

**E78 GROSSETO - FANO**  
**Tratto Nodo di Arezzo – Selci – Lama (E45)**  
**Adeguamento a quattro corsie del tratto**  
**San Zeno – Arezzo – Palazzo del Pero, 1° lotto**

**PROGETTO DEFINITIVO**

**FI 508**

**ANAS - DIREZIONE PROGETTAZIONE E REALIZZAZIONE LAVORI**

<p><b>IL GEOLOGO</b></p> <p><i>Dott. Geol. Roberto Salucci</i>          Ordine dei geologi della Regione Lazio n. 633</p>	<p><b>I PROGETTISTI SPECIALISTICI</b></p> <p><i>Ing. Ambrogio Signorelli</i>          Ordine Ingegneri Provincia di Roma n. A35111</p>	<p><b>PROGETTAZIONE ATI:</b>          (Mandataria) <b>GP INGENGNERIA</b>  <i>GESTIONE PROGETTI INGEGNERIA srl</i></p> <p>(Mandante)</p> <p><b>cooprogetti</b></p> <p><b>engeko</b></p> <p><b>AIM</b>  <i>Studio di Architettura e Ingegneria Moderna</i></p>
<p><b>COORDINATORE PER LA SICUREZZA IN FASE DI PROGETTAZIONE</b></p> <p><i>Arch. Santo Salvatore Vermiglio</i>          Ordine Architetti Provincia di Reggio Calabria n. 1270</p>	<p><i>Ing. Moreno Panfili</i>          Ordine Ingegneri Provincia di Perugia n. A2657</p> <p><i>Ing. Matteo Bordugo</i>          Ordine Ingegneri Provincia di Pordenone n. 750A</p>	<p>(Mandante)</p> <p>(Mandante)</p>
<p><b>VISTO: IL RESP. DEL PROCEDIMENTO</b></p> <p><i>Ing. Francesco Pisani</i></p>	<p><i>Ing. Giuseppe Festa</i>          Ordine Ingegneri Provincia di Roma n. 20629</p>	<p><b>IL PROGETTISTA RESPONSABILE DELL'INTEGRAZIONE DELLE PRESTAZIONI SPECIALISTICHE. (DPR207/10 ART 15 COMMA 12):</b></p> <p><b>Dott. Ing. GIORGIO GUIDUCCI</b>          ORDINE INGEGNERI ROMA N° 14035</p>

**OPERE D'ARTE MINORI – OPERE DI SOSTEGNO**

**Asse principale**

**OS.13 – Terra Armata DX – AP. Dir. FANO da prog. 2+300 alla progr. 2+370**

**Relazione tecnica e di calcolo**

CODICE PROGETTO		NOME FILE	REVISIONE	SCALA
PROGETTO	LIV.PROG ANNO	P01OS13STRRE01_B		
<b>DPFI508</b>	<b>D 23</b>	<b>CODICE ELAB. P01OS13STRRE01</b>	<b>B</b>	<b>-</b>
<b>D</b>				
<b>C</b>				
<b>B</b>	Revisione a seguito istruttoria n°U. 0016028.09-01-2024	Gennaio '24	Colleselli	Bordugo Guiducci
<b>A</b>	Emissione	Agosto '23	Colleselli	Bordugo Guiducci
REV.	DESCRIZIONE	DATA	REDATTO	VERIFICATO APPROVATO



23-09-07 BA

Slide2 - An Interactive Slope Stability Program

Date Created: 07/09/2023, 11:17:39

Software Version: 9.029

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# Slide2 Analysis Information

## 23-09-07 BA

### Project Summary

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File Name:	23-09-07 BA.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.295s
Project Title:	Slide2 - An Interactive Slope Stability Program
Date Created:	07/09/2023, 11:17:39

## General Settings

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Units of Measurement:

Time Units:

Permeability Units:

Data Output:

Failure Direction:

Metric Units

days

meters/second

Standard

Right to Left

## Analysis Options

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Slices Type:	Vertical
<b>Analysis Methods Used</b>	
	Bishop simplified
	Janbu simplified
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

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Groundwater Method:

Pore Fluid Unit Weight [kN/m<sup>3</sup>]:

Advanced Groundwater Method:

Water Surfaces

9.81

None

# Random Numbers

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Pseudo-random Seed:

10116

Random Number Generation Method:

Park and Miller v.3



## Surface Options

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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

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Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

# Materials


## R esistente

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	35 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


## AC alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	30 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


## AC

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	90 kPa
Phi	32 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

## MS alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	27 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

**MS**

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	100 kPa
Phi	28 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

## Global Minimums

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### Method: bishop simplified

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FS	1.169350
Center:	61.507, 327.370
Radius:	23.027
Left Slip Surface Endpoint:	70.084, 306.000
Right Slip Surface Endpoint:	83.058, 319.257
Resisting Moment:	13716.7 kN-m
Driving Moment:	11730.2 kN-m
Total Slice Area:	38.3269 m <sup>2</sup>
Surface Horizontal Width:	12.9735 m
Surface Average Height:	2.95425 m

### Method: janbu simplified

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FS	1.136020
Center:	61.902, 327.916
Radius:	23.392
Left Slip Surface Endpoint:	70.086, 306.002
Right Slip Surface Endpoint:	83.841, 319.800
Resisting Horizontal Force:	479.938 kN
Driving Horizontal Force:	422.474 kN
Total Slice Area:	43.5242 m <sup>2</sup>
Surface Horizontal Width:	13.7548 m
Surface Average Height:	3.16429 m

## Global Minimum Support Data

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No Supports Present

## Valid and Invalid Surfaces

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### Method: bishop simplified

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Number of Valid Surfaces: 12883

Number of Invalid Surfaces: 21

#### Error Codes

Error Code -112 reported for 21 surfaces

### Method: janbu simplified

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Number of Valid Surfaces: 12762

Number of Invalid Surfaces: 142

#### Error Codes

Error Code -108 reported for 46 surfaces

Error Code -111 reported for 96 surfaces

### Error Code Descriptions

The following errors were encountered during the computation:

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

-111 = Safety factor equation did not converge

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

# Slice Data

## Global Minimum Query (bishop simplified) - Safety Factor: 1.16935

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.259469	0.600062	22.2911	R esistente	10	35	7.98167	9.33336	-0.952055	0	-0.952055	2.32002	2.32002
2	0.259469	1.79157	22.9158	R esistente	10	35	10.1283	11.8435	2.63277	0	2.63277	6.91441	6.91441
3	0.259469	2.96469	23.6186	R esistente	10	35	12.2051	14.272	6.10103	0	6.10103	11.438	11.438
4	0.259469	4.11807	24.3251	R esistente	10	35	14.216	16.6235	9.45933	0	9.45933	15.8856	15.8856
5	0.259469	5.2514	25.0357	R esistente	10	35	16.1611	18.898	12.7077	0	12.7077	20.256	20.256
6	0.259469	6.36588	25.7504	R esistente	10	35	18.0432	21.0988	15.8507	0	15.8507	24.5539	24.5539
7	0.259469	7.76322	26.4694	R esistente	10	35	20.3993	23.8539	19.7854	0	19.7854	29.9425	29.9425
8	0.259469	9.36634	27.1929	R esistente	10	35	23.0821	26.9911	24.2658	0	24.2658	36.1248	36.1248
9	0.259469	10.9479	27.9212	R esistente	10	35	25.685	30.0347	28.6125	0	28.6125	42.2241	42.2241
10	0.259469	12.5075	28.6543	R esistente	10	35	28.2073	32.9842	32.8249	0	32.8249	48.2387	48.2387
11	0.259469	14.014	29.3927	R esistente	10	35	30.5961	35.7776	36.8142	0	36.8142	54.0491	54.0491
12	0.259469	15.3364	30.1365	R esistente	10	35	32.6282	38.1538	40.2076	0	40.2076	59.1493	59.1493
13	0.259469	16.6118	30.8859	R esistente	10	35	34.5435	40.3935	43.4065	0	43.4065	64.0688	64.0688
14	0.259469	17.8632	31.6412	R esistente	10	35	36.3823	42.5436	46.4771	0	46.4771	68.8957	68.8957
15	0.259469	19.09	32.4027	R esistente	10	35	38.1436	44.6032	49.4185	0	49.4185	73.6277	73.6277
16	0.259469	20.1983	33.1707	R esistente	10	35	39.6722	46.3907	51.9713	0	51.9713	77.9031	77.9031
17	0.259469	20.7563	33.9455	R esistente	10	35	40.2614	47.0797	52.9552	0	52.9552	80.0561	80.0561
18	0.259469	21.2059	34.7274	R esistente	10	35	40.6546	47.5395	53.612	0	53.612	81.7914	81.7914
19	0.259469	21.6281	35.5167	R esistente	10	35	40.9871	47.9283	54.1672	0	54.1672	83.4211	83.4211
20	0.259469	22.0273	36.314	R esistente	10	35	41.2663	48.2548	54.6337	0	54.6337	84.9623	84.9623
21	0.259469	22.418	37.1194	R esistente	10	35	41.5157	48.5464	55.05	0	55.05	86.4702	86.4702
22	0.259469	22.7808	37.9335	R esistente	10	35	41.7046	48.7673	55.3653	0	55.3653	87.8707	87.8707
23	0.259469	23.1126	38.7568	R esistente	10	35	41.8289	48.9126	55.573	0	55.573	89.1523	89.1523
24	0.259469	23.2238	39.5896	R esistente	10	35	41.596	48.6403	55.1842	0	55.1842	89.5827	89.5827
25	0.259469	23.1205	40.4326	R esistente	10	35	41.025	47.9726	54.2304	0	54.2304	89.1857	89.1857
26	0.259469	22.9828	41.2863	R esistente	10	35	40.3977	47.2391	53.183	0	53.183	88.6561	88.6561
27	0.259469	22.8093	42.1513	R esistente	10	35	39.7134	46.4389	52.0401	0	52.0401	87.9886	87.9886
28	0.259469	22.5986	43.0283	R esistente	10	35	38.9711	45.5708	50.8003	0	50.8003	87.1774	87.1774
29	0.259469	22.349	43.918	R esistente	10	35	38.1695	44.6335	49.4618	0	49.4618	86.2162	86.2162
30	0.259469	22.0587	44.8213	R esistente	10	35	37.3077	43.6258	48.0225	0	48.0225	85.0982	85.0982
31	0.259469	21.7259	45.7389	R esistente	10	35	36.3846	42.5463	46.4809	0	46.4809	83.8162	83.8162
32	0.259469	21.3485	46.6719	R esistente	10	35	35.3988	41.3936	44.8347	0	44.8347	82.362	82.362
33	0.259469	20.924	47.6212	R esistente	10	35	34.349	40.166	43.0814	0	43.0814	80.7263	80.7263
34	0.259469	20.4583	48.5882	R esistente	10	35	33.2451	38.8751	41.2381	0	41.2381	78.9315	78.9315
35	0.259469	19.9519	49.574	R esistente	10	35	32.09	37.5244	39.3089	0	39.3089	76.9798	76.9798
36	0.259469	19.3899	50.5802	R esistente	10	35	30.8655	36.0926	37.264	0	37.264	74.8138	74.8138
37	0.259469	18.7686	51.6083	R esistente	10	35	29.5697	34.5773	35.0999	0	35.0999	72.4187	72.4187
38	0.259469	18.0838	52.6603	R esistente	10	35	28.2005	32.9762	32.8135	0	32.8135	69.7788	69.7788
39	0.259469	17.331	53.7383	R esistente	10	35	26.756	31.2871	30.401	0	30.401	66.876	66.876
40	0.259469	16.5046	54.8447	R esistente	10	35	25.2338	29.5072	27.8591	0	27.8591	63.6897	63.6897
41	0.259469	15.5986	55.9824	R esistente	10	35	23.6318	27.6338	25.1837	0	25.1837	60.1961	60.1961
42	0.259469	14.6057	57.1546	R esistente	10	35	21.9473	25.6641	22.3706	0	22.3706	56.367	56.367
43	0.259469	13.5173	58.3652	R esistente	10	35	20.1779	23.595	19.4157	0	19.4157	52.1699	52.1699
44	0.259469	12.2665	59.619	R esistente	10	35	18.2557	21.3473	16.2056	0	16.2056	47.3454	47.3454
45	0.259469	10.8399	60.9215	R esistente	10	35	16.1823	18.9228	12.7431	0	12.7431	41.8426	41.8426
46	0.259469	9.28041	62.2797	R esistente	10	35	14.0239	16.3988	9.13846	0	9.13846	35.827	35.827
47	0.259469	7.56926	63.7023	R esistente	10	35	11.7792	13.774	5.38989	0	5.38989	29.2258	29.2258
48	0.259469	5.68227	65.2006	R esistente	10	35	9.44827	11.0483	1.49717	0	1.49717	21.9457	21.9457
49	0.259469	3.58764	66.7893	R esistente	10	35	7.03284	8.22385	-2.53661	0	-2.53661	13.8638	13.8638
50	0.259469	1.24193	68.4888	R esistente	10	35	4.53838	5.30695	-6.70236	0	-6.70236	4.81237	4.81237

## Global Minimum Query (janbu simplified) - Safety Factor: 1.13602

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.275096	0.696684	20.8397	R esistente	10	35	8.39561	9.53758	-0.660408	0	-0.660408	2.53545	2.53545
2	0.275096	2.07907	21.5625	R esistente	10	35	10.8264	12.299	3.28328	0	3.28328	7.56155	7.56155
3	0.275096	3.43932	22.2888	R esistente	10	35	13.1814	14.9744	7.10413	0	7.10413	12.5072	12.5072
4	0.275096	4.7771	23.019	R esistente	10	35	15.4609	17.5639	10.8024	0	10.8024	17.3713	17.3713
5	0.275096	6.09205	23.7531	R esistente	10	35	17.665	20.0678	14.3784	0	14.3784	22.1523	22.1523
6	0.275096	7.43644	24.4914	R esistente	10	35	19.8859	22.5908	17.9815	0	17.9815	27.0405	27.0405
7	0.275096	9.20196	25.2341	R esistente	10	35	22.8024	25.904	22.7133	0	22.7133	33.4599	33.4599
8	0.275096	11.0442	25.9813	R esistente	10	35	25.804	29.3139	27.5831	0	27.5831	40.1581	40.1581
9	0.275096	12.8618	26.7333	R esistente	10	35	28.7142	32.6199	32.3046	0	32.3046	46.7673	46.7673
10	0.275096	14.6524	27.4903	R esistente	10	35	31.5291	35.8177	36.8716	0	36.8716	53.2779	53.2779
11	0.275096	16.2683	28.2526	R esistente	10	35	34.0012	38.626	40.8821	0	40.8821	59.1535	59.1535
12	0.275096	17.7674	29.0203	R esistente	10	35	36.2333	41.1617	44.5037	0	44.5037	64.6049	64.6049
13	0.275096	19.24	29.7938	R esistente	10	35	38.3791	43.5994	47.985	0	47.985	69.9594	69.9594
14	0.275096	20.6852	30.5734	R esistente	10	35	40.4379	45.9383	51.3252	0	51.3252	75.2148	75.2148
15	0.275096	22.0389	31.3592	R esistente	10	35	42.3054	48.0598	54.355	0	54.355	80.137	80.137
16	0.275096	22.7817	32.1517	R esistente	10	35	43.146	49.0147	55.7189	0	55.7189	82.8385	82.8385
17	0.275096	23.3548	32.9511	R esistente	10	35	43.6908	49.6336	56.6026	0	56.6026	84.9228	84.9228
18	0.275096	23.8977	33.7578	R esistente	10	35	44.168	50.1757	57.377	0	57.377	86.8978	86.8978
19	0.275096	24.4177	34.5722	R esistente	10	35	44.5894	50.6545	58.0605	0	58.0605	88.7888	88.7888
20	0.275096	24.9276	35.3946	R esistente	10	35	44.9758	51.0934	58.6874	0	58.6874	90.6437	90.6437
21	0.275096	25.406	36.2255	R esistente	10	35	45.2934	51.4542	59.2029	0	59.2029	92.3837	92.3837
22	0.275096	25.8287	37.0654	R esistente	10	35	45.5064	51.6962	59.5482	0	59.5482	93.9212	93.9212
23	0.275096	25.9176	37.9146	R esistente	10	35	45.1951	51.3425	59.0433	0	59.0433	94.2453	94.2453
24	0.275096	25.8748	38.7738	R esistente	10	35	44.6769	50.7539	58.2026	0	58.2026	94.0902	94.0902
25	0.275096	25.7944	39.6435	R esistente	10	35	44.0971	50.0952	57.2618	0	57.2618	93.7985	93.7985
26	0.275096	25.675	40.5242	R esistente	10	35	43.4547	49.3654	56.2196	0	56.2196	93.3652	93.3652
27	0.275096	25.5151	41.4167	R esistente	10	35	42.7486	48.5633	55.0741	0	55.0741	92.7843	92.7843
28	0.275096	25.3129	42.3216	R esistente	10	35	41.978	47.6879	53.8237	0	53.8237	92.0498	92.0498
29	0.275096	25.0666	43.2397	R esistente	10	35	41.1416	46.7377	52.4669	0	52.4669	91.1551	91.1551
30	0.275096	24.7743	44.1719	R esistente	10	35	40.2383	45.7115	51.0012	0	51.0012	90.0929	90.0929
31	0.275096	24.4337	45.1191	R esistente	10	35	39.2667	44.6077	49.4249	0	49.4249	88.8552	88.8552
32	0.275096	24.0496	46.0823	R esistente	10	35	38.2352	43.4359	47.7514	0	47.7514	87.459	87.459
33	0.275096	23.6272	47.0626	R esistente	10	35	37.1526	42.2061	45.9951	0	45.9951	85.9237	85.9237
34	0.275096	23.1489	48.0612	R esistente	10	35	35.9972	40.8935	44.1205	0	44.1205	84.1854	84.1854
35	0.275096	22.611	49.0797	R esistente	10	35	34.7662	39.4951	42.1233	0	42.1233	82.2298	82.2298
36	0.275096	22.0096	50.1195	R esistente	10	35	33.4579	38.0089	40.0009	0	40.0009	80.0438	80.0438
37	0.275096	21.3406	51.1824	R esistente	10	35	32.0702	36.4324	37.7495	0	37.7495	77.6116	77.6116
38	0.275096	20.5992	52.2704	R esistente	10	35	30.6009	34.7632	35.3655	0	35.3655	74.9162	74.9162
39	0.275096	19.7799	53.3858	R esistente	10	35	29.0476	32.9986	32.8454	0	32.8454	71.9377	71.9377
40	0.275096	18.8766	54.5313	R esistente	10	35	27.4077	31.1357	30.185	0	30.185	68.6537	68.6537
41	0.275096	17.8691	55.7099	R esistente	10	35	25.6635	29.1543	27.3553	0	27.3553	64.9907	64.9907
42	0.275096	16.6653	56.9253	R esistente	10	35	23.7168	26.9428	24.1968	0	24.1968	60.6135	60.6135
43	0.275096	15.3317	58.1817	R esistente	10	35	21.6586	24.6046	20.8575	0	20.8575	55.7643	55.7643
44	0.275096	13.8762	59.4842	R esistente	10	35	19.5099	22.1636	17.3714	0	17.3714	50.4717	50.4717
45	0.275096	12.2841	60.8391	R esistente	10	35	17.2683	19.6172	13.7347	0	13.7347	44.6824	44.6824
46	0.275096	10.5373	62.2542	R esistente	10	35	14.9319	16.963	9.94416	0	9.94416	38.3302	38.3302
47	0.275096	8.61289	63.7394	R esistente	10	35	12.4994	14.1996	5.99758	0	5.99758	31.332	31.332
48	0.275096	6.48123	65.3073	R esistente	10	35	9.9706	11.3268	1.89486	0	1.89486	23.5798	23.5798
49	0.275096	4.10272	66.9752	R esistente	10	35	7.34793	8.3474	-2.36016	0	-2.36016	14.9297	14.9297
50	0.275096	1.4224	68.7669	R esistente	10	35	4.63831	5.26921	-6.75628	0	-6.75628	5.18152	5.18152



