



1497 West 40 South  
Lindon, Utah - 84042  
Phone (801) 225-5711

3662 West 2100 South  
Salt Lake City, Utah - 84120  
Phone (801) 737-9138

1596 W. 2650 S. #108  
Ogden, Utah - 84401  
Phone (801) 399-9516

July 13, 2015

Mr. Martin Nobs  
50 River Bluff Road  
Elgin, IL 60120

**RE: Addendum I to the Geotechnical Report  
Lot 15 Ski Lake Estates No. 3  
6640 East 1100 South  
Huntsville, Utah  
Project No.: 145150G**

Mr. Nobs:

This letter is an addendum to the geotechnical report<sup>1</sup> prepared by Earthtec Engineering that was prepared for Lot 15 of the Ski Lake Estates No. 3 located in Huntsville, Utah, dated June 23, 2014. The purpose of this letter is to respond to the engineering review comments<sup>2</sup> provided by Taylor Geotechnical (TG). An engineering geology assessment evaluation<sup>3</sup> of the property was also performed for the property, dated July 10, 2015.

The review comments related to the geotechnical study and our responses are presented below. The review comments are italicized and our responses are presented in plain text.

Recommendations Comment 1 states: *"Engineering calculations that substantiate the recommended allowable bearing capacity and settlement analysis."*

See Appendix A.

Recommendations Comment 2 states: *"Engineering calculations that substantiate the recommended lateral earth pressure coefficients and equivalent fluid densities for active, at rest and passive conditions."*

See Appendix B.

Recommendations Comment 3 states: *"Data that substantiates the soil parameters used for second soil unit in the global stability analysis."*

Based on tests performed by the Bureau of Reclamation<sup>4</sup>, "silty sands, poorly graded sand-silt mixture" have an internal friction angle of 33 to 35 degrees and a cohesion value of 280 to 560 psf. Accordingly, we used an internal friction angle of 32 degrees, an apparent cohesion of 125 psf, a saturated unit weight of 120 pcf, and a moist unit weight of 113 pcf for our analyses. Based on the new laboratory testing from the soil sample obtained from the geologic site investigation, the silty sand soils have an internal friction angle of 34 degrees, an apparent

<sup>1</sup> "Geotechnical Study, Lot 15 Ski Lake Estates No. 3, 6640 East 1100 South, Huntsville, Utah", EE Project No. 145150G, June 23, 2014.

<sup>2</sup> "Subect Document: Earthtec Engineering: "Geotechnical Study, Lot 15 Ski Lake Estates No. 3, 6640 East 1100 South, Huntsville, Utah," Project No. 145150G, prepared for Martin Nobs, dated June 23, 2014.

<sup>3</sup> "Engineering Geology Assessment, Lot 15, Ski Lake Estates No. 3, 6640 East 1100 South, Huntsville, Utah, Job No. 145150, dated July 10, 2015..

<sup>4</sup> U.S. Bureau of Reclamation, 1987, "Design Standards No. 13, Embankment Dams," Denver, Colorado.

cohesion of 240 psf, a saturated unit weight of 137 pcf, and a moist unit weight of 110 pcf for our analyses, thus the new direct shear test results were used in the modeling of the slope. The files for the direct shear testing can be found in Appendix D.

Recommendations Comment 4 states: *"Input and output files for the global stability analyses presented in the subject document."*

Earthtec Engineering performed a new stability analyses based on additional test pits and new laboratory testing on samples collected during a geologic site investigation for the property. See Appendix C.

Recommendations Comment 5 states: *"The entry and exit boundaries as presented in the global stability analyses were outside the boundaries of the home and limited the location of the exit point at the toe. It is recommended to verify that slope is stable near and just below the home as well as the general slope of the area. Please have Earthtec provide global stability analysis considering failure surfaces near the home as well as larger boundaries at the top and bottom of the slope."*

Representative soil samples collected during the geologic field investigation were tested in the laboratory to assess pertinent engineering properties and to aid in refining field classifications, if needed. Tests performed included natural moisture content, liquid and plastic limits determinations, mechanical (partial) gradation analyses, and direct shear tests. The table below summarizes the laboratory test results, which are also included on Figure Nos. 6 and 7, *Direct Shear Test*.

**Table 1: Laboratory Test Results**

Test Pit No.	Depth (ft.)	Natural Moisture (%)	Natural Dry Density (pcf)	Atterberg Limits		Grain Size Distribution (%)			Soil Type
				Liquid Limit	Plasticity Index	Gravel (+ #4)	Sand	Silt/Clay (- #200)	
TP-3	11	16	---	33	*NP	0	70	30	SM
TP-4	11	23	---	55	24	0	31	69	MH

\* NP = Non-Plastic

We evaluated the overall stability of the proposed slope at the subject property based on the new information obtained from the geologic investigation and the new laboratory testing that was performed on the elastic silt (MH) and silty sand (SM) soils. The properties of the native soils at the site were estimated using laboratory testing on samples recovered during our initial geotechnical investigation and the geological field investigation and our experience with similar soils. Our direct shear testing on the native Fat Clay with sand (CH) soils encountered during our initial geotechnical field investigation indicated the soils have an internal friction angle of about 21 degrees and cohesion of about 345 psf. To account for the variability in the native fat clay soils, we used an internal friction angle of 20 degrees, an apparent cohesion of 200 psf, a saturated unit weight of 130 pcf, and a moist unit weight of 110 pcf for our analyses.

Our direct shear testing on the native Silty Sand (SM) soils encountered during the geologic field investigation indicated the soils have an internal friction angle of about 34 degrees and cohesion of about 240 psf. Accordingly, we used an internal friction angle of 34 degrees, an

apparent cohesion of 240 psf, a saturated unit weight of 137 pcf, and a moist unit weight of 110 pcf for our analyses.

Our direct shear testing on the native Sandy Elastic Silt (MH) soils encountered during the geologic field investigation indicated the soils have an internal friction angle of about 31 degrees and cohesion of about 485 psf. To account for the variability in the native elastic silt soils, we used an internal friction angle of 27 degrees, an apparent cohesion of 400 psf, a saturated unit weight of 130 pcf, and a moist unit weight of 118 pcf for our analyses.

Due to the varying soil conditions that were observed throughout the property, certain layers were omitted from the profile due to the small quantities that were observed in the initial geotechnical investigation and the geologic investigation.

For the seismic (pseudostatic) analysis, a peak horizontal ground acceleration of 0.385g for the 2% probability of exceedance in 50 years was obtained for site (grid) locations of 41.247 degrees north latitude and -111.788 degrees west longitude. Typically, one-third to one-half this value is utilized in analysis. Accordingly, a value of 0.193 was used as the pseudostatic coefficient for the stability analysis. The seismic values can be found in Appendix E.

We evaluated the global stability of the proposed site using the computer program XSTABLE. This program uses a limit equilibrium (Bishop's modified) method for calculating factors of safety against sliding on an assumed failure surface and evaluates numerous potential failure surfaces, with the most critical failure surface identified as the one yielding the lowest factor of safety of those evaluated. The configuration analyzed was based on our observations during the initial geotechnical field investigation, the geologic field investigation, the cross section of the native soils based on the referenced geologic site investigation, assumption of the foundation layout, and the topography map of the site that was provided to us by Mr. Karl Lundin with Lundin Homes, see Figure No. 1, *Site Plan Showing Location of Slope Cross-Section*.

The configuration of the proposed slope was analyzed at Cross-Section A-A' and starts at the north portion of the lot near the toe of the slope where the lot was relatively flat. The lot then sloped up hill and to the south and consisted of an approximate 35-foot high slope inclined at approximately 3.7V:1H (Vertical:Horizontal) (approximately 27 percent slope). The lot then continued to slope up hill and to the south and consisted of an approximate 40-foot high slope inclined at approximately 3.25V:1H (Vertical:Horizontal) (approximately 31 percent slope). A 3 to 3½ foot tall rock wall was modeled just north of the proposed home, as indicated in the provide site plan, see Figure 1. The lot then was cut into the existing slope for approximately 30 feet followed by an approximate 10-foot high concrete wall. The slope was flat for approximately 10 feet followed by an approximate 10 foot high slope inclined at approximately 2H:1V (Vertical:Horizontal).

A water table was conservatively placed at approximately 5 to 20 feet below the ground surface, although groundwater was not encountered during our field exploration.

To model the load imposed on the slope by typical residential building, a 1,500 psf load was modeled approximately 45 feet north of the crest of the slope. Typically, the required minimum factors of safety are 1.5 for static conditions and 1.0 for seismic (pseudostatic) conditions. The results of our analyses indicate that the slope configuration described above meets both these requirements. The slope stability data are attached as Figure Nos. 2 through 5, *Stability*

*Results.* Any modifications to the slope, including the construction of retaining walls, should be properly designed and engineered.

The stability result for scenario A was initiated at the north end of the property at the toe of the slope. The model was then terminated on the south end of the property on the north side of 1100 South Street where critical point was located on the existing road that was cut into the existing slope.

The stability results for scenario B was initiated at the north end of the property at the toe of the slope. The model was then terminated on the south end of the proposed home location where the critical point would be located where the proposed home would be cut into the existing slope.

As indicated in the referenced geotechnical report and based on the new laboratory testing and the new stability data, the slope is stable under proposed conditions.

It should be clearly understood that slope movements or even failure can occur if the slope is undermined or the slope soils become saturated. The property owner and the owner's representatives should be made aware of the risks should these or other conditions occur that could saturate or erode/undermine the soils. Surface water should be directed away from the top and bottom of the slope, the slope should be vegetated with drought resistant plants, and sprinklers should not be placed on the face of the slope.

Recommendations Comment 6 states: *"It is recommended that the applicant have Earthtec's geologist review the geology of the site as recommended in the geologic review memo by Simon and Associates, attached to this file review."*

The project site is located within a geologically sensitive area of Huntsville which requires an engineering geology assessment evaluation of the property. The results of the study are contained in the report titled "Engineering Geology Assessment, Lot 15, Ski Lake Estates No. 3, 6640 East 1100 South, Huntsville, Utah, Job No. 145150, dated July 13, 2015.

### **General Conditions**

The information presented in this letter is intended to provide supplementary geotechnical design recommendations for the subject property. This letter should be considered as Addendum II to the geotechnical report. All other recommendations in the above referenced report and letter should be followed. The General Conditions section of the geotechnical report applies to this letter.

Addendum I to the Geotechnical Report  
Lot 15 Ski Lake Estates No. 3  
8640 East 1100 South  
Huntsville, Utah  
Project No.: 145150G

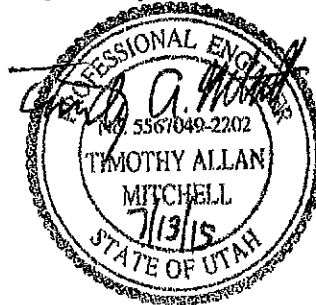
Page 5

We appreciate the opportunity of providing our services on this project. If we can answer questions or be of further service, please contact the undersigned at your convenience.

Respectfully Submitted,  
**EARTHTEC ENGINEERING**



Shawn A. Stuart E.I.T.  
Staff Geotechnical Engineer



Timothy A. Mitchell, P.E.  
Geotechnical Engineer

1 copy emailed  
2 copies mailed

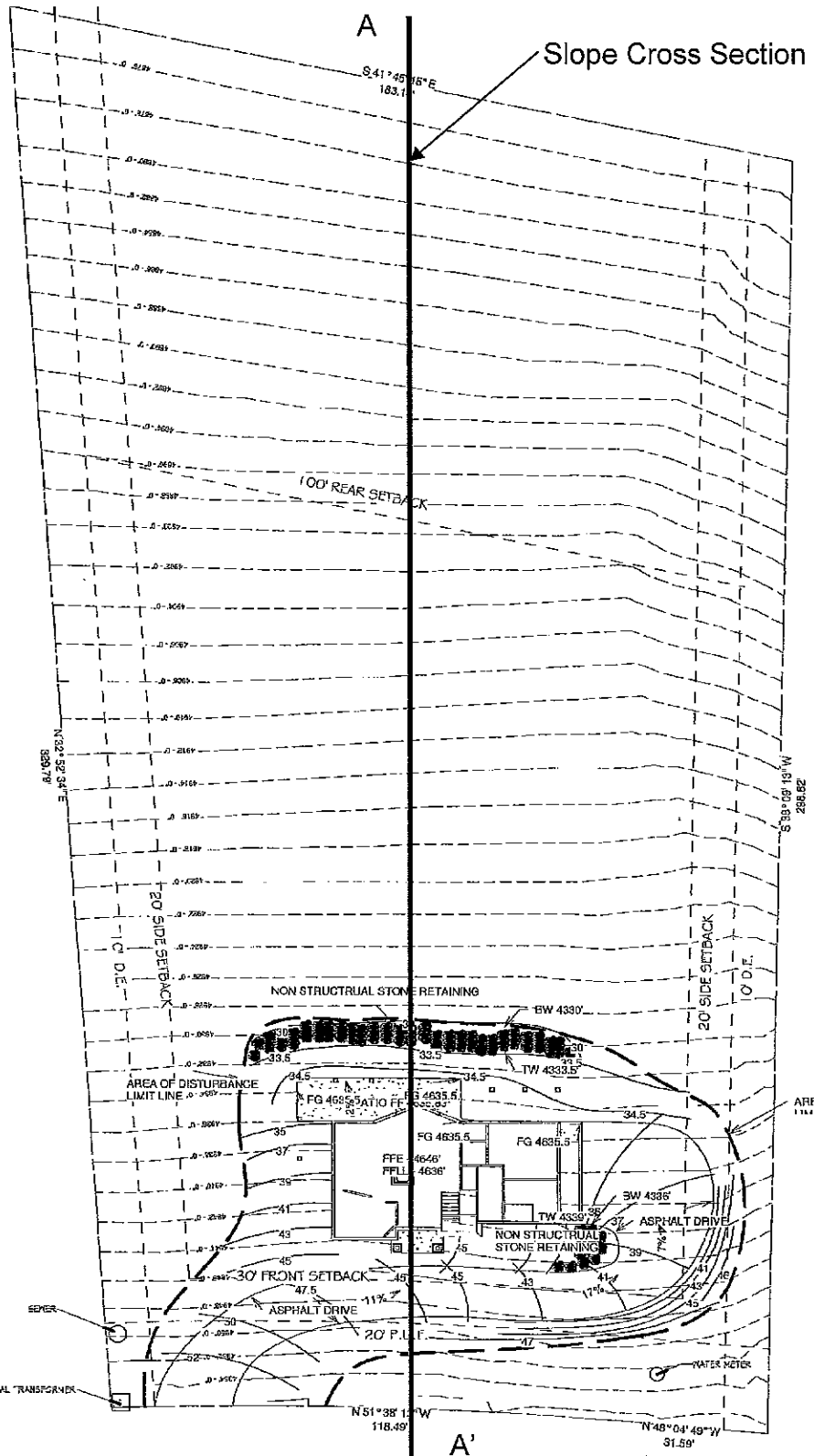
Attachments: Figure No. 1, *Site Plan Showing Location of Slope Cross Section*  
Figure Nos. 2 - 5, *Slope Stability Results*  
Figure Nos. 6 - 7, *Direct Shear Test*  
Appendix A Bearing Capacity and Settlement Analysis  
Appendix B Lateral Earth Pressures  
Appendix C Slope Stability Analysis Files  
Appendix D Direct Shear Files  
Appendix E Seismic Values

**Earthtec Engineering**

Professional Engineering Services ~ Geotechnical Engineering ~ Geologic Studies ~ Code Inspections ~ Special Inspection / Testing ~ Non-Destructive Examination ~ Failure Analysis

# SITE PLAN SHOWING LOCATION OF SLOPE CROSS-SECTION

LOT 15, SKI LAKE ESTATES NO. 3  
6640 EAST 1100 SOUTH, HUNTSVILLE, UTAH



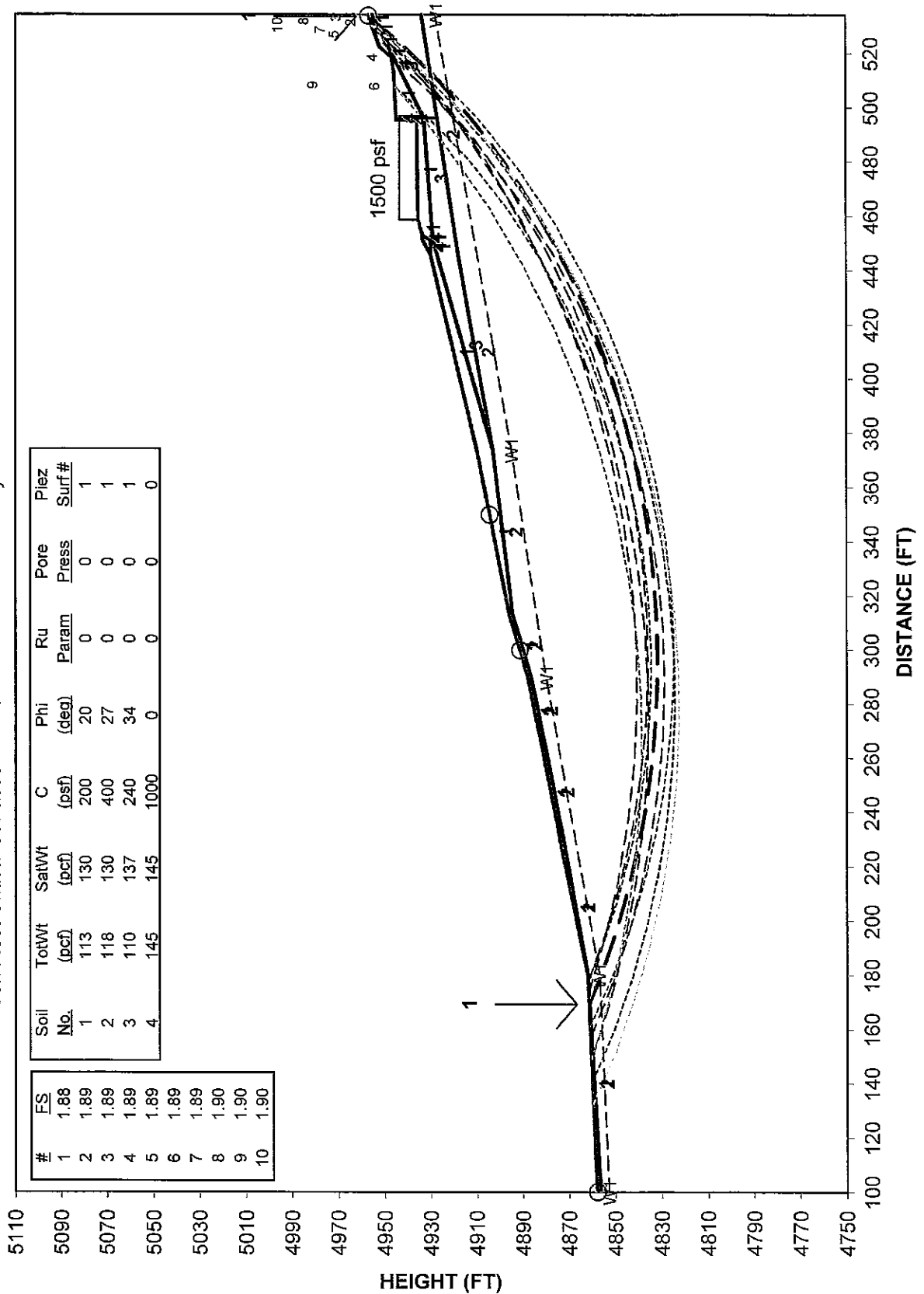
\*Site Map  
Provided by  
Client

Not to Scale



# STABILITY RESULTS

Lot 15 Ski Lakes ~ Static - A  
 Ten Most Critical Surfaces. 145150AC.OPT Run By: Earthtec 7-09-15



Soil No.	TotWt (pcf)	SatWt (pcf)	C (psf)	Phi (deg)	Ru Param	Pore Press	Piez Surf #
1	113	130	200	20	0	0	1
2	118	130	400	27	0	0	1
3	110	137	240	34	0	0	1
4	145	145	1000	0	0	0	0

