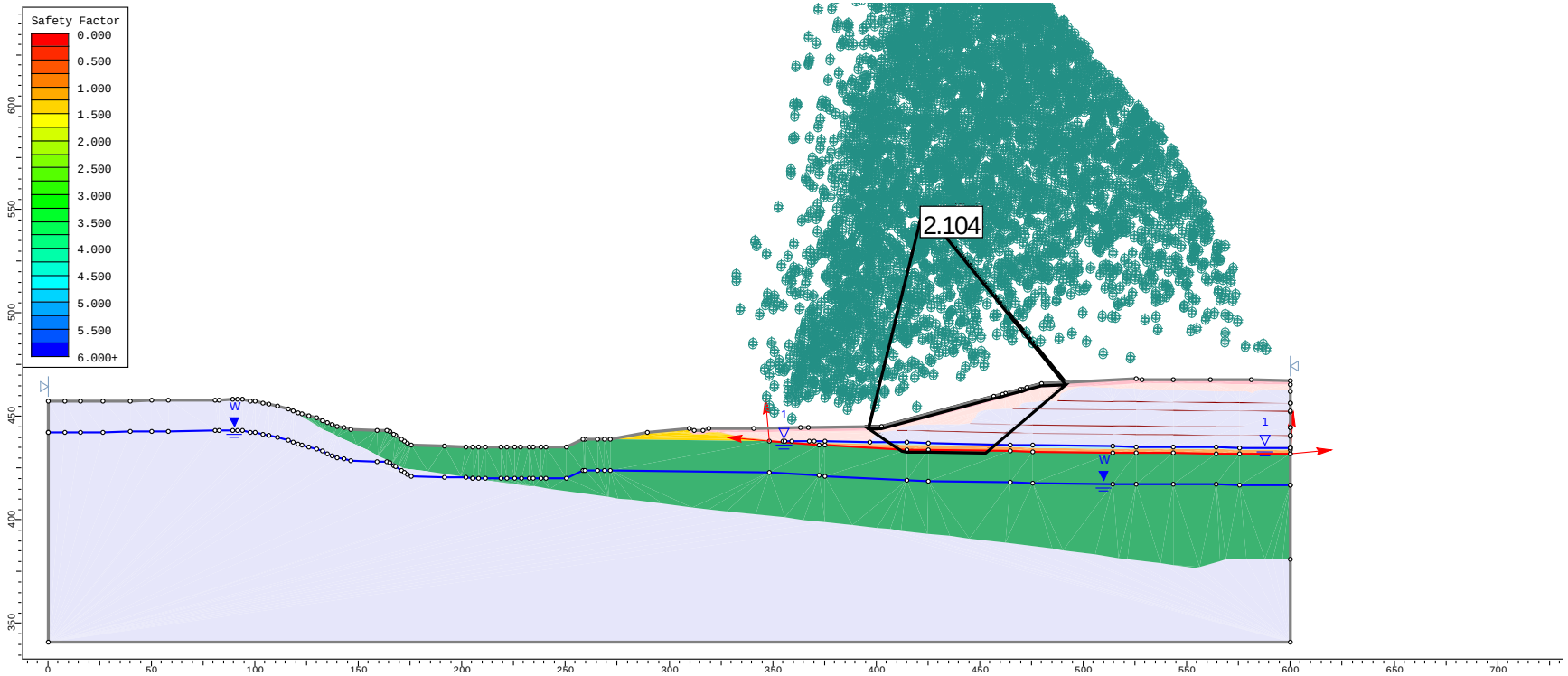

Figure 21. Calculated FS for Block Slope Stability Analysis in Cross Section B-B – South Slope – Long Term Condition
Note: This figure shows the FS calculated using Janbu's Method.

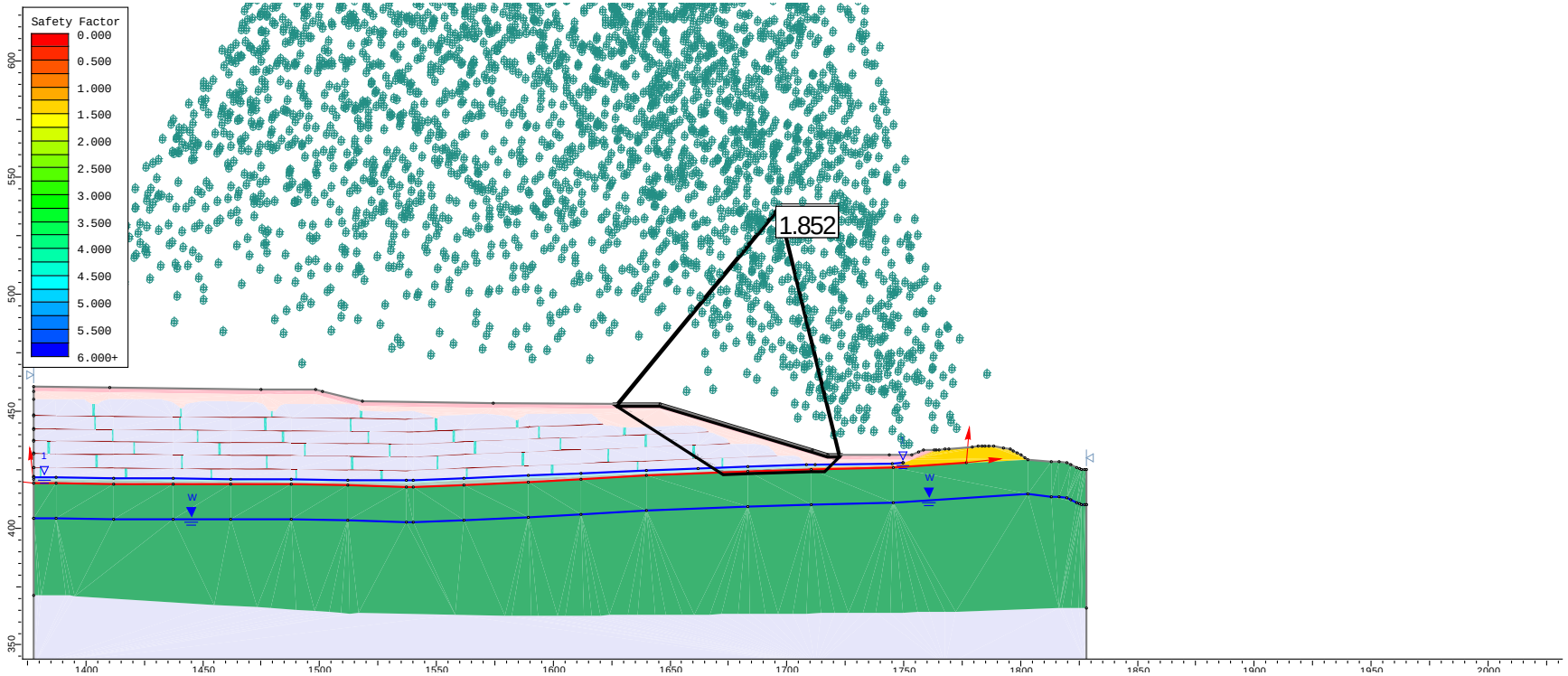

Figure 22. Calculated FS for Block Slope Stability Analysis in Cross Section A-A – East Slope – Long-Term Condition (Residual Liner Interface Shear Strength)

Note: This figure shows the FS calculated using Janbu's Method.

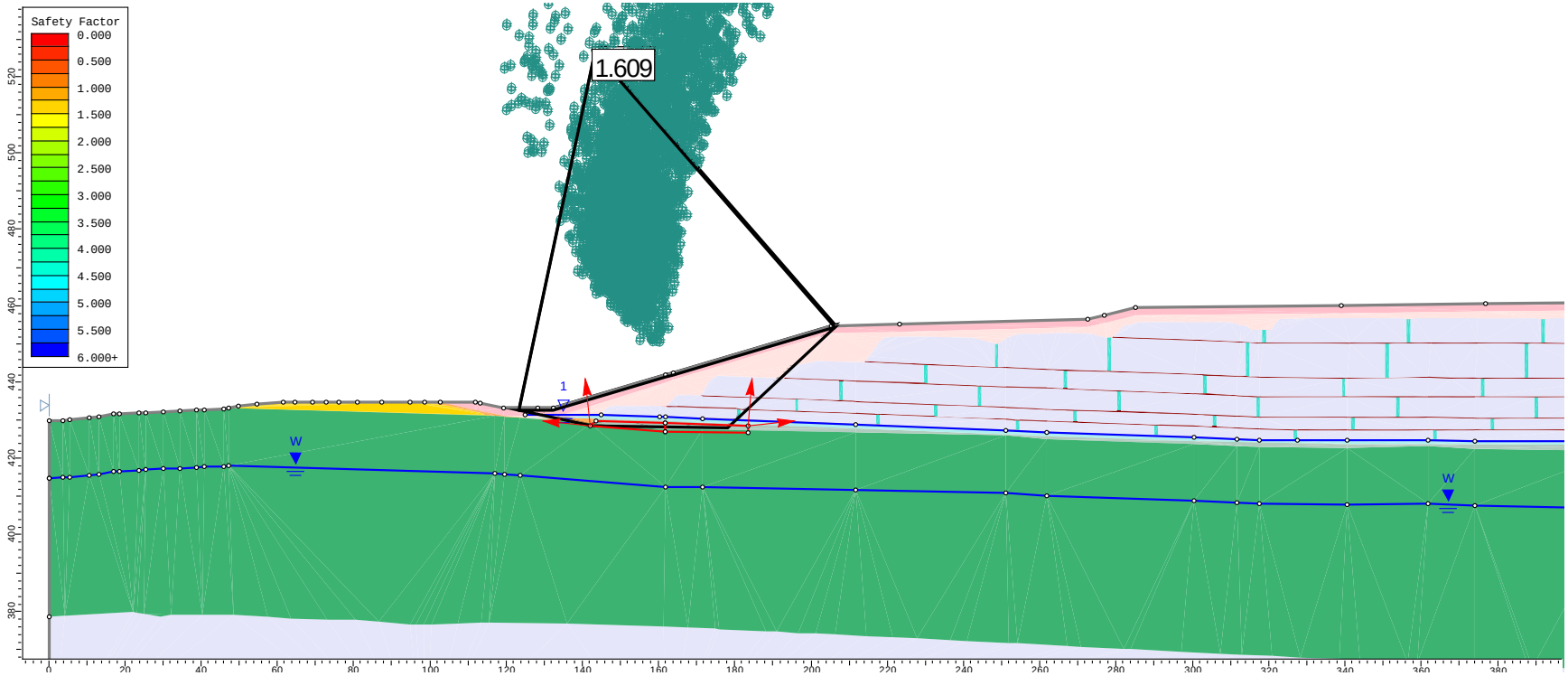

Figure 23. Calculated FS for Block Slope Stability Analysis in Cross Section A-A – West Slope – Long-Term Condition (Residual Liner Interface Shear Strength)
Note: This figure shows the FS calculated using Janbu's Method.

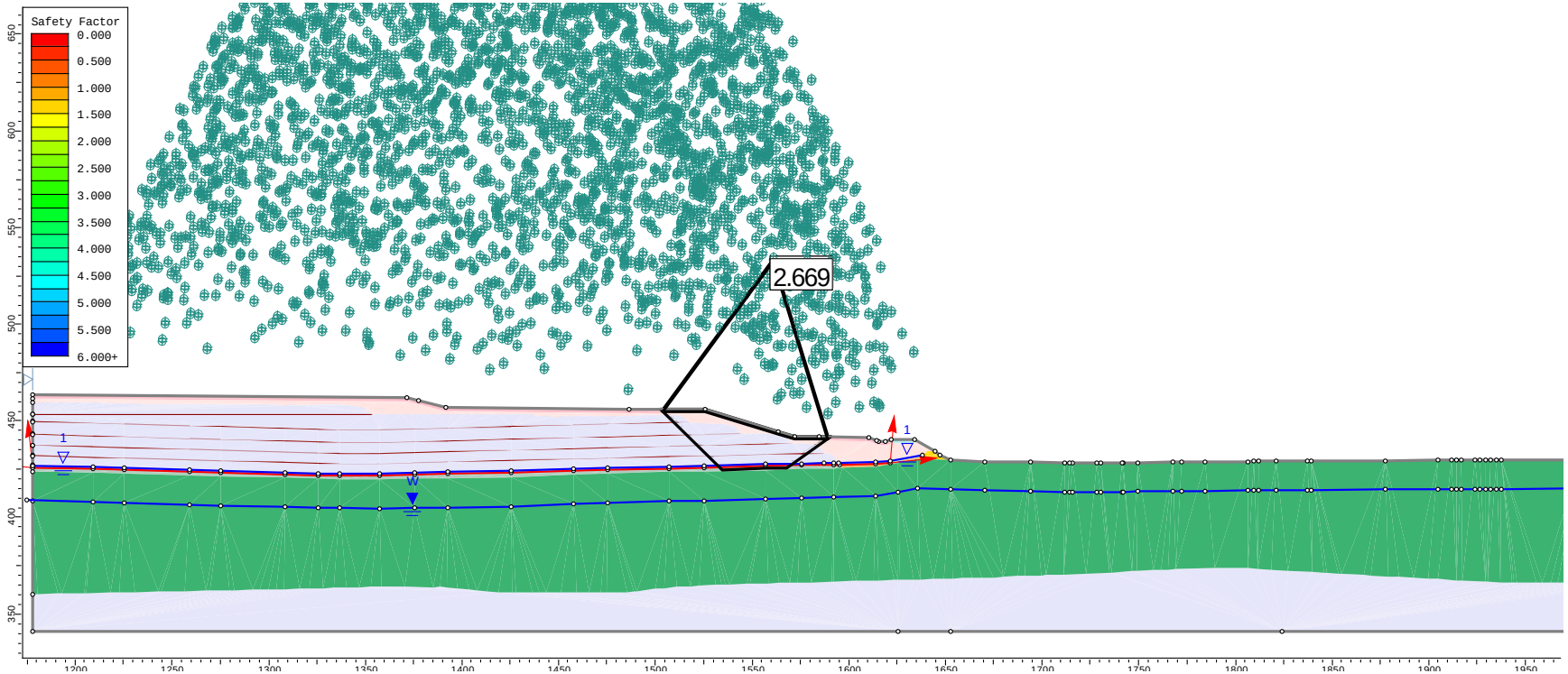

Figure 24. Calculated FS for Block Slope Stability Analysis in Cross Section B-B – North Slope – Long-Term Condition (Residual Liner Interface Shear Strength)
Note: This figure shows the FS calculated using Janbu's Method.

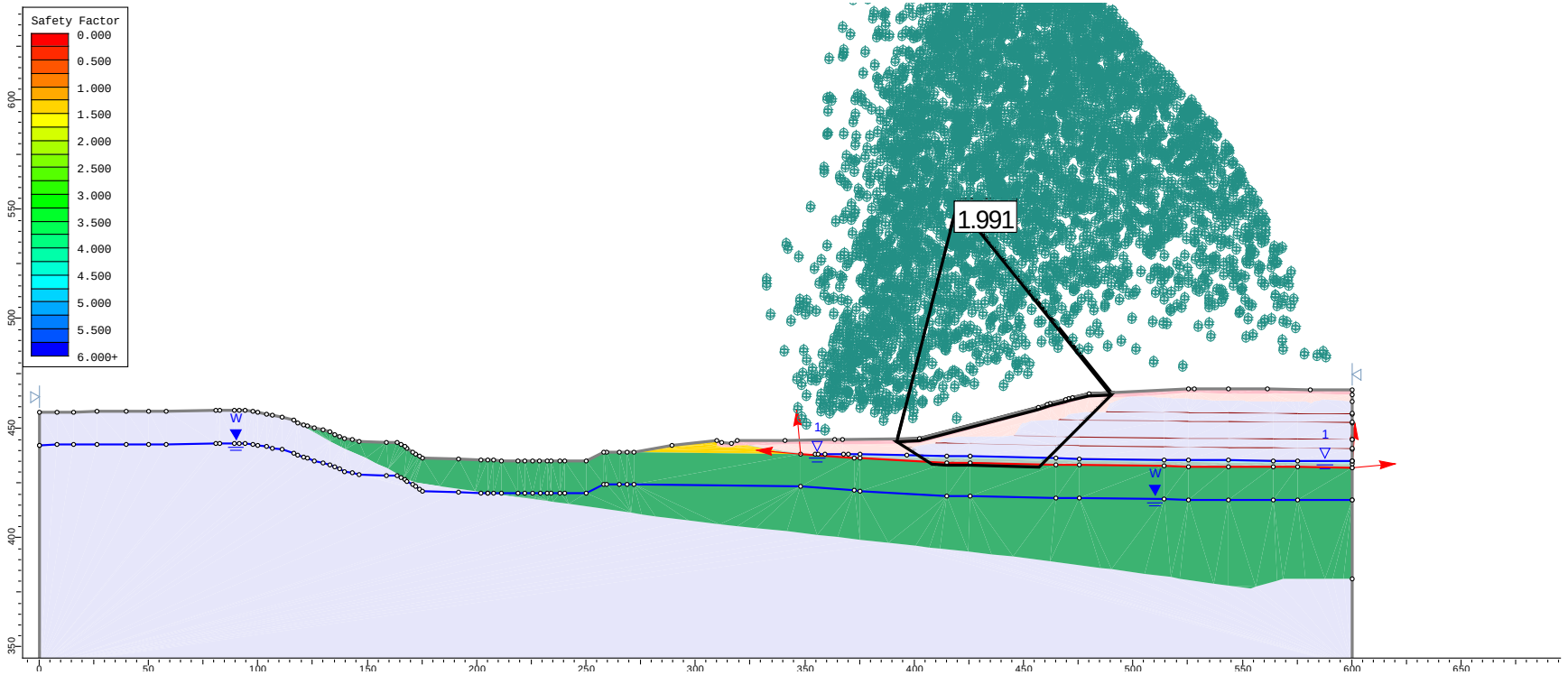

Figure 25. Calculated FS for Block Slope Stability Analysis in Cross Section B-B – South Slope – Long-Term Condition (Residual Liner Interface Shear Strength)

Note: This figure shows the FS calculated using Janbu's Method.

Attachment 1
SLIDE Output Files

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 once for each cross-section (A-A or B-B) and condition (interim, long-term, or residual) to avoid redundancy.

List of Error Codes

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

-102 = Two surface / slope intersections, but resulting arc is actually outside soil region.

-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.

Cross-Section A-A: East, Interim Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base__East_Block_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (undrained)	Dredge Material	Tube-Tube Interface (Horizontal)	Tub-Tube Interface (Vertical)	Tube-Gravel Interface
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Discrete function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	43	86
Cohesion [psf]	0	0	0		0	0	0	0
Friction Angle [deg]	30	35	38		15	15	0.1	24
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Discrete Functions

- Name: SOLW (Undrained, U=0%)

X (ft)	Y (ft)	Cu (lbs/ft2)
1120	440	600
1120	427.5	600
1120	424.5	600
1120	424.4	600
1120	424.3	600
1120	424.2	600
1120	424.1	600
1120	424	600
1120	423.9	597.683
1120	423.8	592.646
1120	423.7	587.563
1120	423.6	582.359
1120	423.5	577.087
1120	423.4	571.796
1120	423.3	566.533
1120	423.2	561.342
1120	423.1	556.26
1120	423	551.323
1120	422.9	546.561
1120	422.8	542.001
1120	422.7	537.664
1120	422.6	533.568
1120	422.5	529.723
1120	422.4	526.138
1120	422.3	522.812
1120	422.2	519.744
1120	422.1	516.924
1120	422	514.337
1120	421.9	511.963
1120	421.8	509.777
1120	421.7	507.745
1120	421.6	505.83
1120	421.5	503.987
1120	421.4	502.166
1120	421.3	500.311
1120	421.2	498.358
1120	421.1	496.255
1120	421	494.037
1120	420.9	491.775
1120	420.8	489.544
1120	420.7	487.425
1120	420.6	485.503
1120	420.5	483.868
1120	420.4	482.606
1120	420.3	481.724
1120	420.2	481.188
1120	420.1	480.964
1120	420	481.009
1120	419.9	481.278
1120	419.8	481.721