# Interslice Data

## Global Minimum Query (bishop simplified) - Safety Factor: 1.16935

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	70.0841	306	0	0	0
2	70.3436	306.106	2.1676	0	0
3	70.603	306.216	4.50087	0	0
4	70.8625	306.33	6.96836	0	0
5	71.122	306.447	9.53916	0	0
6	71.3814	306.568	12.183	0	0
7	71.6409	306.693	14.8703	0	0
8	71.9004	306.822	17.5952	0	0
9	72.1598	306.956	20.336	0	0
10	72.4193	307.093	23.0511	0	0
11	72.6788	307.235	25.6994	0	0
12	72.9383	307.381	28.2395	0	0
13	73.1977	307.532	30.63	0	0
14	73.4572	307.687	32.836	0	0
15	73.7167	307.847	34.8239	0	0
16	73.9761	308.012	36.5604	0	0
17	74.2356	308.181	38.0164	0	0
18	74.4951	308.356	39.1906	0	0
19	74.7545	308.536	40.0734	0	0
20	75.014	308.721	40.653	0	0
21	75.2735	308.911	40.9179	0	0
22	75.5329	309.108	40.8553	0	0
23	75.7924	309.31	40.4552	0	0
24	76.0519	309.518	39.7084	0	0
25	76.3114	309.733	38.636	0	0
26	76.5708	309.954	37.2674	0	0
27	76.8303	310.182	35.6086	0	0
28	77.0898	310.417	33.6671	0	0
29	77.3492	310.659	31.4524	0	0
30	77.6087	310.909	28.9759	0	0
31	77.8682	311.167	26.2514	0	0
32	78.1276	311.433	23.2952	0	0
33	78.3871	311.708	20.1267	0	0
34	78.6466	311.992	16.7682	0	0
35	78.906	312.287	13.2432	0	0
36	79.1655	312.591	9.57745	0	0
37	79.425	312.907	5.80527	0	0
38	79.6845	313.234	1.96634	0	0
39	79.9439	313.574	-1.89329	0	0
40	80.2034	313.928	-5.72006	0	0
41	80.4629	314.297	-9.4516	0	0
42	80.7223	314.681	-13.0149	0	0
43	80.9818	315.083	-16.3243	0	0
44	81.2413	315.504	-19.2782	0	0
45	81.5007	315.947	-21.7245	0	0
46	81.7602	316.413	-23.4809	0	0
47	82.0197	316.907	-24.3628	0	0
48	82.2791	317.432	-24.1433	0	0
49	82.5386	317.994	-22.538	0	0
50	82.7981	318.599	-19.1825	0	0
51	83.0576	319.257	0	0	0

**Global Minimum Query (janbu simplified) - Safety Factor: 1.13602**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	70.0859	306.002	0	0	0
2	70.361	306.107	2.37663	0	0
3	70.6361	306.216	4.99526	0	0
4	70.9112	306.329	7.817	0	0
5	71.1863	306.445	10.8038	0	0
6	71.4614	306.567	13.9182	0	0
7	71.7365	306.692	17.1303	0	0
8	72.0116	306.822	20.4526	0	0
9	72.2867	306.956	23.8468	0	0
10	72.5618	307.094	27.2626	0	0
11	72.8369	307.237	30.6501	0	0
12	73.112	307.385	33.9514	0	0
13	73.3871	307.538	37.1179	0	0
14	73.6622	307.695	40.1081	0	0
15	73.9373	307.858	42.8809	0	0
16	74.2124	308.025	45.3956	0	0
17	74.4875	308.198	47.6194	0	0
18	74.7626	308.377	49.5344	0	0
19	75.0377	308.56	51.1239	0	0
20	75.3128	308.75	52.3719	0	0
21	75.5879	308.946	53.2621	0	0
22	75.863	309.147	53.7796	0	0
23	76.1381	309.355	53.913	0	0
24	76.4131	309.569	53.6834	0	0
25	76.6882	309.79	53.1012	0	0
26	76.9633	310.018	52.1692	0	0
27	77.2384	310.253	50.8921	0	0
28	77.5135	310.496	49.2763	0	0
29	77.7886	310.746	47.3303	0	0
30	78.0637	311.005	45.0651	0	0
31	78.3388	311.272	42.4938	0	0
32	78.6139	311.549	39.6328	0	0
33	78.889	311.834	36.4993	0	0
34	79.1641	312.13	33.112	0	0
35	79.4392	312.436	29.4966	0	0
36	79.7143	312.753	25.684	0	0
37	79.9894	313.083	21.7098	0	0
38	80.2645	313.425	17.6163	0	0
39	80.5396	313.78	13.4524	0	0
40	80.8147	314.15	9.27568	0	0
41	81.0898	314.537	5.15359	0	0
42	81.3649	314.94	1.17124	0	0
43	81.64	315.362	-2.53118	0	0
44	81.9151	315.806	-5.82603	0	0
45	82.1902	316.272	-8.57157	0	0
46	82.4653	316.765	-10.5969	0	0
47	82.7404	317.288	-11.6935	0	0
48	83.0155	317.846	-11.6022	0	0
49	83.2906	318.444	-9.99557	0	0
50	83.5656	319.092	-6.4483	0	0
51	83.8407	319.8	0	0	0

## Discharge Sections

---

### Entity Information

---

#### ◆ Group 1

##### Shared Entities

Type	Coordinates (x,y)
	0, 270
	78.5713, 270
	184.033, 270
	184.033, 317.87
	184.033, 325.934
	183.185, 325.77
	181.792, 325.485
	180.23, 325.069
	180, 325.023
	178.836, 324.776
	178.5, 324.691
	177.341, 324.437
	175.507, 324
	175, 323.904
	174.859, 323.892
	172.668, 323.494
	172.394, 323.473
	171.815, 323.38
	171.496, 323.316
	170.849, 323.208
	170, 323.052
	169.499, 322.949
	168.039, 322.668
	166.512, 322.329
	165.809, 322.143
	165.7, 322.122
	165.265, 322
	165.227, 322
	165, 321.898
	164.907, 321.87
	163.782, 321.358
	163.433, 321.19
	162.804, 321.048
	162.176, 320.895
	161.79, 320.741
	161.44, 320.656
	160.811, 320.488
	160.545, 320.389
	159.257, 320.051
	156.483, 319.287
	155.807, 319.057
	155, 318.816
	154.411, 318.625
	154.15, 318.55

External Boundary






151.627, 317.635  
151.116, 317.481  
150.031, 317.1  
148.963, 316.748  
147.082, 316.278  
146.463, 316.131  
145.215, 315.821  
143.64, 315.466  
142.822, 315.248  
142.068, 315.074  
141.369, 314.932  
141.205, 314.887  
140.283, 314.674  
138.189, 314.243  
137.122, 314.005  
135, 313.411  
134.614, 313.311  
134.098, 313.145  
133.753, 313.065  
133.102, 312.867  
132.177, 312.699  
131.393, 312.48  
129.098, 312.029  
128.949, 312  
128.091, 312  
127.989, 312.114  
126.532, 312.523  
118.748, 315.643  
118.488, 314.721  
118.397, 314.577  
118.247, 314.271  
117.611, 312.523  
117.492, 312  
117.371, 312.204  
117.042, 312.811  
116.474, 314  
116.247, 314.492  
115.578, 316  
115, 317.051  
114.489, 318  
112.621, 320  
109.467, 322  
107.665, 322.842  
107.183, 323.033  
106.58, 323.303  
102.952, 323.748  
101.056, 324  
100, 324.16  
99.0783, 324.314  
93.8739, 324.454  
93.0681, 324.498  
91.8042, 324.539  
91.1293, 324.528  
91.085, 324.522  
90.7514, 324.414  
90.6812, 324.381  
89.687, 324  
89.6211, 323.948  
89.5757, 323.87

89.5451,	323.85
89.5233,	323.805
89.4707,	323.747
89.1214,	323.616
88.4012,	323.258
88.2121,	323.119
88.1011,	323.022
87.9648,	322.92
86.8596,	322.189
86.6088,	322
84.1179,	320
83.8329,	319.794
81.2423,	318
78.6712,	316
76.0493,	314
75.1155,	313.031
74.1016,	312
72.8,	310
71.6211,	308
70.0841,	306
65,	304.675
62.5255,	304
60.4215,	302.379
60.1415,	302.159
59.9398,	302
59.9164,	302
57.4119,	301.432
56.8676,	301.392
55.4929,	301.173
54.0276,	300.999
53.1603,	300.938
51.3633,	300.761
49.9168,	300.637
45.0549,	300.192
44.2251,	300.098
43.1654,	300
42.8906,	299.94
42.0304,	299.808
41.9166,	299.77
41.1284,	299.603
40.9294,	299.533
40.5199,	299.431
40.1064,	299.345
40,	299.308
39.5729,	299.182
38.8098,	298.947
38.4421,	298.859
37.6044,	298.612
36.9161,	298.42
36.2898,	298.291
35.5288,	298.098
35.1931,	298.045
34.086,	298
33.1797,	298.081
33.1322,	298.071
31.2488,	298.125
31.1994,	298.116
28.2449,	298.01
28.1271,	298

	27.679, 297.954 26.2666, 297.721 25.8324, 297.622 25.5242, 297.594 24.5563, 297.398 24.058, 297.35 23.4771, 297.209 23.1817, 297.152 22.8413, 297.122 22.4875, 297.058 22.0046, 297.011 21.6825, 296.964 21.0968, 296.846 20.4778, 296.765 19.419, 296.603 19.1473, 296.547 17.8487, 296.368 17.6833, 296.337 16.961, 296.244 15.9911, 296.107 15, 296.002 13.1538, 295.919 11.4784, 295.821 10, 295.708 9.45612, 295.655 5.8203, 295.468 5, 295.452 3.89765, 295.327 2.24766, 295.246 1.0033, 295.223 0, 295.272 0, 291.16
Material Boundary	42.8906, 299.94 47.1587, 296.358 78.5713, 270
Material Boundary	0, 291.16 4.45842, 291.436 14.1009, 291.436 25.2044, 292.531 35.7965, 293.918 41.4944, 295.305 47.1587, 296.358 47.7766, 296.473 60.0486, 297.359 91.8647, 297.013 100, 296.564 108.116, 296.789 111.549, 297.238 117.73, 298.809 127.686, 302.064 133.523, 304.757 140.322, 307.126 164.722, 312.847 178.743, 316.894 184.033, 317.87

Material Boundary	60.1415, 302.159
	107.036, 302.159
	115.076, 306.696
	124.345, 308.587
	129.098, 312.029

### Scenario-based Entities

Type	Coordinates (x,y)	Master Scenario
Water Table	-0.0946299, 291.076	Assigned to:
	12.4439, 291.523	 R esistente
	31.6217, 293.389	 AC alt
	49.13, 296.001	 AC
	60.5626, 297.226	 MS alt
	65.156, 297.337	 MS
	78.3976, 297.45	
	96.1797, 297.224	
	107.167, 296.885	
	119.651, 299.146	
	128.015, 301.987	
	134.209, 304.962	
	145.536, 308.105	
	153.314, 309.519	
	164.527, 312.244	
	184.033, 317.87	



23-09-13 TA 2

Slide2 - An Interactive Slope Stability Program

Date Created: 08/09/2023, 11:07:04

Software Version: 9.029



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# Slide2 Analysis Information

## 23-09-13 TA 2




### Project Summary

---

File Name: 23-09-13 TA 2.slmd  
 Slide2 Modeler Version: 9.029  
 Project Title: Slide2 - An Interactive Slope Stability Program  
 Date Created: 08/09/2023, 11:07:04

### Currently Open Scenarios

---

Group Name	Scenario Name	Global Minimum	Compute Time
SLU 	Master Scenario	Bishop Simplified: 1.065400	00h:00m:02.413s
SLV kv>0 	Master Scenario	Bishop Simplified: 1.071800	00h:00m:02.538s
SLV kv<0 	Master Scenario	Bishop Simplified: 1.062580	00h:00m:02.441s

## General Settings

---

Units of Measurement:

Time Units:

Permeability Units:

Data Output:

Failure Direction:

Metric Units

days

meters/second

Standard

Left to Right

## Design Standard

### ◆ SLU

Selected Type: Eurocode 7 (User Defined)  
Name: A2+M2+R2

Type	Partial Factor
Permanent Actions: Unfavourable	1.35
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1.5
Variable Actions: Favourable	0
Effective cohesion	1.25
Coefficient of shearing resistance	1.25
Undrained strength	1.4
Weight density	1
Shear strength (other models)	1
Earth resistance	1.1
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv>0

Selected Type: Eurocode 7 (User Defined)  
Name: SISMA

Type	Partial Factor
Permanent Actions: Unfavourable	1
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1
Variable Actions: Favourable	1
Effective cohesion	1
Coefficient of shearing resistance	1
Undrained strength	1
Weight density	1
Shear strength (other models)	1
Earth resistance	1.2
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv<0

Selected Type: Eurocode 7 (User Defined)

Name: SISMA

	<b>Type</b>	<b>Partial Factor</b>
Permanent Actions: Unfavourable		1
Permanent Actions: Favourable		1
Variable Actions: Unfavourable		1
Variable Actions: Favourable		1
Effective cohesion		1
Coefficient of shearing resistance		1
Undrained strength		1
Weight density		1
Shear strength (other models)		1
Earth resistance		1.2
Tensile and plate strength		1
Shear strength		1
Compressive strength		1
Bond strength		1
Seismic Coefficient		1

# Analysis Options

---

## All Open Scenarios

Slices Type:	Vertical
<b>Analysis Methods Used</b>	
	Bishop simplified
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

---

## All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [kN/m <sup>3</sup> ]:	9.81
Advanced Groundwater Method:	None



# Random Numbers

---

## All Open Scenarios

Pseudo-random Seed:

10116

Random Number Generation Method:

Park and Miller v.3

# Surface Options

---

## **All Open Scenarios**

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 [m]:	1
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

# Seismic Loading

---

## ◆ SLU

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

## ◆ SLV kv>0

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	0.045

## ◆ SLV kv<0

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	-0.045

# Loading

---

## ◆ SLU

&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live
&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live

## ◆ SLV kv>0


&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live

## ◆ SLV kv<0


&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live

## Materials


### R

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	0 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


### R esistente

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	50 kPa
Phi	30 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC


Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	90 kPa
Phi	32 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

## Materials In Use


Material		SLU	SLV kv>0	SLV kv<0
R		✓	✓	✓
R esistente		✓	✓	✓
AC alt		✓	✓	✓
AC		✓	✓	✓

## Support


### 200/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 200/30
Ultimate Tensile Strength	200 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	117.625 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	120 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

### 150/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 150/30
Ultimate Tensile Strength	150 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	88.2187 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	90 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

**80/30**

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 80/30
Ultimate Tensile Strength	80 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	47.05 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	50 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes



# Global Minimums

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## ◆ SLU

**Method: bishop simplified**

	FS	1.065400
Center:	128.007, 342.575	
Radius:	23.547	
Left Slip Surface Endpoint:	104.568, 340.322	
Right Slip Surface Endpoint:	133.828, 319.759	
Resisting Moment:	94180.8 kN-m	
Driving Moment:	88399.8 kN-m	
Passive Support Moment:	5295.74 kN-m	
Maximum Single Support Force:	117.625 kN	
Total Support Force:	235.25 kN	
Total Slice Area:	282.259 m <sup>2</sup>	
Surface Horizontal Width:	29.2597 m	
Surface Average Height:	9.64668 m	

## ◆ SLV kv>0

**Method: bishop simplified**

	FS	1.071800
Center:	127.897, 345.266	
Radius:	25.978	
Left Slip Surface Endpoint:	102.423, 340.175	
Right Slip Surface Endpoint:	133.171, 319.829	
Resisting Moment:	91696.2 kN-m	
Driving Moment:	85553.7 kN-m	
Passive Support Moment:	5928.8 kN-m	
Maximum Single Support Force:	117.625 kN	
Total Support Force:	235.25 kN	
Total Slice Area:	303.021 m <sup>2</sup>	
Surface Horizontal Width:	30.7483 m	
Surface Average Height:	9.85491 m	

## ◆ SLV kv<0

**Method: bishop simplified**

<b>FS</b>	<b>1.062580</b>
Center:	128.197, 348.635
Radius:	28.934
Left Slip Surface Endpoint:	100.566, 340.048
Right Slip Surface Endpoint:	132.140, 319.970
Resisting Moment:	95643.4 kN-m
Driving Moment:	90010.7 kN-m
Passive Support Moment:	6549.6 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	235.25 kN
Total Slice Area:	312.688 m <sup>2</sup>
Surface Horizontal Width:	31.5735 m
Surface Average Height:	9.90348 m

## Global Minimum Support Data

### ◆ SLU

Method: bishop simplified

Number of Supports: 26

#### 200/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	9.46842	3.53158	9.46842	3.53158	117.625
131.564, 320.429	13	11.5515	1.44849	11.5515	1.44849	117.625
131.223, 321.159	13	Not Effective	Not Effective	Not Effective	Not Effective	0
130.883, 321.889	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.543, 322.619	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.202, 323.349	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.862, 324.079	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.521, 324.809	12.9998	Not Effective	Not Effective	Not Effective	Not Effective	0
127.181, 325.539	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 150/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 80/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

◆ **SLV kv>0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	8.59869	4.40131	8.59869	4.40131	117.625
131.564, 320.429	13	11.2753	1.72474	11.2753	1.72474	117.625
131.223, 321.159	13	Not Effective	Not Effective	Not Effective	Not Effective	0
130.883, 321.889	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.543, 322.619	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.202, 323.349	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.862, 324.079	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.521, 324.809	12.9998	Not Effective	Not Effective	Not Effective	Not Effective	0
127.181, 325.539	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0

123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

### ◆ **SLV kv<0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	9.80997	3.19003	9.80997	3.19003	117.625
131.223, 321.159	13	12.0907	0.909301	12.0907	0.909301	117.625
130.883, 321.889	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.543, 322.619	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.202, 323.349	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.862, 324.079	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0

127.521, 324.809	12.9998	Not Effective	Not Effective	Not Effective	Not Effective	0
127.181, 325.539	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