#	FS
1	1.88
2	1.89
3	1.89
4	1.89
5	1.89
6	1.89
7	1.89
8	1.90
9	1.90
10	1.90



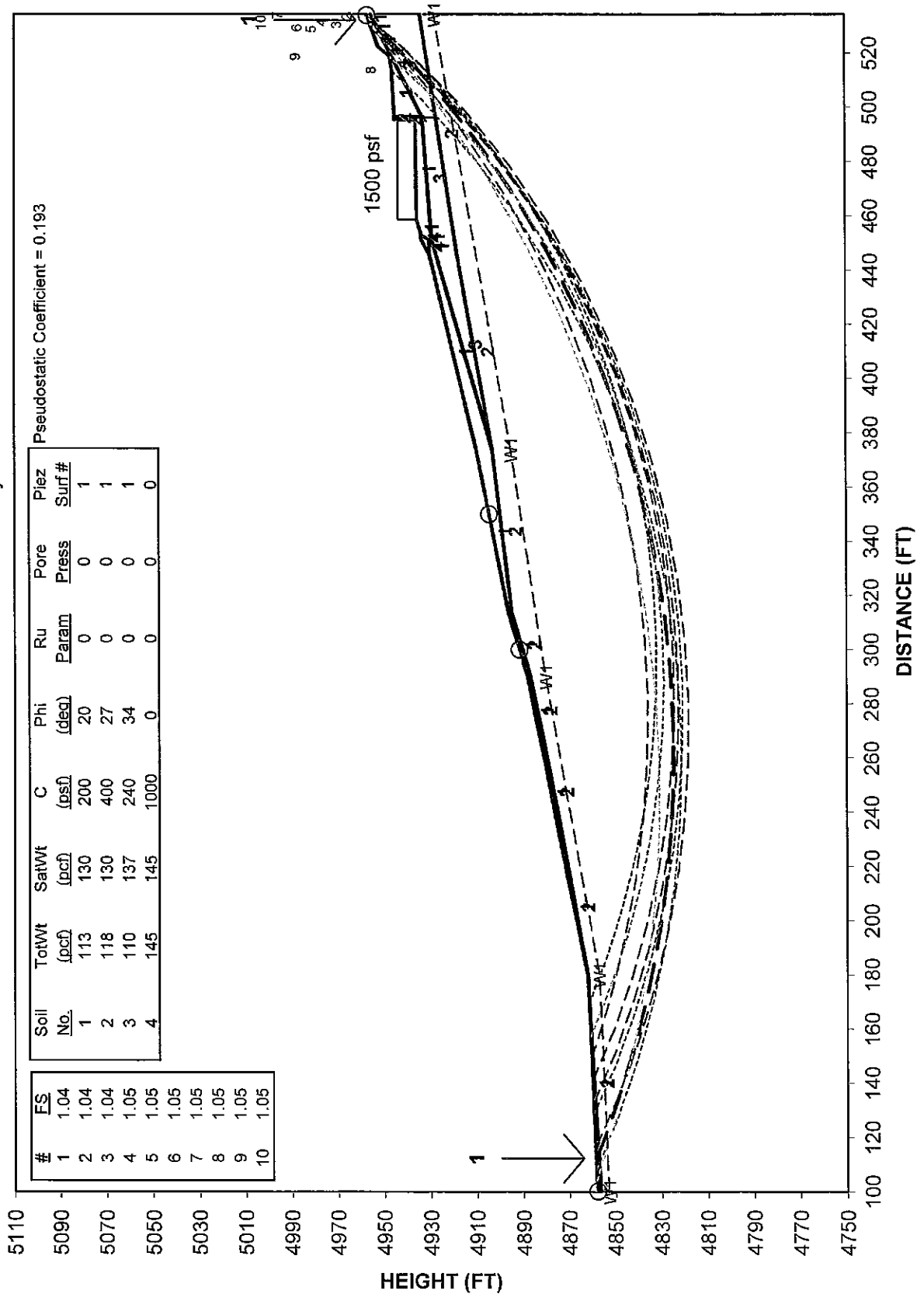
# STABILITY RESULTS

Lot 15 Ski Lakes ~ Seismic - A  
 Ten Most Critical Surfaces. 145150AS.OPT Run By: Earthtec 7-09-15

Pseudostatic Coefficient = 0.193

Soil No.	TotWt (pcf)	SatWt (pcf)	C (psf)	Phi (deg)	Ru Param	Pore Press	Piez Surf.#
1	113	130	200	20	0	0	1
2	118	130	400	27	0	0	1
3	110	137	240	34	0	0	1
4	145	145	1000	0	0	0	0

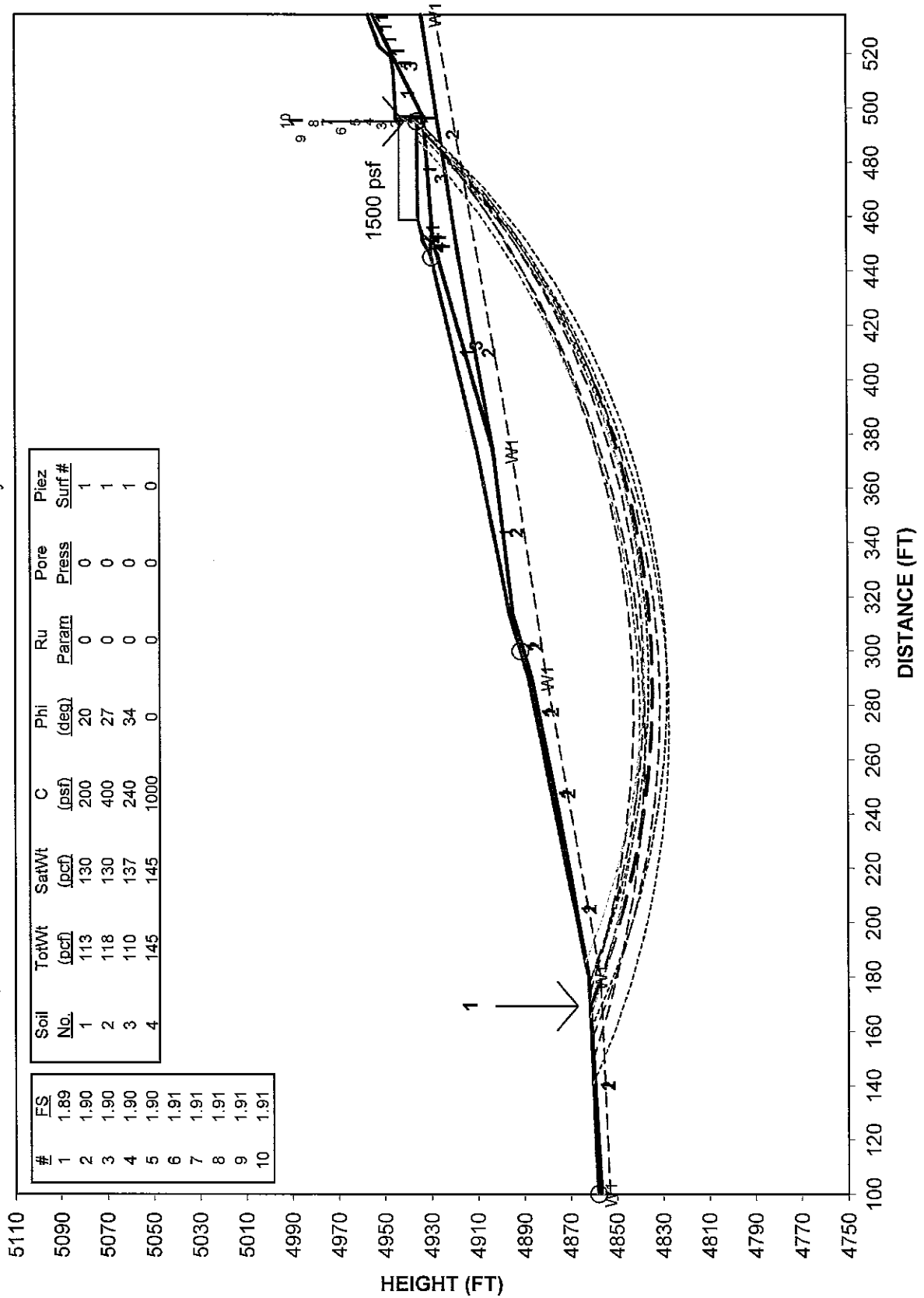
#	FS
1	1.04
2	1.04
3	1.04
4	1.05
5	1.05
6	1.05
7	1.05
8	1.05
9	1.05
10	1.05





# STABILITY RESULTS

Lot 15 Ski Lakes ~ Static - B  
 Ten Most Critical Surfaces. 145150BC.OPT Run By: Earthtec 7-09-15



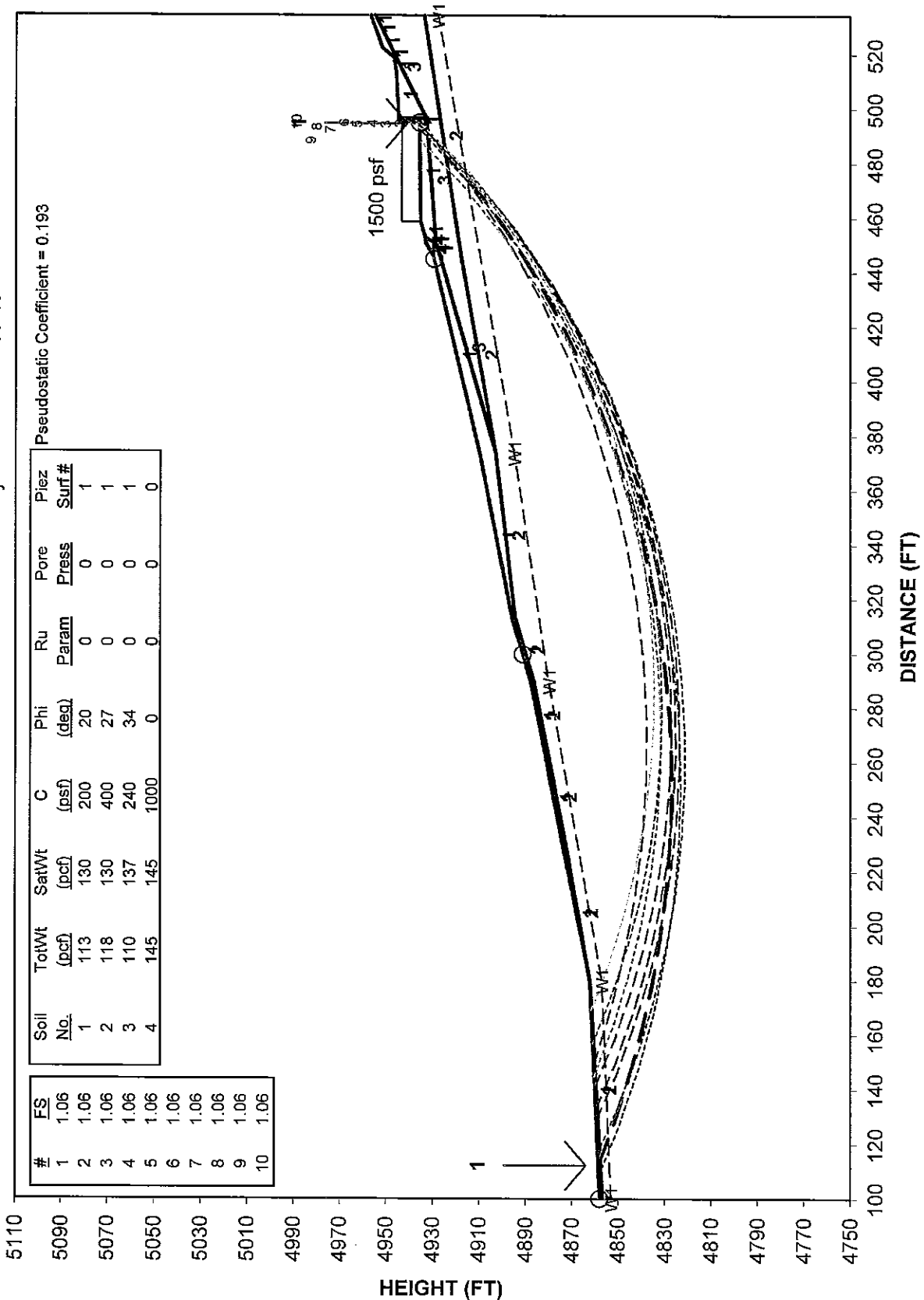
PROJECT NO.: 145150



FIGURE NO.: 4

# STABILITY RESULTS

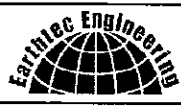
Lot 15 Ski Lakes ~ Seismic - B  
 Ten Most Critical Surfaces. 145150BS.OPT Run By: Earthtec 7-09-15



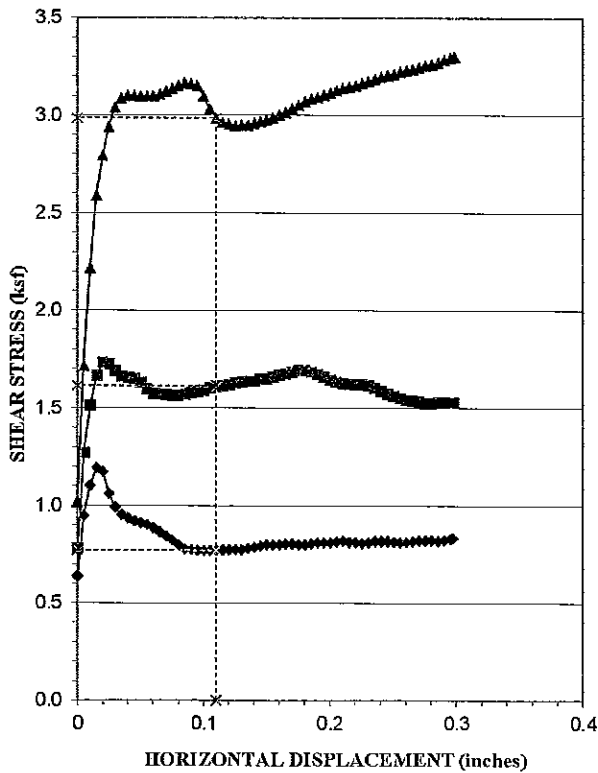
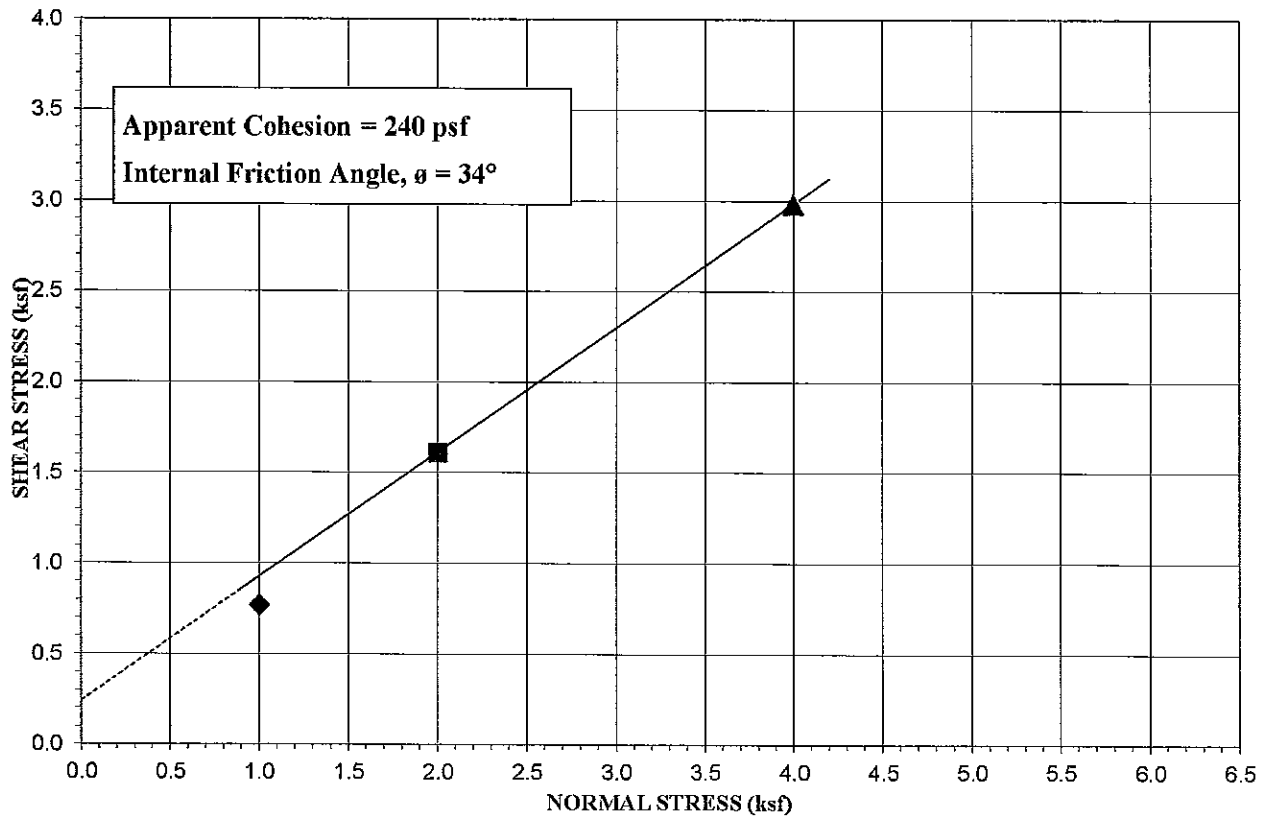
Soil No.	TotWt (pcf)	SatWt (pcf)	C (psf)	Phi (deg)	Ru Param	Pore Press	Piez Surf #
1	113	130	200	20	0	0	1
2	118	130	400	27	0	0	1
3	110	137	240	34	0	0	1
4	145	145	1000	0	0	0	0

#	FS
1	1.06
2	1.06
3	1.06
4	1.06
5	1.06
6	1.06
7	1.06
8	1.06
9	1.06
10	1.06

Pseudostatic Coefficient = 0.193



# DIRECT SHEAR TEST



Source: TP-3	Depth: 11.0 ft
Type of Test: Consolidated Drained/Saturated	
Test No. (Symbol)	1 (◆)    2 (■)    3 (▲)
Sample Type	Remolded
Initial Height, in.	1    1    1
Diameter, in.	2.4    2.4    2.4
Dry Density Before, pcf	95.5    95.5    95.3
Dry Density After, pcf	95.9    80.2    98.7
Moisture % Before	16.2    16.2    16.2
Moisture % After	42.7    70.7    36.2
Normal Load, ksf	1.0    2.0    4.0
Shear Stress, ksf	0.77    1.61    2.98
Strain Rate	.00005240 IN/SEC
<b>Sample Properties</b>	
Cohesion, psf	240
Friction Angle, $\phi$	34
Liquid Limit, %	33
Plasticity Index, %	NP
Percent Gravel	0
Percent Sand	70
Percent Passing No. 200 sieve	30
Classification	Silty SAND (SM)