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

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1120	419.7	482.284
1120	419.6	482.909
1120	419.5	483.532
1120	419.4	484.1
1120	419.3	484.61
1120	419.2	485.072
1120	419.1	485.498
1120	419	485.898
1120	418.9	486.285
1120	418.8	486.671
1120	418.7	487.068
1120	418.6	487.491
1120	418.5	487.953
1120	418.4	488.463
1120	418.3	489.017
1120	418.2	489.603
1120	418.1	490.211
1120	418	490.827
1120	417.9	491.439
1120	417.8	492.033
1120	417.7	492.595
1120	417.6	493.107
1120	417.5	493.555
1120	417.4	493.926
1120	417.3	494.234
1120	417.2	494.5
1120	417.1	494.745
1120	417	494.991
1120	416.9	495.263
1120	416.8	495.584
1120	416.7	495.979
1120	416.6	496.476
1120	416.5	497.101
1120	416.4	497.863
1120	416.3	498.75
1120	416.2	499.746
1120	416.1	500.836
1120	416	502
1120	415.9	503.222
1120	415.8	504.482
1120	415.7	505.76
1120	415.6	507.035
1120	415.5	508.285
1120	415.4	509.49
1120	415.3	510.644
1120	415.2	511.753
1120	415.1	512.824
1120	415	513.862
1120	414.9	514.874
1120	414.8	515.867
1120	414.7	516.847
1120	414.6	517.822
1120	414.5	518.799
1120	414.4	519.785
1120	414.3	520.787
1120	414.2	521.803
1120	414.1	522.831
1120	414	523.868
1120	413.9	524.913
1120	413.8	525.963
1120	413.7	527.015
1120	413.6	528.065
1120	413.5	529.112
1120	413.4	530.151
1120	413.3	531.18
1120	413.2	532.198
1120	413.1	533.204
1120	413	534.2
1120	412.9	535.186
1120	412.8	536.163
1120	412.7	537.13
1120	412.6	538.09
1120	412.5	539.042
1120	412.4	539.988
1120	412.3	540.929
1120	412.2	541.87
1120	412.1	542.814
1120	412	543.764
1120	411.9	544.722
1120	411.8	545.694
1120	411.7	546.682
1120	411.6	547.691
1120	411.5	548.723
1120	411.4	549.783
1120	411.3	550.873
1120	411.2	551.997
1120	411.1	553.158
1120	411	554.36
1120	410.9	555.605
1120	410.8	556.898
1120	410.7	558.242
1120	410.6	559.64
1120	410.5	561.097
1120	410.4	562.613
1120	410.3	564.183
1120	410.2	565.798
1120	410.1	567.449
1120	410	569.127
1120	409.9	570.823
1120	409.8	572.527
1120	409.7	574.229
1120	409.6	575.919
1120	409.5	577.588
1120	409.4	579.225
1120	409.3	580.834
1120	409.2	582.418
1120	409.1	583.981
1120	409	585.528
1120	408.9	587.063
1120	408.8	588.59
1120	408.7	590.115
1120	408.6	591.641
1120	408.5	593.175
1120	408.4	594.719
1120	408.3	596.275
1120	408.2	597.843
1120	408.1	599.422
1120	408	601.013
1120	407.9	602.616
1120	407.8	604.231
1120	407.7	605.857
1120	407.6	607.494
1120	407.5	609.144
1120	407.4	610.804
1120	407.3	612.475
1120	407.2	614.157
1120	407.1	615.848
1120	407	617.549
1120	406.9	619.258
1120	406.8	620.975
1120	406.7	622.698
1120	406.6	624.428
1120	406.5	626.164
1120	406.4	627.905
1120	406.3	629.65
1120	406.2	631.398
1120	406.1	633.149
1120	406	634.901
1120	405.9	636.654
1120	405.8	638.407
1120	405.7	640.16
1120	405.6	641.91
1120	405.5	643.658
1120	405.4	645.402
1120	405.3	647.143
1120	405.2	648.88
1120	405.1	650.615
1120	405	652.348
1120	404.9	654.078
1120	404.8	655.807
1120	404.7	657.534
1120	404.6	659.261
1120	404.5	660.986
1120	404.4	662.712
1120	404.3	664.437
1120	404.2	666.163
1120	404.1	667.89
1120	404	669.618
1120	403.9	671.347

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1120	403.8	673.079
1120	403.7	674.813
1120	403.6	676.55
1120	403.5	678.29
1120	403.4	680.033
1120	403.3	681.781
1120	403.2	683.533
1120	403.1	685.29
1120	403	687.052
1120	402.9	688.82
1120	402.8	690.594
1120	402.7	692.375
1120	402.6	694.163
1120	402.5	695.958
1120	402.4	697.762
1120	402.3	699.573
1120	402.2	701.394
1120	402.1	703.224
1120	402	705.064
1120	401.9	706.914
1120	401.8	708.775
1120	401.7	710.647
1120	401.6	712.531
1120	401.5	714.427
1120	401.4	716.336
1120	401.3	718.259
1120	401.2	720.194
1120	401.1	722.142
1120	401	724.101
1120	400.9	726.069
1120	400.8	728.044
1120	400.7	730.026
1120	400.6	732.011
1120	400.5	734
1120	400.4	735.989
1120	400.3	737.977
1120	400.2	739.963
1120	400.1	741.945
1120	400	743.92
1120	399.9	745.888
1120	399.8	747.845
1120	399.7	749.791
1120	399.6	751.723
1120	399.5	753.639
1120	399.4	755.538
1120	399.3	757.416
1120	399.2	759.274
1120	399.1	761.108
1120	399	762.923
1120	398.9	764.721
1120	398.8	766.503
1120	398.7	768.273
1120	398.6	770.032
1120	398.5	771.785
1120	398.4	773.533
1120	398.3	775.279
1120	398.2	777.025
1120	398.1	778.775
1120	398	780.532
1120	397.9	782.298
1120	397.8	784.076
1120	397.7	785.87
1120	397.6	787.681
1120	397.5	789.513
1120	397.4	791.369
1120	397.3	793.247
1120	397.2	795.146
1120	397.1	797.063
1120	397	798.996
1120	396.9	800.944
1120	396.8	802.903
1120	396.7	804.873
1120	396.6	806.851
1120	396.5	808.835
1120	396.4	810.823
1120	396.3	812.812
1120	396.2	814.8
1120	396.1	816.785
1120	396	818.764
1120	395.9	820.736
1120	395.8	822.697
1120	395.7	824.646
1120	395.6	826.58
1120	395.5	828.497
1120	395.4	830.394
1120	395.3	832.273
1120	395.2	834.135
1120	395.1	835.982
1120	395	837.817
1120	394.9	839.64
1120	394.8	841.454
1120	394.7	843.26
1120	394.6	845.06
1120	394.5	846.857
1120	394.4	848.652
1120	394.3	850.446
1120	394.2	852.243
1120	394.1	854.044
1120	394	855.851
1120	393.9	857.667
1120	393.8	859.492
1120	393.7	861.33
1120	393.6	863.182
1120	393.5	865.051
1120	393.4	866.938
1120	393.3	868.842
1120	393.2	870.765
1120	393.1	872.703
1120	393	874.658
1120	392.9	876.626
1120	392.8	878.609
1120	392.7	880.605
1120	392.6	882.614
1120	392.5	884.633
1120	392.4	886.663
1120	392.3	888.703
1120	392.2	890.751
1120	392.1	892.807
1120	392	894.87
1120	391.9	896.939
1120	391.8	899.012
1120	391.7	901.09
1120	391.6	903.17
1120	391.5	905.253
1120	391.4	907.337
1120	391.3	909.422
1120	391.2	911.508
1120	391.1	913.596
1120	391	915.685
1120	390.9	917.776
1120	390.8	919.868
1120	390.7	921.961
1120	390.6	924.056
1120	390.5	926.152
1120	390.4	928.25
1120	390.3	930.349
1120	390.2	932.45
1120	390.1	934.552
1120	390	936.656
1120	389.9	938.761
1120	389.8	940.868
1120	389.7	942.976
1120	389.6	945.086
1120	389.5	947.198
1120	389.4	949.312
1120	389.3	951.427
1120	389.2	953.543
1120	389.1	955.662
1120	389	957.782
1120	388.9	959.904
1120	388.8	962.028
1120	388.7	964.153
1120	388.6	966.281
1120	388.5	968.41
1120	388.4	970.541
1120	388.3	972.673
1120	388.2	974.808
1120	388.1	976.944
1120	388	979.083

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	387.9	981.223
1120	387.8	983.365
1120	387.7	985.509
1120	387.6	987.655
1120	387.5	989.804
1120	387.4	991.954
1120	387.3	994.106
1120	387.2	996.26
1120	387.1	998.416
1120	387	1000.57
1120	386.9	1002.73
1120	386.8	1004.9
1120	386.7	1007.06
1120	386.6	1009.23
1120	386.5	1011.4
1120	386.4	1013.57
1120	386.3	1015.74
1120	386.2	1017.91
1120	386.1	1020.09
1120	386	1022.27
1120	385.9	1024.45
1120	385.8	1026.64
1120	385.7	1028.82
1120	385.6	1031.01
1120	385.5	1033.2
1120	385.4	1035.39
1120	385.3	1037.59
1120	385.2	1039.78
1120	385.1	1041.98
1120	385	1044.19
1120	384.9	1046.39
1120	384.8	1048.6
1120	384.7	1050.81
1120	384.6	1053.02
1120	384.5	1055.23
1120	384.4	1057.45
1120	384.3	1059.66

1120	384.2	1061.88
1120	384.1	1064.11
1120	384	1066.33
1120	383.9	1068.56
1120	383.8	1070.79
1120	383.7	1073.02
1120	383.6	1075.26
1120	383.5	1077.5
1120	383.4	1079.74
1120	383.3	1081.98
1120	383.2	1084.22
1120	383.1	1086.47
1120	383	1088.72
1120	382.9	1090.98
1120	382.8	1093.23
1120	382.7	1095.49
1120	382.6	1097.75
1120	382.5	1100.01
1120	382.4	1102.28
1120	382.3	1104.55
1120	382.2	1106.82
1120	382.1	1109.09
1120	382	1111.36
1120	381.9	1113.64
1120	381.8	1115.92
1120	381.7	1118.21
1120	381.6	1120.49
1120	381.5	1122.78
1120	381.4	1125.07
1120	381.3	1127.37
1120	381.2	1129.67
1120	381.1	1131.96
1120	381	1134.27
1120	380.9	1136.57
1120	380.8	1138.88
1120	380.7	1141.19
1120	380.6	1143.5

1120	380.5	1145.82
1120	380.4	1148.14
1120	380.3	1150.46
1120	380.2	1152.78
1120	380.1	1155.11
1120	380	1157.44
1120	379.9	1159.77
1120	379.8	1162.1
1120	379.7	1164.44
1120	379.6	1166.78
1120	379.5	1169.12
1120	379.4	1171.47
1120	379.3	1173.82
1120	379.2	1176.17
1120	379.1	1178.52
1120	379	1180.88
1120	378.9	1183.24
1120	378.8	1185.6
1120	378.7	1187.97
1120	378.6	1190.33
1120	378.5	1192.7
1120	378.4	1195.08
1120	378.3	1197.45
1120	378.2	1199.83
1120	378.1	1202.21
1120	378	1204.6
1120	377.9	1206.99
1120	377.8	1209.38
1120	377.7	1211.77
1120	377.6	1214.16
1120	377.5	1216.56

Property	Liner	Foundation	Leveling Soil
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	120	120
Cohesion [psf]	0	0	0
Friction Angle [deg]	19	37	30
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Support Properties

Geotube

- Support Type: GeoTextile
- Force Application: Passive
- Force Orientation: Tangent to Slip Surface
- Anchorage: Both Ends
- Shear Strength Model: Linear
- Strip Coverage: 100 percent
- Tensile Strength: 1600 lb/ft

Global Minimums

Method: janbu simplified

- FS: 2.125340
- Axis Location: 1693.886, 532.761
- Left Slip Surface Endpoint: 1626.297, 452.045
- Right Slip Surface Endpoint: 1717.906, 430.260
- Resisting Horizontal Force=44277.8 lb
- Driving Horizontal Force=20833.3 lb
- Total Slice Area=955.945 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1626.3	452.045
1684.95	423.268
1710.35	424.006
1713.02	424.086
1717.91	430.26

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 1962

- Number of Invalid Surfaces: 3038

Error Codes:

- Error Code -107 reported for 525 surfaces
- Error Code -108 reported for 2282 surfaces
- Error Code -112 reported for 231 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

List Of Coordinates

Water Table

X	Y
1377.54	403.118
1386.89	403.089
1411.74	402.913
1437.21	402.889
1461.74	402.653
1487.85	402.622
1511.74	402.227
1537.11	401.646
1539.82	401.652
1561.75	402.378
1589.12	403.712
1611.75	404.993
1639.75	406.523
1683.22	408.213
1710.35	409.001
1745.21	410.042
1802.77	413.428
1812.97	412.429
1816.28	412.274
1819.76	412
1821.26	411.252
1823.88	410
1824.96	409.513
1826.06	409
1827.11	409.006
1828.16	409.012

Piezoline

X	Y
1377.54	420.711
1386.89	420.627
1411.74	420.405
1437.21	420.176
1461.74	419.957
1487.85	419.855
1511.74	419.666
1537.11	419.284
1539.82	419.317
1561.75	420.401
1589.12	421.488
1611.75	422.33
1639.75	423.482
1661.76	424.371
1683.22	425.238
1708.35	426.001
1711.76	426.067
1744.9	426.703
1749.35	426.869
1749.43	426.872

Block Search Polyline

X	Y
1377.54	418.123
1386.89	418.094
1411.74	417.918
1437.21	417.894
1461.74	417.658
1487.85	417.627
1511.74	417.232
1537.11	416.651
1539.82	416.657
1561.75	417.383
1589.12	418.717
1611.75	419.998
1639.75	421.528
1683.22	423.218
1710.35	424.006
1745.21	425.047
1776.51	426.888

External Boundary

X	Y
1827.11	424.006
1826.06	424
1824.96	424.513
1823.88	425
1821.26	426.252
1819.76	427
1816.28	427.274
1812.97	427.429
1802.77	428.428
1801.69	429.084
1799.88	430.18
1798.52	431
1796.81	432.032
1795.23	433
1792.45	433.449
1788.28	434
1786.11	434.012
1784.61	434.018
1783.15	434.011
1781.45	434
1779.1	433.812
1769.33	433
1767.61	432.702
1764.74	432.447
1763.59	432.229
1763.06	432.229
1758.22	432.229
1756.01	431.396
1753.07	430.261
1743.85	430.261
1717.26	430.26
1710.46	432.305
1645.36	451.855
1573.95	452.565
1518.09	453.12
1500.95	457.456
1498.08	458.169
1474.71	458.401
1409.97	459.044
1377.54	459.367
1377.54	457.367
1377.54	454.03
1377.54	447.253
1377.54	447.003
1377.54	441.601
1377.54	441.351
1377.54	436.41
1377.54	436.16
1377.54	431.007
1377.54	430.757
1377.54	425.101
1377.54	424.851
1377.54	420.961
1377.54	420.711
1377.54	419.711
1377.54	418.118
1377.54	403.118
1377.54	370.037
1377.54	340
1711.76	340
1767.61	340
1828.16	340
1828.16	364.881
1828.16	409.012
1828.16	424.012

Material Boundary

X	Y
1762.13	431.629
1763.59	432.229

Material Boundary

X	Y
1377.54	420.711
1386.89	420.627
1411.74	420.405
1437.21	420.176
1461.74	419.957
1487.85	419.855
1511.74	419.666
1537.11	419.284
1539.82	419.317
1561.75	420.401
1589.12	421.488
1611.75	422.33
1639.75	423.482
1661.76	424.371
1683.22	425.238
1708.35	426.001

Material Boundary

X	Y
1377.54	457.367
1409.97	457.044
1474.71	456.401
1498.09	456.169
1500.95	455.456
1513.7	452.229

Material Boundary

X	Y
1711.76	426.067
1744.9	426.703
1749.35	426.869

Material Boundary

X	Y
1377.54	454.03
1386.78	454.118
1392.89	454.064
1399.32	454
1400.82	453.019
1402.59	452.202

Material Boundary

X	Y
1516.04	451.638
1518.09	451.12
1573.95	450.565
1645.36	449.855
1710.46	430.305
1717.26	428.26

Material Boundary

X	Y
1377.54	370.037
1379.54	370.036
1380.68	370.038
1391.04	370.009
1392.91	370.006
1395.06	370
1454.89	366.16
1472.96	365
1478.78	364.626
1489.73	363.924
1497.79	363.406
1503.97	363.01
1508.86	362.696
1512.83	362.441

1516.51	362.527
1557.79	361.677
1579.2	361.31
1582.1	361.333
1590.42	361.397
1593.51	361.421
1601.62	361.483
1604.9	361.509
1612.8	361.57
1616.27	361.597
1619.96	361.63
1623.82	361.668
1631.63	361.728
1635.85	361.774
1643.41	361.833
1647.89	361.882
1655.2	361.94
1659.94	361.992
1667	362.048
1672.01	362.104
1678.8	362.158
1684.09	362.218
1690.62	362.27
1696.18	362.333
1702.44	362.384
1708.28	362.451
1714.26	362.499
1720.39	362.57
1726.1	362.617
1732.52	362.691
1737.95	362.736
1744.24	362.81
1749.39	362.853
1755.94	362.93
1760.8	362.971
1767.62	363.052
1772.19	363.091
1816.41	364.861
1817.65	364.862
1821.17	364.872
1824.72	364.874
1825.98	364.875
1828.16	364.881

Material Boundary

X	Y
1377.54	418.118
1386.89	418.089
1411.74	417.913
1437.21	417.889

1461.74	417.653
1487.85	417.622
1511.74	417.227
1537.11	416.646
1539.82	416.652
1561.75	417.378
1589.12	418.712
1611.75	419.993
1639.75	421.523

Material Boundary

X	Y
1377.54	419.711
1386.89	419.627
1411.74	419.405
1437.21	419.176
1461.74	418.957
1487.85	418.855
1511.74	418.666
1537.11	418.284
1539.82	418.317
1561.75	419.401
1589.12	420.488
1611.75	421.33
1639.75	422.482

Material Boundary

X	Y
1639.75	422.482
1661.76	423.371
1683.22	424.238

Material Boundary

X	Y
1745.21	425.042
1802.77	428.428

Material Boundary

X	Y
1710.35	424.001
1745.21	425.042

Material Boundary

X	Y
1683.22	424.238
1695.95	424.625
1708.35	425.001
1709.34	425.02
1744.9	425.703

Material Boundary

X	Y
1639.75	421.523
1683.22	423.213
1710.35	424.001

Material Boundary

X	Y
1706.86	427.34
1708.08	426.243
1708.35	426.001
1711.76	426.067

Material Boundary

X	Y
1743.85	428.261
1753.07	428.261
1749.43	426.872
1745.83	425.703

Material Boundary

X	Y
1753.07	428.261
1763.06	432.229

Material Boundary

X	Y
1749.35	426.869
1749.43	426.872

Material Boundary

X	Y
1744.9	425.703
1745.83	425.703

Material Boundary

X	Y
1745.21	425.042
1753.36	428.045
1756.29	429.217

Material Boundary

X	Y
1756.29	429.217
1762.13	431.629

Material Boundary

X	Y
1717.26	428.26
1743.85	428.261

Material Boundary

X	Y
1377.54	424.851
1379.85	424.831
1380.85	424.822
1386.89	424.768
1411.74	424.545
1416.35	424.504
1417.35	424.495
1437.21	424.317
1452.85	424.177
1453.85	424.168
1461.74	424.097
1487.85	423.995
1489.35	423.983
1490.35	423.975
1511.74	423.807
1525.85	423.594
1526.85	423.579
1537.11	423.425
1539.82	423.458
1561.75	424.541
1562.35	424.565
1563.35	424.605
1589.12	425.629
1598.85	425.991
1599.85	426.028
1611.75	426.47
1635.35	427.442
1636.35	427.483
1639.75	427.623
1661.76	428.512
1671.85	428.919
1672.85	428.96
1683.22	429.378
1695.86	429.762
1703.68	430

Material Boundary

X	Y
1377.54	430.757
1386.89	430.673
1403.86	430.521
1404.86	430.512
1411.74	430.451
1437.21	430.222
1440.36	430.194
1441.36	430.185
1461.74	430.003
1476.86	429.944
1477.86	429.94
1487.85	429.901
1511.74	429.713
1513.36	429.688
1514.36	429.673
1537.11	429.33
1539.82	429.363
1549.86	429.859
1550.86	429.909
1561.75	430.447
1586.36	431.425
1587.36	431.465
1589.12	431.535
1611.75	432.376
1622.86	432.833
1623.86	432.874
1639.75	433.528
1659.36	434.32
1660.36	434.361
1661.76	434.417
1675.43	434.97
1676.12	434.997

Material Boundary

X	Y
1561.75	441.041
1589.12	442.128
1593.21	442.281
1594.21	442.318
1611.75	442.97
1621.31	443.363

Material Boundary

X	Y
1377.54	441.351
1386.89	441.267
1410.71	441.054
1411.71	441.045
1411.74	441.045
1437.21	440.816
1447.21	440.727
1448.21	440.718
1461.74	440.597
1483.71	440.511
1484.71	440.507
1487.85	440.495
1511.74	440.306

Material Boundary

X	Y
1511.74	440.306
1520.21	440.179
1521.21	440.164
1537.11	439.924

Material Boundary

X	Y
1377.54	436.16
1383.43	436.107

1384.43	436.098
1386.89	436.076
1411.74	435.853
1419.93	435.78
1420.93	435.771
1437.21	435.625
1456.43	435.453
1457.43	435.444
1461.74	435.406
1487.85	435.303
1492.93	435.263
1493.93	435.256
1511.74	435.115
1529.43	434.849
1530.43	434.834
1537.11	434.733
1539.82	434.766
1561.75	435.85
1565.93	436.016
1566.93	436.056
1589.12	436.937
1602.43	437.432
1603.43	437.47
1611.75	437.779
1638.93	438.898
1639.75	438.931
1639.93	438.939
1661.76	439.82
1666.21	440

Material Boundary

X	Y
1703.68	430
1704.64	429.512
1706.03	428.467
1706.86	427.34

Material Boundary

X	Y
1693.99	431.927
1695.65	430.006
1695.86	429.762

Material Boundary

X	Y

1676.12	434.997
1677.35	434.998
1683.29	435
1686.79	435
1689.52	434.366
1691.7	434
1693.04	432.997
1693.99	431.927

Material Boundary

X	Y
1674.85	435.921
1675.28	435.214
1675.43	434.97

Material Boundary

X	Y
1537.11	445.577
1539.82	445.609
1549.03	446.065

Material Boundary

X	Y
1511.74	445.959
1512.67	445.945
1513.67	445.93
1537.11	445.577

Material Boundary

X	Y
1377.54	447.003
1386.89	446.92
1403.17	446.774
1404.17	446.765
1411.74	446.697
1437.21	446.469
1439.67	446.447
1440.67	446.438
1461.74	446.249
1476.17	446.193
1477.17	446.189
1487.85	446.147