## Valid and Invalid Surfaces

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### ◆ SLU

**Method: bishop simplified**

Number of Valid Surfaces:	11257
Number of Invalid Surfaces:	0

### ◆ SLV kv>0

**Method: bishop simplified**

Number of Valid Surfaces:	11026
Number of Invalid Surfaces:	0

### ◆ SLV kv<0

**Method: bishop simplified**

Number of Valid Surfaces:	11340
Number of Invalid Surfaces:	0

# Slice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.0654

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.587683	27.5215	-80.2737	R	0	29.2561	9.02958	9.62011	18.891	0	18.891	71.5708	71.5708
2	0.587683	71.1202	-73.5168	R	0	29.2561	25.9965	27.6967	54.388	0	54.388	142.245	142.245
3	0.587683	99.6637	-69.0004	R	0	29.2561	40.2607	42.8937	84.2304	0	84.2304	189.115	189.115
4	0.587683	122.584	-65.2939	R	0	29.2561	53.2244	56.7053	111.352	0	111.352	227.038	227.038
5	0.587683	142.148	-62.0569	R	0	29.2561	65.2674	69.5359	136.548	0	136.548	259.592	259.592
6	0.587683	159.379	-59.1369	R	0	29.2561	76.5917	81.6008	160.24	0	160.24	288.403	288.403
7	0.587683	174.851	-56.4492	R	0	29.2561	87.3261	93.0372	182.698	0	182.698	314.379	314.379
8	0.587683	188.925	-53.9406	R	0	29.2561	97.5605	103.941	204.108	0	204.108	338.096	338.096
9	0.587683	201.592	-51.5752	R	0	29.2561	100.477	107.048	210.211	0	210.211	336.868	336.868
10	0.587683	212.728	-49.3275	R	0	29.2561	107.346	114.366	224.581	0	224.581	349.503	349.503
11	0.587683	222.999	-47.1784	R	0	29.2561	115.724	123.292	242.11	0	242.11	366.986	366.986
12	0.587683	229.65	-45.1132	R	0	29.2561	122.256	130.252	255.776	0	255.776	378.516	378.516
13	0.587683	232.479	-43.1204	R	0	29.2561	126.705	134.992	265.085	0	265.085	383.738	383.738
14	0.587683	234.706	-41.1906	R	0	29.2561	130.743	139.294	273.531	0	273.531	387.95	387.95
15	0.587683	236.385	-39.3161	R	0	29.2561	134.397	143.187	281.176	0	281.176	391.242	391.242
16	0.587683	237.56	-37.4908	R	0	29.2561	137.691	146.696	288.067	0	288.067	393.686	393.686
17	0.587683	238.268	-35.709	R	0	29.2561	140.644	149.842	294.246	0	294.246	395.342	395.342
18	0.587683	238.541	-33.9663	R	0	29.2561	143.274	152.644	299.746	0	299.746	396.263	396.263
19	0.587683	238.721	-32.2586	R	0	29.2561	145.787	155.321	305.005	0	305.005	397.02	397.02
20	0.587683	242.977	-30.5825	R	0	29.2561	150.777	160.638	315.444	0	315.444	404.552	404.552
21	0.587683	248.31	-28.9349	R	0	29.2561	156.481	166.715	327.38	0	327.38	413.886	413.886
22	0.587683	253.295	-27.3131	R	0	29.2561	162.026	172.622	338.978	0	338.978	422.652	422.652
23	0.587683	249.563	-25.7148	R	0	29.2561	161.971	172.564	338.866	0	338.866	416.869	416.869
24	0.587683	233.972	-24.1376	R	0	29.2561	154.015	164.088	322.219	0	322.219	391.235	391.235
25	0.587683	218.004	-22.5797	R	0	29.2561	145.501	155.017	304.408	0	304.408	364.914	364.914
26	0.587683	201.74	-21.0392	R	0	29.2561	136.483	145.409	285.54	0	285.54	338.038	338.038
27	0.587683	194.179	-19.5145	R	0	29.2561	133.128	141.835	278.523	0	278.523	325.704	325.704
28	0.587683	197.32	-18.0041	R	0	29.2561	137.069	146.033	286.765	0	286.765	331.312	331.312
29	0.587683	200.217	-16.5065	R	0	29.2561	140.894	150.108	294.767	0	294.767	336.519	336.519
30	0.587683	199.88	-15.0204	R	0	29.2561	142.471	151.789	298.069	0	298.069	336.299	336.299
31	0.587683	184.331	-13.5446	R	0	29.2561	133.069	141.772	278.399	0	278.399	310.456	310.456
32	0.587683	166.459	-12.0779	R	0	29.2561	121.696	129.655	254.605	0	254.605	280.645	280.645
33	0.587683	148.338	-10.6192	R	0	29.2561	109.823	117.005	229.763	0	229.763	250.354	250.354
34	0.587683	133.297	-9.16746	R	0	29.2561	99.9362	106.472	209.079	0	209.079	225.207	225.207
35	0.587683	132.891	-7.72162	R	0	29.2561	100.893	107.491	211.081	0	211.081	224.761	224.761
36	0.587683	134.036	-6.28071	R	0	29.2561	103.053	109.793	215.601	0	215.601	226.943	226.943
37	0.587683	134.643	-4.84379	R	0	29.2561	104.839	111.696	219.338	0	219.338	228.222	228.222
38	0.587683	122.151	-3.40991	R	0	29.2561	96.3319	102.632	201.539	0	201.539	207.279	207.279
39	0.587683	102.597	-1.97817	R	0	29.2561	81.9569	87.3169	171.465	0	171.465	174.295	174.295
40	0.587683	82.8093	-0.547664	R	0	29.2561	67.0147	71.3975	140.203	0	140.203	140.844	140.844
41	0.587683	63.2105	0.882499	R	0	29.2561	51.8309	55.2206	108.437	0	108.437	107.638	107.638
42	0.587683	56.6373	2.31321	R	0	29.2561	47.0645	50.1425	98.4649	0	98.4649	96.5638	96.5638
43	0.587683	56.1438	3.74537	R	0	29.2561	47.2911	50.3839	98.9389	0	98.9389	95.8431	95.8431
44	0.587683	55.4159	5.17988	R	0	29.2561	47.327	50.4222	99.0142	0	99.0142	94.7239	94.7239
45	0.587683	48.0206	6.61765	R	0	29.2561	41.5936	44.3138	87.0191	0	87.0191	82.1936	82.1936
46	0.587683	27.218	8.05963	R	0	29.2561	23.9178	25.482	50.0391	0	50.0391	46.6523	46.6523
47	0.587683	11.0623	9.50676	R	0	29.2561	9.86587	10.5111	20.6407	0	20.6407	18.9885	18.9885
48	0.587683	7.37371	10.9601	R	0	29.2561	6.67704	7.11372	13.9692	0	13.9692	12.6762	12.6762
49	0.525455	3.78172	12.3428	AC alt	40	24.7913	40.8417	43.5128	17.0263	0	17.0263	8.08936	8.08936
50	0.525455	1.19597	13.6551	AC alt	40	24.7913	39.1514	41.7119	12.7374	0	12.7374	3.22575	3.22575



 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.0718**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.621911	15.6464	-75.8851	R	0	35	4.88656	5.23742	8.97576	0	8.97576	28.4086	28.4086
2	0.621911	42.7705	-70.9681	R	0	35	14.6508	15.7027	26.9109	0	26.9109	69.3829	69.3829
3	0.621911	63.6703	-67.1016	R	0	35	24.1562	25.8906	44.3707	0	44.3707	101.561	101.561
4	0.621911	81.2132	-63.7859	R	0	35	33.3358	35.7293	61.2321	0	61.2321	128.937	128.937
5	0.621911	96.527	-60.826	R	0	35	42.1979	45.2277	77.5103	0	77.5103	153.095	153.095
6	0.621911	110.204	-58.1203	R	0	35	50.7657	54.4107	93.2476	0	93.2476	174.87	174.87
7	0.621911	122.604	-55.6073	R	0	35	59.0638	63.3046	108.49	0	108.49	194.774	194.774
8	0.621911	133.963	-53.2469	R	0	35	67.1149	71.9338	123.279	0	123.279	213.146	213.146
9	0.621911	144.451	-51.0105	R	0	35	74.9392	80.3198	137.65	0	137.65	230.227	230.227
10	0.621911	154.19	-48.8776	R	0	35	82.5538	88.4812	151.637	0	151.637	246.195	246.195
11	0.621911	163.274	-46.8322	R	0	35	89.9741	96.4342	165.267	0	165.267	261.188	261.188
12	0.621911	171.565	-44.862	R	0	35	95.5393	102.399	175.488	0	175.488	270.568	270.568
13	0.621911	178.876	-42.9573	R	0	35	101.75	109.056	186.898	0	186.898	281.64	281.64
14	0.621911	185.653	-41.1098	R	0	35	108.174	115.941	198.697	0	198.697	293.096	293.096
15	0.621911	188.916	-39.3131	R	0	35	112.595	120.679	206.817	0	206.817	299.017	299.017
16	0.621911	189.898	-37.5614	R	0	35	115.633	123.935	212.396	0	212.396	301.322	301.322
17	0.621911	190.507	-35.8501	R	0	35	118.396	126.897	217.473	0	217.473	303.02	303.02
18	0.621911	190.768	-34.1749	R	0	35	120.898	129.578	222.067	0	222.067	304.151	304.151
19	0.621911	190.702	-32.5324	R	0	35	123.145	131.987	226.195	0	226.195	304.746	304.746
20	0.621911	190.326	-30.9195	R	0	35	125.147	134.133	229.875	0	229.875	304.832	304.832
21	0.621911	189.657	-29.3333	R	0	35	126.913	136.025	233.117	0	233.117	304.434	304.434
22	0.621911	190.786	-27.7714	R	0	35	129.861	139.185	238.531	0	238.531	306.917	306.917
23	0.621911	194.701	-26.2317	R	0	35	134.742	144.417	247.499	0	247.499	313.893	313.893
24	0.621911	198.387	-24.7121	R	0	35	139.537	149.556	256.306	0	256.306	320.522	320.522
25	0.621911	197.971	-23.2109	R	0	35	141.475	151.633	259.864	0	259.864	320.532	320.532
26	0.621911	185.424	-21.7264	R	0	35	134.592	144.256	247.222	0	247.222	300.854	300.854
27	0.621911	171.804	-20.257	R	0	35	126.637	135.73	232.611	0	232.611	279.348	279.348
28	0.621911	157.961	-18.8014	R	0	35	118.212	126.7	217.136	0	217.136	257.382	257.382
29	0.621911	151.111	-17.3584	R	0	35	114.796	123.038	210.86	0	210.86	246.743	246.743
30	0.621911	153.385	-15.9266	R	0	35	118.27	126.762	217.243	0	217.243	250.993	250.993
31	0.621911	155.49	-14.5049	R	0	35	121.678	130.415	223.503	0	223.503	254.982	254.982
32	0.621911	153.132	-13.0924	R	0	35	121.609	130.341	223.375	0	223.375	251.658	251.658
33	0.621911	138.912	-11.6879	R	0	35	111.949	119.987	205.63	0	205.63	228.789	228.789
34	0.621911	123.83	-10.2904	R	0	35	101.269	108.54	186.014	0	186.014	204.4	204.4
35	0.621911	108.553	-8.89918	R	0	35	90.089	96.5574	165.477	0	165.477	179.583	179.583
36	0.621911	100.834	-7.5132	R	0	35	84.9253	91.0229	155.993	0	155.993	167.194	167.194
37	0.621911	101.75	-6.13163	R	0	35	86.9765	93.2214	159.761	0	159.761	169.104	169.104
38	0.621911	102.487	-4.75363	R	0	35	88.9239	95.3086	163.338	0	163.338	170.732	170.732
39	0.621911	98.3623	-3.37838	R	0	35	86.6399	92.8606	159.142	0	159.142	164.257	164.257
40	0.621911	82.6561	-2.00508	R	0	35	73.9223	79.2299	135.782	0	135.782	138.37	138.37
41	0.621911	66.2494	-0.632936	R	0	35	60.1699	64.4901	110.522	0	110.522	111.186	111.186
42	0.621911	49.6574	0.738847	R	0	35	45.8119	49.1012	84.1485	0	84.1485	83.5577	83.5577
43	0.621911	41.1882	2.11106	R	0	35	38.608	41.3801	70.9162	0	70.9162	69.4931	69.4931
44	0.621911	40.8101	3.48448	R	0	35	38.8789	41.6704	71.4139	0	71.4139	69.0465	69.0465
45	0.621911	40.2458	4.85991	R	0	35	38.9812	41.7801	71.6017	0	71.6017	68.2873	68.2873
46	0.621911	34.3835	6.23815	R	0	35	33.872	36.304	62.217	0	62.217	58.5145	58.5145
47	0.621911	17.2416	7.62003	R	0	35	17.2827	18.5236	31.7452	0	31.7452	29.4331	29.4331
48	0.621911	5.07571	9.00639	R	0	35	5.17941	5.55129	9.51367	0	9.51367	8.69274	8.69274
49	0.621911	2.40943	10.3981	R	0	35	2.50427	2.68408	4.59991	0	4.59991	4.14038	4.14038
50	0.274648	0.242455	11.4044	AC alt	50	30	44.0781	47.2429	11.5899	0	11.5899	2.69871	2.69871

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.06258**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.63147	11.7442	-70.8311	R	0	35	4.50665	4.78868	8.2067	0	8.2067	21.1707	21.1707
2	0.63147	33.2972	-67.3059	R	0	35	12.016	12.768	21.8815	0	21.8815	50.615	50.615
3	0.63147	51.645	-64.2461	R	0	35	19.5226	20.7443	35.5511	0	35.5511	76.0185	76.0185
4	0.63147	67.8007	-61.4967	R	0	35	26.929	28.6142	49.0383	0	49.0383	98.6286	98.6286
5	0.63147	82.3203	-58.9734	R	0	35	34.1992	36.3394	62.2777	0	62.2777	119.135	119.135
6	0.63147	95.5496	-56.6237	R	0	35	41.3211	43.907	75.2468	0	75.2468	137.97	137.97
7	0.63147	107.722	-54.4127	R	0	35	48.2923	51.3144	87.9414	0	87.9414	155.427	155.427
8	0.63147	119.003	-52.3155	R	0	35	55.115	58.5641	100.366	0	100.366	171.716	171.716
9	0.63147	129.518	-50.3136	R	0	35	61.7937	65.6608	112.528	0	112.528	186.995	186.995
10	0.63147	139.36	-48.3928	R	0	35	68.3339	72.6102	124.438	0	124.438	201.385	201.385
11	0.63147	148.606	-46.5422	R	0	35	74.7406	79.4179	136.104	0	136.104	214.981	214.981
12	0.63147	157.314	-44.7527	R	0	35	81.0197	86.0899	147.539	0	147.539	227.862	227.862
13	0.63147	165.535	-43.0172	R	0	35	87.176	92.6315	158.75	0	158.75	240.092	240.092
14	0.63147	173.309	-41.3294	R	0	35	93.1823	99.0136	169.688	0	169.688	251.635	251.635
15	0.63147	180.308	-39.6843	R	0	35	96.8144	102.873	176.302	0	176.302	256.635	256.635
16	0.63147	186.581	-38.0776	R	0	35	102.198	108.594	186.105	0	186.105	266.175	266.175
17	0.63147	192.078	-36.5054	R	0	35	107.23	113.94	195.269	0	195.269	274.63	274.63
18	0.63147	193.419	-34.9646	R	0	35	109.966	116.848	200.252	0	200.252	277.15	277.15
19	0.63147	193.523	-33.4523	R	0	35	111.975	118.982	203.91	0	203.91	277.89	277.89
20	0.63147	193.326	-31.9659	R	0	35	113.775	120.895	207.188	0	207.188	278.188	278.188
21	0.63147	192.845	-30.5033	R	0	35	115.373	122.593	210.097	0	210.097	278.066	278.066
22	0.63147	192.09	-29.0623	R	0	35	116.772	124.08	212.645	0	212.645	277.539	277.539
23	0.63147	191.075	-27.6412	R	0	35	117.977	125.36	214.84	0	214.84	276.625	276.625
24	0.63147	190.013	-26.2384	R	0	35	119.12	126.574	216.919	0	216.919	275.632	275.632
25	0.63147	192.433	-24.8523	R	0	35	122.446	130.109	222.978	0	222.978	279.692	279.692
26	0.63147	196.012	-23.4816	R	0	35	126.56	134.48	230.47	0	230.47	285.451	285.451
27	0.63147	199.263	-22.1249	R	0	35	130.523	138.691	237.684	0	237.684	290.75	290.75
28	0.63147	192.081	-20.7813	R	0	35	127.614	135.6	232.387	0	232.387	280.816	280.816
29	0.63147	177.901	-19.4494	R	0	35	119.858	127.359	218.265	0	218.265	260.59	260.59
30	0.63147	163.513	-18.1285	R	0	35	111.7	118.69	203.41	0	203.41	239.98	239.98
31	0.63147	150.407	-16.8174	R	0	35	104.167	110.686	189.691	0	189.691	221.175	221.175
32	0.63147	149.811	-15.5154	R	0	35	105.178	111.76	191.532	0	191.532	220.731	220.731
33	0.63147	151.928	-14.2215	R	0	35	108.121	114.887	196.89	0	196.89	224.292	224.292
34	0.63147	153.322	-12.935	R	0	35	110.597	117.518	201.4	0	201.4	226.801	226.801
35	0.63147	142.776	-11.6551	R	0	35	104.387	110.92	190.093	0	190.093	211.625	211.625
36	0.63147	127.231	-10.3811	R	0	35	94.2837	100.184	171.693	0	171.693	188.965	188.965
37	0.63147	111.502	-9.11219	R	0	35	83.751	88.9921	152.513	0	152.513	165.946	165.946
38	0.63147	98.2403	-7.84782	R	0	35	74.7951	79.4758	136.204	0	136.204	146.513	146.513
39	0.63147	97.5686	-6.58729	R	0	35	75.3005	80.0128	137.124	0	137.124	145.82	145.82
40	0.63147	98.4011	-5.32996	R	0	35	76.9887	81.8067	140.198	0	140.198	147.381	147.381
41	0.63147	97.7618	-4.07519	R	0	35	77.5499	82.403	141.22	0	141.22	146.746	146.746
42	0.63147	84.3329	-2.82238	R	0	35	67.8342	72.0793	123.528	0	123.528	126.872	126.872
43	0.63147	67.5403	-1.57092	R	0	35	55.096	58.5439	100.331	0	100.331	101.842	101.842
44	0.63147	50.5733	-0.320214	R	0	35	41.8465	44.4653	76.2037	0	76.2037	76.4376	76.4376
45	0.63147	37.5754	0.930342	R	0	35	31.5435	33.5175	57.4416	0	57.4416	56.9293	56.9293
46	0.63147	36.5694	2.18134	R	0	35	31.1523	33.1018	56.7293	0	56.7293	55.5427	55.5427
47	0.63147	36.1783	3.43338	R	0	35	31.2823	33.2399	56.9658	0	56.9658	55.089	55.089
48	0.63147	33.2203	4.68707	R	0	35	29.1646	30.9897	53.1095	0	53.1095	50.7184	50.7184
49	0.63147	17.2768	5.94301	R	0	35	15.4049	16.3689	28.0526	0	28.0526	26.449	26.449
50	0.63147	2.34671	7.20183	R	0	35	2.12591	2.25895	3.87135	0	3.87135	3.60271	3.60271

# Interslice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.0654

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	104.568	340.322	0	0	0
2	105.156	336.894	60.6736	0	0
3	105.744	334.907	154.629	0	0
4	106.331	333.376	261.138	0	0
5	106.919	332.099	373.309	0	0
6	107.507	330.991	487.452	0	0
7	108.094	330.008	601.233	0	0
8	108.682	329.122	713.033	0	0
9	109.27	328.314	821.655	0	0
10	109.857	327.574	918.603	0	0
11	110.445	326.89	1009.12	0	0
12	111.033	326.256	1094.66	0	0
13	111.62	325.666	1173.73	0	0
14	112.208	325.115	1245.16	0	0
15	112.796	324.601	1309.02	0	0
16	113.383	324.12	1365.37	0	0
17	113.971	323.669	1414.32	0	0
18	114.559	323.246	1455.98	0	0
19	115.147	322.851	1490.46	0	0
20	115.734	322.48	1517.93	0	0
21	116.322	322.132	1538.89	0	0
22	116.91	321.807	1553.3	0	0
23	117.497	321.504	1560.98	0	0
24	118.085	321.221	1561.71	0	0
25	118.673	320.958	1556.06	0	0
26	119.26	320.713	1544.96	0	0
27	119.848	320.487	1529.31	0	0
28	120.436	320.279	1398.69	0	0
29	121.023	320.088	1372.92	0	0
30	121.611	319.914	1341.46	0	0
31	122.199	319.756	1304.75	0	0
32	122.786	319.614	1155.57	0	0
33	123.374	319.489	1116.07	0	0
34	123.962	319.378	1076.86	0	0
35	124.549	319.284	1037.97	0	0
36	125.137	319.204	995.501	0	0
37	125.725	319.139	948.891	0	0
38	126.313	319.089	898.211	0	0
39	126.9	319.054	848.664	0	0
40	127.488	319.034	803.986	0	0
41	128.076	319.029	765.396	0	0
42	128.663	319.038	733.959	0	0
43	129.251	319.061	703.966	0	0
44	129.839	319.1	672.371	0	0
45	130.426	319.153	639.287	0	0
46	131.014	319.221	608.914	0	0
47	131.602	319.304	590.695	0	0
48	132.189	319.403	582.867	0	0
49	132.777	319.517	577.354	0	0
50	133.302	319.632	553.938	0	0
51	133.828	319.759	0	0	0

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.0718**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	102.423	340.175	0	0	0
2	103.045	337.702	20.8403	0	0
3	103.667	335.899	64.3961	0	0
4	104.289	334.427	120.756	0	0
5	104.911	333.163	185.017	0	0
6	105.532	332.049	254.163	0	0
7	106.154	331.05	326.123	0	0
8	106.776	330.141	399.376	0	0
9	107.398	329.308	472.751	0	0
10	108.02	328.54	545.309	0	0
11	108.642	327.828	616.283	0	0
12	109.264	327.165	685.026	0	0
13	109.886	326.546	749.901	0	0
14	110.508	325.967	811.139	0	0
15	111.13	325.424	868.608	0	0
16	111.752	324.915	921.113	0	0
17	112.373	324.436	968.077	0	0
18	112.995	323.987	1009.52	0	0
19	113.617	323.565	1045.48	0	0
20	114.239	323.168	1075.99	0	0
21	114.861	322.796	1101.12	0	0
22	115.483	322.446	1120.93	0	0
23	116.105	322.119	1135.67	0	0
24	116.727	321.812	1145.45	0	0
25	117.349	321.526	1150.09	0	0
26	117.971	321.259	1149.45	0	0
27	118.593	321.011	1143.9	0	0
28	119.215	320.782	1134.18	0	0
29	119.836	320.57	1121.02	0	0
30	120.458	320.376	994.642	0	0
31	121.08	320.198	973.614	0	0
32	121.702	320.037	948.065	0	0
33	122.324	319.893	918.692	0	0
34	122.946	319.764	888.179	0	0
35	123.568	319.651	747.737	0	0
36	124.19	319.554	717.713	0	0
37	124.812	319.472	686.878	0	0
38	125.434	319.405	652.729	0	0
39	126.056	319.353	615.211	0	0
40	126.677	319.317	576.132	0	0
41	127.299	319.295	540.646	0	0
42	127.921	319.288	510.021	0	0
43	128.543	319.296	485.379	0	0
44	129.165	319.319	463.496	0	0
45	129.787	319.357	440.33	0	0
46	130.409	319.41	415.968	0	0
47	131.031	319.478	393.806	0	0
48	131.653	319.561	381.988	0	0
49	132.275	319.659	378.291	0	0
50	132.897	319.773	376.429	0	0
51	133.171	319.829	0	0	0