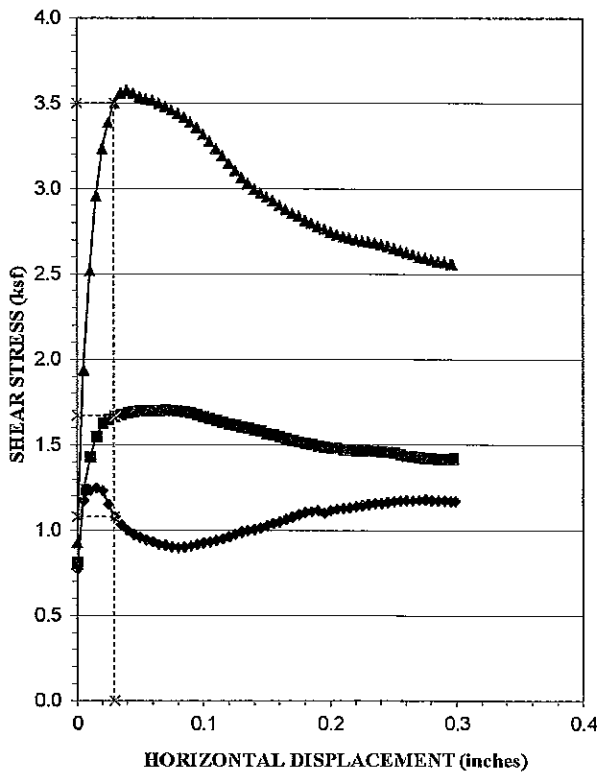
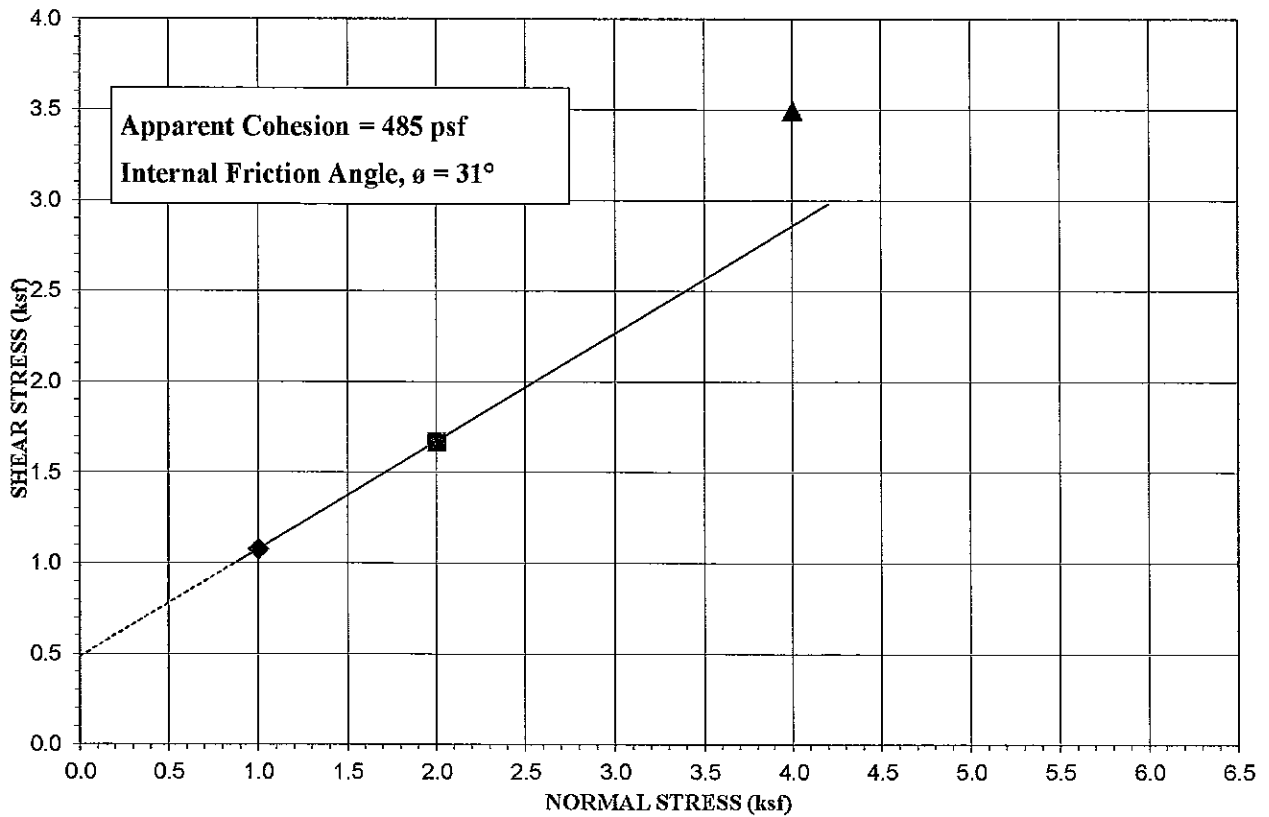
PROJECT: Lot 15 Ski Lakes Estates No. 3

PROJECT NO.: 145150G



FIGURE NO.: 6

# DIRECT SHEAR TEST



Source: TP-4	Depth: 11.0 ft		
Type of Test:	Consolidated Drained/Saturated		
Test No. (Symbol)	1 (◆)	2 (■)	3 (▲)
Sample Type	Remolded		
Initial Height, in.	1	1	1
Diameter, in.	2.4	2.4	2.4
Dry Density Before, pcf	95.7	96.1	96.3
Dry Density After, pcf	92.9	91.2	93.7
Moisture % Before	23.5	23.5	23.5
Moisture % After	40.0	41.4	34.5
Normal Load, ksf	1.0	2.0	4.0
Shear Stress, ksf	1.08	1.67	3.50
Strain Rate	.00006558 IN/SEC		
Sample Properties			
Cohesion, psf	485		
Friction Angle, $\phi$	31		
Liquid Limit, %	55		
Plasticity Index, %	24		
Percent Gravel	0		
Percent Sand	31		
Percent Passing No. 200 sieve	69		
Classification	Sandy Elastic SILT (MH)		

PROJECT: Lot 15 Ski Lakes Estates No. 3

PROJECT NO.: 145150G



FIGURE NO.: 7

**APPENDIX A**

**ALLOWABLE BEARING CAPACITY AND SETTLEMENT**

**CALCULATIONS**





## **APPENDIX B**

### **LATERAL EARTH PRESSURES (STATIC AND DYNAMIC)**



**LATERAL EARTH PRESSURES**

ENTER

Project:  
 Density of water: 62.4 pcf  
 Internal Friction Angle of Soil: 25 deg. = 0.436332 rad.  
 Angle of Soil Backfill (from horiz.): 0 deg. = 0 rad.  
 Friction angle of soil/wall interface: 12.5 deg. = 0.218166 rad.  
 Angle of back of wall (from VERT.): 0 deg. = 0 rad. ( 1.570796  
 Angle of front of wall (from VERT.): 0 deg. = 0 rad.  
 Density of soil (above water): 110 pcf  
 Horizontal Acceleration: 0.19 g  
 Vertical Acceleration: 0.00 g => 0.190367 (theta, rad.)

CALCULATIONS

AT REST  $K_0$  = 0.577  
 At Rest Pressure = 64 psf/ft above water = 90 psf/ft below water

Coulomb  $K_a$  = 0.367 (Accounts for wall friction)  
 Coulomb  $K_p$  = 3.552 (Accounts for wall friction)  
 Coulomb Active Pressure = 40 psf/ft above water = 80 psf/ft below water  
 Coulomb Passive Pressure = 391 psf/ft above water = 231 psf/ft below water

Rankine  $K_a$  = 0.406 (Does NOT account for wall friction) 0.700741  
 Rankine  $K_p$  = 2.464 (Does NOT account for wall friction) 0.582656  
 Rankine Active Pressure = 45 psf/ft above water = 82 psf/ft below water  
 Rankine Passive Pressure = 271 psf/ft above water = 180 psf/ft below water

Mononobe-Okabe Seismic  $K_a$  = 0.53  
 Mononobe-Okabe Seismic  $K_p$  = 2.92  
 M.-O. Seismic Active Pressure = 58.4 psf/ft above water = 88 psf/ft below water  
 M.-O. Seismic Passive Pressure = 321 psf/ft above water = 201 psf/ft below water  
 Est. M.-O. Seismic At-Rest Press. = 80.3 psf/ft above water = 97 psf/ft below water  
 (Estimated only from ratios of  $K_0$  to  $K_a$  and  $K_p$ )

Dynamic Active Pressure ONLY = 18 psf/ft above water = 8 psf/ft below water  
 Dynamic Passive Press. ONLY = 70 psf/ft above water = 30 psf/ft below water  
 Est. Dynamic At-Rest Press. ONLY = 17 psf/ft above water = 7 psf/ft below water

## **APPENDIX C**

### **GLOBAL STABILITY INPUT AND OUT PUT FILES**

```

*****
*           X S T A B L           *
*           Slope Stability Analysis   *
*           using the                 *
*           Method of Slices          *
*           Copyright (C) 1992 Å 94   *
*           Interactive Software Designs, Inc. *
*           MOSCOW, ID 83843, U.S.A.   *
*           All Rights Reserved       *
*           Ver. 5.004                 *
*           94 Å 1295                 *
*****

```

Problem Description : Lot 15 Ski Lakes ~ Static

-----  
SEGMENT BOUNDARY COORDINATES  
-----

19 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	100.0	4858.0	180.0	4862.0	1
2	180.0	4862.0	230.0	4874.0	1
3	230.0	4874.0	264.9	4882.0	1
4	264.9	4882.0	290.1	4888.0	1
5	290.1	4888.0	313.3	4896.0	1
6	313.3	4896.0	373.8	4910.0	1
7	373.8	4910.0	445.9	4930.0	1
8	445.9	4930.0	451.3	4933.5	4
9	451.3	4933.5	452.8	4933.5	4
10	452.8	4933.5	458.7	4935.5	1
11	458.7	4935.5	495.5	4936.0	1
12	495.5	4936.0	495.6	4945.0	4
13	495.6	4945.0	496.6	4945.0	4
14	496.6	4945.0	513.7	4946.0	1
15	513.7	4946.0	518.8	4947.0	1
16	518.8	4947.0	522.6	4952.0	1
17	522.6	4952.0	527.3	4954.0	1
18	527.3	4954.0	531.9	4956.0	1
19	531.9	4956.0	534.3	4957.0	1

15 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	445.9	4930.0	451.3	4930.0	1
2	451.3	4930.0	452.8	4933.5	1
3	495.5	4936.0	496.5	4936.0	1
4	496.5	4936.0	496.6	4945.0	1

	145150AC					
5	100.0	4856.5	180.0	4862.0	2	
6	180.0	4862.0	230.0	4872.5	2	
7	230.0	4872.5	264.9	4880.5	2	
8	264.9	4880.5	290.1	4886.5	2	
9	290.1	4886.5	313.3	4894.5	2	
10	313.3	4894.5	373.8	4903.0	2	
11	373.8	4903.0	451.3	4929.0	3	
12	451.3	4929.0	496.5	4933.0	3	
13	496.5	4933.0	534.3	4955.0	3	
14	373.8	4903.0	445.9	4918.0	2	
15	445.9	4918.0	534.3	4934.0	2	

-----  
ISOTROPIC Soil Parameters  
-----

4 soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	113.0	130.0	200.0	20.00	.000	.0	1
2	118.0	130.0	400.0	27.00	.000	.0	1
3	110.0	137.0	240.0	34.00	.000	.0	1
4	145.0	145.0	1000.0	.00	.000	.0	0

1 water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water surface No. 1 specified by 5 coordinate points

\*\*\*\*\*  
PHREATIC SURFACE,  
\*\*\*\*\*

Point No.	x-water (ft)	y-water (ft)
1	100.00	4853.00
2	180.00	4857.00
3	290.00	4880.00
4	373.80	4895.00
5	534.30	4928.00

BOUNDARY LOADS

1 load(s) specified

Load No.	x-left (ft)	x-right (ft)	Intensity (psf)	Direction (deg)
1	458.7	495.5	1500.0	.0

145150AC

NOTE - Intensity is specified as a uniformly distributed force acting on a HORIZONTALLY projected surface.

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

20 surfaces initiate from each of 50 points equally spaced along the ground surface between x = 100.0 ft and x = 300.0 ft

Each surface terminates between x = 350.0 ft and x = 534.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

10.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees  
Upper angular limit := (slope angle - 5.0) degrees

\*\*\*\*\*  
-- WARNING -- WARNING -- WARNING -- WARNING -- (# 48)  
\*\*\*\*\*  
Negative effective stresses were calculated at the base of a slice. This warning is usually reported for slices that have low self weight and a relatively high "c" shear strength parameter. This effect can be eliminated by inserting a crack or by reducing the "c" value.  
\*\*\*\*\*

-----  
USER SELECTED option to maintain strength greater than zero  
-----

\*\*\*\*\*  
\*\* Factor of safety calculation for surface # 986 \*\*  
\*\* failed to converge within FIFTY iterations \*\*  
\*\* The last calculated value of the FOS was 1#INF... \*\*  
\*\* This will be ignored for final summary of results \*\*

145150AC

\*\*\*\*\*

Circular surface (FOS =500.000) is defined by: xcenter = 343.18  
ycenter = 3953.59 Init. Pt. = 300.00 Seg. Length = 86.37

-----

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface  
is specified by 43 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	169.39	4861.47
2	178.44	4857.22
3	187.64	4853.29
4	196.96	4849.68
5	206.41	4846.39
6	215.96	4843.44
7	225.61	4840.82
8	235.34	4838.53
9	245.15	4836.58
10	255.02	4834.98
11	264.94	4833.71
12	274.90	4832.80
13	284.88	4832.22
14	294.88	4832.00
15	304.88	4832.12
16	314.87	4832.59
17	324.84	4833.40
18	334.77	4834.56
19	344.66	4836.07
20	354.48	4837.91
21	364.24	4840.10
22	373.92	4842.62
23	383.50	4845.48
24	392.98	4848.66
25	402.34	4852.18
26	411.58	4856.01
27	420.67	4860.17
28	429.62	4864.63
29	438.41	4869.41
30	447.02	4874.49
31	455.46	4879.86
32	463.70	4885.52
33	471.74	4891.46
34	479.57	4897.68
35	487.18	4904.17
36	494.56	4910.92
37	501.70	4917.92
38	508.60	4925.16
39	515.24	4932.64
40	521.62	4940.34
41	527.72	4948.26
42	533.55	4956.39



```

*****
*                               *
*           X S T A B L         *
*                               *
*       Slope Stability Analysis *
*           using the           *
*       Method of Slices       *
*                               *
*       Copyright (C) 1992 Å 94 *
*       Interactive Software Designs, Inc. *
*       Moscow, ID 83843, U.S.A. *
*                               *
*       All Rights Reserved     *
*                               *
*       Ver. 5.004              *
*                               *
*                               *
*****

```

Problem Description : Lot 15 Ski Lakes ~ Seismic

-----  
SEGMENT BOUNDARY COORDINATES  
-----

19 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	soil Unit Below Segment
1	100.0	4858.0	180.0	4862.0	1
2	180.0	4862.0	230.0	4874.0	1
3	230.0	4874.0	264.9	4882.0	1
4	264.9	4882.0	290.1	4888.0	1
5	290.1	4888.0	313.3	4896.0	1
6	313.3	4896.0	373.8	4910.0	1
7	373.8	4910.0	445.9	4930.0	1
8	445.9	4930.0	451.3	4933.5	4
9	451.3	4933.5	452.8	4933.5	4
10	452.8	4933.5	458.7	4935.5	1
11	458.7	4935.5	495.5	4936.0	1
12	495.5	4936.0	495.6	4945.0	4
13	495.6	4945.0	496.6	4945.0	4
14	496.6	4945.0	513.7	4946.0	1
15	513.7	4946.0	518.8	4947.0	1
16	518.8	4947.0	522.6	4952.0	1
17	522.6	4952.0	527.3	4954.0	1
18	527.3	4954.0	531.9	4956.0	1
19	531.9	4956.0	534.3	4957.0	1

15 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	soil Unit Below Segment
1	445.9	4930.0	451.3	4930.0	1
2	451.3	4930.0	452.8	4933.5	1
3	495.5	4936.0	496.5	4936.0	1
4	496.5	4936.0	496.6	4945.0	1



			145150As			
5	100.0	4856.5	180.0	4862.0		2
6	180.0	4862.0	230.0	4872.5		2
7	230.0	4872.5	264.9	4880.5		2
8	264.9	4880.5	290.1	4886.5		2
9	290.1	4886.5	313.3	4894.5		2
10	313.3	4894.5	373.8	4903.0		2
11	373.8	4903.0	451.3	4929.0		3
12	451.3	4929.0	496.5	4933.0		3
13	496.5	4933.0	534.3	4955.0		3
14	373.8	4903.0	445.9	4918.0		2
15	445.9	4918.0	534.3	4934.0		2

-----  
ISOTROPIC Soil Parameters  
-----

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	113.0	130.0	200.0	20.00	.000	.0	1
2	118.0	130.0	400.0	27.00	.000	.0	1
3	110.0	137.0	240.0	34.00	.000	.0	1
4	145.0	145.0	1000.0	.00	.000	.0	0

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

\*\*\*\*\*  
PHREATIC SURFACE,  
\*\*\*\*\*

Point No.	x-water (ft)	y-water (ft)
1	100.00	4853.00
2	180.00	4857.00
3	290.00	4880.00
4	373.80	4895.00
5	534.30	4928.00

A horizontal earthquake loading coefficient of .193 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

BOUNDARY LOADS

1 load(s) specified

145150AS

Load No.	x-left (ft)	x-right (ft)	Intensity (psf)	Direction (deg)
1	458.7	495.5	1500.0	.0

NOTE - Intensity is specified as a uniformly distributed force acting on a HORIZONTALLY projected surface.

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

20 surfaces initiate from each of 50 points equally spaced along the ground surface between x = 100.0 ft and x = 300.0 ft

Each surface terminates between x = 350.0 ft and x = 534.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

10.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees  
Upper angular limit := (slope angle - 5.0) degrees

\*\*\*\*\*  
-- WARNING -- WARNING -- WARNING -- WARNING -- (# 48)  
\*\*\*\*\*  
Negative effective stresses were calculated at the base of a slice. This warning is usually reported for slices that have low self weight and a relatively high "c" shear strength parameter. This effect can be eliminated by inserting a crack or by reducing the "c" value.  
\*\*\*\*\*

-----  
USER SELECTED option to maintain strength greater than zero  
-----

145150AS

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface  
is specified by 48 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	112.24	4858.61
2	121.33	4854.43
3	130.53	4850.51
4	139.83	4846.85
5	149.25	4843.47
6	158.75	4840.36
7	168.34	4837.53
8	178.01	4834.98
9	187.75	4832.71
10	197.55	4830.72
11	207.40	4829.02
12	217.30	4827.60
13	227.24	4826.47
14	237.20	4825.63
15	247.19	4825.08
16	257.18	4824.81
17	267.18	4824.84
18	277.18	4825.16
19	287.16	4825.76
20	297.12	4826.66
21	307.05	4827.84
22	316.94	4829.31
23	326.79	4831.06
24	336.58	4833.10
25	346.30	4835.43
26	355.96	4838.03
27	365.53	4840.91
28	375.02	4844.07
29	384.41	4847.50
30	393.70	4851.21
31	402.88	4855.18
32	411.94	4859.41
33	420.87	4863.91
34	429.67	4868.66
35	438.33	4873.66
36	446.84	4878.92
37	455.19	4884.41
38	463.38	4890.15
39	471.40	4896.12
40	479.25	4902.32
41	486.91	4908.75
42	494.38	4915.40
43	501.66	4922.25
44	508.73	4929.32
45	515.60	4936.59
46	522.25	4944.06
47	528.69	4951.71
48	532.18	4956.12

145150AS

\*\*\*\* Simplified BISHOP FOS = 1.040 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Lot 15 Ski Lakes ~ Seismic

	FOS (BISHOP)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.040	261.13	5169.67	344.85	112.24	532.18	3.257E+08
2.	1.044	271.56	5135.21	317.00	116.33	533.47	3.299E+08
3.	1.044	278.47	5128.28	305.67	132.65	530.43	2.955E+08
4.	1.045	274.84	5169.61	333.80	148.98	531.29	2.646E+08
5.	1.045	282.20	5123.49	298.99	140.82	528.77	2.796E+08
6.	1.046	277.09	5124.92	304.21	128.57	529.29	3.013E+08
7.	1.049	296.26	5120.03	288.01	169.39	533.82	2.453E+08
8.	1.049	258.49	5144.41	323.10	108.16	513.69	3.066E+08
9.	1.050	288.04	5113.65	284.67	157.14	518.59	2.435E+08
10.	1.051	246.98	5216.58	385.82	104.08	531.18	3.314E+08

\* \* \* END OF FILE \* \* \*

```

*****
*           X S T A B L           *
*           Slope Stability Analysis   *
*           using the                 *
*           Method of Slices          *
*           Copyright (C) 1992 Å 94   *
*           Interactive Software Designs, Inc. *
*           Moscow, ID 83843, U.S.A.   *
*           All Rights Reserved       *
*           Ver. 5.004                 *
*           94 Å 1295                 *
*****

```

Problem Description : Lot 15 Ski Lakes ~ Static

-----  
SEGMENT BOUNDARY COORDINATES  
-----

19 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	100.0	4858.0	180.0	4862.0	1
2	180.0	4862.0	230.0	4874.0	1
3	230.0	4874.0	264.9	4882.0	1
4	264.9	4882.0	290.1	4888.0	1
5	290.1	4888.0	313.3	4896.0	1
6	313.3	4896.0	373.8	4910.0	1
7	373.8	4910.0	445.9	4930.0	1
8	445.9	4930.0	451.3	4933.5	4
9	451.3	4933.5	452.8	4933.5	4
10	452.8	4933.5	458.7	4935.5	1
11	458.7	4935.5	495.5	4936.0	1
12	495.5	4936.0	495.6	4945.0	4
13	495.6	4945.0	496.6	4945.0	4
14	496.6	4945.0	513.7	4946.0	1
15	513.7	4946.0	518.8	4947.0	1
16	518.8	4947.0	522.6	4952.0	1
17	522.6	4952.0	527.3	4954.0	1
18	527.3	4954.0	531.9	4956.0	1
19	531.9	4956.0	534.3	4957.0	1

15 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	445.9	4930.0	451.3	4930.0	1
2	451.3	4930.0	452.8	4933.5	1
3	495.5	4936.0	496.5	4936.0	1
4	496.5	4936.0	496.6	4945.0	1

			145150BC		
5	100.0	4856.5	180.0	4862.0	2
6	180.0	4862.0	230.0	4872.5	2
7	230.0	4872.5	264.9	4880.5	2
8	264.9	4880.5	290.1	4886.5	2
9	290.1	4886.5	313.3	4894.5	2
10	313.3	4894.5	373.8	4903.0	2
11	373.8	4903.0	451.3	4929.0	3
12	451.3	4929.0	496.5	4933.0	3
13	496.5	4933.0	534.3	4955.0	3
14	373.8	4903.0	445.9	4918.0	2
15	445.9	4918.0	534.3	4934.0	2

-----  
ISOTROPIC Soil Parameters  
-----

4 soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	113.0	130.0	200.0	20.00	.000	.0	1
2	118.0	130.0	400.0	27.00	.000	.0	1
3	110.0	137.0	240.0	34.00	.000	.0	1
4	145.0	145.0	1000.0	.00	.000	.0	0

1 water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water surface No. 1 specified by 5 coordinate points

\*\*\*\*\*  
PHREATIC SURFACE,  
\*\*\*\*\*

Point No.	x-water (ft)	y-water (ft)
1	100.00	4853.00
2	180.00	4857.00
3	290.00	4880.00
4	373.80	4895.00
5	534.30	4928.00

BOUNDARY LOADS

1 load(s) specified

Load No.	x-left (ft)	x-right (ft)	Intensity (psf)	Direction (deg)
1	458.7	495.5	1500.0	.0

145150BC

NOTE - Intensity is specified as a uniformly distributed force acting on a HORIZONTALLY projected surface.