1511.74	445.959

Material Boundary

X	Y
1584.38	445.174
1584.88	445.436
1584.88	442.21

Material Boundary

X	Y
1583.88	442.171
1583.88	445.392

Material Boundary

X	Y
1584.88	445.436
1585.96	446
1587.09	446.778
1587.86	447.349
1588.81	448
1595.55	448.034
1602.59	448.054
1606.59	448.036
1616.09	448
1617.27	446.979
1618.26	446
1619.42	444.981
1620.42	444
1620.98	443.6
1621.31	443.363
1622.66	443
1625.15	442.657
1629.71	442.026
1629.98	441.99
1630.71	441.994
1631.99	442
1653.52	442.916
1655.32	442.975
1657.79	443.004
1660.79	443.001
1665.02	441.795
1665.61	440.971
1666.06	440.244
1666.21	440
1668.3	439.395

1669.17	439
1672.68	438.006
1674.2	436.93
1674.85	435.921

Material Boundary

X	Y
1550.17	440.718
1550.17	445.994

Material Boundary

X	Y
1549.17	440.669
1549.17	446.056

Material Boundary

X	Y
1556.71	440.792
1557.71	440.841
1561.75	441.041

Material Boundary

X	Y
1671.85	425.029
1671.85	428.919

Material Boundary

X	Y
1672.85	425.069
1672.85	428.96

Material Boundary

X	Y
1635.35	423.551
1635.35	427.442

Material Boundary

X	Y
1636.35	423.593
1636.35	427.483

Material Boundary

X	Y
1598.85	422.1
1598.85	425.991

Material Boundary

X	Y
1599.85	422.138
1599.85	426.028

Material Boundary

X	Y
1562.35	420.675
1562.35	424.565

Material Boundary

X	Y
1563.35	420.715
1563.35	424.605

Material Boundary

X	Y
1525.85	419.704
1525.85	423.594

Material Boundary

X	Y
1526.85	419.689
1526.85	423.579

Material Boundary

X	Y
1489.35	420.093
1489.35	423.983

Material Boundary

X	Y
1490.35	420.085
1490.35	423.975

Material Boundary

X	Y
1416.35	420.613
1416.35	424.504

Material Boundary

X	Y
1417.35	420.604
1417.35	424.495

Material Boundary

X	Y
1452.85	420.286
1452.85	424.177

Material Boundary

X	Y
1453.85	420.277
1453.85	424.168

Material Boundary

X	Y
1379.85	420.94
1379.85	424.831

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Material Boundary

X	Y
1380.85	420.931
1380.85	424.822

Material Boundary

X	Y
1549.86	424.204
1549.86	429.859

Material Boundary

X	Y
1441.36	424.53
1441.36	430.185

Material Boundary

X	Y
1659.36	428.665
1659.36	434.32

Material Boundary

X	Y
1550.86	424.253
1550.86	429.909

Material Boundary

X	Y
1403.86	424.866
1403.86	430.521

Material Boundary

X	Y
1660.36	428.705
1660.36	434.361

Material Boundary

X	Y
1513.36	424.033
1513.36	429.688

Material Boundary

X	Y
1404.86	424.857
1404.86	430.512

Material Boundary

X	Y
1622.86	427.177
1622.86	432.833

Material Boundary

X	Y
1514.36	424.018
1514.36	429.673

Material Boundary

X	Y
1638.93	433.745
1638.93	438.898

Material Boundary

X	Y
1623.86	427.219
1623.86	432.874

Material Boundary

X	Y
1476.86	424.288
1476.86	429.944

Material Boundary

X	Y
1639.93	433.786
1639.93	438.939

Material Boundary

X	Y
1586.36	425.769
1586.36	431.425

Material Boundary

X	Y
1477.86	424.284
1477.86	429.94

Material Boundary

X	Y
1602.43	432.28
1602.43	437.432

Material Boundary

X	Y
1587.36	425.809
1587.36	431.465

Material Boundary

X	Y
1440.36	424.539
1440.36	430.194

Material Boundary

X	Y
1603.43	432.317
1603.43	437.47

Material Boundary

X	Y
1565.93	430.863
1565.93	436.016

Material Boundary

X	Y
1457.43	430.291
1457.43	435.444

Material Boundary

X	Y
1593.21	437.34
1593.21	442.281

Material Boundary

X	Y
1566.93	430.903
1566.93	436.056

Material Boundary

X	Y
1419.93	430.627
1419.93	435.78

Material Boundary

X	Y
1594.21	437.377
1594.21	442.318

Material Boundary

X	Y
1529.43	429.696
1529.43	434.849

Material Boundary

X	Y
1420.93	430.618
1420.93	435.771

Material Boundary

X	Y
1556.71	435.851
1556.71	440.792

Material Boundary

X	Y
1530.43	429.681
1530.43	434.834

Material Boundary

X	Y
1383.43	430.954
1383.43	436.107

Material Boundary

X	Y
1557.71	435.9
1557.71	440.841

Material Boundary

X	Y
1492.93	430.111
1492.93	435.263

Material Boundary

X	Y
1384.43	430.945
1384.43	436.098

Material Boundary

X	Y
1520.21	435.238
1520.21	440.179

Material Boundary

X	Y
1493.93	430.103
1493.93	435.256

Material Boundary

X	Y
1629.71	438.768
1629.71	442.026

Material Boundary

X	Y
1521.21	435.223
1521.21	440.164

Material Boundary

X	Y
1456.43	430.3
1456.43	435.453

Material Boundary

X	Y
1630.71	438.809
1630.71	441.994

Material Boundary

X	Y
1483.71	435.57
1483.71	440.511

Material Boundary

X	Y
1484.71	435.566
1484.71	440.507

Material Boundary

X	Y
1447.21	435.786
1447.21	440.727

Material Boundary

X	Y
1448.21	435.777
1448.21	440.718

Material Boundary

X	Y
1411.71	436.104
1411.71	441.045

Material Boundary

X	Y
1410.71	436.113
1410.71	441.054

Material Boundary

X	Y
1512.67	440.543
1512.67	445.945

Material Boundary

X	Y
1513.67	440.527
1513.67	445.93

Material Boundary

X	Y
1476.17	440.79
1476.17	446.193

Material Boundary

X	Y
1477.17	440.786
1477.17	446.189

Material Boundary

X	Y
1439.67	441.044
1439.67	446.447

Material Boundary

X	Y
1440.67	441.035
1440.67	446.438

Material Boundary

X	Y
1403.17	441.371
1403.17	446.774

Material Boundary

X	Y
1404.17	441.362
1404.17	446.765

Material Boundary

X	Y
1517.54	449.074
1518.04	449.025

1518.04	446.114

Material Boundary

X	Y
1518.04	449.025
1518.46	448.984
1528.82	448.843
1539.92	448.982
1544.67	448
1545.97	447.54
1547.54	447
1548.66	446.296
1549.03	446.065
1549.17	446.056
1550.17	445.994
1551.14	446.942
1562.42	447.653
1567.37	447.704
1571.79	447.69
1578.82	447.146
1580.2	447.054
1581.14	446.733
1582.49	446
1583.88	445.392
1584.38	445.174

Material Boundary

X	Y
1517.04	446.129
1517.04	449.745
1517.54	449.074

Material Boundary

X	Y
1479.39	448.973
1479.89	449.018
1479.89	446.428

Material Boundary

X	Y
1479.89	449.018
1480.88	449.107

1481.72	450.127
1482.4	451
1483.55	451.471
1484.76	452
1497.24	452.011
1504.47	452.007
1510.87	452
1513.7	452.229
1516.04	451.638
1516.74	450.144
1517.04	449.745

Material Boundary

X	Y
1478.89	446.432
1478.89	449.12
1479.39	448.973

Material Boundary

X	Y
1440.58	450.056
1441.08	450.461
1441.08	446.684

Material Boundary

X	Y
1440.08	446.693
1440.08	450.375
1440.58	450.056

Material Boundary

X	Y
1441.08	450.461
1441.75	451
1442.48	451.916
1444.16	452.296
1447.14	453
1449.67	453.177
1459.85	453.212
1471.88	453.043
1472.79	452.88
1475.49	452
1476.75	450.994
1477.8	449.442
1478.89	449.12

Material Boundary

X	Y
1403.09	451.972
1403.59	451.995
1403.59	447.02

Material Boundary

X	Y
1402.59	447.029
1402.59	452.202
1403.09	451.972

Material Boundary

X	Y
1403.59	451.995
1404.88	452.054
1406.51	453.108
1409.62	454
1417.85	454.084
1421.2	454.112
1432.23	454.006
1433.49	453.827
1436.92	452.929
1438.16	452
1439.04	451.038
1440.08	450.375

Material Boundary

X	Y
1377.54	420.961
1379.85	420.94
1380.85	420.931
1386.89	420.877
1411.74	420.655
1416.35	420.613
1417.35	420.604
1437.21	420.426
1452.85	420.286
1453.85	420.277
1461.74	420.207
1487.85	420.105
1489.35	420.093
1490.35	420.085
1511.74	419.916
1525.85	419.704
1526.85	419.689
1537.11	419.534
1539.82	419.567
1561.75	420.651
1562.35	420.675
1563.35	420.715
1589.12	421.738
1598.85	422.1
1599.85	422.138
1611.75	422.58
1635.35	423.551
1636.35	423.593
1639.75	423.732
1661.76	424.621
1671.85	425.029
1672.85	425.069
1683.22	425.488
1708.08	426.243

Material Boundary

X	Y
1377.54	425.101
1386.89	425.018
1403.86	424.866
1404.86	424.857
1411.74	424.795
1437.21	424.567
1440.36	424.539
1441.36	424.53
1461.74	424.347
1476.86	424.288
1477.86	424.284
1487.85	424.245
1511.74	424.057
1513.36	424.033
1514.36	424.018
1537.11	423.675
1539.82	423.708
1549.86	424.204
1550.86	424.253
1561.75	424.791
1586.36	425.769
1587.36	425.809

1589.12	425.879
1611.75	426.72
1622.86	427.177
1623.86	427.219
1639.75	427.873
1659.36	428.665
1660.36	428.705
1661.76	428.762
1683.22	429.628
1695.65	430.006

Material Boundary

X	Y
1377.54	431.007
1383.43	430.954
1384.43	430.945
1386.89	430.923
1411.74	430.701
1419.93	430.627
1420.93	430.618
1437.21	430.472
1456.43	430.3
1457.43	430.291
1461.74	430.253
1487.85	430.151
1492.93	430.111
1493.93	430.103
1511.74	429.963
1529.43	429.696
1530.43	429.681
1537.11	429.58
1539.82	429.613
1561.75	430.697
1565.93	430.863
1566.93	430.903
1589.12	431.785
1602.43	432.28
1603.43	432.317
1611.75	432.626
1638.93	433.745
1639.75	433.778
1639.93	433.786
1661.76	434.667
1675.28	435.214

Material Boundary

X	Y
1377.54	436.41

1386.89	436.326
1410.71	436.113
1411.71	436.104
1411.74	436.103
1437.21	435.875
1447.21	435.786
1448.21	435.777
1461.74	435.656
1483.71	435.57
1484.71	435.566
1487.85	435.553
1511.74	435.365
1520.21	435.238
1521.21	435.223
1537.11	434.983
1539.82	435.016
1556.71	435.851
1557.71	435.9
1561.75	436.1
1589.12	437.187
1593.21	437.34
1594.21	437.377
1611.75	438.029
1629.71	438.768
1630.71	438.809
1639.75	439.181
1661.76	440.07
1666.06	440.244

Material Boundary

X	Y
1561.75	441.291
1583.88	442.171
1584.88	442.21
1589.12	442.378
1611.75	443.22
1620.98	443.6

Material Boundary

X	Y
1550.17	440.718
1561.75	441.291

Material Boundary

X	Y

1537.11	439.924
1539.82	439.957

Material Boundary

X	Y
1537.11	440.174
1539.82	440.207
1549.17	440.669
1550.17	440.718

Material Boundary

X	Y
1511.74	440.556
1512.67	440.543
1513.67	440.527
1537.11	440.174

Material Boundary

X	Y
1377.54	441.601
1386.89	441.517
1403.17	441.371
1404.17	441.362
1411.74	441.295
1437.21	441.066
1439.67	441.044
1440.67	441.035
1461.74	440.847
1476.17	440.79
1477.17	440.786
1487.85	440.745
1511.74	440.556

Material Boundary

X	Y
1537.11	445.827
1539.82	445.859
1548.66	446.296

Material Boundary

X	Y
1511.74	446.209
1517.04	446.129
1518.04	446.114
1537.11	445.827

Material Boundary

X	Y
1377.54	447.253
1386.89	447.17
1402.59	447.029
1403.59	447.02
1411.74	446.947
1437.21	446.719
1440.08	446.693
1441.08	446.684
1461.74	446.499
1478.89	446.432
1479.89	446.428
1487.85	446.397
1511.74	446.209

Material Boundary

X	Y
1539.82	439.957
1556.71	440.792

Material Boundary

X	Y
1377.54	403.118
1386.89	403.089
1411.74	402.913
1437.21	402.889
1461.74	402.653
1487.85	402.622
1511.74	402.227
1537.11	401.646
1539.82	401.652
1561.75	402.378
1589.12	403.712
1611.75	404.993
1639.75	406.523

Material Boundary

X	Y
1639.75	406.523
1683.22	408.213
1710.35	409.001

Material Boundary

X	Y
1710.35	409.001
1745.21	410.042

Material Boundary

X	Y
1745.21	410.042
1802.77	413.428

Material Boundary

X	Y
1802.77	413.428
1812.97	412.429
1816.28	412.274
1819.76	412
1821.26	411.252
1823.88	410
1824.96	409.513
1826.06	409
1827.11	409.006
1828.16	409.012

Cross-Section A-A: East, Interim Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base__East_Circular_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 1.774560
- Center: 1689.179, 485.780
- Radius: 79.332
- Left Slip Surface Endpoint: 1617.336, 452.134
- Right Slip Surface Endpoint: 1745.846, 430.261
- Resisting Moment=6.99277e+006 lb-ft
- Driving Moment=3.94057e+006 lb-ft
- Resisting Horizontal Force=74855.7 lb
- Driving Horizontal Force=42182.7 lb
- Total Slice Area=3098.14 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 17818
- Number of Invalid Surfaces: 10793

Error Codes:

- Error Code -103 reported for 1238 surfaces
- Error Code -106 reported for 1 surface
- Error Code -107 reported for 2436 surfaces
- Error Code -108 reported for 1307 surfaces
- Error Code -111 reported for 3748 surfaces
- Error Code -112 reported for 1850 surfaces

- Error Code -115 reported for 213 surfaces

Error Codes

The following errors were encountered during the computation:

- -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.
- -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).
- -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.
- -115 = Surface too shallow, below the minimum depth.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section A-A: East, Long-Term Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base__East_Block_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tub-Tube Interface (Vertical)	Tube-Gravel Interface
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	43	86
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	0.1	24
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Liner	Foundation	Leveling Soil
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	120	120
Cohesion [psf]	0	0	0
Friction Angle [deg]	19	37	30
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: janbu simplified

- FS: 1.930480
- Axis Location: 1696.636, 536.451
- Left Slip Surface Endpoint: 1627.209, 452.036
- Right Slip Surface Endpoint: 1722.512, 430.260

- Resisting Horizontal Force=48715 lb
- Driving Horizontal Force=25234.7 lb
- Total Slice Area=1155.84 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1627.21	452.036
1672.69	422.808
1683.22	423.218
1710.35	424.006
1716.05	424.177
1722.51	430.26

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3159
- Number of Invalid Surfaces: 1841

Error Codes:

- Error Code -107 reported for 525 surfaces
- Error Code -108 reported for 525 surfaces
- Error Code -112 reported for 791 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section A-A: East, Long-Term Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base__East_Circular_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 1.932140
- Center: 1744.487, 669.228
- Radius: 238.716
- Left Slip Surface Endpoint: 1646.747, 451.439
- Right Slip Surface Endpoint: 1706.056, 433.627
- Resisting Moment=1.31929e+006 lb-ft
- Driving Moment=682814 lb-ft
- Resisting Horizontal Force=5296.81 lb
- Driving Horizontal Force=2741.43 lb
- Total Slice Area=83.289 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 10614
- Number of Invalid Surfaces: 17997

Error Codes:

- Error Code -102 reported for 47 surfaces
- Error Code -106 reported for 901 surfaces
- Error Code -107 reported for 1096 surfaces
- Error Code -108 reported for 6 surfaces
- Error Code -115 reported for 11855 surfaces
- Error Code -1000 reported for 4092 surfaces

Error Codes

The following errors were encountered during the computation:

- -102 = Two surface / slope intersections, but resulting arc is actually outside soil region.
- -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).
- -115 = Surface too shallow, below the minimum depth.
- -1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section A-A: East, Residual Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base__East_Block_Long Term_Residual
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tub-Tube Interface (Vertical)	Tube-Gravel Interface
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	43	86
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	0.1	24
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Liner	Foundation	Leveling Soil	Liner (Residual)
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	120	120	100
Cohesion [psf]	0	0	0	0
Friction Angle [deg]	19	37	30	17
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: janbu simplified

- FS: 1.851640
- Axis Location: 1696.636, 536.451
- Left Slip Surface Endpoint: 1627.209, 452.036
- Right Slip Surface Endpoint: 1722.512, 430.260
- Resisting Horizontal Force=46302.3 lb
- Driving Horizontal Force=25006.1 lb

- Total Slice Area=1155.84 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1627.21	452.036
1672.69	422.808
1683.22	423.218
1710.35	424.006
1716.05	424.177
1722.51	430.26

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3105
- Number of Invalid Surfaces: 1895

Error Codes:

- Error Code -107 reported for 525 surfaces
- Error Code -108 reported for 567 surfaces
- Error Code -112 reported for 803 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Cross-Section A-A: West, Interim Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base_West_Block_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (undrained)	Dredge Material	Tube-Tube Interface (Horizontal)	Tub-Tube Interface (Vertical)	Tube-Gravel Interface
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Discrete function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	43	86
Cohesion [psf]	0	0	0		0	0	0	0
Friction Angle [deg]	30	35	38		15	15	0.1	24
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Discrete Functions

- Name: SOLW (Undrained, U=0%)

X (ft)	Y (ft)	Cu (lbs/ft2)
1120	440	600
1120	427.5	600
1120	424.5	600
1120	424.4	600
1120	424.3	600
1120	424.2	600
1120	424.1	600
1120	424	600
1120	423.9	597.683
1120	423.8	592.646
1120	423.7	587.563
1120	423.6	582.359
1120	423.5	577.087
1120	423.4	571.796
1120	423.3	566.533
1120	423.2	561.342
1120	423.1	556.26
1120	423	551.323
1120	422.9	546.561
1120	422.8	542.001
1120	422.7	537.664
1120	422.6	533.568
1120	422.5	529.723
1120	422.4	526.138
1120	422.3	522.812
1120	422.2	519.744
1120	422.1	516.924
1120	422	514.337
1120	421.9	511.963
1120	421.8	509.777
1120	421.7	507.745
1120	421.6	505.83
1120	421.5	503.987
1120	421.4	502.166
1120	421.3	500.311
1120	421.2	498.358
1120	421.1	496.255
1120	421	494.037
1120	420.9	491.775
1120	420.8	489.544
1120	420.7	487.425
1120	420.6	485.503
1120	420.5	483.868
1120	420.4	482.606

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	420.3	481.724
1120	420.2	481.188
1120	420.1	480.964
1120	420	481.009
1120	419.9	481.278
1120	419.8	481.721
1120	419.7	482.284
1120	419.6	482.909
1120	419.5	483.532
1120	419.4	484.1
1120	419.3	484.61
1120	419.2	485.072
1120	419.1	485.498
1120	419	485.898
1120	418.9	486.285
1120	418.8	486.671
1120	418.7	487.068
1120	418.6	487.491
1120	418.5	487.953
1120	418.4	488.463
1120	418.3	489.017
1120	418.2	489.603
1120	418.1	490.211
1120	418	490.827
1120	417.9	491.439
1120	417.8	492.033
1120	417.7	492.595
1120	417.6	493.107
1120	417.5	493.555
1120	417.4	493.926
1120	417.3	494.234
1120	417.2	494.5
1120	417.1	494.745
1120	417	494.991
1120	416.9	495.263
1120	416.8	495.584
1120	416.7	495.979
1120	416.6	496.476
1120	416.5	497.101
1120	416.4	497.863
1120	416.3	498.75
1120	416.2	499.746
1120	416.1	500.836
1120	416	502
1120	415.9	503.222
1120	415.8	504.482
1120	415.7	505.76
1120	415.6	507.035
1120	415.5	508.285
1120	415.4	509.49
1120	415.3	510.644
1120	415.2	511.753
1120	415.1	512.824
1120	415	513.862
1120	414.9	514.874
1120	414.8	515.867
1120	414.7	516.847
1120	414.6	517.822
1120	414.5	518.799
1120	414.4	519.785
1120	414.3	520.787
1120	414.2	521.803
1120	414.1	522.831
1120	414	523.868
1120	413.9	524.913
1120	413.8	525.963
1120	413.7	527.015
1120	413.6	528.065
1120	413.5	529.112
1120	413.4	530.151
1120	413.3	531.18
1120	413.2	532.198
1120	413.1	533.204
1120	413	534.2
1120	412.9	535.186
1120	412.8	536.163
1120	412.7	537.13
1120	412.6	538.09
1120	412.5	539.042
1120	412.4	539.988
1120	412.3	540.929
1120	412.2	541.87
1120	412.1	542.814
1120	412	543.764
1120	411.9	544.722
1120	411.8	545.694
1120	411.7	546.682
1120	411.6	547.691
1120	411.5	548.723
1120	411.4	549.783
1120	411.3	550.873
1120	411.2	551.997
1120	411.1	553.158
1120	411	554.36
1120	410.9	555.605
1120	410.8	556.898
1120	410.7	558.242
1120	410.6	559.64
1120	410.5	561.097
1120	410.4	562.613
1120	410.3	564.183
1120	410.2	565.798
1120	410.1	567.449
1120	410	569.127
1120	409.9	570.823
1120	409.8	572.527
1120	409.7	574.229
1120	409.6	575.919
1120	409.5	577.588
1120	409.4	579.225
1120	409.3	580.834
1120	409.2	582.418
1120	409.1	583.981
1120	409	585.528
1120	408.9	587.063
1120	408.8	588.59
1120	408.7	590.115
1120	408.6	591.641
1120	408.5	593.175
1120	408.4	594.719
1120	408.3	596.275
1120	408.2	597.843
1120	408.1	599.422
1120	408	601.013
1120	407.9	602.616
1120	407.8	604.231
1120	407.7	605.857
1120	407.6	607.494
1120	407.5	609.144
1120	407.4	610.804
1120	407.3	612.475
1120	407.2	614.157
1120	407.1	615.848
1120	407	617.549
1120	406.9	619.258
1120	406.8	620.975
1120	406.7	622.698
1120	406.6	624.428
1120	406.5	626.164
1120	406.4	627.905
1120	406.3	629.65
1120	406.2	631.398
1120	406.1	633.149
1120	406	634.901
1120	405.9	636.654
1120	405.8	638.407
1120	405.7	640.16
1120	405.6	641.91
1120	405.5	643.658
1120	405.4	645.402
1120	405.3	647.143
1120	405.2	648.88
1120	405.1	650.615
1120	405	652.348
1120	404.9	654.078
1120	404.8	655.807
1120	404.7	657.534
1120	404.6	659.261
1120	404.5	660.986