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.06258**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	100.566	340.048	0	0	0
2	101.197	338.231	13.3908	0	0
3	101.829	336.721	42.1353	0	0
4	102.46	335.412	81.3031	0	0
5	103.092	334.249	127.755	0	0
6	103.723	333.199	179.295	0	0
7	104.355	332.241	234.288	0	0
8	104.986	331.359	291.463	0	0
9	105.618	330.541	349.801	0	0
10	106.249	329.78	408.463	0	0
11	106.881	329.069	466.743	0	0
12	107.512	328.403	524.038	0	0
13	108.144	327.777	579.825	0	0
14	108.775	327.187	633.644	0	0
15	109.407	326.632	685.071	0	0
16	110.038	326.108	732.728	0	0
17	110.67	325.613	777.254	0	0
18	111.301	325.146	818.291	0	0
19	111.932	324.704	854.888	0	0
20	112.564	324.287	886.872	0	0
21	113.195	323.893	914.275	0	0
22	113.827	323.521	937.139	0	0
23	114.458	323.17	955.515	0	0
24	115.09	322.839	969.462	0	0
25	115.721	322.528	979.06	0	0
26	116.353	322.236	984.477	0	0
27	116.984	321.961	985.631	0	0
28	117.616	321.705	982.377	0	0
29	118.247	321.465	974.972	0	0
30	118.879	321.242	964.156	0	0
31	119.51	321.035	839.866	0	0
32	120.142	320.844	823.989	0	0
33	120.773	320.669	804.791	0	0
34	121.405	320.509	781.861	0	0
35	122.036	320.364	644.497	0	0
36	122.667	320.234	616.342	0	0
37	123.299	320.118	588.252	0	0
38	123.93	320.017	560.967	0	0
39	124.562	319.93	534.538	0	0
40	125.193	319.857	505.873	0	0
41	125.825	319.798	474.478	0	0
42	126.456	319.753	440.764	0	0
43	127.088	319.722	409.455	0	0
44	127.719	319.705	382.552	0	0
45	128.351	319.701	361.002	0	0
46	128.982	319.711	343.917	0	0
47	129.614	319.735	326.211	0	0
48	130.245	319.773	307.594	0	0
49	130.877	319.825	289.454	0	0
50	131.508	319.891	279.456	0	0
51	132.14	319.97	0	0	0

## Discharge Sections

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### Entity Information

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#### ◆ SLU

##### Shared Entities

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64
	180.625, 311.703
	179.812, 311.839
	179.723, 311.846

178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
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175.979, 312.68  
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174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
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164.733, 314.633  
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164.07, 314.761  
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163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
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156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52  
151.791, 316.568  
151.361, 316.642  
150.961, 316.72

External Boundary

150.563, 316.814  
149.573, 317.001  
149.066, 317.119  
148.57, 317.224  
147.953, 317.359  
147.598, 317.443  
147.299, 317.493  
146.854, 317.583  
146.019, 317.733  
145.925, 317.758  
144.965, 318  
144.923, 318.015  
144.676, 318.09  
144.626, 318.096  
143.617, 318.401  
143.4, 318.414  
142.609, 318.643  
141.925, 318.797  
141.499, 318.812  
141.223, 318.825  
140.62, 318.927  
140.37, 318.959  
139.669, 318.979  
139.185, 319.043  
138.625, 319.068  
138.322, 319.113  
137.879, 319.142  
137.769, 319.159  
137.61, 319.171  
137.352, 319.223  
135.236, 319.686  
134.2, 319.735  
133.61, 319.774  
132.936, 319.859  
132.623, 319.907  
132.182, 319.964  
131.931, 320  
131.729, 320.076  
131.721, 320.092  
130.543, 322.619  
128.543, 322.619  
126.21, 327.619  
124.21, 327.619  
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119.878, 332.619  
117.547, 337.619  
115.547, 337.619  
111.047, 340.62  
109.397, 340.653  
96.9967, 339.803  
92.206, 339.931  
78.563, 339.14  
76.9128, 339.108  
68.1212, 333.247  
65.4218, 334.161  
62.7107, 335.219  
62.056, 335.55  
61.3599, 336  
60.905, 336.17



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59.672, 336.622  
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58.1148, 337.114  
57.8762, 337.206  
56.9205, 337.012  
56.3362, 337.134  
55.7206, 337.305  
54.7744, 337.618  
53.8336, 338  
52.7348, 338.403  
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50.9233, 339.223  
50.1857, 339.596  
50.121, 339.637  
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48.1368, 340.701  
47.2093, 341.067  
46.6663, 341.333  
46.4381, 341.424  
45.2371, 341.895  
45.1988, 341.912  
45.1668, 341.926  
45.1352, 341.938  
44.9566, 342  
43.9785, 342.368  
43.6906, 342.459  
43.1313, 342.638  
42.5615, 342.805  
42.0121, 342.929  
41.4108, 343.109  
40.0761, 343.478  
39.6983, 343.565  
39.0569, 343.696  
38.8454, 343.553  
37.7178, 343.965  
37.6252, 344  
36.5454, 344.291  
35.8231, 344.472  
34.8494, 344.749  
33.553, 345.058  
32.7793, 345.274  
32.4141, 345.388  
31.5581, 345.604  
31.3936, 345.675  
30.9158, 345.595  
30.4833, 345.806  
30.1441, 346  
29.3156, 346.186  
28.9408, 346.261  
26.846, 346.693  
26.3194, 346.778  
25.8928, 346.872

	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978



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12.9744, 345.467
14.0755, 344.967
18.2313, 344.215
19.4458, 343.988
24.0355, 343.318
24.456, 343.247
25.1862, 343.086
25.7646, 342.993
27.7091, 342.592
27.7591, 342.582
31.2928, 341.656
31.9142, 341.482
33.1927, 341.177
34.1211, 340.913
34.8964, 340.719
35.5591, 340.54
40.9307, 339.224
41.1563, 339.158
41.6309, 339.006
41.7252, 338.976
42.6077, 338.644
42.6609, 338.626
43.7908, 338.182
44.3444, 337.912
45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562

Material Boundary

136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

Water Table

131.806, 317.053  
131.922, 317.01  
133.086, 316.845  
133.48, 316.793  
133.814, 316.742  
134.832, 316.614  
135.735, 316.555  
136.168, 316.534  
137.697, 316.2  
138.507, 316.038  
138.848, 316.012  
138.992, 315.99  
139.452, 315.959  
139.843, 315.901  
140.471, 315.874  
141.016, 315.802  
141.638, 315.784  
142.344, 315.664  
142.794, 315.643  
144.025, 315.286  
144.192, 315.277  
144.567, 315.163  
144.618, 315.145  
144.674, 315.131  
144.954, 315.046  
145.062, 315.033  
145.922, 314.816  
146.284, 314.721  
147.333, 314.533  
147.827, 314.432  
148, 314.403  
148.166, 314.364  
148.871, 314.211  
149.314, 314.116  
149.911, 313.978  
150.884, 313.794  
151.262, 313.705  
151.904, 313.58  
152.464, 313.484  
152.816, 313.428  
153.706, 313.286  
153.968, 313.246  
154.96, 313.103  
155.062, 313.089  
155.865, 312.957  
156.182, 312.896  
157.23, 312.773  
157.292, 312.761  
158.805, 312.557  
158.925, 312.531  
159.624, 312.444  
160.195, 312.293  
160.861, 312.226  
161.102, 312.15  
162.121, 312.063  
162.398, 311.975  
163.373, 311.958  
163.815, 311.804  
164.095, 311.785



164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv>0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
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169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
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167.495, 314  
166.921, 314.116  
166.851, 314.133  
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165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52

External Boundary

151.791, 316.568  
151.361, 316.642  
150.961, 316.72  
150.563, 316.814  
149.573, 317.001  
149.066, 317.119  
148.57, 317.224  
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147.598, 317.443  
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92.206, 339.931  
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76.9128, 339.108  
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65.4218, 334.161  
62.7107, 335.219

62.056, 335.55
61.3599, 336
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46.6663, 341.333
46.4381, 341.424
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45.1988, 341.912
45.1668, 341.926
45.1352, 341.938
44.9566, 342
43.9785, 342.368
43.6906, 342.459
43.1313, 342.638
42.5615, 342.805
42.0121, 342.929
41.4108, 343.109
40.0761, 343.478
39.6983, 343.565
39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
35.8231, 344.472
34.8494, 344.749
33.553, 345.058
32.7793, 345.274
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31.5581, 345.604
31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261

	26.846, 346.693
	26.3194, 346.778
	25.8928, 346.872
	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978

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25.1862, 343.086
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27.7591, 342.582
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42.6077, 338.644
42.6609, 338.626
43.7908, 338.182
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46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562





Material Boundary


136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

Water Table

131.806, 317.053  
131.922, 317.01  
133.086, 316.845  
133.48, 316.793  
133.814, 316.742  
134.832, 316.614  
135.735, 316.555  
136.168, 316.534  
137.697, 316.2  
138.507, 316.038  
138.848, 316.012  
138.992, 315.99  
139.452, 315.959  
139.843, 315.901  
140.471, 315.874  
141.016, 315.802  
141.638, 315.784  
142.344, 315.664  
142.794, 315.643  
144.025, 315.286  
144.192, 315.277  
144.567, 315.163  
144.618, 315.145  
144.674, 315.131  
144.954, 315.046  
145.062, 315.033  
145.922, 314.816  
146.284, 314.721  
147.333, 314.533  
147.827, 314.432  
148, 314.403  
148.166, 314.364  
148.871, 314.211  
149.314, 314.116  
149.911, 313.978  
150.884, 313.794  
151.262, 313.705  
151.904, 313.58  
152.464, 313.484  
152.816, 313.428  
153.706, 313.286  
153.968, 313.246  
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156.182, 312.896  
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157.292, 312.761  
158.805, 312.557  
158.925, 312.531  
159.624, 312.444  
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160.861, 312.226  
161.102, 312.15  
162.121, 312.063  
162.398, 311.975  
163.373, 311.958  
163.815, 311.804  
164.095, 311.785

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
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176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
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180.811, 308.7
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182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv<0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
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167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
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164.426, 314.72  
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161.727, 315.145  
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160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
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154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
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	151.361, 316.642
	150.961, 316.72
	150.563, 316.814
	149.573, 317.001
	149.066, 317.119
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	143.4, 318.414
	142.609, 318.643
	141.925, 318.797
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	140.62, 318.927
	140.37, 318.959
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External Boundary	138.625, 319.068
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	137.769, 319.159
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28.9408, 346.261

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	25.8928, 346.872
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	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
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	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978



12.6593, 345.59
12.9744, 345.467
14.0755, 344.967
18.2313, 344.215
19.4458, 343.988
24.0355, 343.318
24.456, 343.247
25.1862, 343.086
25.7646, 342.993
27.7091, 342.592
27.7591, 342.582
31.2928, 341.656
31.9142, 341.482
33.1927, 341.177
34.1211, 340.913
34.8964, 340.719
35.5591, 340.54
40.9307, 339.224
41.1563, 339.158
41.6309, 339.006
41.7252, 338.976
42.6077, 338.644
42.6609, 338.626
43.7908, 338.182
44.3444, 337.912
45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562

Material Boundary

136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

Water Table

131.806, 317.053  
131.922, 317.01  
133.086, 316.845  
133.48, 316.793  
133.814, 316.742  
134.832, 316.614  
135.735, 316.555  
136.168, 316.534  
137.697, 316.2  
138.507, 316.038  
138.848, 316.012  
138.992, 315.99  
139.452, 315.959  
139.843, 315.901  
140.471, 315.874  
141.016, 315.802  
141.638, 315.784  
142.344, 315.664  
142.794, 315.643  
144.025, 315.286  
144.192, 315.277  
144.567, 315.163  
144.618, 315.145  
144.674, 315.131  
144.954, 315.046  
145.062, 315.033  
145.922, 314.816  
146.284, 314.721  
147.333, 314.533  
147.827, 314.432  
148, 314.403  
148.166, 314.364  
148.871, 314.211  
149.314, 314.116  
149.911, 313.978  
150.884, 313.794  
151.262, 313.705  
151.904, 313.58  
152.464, 313.484  
152.816, 313.428  
153.706, 313.286  
153.968, 313.246  
154.96, 313.103  
155.062, 313.089  
155.865, 312.957  
156.182, 312.896  
157.23, 312.773  
157.292, 312.761  
158.805, 312.557  
158.925, 312.531  
159.624, 312.444  
160.195, 312.293  
160.861, 312.226  
161.102, 312.15  
162.121, 312.063  
162.398, 311.975  
163.373, 311.958  
163.815, 311.804  
164.095, 311.785



164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No



23-09-13 TA 2 interna  
Slide2 - An Interactive Slope Stability Program  
Date Created: 08/09/2023, 11:07:04  
Software Version: 9.029

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# Slide2 Analysis Information

## 23-09-13 TA 2 interna




### Project Summary

---

File Name: 23-09-13 TA 2 interna.slmd  
 Slide2 Modeler Version: 9.029  
 Project Title: Slide2 - An Interactive Slope Stability Program  
 Date Created: 08/09/2023, 11:07:04

### Currently Open Scenarios

---

Group Name	Scenario Name	Global Minimum	Compute Time
SLU 	Master Scenario	Bishop Simplified: 1.220660	00h:00m:02.21s
SLV kv>0 	Master Scenario	Bishop Simplified: 1.273090	00h:00m:01.965s
SLV kv<0 	Master Scenario	Bishop Simplified: 1.295540	00h:00m:01.953s

## General Settings

---

Units of Measurement:

Time Units:

Permeability Units:

Data Output:

Failure Direction:

Metric Units

days

meters/second

Standard

Left to Right

## Design Standard

---

### ◆ SLU

Selected Type: Eurocode 7 (User Defined)  
 Name: A2+M2+R2

Type	Partial Factor
Permanent Actions: Unfavourable	1.35
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1.5
Variable Actions: Favourable	0
Effective cohesion	1.25
Coefficient of shearing resistance	1.25
Undrained strength	1.4
Weight density	1
Shear strength (other models)	1
Earth resistance	1.1
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv>0

Selected Type: Eurocode 7 (User Defined)  
 Name: SISMA

Type	Partial Factor
Permanent Actions: Unfavourable	1
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1
Variable Actions: Favourable	1
Effective cohesion	1
Coefficient of shearing resistance	1
Undrained strength	1
Weight density	1
Shear strength (other models)	1
Earth resistance	1.2
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv<0



Selected Type: Eurocode 7 (User Defined)

Name: SISMA

Type	Partial Factor
Permanent Actions: Unfavourable	1
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1
Variable Actions: Favourable	1
Effective cohesion	1
Coefficient of shearing resistance	1
Undrained strength	1
Weight density	1
Shear strength (other models)	1
Earth resistance	1.2
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

# Analysis Options

---

## All Open Scenarios

Slices Type:	Vertical
<b>Analysis Methods Used</b>	
	Bishop simplified
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

---

## All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [kN/m <sup>3</sup> ]:	9.81
Advanced Groundwater Method:	None

# Random Numbers

---

## All Open Scenarios

Pseudo-random Seed:

10116

Random Number Generation Method:

Park and Miller v.3

# Surface Options

---

## All Open Scenarios

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

---

## ◆ SLU

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

## ◆ SLV kv>0

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	0.045

## ◆ SLV kv<0

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	-0.045

# Loading

---

## ◆ SLU

Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live
Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live

## ◆ SLV kv>0

Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live


## ◆ SLV kv<0

Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live


## Materials

---


### R

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	0 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


### R resistente

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	50 kPa
Phi	30 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	90 kPa
Phi	32 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

## Materials In Use


---




Material		SLU	SLV kv>0	SLV kv<0
R		✓	✓	✓
R esistente		✓	✓	✓
AC alt		✓	✓	✓
AC		✓	✓	✓

## Support


### 200/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 200/30
Ultimate Tensile Strength	200 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	117.625 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	120 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

### 150/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 150/30
Ultimate Tensile Strength	150 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	88.2187 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	90 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

**80/30**

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 80/30
Ultimate Tensile Strength	80 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	47.05 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	50 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

# Global Minimums

---

## ◆ SLU

**Method: bishop simplified**

FS	1.220660
Center:	128.860, 340.558
Radius:	20.858
Left Slip Surface Endpoint:	108.002, 340.558
Right Slip Surface Endpoint:	132.177, 319.965
Resisting Moment:	76986.6 kN-m
Driving Moment:	63069.4 kN-m
Passive Support Moment:	15757.7 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	889.116 kN
Total Slice Area:	215.318 m <sup>2</sup>
Surface Horizontal Width:	24.1754 m
Surface Average Height:	8.90651 m

## ◆ SLV kv>0

**Method: bishop simplified**

FS	1.273090
Center:	128.860, 340.558
Radius:	20.858
Left Slip Surface Endpoint:	108.002, 340.558
Right Slip Surface Endpoint:	132.175, 319.965
Resisting Moment:	67117.3 kN-m
Driving Moment:	52720.2 kN-m
Passive Support Moment:	15758.9 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	889.19 kN
Total Slice Area:	215.31 m <sup>2</sup>
Surface Horizontal Width:	24.1734 m
Surface Average Height:	8.9069 m

## ◆ SLV kv<0

**Method: bishop simplified**

<b>FS</b>	<b>1.295540</b>
Center:	128.859, 340.558
Radius:	20.858
Left Slip Surface Endpoint:	108.001, 340.558
Right Slip Surface Endpoint:	132.178, 319.965
Resisting Moment:	62937.5 kN-m
Driving Moment:	48580 kN-m
Passive Support Moment:	15752.5 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	888.771 kN
Total Slice Area:	215.342 m <sup>2</sup>
Surface Horizontal Width:	24.1772 m
Surface Average Height:	8.90683 m

## Global Minimum Support Data

### ◆ SLU

Method: bishop simplified

Number of Supports: 26

#### 200/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	8.16762	4.83238	8.16762	4.83238	117.625
131.223, 321.159	13	10.0241	2.97589	10.0241	2.97589	117.625
130.883, 321.889	13	11.3238	1.67617	11.3238	1.67617	117.625
128.543, 322.619	13	10.323	2.67698	10.323	2.67698	117.625
128.202, 323.349	12.9999	11.1256	1.87435	11.1256	1.87435	117.625
127.862, 324.079	12.9999	11.7854	1.21449	11.7854	1.21449	117.625
127.521, 324.809	12.9998	12.3352	0.664636	12.3352	0.664636	117.625
127.181, 325.539	12.9997	12.7919	0.207838	12.7919	0.207838	65.7413
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 150/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 80/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

◆ **SLV kv>0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	8.1663	4.8337	8.1663	4.8337	117.625
131.223, 321.159	13	10.0232	2.97678	10.0232	2.97678	117.625
130.883, 321.889	13	11.3233	1.67675	11.3233	1.67675	117.625
128.543, 322.619	13	10.3225	2.67749	10.3225	2.67749	117.625
128.202, 323.349	12.9999	11.1252	1.87472	11.1252	1.87472	117.625
127.862, 324.079	12.9999	11.7851	1.21479	11.7851	1.21479	117.625
127.521, 324.809	12.9998	12.3349	0.664879	12.3349	0.664879	117.625
127.181, 325.539	12.9997	12.7917	0.208071	12.7917	0.208071	65.8151
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0

123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

### ◆ **SLV kv<0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	8.16955	4.83045	8.16955	4.83045	117.625
131.223, 321.159	13	10.0257	2.97429	10.0257	2.97429	117.625
130.883, 321.889	13	11.3252	1.67481	11.3252	1.67481	117.625
128.543, 322.619	13	10.3243	2.67567	10.3243	2.67567	117.625
128.202, 323.349	12.9999	11.1268	1.87316	11.1268	1.87316	117.625
127.862, 324.079	12.9999	11.7865	1.21334	11.7865	1.21334	117.625



127.521, 324.809	12.9998	12.3363	0.663541	12.3363	0.663541	117.625
127.181, 325.539	12.9997	12.793	0.206745	12.793	0.206745	65.3958
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

