September 2, 2022
NewFields Project No. 475.0398.000

HDR Inc.
9805 Double R Boulevard, Suite 101
Reno, Nevada 89521

Attention: **Mr. Ruedy Edgington, P.E.**
Project Manager

Re: **I-3262 MSE Wall Design**
US395 North Valleys Project
Washoe County, Nevada

1. INTRODUCTION

This memo presents the results of Newfield's external stability analyses for mechanically stabilized earth (MSE) wall design for Structure I-3262 in support of the US395 North Valleys Project in Washoe County, Nevada.

MSE walls will be constructed for the wing walls of Structure I-3262 as shown on the plan sheet entitled *Virginia St. On-Ramp Over US-395 South Off-Ramp, Sheet 300* (NDOT, 2022). The MSE walls are designated as RW13 and RW20 at Abutment 1 and RW9 and RW15 at Abutment 2. The MSE wall system has not been identified at this time, therefore it has been assumed to be either a geosynthetic or metallic reinforced wall with concrete panel facing.

2. MECHANICALLY STABILIZED EARTH WALLS

For analysis of the MSE walls, calculations were performed for external stability and global stability. External stability consists of bearing capacity, overturning, and sliding resistance. The analyzed wall sections are provided in Attachment A.

Internal stability of the wall system will be the responsibility of the selected wall vendor.

Compound stability was performed as an initial feasibility check of the proposed back-to-back MSE walls. MSE walls for this initial check were based on strength properties for a geosynthetic grid reinforcement listed in the Slide database. The results of the initial check indicated that compound stability would not preclude the proposed back-to-back wall system from working, so external and global stability analyses were performed.

2.1. Analysis Approach

External stability analyses were performed along each of the retaining walls in accordance with *AASHTO 2020 Bridge Design Specification* guidelines (AASHTO, 2020). These analyses were performed using the software MSEW 3.0 developed by ADAMA Engineering, Inc. The software is capable of performing external stability calculations including bearing resistance, resistance to sliding failure, and resistance to overturning using AASHTO LRFD methodology.

The MSEW outputs provide a CDR (Capacity Demand Ratio) value. While LRFD does not explicitly use factors of safety but rather it increases the load (demands) and decreases the resistance (capacity) by applying either a demand or resistance factor. Instead of minimum factors of safety, the basis of the LRFD approach is the factored resistance must meet or exceed the factored load. Therefore, the CDR for all aspects of stability for the referenced external cases must be greater than 1.0.

Global stability was analyzed using the program Slide developed by Rocscience Inc. For global stability, the reinforced soil mass of the MSE wall as modeled with infinite strength to ensure critical failure surfaces did not pass through the reinforced zone per AASHTO guidelines. Stability analyses were used to determine minimum initial reinforcement lengths.

2.2. Global Slope Stability Analysis

Global stability of MSE walls were analyzed for both static and pseudostatic loading conditions using the Spencer method. Soil layer modeling was developed based on the subsurface conditions noted in boring BH19-BR-18 which was considered to represent the worse-case soil conditions for the I-3262 site. A copy of the boring log for BH19-BR-18 is provided in Attachment D.

The depth to groundwater varied from approximately 45 feet to 65 feet below existing ground surface, or roughly elevation 5,087 to 5,071 feet. A design groundwater elevation of 5,087 feet was used in design.

Embedment depths were based *AASHTO 2020 Bridge Design Specification* guidelines, Table C11.10.2.2-1 (AASHTO, 2020). For walls with a horizontal slope in front of the wall, a minimum embedment depth of 2 feet was used. For walls with a 2:1 slope in front of the wall, a minimum embedment depth of H/7 was used for design, with H = height.

A 270 psf traffic surcharge was applied at the top of wall and modeled as a uniformly distributed load to account for vehicular traffic loads.

For pseudostatic loading conditions, slope stabilities were assessed using one-half of the recommended peak ground acceleration (PGA) per Section 12.3.5 of the *NDOT Structures Manual* (2008).

2.2.1. Global Slope Stability Material Properties

The angle of internal shearing resistance (ϕ) for the foundation soils were estimated using the Peck, Hanson, and Thornburn correlation (AASHTO, 2020) and boring BH19-BR-18 corrected blow counts $(N1)_{60}$. The blow count correction and angle of internal shearing resistance correlations are provided in Appendix D.

For simplicity, an angle of internal shearing resistance of 36 degrees, and a nominal cohesion of 100 psf was used in the analyses for foundation soils. An angle of internal shearing resistance (ϕ) of 34 degrees was assumed for the MSE backfill as a minimum strength value in accordance with Section 642 of the NDOT *Standard Specifications* (NDOT, 2014). Table 1 presents the material properties used in the stability analysis.

Table 1: Material Properties Used in Global Stability Analyses

Material	Unit Weight (pcf)	Angle of Internal Shearing Resistance (degrees)	Cohesion (psf)
Foundation Soils (Clayey Sand) [(1)]	135	36	100
MSE Reinforced Fill [(2)]	135	34	0

Notes:
[(1)] Foundation soil properties are based on the conditions noted in boring log BH19-BR-18 as presented in the *Geotechnical Design Report, Phase 1B: US395 North Valleys* (NewFields, 2020) and an average foundation elevation of 5120 feet or less.
[(2)] Since the proposed MSE structures are back-to-back walls, all retained fill behind the MSE wall should meet the properties of MSE Reinforced Fill as outlined in Section 642 of the *NDOT Standard Specifications* (NDOT, 2014).

2.2.2. Global Stability Analysis Results

Results of the global stability analysis are shown in Table 2. Stability outputs are provided in Attachment B.

Table 2: MSE Wall Stability Analyses Results

Wall Location	Maximum Wall Height (H)	Reinforcement Length	Minimum Factor of Safety (FOS)	
			Static	Pseudostatic
RW9 Section B-B	7.9	0.85*H	2.0	1.2
RW9 – RW15 Section B - B	21.8	0.85*H	2.3	1.5
RW9 – RW15 Section C – C	17.3	0.85*H	3.8	2.1
RW9 Section A – A	15.1	0.85*H	2.1	1.3
RW13	6.1	0.85*H	2.4	1.6
RW15 – RW9	26.1	0.85*H	2.6	1.6
RW20 – RW13	23.1	0.85*H	2.5	1.7

Section 11.6.2.3 of the *AASHTO LRFD Bridge Design Specifications* (2020) states a resistance factor of 0.65 should be applied to the evaluation of overall stability of earth slopes supporting a structural element under the service limit state. The applied resistance factor is equivalent to a factor of safety of approximately 1.5 using the allowable stress design (ASD) design methodology. Section 6.2.2 of the *LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations Reference Manual* (FHWA, 2011) recommends a minimum factor of safety of 1.1 for pseudostatic (seismic) analyses.

2.3. Bearing, Sliding, and Overturning Resistance

Bearing and sliding resistance at the base of the MSE wall was calculated using strength limit loads for various heights in accordance with *AASHTO LRFD Bridge Design Specifications* (AASHTO, 2020). Wall sections are provided in Attachment A.

Sliding failure occurs when the force effects due to the horizontal component of loads exceed the more critical of either the factored shear resistance of the soils or the factored shear resistance at the interface between the soil and the foundation. The sliding resistance of the MSE wall system was evaluated under the strength limit load according to *AASHTO LRFD Bridge Design Specifications* (AASHTO, 2020).

Overturning was also considered as part of the external stability analyses. Overturning failure occurs when the force effects due to the horizontal component of loads exceed the sum of the MSE wall system mass. Results of the MSEW external stability calculations are presented in Attachment C.

2.4. Minimum Reinforcement Lengths for External Stability

The results of the external stability analyses for static and pseudostatic conditions indicate the I-3262 MSE walls may be designed using a reinforcement length of 0.85H (0.85 * wall height). In no case shall reinforcement lengths be less than 8 feet. These recommendations are based on the provided wall sections referenced and external stability requirements. The wall vendor may require longer reinforcement lengths once internal stability calculations have been completed.

In no case should the distance between back-to-back MSE walls be less than 1.1H, with H being the height of the taller of the two back-to-back walls. In accordance with Section 642 of the *Standard Specifications for Road and Bridge Construction* (NDOT, 2014), the top two layers of reinforcement should be at least 5 feet longer than the minimum required lengths determined from the internal and external stability calculations.

2.5. Settlement Analysis

Settlement of MSE walls RW9, RW13, RW15, and RW20 were estimated using elastic theory procedures and the program Settle3 by Rocscience. To estimate settlement the elastic modulus (Es) values were estimated based on blow count correlations shown in Table C10.4.6.2.1 of *AASHTO LRFD Bridge Design Specifications* (AASHTO, 2020) and provided in Attachment D. The depth of the soil profile used in the model to assess potential settlement was developed following guidance for stress influence and test hole depths provided in Section 10.4.2, *AASHTO LRFD Bridge Design Specifications* (2020).

The MSE walls were modeled as a uniform block with a unit weight of 135 pcf. Total maximum settlement is estimated to be less than 2 inches which meets the recommended limit as presented in Section C11.10.4.1 of *AASHTO LRFD Bridge Design Specifications* (AASHTO, 2020). Differential settlement is anticipated to be less than 1:500, below the limiting criteria as outlined in Section C11.10.4.1 of *AASHTO LRFD Bridge Design Specifications* (AASHTO, 2020). Copies of the Settle3 outputs and report are provided in Attachment D.

2.6. MSE Internal Stability Material Properties

The internal stability evaluation including internal sliding, reinforcement pullout and tensile overstress, connection break and pullout, and material uncertainty is the responsibility of the wall vendor. Soil properties recommended for use in assessing MSE internal stability are provided in Table 3.

Table 3: Soil Properties Recommended for Internal Stability Analyses

Material	Unit Weight (pcf)	Angle of Internal Shearing Resistance (degrees)	Cohesion (psf)
Foundation Soils (Clayey Sand and Gravels)	135	36	100
MSE Reinforced Fill [(1)]	135	34	0

Notes: [(1)] **Since the proposed MSE structures are back-to-back walls, all retained fill behind the MSE wall should meet the properties of MSE Reinforced Fill as outlined in Section 642 of the *NDOT Standard Specifications* (NDOT, 2014).**

All materials should be free of organic matter and deleterious substances. Fill material for the reinforced zone shall meet soil index, strength, and chemical requirements for MSE reinforcement as outlined in Section 642.02.04 of the *NDOT Standard Specifications* (NDOT, 2014).

3. LIMITATIONS

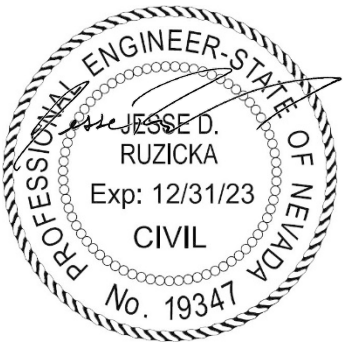
The recommendations contained in this report are based on field exploration, laboratory testing, and our understanding of the proposed construction. The soil data used in the preparation of this report are based on the field explorations performed at the locations referenced in the *Geotechnical Design Report, Phase 1B: US395 North Valleys* (NewFields, 2020). It is possible that variation in the soil conditions may exist between the locations explored. Therefore, if any soil conditions are encountered at the site that are different from those outlined in this report, NewFields should be immediately notified so that we may review and make supplementary recommendations if warranted.

This report has been prepared solely for the use of HDR and their client for design of the US395 North Valleys Project. Our services were performed using generally accepted geotechnical engineering practice common to the area at the time of this report. No other warranties, either expressed or implied, are included or intended.

If you have any questions or require additional information, please contact the undersigned.

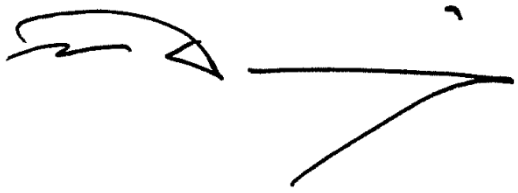
Sincerely,

NewFields Mining Design & Technical Services



Jesse Ruzicka, P.E. 09/02/2022
Senior Engineer

Reviewed by:



Mark Doehring, P.E.
Senior Engineer

JR/MD/ng

LIST OF ATTACHMENTS:
Attachment A – Profiles
Attachment B – SLIDE Global Stability Results
Attachment C – MSEW Results
Attachment D – Settle3 Results

Addressee: Electronic

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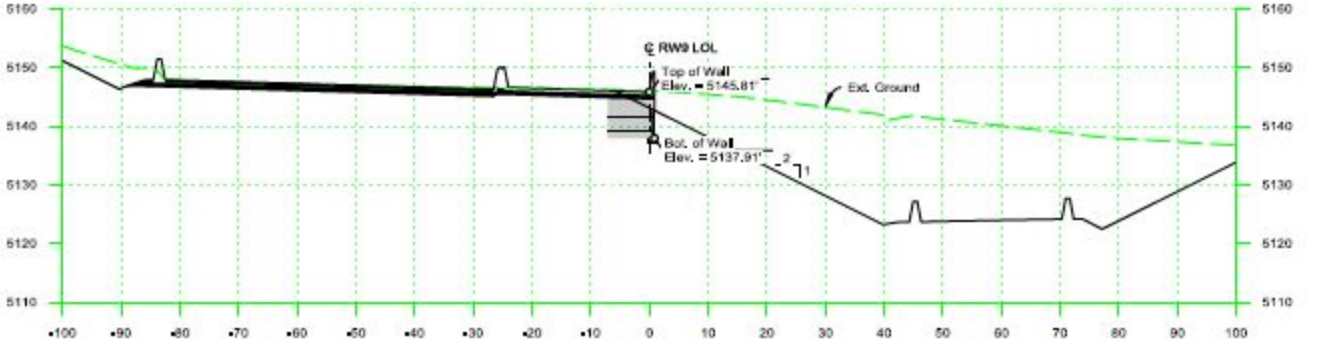
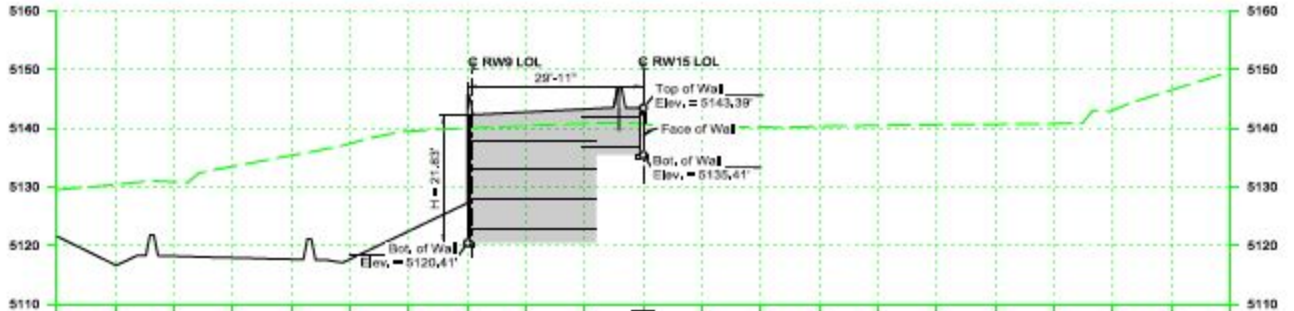
NewFields

ATTACHMENT A
Profiles



SECTION B-B

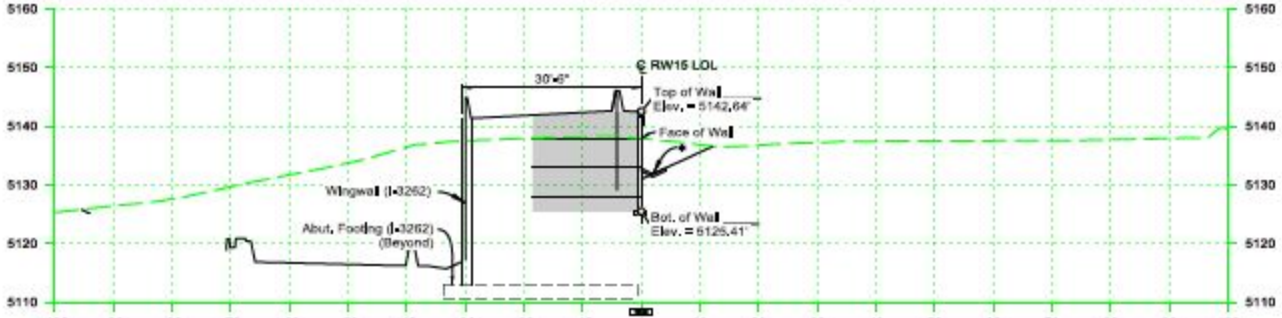
STATION RW9 12+00.00 (Mid-Wall)



SECTION B–B

STATION RW15 10+50.00 (MID WALL)

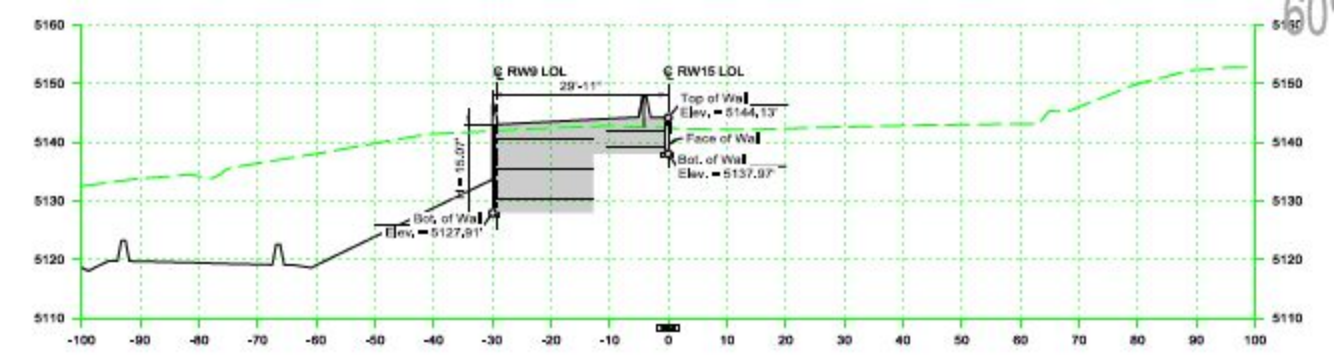
♦ - Paved V-Ditch (2:1 Slope Away from Wall)



SECTION C-C

STATION RW15 11+12.00 (END OF WALL)

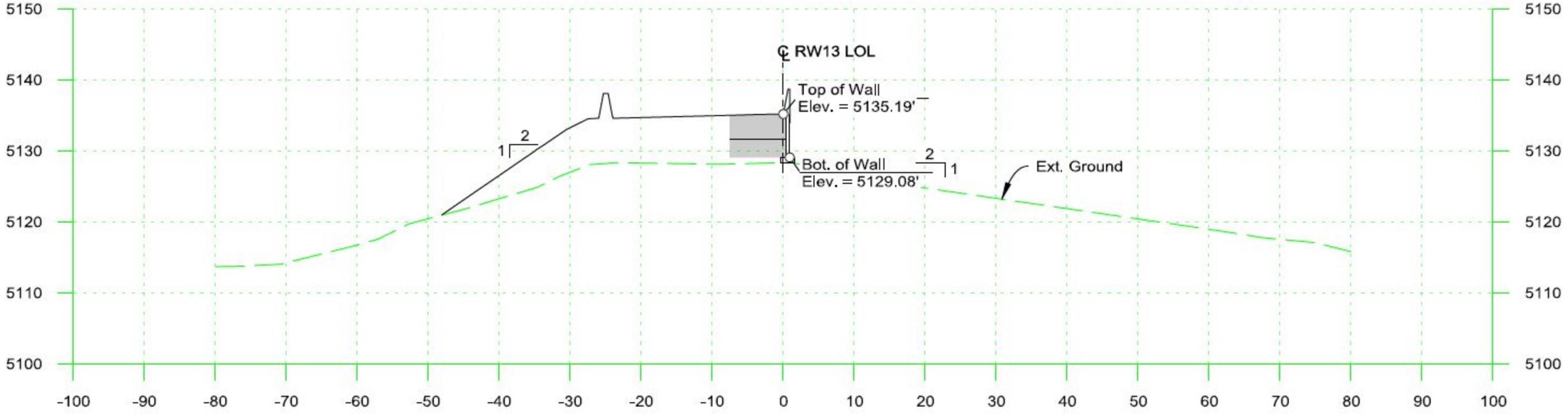
♦ - Paved V-Ditch (2:1 Slope Away from Wall)



SECTION A-A

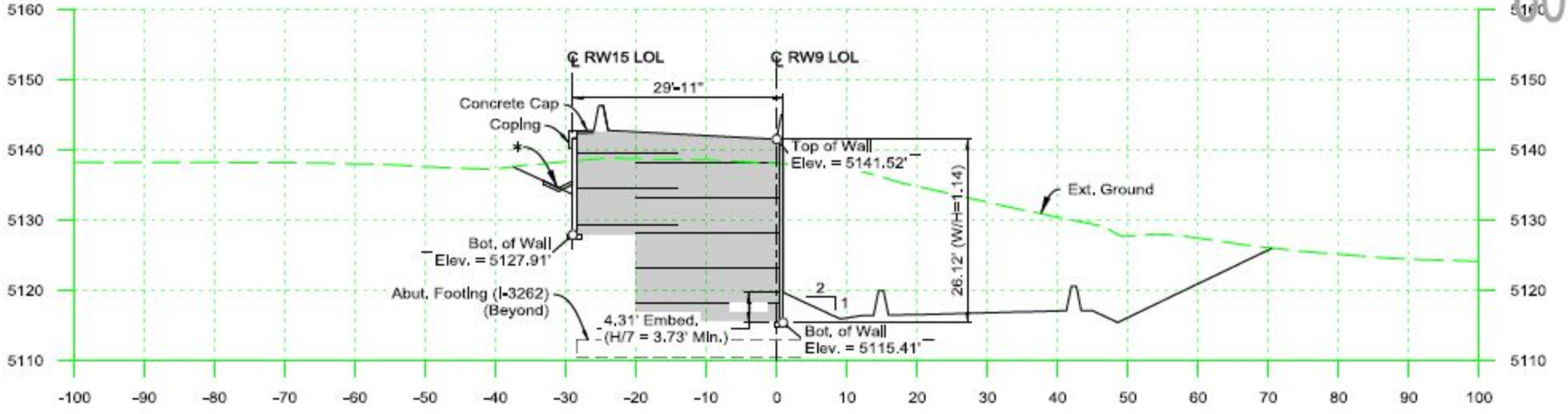
STATION RW15 10+00.00 (BEGIN OF WALL)

♦ = Paved V-Ditch (2:1 Slope Away from Wall)



SECTION B-B

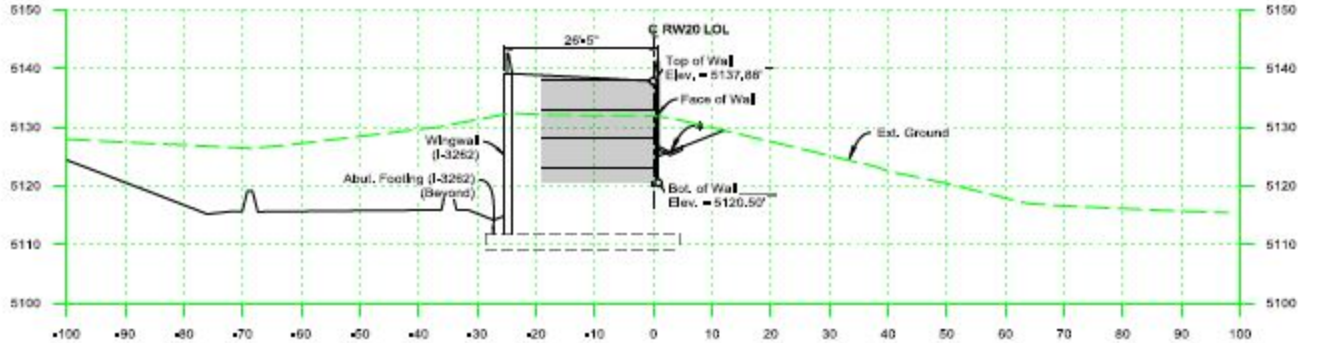
STATION RW13 10+63.12 (END OF WALL)



SECTION A-A

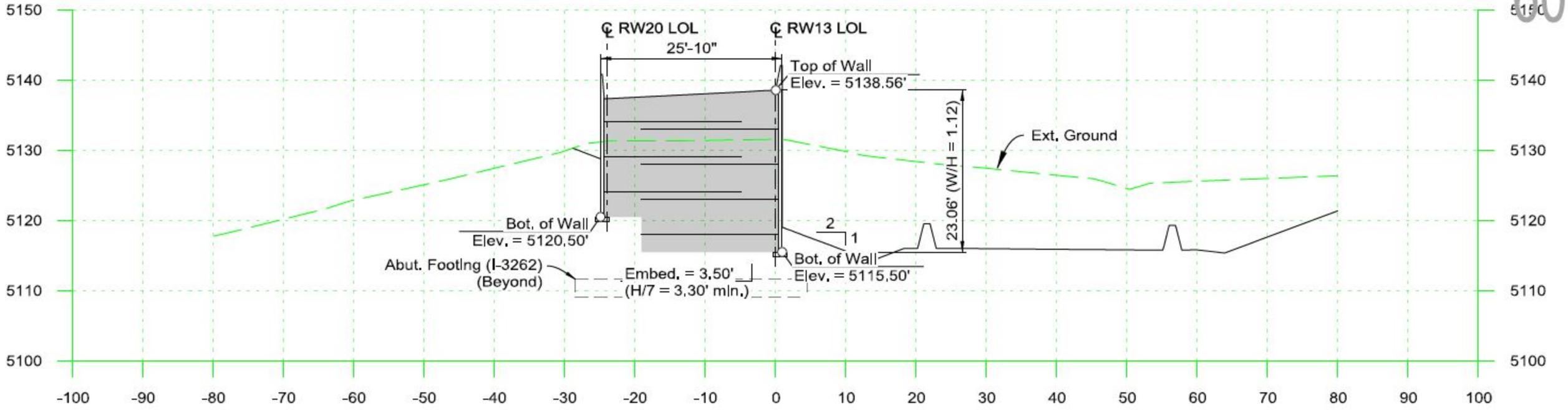
STATION RW9 10+00,00 (BEGIN OF WALL)

* - Paved V-Ditch (2:1 Slope Away from Wall)



SECTION B–B

STATION RW20 10+50.61 (END OF WALL)



SECTION A-A

STATION RW13 10+00.00 (BEGIN OF WALL)

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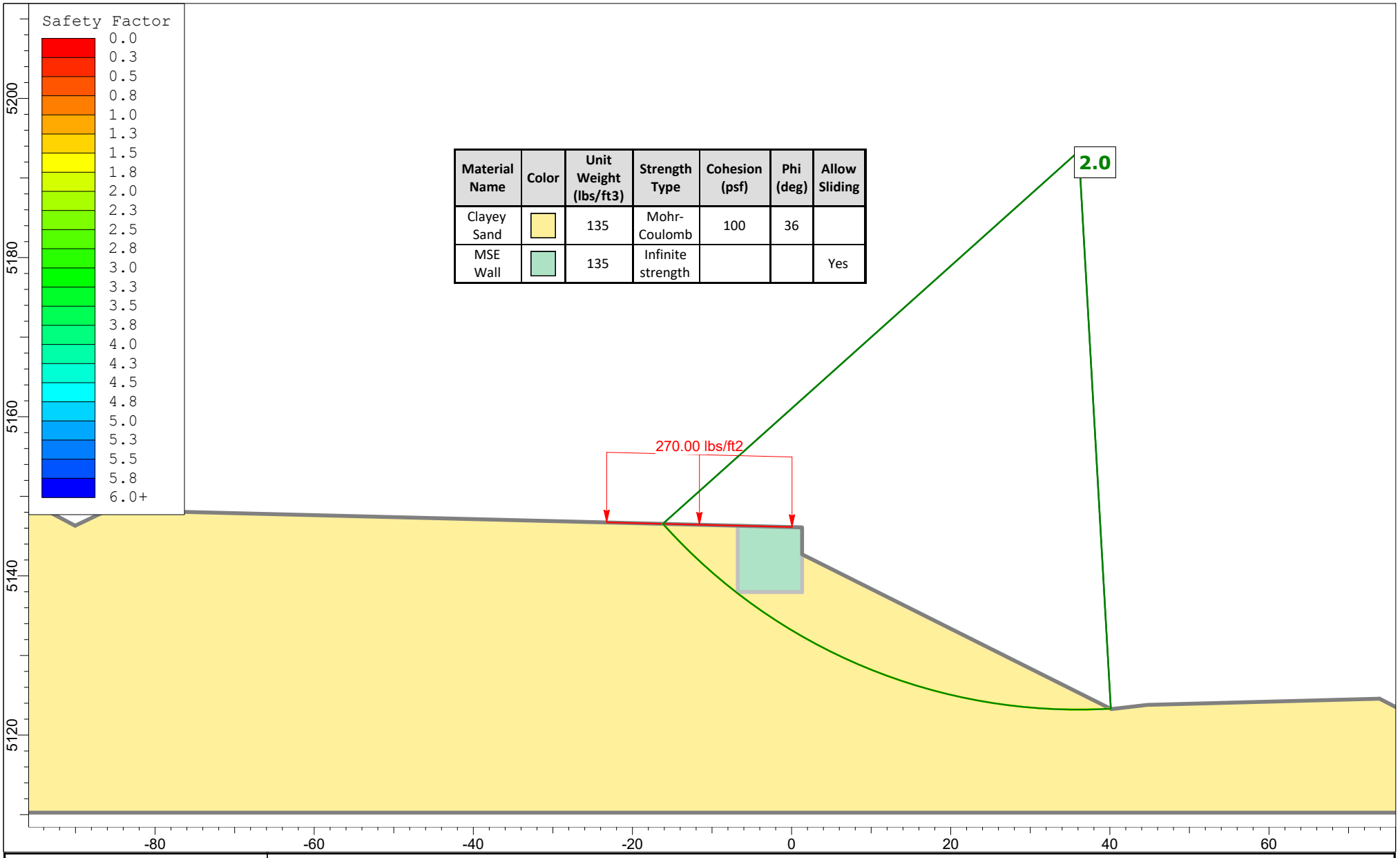
ATTACHMENT B

SLIDE Global Stability Results



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 - Section B		
Drawn By	J. Ruzicka	*Scale* 1:200	*Company* NewFields
Date Printed	8/19/2022		*File Name* RW9_Static.slim

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.929s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	1.968410
Center:	36.099, 5193.364
Radius:	70.184
Left Slip Surface Endpoint:	-16.181, 5146.537
Right Slip Surface Endpoint:	40.123, 5123.295
Resisting Moment:	3.31332e+06 lb-ft
Driving Moment:	1.68325e+06 lb-ft
Resisting Horizontal Force:	42434.5 lb
Driving Horizontal Force:	21557.8 lb
Total Slice Area:	410.413 ft2
Surface Horizontal Width:	56.3034 ft
Surface Average Height:	7.28932 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	5842
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.96841

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.12607	91.1669	-47.4691	Clayey Sand	100	36	119.775	235.767	186.867	0	186.867	317.437	317.437
2	1.12607	269.218	-46.1259	Clayey Sand	100	36	157.293	309.618	288.515	0	288.515	452.115	452.115
3	1.12607	439.004	-44.8148	Clayey Sand	100	36	194.584	383.022	389.546	0	389.546	582.876	582.876
4	1.12607	601.083	-43.5328	Clayey Sand	100	36	231.625	455.932	489.898	0	489.898	709.953	709.953
5	1.12607	755.943	-42.2776	Clayey Sand	100	36	268.394	528.31	589.519	0	589.519	833.547	833.547
6	1.12607	904.013	-41.0469	Clayey Sand	100	36	304.879	600.126	688.366	0	688.366	953.831	953.831
7	1.12607	1045.67	-39.8388	Clayey Sand	100	36	341.063	671.352	786.399	0	786.399	1070.95	1070.95
8	1.12607	1181.26	-38.6516	Clayey Sand	100	36	376.936	741.965	883.589	0	883.589	1185.05	1185.05
9	1.12607	1311.07	-37.4838	Clayey Sand	100	36	412.487	811.943	979.903	0	979.903	1296.23	1296.23
10	1.12607	1435.38	-36.3339	Clayey Sand	100	36	447.707	881.27	1075.32	0	1075.32	1404.61	1404.61
11	1.12607	1554.44	-35.2009	Clayey Sand	100	36	482.588	949.931	1169.83	0	1169.83	1510.27	1510.27
12	1.12607	1668.45	-34.0834	Clayey Sand	100	36	517.123	1017.91	1263.39	0	1263.39	1613.29	1613.29
13	1.12607	1777.63	-32.9805	Clayey Sand	100	36	551.306	1085.2	1356.01	0	1356.01	1713.76	1713.76
14	1.12607	1882.15	-31.8912	Clayey Sand	100	36	585.132	1151.78	1447.65	0	1447.65	1811.73	1811.73
15	1.12607	1982.19	-30.8146	Clayey Sand	100	36	574.596	1131.04	1419.11	0	1419.11	1761.84	1761.84
16	1.12607	1832.92	-29.75	Clayey Sand	100	36	512.622	1009.05	1251.2	0	1251.2	1544.18	1544.18
17	1.12607	1576.02	-28.6965	Clayey Sand	100	36	453.762	893.19	1091.73	0	1091.73	1340.12	1340.12
18	1.12607	1582.07	-27.6536	Clayey Sand	100	36	461.544	908.507	1112.82	0	1112.82	1354.66	1354.66
19	1.12607	1584.16	-26.6205	Clayey Sand	100	36	468.332	921.869	1131.21	0	1131.21	1365.94	1365.94
20	1.12607	1582.41	-25.5967	Clayey Sand	100	36	474.117	933.257	1146.88	0	1146.88	1374	1374
21	1.12607	1576.92	-24.5816	Clayey Sand	100	36	478.89	942.651	1159.81	0	1159.81	1378.88	1378.88
22	1.12607	1567.77	-23.5747	Clayey Sand	100	36	482.637	950.028	1169.97	0	1169.97	1380.57	1380.57
23	1.12607	1555.05	-22.5754	Clayey Sand	100	36	485.349	955.365	1177.31	0	1177.31	1379.09	1379.09
24	1.12607	1538.85	-21.5833	Clayey Sand	100	36	487.01	958.635	1181.81	0	1181.81	1374.46	1374.46
25	1.12607	1519.22	-20.598	Clayey Sand	100	36	487.606	959.809	1183.43	0	1183.43	1366.69	1366.69
26	1.12607	1496.25	-19.6189	Clayey Sand	100	36	487.122	958.855	1182.11	0	1182.11	1355.75	1355.75
27	1.12607	1469.99	-18.6459	Clayey Sand	100	36	485.54	955.742	1177.82	0	1177.82	1341.66	1341.66
28	1.12607	1440.5	-17.6783	Clayey Sand	100	36	482.842	950.431	1170.52	0	1170.52	1324.41	1324.41
29	1.12607	1407.83	-16.716	Clayey Sand	100	36	479.008	942.884	1160.13	0	1160.13	1303.99	1303.99
30	1.12607	1372.04	-15.7585	Clayey Sand	100	36	474.017	933.06	1146.61	0	1146.61	1280.37	1280.37

31	1.12607	1333.16	-14.8054	Clayey Sand	100	36	467.846	920.912	1129.89	0	1129.89	1253.54	1253.54
32	1.12607	1291.25	-13.8566	Clayey Sand	100	36	460.47	906.394	1109.9	0	1109.9	1223.49	1223.49
33	1.12607	1246.33	-12.9116	Clayey Sand	100	36	451.864	889.453	1086.59	0	1086.59	1190.17	1190.17
34	1.12607	1198.45	-11.9702	Clayey Sand	100	36	441.998	870.033	1059.86	0	1059.86	1153.57	1153.57
35	1.12607	1147.63	-11.032	Clayey Sand	100	36	430.843	848.076	1029.64	0	1029.64	1113.63	1113.63
36	1.12607	1093.91	-10.0969	Clayey Sand	100	36	418.367	823.518	995.837	0	995.837	1070.34	1070.34
37	1.12607	1037.31	-9.1644	Clayey Sand	100	36	404.535	796.291	958.359	0	958.359	1023.62	1023.62
38	1.12607	977.851	-8.23438	Clayey Sand	100	36	389.31	766.322	917.114	0	917.114	973.453	973.453
39	1.12607	915.56	-7.30654	Clayey Sand	100	36	372.653	733.533	871.983	0	871.983	919.764	919.764
40	1.12607	850.455	-6.38063	Clayey Sand	100	36	354.52	697.84	822.855	0	822.855	862.5	862.5
41	1.12607	782.551	-5.45638	Clayey Sand	100	36	334.866	659.153	769.609	0	769.609	801.595	801.595
42	1.12607	711.862	-4.53356	Clayey Sand	100	36	313.643	617.378	712.11	0	712.11	736.979	736.979
43	1.12607	638.4	-3.61192	Clayey Sand	100	36	290.798	572.41	650.217	0	650.217	668.573	668.573
44	1.12607	562.175	-2.69121	Clayey Sand	100	36	266.275	524.139	583.777	0	583.777	596.293	596.293
45	1.12607	483.193	-1.7712	Clayey Sand	100	36	240.014	472.446	512.628	0	512.628	520.05	520.05
46	1.12607	401.461	-0.85164	Clayey Sand	100	36	211.949	417.203	436.592	0	436.592	439.742	439.742
47	1.12607	316.981	0.0676971	Clayey Sand	100	36	182.011	358.272	355.481	0	355.481	355.266	355.266
48	1.12607	229.754	0.987052	Clayey Sand	100	36	150.124	295.505	269.091	0	269.091	266.504	266.504
49	1.12607	139.779	1.90666	Clayey Sand	100	36	116.207	228.743	177.199	0	177.199	173.331	173.331
50	1.12607	47.0519	2.82676	Clayey Sand	100	36	80.0906	157.651	79.35	0	79.35	75.3954	75.3954

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.96841

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-16.1805	5146.54	0	0	0
2	-15.0545	5145.31	94.5562	38.7974	22.3089
3	-13.9284	5144.14	255.401	104.794	22.3089
4	-12.8023	5143.02	472.181	193.741	22.3089
5	-11.6763	5141.95	735.54	301.8	22.3089
6	-10.5502	5140.93	1036.97	425.481	22.3089
7	-9.42412	5139.95	1368.7	561.593	22.3089
8	-8.29805	5139.01	1723.58	707.202	22.3088
9	-7.17198	5138.11	2095	859.602	22.3089
10	-6.04592	5137.24	2476.86	1016.28	22.3088
11	-4.91985	5136.41	2863.46	1174.91	22.3089
12	-3.79378	5135.62	3249.48	1333.3	22.3089
13	-2.66772	5134.86	3629.96	1489.41	22.3088
14	-1.54165	5134.13	4000.22	1641.33	22.3088
15	-0.415581	5133.43	4355.86	1787.25	22.3088
16	0.710486	5132.75	4662.18	1912.94	22.3088
17	1.83655	5132.11	4890.38	2006.57	22.3088
18	2.96262	5131.49	5052.53	2073.11	22.3089
19	4.08869	5130.9	5189.56	2129.33	22.3088
20	5.21476	5130.34	5300.8	2174.97	22.3088
21	6.34082	5129.8	5385.75	2209.83	22.3089
22	7.46689	5129.29	5444.09	2233.77	22.3089
23	8.59296	5128.79	5475.66	2246.72	22.3089
24	9.71902	5128.33	5480.48	2248.7	22.3089
25	10.8451	5127.88	5458.69	2239.76	22.3089
26	11.9712	5127.46	5410.62	2220.04	22.3089
27	13.0972	5127.06	5336.75	2189.73	22.3089
28	14.2233	5126.68	5237.71	2149.09	22.3089
29	15.3494	5126.32	5114.26	2098.44	22.3089
30	16.4754	5125.98	4967.37	2038.16	22.3088
31	17.6015	5125.66	4798.1	1968.71	22.3088
32	18.7276	5125.36	4607.73	1890.6	22.3089
33	19.8536	5125.09	4397.67	1804.41	22.3089
34	20.9797	5124.83	4169.49	1710.79	22.3089
35	22.1058	5124.59	3924.96	1610.45	22.3088
36	23.2318	5124.37	3665.99	1504.2	22.3089
37	24.3579	5124.17	3394.71	1392.89	22.3089
38	25.484	5123.99	3113.42	1277.47	22.3089
39	26.61	5123.82	2824.61	1158.97	22.3089
40	27.7361	5123.68	2531.01	1038.5	22.3089
41	28.8622	5123.55	2235.54	917.265	22.3088
42	29.9882	5123.45	1941.35	796.558	22.3089
43	31.1143	5123.36	1651.86	677.776	22.3089
44	32.2404	5123.29	1370.72	562.421	22.3089
45	33.3664	5123.23	1101.87	452.108	22.3088
46	34.4925	5123.2	849.53	348.571	22.3089
47	35.6186	5123.18	618.242	253.671	22.3088
48	36.7446	5123.18	412.875	169.407	22.3089
49	37.8707	5123.2	238.657	97.9233	22.3088
50	38.9968	5123.24	101.197	41.5224	22.309
51	40.1228	5123.3	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
0.0576972	5146.13
-6.768	5146.3
-23.2301	5146.71