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	404.4	662.712
1120	404.3	664.437
1120	404.2	666.163
1120	404.1	667.89
1120	404	669.618
1120	403.9	671.347
1120	403.8	673.079
1120	403.7	674.813
1120	403.6	676.55
1120	403.5	678.29
1120	403.4	680.033
1120	403.3	681.781
1120	403.2	683.533
1120	403.1	685.29
1120	403	687.052
1120	402.9	688.82
1120	402.8	690.594
1120	402.7	692.375
1120	402.6	694.163
1120	402.5	695.958
1120	402.4	697.762
1120	402.3	699.573
1120	402.2	701.394
1120	402.1	703.224
1120	402	705.064
1120	401.9	706.914
1120	401.8	708.775
1120	401.7	710.647
1120	401.6	712.531
1120	401.5	714.427
1120	401.4	716.336
1120	401.3	718.259
1120	401.2	720.194
1120	401.1	722.142
1120	401	724.101
1120	400.9	726.069
1120	400.8	728.044
1120	400.7	730.026
1120	400.6	732.011
1120	400.5	734
1120	400.4	735.989
1120	400.3	737.977
1120	400.2	739.963
1120	400.1	741.945
1120	400	743.92
1120	399.9	745.888
1120	399.8	747.845
1120	399.7	749.791
1120	399.6	751.723
1120	399.5	753.639
1120	399.4	755.538
1120	399.3	757.416
1120	399.2	759.274
1120	399.1	761.108
1120	399	762.923
1120	398.9	764.721
1120	398.8	766.503
1120	398.7	768.273
1120	398.6	770.032
1120	398.5	771.785
1120	398.4	773.533
1120	398.3	775.279
1120	398.2	777.025
1120	398.1	778.775
1120	398	780.532
1120	397.9	782.298
1120	397.8	784.076
1120	397.7	785.87
1120	397.6	787.681
1120	397.5	789.513
1120	397.4	791.369
1120	397.3	793.247
1120	397.2	795.146
1120	397.1	797.063
1120	397	798.996
1120	396.9	800.944
1120	396.8	802.903
1120	396.7	804.873
1120	396.6	806.851
1120	396.5	808.835
1120	396.4	810.823
1120	396.3	812.812
1120	396.2	814.8
1120	396.1	816.785
1120	396	818.764
1120	395.9	820.736
1120	395.8	822.697
1120	395.7	824.646
1120	395.6	826.58
1120	395.5	828.497
1120	395.4	830.394
1120	395.3	832.273
1120	395.2	834.135
1120	395.1	835.982
1120	395	837.817
1120	394.9	839.64
1120	394.8	841.454
1120	394.7	843.26
1120	394.6	845.06
1120	394.5	846.857
1120	394.4	848.652
1120	394.3	850.446
1120	394.2	852.243
1120	394.1	854.044
1120	394	855.851
1120	393.9	857.667
1120	393.8	859.492
1120	393.7	861.33
1120	393.6	863.182
1120	393.5	865.051
1120	393.4	866.938
1120	393.3	868.842
1120	393.2	870.765
1120	393.1	872.703
1120	393	874.658
1120	392.9	876.626
1120	392.8	878.609
1120	392.7	880.605
1120	392.6	882.614
1120	392.5	884.633
1120	392.4	886.663
1120	392.3	888.703
1120	392.2	890.751
1120	392.1	892.807
1120	392	894.87
1120	391.9	896.939
1120	391.8	899.012
1120	391.7	901.09
1120	391.6	903.17
1120	391.5	905.253
1120	391.4	907.337
1120	391.3	909.422
1120	391.2	911.508
1120	391.1	913.596
1120	391	915.685
1120	390.9	917.776
1120	390.8	919.868
1120	390.7	921.961
1120	390.6	924.056
1120	390.5	926.152
1120	390.4	928.25
1120	390.3	930.349
1120	390.2	932.45
1120	390.1	934.552
1120	390	936.656
1120	389.9	938.761
1120	389.8	940.868
1120	389.7	942.976
1120	389.6	945.086
1120	389.5	947.198
1120	389.4	949.312
1120	389.3	951.427
1120	389.2	953.543
1120	389.1	955.662
1120	389	957.782
1120	388.9	959.904
1120	388.8	962.028
1120	388.7	964.153
1120	388.6	966.281

1120	388.5	968.41
1120	388.4	970.541
1120	388.3	972.673
1120	388.2	974.808
1120	388.1	976.944
1120	388	979.083
1120	387.9	981.223
1120	387.8	983.365
1120	387.7	985.509
1120	387.6	987.655
1120	387.5	989.804
1120	387.4	991.954
1120	387.3	994.106
1120	387.2	996.26
1120	387.1	998.416
1120	387	1000.57
1120	386.9	1002.73
1120	386.8	1004.9
1120	386.7	1007.06
1120	386.6	1009.23
1120	386.5	1011.4
1120	386.4	1013.57
1120	386.3	1015.74
1120	386.2	1017.91
1120	386.1	1020.09
1120	386	1022.27
1120	385.9	1024.45
1120	385.8	1026.64
1120	385.7	1028.82
1120	385.6	1031.01
1120	385.5	1033.2
1120	385.4	1035.39
1120	385.3	1037.59
1120	385.2	1039.78
1120	385.1	1041.98
1120	385	1044.19
1120	384.9	1046.39
1120	384.8	1048.6
1120	384.7	1050.81

1120	384.6	1053.02
1120	384.5	1055.23
1120	384.4	1057.45
1120	384.3	1059.66
1120	384.2	1061.88
1120	384.1	1064.11
1120	384	1066.33
1120	383.9	1068.56
1120	383.8	1070.79
1120	383.7	1073.02
1120	383.6	1075.26
1120	383.5	1077.5
1120	383.4	1079.74
1120	383.3	1081.98
1120	383.2	1084.22
1120	383.1	1086.47
1120	383	1088.72
1120	382.9	1090.98
1120	382.8	1093.23
1120	382.7	1095.49
1120	382.6	1097.75
1120	382.5	1100.01
1120	382.4	1102.28
1120	382.3	1104.55
1120	382.2	1106.82
1120	382.1	1109.09
1120	382	1111.36
1120	381.9	1113.64
1120	381.8	1115.92
1120	381.7	1118.21
1120	381.6	1120.49
1120	381.5	1122.78
1120	381.4	1125.07
1120	381.3	1127.37
1120	381.2	1129.67
1120	381.1	1131.96
1120	381	1134.27
1120	380.9	1136.57
1120	380.8	1138.88

1120	380.7	1141.19
1120	380.6	1143.5
1120	380.5	1145.82
1120	380.4	1148.14
1120	380.3	1150.46
1120	380.2	1152.78
1120	380.1	1155.11
1120	380	1157.44
1120	379.9	1159.77
1120	379.8	1162.1
1120	379.7	1164.44
1120	379.6	1166.78
1120	379.5	1169.12
1120	379.4	1171.47
1120	379.3	1173.82
1120	379.2	1176.17
1120	379.1	1178.52
1120	379	1180.88
1120	378.9	1183.24
1120	378.8	1185.6
1120	378.7	1187.97
1120	378.6	1190.33
1120	378.5	1192.7
1120	378.4	1195.08
1120	378.3	1197.45
1120	378.2	1199.83
1120	378.1	1202.21
1120	378	1204.6
1120	377.9	1206.99
1120	377.8	1209.38
1120	377.7	1211.77
1120	377.6	1214.16
1120	377.5	1216.56

Property	Liner	Foundation	Leveling Soil
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	120	120
Cohesion [psf]	0	0	0
Friction Angle [deg]	19	37	30
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Support Properties

Geotube

- Support Type: GeoTextile
- Force Application: Passive
- Force Orientation: Tangent to Slip Surface
- Anchorage: Both Ends
- Shear Strength Model: Linear
- Strip Coverage: 100 percent
- Tensile Strength: 1600 lb/ft

Global Minimums

Method: janbu simplified

- FS: 2.052870
- Axis Location: 154.257, 540.601
- Left Slip Surface Endpoint: 127.814, 432.584
- Right Slip Surface Endpoint: 224.805, 454.637
- Resisting Horizontal Force=42913.4 lb
- Driving Horizontal Force=20904.1 lb
- Total Slice Area=879.15 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
127.814	432.584
130.915	429.326
161.64	426.971
164.669	426.932
224.805	454.637

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 1856
- Number of Invalid Surfaces: 3144

Error Codes:

- Error Code -107 reported for 491 surfaces
- Error Code -108 reported for 2400 surfaces
- Error Code -112 reported for 253 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

List Of Coordinates

Water Table

X	Y
-3.55271e-015	414.167
3.75161	414.326
5.40252	414.408
10.6498	415
13.2622	415.279
17.0667	416
18.4544	416.037
23.6038	416.291
25.5028	416.349
30.0263	416.596
34.4589	416.828
38.6887	417
40.6533	417.14
45.7865	417.294
47.2495	417.552
117.054	415.388
119.538	415.192
123.634	414.879
161.64	411.966
171.361	411.84
211.644	411.174
250.936	410.308
261.648	409.443
300.326	408.15
311.652	407.708
317.539	407.408
340.48	407.197
361.656	407.588
373.897	406.941
411.659	406.252
421.434	406.222
431.784	406.138
311.652	424.426
317.539	424.125
327.47	424.067
340.48	423.991
361.656	424.036
373.897	423.97
411.659	423.947
421.434	423.941
431.784	423.934

Piezoline

X	Y
124.986	430.751
144.97	430.751
160.111	430.287
161.64	430.24
171.361	429.843
211.644	428.244
250.936	426.685
261.648	426.247
300.326	424.891

Block Search Polyline

X	Y
85.9786	431.356
117.054	430.393
119.538	430.197
123.634	429.884
161.64	426.971
171.361	426.845
211.644	426.179
250.936	425.313
261.648	424.448
300.326	423.155

311.652	422.713
317.539	422.413
340.48	422.202
361.656	422.593
373.897	421.946
411.659	421.257
421.434	421.227
431.784	421.143

External Boundary

X	Y
45.7865	432.294
40.6533	432.14
38.6887	432
34.4589	431.828
30.0263	431.596
25.5028	431.349
23.6038	431.291
18.4544	431.037
17.0667	431
13.2622	430.279
10.6498	430
5.40252	429.408
3.75161	429.326
0	429.167
-3.55271e-015	414.167
0	377.894
0	340
98.5552	340
161.64	340
431.784	340
431.784	363.489
431.784	406.138
431.784	421.138
431.784	422.934
431.784	423.934
431.784	424.184
431.784	426.647
431.784	426.897
431.784	429.826
431.784	430.076
431.784	435.246
431.784	435.496
431.784	440.28
431.784	440.53
431.784	449.269
431.784	449.294
431.784	449.544
431.784	456.897
431.784	458.421

431.784	460.421
376.913	459.869
339.055	459.488
285.031	458.945
276.752	456.876
272.52	455.819
223.164	454.596
205.088	454.14
163.653	441.854
161.64	441.259
132.304	432.584
128.199	432.584
119.297	432.585
113.118	433.795
111.949	434.003
102.582	434.003
98.5552	434.003
94.7672	434.011
87.2606	434.022
80.9092	434.013
76.0202	434.007
72.8356	434.008
69.0775	434.004
64.4862	434.001
61.3983	434
54.5453	433.453
49.6415	432.975
47.2495	432.552

Material Boundary

X	Y
98.5552	434.003
99.9218	434
101.467	433.705
104.922	432.954
109.598	431.939
113.015	431.197
114.411	430.813
117.054	430.388

Material Boundary

X	Y
161.64	430.24
164.87	430.108
171.361	429.843
211.644	428.244
250.936	426.685
261.648	426.247

300.326	424.891
311.652	424.426
317.539	424.125
327.47	424.067
340.48	423.991
361.656	424.036

Material Boundary

X	Y
163.653	439.854
205.088	452.14
223.164	452.596
272.52	453.819
276.752	454.876
285.033	456.945
339.055	457.488
376.913	457.869
431.784	458.421

Material Boundary

X	Y
144.97	430.751
146.133	430.716
160.111	430.287
161.64	430.24

Material Boundary

X	Y
144.97	430.751
145.09	430.998
145.577	432
146.643	432.551
147.456	433
148.987	433.037
151.237	433.066
152.654	433.039
156.784	433
160.111	433

Material Boundary

X	Y
161.64	426.966

171.361	426.84
211.644	426.174
250.936	425.308

Material Boundary

X	Y
250.936	425.308
261.648	424.443
300.326	423.15
311.652	422.708
317.539	422.408
340.48	422.197
361.656	422.588

Material Boundary

X	Y
0	377.894
4.14537	378.158
22.1464	379.149
23.1892	378.959
24.8284	378.662
29.3418	377.843
32.1813	378.298
40.2475	378.404
48.3824	378.283
57.3202	377.787
63.6229	377.435
72.9722	377.092
80.486	376.957
86.5799	376.511
94.7665	375.912
96.245	375.804
98.3509	375.746
100.285	375.738
107.27	376.058
113.278	376.334
115.416	376.173
135.821	375.971
161.103	375.321
167.716	375
174.765	374.658
175.803	374.608
187.98	374.017
190.964	373.872
196.432	373.606
200.997	373.385
206.129	373.136
214.418	372.734

221.297	372.4
227.641	372.092
236.469	371.663
240.867	371.45
251.645	370.927
254.096	370.808
267.075	370.178
270.743	370
281.801	369.463
283.81	369.366
296.945	368.728
307.138	368.234
312.8	367.959
320.904	367.566
328.334	367.205
338.346	366.719
343.728	366.458
356.351	365.845
358.985	365.718
373.987	364.994
388.049	364.621
389.182	364.593
402.009	364.254
404.236	364.2
415.962	363.892
419.269	363.812
422.997	363.714
429.909	363.534
431.784	363.489

Material Boundary

X	Y
361.656	422.588
373.897	421.941
411.659	421.252
421.434	421.222
431.784	421.138

Material Boundary

X	Y
211.644	427.244
250.936	425.685
261.648	425.247
300.326	423.891
340.48	422.991
361.656	423.036

Material Boundary

X	Y
161.64	429.24
171.361	428.843
211.644	427.244

Material Boundary

X	Y
361.656	423.036
373.897	422.97
411.659	422.947

Material Boundary

X	Y
411.659	422.947
421.434	422.941
431.784	422.934

Material Boundary

X	Y
160.111	433
161.64	432.953

Material Boundary

X	Y
161.64	432.953
162.137	432.933

Material Boundary

X	Y
170.86	435.755
171.361	435.735
195.611	434.772
196.611	434.733
211.644	434.136
232.111	433.324
233.111	433.285

250.936	432.577
261.648	432.139
268.611	431.895
269.611	431.86
300.326	430.783
305.111	430.586
306.111	430.545
311.652	430.318
317.539	430.017
340.48	429.883
341.611	429.886
342.611	429.888
361.656	429.928
373.897	429.862
378.111	429.86
379.111	429.859
411.659	429.839
414.611	429.837
415.611	429.836
421.434	429.833
431.784	429.826

Material Boundary

X	Y
175.283	440.999
192.808	440.304
207.171	439.734
208.171	439.694
211.644	439.556
243.671	438.286
244.671	438.246
250.936	437.997
261.648	437.559
280.171	436.909
281.171	436.874
300.326	436.203
311.652	435.738
316.671	435.481
317.539	435.437
317.671	435.436
340.48	435.303
353.171	435.33
354.171	435.332
361.656	435.348
373.897	435.282
389.671	435.272
390.671	435.272
411.659	435.259
421.434	435.253
426.171	435.25
427.171	435.249
431.784	435.246

Material Boundary

X	Y
202.61	444.948
211.644	444.59
213.881	444.501
229.598	443.878
230.598	443.838
250.936	443.031
261.648	442.593
266.098	442.437
267.098	442.402
277.238	442.046
300.326	441.236
302.598	441.143
303.598	441.102
311.652	440.771
317.539	440.47
339.098	440.345
340.098	440.339
340.48	440.337
361.656	440.382
367.491	440.351
373.897	440.316
375.598	440.315
376.598	440.314
411.659	440.292
412.098	440.292
413.098	440.292
421.434	440.286
431.784	440.28

Material Boundary

X	Y
278.829	451.035
301.216	450.25
312.542	449.785
313.989	449.711
314.989	449.66
317.216	449.546
318.429	449.484
341.369	449.351
350.489	449.37
351.489	449.372
362.545	449.396
374.787	449.33
386.989	449.322
387.989	449.321
412.549	449.306
422.324	449.3
423.489	449.299
424.489	449.299
431.784	449.294

Material Boundary

X	Y
180.47	429.731
180.47	432.194

Material Boundary

X	Y
181.47	429.692
181.47	432.155

Material Boundary

X	Y
216.97	428.283
216.97	430.746

Material Boundary

X	Y
217.97	428.243
217.97	430.706

Material Boundary

X	Y
253.47	426.832
253.47	429.295

Material Boundary

X	Y
254.47	426.791

254.47	429.254

Material Boundary

X	Y
289.97	425.504
289.97	427.967

Material Boundary

X	Y
290.97	425.469
290.97	427.932

Material Boundary

X	Y
326.47	424.323
326.47	426.786

Material Boundary

X	Y
327.47	424.317
327.47	426.78

Material Boundary

X	Y
373.897	423.97
411.659	423.947
421.434	423.941
431.784	423.934

Material Boundary

X	Y
373.897	426.683
399.47	426.667
400.47	426.667
411.659	426.66
421.434	426.654

431.784	426.647

Material Boundary

X	Y
363.97	426.737
373.897	426.683

Material Boundary

X	Y
361.656	424.036
373.897	423.97

Material Boundary

X	Y
399.47	424.204
399.47	426.667

Material Boundary

X	Y
400.47	424.204
400.47	426.667

Material Boundary

X	Y
195.611	431.844
195.611	434.772

Material Boundary

X	Y
196.611	431.804
196.611	434.733

Material Boundary

X	Y
232.111	430.395
232.111	433.324

Material Boundary

X	Y
233.111	430.356
233.111	433.285

Material Boundary

X	Y
268.611	428.966
268.611	431.895

Material Boundary

X	Y
269.611	428.931
269.611	431.86

Material Boundary

X	Y
305.111	427.657
305.111	430.586

Material Boundary

X	Y
306.111	427.616
306.111	430.545

Material Boundary

X	Y
341.611	426.957
341.611	429.886

Material Boundary

X	Y
342.611	426.959
342.611	429.888

Material Boundary

X	Y
243.671	433.116
243.671	438.286

Material Boundary

X	Y
354.171	430.162
354.171	435.332

Material Boundary

X	Y
378.111	426.931
378.111	429.86

Material Boundary

X	Y
244.671	433.076
244.671	438.246

Material Boundary

X	Y
389.671	430.102
389.671	435.272

Material Boundary

X	Y
379.111	426.93
379.111	429.859

Material Boundary

X	Y
280.171	431.739
280.171	436.909

Material Boundary

X	Y
390.671	430.102
390.671	435.272

Material Boundary

X	Y
414.611	426.908
414.611	429.837

Material Boundary

X	Y
281.171	431.704
281.171	436.874

Material Boundary

X	Y
426.171	430.08
426.171	435.25

Material Boundary

X	Y
415.611	426.907
415.611	429.836

Material Boundary

X	Y
316.671	430.311
316.671	435.481

Material Boundary

X	Y
427.171	430.079
427.171	435.249

Material Boundary

X	Y
207.171	434.564
207.171	439.734

Material Boundary

X	Y
317.671	430.266
317.671	435.436

Material Boundary

X	Y
47.2495	432.552
117.054	430.388

Material Boundary

X	Y
208.171	434.524
208.171	439.694

Material Boundary

X	Y
353.171	430.16
353.171	435.33

Material Boundary

X	Y
123.634	429.879
161.64	426.966

Material Boundary

X	Y
135.157	429.887
144.97	429.751
150.061	429.595
161.64	429.24

Material Boundary

X	Y
102.582	434.003
111.949	432.003
113.118	431.795
119.297	430.585
124.986	430.584
128.199	430.584
132.304	430.584
134.118	430.584
161.64	439.222