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

20 surfaces initiate from each of 50 points equally spaced along the ground surface between x = 100.0 ft and x = 300.0 ft

Each surface terminates between x = 445.0 ft and x = 495.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*

8.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees  
Upper angular limit := (slope angle - 5.0) degrees

\*\*\*\*\*  
-- WARNING -- WARNING -- WARNING -- WARNING -- (# 48)  
\*\*\*\*\*  
Negative effective stresses were calculated at the base of a slice. This warning is usually reported for slices that have low self weight and a relatively high "c" shear strength parameter. This effect can be eliminated by inserting a crack or by reducing the "c" value.  
\*\*\*\*\*

-----  
USER SELECTED option to maintain strength greater than zero  
-----

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

145150BC

The most critical circular failure surface  
is specified by 47 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	169.39	4861.47
2	176.63	4858.07
3	183.97	4854.89
4	191.40	4851.93
5	198.92	4849.20
6	206.52	4846.70
7	214.19	4844.42
8	221.93	4842.38
9	229.72	4840.57
10	237.56	4838.99
11	245.45	4837.65
12	253.37	4836.55
13	261.33	4835.69
14	269.30	4835.07
15	277.29	4834.69
16	285.29	4834.54
17	293.29	4834.64
18	301.28	4834.98
19	309.26	4835.56
20	317.22	4836.38
21	325.15	4837.44
22	333.04	4838.74
23	340.90	4840.27
24	348.70	4842.04
25	356.44	4844.04
26	364.13	4846.27
27	371.74	4848.74
28	379.27	4851.43
29	386.72	4854.35
30	394.08	4857.48
31	401.34	4860.84
32	408.49	4864.42
33	415.54	4868.21
34	422.47	4872.21
35	429.27	4876.42
36	435.95	4880.83
37	442.49	4885.43
38	448.88	4890.24
39	455.14	4895.23
40	461.23	4900.41
41	467.17	4905.77
42	472.95	4911.30
43	478.55	4917.01
44	483.99	4922.88
45	489.24	4928.92
46	494.31	4935.11
47	494.99	4935.99

\*\*\*\* Simplified BISHOP FOS = 1.893 \*\*\*\*

The following is a summary of the TEN most critical surfaces



145150BC

Problem Description : Lot 15 Ski Lakes ~ Static

	FOS (BISHOP)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.893	286.03	5100.62	266.08	169.39	494.99	2.024E+08
2.	1.897	287.69	5104.39	266.35	177.55	494.12	1.910E+08
3.	1.899	280.13	5099.94	268.86	157.14	493.35	2.142E+08
4.	1.900	278.61	5139.28	296.85	173.47	494.89	1.991E+08
5.	1.902	266.65	5151.38	313.83	148.98	494.67	2.282E+08
6.	1.906	289.39	5090.12	254.17	177.55	491.49	1.856E+08
7.	1.907	286.68	5082.37	254.40	161.22	494.71	2.131E+08
8.	1.908	272.66	5107.16	280.09	140.82	494.27	2.388E+08
9.	1.910	274.32	5126.83	287.07	165.31	488.54	1.941E+08
10.	1.910	295.86	5088.45	250.59	185.71	494.97	1.812E+08

\* \* \* END OF FILE \* \* \*

```

*****
*           X S T A B L           *
*           Slope Stability Analysis *
*           using the             *
*           Method of Slices      *
*           Copyright (C) 1992 Å 94 *
*           Interactive Software Designs, Inc. *
*           Moscow, ID 83843, U.S.A. *
*           All Rights Reserved    *
*           Ver. 5.004             *
*           94 Å 1295             *
*****

```

Problem Description : Lot 15 Ski Lakes ~ Seismic

-----  
SEGMENT BOUNDARY COORDINATES  
-----

19 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	100.0	4858.0	180.0	4862.0	1
2	180.0	4862.0	230.0	4874.0	1
3	230.0	4874.0	264.9	4882.0	1
4	264.9	4882.0	290.1	4888.0	1
5	290.1	4888.0	313.3	4896.0	1
6	313.3	4896.0	373.8	4910.0	1
7	373.8	4910.0	445.9	4930.0	1
8	445.9	4930.0	451.3	4933.5	4
9	451.3	4933.5	452.8	4933.5	4
10	452.8	4933.5	458.7	4935.5	1
11	458.7	4935.5	495.5	4936.0	1
12	495.5	4936.0	495.6	4945.0	4
13	495.6	4945.0	496.6	4945.0	4
14	496.6	4945.0	513.7	4946.0	1
15	513.7	4946.0	518.8	4947.0	1
16	518.8	4947.0	522.6	4952.0	1
17	522.6	4952.0	527.3	4954.0	1
18	527.3	4954.0	531.9	4956.0	1
19	531.9	4956.0	534.3	4957.0	1

15 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	445.9	4930.0	451.3	4930.0	1
2	451.3	4930.0	452.8	4933.5	1
3	495.5	4936.0	496.5	4936.0	1
4	496.5	4936.0	496.6	4945.0	1

			145150BS		
5	100.0	4856.5	180.0	4862.0	2
6	180.0	4862.0	230.0	4872.5	2
7	230.0	4872.5	264.9	4880.5	2
8	264.9	4880.5	290.1	4886.5	2
9	290.1	4886.5	313.3	4894.5	2
10	313.3	4894.5	373.8	4903.0	2
11	373.8	4903.0	451.3	4929.0	3
12	451.3	4929.0	496.5	4933.0	3
13	496.5	4933.0	534.3	4955.0	3
14	373.8	4903.0	445.9	4918.0	2
15	445.9	4918.0	534.3	4934.0	2

-----  
ISOTROPIC Soil Parameters  
-----

4 soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	113.0	130.0	200.0	20.00	.000	.0	1
2	118.0	130.0	400.0	27.00	.000	.0	1
3	110.0	137.0	240.0	34.00	.000	.0	1
4	145.0	145.0	1000.0	.00	.000	.0	0

1 water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water surface No. 1 specified by 5 coordinate points

\*\*\*\*\*  
PHREATIC SURFACE,  
\*\*\*\*\*

Point No.	x-water (ft)	y-water (ft)
1	100.00	4853.00
2	180.00	4857.00
3	290.00	4880.00
4	373.80	4895.00
5	534.30	4928.00

A horizontal earthquake loading coefficient of .193 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

BOUNDARY LOADS

1 load(s) specified

145150BS

Load No.	x-left (ft)	x-right (ft)	Intensity (psf)	Direction (deg)
1	458.7	495.5	1500.0	.0

NOTE - Intensity is specified as a uniformly distributed force acting on a HORIZONTALLY projected surface.

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

20 surfaces initiate from each of 50 points equally spaced along the ground surface between x = 100.0 ft and x = 300.0 ft

Each surface terminates between x = 445.0 ft and x = 495.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*  
8.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees  
Upper angular limit := (slope angle - 5.0) degrees

\*\*\*\*\*  
-- WARNING -- WARNING -- WARNING -- WARNING -- (# 48)  
\*\*\*\*\*  
Negative effective stresses were calculated at the base of a slice. This warning is usually reported for slices that have low self weight and a relatively high "c" shear strength parameter. This effect can be eliminated by inserting a crack or by reducing the "c" value.  
\*\*\*\*\*

-----  
USER SELECTED option to maintain strength greater than zero  
-----

145150BS

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface  
is specified by 54 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	112.24	4858.61
2	119.51	4855.26
3	126.86	4852.09
4	134.28	4849.11
5	141.77	4846.30
6	149.33	4843.69
7	156.95	4841.25
8	164.63	4839.01
9	172.36	4836.96
10	180.14	4835.09
11	187.97	4833.42
12	195.83	4831.94
13	203.72	4830.66
14	211.65	4829.57
15	219.60	4828.68
16	227.57	4827.98
17	235.55	4827.48
18	243.55	4827.17
19	251.55	4827.06
20	259.55	4827.15
21	267.54	4827.44
22	275.53	4827.92
23	283.50	4828.60
24	291.45	4829.47
25	299.38	4830.54
26	307.28	4831.80
27	315.14	4833.26
28	322.97	4834.91
29	330.76	4836.76
30	338.49	4838.79
31	346.18	4841.02
32	353.80	4843.43
33	361.37	4846.03
34	368.87	4848.81
35	376.30	4851.78
36	383.65	4854.93
37	390.93	4858.26
38	398.12	4861.77
39	405.22	4865.46
40	412.22	4869.31
41	419.14	4873.34
42	425.95	4877.54
43	432.65	4881.91
44	439.25	4886.43
45	445.73	4891.12
46	452.09	4895.97
47	458.34	4900.97
48	464.45	4906.13

		145150BS
49	470.44	4911.43
50	476.30	4916.88
51	482.02	4922.47
52	487.60	4928.20
53	493.04	4934.07
54	494.74	4935.99

\*\*\*\* Simplified BISHOP FOS = 1.056 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Lot 15 Ski Lakes ~ Seismic

	FOS (BISHOP)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.056	252.01	5152.30	325.24	112.24	494.74	2.693E+08
2.	1.058	268.55	5111.45	286.15	132.65	494.49	2.409E+08
3.	1.058	272.66	5107.16	280.09	140.82	494.27	2.289E+08
4.	1.059	266.65	5151.38	313.83	148.98	494.67	2.180E+08
5.	1.059	267.16	5108.56	285.09	128.57	494.33	2.467E+08
6.	1.060	260.79	5117.40	296.21	116.33	494.90	2.667E+08
7.	1.060	252.33	5134.43	311.41	108.16	492.36	2.709E+08
8.	1.061	280.13	5099.94	268.86	157.14	493.35	2.052E+08
9.	1.062	269.11	5114.22	282.72	144.90	488.27	2.093E+08
10.	1.063	286.03	5100.62	266.08	169.39	494.99	1.937E+08

\* \* \* END OF FILE \* \* \*

```

*****
*                               *
*           X S T A B L         *
*                               *
*           Slope Stability Analysis *
*           using the           *
*           Method of Slices     *
*                               *
*           Copyright (C) 1992 Å 94 *
*           Interactive Software Designs, Inc. *
*           Moscow, ID 83843, U.S.A. *
*                               *
*           All Rights Reserved   *
*                               *
*           Ver. 5.004           94 Å 1295 *
*****

```

Problem Description : Lot 15 Ski Lakes ~ Seismic

-----  
SEGMENT BOUNDARY COORDINATES  
-----

19 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	100.0	4858.0	180.0	4862.0	1
2	180.0	4862.0	230.0	4874.0	1
3	230.0	4874.0	264.9	4882.0	1
4	264.9	4882.0	290.1	4888.0	1
5	290.1	4888.0	313.3	4896.0	1
6	313.3	4896.0	373.8	4910.0	1
7	373.8	4910.0	445.9	4930.0	1
8	445.9	4930.0	451.3	4933.5	4
9	451.3	4933.5	452.8	4933.5	4
10	452.8	4933.5	458.7	4935.5	1
11	458.7	4935.5	495.5	4936.0	1
12	495.5	4936.0	495.6	4945.0	4
13	495.6	4945.0	496.6	4945.0	4
14	496.6	4945.0	513.7	4946.0	1
15	513.7	4946.0	518.8	4947.0	1
16	518.8	4947.0	522.6	4952.0	1
17	522.6	4952.0	527.3	4954.0	1
18	527.3	4954.0	531.9	4956.0	1
19	531.9	4956.0	534.3	4957.0	1

15 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	445.9	4930.0	451.3	4930.0	1
2	451.3	4930.0	452.8	4933.5	1
3	495.5	4936.0	496.5	4936.0	1
4	496.5	4936.0	496.6	4945.0	1

			145150BS		
5	100.0	4856.5	180.0	4862.0	2
6	180.0	4862.0	230.0	4872.5	2
7	230.0	4872.5	264.9	4880.5	2
8	264.9	4880.5	290.1	4886.5	2
9	290.1	4886.5	313.3	4894.5	2
10	313.3	4894.5	373.8	4903.0	2
11	373.8	4903.0	451.3	4929.0	3
12	451.3	4929.0	496.5	4933.0	3
13	496.5	4933.0	534.3	4955.0	3
14	373.8	4903.0	445.9	4918.0	2
15	445.9	4918.0	534.3	4934.0	2

-----  
ISOTROPIC Soil Parameters  
-----

4 soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	113.0	130.0	200.0	20.00	.000	.0	1
2	118.0	130.0	400.0	27.00	.000	.0	1
3	110.0	137.0	240.0	34.00	.000	.0	1
4	145.0	145.0	1000.0	.00	.000	.0	0

1 water surface(s) have been specified

unit weight of water = 62.40 (pcf)

Water surface No. 1 specified by 5 coordinate points

\*\*\*\*\*  
PHREATIC SURFACE,  
\*\*\*\*\*

Point No.	x-water (ft)	y-water (ft)
1	100.00	4853.00
2	180.00	4857.00
3	290.00	4880.00
4	373.80	4895.00
5	534.30	4928.00

A horizontal earthquake loading coefficient of .193 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

BOUNDARY LOADS

1 load(s) specified



145150BS

Load No.	x-left (ft)	x-right (ft)	Intensity (psf)	Direction (deg)
1	458.7	495.5	1500.0	.0

NOTE - Intensity is specified as a uniformly distributed force acting on a HORIZONTALLY projected surface.

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

20 surfaces initiate from each of 50 points equally spaced along the ground surface between x = 100.0 ft and x = 300.0 ft

Each surface terminates between x = 445.0 ft and x = 495.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

\* \* \* \* \* DEFAULT SEGMENT LENGTH SELECTED BY XSTABL \* \* \* \* \*  
8.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees  
Upper angular limit := (slope angle - 5.0) degrees

\*\*\*\*\*  
-- WARNING -- WARNING -- WARNING -- WARNING -- (# 48)  
\*\*\*\*\*  
Negative effective stresses were calculated at the base of a slice. This warning is usually reported for slices that have low self weight and a relatively high "c" shear strength parameter. This effect can be eliminated by inserting a crack or by reducing the "c" value.  
\*\*\*\*\*

-----  
USER SELECTED option to maintain strength greater than zero  
-----

145150BS

Factors of safety have been calculated by the :

\* \* \* \* \* SIMPLIFIED BISHOP METHOD \* \* \* \* \*

The most critical circular failure surface  
is specified by 54 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	112.24	4858.61
2	119.51	4855.26
3	126.86	4852.09
4	134.28	4849.11
5	141.77	4846.30
6	149.33	4843.69
7	156.95	4841.25
8	164.63	4839.01
9	172.36	4836.96
10	180.14	4835.09
11	187.97	4833.42
12	195.83	4831.94
13	203.72	4830.66
14	211.65	4829.57
15	219.60	4828.68
16	227.57	4827.98
17	235.55	4827.48
18	243.55	4827.17
19	251.55	4827.06
20	259.55	4827.15
21	267.54	4827.44
22	275.53	4827.92
23	283.50	4828.60
24	291.45	4829.47
25	299.38	4830.54
26	307.28	4831.80
27	315.14	4833.26
28	322.97	4834.91
29	330.76	4836.76
30	338.49	4838.79
31	346.18	4841.02
32	353.80	4843.43
33	361.37	4846.03
34	368.87	4848.81
35	376.30	4851.78
36	383.65	4854.93
37	390.93	4858.26
38	398.12	4861.77
39	405.22	4865.46
40	412.22	4869.31
41	419.14	4873.34
42	425.95	4877.54
43	432.65	4881.91
44	439.25	4886.43
45	445.73	4891.12
46	452.09	4895.97
47	458.34	4900.97
48	464.45	4906.13

		145150BS
49	470.44	4911.43
50	476.30	4916.88
51	482.02	4922.47
52	487.60	4928.20
53	493.04	4934.07
54	494.74	4935.99

\*\*\*\* Simplified BISHOP FOS = 1.056 \*\*\*\*

The following is a summary of the TEN most critical surfaces

Problem Description : Lot 15 Ski Lakes ~ Seismic

	FOS (BISHOP)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.056	252.01	5152.30	325.24	112.24	494.74	2.693E+08
2.	1.058	268.55	5111.45	286.15	132.65	494.49	2.409E+08
3.	1.058	272.66	5107.16	280.09	140.82	494.27	2.289E+08
4.	1.059	266.65	5151.38	313.83	148.98	494.67	2.180E+08
5.	1.059	267.16	5108.56	285.09	128.57	494.33	2.467E+08
6.	1.060	260.79	5117.40	296.21	116.33	494.90	2.667E+08
7.	1.060	252.33	5134.43	311.41	108.16	492.36	2.709E+08
8.	1.061	280.13	5099.94	268.86	157.14	493.35	2.052E+08
9.	1.062	269.11	5114.22	282.72	144.90	488.27	2.093E+08
10.	1.063	286.03	5100.62	266.08	169.39	494.99	1.937E+08

\* \* \* END OF FILE \* \* \*

## **APPENDIX D**

### **DIRECT SHEAR FILES**

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
Boring No.: 1  
Sample No.: 1  
Test No.: 1

Location: Huntsville  
Tested By: Shawn  
Test Date: 6/12/14  
Sample Type: Block

Project No.: 145150G  
Checked By: Shawn  
Depth: 3.5'  
Elevation:

Soil Description: Consolidation  
Remarks: UNDISTURBED

Load Increment: 1 of 10  
Applied Stress: 0.05 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.03	0.17	3.243e-005

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 2 of 10  
 Applied Stress: 0.125 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	3.243e-005
2	1.00	1.00	0.001427
3	2.00	1.42	0.001394
4	3.00	1.73	0.001492
5	4.00	2.00	0.001459
6	5.00	2.24	0.001459
7	7.00	2.65	0.001362
8	9.00	3.00	0.001167
9	11.00	3.32	0.001038
10	13.00	3.61	0.0009405
11	15.00	3.87	0.0008432
12	20.00	4.47	0.0007459
13	25.00	5.00	0.0006162
14	25.04	5.00	0.0006162

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 3 of 10  
 Applied Stress: 0.25 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.0006162
2	1.00	1.00	0.004151
3	2.00	1.42	0.004378
4	3.00	1.73	0.004508
5	4.00	2.00	0.00454
6	5.00	2.24	0.004605
7	7.00	2.65	0.004702
8	9.00	3.00	0.004702
9	11.00	3.32	0.004702
10	13.00	3.61	0.005027
11	15.00	3.87	0.005027
12	20.00	4.47	0.004962
13	25.00	5.00	0.004929
14	30.00	5.48	0.004897
15	35.00	5.92	0.005156
16	40.00	6.32	0.005092
17	40.13	6.33	0.005092