## Valid and Invalid Surfaces

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### ◆ SLU

**Method: bishop simplified**

Number of Valid Surfaces:	7512
Number of Invalid Surfaces:	0

### ◆ SLV kv>0

**Method: bishop simplified**

Number of Valid Surfaces:	7245
Number of Invalid Surfaces:	0

### ◆ SLV kv<0

**Method: bishop simplified**

Number of Valid Surfaces:	7615
Number of Invalid Surfaces:	0

# Slice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.22066

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.483507	29.3611	-83.8196	R	0	29.2561	7.23315	8.82922	17.338	0	17.338	84.1333	84.1333
2	0.483507	70.7683	-75.0621	R	0	29.2561	27.0696	33.0428	64.886	0	64.886	166.351	166.351
3	0.483507	91.9374	-70.4956	R	0	29.2561	39.4056	48.1008	94.4556	0	94.4556	205.706	205.706
4	0.483507	108.31	-66.8189	R	0	29.2561	45.138	55.0981	108.196	0	108.196	213.607	213.607
5	0.483507	121.922	-63.6361	R	0	29.2561	54.6538	66.7137	131.006	0	131.006	241.28	241.28
6	0.483507	133.806	-60.7799	R	0	29.2561	63.4542	77.456	152.1	0	152.1	265.545	265.545
7	0.483507	143.396	-58.1605	R	0	29.2561	71.1844	86.8919	170.629	0	170.629	285.262	285.262
8	0.483507	149.079	-55.7224	R	0	29.2561	76.9095	93.8803	184.353	0	184.353	297.193	297.193
9	0.483507	153.753	-53.4286	R	0	29.2561	82.0015	100.096	196.559	0	196.559	307.089	307.089
10	0.483507	157.73	-51.2528	R	0	29.2561	86.6204	105.734	207.63	0	207.63	315.568	315.568
11	0.483507	161.106	-49.1759	R	0	29.2561	90.8214	110.862	217.699	0	217.699	322.827	322.827
12	0.483507	163.955	-47.1829	R	0	29.2561	94.6455	115.53	226.867	0	226.867	329.014	329.014
13	0.483507	166.336	-45.2622	R	0	29.2561	98.1289	119.782	235.216	0	235.216	334.248	334.248
14	0.483507	168.296	-43.4046	R	0	29.2561	101.297	123.649	242.81	0	242.81	338.617	338.617
15	0.483507	169.873	-41.6024	R	0	29.2561	104.175	127.162	249.708	0	249.708	342.207	342.207
16	0.483507	171.429	-39.8492	R	0	29.2561	106.986	130.594	256.448	0	256.448	345.741	345.741
17	0.483507	175.773	-38.1398	R	0	29.2561	111.524	136.133	267.323	0	267.323	354.895	354.895
18	0.483507	180.584	-36.4696	R	0	29.2561	116.384	142.065	278.975	0	278.975	364.999	364.999
19	0.483507	185.113	-34.8347	R	0	29.2561	121.095	147.816	290.266	0	290.266	374.539	374.539
20	0.483507	188.922	-33.2317	R	0	29.2561	125.362	153.024	300.494	0	300.494	382.627	382.627
21	0.483507	183.112	-31.6575	R	0	29.2561	123.182	150.363	295.268	0	295.268	371.22	371.22
22	0.483507	173.353	-30.1097	R	0	29.2561	118.166	144.24	283.244	0	283.244	351.769	351.769
23	0.483507	163.367	-28.5857	R	0	29.2561	112.789	137.677	270.357	0	270.357	331.815	331.815
24	0.483507	153.165	-27.0835	R	0	29.2561	107.062	130.686	256.629	0	256.629	311.376	311.376
25	0.483507	144.048	-25.6012	R	0	29.2561	101.908	124.395	244.276	0	244.276	293.105	293.105
26	0.483507	144.829	-24.1371	R	0	29.2561	103.671	126.547	248.5	0	248.5	294.955	294.955
27	0.483507	147.563	-22.6895	R	0	29.2561	106.846	130.423	256.113	0	256.113	300.785	300.785
28	0.483507	150.11	-21.2572	R	0	29.2561	109.92	134.175	263.48	0	263.48	306.242	306.242
29	0.483507	151.865	-19.8386	R	0	29.2561	112.441	137.252	269.521	0	269.521	310.087	310.087
30	0.483507	143.833	-18.4326	R	0	29.2561	107.658	131.414	258.057	0	258.057	293.938	293.938
31	0.483507	132.319	-17.038	R	0	29.2561	100.108	122.198	239.96	0	239.96	270.638	270.638
32	0.483507	120.638	-15.6537	R	0	29.2561	92.2427	112.597	221.108	0	221.108	246.955	246.955
33	0.483507	108.793	-14.2788	R	0	29.2561	84.0635	102.613	201.501	0	201.501	222.896	222.896
34	0.483507	98.3276	-12.9122	R	0	29.2561	76.7729	93.7136	184.026	0	184.026	201.626	201.626
35	0.483507	97.8473	-11.553	R	0	29.2561	77.1932	94.2266	185.033	0	185.033	200.813	200.813
36	0.483507	99.0603	-10.2004	R	0	29.2561	78.9602	96.3836	189.269	0	189.269	203.476	203.476
37	0.483507	100.12	-8.85354	R	0	29.2561	80.6299	98.4217	193.271	0	193.271	205.83	205.83
38	0.483507	100.242	-7.51158	R	0	29.2561	81.5622	99.5597	195.506	0	195.506	206.26	206.26
39	0.483507	90.4062	-6.17377	R	0	29.2561	74.3205	90.7201	178.147	0	178.147	186.187	186.187
40	0.483507	77.4818	-4.83932	R	0	29.2561	64.3564	78.5573	154.263	0	154.263	159.712	159.712
41	0.483507	64.4094	-3.5075	R	0	29.2561	54.0558	65.9838	129.573	0	129.573	132.886	132.886
42	0.483507	51.1899	-2.17758	R	0	29.2561	43.4117	52.9909	104.058	0	104.058	105.709	105.709
43	0.483507	39.636	-0.848834	R	0	29.2561	33.9686	41.4641	81.4232	0	81.4232	81.9264	81.9264
44	0.483507	38.0814	0.479457	R	0	29.2561	32.9844	40.2627	79.0639	0	79.0639	78.7879	78.7879
45	0.483507	37.9553	1.80801	R	0	29.2561	33.2299	40.5624	79.6524	0	79.6524	78.6035	78.6035
46	0.483507	37.6827	3.13753	R	0	29.2561	33.3519	40.7113	79.9448	0	79.9448	78.1166	78.1166
47	0.483507	36.2803	4.46875	R	0	29.2561	32.4669	39.631	77.8236	0	77.8236	75.2862	75.2862
48	0.483507	24.7718	5.80239	R	0	29.2561	22.4181	27.3649	53.7365	0	53.7365	51.4584	51.4584
49	0.483507	10.5228	7.13919	R	0	29.2561	9.63241	11.7579	23.089	0	23.089	21.8825	21.8825
50	0.483507	1.12305	8.47992	R	0	29.2561	1.04008	1.26958	2.49309	0	2.49309	2.33802	2.33802

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.27309**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.483468	21.7461	-83.8198	R	0	35	4.0024	5.09541	8.7324	0	8.7324	45.694	45.694
2	0.483468	52.4141	-75.0626	R	0	35	17.8808	22.7639	39.0122	0	39.0122	106.037	106.037
3	0.483468	68.0929	-70.4962	R	0	35	27.4092	34.8944	59.8013	0	59.8013	137.186	137.186
4	0.483468	80.2195	-66.8196	R	0	35	34.8246	44.3348	75.9799	0	75.9799	157.309	157.309
5	0.483468	90.3011	-63.6368	R	0	35	42.4444	54.0355	92.6047	0	92.6047	178.246	178.246
6	0.483468	99.1029	-60.7808	R	0	35	49.548	63.079	108.103	0	108.103	196.689	196.689
7	0.483468	106.207	-58.1614	R	0	35	55.8454	71.0962	121.843	0	121.843	211.778	211.778
8	0.483468	110.416	-55.7234	R	0	35	60.5865	77.1321	132.187	0	132.187	221.082	221.082
9	0.483468	113.879	-53.4296	R	0	35	64.8378	82.5443	141.462	0	141.462	228.86	228.86
10	0.483468	116.824	-51.254	R	0	35	68.7221	87.4894	149.938	0	149.938	235.576	235.576
11	0.483468	119.324	-49.1771	R	0	35	72.28	92.0189	157.7	0	157.7	241.37	241.37
12	0.483468	121.435	-47.1841	R	0	35	75.5431	96.1732	164.819	0	164.819	246.353	246.353
13	0.483468	123.198	-45.2635	R	0	35	78.537	99.9847	171.351	0	171.351	250.614	250.614
14	0.483468	124.65	-43.406	R	0	35	81.2825	103.48	177.341	0	177.341	254.223	254.223
15	0.483468	125.818	-41.6038	R	0	35	83.7977	106.682	182.829	0	182.829	257.238	257.238
16	0.483468	126.97	-39.8507	R	0	35	86.261	109.818	188.204	0	188.204	260.203	260.203
17	0.483468	130.185	-38.1414	R	0	35	90.1209	114.732	196.625	0	196.625	267.394	267.394
18	0.483468	133.748	-36.4713	R	0	35	94.2541	119.994	205.643	0	205.643	275.314	275.314
19	0.483468	137.102	-34.8364	R	0	35	98.2766	125.115	214.42	0	214.42	282.817	282.817
20	0.483468	139.928	-33.2334	R	0	35	101.952	129.794	222.438	0	222.438	289.238	289.238
21	0.483468	135.637	-31.6593	R	0	35	100.39	127.805	219.03	0	219.03	280.933	280.933
22	0.483468	128.409	-30.1115	R	0	35	96.492	122.843	210.524	0	210.524	266.485	266.485
23	0.483468	121.014	-28.5876	R	0	35	92.2802	117.481	201.336	0	201.336	251.622	251.622
24	0.483468	113.458	-27.0855	R	0	35	87.7621	111.729	191.478	0	191.478	236.36	236.36
25	0.483468	106.697	-25.6032	R	0	35	83.6877	106.542	182.59	0	182.59	222.692	222.692
26	0.483468	107.265	-24.1392	R	0	35	85.2838	108.574	186.072	0	186.072	224.291	224.291
27	0.483468	109.29	-22.6917	R	0	35	88.0582	112.106	192.124	0	192.124	228.944	228.944
28	0.483468	111.177	-21.2594	R	0	35	90.7563	115.541	198.012	0	198.012	233.322	233.322
29	0.483468	112.484	-19.8408	R	0	35	93.0115	118.412	202.931	0	202.931	236.492	236.492
30	0.483468	106.551	-18.4349	R	0	35	89.2301	113.598	194.682	0	194.682	224.425	224.425
31	0.483468	98.024	-17.0403	R	0	35	83.1237	105.824	181.36	0	181.36	206.837	206.837
32	0.483468	89.3726	-15.6561	R	0	35	76.7339	97.6891	167.417	0	167.417	188.923	188.923
33	0.483468	80.5999	-14.2813	R	0	35	70.0588	89.1911	152.854	0	152.854	170.687	170.687
34	0.483468	72.8367	-12.9147	R	0	35	64.0903	81.5927	139.832	0	139.832	154.528	154.528
35	0.483468	72.4671	-11.5556	R	0	35	64.5468	82.1739	140.828	0	140.828	154.025	154.025
36	0.483468	73.3657	-10.2031	R	0	35	66.1464	84.2103	144.318	0	144.318	156.223	156.223
37	0.483468	74.1506	-8.85629	R	0	35	67.6713	86.1516	147.645	0	147.645	158.189	158.189
38	0.483468	74.2513	-7.51441	R	0	35	68.5923	87.3242	149.654	0	149.654	158.702	158.702
39	0.483468	66.9872	-6.17666	R	0	35	62.6414	79.7482	136.671	0	136.671	143.45	143.45
40	0.483468	57.4153	-4.84228	R	0	35	54.3526	69.1958	118.586	0	118.586	123.191	123.191
41	0.483468	47.7339	-3.51053	R	0	35	45.7485	58.2419	99.8137	0	99.8137	102.62	102.62
42	0.483468	37.9435	-2.18068	R	0	35	36.8203	46.8755	80.3342	0	80.3342	81.7363	81.7363
43	0.483468	29.3691	-0.852005	R	0	35	28.8599	36.7412	62.9661	0	62.9661	63.3953	63.3953
44	0.483468	28.2014	0.476212	R	0	35	28.0668	35.7315	61.2358	0	61.2358	61.0025	61.0025
45	0.483468	28.1084	1.80469	R	0	35	28.3366	36.0751	61.8246	0	61.8246	60.9318	60.9318
46	0.483468	27.9067	3.13413	R	0	35	28.5036	36.2876	62.1889	0	62.1889	60.6282	60.6282
47	0.483468	26.8826	4.46527	R	0	35	27.825	35.4237	60.7083	0	60.7083	58.5354	58.5354
48	0.483468	18.3826	5.79883	R	0	35	19.2866	24.5536	42.0794	0	42.0794	40.1207	40.1207
49	0.483468	7.82976	7.13555	R	0	35	8.32926	10.6039	18.1726	0	18.1726	17.1299	17.1299
50	0.483468	0.836135	8.47618	R	0	35	0.902151	1.14852	1.96831	0	1.96831	1.83386	1.83386

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.29554**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.483544	21.7516	-83.8194	R	0	35	3.68709	4.77677	8.18632	0	8.18632	42.2341	42.2341
2	0.483544	52.4274	-75.0617	R	0	35	16.3284	21.1541	36.2534	0	36.2534	97.4553	97.4553
3	0.483544	68.1102	-70.495	R	0	35	24.9659	32.3443	55.431	0	55.431	125.913	125.913
4	0.483544	80.2403	-66.8182	R	0	35	31.5891	40.9249	70.1362	0	70.1362	143.904	143.904
5	0.483544	90.3243	-63.6352	R	0	35	38.4762	49.8474	85.4273	0	85.4273	163.057	163.057
6	0.483544	99.1283	-60.779	R	0	35	44.8916	58.1588	99.6712	0	99.6712	179.926	179.926
7	0.483544	106.236	-58.1595	R	0	35	50.5745	65.5213	112.289	0	112.289	193.729	193.729
8	0.483544	110.447	-55.7213	R	0	35	54.846	71.0552	121.772	0	121.772	202.238	202.238
9	0.483544	113.909	-53.4274	R	0	35	58.6726	76.0127	130.268	0	130.268	209.35	209.35
10	0.483544	116.855	-51.2516	R	0	35	62.1664	80.5391	138.026	0	138.026	215.488	215.488
11	0.483544	119.356	-49.1746	R	0	35	65.3644	84.6822	145.126	0	145.126	220.784	220.784
12	0.483544	121.467	-47.1815	R	0	35	68.2952	88.4792	151.634	0	151.634	225.338	225.338
13	0.483544	123.23	-45.2608	R	0	35	70.9823	91.9604	157.6	0	157.6	229.231	229.231
14	0.483544	124.682	-43.4031	R	0	35	73.4445	95.1503	163.066	0	163.066	232.527	232.527
15	0.483544	125.85	-41.6008	R	0	35	75.6978	98.0695	168.069	0	168.069	235.279	235.279
16	0.483544	127.002	-39.8476	R	0	35	77.905	100.929	172.969	0	172.969	237.987	237.987
17	0.483544	130.219	-38.1381	R	0	35	81.373	105.422	180.669	0	180.669	244.561	244.561
18	0.483544	133.783	-36.4679	R	0	35	85.0858	110.232	188.913	0	188.913	251.8	251.8
19	0.483544	137.138	-34.8329	R	0	35	88.6981	114.912	196.933	0	196.933	258.656	258.656
20	0.483544	139.96	-33.2298	R	0	35	91.9933	119.181	204.25	0	204.25	264.517	264.517
21	0.483544	135.658	-31.6556	R	0	35	90.5584	117.322	201.065	0	201.065	256.898	256.898
22	0.483544	128.428	-30.1076	R	0	35	87.0239	112.743	193.216	0	193.216	243.677	243.677
23	0.483544	121.03	-28.5836	R	0	35	83.2078	107.799	184.744	0	184.744	230.08	230.08
24	0.483544	113.471	-27.0813	R	0	35	79.1176	102.5	175.662	0	175.662	216.116	216.116
25	0.483544	106.717	-25.599	R	0	35	75.4353	97.7294	167.486	0	167.486	203.627	203.627
26	0.483544	107.296	-24.1348	R	0	35	76.8673	99.5846	170.666	0	170.666	205.106	205.106
27	0.483544	109.321	-22.6872	R	0	35	79.3522	102.804	176.183	0	176.183	209.356	209.356
28	0.483544	111.208	-21.2548	R	0	35	81.7682	105.934	181.547	0	181.547	213.353	213.353
29	0.483544	112.507	-19.8361	R	0	35	83.7782	108.538	186.01	0	186.01	216.232	216.232
30	0.483544	106.553	-18.43	R	0	35	80.3426	104.087	178.381	0	178.381	205.155	205.155
31	0.483544	98.0229	-17.0354	R	0	35	74.8283	96.943	166.139	0	166.139	189.066	189.066
32	0.483544	89.3684	-15.651	R	0	35	69.0604	89.4705	153.333	0	153.333	172.681	172.681
33	0.483544	80.5925	-14.276	R	0	35	63.0382	81.6685	139.962	0	139.962	156.002	156.002
34	0.483544	72.8428	-12.9094	R	0	35	57.6671	74.71	128.036	0	128.036	141.254	141.254
35	0.483544	72.4906	-11.5501	R	0	35	58.0808	75.246	128.955	0	128.955	140.824	140.824
36	0.483544	73.389	-10.1975	R	0	35	59.5083	77.0954	132.124	0	132.124	142.829	142.829
37	0.483544	74.1737	-8.85054	R	0	35	60.868	78.8569	135.143	0	135.143	144.621	144.621
38	0.483544	74.26	-7.50852	R	0	35	61.6724	79.8991	136.929	0	136.929	145.058	145.058
39	0.483544	66.9662	-6.17063	R	0	35	56.2864	72.9213	124.971	0	124.971	131.056	131.056
40	0.483544	57.3909	-4.83611	R	0	35	48.8231	63.2523	108.4	0	108.4	112.531	112.531
41	0.483544	47.7059	-3.50421	R	0	35	41.0792	53.2197	91.2068	0	91.2068	93.7223	93.7223
42	0.483544	37.9119	-2.17422	R	0	35	33.0471	42.8139	73.3735	0	73.3735	74.6282	74.6282
43	0.483544	29.3593	-0.845389	R	0	35	25.9099	33.5673	57.5269	0	57.5269	57.9092	57.9092
44	0.483544	28.2141	0.482984	R	0	35	25.212	32.6632	55.9774	0	55.9774	55.7649	55.7649
45	0.483544	28.1205	1.81162	R	0	35	25.4482	32.9692	56.5019	0	56.5019	55.697	55.697
46	0.483544	27.9182	3.14122	R	0	35	25.5916	33.155	56.8204	0	56.8204	55.4159	55.4159
47	0.483544	26.8722	4.47253	R	0	35	24.9566	32.3323	55.4104	0	55.4104	53.4583	53.4583
48	0.483544	18.335	5.80626	R	0	35	17.256	22.3558	38.3129	0	38.3129	36.5582	36.5582
49	0.483544	7.77823	7.14315	R	0	35	7.42057	9.61365	16.4757	0	16.4757	15.5457	15.5457
50	0.483544	0.829998	8.48397	R	0	35	0.802908	1.0402	1.78267	0	1.78267	1.6629	1.6629

# Interslice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.22066

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	108.002	340.558	0	0	0
2	108.486	336.093	74.9158	0	0
3	108.969	334.28	180.433	0	0
4	109.453	332.915	291.22	0	0
5	109.936	331.786	391.59	0	0
6	110.42	330.811	493	0	0
7	110.903	329.946	593.836	0	0
8	111.387	329.168	692.314	0	0
9	111.87	328.458	785.951	0	0
10	112.354	327.806	874.451	0	0
11	112.837	327.204	957.717	0	0
12	113.321	326.644	1035.7	0	0
13	113.804	326.122	1108.38	0	0
14	114.288	325.634	1175.76	0	0
15	114.771	325.177	1184.02	0	0
16	115.255	324.748	1144.55	0	0
17	115.738	324.344	1196.38	0	0
18	116.222	323.965	1147.65	0	0
19	116.705	323.607	1191.14	0	0
20	117.189	323.271	1133.97	0	0
21	117.672	322.954	1168.62	0	0
22	118.156	322.656	1197.16	0	0
23	118.639	322.376	1123.15	0	0
24	119.123	322.112	1139.91	0	0
25	119.606	321.865	1055.3	0	0
26	120.09	321.633	1062.67	0	0
27	120.573	321.416	1066.45	0	0
28	121.057	321.214	1066.62	0	0
29	121.54	321.026	966.734	0	0
30	122.024	320.852	959.449	0	0
31	122.507	320.691	949.043	0	0
32	122.991	320.542	936.253	0	0
33	123.474	320.407	825.302	0	0
34	123.958	320.284	809.501	0	0
35	124.441	320.173	792.823	0	0
36	124.925	320.074	773.832	0	0
37	125.408	319.987	752.166	0	0
38	125.892	319.912	727.784	0	0
39	126.375	319.848	700.859	0	0
40	126.859	319.796	674.285	0	0
41	127.342	319.755	649.52	0	0
42	127.826	319.725	627.255	0	0
43	128.309	319.707	608.203	0	0
44	128.793	319.7	592.382	0	0
45	129.276	319.704	576.133	0	0
46	129.76	319.719	558.87	0	0
47	130.243	319.746	540.644	0	0
48	130.727	319.783	522.024	0	0
49	131.21	319.832	508.558	0	0
50	131.694	319.893	502.508	0	0
51	132.177	319.965	0	0	0