Material Boundary

X	Y
161.64	439.222
163.653	439.854

Material Boundary

X	Y
128.191	429.802
132.317	429.802

Material Boundary

X	Y
124.986	430.084
128.191	429.802

Material Boundary

X	Y
117.054	430.388
119.538	430.192
123.634	429.879

Material Boundary

X	Y
119.297	430.585
124.986	430.084
132.304	430.084
144.97	430.751

Material Boundary

X	Y
132.317	429.802
135.157	429.887

Material Boundary

X	Y
229.598	439.094
229.598	443.878

Material Boundary

X	Y
230.598	439.054
230.598	443.838

Material Boundary

X	Y
266.098	437.653
266.098	442.437

Material Boundary

X	Y
267.098	437.618
267.098	442.402

Material Boundary

X	Y
302.598	436.359
302.598	441.143

Material Boundary

X	Y
303.598	436.318
303.598	441.102

Material Boundary

X	Y
339.098	435.561
339.098	440.345

Material Boundary

X	Y
340.098	435.556
340.098	440.339

Material Boundary

X	Y
375.598	435.531
375.598	440.315

Material Boundary

X	Y
376.598	435.531
376.598	440.314

Material Boundary

X	Y
412.098	435.508
412.098	440.292

Material Boundary

X	Y
413.098	435.508
413.098	440.292

Material Boundary

X	Y
362.97	426.742
363.97	426.737

Material Boundary

X	Y
249.04	443.356
249.04	449.53

Material Boundary

X	Y
248.04	443.396
248.04	449.362

Material Boundary

X	Y
277.489	442.287
277.489	451.039

Material Boundary

X	Y
278.489	442.252
278.489	451.022
278.489	451.036

Material Boundary

X	Y
313.989	440.902
313.989	449.711

Material Boundary

X	Y
314.989	440.851
314.989	449.66

Material Boundary

X	Y
350.489	440.608
350.489	449.37

Material Boundary

X	Y
351.489	440.61
351.489	449.372

Material Boundary

X	Y
386.989	440.558
386.989	449.322

Material Boundary

X	Y
387.989	440.557
387.989	449.321

Material Boundary

X	Y
423.489	440.535
423.489	449.299

Material Boundary

X	Y
424.489	440.534
424.489	449.299

Material Boundary

X	Y
318.14	449.749
318.14	452.932

Material Boundary

X	Y
319.14	449.73
319.14	452.961

Material Boundary

X	Y
357.077	449.634
357.077	455.827

Material Boundary

X	Y
356.077	449.632
356.077	455.838

Material Boundary

X	Y
392.477	449.569
392.477	455.904

Material Boundary

X	Y
391.477	449.569
391.477	455.894

Material Boundary

X	Y
425.625	449.548
425.625	456.078

Material Boundary

X	Y
424.625	449.548
424.625	456.002

Material Boundary

X	Y
145.09	430.998
160.111	430.537
161.64	430.49

Material Boundary

X	Y
161.64	430.49
164.87	430.358
171.361	430.093
180.47	429.731
181.47	429.692
211.644	428.494
216.97	428.283
217.97	428.243
250.936	426.935
253.47	426.832
254.47	426.791
261.648	426.497
289.97	425.504
290.97	425.469
300.326	425.141
311.652	424.676
317.539	424.375
326.47	424.323
327.47	424.317
340.48	424.241
361.656	424.286

Material Boundary

X	Y
361.656	424.286
362.97	424.279

Material Boundary

X	Y
362.97	424.279
362.97	426.742

Material Boundary

X	Y
363.97	424.274
363.97	426.737

Material Boundary

X	Y
362.97	424.279
363.97	424.274

Material Boundary

X	Y
363.97	424.274
373.897	424.22
399.47	424.204
400.47	424.204
411.659	424.197
421.434	424.191
431.784	424.184

Material Boundary

X	Y
362.97	426.992
373.897	426.933

Material Boundary

X	Y
373.897	426.933
378.111	426.931
379.111	426.93
411.659	426.91
414.611	426.908
415.611	426.907
421.434	426.904
431.784	426.897

Material Boundary

X	Y
171.024	435.998
171.361	435.985
207.171	434.564
208.171	434.524
211.644	434.386
243.671	433.116
244.671	433.076
250.936	432.827
261.648	432.389
280.171	431.739
281.171	431.704
300.326	431.033
311.652	430.568
316.671	430.311
317.539	430.267
317.671	430.266
340.48	430.133
353.171	430.16
354.171	430.162
361.656	430.178
373.897	430.112
389.671	430.102
390.671	430.102
411.659	430.089
421.434	430.083
426.171	430.08
427.171	430.079
431.784	430.076

Material Boundary

X	Y
192.99	440.546
211.644	439.806
229.598	439.094
230.598	439.054
243.671	438.536
244.671	438.496
250.936	438.247
261.648	437.809
266.098	437.653
267.098	437.618
300.326	436.453
302.598	436.359
303.598	436.318
311.652	435.988

317.539	435.687
339.098	435.561
340.098	435.556
340.48	435.553
361.656	435.598
373.897	435.532
375.598	435.531
376.598	435.531
411.659	435.509
412.098	435.508
413.098	435.508
421.434	435.503
431.784	435.496

Material Boundary

X	Y
214.072	444.744
248.04	443.396
249.04	443.356
250.936	443.281
261.648	442.843
277.238	442.296
277.489	442.287
278.489	442.252
300.326	441.486
311.652	441.021
313.989	440.902
314.989	440.851
317.539	440.72
340.48	440.587
350.489	440.608
351.489	440.61
361.656	440.632
367.491	440.601
373.897	440.566
386.989	440.558
387.989	440.557
411.659	440.542
421.434	440.536
423.489	440.535
424.489	440.534
431.784	440.53

Material Boundary

X	Y
279.132	451.274
301.216	450.5
312.542	450.035

317.216	449.796
318.14	449.749
318.429	449.734
319.14	449.73
341.369	449.601
356.077	449.632
357.077	449.634
362.545	449.646
374.787	449.58
391.477	449.569
392.477	449.569
412.549	449.556
422.324	449.55
424.625	449.548
425.625	449.548
431.784	449.544

Material Boundary

X	Y
160.111	433
162.137	432.933
162.275	432.927

Material Boundary

X	Y
162.275	432.927
164.87	432.821
171.361	432.556
180.47	432.194
181.47	432.155
211.644	430.957
216.97	430.746
217.97	430.706
250.936	429.398
253.47	429.295
254.47	429.254
261.648	428.96
289.97	427.967
290.97	427.932
300.326	427.604
311.652	427.139
317.539	426.838
326.47	426.786
327.47	426.78
340.48	426.704
361.656	426.749
362.97	426.742

Material Boundary

X	Y
163.843	434.94
164.87	436

Material Boundary

X	Y
161.64	432.953
161.908	433.195
163.843	434.94

Material Boundary

X	Y
170.86	435.755
171.024	435.998
171.671	437.013

Material Boundary

X	Y
171.671	437.013
172.774	438.719
173.604	440
175.283	440.999

Material Boundary

X	Y
164.87	436
170.86	435.755

Material Boundary

X	Y
192.808	440.304
192.99	440.546
194.098	442.012

Material Boundary

X	Y
194.098	442.012
194.843	443
195.703	443.856
197.63	444
199.039	444.333
201.281	444.754
202.61	444.948

Material Boundary

X	Y
215.134	446.124
215.966	447.147
216.496	448
217.135	449.011
217.692	450
219.285	450.849
222.968	451.292
230.916	451.309
240.998	451.044
242.175	450.873
246.295	450
248.04	449.362
248.466	449.206
249.04	449.53
249.871	450
251.045	450.805
252.301	451.328
254.409	452
259.623	452.119
264.149	452.202
265.486	452.172
273.237	452
277.238	451.04
277.489	451.039
278.063	451.037
278.489	451.036
278.829	451.035
279.132	451.274
280.049	452
280.839	452.967
281.837	454
284.248	454.56
286.139	455
297.445	455
309.911	455
312.328	454.42
314.075	454
315.435	453.002
317.216	452.95
317.997	452.927
318.14	452.932
318.216	452.934
319.14	452.961
320.435	453
321.223	454.031
322.1	455
322.741	455.946
329.676	456.063
338.845	456.148
348.418	456.064
354.975	456
356.077	455.838
356.577	455.765
357.077	455.827
358.137	455.959
372.285	456.058
374.378	456.066
387.415	456.014
390.487	455.984
391.477	455.894
391.977	455.849
392.477	455.904
393.339	456
395.106	456.164
408.854	456.159
413.727	456.086
424.625	456.002
425.125	455.998
425.625	456.078
429.331	456.667
431.784	456.897

Material Boundary

X	Y
213.881	444.501
214.072	444.744
215.134	446.124

Material Boundary

X	Y
161.908	433.195
164.87	433.071
171.361	432.806
180.47	432.444
181.47	432.405
195.611	431.844
196.611	431.804
211.644	431.207
216.97	430.996
217.97	430.956
232.111	430.395
233.111	430.356
250.936	429.648
253.47	429.545
254.47	429.504
261.648	429.21
268.611	428.966
269.611	428.931
289.97	428.217
290.97	428.182
300.326	427.854
305.111	427.657
306.111	427.616
311.652	427.389
317.539	427.088
326.47	427.036
327.47	427.03
340.48	426.954
341.611	426.957
342.611	426.959
361.656	426.999
362.97	426.992

Material Boundary

X	Y
-3.55271e-015	414.167
3.75161	414.326
5.40252	414.408
10.6498	415
13.2622	415.279
17.0667	416
18.4544	416.037
23.6038	416.291
25.5028	416.349
30.0263	416.596
34.4589	416.828
38.6887	417
40.6533	417.14
45.7865	417.294
47.2495	417.552

Material Boundary

X	Y
47.2495	417.552

117.054	415.388

Material Boundary

X	Y
117.054	415.388
119.538	415.192
123.634	414.879

Material Boundary

X	Y
123.634	414.879
161.64	411.966

Material Boundary

X	Y
161.64	411.966
171.361	411.84
211.644	411.174
250.936	410.308

Material Boundary

X	Y
250.936	410.308
261.648	409.443
300.326	408.15
311.652	407.708
317.539	407.408

340.48	407.197
361.656	407.588

Material Boundary

X	Y
361.656	407.588
373.897	406.941
411.659	406.252
421.434	406.222
431.784	406.138

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section A-A: West, Interim Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base_West_Circular_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 1.783540
- Center: 159.287, 471.528
- Radius: 60.771
- Left Slip Surface Endpoint: 111.486, 434.003
- Right Slip Surface Endpoint: 217.611, 454.456
- Resisting Moment=4.48859e+006 lb-ft
- Driving Moment=2.51667e+006 lb-ft
- Resisting Horizontal Force=59367.4 lb
- Driving Horizontal Force=33286.2 lb
- Total Slice Area=2367.52 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 20018
- Number of Invalid Surfaces: 8593

Error Codes:

- Error Code -103 reported for 2251 surfaces
- Error Code -107 reported for 1733 surfaces
- Error Code -108 reported for 688 surfaces
- Error Code -111 reported for 1050 surfaces
- Error Code -112 reported for 2796 surfaces
- Error Code -115 reported for 75 surfaces

Error Codes

The following errors were encountered during the computation:

- -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.
- -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).
- -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.
- -115 = Surface too shallow, below the minimum depth.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section A-A: West, Long-Term Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base__East_Block_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tub-Tube Interface (Vertical)	Tube-Gravel Interface
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	43	86
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	0.1	24
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Liner	Foundation	Leveling Soil
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	120	120
Cohesion [psf]	0	0	0
Friction Angle [deg]	19	37	30
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: janbu simplified

- FS: 1.930480
- Axis Location: 1696.636, 536.451
- Left Slip Surface Endpoint: 1627.209, 452.036
- Right Slip Surface Endpoint: 1722.512, 430.260

- Resisting Horizontal Force=48715 lb
- Driving Horizontal Force=25234.7 lb
- Total Slice Area=1155.84 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1627.21	452.036
1672.69	422.808
1683.22	423.218
1710.35	424.006
1716.05	424.177
1722.51	430.26

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3159
- Number of Invalid Surfaces: 1841

Error Codes:

- Error Code -107 reported for 525 surfaces
- Error Code -108 reported for 525 surfaces
- Error Code -112 reported for 791 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Cross-Section A-A: West, Long-Term Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base_West_Circular_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 1.958960
- Center: 97.630, 672.899
- Radius: 242.207
- Left Slip Surface Endpoint: 136.550, 433.840
- Right Slip Surface Endpoint: 195.162, 451.197
- Resisting Moment=1.26455e+006 lb-ft
- Driving Moment=645524 lb-ft
- Resisting Horizontal Force=5009.09 lb
- Driving Horizontal Force=2557.02 lb
- Total Slice Area=78.5889 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 25198
- Number of Invalid Surfaces: 3413

Error Codes:

- Error Code -106 reported for 11 surfaces
- Error Code -107 reported for 190 surfaces
- Error Code -108 reported for 10 surfaces
- Error Code -115 reported for 3202 surfaces

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Error Codes

The following errors were encountered during the computation:

- -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).
- -115 = Surface too shallow, below the minimum depth.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section A-A: West, Residual Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-A_EastWest_Base_West_Block_Long Term_Residual
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 100
- Tolerance: 0.005
- Maximum number of iterations: 200
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tub-Tube Interface (Vertical)	Tube-Gravel Interface
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	43	86
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	0.1	24
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Liner	Foundation	Leveling Soil	Liner (Residual)
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	120	120	100
Cohesion [psf]	0	0	0	0
Friction Angle [deg]	19	37	30	17
Water Surface	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1

Global Minimums

Method: janbu simplified

- FS: 1.609450
- Axis Location: 143.264, 526.351
- Left Slip Surface Endpoint: 123.365, 432.584
- Right Slip Surface Endpoint: 206.338, 454.172
- Resisting Horizontal Force=29012.7 lb
- Driving Horizontal Force=18026.5 lb
- Total Slice Area=762.465 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
123.365	432.584
142.587	428.448
178.002	428.053
206.338	454.172

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 2961
- Number of Invalid Surfaces: 2039

Error Codes:

- Error Code -107 reported for 101 surfaces
- Error Code -108 reported for 786 surfaces
- Error Code -112 reported for 1152 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Cross-Section B-B: North, Interim Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_North_Block_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (undrained)	Dredge Material	Tube-Tube Interface (Horizontal)	Tube-Gravel Interface	Liner
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Discrete function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	86	100
Cohesion [psf]	0	0	0		0	0	0	0
Friction Angle [deg]	30	35	38		15	15	24	19
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Discrete Functions

- Name: SOLW (Undrained, U=0%)

X (ft)	Y (ft)	Cu (lbs/ft2)
1120	440	600
1120	427.5	600
1120	424.5	600
1120	424.4	600
1120	424.3	600
1120	424.2	600
1120	424.1	600
1120	424	600
1120	423.9	597.683
1120	423.8	592.646
1120	423.7	587.563
1120	423.6	582.359
1120	423.5	577.087
1120	423.4	571.796
1120	423.3	566.533
1120	423.2	561.342
1120	423.1	556.26
1120	423	551.323
1120	422.9	546.561
1120	422.8	542.001
1120	422.7	537.664
1120	422.6	533.568
1120	422.5	529.723
1120	422.4	526.138
1120	422.3	522.812
1120	422.2	519.744
1120	422.1	516.924
1120	422	514.337
1120	421.9	511.963
1120	421.8	509.777
1120	421.7	507.745
1120	421.6	505.83
1120	421.5	503.987
1120	421.4	502.166
1120	421.3	500.311
1120	421.2	498.358
1120	421.1	496.255
1120	421	494.037
1120	420.9	491.775
1120	420.8	489.544
1120	420.7	487.425
1120	420.6	485.503
1120	420.5	483.868
1120	420.4	482.606

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	420.3	481.724
1120	420.2	481.188
1120	420.1	480.964
1120	420	481.009
1120	419.9	481.278
1120	419.8	481.721
1120	419.7	482.284
1120	419.6	482.909
1120	419.5	483.532
1120	419.4	484.1
1120	419.3	484.61
1120	419.2	485.072
1120	419.1	485.498
1120	419	485.898
1120	418.9	486.285
1120	418.8	486.671
1120	418.7	487.068
1120	418.6	487.491
1120	418.5	487.953
1120	418.4	488.463
1120	418.3	489.017
1120	418.2	489.603
1120	418.1	490.211
1120	418	490.827
1120	417.9	491.439
1120	417.8	492.033
1120	417.7	492.595
1120	417.6	493.107
1120	417.5	493.555
1120	417.4	493.926
1120	417.3	494.234
1120	417.2	494.5
1120	417.1	494.745
1120	417	494.991
1120	416.9	495.263
1120	416.8	495.584
1120	416.7	495.979
1120	416.6	496.476
1120	416.5	497.101
1120	416.4	497.863
1120	416.3	498.75
1120	416.2	499.746
1120	416.1	500.836
1120	416	502
1120	415.9	503.222
1120	415.8	504.482
1120	415.7	505.76
1120	415.6	507.035
1120	415.5	508.285
1120	415.4	509.49
1120	415.3	510.644
1120	415.2	511.753
1120	415.1	512.824
1120	415	513.862
1120	414.9	514.874
1120	414.8	515.867
1120	414.7	516.847
1120	414.6	517.822
1120	414.5	518.799
1120	414.4	519.785
1120	414.3	520.787
1120	414.2	521.803
1120	414.1	522.831
1120	414	523.868
1120	413.9	524.913
1120	413.8	525.963
1120	413.7	527.015
1120	413.6	528.065
1120	413.5	529.112
1120	413.4	530.151
1120	413.3	531.18
1120	413.2	532.198
1120	413.1	533.204
1120	413	534.2
1120	412.9	535.186
1120	412.8	536.163
1120	412.7	537.13
1120	412.6	538.09
1120	412.5	539.042
1120	412.4	539.988
1120	412.3	540.929
1120	412.2	541.87
1120	412.1	542.814
1120	412	543.764
1120	411.9	544.722
1120	411.8	545.694
1120	411.7	546.682
1120	411.6	547.691
1120	411.5	548.723
1120	411.4	549.783
1120	411.3	550.873
1120	411.2	551.997
1120	411.1	553.158
1120	411	554.36
1120	410.9	555.605
1120	410.8	556.898
1120	410.7	558.242
1120	410.6	559.64
1120	410.5	561.097
1120	410.4	562.613
1120	410.3	564.183
1120	410.2	565.798
1120	410.1	567.449
1120	410	569.127
1120	409.9	570.823
1120	409.8	572.527
1120	409.7	574.229
1120	409.6	575.919
1120	409.5	577.588
1120	409.4	579.225
1120	409.3	580.834
1120	409.2	582.418
1120	409.1	583.981
1120	409	585.528
1120	408.9	587.063
1120	408.8	588.59
1120	408.7	590.115
1120	408.6	591.641
1120	408.5	593.175
1120	408.4	594.719
1120	408.3	596.275
1120	408.2	597.843
1120	408.1	599.422
1120	408	601.013
1120	407.9	602.616
1120	407.8	604.231
1120	407.7	605.857
1120	407.6	607.494
1120	407.5	609.144
1120	407.4	610.804
1120	407.3	612.475
1120	407.2	614.157
1120	407.1	615.848
1120	407	617.549
1120	406.9	619.258
1120	406.8	620.975
1120	406.7	622.698
1120	406.6	624.428
1120	406.5	626.164
1120	406.4	627.905
1120	406.3	629.65
1120	406.2	631.398
1120	406.1	633.149
1120	406	634.901
1120	405.9	636.654
1120	405.8	638.407
1120	405.7	640.16
1120	405.6	641.91
1120	405.5	643.658
1120	405.4	645.402
1120	405.3	647.143
1120	405.2	648.88
1120	405.1	650.615
1120	405	652.348
1120	404.9	654.078
1120	404.8	655.807
1120	404.7	657.534
1120	404.6	659.261
1120	404.5	660.986

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	404.4	662.712
1120	404.3	664.437
1120	404.2	666.163
1120	404.1	667.89
1120	404	669.618
1120	403.9	671.347
1120	403.8	673.079
1120	403.7	674.813
1120	403.6	676.55
1120	403.5	678.29
1120	403.4	680.033
1120	403.3	681.781
1120	403.2	683.533
1120	403.1	685.29
1120	403	687.052
1120	402.9	688.82
1120	402.8	690.594
1120	402.7	692.375
1120	402.6	694.163
1120	402.5	695.958
1120	402.4	697.762
1120	402.3	699.573
1120	402.2	701.394
1120	402.1	703.224
1120	402	705.064
1120	401.9	706.914
1120	401.8	708.775
1120	401.7	710.647
1120	401.6	712.531
1120	401.5	714.427
1120	401.4	716.336
1120	401.3	718.259
1120	401.2	720.194
1120	401.1	722.142
1120	401	724.101
1120	400.9	726.069
1120	400.8	728.044
1120	400.7	730.026
1120	400.6	732.011
1120	400.5	734
1120	400.4	735.989
1120	400.3	737.977
1120	400.2	739.963
1120	400.1	741.945
1120	400	743.92
1120	399.9	745.888
1120	399.8	747.845
1120	399.7	749.791
1120	399.6	751.723
1120	399.5	753.639
1120	399.4	755.538
1120	399.3	757.416
1120	399.2	759.274
1120	399.1	761.108
1120	399	762.923
1120	398.9	764.721
1120	398.8	766.503
1120	398.7	768.273
1120	398.6	770.032
1120	398.5	771.785
1120	398.4	773.533
1120	398.3	775.279
1120	398.2	777.025
1120	398.1	778.775
1120	398	780.532
1120	397.9	782.298
1120	397.8	784.076
1120	397.7	785.87
1120	397.6	787.681
1120	397.5	789.513
1120	397.4	791.369
1120	397.3	793.247
1120	397.2	795.146
1120	397.1	797.063
1120	397	798.996
1120	396.9	800.944
1120	396.8	802.903
1120	396.7	804.873
1120	396.6	806.851
1120	396.5	808.835
1120	396.4	810.823
1120	396.3	812.812
1120	396.2	814.8
1120	396.1	816.785
1120	396	818.764
1120	395.9	820.736
1120	395.8	822.697
1120	395.7	824.646
1120	395.6	826.58
1120	395.5	828.497
1120	395.4	830.394
1120	395.3	832.273
1120	395.2	834.135
1120	395.1	835.982
1120	395	837.817
1120	394.9	839.64
1120	394.8	841.454
1120	394.7	843.26
1120	394.6	845.06
1120	394.5	846.857
1120	394.4	848.652
1120	394.3	850.446
1120	394.2	852.243
1120	394.1	854.044
1120	394	855.851
1120	393.9	857.667
1120	393.8	859.492
1120	393.7	861.33
1120	393.6	863.182
1120	393.5	865.051
1120	393.4	866.938
1120	393.3	868.842
1120	393.2	870.765
1120	393.1	872.703
1120	393	874.658
1120	392.9	876.626
1120	392.8	878.609
1120	392.7	880.605
1120	392.6	882.614
1120	392.5	884.633
1120	392.4	886.663
1120	392.3	888.703
1120	392.2	890.751
1120	392.1	892.807
1120	392	894.87
1120	391.9	896.939
1120	391.8	899.012
1120	391.7	901.09
1120	391.6	903.17
1120	391.5	905.253
1120	391.4	907.337
1120	391.3	909.422
1120	391.2	911.508
1120	391.1	913.596
1120	391	915.685
1120	390.9	917.776
1120	390.8	919.868
1120	390.7	921.961
1120	390.6	924.056
1120	390.5	926.152
1120	390.4	928.25
1120	390.3	930.349
1120	390.2	932.45
1120	390.1	934.552
1120	390	936.656
1120	389.9	938.761
1120	389.8	940.868
1120	389.7	942.976
1120	389.6	945.086
1120	389.5	947.198
1120	389.4	949.312
1120	389.3	951.427
1120	389.2	953.543
1120	389.1	955.662
1120	389	957.782
1120	388.9	959.904
1120	388.8	962.028
1120	388.7	964.153
1120	388.6	966.281