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 4 of 10  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.005092
2	1.00	1.00	0.01398
3	2.00	1.42	0.01479
4	3.00	1.73	0.01521
5	4.00	2.00	0.01544
6	5.00	2.24	0.01557
7	7.00	2.65	0.01579
8	9.00	3.00	0.01592
9	11.00	3.32	0.01599
10	13.00	3.61	0.01605
11	15.00	3.87	0.01609
12	20.00	4.47	0.01618
13	25.00	5.00	0.01634
14	30.00	5.48	0.01644
15	35.00	5.92	0.01654
16	40.00	6.32	0.01657
17	45.00	6.71	0.01673
18	50.00	7.07	0.0168
19	55.00	7.42	0.01683
20	60.00	7.75	0.01693
21	65.00	8.06	0.01706
22	70.00	8.37	0.01709
23	75.00	8.66	0.01716
24	80.00	8.94	0.01725
25	85.00	9.22	0.01719
26	90.00	9.49	0.01742
27	95.00	9.75	0.01742
28	100.00	10.00	0.01745
29	101.85	10.09	0.01742



DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 5 of 10  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.01742
2	1.00	1.00	0.01754
3	2.00	1.42	0.01754
4	3.00	1.73	0.01754
5	4.00	2.00	0.01754
6	5.00	2.24	0.01754
7	7.00	2.65	0.01751
8	9.00	3.00	0.01751
9	11.00	3.32	0.01751
10	13.00	3.61	0.01751
11	15.00	3.87	0.01754
12	20.00	4.47	0.01751
13	25.00	5.00	0.01754
14	30.00	5.48	0.01758
15	35.00	5.92	0.01761
16	40.00	6.32	0.01758
17	45.00	6.71	0.01754
18	50.00	7.07	0.01758
19	55.00	7.42	0.01761
20	55.45	7.45	0.01758

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 6 of 10  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.01758
2	1.00	1.00	0.03629
3	2.00	1.42	0.03924
4	3.00	1.73	0.04028
5	4.00	2.00	0.04106
6	5.00	2.24	0.04154
7	7.00	2.65	0.04193
8	9.00	3.00	0.04229
9	11.00	3.32	0.04255
10	13.00	3.61	0.04271
11	15.00	3.87	0.04281
12	20.00	4.47	0.04316
13	25.00	5.00	0.04342
14	30.00	5.48	0.04362
15	35.00	5.92	0.04388
16	40.00	6.32	0.04401
17	45.00	6.71	0.04407
18	50.00	7.07	0.04414
19	55.00	7.42	0.04417
20	56.96	7.55	0.0442

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 7 of 10  
 Applied Stress: 2 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.0442
2	1.00	1.00	0.07559
3	2.00	1.42	0.07845
4	3.00	1.73	0.07975
5	4.00	2.00	0.08072
6	5.00	2.24	0.08143
7	7.00	2.65	0.0825
8	9.00	3.00	0.08299
9	11.00	3.32	0.08344
10	13.00	3.61	0.0838
11	15.00	3.87	0.08416
12	20.00	4.47	0.08445
13	25.00	5.00	0.08464
14	30.00	5.48	0.08484
15	35.00	5.92	0.08497
16	40.00	6.32	0.08523
17	45.00	6.71	0.08542
18	50.00	7.07	0.08555
19	52.63	7.25	0.08565

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 8 of 10  
 Applied Stress: 4 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.08565
2	1.00	1.00	0.1184
3	2.00	1.42	0.1197
4	3.00	1.73	0.1212
5	4.00	2.00	0.1223
6	5.00	2.24	0.1227
7	7.00	2.65	0.1235
8	9.00	3.00	0.1241
9	11.00	3.32	0.1251
10	13.00	3.61	0.1258
11	15.00	3.87	0.1262
12	20.00	4.47	0.1273
13	25.00	5.00	0.1278
14	30.00	5.48	0.1283
15	35.00	5.92	0.1288
16	40.00	6.32	0.1295
17	45.00	6.71	0.1297
18	50.00	7.07	0.1298
19	55.00	7.42	0.1299
20	60.00	7.75	0.1301
21	65.00	8.06	0.1302
22	68.62	8.28	0.1302

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 9 of 10  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.1302
2	1.00	1.00	0.1226
3	2.00	1.42	0.1224
4	3.00	1.73	0.1221
5	4.00	2.00	0.122
6	5.00	2.24	0.1218
7	7.00	2.65	0.1217
8	9.00	3.00	0.1214
9	11.00	3.32	0.1211
10	13.00	3.61	0.1209
11	15.00	3.87	0.1208
12	20.00	4.47	0.1206
13	25.00	5.00	0.1204
14	30.00	5.48	0.1203
15	35.00	5.92	0.1199
16	39.37	6.27	0.1197

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/12/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 10 of 10  
 Applied Stress: 0.25 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.1197
2	1.00	1.00	0.1159
3	2.00	1.42	0.1146
4	3.00	1.73	0.1143
5	4.00	2.00	0.1138
6	5.00	2.24	0.1134
7	7.00	2.65	0.1131
8	9.00	3.00	0.113
9	11.00	3.32	0.1129
10	13.00	3.61	0.1127
11	15.00	3.87	0.1125
12	20.00	4.47	0.1118
13	25.00	5.00	0.1112
14	30.00	5.48	0.1107
15	35.00	5.92	0.1103
16	40.00	6.32	0.1101
17	45.00	6.71	0.11
18	50.00	7.07	0.1098
19	55.00	7.42	0.1097
20	60.00	7.75	0.1096
21	65.00	8.06	0.1095
22	70.00	8.37	0.1093
23	75.00	8.66	0.1091
24	80.00	8.94	0.1088
25	85.00	9.22	0.1087
26	90.00	9.49	0.1084
27	95.00	9.75	0.1082
28	100.00	10.00	0.108
29	105.00	10.25	0.1079
30	110.00	10.49	0.1078
31	110.70	10.52	0.1077

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
Boring No.: 2  
Sample No.: 1  
Test No.: 1

Location: Huntsville  
Tested By: Shawn  
Test Date: 6/10/14  
Sample Type: Block

Project No.: 145150G  
Checked By: Shawn  
Depth: 3.5'  
Elevation:

Soil Description: Consolidation  
Remarks: UNDISTURBED

Load Increment: 1 of 10  
Applied Stress: 0.05 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.05	0.23	-0.000227

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 2 of 10  
 Applied Stress: 0.125 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	-0.000227
2	1.00	1.00	-0.0002919
3	2.00	1.42	-0.0002594
4	3.00	1.73	-0.0002594
5	4.00	2.00	-0.0002594
6	5.00	2.24	-0.0002594
7	7.00	2.65	-0.0002594
8	9.00	3.00	-0.0002919
9	11.00	3.32	-0.0002594
10	13.00	3.61	-0.0002594
11	15.00	3.87	-0.0002594
12	20.00	4.47	-0.0002594
13	25.00	5.00	-0.0002594
14	30.00	5.48	-0.000227
15	35.00	5.92	-0.0001297
16	40.00	6.32	-0.0001622
17	45.00	6.71	-0.0006162
18	50.00	7.07	-0.0009729
19	55.00	7.42	-0.001232
20	60.00	7.75	-0.001394
21	65.00	8.06	-0.001459
22	70.00	8.37	-0.001167
23	75.00	8.66	-0.0009729
24	80.00	8.94	-0.000908
25	80.74	8.99	-0.0008756



DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 3 of 10  
 Applied Stress: 0.25 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	-0.0008756
2	1.00	1.00	0.001719
3	2.00	1.42	0.001751
4	3.00	1.73	0.001784
5	4.00	2.00	0.001816
6	5.00	2.24	0.001816
7	7.00	2.65	0.001881
8	9.00	3.00	0.001913
9	11.00	3.32	0.001913
10	13.00	3.61	0.001913
11	15.00	3.87	0.001913
12	16.83	4.10	0.001881

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 4 of 10  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.001881
2	1.00	1.00	0.007459
3	2.00	1.42	0.007783
4	3.00	1.73	0.007978
5	4.00	2.00	0.008108
6	5.00	2.24	0.008172
7	7.00	2.65	0.008302
8	9.00	3.00	0.008399
9	11.00	3.32	0.008367
10	13.00	3.61	0.008464
11	15.00	3.87	0.008432
12	18.64	4.32	0.008432

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 5 of 10  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.008432
2	1.00	1.00	0.008432
3	2.00	1.42	0.008562
4	3.00	1.73	0.008562
5	4.00	2.00	0.008562
6	5.00	2.24	0.008562
7	7.00	2.65	0.008529
8	9.00	3.00	0.008529
9	11.00	3.32	0.008497
10	13.00	3.61	0.008497
11	15.00	3.87	0.008497
12	20.00	4.47	0.008497
13	25.00	5.00	0.008529
14	30.00	5.48	0.008464
15	35.00	5.92	0.008594
16	40.00	6.32	0.008691
17	45.00	6.71	0.008821
18	50.00	7.07	0.008951
19	55.00	7.42	0.009048
20	60.00	7.75	0.009178
21	65.00	8.06	0.009243
22	70.00	8.37	0.009243
23	75.00	8.66	0.009275
24	80.00	8.94	0.009275
25	85.00	9.22	0.009243
26	90.00	9.49	0.00921
27	95.00	9.75	0.009113
28	100.00	10.00	0.009145
29	105.00	10.25	0.009113
30	110.00	10.49	0.00908
31	115.00	10.72	0.009016
32	120.00	10.95	0.009016
33	125.00	11.18	0.008951
34	130.00	11.40	0.008853
35	135.00	11.62	0.008789
36	140.00	11.83	0.008691
37	145.00	12.04	0.008594
38	150.00	12.25	0.008562
39	155.00	12.45	0.008529
40	160.00	12.65	0.008432
41	165.00	12.85	0.008335
42	170.00	13.04	0.00827
43	175.00	13.23	0.008205
44	180.00	13.42	0.008172
45	185.00	13.60	0.008108
46	190.00	13.78	0.00801
47	195.00	13.96	0.007945
48	200.00	14.14	0.007913
49	205.00	14.32	0.007783
50	210.00	14.49	0.007686
51	215.00	14.66	0.007621
52	220.00	14.83	0.007621
53	225.00	15.00	0.007556
54	230.00	15.17	0.007524
55	235.00	15.33	0.007459
56	240.00	15.49	0.007459
57	245.00	15.65	0.007394
58	250.00	15.81	0.007362
59	255.00	15.97	0.007297
60	260.00	16.12	0.007264
61	265.00	16.28	0.007394
62	270.00	16.43	0.007621
63	275.00	16.58	0.007816
64	280.00	16.73	0.00801
65	285.00	16.88	0.008172
66	290.00	17.03	0.00827
67	295.00	17.18	0.008367
68	300.00	17.32	0.008497
69	305.00	17.46	0.008594
70	310.00	17.61	0.008724
71	315.00	17.75	0.008821
72	320.00	17.89	0.008951
73	325.00	18.03	0.00908
74	330.00	18.17	0.009178
75	335.00	18.30	0.009307
76	340.00	18.44	0.009372
77	345.00	18.57	0.00947
78	350.00	18.71	0.009502
79	355.00	18.84	0.009632
80	360.00	18.97	0.009697
81	365.00	19.10	0.009761

82	370.00	19.24	0.009826
83	375.00	19.36	0.009891
84	380.00	19.49	0.009956
85	385.00	19.62	0.01002
86	390.00	19.75	0.01009
87	395.00	19.87	0.01015
88	400.00	20.00	0.01031
89	405.00	20.12	0.01035
90	410.00	20.25	0.01035
91	415.00	20.37	0.01041
92	420.00	20.49	0.01047
93	425.00	20.62	0.01047
94	430.00	20.74	0.01051
95	435.00	20.86	0.01051
96	440.00	20.98	0.01051
97	445.00	21.10	0.01054
98	450.00	21.21	0.01044
99	455.00	21.33	0.01038
100	460.00	21.45	0.01028
101	465.00	21.56	0.01022
102	470.00	21.68	0.01015
103	475.00	21.79	0.01012
104	480.00	21.91	0.01009
105	485.00	22.02	0.01005
106	489.99	22.14	0.01002

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 6 of 10  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.01002
2	1.00	1.00	0.01871
3	2.00	1.42	0.0191
4	3.00	1.73	0.0193
5	4.00	2.00	0.01943
6	5.00	2.24	0.01949
7	7.00	2.65	0.01965
8	9.00	3.00	0.01972
9	11.00	3.32	0.01981
10	13.00	3.61	0.01985
11	15.00	3.87	0.01985
12	20.00	4.47	0.02004
13	25.00	5.00	0.02011
14	30.00	5.48	0.02014
15	33.60	5.80	0.0204

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 7 of 10  
 Applied Stress: 2 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.0204
2	1.00	1.00	0.0372
3	2.00	1.42	0.03866
4	3.00	1.73	0.03911
5	4.00	2.00	0.0394
6	5.00	2.24	0.03963
7	7.00	2.65	0.03989
8	9.00	3.00	0.04028
9	11.00	3.32	0.04064
10	13.00	3.61	0.0408
11	15.00	3.87	0.04115
12	20.00	4.47	0.04138
13	25.00	5.00	0.04167
14	30.00	5.48	0.04177
15	35.00	5.92	0.0418
16	40.00	6.32	0.0419
17	45.00	6.71	0.04187
18	50.00	7.07	0.04187
19	55.00	7.42	0.0419
20	60.00	7.75	0.04183
21	65.00	8.06	0.0419
22	70.00	8.37	0.04187
23	75.00	8.66	0.04203
24	77.12	8.78	0.042

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 8 of 10  
 Applied Stress: 4 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.042
2	1.00	1.00	0.06963
3	2.00	1.42	0.072
4	3.00	1.73	0.07268
5	4.00	2.00	0.07303
6	5.00	2.24	0.07339
7	7.00	2.65	0.07378
8	9.00	3.00	0.07449
9	11.00	3.32	0.07491
10	13.00	3.61	0.07534
11	15.00	3.87	0.0755
12	20.00	4.47	0.07592
13	25.00	5.00	0.07621
14	30.00	5.48	0.07647
15	35.00	5.92	0.07667
16	40.00	6.32	0.07679
17	45.00	6.71	0.07692
18	50.00	7.07	0.07699
19	55.00	7.42	0.07725
20	60.00	7.75	0.07728
21	65.00	8.06	0.07774
22	70.00	8.37	0.07774
23	75.00	8.66	0.07777
24	80.00	8.94	0.07796
25	85.00	9.22	0.07799
26	86.25	9.29	0.07799

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 9 of 10  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.07799
2	1.00	1.00	0.06856
3	2.00	1.42	0.06791
4	3.00	1.73	0.06758
5	4.00	2.00	0.06742
6	5.00	2.24	0.06726
7	7.00	2.65	0.06713
8	9.00	3.00	0.0669
9	11.00	3.32	0.0669
10	13.00	3.61	0.06671
11	15.00	3.87	0.06671
12	20.00	4.47	0.06645
13	25.00	5.00	0.06645
14	30.00	5.48	0.06622
15	35.00	5.92	0.06622
16	40.00	6.32	0.06625
17	45.00	6.71	0.06625
18	50.00	7.07	0.06625
19	55.00	7.42	0.06629
20	60.00	7.75	0.06632
21	65.00	8.06	0.06606
22	70.00	8.37	0.06609
23	72.84	8.53	0.06613



DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes No. 3  
 Boring No.: 2  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/10/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation:

Soil Description: Consolidation  
 Remarks: UNDISTURBED

Load Increment: 10 of 10  
 Applied Stress: 0.25 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0.06613
2	1.00	1.00	0.05828
3	2.00	1.42	0.05737
4	3.00	1.73	0.05685
5	4.00	2.00	0.05653
6	5.00	2.24	0.05617
7	7.00	2.65	0.05578
8	9.00	3.00	0.05507
9	11.00	3.32	0.05461
10	13.00	3.61	0.05429
11	15.00	3.87	0.0539
12	20.00	4.47	0.05354
13	25.00	5.00	0.05312
14	30.00	5.48	0.05306
15	35.00	5.92	0.05299
16	40.00	6.32	0.05289
17	45.00	6.71	0.05293
18	50.00	7.07	0.05276
19	55.00	7.42	0.05276
20	60.00	7.75	0.05276
21	65.00	8.06	0.05244
22	70.00	8.37	0.05247
23	75.00	8.66	0.0525
24	79.88	8.94	0.0525

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location:  
 Tested By: Shawn  
 Test Date: 6/13/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation: Not Marked

Soil Description: 1 ksf  
 Remarks: Undisturbed

Load Increment: 1 of 1  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.004021
3	0.33	0.58	0.005124
4	0.50	0.71	0.009113
5	0.67	0.82	0.01086
6	0.83	0.91	0.01125
7	1.00	1.00	0.01158
8	1.17	1.08	0.01174
9	1.34	1.16	0.01187
10	1.50	1.23	0.0119
11	1.67	1.29	0.01193
12	1.84	1.35	0.01197
13	2.00	1.42	0.01203
14	2.17	1.47	0.01206
15	2.34	1.53	0.01206
16	2.50	1.58	0.0121
17	2.67	1.63	0.01213
18	2.84	1.68	0.0121
19	3.00	1.73	0.01213
20	3.17	1.78	0.01216
21	3.33	1.83	0.01216
22	3.50	1.87	0.01216
23	3.67	1.92	0.01216
24	3.83	1.96	0.01216
25	4.00	2.00	0.01216
26	4.17	2.04	0.01216
27	4.34	2.08	0.01219
28	4.50	2.12	0.01219
29	4.67	2.16	0.01219
30	4.84	2.20	0.01223
31	5.00	2.24	0.01219
32	5.17	2.27	0.01223
33	5.34	2.31	0.01223
34	5.50	2.35	0.01223
35	5.67	2.38	0.01223
36	5.84	2.42	0.01223
37	6.00	2.45	0.01223
38	6.17	2.48	0.01223
39	6.33	2.52	0.01223
40	6.50	2.55	0.01223
41	6.67	2.58	0.01223
42	6.83	2.61	0.01223
43	7.00	2.65	0.01223
44	7.17	2.68	0.01223
45	7.34	2.71	0.01223
46	7.50	2.74	0.01226
47	7.67	2.77	0.01226
48	7.84	2.80	0.01226
49	8.00	2.83	0.01226
50	8.17	2.86	0.01226
51	8.34	2.89	0.01226
52	8.50	2.92	0.01226
53	8.67	2.94	0.01226
54	8.83	2.97	0.01226
55	9.00	3.00	0.01226
56	9.17	3.03	0.01226
57	9.33	3.06	0.01226
58	9.50	3.08	0.01226
59	9.67	3.11	0.01229
60	9.83	3.14	0.01229
61	10.00	3.16	0.01226
62	10.17	3.19	0.01232
63	10.34	3.21	0.01232
64	10.50	3.24	0.01232
65	10.54	3.25	0.01232

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location:  
 Tested By: Shawn  
 Test Date: 6/13/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation: Not Marked

Soil Description: 2 ksf  
 Remarks: Undisturbed

Load Increment: 1 of 1  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.007816
3	0.33	0.58	0.01878
4	0.50	0.71	0.02688
5	0.67	0.82	0.03288
6	0.83	0.91	0.03512
7	1.00	1.00	0.03593
8	1.17	1.08	0.03635
9	1.34	1.16	0.03681
10	1.50	1.23	0.03704
11	1.67	1.29	0.03713
12	1.84	1.36	0.03733
13	2.00	1.41	0.03746
14	2.17	1.47	0.03765
15	2.33	1.53	0.03775
16	2.50	1.58	0.03794
17	2.67	1.63	0.03807
18	2.83	1.68	0.03817
19	3.00	1.73	0.03824
20	3.17	1.78	0.0383
21	3.34	1.83	0.0384
22	3.50	1.87	0.03843
23	3.67	1.92	0.03843
24	3.84	1.96	0.03846
25	4.00	2.00	0.03849
26	4.17	2.04	0.03853
27	4.34	2.08	0.03856
28	4.50	2.12	0.03856
29	4.67	2.16	0.03859
30	4.84	2.20	0.03862
31	5.00	2.24	0.03866
32	5.17	2.27	0.03869
33	5.33	2.31	0.03872
34	5.50	2.35	0.03885
35	5.67	2.38	0.03885
36	5.83	2.42	0.03892
37	6.00	2.45	0.03895
38	6.17	2.48	0.03895
39	6.34	2.52	0.03901
40	6.50	2.55	0.03905
41	6.67	2.58	0.03908
42	6.84	2.61	0.03908
43	7.00	2.65	0.03914
44	7.17	2.68	0.03918
45	7.34	2.71	0.03924
46	7.50	2.74	0.03931
47	7.67	2.77	0.03931
48	7.83	2.80	0.03931
49	8.00	2.83	0.03934
50	8.17	2.86	0.0394
51	8.33	2.89	0.0394
52	8.50	2.92	0.0394
53	8.67	2.94	0.0394
54	8.83	2.97	0.03944
55	9.00	3.00	0.0395
56	9.17	3.03	0.0395
57	9.34	3.06	0.03953
58	9.50	3.08	0.03953
59	9.67	3.11	0.03956
60	9.84	3.14	0.03956
61	10.00	3.16	0.03956
62	10.17	3.19	0.03956
63	10.34	3.22	0.0396
64	10.50	3.24	0.0396
65	10.67	3.27	0.0396
66	10.69	3.27	0.0396