External Boundary

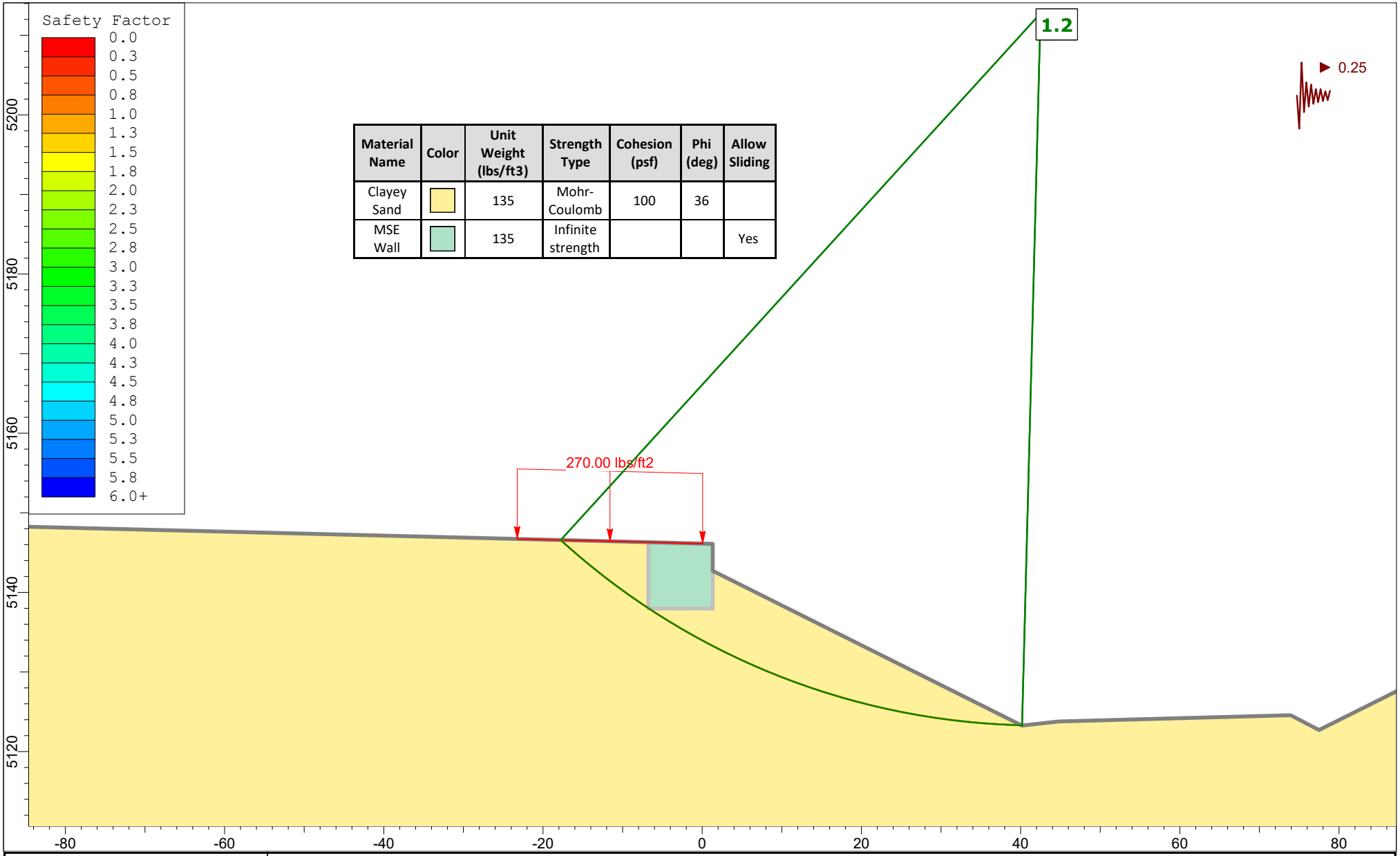
X	Y
-99.635	5110.25
100.402	5110.25
100.402	5134.17
77.491	5122.71
73.911	5124.57
44.716	5123.78
40.183	5123.27
1.32	5142.71
1.32	5146.1
-6.768	5146.3
-85.909	5148.28
-90.042	5146.31
-99.635	5151.36

Material Boundary

X	Y
1.32	5137.98
1.32	5142.71

Material Boundary

X	Y
-6.768	5146.3
-6.768	5137.98
1.32	5137.98



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 - Section B		
Drawn By	J. Ruzicka	*Scale*	1:200
Company	NewFields		
Date Printed	8/19/2022	*File Name*	RW9_Seismic.slim

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:02.781s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	1.228110
Center:	42.499, 5212.750
Radius:	89.514
Left Slip Surface Endpoint:	-17.782, 5146.577
Right Slip Surface Endpoint:	40.179, 5123.267
Resisting Moment:	3.66614e+06 lb-ft
Driving Moment:	2.98519e+06 lb-ft
Resisting Horizontal Force:	37440.5 lb
Driving Horizontal Force:	30486.3 lb
Total Slice Area:	378.708 ft2
Surface Horizontal Width:	57.9612 ft
Surface Average Height:	6.53383 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	10778
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.22811

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.15922	78.932	-41.8344	Clayey Sand	100	36	186.697	229.284	177.944	0	177.944	345.072	345.072
2	1.15922	234.02	-40.846	Clayey Sand	100	36	228.86	281.065	249.214	0	249.214	447.081	447.081
3	1.15922	383.677	-39.8722	Clayey Sand	100	36	271.374	333.277	321.078	0	321.078	547.758	547.758
4	1.15922	528.132	-38.912	Clayey Sand	100	36	314.213	385.888	393.492	0	393.492	647.138	647.138
5	1.15922	667.598	-37.9646	Clayey Sand	100	36	357.353	438.869	466.414	0	466.414	745.253	745.253
6	1.15922	802.267	-37.0293	Clayey Sand	100	36	400.775	492.196	539.812	0	539.812	842.139	842.139
7	1.15922	932.315	-36.1054	Clayey Sand	100	36	444.463	545.849	613.659	0	613.659	937.83	937.83
8	1.15922	1057.91	-35.1922	Clayey Sand	100	36	488.403	599.812	687.932	0	687.932	1032.36	1032.36
9	1.15922	1179.19	-34.2892	Clayey Sand	100	36	532.583	654.07	762.613	0	762.613	1125.77	1125.77
10	1.15922	1296.31	-33.3957	Clayey Sand	100	36	576.996	708.614	837.688	0	837.688	1218.08	1218.08
11	1.15922	1409.39	-32.5114	Clayey Sand	100	36	621.634	763.435	913.139	0	913.139	1309.34	1309.34
12	1.15922	1518.55	-31.6357	Clayey Sand	100	36	666.493	818.527	988.969	0	988.969	1399.57	1399.57
13	1.15922	1623.9	-30.7682	Clayey Sand	100	36	711.57	873.886	1065.16	0	1065.16	1488.81	1488.81
14	1.15922	1725.54	-29.9084	Clayey Sand	100	36	756.862	929.51	1141.72	0	1141.72	1577.08	1577.08
15	1.15922	1823.58	-29.056	Clayey Sand	100	36	802.369	985.397	1218.64	0	1218.64	1664.43	1664.43
16	1.15922	1918.1	-28.2106	Clayey Sand	100	36	771.882	947.956	1167.11	0	1167.11	1581.17	1581.17
17	1.15922	1720.67	-27.3718	Clayey Sand	100	36	669.284	821.954	993.687	0	993.687	1340.19	1340.19
18	1.15922	1478.29	-26.5393	Clayey Sand	100	36	597.477	733.767	872.306	0	872.306	1170.71	1170.71
19	1.15922	1476.5	-25.7128	Clayey Sand	100	36	607.195	745.702	888.736	0	888.736	1181.13	1181.13
20	1.15922	1471.5	-24.8921	Clayey Sand	100	36	615.91	756.405	903.461	0	903.461	1189.25	1189.25
21	1.15922	1463.35	-24.0767	Clayey Sand	100	36	623.593	765.841	916.455	0	916.455	1195.1	1195.1
22	1.15922	1452.11	-23.2665	Clayey Sand	100	36	630.212	773.97	927.638	0	927.638	1198.61	1198.61
23	1.15922	1437.84	-22.4612	Clayey Sand	100	36	635.733	780.75	936.97	0	936.97	1199.8	1199.8
24	1.15922	1420.6	-21.6606	Clayey Sand	100	36	640.12	786.138	944.392	0	944.392	1198.62	1198.62
25	1.15922	1400.43	-20.8644	Clayey Sand	100	36	643.336	790.087	949.819	0	949.819	1195.03	1195.03
26	1.15922	1377.37	-20.0723	Clayey Sand	100	36	645.339	792.547	953.21	0	953.21	1189.02	1189.02
27	1.15922	1351.49	-19.2843	Clayey Sand	100	36	646.086	793.465	954.474	0	954.474	1180.53	1180.53
28	1.15922	1322.8	-18.5	Clayey Sand	100	36	645.533	792.786	953.54	0	953.54	1169.53	1169.53
29	1.15922	1291.37	-17.7193	Clayey Sand	100	36	643.63	790.448	950.321	0	950.321	1155.97	1155.97
30	1.15922	1257.21	-16.942	Clayey Sand	100	36	640.324	786.388	944.731	0	944.731	1139.79	1139.79

31	1.15922	1220.37	-16.1679	Clayey Sand	100	36	635.559	780.536	936.676	0	936.676	1120.94	1120.94
32	1.15922	1180.88	-15.3968	Clayey Sand	100	36	629.277	772.821	926.058	0	926.058	1099.35	1099.35
33	1.15922	1138.76	-14.6286	Clayey Sand	100	36	621.413	763.164	912.767	0	912.767	1074.96	1074.96
34	1.15922	1094.05	-13.863	Clayey Sand	100	36	611.9	751.48	896.681	0	896.681	1047.69	1047.69
35	1.15922	1046.78	-13.1	Clayey Sand	100	36	600.662	737.679	877.687	0	877.687	1017.46	1017.46
36	1.15922	996.957	-12.3393	Clayey Sand	100	36	587.624	721.667	855.654	0	855.654	984.199	984.199
37	1.15922	944.618	-11.5808	Clayey Sand	100	36	572.7	703.338	830.423	0	830.423	947.781	947.781
38	1.15922	889.779	-10.8244	Clayey Sand	100	36	555.799	682.582	801.855	0	801.855	908.124	908.124
39	1.15922	832.461	-10.0698	Clayey Sand	100	36	536.824	659.279	769.782	0	769.782	865.114	865.114
40	1.15922	772.681	-9.31707	Clayey Sand	100	36	515.672	633.302	734.027	0	734.027	818.629	818.629
41	1.15922	710.456	-8.56593	Clayey Sand	100	36	492.23	604.512	694.401	0	694.401	768.544	768.544
42	1.15922	645.801	-7.81626	Clayey Sand	100	36	466.374	572.759	650.697	0	650.697	714.717	714.717
43	1.15922	578.729	-7.06794	Clayey Sand	100	36	437.976	537.883	602.695	0	602.695	656.999	656.999
44	1.15922	509.254	-6.32083	Clayey Sand	100	36	406.894	499.711	550.156	0	550.156	595.227	595.227
45	1.15922	437.386	-5.5748	Clayey Sand	100	36	372.976	458.055	492.82	0	492.82	529.225	529.225
46	1.15922	363.134	-4.82971	Clayey Sand	100	36	336.055	412.712	430.411	0	430.411	458.805	458.805
47	1.15922	286.507	-4.08544	Clayey Sand	100	36	295.952	363.461	362.623	0	362.623	383.761	383.761
48	1.15922	207.513	-3.34187	Clayey Sand	100	36	252.473	310.065	289.129	0	289.129	303.872	303.872
49	1.15922	126.158	-2.59885	Clayey Sand	100	36	205.408	252.264	209.573	0	209.573	218.896	218.896
50	1.15922	42.445	-1.85627	Clayey Sand	100	36	148.831	182.781	113.938	0	113.938	118.762	118.762

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.22811

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-17.782	5146.58	0	0	0
2	-16.6228	5145.54	-12.3289	-8.23715	33.7476
3	-15.4636	5144.54	30.2879	20.2359	33.7476
4	-14.3043	5143.57	122.097	81.5753	33.7476
5	-13.1451	5142.63	257.611	172.114	33.7475
6	-11.9859	5141.73	431.58	288.345	33.7475
7	-10.8267	5140.85	638.973	426.908	33.7475
8	-9.66745	5140.01	874.959	584.574	33.7475
9	-8.50823	5139.19	1134.89	758.235	33.7474
10	-7.349	5138.4	1414.26	944.893	33.7476
11	-6.18978	5137.64	1708.76	1141.65	33.7475
12	-5.03056	5136.9	2014.17	1345.7	33.7475
13	-3.87133	5136.18	2326.42	1554.32	33.7475
14	-2.71211	5135.49	2641.54	1764.85	33.7474
15	-1.55289	5134.83	2955.67	1974.73	33.7475
16	-0.393663	5134.18	3265.04	2181.42	33.7475
17	0.765561	5133.56	3574.32	2388.06	33.7475
18	1.92478	5132.96	3823.95	2554.85	33.7476
19	3.08401	5132.38	4005.01	2675.81	33.7475
20	4.24323	5131.82	4165.4	2782.97	33.7475
21	5.40245	5131.29	4304.3	2875.77	33.7475
22	6.56168	5130.77	4420.97	2953.72	33.7475
23	7.7209	5130.27	4514.82	3016.42	33.7475
24	8.88013	5129.79	4585.36	3063.55	33.7475
25	10.0393	5129.33	4632.24	3094.88	33.7476
26	11.1986	5128.89	4655.23	3110.24	33.7476
27	12.3578	5128.46	4654.23	3109.56	33.7475
28	13.517	5128.06	4629.25	3092.88	33.7476
29	14.6762	5127.67	4580.47	3060.28	33.7475
30	15.8355	5127.3	4508.17	3011.98	33.7475
31	16.9947	5126.95	4412.79	2948.26	33.7476
32	18.1539	5126.61	4294.93	2869.51	33.7475
33	19.3131	5126.29	4155.31	2776.23	33.7475
34	20.4724	5125.99	3994.84	2669.02	33.7476
35	21.6316	5125.7	3814.59	2548.59	33.7475
36	22.7908	5125.43	3615.79	2415.77	33.7475
37	23.95	5125.18	3399.9	2271.53	33.7475
38	25.1093	5124.94	3168.53	2116.94	33.7474
39	26.2685	5124.72	2923.53	1953.26	33.7476
40	27.4277	5124.51	2666.96	1781.84	33.7475
41	28.5869	5124.32	2401.14	1604.24	33.7475
42	29.7461	5124.15	2128.63	1422.17	33.7475
43	30.9054	5123.99	1852.25	1237.52	33.7476
44	32.0646	5123.85	1575.16	1052.39	33.7475
45	33.2238	5123.72	1300.79	869.078	33.7475
46	34.383	5123.61	1032.95	690.128	33.7474
47	35.5423	5123.51	775.795	518.321	33.7475
48	36.7015	5123.42	533.906	356.711	33.7475
49	37.8607	5123.36	312.284	208.642	33.7475
50	39.0199	5123.3	116.412	77.7768	33.7475
51	40.1792	5123.27	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
0.0576972	5146.13
-6.768	5146.3
-23.2301	5146.71

External Boundary

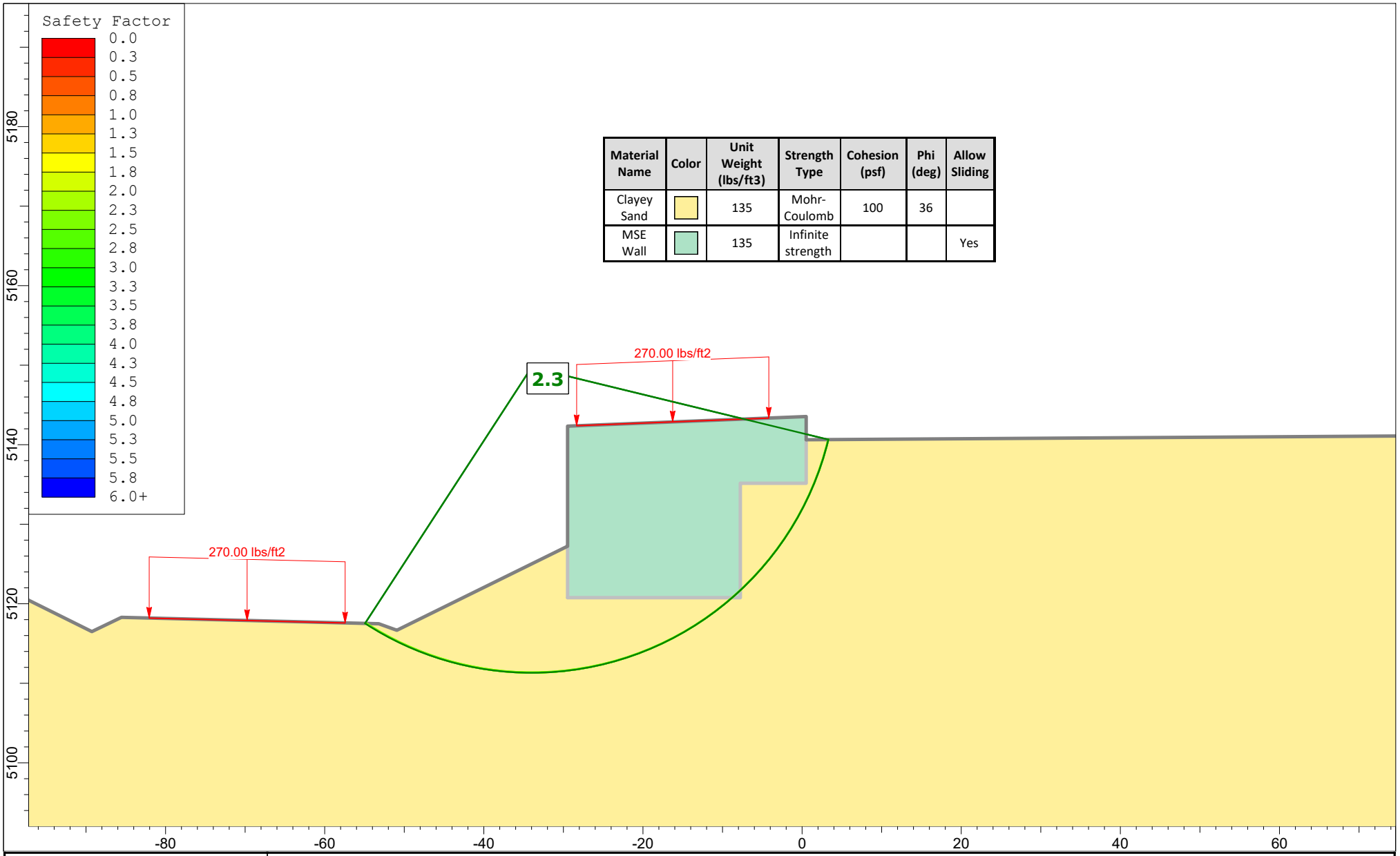
X	Y
-99.635	5110.25
100.402	5110.25
100.402	5134.17
77.491	5122.71
73.911	5124.57
44.716	5123.78
40.183	5123.27
1.32	5142.71
1.32	5146.1
-6.768	5146.3
-85.909	5148.28
-90.042	5146.31
-99.635	5151.36

Material Boundary

X	Y
1.32	5137.98
1.32	5142.71

Material Boundary

X	Y
-6.768	5146.3
-6.768	5137.98
1.32	5137.98



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 - RW15 Section B-B		
Drawn By	J. Ruzicka	Scale	1:200
Company	NewFields		
Date Printed	8/19/2022	File Name	RW9_RW15_Section_B-B_Static.slim

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US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

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Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.515s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

2 Distributed Loads present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical
Distributed Load 2	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	2.260090
Center:	-34.000, 5149.722
Radius:	38.404
Left Slip Surface Endpoint:	-54.934, 5117.525
Right Slip Surface Endpoint:	3.316, 5140.646
Resisting Moment:	4.11545e+06 lb-ft
Driving Moment:	1.82092e+06 lb-ft
Resisting Horizontal Force:	94146.9 lb
Driving Horizontal Force:	41656.3 lb
Total Slice Area:	958.951 ft2
Surface Horizontal Width:	58.2502 ft
Surface Average Height:	16.4626 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	3851
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.26009

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.165	54.977	-32.0064	Clayey Sand	100	36	100.94	228.134	176.362	0	176.362	113.271	113.271
2	1.165	152.172	-29.9782	Clayey Sand	100	36	147.131	332.529	320.048	0	320.048	235.177	235.177
3	1.165	195.411	-27.9907	Clayey Sand	100	36	162.564	367.409	368.056	0	368.056	281.653	281.653
4	1.165	248.263	-26.0392	Clayey Sand	100	36	181.442	410.076	426.783	0	426.783	338.134	338.134
5	1.165	409.428	-24.1197	Clayey Sand	100	36	248.162	560.868	634.331	0	634.331	523.22	523.22
6	1.165	578.193	-22.2286	Clayey Sand	100	36	313.45	708.425	837.426	0	837.426	709.327	709.327
7	1.165	739.942	-20.3627	Clayey Sand	100	36	371.473	839.562	1017.92	0	1017.92	880.047	880.047
8	1.165	894.938	-18.5192	Clayey Sand	100	36	423.192	956.452	1178.81	0	1178.81	1037.05	1037.05
9	1.165	1043.41	-16.6953	Clayey Sand	100	36	469.376	1060.83	1322.47	0	1322.47	1181.7	1181.7
10	1.165	1185.55	-14.8887	Clayey Sand	100	36	510.652	1154.12	1450.86	0	1450.86	1315.1	1315.1
11	1.165	1321.53	-13.0971	Clayey Sand	100	36	547.527	1237.46	1565.57	0	1565.57	1438.19	1438.19
12	1.165	1451.48	-11.3185	Clayey Sand	100	36	580.424	1311.81	1667.92	0	1667.92	1551.74	1551.74
13	1.165	1575.54	-9.55093	Clayey Sand	100	36	609.701	1377.98	1758.99	0	1758.99	1656.4	1656.4
14	1.165	1693.8	-7.79245	Clayey Sand	100	36	635.652	1436.63	1839.71	0	1839.71	1752.73	1752.73
15	1.165	1806.34	-6.04134	Clayey Sand	100	36	658.527	1488.33	1910.88	0	1910.88	1841.18	1841.18
16	1.165	1913.22	-4.29588	Clayey Sand	100	36	678.544	1533.57	1973.13	0	1973.13	1922.16	1922.16
17	1.165	2014.5	-2.55441	Clayey Sand	100	36	695.875	1572.74	2027.06	0	2027.06	1996.01	1996.01
18	1.165	2110.19	-0.815305	Clayey Sand	100	36	710.689	1606.22	2073.13	0	2073.13	2063.02	2063.02
19	1.165	2200.33	0.923052	Clayey Sand	100	36	723.108	1634.29	2111.77	0	2111.77	2123.42	2123.42
20	1.165	2284.9	2.66226	Clayey Sand	100	36	733.258	1657.23	2143.34	0	2143.34	2177.44	2177.44
21	1.165	2363.89	4.40393	Clayey Sand	100	36	741.232	1675.25	2168.15	0	2168.15	2225.23	2225.23
22	1.165	2796.38	6.14969	Clayey Sand	100	36	850.17	1921.46	2507.02	0	2507.02	2598.62	2598.62
23	1.165	4825.95	7.90121	Clayey Sand	100	36	1418.38	3205.66	4274.57	0	4274.57	4471.42	4471.42
24	1.165	4804.98	9.66019	Clayey Sand	100	36	1455.22	3288.92	4389.17	0	4389.17	4636.88	4636.88
25	1.165	4778.22	11.4284	Clayey Sand	100	36	1418.32	3205.52	4274.38	0	4274.38	4561.1	4561.1
26	1.165	4745.54	13.2078	Clayey Sand	100	36	1380.79	3120.72	4157.66	0	4157.66	4481.72	4481.72
27	1.165	4706.84	15.0002	Clayey Sand	100	36	1342.61	3034.42	4038.88	0	4038.88	4398.64	4398.64
28	1.165	4661.96	16.8078	Clayey Sand	100	36	1303.73	2946.54	3917.93	0	3917.93	4311.74	4311.74
29	1.165	4610.74	18.6328	Clayey Sand	100	36	1264.11	2857	3794.68	0	3794.68	4220.91	4220.91
30	1.165	4552.99	20.4777	Clayey Sand	100	36	1223.71	2765.7	3669.03	0	3669.03	4126.01	4126.01

31	1.165	4488.46	22.345	Clayey Sand	100	36	1182.51	2672.57	3540.84	0	3540.84	4026.9	4026.9
32	1.165	4416.9	24.2378	Clayey Sand	100	36	1140.44	2577.49	3409.97	0	3409.97	3923.41	3923.41
33	1.165	4338.01	26.1592	Clayey Sand	100	36	1097.47	2480.37	3276.3	0	3276.3	3815.35	3815.35
34	1.165	4251.41	28.1128	Clayey Sand	100	36	1053.54	2381.1	3139.67	0	3139.67	3702.51	3702.51
35	1.165	4156.7	30.1027	Clayey Sand	100	36	1008.62	2279.57	2999.92	0	2999.92	3584.66	3584.66
36	1.165	4053.39	32.1336	Clayey Sand	100	36	962.634	2175.64	2856.88	0	2856.88	3461.52	3461.52
37	1.165	3940.91	34.2108	Clayey Sand	100	36	915.525	2069.17	2710.33	0	2710.33	3332.78	3332.78
38	1.165	3818.57	36.3407	Clayey Sand	100	36	867.222	1960	2560.07	0	2560.07	3198.06	3198.06
39	1.165	3685.56	38.5306	Clayey Sand	100	36	817.64	1847.94	2405.84	0	2405.84	3056.93	3056.93
40	1.165	3540.91	40.7895	Clayey Sand	100	36	766.691	1732.79	2247.34	0	2247.34	2908.89	2908.89
41	1.165	3383.39	43.1283	Clayey Sand	100	36	714.259	1614.29	2084.25	0	2084.25	2753.3	2753.3
42	1.165	3211.5	45.5604	Clayey Sand	100	36	660.226	1492.17	1916.15	0	1916.15	2589.42	2589.42
43	1.165	3023.3	48.1032	Clayey Sand	100	36	604.423	1366.05	1742.57	0	1742.57	2416.28	2416.28
44	1.165	2816.29	50.7792	Clayey Sand	100	36	524.169	1184.67	1492.92	0	1492.92	2135.14	2135.14
45	1.165	2587.04	53.619	Clayey Sand	100	36	437.769	989.397	1224.15	0	1224.15	1818.34	1818.34
46	1.165	2330.75	56.666	Clayey Sand	100	36	377.863	854.004	1037.8	0	1037.8	1612.3	1612.3
47	1.165	2040.22	59.9853	Clayey Sand	100	36	315.272	712.542	843.09	0	843.09	1388.83	1388.83
48	1.165	1513.26	63.6835	Clayey Sand	100	36	225.169	508.902	562.806	0	562.806	1018.07	1018.07
49	1.165	835.44	67.9607	Clayey Sand	100	36	126.266	285.372	255.142	0	255.142	567.045	567.045
50	1.165	304.856	73.3036	Clayey Sand	100	36	58.6947	132.655	44.946	0	44.946	240.63	240.63

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.26009

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-54.9345	5117.52	0	0	0
2	-53.7694	5116.8	246.072	83.7907	18.8044
3	-52.6044	5116.12	632.643	215.423	18.8044
4	-51.4394	5115.51	1050.02	357.547	18.8045
5	-50.2744	5114.94	1504.43	512.278	18.8044
6	-49.1094	5114.41	2124.55	723.439	18.8044
7	-47.9444	5113.94	2888.6	983.609	18.8044
8	-46.7794	5113.51	3761.73	1280.92	18.8044
9	-45.6144	5113.12	4715	1605.52	18.8044
10	-44.4494	5112.77	5724.18	1949.16	18.8044
11	-43.2844	5112.46	6768.77	2304.86	18.8044
12	-42.1194	5112.19	7831.29	2666.66	18.8044
13	-40.9544	5111.95	8896.74	3029.46	18.8044
14	-39.7894	5111.76	9952.19	3388.85	18.8044
15	-38.6244	5111.6	10986.4	3741.01	18.8044
16	-37.4594	5111.47	11989.6	4082.6	18.8043
17	-36.2944	5111.39	12953.1	4410.71	18.8044
18	-35.1294	5111.33	13869.6	4722.77	18.8043
19	-33.9644	5111.32	14732.3	5016.54	18.8044
20	-32.7994	5111.34	15535.5	5290.04	18.8044
21	-31.6344	5111.39	16274	5541.53	18.8044
22	-30.4694	5111.48	16943.5	5769.48	18.8044
23	-29.3044	5111.61	17619.7	5999.75	18.8044
24	-28.1394	5111.77	18581.8	6327.35	18.8044
25	-26.9744	5111.97	19407.5	6608.53	18.8044
26	-25.8094	5112.2	20054	6828.67	18.8044
27	-24.6444	5112.47	20526.7	6989.61	18.8044
28	-23.4794	5112.79	20830.8	7093.16	18.8044
29	-22.3144	5113.14	20971.6	7141.12	18.8044
30	-21.1494	5113.53	20954.4	7135.27	18.8044
31	-19.9844	5113.97	20784.5	7077.4	18.8044
32	-18.8193	5114.45	20467.2	6969.35	18.8044
33	-17.6543	5114.97	20007.9	6812.97	18.8044
34	-16.4893	5115.54	19412.3	6610.16	18.8044
35	-15.3243	5116.16	18686.2	6362.91	18.8044
36	-14.1593	5116.84	17835.7	6073.29	18.8044
37	-12.9943	5117.57	16867.2	5743.49	18.8043
38	-11.8293	5118.36	15787.5	5375.87	18.8044
39	-10.6643	5119.22	14604.2	4972.93	18.8044
40	-9.49932	5120.15	13325.3	4537.46	18.8045
41	-8.33432	5121.15	11959.9	4072.5	18.8044
42	-7.16932	5122.25	10517.9	3581.49	18.8044
43	-6.00431	5123.43	9011.02	3068.37	18.8044
44	-4.83931	5124.73	7452.68	2537.74	18.8044
45	-3.67431	5126.16	5932.68	2020.16	18.8044
46	-2.5093	5127.74	4507.21	1534.77	18.8044
47	-1.3443	5129.51	3109.43	1058.8	18.8044
48	-0.179295	5131.53	1776.68	604.985	18.8044
49	0.985708	5133.88	713.448	242.939	18.8044
50	2.15071	5136.76	126.371	43.031	18.8044
51	3.31571	5140.65	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-4.18518	5143.36
-28.3408	5142.39

Distributed Load

X	Y
-57.4404	5117.59
-82.0621	5118.2

External Boundary

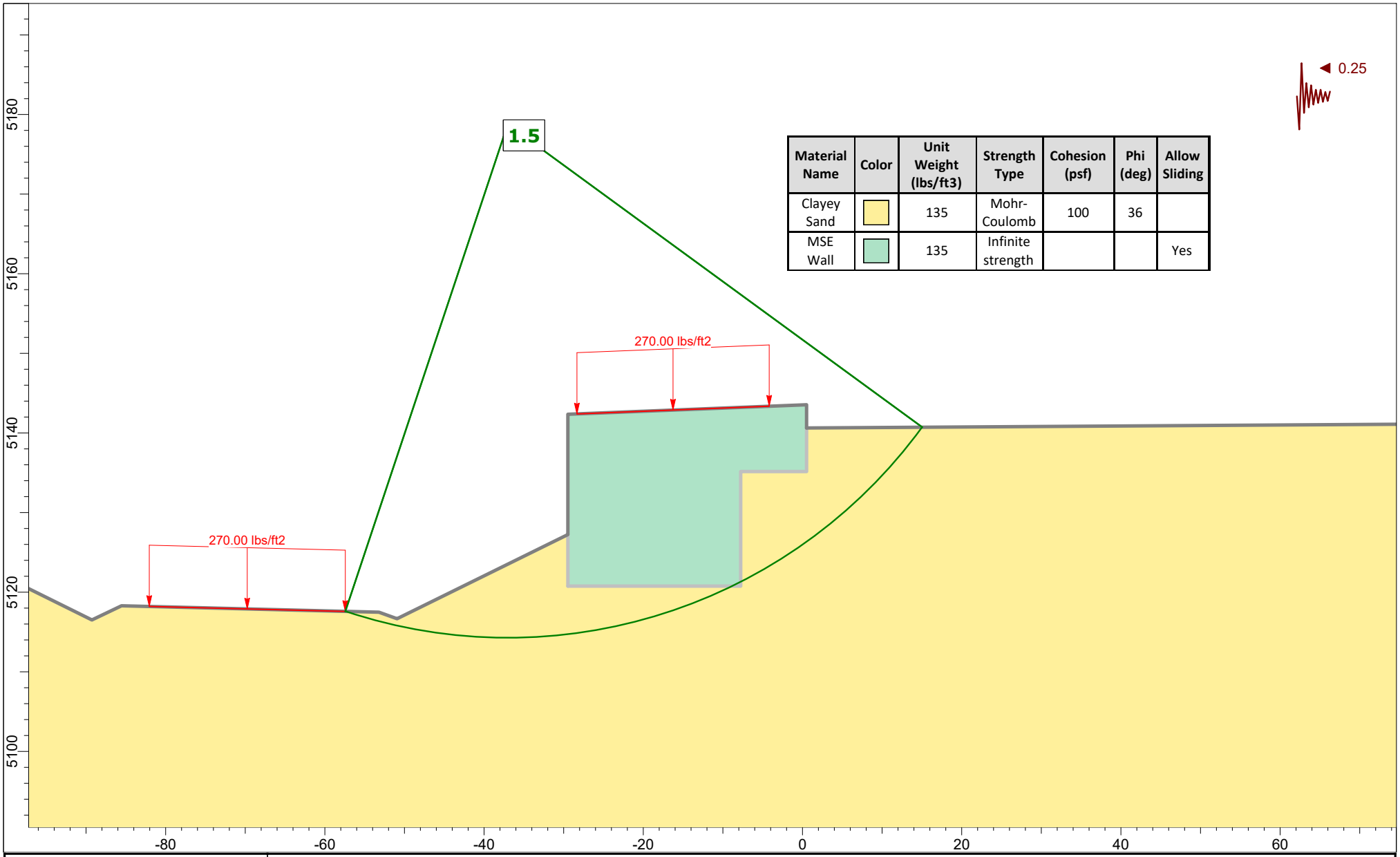
X	Y
-99.418	5121.54
-99.418	5090.09
75.559	5090.09
75.559	5141.1
0.503	5140.63
0.503	5143.54
-29.481	5142.34
-29.481	5127.24
-50.929	5116.67
-53.216	5117.48
-85.552	5118.29
-89.271	5116.51

Material Boundary

X	Y
-29.481	5120.76
-7.762	5120.76
-7.762	5135.16
0.503	5135.16
0.503	5140.63

Material Boundary

X	Y
-29.481	5120.76
-29.481	5127.24



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 - RW15 Section B-B		
Drawn By	J. Ruzicka	*Scale*	1:200
Company	NewFields		
Date Printed	8/19/2022	*File Name*	RW9_RW15_Section_B-B_Seismic.slim

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US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

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Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:02.418s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

2 Distributed Loads present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical
Distributed Load 2	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	1.480510
Center:	-37.034, 5178.758
Radius:	64.485
Left Slip Surface Endpoint:	-57.439, 5117.587
Right Slip Surface Endpoint:	15.037, 5140.719
Resisting Moment:	6.67459e+06 lb-ft
Driving Moment:	4.50831e+06 lb-ft
Resisting Horizontal Force:	96788.1 lb
Driving Horizontal Force:	65374.9 lb
Total Slice Area:	992.342 ft2
Surface Horizontal Width:	72.476 ft
Surface Average Height:	13.692 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	7799
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.48051

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.44952	41.9222	-17.7715	Clayey Sand	100	36	252.162	373.328	376.204	0	376.204	295.382	295.382
2	1.44952	122.115	-16.4239	Clayey Sand	100	36	313.247	463.766	500.681	0	500.681	408.345	408.345
3	1.44952	194.73	-15.0856	Clayey Sand	100	36	356.422	527.687	588.661	0	588.661	492.587	492.587
4	1.44952	205.976	-13.7556	Clayey Sand	100	36	340.727	504.45	556.678	0	556.678	473.267	473.267
5	1.44952	202.255	-12.4332	Clayey Sand	100	36	315.433	467.001	505.134	0	505.134	435.59	435.59
6	1.44952	372.144	-11.1175	Clayey Sand	100	36	418.381	619.417	714.913	0	714.913	632.697	632.697
7	1.44952	564.333	-9.80765	Clayey Sand	100	36	522.276	773.235	926.629	0	926.629	836.345	836.345
8	1.44952	749.855	-8.503	Clayey Sand	100	36	608.619	901.067	1102.58	0	1102.58	1011.59	1011.59
9	1.44952	928.783	-7.20277	Clayey Sand	100	36	680.535	1007.54	1249.12	0	1249.12	1163.12	1163.12
10	1.44952	1101.18	-5.90626	Clayey Sand	100	36	740.479	1096.29	1371.28	0	1371.28	1294.67	1294.67
11	1.44952	1267.1	-4.61278	Clayey Sand	100	36	790.397	1170.19	1472.99	0	1472.99	1409.22	1409.22
12	1.44952	1426.57	-3.32166	Clayey Sand	100	36	831.835	1231.54	1557.43	0	1557.43	1509.15	1509.15
13	1.44952	1579.64	-2.03222	Clayey Sand	100	36	866.039	1282.18	1627.13	0	1627.13	1596.4	1596.4
14	1.44952	1726.31	-0.743814	Clayey Sand	100	36	894.016	1323.6	1684.14	0	1684.14	1672.53	1672.53
15	1.44952	1866.61	0.544217	Clayey Sand	100	36	916.576	1357	1730.12	0	1730.12	1738.83	1738.83
16	1.44952	2000.53	1.83252	Clayey Sand	100	36	934.401	1383.39	1766.43	0	1766.43	1796.33	1796.33
17	1.44952	2128.05	3.12176	Clayey Sand	100	36	948.031	1403.57	1794.2	0	1794.2	1845.91	1845.91
18	1.44952	2249.18	4.41258	Clayey Sand	100	36	957.92	1418.21	1814.36	0	1814.36	1888.28	1888.28
19	1.44952	2363.86	5.70565	Clayey Sand	100	36	964.451	1427.88	1827.67	0	1827.67	1924.03	1924.03
20	1.44952	4543.55	7.00164	Clayey Sand	100	36	1698.92	2515.27	3324.34	0	3324.34	3532.99	3532.99
21	1.44952	5373.15	8.30125	Clayey Sand	100	36	2073.24	3069.45	4087.1	0	4087.1	4389.6	4389.6
22	1.44952	5339.83	9.60517	Clayey Sand	100	36	2001.87	2963.79	3941.68	0	3941.68	4280.45	4280.45
23	1.44952	5299.85	10.9141	Clayey Sand	100	36	1921.07	2844.17	3777.02	0	3777.02	4147.46	4147.46
24	1.44952	5253.14	12.2289	Clayey Sand	100	36	1842.84	2728.34	3617.6	0	3617.6	4017.01	4017.01
25	1.44952	5199.59	13.5502	Clayey Sand	100	36	1766.88	2615.89	3462.82	0	3462.82	3888.65	3888.65
26	1.44952	5139.1	14.879	Clayey Sand	100	36	1692.96	2506.44	3312.18	0	3312.18	3761.97	3761.97
27	1.44952	5071.54	16.2159	Clayey Sand	100	36	1620.85	2399.68	3165.24	0	3165.24	3636.62	3636.62
28	1.44952	4996.78	17.5621	Clayey Sand	100	36	1550.36	2295.32	3021.6	0	3021.6	3512.27	3512.27
29	1.44952	4914.66	18.9183	Clayey Sand	100	36	1481.32	2193.11	2880.93	0	2880.93	3388.62	3388.62
30	1.44952	4825	20.2856	Clayey Sand	100	36	1413.59	2092.84	2742.91	0	2742.91	3265.41	3265.41