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	388.5	968.41
1120	388.4	970.541
1120	388.3	972.673
1120	388.2	974.808
1120	388.1	976.944
1120	388	979.083
1120	387.9	981.223
1120	387.8	983.365
1120	387.7	985.509
1120	387.6	987.655
1120	387.5	989.804
1120	387.4	991.954
1120	387.3	994.106
1120	387.2	996.26
1120	387.1	998.416
1120	387	1000.57
1120	386.9	1002.73
1120	386.8	1004.9
1120	386.7	1007.06
1120	386.6	1009.23
1120	386.5	1011.4
1120	386.4	1013.57
1120	386.3	1015.74
1120	386.2	1017.91
1120	386.1	1020.09
1120	386	1022.27
1120	385.9	1024.45
1120	385.8	1026.64
1120	385.7	1028.82
1120	385.6	1031.01
1120	385.5	1033.2
1120	385.4	1035.39
1120	385.3	1037.59
1120	385.2	1039.78
1120	385.1	1041.98
1120	385	1044.19
1120	384.9	1046.39
1120	384.8	1048.6
1120	384.7	1050.81
1120	384.6	1053.02
1120	384.5	1055.23
1120	384.4	1057.45
1120	384.3	1059.66
1120	384.2	1061.88
1120	384.1	1064.11
1120	384	1066.33
1120	383.9	1068.56
1120	383.8	1070.79
1120	383.7	1073.02
1120	383.6	1075.26
1120	383.5	1077.5
1120	383.4	1079.74
1120	383.3	1081.98
1120	383.2	1084.22
1120	383.1	1086.47
1120	383	1088.72
1120	382.9	1090.98
1120	382.8	1093.23
1120	382.7	1095.49
1120	382.6	1097.75
1120	382.5	1100.01
1120	382.4	1102.28
1120	382.3	1104.55
1120	382.2	1106.82
1120	382.1	1109.09
1120	382	1111.36
1120	381.9	1113.64
1120	381.8	1115.92
1120	381.7	1118.21
1120	381.6	1120.49
1120	381.5	1122.78
1120	381.4	1125.07
1120	381.3	1127.37
1120	381.2	1129.67
1120	381.1	1131.96
1120	381	1134.27
1120	380.9	1136.57
1120	380.8	1138.88
1120	380.7	1141.19
1120	380.6	1143.5
1120	380.5	1145.82
1120	380.4	1148.14
1120	380.3	1150.46
1120	380.2	1152.78
1120	380.1	1155.11
1120	380	1157.44
1120	379.9	1159.77
1120	379.8	1162.1
1120	379.7	1164.44
1120	379.6	1166.78
1120	379.5	1169.12
1120	379.4	1171.47
1120	379.3	1173.82
1120	379.2	1176.17
1120	379.1	1178.52
1120	379	1180.88
1120	378.9	1183.24
1120	378.8	1185.6
1120	378.7	1187.97
1120	378.6	1190.33
1120	378.5	1192.7
1120	378.4	1195.08
1120	378.3	1197.45
1120	378.2	1199.83
1120	378.1	1202.21
1120	378	1204.6
1120	377.9	1206.99
1120	377.8	1209.38
1120	377.7	1211.77
1120	377.6	1214.16
1120	377.5	1216.56

Property	Foundation	Leveling Soil
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120
Cohesion [psf]	0	0
Friction Angle [deg]	37	30
Water Surface	Water Table	Water Table
Hu Value	1	1

Support Properties

Geotube

- Support Type: GeoTextile
- Force Application: Passive
- Force Orientation: Tangent to Slip Surface
- Anchorage: Both Ends
- Shear Strength Model: Linear
- Strip Coverage: 100 percent
- Tensile Strength: 1600 lb/ft

Global Minimums

Method: janbu simplified

- FS: 3.117430
- Axis Location: 1556.527, 559.485
- Left Slip Surface Endpoint: 1486.046, 454.899
- Right Slip Surface Endpoint: 1597.908, 440.349
- Resisting Horizontal Force=60098.7 lb
- Driving Horizontal Force=19278.3 lb
- Total Slice Area=1340.02 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1486.05	454.899
1549.3	424.472
1597.91	440.349

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 1290

- Number of Invalid Surfaces: 3710

Error Codes:

- Error Code -106 reported for 31 surfaces
- Error Code -107 reported for 1208 surfaces
- Error Code -108 reported for 2443 surfaces
- Error Code -112 reported for 28 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

List Of Coordinates

Water Table

X	Y
1174.54	407.711
1209.11	406.699
1225.24	406.222
1258.76	405.198
1275.24	404.856
1308.4	404.237
1325.24	403.928
1336.44	403.527
1357.35	403.38
1375.24	403.737
1392.69	403.99
1425.24	404.344
1457.33	405.678
1475.24	406.461
1506.97	407.199
1525.25	407.461
1556.61	408.155
1575.25	408.748
1591.92	409.078
1613.98	409.749
1625.26	411.996
1635.32	414
1652.77	413.444
1670.05	412.693
1693.67	412.26
1711.39	412.007
1714.19	412.008
1715.79	412.008
1728.01	412
1730.24	412
1741.07	412
1742.01	412
1749.5	412.09
1767.27	412.292
1771.82	412.34
1783.87	412.475
1806.18	412.692
1809.37	412.727
1811.78	412.756
1820.7	412.833
1836.96	412.995
1839.02	413
1877.17	413.213
1904.33	413.351
1911.72	413.374
1914.08	413.387
1916.58	413.398
1923.56	413.425
1926.18	413.435
1929.32	413.45
1931.93	413.458
1934.79	413.474
1937.31	413.48
1978.25	413.689
2024.59	413.978
2029.85	413.982
2031.92	413.983
2035.49	413.986
2037.88	413.995
2039.39	414
2045.55	414.094
2050.82	414.182
2055.83	414.227
2076.35	414.46
2121.65	414.991
2124.47	415
2145.98	415.257
2212.68	416

2221.72	416.01
2225.33	416.012
2229.67	416.009
2231.98	416.009
2235.72	416.007
2237.66	416.007
2243.79	416.004
2253.87	416.001
2256.76	416
2260.42	416
2265.24	416
2268.12	416.01
2273.6	416.121
2279.23	416.281
2283.87	416.442
2284.34	416.458
2288.07	416.578
2300.7	417
2313.12	417.27
2340.82	417.949
2343.12	418.568
2345.28	419
2347.6	420
2349.99	421
2351.64	420.464
2357.72	420
2360.75	420.039
2363.22	419.255
2365.22	418.379
2367.89	417.263
2376.02	417.242
2378.85	417.094
2380.4	417
2386.4	416
2388.14	415
2389.88	414
2391.79	413
2394.95	411.469
2397.98	410
2400.04	409
2402.11	408
2405.18	406.508
2408.3	405
2410.36	404
2412.42	403
2414.49	402
2416.55	401
2419.7	399.477
2422.75	398
2425.75	396.485
2428.37	395.056
2430.32	394
2433.21	392.435
2435.86	391
2437.7	390
2439.54	389
2441.39	388
2444.17	386.539
2447.51	385
2449.76	384
2452	383
2453.2	382.455
2456.42	381.42
2458	381
2459.51	380.642
2462.15	380
2463.38	379.618
2465.38	379
2468.61	378
2472.12	377.984
2475.64	378
2478.23	378.623
2479.84	379
2481.32	379.352
2484.02	380
2488.54	380.401
2495.31	381
2497.11	381.151
2507.41	381.151

Piezoline

X	Y
1177.75	425.559
1209.11	424.699
1225.24	424.257
1258.76	423.338
1275.24	422.886
1308.4	421.977
1325.24	421.536
1336.44	421.233
1357.35	421.281
1375.24	421.744
1392.69	422.195
1425.24	422.986
1457.33	423.76
1475.24	424.223
1506.97	424.989
1525.25	425.462
1556.61	426.219
1575.25	426.701
1587.02	426.978
1591.92	427.094
1594.38	427.147
1613.98	427.574
1621.22	427.855
1638.06	431.018

Block Search Window

X	Y
1487.18	423.511
1487.18	421.739
1596.83	424.227
1596.83	426.175

External Boundary

X	Y
2497.11	396.151
2495.31	396
2488.54	395.401
2484.02	395
2481.32	394.352
2479.84	394
2478.23	393.623
2475.64	393
2472.12	392.984
2468.61	393
2465.38	394
2463.38	394.618
2462.15	395
2459.51	395.642
2458	396
2456.42	396.42
2453.2	397.455
2452	398
2449.76	399
2447.51	400
2444.17	401.539
2441.39	403
2439.54	404
2437.7	405
2435.86	406
2433.21	407.435
2430.32	409
2428.37	410.056
2425.75	411.485
2422.75	413
2419.7	414.477
2416.55	416
2414.49	417
2412.42	418
2410.36	419

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

2408.3	420
2405.18	421.508
2402.11	423
2400.04	424
2397.98	425
2394.95	426.469
2391.79	428
2389.88	429
2388.14	430
2386.4	431
2380.4	432
2378.85	432.094
2376.02	432.242
2367.89	432.263
2365.22	433.379
2363.22	434.255
2360.75	435.039
2357.72	435
2351.64	435.464
2349.99	436
2347.6	435
2345.28	434
2343.12	433.568
2340.82	432.949
2313.12	432.27
2300.7	432
2288.07	431.578
2284.34	431.458
2279.23	431.281
2273.6	431.121
2268.12	431.01
2265.24	431
2260.42	431
2256.76	431
2253.87	431.001
2243.79	431.004
2237.66	431.007
2235.72	431.007
2231.98	431.009
2229.67	431.009
2225.33	431.012
2221.72	431.01
2212.68	431
2145.98	430.257
2124.47	430
2121.65	429.991
2076.35	429.46
2055.83	429.227
2050.82	429.182
2045.55	429.094
2039.39	429
2037.88	428.995
2035.49	428.986

2031.92	428.983
2029.85	428.982
2024.59	428.978
1978.25	428.689
1937.31	428.48
1934.79	428.474
1931.93	428.458
1929.32	428.45
1926.18	428.435
1923.56	428.425
1916.58	428.398
1914.08	428.387
1911.72	428.374
1904.33	428.351
1877.17	428.213
1839.02	428
1836.96	427.995
1820.7	427.833
1811.78	427.756
1809.37	427.727
1806.18	427.692
1783.87	427.475
1771.82	427.34
1767.27	427.292
1749.5	427.09
1742.01	427
1741.07	427
1730.24	427
1728.01	427
1715.79	427.008
1714.19	427.008
1711.39	427.007
1693.67	427.26
1670.05	427.693
1652.77	428.444
1647.23	431.149
1644.41	433
1633.96	439.288
1621.96	439.288
1618.69	438.192
1615.46	438.193
1614.5	438.579
1610.46	440.194
1584.32	440.518
1571.95	440.66
1563.15	443.303
1525.73	454.607
1486.06	454.899
1391.46	455.595
1377.58	459.018
1371.18	460.595
1177.75	462.016
1177.75	460.016

1177.75	458.108
1177.75	452.325
1177.75	452.075
1177.75	448.572
1177.75	448.322
1177.75	441.892
1177.75	441.642
1177.75	436.265
1177.75	436.015
1177.75	430.831
1177.75	430.581
1177.75	425.809
1177.75	425.559
1177.75	424.559
1177.75	422.532
1177.75	407.532
1177.75	358.845
1177.75	340
1625.25	340
1652.43	340
1824.03	340
2343.12	340
2505.89	340
2505.56	396.207

Material Boundary

X	Y
1567.48	440.005
1568.55	439.683
1571.95	438.66
1584.32	438.518
1610.46	438.194
1614.5	436.579
1615.46	436.193
1619.08	436.192

Material Boundary

X	Y
1563.31	441.256
1567.48	440.005

Material Boundary

X	Y
1177.75	424.559
1209.11	423.699

1225.24	423.257
1258.76	422.338
1275.24	421.886
1308.4	420.977
1325.24	420.536
1336.44	420.233
1357.35	420.281
1375.24	420.744
1392.69	421.195
1425.24	421.986
1457.33	422.76
1475.24	423.223
1506.97	423.989
1525.25	424.462
1556.61	425.219
1575.25	425.701
1591.92	426.094
1613.98	426.574

Material Boundary

X	Y
1177.75	358.845
1180.46	358.904
1191.05	359.281
1192.87	359.322
1204.47	359.584
1205.4	359.617
1217.99	359.895
1222.86	360
1230.76	360.134
1242.86	360.344
1244.08	360.376
1256.32	360.599
1267.34	360.799
1269.4	360.855
1279.55	361.042
1282.23	361.116
1291.73	361.295
1295.06	361.39
1299.58	361.477
1303.53	361.592
1307.9	361.678
1316.01	361.838
1320.75	361.98
1328.11	362.129
1333.6	362.298
1340.18	362.434
1346.45	362.633
1352.73	362.849
1358.21	362.969
1370.47	362.876
1385.13	362.573
1388.38	362.835
1391.76	362.52
1396.29	362.096
1397.46	362.168
1403.41	361.561
1407.45	361.148
1412.6	360.623
1418.72	360
1425.65	359.975
1427.78	359.968
1436.11	359.939
1439.83	359.929
1443.26	359.919
1451.14	359.898
1458.99	359.923
1465.65	359.943
1471.39	359.961
1474.57	359.971
1485.22	360
1488.69	360.455
1490.09	360.638
1499.75	361.907
1504.63	362.112
1511.09	362.816
1518.19	363.065
1522.55	363.47
1531.21	363.731
1534.06	363.921
1536.26	364.022
1538.2	364.073
1547.17	364.31
1548.55	364.346
1558.15	364.6
1563.65	364.745
1569.29	364.894
1573.32	365
1580.35	365.186
1591.04	365.468
1592.11	365.496
1601.93	365.755
1603.6	365.799
1612.73	366.04
1615.03	366.101
1623.48	366.324
1625.25	366.37
1626.4	366.401
1633.36	366.584
1636.86	366.677
1643.31	366.847
1649.13	367.001
1653.35	367.112
1658.7	367.253
1663.47	367.379
1668.81	367.52
1674.81	367.678
1679.75	368.097
1687.1	368.265
1690.82	368.542
1699.19	368.712
1701.97	368.897
1711.16	369.063
1722.37	369.475
1734.78	369.998
1735.91	370.072
1746.52	370.878
1748.72	370.922
1757.58	371.519
1761.37	371.587
1764.85	371.696
1768.89	371.845
1789.19	372.284
1806.16	372.363
1811.45	372.045
1818.19	371.64
1827.06	371.106
1839.65	370.35
1845.47	370
1846.95	369.917
1853.3	369.56
1854.61	369.488
1866.19	368.84
1869.63	368.653
1879.04	368.128
1884.59	367.828
1891.86	367.424
1899.48	367.013
1904.65	366.727
1914.31	366.208
1917.41	366.037
1929.08	365.412
1930.13	365.354
1936.78	365
1942.79	364.987
1943.89	364.984
1945.51	364.98
1955.36	364.958
1958.49	364.95
1962.86	364.938
1966.79	364.929
1971.91	364.915
1976.05	364.904
1978.23	364.908
1982.9	364.92
1985.41	364.926

1989.68	364.936
1992.82	364.944
1998.99	364.962
2001.14	364.967
2002.72	364.971
2012.57	365.007
2024.54	365.685
2026.53	365.798
2036.61	366.37
2040.62	366.597
2048.84	367.062
2054.93	367.407
2065.69	368.394
2080.73	369.955
2082.31	370
2096.58	372.99
2106.17	375
2110.46	375.899
2130.03	380
2140.66	382.228
2153.89	385
2167.62	387.877
2177.75	390
2200.11	394.686
2201.61	395
2221.84	399.239
2225.57	400.022
2249.53	405.043
2267.02	408.707
2272.7	410
2276.42	412.147
2281.37	415
2283.87	416.442
2290.03	419.994
2291.76	420.884
2308.94	425
2311.17	425.536
2329.81	430
2334.09	431.139
2340.82	432.949

Material Boundary

X	Y
1635.32	429
1652.77	428.444

Material Boundary

X	Y

1177.75	422.532
1209.11	421.699
1225.24	421.222
1258.76	420.198
1275.24	419.856
1308.4	419.237
1325.24	418.928
1336.44	418.527
1357.35	418.38
1375.24	418.737
1392.69	418.99
1425.24	419.344
1457.33	420.678
1475.24	421.461
1506.97	422.199
1525.25	422.461
1556.61	423.155
1575.25	423.748
1591.92	424.078
1613.98	424.749

Material Boundary

X	Y
1563.3	440.868
1568.5	439.41
1569.04	438.236

Material Boundary

X	Y
1569.04	438.236
1570.17	437.276
1570.46	437.033
1572.07	436.84
1573.05	436.778
1574.99	436.885
1576.48	436.838
1580.85	436.726
1582.48	436.369
1583.72	436
1584.86	435.104
1585.66	434.078
1586.6	432.749
1586.88	432.247
1587.02	432
1590.23	431.274
1591.54	431
1592.3	429.978

1593.07	428.93

Material Boundary

X	Y
1177.75	460.016
1371.18	458.595
1377.58	457.018
1391.46	453.595
1486.06	452.899
1525.73	452.607
1563.31	441.256

Material Boundary

X	Y
1177.75	425.559
1209.11	424.699
1225.24	424.257
1258.76	423.338
1275.24	422.886
1308.4	421.977
1325.24	421.536
1336.44	421.233
1357.35	421.281
1375.24	421.744
1392.69	422.195
1425.24	422.986
1457.33	423.76
1475.24	424.223
1506.97	424.989
1525.25	425.462
1556.61	426.219
1575.25	426.701

Material Boundary

X	Y
1621.96	437.245
1633.96	437.245

Material Boundary

X	Y
1619.08	436.192
1621.96	437.245

1621.96	439.288

Material Boundary

X	Y
1633.96	437.245
1633.96	438.189
1633.96	439.288

Material Boundary

X	Y
1613.98	424.749
1625.26	426.996

Material Boundary

X	Y
1613.98	426.574
1621.22	426.855
1636.47	429.852

Material Boundary

X	Y
1625.26	426.996
1635.32	429
1636.47	429.852

Material Boundary

X	Y
1636.47	429.852
1638.06	431.018
1639.39	432
1640.61	432.825
1642.63	433
1644.41	433

Material Boundary

X	Y

1575.25	426.701
1587.02	426.978
1591.92	427.094
1594.38	427.147
1613.98	427.574
1621.22	427.855
1638.06	431.018

Material Boundary

X	Y
1593.07	428.93
1593.81	428
1594.22	427.394
1594.38	427.147

Material Boundary

X	Y
1575.25	431.723
1587.02	432

Material Boundary

X	Y
1177.75	430.581
1209.11	429.721
1225.24	429.279
1258.76	428.36
1275.24	427.908
1308.4	426.999
1325.24	426.558
1336.44	426.255
1357.35	426.303
1375.24	426.765
1392.69	427.216
1425.24	428.008
1457.33	428.782
1475.24	429.245
1506.97	430.01
1525.25	430.483
1556.61	431.24
1575.25	431.723

Material Boundary

X	Y
1357.35	444.044
1375.24	444.506
1392.69	444.957
1425.24	445.749
1457.33	446.522
1475.24	446.986
1506.97	447.751
1516.95	448.01

Material Boundary

X	Y
1177.75	458.108
1182.28	458.094
1184.96	458.095
1187.8	458.086
1190.27	458.083
1191.7	458.08
1196.61	458.062
1197.96	458.06
1200.12	458.051
1204.31	458.04
1206.95	458.022
1207.02	458.022
1208.07	458.013
1209.06	458
1210.23	457.982
1214.98	457.771
1219.75	457.619
1223.2	457.551
1229.47	457.542
1237.34	457.134
1242.74	457.124
1244.87	457.123
1250.5	457.108
1255.81	457.095
1258.28	457.094
1263.69	457.079
1269.22	457.067
1272.04	457.065
1277.36	457.051
1281.33	457.047
1286.39	457.033
1290.87	457.023
1295.38	457.021
1297.96	457.014
1300.27	457.007
1303.26	457.001
1307.54	456.926
1309.13	456.912