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.27309**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	108.002	340.558	0	0	0
2	108.485	336.093	39.2346	0	0
3	108.969	334.281	106.274	0	0
4	109.452	332.916	181.048	0	0
5	109.936	331.787	257.33	0	0
6	110.419	330.811	335.403	0	0
7	110.903	329.947	413.954	0	0
8	111.386	329.168	491.535	0	0
9	111.87	328.459	566.115	0	0
10	112.353	327.807	637.38	0	0
11	112.837	327.205	705.181	0	0
12	113.32	326.645	769.417	0	0
13	113.804	326.123	830.017	0	0
14	114.287	325.635	886.938	0	0
15	114.771	325.178	888.456	0	0
16	115.254	324.749	845.563	0	0
17	115.737	324.345	891.438	0	0
18	116.221	323.965	842.051	0	0
19	116.704	323.608	882.23	0	0
20	117.188	323.272	827.035	0	0
21	117.671	322.955	861.033	0	0
22	118.155	322.657	890.229	0	0
23	118.638	322.376	821.985	0	0
24	119.122	322.113	841.511	0	0
25	119.605	321.866	764.434	0	0
26	120.089	321.634	776.059	0	0
27	120.572	321.417	784.98	0	0
28	121.056	321.215	791.271	0	0
29	121.539	321.027	702.445	0	0
30	122.023	320.853	703.199	0	0
31	122.506	320.691	701.21	0	0
32	122.99	320.543	696.892	0	0
33	123.473	320.408	598.287	0	0
34	123.956	320.285	590.625	0	0
35	124.44	320.174	581.827	0	0
36	124.923	320.075	571.194	0	0
37	125.407	319.988	558.509	0	0
38	125.89	319.913	543.723	0	0
39	126.374	319.849	526.924	0	0
40	126.857	319.796	509.942	0	0
41	127.341	319.756	493.795	0	0
42	127.824	319.726	479.023	0	0
43	128.308	319.707	466.187	0	0
44	128.791	319.7	455.385	0	0
45	129.275	319.704	444.162	0	0
46	129.758	319.72	432.103	0	0
47	130.242	319.746	419.242	0	0
48	130.725	319.784	405.969	0	0
49	131.208	319.833	396.269	0	0
50	131.692	319.893	391.862	0	0
51	132.175	319.965	0	0	0

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.29554**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	108.001	340.558	0	0	0
2	108.485	336.092	36.9528	0	0
3	108.968	334.28	99.7496	0	0
4	109.452	332.915	169.746	0	0
5	109.935	331.786	241.001	0	0
6	110.419	330.81	313.997	0	0
7	110.902	329.946	387.517	0	0
8	111.386	329.167	460.214	0	0
9	111.869	328.458	530.186	0	0
10	112.353	327.806	597.142	0	0
11	112.837	327.203	660.94	0	0
12	113.32	326.644	721.486	0	0
13	113.804	326.122	778.713	0	0
14	114.287	325.634	832.578	0	0
15	114.771	325.177	832.578	0	0
16	115.254	324.747	788.867	0	0
17	115.738	324.344	832.634	0	0
18	116.221	323.964	783.02	0	0
19	116.705	323.607	821.651	0	0
20	117.188	323.27	766.802	0	0
21	117.672	322.953	799.85	0	0
22	118.156	322.655	828.439	0	0
23	118.639	322.375	761.516	0	0
24	119.123	322.111	781.05	0	0
25	119.606	321.864	705.837	0	0
26	120.09	321.632	717.948	0	0
27	120.573	321.416	727.595	0	0
28	121.057	321.214	734.866	0	0
29	121.54	321.026	648.884	0	0
30	122.024	320.851	651.141	0	0
31	122.507	320.69	650.812	0	0
32	122.991	320.542	648.239	0	0
33	123.475	320.406	553.027	0	0
34	123.958	320.283	547.163	0	0
35	124.442	320.172	540.155	0	0
36	124.925	320.074	531.468	0	0
37	125.409	319.987	520.923	0	0
38	125.892	319.911	508.477	0	0
39	126.376	319.848	494.201	0	0
40	126.859	319.795	479.668	0	0
41	127.343	319.754	465.766	0	0
42	127.826	319.725	452.985	0	0
43	128.31	319.707	441.835	0	0
44	128.794	319.699	432.415	0	0
45	129.277	319.703	422.588	0	0
46	129.761	319.719	412.003	0	0
47	130.244	319.745	400.686	0	0
48	130.728	319.783	388.993	0	0
49	131.211	319.832	380.451	0	0
50	131.695	319.893	376.58	0	0
51	132.178	319.965	0	0	0



## Discharge Sections

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### Entity Information

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#### ◆ SLU

##### Shared Entities

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64
	180.625, 311.703
	179.812, 311.839
	179.723, 311.846

178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52  
151.791, 316.568  
151.361, 316.642  
150.961, 316.72

External Boundary

150.563, 316.814  
149.573, 317.001  
149.066, 317.119  
148.57, 317.224  
147.953, 317.359  
147.598, 317.443  
147.299, 317.493  
146.854, 317.583  
146.019, 317.733  
145.925, 317.758  
144.965, 318  
144.923, 318.015  
144.676, 318.09  
144.626, 318.096  
143.617, 318.401  
143.4, 318.414  
142.609, 318.643  
141.925, 318.797  
141.499, 318.812  
141.223, 318.825  
140.62, 318.927  
140.37, 318.959  
139.669, 318.979  
139.185, 319.043  
138.625, 319.068  
138.322, 319.113  
137.879, 319.142  
137.769, 319.159  
137.61, 319.171  
137.352, 319.223  
135.236, 319.686  
134.2, 319.735  
133.61, 319.774  
132.936, 319.859  
132.623, 319.907  
132.182, 319.964  
131.931, 320  
131.729, 320.076  
131.721, 320.092  
130.543, 322.619  
128.543, 322.619  
126.21, 327.619  
124.21, 327.619  
121.878, 332.619  
119.878, 332.619  
117.547, 337.619  
115.547, 337.619  
111.047, 340.62  
109.397, 340.653  
96.9967, 339.803  
92.206, 339.931  
78.563, 339.14  
76.9128, 339.108  
68.1212, 333.247  
65.4218, 334.161  
62.7107, 335.219  
62.056, 335.55  
61.3599, 336  
60.905, 336.17

60.0061, 336.515
59.672, 336.622
59.1025, 336.84
58.5731, 336.957
58.3209, 337.05
58.1148, 337.114
57.8762, 337.206
56.9205, 337.012
56.3362, 337.134
55.7206, 337.305
54.7744, 337.618
53.8336, 338
52.7348, 338.403
52.1842, 338.636
51.6937, 338.853
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50.1857, 339.596
50.121, 339.637
49.4481, 340
49.1144, 340.174
48.9611, 340.241
48.6364, 340.414
48.1368, 340.701
47.2093, 341.067
46.6663, 341.333
46.4381, 341.424
45.2371, 341.895
45.1988, 341.912
45.1668, 341.926
45.1352, 341.938
44.9566, 342
43.9785, 342.368
43.6906, 342.459
43.1313, 342.638
42.5615, 342.805
42.0121, 342.929
41.4108, 343.109
40.0761, 343.478
39.6983, 343.565
39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
35.8231, 344.472
34.8494, 344.749
33.553, 345.058
32.7793, 345.274
32.4141, 345.388
31.5581, 345.604
31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261
26.846, 346.693
26.3194, 346.778
25.8928, 346.872

	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978

12.6593, 345.59
12.9744, 345.467
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19.4458, 343.988
24.0355, 343.318
24.456, 343.247
25.1862, 343.086
25.7646, 342.993
27.7091, 342.592
27.7591, 342.582
31.2928, 341.656
31.9142, 341.482
33.1927, 341.177
34.1211, 340.913
34.8964, 340.719
35.5591, 340.54
40.9307, 339.224
41.1563, 339.158
41.6309, 339.006
41.7252, 338.976
42.6077, 338.644
42.6609, 338.626
43.7908, 338.182
44.3444, 337.912
45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562



Material Boundary

136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173




168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

	131.806, 317.053	
	131.922, 317.01	
	133.086, 316.845	
	133.48, 316.793	
	133.814, 316.742	
	134.832, 316.614	
	135.735, 316.555	
	136.168, 316.534	
	137.697, 316.2	
	138.507, 316.038	
	138.848, 316.012	
	138.992, 315.99	
	139.452, 315.959	
	139.843, 315.901	
	140.471, 315.874	
	141.016, 315.802	
	141.638, 315.784	
	142.344, 315.664	
	142.794, 315.643	
	144.025, 315.286	
	144.192, 315.277	
	144.567, 315.163	
	144.618, 315.145	
	144.674, 315.131	
	144.954, 315.046	
	145.062, 315.033	
	145.922, 314.816	
Water Table	146.284, 314.721	
	147.333, 314.533	
	147.827, 314.432	
	148, 314.403	
	148.166, 314.364	
	148.871, 314.211	
	149.314, 314.116	
	149.911, 313.978	
	150.884, 313.794	
	151.262, 313.705	
	151.904, 313.58	
	152.464, 313.484	
	152.816, 313.428	
	153.706, 313.286	
	153.968, 313.246	
	154.96, 313.103	
	155.062, 313.089	
	155.865, 312.957	
	156.182, 312.896	
	157.23, 312.773	
	157.292, 312.761	
	158.805, 312.557	
	158.925, 312.531	
	159.624, 312.444	
	160.195, 312.293	
	160.861, 312.226	
	161.102, 312.15	
	162.121, 312.063	
	162.398, 311.975	
	163.373, 311.958	
	163.815, 311.804	
	164.095, 311.785	

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv>0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52

	151.791, 316.568
	151.361, 316.642
	150.961, 316.72
	150.563, 316.814
	149.573, 317.001
	149.066, 317.119
	148.57, 317.224
	147.953, 317.359
	147.598, 317.443
	147.299, 317.493
	146.854, 317.583
	146.019, 317.733
	145.925, 317.758
	144.965, 318
	144.923, 318.015
	144.676, 318.09
	144.626, 318.096
	143.617, 318.401
	143.4, 318.414
	142.609, 318.643
	141.925, 318.797
	141.499, 318.812
	141.223, 318.825
	140.62, 318.927
	140.37, 318.959
	139.669, 318.979
	139.185, 319.043
External Boundary	138.625, 319.068
	138.322, 319.113
	137.879, 319.142
	137.769, 319.159
	137.61, 319.171
	137.352, 319.223
	135.236, 319.686
	134.2, 319.735
	133.61, 319.774
	132.936, 319.859
	132.623, 319.907
	132.182, 319.964
	131.931, 320
	131.729, 320.076
	131.721, 320.092
	130.543, 322.619
	128.543, 322.619
	126.21, 327.619
	124.21, 327.619
	121.878, 332.619
	119.878, 332.619
	117.547, 337.619
	115.547, 337.619
	111.047, 340.62
	109.397, 340.653
	96.9967, 339.803
	92.206, 339.931
	78.563, 339.14
	76.9128, 339.108
	68.1212, 333.247
	65.4218, 334.161
	62.7107, 335.219

62.056, 335.55
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45.1352, 341.938
44.9566, 342
43.9785, 342.368
43.6906, 342.459
43.1313, 342.638
42.5615, 342.805
42.0121, 342.929
41.4108, 343.109
40.0761, 343.478
39.6983, 343.565
39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
35.8231, 344.472
34.8494, 344.749
33.553, 345.058
32.7793, 345.274
32.4141, 345.388
31.5581, 345.604
31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261



	26.846, 346.693
	26.3194, 346.778
	25.8928, 346.872
	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978



12.6593, 345.59
12.9744, 345.467
14.0755, 344.967
18.2313, 344.215
19.4458, 343.988
24.0355, 343.318
24.456, 343.247
25.1862, 343.086
25.7646, 342.993
27.7091, 342.592
27.7591, 342.582
31.2928, 341.656
31.9142, 341.482
33.1927, 341.177
34.1211, 340.913
34.8964, 340.719
35.5591, 340.54
40.9307, 339.224
41.1563, 339.158
41.6309, 339.006
41.7252, 338.976
42.6077, 338.644
42.6609, 338.626
43.7908, 338.182
44.3444, 337.912
45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562

Material Boundary

136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

	131.806, 317.053	
	131.922, 317.01	
	133.086, 316.845	
	133.48, 316.793	
	133.814, 316.742	
	134.832, 316.614	
	135.735, 316.555	
	136.168, 316.534	
	137.697, 316.2	
	138.507, 316.038	
	138.848, 316.012	
	138.992, 315.99	
	139.452, 315.959	
	139.843, 315.901	
	140.471, 315.874	
	141.016, 315.802	
	141.638, 315.784	
	142.344, 315.664	
	142.794, 315.643	
	144.025, 315.286	
	144.192, 315.277	
	144.567, 315.163	
	144.618, 315.145	
	144.674, 315.131	
	144.954, 315.046	
	145.062, 315.033	
	145.922, 314.816	
	146.284, 314.721	
Water Table	147.333, 314.533	
	147.827, 314.432	
	148, 314.403	
	148.166, 314.364	
	148.871, 314.211	
	149.314, 314.116	
	149.911, 313.978	
	150.884, 313.794	
	151.262, 313.705	
	151.904, 313.58	
	152.464, 313.484	
	152.816, 313.428	
	153.706, 313.286	
	153.968, 313.246	
	154.96, 313.103	
	155.062, 313.089	
	155.865, 312.957	
	156.182, 312.896	
	157.23, 312.773	
	157.292, 312.761	
	158.805, 312.557	
	158.925, 312.531	
	159.624, 312.444	
	160.195, 312.293	
	160.861, 312.226	
	161.102, 312.15	
	162.121, 312.063	
	162.398, 311.975	
	163.373, 311.958	
	163.815, 311.804	
	164.095, 311.785	

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432



	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv<0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52

	151.791, 316.568
	151.361, 316.642
	150.961, 316.72
	150.563, 316.814
	149.573, 317.001
	149.066, 317.119
	148.57, 317.224
	147.953, 317.359
	147.598, 317.443
	147.299, 317.493
	146.854, 317.583
	146.019, 317.733
	145.925, 317.758
	144.965, 318
	144.923, 318.015
	144.676, 318.09
	144.626, 318.096
	143.617, 318.401
	143.4, 318.414
	142.609, 318.643
	141.925, 318.797
	141.499, 318.812
	141.223, 318.825
	140.62, 318.927
	140.37, 318.959
	139.669, 318.979
External Boundary	139.185, 319.043
	138.625, 319.068
	138.322, 319.113
	137.879, 319.142
	137.769, 319.159
	137.61, 319.171
	137.352, 319.223
	135.236, 319.686
	134.2, 319.735
	133.61, 319.774
	132.936, 319.859
	132.623, 319.907
	132.182, 319.964
	131.931, 320
	131.729, 320.076
	131.721, 320.092
	130.543, 322.619
	128.543, 322.619
	126.21, 327.619
	124.21, 327.619
	121.878, 332.619
	119.878, 332.619
	117.547, 337.619
	115.547, 337.619
	111.047, 340.62
	109.397, 340.653
	96.9967, 339.803
	92.206, 339.931
	78.563, 339.14
	76.9128, 339.108
	68.1212, 333.247
	65.4218, 334.161
	62.7107, 335.219

62.056, 335.55
61.3599, 336
60.905, 336.17
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59.672, 336.622
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58.1148, 337.114
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56.3362, 337.134
55.7206, 337.305
54.7744, 337.618
53.8336, 338
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39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
35.8231, 344.472
34.8494, 344.749
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31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261

	26.846, 346.693
	26.3194, 346.778
	25.8928, 346.872
	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978

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131.467, 316.208
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Material Boundary

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167.358, 310.173



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179.85, 307.953
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182.958, 307.53
183.667, 307.422
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185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
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11.8995, 347.722  
12.7816, 347.128  
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13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
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29.3778, 343.22  
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34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
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43.2496, 339.643  
43.3439, 339.614  
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44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
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47.6431, 337.761  
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58.8788, 333.65  
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82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

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	131.922, 317.01	
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	133.48, 316.793	
	133.814, 316.742	
	134.832, 316.614	
	135.735, 316.555	
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	138.507, 316.038	
	138.848, 316.012	
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	139.452, 315.959	
	139.843, 315.901	
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	141.016, 315.802	
	141.638, 315.784	
	142.344, 315.664	
	142.794, 315.643	
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	144.674, 315.131	
	144.954, 315.046	
	145.062, 315.033	
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Water Table	146.284, 314.721	
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	147.827, 314.432	
	148, 314.403	
	148.166, 314.364	
	148.871, 314.211	
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	153.968, 313.246	
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	161.102, 312.15	
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	164.095, 311.785	

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169.888, 310.72
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189.035, 307.5
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190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
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195.765, 304.55
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196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No

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## **1. PREMESSA**

La presente relazione si occupa del calcolo delle opere in terra rinforzata previste nel Progetto Definitivo Tratto Nodo Di Arezzo – Selci – Lama (E45), Adeguamento a quattro corsie del tratto San Zeno – Arezzo – Palazzo del Pero, 1° Lotto (FI508).

Per adeguare il tracciato stradale a quattro corsie dalla progressiva pk 2+300 alla pk 2+370, è necessario ampliare il rilevato esistente. La soluzione progettuale prevede a questo scopo la realizzazione di un rilevato in terra rinforzata in allargamento rispetto a quello esistente.

Alla base del rilevato esistenti sono presenti dei tombini idraulici per il deflusso delle acque che dovranno essere adeguati.

La presente relazione riguarda solo il dimensionamento della terra rinforzata tra la pk 2+300 alla pk 2+370.

Il lavoro è stato svolto in ottemperanza al D.M. 17/01/2018 “Aggiornamento delle Norme Tecniche per le Costruzioni”, ed ai sensi della legge sui lavori pubblici D.lgs. n. 50/2016 e del regolamento D.P.R. 207/2010 considerando il livello progettuale di progetto definitivo.

## **2. DOCUMENTAZIONE DI RIFERIMENTO**

### **2.1. NORMATIVA E RACCOMANDAZIONI TECNICHE**

1. EN 1997 Eurocode 7: Geotechnical Design;
2. EN 1998 Eurocode 8: Design of structures for earthquake resistance;
3. AGI (1994) Raccomandazioni sulle prove geotecniche di laboratorio. Associazione Geotecnica Italiana;
4. AGI (1977) "Raccomandazioni sulla programmazione ed esecuzione delle indagini geotecniche";
5. AGI (2005) "Aspetti geotecnici della progettazione in zona sismica";
6. ASG (2016). Linee guida per indagini geofisiche. Associazione Italiana di Geofisica;
7. ASTM International - ASTM D1586/ D1586M-18, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils;
8. ASTM International - ASTM D4633-16, Standard Test Method for Energy Measurement for Dynamic Penetrometers;
9. UNI EN ISO 22476-3:2021, Indagini e prove geotecniche - Prove in sito - Parte 3: Prova penetrometrica dinamica tipo SPT (Standard Penetration Test);
10. UNI 11531-1:2014, Costruzione e manutenzione delle opere civili delle Infrastrutture, Criteri per l'impiego dei materiali, Parte I: Terre e miscele di aggregati non legati, Aprile 2014
11. UNI EN 206-1:2016, Calcestruzzo - Parte 1: Specificazione, prestazione, produzione e conformità
12. CNR BU N. 146 del 14 dicembre 1992, Determinazione dei moduli di deformazione  $M_d$  e  $M_d'$  mediante prova di carico a doppio ciclo con piastra circolare
13. D.M. 17/01/2018 Aggiornamento delle "Norme tecniche per le costruzioni";
14. Circolare 21/01/2019 "Istruzioni per l'applicazione dell'Aggiornamento delle Nuove norme tecniche per le costruzioni di cui al DM17/01/2018;
15. UNI EN 14475:2006 Esecuzione di lavori geotecnici speciali - Terra rinforzata.