31	1.44952	4727.61	21.6651	Clayey Sand	100	36	1347.05	1994.32	2607.3	0	2607.3	3142.4	3142.4
32	1.44952	4622.27	23.0579	Clayey Sand	100	36	1281.56	1897.36	2473.86	0	2473.86	3019.37	3019.37
33	1.44952	4508.74	24.4653	Clayey Sand	100	36	1217.03	1801.83	2342.36	0	2342.36	2896.1	2896.1
34	1.44952	4386.75	25.8886	Clayey Sand	100	36	1153.38	1707.59	2212.65	0	2212.65	2772.42	2772.42
35	1.44952	4256	27.3293	Clayey Sand	100	36	1090.52	1614.52	2084.57	0	2084.57	2648.13	2648.13
36	1.44952	4116.14	28.789	Clayey Sand	100	36	1028.39	1522.54	1957.96	0	1957.96	2523.06	2523.06
37	1.44952	3966.8	30.2694	Clayey Sand	100	36	941.466	1393.85	1780.83	0	1780.83	2330.3	2330.3
38	1.44952	3807.56	31.7725	Clayey Sand	100	36	811.619	1201.61	1516.23	0	1516.23	2018.91	2018.91
39	1.44952	3637.93	33.3005	Clayey Sand	100	36	754.456	1116.98	1399.75	0	1399.75	1895.35	1895.35
40	1.44952	3442.21	34.8558	Clayey Sand	100	36	695.044	1029.02	1278.69	0	1278.69	1762.76	1762.76
41	1.44952	2689.76	36.4411	Clayey Sand	100	36	540.587	800.345	963.944	0	963.944	1363.1	1363.1
42	1.44952	2475.78	38.0595	Clayey Sand	100	36	486.815	720.734	854.368	0	854.368	1235.52	1235.52
43	1.44952	2248.72	39.7145	Clayey Sand	100	36	433.618	641.976	745.967	0	745.967	1106.15	1106.15
44	1.44952	2007.61	41.4103	Clayey Sand	100	36	381.021	564.105	638.785	0	638.785	974.822	974.822
45	1.44952	1751.36	43.1517	Clayey Sand	100	36	329.059	487.175	532.9	0	532.9	841.386	841.386
46	1.44952	1478.64	44.9443	Clayey Sand	100	36	277.789	411.27	428.427	0	428.427	705.677	705.677
47	1.44952	1187.87	46.7948	Clayey Sand	100	36	227.294	336.511	325.529	0	325.529	567.529	567.529
48	1.44952	877.151	48.7114	Clayey Sand	100	36	177.689	263.071	224.448	0	224.448	426.789	426.789
49	1.44952	544.131	50.7043	Clayey Sand	100	36	129.149	191.206	125.535	0	125.535	283.348	283.348
50	1.44952	185.86	52.7859	Clayey Sand	100	36	81.6099	120.824	28.6621	0	28.6621	136.124	136.124

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.48051

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-57.4393	5117.59	0	0	0
2	-55.9898	5117.12	530.723	411.47	37.7865
3	-54.5403	5116.7	1169.31	906.566	37.7864
4	-53.0908	5116.3	1868.55	1448.69	37.7865
5	-51.6413	5115.95	2509.71	1945.78	37.7864
6	-50.1917	5115.63	3078.94	2387.1	37.7864
7	-48.7422	5115.35	3797.5	2944.21	37.7865
8	-47.2927	5115.09	4647.54	3603.24	37.7864
9	-45.8432	5114.88	5583.41	4328.82	37.7864
10	-44.3937	5114.69	6568.94	5092.9	37.7864
11	-42.9441	5114.54	7575.27	5873.12	37.7865
12	-41.4946	5114.43	8579.31	6651.55	37.7865
13	-40.0451	5114.34	9562.45	7413.77	37.7864
14	-38.5956	5114.29	10509.7	8148.17	37.7864
15	-37.146	5114.27	11408.9	8845.34	37.7865
16	-35.6965	5114.29	12250.3	9497.7	37.7865
17	-34.247	5114.33	13026.1	10099.1	37.7863
18	-32.7975	5114.41	13729.8	10644.7	37.7864
19	-31.348	5114.52	14356.6	11130.7	37.7865
20	-29.8984	5114.67	14902.4	11553.8	37.7863
21	-28.4489	5114.85	15643.4	12128.4	37.7866
22	-26.9994	5115.06	16448.4	12752.5	37.7865
23	-25.5499	5115.3	17055.5	13223.1	37.7864
24	-24.1004	5115.58	17466.4	13541.7	37.7864
25	-22.6508	5115.9	17694.5	13718.5	37.7863
26	-21.2013	5116.25	17752.3	13763.4	37.7865
27	-19.7518	5116.63	17652.1	13685.7	37.7865
28	-18.3023	5117.05	17405.1	13494.2	37.7865
29	-16.8528	5117.51	17022.6	13197.6	37.7864
30	-15.4032	5118.01	16515.2	12804.3	37.7866
31	-13.9537	5118.55	15893.5	12322.3	37.7866
32	-12.5042	5119.12	15167.7	11759.5	37.7864
33	-11.0547	5119.74	14348	11124	37.7864
34	-9.60515	5120.4	13444.5	10423.5	37.7864
35	-8.15563	5121.1	12467.2	9665.83	37.7864
36	-6.70611	5121.85	11426.3	8858.84	37.7865
37	-5.25659	5122.65	10332.1	8010.49	37.7865
38	-3.80707	5123.49	9201.9	7134.24	37.7864
39	-2.35755	5124.39	8068.15	6255.24	37.7864
40	-0.908027	5125.34	6922.17	5366.77	37.7865
41	0.541494	5126.35	5780.72	4481.8	37.7865
42	1.99101	5127.42	4862.13	3769.61	37.7864
43	3.44054	5128.56	3980.95	3086.43	37.7864
44	4.89006	5129.76	3150.7	2442.74	37.7864
45	6.33958	5131.04	2385.85	1849.75	37.7864
46	7.7891	5132.4	1702.01	1319.57	37.7865
47	9.23862	5133.85	1116.21	865.398	37.7864
48	10.6881	5135.39	647.138	501.726	37.7864
49	12.1377	5137.04	315.576	244.666	37.7864
50	13.5872	5138.81	144.86	112.31	37.7864
51	15.0367	5140.72	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-4.18518	5143.36
-28.3408	5142.39

Distributed Load

X	Y
-57.4404	5117.59
-82.0621	5118.2

External Boundary

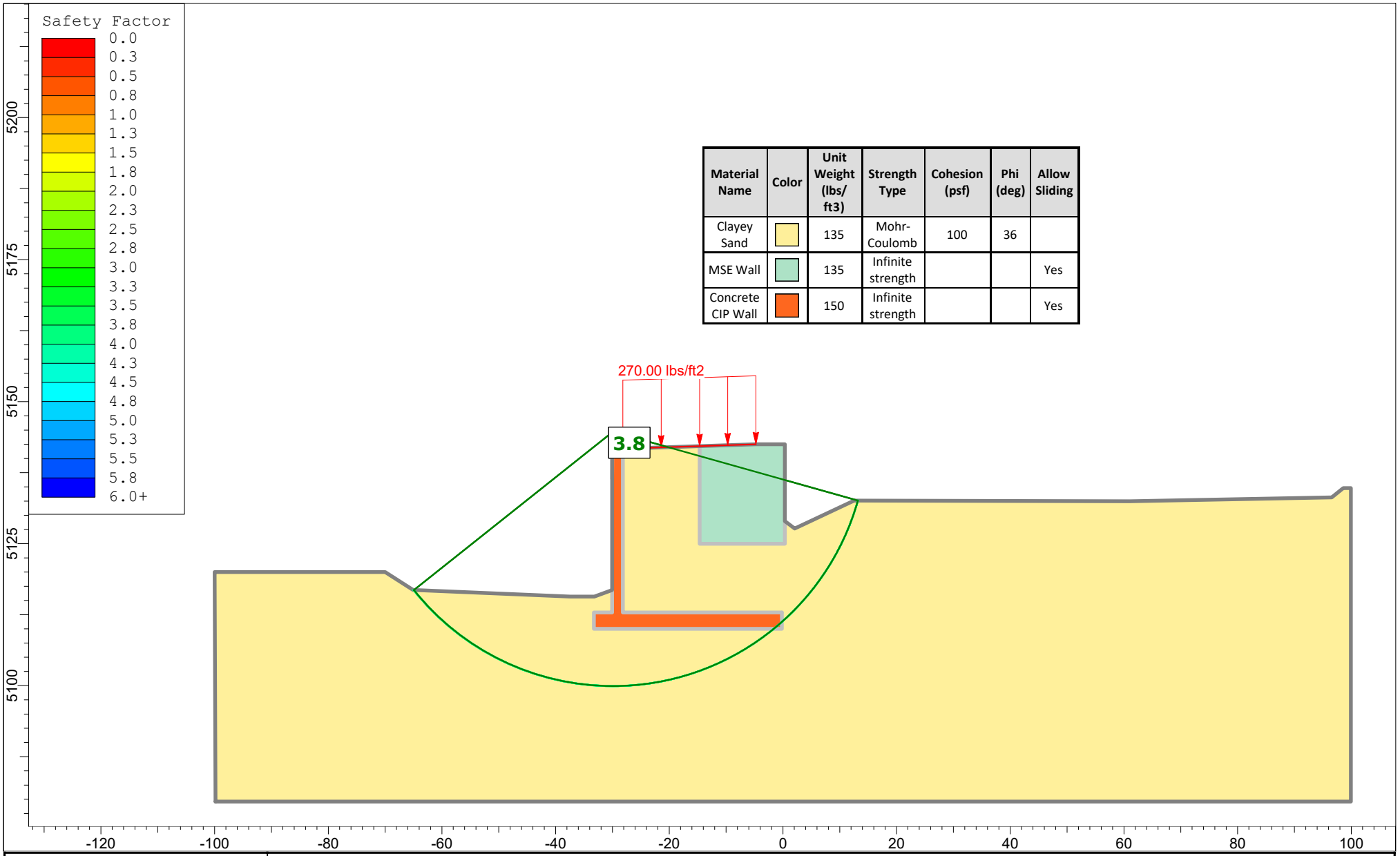
X	Y
-99.418	5121.54
-99.418	5090.09
75.559	5090.09
75.559	5141.1
0.503	5140.63
0.503	5143.54
-29.481	5142.34
-29.481	5127.24
-50.929	5116.67
-53.216	5117.48
-85.552	5118.29
-89.271	5116.51

Material Boundary

X	Y
-29.481	5120.76
-7.762	5120.76
-7.762	5135.16
0.503	5135.16
0.503	5140.63

Material Boundary

X	Y
-29.481	5120.76
-29.481	5127.24



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes
Concrete CIP Wall		150	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 - RW15, Section C-C		
Drawn By	J. Ruzicka	*Scale*	1:280
Company	NewFields		
Date Printed	9/2/2022	*File Name*	RW9_RW15_Section_C-C_Static.slim

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.73s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0
Concrete CIP Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	150
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	3.830510
Center:	-29.897, 5144.709
Radius:	44.778
Left Slip Surface Endpoint:	-64.937, 5116.829
Right Slip Surface Endpoint:	13.206, 5132.576
Resisting Moment:	8.69643e+06 lb-ft
Driving Moment:	2.27031e+06 lb-ft
Resisting Horizontal Force:	173005 lb
Driving Horizontal Force:	45164.9 lb
Total Slice Area:	1687.31 ft2
Surface Horizontal Width:	78.1422 ft
Surface Average Height:	21.5928 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	1735
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 3.83051

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.56284	189.132	-49.9381	Clayey Sand	100	36	75.9301	290.851	262.684	0	262.684	172.392	172.392
2	1.56284	547.652	-46.9203	Clayey Sand	100	36	141	540.1	605.746	0	605.746	454.963	454.963
3	1.56284	869.691	-44.0646	Clayey Sand	100	36	193.58	741.512	882.965	0	882.965	695.605	695.605
4	1.56284	1160.47	-41.3411	Clayey Sand	100	36	237.173	908.495	1112.8	0	1112.8	904.136	904.136
5	1.56284	1423.9	-38.7274	Clayey Sand	100	36	273.911	1049.22	1306.49	0	1306.49	1086.83	1086.83
6	1.56284	1662.97	-36.2064	Clayey Sand	100	36	305.189	1169.03	1471.39	0	1471.39	1247.97	1247.97
7	1.56284	1880.04	-33.7643	Clayey Sand	100	36	331.966	1271.6	1612.57	0	1612.57	1390.64	1390.64
8	1.56284	2077.02	-31.3901	Clayey Sand	100	36	354.934	1359.58	1733.67	0	1733.67	1517.1	1517.1
9	1.56284	2255.45	-29.0746	Clayey Sand	100	36	374.611	1434.95	1837.4	0	1837.4	1629.12	1629.12
10	1.56284	2416.6	-26.8101	Clayey Sand	100	36	391.387	1499.21	1925.84	0	1925.84	1728.05	1728.05
11	1.56284	2561.52	-24.59	Clayey Sand	100	36	405.567	1553.53	2000.61	0	2000.61	1815.02	1815.02
12	1.56284	2691.12	-22.4088	Clayey Sand	100	36	417.404	1598.87	2063.01	0	2063.01	1890.9	1890.9
13	1.56284	2806.12	-20.2613	Clayey Sand	100	36	427.089	1635.97	2114.09	0	2114.09	1956.43	1956.43
14	1.56284	2907.17	-18.1431	Clayey Sand	100	36	434.793	1665.48	2154.69	0	2154.69	2012.22	2012.22
15	1.56284	2994.79	-16.0504	Clayey Sand	100	36	440.644	1687.89	2185.55	0	2185.55	2058.78	2058.78
16	1.56284	3069.43	-13.9795	Clayey Sand	100	36	444.761	1703.66	2207.25	0	2207.25	2096.52	2096.52
17	1.56284	3131.46	-11.927	Clayey Sand	100	36	447.233	1713.13	2220.29	0	2220.29	2125.82	2125.82
18	1.56284	3182.38	-9.89002	Clayey Sand	100	36	448.303	1717.23	2225.93	0	2225.93	2147.77	2147.77
19	1.56284	3231.52	-7.86559	Clayey Sand	100	36	449.22	1720.74	2230.75	0	2230.75	2168.69	2168.69
20	1.56284	3271.2	-5.851	Clayey Sand	100	36	448.969	1719.78	2229.44	0	2229.44	2183.43	2183.43
21	1.56284	3377.97	-3.84366	Clayey Sand	100	36	457.326	1751.79	2273.5	0	2273.5	2242.77	2242.77
22	1.56284	3527.58	-1.84104	Clayey Sand	100	36	470.916	1803.85	2345.15	0	2345.15	2330.01	2330.01
23	1.56284	7690.82	0.159331	Clayey Sand	100	36	983.501	3767.31	5047.62	0	5047.62	5050.35	5050.35
24	1.56284	9223.39	2.1599	Clayey Sand	100	36	1185.8	4542.2	6114.16	0	6114.16	6158.89	6158.89
25	1.56284	8865.08	4.1631	Clayey Sand	100	36	1155.57	4426.43	5954.82	0	5954.82	6038.93	6038.93
26	1.56284	8846.16	6.17143	Clayey Sand	100	36	1140.36	4368.16	5874.61	0	5874.61	5997.92	5997.92
27	1.56284	8815.52	8.18741	Clayey Sand	100	36	1123.95	4305.3	5788.09	0	5788.09	5949.81	5949.81
28	1.56284	8773	10.2137	Clayey Sand	100	36	1106.32	4237.78	5695.16	0	5695.16	5894.49	5894.49
29	1.56284	8718.4	12.2529	Clayey Sand	100	36	1087.45	4165.5	5595.68	0	5595.68	5831.85	5831.85
30	1.56284	8651.45	14.3081	Clayey Sand	100	36	1067.31	4088.35	5489.49	0	5489.49	5761.71	5761.71

31	1.56284	8571.84	16.3823	Clayey Sand	100	36	1045.86	4006.19	5376.41	0	5376.41	5683.87	5683.87
32	1.56284	8479.19	18.4788	Clayey Sand	100	36	1023.06	3918.86	5256.21	0	5256.21	5598.1	5598.1
33	1.56284	8373.11	20.6013	Clayey Sand	100	36	998.883	3826.23	5128.71	0	5128.71	5504.19	5504.19
34	1.56284	8253.15	22.7539	Clayey Sand	100	36	973.262	3728.09	4993.64	0	4993.64	5401.84	5401.84
35	1.56284	8118.5	24.941	Clayey Sand	100	36	946.127	3624.15	4850.57	0	4850.57	5290.57	5290.57
36	1.56284	7968.38	27.1677	Clayey Sand	100	36	917.397	3514.1	4699.1	0	4699.1	5169.93	5169.93
37	1.56284	7801.88	29.4399	Clayey Sand	100	36	886.984	3397.6	4538.76	0	4538.76	5039.36	5039.36
38	1.56284	7617.92	31.7642	Clayey Sand	100	36	854.784	3274.26	4369	0	4369	4898.25	4898.25
39	1.56284	7413.78	34.1486	Clayey Sand	100	36	799.014	3060.63	4074.96	0	4074.96	4616.92	4616.92
40	1.56284	7180.89	36.6024	Clayey Sand	100	36	741.194	2839.15	3770.12	0	3770.12	4320.63	4320.63
41	1.56284	6920.7	39.1372	Clayey Sand	100	36	702.139	2689.55	3564.2	0	3564.2	4135.57	4135.57
42	1.56284	5921.68	41.7671	Clayey Sand	100	36	592.125	2268.14	2984.18	0	2984.18	3512.99	3512.99
43	1.56284	3233.97	44.5101	Clayey Sand	100	36	326.604	1251.06	1584.3	0	1584.3	1905.37	1905.37
44	1.56284	2893.97	47.3893	Clayey Sand	100	36	287.471	1101.16	1377.98	0	1377.98	1690.49	1690.49
45	1.56284	2670.13	50.4364	Clayey Sand	100	36	259.506	994.04	1230.54	0	1230.54	1544.64	1544.64
46	1.56284	2401.12	53.6954	Clayey Sand	100	36	227.85	872.781	1063.64	0	1063.64	1373.77	1373.77
47	1.56284	2075.52	57.2322	Clayey Sand	100	36	191.932	735.199	874.276	0	874.276	1172.46	1172.46
48	1.56284	1675.02	61.1527	Clayey Sand	100	36	150.964	578.271	658.284	0	658.284	932.351	932.351
49	1.56284	1166.33	65.6514	Clayey Sand	100	36	103.809	397.642	409.668	0	409.668	639.062	639.062
50	1.56284	458.84	71.178	Clayey Sand	100	36	48.0485	184.05	115.685	0	115.685	256.649	256.649

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 3.83051

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-64.9365	5116.83	0	0	0
2	-63.3737	5114.97	606.801	80.8789	7.59205
3	-61.8108	5113.3	1839.44	245.174	7.59205
4	-60.248	5111.79	3477.45	463.5	7.59205
5	-58.6851	5110.41	5378.03	716.823	7.59205
6	-57.1223	5109.16	7443.36	992.106	7.59206
7	-55.5595	5108.01	9603.53	1280.03	7.59206
8	-53.9966	5106.97	11807	1573.72	7.59204
9	-52.4338	5106.02	14014.7	1867.98	7.59205
10	-50.8709	5105.15	16196.5	2158.79	7.59206
11	-49.3081	5104.36	18328.9	2443.02	7.59208
12	-47.7452	5103.64	20393.4	2718.18	7.59205
13	-46.1824	5103	22374.9	2982.29	7.59205
14	-44.6195	5102.42	24261.7	3233.79	7.59208
15	-43.0567	5101.91	26044.4	3471.4	7.59208
16	-41.4939	5101.46	27715.5	3694.13	7.59206
17	-39.931	5101.07	29269	3901.2	7.59208
18	-38.3682	5100.74	30700.7	4092.01	7.59205
19	-36.8053	5100.47	32007.5	4266.2	7.59206
20	-35.2425	5100.25	33190.9	4423.93	7.59206
21	-33.6796	5100.09	34249.3	4565.01	7.59207
22	-32.1168	5099.99	35202.5	4692.05	7.59206
23	-30.5539	5099.94	36056	4805.81	7.59206
24	-28.9911	5099.94	37570.4	5007.67	7.59207
25	-27.4283	5100	39062.5	5206.54	7.59206
26	-25.8654	5100.11	40190.3	5356.86	7.59206
27	-24.3026	5100.28	40979	5461.99	7.59207
28	-22.7397	5100.51	41433.3	5522.54	7.59206
29	-21.1769	5100.79	41558	5539.15	7.59205
30	-19.614	5101.13	41357.5	5512.44	7.59207
31	-18.0512	5101.53	40836.8	5443.03	7.59206
32	-16.4883	5101.99	40000.4	5331.56	7.59207
33	-14.9255	5102.51	38853.5	5178.68	7.59205
34	-13.3627	5103.1	37400.9	4985.07	7.59206
35	-11.7998	5103.75	35648.1	4751.44	7.59205
36	-10.237	5104.48	33600.7	4478.55	7.59206
37	-8.67412	5105.28	31264.8	4167.2	7.59205
38	-7.11128	5106.16	28647	3818.29	7.59207
39	-5.54843	5107.13	25754.7	3432.77	7.59204
40	-3.98559	5108.19	22683.2	3023.39	7.59207
41	-2.42275	5109.35	19464.8	2594.42	7.59208
42	-0.859902	5110.62	16028.8	2136.44	7.59207
43	0.702942	5112.02	12788.7	1704.58	7.59209
44	2.26579	5113.55	10864.9	1448.16	7.59209
45	3.82863	5115.25	8972.89	1195.97	7.59204
46	5.39147	5117.15	7050.6	939.756	7.59206
47	6.95432	5119.27	5143.96	685.625	7.59206
48	8.51716	5121.7	3321.01	442.649	7.59206
49	10.08	5124.54	1689.13	225.139	7.59203
50	11.6429	5127.99	436.497	58.1796	7.59206
51	13.2057	5132.58	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-28.179	5141.7
-14.6643	5142.15
-4.769	5142.49

External Boundary

X	Y
-99.84	5079.59
99.918	5079.59
99.918	5134.77
98.584	5134.77
96.558	5133.14
61.01	5132.45
12.533	5132.58
2.069	5127.66
0.338	5128.96
0.338	5142.49
-4.769	5142.49
-14.6643	5142.15
-28.179	5141.7
-30.0258	5141.64
-30.066	5141.64
-30.066	5137.63
-30.066	5136.41
-30.066	5116.83
-33.193	5115.68
-37.453	5115.68
-65.071	5116.84
-70	5120
-100	5120

Material Boundary

X	Y
-14.6643	5142.15
-14.6643	5124.96
0.338	5124.96
0.338	5128.96

Material Boundary

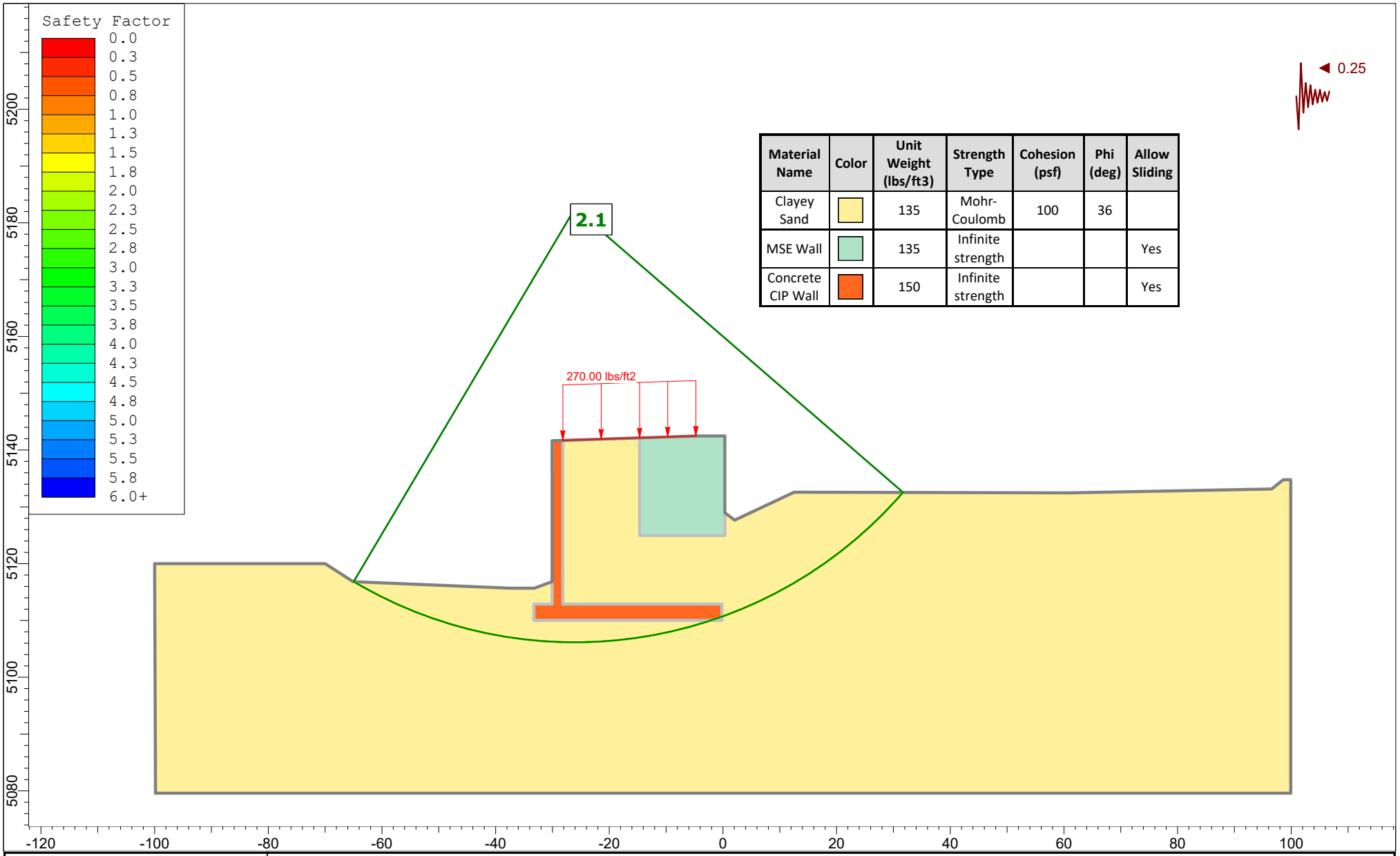
X	Y
-30.066	5116.83
-30.066	5112.88
-33.275	5112.88
-33.275	5110
-0.199	5110
-0.199	5112.88

Material Boundary

X	Y
-30.066	5136.41
-30.0258	5141.64

Material Boundary

X	Y
-28.179	5141.7
-28.179	5112.88
-0.199	5112.88



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes
Concrete CIP Wall		150	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 - RW15, Section C-C		
Drawn By	J. Ruzicka	Scale	1:280
Company	NewFields		
Date Printed	9/2/2022	File Name	RW9_RW15_Section_C-C_Seismic.slim

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.417s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0
Concrete CIP Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	150
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	2.135270
Center:	-26.027, 5182.545
Radius:	76.389
Left Slip Surface Endpoint:	-64.974, 5116.831
Right Slip Surface Endpoint:	31.710, 5132.529
Resisting Moment:	1.35906e+07 lb-ft
Driving Moment:	6.36482e+06 lb-ft
Resisting Horizontal Force:	170084 lb
Driving Horizontal Force:	79654.3 lb
Total Slice Area:	1637.76 ft2
Surface Horizontal Width:	96.6843 ft
Surface Average Height:	16.9392 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	2852
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.13527

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.93369	134.061	-29.8181	Clayey Sand	100	36	181.276	387.073	395.122	0	395.122	291.229	291.229
2	1.93369	392.632	-28.1597	Clayey Sand	100	36	290.079	619.398	714.888	0	714.888	559.612	559.612
3	1.93369	632.536	-26.5265	Clayey Sand	100	36	372.221	794.793	956.301	0	956.301	770.503	770.503
4	1.93369	854.581	-24.9164	Clayey Sand	100	36	434.655	928.106	1139.79	0	1139.79	937.879	937.879
5	1.93369	1059.48	-23.327	Clayey Sand	100	36	482.184	1029.59	1279.48	0	1279.48	1071.55	1071.55
6	1.93369	1247.86	-21.7564	Clayey Sand	100	36	518.197	1106.49	1385.31	0	1385.31	1178.51	1178.51
7	1.93369	1420.28	-20.2028	Clayey Sand	100	36	545.13	1164	1464.47	0	1464.47	1263.87	1263.87
8	1.93369	1577.23	-18.6646	Clayey Sand	100	36	564.772	1205.94	1522.2	0	1522.2	1331.42	1331.42
9	1.93369	1719.14	-17.1402	Clayey Sand	100	36	578.451	1235.15	1562.39	0	1562.39	1384	1384
10	1.93369	1846.4	-15.6282	Clayey Sand	100	36	587.172	1253.77	1588.03	0	1588.03	1423.77	1423.77
11	1.93369	1959.35	-14.1274	Clayey Sand	100	36	591.705	1263.45	1601.36	0	1601.36	1452.43	1452.43
12	1.93369	2058.27	-12.6363	Clayey Sand	100	36	592.66	1265.49	1604.16	0	1604.16	1471.29	1471.29
13	1.93369	2143.44	-11.154	Clayey Sand	100	36	590.506	1260.89	1597.83	0	1597.83	1481.4	1481.4
14	1.93369	2215.07	-9.67911	Clayey Sand	100	36	585.621	1250.46	1583.47	0	1583.47	1483.59	1483.59
15	1.93369	2279.59	-8.21072	Clayey Sand	100	36	579.73	1237.88	1566.15	0	1566.15	1482.5	1482.5
16	1.93369	2345.3	-6.74774	Clayey Sand	100	36	574.7	1227.14	1551.38	0	1551.38	1483.38	1483.38
17	1.93369	2478.82	-5.28917	Clayey Sand	100	36	584.451	1247.96	1580.04	0	1580.04	1525.93	1525.93
18	1.93369	2720.5	-3.83403	Clayey Sand	100	36	615.735	1314.76	1671.97	0	1671.97	1630.71	1630.71
19	1.93369	9784.11	-2.38136	Clayey Sand	100	36	1992.37	4254.24	5717.8	0	5717.8	5634.95	5634.95
20	1.93369	9390.42	-0.930229	Clayey Sand	100	36	1971.69	4210.1	5657.05	0	5657.05	5625.03	5625.03
21	1.93369	9385.14	0.520308	Clayey Sand	100	36	1917.04	4093.4	5496.42	0	5496.42	5513.83	5513.83
22	1.93369	9390.86	1.97118	Clayey Sand	100	36	1864.3	3980.79	5341.45	0	5341.45	5405.61	5405.61
23	1.93369	9383.77	3.42332	Clayey Sand	100	36	1812.11	3869.34	5188.05	0	5188.05	5296.45	5296.45
24	1.93369	9363.83	4.87766	Clayey Sand	100	36	1760.33	3758.78	5035.88	0	5035.88	5186.1	5186.1
25	1.93369	9330.97	6.33516	Clayey Sand	100	36	1708.85	3648.86	4884.59	0	4884.59	5074.31	5074.31
26	1.93369	9285.09	7.7968	Clayey Sand	100	36	1657.58	3539.38	4733.9	0	4733.9	4960.86	4960.86
27	1.93369	9226.26	9.26356	Clayey Sand	100	36	1606.45	3430.21	4583.64	0	4583.64	4845.66	4845.66
28	1.93369	9154.33	10.7365	Clayey Sand	100	36	1555.39	3321.18	4433.58	0	4433.58	4728.5	4728.5
29	1.93369	9068.92	12.2166	Clayey Sand	100	36	1504.3	3212.09	4283.43	0	4283.43	4609.12	4609.12
30	1.93369	8969.81	13.7051	Clayey Sand	100	36	1453.12	3102.81	4133.01	0	4133.01	4487.38	4487.38

31	1.93369	8856.77	15.203	Clayey Sand	100	36	1401.8	2993.22	3982.17	0	3982.17	4363.11	4363.11
32	1.93369	8723.1	16.7117	Clayey Sand	100	36	1275.65	2723.85	3611.42	0	3611.42	3994.42	3994.42
33	1.93369	8562.06	18.2325	Clayey Sand	100	36	1211.92	2587.77	3424.13	0	3424.13	3823.35	3823.35
34	1.93369	7540.81	19.7666	Clayey Sand	100	36	1047.68	2237.07	2941.42	0	2941.42	3317.92	3317.92
35	1.93369	4345.91	21.3157	Clayey Sand	100	36	610.288	1303.13	1655.96	0	1655.96	1894.1	1894.1
36	1.93369	4239.45	22.8813	Clayey Sand	100	36	582.432	1243.65	1574.09	0	1574.09	1819.9	1819.9
37	1.93369	4255.29	24.4652	Clayey Sand	100	36	570.476	1218.12	1538.96	0	1538.96	1798.52	1798.52
38	1.93369	4254.17	26.0693	Clayey Sand	100	36	556.576	1188.44	1498.11	0	1498.11	1770.4	1770.4
39	1.93369	4235.41	27.6957	Clayey Sand	100	36	540.775	1154.7	1451.66	0	1451.66	1735.53	1735.53
40	1.93369	4198.21	29.3467	Clayey Sand	100	36	523.105	1116.97	1399.73	0	1399.73	1693.85	1693.85
41	1.93369	4041.33	31.025	Clayey Sand	100	36	492.52	1051.66	1309.85	0	1309.85	1606.08	1606.08
42	1.93369	3726.8	32.7334	Clayey Sand	100	36	446.007	952.346	1173.15	0	1173.15	1459.85	1459.85
43	1.93369	3389.97	34.4752	Clayey Sand	100	36	399.068	852.118	1035.2	0	1035.2	1309.22	1309.22
44	1.93369	3030.28	36.2543	Clayey Sand	100	36	351.823	751.237	896.35	0	896.35	1154.36	1154.36
45	1.93369	2646.18	38.0749	Clayey Sand	100	36	304.31	649.785	756.715	0	756.715	995.109	995.109
46	1.93369	2235.82	39.942	Clayey Sand	100	36	256.583	547.875	616.448	0	616.448	831.305	831.305
47	1.93369	1797.03	41.8617	Clayey Sand	100	36	208.708	445.648	475.744	0	475.744	662.755	662.755
48	1.93369	1327.2	43.8409	Clayey Sand	100	36	160.775	343.299	334.872	0	334.872	489.271	489.271
49	1.93369	823.182	45.8883	Clayey Sand	100	36	112.908	241.088	194.192	0	194.192	310.656	310.656
50	1.93369	281.097	48.0144	Clayey Sand	100	36	66.8583	142.761	58.8548	0	58.8548	133.146	133.146

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.13527

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-64.9741	5116.83	0	0	0
2	-63.0404	5115.72	755.652	446.877	30.5992
3	-61.1067	5114.69	1959.58	1158.85	30.5991
4	-59.173	5113.72	3445.77	2037.76	30.5992
5	-57.2393	5112.82	5098.22	3014.98	30.5992
6	-55.3056	5111.99	6834.62	4041.85	30.5992
7	-53.3719	5111.22	8595.88	5083.42	30.5992
8	-51.4383	5110.51	10339.2	6114.4	30.5992
9	-49.5046	5109.85	12033.6	7116.42	30.5992
10	-47.5709	5109.26	13656.5	8076.16	30.5992
11	-45.6372	5108.72	15191.7	8984.05	30.5992
12	-43.7035	5108.23	16627.8	9833.35	30.5992
13	-41.7698	5107.8	17957.2	10619.5	30.5992
14	-39.8361	5107.42	19174.8	11339.5	30.599
15	-37.9025	5107.09	20278	11992	30.5992
16	-35.9688	5106.81	21268.5	12577.8	30.5993
17	-34.0351	5106.58	22150.8	13099.5	30.5991
18	-32.1014	5106.4	22946.5	13570.1	30.5992
19	-30.1677	5106.27	23676.2	14001.6	30.5992
20	-28.234	5106.19	25550.7	15110.2	30.5993
21	-26.3003	5106.16	27201.5	16086.4	30.5992
22	-24.3666	5106.17	28473.5	16838.6	30.5991
23	-22.433	5106.24	29382.9	17376.4	30.5991
24	-20.4993	5106.36	29948.4	17710.8	30.5991
25	-18.5656	5106.52	30187.6	17852.3	30.5992
26	-16.6319	5106.74	30117.6	17810.9	30.5992
27	-14.6982	5107	29755	17596.4	30.5991
28	-12.7645	5107.32	29115.7	17218.4	30.5992
29	-10.8308	5107.68	28215.6	16686.1	30.5992
30	-8.89715	5108.1	27070.1	16008.7	30.5992
31	-6.96346	5108.57	25694.5	15195.2	30.5992
32	-5.02978	5109.1	24104.1	14254.7	30.5993
33	-3.09609	5109.68	22298.6	13186.9	30.5991
34	-1.1624	5110.32	20325.5	12020	30.599
35	0.771286	5111.01	18426.4	10897	30.5992
36	2.70497	5111.77	17273.1	10215	30.5993
37	4.63866	5112.58	16057.3	9495.94	30.5992
38	6.57235	5113.46	14744.9	8719.84	30.5992
39	8.50603	5114.41	13342.7	7890.58	30.5991
40	10.4397	5115.42	11858.3	7012.72	30.5991
41	12.3734	5116.51	10300.6	6091.54	30.5991
42	14.3071	5117.67	8721.25	5157.56	30.5992
43	16.2408	5118.92	7195.59	4255.32	30.5992
44	18.1745	5120.24	5746.91	3398.6	30.5992
45	20.1082	5121.66	4400.02	2602.08	30.5992
46	22.0418	5123.18	3181.87	1881.69	30.5992
47	23.9755	5124.8	2121.95	1254.88	30.5992
48	25.9092	5126.53	1252.83	740.894	30.5991
49	27.8429	5128.39	610.719	361.166	30.5992
50	29.7766	5130.38	236.381	139.791	30.5992
51	31.7103	5132.53	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-28.179	5141.7
-14.6643	5142.15
-4.769	5142.49

External Boundary

X	Y
-99.84	5079.59
99.918	5079.59
99.918	5134.77
98.584	5134.77
96.558	5133.14
61.01	5132.45
12.533	5132.58
2.069	5127.66
0.338	5128.96
0.338	5142.49
-4.769	5142.49
-14.6643	5142.15
-28.179	5141.7
-30.0258	5141.64
-30.066	5141.64
-30.066	5137.63
-30.066	5136.41
-30.066	5116.83
-33.193	5115.68
-37.453	5115.68
-65.071	5116.84
-70	5120
-100	5120

Material Boundary

X	Y
-14.6643	5142.15
-14.6643	5124.96
0.338	5124.96
0.338	5128.96

Material Boundary

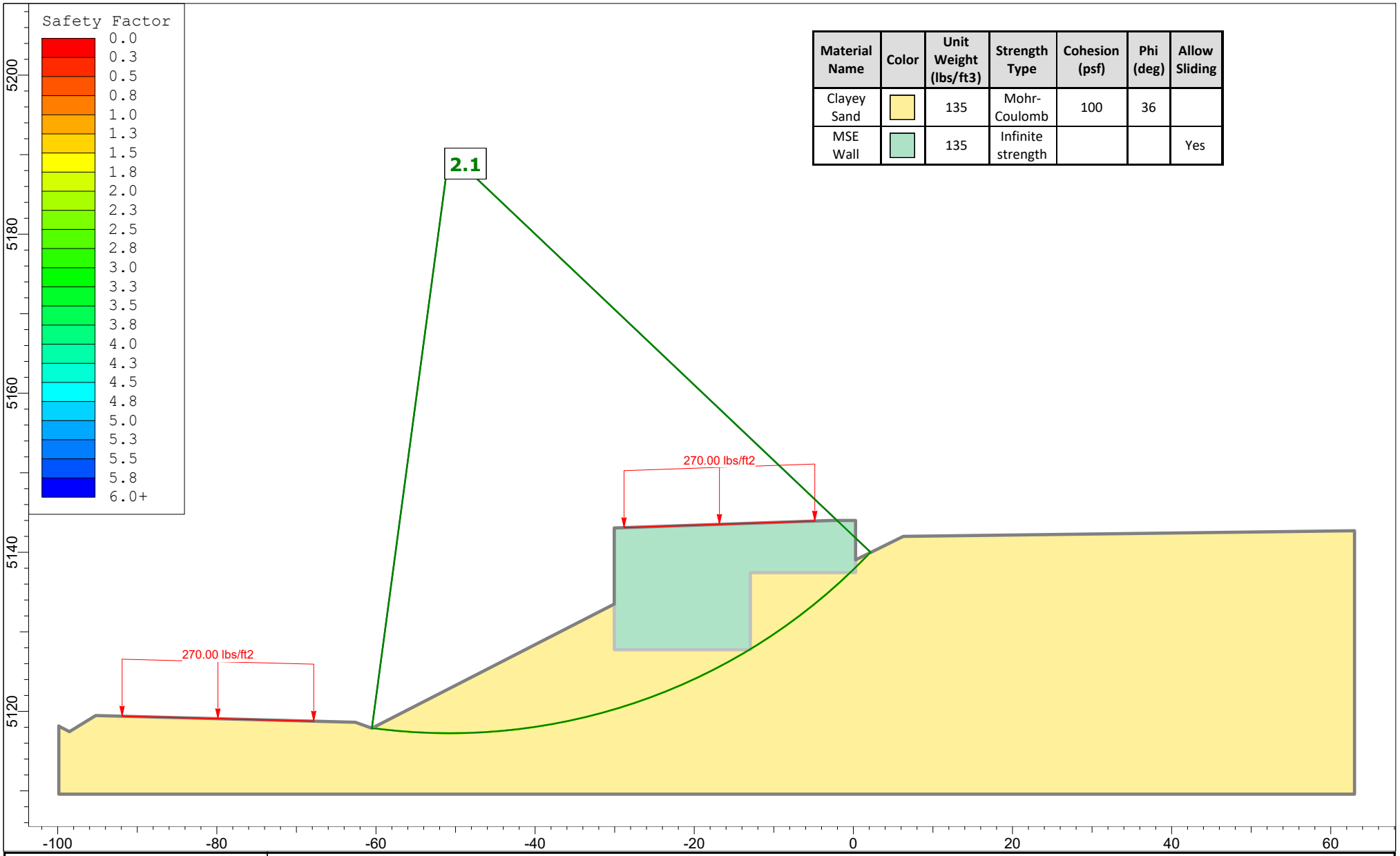
X	Y
-30.066	5116.83
-30.066	5112.88
-33.275	5112.88
-33.275	5110
-0.199	5110
-0.199	5112.88