1310.22	456.934
1312.71	456.95
1315.31	456.928
1318.18	456.943
1319.05	456.937
1325.98	457
1330.25	457.015
1332.13	457.023
1335.83	457.004
1341.09	456.713
1349.01	455.739

Material Boundary

X	Y
1349.01	455.739
1350.16	454.727
1350.83	453.862
1351.68	453
1353	452.325
1353.49	452.075
1354.8	452
1357.32	452
1359.45	452
1360.58	452
1368.75	452
1373.54	452
1381.4	452
1387.52	452
1394.56	452
1401.23	452
1402.25	452
1406.03	452.015
1417.37	452.099
1418.26	452.096
1419.09	452.099
1431.68	452.004
1433.16	452
1435.21	451.928
1438.74	451.381
1440.71	451.284
1444.97	450.941
1445.83	450.815
1447.56	450.858
1452.33	451
1460.04	451.037
1469.43	451.059
1480.23	451.098
1481.31	451.079
1482.48	451.044
1487.27	451.396

1494.9	451.491
1499.02	451.735
1501.75	451.798
1506.24	451.806
1508.31	451.75
1509.58	451.79
1510.71	451.741
1514.59	450.792
1515.29	450
1515.92	449.16
1516.73	448.254
1516.95	448.01
1518.47	447.866
1520.26	447.808
1530.75	447.138
1535.53	447
1537.34	446.618
1541.22	445.869
1541.88	445
1542.6	444.009
1543.26	443
1543.92	442.245
1544.14	442
1547.54	441.955
1550.52	442
1552.07	442
1555.3	442
1556.37	441.885
1557.22	441.85
1563.3	440.868

Material Boundary

X	Y
1177.75	448.322
1209.11	447.462
1225.24	447.02
1258.76	446.101
1275.24	445.649
1308.4	444.739
1325.24	444.298
1336.44	443.996
1357.35	444.044

Material Boundary

X	Y
1177.75	452.075
1353.49	452.075

Material Boundary

X	Y
1177.75	436.015
1209.11	435.155
1225.24	434.713
1258.76	433.794
1275.24	433.342
1308.4	432.433
1325.24	431.992
1336.44	431.689
1357.35	431.737
1375.24	432.2
1392.69	432.651
1425.24	433.442
1457.33	434.216
1475.24	434.679
1506.97	435.445
1525.25	435.918
1556.61	436.675
1570.46	437.033

Material Boundary

X	Y
1177.75	441.642
1209.11	440.782
1225.24	440.34
1258.76	439.421
1275.24	438.969
1308.4	438.06
1325.24	437.619
1336.44	437.316
1357.35	437.364
1375.24	437.827
1392.69	438.278
1425.24	439.069
1457.33	439.843
1475.24	440.306
1506.97	441.072
1525.25	441.545
1544.14	442

Material Boundary

X	Y
1177.75	425.809
1209.11	424.949
1225.24	424.507

1258.76	423.588
1275.24	423.136
1308.4	422.227
1325.24	421.786
1336.44	421.483
1357.35	421.531
1375.24	421.994
1392.69	422.445
1425.24	423.236
1457.33	424.01
1475.24	424.473
1506.97	425.239
1525.25	425.712
1556.61	426.469
1575.25	426.951

Material Boundary

X	Y
1575.25	426.951
1587.02	427.228
1591.92	427.344
1594.22	427.394

Material Boundary

X	Y
1575.25	431.973
1586.88	432.247

Material Boundary

X	Y
1177.75	430.831
1209.11	429.971
1225.24	429.529
1258.76	428.61
1275.24	428.158
1308.4	427.249
1325.24	426.808
1336.44	426.505
1357.35	426.553
1375.24	427.015
1392.69	427.466
1425.24	428.258
1457.33	429.032
1475.24	429.495
1506.97	430.26

1525.25	430.733
1556.61	431.49
1575.25	431.973

Material Boundary

X	Y
1177.75	436.265
1209.11	435.405
1225.24	434.963
1258.76	434.044
1275.24	433.592
1308.4	432.683
1325.24	432.242
1336.44	431.939
1357.35	431.987
1375.24	432.45
1392.69	432.901
1425.24	433.692
1457.33	434.466
1475.24	434.929
1506.97	435.695
1525.25	436.168
1556.61	436.925
1570.17	437.276

Material Boundary

X	Y
1177.75	441.892
1209.11	441.032
1225.24	440.59
1258.76	439.671
1275.24	439.219
1308.4	438.31
1325.24	437.869
1336.44	437.566
1357.35	437.614
1375.24	438.077
1392.69	438.528
1425.24	439.319
1457.33	440.093
1475.24	440.556
1506.97	441.322
1525.25	441.795
1543.92	442.245

Material Boundary

X	Y
1357.35	444.294
1375.24	444.756
1392.69	445.207
1425.24	445.999
1457.33	446.772
1475.24	447.236
1506.97	448.001
1516.73	448.254

Material Boundary

X	Y
1177.75	452.325
1353	452.325

Material Boundary

X	Y
1177.75	448.572
1209.11	447.712
1225.24	447.27
1258.76	446.351
1275.24	445.899
1308.4	444.989
1325.24	444.548
1336.44	444.246
1357.35	444.294

Material Boundary

X	Y
1635.32	414
1652.77	413.444

Material Boundary

X	Y
1625.26	411.996
1635.32	414

Material Boundary

X	Y

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1613.98	409.749
1625.26	411.996

Material Boundary

X	Y
1177.75	407.532
1209.11	406.699
1225.24	406.222

1258.76	405.198
1275.24	404.856
1308.4	404.237
1325.24	403.928
1336.44	403.527
1357.35	403.38
1375.24	403.737
1392.69	403.99
1425.24	404.344
1457.33	405.678

1475.24	406.461
1506.97	407.199
1525.25	407.461
1556.61	408.155
1575.25	408.748
1591.92	409.078
1613.98	409.749

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: North, Interim Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_North_Circular_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 2.052310
- Center: 1603.675, 568.451
- Radius: 171.684
- Left Slip Surface Endpoint: 1474.834, 454.981
- Right Slip Surface Endpoint: 1701.194, 427.153
- Resisting Moment=2.85883e+007 lb-ft
- Driving Moment=1.39298e+007 lb-ft
- Resisting Horizontal Force=152390 lb
- Driving Horizontal Force=74252.9 lb
- Total Slice Area=6912.78 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 9040
- Number of Invalid Surfaces: 19571

Error Codes:

- Error Code -103 reported for 17509 surfaces
- Error Code -107 reported for 4 surfaces
- Error Code -108 reported for 682 surfaces
- Error Code -111 reported for 1246 surfaces
- Error Code -112 reported for 130 surfaces

Error Codes

The following errors were encountered during the computation:

- -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.
- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: North, Long-Term Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_North_Block_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tube-Gravel Interface	Liner
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	86	100
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	24	19
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Foundation	Leveling Soil
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120
Cohesion [psf]	0	0
Friction Angle [deg]	37	30
Water Surface	Water Table	Water Table
Hu Value	1	1

Global Minimums

Method: janbu simplified

- FS: 2.828830
- Axis Location: 1566.178, 523.071
- Left Slip Surface Endpoint: 1514.188, 454.692
- Right Slip Surface Endpoint: 1589.688, 440.451
- Resisting Horizontal Force=48929.4 lb
- Driving Horizontal Force=17296.7 lb
- Total Slice Area=1139.54 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1514.19	454.692
1533.15	424.646
1556.61	425.165
1557.97	425.208
1589.69	440.451

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3088
- Number of Invalid Surfaces: 1912

Error Codes:

- Error Code -107 reported for 763 surfaces
- Error Code -108 reported for 604 surfaces
- Error Code -112 reported for 545 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: North, Long-Term Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_North_Circular_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 2.780550
- Center: 1549.675, 473.193
- Radius: 42.084
- Left Slip Surface Endpoint: 1511.867, 454.709
- Right Slip Surface Endpoint: 1576.310, 440.610
- Resisting Moment=1.83525e+006 lb-ft
- Driving Moment=660031 lb-ft
- Resisting Horizontal Force=39146.6 lb
- Driving Horizontal Force=14078.7 lb
- Total Slice Area=797.585 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 6567
- Number of Invalid Surfaces: 22044

Error Codes:

- Error Code -103 reported for 19651 surfaces
- Error Code -107 reported for 131 surfaces
- Error Code -108 reported for 85 surfaces
- Error Code -112 reported for 2177 surfaces

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Error Codes

The following errors were encountered during the computation:

- -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.
- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: North, Residual Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_North_Block_Long Term_Residual
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Left to Right
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tube-Gravel Interface	Liner
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	86	100
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	24	19
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Foundation	Leveling Soil	Liner (Residual)
Color			
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	100
Cohesion [psf]	0	0	0
Friction Angle [deg]	37	30	17
Water Surface	Water Table	Water Table	Water Table
Hu Value	1	1	1

Global Minimums

Method: janbu simplified

- FS: 2.668650
- Axis Location: 1560.724, 532.399
- Left Slip Surface Endpoint: 1504.027, 454.766
- Right Slip Surface Endpoint: 1588.812, 440.462
- Resisting Horizontal Force=53082.5 lb
- Driving Horizontal Force=19891.2 lb
- Total Slice Area=1331.65 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
1504.03	454.766
1534.6	424.682
1556.61	425.214
1567.77	425.503
1588.81	440.462

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3008
- Number of Invalid Surfaces: 1992

Error Codes:

- Error Code -107 reported for 746 surfaces
- Error Code -108 reported for 694 surfaces
- Error Code -112 reported for 552 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: South, Interim Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_South_Block_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (undrained)	Dredge Material	Tube-Tube Interface (Horizontal)	Tube-Gravel Interface	Liner
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Discrete function	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	86	100
Cohesion [psf]	0	0	0		0	0	0	0
Friction Angle [deg]	30	35	38		15	15	24	19
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Discrete Functions

- Name: SOLW (Undrained, U=0%)

X (ft)	Y (ft)	Cu (lbs/ft2)
1120	440	600
1120	427.5	600
1120	424.5	600
1120	424.4	600
1120	424.3	600
1120	424.2	600
1120	424.1	600
1120	424	600
1120	423.9	597.683
1120	423.8	592.646
1120	423.7	587.563
1120	423.6	582.359
1120	423.5	577.087
1120	423.4	571.796
1120	423.3	566.533
1120	423.2	561.342
1120	423.1	556.26
1120	423	551.323
1120	422.9	546.561
1120	422.8	542.001
1120	422.7	537.664
1120	422.6	533.568
1120	422.5	529.723
1120	422.4	526.138
1120	422.3	522.812
1120	422.2	519.744
1120	422.1	516.924
1120	422	514.337
1120	421.9	511.963
1120	421.8	509.777
1120	421.7	507.745
1120	421.6	505.83
1120	421.5	503.987
1120	421.4	502.166
1120	421.3	500.311
1120	421.2	498.358
1120	421.1	496.255
1120	421	494.037
1120	420.9	491.775
1120	420.8	489.544
1120	420.7	487.425
1120	420.6	485.503
1120	420.5	483.868
1120	420.4	482.606

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	420.3	481.724
1120	420.2	481.188
1120	420.1	480.964
1120	420	481.009
1120	419.9	481.278
1120	419.8	481.721
1120	419.7	482.284
1120	419.6	482.909
1120	419.5	483.532
1120	419.4	484.1
1120	419.3	484.61
1120	419.2	485.072
1120	419.1	485.498
1120	419	485.898
1120	418.9	486.285
1120	418.8	486.671
1120	418.7	487.068
1120	418.6	487.491
1120	418.5	487.953
1120	418.4	488.463
1120	418.3	489.017
1120	418.2	489.603
1120	418.1	490.211
1120	418	490.827
1120	417.9	491.439
1120	417.8	492.033
1120	417.7	492.595
1120	417.6	493.107
1120	417.5	493.555
1120	417.4	493.926
1120	417.3	494.234
1120	417.2	494.5
1120	417.1	494.745
1120	417	494.991
1120	416.9	495.263
1120	416.8	495.584
1120	416.7	495.979
1120	416.6	496.476
1120	416.5	497.101
1120	416.4	497.863
1120	416.3	498.75
1120	416.2	499.746
1120	416.1	500.836
1120	416	502
1120	415.9	503.222
1120	415.8	504.482
1120	415.7	505.76
1120	415.6	507.035
1120	415.5	508.285
1120	415.4	509.49
1120	415.3	510.644
1120	415.2	511.753
1120	415.1	512.824
1120	415	513.862
1120	414.9	514.874
1120	414.8	515.867
1120	414.7	516.847
1120	414.6	517.822
1120	414.5	518.799
1120	414.4	519.785
1120	414.3	520.787
1120	414.2	521.803
1120	414.1	522.831
1120	414	523.868
1120	413.9	524.913
1120	413.8	525.963
1120	413.7	527.015
1120	413.6	528.065
1120	413.5	529.112
1120	413.4	530.151
1120	413.3	531.18
1120	413.2	532.198
1120	413.1	533.204
1120	413	534.2
1120	412.9	535.186
1120	412.8	536.163
1120	412.7	537.13
1120	412.6	538.09
1120	412.5	539.042
1120	412.4	539.988
1120	412.3	540.929
1120	412.2	541.87
1120	412.1	542.814
1120	412	543.764
1120	411.9	544.722
1120	411.8	545.694
1120	411.7	546.682
1120	411.6	547.691
1120	411.5	548.723
1120	411.4	549.783
1120	411.3	550.873
1120	411.2	551.997
1120	411.1	553.158
1120	411	554.36
1120	410.9	555.605
1120	410.8	556.898
1120	410.7	558.242
1120	410.6	559.64
1120	410.5	561.097
1120	410.4	562.613
1120	410.3	564.183
1120	410.2	565.798
1120	410.1	567.449
1120	410	569.127
1120	409.9	570.823
1120	409.8	572.527
1120	409.7	574.229
1120	409.6	575.919
1120	409.5	577.588
1120	409.4	579.225
1120	409.3	580.834
1120	409.2	582.418
1120	409.1	583.981
1120	409	585.528
1120	408.9	587.063
1120	408.8	588.59
1120	408.7	590.115
1120	408.6	591.641
1120	408.5	593.175
1120	408.4	594.719
1120	408.3	596.275
1120	408.2	597.843
1120	408.1	599.422
1120	408	601.013
1120	407.9	602.616
1120	407.8	604.231
1120	407.7	605.857
1120	407.6	607.494
1120	407.5	609.144
1120	407.4	610.804
1120	407.3	612.475
1120	407.2	614.157
1120	407.1	615.848
1120	407	617.549
1120	406.9	619.258
1120	406.8	620.975
1120	406.7	622.698
1120	406.6	624.428
1120	406.5	626.164
1120	406.4	627.905
1120	406.3	629.65
1120	406.2	631.398
1120	406.1	633.149
1120	406	634.901
1120	405.9	636.654
1120	405.8	638.407
1120	405.7	640.16
1120	405.6	641.91
1120	405.5	643.658
1120	405.4	645.402
1120	405.3	647.143
1120	405.2	648.88
1120	405.1	650.615
1120	405	652.348
1120	404.9	654.078
1120	404.8	655.807
1120	404.7	657.534
1120	404.6	659.261
1120	404.5	660.986

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

1120	404.4	662.712
1120	404.3	664.437
1120	404.2	666.163
1120	404.1	667.89
1120	404	669.618
1120	403.9	671.347
1120	403.8	673.079
1120	403.7	674.813
1120	403.6	676.55
1120	403.5	678.29
1120	403.4	680.033
1120	403.3	681.781
1120	403.2	683.533
1120	403.1	685.29
1120	403	687.052
1120	402.9	688.82
1120	402.8	690.594
1120	402.7	692.375
1120	402.6	694.163
1120	402.5	695.958
1120	402.4	697.762
1120	402.3	699.573
1120	402.2	701.394
1120	402.1	703.224
1120	402	705.064
1120	401.9	706.914
1120	401.8	708.775
1120	401.7	710.647
1120	401.6	712.531
1120	401.5	714.427
1120	401.4	716.336
1120	401.3	718.259
1120	401.2	720.194
1120	401.1	722.142
1120	401	724.101
1120	400.9	726.069
1120	400.8	728.044
1120	400.7	730.026
1120	400.6	732.011
1120	400.5	734
1120	400.4	735.989
1120	400.3	737.977
1120	400.2	739.963
1120	400.1	741.945
1120	400	743.92
1120	399.9	745.888
1120	399.8	747.845
1120	399.7	749.791
1120	399.6	751.723
1120	399.5	753.639
1120	399.4	755.538
1120	399.3	757.416
1120	399.2	759.274
1120	399.1	761.108
1120	399	762.923
1120	398.9	764.721
1120	398.8	766.503
1120	398.7	768.273
1120	398.6	770.032
1120	398.5	771.785
1120	398.4	773.533
1120	398.3	775.279
1120	398.2	777.025
1120	398.1	778.775
1120	398	780.532
1120	397.9	782.298
1120	397.8	784.076
1120	397.7	785.87
1120	397.6	787.681
1120	397.5	789.513
1120	397.4	791.369
1120	397.3	793.247
1120	397.2	795.146
1120	397.1	797.063
1120	397	798.996
1120	396.9	800.944
1120	396.8	802.903
1120	396.7	804.873
1120	396.6	806.851
1120	396.5	808.835
1120	396.4	810.823
1120	396.3	812.812
1120	396.2	814.8
1120	396.1	816.785
1120	396	818.764
1120	395.9	820.736
1120	395.8	822.697
1120	395.7	824.646
1120	395.6	826.58
1120	395.5	828.497
1120	395.4	830.394
1120	395.3	832.273
1120	395.2	834.135
1120	395.1	835.982
1120	395	837.817
1120	394.9	839.64
1120	394.8	841.454
1120	394.7	843.26
1120	394.6	845.06
1120	394.5	846.857
1120	394.4	848.652
1120	394.3	850.446
1120	394.2	852.243
1120	394.1	854.044
1120	394	855.851
1120	393.9	857.667
1120	393.8	859.492
1120	393.7	861.33
1120	393.6	863.182
1120	393.5	865.051
1120	393.4	866.938
1120	393.3	868.842
1120	393.2	870.765
1120	393.1	872.703
1120	393	874.658
1120	392.9	876.626
1120	392.8	878.609
1120	392.7	880.605
1120	392.6	882.614
1120	392.5	884.633
1120	392.4	886.663
1120	392.3	888.703
1120	392.2	890.751
1120	392.1	892.807
1120	392	894.87
1120	391.9	896.939
1120	391.8	899.012
1120	391.7	901.09
1120	391.6	903.17
1120	391.5	905.253
1120	391.4	907.337
1120	391.3	909.422
1120	391.2	911.508
1120	391.1	913.596
1120	391	915.685
1120	390.9	917.776
1120	390.8	919.868
1120	390.7	921.961
1120	390.6	924.056
1120	390.5	926.152
1120	390.4	928.25
1120	390.3	930.349
1120	390.2	932.45
1120	390.1	934.552
1120	390	936.656
1120	389.9	938.761
1120	389.8	940.868
1120	389.7	942.976
1120	389.6	945.086
1120	389.5	947.198
1120	389.4	949.312
1120	389.3	951.427
1120	389.2	953.543
1120	389.1	955.662
1120	389	957.782
1120	388.9	959.904
1120	388.8	962.028
1120	388.7	964.153
1120	388.6	966.281

1120	388.5	968.41
1120	388.4	970.541
1120	388.3	972.673
1120	388.2	974.808
1120	388.1	976.944
1120	388	979.083
1120	387.9	981.223
1120	387.8	983.365
1120	387.7	985.509
1120	387.6	987.655
1120	387.5	989.804
1120	387.4	991.954
1120	387.3	994.106
1120	387.2	996.26
1120	387.1	998.416
1120	387	1000.57
1120	386.9	1002.73
1120	386.8	1004.9
1120	386.7	1007.06
1120	386.6	1009.23
1120	386.5	1011.4
1120	386.4	1013.57
1120	386.3	1015.74
1120	386.2	1017.91
1120	386.1	1020.09
1120	386	1022.27
1120	385.9	1024.45
1120	385.8	1026.64
1120	385.7	1028.82
1120	385.6	1031.01
1120	385.5	1033.2
1120	385.4	1035.39
1120	385.3	1037.59
1120	385.2	1039.78
1120	385.1	1041.98
1120	385	1044.19
1120	384.9	1046.39
1120	384.8	1048.6
1120	384.7	1050.81
1120	384.6	1053.02
1120	384.5	1055.23
1120	384.4	1057.45
1120	384.3	1059.66
1120	384.2	1061.88
1120	384.1	1064.11
1120	384	1066.33
1120	383.9	1068.56
1120	383.8	1070.79
1120	383.7	1073.02
1120	383.6	1075.26
1120	383.5	1077.5
1120	383.4	1079.74
1120	383.3	1081.98
1120	383.2	1084.22
1120	383.1	1086.47
1120	383	1088.72
1120	382.9	1090.98
1120	382.8	1093.23
1120	382.7	1095.49
1120	382.6	1097.75
1120	382.5	1100.01
1120	382.4	1102.28
1120	382.3	1104.55
1120	382.2	1106.82
1120	382.1	1109.09
1120	382	1111.36
1120	381.9	1113.64
1120	381.8	1115.92
1120	381.7	1118.21
1120	381.6	1120.49
1120	381.5	1122.78
1120	381.4	1125.07
1120	381.3	1127.37
1120	381.2	1129.67
1120	381.1	1131.96
1120	381	1134.27
1120	380.9	1136.57
1120	380.8	1138.88
1120	380.7	1141.19
1120	380.6	1143.5
1120	380.5	1145.82
1120	380.4	1148.14
1120	380.3	1150.46
1120	380.2	1152.78
1120	380.1	1155.11
1120	380	1157.44
1120	379.9	1159.77
1120	379.8	1162.1
1120	379.7	1164.44
1120	379.6	1166.78
1120	379.5	1169.12
1120	379.4	1171.47
1120	379.3	1173.82
1120	379.2	1176.17
1120	379.1	1178.52
1120	379	1180.88
1120	378.9	1183.24
1120	378.8	1185.6
1120	378.7	1187.97
1120	378.6	1190.33
1120	378.5	1192.7
1120	378.4	1195.08
1120	378.3	1197.45
1120	378.2	1199.83
1120	378.1	1202.21
1120	378	1204.6
1120	377.9	1206.99
1120	377.8	1209.38
1120	377.7	1211.77
1120	377.6	1214.16
1120	377.5	1216.56