## **2.2. ELABORATI DI PROGETTO**

1. P01GA01OSTRE01, Relazione di Calcolo Strutture - Galleria Artificiale Cignano;
2. P01GA02OSTRE01, Relazione di Calcolo Strutture – Galleria Artificiale Torrino;
3. P01OS10STRDI01, Terra rinforzata – Pianta, sezione tipologica e dettagli;
4. P01OS10STRRE01, Relazione sulla terra rinforzata tra la pk. 1+980 e 2+110;
5. P01OS13STRDI01, Terra rinforzata – Pianta, sezione tipologica e dettagli;
6. P01VI01GETFG01÷10 Profilo geotecnico Viadotto VI.01÷VI.10
7. T00GE00GETSG01-06, Sezioni geotecniche
8. T00GE01GETCS01-02, Planimetria con classificazione sismica del territorio - Tav. 1-2 di 2
9. T010GE01GEORE01, Relazione geologica, geomorfologica e idrogeologica
10. T01GE00GEOPU01-05 Planimetrie ubicazione indagini geognostiche, Tav 1-5 di 5;
11. T01GE00GEORE01 Documentazione indagini geognostiche - Sondaggi geognostici e prove in sito
12. T01GE00GEORE02 Documentazione indagini geognostiche - Georeferenziazione delle indagini
13. T01GE00GEORE03 Documentazione indagini geognostiche - Analisi e prove di laboratorio geotecnico
14. T01GE00GEORE04 Documentazione indagini geognostiche - Campagna geofisica.
15. T01GE00GETDI01÷05, Interventi di stabilizzazione - Pianta, sezioni tipologiche e dettagli - Tav. 1-5 di 5
16. T01GE00GETDI06÷09, Interventi di stabilizzazione dei fronti di scavo - Pianta, sezione tipologica e dettagli - Tav. 1-4 di 4
17. T01GE00GETFG01-05, Profilo geotecnico Asse Grosseto, Tav.1-5 di 5;
18. T01GE00GETFG06, Profilo geotecnico Asse Fano, Tav.6;
19. T01GE00GETFG07, Profilo geotecnico, Rampa E e F;
20. T01GE00GETFG08 Profilo geotecnico, Rampa L e J;
21. T01GE00GETFG09 Profilo geotecnico, Rampa di collegamento Pero;
22. T01GE00GETSG01÷06, Sezioni geotecniche;
23. T01GE01GEOCG01-05, Carta geologica - Tav. 1-5 di 5;
24. T01GE01GEOCG06-10, Carta geomorfologica - Tav. 6-10 di 10;
25. T01GE01GEOCI01-05, Carta idrogeologica- Tav. 1-5 di 5;
26. T01GE01GEOFG01-05, Profilo geologico Asse Grosseto- Tav.1-5 di 5;
27. T01GE01GEOFG06, Profilo geologico Asse Fano- Tav.6;
28. T01GE01GEORE02, Rilievi geomeccanici;
29. T01GE01GEOSG01-02, Sezioni geologiche, Tav.1-2 di 2;

## **2.3. BIBLIOGRAFIA**

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## 21. Simbologia

Si riporta di seguito l'elenco dei simboli dei parametri geotecnici utilizzati nella presente relazione:

$\rho$	densità del terreno;
$\gamma / \gamma'$	peso di volume del terreno / peso di volume immerso del terreno
$w_n$	contenuto d'acqua naturale
$w_L$	limite di liquidità
$w_P$	limite di plasticità
IP	indice di plasticità
$D_r$	densità relativa
$\phi'$	valore dell'angolo di resistenza al taglio efficace (f di picco)
$\phi'_k$	valore caratteristico angolo di resistenza al taglio efficace (f di picco)
$\phi'_R$	valore dell'angolo di attrito residuo
$c'$	valore della coesione in condizioni drenate efficace
$c'_k$	valore caratteristico coesione in condizioni drenate efficace
$c_u$	valore della coesione in condizioni non drenate
$c_{u,k}$	valore caratteristico coesione in condizioni non drenate
$\sigma_c$	Resistenza a compressione della roccia
$G_{max} = G_0$	modulo di taglio alle piccole deformazioni
$E_0$	modulo di Young alle piccole deformazioni
$E_{25}$	modulo con riferimento ad un grado di mobilitazione della resistenza ultima a taglio pari al 25-30% e una deformazione dell'ordine di $1 \times 10^{-3}$
$E_m$	modulo di elasticità dell'ammasso roccioso
$E_{op, fondaz dirette}$	modulo elastico di Young operativo (opere di fondazione dirette)
$E_{op, fondaz profonde}$	modulo elastico di Young operativo (opere di fondazione profonde – opere di sostegno)
M	modulo edometrico confinato
$M_{fondaz dirette}$	modulo edometrico operativo per fondazioni dirette
$M_{fondaz profonde}$	modulo edometrico operativo per fondazioni profonde
r	rapporto tra il modulo elastico di ricompressione e di compressione vergine
$\Delta\sigma$	intervallo tensionale relativo alla prova edometrica
OCR	grado di sovraconsolidazione
$e_o$	indice dei vuoti iniziale
$c_C$	indice di compressione
$c_R$	indice di ricompressione
$c_V$	coefficiente di consolidazione verticale
k	coefficiente di permeabilità
$V_s$	velocità delle onde di taglio
$\nu$	coefficiente di Poisson
Z	profondità dal piano campagna

### **3. INQUADRAMENTO GEOLOGICO, GEOMORFOLOGICO E IDROGEOLOGICO**

Lungo il tracciato dell'opera in progetto sono state riconosciute le seguenti unità geologiche (rif.: T01GE01GEORE01 - Relazione geologica, geomorfologica e idrogeologica):

#### **LITOLOGIE DEL SUBSTRATO**

- *Unità Arenarie del Cervarola (ac)*. Sono formate da un'alternanza di siltiti, arenarie fini e marne argillose con locali intercalazioni di calcari marnosi e noduli di selce. Le arenarie sono generalmente di esiguo spessore (3 - 4 cm), ma possono raggiungere spessori anche di 20 - 30 cm. I litotipi coerenti-lapidei sono caratterizzati generalmente da un grado di fratturazione medio alto e si differenziano sostanzialmente per la presenza o meno di differenziazioni litologiche e stratigrafiche. Prevalentemente si riscontra la presenza di Arenarie con intercalazioni argillitiche e siltitiche con buone proprietà meccaniche. Le caratteristiche meccaniche di tale classe diminuiscono però fortemente all'aumentare del grado di alterazione e della potenza degli strati argilloso-siltosi oltre che all'aumentare del grado di fratturazione. L'alterazione è rappresentata da un ammasso costituito da uno scheletro di clasti e blocchi arenacei e marnosi in matrice sabbiosa-argillosa fratturati, spesso le porzioni sono destrutturate ma sono ancora riconoscibili strutture originarie (stratificazione). La formazione delle Arenarie del Cervarola è interessata da numerose dislocazioni per faglia diretta orientate in direzione appenninica (NW-SE), che attraversano il substrato e che vengono intercettate circa ortogonalmente dal tracciato stradale.
- *Unità Marne di San Polo (ms)*. La formazione è rappresentata da marne giallastre e grigie a frattura scheggiata intercalate al Macigno del Mugello. Essa si incontra solamente nella porzione iniziale del lotto 1, tra circa la pk 1200 e la pk 1550. Si tratta di marne a grana fine intensamente alterate, dalle basse caratteristiche di resistenza (resistenza a compressione uniaassiale bassa), poco tenaci, scarsamente rigide ed elastiche, fittamente laminate ed intensamente fratturate (RQD bassi) con riempimenti a matrice argillosa.

#### **DEPOSITI CONTINENTALI QUATERNARI**

- *Depositi alluvionali recenti ed attuali (at)*. Individuano depositi alluvionali recenti di ambiente fluviale, costituiti da limi argillosi, limi sabbiosi, argille limose, con spessi banchi di sabbie e strati ghiaiosi, di età olocenica. Affiorano maggiormente nella parte più a Ovest del tracciato dove ricoprono il substrato costituito dal Macigno del Mugello fino alle aree marginali in cui questo viene ad emergere. Gli spessori delle alluvioni tendono ad aumentare progressivamente verso Arezzo. Localmente sono presenti anche intercalazioni di terre fini e medio-fini, da argilla a limo sabbioso, che talvolta possono prevalere, in particolare nella parte sommatiale.
- *Terreni di riporto (r)*. Data l'intensa urbanizzazione dell'area, sono presenti terreni di riporto rappresentati da materiali eterogenei, da limi sabbiosi e/o argillosi a sabbie limose, con ghiaia o ciottoli di varia composizione, spesso clasti di marna, arenaria e laterizi; talora vi è presente sostanza organica. I terreni suddetti, intercettati da alcuni sondaggi, rappresentano rilevati stradali oppure aree di colmamento artificiale (da pk 0 a pk 450, da pk 0+750 a pk 1+300, da pk 1+700 a pk 1+740, da pk 2+025 a pk 2+125, da pk 2+325 a pk 2+375, da pk 2+490 a pk 2+630, da pk 3+750 a pk 3+925, da pk 4+175 a pk 4+280, da pk 4+600 a pk 4+710, da pk 5+390 a pk 5+460, da pk 5+540 a pk 5+660, da pk 6+210 a pk 6+280, da pk 6+650 a pk 6+675, da pk 7+015 a pk 7+400, da pk 8+100 a pk 8+475).
- *Depositi di frana (dt)*. Nell'area del tracciato del Lotto 1, nonostante i terreni affioranti non siano di natura particolarmente franosa, sono stati cartografati n. 17 fenomeni franosi. Questi sono concentrati nelle aree in cui gli ammassi risultano particolarmente fratturati e, più in generale, sui versanti con giacitura a franapoggio e traversipoggio.

#### **4. INQUADRAMENTO GEOTECNICO**

Alla luce delle informazioni disponibili sulla geologia locale e, soprattutto, in base ai risultati delle indagini geognostiche e geotecniche di progetto, che hanno incluso sondaggi geognostici, pozzetti esplorativi, prove in sito, rilievi geomeccanici e prove di laboratorio su terreni e campioni litoidi, è stato possibile mettere a punto il modello geotecnico generale sintetizzato nelle Tabelle riportate di seguito. Per la completa caratterizzazione del sito si rimanda alla relazione geologica e alla relazione geotecnica di progetto.

**Tabella 4-1 Schema riassuntivo delle unità geotecniche e le corrispondenti geologiche**

UNITÀ GEOLOGICA	UNITÀ GEOTECNICA	TIPOLOGIA TERRENO/ROCCIA
R – Terreni di riporto	R - Riporto	Riporto
Fn - Frana	FN - Frana	Depositi di frana
at – Alluvioni recenti ed attuali	LS – Limi e sabbie	Coesivo in prevalenza limoso sabbioso
at – Alluvioni recenti ed attuali	GS – Ghiaie e sabbie limose	Incoerente in prevalenza ghiaiosa sabbiosa
ac – Arenaria del Cervarola	AC – Arenaria del Cervarola	Substrato formato da alternanze tra arenarie siltiti argilliti
ac – Arenaria del Cervarola	AC alt - Arenaria del Cervarola alterata	Substrato formato da alternanze tra arenarie siltiti argilliti fortemente alterato e destrutturato
ms – Marne di San Polo	MS – Marne di San Polo	Alternanze tra arenarie siltiti argilliti
ms – Marne di San Polo	MS alt - Marne di San Polo alterate	Substrato formato da alternanze tra arenarie siltiti argilliti fortemente alterato e destrutturato

#### **4.1. Caratterizzazione delle unità geotecniche**

Le tavole di progetto che raffigurano il profilo geotecnico a cui si fa riferimento da Ovest verso Est per la carreggiata in direzione Grosseto sono:

- T01GE00GETFG01, profilo dalla pk 0+000 alla pk 1+800 (pk espresse in dir. Grosseto);
- T01GE00GETFG02, profilo dalla pk 1+650 alla pk 3+475 (pk espresse in dir. Grosseto);
- T01GE00GETFG03, profilo dalla pk 3+325 alla pk 5+150 (pk espresse in dir. Grosseto);
- T01GE00GETFG04, profilo dalla pk 5+000 alla pk 6+825 (pk espresse in dir. Grosseto);
- T01GE00GETFG05, profilo dalla pk 6+700 alla pk 8+475 (pk espresse in dir. Grosseto).

Le tavole di progetto che raffigurano il profilo geotecnico a cui si fa riferimento da Ovest verso Est per la carreggiata in direzione Fano sono le stesse di quelle della direzione Grosseto, ad eccezione del tratto da pk 5+000 ÷ 6+825 espresse in dir. Fano:

- T01GE00GETFG01, profilo dalla pk 0+000 alla pk 1+800 (pk espresse in dir. Grosseto);
- T01GE00GETFG02, profilo dalla pk 1+650 alla pk 3+475 (pk espresse in dir. Grosseto);
- T01GE00GETFG03, profilo dalla pk 3+325 alla pk 5+150 (pk espresse in dir. Grosseto);
- T01GE00GETFG05, profilo dalla pk 6+700 alla pk 8+475 (pk espresse in dir. Grosseto).
- T01GE00GETFG06, profilo dalla pk 5+000 alla pk 6+875 (pk espresse in dir Fano);

Per le rampe di accesso ed i collegamenti è possibile fare riferimento ai seguenti profili:

- T01GE00GETFG07, profilo rampa E e rampa F;
- T01GE00GETFG08, profilo rampa J e rampa L;
- T01GE00GETFG09, Rampa collegamento Pero.

Inoltre, è possibile fare riferimento alle seguenti sezioni geotecniche:

- T01GE00GETSG01, Sezione geotecniche (pk GR 1+800; pk GR 2+505);
- T01GE00GETSG02, Sezione geotecniche (pk GR 2+775; pk GR 2+970);
- T01GE00GETSG03, Sezione geotecniche (pk GR 3+080; pk GR 3+862);
- T01GE00GETSG04, Sezione geotecniche (pk GR 4+120; pk GR 4+283);
- T01GE00GETSG05, Sezione geotecniche (pk GR 5+032; pk GR 5+530);
- T01GE00GETSG06, Sezione geotecniche (pk GR 5+032; pk GR 5+530).

Facendo riferimento al profilo longitudinale in dir. Grosseto, di seguito vengono brevemente descritti i terreni di fondazione che interagiscono con l'opera in progetto.

Dalla pk **0+000** alla **0+475** il profilo stratigrafico è caratterizzato dalla presenza di terreni alluvionali di natura limosa intervallati da lenti più argillose o più sabbioso-ghiaiose. Il suo spessore tende velocemente a diminuire da Ovest verso Est fino a scomparire alla pk 0+475 circa, dove il substrato è affiorante. Il sondaggio B\_S01 non intercetta il substrato roccioso.

Dalla **0+475** alla **0+750** il substrato roccioso è affiorante; per quanto significativa, la prova MASW ha indicato la presenza di uno spessore di substrato alterato (unità AC alt) di spessore pari a circa 4-5 m, seguito dal substrato con migliore caratteristiche fisico-meccaniche, si tratta dell'unità delle Arenarie del Cervarola (unità AC).

Dalla **0+475** alla **1+200**, ancora una volta, il profilo stratigrafico è caratterizzato dalla presenza di depositi alluvionali. Tuttavia, in questo caso la loro natura è francamente incoerente (unità GS), come suggeriscono l'esito dei sondaggi B\_S02 e B\_S03 e delle prove di laboratorio eseguite sui campioni estratti. La sua profondità massima, alla pk 1+000 raggiunge circa 25-26 m da p.c., mentre lateralmente (sia verso Est che verso Ovest) la sua profondità tende a diminuire. Al di sotto dei terreni

alluvionali si incontrano le Arenarie del Cervarola (unità AC). Anche in questo caso, nella parte superficiale dell'unità AC, è presente un cappellaccio di alterazione (AC alt) con spessore minimo.

Dalla **1+200** alla **1+600** affiora il substrato roccioso dell'unità delle Marne di San Polo (unità MS); le indagini disponibili hanno indicato uno spessore di circa 5-6 m di substrato alterato. In corrispondenza delle pk 1+200 e 1+600, come indicato negli elaborati geologici, sono presenti i limiti geologici tra Arenarie del Cervarola e Marne di San Polo.

Dalla **1+600** alla **8+125** affiora persistentemente il substrato roccioso e, in particolare, la formazione geologica delle Arenarie del Cervarola. Lungo tutto il tracciato è presente, dapprima, l'unità costituita dal substrato roccioso alterato (AC alt), con spessore variabile da pochi metri fino talvolta a cc 30 m, come ad esempio in corrispondenza dei sondaggi B\_S11, B\_S12. Segue il substrato non alterato con buone caratteristiche fisico-meccaniche. Anche all'interno dell'unità AC sono presenti lenti di substrato alterato (vedi B\_S05, B\_S14, B\_S15, MASW4).

Dalla **8+125** alla **8+475** il substrato roccioso non è più affiorante, ma sepolto da depositi di natura alluvionale, composti in prevalenza terreni coesivi. Il loro spessore è di circa una decina di metri.

## 4.2. Sintesi della caratterizzazione geotecnica

Alla luce dei risultati delle indagini di progetto, tenuto conto della disponibilità di dati sperimentali, sulla base della caratterizzazione di ciascuna unità geotecnica, è possibile proporre la sintesi dei parametri geotecnici riportati nella seguente Tabella.

**Tabella 4-2 Sintesi dei parametri geotecnici**

Unità geotecnica	Unità geologica	$\gamma/\gamma'$ (kN/m <sup>3</sup> )	Variabilità parametri			Valori caratteristici		
			$\phi'$	c'	c <sub>u</sub>	$\phi'_{k}$	c'_{k}	c <sub>u k</sub>
			(°)	(kPa)	(kPa)	(°)	(kPa)	(kPa)
R	r	20.0/10.0	26÷35	0÷10	-	35	0	-
FN	fn	19.5/9.5	20÷30	0÷10	-	21÷26	0÷5	-
LS	at	19.5/9.5	24÷28	10÷30	40÷60	26	10	50
GS	at	19.5/9.5	27÷32	0	-	30	0	-
MS alt	ms	19.5/9.5	24÷32	10÷80	-	27	10÷50*	-
MS	ms	23.0/13.0	24÷32	80÷200	-	28	100	-
AC alt	ac	19.5/9.5	25÷35	10÷80	-	30	10÷50*	-
AC	ac	23.0/13.0	25÷35	80÷210	-	32	90	-

\*Valore che incrementa con la profondità

Unità geotecnica	Unità geologica	Valori di deformabilità di riferimento							
		q <sub>s</sub> per micropali tipo IGU	V <sub>s</sub>	G <sub>0</sub>	v	M <sub>fond. Dir.</sub>	E <sub>fond. Dir.</sub>	E <sub>fond. Prof.</sub>	E <sub>substr</sub>
		(kPa)	(m/s)	(MPa)	(-)	(MPa)	(MPa)	(MPa)	(MPa)
R	r	100	200	80	0.25	-	20	30	-
FN	fn	60	100÷200	20÷80	0.3	-	6÷10	9÷15	-
LS	at	-	200÷400	80÷300	0.3	4÷20	3÷16	8÷30	-
GS	at	100÷150	200÷400	80÷300	0.3	-	10÷15	15÷22	-
MS alt	ms	200÷400	200÷700	80÷1000	0.2	-	20÷240	25÷300	-
MS	ms	400÷600	700÷1000	1100÷2300	0.2	-	-	-	1100÷1400
AC alt	ac	200÷400	200÷700	80÷1000	0.2	-	20÷240	25÷300	-
AC	ac	400÷600	700÷1000	1100÷2300	0.2	-	-	-	1100÷1400

Si sottolinea che per la caratterizzazione geomeccanica dei materiali litoidi appartenenti alle fasce cataclastiche (zone di faglia), si ritiene opportuno fare riferimento ai parametri definiti per le unità di ammasso roccioso alterato (MS alt, AC alt).

Per quanto riguarda il regime delle pressioni neutre si riporta di seguito la Tabella delle misure piezometriche eseguite sia durante l'esecuzione dei sondaggi, sia nelle successive sessioni di monitoraggio. In ogni caso, per l'inquadramento idrogeologico dell'area si rimanda alla Relazione geologica (T01GE01GEORE01) e agli elaborati di progetto della Carta idrogeologica (T01GE01GEOCI01÷5).



**Tabella 4-3 Livelli piezometrici misurati in occasione della campagna di indagine del 2023**

PIEZOMETRO	LETTURE ESEGUITE DURANTE L'ESECUZIONE DEI SONDAGGI (m da p.c.)	LETTURA 16/03/2023 (m da p.c.)	LETTURA 19/06/2023 (m da p.c.)	LETTURA 04/07/2023 (m da p.c.)	LETTURA 01/08/2023 (m da p.c.)
B_S01	4.20	-	0.31	0.70	1.89
B_S03	3.05	-	1.75	2.59	4.06
B_S03Bis	4.16	-	10.96	11.36	11.6
B_S03Ter	6.52	-	8.07	8.50	8.88
B_S04	17.72	-	14.33	14.37	14.56
B_S06	13.41	11.75	10.54	12.37	14.51
B_S08	11.4	10.73	11.67	11.81	11.99
B_S09Bis	10.75	9.75	9.97	10.60	11.34
B_S10	-	10.96	11.10	12.32	12.77
B_S10bis	-	-	11.30	13.10	14.52
B_S12	28.4	Asciutto*	29.72	29.81	29.86
B_S14	4.5	3.98	5.70	6.77	7.97
B_S15	7.9	16.92	17.47	17.84	18.09
B_S15Bis	11.4	10.47	10.73	11.27	11.99
B_S19	-	9.98	9.67	11.34	12.74
B_S19Bis	0.85	1.94	1.01	0.99	1.36
B_S20Bis	1.3	1.33	1.15	1.24	1.48
B_S21	-	3.49	3.65	3.79	4.10
B_S22	5.4	4.50	4.77	4.66	5.38

### 4.3. Azione sismica di progetto

L'azione sismica di riferimento, utilizzata per lo svolgimento delle analisi presentate nel capitolo successivo, è stata definita sulla base dei criteri esposti nelle "Norme tecniche per le costruzioni" (Decreto Ministeriale 17 gennaio 2018).