Material Boundary

X	Y
-30.066	5136.41
-30.0258	5141.64

Material Boundary

X	Y
-28.179	5141.7
-28.179	5112.88
-0.199	5112.88



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW9 Section A-A		
Drawn By	J. Ruzicka	*Scale*	1:200
Company	NewFields		
Date Printed	8/19/2022	*File Name*	RW9_Section_A-A_Static.slim

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US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

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Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.327s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

2 Distributed Loads present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical
Distributed Load 2	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	2.114560
Center:	-50.789, 5190.268
Radius:	73.038
Left Slip Surface Endpoint:	-60.507, 5117.880
Right Slip Surface Endpoint:	2.183, 5139.984
Resisting Moment:	5.78321e+06 lb-ft
Driving Moment:	2.73495e+06 lb-ft
Resisting Horizontal Force:	72633.9 lb
Driving Horizontal Force:	34349.4 lb
Total Slice Area:	723.843 ft2
Surface Horizontal Width:	62.6902 ft
Surface Average Height:	11.5464 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	4391
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.11456

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.2538	67.6887	-7.15062	Clayey Sand	100	36	79.6095	168.339	94.0606	0	94.0606	84.0733	84.0733
2	1.2538	201.207	-6.16033	Clayey Sand	100	36	123.753	261.683	222.538	0	222.538	209.181	209.181
3	1.2538	331.018	-5.17188	Clayey Sand	100	36	165.441	349.835	343.868	0	343.868	328.894	328.894
4	1.2538	457.14	-4.18497	Clayey Sand	100	36	204.783	433.026	458.372	0	458.372	443.387	443.387
5	1.2538	579.589	-3.1993	Clayey Sand	100	36	241.881	511.472	566.342	0	566.342	552.822	552.822
6	1.2538	698.376	-2.21458	Clayey Sand	100	36	276.827	585.368	668.052	0	668.052	657.346	657.346
7	1.2538	813.512	-1.23052	Clayey Sand	100	36	309.707	654.895	763.747	0	763.747	757.094	757.094
8	1.2538	925.002	-0.246815	Clayey Sand	100	36	340.6	720.219	853.658	0	853.658	852.191	852.191
9	1.2538	1032.85	0.736814	Clayey Sand	100	36	369.577	781.493	937.995	0	937.995	942.748	942.748
10	1.2538	1137.05	1.72066	Clayey Sand	100	36	396.706	838.859	1016.95	0	1016.95	1028.87	1028.87
11	1.2538	1237.6	2.70501	Clayey Sand	100	36	422.049	892.448	1090.71	0	1090.71	1110.65	1110.65
12	1.2538	1334.5	3.69017	Clayey Sand	100	36	445.662	942.38	1159.44	0	1159.44	1188.18	1188.18
13	1.2538	1427.73	4.67642	Clayey Sand	100	36	467.6	988.768	1223.28	0	1223.28	1261.53	1261.53
14	1.2538	1517.28	5.66406	Clayey Sand	100	36	487.909	1031.71	1282.39	0	1282.39	1330.78	1330.78
15	1.2538	1603.13	6.65339	Clayey Sand	100	36	506.636	1071.31	1336.89	0	1336.89	1395.99	1395.99
16	1.2538	1685.26	7.64472	Clayey Sand	100	36	523.825	1107.66	1386.92	0	1386.92	1457.23	1457.23
17	1.2538	1763.65	8.63835	Clayey Sand	100	36	539.507	1140.82	1432.57	0	1432.57	1514.53	1514.53
18	1.2538	1838.27	9.63462	Clayey Sand	100	36	553.727	1170.89	1473.95	0	1473.95	1567.95	1567.95
19	1.2538	1909.09	10.6338	Clayey Sand	100	36	566.515	1197.93	1511.16	0	1511.16	1617.53	1617.53
20	1.2538	1976.06	11.6363	Clayey Sand	100	36	577.898	1222	1544.3	0	1544.3	1663.31	1663.31
21	1.2538	2039.16	12.6424	Clayey Sand	100	36	587.91	1243.17	1573.44	0	1573.44	1705.31	1705.31
22	1.2538	2098.34	13.6526	Clayey Sand	100	36	596.569	1261.48	1598.65	0	1598.65	1743.55	1743.55
23	1.2538	2153.55	14.667	Clayey Sand	100	36	603.908	1277	1620	0	1620	1778.06	1778.06
24	1.2538	2204.73	15.6862	Clayey Sand	100	36	609.942	1289.76	1637.57	0	1637.57	1808.86	1808.86
25	1.2538	3384.5	16.7105	Clayey Sand	100	36	899.842	1902.77	2481.3	0	2481.3	2751.45	2751.45
26	1.2538	3791.41	17.7403	Clayey Sand	100	36	1051.37	2223.18	2922.3	0	2922.3	3258.65	3258.65
27	1.2538	3728.75	18.7761	Clayey Sand	100	36	1046.37	2212.62	2907.77	0	2907.77	3263.5	3263.5
28	1.2538	3661.8	19.8183	Clayey Sand	100	36	1017.55	2151.67	2823.88	0	2823.88	3190.58	3190.58
29	1.2538	3590.46	20.8673	Clayey Sand	100	36	988.139	2089.48	2738.29	0	2738.29	3114.97	3114.97
30	1.2538	3514.66	21.9238	Clayey Sand	100	36	958.152	2026.07	2651.01	0	2651.01	3036.64	3036.64

31	1.2538	3434.3	22.9881	Clayey Sand	100	36	927.588	1961.44	2562.05	0	2562.05	2955.56	2955.56
32	1.2538	3349.26	24.0609	Clayey Sand	100	36	896.447	1895.59	2471.43	0	2471.43	2871.69	2871.69
33	1.2538	3259.44	25.1428	Clayey Sand	100	36	864.738	1828.54	2379.13	0	2379.13	2784.99	2784.99
34	1.2538	3164.71	26.2343	Clayey Sand	100	36	832.457	1760.28	2285.18	0	2285.18	2695.42	2695.42
35	1.2538	3064.92	27.3362	Clayey Sand	100	36	799.608	1690.82	2189.57	0	2189.57	2602.92	2602.92
36	1.2538	2959.93	28.4492	Clayey Sand	100	36	766.192	1620.16	2092.31	0	2092.31	2507.44	2507.44
37	1.2538	2849.59	29.574	Clayey Sand	100	36	732.209	1548.3	1993.42	0	1993.42	2408.93	2408.93
38	1.2538	2733.7	30.7115	Clayey Sand	100	36	697.668	1475.26	1892.88	0	1892.88	2307.32	2307.32
39	1.2538	2612.07	31.8625	Clayey Sand	100	36	662.563	1401.03	1790.71	0	1790.71	2202.52	2202.52
40	1.2538	2484.49	33.0282	Clayey Sand	100	36	626.901	1325.62	1686.92	0	1686.92	2094.48	2094.48
41	1.2538	2350.73	34.2094	Clayey Sand	100	36	590.681	1249.03	1581.5	0	1581.5	1983.07	1983.07
42	1.2538	2210.52	35.4075	Clayey Sand	100	36	553.907	1171.27	1474.48	0	1474.48	1868.23	1868.23
43	1.2538	2063.58	36.6237	Clayey Sand	100	36	516.583	1092.35	1365.85	0	1365.85	1749.82	1749.82
44	1.2538	1909.58	37.8593	Clayey Sand	100	36	478.712	1012.26	1255.63	0	1255.63	1627.75	1627.75
45	1.2538	1748.17	39.1161	Clayey Sand	100	36	401.075	848.097	1029.67	0	1029.67	1355.8	1355.8
46	1.2538	1578.95	40.3957	Clayey Sand	100	36	337.778	714.251	845.445	0	845.445	1132.87	1132.87
47	1.2538	1397.93	41.7002	Clayey Sand	100	36	298.78	631.788	731.943	0	731.943	998.148	998.148
48	1.2538	1204.33	43.0316	Clayey Sand	100	36	258.622	546.871	615.067	0	615.067	856.503	856.503
49	1.2538	582.666	44.3927	Clayey Sand	100	36	143.75	303.967	280.737	0	280.737	421.471	421.471
50	1.2538	56.6284	45.7862	Clayey Sand	100	36	49.9111	105.54	7.62503	0	7.62503	58.9249	58.9249

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.11456

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-60.5073	5117.88	0	0	0
2	-59.2535	5117.72	114.639	38.4115	18.5242
3	-57.9997	5117.59	299.961	100.507	18.5243
4	-56.7459	5117.47	546.476	183.105	18.5242
5	-55.4921	5117.38	845.36	283.251	18.5242
6	-54.2383	5117.31	1188.41	398.196	18.5243
7	-52.9845	5117.26	1567.99	525.379	18.5242
8	-51.7307	5117.24	1976.98	662.419	18.5243
9	-50.4769	5117.23	2408.76	807.094	18.5243
10	-49.2231	5117.25	2857.15	957.333	18.5242
11	-47.9693	5117.28	3316.38	1111.21	18.5243
12	-46.7155	5117.34	3781.09	1266.91	18.5242
13	-45.4617	5117.42	4246.27	1422.78	18.5242
14	-44.2079	5117.53	4707.25	1577.24	18.5243
15	-42.9541	5117.65	5159.71	1728.84	18.5242
16	-41.7003	5117.8	5599.59	1876.23	18.5242
17	-40.4465	5117.97	6023.14	2018.15	18.5243
18	-39.1926	5118.16	6426.9	2153.43	18.5242
19	-37.9388	5118.37	6807.65	2281.01	18.5242
20	-36.685	5118.61	7162.4	2399.88	18.5243
21	-35.4312	5118.86	7488.45	2509.12	18.5242
22	-34.1774	5119.14	7783.28	2607.91	18.5242
23	-32.9236	5119.45	8044.62	2695.48	18.5243
24	-31.6698	5119.78	8270.41	2771.13	18.5242
25	-30.416	5120.13	8458.79	2834.25	18.5242
26	-29.1622	5120.51	8653.35	2899.44	18.5242
27	-27.9084	5120.91	8799.77	2948.5	18.5242
28	-26.6546	5121.33	8872.67	2972.93	18.5242
29	-25.4008	5121.79	8872.88	2973	18.5242
30	-24.147	5122.26	8803.38	2949.71	18.5242
31	-22.8932	5122.77	8667.28	2904.11	18.5242
32	-21.6394	5123.3	8467.87	2837.29	18.5242
33	-20.3856	5123.86	8208.59	2750.42	18.5243
34	-19.1318	5124.45	7893.08	2644.7	18.5242
35	-17.878	5125.07	7525.15	2521.42	18.5242
36	-16.6242	5125.71	7108.84	2381.93	18.5242
37	-15.3704	5126.39	6648.42	2227.66	18.5243
38	-14.1166	5127.1	6148.4	2060.12	18.5243
39	-12.8628	5127.85	5613.58	1880.92	18.5243
40	-11.609	5128.63	5049.07	1691.77	18.5242
41	-10.3551	5129.44	4460.29	1494.49	18.5242
42	-9.10134	5130.3	3853.05	1291.02	18.5242
43	-7.84754	5131.19	3233.57	1083.46	18.5243
44	-6.59373	5132.12	2608.53	874.03	18.5243
45	-5.33993	5133.09	1985.15	665.154	18.5242
46	-4.08613	5134.11	1438.39	481.955	18.5242
47	-2.83232	5135.18	960.006	321.665	18.5242
48	-1.57852	5136.3	517.068	173.252	18.5243
49	-0.324713	5137.47	121.497	40.7093	18.5242
50	0.929091	5138.7	-42.8226	-14.3484	18.5243
51	2.1829	5139.98	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-4.84642	5143.93
-28.8162	5143.1

Distributed Load

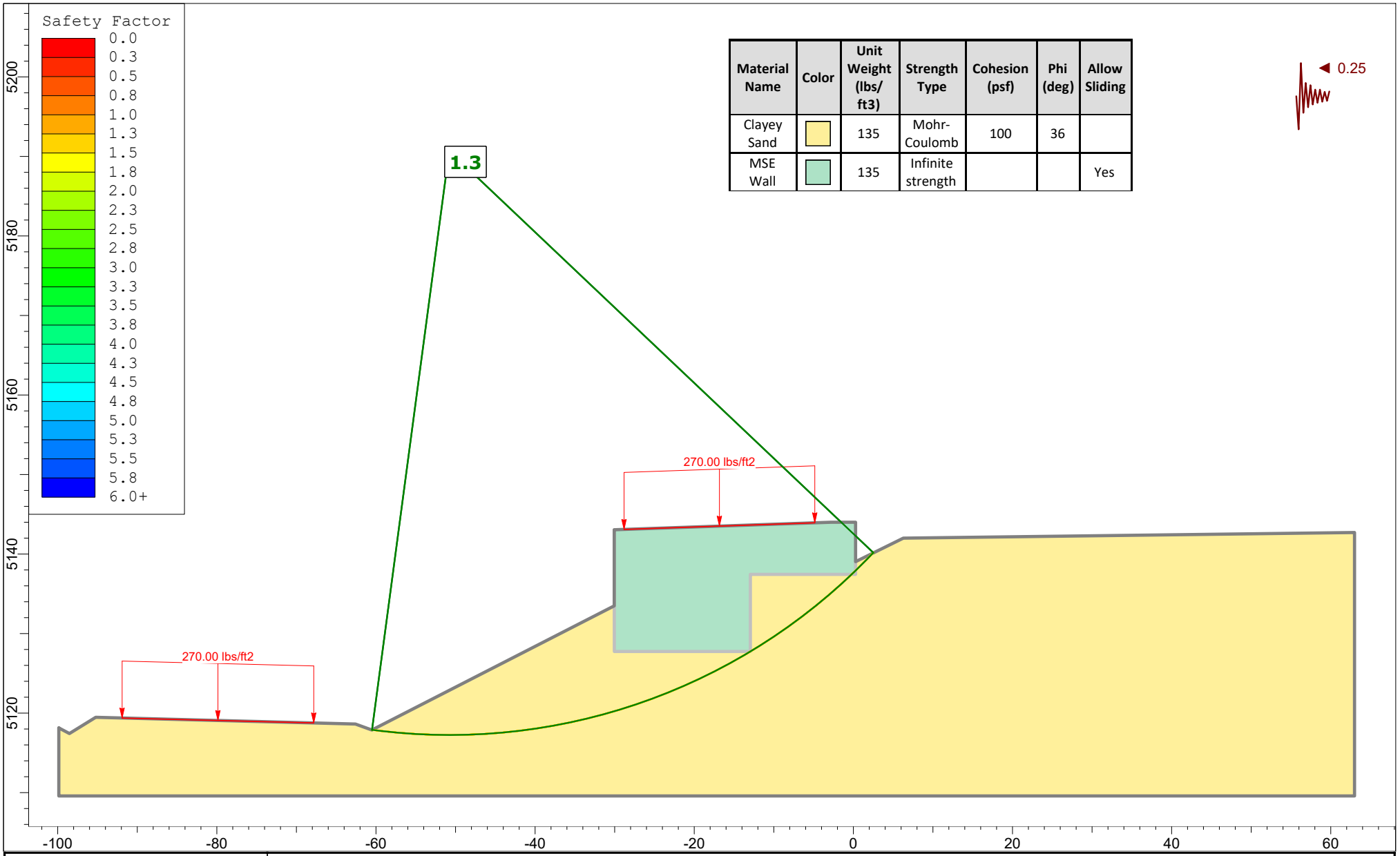
X	Y
-67.8174	5118.76
-91.9008	5119.38

External Boundary

X	Y
-99.857	5118.14
-99.857	5109.58
62.991	5109.58
62.991	5142.7
6.274	5142.01
0.282	5139.05
0.282	5144
-2.809	5144
-30.059	5143.05
-30.059	5133.48
-60.509	5117.88
-62.584	5118.63
-95.213	5119.47
-98.525	5117.44

Material Boundary

X	Y
-30.059	5143.05
-30.032	5127.76
-12.937	5127.76
-12.937	5137.44
0.282	5137.44
0.282	5139.05



NewFields	US 395 North Valleys			
SLIDEINTERPRET 9.024	*Analysis Description*	RW9 Section A-A		
	Drawn By	J. Ruzicka	*Scale* 1:200	*Company* NewFields
	Date Printed	8/19/2022		*File Name* RW9_Section_A-A_Seismic.slim

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US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

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Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:02.231s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

2 Distributed Loads present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical
Distributed Load 2	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	1.309810
Center:	-50.791, 5190.716
Radius:	73.479
Left Slip Surface Endpoint:	-60.503, 5117.882
Right Slip Surface Endpoint:	2.524, 5140.153
Resisting Moment:	5.51903e+06 lb-ft
Driving Moment:	4.21361e+06 lb-ft
Resisting Horizontal Force:	69472.9 lb
Driving Horizontal Force:	53040.5 lb
Total Slice Area:	726.165 ft2
Surface Horizontal Width:	63.0271 ft
Surface Average Height:	11.5215 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	7553
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.30981

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.26054	68.3221	-7.10011	Clayey Sand	100	36	227.288	297.704	272.117	0	272.117	243.806	243.806
2	1.26054	203.089	-6.11057	Clayey Sand	100	36	330.043	432.293	457.362	0	457.362	422.029	422.029
3	1.26054	334.112	-5.12286	Clayey Sand	100	36	420.153	550.321	619.814	0	619.814	582.147	582.147
4	1.26054	461.41	-4.13667	Clayey Sand	100	36	499.191	653.845	762.302	0	762.302	726.199	726.199
5	1.26054	584.998	-3.1517	Clayey Sand	100	36	568.492	744.617	887.242	0	887.242	855.939	855.939
6	1.26054	704.888	-2.16767	Clayey Sand	100	36	629.203	824.136	996.691	0	996.691	972.874	972.874
7	1.26054	821.091	-1.18428	Clayey Sand	100	36	682.304	893.688	1092.42	0	1092.42	1078.31	1078.31
8	1.26054	933.61	-0.201242	Clayey Sand	100	36	728.641	954.381	1175.96	0	1175.96	1173.4	1173.4
9	1.26054	1042.45	0.78174	Clayey Sand	100	36	768.943	1007.17	1248.61	0	1248.61	1259.1	1259.1
10	1.26054	1147.6	1.76495	Clayey Sand	100	36	803.841	1052.88	1311.53	0	1311.53	1336.3	1336.3
11	1.26054	1249.08	2.74869	Clayey Sand	100	36	833.883	1092.23	1365.69	0	1365.69	1405.72	1405.72
12	1.26054	1346.85	3.73323	Clayey Sand	100	36	859.545	1125.84	1411.95	0	1411.95	1468.04	1468.04
13	1.26054	1440.93	4.71888	Clayey Sand	100	36	881.242	1154.26	1451.07	0	1451.07	1523.81	1523.81
14	1.26054	1531.28	5.70593	Clayey Sand	100	36	899.337	1177.96	1483.68	0	1483.68	1573.54	1573.54
15	1.26054	1617.9	6.69469	Clayey Sand	100	36	914.148	1197.36	1510.39	0	1510.39	1617.69	1617.69
16	1.26054	1700.76	7.68545	Clayey Sand	100	36	925.951	1212.82	1531.67	0	1531.67	1656.62	1656.62
17	1.26054	1779.84	8.67853	Clayey Sand	100	36	934.998	1224.67	1547.98	0	1547.98	1690.69	1690.69
18	1.26054	1855.11	9.67425	Clayey Sand	100	36	941.495	1233.18	1559.69	0	1559.69	1720.19	1720.19
19	1.26054	1926.54	10.6729	Clayey Sand	100	36	945.641	1238.61	1567.17	0	1567.17	1745.39	1745.39
20	1.26054	1994.09	11.6749	Clayey Sand	100	36	947.603	1241.18	1570.7	0	1570.7	1766.51	1766.51
21	1.26054	2057.72	12.6805	Clayey Sand	100	36	947.534	1241.09	1570.57	0	1570.57	1783.76	1783.76
22	1.26054	2117.39	13.6901	Clayey Sand	100	36	945.557	1238.5	1567	0	1567	1797.33	1797.33
23	1.26054	2173.04	14.704	Clayey Sand	100	36	941.793	1233.57	1560.22	0	1560.22	1807.37	1807.37
24	1.26054	2224.62	15.7227	Clayey Sand	100	36	936.35	1226.44	1550.42	0	1550.42	1814.01	1814.01
25	1.26054	3617.11	16.7465	Clayey Sand	100	36	1421.26	1861.58	2424.61	0	2424.61	2852.26	2852.26
26	1.26054	3805.7	17.7759	Clayey Sand	100	36	1581.73	2071.77	2713.92	0	2713.92	3221.02	3221.02
27	1.26054	3742.21	18.8112	Clayey Sand	100	36	1538.83	2015.58	2636.57	0	2636.57	3160.76	3160.76
28	1.26054	3674.39	19.8529	Clayey Sand	100	36	1476.29	1933.66	2523.82	0	2523.82	3056.85	3056.85
29	1.26054	3602.14	20.9015	Clayey Sand	100	36	1414.83	1853.16	2413.01	0	2413.01	2953.33	2953.33
30	1.26054	3525.38	21.9575	Clayey Sand	100	36	1354.37	1773.97	2304.02	0	2304.02	2850.06	2850.06

31	1.26054	3444	23.0214	Clayey Sand	100	36	1294.86	1696.02	2196.73	0	2196.73	2746.93	2746.93
32	1.26054	3357.9	24.0938	Clayey Sand	100	36	1236.22	1619.21	2091.01	0	2091.01	2643.83	2643.83
33	1.26054	3266.97	25.1752	Clayey Sand	100	36	1178.39	1543.47	1986.77	0	1986.77	2540.65	2540.65
34	1.26054	3171.06	26.2663	Clayey Sand	100	36	1121.34	1468.74	1883.9	0	1883.9	2437.28	2437.28
35	1.26054	3070.05	27.3678	Clayey Sand	100	36	1065	1394.95	1782.35	0	1782.35	2333.63	2333.63
36	1.26054	2963.78	28.4803	Clayey Sand	100	36	1009.35	1322.06	1682.02	0	1682.02	2229.61	2229.61
37	1.26054	2852.09	29.6047	Clayey Sand	100	36	954.352	1250.02	1582.87	0	1582.87	2125.12	2125.12
38	1.26054	2734.8	30.7418	Clayey Sand	100	36	899.97	1178.79	1484.83	0	1484.83	2020.08	2020.08
39	1.26054	2611.71	31.8925	Clayey Sand	100	36	846.184	1108.34	1387.86	0	1387.86	1914.41	1914.41
40	1.26054	2482.6	33.0577	Clayey Sand	100	36	792.971	1038.64	1291.93	0	1291.93	1808.03	1808.03
41	1.26054	2347.24	34.2386	Clayey Sand	100	36	740.317	969.674	1197	0	1197	1700.85	1700.85
42	1.26054	2205.36	35.4363	Clayey Sand	100	36	688.208	901.422	1103.06	0	1103.06	1592.8	1592.8
43	1.26054	2056.67	36.6521	Clayey Sand	100	36	636.642	833.88	1010.1	0	1010.1	1483.81	1483.81
44	1.26054	1900.84	37.8874	Clayey Sand	100	36	585.616	767.046	918.112	0	918.112	1373.8	1373.8
45	1.26054	1737.52	39.1438	Clayey Sand	100	36	458.604	600.684	689.13	0	689.13	1062.41	1062.41
46	1.26054	1566.11	40.4231	Clayey Sand	100	36	397.536	520.696	579.038	0	579.038	917.644	917.644
47	1.26054	1381.3	41.7272	Clayey Sand	100	36	349.824	458.203	493.025	0	493.025	805.005	805.005
48	1.26054	1185.42	43.0584	Clayey Sand	100	36	302.335	396.001	407.41	0	407.41	689.919	689.919
49	1.26054	355.854	44.4192	Clayey Sand	100	36	138.775	181.769	112.545	0	112.545	248.534	248.534
50	1.26054	57.3396	45.8124	Clayey Sand	100	36	80.5058	105.447	7.49765	0	7.49765	90.3194	90.3194

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.30981

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-60.5029	5117.88	0	0	0
2	-59.2424	5117.73	312.717	249.909	38.6302
3	-57.9818	5117.59	740.519	591.789	38.6303
4	-56.7213	5117.48	1257.7	1005.1	38.6304
5	-55.4607	5117.39	1842.34	1472.31	38.6302
6	-54.2002	5117.32	2475.7	1978.47	38.6303
7	-52.9397	5117.27	3141.74	2510.73	38.6302
8	-51.6791	5117.24	3826.71	3058.12	38.6301
9	-50.4186	5117.24	4518.81	3611.22	38.6302
10	-49.158	5117.26	5207.92	4161.93	38.6302
11	-47.8975	5117.29	5885.35	4703.3	38.6302
12	-46.6369	5117.35	6543.66	5229.39	38.6302
13	-45.3764	5117.44	7176.44	5735.08	38.6302
14	-44.1159	5117.54	7778.26	6216.03	38.6303
15	-42.8553	5117.67	8344.46	6668.51	38.6302
16	-41.5948	5117.82	8871.11	7089.38	38.6302
17	-40.3342	5117.99	9354.88	7475.99	38.6302
18	-39.0737	5118.18	9793.02	7826.12	38.6302
19	-37.8131	5118.39	10183.2	8137.96	38.6303
20	-36.5526	5118.63	10523.7	8410.02	38.6301
21	-35.2921	5118.89	10812.9	8641.15	38.6302
22	-34.0315	5119.17	11049.8	8830.45	38.6301
23	-32.771	5119.48	11233.5	8977.31	38.6303
24	-31.5104	5119.81	11363.7	9081.32	38.6302
25	-30.2499	5120.17	11440	9142.29	38.6301
26	-28.9894	5120.55	11411.1	9119.26	38.6303
27	-27.7288	5120.95	11360.7	9078.97	38.6303
28	-26.4683	5121.38	11236.6	8979.8	38.6303
29	-25.2077	5121.83	11034	8817.83	38.6301
30	-23.9472	5122.32	10758.8	8597.93	38.6302
31	-22.6866	5122.82	10417.2	8324.91	38.6301
32	-21.4261	5123.36	10015	8003.51	38.6302
33	-20.1656	5123.92	9558.18	7638.45	38.6302
34	-18.905	5124.52	9052.63	7234.44	38.6302
35	-17.6445	5125.14	8504.22	6796.17	38.6302
36	-16.3839	5125.79	7918.85	6328.38	38.6302
37	-15.1234	5126.47	7302.49	5835.81	38.6302
38	-13.8628	5127.19	6661.16	5323.29	38.6302
39	-12.6023	5127.94	6000.98	4795.7	38.6302
40	-11.3418	5128.73	5328.18	4258.04	38.6303
41	-10.0812	5129.55	4649.17	3715.4	38.6302
42	-8.82068	5130.4	3970.49	3173.03	38.6302
43	-7.56014	5131.3	3298.91	2636.33	38.6302
44	-6.2996	5132.24	2641.43	2110.9	38.6301
45	-5.03906	5133.22	2005.33	1602.57	38.6303
46	-3.77851	5134.25	1443.12	1153.27	38.6301
47	-2.51797	5135.32	931.991	744.804	38.6302
48	-1.25743	5136.44	474.259	379.006	38.6302
49	0.00311278	5137.62	79.8822	63.8382	38.6302
50	1.26365	5138.86	27.1761	21.7178	38.6301
51	2.5242	5140.15	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-4.84642	5143.93
-28.8162	5143.1

Distributed Load

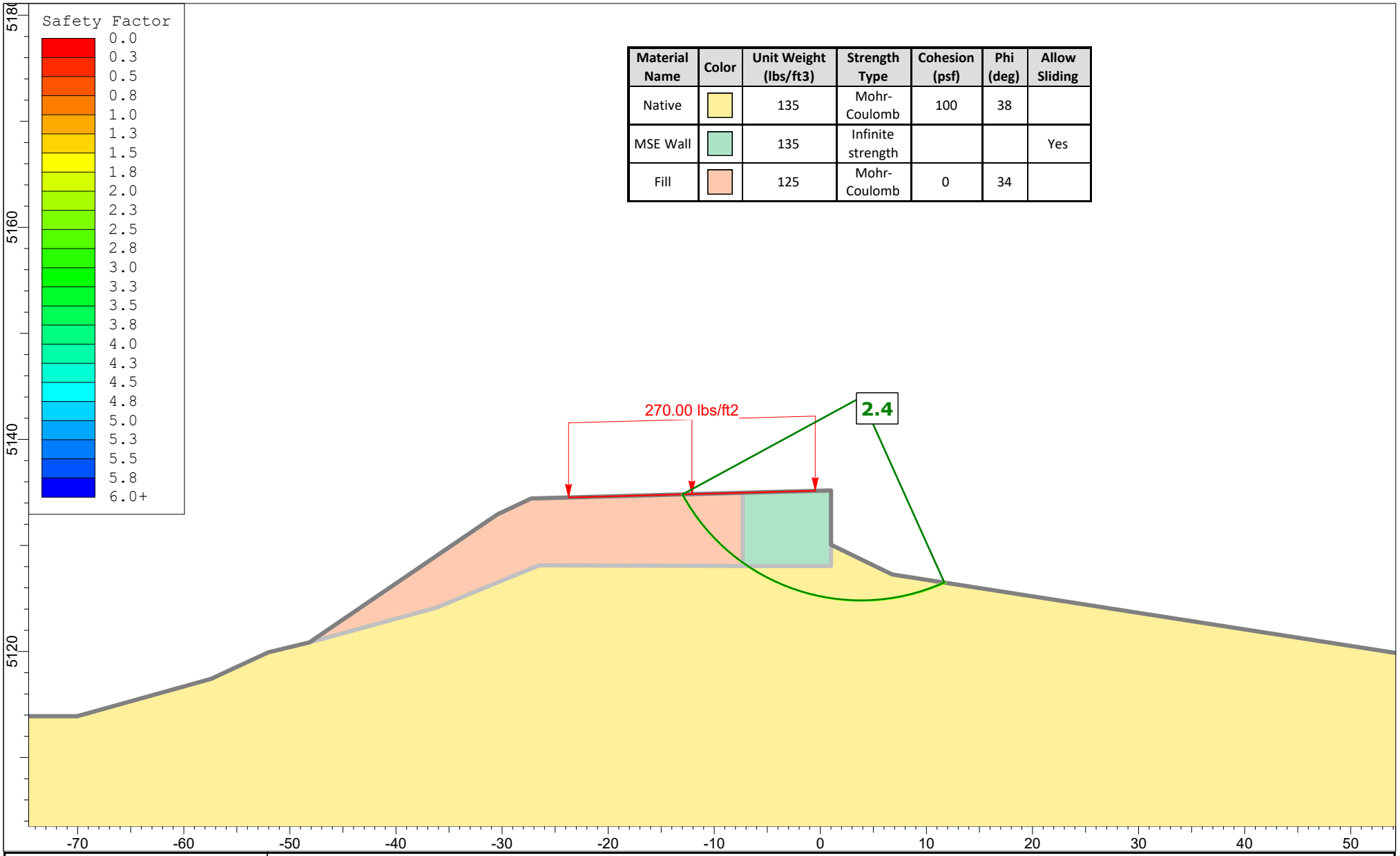
X	Y
-67.8174	5118.76
-91.9008	5119.38

External Boundary

X	Y
-99.857	5118.14
-99.857	5109.58
62.991	5109.58
62.991	5142.7
6.274	5142.01
0.282	5139.05
0.282	5144
-2.809	5144
-30.059	5143.05
-30.059	5133.48
-60.509	5117.88
-62.584	5118.63
-95.213	5119.47
-98.525	5117.44

Material Boundary

X	Y
-30.059	5143.05
-30.032	5127.76
-12.937	5127.76
-12.937	5137.44
0.282	5137.44
0.282	5139.05



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Native		135	Mohr-Coulomb	100	38	
MSE Wall		135	Infinite strength			Yes
Fill		125	Mohr-Coulomb	0	34	

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW13		
Drawn By	J. Ruzicka	*Scale*	1:150
Company	NewFields		
Date Printed	8/19/2022	*File Name*	RW13_Static.slim

rocscience

NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:02.3s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Native	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	38
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0
Fill	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	125
Cohesion [psf]	0
Friction Angle [deg]	34
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	2.420170
Center:	3.835, 5143.970
Radius:	19.163
Left Slip Surface Endpoint:	-12.997, 5134.810
Right Slip Surface Endpoint:	11.696, 5126.493
Resisting Moment:	324825 lb-ft
Driving Moment:	134216 lb-ft
Resisting Horizontal Force:	15376.1 lb
Driving Horizontal Force:	6353.31 lb
Total Slice Area:	122.284 ft2
Surface Horizontal Width:	24.6928 ft
Surface Average Height:	4.95222 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	8146
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.42017

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.493856	26.7842	-59.9702	Fill	0	34	45.7414	110.702	164.122	0	164.122	243.254	243.254
2	0.493856	77.5755	-57.1342	Fill	0	34	63.8249	154.467	229.008	0	229.008	327.795	327.795
3	0.493856	123.368	-54.5021	Fill	0	34	81.5885	197.458	292.743	0	292.743	407.135	407.135
4	0.493856	165.099	-52.0304	Fill	0	34	98.998	239.592	355.21	0	355.21	482.061	482.061
5	0.493856	203.426	-49.689	Fill	0	34	116.041	280.839	416.361	0	416.361	553.139	553.139
6	0.493856	238.83	-47.4558	Fill	0	34	132.715	321.193	476.188	0	476.188	620.797	620.797
7	0.493856	271.678	-45.3139	Fill	0	34	149.025	360.665	534.708	0	534.708	685.375	685.375
8	0.493856	302.256	-43.2503	Fill	0	34	164.977	399.273	591.945	0	591.945	747.142	747.142
9	0.493856	330.793	-41.2545	Fill	0	34	180.581	437.037	647.933	0	647.933	806.323	806.323
10	0.493856	357.475	-39.3181	Fill	0	34	195.846	473.98	702.704	0	702.704	863.105	863.105
11	0.493856	382.455	-37.4339	Fill	0	34	210.781	510.126	756.294	0	756.294	917.646	917.646
12	0.493856	422.214	-35.5961	Fill	0	34	232.231	562.039	833.257	0	833.257	999.494	999.494
13	0.493856	462.03	-33.7996	Native	100	38	329.484	797.407	892.64	0	892.64	1113.21	1113.21
14	0.493856	484.248	-32.0401	Native	100	38	347.462	840.917	948.332	0	948.332	1165.79	1165.79
15	0.493856	505.069	-30.3139	Native	100	38	365.11	883.629	1003	0	1003	1216.47	1216.47
16	0.493856	524.571	-28.6176	Native	100	38	382.438	925.565	1056.67	0	1056.67	1265.34	1265.34
17	0.493856	542.816	-26.9482	Native	100	38	399.455	966.75	1109.39	0	1109.39	1312.47	1312.47
18	0.493856	559.862	-25.3033	Native	100	38	416.172	1007.21	1161.17	0	1161.17	1357.92	1357.92
19	0.493856	575.758	-23.6804	Native	100	38	432.596	1046.96	1212.05	0	1212.05	1401.77	1401.77
20	0.493856	590.549	-22.0775	Native	100	38	448.737	1086.02	1262.05	0	1262.05	1444.06	1444.06
21	0.493856	604.272	-20.4926	Native	100	38	464.604	1124.42	1311.2	0	1311.2	1484.84	1484.84
22	0.493856	616.962	-18.9239	Native	100	38	480.202	1162.17	1359.52	0	1359.52	1524.15	1524.15
23	0.493856	628.649	-17.3698	Native	100	38	495.544	1199.3	1407.04	0	1407.04	1562.05	1562.05
24	0.493856	639.359	-15.8288	Native	100	38	510.638	1235.83	1453.79	0	1453.79	1598.57	1598.57
25	0.493856	649.116	-14.2994	Native	100	38	525.488	1271.77	1499.8	0	1499.8	1633.74	1633.74
26	0.493856	657.94	-12.7804	Native	100	38	486.11	1176.47	1377.82	0	1377.82	1488.09	1488.09
27	0.493856	665.848	-11.2705	Native	100	38	469.165	1135.46	1325.33	0	1325.33	1418.83	1418.83
28	0.493856	672.857	-9.76854	Native	100	38	481.805	1166.05	1364.49	0	1364.49	1447.44	1447.44
29	0.493856	461.066	-8.27328	Native	100	38	349.72	846.381	955.323	0	955.323	1006.17	1006.17
30	0.493856	323.379	-6.78369	Native	100	38	262.749	635.898	685.917	0	685.917	717.173	717.173
31	0.493856	310.846	-5.29869	Native	100	38	258.574	625.793	672.984	0	672.984	696.966	696.966
32	0.493856	297.453	-3.81725	Native	100	38	253.608	613.775	657.602	0	657.602	674.523	674.523
33	0.493856	283.206	-2.33836	Native	100	38	247.822	599.772	639.679	0	639.679	649.799	649.799
34	0.493856	268.108	-0.86104	Native	100	38	241.181	583.7	619.108	0	619.108	622.733	622.733
35	0.493856	252.161	0.615713	Native	100	38	233.647	565.465	595.768	0	595.768	593.257	593.257
36	0.493856	235.364	2.09287	Native	100	38	225.173	544.957	569.518	0	569.518	561.29	561.29
37	0.493856	217.717	3.57143	Native	100	38	215.709	522.053	540.203	0	540.203	526.74	526.74
38	0.493856	199.216	5.05237	Native	100	38	205.197	496.612	507.64	0	507.64	489.498	489.498
39	0.493856	179.856	6.53671	Native	100	38	193.57	468.473	471.625	0	471.625	449.445	449.445
40	0.493856	159.631	8.02547	Native	100	38	180.751	437.449	431.915	0	431.915	406.431	406.431
41	0.493856	143.517	9.51971	Native	100	38	170.846	413.477	401.232	0	401.232	372.582	372.582
42	0.493856	132.406	11.0205	Native	100	38	164.827	398.909	382.587	0	382.587	350.487	350.487
43	0.493856	120.408	12.529	Native	100	38	157.781	381.858	360.762	0	360.762	325.699	325.699
44	0.493856	107.496	14.0464	Native	100	38	149.608	362.078	335.445	0	335.445	298.015	298.015
45	0.493856	93.6549	15.574	Native	100	38	140.2	339.309	306.3	0	306.3	267.224	267.224
46	0.493856	78.8636	17.1129	Native	100	38	129.428	313.238	272.932	0	272.932	233.082	233.082
47	0.493856	63.0998	18.6647	Native	100	38	117.138	283.493	234.86	0	234.86	195.292	195.292
48	0.493856	46.3374	20.2309	Native	100	38	103.144	249.627	191.514	0	191.514	153.501	153.501
49	0.493856	28.5471	21.813	Native	100	38	87.2224	211.093	142.193	0	142.193	107.283	107.283
50	0.493856	9.69553	23.4128	Native	100	38	69.4229	168.015	87.0555	0	87.0555	56.995	56.995

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.42017

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-12.9968	5134.81	0	0	0
2	-12.5029	5133.96	117.632	40.5114	19.0032
3	-12.0091	5133.19	261.165	89.9425	19.0032
4	-11.5152	5132.5	423.575	145.875	19.0032
5	-11.0213	5131.87	599.466	206.45	19.0032
6	-10.5275	5131.28	784.532	270.185	19.0032
7	-10.0336	5130.75	975.241	335.863	19.0032
8	-9.53978	5130.25	1168.63	402.464	19.0032
9	-9.04592	5129.78	1362.17	469.117	19.0032
10	-8.55207	5129.35	1553.66	535.065	19.0032
11	-8.05821	5128.94	1741.18	599.644	19.0032
12	-7.56435	5128.57	1923.01	662.264	19.0032
13	-7.0705	5128.21	2102.9	724.216	19.0032
14	-6.57664	5127.88	2235.31	769.816	19.0031
15	-6.08278	5127.57	2356.83	811.669	19.0032
16	-5.58893	5127.28	2466.15	849.318	19.0032
17	-5.09507	5127.01	2562.03	882.336	19.0032
18	-4.60121	5126.76	2643.31	910.329	19.0032
19	-4.10736	5126.53	2708.91	932.921	19.0032
20	-3.6135	5126.31	2757.81	949.76	19.0032
21	-3.11964	5126.11	2789.02	960.508	19.0031
22	-2.62579	5125.93	2801.6	964.843	19.0032
23	-2.13193	5125.76	2794.66	962.452	19.0032
24	-1.63807	5125.6	2767.32	953.035	19.0032
25	-1.14422	5125.46	2718.71	936.297	19.0032
26	-0.650362	5125.34	2648.01	911.948	19.0032
27	-0.156505	5125.23	2562.32	882.436	19.0032
28	0.337351	5125.13	2461.08	847.569	19.0031
29	0.831208	5125.04	2339.17	805.586	19.0032
30	1.32506	5124.97	2235.08	769.738	19.0032
31	1.81892	5124.91	2145.63	738.932	19.0032
32	2.31278	5124.87	2048.77	705.574	19.0031
33	2.80663	5124.83	1945.2	669.907	19.0032
34	3.30049	5124.81	1835.72	632.205	19.0032
35	3.79435	5124.81	1721.22	592.771	19.0032
36	4.2882	5124.81	1602.68	551.948	19.0032
37	4.78206	5124.83	1481.21	510.115	19.0032
38	5.27592	5124.86	1358.04	467.696	19.0032
39	5.76977	5124.9	1234.55	425.167	19.0032
40	6.26363	5124.96	1112.28	383.057	19.0031
41	6.75749	5125.03	992.945	341.96	19.0032
42	7.25134	5125.11	875.351	301.462	19.0032
43	7.7452	5125.21	757.161	260.759	19.0032
44	8.23905	5125.32	639.655	220.291	19.0032
45	8.73291	5125.44	524.33	180.574	19.0032
46	9.22677	5125.58	412.938	142.211	19.0031
47	9.72062	5125.73	307.525	105.909	19.0033
48	10.2145	5125.9	210.502	72.4947	19.0032
49	10.7083	5126.08	124.712	42.9494	19.0031
50	11.2022	5126.28	53.535	18.4369	19.0032
51	11.6961	5126.49	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-0.474616	5135.15
-7.31575	5134.96
-23.7239	5134.52