Property	Foundation	Leveling Soil
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120
Cohesion [psf]	0	0
Friction Angle [deg]	37	30
Water Surface	Water Table	Water Table
Hu Value	1	1

Support Properties

Geotube

- Support Type: GeoTextile
- Force Application: Passive
- Force Orientation: Tangent to Slip Surface
- Anchorage: Both Ends
- Shear Strength Model: Linear
- Strip Coverage: 100 percent
- Tensile Strength: 1600 lb/ft

Global Minimums

Method: janbu simplified

- FS: 2.263660
- Axis Location: 427.648, 574.668
- Left Slip Surface Endpoint: 390.082, 443.747
- Right Slip Surface Endpoint: 509.845, 466.063
- Resisting Horizontal Force=59448.5 lb
- Driving Horizontal Force=26262.1 lb
- Total Slice Area=1304.79 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
390.082	443.747
411.77	435.272
414.841	435.208
425.217	434.968
437.815	434.67
509.845	466.063

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 2259
- Number of Invalid Surfaces: 2741

Error Codes:

- Error Code -107 reported for 300 surfaces
- Error Code -108 reported for 2137 surfaces
- Error Code -112 reported for 304 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

List Of Coordinates

Water Table

X	Y
-3.55271e-015	441.092
8.20625	441.159
15.7106	441.204
26.4529	441.32
39.5792	441.424
49.948	441.502
57.9412	441.556
80.8057	441.881
82.6513	441.896
89.1287	442
91.4643	442.015
93.8654	442
97.4303	441.315
99.8627	441
103.632	440.277
106.595	439.646
110.967	439
116.065	437.497
118.266	436.357
120.745	435.444
122.687	435
125.831	434
129.562	433
132.704	432
134.941	431
137.195	430
139.464	429
142.855	428.433
146.259	427.609
158.753	427.13
163.694	427.028
165.119	426.426
166.853	425.244
168.002	424.54
170.515	423
171.956	422
173.549	421
175.162	420
191.544	419.526
201.655	419.257
204.998	419.174
205.147	419.172
207.684	419.137
211.264	419
218.926	419
221.747	419
225.454	419
228.797	419.001
232.165	419.001
234.063	419.001
238.013	419.002
240.224	419.002
250.11	419.002
258.106	423
259.14	423
265.164	423
268.782	423
271.578	423
348.093	422
372.42	420.24
375.216	420.037
414.841	417.826
425.217	417.703
464.483	417.034
475.218	416.817
514.125	416.335
525.219	416.184
543.392	416.084
563.767	415.971
575.221	415.904
600	415.77

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Piezoline

X	Y
354.636	436.986
355.914	437
359.162	437.029
367.613	437.106
369.734	437.088
375.216	437.037
396.68	436.591
414.841	436.213
425.217	435.973
464.483	435.043
475.218	434.791
514.125	434.339
525.219	434.201
543.392	434.063
563.767	433.909
575.221	433.822
600	433.634

Block Search Polyline

X	Y
354.636	436.981
367.613	436.101
369.734	436.083
375.216	436.031
414.841	435.208
425.217	434.968
464.483	434.038
475.218	433.786
514.125	433.334
525.219	433.196
543.392	433.058
563.767	432.904
575.221	432.817
600	432.629

External Boundary

X	Y
268.782	438
265.164	438
259.14	438
258.106	438
250.11	434.002
240.224	434.002
238.013	434.002
234.063	434.001
232.165	434.001
228.317	434
225.454	434
221.747	434
218.926	434
211.264	434
207.684	434.137
204.998	434.174
201.655	434.257
191.544	434.526
175.162	435
173.549	436
171.956	437
170.515	438
168.002	439.54
166.853	440.244
165.119	441.426
163.694	442.028
158.753	442.13
146.259	442.609
142.855	443.433
139.464	444
137.195	445
134.941	446
132.704	447
129.562	448
125.831	449
122.687	450
120.745	450.444
118.266	451.357
116.065	452.497
110.967	454
106.595	454.646
103.632	455.277
99.8627	456
97.4303	456.315
93.8654	457
91.4643	457.015
89.1287	457
82.6513	456.896
80.8057	456.881
57.9412	456.556
49.948	456.502
39.5792	456.424
26.4529	456.32
15.7106	456.204
8.20625	456.159
0	456.092
-3.55271e-015	441.092
0	340
132.717	340
258.106	340
309.486	340
375.216	340
543.392	340
600	340
600	380
600	415.77
600	430.77
600	432.634
600	433.634
600	433.884
600	439.31
600	439.56
600	443.389
600	443.639
600	451.199
600	451.449
600	455.196
600	455.446
600	461.138
600	464.274
600	466.274
580.717	466.416
561.167	466.56
543.392	466.691
528.091	466.804
525.329	466.824
479.758	464.583
472.404	462.619
470.389	462.08
469.207	461.763
462.067	459.851
460.647	459.471
456.455	458.349
402.348	443.869
367.082	443.517
363.452	443.48
340.819	443.254
318.881	443.035
316.275	441.993
312.007	442.1
309.486	443.109
289.221	441
271.578	438

Material Boundary

X	Y
309.486	441.109
311.938	440.128
316.262	440.008
318.881	441.037

Material Boundary

X	Y
318.881	441.037
323.436	441.082

Material Boundary

X	Y
375.216	437.037
396.68	436.591

Material Boundary

X	Y
375.216	436.036
414.841	435.213
425.217	434.973
464.483	434.043
475.218	433.791
514.125	433.339
525.219	433.201

Material Boundary

X	Y
132.717	442.514
137.914	440.103
139.795	439.24
149.087	435
154.237	432.558
159.491	430
166.541	426.395
169.27	425
170.418	424.413
171.428	423.896
183.282	422.235
199.237	420
205.147	419.172
231.909	415.422
234.923	415
242.109	413.993
270.609	410
275.46	409.32
281.627	408.574
296.792	406.611
311.147	405
319.015	404.117
327.288	403.189
341.758	401.566
355.711	400
364.83	398.977
375.061	397.829
388.165	396.359
400.275	395
406.653	394.284
411.701	393.718
424.707	392.259
435.391	391.06
444.839	390
462.008	387.867
484.965	385
490.161	384.282
505.363	382.181
517.1	380.558
521.14	380

Material Boundary

X	Y
118.266	451.357
132.717	442.514

Material Boundary

X	Y
289.221	441
301.527	441.097
306.356	441.133
309.486	441.109
309.486	443.109

Material Boundary

X	Y
271.578	438
348.093	437

Material Boundary

X	Y
348.093	437
372.42	435.24
375.216	435.037
414.841	432.826

Material Boundary

X	Y
414.841	432.826
425.217	432.703

Material Boundary

X	Y
425.217	432.703
464.483	432.034
475.218	431.817
514.125	431.335
525.219	431.184

Material Boundary

X	Y
323.436	441.082
325.34	441.101
340.819	441.254
363.452	441.48
367.082	441.517
402.348	441.869
456.455	456.349
460.647	457.471
462.067	457.851
469.207	459.763
470.389	460.08
472.382	460.613
473.728	460.974
479.758	462.583
499.854	463.293
524.43	464.83
525.666	464.821
528.091	464.804

Material Boundary

X	Y
396.68	436.591
396.87	436.837
397.772	438.006

398.664	439
399.392	439.983
402.625	441
405.553	441.399
409.481	442
410.033	442.239
411.479	442.863
412.427	443.404
413.193	443.841
420.225	444.979
421.997	444.98
428.815	444.988
433.288	444.993
439.77	445
444.169	445.164
445.293	445.252
445.444	445.499
445.75	446
446.784	447.15
447.433	448.135
447.874	449.099
448.687	450.241
449.434	451
450.815	451.368
453.146	452
454.455	452.043
462.308	452.493
465.392	452.585
466.475	452.81
468.325	453.194
469.09	454
469.995	454.913
470.931	455.375
475.068	455.607
477.511	455.975
478.622	455.983
482.105	455.986
482.959	455.99
485.081	455.989
485.922	455.992
487.428	456.211
487.568	456.459
487.993	457.216
488.614	458.552
489.241	460.038
490.305	460.634
491.228	461.074
493.757	462
495.125	462.487
497.23	463
499.854	463.093
508.104	463
511.548	462.68
512.963	462.625
515.968	462.553
518.738	462.321
523.784	462.18
524.641	462.109
527.555	462
528.902	461.796

Material Boundary

X	Y
396.68	436.591
414.841	436.213

Material Boundary

X	Y
414.841	436.213
425.217	435.973
464.483	435.043
475.218	434.791
514.125	434.339
525.219	434.201

Material Boundary

X	Y
369.734	437.088
375.216	437.037

Material Boundary

X	Y
354.636	436.986
367.613	436.106
369.734	436.088
375.216	436.036

Material Boundary

X	Y
323.436	441.082
325.453	440.573
327.99	440
332.443	439.064
333.789	438.839
335.555	438.486
338.11	438
339.748	437.826
348.093	437

Material Boundary

X	Y
325.34	441.101
325.453	441.073
327.99	440.5
332.443	439.564
333.789	439.339
335.555	438.986
338.11	438.5
339.748	438.326
348.093	437.5
354.636	436.986

Material Boundary

X	Y
354.636	436.986
355.914	437

Material Boundary

X	Y
355.914	437
359.162	437.029
367.613	437.106
369.734	437.088

Material Boundary

X	Y
271.578	438
285.085	439
287.153	440
289.221	441

Material Boundary

X	Y
409.481	442
414.841	441.888

Material Boundary

X	Y
414.841	441.888
425.217	441.649
464.483	440.718
475.218	440.467
514.125	440.015
525.219	439.876
543.392	439.739

Material Boundary

X	Y
445.293	445.252
464.483	444.797
475.218	444.546

Material Boundary

X	Y
514.125	444.094
525.219	443.956
543.392	443.818

Material Boundary

X	Y
487.428	456.211
514.125	455.9
525.219	455.762
543.392	455.624

Material Boundary

X	Y
475.218	444.546
514.125	444.094

Material Boundary

X	Y
465.392	452.585
475.218	452.356

Material Boundary

X	Y
475.218	452.356
514.125	451.903

Material Boundary

X	Y
514.125	451.903
525.219	451.765
543.392	451.627

Material Boundary

X	Y
414.841	442.138
425.217	441.899
464.483	440.968
475.218	440.717
514.125	440.265
525.219	440.126
543.392	439.989

Material Boundary

X	Y
410.033	442.239
414.841	442.138

Material Boundary

X	Y
445.444	445.499
464.483	445.047
475.218	444.796

Material Boundary

X	Y
475.218	444.796
514.125	444.344

Material Boundary

X	Y
514.125	444.344
525.219	444.206
543.392	444.068

Material Boundary

X	Y
487.568	456.459
514.125	456.15
525.219	456.012
543.392	455.874

Material Boundary

X	Y
475.218	452.606
514.125	452.153

Material Boundary

X	Y
514.125	452.153
525.219	452.015
543.392	451.877

Material Boundary

X	Y
466.475	452.81
475.218	452.606

Material Boundary

X	Y
396.87	436.837
414.841	436.463

Material Boundary

X	Y
414.841	436.463
425.217	436.223
464.483	435.293
475.218	435.041
514.125	434.589
525.219	434.451
543.392	434.313

Material Boundary

X	Y
528.091	464.804
543.392	464.691
561.167	464.56
580.717	464.416
600	464.274

Material Boundary

X	Y
528.902	461.796
531.96	461.759
536.781	461.532
538.948	461.393
543.392	461.364
548.521	461.331
550.578	461.233
551.501	461.171
563.212	461.132
564.952	461.079
567.682	461.015
568.771	461.017
572.058	461.013
572.938	461.008
575.506	460.999
576.595	461
578.728	460.92
581.186	460.197
582.675	460.963
585.833	461.563
586.892	461.66
594.607	461.405
599.204	461.161
600	461.138

Material Boundary

X	Y
525.219	434.201
543.392	434.063

Material Boundary

X	Y
525.219	433.201
543.392	433.063
563.767	432.909
575.221	432.822
600	432.634

Material Boundary

X	Y
525.219	431.184
543.392	431.084
563.767	430.971
575.221	430.904
600	430.77

Material Boundary

X	Y
521.14	380
536.923	377.819
543.392	376.964
553.743	375.597
556.047	376.28
565.664	379.131
568.595	380
578.485	380
587.662	380
591.277	380
596.03	380
600	380

Material Boundary

X	Y
543.392	434.063
563.767	433.909
575.221	433.822
600	433.634

Material Boundary

X	Y
543.392	439.739
563.767	439.584
575.221	439.498
600	439.31

Material Boundary

X	Y
543.392	443.818
563.767	443.664
575.221	443.577
600	443.389

Material Boundary

X	Y
543.392	451.627
563.767	451.473
575.221	451.386
600	451.199

Material Boundary

X	Y
543.392	455.624
563.767	455.47
575.221	455.383
600	455.196

Material Boundary

X	Y

543.392	455.874
563.767	455.72
575.221	455.633
600	455.446

Material Boundary

X	Y
543.392	451.877
563.767	451.723
575.221	451.636
600	451.449

Material Boundary

X	Y
543.392	444.068
563.767	443.914
575.221	443.827
600	443.639

Material Boundary

X	Y
543.392	439.989
563.767	439.834
575.221	439.748
600	439.56

Material Boundary

X	Y
543.392	434.313
563.767	434.159
575.221	434.072
600	433.884

Material Boundary

X	Y
-3.55271e-015	441.092
8.20625	441.159
15.7106	441.204
26.4529	441.32
39.5792	441.424
49.948	441.502
57.9412	441.556
80.8057	441.881
82.6513	441.896
89.1287	442
91.4643	442.015
93.8654	442
97.4303	441.315
99.8627	441
103.632	440.277
106.595	439.646
110.967	439
116.065	437.497
118.266	436.357
120.745	435.444
122.687	435
125.831	434
129.562	433
132.704	432
134.941	431
137.195	430
139.464	429
142.855	428.433
146.259	427.609
158.753	427.13
163.694	427.028
165.119	426.426
166.853	425.244
168.002	424.54
170.515	423
171.956	422
173.549	421
175.162	420
191.544	419.526
201.655	419.257
204.998	419.174
205.147	419.172
207.684	419.137
211.264	419
218.926	419
221.747	419
225.454	419
228.797	419.001
232.165	419.001
234.063	419.001
238.013	419.002
240.224	419.002
250.11	419.002
258.106	423
259.14	423
265.164	423
268.782	423
271.578	423

Material Boundary

X	Y
271.578	423
348.093	422

Material Boundary

X	Y
348.093	422
372.42	420.24
375.216	420.037
414.841	417.826

Material Boundary

X	Y
414.841	417.826
425.217	417.703

Material Boundary

X	Y
425.217	417.703
464.483	417.034
475.218	416.817
514.125	416.335
525.219	416.184

Material Boundary

X	Y
525.219	416.184
543.392	416.084
563.767	415.971
575.221	415.904
600	415.77

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: South, Interim Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_South_Circular_Interim
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 1.767300
- Center: 426.887, 519.841
- Radius: 83.029
- Left Slip Surface Endpoint: 393.588, 443.782
- Right Slip Surface Endpoint: 489.271, 465.051
- Resisting Moment=3.62419e+006 lb-ft
- Driving Moment=2.0507e+006 lb-ft
- Resisting Horizontal Force=39857.3 lb
- Driving Horizontal Force=22552.7 lb
- Total Slice Area=1059.01 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 23765
- Number of Invalid Surfaces: 4846

Error Codes:

- Error Code -103 reported for 2965 surfaces
- Error Code -108 reported for 583 surfaces
- Error Code -111 reported for 1067 surfaces
- Error Code -112 reported for 201 surfaces
- Error Code -115 reported for 30 surfaces

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Error Codes

The following errors were encountered during the computation:

- -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.
- -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).
- -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.
- -115 = Surface too shallow, below the minimum depth.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: South, Long-Term Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_South_Block_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tube-Gravel Interface	Liner
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	86	100
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	24	19
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Foundation	Leveling Soil
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120
Cohesion [psf]	0	0
Friction Angle [deg]	37	30
Water Surface	Water Table	Water Table
Hu Value	1	1

Global Minimums

Method: janbu simplified

- FS: 2.104340
- Axis Location: 422.572, 549.804
- Left Slip Surface Endpoint: 396.270, 443.808
- Right Slip Surface Endpoint: 491.587, 465.165

- Resisting Horizontal Force=57754.9 lb
- Driving Horizontal Force=27445.6 lb
- Total Slice Area=1410.62 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
396.27	443.808
412.098	432.984
414.841	432.831
425.217	432.708
452.901	432.236
491.587	465.165

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3229
- Number of Invalid Surfaces: 1771

Error Codes:

- Error Code -107 reported for 300 surfaces
- Error Code -108 reported for 587 surfaces
- Error Code -112 reported for 884 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: South, Long-Term Condition, Global Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_South_Circular_Long Term
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Spencer

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116

- Random Number Generation Method: Park and Miller v.3

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: 2

Global Minimums

Method: spencer

- FS: 2.138490
- Center: 415.066, 496.864
- Radius: 54.883
- Left Slip Surface Endpoint: 400.851, 443.854
- Right Slip Surface Endpoint: 453.320, 457.510
- Resisting Moment=831877 lb-ft
- Driving Moment=389001 lb-ft
- Resisting Horizontal Force=14260.2 lb
- Driving Horizontal Force=6668.35 lb
- Total Slice Area=252.511 ft2

Valid / Invalid Surfaces

Method: spencer

- Number of Valid Surfaces: 20065
- Number of Invalid Surfaces: 8546

Error Codes:

- Error Code -103 reported for 6578 surfaces
- Error Code -108 reported for 35 surfaces
- Error Code -111 reported for 10 surfaces
- Error Code -112 reported for 1923 surfaces

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Error Codes

The following errors were encountered during the computation:

- -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.
- -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).
- -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.

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Cross-Section B-B: South, Residual Condition, Block Stability

Written by:	**Mustafa Erten / Meena Viswanath**	Date:	**02/09/2015**	Reviewed by:	**Ali Ebrahimi / Jay Beech**	Date:	**02/09/2015**

Client:	**Honeywell**	Project:	**Onondaga Lake SCA Final Cover Design**	Project/ Proposal No.:	**GD5497**	Task No.:	**03**

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

- File Name: CS-B_NorthSouth_South_Block_Long Term_Residual
- Slide Modeler Version: 6.033
- Project Title: SLIDE - An Interactive Slope Stability Program
- Date Created: 8/20/2014, 1:36:58 PM

General Settings

- Units of Measurement: Imperial Units
- Time Units: seconds
- Permeability Units: feet/second
- Failure Direction: Right to Left
- Data Output: Standard
- Maximum Material Properties: 30
- Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

- Janbu simplified

- Number of slices: 50
- Tolerance: 0.005
- Maximum number of iterations: 50
- Check malpha < 0.2: Yes
- Initial trial value of FS: 1
- Steffensen Iteration: Yes

Groundwater Analysis

- Groundwater Method: Water Surfaces
- Pore Fluid Unit Weight: 62.4 lbs/ft3
- Advanced Groundwater Method: None

Random Numbers

- Pseudo-random Seed: 10116
- Random Number Generation Method: Park and Miller v.3

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

Property	Final Cover Soil	Dike Soil	Gravel	SOLW (Drained)	Dredge Material (Long Term)	Tube-Tube Interface (Horizontal)	Tube-Gravel Interface	Foundation
Color								
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	120	120	82	86	86	86	120
Cohesion [psf]	0	0	0	0	0	0	0	0
Friction Angle [deg]	30	35	38	34	30	15	24	37
Water Surface	Water Table	Water Table	Piezometric Line 1	Water Table	Water Table	Water Table	Water Table	Water Table
Hu Value	1	1	1	1	1	1	1	1

Property	Leveling Soil	Liner (Residual)
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	100
Cohesion [psf]	0	0
Friction Angle [deg]	30	17
Water Surface	Water Table	Water Table
Hu Value	1	1

Global Minimums

Method: janbu simplified

- FS: 1.991310
- Axis Location: 419.840, 552.277
- Left Slip Surface Endpoint: 392.239, 443.768
- Right Slip Surface Endpoint: 490.086, 465.091

- Resisting Horizontal Force=54959.2 lb
- Driving Horizontal Force=27599.4 lb
- Total Slice Area=1497.75 ft2

Global Minimum Coordinates

Method: janbu simplified

X	Y
392.239	443.768
408.027	433.211
414.841	432.831
425.217	432.708
456.998	432.166
490.086	465.091

Valid / Invalid Surfaces

Method: janbu simplified

- Number of Valid Surfaces: 3166
- Number of Invalid Surfaces: 1834

Error Codes:

- Error Code -107 reported for 300 surfaces
- Error Code -108 reported for 619 surfaces
- Error Code -112 reported for 915 surfaces

Error Codes

The following errors were encountered during the computation:

- -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).
- -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.

A-7

Gas Management System Design for SCA Final Cover System

(To be provided in a future submittal.)

A-8

Sump and Riser Calculations for SCA Final Cover Design

(To be provided in a future submittal.)

A-9

SCA Final Cover System Stormwater Management System

(To be provided in a future submittal.)