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location:  
 Tested By: Shawn  
 Test Date: 6/13/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation: Not Marked

Soil Description: 4 ksf  
 Remarks: Undisturbed

Load Increment: 1 of 1  
 Applied Stress: 2 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.02303
3	0.33	0.58	0.04226
4	0.50	0.71	0.05377
5	0.67	0.82	0.06006
6	0.83	0.91	0.06097
7	1.00	1.00	0.06217
8	1.17	1.08	0.06311
9	1.34	1.16	0.06369
10	1.50	1.23	0.06386
11	1.67	1.29	0.06402
12	1.84	1.35	0.06418
13	2.00	1.42	0.06444
14	2.17	1.47	0.06463
15	2.34	1.53	0.0648
16	2.50	1.58	0.06502
17	2.67	1.63	0.06518
18	2.84	1.68	0.06528
19	3.00	1.73	0.06541
20	3.17	1.78	0.06551
21	3.33	1.83	0.06561
22	3.50	1.87	0.06577
23	3.67	1.92	0.0659
24	3.83	1.96	0.06603
25	4.00	2.00	0.06616
26	4.17	2.04	0.06629
27	4.34	2.08	0.06638
28	4.50	2.12	0.06648
29	4.67	2.16	0.06655
30	4.84	2.20	0.06661
31	5.00	2.24	0.06668
32	5.17	2.27	0.06671
33	5.34	2.31	0.06674
34	5.50	2.35	0.06677
35	5.67	2.38	0.06681
36	5.83	2.42	0.06684
37	6.00	2.45	0.06687
38	6.17	2.48	0.06694
39	6.33	2.52	0.067
40	6.50	2.55	0.06703
41	6.67	2.58	0.06707
42	6.83	2.61	0.06707
43	7.00	2.65	0.0671
44	7.17	2.68	0.06713
45	7.34	2.71	0.06716
46	7.50	2.74	0.06716
47	7.67	2.77	0.0672
48	7.84	2.80	0.06723
49	8.00	2.83	0.06723
50	8.17	2.86	0.06723
51	8.34	2.89	0.06723
52	8.50	2.92	0.06726
53	8.67	2.94	0.06729
54	8.83	2.97	0.06729
55	9.00	3.00	0.06729
56	9.17	3.03	0.06733
57	9.33	3.06	0.06736
58	9.50	3.08	0.06736
59	9.67	3.11	0.06736
60	9.84	3.14	0.06739
61	10.00	3.16	0.06742
62	10.17	3.19	0.06745
63	10.34	3.21	0.06745
64	10.50	3.24	0.06745
65	10.67	3.27	0.06749
66	10.74	3.28	0.06749

## DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location:  
 Tested By: Shawn  
 Test Date: 6/13/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation: Not Marked

Soil Description: 1 ksf  
 Remarks: Undisturbed

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.4981	0.01547	0.1448	0	0
2	1.63	0.4989	0.01609	0.2222	0.004992	0.004992
3	3.22	0.4981	0.01657	0.273	0.009983	0.009983
4	4.72	0.4989	0.0167	0.3121	0.01498	0.01498
5	6.34	0.4998	0.0169	0.3479	0.01997	0.01997
6	7.70	0.4998	0.01696	0.3704	0.02501	0.02501
7	9.03	0.4998	0.01693	0.3854	0.03	0.03
8	10.48	0.5014	0.01693	0.3979	0.03499	0.03499
9	12.07	0.5006	0.01693	0.4062	0.03998	0.03998
10	13.49	0.5006	0.01693	0.4078	0.04497	0.04497
11	14.97	0.5006	0.0167	0.3995	0.04997	0.04997
12	16.32	0.5006	0.01664	0.397	0.05501	0.05501
13	17.89	0.5014	0.01647	0.392	0.06	0.06
14	19.35	0.5006	0.01618	0.387	0.06499	0.06499
15	20.87	0.5006	0.01596	0.3812	0.06998	0.06998
16	22.19	0.5006	0.01566	0.377	0.07497	0.07497
17	23.57	0.5006	0.01521	0.3721	0.07997	0.07997
18	25.14	0.5014	0.01489	0.3671	0.08501	0.08501
19	26.61	0.5014	0.01466	0.3621	0.09	0.09
20	27.96	0.5014	0.01437	0.3579	0.09499	0.09499
21	29.36	0.5014	0.01411	0.3537	0.09998	0.09998
22	30.90	0.5006	0.01372	0.3496	0.105	0.105
23	32.33	0.5006	0.01352	0.3446	0.11	0.11
24	33.89	0.5006	0.0133	0.3404	0.115	0.115
25	35.25	0.5006	0.0131	0.3388	0.12	0.12
26	36.74	0.5006	0.013	0.3346	0.125	0.125
27	38.05	0.5006	0.01287	0.3313	0.13	0.13
28	39.63	0.5006	0.01278	0.3288	0.135	0.135
29	41.17	0.5006	0.01268	0.3279	0.14	0.14
30	42.55	0.5006	0.01258	0.3263	0.145	0.145
31	44.01	0.5006	0.01252	0.3254	0.15	0.15
32	45.47	0.5006	0.01249	0.3238	0.155	0.155
33	46.85	0.5006	0.01245	0.3238	0.16	0.16
34	48.37	0.4998	0.01242	0.3229	0.165	0.165
35	49.77	0.5006	0.01239	0.3221	0.17	0.17
36	51.20	0.4998	0.01232	0.3213	0.175	0.175
37	52.71	0.4998	0.01223	0.3204	0.18	0.18
38	54.20	0.5006	0.01216	0.3188	0.185	0.185
39	55.71	0.4998	0.0121	0.3171	0.19	0.19
40	56.97	0.4998	0.01206	0.3163	0.195	0.195
41	58.58	0.4998	0.0121	0.3171	0.2	0.2
42	59.96	0.4998	0.0121	0.3155	0.205	0.205
43	61.35	0.4998	0.0121	0.3155	0.21	0.21
44	62.72	0.4998	0.01206	0.3155	0.215	0.215
45	64.04	0.4998	0.01203	0.3138	0.22	0.22
46	65.41	0.4998	0.01203	0.3138	0.225	0.225
47	67.08	0.5006	0.01203	0.3105	0.23	0.23
48	68.53	0.4989	0.012	0.3088	0.235	0.235
49	70.08	0.4998	0.01197	0.3088	0.24	0.24
50	71.39	0.4998	0.01193	0.3096	0.245	0.245
51	72.81	0.4998	0.01193	0.3088	0.25	0.25
52	74.20	0.4998	0.0119	0.3071	0.255	0.255
53	75.60	0.4989	0.0119	0.3055	0.26	0.26
54	77.19	0.4989	0.0119	0.3055	0.265	0.265
55	78.62	0.4998	0.0119	0.3046	0.27	0.27
56	79.91	0.4998	0.0119	0.3046	0.275	0.275
57	81.44	0.4998	0.01187	0.3046	0.28	0.28
58	82.92	0.4998	0.01187	0.303	0.285	0.285
59	84.44	0.4998	0.0119	0.3021	0.29	0.29
60	85.86	0.4998	0.0119	0.3021	0.295	0.295
61	86.31	0.4998	0.0119	0.3021	0.2965	0.2965

DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location:  
 Tested By: Shawn  
 Test Date: 6/13/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation: Not Marked

Soil Description: 2 ksf  
 Remarks: Undisturbed

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.9971	0.04368	0.1848	0	0
2	1.32	0.9962	0.04443	0.2447	0.004992	0.004992
3	2.98	0.9971	0.04569	0.2971	0.009983	0.009983
4	4.66	0.9979	0.04689	0.3404	0.01498	0.01498
5	6.00	0.9979	0.04748	0.3704	0.01997	0.01997
6	7.49	0.9987	0.048	0.3979	0.02501	0.02501
7	9.05	0.9971	0.04858	0.4228	0.03	0.03
8	10.46	0.9979	0.04903	0.4594	0.03499	0.03499
9	11.98	0.9979	0.04952	0.4911	0.03998	0.03998
10	13.48	0.9971	0.04972	0.5119	0.04497	0.04497
11	14.89	0.9979	0.04985	0.5285	0.04997	0.04997
12	16.26	0.9987	0.04994	0.5418	0.05501	0.05501
13	17.63	0.9987	0.0501	0.551	0.06	0.06
14	19.07	0.9987	0.05033	0.561	0.06499	0.06499
15	20.65	0.9987	0.05046	0.5685	0.06998	0.06998
16	22.19	0.9987	0.05062	0.5768	0.07497	0.07497
17	23.56	0.9987	0.05085	0.5818	0.07997	0.07997
18	25.05	0.9987	0.05098	0.5876	0.08501	0.08501
19	26.30	0.9987	0.05111	0.5926	0.09	0.09
20	27.89	0.9987	0.05121	0.5959	0.09499	0.09499
21	29.40	0.9987	0.05124	0.5993	0.09998	0.09998
22	30.78	0.9996	0.05137	0.6001	0.105	0.105
23	32.15	0.9996	0.0514	0.6034	0.11	0.11
24	33.67	0.9987	0.05147	0.6051	0.115	0.115
25	35.16	0.9987	0.05153	0.6051	0.12	0.12
26	36.70	0.9987	0.05179	0.6068	0.125	0.125
27	38.05	0.9987	0.05192	0.6093	0.13	0.13
28	39.57	0.9996	0.05205	0.6109	0.135	0.135
29	40.89	0.9987	0.05228	0.6109	0.14	0.14
30	42.44	0.9996	0.05244	0.6109	0.145	0.145
31	43.77	0.9987	0.05263	0.6084	0.15	0.15
32	45.40	0.9987	0.05289	0.6059	0.155	0.155
33	46.81	0.9987	0.05309	0.6034	0.16	0.16
34	48.32	0.9987	0.05319	0.6034	0.165	0.165
35	49.81	0.9987	0.05332	0.6051	0.17	0.17
36	51.32	0.9996	0.05338	0.6059	0.175	0.175
37	52.65	0.9996	0.05335	0.6051	0.18	0.18
38	54.17	0.9987	0.05341	0.6026	0.185	0.185
39	55.56	0.9987	0.05345	0.6026	0.19	0.19
40	56.98	0.9987	0.05351	0.6018	0.195	0.195
41	58.39	0.9987	0.05354	0.6001	0.2	0.2
42	59.95	0.9987	0.05361	0.5984	0.205	0.205
43	61.34	0.9996	0.05364	0.5968	0.21	0.21
44	62.72	0.9987	0.0537	0.5968	0.215	0.215
45	64.08	0.9996	0.05377	0.5951	0.22	0.22
46	65.57	0.9987	0.05383	0.5934	0.225	0.225
47	67.03	0.9987	0.05387	0.591	0.23	0.23
48	68.35	0.9996	0.0539	0.591	0.235	0.235
49	69.95	0.9996	0.0539	0.5893	0.24	0.24
50	71.22	0.9987	0.0539	0.5885	0.245	0.245
51	72.88	0.9987	0.05396	0.5868	0.25	0.25
52	74.26	0.9996	0.05396	0.586	0.255	0.255
53	75.56	0.9996	0.05403	0.5826	0.26	0.26
54	77.08	0.9996	0.054	0.5801	0.265	0.265
55	78.55	0.9996	0.05406	0.5801	0.27	0.27
56	80.02	0.9987	0.05406	0.5793	0.275	0.275
57	81.42	0.9987	0.05409	0.5785	0.28	0.28
58	82.94	0.9987	0.05419	0.5801	0.285	0.285
59	84.31	0.9996	0.05419	0.5776	0.29	0.29
60	85.83	0.9987	0.05422	0.581	0.295	0.295
61	86.32	0.9987	0.05419	0.581	0.2971	0.2971

DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 1  
 Sample No.: 1  
 Test No.: 1

Location:  
 Tested By: Shawn  
 Test Date: 6/13/14  
 Sample Type: Block

Project No.: 145150G  
 Checked By: Shawn  
 Depth: 3.5'  
 Elevation: Not Marked

Soil Description: 4 ksf  
 Remarks: Undisturbed

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	1.997	0.07339	0.2863	0	0
2	1.60	1.997	0.0741	0.4178	0.004992	0.004992
3	3.18	1.996	0.07495	0.5169	0.009983	0.009983
4	4.67	1.997	0.07589	0.5893	0.01498	0.01498
5	6.08	1.997	0.07673	0.6434	0.01997	0.01997
6	7.70	1.998	0.07731	0.7017	0.02501	0.02501
7	9.09	1.999	0.07786	0.7433	0.03	0.03
8	10.41	1.999	0.07832	0.7791	0.03499	0.03499
9	11.98	1.997	0.07881	0.8165	0.03998	0.03998
10	13.42	1.997	0.07949	0.8473	0.04502	0.04502
11	14.82	1.998	0.07984	0.8723	0.04997	0.04997
12	16.30	1.999	0.08026	0.8931	0.05501	0.05501
13	17.94	1.999	0.08085	0.9106	0.06	0.06
14	19.24	1.998	0.0814	0.9197	0.06499	0.06499
15	20.69	1.998	0.08179	0.9289	0.06998	0.06998
16	22.27	1.998	0.08205	0.9364	0.07497	0.07497
17	23.54	1.998	0.08234	0.9405	0.07997	0.07997
18	25.21	1.998	0.08266	0.9447	0.08501	0.08501
19	26.50	1.998	0.08286	0.9455	0.09	0.09
20	27.93	1.999	0.08302	0.9464	0.09499	0.09499
21	29.53	1.999	0.08318	0.9464	0.09998	0.09998
22	30.75	1.999	0.08328	0.9447	0.105	0.105
23	32.35	1.999	0.08335	0.9422	0.11	0.11
24	33.66	1.999	0.08344	0.9389	0.115	0.115
25	35.09	1.999	0.08354	0.9364	0.12	0.12
26	36.62	1.999	0.08361	0.9322	0.125	0.125
27	37.98	1.999	0.0837	0.9289	0.13	0.13
28	39.42	1.999	0.08386	0.9264	0.135	0.135
29	40.90	1.999	0.08396	0.9214	0.14	0.14
30	42.45	1.999	0.08409	0.9172	0.145	0.145
31	43.85	1.999	0.08419	0.9131	0.15	0.15
32	45.29	1.999	0.08432	0.9097	0.155	0.155
33	46.67	1.999	0.08438	0.9047	0.16	0.16
34	48.09	1.999	0.08448	0.9022	0.165	0.165
35	49.58	1.999	0.08458	0.8981	0.17	0.17
36	50.98	1.999	0.08474	0.8948	0.175	0.175
37	52.59	1.999	0.08484	0.8914	0.18	0.18
38	53.96	1.999	0.08503	0.8889	0.185	0.185
39	55.41	1.999	0.08526	0.8856	0.19	0.19
40	56.75	1.999	0.08539	0.8831	0.195	0.195
41	58.18	1.999	0.08562	0.8814	0.2	0.2
42	59.78	1.999	0.08578	0.8773	0.205	0.205
43	61.31	1.999	0.08597	0.8764	0.21	0.21
44	62.54	1.999	0.08607	0.8748	0.215	0.215
45	63.97	1.999	0.08623	0.8739	0.22	0.22
46	65.33	1.998	0.08639	0.8731	0.225	0.225
47	66.80	1.999	0.08649	0.8723	0.23	0.23
48	68.32	1.999	0.08665	0.8706	0.235	0.235
49	69.78	1.999	0.08685	0.8698	0.24	0.24
50	71.17	1.999	0.08695	0.869	0.245	0.245
51	72.56	1.999	0.08704	0.8673	0.25	0.25
52	74.06	1.999	0.08714	0.8656	0.255	0.255
53	75.40	1.999	0.08737	0.8656	0.26	0.26
54	76.97	1.999	0.08746	0.8656	0.265	0.265
55	78.38	1.999	0.08759	0.864	0.27	0.27
56	79.74	1.999	0.08766	0.8648	0.275	0.275
57	81.28	1.999	0.08776	0.864	0.28	0.28
58	82.65	1.999	0.08785	0.8656	0.285	0.285
59	84.16	1.998	0.08798	0.8681	0.29	0.29
60	85.56	1.999	0.08811	0.8698	0.295	0.295
61	85.83	1.999	0.08811	0.8706	0.296	0.296

DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 3  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/30/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 1 ksf  
 Remarks: Disturbed-Remolded

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.5014	0.01485	0.3188	0	0
2	1.63	0.5023	0.01411	0.4736	0.004992	0.004992
3	3.18	0.5014	0.01258	0.5518	0.009983	0.009983
4	4.72	0.5056	0.01119	0.5968	0.01498	0.01498
5	6.28	0.5064	0.009437	0.586	0.01997	0.01997
6	8.01	0.5031	0.007816	0.5302	0.02501	0.02501
7	9.53	0.5014	0.007329	0.4961	0.03	0.03
8	11.04	0.5014	0.006486	0.4769	0.03499	0.03499
9	12.65	0.5006	0.005773	0.4678	0.03998	0.03998
10	14.10	0.5006	0.005156	0.4603	0.04497	0.04497
11	15.69	0.5014	0.004573	0.4553	0.04997	0.04997
12	17.32	0.5031	0.003924	0.4511	0.05501	0.05501
13	18.99	0.5039	0.003308	0.4428	0.06	0.06
14	20.43	0.5023	0.002659	0.432	0.06499	0.06499
15	21.94	0.5006	0.002076	0.4212	0.06998	0.06998
16	23.62	0.5014	0.001816	0.4112	0.07497	0.07497
17	25.04	0.5006	0.001557	0.3987	0.07997	0.07997
18	26.78	0.5006	0.001135	0.3887	0.08501	0.08501
19	28.20	0.5014	0.000908	0.387	0.09	0.09
20	29.79	0.5006	0.0006486	0.3845	0.09499	0.09499
21	31.51	0.5014	0.0004865	0.3845	0.09998	0.09998
22	32.86	0.5006	0.0003567	0.3845	0.105	0.105
23	34.62	0.5006	0.0001946	0.3845	0.11	0.11
24	36.12	0.5006	6.486e-005	0.3862	0.115	0.115
25	37.52	0.5006	3.243e-005	0.3862	0.12	0.12
26	39.19	0.5006	-9.729e-005	0.387	0.125	0.125
27	40.74	0.5006	-9.729e-005	0.3862	0.13	0.13
28	42.29	0.5006	-0.0002594	0.3895	0.135	0.135
29	43.75	0.5006	-0.0002919	0.3929	0.14	0.14
30	45.42	0.5006	-0.0004216	0.3962	0.145	0.145
31	46.96	0.5006	-0.0004216	0.3995	0.15	0.15
32	48.52	0.5006	-0.000681	0.3987	0.155	0.155
33	50.09	0.5006	-0.000681	0.3995	0.16	0.16
34	51.62	0.4998	-0.000908	0.4012	0.165	0.165
35	53.16	0.5006	-0.000908	0.4012	0.17	0.17
36	54.90	0.5006	-0.001103	0.3995	0.175	0.175
37	56.49	0.5006	-0.001103	0.3995	0.18	0.18
38	57.90	0.5006	-0.001265	0.402	0.185	0.185
39	59.49	0.5006	-0.001265	0.4045	0.19	0.19
40	60.88	0.5006	-0.001265	0.4045	0.195	0.195
41	62.61	0.5006	-0.001524	0.4053	0.2	0.2
42	64.21	0.5006	-0.001524	0.407	0.205	0.205
43	65.92	0.5006	-0.001557	0.4087	0.21	0.21
44	67.38	0.5006	-0.001816	0.4062	0.215	0.215
45	68.96	0.5006	-0.001849	0.4053	0.22	0.22
46	70.36	0.5006	-0.001881	0.4037	0.225	0.225
47	71.93	0.5006	-0.002205	0.4053	0.23	0.23
48	73.53	0.4998	-0.00227	0.4087	0.235	0.235
49	75.10	0.4998	-0.002303	0.4087	0.24	0.24
50	76.56	0.4998	-0.002594	0.4087	0.245	0.245
51	78.11	0.5006	-0.002659	0.407	0.25	0.25
52	79.86	0.5006	-0.002692	0.4053	0.255	0.255
53	81.21	0.5006	-0.002984	0.407	0.26	0.26
54	82.87	0.5006	-0.003016	0.4078	0.265	0.265
55	84.47	0.5006	-0.003178	0.4103	0.27	0.27
56	85.90	0.5006	-0.003178	0.4103	0.275	0.275
57	87.70	0.5006	-0.003373	0.4112	0.28	0.28
58	89.03	0.4998	-0.003373	0.4095	0.285	0.285
59	90.72	0.5006	-0.003535	0.4112	0.29	0.29
60	92.24	0.5006	-0.003535	0.4145	0.295	0.295
61	92.81	0.4998	-0.003535	0.4162	0.2968	0.2968



DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 3  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/30/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 2 ksf  
 Remarks: Disturbed-Remolded

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.9987	0.01829	0.3912	0	0
2	1.84	1.001	0.01829	0.6359	0.004992	0.004992
3	3.33	1.001	0.01826	0.7574	0.009983	0.009983
4	4.90	1.004	0.01732	0.8348	0.01498	0.01498
5	6.49	1.004	0.01651	0.8665	0.01997	0.01997
6	8.22	1.005	0.01531	0.864	0.02501	0.02501
7	9.72	1.003	0.01424	0.8448	0.03	0.03
8	11.21	1.001	0.01359	0.8332	0.03499	0.03499
9	12.89	1.003	0.01291	0.829	0.03998	0.03998
10	14.29	1.003	0.01236	0.8257	0.04497	0.04497
11	15.83	1.001	0.01167	0.8157	0.04997	0.04997
12	17.45	1.002	0.01112	0.799	0.05501	0.05501
13	19.15	1.001	0.0109	0.7882	0.06	0.06
14	20.56	1	0.01077	0.7866	0.06499	0.06499
15	22.08	1	0.01035	0.7841	0.06998	0.06998
16	23.80	1	0.01035	0.7824	0.07497	0.07497
17	25.21	1	0.01031	0.7832	0.07997	0.07997
18	26.97	1	0.009956	0.7857	0.08501	0.08501
19	28.38	1	0.009956	0.789	0.09	0.09
20	29.94	1	0.009956	0.7932	0.09499	0.09499
21	31.67	0.9996	0.009729	0.7957	0.09998	0.09998
22	32.98	1	0.009729	0.8024	0.105	0.105
23	34.80	1	0.009697	0.8065	0.11	0.11
24	36.15	1	0.009632	0.8074	0.115	0.115
25	37.70	1	0.009632	0.8115	0.12	0.12
26	39.39	1	0.009599	0.8157	0.125	0.125
27	40.90	0.9996	0.009599	0.8182	0.13	0.13
28	42.48	1	0.009567	0.8198	0.135	0.135
29	43.96	1	0.009307	0.8198	0.14	0.14
30	45.64	0.9996	0.009307	0.8265	0.145	0.145
31	47.20	0.9987	0.00921	0.8265	0.15	0.15
32	48.70	0.9996	0.009178	0.8315	0.155	0.155
33	50.22	0.9996	0.009178	0.8357	0.16	0.16
34	51.73	0.9996	0.00908	0.8382	0.165	0.165
35	53.34	1	0.00908	0.8423	0.17	0.17
36	54.91	0.9996	0.00908	0.8465	0.175	0.175
37	56.60	1	0.009048	0.8465	0.18	0.18
38	58.12	1	0.009016	0.8431	0.185	0.185
39	59.68	1	0.008724	0.8373	0.19	0.19
40	61.15	1	0.008691	0.8307	0.195	0.195
41	62.69	1	0.008626	0.8232	0.2	0.2
42	64.39	0.9996	0.00814	0.8173	0.205	0.205
43	66.06	0.9996	0.008075	0.8148	0.21	0.21
44	67.44	0.9996	0.008075	0.8132	0.215	0.215
45	68.97	0.9996	0.008043	0.8115	0.22	0.22
46	70.44	1	0.00801	0.8115	0.225	0.225
47	72.02	0.9996	0.007783	0.809	0.23	0.23
48	73.65	1	0.007751	0.8032	0.235	0.235
49	75.23	0.9996	0.007718	0.7949	0.24	0.24
50	76.76	1	0.007297	0.7874	0.245	0.245
51	78.24	1	0.007264	0.7816	0.25	0.25
52	79.85	1	0.007264	0.7774	0.255	0.255
53	81.33	1	0.007232	0.7724	0.26	0.26
54	83.05	0.9996	0.007232	0.7699	0.265	0.265
55	84.65	0.9987	0.007232	0.7682	0.27	0.27
56	86.01	0.9996	0.007005	0.7641	0.275	0.275
57	87.67	0.9987	0.007005	0.7641	0.28	0.28
58	89.18	0.9996	0.007005	0.7657	0.285	0.285
59	90.77	0.9996	0.007005	0.7666	0.29	0.29
60	92.31	0.9987	0.00707	0.7657	0.295	0.295
61	93.01	0.9996	0.00707	0.7657	0.2973	0.2973

DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 3  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/30/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 4 ksf  
 Remarks: Disturbed-Remolded

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	1.998	0.03026	0.5094	0	0
2	1.79	1.998	0.03068	0.8581	0.004992	0.004992
3	3.34	1.999	0.03078	1.109	0.009983	0.009983
4	5.12	2.002	0.03113	1.295	0.01498	0.01498
5	6.54	2.002	0.03091	1.397	0.01997	0.01997
6	8.02	2.002	0.03029	1.47	0.02501	0.02501
7	9.59	2.002	0.03003	1.521	0.03	0.03
8	11.15	2.001	0.02938	1.543	0.03499	0.03499
9	12.70	2.001	0.02912	1.551	0.03998	0.03998
10	14.33	2.002	0.02867	1.55	0.04497	0.04497
11	15.93	2.001	0.02838	1.548	0.04997	0.04997
12	17.47	2.002	0.02834	1.549	0.05501	0.05501
13	18.95	2.001	0.02795	1.549	0.06	0.06
14	20.46	2.002	0.02792	1.554	0.06499	0.06499
15	22.22	2.001	0.02773	1.562	0.06998	0.06998
16	23.76	2.001	0.02753	1.568	0.07497	0.07497
17	25.32	2.001	0.02753	1.576	0.07997	0.07997
18	26.91	2.001	0.02744	1.583	0.08501	0.08501
19	28.61	2	0.02724	1.581	0.09	0.09
20	29.90	2.001	0.02727	1.576	0.09499	0.09499
21	31.52	2	0.02705	1.55	0.09998	0.09998
22	33.17	1.997	0.02701	1.516	0.105	0.105
23	34.62	1.999	0.02688	1.492	0.11	0.11
24	36.24	1.999	0.02688	1.482	0.115	0.115
25	37.72	1.999	0.02688	1.477	0.12	0.12
26	39.30	1.999	0.02688	1.473	0.125	0.125
27	40.90	2	0.02721	1.474	0.13	0.13
28	42.42	1.999	0.02727	1.475	0.135	0.135
29	44.03	1.999	0.02731	1.48	0.14	0.14
30	45.57	1.999	0.02737	1.484	0.145	0.145
31	47.18	1.999	0.0274	1.488	0.15	0.15
32	48.63	1.999	0.02753	1.493	0.155	0.155
33	50.27	1.999	0.02766	1.501	0.16	0.16
34	51.92	1.999	0.02779	1.507	0.165	0.165
35	53.49	1.998	0.02789	1.517	0.17	0.17
36	55.01	1.998	0.02808	1.526	0.175	0.175
37	56.67	1.999	0.02818	1.535	0.18	0.18
38	58.14	1.999	0.02838	1.541	0.185	0.185
39	59.77	1.999	0.02851	1.546	0.19	0.19
40	61.27	1.999	0.0287	1.552	0.195	0.195
41	62.82	1.999	0.02883	1.558	0.2	0.2
42	64.39	1.999	0.0289	1.564	0.205	0.205
43	66.04	1.999	0.02909	1.569	0.21	0.21
44	67.61	1.999	0.02922	1.573	0.215	0.215
45	69.03	1.998	0.02941	1.576	0.22	0.22
46	70.56	1.998	0.02951	1.582	0.225	0.225
47	72.14	1.999	0.02974	1.587	0.23	0.23
48	73.76	1.999	0.02987	1.593	0.235	0.235
49	75.35	1.999	0.02997	1.599	0.24	0.24
50	76.97	1.999	0.03019	1.603	0.245	0.245
51	78.27	1.999	0.03029	1.606	0.25	0.25
52	80.02	1.999	0.03055	1.612	0.255	0.255
53	81.54	1.999	0.03058	1.616	0.26	0.26
54	83.15	1.999	0.03074	1.619	0.265	0.265
55	84.74	1.999	0.03084	1.623	0.27	0.27
56	86.28	1.999	0.03097	1.629	0.275	0.275
57	87.78	1.999	0.03107	1.631	0.28	0.28
58	89.37	1.999	0.0312	1.635	0.285	0.285
59	90.92	1.999	0.0313	1.643	0.29	0.29
60	92.50	1.999	0.03146	1.649	0.295	0.295
61	93.47	1.999	0.03159	1.651	0.2981	0.2981

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 3  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/30/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 1 ksf  
 Remarks: Disturbed-Remolded

Load Increment: 1 of 1  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.004638
3	0.33	0.58	0.006713
4	0.50	0.71	0.008918
5	0.67	0.82	0.01138
6	0.83	0.91	0.01155
7	1.00	1.00	0.01164
8	1.17	1.08	0.01171
9	1.34	1.16	0.0118
10	1.50	1.23	0.01193
11	1.67	1.29	0.01193
12	1.84	1.35	0.012
13	2.00	1.42	0.012
14	2.17	1.47	0.01216
15	2.34	1.53	0.01216
16	2.50	1.58	0.01216
17	2.67	1.63	0.01216
18	2.84	1.68	0.01216
19	3.00	1.73	0.01216
20	3.17	1.78	0.01226
21	3.33	1.83	0.01226
22	3.50	1.87	0.01226
23	3.67	1.92	0.01226
24	3.83	1.96	0.01226
25	4.00	2.00	0.01226
26	4.17	2.04	0.01226
27	4.34	2.08	0.01226
28	4.50	2.12	0.01226
29	4.67	2.16	0.01226
30	4.84	2.20	0.01226
31	5.00	2.24	0.01226
32	5.17	2.27	0.01249
33	5.34	2.31	0.01249
34	5.50	2.35	0.01249
35	5.67	2.38	0.01249
36	5.83	2.42	0.01249
37	6.00	2.45	0.01249
38	6.17	2.48	0.01249
39	6.33	2.52	0.01249
40	6.50	2.55	0.01245
41	6.67	2.58	0.01245
42	6.84	2.61	0.01245
43	7.00	2.65	0.01245
44	7.17	2.68	0.01245
45	7.34	2.71	0.01245
46	7.50	2.74	0.01245
47	7.67	2.77	0.01245
48	7.84	2.80	0.01245
49	8.00	2.83	0.01245
50	8.17	2.86	0.01245
51	8.34	2.89	0.01245
52	8.50	2.92	0.01245
53	8.67	2.94	0.01245
54	8.83	2.97	0.01245
55	9.00	3.00	0.01245
56	9.17	3.03	0.01245
57	9.33	3.06	0.01245
58	9.50	3.08	0.01258
59	9.67	3.11	0.01258
60	9.84	3.14	0.01258
61	10.00	3.16	0.01258
62	10.17	3.19	0.01258
63	10.34	3.21	0.01258
64	10.50	3.24	0.01255
65	10.57	3.25	0.01255

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 3  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/30/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 2 ksf  
 Remarks: Disturbed-Remolded

Load Increment: 1 of 1  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.007621
3	0.34	0.58	0.01518
4	0.50	0.71	0.01596
5	0.67	0.82	0.01615
6	0.84	0.91	0.01625
7	1.00	1.00	0.01628
8	1.17	1.08	0.01631
9	1.34	1.16	0.01638
10	1.50	1.23	0.01641
11	1.67	1.29	0.01644
12	1.83	1.35	0.01651
13	2.00	1.41	0.01651
14	2.17	1.47	0.01651
15	2.33	1.53	0.01654
16	2.50	1.58	0.01654
17	2.67	1.63	0.01657
18	2.84	1.68	0.01657
19	3.00	1.73	0.01657
20	3.17	1.78	0.01657
21	3.34	1.83	0.0166
22	3.50	1.87	0.0166
23	3.67	1.92	0.01664
24	3.84	1.96	0.01664
25	4.00	2.00	0.01664
26	4.17	2.04	0.01664
27	4.34	2.08	0.01667
28	4.50	2.12	0.0167
29	4.67	2.16	0.0167
30	4.83	2.20	0.0167
31	5.00	2.24	0.01673
32	5.17	2.27	0.01673
33	5.33	2.31	0.01673
34	5.50	2.35	0.01673
35	5.67	2.38	0.01673
36	5.84	2.42	0.01677
37	6.00	2.45	0.0168
38	6.17	2.48	0.0168
39	6.34	2.52	0.0168
40	6.50	2.55	0.01683
41	6.67	2.58	0.01686
42	6.84	2.61	0.01686
43	7.00	2.65	0.01686
44	7.17	2.68	0.01683
45	7.33	2.71	0.01683
46	7.50	2.74	0.01683
47	7.67	2.77	0.01683
48	7.83	2.80	0.01683
49	8.00	2.83	0.01683
50	8.17	2.86	0.01683
51	8.33	2.89	0.01683
52	8.50	2.92	0.01683
53	8.67	2.94	0.01683
54	8.84	2.97	0.01683
55	9.00	3.00	0.01686
56	9.17	3.03	0.01686
57	9.34	3.06	0.01686
58	9.50	3.08	0.01686
59	9.67	3.11	0.01683
60	9.84	3.14	0.01683
61	10.00	3.16	0.01686
62	10.17	3.19	0.01686
63	10.33	3.21	0.01686
64	10.34	3.22	0.01686

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 3  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/30/15  
 Sample Type: Bag

Project No.: 14S150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 4 ksf  
 Remarks: Disturbed-Remolded

Load Increment: 1 of 1  
 Applied Stress: 2 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.01871
3	0.33	0.58	0.02455
4	0.50	0.71	0.02481
5	0.67	0.82	0.02494
6	0.83	0.91	0.025
7	1.00	1.00	0.0251
8	1.17	1.08	0.02517
9	1.34	1.16	0.02523
10	1.50	1.23	0.02526
11	1.67	1.29	0.02526
12	1.84	1.35	0.02533
13	2.00	1.42	0.02533
14	2.17	1.47	0.02539
15	2.34	1.53	0.02539
16	2.50	1.58	0.02543
17	2.67	1.63	0.02546
18	2.84	1.68	0.02546
19	3.00	1.73	0.02546
20	3.17	1.78	0.02556
21	3.33	1.83	0.02552
22	3.50	1.87	0.02556
23	3.67	1.92	0.02552
24	3.83	1.96	0.02565
25	4.00	2.00	0.02565
26	4.17	2.04	0.02565
27	4.34	2.08	0.02565
28	4.50	2.12	0.02565
29	4.67	2.16	0.02565
30	4.84	2.20	0.02565
31	5.00	2.24	0.02565
32	5.17	2.27	0.02575
33	5.34	2.31	0.02575
34	5.50	2.35	0.02572
35	5.67	2.38	0.02572
36	5.84	2.42	0.02572
37	6.00	2.45	0.02572
38	6.17	2.48	0.02572
39	6.33	2.52	0.02572
40	6.50	2.55	0.02572
41	6.67	2.58	0.02585
42	6.83	2.61	0.02585
43	7.00	2.65	0.02585
44	7.17	2.68	0.02585
45	7.34	2.71	0.02585
46	7.50	2.74	0.02585
47	7.67	2.77	0.02585
48	7.84	2.80	0.02585
49	8.00	2.83	0.02585
50	8.17	2.86	0.02585
51	8.34	2.89	0.02585
52	8.50	2.92	0.02581
53	8.67	2.94	0.02585
54	8.83	2.97	0.02581
55	9.00	3.00	0.02588
56	9.17	3.03	0.02588
57	9.33	3.06	0.02588
58	9.50	3.08	0.02588
59	9.67	3.11	0.02588
60	9.83	3.14	0.02588
61	10.00	3.16	0.02588
62	10.17	3.19	0.02588
63	10.34	3.21	0.02588
64	10.50	3.24	0.02588
65	10.67	3.27	0.02588
66	10.82	3.29	0.02588

## DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 4  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/29/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 1 ksf  
 Remarks: Disturbed-Remolded

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.5006	0.0167	0.3854	0	0
2	1.39	0.5014	0.01634	0.5876	0.004992	0.004992
3	2.82	0.5039	0.0157	0.6168	0.009983	0.009983
4	3.95	0.5014	0.01476	0.6234	0.01498	0.01498
5	5.25	0.5006	0.01346	0.6159	0.01997	0.01997
6	6.66	0.5023	0.01287	0.5751	0.02501	0.02501
7	7.79	0.5031	0.01229	0.5393	0.03	0.03
8	8.99	0.5031	0.01151	0.516	0.03499	0.03499
9	10.21	0.5039	0.01077	0.5002	0.03998	0.03998
10	11.48	0.5023	0.01018	0.4877	0.04497	0.04497
11	12.61	0.5006	0.009729	0.4794	0.04997	0.04997
12	13.85	0.5014	0.009145	0.4719	0.05501	0.05501
13	15.17	0.5023	0.008789	0.4669	0.06	0.06
14	16.49	0.5023	0.008399	0.4586	0.06499	0.06499
15	17.65	0.5006	0.008075	0.4561	0.06998	0.06998
16	18.82	0.5006	0.007718	0.452	0.07502	0.07502
17	20.17	0.5006	0.007264	0.4495	0.07997	0.07997
18	21.38	0.5023	0.006778	0.4503	0.08501	0.08501
19	22.70	0.5014	0.006324	0.4536	0.09	0.09
20	23.81	0.5006	0.005902	0.4586	0.09499	0.09499
21	25.07	0.5014	0.005383	0.4636	0.09998	0.09998
22	26.48	0.5014	0.004865	0.4661	0.105	0.105
23	27.55	0.5014	0.004475	0.4703	0.11	0.11
24	28.97	0.5014	0.003989	0.4753	0.115	0.115
25	30.11	0.5006	0.003697	0.4819	0.12	0.12
26	31.23	0.5014	0.003438	0.4886	0.125	0.125
27	32.60	0.5014	0.003243	0.4952	0.13	0.13
28	33.85	0.5006	0.003016	0.4994	0.135	0.135
29	35.15	0.5006	0.002854	0.5027	0.14	0.14
30	36.29	0.5006	0.002659	0.5069	0.145	0.145
31	37.63	0.5014	0.00253	0.5144	0.15	0.15
32	38.93	0.5014	0.0024	0.5202	0.155	0.155
33	40.14	0.5014	0.002173	0.5252	0.16	0.16
34	41.43	0.5014	0.001946	0.5319	0.165	0.165
35	42.61	0.5014	0.001589	0.5385	0.17	0.17
36	43.86	0.5014	0.001394	0.546	0.175	0.175
37	45.27	0.5014	0.001135	0.5527	0.18	0.18
38	46.47	0.5006	0.0009729	0.5543	0.185	0.185
39	47.62	0.5006	0.0007459	0.5585	0.19	0.19
40	48.88	0.4965	0.0008108	0.5502	0.195	0.195
41	50.08	0.4998	0.0008108	0.5577	0.2	0.2
42	51.43	0.5006	0.0007783	0.5627	0.205	0.205
43	52.65	0.4998	0.000681	0.5643	0.21	0.21
44	54.00	0.5006	0.0005837	0.566	0.215	0.215
45	55.20	0.5014	0.0003243	0.5701	0.22	0.22
46	56.40	0.5014	9.729e-005	0.5726	0.225	0.225
47	57.56	0.5006	-6.486e-005	0.576	0.23	0.23
48	58.82	0.5006	-0.0002919	0.5793	0.235	0.235
49	60.05	0.5006	-0.0004865	0.5785	0.24	0.24
50	61.33	0.5006	-0.000681	0.5818	0.245	0.245
51	62.47	0.5014	-0.0008432	0.5843	0.25	0.25
52	63.70	0.5006	-0.00107	0.586	0.255	0.255
53	65.20	0.5006	-0.001297	0.5876	0.26	0.26
54	66.27	0.4998	-0.001427	0.5868	0.265	0.265
55	67.59	0.5006	-0.001719	0.5885	0.27	0.27
56	68.84	0.5014	-0.001946	0.5893	0.275	0.275
57	70.00	0.5006	-0.002173	0.5876	0.28	0.28
58	71.49	0.5014	-0.002303	0.5868	0.285	0.285
59	72.50	0.5006	-0.002432	0.5868	0.29	0.29
60	73.83	0.4989	-0.002562	0.5851	0.295	0.295
61	74.74	0.5006	-0.002627	0.5851	0.2986	0.2986

DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 4  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/29/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 2 ksf  
 Remarks: Disturbed-Remolded

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.9996	0.009307	0.407	0	0
2	1.33	0.9987	0.009275	0.6201	0.004992	0.004992
3	2.47	0.9979	0.009243	0.7141	0.009983	0.009983
4	3.76	0.9987	0.009275	0.7757	0.01498	0.01498
5	5.19	1	0.009275	0.8148	0.01997	0.01997
6	6.37	0.9987	0.009275	0.8257	0.02501	0.02501
7	7.66	1.001	0.00921	0.8357	0.03	0.03
8	8.99	0.9996	0.009178	0.8398	0.03499	0.03499
9	10.20	0.9996	0.009178	0.8448	0.03998	0.03998
10	11.44	1	0.009178	0.8481	0.04497	0.04497
11	12.65	0.9996	0.00921	0.8515	0.04997	0.04997
12	13.95	0.9996	0.009145	0.8506	0.05501	0.05501
13	15.13	1	0.009113	0.8506	0.06	0.06
14	16.29	0.9996	0.008951	0.8515	0.06499	0.06499
15	17.48	1	0.008951	0.8531	0.06998	0.06998
16	18.91	1	0.008853	0.8523	0.07497	0.07497
17	20.16	1	0.008724	0.8498	0.07997	0.07997
18	21.38	1	0.008562	0.8481	0.08501	0.08501
19	22.61	1	0.008335	0.844	0.09	0.09
20	23.80	1	0.008335	0.8398	0.09499	0.09499
21	25.12	1	0.008075	0.834	0.09998	0.09998
22	26.40	1.001	0.007848	0.8282	0.105	0.105
23	27.59	1	0.007686	0.8232	0.11	0.11
24	28.78	1	0.007654	0.8182	0.115	0.115
25	30.01	1	0.007427	0.8124	0.12	0.12
26	31.28	1	0.0072	0.8082	0.125	0.125
27	32.50	1	0.007167	0.804	0.13	0.13
28	33.78	1	0.00707	0.8007	0.135	0.135
29	35.06	1	0.006972	0.7965	0.14	0.14
30	36.19	1	0.006778	0.7924	0.145	0.145
31	37.51	1	0.006648	0.7841	0.15	0.15
32	38.69	1	0.006518	0.7799	0.155	0.155
33	40.08	1	0.006259	0.7741	0.16	0.16
34	41.21	1	0.006129	0.7699	0.165	0.165
35	42.55	1	0.006032	0.7641	0.17	0.17
36	43.93	1	0.005935	0.7591	0.175	0.175
37	45.15	1	0.005805	0.7558	0.18	0.18
38	46.27	1	0.005773	0.7524	0.185	0.185
39	47.57	1	0.005708	0.7483	0.19	0.19
40	48.79	1	0.005643	0.7458	0.195	0.195
41	50.05	1	0.005448	0.7433	0.2	0.2
42	51.30	1	0.005416	0.7408	0.205	0.205
43	52.59	1	0.005221	0.7383	0.21	0.21
44	53.75	1	0.005059	0.7358	0.215	0.215
45	54.92	1	0.0048	0.7341	0.22	0.22
46	56.11	1	0.004767	0.7341	0.225	0.225
47	57.45	1	0.004605	0.7349	0.23	0.23
48	58.63	1	0.004605	0.7333	0.235	0.235
49	59.82	0.9996	0.004573	0.7316	0.24	0.24
50	61.12	1	0.004411	0.7291	0.245	0.245
51	62.27	1	0.004378	0.7275	0.25	0.25
52	63.74	1	0.004281	0.7216	0.255	0.255
53	64.85	1	0.004183	0.7183	0.26	0.26
54	66.04	1	0.004054	0.7166	0.265	0.265
55	67.31	0.9996	0.003989	0.715	0.27	0.27
56	68.59	0.9996	0.003859	0.7108	0.275	0.275
57	69.92	1	0.003827	0.7108	0.28	0.28
58	71.07	1	0.003827	0.71	0.285	0.285
59	72.36	0.9996	0.003794	0.71	0.29	0.29
60	73.53	1	0.003438	0.7091	0.295	0.295
61	74.03	1	0.003405	0.7108	0.2969	0.2969

DIRECT SHEAR TEST DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 4  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/29/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 4 ksf  
 Remarks: Disturbed-Remolded

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	1.998	0.06467	0.4636	0	0
2	1.47	1.997	0.06541	0.9688	0.004992	0.004992
3	2.67	1.997	0.0657	1.26	0.009983	0.009983
4	4.06	1.999	0.06606	1.479	0.01498	0.01498
5	5.50	1.999	0.06632	1.618	0.01997	0.01997
6	6.67	1.999	0.06645	1.694	0.02501	0.02501
7	7.98	2	0.06655	1.75	0.03	0.03
8	9.31	1.999	0.06658	1.781	0.03499	0.03499
9	10.56	2	0.06664	1.789	0.03998	0.03998
10	11.86	2	0.06671	1.78	0.04497	0.04497
11	13.16	2	0.06674	1.77	0.04997	0.04997
12	14.37	2.001	0.06684	1.763	0.05501	0.05501
13	15.53	2.001	0.06697	1.76	0.06	0.06
14	16.71	2.001	0.06687	1.751	0.06499	0.06499
15	17.91	2.001	0.06668	1.742	0.06998	0.06998
16	19.33	2.001	0.06642	1.731	0.07497	0.07497
17	20.63	2.001	0.06622	1.72	0.07997	0.07997
18	21.81	2.001	0.06606	1.709	0.08501	0.08501
19	23.08	2.001	0.06587	1.696	0.09	0.09
20	24.18	2.001	0.06577	1.68	0.09499	0.09499
21	25.52	2.001	0.06564	1.66	0.09998	0.09998
22	26.81	2.002	0.06554	1.639	0.105	0.105
23	27.98	2.001	0.06544	1.618	0.11	0.11
24	29.19	2.001	0.06538	1.597	0.115	0.115
25	30.46	2.001	0.06531	1.574	0.12	0.12
26	31.71	2.001	0.06525	1.554	0.125	0.125
27	33.02	2.001	0.06518	1.533	0.13	0.13
28	34.22	2	0.06509	1.517	0.135	0.135
29	35.53	2.001	0.06502	1.5	0.14	0.14
30	36.67	2.001	0.06496	1.488	0.145	0.145
31	38.00	2.001	0.06489	1.476	0.15	0.15
32	39.13	2	0.0648	1.465	0.155	0.155
33	40.49	2	0.06476	1.452	0.16	0.16
34	41.67	2.001	0.06473	1.439	0.165	0.165
35	43.02	2	0.0647	1.428	0.17	0.17
36	44.32	2.001	0.0646	1.42	0.175	0.175
37	45.60	2.001	0.06454	1.408	0.18	0.18
38	46.72	2	0.06447	1.4	0.185	0.185
39	48.07	2	0.06441	1.391	0.19	0.19
40	49.25	2.001	0.06437	1.382	0.195	0.195
41	50.50	2	0.06437	1.374	0.2	0.2
42	51.78	2	0.06434	1.366	0.205	0.205
43	53.09	2	0.06431	1.361	0.21	0.21
44	54.23	2	0.06428	1.356	0.215	0.215
45	55.46	2.001	0.06424	1.351	0.22	0.22
46	56.64	2.001	0.06418	1.348	0.225	0.225
47	57.93	2.001	0.06415	1.345	0.23	0.23
48	59.16	2	0.06418	1.342	0.235	0.235
49	60.29	2	0.06415	1.338	0.24	0.24
50	61.69	2	0.06405	1.332	0.245	0.245
51	62.80	2.001	0.06398	1.326	0.25	0.25
52	64.20	2	0.06395	1.32	0.255	0.255
53	65.40	2.001	0.06392	1.314	0.26	0.26
54	66.55	2.001	0.06386	1.308	0.265	0.265
55	67.85	2	0.06382	1.3	0.27	0.27
56	69.15	2.001	0.06369	1.298	0.275	0.275
57	70.39	2	0.06369	1.293	0.28	0.28
58	71.66	2	0.06369	1.288	0.285	0.285
59	72.92	2	0.06369	1.285	0.29	0.29
60	74.12	2	0.06366	1.279	0.295	0.295
61	74.43	2	0.06366	1.279	0.2963	0.2963



DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boxing No.: 4  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/29/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 1 ksf  
 Remarks: Disturbed-Remolded

Load Increment: 1 of 1  
 Applied Stress: 0.5 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.006875
3	0.33	0.58	0.00934
4	0.50	0.71	0.01281
5	0.67	0.82	0.01625
6	0.83	0.91	0.01644
7	1.00	1.00	0.01657
8	1.17	1.08	0.01673
9	1.34	1.16	0.0168
10	1.50	1.23	0.01683
11	1.67	1.29	0.0169
12	1.84	1.35	0.0169
13	2.00	1.42	0.0169
14	2.17	1.47	0.0169
15	2.34	1.53	0.0169
16	2.50	1.58	0.0169
17	2.67	1.63	0.0169
18	2.84	1.68	0.01706
19	3.00	1.73	0.01706
20	3.17	1.78	0.01706
21	3.33	1.83	0.01706
22	3.50	1.87	0.01706
23	3.67	1.92	0.01706
24	3.83	1.96	0.01706
25	4.00	2.00	0.01706
26	4.17	2.04	0.01706
27	4.34	2.08	0.01706
28	4.50	2.12	0.01706
29	4.67	2.16	0.01703
30	4.84	2.20	0.01706
31	5.00	2.24	0.01706
32	5.17	2.27	0.01703
33	5.34	2.31	0.01703
34	5.50	2.35	0.01706
35	5.67	2.38	0.01703
36	5.84	2.42	0.01703
37	6.00	2.45	0.01706
38	6.17	2.48	0.01706
39	6.33	2.52	0.01706
40	6.50	2.55	0.01703
41	6.67	2.58	0.01706
42	6.83	2.61	0.01703
43	7.00	2.65	0.01706
44	7.17	2.68	0.01703
45	7.34	2.71	0.01703
46	7.50	2.74	0.01706
47	7.67	2.77	0.01706
48	7.84	2.80	0.01706
49	8.00	2.83	0.01706
50	8.17	2.86	0.01703
51	8.34	2.89	0.01706
52	8.50	2.92	0.01706
53	8.67	2.94	0.01706
54	8.83	2.97	0.01706
55	9.00	3.00	0.01706
56	9.17	3.03	0.01706
57	9.33	3.06	0.01706
58	9.50	3.08	0.01706
59	9.67	3.11	0.01706
60	9.84	3.14	0.01706
61	10.00	3.16	0.01706
62	10.17	3.19	0.01706
63	10.33	3.21	0.01706
64	10.50	3.24	0.01706
65	10.62	3.26	0.01706

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 4  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/29/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 2 ksf  
 Remarks: Disturbed-Remolded

Load Increment: 1 of 1  
 Applied Stress: 1 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.003924
3	0.33	0.58	0.007329
4	0.50	0.71	0.007881
5	0.67	0.82	0.00801
6	0.83	0.91	0.00801
7	1.00	1.00	0.008108
8	1.17	1.08	0.008108
9	1.34	1.16	0.008108
10	1.50	1.23	0.008205
11	1.67	1.29	0.008205
12	1.84	1.36	0.008205
13	2.00	1.42	0.008205
14	2.17	1.47	0.008205
15	2.34	1.53	0.008205
16	2.50	1.58	0.008205
17	2.67	1.63	0.008205
18	2.83	1.68	0.008205
19	3.00	1.73	0.008205
20	3.17	1.78	0.008205
21	3.33	1.83	0.008205
22	3.50	1.87	0.008335
23	3.67	1.92	0.008335
24	3.83	1.96	0.008335
25	4.00	2.00	0.008367
26	4.17	2.04	0.008399
27	4.34	2.08	0.008399
28	4.50	2.12	0.008399
29	4.67	2.16	0.008399
30	4.84	2.20	0.008399
31	5.00	2.24	0.008399
32	5.17	2.27	0.008399
33	5.34	2.31	0.008399
34	5.50	2.35	0.008399
35	5.67	2.38	0.008367
36	5.83	2.42	0.008399
37	6.00	2.45	0.008399
38	6.17	2.48	0.008399
39	6.33	2.52	0.008399
40	6.50	2.55	0.008399
41	6.67	2.58	0.008399
42	6.83	2.61	0.008399
43	7.00	2.65	0.008399
44	7.17	2.68	0.008399
45	7.34	2.71	0.008399
46	7.50	2.74	0.008399
47	7.67	2.77	0.008399
48	7.84	2.80	0.008399
49	8.00	2.83	0.008399
50	8.17	2.86	0.008399
51	8.34	2.89	0.008399
52	8.50	2.92	0.008399
53	8.67	2.94	0.008756
54	8.83	2.97	0.008756
55	9.00	3.00	0.008756
56	9.17	3.03	0.008756
57	9.33	3.06	0.008756
58	9.50	3.08	0.008756
59	9.67	3.11	0.008756
60	9.84	3.14	0.008756
61	10.00	3.16	0.008756
62	10.17	3.19	0.008756
63	10.34	3.21	0.008756
64	10.50	3.24	0.008756
65	10.67	3.27	0.008756
66	10.84	3.29	0.008756
67	11.00	3.32	0.008756
68	11.17	3.34	0.008756
69	11.34	3.37	0.008756
70	11.50	3.39	0.008756
71	11.67	3.42	0.008756
72	11.83	3.44	0.008789
73	12.00	3.46	0.008756
74	12.17	3.49	0.008756
75	12.33	3.51	0.008789
76	12.50	3.54	0.008789
77	12.67	3.56	0.008789
78	12.84	3.58	0.008789
79	13.00	3.61	0.008789
80	13.17	3.63	0.008789
81	13.34	3.65	0.008789

82	13.50	3.67	0.008789
83	13.67	3.70	0.008789
84	13.84	3.72	0.008789
85	14.00	3.74	0.008789
86	14.17	3.76	0.008789
87	14.34	3.79	0.008789
88	14.50	3.81	0.008789
89	14.67	3.83	0.008789
90	14.83	3.85	0.008789
91	15.00	3.87	0.008789
92	15.17	3.89	0.008789
93	15.33	3.92	0.008789
94	15.50	3.94	0.008789
95	15.67	3.96	0.008756
96	15.84	3.98	0.008756
97	16.00	4.00	0.008756
98	16.17	4.02	0.008756
99	16.34	4.04	0.008756
100	16.50	4.06	0.008756
101	16.67	4.08	0.008756
102	16.84	4.10	0.008756
103	17.00	4.12	0.008756
104	17.17	4.14	0.008756
105	17.33	4.16	0.008756
106	17.50	4.18	0.008756
107	17.67	4.20	0.008756
108	17.83	4.22	0.008756
109	18.00	4.24	0.008756
110	18.17	4.26	0.008756
111	18.33	4.28	0.008756
112	18.50	4.30	0.008756
113	18.67	4.32	0.008756
114	18.84	4.34	0.008756
115	18.84	4.34	0.008756

DIRECT SHEAR TEST CONSOLIDATION DATA

Project: Lot 15 Ski Lakes  
 Boring No.: 4  
 Sample No.: 1  
 Test No.: 1

Location: Huntsville  
 Tested By: Shawn  
 Test Date: 6/29/15  
 Sample Type: Bag

Project No.: 145150G  
 Checked By: Tim  
 Depth: 11'  
 Elevation: Not Marked

Soil Description: 4 ksf  
 Remarks: Disturbed-Remolded

Load Increment: 1 of 1  
 Applied Stress: 2 tsf

	Elapsed Time min	Sq.Rt. of Time min	Displacement in
1	0.00	0.00	0
2	0.17	0.41	0.02429
3	0.33	0.58	0.04492
4	0.50	0.71	0.05542
5	0.67	0.82	0.05811
6	0.83	0.91	0.05876
7	1.00	1.00	0.05948
8	1.17	1.08	0.05964
9	1.34	1.16	0.05983
10	1.50	1.23	0.06003
11	1.67	1.29	0.06026
12	1.84	1.35	0.06035
13	2.00	1.42	0.06045
14	2.17	1.47	0.06051
15	2.34	1.53	0.06064
16	2.50	1.58	0.06074
17	2.67	1.63	0.06081
18	2.84	1.68	0.0609
19	3.00	1.73	0.0611
20	3.17	1.78	0.0611
21	3.33	1.83	0.06116
22	3.50	1.87	0.0612
23	3.67	1.92	0.06123
24	3.83	1.96	0.06129
25	4.00	2.00	0.06129
26	4.17	2.04	0.06129
27	4.34	2.08	0.06133
28	4.50	2.12	0.06133
29	4.67	2.16	0.06142
30	4.84	2.20	0.06139
31	5.00	2.24	0.06142
32	5.17	2.27	0.06142
33	5.34	2.31	0.06142
34	5.50	2.35	0.06146
35	5.67	2.38	0.06146
36	5.84	2.42	0.06146
37	6.00	2.45	0.06146
38	6.17	2.48	0.06149
39	6.33	2.52	0.06152
40	6.50	2.55	0.06152
41	6.67	2.58	0.06152
42	6.83	2.61	0.06152
43	7.00	2.65	0.06152
44	7.17	2.68	0.06152
45	7.34	2.71	0.06155
46	7.50	2.74	0.06155
47	7.67	2.77	0.06155
48	7.84	2.80	0.06155
49	8.00	2.83	0.06155
50	8.17	2.86	0.06159
51	8.34	2.89	0.06159
52	8.50	2.92	0.06159
53	8.67	2.94	0.06159
54	8.83	2.97	0.06159
55	9.00	3.00	0.06159
56	9.17	3.03	0.06159
57	9.33	3.06	0.06159
58	9.50	3.08	0.06159
59	9.67	3.11	0.06159
60	9.83	3.14	0.06162
61	10.00	3.16	0.06175
62	10.17	3.19	0.06175
63	10.34	3.21	0.06175
64	10.50	3.24	0.06175
65	10.56	3.25	0.06175

**APPENDIX E**  
**SEISMIC VALUES**

Project Name = 145150G

Conterminous 48 States

2002 Data

Hazard Curve for PGA

Latitude = 41.2470

Longitude = -111.7880

Data are based on a 0.05 deg grid spacing

Frequency of Exceedance values less than

1E-4 should be used with caution.

Ground Motion (g)	Frequency of Exceedance (per year)
0.005	1.7308E-01
0.007	1.4641E-01
0.010	1.1724E-01
0.014	8.8382E-02
0.019	6.2373E-02
0.027	4.1484E-02
0.038	2.6265E-02
0.053	1.5847E-02
0.074	9.2836E-03
0.103	5.424E-03
0.145	3.1376E-03
0.203	1.776E-03
0.284	9.008E-04
0.397	3.7389E-04
0.556	1.161E-04
0.778	2.5662E-05
1.090	3.9622E-06
1.520	5.8182E-07
2.130	1.1613E-07

Ground Motion (g)	Freq. of Exceed. (per year)	Return Pd. (years)	P.E. %	Exp. Time (years)
0.3854	4.0404E-04	2475.00	2.00	50.0

Project Name = 145150G  
Conterminous 48 States  
2006 International Residential Code  
Latitude = 41.247  
Longitude = -111.788  
Residential Seismic Design Category  
Ss and S1 = Mapped Spectral Acceleration Values  
Site Class D - Fa = 1.12, Fv = 1.71  
MCE MAP VALUES  
Short Period Map Value - Ss = 0.94g  
1.0 sec Period Map Value - S1 = 0.35g

#### RESIDENTIAL DESIGN INFORMATION

Short Period Map Value - Ss = 0.94g  
Soil factor for Site Class D - Fa = 1.12  
Residential Site Value =  $\frac{2}{3} \times Fa \times Ss = 0.70g$   
Residential Seismic Design Category = D1