External Boundary

X	Y
74.867	5116.98
70.045	5117.49
53.754	5119.94
6.77862	5127.26
1.015	5130.06
1.015	5135.19
-7.31575	5134.96
-27.257	5134.42
-30.461	5132.91
-48.17	5120.85
-52.041	5119.91
-57.425	5117.42
-70.036	5113.9
-79.911	5113.9
-79.911	5090
80	5090
80.185	5115.69

Material Boundary

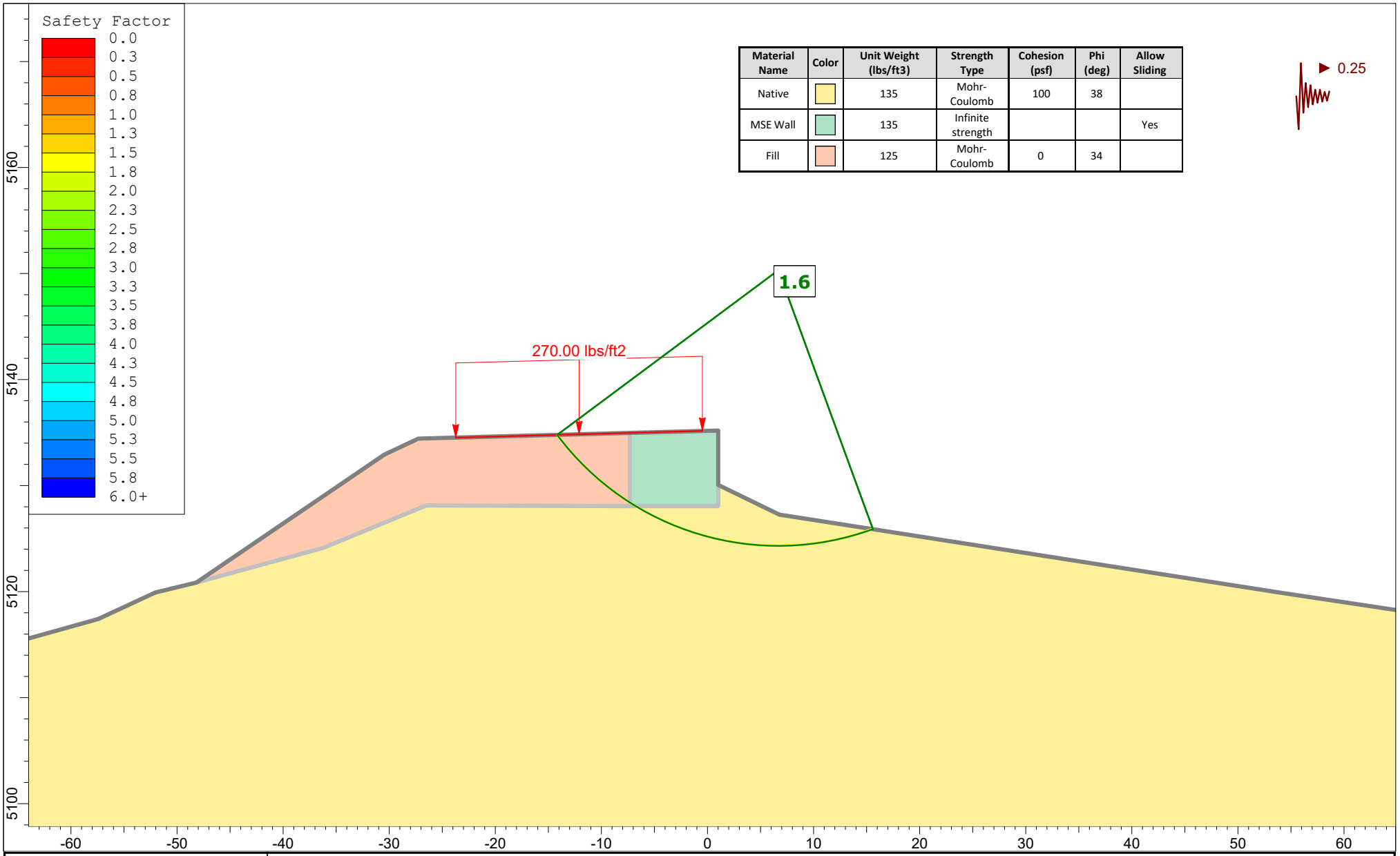
X	Y
-48.17	5120.85
-36.209	5124.13
-26.508	5128.12
-7.31575	5128.06

Material Boundary

X	Y
-7.31575	5128.06
-7.31575	5134.96

Material Boundary

X	Y
-7.31575	5128.06
1.015	5128.06
1.015	5130.06



NewFields

US 395 North Valleys

Analysis Description	RW13		
Drawn By	J. Ruzicka	*Scale* 1:150	*Company* NewFields
Date Printed	8/19/2022		*File Name* RW13_Seismic.slim

SLIDEINTERPRET 9.024

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:02.716s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Native	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	38
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0
Fill	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	125
Cohesion [psf]	0
Friction Angle [deg]	34
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.613940
Center:	6.684, 5150.309
Radius:	25.999
Left Slip Surface Endpoint:	-14.166, 5134.778
Right Slip Surface Endpoint:	15.596, 5125.885
Resisting Moment:	473446 lb-ft
Driving Moment:	293348 lb-ft
Resisting Horizontal Force:	16839 lb
Driving Horizontal Force:	10433.5 lb
Total Slice Area:	136.737 ft2
Surface Horizontal Width:	29.7617 ft
Surface Average Height:	4.59438 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	9193
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.61394

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.595235	29.1972	-52.2471	Fill	0	34	65.3568	105.482	156.384	0	156.384	240.785	240.785
2	0.595235	85.528	-50.1521	Fill	0	34	86.2932	139.272	206.479	0	206.479	309.875	309.875
3	0.595235	137.982	-48.1455	Fill	0	34	107.323	173.213	256.798	0	256.798	376.603	376.603
4	0.595235	187.006	-46.2145	Fill	0	34	128.403	207.234	307.238	0	307.238	441.203	441.203
5	0.595235	232.958	-44.3494	Fill	0	34	149.499	241.283	357.717	0	357.717	503.859	503.859
6	0.595235	276.127	-42.542	Fill	0	34	170.588	275.318	408.175	0	408.175	564.72	564.72
7	0.595235	316.754	-40.7855	Fill	0	34	191.648	309.309	458.57	0	458.57	623.911	623.911
8	0.595235	355.039	-39.0743	Fill	0	34	212.67	343.236	508.868	0	508.868	681.541	681.541
9	0.595235	391.153	-37.4038	Fill	0	34	233.639	377.08	559.045	0	559.045	737.7	737.7
10	0.595235	425.24	-35.7697	Fill	0	34	254.553	410.834	609.086	0	609.086	792.471	792.471
11	0.595235	457.426	-34.1686	Fill	0	34	275.406	444.489	658.981	0	658.981	845.926	845.926
12	0.595235	507.298	-32.5973	Fill	0	34	304.768	491.877	729.239	0	729.239	924.126	924.126
13	0.595235	557.835	-31.0532	Native	100	38	447.639	722.463	796.716	0	796.716	1066.25	1066.25
14	0.595235	587.082	-29.5337	Native	100	38	474.671	766.09	852.555	0	852.555	1121.48	1121.48
15	0.595235	614.665	-28.0368	Native	100	38	501.728	809.759	908.45	0	908.45	1175.64	1175.64
16	0.595235	640.654	-26.5604	Native	100	38	528.823	853.489	964.421	0	964.421	1228.78	1228.78
17	0.595235	665.111	-25.1028	Native	100	38	555.967	897.297	1020.49	0	1020.49	1280.96	1280.96
18	0.595235	688.092	-23.6624	Native	100	38	583.174	941.208	1076.7	0	1076.7	1332.24	1332.24
19	0.595235	709.647	-22.2377	Native	100	38	610.461	985.247	1133.07	0	1133.07	1382.66	1382.66
20	0.595235	729.821	-20.8273	Native	100	38	637.846	1029.45	1189.64	0	1189.64	1432.28	1432.28
21	0.595235	748.652	-19.4301	Native	100	38	665.35	1073.84	1246.45	0	1246.45	1481.15	1481.15
22	0.595235	766.177	-18.0448	Native	100	38	692.994	1118.45	1303.56	0	1303.56	1529.33	1529.33
23	0.595235	782.428	-16.6703	Native	100	38	720.814	1163.35	1361.02	0	1361.02	1576.87	1576.87
24	0.595235	797.432	-15.3056	Native	100	38	620.96	1002.19	1154.75	0	1154.75	1324.69	1324.69
25	0.595235	811.215	-13.9497	Native	100	38	645.698	1042.12	1205.86	0	1205.86	1366.25	1366.25
26	0.595235	616.532	-12.6018	Native	100	38	519.992	839.236	946.179	0	946.179	1062.43	1062.43
27	0.595235	398.811	-11.261	Native	100	38	370.229	597.527	636.805	0	636.805	710.522	710.522
28	0.595235	384.489	-9.92636	Native	100	38	368.232	594.305	632.681	0	632.681	697.123	697.123
29	0.595235	369.021	-8.59716	Native	100	38	365.113	589.27	626.237	0	626.237	681.437	681.437
30	0.595235	352.42	-7.2726	Native	100	38	360.806	582.32	617.341	0	617.341	663.386	663.386
31	0.595235	334.696	-5.95194	Native	100	38	355.242	573.339	605.846	0	605.846	642.882	642.882
32	0.595235	315.859	-4.63445	Native	100	38	348.336	562.194	591.58	0	591.58	619.817	619.817
33	0.595235	295.915	-3.31941	Native	100	38	339.996	548.733	574.353	0	574.353	594.072	594.072
34	0.595235	274.871	-2.00613	Native	100	38	330.114	532.784	553.938	0	553.938	565.501	565.501
35	0.595235	252.729	-0.693893	Native	100	38	318.568	514.149	530.087	0	530.087	533.945	533.945
36	0.595235	234.716	0.617977	Native	100	38	310.249	500.723	512.902	0	512.902	509.556	509.556
37	0.595235	225.917	1.93017	Native	100	38	310.549	501.207	513.521	0	513.521	503.055	503.055
38	0.595235	216.297	3.24338	Native	100	38	310.028	500.366	512.444	0	512.444	494.876	494.876
39	0.595235	205.577	4.5583	Native	100	38	308.312	497.597	508.902	0	508.902	484.321	484.321
40	0.595235	193.751	5.87562	Native	100	38	305.277	492.699	502.632	0	502.632	471.216	471.216
41	0.595235	180.812	7.19608	Native	100	38	300.775	485.432	493.329	0	493.329	455.354	455.354
42	0.595235	166.751	8.52039	Native	100	38	294.629	475.513	480.634	0	480.634	436.495	436.495
43	0.595235	151.558	9.84931	Native	100	38	286.628	462.601	464.109	0	464.109	414.345	414.345
44	0.595235	135.22	11.1836	Native	100	38	276.521	446.288	443.229	0	443.229	388.559	388.559
45	0.595235	117.721	12.5241	Native	100	38	263.996	426.074	417.356	0	417.356	358.713	358.713
46	0.595235	99.044	13.8715	Native	100	38	248.676	401.348	385.707	0	385.707	324.297	324.297
47	0.595235	79.1701	15.2269	Native	100	38	230.092	371.354	347.317	0	347.317	284.687	284.687
48	0.595235	58.0766	16.591	Native	100	38	207.66	335.151	300.979	0	300.979	239.109	239.109
49	0.595235	35.7385	17.9649	Native	100	38	180.644	291.549	245.171	0	245.171	186.599	186.599
50	0.595235	12.1275	19.3496	Native	100	38	151.442	244.419	184.848	0	184.848	131.666	131.666

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.61394

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-14.166	5134.78	0	0	0
2	-13.5707	5134.01	88.542	46.807	27.8628
3	-12.9755	5133.3	205.739	108.762	27.8628
4	-12.3803	5132.63	346.881	183.376	27.8628
5	-11.785	5132.01	507.88	268.487	27.8628
6	-11.1898	5131.43	685.132	362.19	27.8628
7	-10.5946	5130.88	875.42	462.784	27.8628
8	-9.99932	5130.37	1075.84	568.733	27.8628
9	-9.40409	5129.89	1283.74	678.637	27.8627
10	-8.80885	5129.43	1496.68	791.208	27.8628
11	-8.21362	5129	1712.41	905.253	27.8628
12	-7.61838	5128.6	1928.83	1019.66	27.8628
13	-7.02315	5128.22	2151.52	1137.39	27.8629
14	-6.42791	5127.86	2309.65	1220.98	27.8628
15	-5.83268	5127.52	2460.93	1300.95	27.8628
16	-5.23744	5127.2	2603.43	1376.28	27.8628
17	-4.64221	5126.91	2735.28	1445.98	27.8627
18	-4.04697	5126.63	2854.67	1509.1	27.8628
19	-3.45174	5126.37	2959.83	1564.69	27.8628
20	-2.85651	5126.12	3049.04	1611.85	27.8628
21	-2.26127	5125.9	3120.59	1649.67	27.8627
22	-1.66604	5125.69	3172.78	1677.27	27.8629
23	-1.0708	5125.49	3203.95	1693.74	27.8628
24	-0.475567	5125.32	3212.4	1698.21	27.8628
25	0.119668	5125.15	3229.65	1707.33	27.8628
26	0.714902	5125	3225.78	1705.29	27.8629
27	1.31014	5124.87	3195.81	1689.44	27.8628
28	1.90537	5124.75	3150.25	1665.36	27.8629
29	2.50061	5124.65	3092.74	1634.95	27.8628
30	3.09584	5124.56	3023.67	1598.44	27.8628
31	3.69107	5124.48	2943.56	1556.09	27.8628
32	4.28631	5124.42	2853.04	1508.24	27.8629
33	4.88154	5124.37	2752.87	1455.28	27.8628
34	5.47678	5124.34	2643.97	1397.72	27.8629
35	6.07201	5124.32	2527.43	1336.11	27.8629
36	6.66725	5124.31	2404.5	1271.12	27.8628
37	7.26248	5124.32	2274.92	1202.62	27.8628
38	7.85772	5124.34	2135.95	1129.15	27.8628
39	8.45295	5124.37	1987.9	1050.89	27.8629
40	9.04819	5124.42	1831.33	968.118	27.8628
41	9.64342	5124.48	1666.97	881.232	27.8629
42	10.2387	5124.55	1495.78	790.732	27.8628
43	10.8339	5124.64	1318.95	697.253	27.8628
44	11.4291	5124.75	1137.99	601.59	27.8628
45	12.0244	5124.86	954.774	504.734	27.8628
46	12.6196	5125	771.626	407.914	27.8628
47	13.2148	5125.14	591.432	312.656	27.8628
48	13.8101	5125.31	417.771	220.852	27.8629
49	14.4053	5125.48	255.107	134.86	27.8628
50	15.0005	5125.68	109.024	57.6345	27.8627
51	15.5958	5125.88	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
-0.474616	5135.15
-7.31575	5134.96
-23.7239	5134.52

External Boundary

X	Y
74.867	5116.98
70.045	5117.49
53.754	5119.94
6.77862	5127.26
1.015	5130.06
1.015	5135.19
-7.31575	5134.96
-27.257	5134.42
-30.461	5132.91
-48.17	5120.85
-52.041	5119.91
-57.425	5117.42
-70.036	5113.9
-79.911	5113.9
-79.911	5090
80	5090
80.185	5115.69

Material Boundary

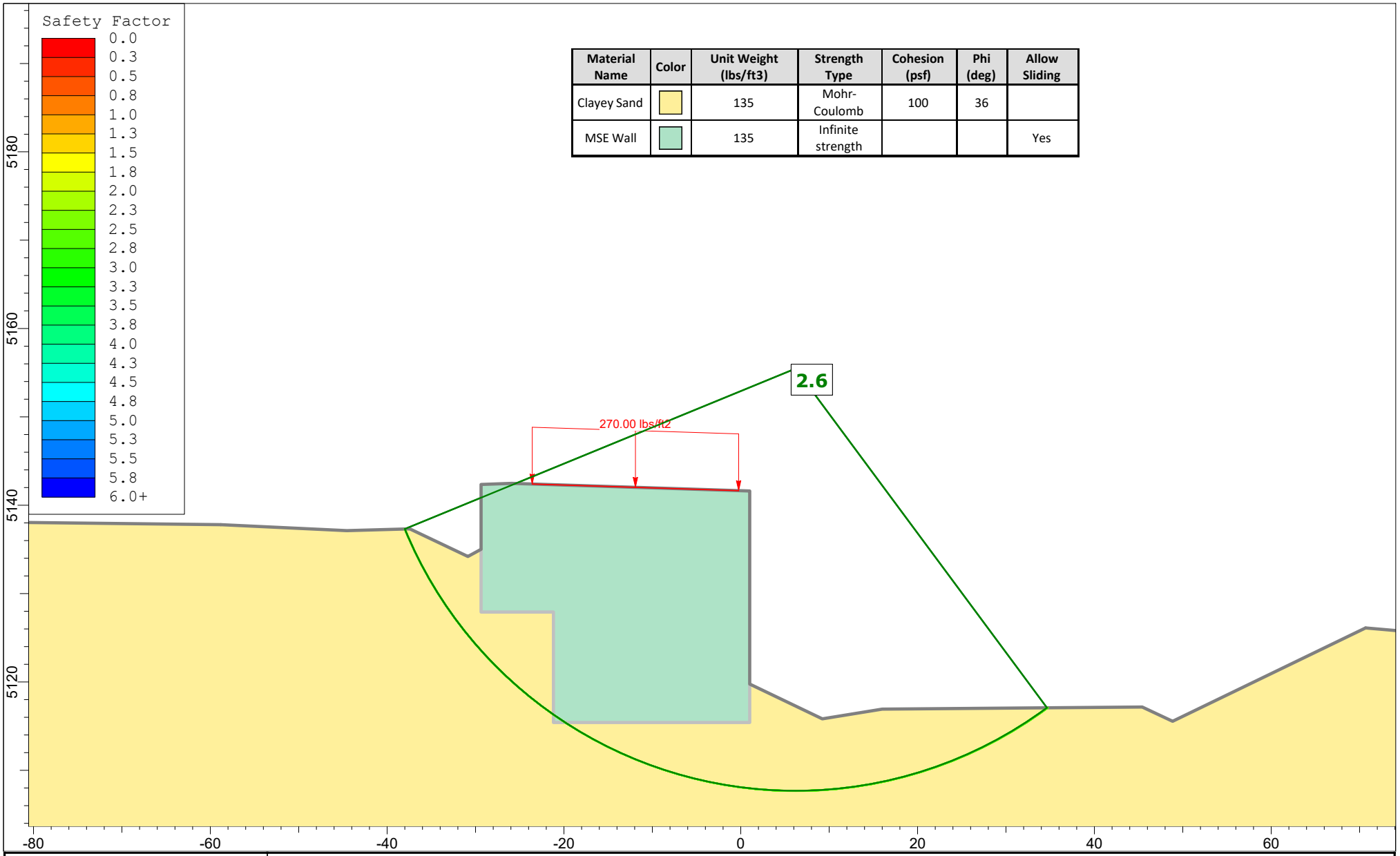
X	Y
-48.17	5120.85
-36.209	5124.13
-26.508	5128.12
-7.31575	5128.06

Material Boundary

X	Y
-7.31575	5128.06
-7.31575	5134.96

Material Boundary

X	Y
-7.31575	5128.06
1.015	5128.06
1.015	5130.06



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW15-RW9		
Drawn By	J. Ruzicka	*Scale*	1:180
Company	NewFields		
Date Printed	8/22/2022	*File Name*	RW15_RW9_Static.slim

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

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Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.190s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	2.566810
Center:	6.200, 5155.460
Radius:	47.777
Left Slip Surface Endpoint:	-37.994, 5137.307
Right Slip Surface Endpoint:	34.645, 5117.074
Resisting Moment:	6.16268e+06 lb-ft
Driving Moment:	2.40091e+06 lb-ft
Resisting Horizontal Force:	115239 lb
Driving Horizontal Force:	44895.7 lb
Total Slice Area:	1154.06 ft2
Surface Horizontal Width:	72.6392 ft
Surface Average Height:	15.8875 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	3307
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.56681

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.45278	290.11	-65.5633	Clayey Sand	100	36	55.8115	143.257	59.5389	0	59.5389	182.365	182.365
2	1.45278	742.633	-61.6238	Clayey Sand	100	36	106.092	272.317	237.173	0	237.173	433.581	433.581
3	1.45278	1100.49	-58.14	Clayey Sand	100	36	151.924	389.961	399.096	0	399.096	643.554	643.554
4	1.45278	1397.85	-54.9716	Clayey Sand	100	36	194.24	498.577	548.596	0	548.596	825.707	825.707
5	1.45278	1649.76	-52.0375	Clayey Sand	100	36	233.337	598.933	686.723	0	686.723	985.785	985.785
6	1.45278	2124.7	-49.2857	Clayey Sand	100	36	302.424	776.265	930.8	0	930.8	1282.22	1282.22
7	1.45278	3860.77	-46.6803	Clayey Sand	100	36	541.061	1388.8	1773.88	0	1773.88	2347.65	2347.65
8	1.45278	4161.48	-44.1953	Clayey Sand	100	36	598.482	1536.19	1976.74	0	1976.74	2558.64	2558.64
9	1.45278	4433.8	-41.8114	Clayey Sand	100	36	653.231	1676.72	2170.17	0	2170.17	2754.46	2754.46
10	1.45278	4670.52	-39.5134	Clayey Sand	100	36	708.631	1818.92	2365.89	0	2365.89	2950.32	2950.32
11	1.45278	4887.26	-37.2891	Clayey Sand	100	36	810.325	2079.95	2725.17	0	2725.17	3342.23	3342.23
12	1.45278	5086.74	-35.129	Clayey Sand	100	36	858.533	2203.69	2895.48	0	2895.48	3499.51	3499.51
13	1.45278	5270.34	-33.0247	Clayey Sand	100	36	904.979	2322.91	3059.57	0	3059.57	3647.83	3647.83
14	1.45278	5439.21	-30.9697	Clayey Sand	100	36	949.755	2437.84	3217.77	0	3217.77	3787.75	3787.75
15	1.45278	5594.3	-28.9581	Clayey Sand	100	36	992.941	2548.69	3370.33	0	3370.33	3919.78	3919.78
16	1.45278	5736.44	-26.9848	Clayey Sand	100	36	1034.6	2655.62	3517.51	0	3517.51	4044.32	4044.32
17	1.45278	5866.32	-25.0457	Clayey Sand	100	36	1074.79	2758.79	3659.51	0	3659.51	4161.74	4161.74
18	1.45278	5984.52	-23.1367	Clayey Sand	100	36	1113.58	2858.34	3796.53	0	3796.53	4272.35	4272.35
19	1.45278	6091.57	-21.2547	Clayey Sand	100	36	1150.99	2954.38	3928.72	0	3928.72	4376.42	4376.42
20	1.45278	6187.91	-19.3963	Clayey Sand	100	36	1187.09	3047.03	4056.24	0	4056.24	4474.2	4474.2
21	1.45278	6273.91	-17.5591	Clayey Sand	100	36	1221.9	3136.38	4179.21	0	4179.21	4565.86	4565.86
22	1.45278	6349.91	-15.7402	Clayey Sand	100	36	1255.46	3222.52	4297.77	0	4297.77	4651.62	4651.62
23	1.45278	6416.18	-13.9376	Clayey Sand	100	36	1287.79	3305.52	4412.02	0	4412.02	4731.61	4731.61
24	1.45278	6472.97	-12.1489	Clayey Sand	100	36	1318.94	3385.46	4522.04	0	4522.04	4805.97	4805.97
25	1.45278	6520.47	-10.3721	Clayey Sand	100	36	1348.91	3462.4	4627.94	0	4627.94	4874.84	4874.84
26	1.45278	6558.87	-8.60546	Clayey Sand	100	36	1377.15	3534.87	4727.69	0	4727.69	4936.09	4936.09
27	1.45278	5958.01	-6.84698	Clayey Sand	100	36	1205.42	3094.08	4121	0	4121	4265.74	4265.74
28	1.45278	2241.16	-5.09497	Clayey Sand	100	36	485.977	1247.41	1579.28	0	1579.28	1622.61	1622.61
29	1.45278	2125.62	-3.34772	Clayey Sand	100	36	470.296	1207.16	1523.88	0	1523.88	1551.39	1551.39
30	1.45278	2001.36	-1.60359	Clayey Sand	100	36	452.266	1160.88	1460.18	0	1460.18	1472.84	1472.84

31	1.45278	1868.42	0.13905	Clayey Sand	100	36	431.801	1108.35	1387.87	0	1387.87	1386.82	1386.82
32	1.45278	1726.82	1.88182	Clayey Sand	100	36	408.795	1049.3	1306.6	0	1306.6	1293.17	1293.17
33	1.45278	1599.2	3.62634	Clayey Sand	100	36	388.031	996.003	1233.24	0	1233.24	1208.65	1208.65
34	1.45278	1600.19	5.37423	Clayey Sand	100	36	394.847	1013.5	1257.32	0	1257.32	1220.18	1220.18
35	1.45278	1615.51	7.12716	Clayey Sand	100	36	405.175	1040.01	1293.81	0	1293.81	1243.15	1243.15
36	1.45278	1621.96	8.88683	Clayey Sand	100	36	413.947	1062.52	1324.8	0	1324.8	1260.07	1260.07
37	1.45278	1619.42	10.655	Clayey Sand	100	36	421.076	1080.82	1349.99	0	1349.99	1270.77	1270.77
38	1.45278	1592.4	12.4335	Clayey Sand	100	36	422.822	1085.3	1356.16	0	1356.16	1262.93	1262.93
39	1.45278	1527.73	14.2243	Clayey Sand	100	36	415.689	1066.99	1330.95	0	1330.95	1225.58	1225.58
40	1.45278	1452.92	16.0294	Clayey Sand	100	36	405.934	1041.96	1296.49	0	1296.49	1179.87	1179.87
41	1.45278	1368.33	17.851	Clayey Sand	100	36	393.495	1010.03	1252.54	0	1252.54	1125.82	1125.82
42	1.45278	1273.7	19.6915	Clayey Sand	100	36	378.119	970.559	1198.22	0	1198.22	1062.9	1062.9
43	1.45278	1168.67	21.5534	Clayey Sand	100	36	359.501	922.77	1132.45	0	1132.45	990.45	990.45
44	1.45278	1052.86	23.4395	Clayey Sand	100	36	337.27	865.707	1053.91	0	1053.91	907.682	907.682
45	1.45278	925.817	25.353	Clayey Sand	100	36	310.968	798.197	960.986	0	960.986	813.64	813.64
46	1.45278	787.018	27.2974	Clayey Sand	100	36	280.023	718.767	851.66	0	851.66	707.145	707.145
47	1.45278	635.854	29.2764	Clayey Sand	100	36	243.706	625.546	723.354	0	723.354	586.724	586.724
48	1.45278	471.611	31.2947	Clayey Sand	100	36	201.07	516.108	572.723	0	572.723	450.497	450.497
49	1.45278	293.453	33.3571	Clayey Sand	100	36	150.862	387.235	395.346	0	395.346	296.032	296.032
50	1.45278	100.391	35.4698	Clayey Sand	100	36	93.1362	239.063	191.404	0	191.404	125.044	125.044

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.56681

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-37.994	5137.31	0	0	0
2	-36.5412	5134.11	109.301	25.2641	13.0149
3	-35.0884	5131.42	593.11	137.093	13.0149
4	-33.6356	5129.08	1305.41	301.735	13.0149
5	-32.1828	5127.01	2160.33	499.344	13.0149
6	-30.73	5125.15	3100.12	716.569	13.0149
7	-29.2772	5123.46	4232.24	978.251	13.0149
8	-27.8245	5121.92	6179.28	1428.29	13.0149
9	-26.3717	5120.51	8102.32	1872.79	13.0149
10	-24.9189	5119.21	9973.67	2305.34	13.0149
11	-23.4661	5118.01	11779.2	2722.67	13.0149
12	-22.0133	5116.9	13617.2	3147.51	13.0149
13	-20.5605	5115.88	15329.9	3543.38	13.0149
14	-19.1078	5114.94	16904.8	3907.42	13.0149
15	-17.655	5114.06	18331	4237.06	13.0149
16	-16.2022	5113.26	19598.3	4530	13.0149
17	-14.7494	5112.52	20697.8	4784.14	13.0149
18	-13.2966	5111.84	21621.1	4997.56	13.0149
19	-11.8438	5111.22	22360.6	5168.49	13.0149
20	-10.3911	5110.66	22909.1	5295.27	13.0149
21	-8.93828	5110.14	23259.8	5376.34	13.0149
22	-7.48549	5109.69	23406.5	5410.23	13.0149
23	-6.03271	5109.28	23342.9	5395.54	13.0149
24	-4.57992	5108.92	23063.3	5330.91	13.0149
25	-3.12714	5108.6	22562.1	5215.05	13.0149
26	-1.67436	5108.34	21833.6	5046.67	13.0149
27	-0.221573	5108.12	20873	4824.62	13.0149
28	1.23121	5107.94	19841.2	4586.14	13.0149
29	2.68399	5107.81	19339.9	4470.28	13.0149
30	4.13678	5107.73	18786.4	4342.34	13.0149
31	5.58956	5107.69	18189	4204.24	13.0149
32	7.04235	5107.69	17557	4058.16	13.0149
33	8.49513	5107.74	16900.9	3906.51	13.0149
34	9.94791	5107.83	16223.8	3750.01	13.0149
35	11.4007	5107.97	15478.5	3577.74	13.0149
36	12.8535	5108.15	14655.1	3387.4	13.0149
37	14.3063	5108.38	13752.9	3178.88	13.0149
38	15.759	5108.65	12772.4	2952.24	13.0149
39	17.2118	5108.97	11723.9	2709.9	13.015
40	18.6646	5109.34	10630.1	2457.06	13.0149
41	20.1174	5109.76	9499.4	2195.72	13.0149
42	21.5702	5110.22	8341.9	1928.17	13.0149
43	23.023	5110.74	7169.76	1657.24	13.0149
44	24.4758	5111.32	5997.82	1386.35	13.0149
45	25.9285	5111.95	4844.18	1119.69	13.0149
46	27.3813	5112.63	3731.03	862.4	13.0149
47	28.8341	5113.38	2685.81	620.805	13.0149
48	30.2869	5114.2	1742.72	402.816	13.0149
49	31.7397	5115.08	944.918	218.411	13.0149
50	33.1925	5116.04	347.718	80.3725	13.0149
51	34.6452	5117.07	0	0	0

Discharge Sections

Entity Information

Distributed Load

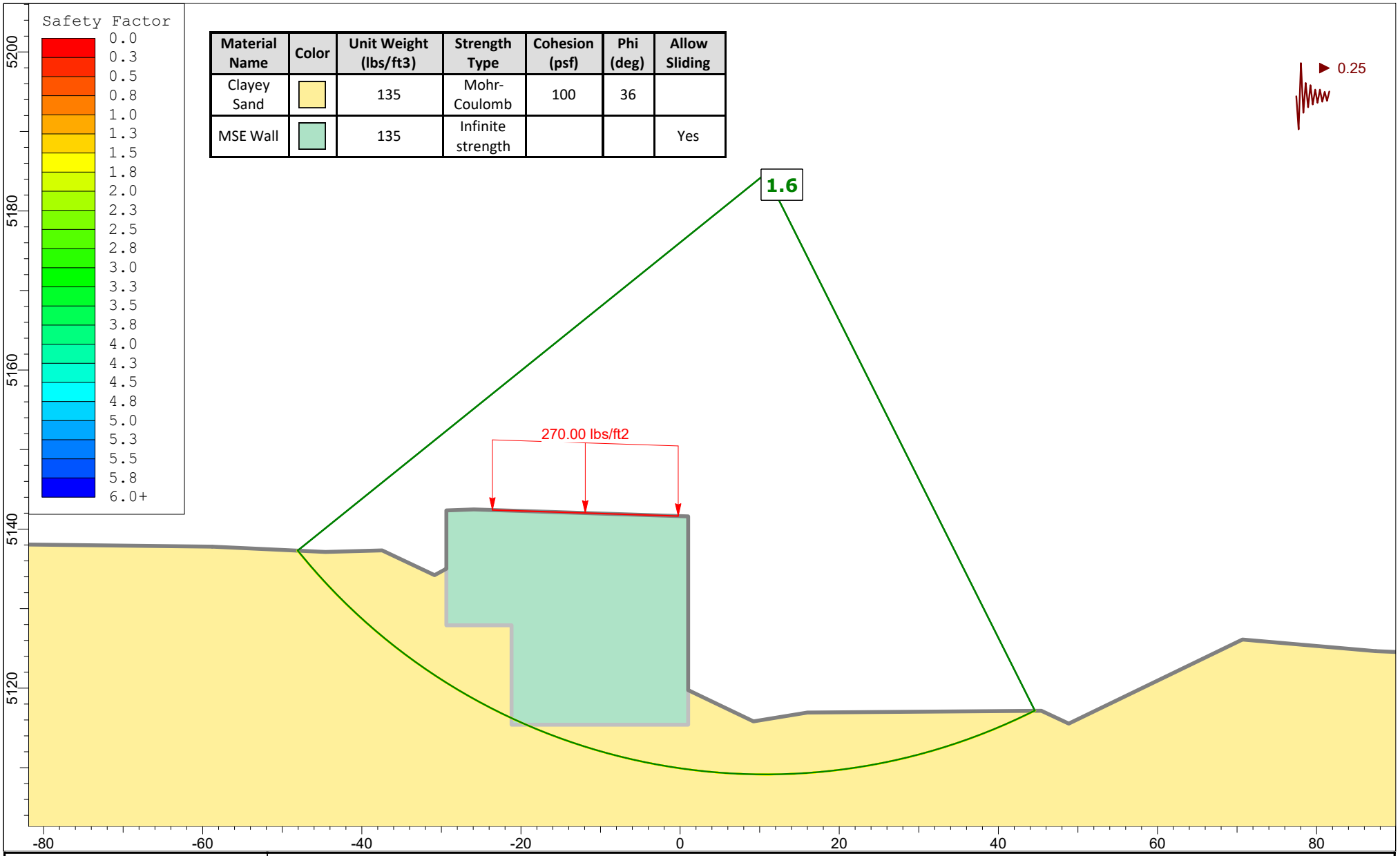
X	Y
-0.232998	5141.65
-23.5863	5142.4

External Boundary

X	Y
-99.813	5138.26
-99.813	5080
100.512	5080
100.152	5124.13
87.436	5124.66
70.681	5126.12
48.855	5115.55
45.409	5117.16
16.003	5116.93
9.225	5115.82
1.018	5119.76
1.018	5141.6
-25.91	5142.48
-29.37	5142.34
-29.37	5135.02
-30.862	5134.2
-37.441	5137.32
-44.564	5137.12
-58.808	5137.8

Material Boundary

X	Y
-29.37	5135.02
-29.37	5127.91
-21.182	5127.91
-21.182	5115.41
1.018	5115.41
1.018	5119.76



NewFields

US 395 North Valleys

Analysis Description	RW15-RW9		
Drawn By	J. Ruzicka	Scale	1:200
Company	NewFields		
Date Printed	8/22/2022	File Name	RW15_RW9_Seismic.slim

SLIDEINTERPRET 9.024

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US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

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Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.791s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	1.643920
Center:	10.754, 5184.702
Radius:	75.555
Left Slip Surface Endpoint:	-48.070, 5137.287
Right Slip Surface Endpoint:	44.598, 5117.152
Resisting Moment:	1.01844e+07 lb-ft
Driving Moment:	6.19522e+06 lb-ft
Resisting Horizontal Force:	126231 lb
Driving Horizontal Force:	76786.4 lb
Total Slice Area:	1266.29 ft2
Surface Horizontal Width:	92.6685 ft
Surface Average Height:	13.6647 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	4016
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.64392

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.85337	265.631	-50.0353	Clayey Sand	100	36	80.1218	131.714	43.6504	0	43.6504	139.255	139.255
2	1.85337	776.975	-47.893	Clayey Sand	100	36	139.998	230.145	179.129	0	179.129	334.029	334.029
3	1.85337	1271.43	-45.8362	Clayey Sand	100	36	202.632	333.111	320.85	0	320.85	529.485	529.485
4	1.85337	1746.14	-43.853	Clayey Sand	100	36	267.267	439.366	467.098	0	467.098	723.872	723.872
5	1.85337	2190.4	-41.9337	Clayey Sand	100	36	332.161	546.046	613.929	0	613.929	912.313	912.313
6	1.85337	2598.75	-40.0707	Clayey Sand	100	36	396.119	651.188	758.644	0	758.644	1091.86	1091.86
7	1.85337	2819.69	-38.2574	Clayey Sand	100	36	438.112	720.221	853.662	0	853.662	1199.13	1199.13
8	1.85337	2954.1	-36.4883	Clayey Sand	100	36	469.805	772.322	925.371	0	925.371	1272.86	1272.86
9	1.85337	3066.59	-34.7588	Clayey Sand	100	36	499.416	821	992.373	0	992.373	1338.94	1338.94
10	1.85337	3279.48	-33.0648	Clayey Sand	100	36	544.85	895.689	1095.17	0	1095.17	1449.88	1449.88
11	1.85337	5376.89	-31.4029	Clayey Sand	100	36	879.708	1446.17	1852.84	0	1852.84	2389.87	2389.87
12	1.85337	5834.66	-29.7699	Clayey Sand	100	36	975.376	1603.44	2069.31	0	2069.31	2627.23	2627.23
13	1.85337	6091.55	-28.1632	Clayey Sand	100	36	1042.78	1714.24	2221.81	0	2221.81	2780.07	2780.07
14	1.85337	6316.65	-26.5802	Clayey Sand	100	36	1182.74	1944.33	2538.49	0	2538.49	3130.26	3130.26
15	1.85337	6525.84	-25.0189	Clayey Sand	100	36	1269.59	2087.11	2735.02	0	2735.02	3327.55	3327.55
16	1.85337	6719.72	-23.4772	Clayey Sand	100	36	1336.03	2196.32	2885.34	0	2885.34	3465.62	3465.62
17	1.85337	6898.85	-21.9533	Clayey Sand	100	36	1402.15	2305.02	3034.95	0	3034.95	3600.12	3600.12
18	1.85337	7063.71	-20.4456	Clayey Sand	100	36	1467.99	2413.25	3183.91	0	3183.91	3731.18	3731.18
19	1.85337	7214.74	-18.9525	Clayey Sand	100	36	1533.57	2521.07	3332.32	0	3332.32	3858.95	3858.95
20	1.85337	7352.31	-17.4727	Clayey Sand	100	36	1598.95	2628.55	3480.25	0	3480.25	3983.57	3983.57
21	1.85337	7476.77	-16.0049	Clayey Sand	100	36	1664.17	2735.76	3627.81	0	3627.81	4105.16	4105.16
22	1.85337	7588.41	-14.5478	Clayey Sand	100	36	1729.26	2842.77	3775.1	0	3775.1	4223.86	4223.86
23	1.85337	7687.5	-13.1002	Clayey Sand	100	36	1794.3	2949.69	3922.26	0	3922.26	4339.82	4339.82
24	1.85337	7774.28	-11.6611	Clayey Sand	100	36	1859.35	3056.62	4069.44	0	4069.44	4453.18	4453.18
25	1.85337	7848.94	-10.2294	Clayey Sand	100	36	1924.47	3163.67	4216.78	0	4216.78	4564.07	4564.07
26	1.85337	7911.66	-8.80418	Clayey Sand	100	36	1965.11	3230.49	4308.75	0	4308.75	4613.11	4613.11
27	1.85337	5124.45	-7.38441	Clayey Sand	100	36	1262.54	2075.52	2719.07	0	2719.07	2882.7	2882.7
28	1.85337	2324.68	-5.96919	Clayey Sand	100	36	628.706	1033.54	1284.91	0	1284.91	1350.65	1350.65
29	1.85337	2145.13	-4.55762	Clayey Sand	100	36	601.613	989.004	1223.61	0	1223.61	1271.57	1271.57
30	1.85337	1954.08	-3.14882	Clayey Sand	100	36	569.93	936.92	1151.92	0	1151.92	1183.28	1183.28

31	1.85337	1752.7	-1.74192	Clayey Sand	100	36	533.589	877.177	1069.69	0	1069.69	1085.92	1085.92
32	1.85337	1712.36	-0.33607	Clayey Sand	100	36	538.15	884.675	1080.01	0	1080.01	1083.17	1083.17
33	1.85337	1785.13	1.06957	Clayey Sand	100	36	574.271	944.055	1161.74	0	1161.74	1151.02	1151.02
34	1.85337	1846.51	2.47586	Clayey Sand	100	36	609.504	1001.98	1241.46	0	1241.46	1215.11	1215.11
35	1.85337	1889.85	3.88365	Clayey Sand	100	36	641.824	1055.11	1314.6	0	1314.6	1271.02	1271.02
36	1.85337	1868.02	5.29379	Clayey Sand	100	36	656.551	1079.32	1347.92	0	1347.92	1287.08	1287.08
37	1.85337	1822.89	6.70715	Clayey Sand	100	36	665.071	1093.32	1367.19	0	1367.19	1288.98	1288.98
38	1.85337	1766.15	8.12463	Clayey Sand	100	36	670.556	1102.34	1379.6	0	1379.6	1283.87	1283.87
39	1.85337	1697.68	9.54714	Clayey Sand	100	36	672.63	1105.75	1384.3	0	1384.3	1271.17	1271.17
40	1.85337	1617.35	10.9756	Clayey Sand	100	36	670.866	1102.85	1380.3	0	1380.3	1250.2	1250.2
41	1.85337	1524.98	12.411	Clayey Sand	100	36	664.715	1092.74	1366.39	0	1366.39	1220.11	1220.11
42	1.85337	1420.4	13.8544	Clayey Sand	100	36	653.515	1074.33	1341.05	0	1341.05	1179.87	1179.87
43	1.85337	1303.38	15.3068	Clayey Sand	100	36	636.443	1046.26	1302.42	0	1302.42	1128.22	1128.22
44	1.85337	1173.68	16.7694	Clayey Sand	100	36	612.462	1006.84	1248.16	0	1248.16	1063.6	1063.6
45	1.85337	1031.02	18.2433	Clayey Sand	100	36	580.254	953.891	1175.28	0	1175.28	984.015	984.015
46	1.85337	875.061	19.7299	Clayey Sand	100	36	538.126	884.636	1079.96	0	1079.96	886.963	886.963
47	1.85337	705.459	21.2304	Clayey Sand	100	36	483.873	795.448	957.203	0	957.203	769.226	769.226
48	1.85337	521.802	22.7463	Clayey Sand	100	36	414.581	681.538	800.42	0	800.42	626.603	626.603
49	1.85337	323.63	24.2793	Clayey Sand	100	36	326.347	536.488	600.776	0	600.776	453.567	453.567
50	1.85337	110.428	25.831	Clayey Sand	100	36	228.499	375.634	379.378	0	379.378	268.765	268.765

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.64392

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-48.0701	5137.29	0	0	0
2	-46.2168	5135.08	14.4706	7.5918	27.6831
3	-44.3634	5133.02	316.623	166.111	27.683
4	-42.51	5131.12	871.26	457.093	27.6831
5	-40.6566	5129.34	1644.25	862.63	27.683
6	-38.8033	5127.67	2598.47	1363.25	27.6831
7	-36.9499	5126.11	3696.9	1939.52	27.683
8	-35.0965	5124.65	4837.56	2537.95	27.683
9	-33.2432	5123.28	5974.04	3134.19	27.6831
10	-31.3898	5121.99	7091.58	3720.49	27.6831
11	-29.5364	5120.79	8223.21	4314.18	27.6831
12	-27.6831	5119.66	10033.6	5264	27.6832
13	-25.8297	5118.6	11878.6	6231.94	27.6831
14	-23.9763	5117.6	13673.7	7173.72	27.6831
15	-22.1229	5116.68	15415.2	8087.33	27.683
16	-20.2696	5115.81	17059.7	8950.13	27.6831
17	-18.4162	5115.01	18586.6	9751.17	27.683
18	-16.5628	5114.26	19980.3	10482.4	27.6832
19	-14.7095	5113.57	21225.8	11135.8	27.6831
20	-12.8561	5112.93	22308.6	11703.9	27.6831
21	-11.0027	5112.35	23214	12178.9	27.6831
22	-9.14935	5111.82	23928	12553.5	27.6831
23	-7.29598	5111.34	24436.4	12820.2	27.6831
24	-5.44261	5110.9	24725	12971.6	27.6831
25	-3.58924	5110.52	24779.6	13000.2	27.683
26	-1.73587	5110.19	24586	12898.7	27.6831
27	0.117504	5109.9	24159.3	12674.8	27.683
28	1.97087	5109.66	23753.9	12462.1	27.683
29	3.82425	5109.47	23419.1	12286.5	27.6831
30	5.67762	5109.32	23021.3	12077.8	27.6831
31	7.53099	5109.22	22571.2	11841.6	27.683
32	9.38436	5109.16	22080.9	11584.4	27.683
33	11.2377	5109.15	21523.5	11292	27.6831
34	13.0911	5109.18	20865.4	10946.7	27.683
35	14.9445	5109.26	20098.1	10544.2	27.6832
36	16.7978	5109.39	19215.8	10081.3	27.6831
37	18.6512	5109.56	18234.7	9566.56	27.6831
38	20.5046	5109.78	17160	9002.74	27.6831
39	22.358	5110.04	15993.9	8390.98	27.6831
40	24.2113	5110.36	14740.4	7733.34	27.6831
41	26.0647	5110.72	13405.5	7032.98	27.683
42	27.9181	5111.12	11997.7	6294.39	27.683
43	29.7714	5111.58	10528.8	5523.76	27.683
44	31.6248	5112.09	9014.57	4729.36	27.6831
45	33.4782	5112.65	7475.98	3922.16	27.6831
46	35.3315	5113.26	5940.5	3116.59	27.683
47	37.1849	5113.92	4444.24	2331.6	27.683
48	39.0383	5114.64	3034.77	1592.15	27.6831
49	40.8917	5115.42	1775.01	931.235	27.6831
50	42.745	5116.25	748.92	392.909	27.683
51	44.5984	5117.15	0	0	0

Discharge Sections

Entity Information

Distributed Load

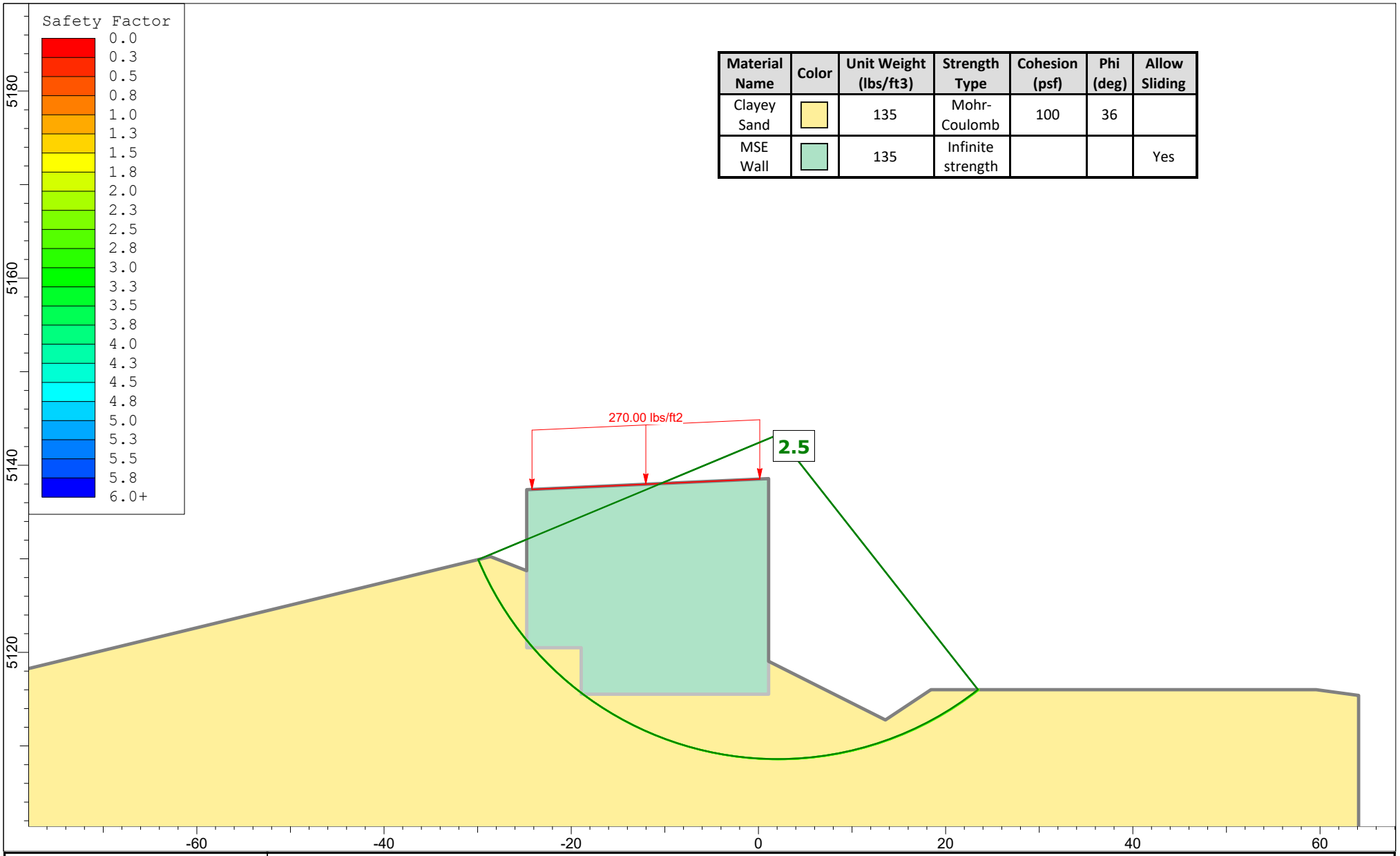
X	Y
-0.232998	5141.65
-23.5863	5142.4

External Boundary

X	Y
-99.813	5138.26
-99.813	5080
100.512	5080
100.152	5124.13
87.436	5124.66
70.681	5126.12
48.855	5115.55
45.409	5117.16
16.003	5116.93
9.225	5115.82
1.018	5119.76
1.018	5141.6
-25.91	5142.48
-29.37	5142.34
-29.37	5135.02
-30.862	5134.2
-37.441	5137.32
-44.564	5137.12
-58.808	5137.8

Material Boundary

X	Y
-29.37	5135.02
-29.37	5127.91
-21.182	5127.91
-21.182	5115.41
1.018	5115.41
1.018	5119.76



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding
Clayey Sand		135	Mohr-Coulomb	100	36	
MSE Wall		135	Infinite strength			Yes

NewFields

SLIDEINTERPRET 9.024

US 395 North Valleys

Analysis Description	RW20 - RW13		
Drawn By	J. Ruzicka	*Scale*	1:170
Company	NewFields		
Date Printed	8/19/2022	*File Name*	RW20_RW13_Static.slim

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:01.271s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	2.538880
Center:	2.049, 5143.250
Radius:	34.647
Left Slip Surface Endpoint:	-29.933, 5129.925
Right Slip Surface Endpoint:	23.463, 5116.013
Resisting Moment:	3.09493e+06 lb-ft
Driving Moment:	1.21901e+06 lb-ft
Resisting Horizontal Force:	80149.8 lb
Driving Horizontal Force:	31568.9 lb
Total Slice Area:	784.975 ft2
Surface Horizontal Width:	53.3952 ft
Surface Average Height:	14.7012 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	2157
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.53888

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.0679	185.807	-65.2698	Clayey Sand	100	36	52.8721	134.236	47.1218	0	47.1218	161.915	161.915
2	1.0679	501.066	-61.3185	Clayey Sand	100	36	100.386	254.869	213.159	0	213.159	396.659	396.659
3	1.0679	706.13	-57.8201	Clayey Sand	100	36	137.179	348.281	341.729	0	341.729	559.736	559.736
4	1.0679	876.65	-54.6361	Clayey Sand	100	36	171.181	434.607	460.547	0	460.547	701.743	701.743
5	1.0679	1219.72	-51.6858	Clayey Sand	100	36	235.76	598.567	686.219	0	686.219	984.591	984.591
6	1.0679	2442	-48.9175	Clayey Sand	100	36	488.282	1239.69	1568.65	0	1568.65	2128.72	2128.72
7	1.0679	2617.86	-46.2956	Clayey Sand	100	36	556.651	1413.27	1807.55	0	1807.55	2389.97	2389.97
8	1.0679	2779.23	-43.7942	Clayey Sand	100	36	604.168	1533.91	1973.61	0	1973.61	2552.87	2552.87
9	1.0679	2927.91	-41.3936	Clayey Sand	100	36	649.96	1650.17	2133.63	0	2133.63	2706.52	2706.52
10	1.0679	3065.3	-39.0789	Clayey Sand	100	36	694.176	1762.43	2288.14	0	2288.14	2851.86	2851.86
11	1.0679	3192.5	-36.838	Clayey Sand	100	36	736.939	1871	2437.57	0	2437.57	2989.63	2989.63
12	1.0679	3310.41	-34.6611	Clayey Sand	100	36	778.355	1976.15	2582.3	0	2582.3	3120.47	3120.47
13	1.0679	3419.78	-32.54	Clayey Sand	100	36	818.511	2078.1	2722.63	0	2722.63	3244.88	3244.88
14	1.0679	3521.2	-30.4679	Clayey Sand	100	36	857.492	2177.07	2858.84	0	2858.84	3363.3	3363.3
15	1.0679	3615.2	-28.4392	Clayey Sand	100	36	895.363	2273.22	2991.19	0	2991.19	3476.1	3476.1
16	1.0679	3702.21	-26.4486	Clayey Sand	100	36	932.191	2366.72	3119.88	0	3119.88	3583.61	3583.61
17	1.0679	3782.59	-24.492	Clayey Sand	100	36	968.025	2457.7	3245.09	0	3245.09	3686.08	3686.08
18	1.0679	3856.67	-22.5654	Clayey Sand	100	36	1002.92	2546.29	3367.02	0	3367.02	3783.79	3783.79
19	1.0679	3924.72	-20.6653	Clayey Sand	100	36	1036.91	2632.59	3485.82	0	3485.82	3876.91	3876.91
20	1.0679	3986.96	-18.7888	Clayey Sand	100	36	1070.05	2716.73	3601.63	0	3601.63	3965.67	3965.67
21	1.0679	4043.61	-16.933	Clayey Sand	100	36	1102.38	2798.8	3714.58	0	3714.58	4050.2	4050.2
22	1.0679	4094.83	-15.0953	Clayey Sand	100	36	1133.92	2878.89	3824.81	0	3824.81	4130.67	4130.67
23	1.0679	4140.78	-13.2735	Clayey Sand	100	36	1164.72	2957.08	3932.44	0	3932.44	4207.2	4207.2
24	1.0679	4181.58	-11.4651	Clayey Sand	100	36	1194.81	3033.48	4037.59	0	4037.59	4279.92	4279.92
25	1.0679	4217.33	-9.66836	Clayey Sand	100	36	1224.22	3108.14	4140.36	0	4140.36	4348.92	4348.92
26	1.0679	4248.12	-7.88113	Clayey Sand	100	36	1252.99	3181.18	4240.88	0	4240.88	4414.32	4414.32
27	1.0679	4274.03	-6.10159	Clayey Sand	100	36	1281.14	3252.65	4339.25	0	4339.25	4476.2	4476.2
28	1.0679	4295.11	-4.32795	Clayey Sand	100	36	1308.71	3322.66	4435.61	0	4435.61	4534.66	4534.66
29	1.0679	4311.39	-2.55846	Clayey Sand	100	36	1267.19	3217.25	4290.53	0	4290.53	4347.15	4347.15
30	1.0679	1593.54	-0.791405	Clayey Sand	100	36	498.365	1265.29	1603.89	0	1603.89	1610.77	1610.77

31	1.0679	1391.3	0.974892	Clayey Sand	100	36	448.04	1137.52	1428.02	0	1428.02	1420.4	1420.4
32	1.0679	1309.05	2.74212	Clayey Sand	100	36	431.488	1095.5	1370.18	0	1370.18	1349.52	1349.52
33	1.0679	1222.04	4.51196	Clayey Sand	100	36	412.913	1048.34	1305.27	0	1305.27	1272.69	1272.69
34	1.0679	1130.24	6.28613	Clayey Sand	100	36	392.204	995.758	1232.91	0	1232.91	1189.7	1189.7
35	1.0679	1033.6	8.06639	Clayey Sand	100	36	369.234	937.441	1152.64	0	1152.64	1100.31	1100.31
36	1.0679	932.068	9.85452	Clayey Sand	100	36	343.856	873.008	1063.95	0	1063.95	1004.22	1004.22
37	1.0679	825.572	11.6524	Clayey Sand	100	36	315.892	802.013	966.236	0	966.236	901.092	901.092
38	1.0679	714.021	13.462	Clayey Sand	100	36	285.138	723.931	858.768	0	858.768	790.512	790.512
39	1.0679	597.306	15.2855	Clayey Sand	100	36	251.347	638.139	740.684	0	740.684	671.992	671.992
40	1.0679	475.301	17.1249	Clayey Sand	100	36	214.224	543.888	610.96	0	610.96	544.954	544.954
41	1.0679	354.275	18.9827	Clayey Sand	100	36	175.723	446.139	476.42	0	476.42	415.973	415.973
42	1.0679	352.669	20.8616	Clayey Sand	100	36	179.402	455.481	489.278	0	489.278	420.909	420.909
43	1.0679	393.468	22.7642	Clayey Sand	100	36	199.569	506.681	559.749	0	559.749	476.004	476.004
44	1.0679	428.207	24.6938	Clayey Sand	100	36	218.809	555.53	626.983	0	626.983	526.371	526.371
45	1.0679	456.61	26.6538	Clayey Sand	100	36	237.038	601.811	690.683	0	690.683	571.705	571.705
46	1.0679	452.001	28.648	Clayey Sand	100	36	243.093	617.183	711.842	0	711.842	579.039	579.039
47	1.0679	368.369	30.6811	Clayey Sand	100	36	215.601	547.386	615.774	0	615.774	487.856	487.856
48	1.0679	273.168	32.7579	Clayey Sand	100	36	180.974	459.471	494.769	0	494.769	378.327	378.327
49	1.0679	169.969	34.8845	Clayey Sand	100	36	139.703	354.689	350.549	0	350.549	253.147	253.147
50	1.0679	58.1499	37.0677	Clayey Sand	100	36	91.5868	232.528	182.409	0	182.409	113.223	113.223

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.53888

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-29.9325	5129.92	0	0	0
2	-28.8646	5127.61	52.8126	13.1234	13.9548
3	-27.7967	5125.65	361.746	89.8902	13.9548
4	-26.7288	5123.96	795.26	197.614	13.9548
5	-25.6609	5122.45	1305.5	324.404	13.9548
6	-24.593	5121.1	1981.25	492.321	13.9548
7	-23.5251	5119.88	3381.47	840.26	13.9548
8	-22.4572	5118.76	4806.86	1194.46	13.9548
9	-21.3893	5117.73	6182.62	1536.32	13.9548
10	-20.3214	5116.79	7497.1	1862.95	13.9548
11	-19.2535	5115.93	8740.34	2171.89	13.9548
12	-18.1856	5115.13	9903.7	2460.97	13.9548
13	-17.1177	5114.39	10979.5	2728.29	13.9548
14	-16.0498	5113.71	11960.8	2972.15	13.9548
15	-14.9819	5113.08	12841.5	3190.98	13.9548
16	-13.914	5112.5	13615.6	3383.35	13.9548
17	-12.8461	5111.97	14277.9	3547.91	13.9548
18	-11.7782	5111.48	14823.2	3683.42	13.9548
19	-10.7103	5111.04	15246.8	3788.66	13.9547
20	-9.64238	5110.64	15543.9	3862.5	13.9548
21	-8.57447	5110.27	15710.1	3903.8	13.9548
22	-7.50657	5109.95	15741	3911.47	13.9547
23	-6.43867	5109.66	15632.2	3884.45	13.9548
24	-5.37076	5109.41	15379.5	3821.65	13.9548
25	-4.30286	5109.19	14978.5	3722.01	13.9548
26	-3.23496	5109.01	14424.9	3584.44	13.9548
27	-2.16705	5108.86	13714.2	3407.84	13.9548
28	-1.09915	5108.75	12841.9	3191.09	13.9548
29	-0.0312468	5108.67	11803.3	2933.01	13.9548
30	1.03666	5108.62	10655.3	2647.73	13.9548
31	2.10456	5108.6	10146.9	2521.41	13.9548
32	3.17246	5108.62	9642.69	2396.11	13.9548
33	4.24037	5108.67	9111.98	2264.23	13.9548
34	5.30827	5108.76	8561.19	2127.37	13.9548
35	6.37617	5108.87	7997.47	1987.29	13.9548
36	7.44408	5109.03	7428.85	1845.99	13.9548
37	8.51198	5109.21	6864.41	1705.74	13.9548
38	9.57988	5109.43	6314.39	1569.06	13.9548
39	10.6478	5109.69	5790.47	1438.87	13.9548
40	11.7157	5109.98	5305.98	1318.48	13.9548
41	12.7836	5110.31	4876.26	1211.7	13.9548
42	13.8515	5110.68	4513.66	1121.6	13.9548
43	14.9194	5111.08	4123.02	1024.53	13.9548
44	15.9873	5111.53	3659.14	909.26	13.9548
45	17.0552	5112.02	3117.68	774.713	13.9548
46	18.1231	5112.56	2494.42	619.838	13.9548
47	19.191	5113.14	1819.62	452.157	13.9548
48	20.2589	5113.77	1199.31	298.016	13.9548
49	21.3268	5114.46	666.155	165.533	13.9548
50	22.3947	5115.21	256.018	63.6178	13.9548
51	23.4626	5116.01	0	0	0

Discharge Sections

Entity Information

Distributed Load

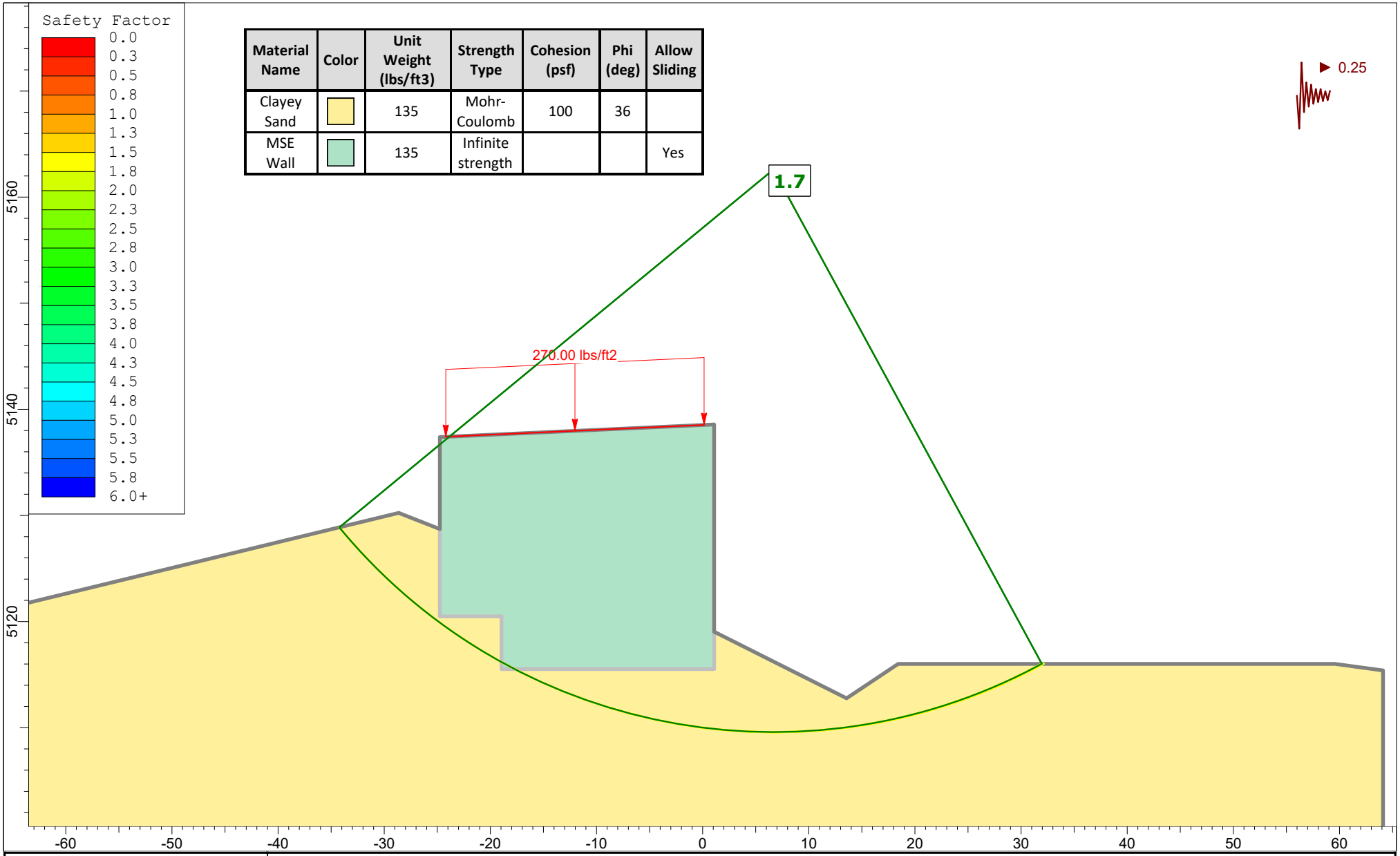
X	Y
0.13502	5138.53
-24.1896	5137.42

External Boundary

X	Y
-79.985	5117.78
-80	5100
64.113	5100.21
64.113	5115.4
59.577	5116.01
55.471	5116.01
18.425	5116.01
13.566	5112.78
1.084	5119.04
1.084	5138.57
-24.761	5137.4
-24.761	5128.72
-28.633	5130.24

Material Boundary

X	Y
-24.761	5128.72
-24.761	5120.49
-18.941	5120.49
-18.941	5115.53
1.084	5115.53
1.084	5119.04



NewFields

US 395 North Valleys

Analysis Description	RW20 - RW13		
Drawn By	J. Ruzicka	Scale	1:150
Company	NewFields		
Date Printed	8/19/2022	File Name	RW20_RW13_Seismic.slim

SLIDEINTERPRET 9.024

rocscience

US 395 North Valleys
NewFields
Date Created: 8/19/2022
Software Version: 9.024

Table of Contents

Slide2 Analysis Information

US 395 North Valleys

Project Summary

Slide2 Modeler Version:	9.024
Compute Time:	00h:00m:02.389s
Author:	J. Ruzicka
Company:	NewFields
Date Created:	8/19/2022

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

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

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.25

Loading

1 Distributed Load present

Distributed Load 1	
Distribution:	Constant
Magnitude [psf]:	270
Orientation:	Vertical

Materials

Clayey Sand	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	135
Cohesion [psf]	100
Friction Angle [deg]	36
Water Surface	None
Ru Value	0
MSE Wall	
Color	
Strength Type	Infinite strength
Unit Weight [lbs/ft3]	135
Allow Sliding Along Boundary	Yes
Water Surface	None
Ru Value	0
Ru Value	0

Global Minimums

Method: spencer

FS	1.682520
Center:	6.674, 5162.596
Radius:	53.004
Left Slip Surface Endpoint:	-34.226, 5128.883
Right Slip Surface Endpoint:	31.961, 5116.013
Resisting Moment:	4.76009e+06 lb-ft
Driving Moment:	2.82915e+06 lb-ft
Resisting Horizontal Force:	84072.3 lb
Driving Horizontal Force:	49968.2 lb
Total Slice Area:	818.344 ft2
Surface Horizontal Width:	66.1869 ft
Surface Average Height:	12.3641 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	7231
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.68252

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.32374	166.707	-49.4024	Clayey Sand	100	36	75.6839	127.34	37.6298	0	37.6298	125.939	125.939
2	1.32374	490.058	-47.2488	Clayey Sand	100	36	126.56	212.939	155.447	0	155.447	292.353	292.353
3	1.32374	794.423	-45.1797	Clayey Sand	100	36	178.618	300.529	276.004	0	276.004	455.747	455.747
4	1.32374	1081.85	-43.1834	Clayey Sand	100	36	231.677	389.801	398.877	0	398.877	616.31	616.31
5	1.32374	1308.96	-41.2505	Clayey Sand	100	36	277.928	467.619	505.984	0	505.984	749.725	749.725
6	1.32374	1420.94	-39.3732	Clayey Sand	100	36	306.521	515.727	572.199	0	572.199	823.739	823.739
7	1.32374	1516.29	-37.5453	Clayey Sand	100	36	333.346	560.861	634.322	0	634.322	890.526	890.526
8	1.32374	2953.69	-35.7611	Clayey Sand	100	36	647.69	1089.75	1362.27	0	1362.27	1828.73	1828.73
9	1.32374	3361.27	-34.0162	Clayey Sand	100	36	794.154	1336.18	1701.46	0	1701.46	2237.45	2237.45
10	1.32374	3526.68	-32.3065	Clayey Sand	100	36	850.956	1431.75	1833	0	1833	2371.09	2371.09
11	1.32374	3682.29	-30.6285	Clayey Sand	100	36	907.835	1527.45	1964.72	0	1964.72	2502.22	2502.22
12	1.32374	3828.62	-28.9791	Clayey Sand	100	36	964.815	1623.32	2096.68	0	2096.68	2631.02	2631.02
13	1.32374	3966.11	-27.3556	Clayey Sand	100	36	1021.93	1719.42	2228.94	0	2228.94	2757.66	2757.66
14	1.32374	4095.16	-25.7556	Clayey Sand	100	36	1079.21	1815.8	2361.6	0	2361.6	2882.28	2882.28
15	1.32374	4216.12	-24.177	Clayey Sand	100	36	1136.71	1912.54	2494.75	0	2494.75	3005.06	3005.06
16	1.32374	4329.29	-22.6176	Clayey Sand	100	36	1194.46	2009.71	2628.49	0	2628.49	3126.13	3126.13
17	1.32374	4434.94	-21.0757	Clayey Sand	100	36	1252.53	2107.4	2762.95	0	2762.95	3245.65	3245.65
18	1.32374	4533.31	-19.5497	Clayey Sand	100	36	1310.96	2205.72	2898.27	0	2898.27	3363.79	3363.79
19	1.32374	4624.62	-18.038	Clayey Sand	100	36	1369.83	2304.77	3034.6	0	3034.6	3480.69	3480.69
20	1.32374	4709.06	-16.5391	Clayey Sand	100	36	1429.21	2404.68	3172.12	0	3172.12	3596.54	3596.54
21	1.32374	4786.78	-15.0519	Clayey Sand	100	36	1489.19	2505.6	3311.02	0	3311.02	3711.5	3711.5
22	1.32374	4857.94	-13.5749	Clayey Sand	100	36	1549.87	2607.68	3451.53	0	3451.53	3825.76	3825.76
23	1.32374	4922.66	-12.1071	Clayey Sand	100	36	1611.34	2711.11	3593.88	0	3593.88	3939.53	3939.53
24	1.32374	4981.06	-10.6474	Clayey Sand	100	36	1673.73	2816.09	3738.38	0	3738.38	4053.04	4053.04
25	1.32374	5033.23	-9.19455	Clayey Sand	100	36	1737.19	2922.85	3885.32	0	3885.32	4166.51	4166.51
26	1.32374	5079.26	-7.74768	Clayey Sand	100	36	1796.29	3022.29	4022.19	0	4022.19	4266.58	4266.58
27	1.32374	3976.62	-6.30578	Clayey Sand	100	36	1362.12	2291.79	3016.74	0	3016.74	3167.26	3167.26
28	1.32374	1555.99	-4.86787	Clayey Sand	100	36	594.367	1000.03	1238.79	0	1238.79	1289.41	1289.41
29	1.32374	1454.47	-3.43303	Clayey Sand	100	36	577.03	970.864	1198.64	0	1198.64	1233.26	1233.26
30	1.32374	1347	-2.00035	Clayey Sand	100	36	556.376	936.113	1150.81	0	1150.81	1170.24	1170.24

31	1.32374	1233.61	-0.568914	Clayey Sand	100	36	532.118	895.3	1094.63	0	1094.63	1099.92	1099.92
32	1.32374	1114.31	0.862163	Clayey Sand	100	36	503.924	847.863	1029.35	0	1029.35	1021.76	1021.76
33	1.32374	989.093	2.29378	Clayey Sand	100	36	471.401	793.141	954.024	0	954.024	935.142	935.142
34	1.32374	857.955	3.72683	Clayey Sand	100	36	434.083	730.354	867.609	0	867.609	839.334	839.334
35	1.32374	720.869	5.16222	Clayey Sand	100	36	391.419	658.57	768.805	0	768.805	733.443	733.443
36	1.32374	577.801	6.60087	Clayey Sand	100	36	342.744	576.673	656.084	0	656.084	616.422	616.422
37	1.32374	539.537	8.04372	Clayey Sand	100	36	338.262	569.133	645.705	0	645.705	597.902	597.902
38	1.32374	658.951	9.49172	Clayey Sand	100	36	409.305	688.664	810.223	0	810.223	741.79	741.79
39	1.32374	773.698	10.9459	Clayey Sand	100	36	484.863	815.791	985.199	0	985.199	891.426	891.426
40	1.32374	878.201	12.4072	Clayey Sand	100	36	562.797	946.917	1165.68	0	1165.68	1041.87	1041.87
41	1.32374	870.184	13.8768	Clayey Sand	100	36	586.652	987.053	1220.92	0	1220.92	1075.99	1075.99
42	1.32374	808.482	15.3557	Clayey Sand	100	36	581.97	979.176	1210.08	0	1210.08	1050.26	1050.26
43	1.32374	740.189	16.8453	Clayey Sand	100	36	573.004	964.09	1189.32	0	1189.32	1015.83	1015.83
44	1.32374	665.152	18.3466	Clayey Sand	100	36	558.791	940.177	1156.4	0	1156.4	971.096	971.096
45	1.32374	583.203	19.8612	Clayey Sand	100	36	538.039	905.261	1108.35	0	1108.35	913.994	913.994
46	1.32374	494.147	21.3903	Clayey Sand	100	36	508.98	856.369	1041.05	0	1041.05	841.686	841.686
47	1.32374	397.767	22.9356	Clayey Sand	100	36	469.162	789.375	948.843	0	948.843	750.318	750.318
48	1.32374	293.818	24.4988	Clayey Sand	100	36	415.116	698.441	823.686	0	823.686	634.518	634.518
49	1.32374	182.021	26.0817	Clayey Sand	100	36	341.843	575.158	653.999	0	653.999	486.667	486.667
50	1.32374	62.0617	27.6863	Clayey Sand	100	36	265.143	446.108	476.376	0	476.376	337.254	337.254

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.68252

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	-34.2262	5128.88	0	0	0
2	-32.9024	5127.34	-0.670876	-0.387615	30.0182
3	-31.5787	5125.91	176.431	101.937	30.0181
4	-30.2549	5124.57	505.581	292.111	30.0182
5	-28.9312	5123.33	964.04	556.997	30.0182
6	-27.6075	5122.17	1509.74	872.286	30.0181
7	-26.2837	5121.08	2079.65	1201.57	30.0183
8	-24.96	5120.07	2661.57	1537.78	30.0181
9	-23.6363	5119.11	3838.91	2218.02	30.0182
10	-22.3125	5118.22	5145.11	2972.71	30.0182
11	-20.9888	5117.38	6431.45	3715.92	30.0182
12	-19.665	5116.6	7686.72	4441.19	30.0182
13	-18.3413	5115.87	8900.23	5142.32	30.0182
14	-17.0176	5115.18	10061.7	5813.37	30.0181
15	-15.6938	5114.54	11161.1	6448.58	30.0182
16	-14.3701	5113.95	12188.7	7042.31	30.0182
17	-13.0464	5113.4	13135	7589.05	30.0182
18	-11.7226	5112.89	13990.5	8083.35	30.0182
19	-10.3989	5112.42	14745.9	8519.8	30.0182
20	-9.07515	5111.99	15391.8	8892.97	30.0182
21	-7.75141	5111.59	15918.7	9197.42	30.0182
22	-6.42768	5111.24	16317.2	9427.65	30.0182
23	-5.10394	5110.92	16577.5	9578.04	30.0182
24	-3.7802	5110.63	16689.6	9642.83	30.0182
25	-2.45647	5110.38	16643.4	9616.12	30.0182
26	-1.13273	5110.17	16428.1	9491.74	30.0182
27	0.191008	5109.99	16037.8	9266.21	30.0182
28	1.51474	5109.84	15665	9050.84	30.0182
29	2.83848	5109.73	15404.7	8900.42	30.0182
30	4.16222	5109.65	15097.5	8722.93	30.0182
31	5.48596	5109.61	14748.9	8521.5	30.0181
32	6.80969	5109.59	14365.3	8299.87	30.0181
33	8.13343	5109.61	13954.4	8062.48	30.0182
34	9.45717	5109.67	13525.3	7814.56	30.0182
35	10.7809	5109.75	13088.7	7562.33	30.0183
36	12.1046	5109.87	12657.4	7313.12	30.0182
37	13.4284	5110.02	12246.4	7075.64	30.0182
38	14.7521	5110.21	11811.4	6824.34	30.0183
39	16.0759	5110.43	11253.5	6501.98	30.0182
40	17.3996	5110.69	10551.1	6096.13	30.0181
41	18.7233	5110.98	9684.04	5595.19	30.0182
42	20.0471	5111.31	8723.55	5040.24	30.0182
43	21.3708	5111.67	7713.23	4456.5	30.0182
44	22.6945	5112.07	6660.94	3848.52	30.0182
45	24.0183	5112.51	5577.81	3222.71	30.0182
46	25.342	5112.99	4479.39	2588.07	30.0182
47	26.6657	5113.51	3387.47	1957.19	30.0182
48	27.9895	5114.07	2332.62	1347.73	30.0183
49	29.3132	5114.67	1358.15	784.702	30.0181
50	30.637	5115.32	526.092	303.962	30.0182
51	31.9607	5116.01	0	0	0

Discharge Sections

Entity Information

Distributed Load

X	Y
0.13502	5138.53
-24.1896	5137.42

External Boundary

X	Y
-79.985	5117.78
-80	5100
64.113	5100.21
64.113	5115.4
59.577	5116.01
55.471	5116.01
18.425	5116.01
13.566	5112.78
1.084	5119.04
1.084	5138.57
-24.761	5137.4
-24.761	5128.72
-28.633	5130.24

Material Boundary

X	Y
-24.761	5128.72
-24.761	5120.49
-18.941	5120.49
-18.941	5115.53
1.084	5115.53
1.084	5119.04

NewFields

ATTACHMENT C

MSEW Results

AASHTO 2005 (LRFD)
RW9

PROJECT IDENTIFICATION

Title: RW9
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW9

Description:

Wall Height 7.9 ft, Grid Length 0.85H or 8ft minimum

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

Original file path and name: S:\Projects\0398.000 NDOT US395 North Valleys\08_Analys.....
.....W9_North_Valleys.BEN
Original date and time of creating this file: 08/23/2022

PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

DESIGN DATA

DESIGN OBJECTIVES

Minimum Capacity Demand Ratio in pullout, CDR-po	1.00
Minimum Capacity Demand Ratio in direct sliding, CDR-sliding	1.00
Maximum allowable eccentricity ratio at each reinforcement level, e/L	0.2500
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-static	1.50
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-seismic	1.10

Prescribed minimum resistive length to prevent pullout, Le = 3.28 ft.
Prescribed minimum normalized length of each layer is: L/Hd = 0.85 --> L = 6.71 ft.
Prescribed minimum absolute total length of each layer is: L = 8.00 ft.

BEARING CAPACITY

Bearing capacity is controlled by general shear.

Maximum permissible eccentricity ratio (soil), e/L	0.2500
Min. Capacity Demand Ratio with respect to ultimate bearing capacity (Meyerhof approach)	1.00

Bearing capacity coefficients: Nc = 0.00 $N\gamma$ = 14.94

SOIL DATA

REINFORCED SOIL

Unit weight, γ	135.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

RETAINED SOIL

Unit weight, γ	135.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight, $\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction, $\phi_{equiv.}$	36.0 °
Equivalent cohesion, $c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ = 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

SEISMICITY

Maximum ground acceleration coefficient, α_o = 0.250
Kae ($\alpha_o > 0$) = 0.4951 Kae ($\alpha_o = 0$) = 0.2827 Δ Kae = 0.2124 (see eq. 37 in DEMO 82)

DIRECT SLIDING / ECCENTRICITY

Seismic CDR is 100.0% of specified static CDR for direct sliding.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

BEARING CAPACITY

Seismic CDR is 100.0% of specified static CDR for bearing capacity.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

INTERNAL STABILITY

Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.
Seismic Capacity Demand Ratio in pullout, CDR-po, is 100.0% of its specified static value.
Seismic Capacity Demand Ratio, CDR-overall, is 100.0% of its specified static value.
The reduction of CDR pertains to geogrid strength and to connection strength for break mode of failure.

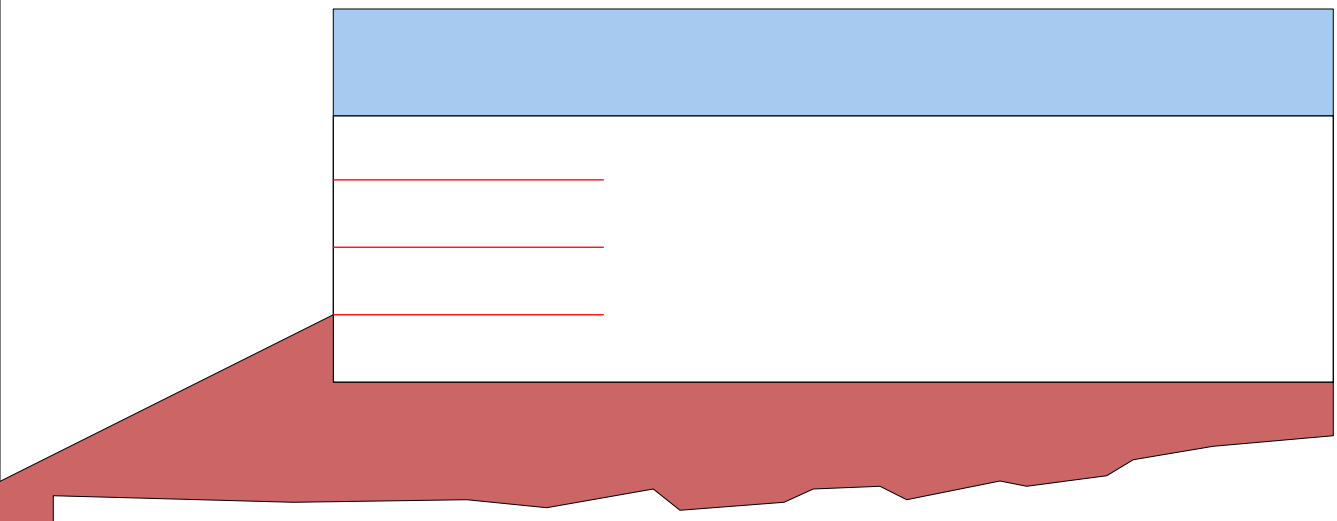
INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	7.90	[ft]	{ Embedded depth is E = 2.00 ft, and height above top of finished bottom grade is H = 5.90 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

DESIGNED REINFORCEMENT LAYOUT:



SCALE:

0 2 4 6 [ft]

AASHTO 2005 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	$\gamma_{p\text{-}EV}$	1.35
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	$\gamma_{p\text{-}EQ}$	1.00
Load factor for live load surchrge, LS, from Figure C11.5.5-3: (Same as in External Stability).	$\gamma_{p\text{-}LS}$	1.75
Load factor for dead load surchrge, ES: (Same as in External Stability).	$\gamma_{p\text{-}ES}$	1.50

Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20

Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20

Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90		1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static	Combined Static/Seismic	
Sliding and Eccentricity	$\gamma_{p\text{-}EV}$	1.00	$\gamma_{p\text{-}EQ}$	1.00
Bearing Capacity	$\gamma_{p\text{-}EV}$	1.35	$\gamma_{p\text{-}EQ}$	1.35

Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	$\gamma_{p\text{-}EH}$	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{p\text{-}EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	$\gamma_{p\text{-}EQ}$	1.00

Resistance factor for shear resistance along common interfaces from Table 10.5.5-1:		Static	Combined Static/Seismic	
Reinforced Soil and Foundation	ϕ_τ	1.00		1.00
Reinforced Soil and Reinforcement	ϕ_τ	1.00		1.00

Resistance factor for bearing capacity of shallow foundation from Table 10.5.5-1:		Static	Combined Static/Seismic
	ϕ_f	0.65	0.65

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

LEGEND:
(1) Connection strength
(2) Geogrid strength
(3) Pullout resistance
(4) Direct sliding
(5) Eccentricity

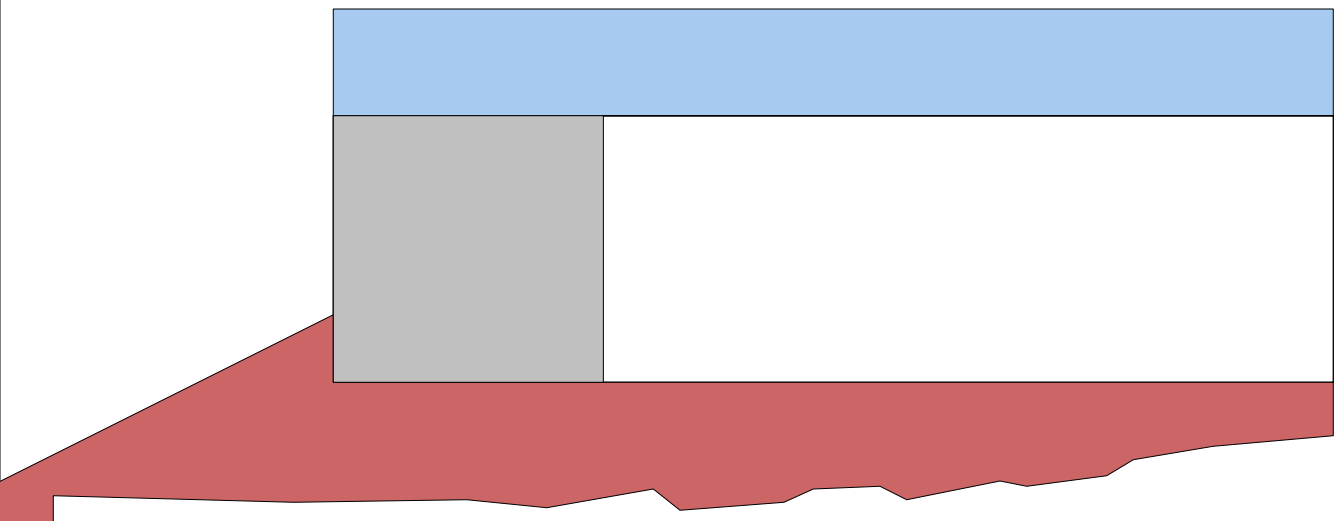
√ Satisfactory
⊗ Unsatisfactory

Bearing capacity: √
Foudation Interface: Direct sliding √ Eccentricity √

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
1	2.00	8.00	N/A	⊗	⊗	√	√	√
2	4.00	8.00	N/A	⊗	⊗	√	√	√
3	6.00	8.00	N/A	⊗	⊗	√	√	√

BEARING CAPACITY for DESIGNED LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Ultimate bearing capacity, q-ult	4484	3874	[lb/ft ²]
Meyerhof stress, σ_V	2236.6	2588	[lb/ft ²]
Eccentricity, e	0.58	1.04	[ft]
Eccentricity, e/L	0.072	0.131	
CDR calculated	2.00	1.50	
Base length	8.00	8.00	[ft]



SCALE:

0 2 4 6 [ft]

DIRECT SLIDING for DESIGNED LAYOUT (for GEOGRID reinforcements)

Specified CDR-static = 1.000 and CDR-seismic = 1.000

Along reinforced and foundation soils interface: CDR-static = 2.025 and CDR-seismic = 1.264

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	2.00	8.00	1.905	1.241	N/A	
2	4.00	8.00	2.350	1.636	N/A	
3	6.00	8.00	3.065	2.400	N/A	

ECCENTRICITY for DESIGNED LAYOUT

At interface with foundation: e/L static = 0.1300, e/L seismic = 0.2342; Overturning: CDR-static = 3.85, CDR-seismic = 2.13

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	2.00	8.00	0.0841	0.1422	N/A	
2	4.00	8.00	0.0469	0.0723	N/A	
3	6.00	8.00	0.0187	0.0247	N/A	

AASHTO 2005 (LRFD)
RW9

PROJECT IDENTIFICATION

Title: RW9
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW9_RW15 Section B-B

Description:

Wall Height H1 = 21.83ft, H2 = 7.97 ft, Grid Length 0.85H or 8ft minimum

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

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Original date and time of creating this file: 08/23/2022

PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

DESIGN DATA

DESIGN OBJECTIVES

Minimum Capacity Demand Ratio in pullout, CDR-po	1.00
Minimum Capacity Demand Ratio in direct sliding, CDR-sliding	1.00
Maximum allowable eccentricity ratio at each reinforcement level, e/L	0.2500
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-static	1.50
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-seismic	1.10

Prescribed minimum resistive length to prevent pullout, Le = 3.28 ft.
Prescribed minimum normalized length of each layer is: L/Hd = 0.85 --> L = 18.56 ft.
Prescribed minimum absolute total length of each layer is: L = 8.00 ft.

BEARING CAPACITY

Bearing capacity is controlled by general shear.	
Maximum permissible eccentricity ratio (soil), e/L	0.2500
Min. Capacity Demand Ratio with respect to ultimate bearing capacity (Meyerhof approach)	1.00

Bearing capacity coefficients: Nc = 0.00 N γ= 14.94

SOIL DATA

REINFORCED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

RETAINED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight,	$\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction,	$\phi_{equiv.}$	36.0 °
Equivalent cohesion,	$c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ= 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

SEISMICITY

Maximum ground acceleration coefficient, α_o = 0.250
Kae (α_o> 0) = 0.4951 Kae (α_o= 0) = 0.2827 Δ Kae = 0.2124 (see eq. 37 in DEMO 82)

DIRECT SLIDING / ECCENTRICITY
Seismic CDR is 100.0% of specified static CDR for direct sliding.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

BEARING CAPACITY
Seismic CDR is 100.0% of specified static CDR for bearing capacity.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

INTERNAL STABILITY
Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.
Seismic Capacity Demand Ratio in pullout, CDR-po, is 100.0% of its specified static value.
Seismic Capacity Demand Ratio, CDR-overall, is 100.0% of its specified static value.
The reduction of CDR pertains to geogrid strength and to connection strength for break mode of failure.

INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	21.83	[ft]	{ Embedded depth is E = 3.12 ft, and height above top of finished bottom grade is H = 18.71 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

DESIGNED REINFORCEMENT LAYOUT:

SCALE:

0 2 4 6 8 10 [ft]

AASHTO 2005 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	$\gamma_{p\text{-}EV}$	1.35
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	$\gamma_{p\text{-}EQ}$	1.00
Load factor for live load surchrge, LS, from Figure C11.5.5-3: (Same as in External Stability).	$\gamma_{p\text{-}LS}$	1.75
Load factor for dead load surchrge, ES: (Same as in External Stability).	$\gamma_{p\text{-}ES}$	1.50

Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20

Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20

Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90		1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static	Combined Static/Seismic	
Sliding and Eccentricity	$\gamma_{p\text{-}EV}$	1.00	$\gamma_{p\text{-}EQ}$	1.00
Bearing Capacity	$\gamma_{p\text{-}EV}$	1.35	$\gamma_{p\text{-}EQ}$	1.35

Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	$\gamma_{p\text{-}EH}$	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{p\text{-}EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	$\gamma_{p\text{-}EQ}$	1.00

Resistance factor for shear resistance along common interfaces from Table 10.5.5-1:		Static	Combined Static/Seismic	
Reinforced Soil and Foundation	ϕ_τ	1.00		1.00
Reinforced Soil and Reinforcement	ϕ_τ	1.00		1.00

Resistance factor for bearing capacity of shallow foundation from Table 10.5.5-1:		Static	Combined Static/Seismic
	ϕ_f	0.65	0.65

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

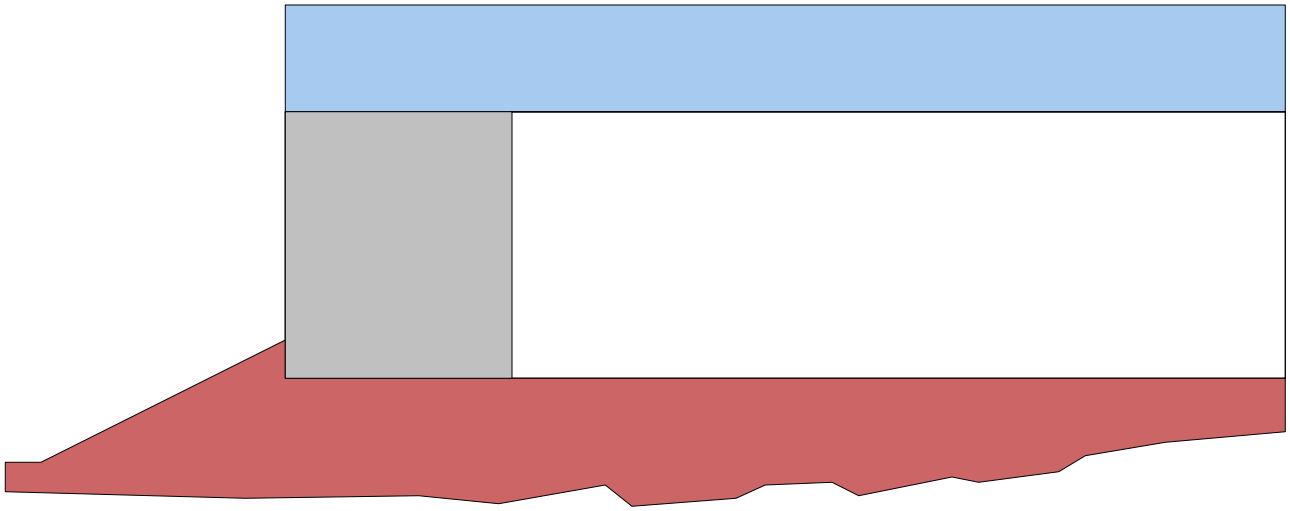
LEGEND: (1) Connection strength √ Satisfactory
(2) Geogrid strength ⊗ Unsatisfactory
(3) Pullout resistance
(4) Direct sliding
(5) Eccentricity

Bearing capacity: √
Foudation Interface: Direct sliding √ Eccentricity √

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
1	2.00	18.56	N/A	⊗	⊗	√	√	√
2	4.00	18.56	N/A	⊗	⊗	√	√	√
3	6.00	18.56	N/A	⊗	⊗	√	√	√
4	8.00	18.56	N/A	⊗	⊗	√	√	√
5	10.00	18.56	N/A	⊗	⊗	√	√	√
6	12.00	18.56	N/A	⊗	⊗	√	√	√
7	14.00	18.56	N/A	⊗	⊗	√	√	√
8	16.00	18.56	N/A	⊗	⊗	√	√	√
9	18.00	18.56	N/A	⊗	⊗	√	√	√
10	20.00	18.56	N/A	⊗	⊗	√	√	√

BEARING CAPACITY for DESIGNED LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Ultimate bearing capacity, q-ult	10082	7700	[lb/ft ²]
Meyerhof stress, σ_V	5369.7	7031	[lb/ft ²]
Eccentricity, e	1.59	3.40	[ft]
Eccentricity, e/L	0.086	0.183	
CDR calculated	1.88	1.10	
Base length	18.56	18.56	[ft]



SCALE:

0 2 4 6 8 10[ft]

DIRECT SLIDING for DESIGNED LAYOUT (for GEOGRID reinforcements)

Specified CDR-static = 1.000 and CDR-seismic = 1.000

Along reinforced and foundation soils interface: CDR-static = 2.228 and CDR-seismic = 1.245

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	2.00	18.56	1.906	1.074	N/A	
2	4.00	18.56	2.075	1.180	N/A	
3	6.00	18.56	2.278	1.309	N/A	
4	8.00	18.56	2.524	1.471	N/A	
5	10.00	18.56	2.830	1.678	N/A	
6	12.00	18.56	3.221	1.952	N/A	
7	14.00	18.56	3.736	2.335	N/A	
8	16.00	18.56	4.448	2.903	N/A	
9	18.00	18.56	5.495	3.838	N/A	
10	20.00	18.56	7.186	5.659	N/A	

ECCENTRICITY for DESIGNED LAYOUT

At interface with foundation: e/L static = 0.1292, e/L seismic = 0.2771; Overturning: CDR-static = 3.87, CDR-seismic = 1.80

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	2.00	18.56	0.1092	0.2313	N/A	
2	4.00	18.56	0.0909	0.1895	N/A	
3	6.00	18.56	0.0742	0.1520	N/A	
4	8.00	18.56	0.0591	0.1185	N/A	
5	10.00	18.56	0.0457	0.0892	N/A	
6	12.00	18.56	0.0340	0.0639	N/A	
7	14.00	18.56	0.0238	0.0429	N/A	
8	16.00	18.56	0.0154	0.0259	N/A	
9	18.00	18.56	0.0085	0.0131	N/A	
10	20.00	18.56	0.0033	0.0044	N/A	

AASHTO 2005 (LRFD)
RW9

PROJECT IDENTIFICATION

Title: RW9
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW9_RW15 Section C-C

Description:

Wall Height H = 17.26 ft, Grid Length 0.85H (or 14.67 ft)

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

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PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

DESIGN DATA

DESIGN OBJECTIVES

Minimum Capacity Demand Ratio in pullout, CDR-po	1.00
Minimum Capacity Demand Ratio in direct sliding, CDR-sliding	1.00
Maximum allowable eccentricity ratio at each reinforcement level, e/L	0.2500
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-static	1.50
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-seismic	1.10

Prescribed minimum resistive length to prevent pullout, Le = 3.28 ft.
Prescribed minimum normalized length of each layer is: L/Hd = 0.85 --> L = 14.67 ft.
Prescribed minimum absolute total length of each layer is: L = 8.00 ft.

BEARING CAPACITY

Bearing capacity is controlled by general shear.

Maximum permissible eccentricity ratio (soil), e/L	0.2500
Min. Capacity Demand Ratio with respect to ultimate bearing capacity (Meyerhof approach)	1.00

Bearing capacity coefficients: Nc = 50.59 N γ= 56.31

SOIL DATA

REINFORCED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

RETAINED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight,	$\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction,	$\phi_{equiv.}$	36.0 °
Equivalent cohesion,	$c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ= 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

SEISMICITY

Maximum ground acceleration coefficient, α_o = 0.250
Kae (α_o> 0) = 0.4951 Kae (α_o= 0) = 0.2827 Δ Kae = 0.2124 (see eq. 37 in DEMO 82)

DIRECT SLIDING / ECCENTRICITY

Seismic CDR is 100.0% of specified static CDR for direct sliding.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

BEARING CAPACITY

Seismic CDR is 100.0% of specified static CDR for bearing capacity.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

INTERNAL STABILITY

Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.
Seismic Capacity Demand Ratio in pullout, CDR-po, is 100.0% of its specified static value.
Seismic Capacity Demand Ratio, CDR-overall, is 100.0% of its specified static value.
The reduction of CDR pertains to geogrid strength and to connection strength for break mode of failure.

INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	17.26	[ft]	{ Embedded depth is E = 2.00 ft, and height above top of finished bottom grade is H = 15.26 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

DESIGNED REINFORCEMENT LAYOUT:

SCALE:

0 2 4 6 8 10 [ft]

AASHTO 2005 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	$\gamma_{p\text{-}EV}$	1.35
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	$\gamma_{p\text{-}EQ}$	1.00
Load factor for live load surchrge, LS, from Figure C11.5.5-3: (Same as in External Stability).	$\gamma_{p\text{-}LS}$	1.75
Load factor for dead load surchrge, ES: (Same as in External Stability).	$\gamma_{p\text{-}ES}$	1.50

Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20

Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20

Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90		1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static	Combined Static/Seismic	
Sliding and Eccentricity	$\gamma_{p\text{-}EV}$	1.00	$\gamma_{p\text{-}EQ}$	1.00
Bearing Capacity	$\gamma_{p\text{-}EV}$	1.35	$\gamma_{p\text{-}EQ}$	1.35

Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	$\gamma_{p\text{-}EH}$	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{p\text{-}EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	$\gamma_{p\text{-}EQ}$	1.00

Resistance factor for shear resistance along common interfaces from Table 10.5.5-1:		Static	Combined Static/Seismic	
Reinforced Soil and Foundation	ϕ_τ	1.00		1.00
Reinforced Soil and Reinforcement	ϕ_τ	1.00		1.00

Resistance factor for bearing capacity of shallow foundation from Table 10.5.5-1:		Static	Combined Static/Seismic
	ϕ_f	0.65	0.65

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

LEGEND: (1) Connection strength √ Satisfactory
(2) Geogrid strength ⊗ Unsatisfactory
(3) Pullout resistance
(4) Direct sliding
(5) Eccentricity

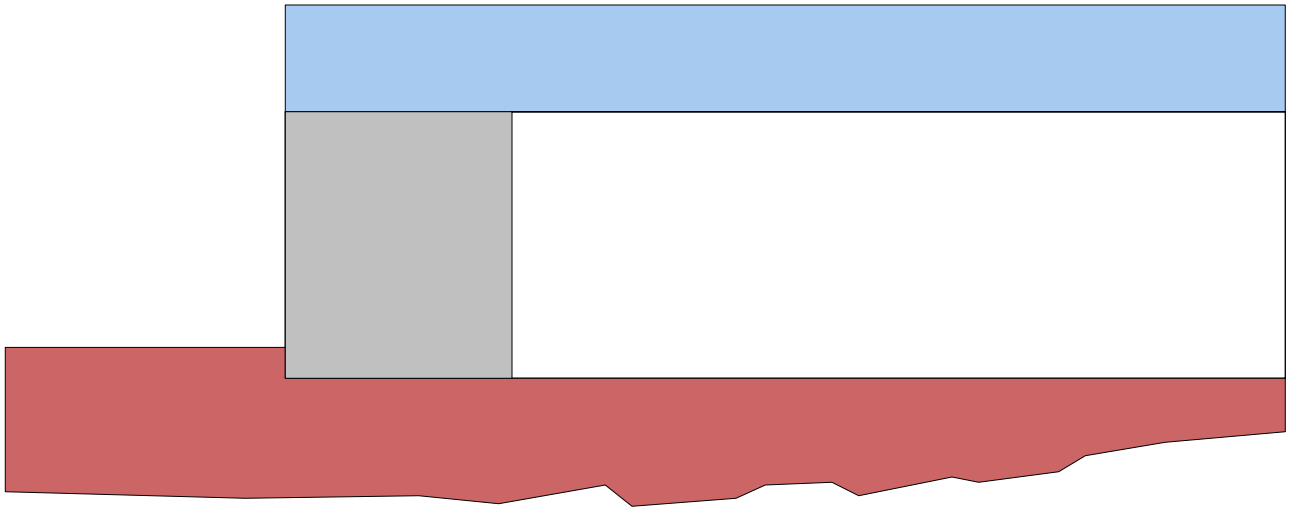
Bearing capacity: √
Foudation Interface: Direct sliding √ Eccentricity √

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
1	1.50	14.67	N/A	⊗	⊗	√	√	√
2	3.50	14.67	N/A	⊗	⊗	√	√	√
3	5.50	14.67	N/A	⊗	⊗	√	√	√
4	7.50	14.67	N/A	⊗	⊗	√	√	√

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
5	9.50	14.67	N/A	⊗	⊗	√	√	√
6	11.50	14.67	N/A	⊗	⊗	√	√	√
7	13.50	14.67	N/A	⊗	⊗	√	√	√
8	15.50	14.67	N/A	⊗	⊗	√	√	√

BEARING CAPACITY for DESIGNED LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Ultimate bearing capacity, q-ult	33115	26211	[lb/ft ²]
Meyerhof stress, σ_V	4396.8	5721	[lb/ft ²]
Eccentricity, e	1.30	2.70	[ft]
Eccentricity, e/L	0.089	0.184	
CDR calculated	7.53	4.58	
Base length	14.67	14.67	[ft]



SCALE:

0 2 4 6 8 10 [ft]

DIRECT SLIDING for DESIGNED LAYOUT (for GEOGRID reinforcements)

Specified CDR-static = 1.000 and CDR-seismic = 1.000

Along reinforced and foundation soils interface: CDR-static = 2.128 and CDR-seismic = 1.214

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	1.50	14.67	1.807	1.039	N/A	
2	3.50	14.67	2.003	1.168	N/A	
3	5.50	14.67	2.247	1.333	N/A	
4	7.50	14.67	2.559	1.553	N/A	
5	9.50	14.67	2.971	1.859	N/A	
6	11.50	14.67	3.540	2.315	N/A	
7	13.50	14.67	4.381	3.069	N/A	
8	15.50	14.67	5.744	4.550	N/A	

ECCENTRICITY for DESIGNED LAYOUT

At interface with foundation: e/L static = 0.1375, e/L seismic = 0.2854; Overturning: CDR-static = 3.64, CDR-seismic = 1.75

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	1.50	14.67	0.1178	0.2411	N/A	
2	3.50	14.67	0.0938	0.1878	N/A	
3	5.50	14.67	0.0724	0.1411	N/A	
4	7.50	14.67	0.0537	0.1010	N/A	
5	9.50	14.67	0.0376	0.0675	N/A	
6	11.50	14.67	0.0241	0.0406	N/A	
7	13.50	14.67	0.0133	0.0203	N/A	
8	15.50	14.67	0.0051	0.0066	N/A	

AASHTO 2005 (LRFD)
RW9

PROJECT IDENTIFICATION

Title: RW9
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW9_Section A-A

Description:

Wall Height H = 15.07 ft, Grid Length 0.85H (or 12.81 ft)

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

Original file path and name: S:\Projects\0398.000 NDOT US395 North Valleys\08_Analys.....
.....\RW9_Section_A-A.BEN

Original date and time of creating this file: 08/23/2022

PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

DESIGN DATA

DESIGN OBJECTIVES

Minimum Capacity Demand Ratio in pullout, CDR-po	1.00
Minimum Capacity Demand Ratio in direct sliding, CDR-sliding	1.00
Maximum allowable eccentricity ratio at each reinforcement level, e/L	0.2500
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-static	1.50
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-seismic	1.10

Prescribed minimum resistive length to prevent pullout, Le = 3.28 ft.
Prescribed minimum normalized length of each layer is: L/Hd = 0.85 --> L = 12.81 ft.
Prescribed minimum absolute total length of each layer is: L = 8.00 ft.

BEARING CAPACITY

Bearing capacity is controlled by general shear.

Maximum permissible eccentricity ratio (soil), e/L	0.2500
Min. Capacity Demand Ratio with respect to ultimate bearing capacity (Meyerhof approach)	1.00

Bearing capacity coefficients: Nc = 0.00 $N\gamma$ = 14.94

SOIL DATA

REINFORCED SOIL

Unit weight, γ	135.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

RETAINED SOIL

Unit weight, γ	135.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight, $\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction, $\phi_{equiv.}$	36.0 °
Equivalent cohesion, $c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ = 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

SEISMICITY

Maximum ground acceleration coefficient, α_o = 0.250
Kae (α_o > 0) = 0.4951 Kae (α_o = 0) = 0.2827 Δ Kae = 0.2124 (see eq. 37 in DEMO 82)

DIRECT SLIDING / ECCENTRICITY

Seismic CDR is 100.0% of specified static CDR for direct sliding.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

BEARING CAPACITY

Seismic CDR is 100.0% of specified static CDR for bearing capacity.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

INTERNAL STABILITY

Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.
Seismic Capacity Demand Ratio in pullout, CDR-po, is 100.0% of its specified static value.
Seismic Capacity Demand Ratio, CDR-overall, is 100.0% of its specified static value.
The reduction of CDR pertains to geogrid strength and to connection strength for break mode of failure.

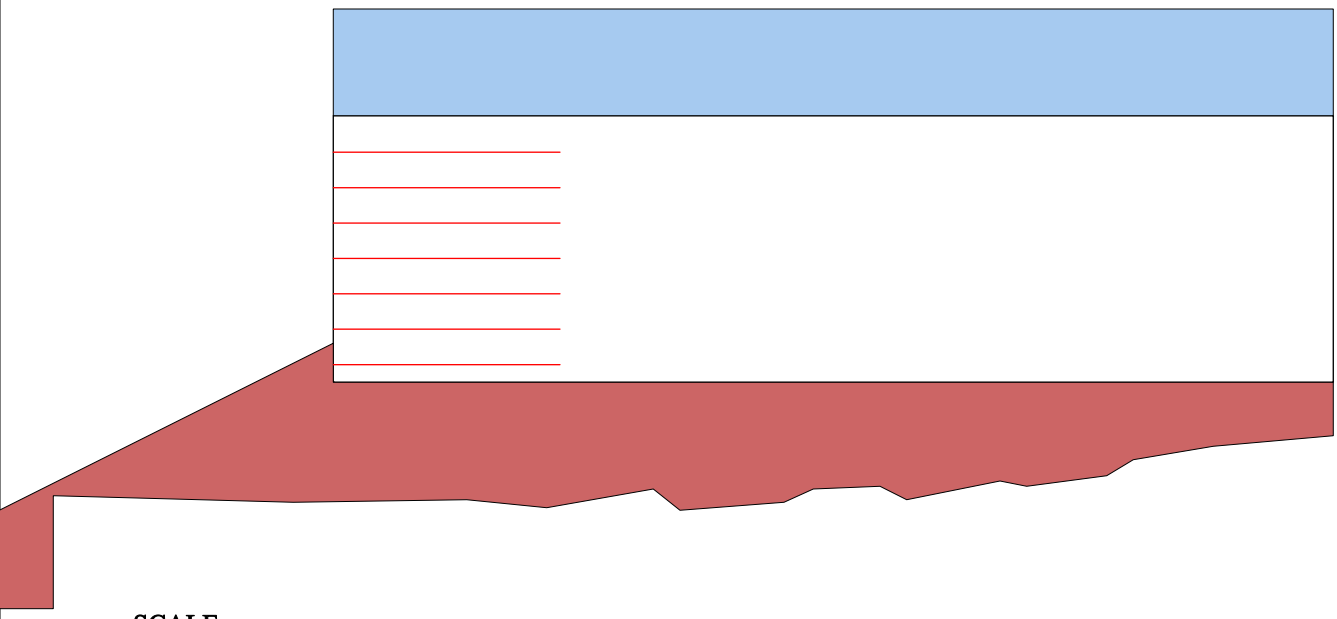
INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	15.07	[ft]	{ Embedded depth is E = 2.20 ft, and height above top of finished bottom grade is H = 12.87 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

DESIGNED REINFORCEMENT LAYOUT:



SCALE:

0 2 4 6 8 10 [ft]

AASHTO 2005 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	$\gamma_{p\text{-}EV}$	1.35	
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	$\gamma_{p\text{-}EQ}$	1.00	
Load factor for live load surchrge, LS, from Figure C11.5.5-3: (Same as in External Stability).	$\gamma_{p\text{-}LS}$	1.75	
Load factor for dead load surchrge, ES: (Same as in External Stability).	$\gamma_{p\text{-}ES}$	1.50	

Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic
Geogrid:		0.90	1.20

Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic
Geogrid:		0.90	1.20

Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90	1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static	Combined Static/Seismic	
Sliding and Eccentricity	$\gamma_{p\text{-}EV}$	1.00	$\gamma_{p\text{-}EQ}$	1.00
Bearing Capacity	$\gamma_{p\text{-}EV}$	1.35	$\gamma_{p\text{-}EQ}$	1.35

Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	$\gamma_{p\text{-}EH}$	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{p\text{-}EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	$\gamma_{p\text{-}EQ}$	1.00

Resistance factor for shear resistance along common interfaces from Table 10.5.5-1:		Static	Combined Static/Seismic	
Reinforced Soil and Foundation	ϕ_τ	1.00		1.00
Reinforced Soil and Reinforcement	ϕ_τ	1.00		1.00

Resistance factor for bearing capacity of shallow foundation from Table 10.5.5-1:		Static	Combined Static/Seismic
	ϕ_f	0.65	0.65

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

LEGEND:
(1) Connection strength
(2) Geogrid strength
(3) Pullout resistance
(4) Direct sliding
(5) Eccentricity

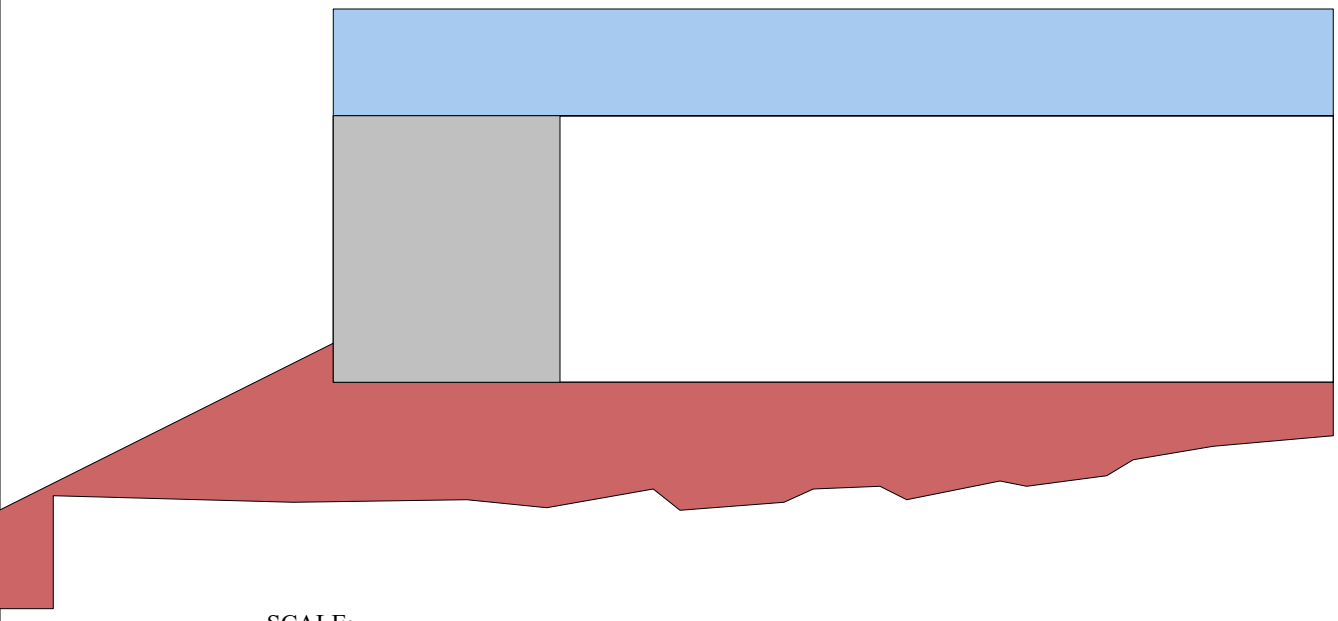
√ Satisfactory
⊗ Unsatisfactory

Bearing capacity: √
Foudation Interface: Direct sliding √ Eccentricity √

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
1	1.00	12.82	1	⊗	⊗	√	√	√
2	3.00	12.82	1	⊗	⊗	√	√	√
3	5.00	12.82	1	⊗	⊗	√	√	√
4	7.00	12.82	1	⊗	⊗	√	√	√
5	9.00	12.82	1	⊗	⊗	√	√	√
6	11.00	12.82	1	⊗	⊗	√	√	√
7	13.00	12.82	1	⊗	⊗	√	√	√

BEARING CAPACITY for DESIGNED LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Ultimate bearing capacity, q-ult	6882	5313	[lb/ft ²]
Meyerhof stress, σ_V	3929.8	5090	[lb/ft ²]
Eccentricity, e	1.16	2.36	[ft]
Eccentricity, e/L	0.090	0.184	
CDR calculated	1.75	1.04	
Base length	12.82	12.82	[ft]



SCALE:

0 2 4 6 8 10 [ft]

DIRECT SLIDING for DESIGNED LAYOUT (for GEOGRID reinforcements)

Specified CDR-static = 1.000 and CDR-seismic = 1.000

Along reinforced and foundation soils interface: CDR-static = 2.066 and CDR-seismic = 1.193

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	1.00	12.82	1.721	1.001	1	
2	3.00	12.82	1.927	1.140	1	
3	5.00	12.82	2.188	1.323	1	
4	7.00	12.82	2.532	1.576	1	
5	9.00	12.82	3.004	1.949	1	
6	11.00	12.82	3.691	2.552	1	
7	13.00	12.82	4.787	3.699	1	

ECCENTRICITY for DESIGNED LAYOUT

At interface with foundation: e/L static = 0.1431, e/L seismic = 0.2908; Overturning: CDR-static = 3.49, CDR-seismic = 1.72

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	1.00	12.82	0.1275	0.2563	1	
2	3.00	12.82	0.0990	0.1938	1	
3	5.00	12.82	0.0740	0.1399	1	
4	7.00	12.82	0.0523	0.0947	1	
5	9.00	12.82	0.0341	0.0581	1	
6	11.00	12.82	0.0194	0.0302	1	
7	13.00	12.82	0.0081	0.0109	1	

AASHTO 2005 (LRFD)
RW13

PROJECT IDENTIFICATION

Title: RW13
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW13_Section B-B

Description:

Wall Height H = 6.11 ft, Grid Length 8 ft minimum

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

Original file path and name: S:\Projects\0398.000 NDOT US395 North Valleys\08_Analys.....
.....RW13_Section_B-B.BEN
Original date and time of creating this file: 08/23/2022

PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

DESIGN DATA

DESIGN OBJECTIVES

Minimum Capacity Demand Ratio in pullout, CDR-po	1.00
Minimum Capacity Demand Ratio in direct sliding, CDR-sliding	1.00
Maximum allowable eccentricity ratio at each reinforcement level, e/L	0.2500
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-static	1.50
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-seismic	1.10

Prescribed minimum resistive length to prevent pullout, Le = 3.28 ft.
Prescribed minimum normalized length of each layer is: L/Hd = 0.85 --> L = 6.89 ft.
Prescribed minimum absolute total length of each layer is: L = 8.00 ft.

BEARING CAPACITY

Bearing capacity is controlled by general shear.

Maximum permissible eccentricity ratio (soil), e/L	0.2500
Min. Capacity Demand Ratio with respect to ultimate bearing capacity (Meyerhof approach)	1.00

Bearing capacity coefficients: Nc = 0.00 N γ= 14.94

SOIL DATA

REINFORCED SOIL

Unit weight, γ	135.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

RETAINED SOIL

Unit weight, γ	135.0 lb/ft ^{3}
Design value of internal angle of friction, ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight, $\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction, $\phi_{equiv.}$	36.0 °
Equivalent cohesion, $c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ= 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

SEISMICITY

Maximum ground acceleration coefficient, α_o = 0.250
Kae (α_o> 0) = 0.4951 Kae (α_o= 0) = 0.2827 Δ Kae = 0.2124 (see eq. 37 in DEMO 82)

DIRECT SLIDING / ECCENTRICITY

Seismic CDR is 100.0% of specified static CDR for direct sliding.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

BEARING CAPACITY

Seismic CDR is 100.0% of specified static CDR for bearing capacity.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

INTERNAL STABILITY

Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.
Seismic Capacity Demand Ratio in pullout, CDR-po, is 100.0% of its specified static value.
Seismic Capacity Demand Ratio, CDR-overall, is 100.0% of its specified static value.
The reduction of CDR pertains to geogrid strength and to connection strength for break mode of failure.

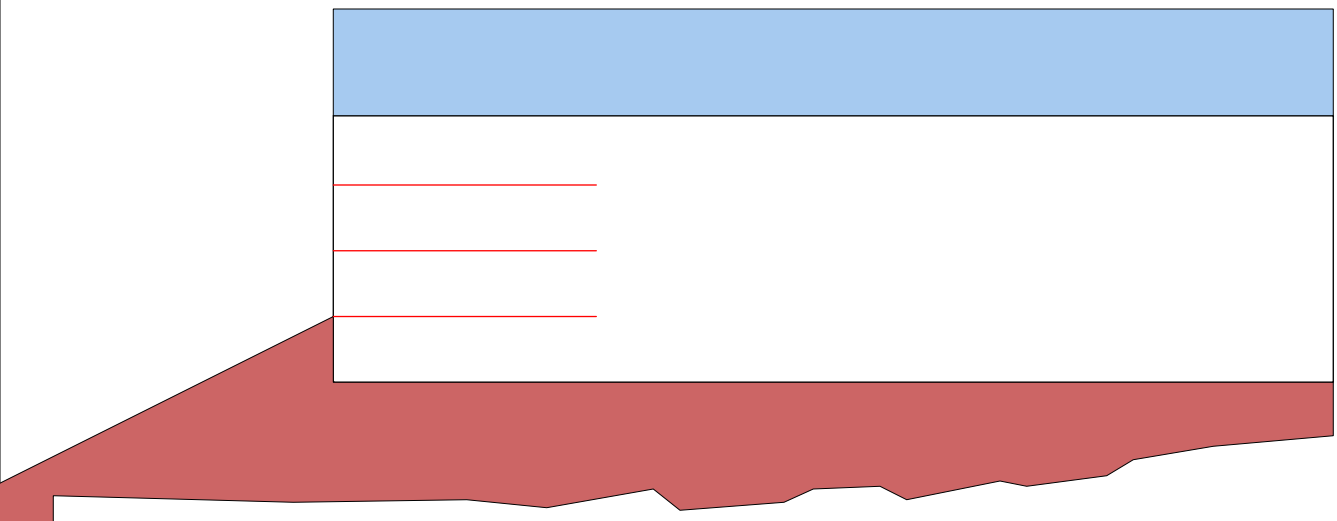
INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	8.11	[ft]	{ Embedded depth is E = 2.00 ft, and height above top of finished bottom grade is H = 6.11 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

DESIGNED REINFORCEMENT LAYOUT:



SCALE:

0 2 4 6 [ft]

AASHTO 2005 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	$\gamma_{p\text{-}EV}$	1.35		
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	$\gamma_{p\text{-}EQ}$	1.00		
Load factor for live load surchrge, LS, from Figure C11.5.5-3: (Same as in External Stability).	$\gamma_{p\text{-}LS}$	1.75		
Load factor for dead load surchrge, ES: (Same as in External Stability).	$\gamma_{p\text{-}ES}$	1.50		

Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic
Geogrid:		0.90	1.20

Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic
Geogrid:		0.90	1.20

Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90	1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static	Combined Static/Seismic	
Sliding and Eccentricity	$\gamma_{p\text{-}EV}$	1.00	$\gamma_{p\text{-}EQ}$	1.00
Bearing Capacity	$\gamma_{p\text{-}EV}$	1.35	$\gamma_{p\text{-}EQ}$	1.35

Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	$\gamma_{p\text{-}EH}$	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{p\text{-}EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	$\gamma_{p\text{-}EQ}$	1.00

Resistance factor for shear resistance along common interfaces from Table 10.5.5-1:		Static	Combined Static/Seismic	
Reinforced Soil and Foundation	ϕ_τ	1.00		1.00
Reinforced Soil and Reinforcement	ϕ_τ	1.00		1.00

Resistance factor for bearing capacity of shallow foundation from Table 10.5.5-1:		Static	Combined Static/Seismic
	ϕ_f	0.65	0.65

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

LEGEND:
(1) Connection strength
(2) Geogrid strength
(3) Pullout resistance
(4) Direct sliding
(5) Eccentricity

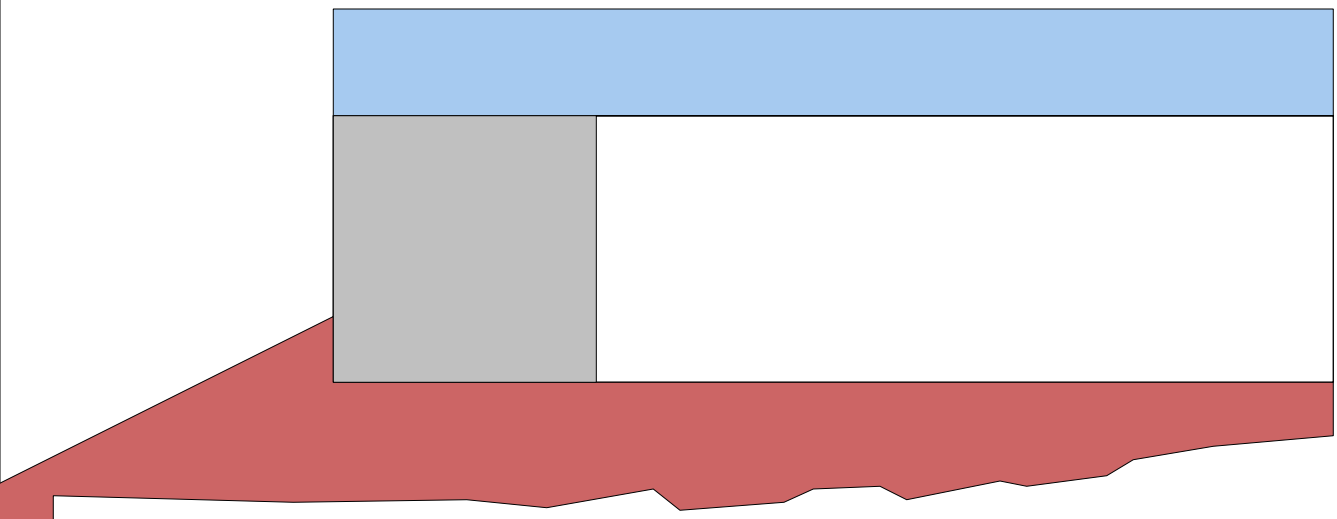
√ Satisfactory
⊗ Unsatisfactory

Bearing capacity: √
Foudation Interface: Direct sliding √ Eccentricity √

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
1	2.00	8.00	N/A	⊗	⊗	√	√	√
2	4.00	8.00	N/A	⊗	⊗	√	√	√
3	6.00	8.00	N/A	⊗	⊗	√	√	√

BEARING CAPACITY for DESIGNED LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Ultimate bearing capacity, q-ult	4447	3801	[lb/ft ²]
Meyerhof stress, σ_V	2300.0	2691	[lb/ft ²]
Eccentricity, e	0.61	1.10	[ft]
Eccentricity, e/L	0.076	0.138	
CDR calculated	1.93	1.41	
Base length	8.00	8.00	[ft]



SCALE:

0 2 4 6 [ft]

DIRECT SLIDING for DESIGNED LAYOUT (for GEOGRID reinforcements)

Specified CDR-static = 1.000 and CDR-seismic = 1.000

Along reinforced and foundation soils interface: CDR-static = 1.992 and CDR-seismic = 1.239

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	2.00	8.00	1.868	1.210	N/A	
2	4.00	8.00	2.293	1.583	N/A	
3	6.00	8.00	2.970	2.288	N/A	

ECCENTRICITY for DESIGNED LAYOUT

At interface with foundation: e/L static = 0.1353, e/L seismic = 0.2451; Overturning: CDR-static = 3.69, CDR-seismic = 2.04

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	2.00	8.00	0.0885	0.1508	N/A	
2	4.00	8.00	0.0504	0.0786	N/A	
3	6.00	8.00	0.0212	0.0287	N/A	

AASHTO 2005 (LRFD)
RW15_RW9_Section A-A

PROJECT IDENTIFICATION

Title: RW15 RW9 Section A-A
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW15_RW9_Section A-A

Description:

Wall Height H = 26.12 ft, Grid Length 22.2 ft

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

Original file path and name: S:\Projects\0398.000 NDOT US395 North Valleys\08_Analys.....
.....n _A-A_Individual.BEN
Original date and time of creating this file: 08/23/2022

PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

DESIGN DATA

DESIGN OBJECTIVES

Minimum Capacity Demand Ratio in pullout, CDR-po	1.00
Minimum Capacity Demand Ratio in direct sliding, CDR-sliding	1.00
Maximum allowable eccentricity ratio at each reinforcement level, e/L	0.2500
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-static	1.50
Minimum Capacity Demand Ratio in compound and overall failure, CDR-comp-seismic	1.10

Prescribed minimum resistive length to prevent pullout, Le = 3.28 ft.
Prescribed minimum normalized length of each layer is: L/Hd = 0.85 --> L = 8.86 ft.
Prescribed minimum absolute total length of each layer is: L = 8.00 ft.

BEARING CAPACITY

Bearing capacity is controlled by general shear.

Maximum permissible eccentricity ratio (soil), e/L	0.2500
Min. Capacity Demand Ratio with respect to ultimate bearing capacity (Meyerhof approach)	1.00

Bearing capacity coefficients: Nc = 0.00 $N\gamma$= 14.94

SOIL DATA

REINFORCED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

RETAINED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight,	$\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction,	$\phi_{equiv.}$	36.0 °
Equivalent cohesion,	$c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ= 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

SEISMICITY

Maximum ground acceleration coefficient, α_o = 0.250
Kae (α_o> 0) = 0.4951 Kae (α_o= 0) = 0.2827 Δ Kae = 0.2124 (see eq. 37 in DEMO 82)

DIRECT SLIDING / ECCENTRICITY

Seismic CDR is 100.0% of specified static CDR for direct sliding.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

BEARING CAPACITY

Seismic CDR is 100.0% of specified static CDR for bearing capacity.
Maximum allowable eccentricity, e/L, under seismic conditions is: 0.4000

INTERNAL STABILITY

Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.
Seismic Capacity Demand Ratio in pullout, CDR-po, is 100.0% of its specified static value.
Seismic Capacity Demand Ratio, CDR-overall, is 100.0% of its specified static value.
The reduction of CDR pertains to geogrid strength and to connection strength for break mode of failure.

INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	10.42	[ft]	{ Embedded depth is E = 4.31 ft, and height above top of finished bottom grade is H = 6.11 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M   S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

DESIGNED REINFORCEMENT LAYOUT:

SCALE:

0 2 4 6 [ft]

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

LEGEND:
(1) Connection strength
(2) Geogrid strength
(3) Pullout resistance
(4) Direct sliding
(5) Eccentricity

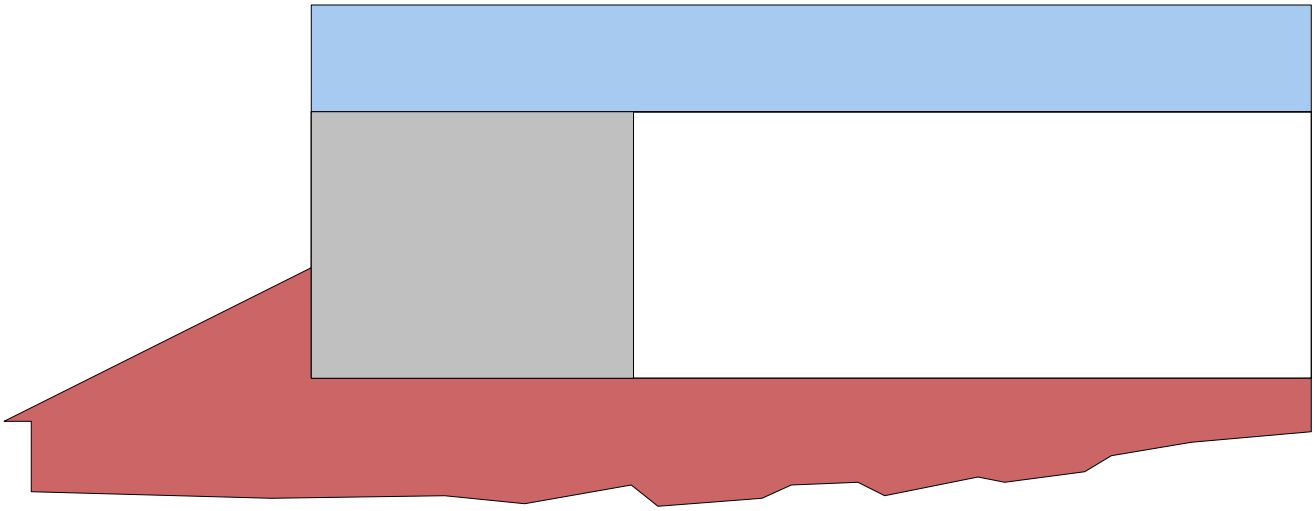
√ Satisfactory
⊗ Unsatisfactory

Bearing capacity: √
Foudation Interface: Direct sliding √ Eccentricity √

#	Geogrid Elevation [ft]	Length [ft]	Type #	(1)	(2)	(3)	(4)	(5)
1	1.50	12.59	N/A	⊗	⊗	√	√	√
2	3.50	12.59	N/A	⊗	⊗	√	√	√
3	5.50	12.59	N/A	⊗	⊗	√	√	√
4	7.50	12.59	N/A	⊗	⊗	√	√	√
5	9.50	12.59	N/A	√	√	√	√	√

BEARING CAPACITY for DESIGNED LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Ultimate bearing capacity, q-ult	7461	6745	[lb/ft ²]
Meyerhof stress, σ_V	2623.4	2902	[lb/ft ²]
Eccentricity, e	0.60	1.15	[ft]
Eccentricity, e/L	0.048	0.091	
CDR calculated	2.84	2.32	
Base length	12.59	12.59	[ft]



SCALE:

0 2 4 6 [ft]

DIRECT SLIDING for DESIGNED LAYOUT (for GEOGRID reinforcements)

Specified CDR-static = 1.000 and CDR-seismic = 1.000

Along reinforced and foundation soils interface: CDR-static = 2.655 and CDR-seismic = 1.598

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	1.50	12.59	2.332	1.432	N/A	
2	3.50	12.59	2.734	1.739	N/A	
3	5.50	12.59	3.305	2.216	N/A	
4	7.50	12.59	4.176	3.051	N/A	
5	9.50	12.59	5.671	4.898	N/A	

ECCENTRICITY for DESIGNED LAYOUT

At interface with foundation: e/L static = 0.0809, e/L seismic = 0.1541; Overturning: CDR-static = 6.18, CDR-seismic = 3.24

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	1.50	12.59	0.0633	0.1169	N/A	
2	3.50	12.59	0.0429	0.0752	N/A	
3	5.50	12.59	0.0261	0.0425	N/A	
4	7.50	12.59	0.0129	0.0187	N/A	
5	9.50	12.59	0.0032	0.0038	N/A	

AASHTO 2007-2010 (LRFD)
RW20_RW13

MSEW(3.0): Update # 14.980

PROJECT IDENTIFICATION

Title: RW20 RW13
Project Number: 475.0398.000
Client: HDR
Designer: JRuzicka
Station Number: RW20_RW13 A-A

Description:

Wall Height 23.06 ft, Grid Length 0.85H

Company's information:

Name: NewFields MDTS
Street: 1301 North McCarran Blvd, Ste. 101

Sparks, NV 89431
Telephone #: 1-775-525-2575
Fax #: 1-775-525-2577
E-Mail: jruzicka@newfields.com

Original file path and name: S:\Projects\0398.000 NDOT US395 North Valleys\08_Analys.....
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Original date and time of creating this file: 08/23/2022

PROGRAM MODE:

ANALYSIS
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

SOIL DATA

REINFORCED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

RETAINED SOIL

Unit weight,	γ	135.0 lb/ft ^{3}
Design value of internal angle of friction,	ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight,	$\gamma_{equiv.}$	135.0 lb/ft ^{3}
Equivalent internal angle of friction,	$\phi_{equiv.}$	36.0 °
Equivalent cohesion,	$c_{equiv.}$	100.0 lb/ft ^{2}

Water table does not affect bearing capacity

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ = 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 0.00 N γ = 14.94

SEISMICITY

Maximum ground acceleration coefficient, A = 0.250
Design acceleration coefficient in Internal Stability: Kh = Am = 0.300
Design acceleration coefficient in External Stability: Kh_d = 0.300 => Kh = Am = 0.300

Kae (Kh > 0) = 0.4951 Kae (Kh = 0) = 0.2827 Δ Kae = 0.2124
Seismic soil-geogrid friction coefficient, F* is 80.0% of its specified static value.

INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	23.05	[ft]	{ Embedded depth is E = 3.29 ft, and height above top of finished bottom grade is H = 19.76 ft }
Batter, ω	0.0	[deg]	
Backslope, β	0.0	[deg]	
Backslope rise	0.0	[ft]	Broken back equivalent angle, I = 0.00° (see Fig. 25 in DEMO 82)

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 270.0 [lb/ft ²]

ANALYZED REINFORCEMENT LAYOUT:

SCALE:

0 2 4 6 8 10[ft]

AASHTO 2007-2010 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	$\gamma_{p\text{-}EV}$	1.35		
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	$\gamma_{p\text{-}EQ}$	1.00		
Load factor for live load surchrge, LS, from Figure C11.5.5-3(b): (Same as in External Stability).	$\gamma_{p\text{-}LS}$	1.75		
Load factor for dead load surchrge, ES: (Same as in External Stability).	$\gamma_{p\text{-}ES}$	1.50		
Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20
Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic	
Geogrid:		0.90		1.20
Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90		1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static	Combined Static/Seismic	
Sliding and Eccentricity	$\gamma_{p\text{-}EV}$	1.00	$\gamma_{p\text{-}EQ}$	1.00
Bearing Capacity	$\gamma_{p\text{-}EV}$	1.35	$\gamma_{p\text{-}EQ}$	1.35

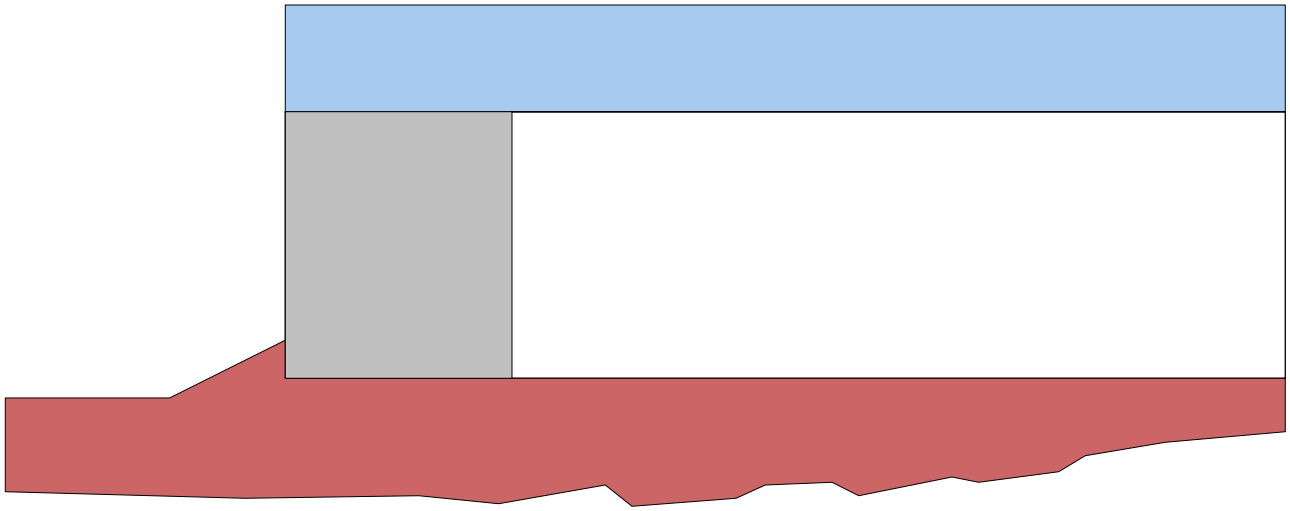
Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	$\gamma_{p\text{-}EH}$	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{p\text{-}EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	$\gamma_{p\text{-}EQ}$	1.00

Resistance factor for shear resistance along common interfaces from Table 11.5.6-1:		Static	Combined Static/Seismic	
Reinforced Soil and Foundation	ϕ_τ	1.00		1.00
Reinforced Soil and Reinforcement	ϕ_τ	1.00		1.00
Resistance factor for bearing capacity of shallow foundation from Table 11.5.6-1:		Static	Combined Static/Seismic	
	ϕ_b	0.65		0.65

BEARING CAPACITY for GIVEN LAYOUT

	STATIC	SEISMIC	UNITS
(Water table does not affect bearing capacity)			
Factored bearing resistance. q-n	10667	8139	[lb/ft ²]
Factored bearing load, σ_V	5628.6	7377	[lb/ft ²]
Eccentricity, e	1.66	3.59	[ft]
Eccentricity, e/L	0.085	0.183	
CDR calculated	1.90	1.10	
Base length	19.60	19.60	[ft]

Unfactored applied bearing pressure = (Unfactored R) / [L - 2 * (Unfactored e)] =
Static: Unfactored R = 66282.26 [lb/ft], L = 19.60, Unfactored e = 1.48 [ft], and Sigma = 3983.90 [lb/ft ²]
Seismic: Unfactored R = 66282.26 [lb/ft], L = 19.60, Unfactored e = 4.15 [ft], and Sigma = 5862.05 [lb/ft ²]



SCALE:

0 2 4 6 8 10[ft]

DIRECT SLIDING for GIVEN LAYOUT (for GEOGRID reinforcements)

Along reinforced and foundation soils interface: CDR-static = 2.250 and CDR-seismic = 1.252

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static	CDR Seismic	Geogrid Type #	Product name
1	2.00	19.60	1.918	1.075	1	
2	4.00	19.60	2.079	1.175	1	
3	6.00	19.60	2.271	1.296	1	
4	8.00	19.60	2.501	1.445	1	
5	10.00	19.60	2.784	1.632	1	
6	12.00	19.60	3.138	1.875	1	
7	14.00	19.60	3.595	2.203	1	
8	16.00	19.60	4.209	2.670	1	
9	18.00	19.60	5.075	3.389	1	
10	20.00	24.60	8.021	5.818	1	
11	22.00	24.60	10.827	9.207	1	

ECCENTRICITY for GIVEN LAYOUT

At interface with foundation: e/L static = 0.1274, e/L seismic = 0.2752; Overturning: CDR-static = 3.92, CDR-seismic = 1.82

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	2.00	19.60	0.1086	0.2319	1	
2	4.00	19.60	0.0913	0.1922	1	
3	6.00	19.60	0.0754	0.1563	1	
4	8.00	19.60	0.0611	0.1241	1	
5	10.00	19.60	0.0481	0.0955	1	
6	12.00	19.60	0.0367	0.0707	1	
7	14.00	19.60	0.0267	0.0495	1	
8	16.00	19.60	0.0182	0.0320	1	
9	18.00	19.60	0.0112	0.0183	1	
10	20.00	24.60	0.0036	0.0052	1	
11	22.00	24.60	0.0010	0.0012	1	

NewFields

ATTACHMENT D

Settle3 Results

NewFields

CLIENT Nevada Department of Transportation
PROJECT NAME US395 North Valleys, Phase 1B
PROJECT NUMBER 475.0398.000
PROJECT LOCATION Between Mileposts WA 27.1 and WA 32.6
DATE STARTED 6/3/19 **COMPLETED** 6/4/19
GROUND ELEVATION 5132 ft **HOLE SIZE** 8" Diameter
DRILLING CONTRACTOR Geotechnical Drilling
COORDINATES ():
DRILLING METHOD HSA
LATITUDE **LONGITUDE**
LOGGED BY M. Walden **CHECKED BY** M.Doehring
DEPTH TO WATER (FT BGS) 45
NOTES Rig Unit 17 Station 'GV3' 26+10 Offset (ft) 20 Right

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (INCHES)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	% GRAVEL	% SAND	% FINES	REMARKS
	0												Drilling started at 11:38am
5130			**FILL: Silty Sand (SM)**, brown, moist, medium dense, nonplastic, fine to coarse sand, some subangular gravel	SPT	6-6-5 (11)	18							12:02pm
	5		**FILL: Clayey Sand (SC)**, some gravel, trace cobble, orange brown, moist, loose, low to medium plasticity, fine to coarse sand, subangular gravel	MC	7-7-6 (13)	18							12:10pm
5125				SPT	4-2-2 (4)	14							12:18pm
	10		very dense	MC	11-60-70/5in	9							12:28pm
5120													
	15		**FILL: Clayey Sand (SC)**, trace gravel, brown, moist, medium dense, low to medium plasticity, fine to coarse sand, subangular gravel	SPT	4-8-16 (24)	14							12:40pm
5115													
	20			MC	13-12-14 (26)	18							12:30am
5110													
	25		**GRANODIORITE:** extremely weak, highly weathered, clayey sand, trace gravel, whitish brown, moist, medium plasticity, fine to medium sand	SPT	7-17-31 (48)	18	15.7	33	15	1	56	43	1:03pm
5105													
	30			SPT	70/6in	5.5	9.4						1:20pm
5100													
	35												

(Continued Next Page)

NewFields

CLIENT Nevada Department of Transportation
PROJECT NAME US395 North Valleys, Phase 1B
PROJECT NUMBER 475.0398.000
PROJECT LOCATION Between Mileposts WA 27.1 and WA 32.6

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (INCHES)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	% GRAVEL	% SAND	% FINES	REMARKS
	35			SPT	50/6in	5.5							1:49pm
5095													
	40		**GRANODIORITE:** extremely weak, highly to completely weathered, silty sand, some gravel, orange brown, wet, low plasticity, fine to coarse sand, fine subangular gravel, iron oxide staining	SPT	31-49-50/5in	17	40.5	32	9	13	63	24	2:20pm
5090													
	45	▽	completely weathered	SPT	50/5in	5							Water table at 45', 2:55pm
5085													
	50			SPT	50/4in	4							7:05am (4 June)
5080													
	55			SPT	50/3in	3							7:32am
5075													
	60			SPT	50/5in	5							8:04am
5070													
	65			SPT	50/3in	3							8:36am
5065													
	70			SPT	31-49-50/0in	14							9:16am
5060													
	75												

(Continued Next Page)

NewFields

CLIENT Nevada Department of Transportation
PROJECT NAME US395 North Valleys, Phase 1B
PROJECT NUMBER 475.0398.000
PROJECT LOCATION Between Mileposts WA 27.1 and WA 32.6

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (INCHES)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	% GRAVEL	% SAND	% FINES	REMARKS
	75												
5055													
	80			SPT	50/5in	5							10:12am
5050													
	85												
5045													
	90			SPT	50/5in	5							11:18am
5040			**GRANODIORITE:** extremely weak, highly weathered, clayey sand, trace gravel, gray, wet, high plasticity, subangular gravel, iron oxide staining										
	95												
5035													
	100			SPT	50/5in	5							
			EOH at 100.5ft; backfilled with bentonite chips and cuttings to the surface										

CORRECTION OF BLOW COUNTS

Project Number **475.0398.000**
Project Name **US395 North Valleys**

FORMULA:

$$(N_1)_{corrected}' = C_N * C_s * C_E * N_{field}$$

where:

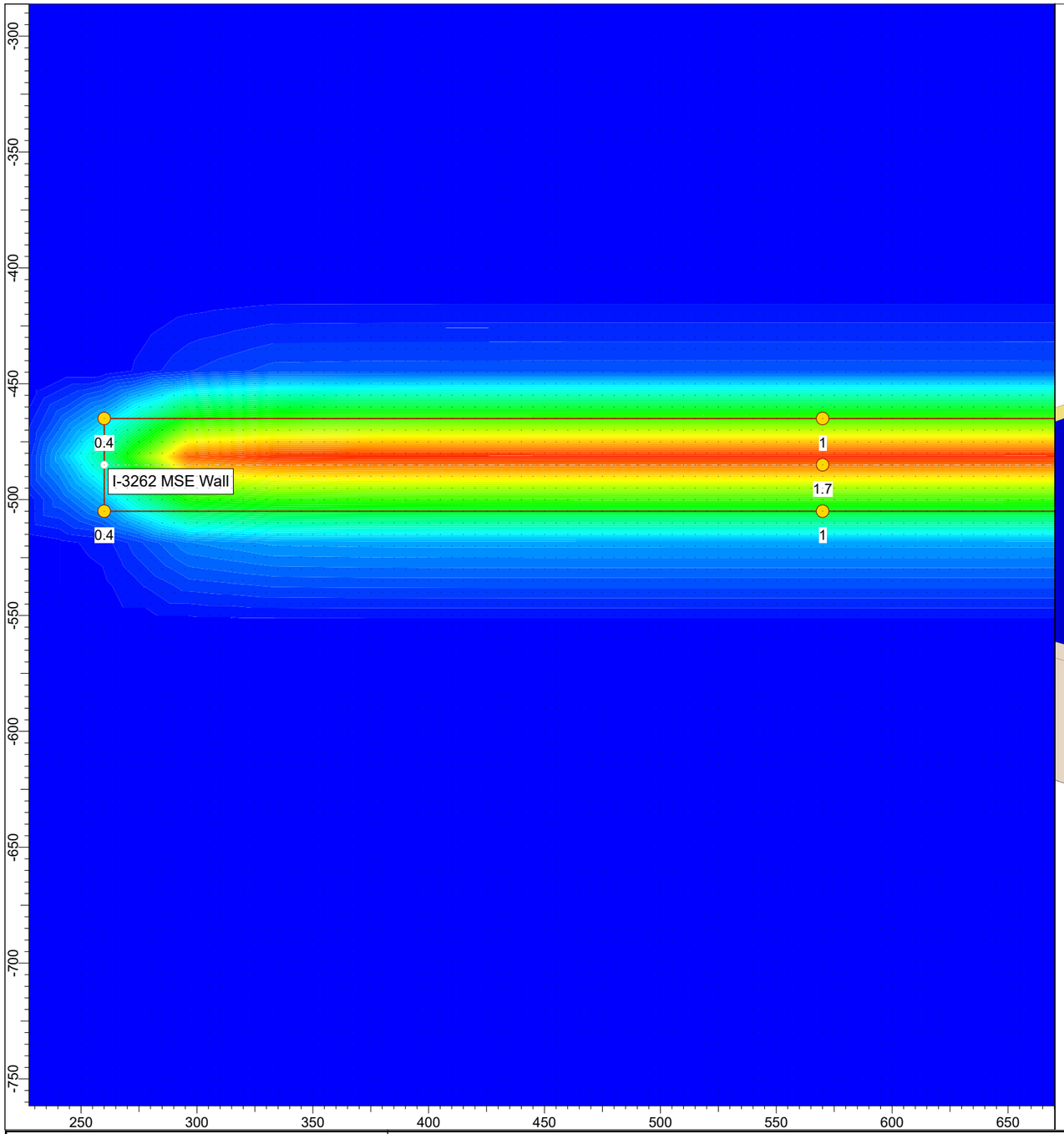
$(N_1)_{corrected}'$ = Corrected blow count for 1 tsf, 60% efficiency
C_N = Overburden correction factor (See Reference 1)
C_E = Energy correction (Efficiency/60%)
C_s = Sampler Correction (Burmister, 1948)
Efficiency = **82%** **Rig Unit 17**

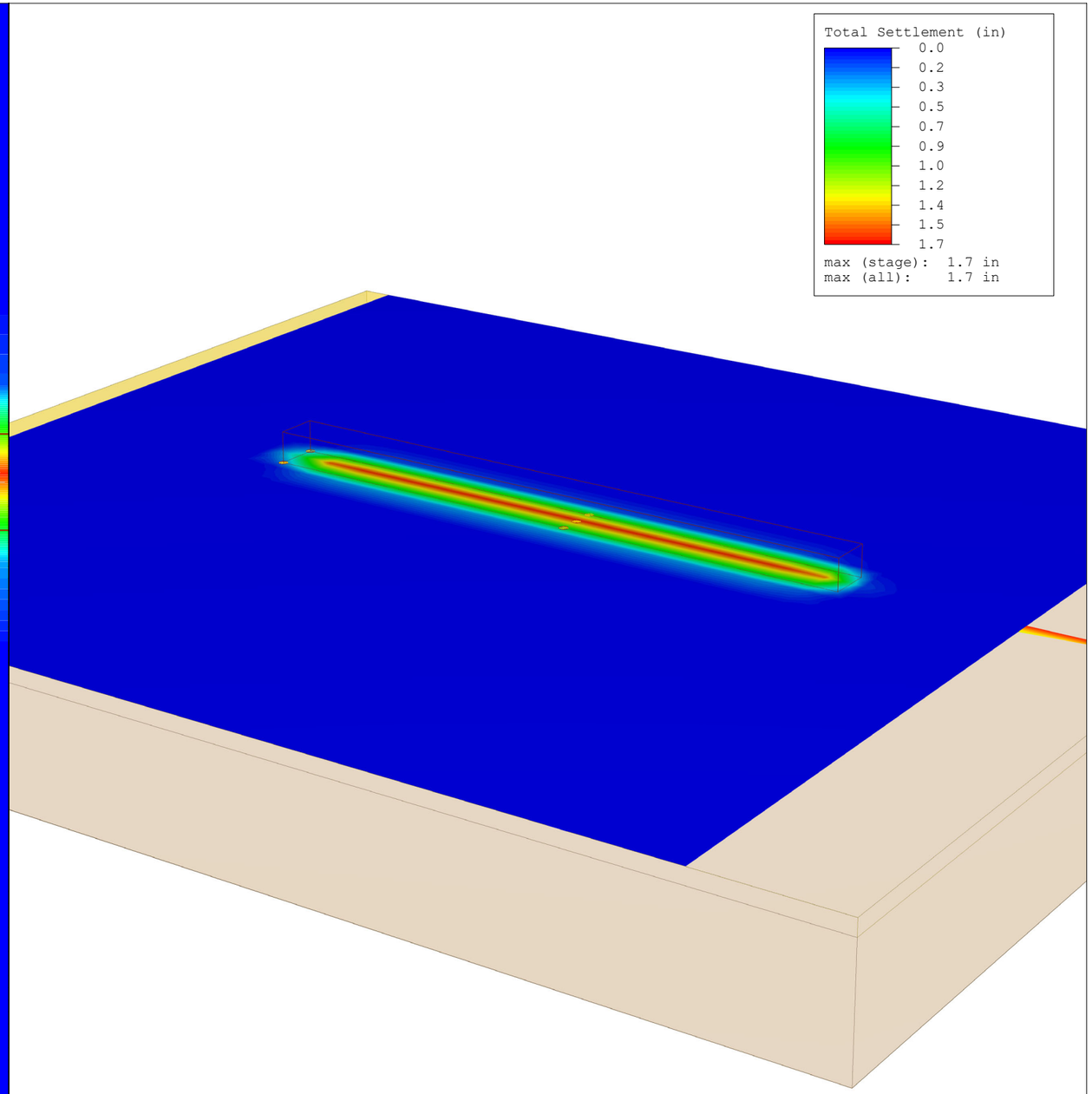
CALCULATIONS:

Boring: **BH19-BR-18** **Boring Elevation (ft msl):** **5132**
Depth to water (ft bgs): **45** **Groundwater Elevation (ft msl):** **5087.0**

Depth (ft bgs)	Elevation (ft msl)	Unit Weight (pcf)	Total Stress (psf)	Effective Stress (psf)		Sampler SPT = 1 MC = 2	Uncorrected Blow Count (N)** [1]	Soil Type (1=fine-grained, 2=coarse-grained)	C_N	C_E	C_s	$(N_1)_{corr}$ (for cohesionless behavior)	$(N)_{corr}$ (for cohesive behavior)	Ø' (for cohesionless soils) [2]	Su (psf) [3]	Material Type	tan (phi)	Multiplier Table C10.4.6.3.1	Es (ksi) [4]
2.5	5129.5	135	337.5	338	SPT	1	11	2	1.60	1.37	1.00	24	-	34	-	SM	0.991	0.139	3.34
5	5127.0	135	675	675	MC	2	13	2	1.37	1.37	0.67	16	-	32	-	SC	0.983	0.139	2.25
10	5122.0	135	1350	1350	MC	2	100	2	1.13	1.37	0.67	103	-	43	-	SC	1.778	0.139	14.36
15	5117.0	135	2025	2025	SPT	1	24	2	1.00	1.37	1.00	33	-	37	-	SC	1.012	0.139	4.55
20	5112.0	135	2700	2700	MC	2	26	2	0.90	1.37	0.67	21	-	34	-	SC	0.977	0.139	2.97
25	5107.0	135	3375	3375	SPT	1	48	2	0.83	1.37	1.00	54	-	41	-	GRANODIORITE	1.140	0.167	9.06
30	5102.0	135	4050	4050	MC	2	100	2	0.77	1.37	0.67	70	-	43	-	GRANODIORITE	1.398	0.167	11.66
35	5097.0	135	4725	4725	SPT	1	100	2	0.71	1.37	1.00	98	-	43	-	GRANODIORITE	1.342	0.167	16.30
40	5092.0	135	5400	5400	SPT	1	100	2	0.67	1.37	1.00	92	-	43	-	GRANODIORITE	1.294	0.167	15.28
45	5087.0	135	6075	6075	SPT	1	100	2	0.63	1.37	1.00	86	-	43	-	GRANODIORITE	1.253	0.167	14.38
50	5082.0	135	6750	6438	SPT	1	100	2	0.61	1.37	1.00	83	-	43	-	GRANODIORITE	1.232	0.167	13.94
55	5077.0	135	7425	6801	SPT	1	100	2	0.59	1.37	1.00	81	-	43	-	GRANODIORITE	1.213	0.167	13.52
60	5072.0	135	8100	7164	SPT	1	100	2	0.58	1.37	1.00	79	-	43	-	GRANODIORITE	1.195	0.167	13.13
65	5067.0	135	8775	7527	SPT	1	100	2	0.56	1.37	1.00	76	-	43	-	GRANODIORITE	1.178	0.167	12.75
70	5062.0	135	9450	7890	SPT	1	100	2	0.54	1.37	1.00	74	-	43	-	GRANODIORITE	1.162	0.167	12.39
75	5057.0	135	10125	8253	SPT	1	100	2	0.53	1.37	1.00	72	-	43	-	GRANODIORITE	1.147	0.167	12.05
80	5052.0	135	10800	8616	SPT	1	100	2	0.51	1.37	1.00	70	-	43	-	GRANODIORITE	1.132	0.167	11.72
85	5047.0	135	11475	8979	SPT	1	100	2	0.50	1.37	1.00	68	-	43	-	GRANODIORITE	1.118	0.167	11.40
90	5042.0	135	12150	9342	SPT	1	100	2	0.49	1.37	1.00	66	-	43	-	GRANODIORITE	1.105	0.167	11.10
95	5037.0	135	12825	9705	SPT	1	100	2	0.47	1.37	1.00	65	-	43	-	GRANODIORITE	1.093	0.167	10.81
100	5032.0	135	13500	10068	SPT	1	100	2	0.46	1.37	1.00	63	-	43	-	GRANODIORITE	1.081	0.167	10.53

[1] Field counts limited to 100 blows for SPT and 140 for California Modified Sampler
[2] Based on Peck, Hanson, Thorton (1974), phi ' = 54°-27.6034*exp(-0.014$(N_1)_{60}$)
[3] Based on Stroud (1974), $S_u = f_1 * N_{60} * (Pa/100)$, f1 = 4.5 to 5.5
[4] Based on Bowles 1998, AASHTO Table C10.4.6.2.1: Coarse sands and sands with little gravel $0.139N1_{60}$ and Coarse Sandy gravel and gravel $0.167N1_{60}$





NewFields

SETTLE3 5.015

Project	US395 North Valleys			
Analysis Description	Settlement Analysis - I-3262 MSE Walls			
Drawn By	J. Ruzicka	Scale	$ModelScale	Company: NewFields
Date	September 2022			File Name: I-3262_MSE_Wall_Settlement.s3z

rocscience

US395 North Valleys
NewFields
Report Creation Date: 2022/09/02, 14:01:32

Table of Contents

Settle3 Analysis Information

US395 North Valleys

Project Settings

Document Name	I-3262_MSE_Wall_Settlement.s3z
Project Title	US395 North Valleys
Analysis	Settlement Analysis - I-3262 MSE Walls
Author	J. Ruzicka
Company	NewFields
Date Created	September 2022
Stress Computation Method	Boussinesq
Use settlement cutoff	
Load/Insitu vertical stress ratio	0.1
Minimum settlement ratio for subgrade modulus	0.9
Use average poisson's ratio to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name
1	Stage 1

Results

Time taken to compute: 0.664162 seconds

Stage: Stage 1

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.65845
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.65845
Loading Stress ZZ [ksf]	0	3.6585
Loading Stress XX [ksf]	-1.0468	1.95346
Loading Stress YY [ksf]	-0.248089	3.56226
Effective Stress ZZ [ksf]	0	15.5569
Effective Stress XX [ksf]	-1.0468	6.76882
Effective Stress YY [ksf]	-0.248089	6.75586
Total Stress ZZ [ksf]	0	15.5569
Total Stress XX [ksf]	-1.0468	6.76882
Total Stress YY [ksf]	-0.248089	6.75586
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00558549
Pore Water Pressure [ksf]	0	0
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.01755	15.5507
Over-consolidation Ratio	1	1
Void Ratio	0	0
Hydroconsolidation Settlement [in]	0	0
Undrained Shear Strength	0	0.0868425

Embankments

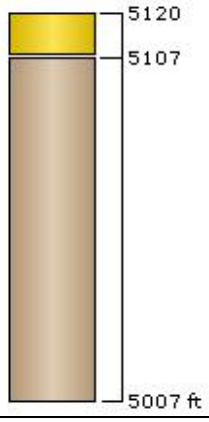
1. Embankment: "I-3262 MSE Wall"

Label	I-3262 MSE Wall
Center Line	(260, -485) to (840, -485)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Layers	1
Base Width	40

Layer	Stage	Left Bench Width (ft)	Left Angle (deg)	Height (ft)	Unit Weight (kips/ft3)	Right Angle (deg)	Right Bench Width (ft)
1	Stage 1	0	90	27.1	0.135	90	0

Soil Layers

Layer #	Type	Thickness [ft]	Elevation [ft]
1	Sand_1	13	5120
2	Gravel_1	100	5107



Soil Properties

Property	Sand_1	Gravel_1
Color		
Unit Weight [kips/ft3]	0.135	0.13
Saturated Unit Weight [kips/ft3]	0.135	0.13
K0	0.45	0.45
Immediate Settlement	Enabled	Enabled
Es [ksf]	655	2000
Esur [ksf]	655	2000
Undrained Su A [kips/ft2]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	4	4

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft3

Piezometric Line Entities

ID	Elevation (ft)
2	439.3 ft
3	416.3 ft
4	33 ft

Query

Query Points

Point #	Query Point Name	(X,Y) Location	Number of Divisions
1	Query Point 1	570, -485	Auto: 41
2	Query Point 2	260, -465	Auto: 41
3	Query Point 3	260, -505	Auto: 41
4	Query Point 4	570, -465	Auto: 41
5	Query Point 5	570, -505	Auto: 41

Field Point Grid

Number of points	784
Expansion Factor	2

Grid Coordinates

X [ft]	Y [ft]
1130	0
1130	-1000
-30	-1000
-30	0