L'azione sismica viene valutata a partire dalla cosiddetta "pericolosità sismica di base" riferita ad un sito con suolo rigido (categoria A) e superficie topografica orizzontale.

Allo stato attuale la pericolosità sismica di base sul territorio italiano è fornita dai dati pubblicati sul sito dell'Istituto Nazionale di Geofisica e Vulcanologia (INGV). La Figura riportata di seguito mostra la distribuzione dell'accelerazione massima orizzontale  $a_g$  di riferimento su suolo rigido con possibilità di superamento pari al 10% in 50 anni, per le coordinate Lat. 43.419682° e Long. 11.924533° nel comune di Arezzo e ottenuta dal citato database. Si tratta di una coordinata rappresentativa dell'intero tracciato posta nel mezzo alla pk 5+200.

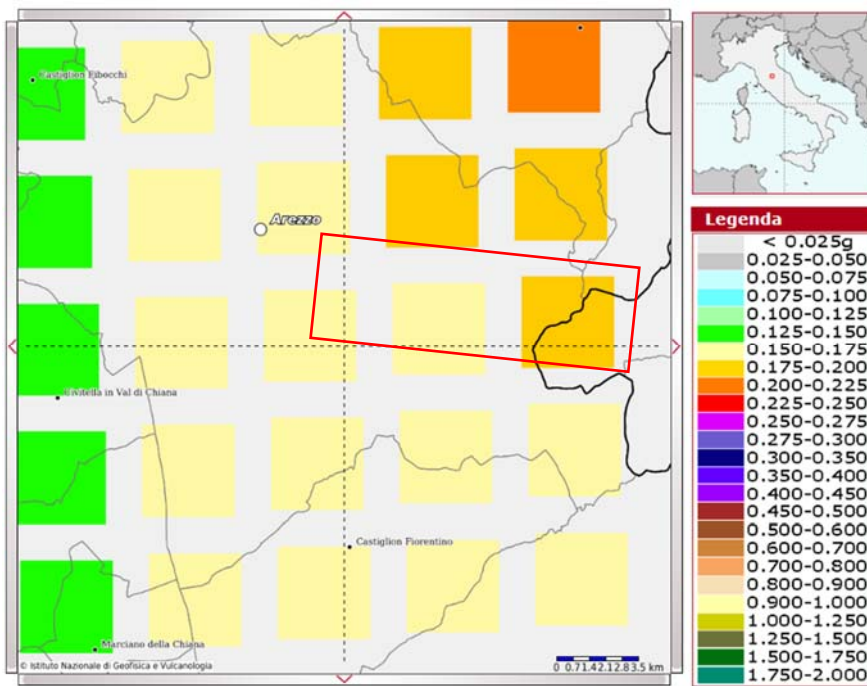
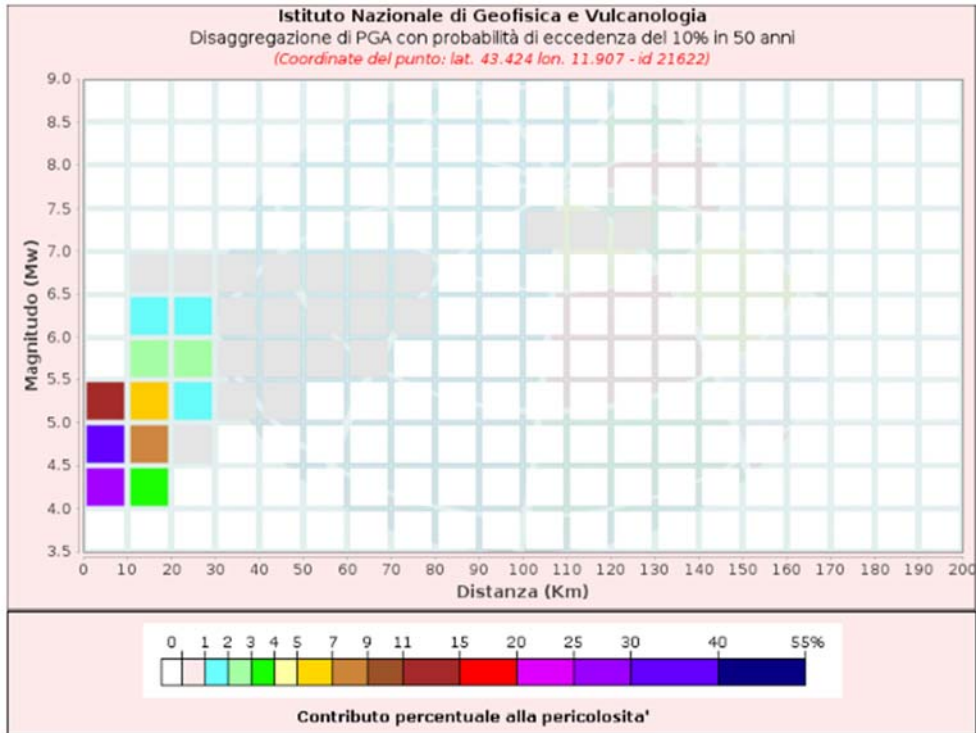


Figura 4-1 Accelerazione massima orizzontale  $a_g$  di riferimento su suolo rigido con possibilità di superamento pari al 10 % in 50 anni, dal sito dell'istituto nazionale di Geofisica e Vulcanologia (Lat. 43.419682° e Long. 11.924533°). In rosso è indicato approssimativamente il tracciato della E78 Grosseto Fano in oggetto

Inoltre, nelle seguenti Figure si riportano il grafico della disaggregazione della pericolosità sismica che consente di valutare i contributi di diverse sorgenti sismiche alla pericolosità di un sito. Dai grafici viene fornito il terremoto che domina lo scenario di pericolosità.



a)

**Disaggregazione di PGA con probabilità di eccedenza del 10% in 50 anni**  
(Coordinate del punto: lat. 43.424 lon. 11.907 - id 21622)

Distanza (Km)	Magnitudo (Mw)										
	3.5-4.0	4.0-4.5	4.5-5.0	5.0-5.5	5.5-6.0	6.0-6.5	6.5-7.0	7.0-7.5	7.5-8.0	8.0-8.5	8.5-9.0
0-10	0.0000	25.1000	33.7000	11.6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10-20	0.0000	3.0600	7.8200	6.1300	2.2000	1.5900	0.0187	0.0000	0.0000	0.0000	0.0000
20-30	0.0000	0.0000	0.3620	1.6400	2.0800	1.9600	0.0514	0.0000	0.0000	0.0000	0.0000
30-40	0.0000	0.0000	0.0000	0.1160	0.7120	0.9940	0.0402	0.0000	0.0000	0.0000	0.0000
40-50	0.0000	0.0000	0.0000	0.0005	0.1430	0.3990	0.0207	0.0000	0.0000	0.0000	0.0000
50-60	0.0000	0.0000	0.0000	0.0000	0.0143	0.1300	0.0063	0.0000	0.0000	0.0000	0.0000
60-70	0.0000	0.0000	0.0000	0.0000	0.0001	0.0325	0.0020	0.0000	0.0000	0.0000	0.0000
70-80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0039	0.0004	0.0000	0.0000	0.0000	0.0000
80-90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
90-100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
100-110	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0019	0.0000	0.0000	0.0000
110-120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0037	0.0000	0.0000	0.0000
120-130	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000	0.0000
130-140	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
140-150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
150-160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
160-170	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
170-180	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
180-190	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
190-200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

**Valori Medi**

Magnitudo	Distanza	Epsilon
4.86	8.88	1.16

b)

Figura 4-2 a) Grafico di disaggregazione per sito in coordinate rappresentative per il tracciato in oggetto (Lat. 43.419682° e Long. 11.924533°); b) Disaggregazione di PGA con probabilità di eccedenza del 10% in 50 anni, per sito in coordinate rappresentative per il tracciato in oggetto (Lat. 43.422, Long. 11.923)

I valori dei parametri  $a_g$  (accelerazione orizzontale massima al sito),  $F_0$  (valore massimo del fattore di amplificazione dello spettro in accelerazione orizzontale) e  $T_C^*$  (periodo di inizio del tratto a velocità costante dello spettro in accelerazione orizzontale), per i periodi di ritorno  $T_R$  di riferimento sono sito specifici, ovvero cambiano in base alla coordinata (Forniti attraverso l'applicativo 'Spettri' elaborato dal M.LL.PP).

La Figura 4-1, infatti, mostra come il valore di  $a_g$  su suolo rigido con possibilità di superamento pari al 10% in 50 anni è variabile. Infatti, nel Comune di Arezzo, si osserva che varia da circa 0.125÷0.150 nella parte Nord/ Nord-Ovest, nella parte centrale e meridionale del comune tra 0.150÷0.175, mentre nella porzione a Nord-Est/Est i valori raggiungono accelerazioni pari a 0.175÷0.200.

In accordo con le NTC18 per le opere in progetto possono essere definite le seguenti caratteristiche:

Vita nominale

La vita nominale di un'opera è intesa come numero di anni nel quale deve poter essere usata per lo scopo al quale è destinata ed è definita dalle NTC in funzione del tipo di costruzione (*tabella 2.4.1*). Nel caso del presente intervento si considera:

$$V_N = 50 \text{ anni}$$

Classe d'uso

In presenza di azioni sismiche, con lo scopo di valutare le conseguenze di una interruzione di operatività assegnata o di un eventuale collasso della struttura, le costruzioni sono catalogate in 4 classi d'uso (par. 2.4.2, NTC2018) a cui corrisponde un valore del coefficiente d'uso  $C_u$  per la definizione dell'azione sismica.

All'opera in oggetto viene assegnata una Classe d'uso IV. A tale classe d'uso è associato un coefficiente d'uso  $C_u$  pari a 2.

Periodo di riferimento

Il periodo di riferimento con il quale valutare le azioni sismiche di progetto è dato dal prodotto della vita nominale e del coefficiente d'uso. Nel caso in esame si ha:

$$V_R = V_N \times C_u = 100 \text{ anni}$$

Nelle seguenti Tabelle sono riportati n.3 esempi di valori dei parametri  $a_g$ ,  $F_0$ ,  $T_C^*$  in funzione dei periodi di ritorno  $T_R$  indicati e di valori dei parametri sismici per i tempi di ritorno associati ai quattro stati limite SLO, SLD, SLV e SLC per 3 coordinate rappresentative per l'intero tracciato (circa sono state scelte all'inizio, nel mezzo e alla fine del tracciato).

**Tabella 4-4 Parametri  $a_g$ ,  $F_0$ ,  $T_C^*$  in funzione dei periodi di ritorno  $T_R$  indicati e i valori dei parametri sismici per i tempi di ritorno associati ai quattro stati limite SLO, SLD, SLV e SLC per le coordinate indicate**

Pk. 0+650  
 Lat. 43.444111°  
 Long. 11.886107°

$T_R$ [anni]	$a_g$ [g]	$F_0$ [-]	$T_C^*$ [s]
30	0.054	2.512	0.261
50	0.067	2.515	0.273
72	0.077	2.522	0.278
101	0.089	2.468	0.283
140	0.102	2.455	0.285
201	0.118	2.415	0.288
475	0.160	2.423	0.292
975	0.200	2.432	0.300
2475	0.260	2.465	0.313

SLATO LIMITE	$T_R$ [anni]	$a_g$ [g]	$F_0$ [-]	$T_C^*$ [s]
SLO	60	0.072	2.518	0.275
SLD	101	0.089	2.468	0.283
SLV	949	0.199	2.431	0.300
SLC	1950	0.243	2.456	0.310

Pk. 3+300  
Lat. 43.432845°  
Long. 11.911414°

$T_R$ [anni]	$a_g$ [g]	$F_o$ [-]	$T_C^*$ [s]
30	0.055	2.509	0.262
50	0.068	2.507	0.273
72	0.078	2.517	0.278
101	0.091	2.453	0.282
140	0.103	2.454	0.285
201	0.120	2.414	0.288
475	0.162	2.424	0.293
975	0.202	2.432	0.301
2475	0.263	2.466	0.314

SLATO LIMITE	$T_R$ [anni]	$a_g$ [g]	$F_o$ [-]	$T_C^*$ [s]
SLO	60	0.073	2.512	0.275
SLD	101	0.091	2.454	0.282
SLV	949	0.201	2.432	0.300
SLC	1950	0.246	2.458	0.311

Pk. 8+050  
Lat. 43.426464°  
Long. 11.949885°

$T_R$ [anni]	$a_g$ [g]	$F_o$ [-]	$T_C^*$ [s]
30	0.056	2.503	0.262
50	0.069	2.495	0.273
72	0.080	2.508	0.278
101	0.093	2.448	0.283
140	0.106	2.444	0.286
201	0.123	2.416	0.288
475	0.167	2.419	0.294
975	0.208	2.429	0.304
2475	0.269	2.474	0.317

SLATO LIMITE	$T_R$ [anni]	$a_g$ [g]	$F_o$ [-]	$T_C^*$ [s]
SLO	60	0.075	2.502	0.276
SLD	101	0.093	2.448	0.283
SLV	949	0.206	2.429	0.304
SLC	1950	0.252	2.462	0.314

Il valore dell'accelerazione di riferimento  $a_g$  così ottenuto deve essere modificato per tener conto sia delle variazioni prodotte dalle condizioni stratigrafiche locali che della morfologia del sito; l'accelerazione massima orizzontale di riferimento si ottiene con la seguente espressione:

$$a_{max} = a_g \times S_s \times S_t$$

dove  $S_s$  è un coefficiente di amplificazione stratigrafica e  $S_t$  di amplificazione topografica.

L'attribuzione delle categorie di sottosuolo è stata svolta in funzione dei risultati delle indagini disponibili, ovvero in base ai risultati in termini di velocità equivalente di propagazione delle onde di taglio  $S$ ,  $V_{s,eq}$ . Tali dati sono stati ottenuti dalle prospezioni sismiche di tipo MASW e Down-Hole, così distribuite lungo il lotto:

- N°4 indagini MASW (B\_MASW1, B\_MASW2, B\_MASW3, B\_MASW4);
- N°4 prove down-hole nei fori di sondaggio (B\_S07, B\_S11, B\_S13, B\_S20).

I risultati delle indagini sismiche sono sintetizzati nella Tabella seguente la quale, sulla base dei valori di  $x$  propone anche la categoria di suolo secondo quanto disposto dal par. 3.2.2. della normativa vigente.

**Tabella 4-5 Categoria di sottosuolo secondo le NTC18 delle prove sismiche effettuate**

ID PROVA SISMICA	$V_{s,eq}$ (m/s)	Cat. di suolo NTC'18
B_MASW1	755	B
B_MASW2	770	B
B_MASW3	743	B
B_MASW4	484	B
B_S07	378	B
B_S11	559	B
B_S13	341	E
B_S20	280	E

In base alle informazioni riportate, desunte dalla campagna di indagini, per le opere nell'area del tracciato in progetto è possibile considerare i terreni di fondazione come appartenenti alla categoria B: *“Rocce tenere e depositi di terreni a grana grossa molto addensati o terreni a grana fina molto consistenti, caratterizzati da un miglioramento delle proprietà meccaniche con la profondità e da valori di velocità equivalente compresi tra 360 m/s e 800 m/s.”*

Per quanto riguarda gli effetti legati alla topografia del sito, alla luce delle informazioni disponibili è possibile assegnare la categoria topografica T1: *“Superficie pianeggiante, pendii e rilievi isolati con inclinazione media  $i \leq 15^\circ$ ”*.

Pertanto, il coefficiente di amplificazione stratigrafica è pari a  $S_s = 1.2$  e il coefficiente di amplificazione topografica è pari a  $S_t = 1.0$ .

Con riferimento ad uno Stato Limite di Salvaguardia della Vita (SLV), rappresentativo dell'intero tracciato, l'accelerazione massima attesa al sito è pari a:

$$a_{max} = 0.2g \times 1.20 \times 1.0 = 0.24g$$



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## 6. METODO DI CALCOLO

### 6.1. Premessa

Dal punto di vista normativo, le opere in terra rinforzata possono essere trattate secondo le indicazioni riportate nel paragrafo § 6.5 OPERE DI SOSTEGNO delle NTC 2018: esse rientrano nella definizione di “...strutture miste, che esplicano la funzione di sostegno anche per effetto di trattamenti di miglioramento e per la presenza di particolari elementi di rinforzo e collegamento”.

Secondo quanto previsto dalla normativa si devono considerare i seguenti stati limite ultimi:

- SLU di tipo geotecnico (GEO)  
 stabilità globale del complesso opera di sostegno-terreno e stabilità interna.

### 6.1. Analisi di stabilità

La verifica di stabilità, che confronta il valore di progetto dell'azione o dell'effetto dell'azione  $E_d$  con quello di progetto della resistenza del sistema geotecnico  $R_d$ , è stata condotta secondo l'approccio 1 con la combinazione 2 “A2+M2+R2”, tenendo conto dei coefficienti parziali riportati nelle tabelle 6.2.I, 6.2.II e 6.8.I delle NTC, di seguito riportati per completezza.

Tab. 6.2.I – Coefficienti parziali per le azioni o per l'effetto delle azioni

	Effetto	Coefficiente Parziale $\gamma_F$ (o $\gamma_E$ )	EQU	(A1)	(A2)
Carichi permanenti $G_1$	Favorevole	$\gamma_{G1}$	0,9	1,0	1,0
	Sfavorevole		1,1	1,3	1,0
Carichi permanenti $G_2^{(1)}$	Favorevole	$\gamma_{G2}$	0,8	0,8	0,8
	Sfavorevole		1,5	1,5	1,3
Azioni variabili Q	Favorevole	$\gamma_Q$	0,0	0,0	0,0
	Sfavorevole		1,5	1,5	1,3

<sup>(1)</sup> Per i carichi permanenti  $G_2$  si applica quanto indicato alla Tabella 2.6.I. Per la spinta delle terre si fa riferimento ai coefficienti  $\gamma_{G1}$

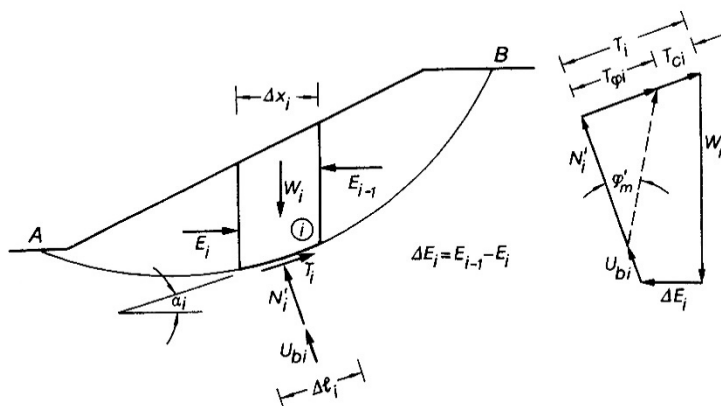
Tab. 6.2.II – Coefficienti parziali per i parametri geotecnici del terreno

Parametro	Grandezza alla quale applicare il coefficiente parziale	Coefficiente parziale $\gamma_M$	(M1)	(M2)
Tangente dell'angolo di resistenza al taglio	$\tan \phi'_k$	$\gamma_{\phi'}$	1,0	1,25
Coesione efficace	$c'_k$	$\gamma_{c'}$	1,0	1,25
Resistenza non drenata	$c_{uk}$	$\gamma_{cu}$	1,0	1,4
Peso dell'unità di volume	$\gamma_\gamma$	$\gamma_\gamma$	1,0	1,0

Tab. 6.8.I – Coefficienti parziali per le verifiche di sicurezza di opere di materiali sciolti e di fronti di scavo

COEFFICIENTE	R2
$\gamma_R$	1,1

Le verifiche sono state condotte con il metodo di Bishop semplificato (1955) ed ipotizzando superfici di scorrimento circolari di raggio  $r$ , con il materiale coinvolto nella rottura suddiviso in conci di larghezza  $b$  (vedi schema riportato di seguito), per ognuna delle quali vengono valutati il momento stabilizzante  $M_s$  (resistenza  $R$  del sistema geotecnico) e il momento ribaltante  $M_r$  (azione  $E$ ) calcolati rispetto al centro del cerchio.



Il contributo al momento stabilizzante  $M_s$  di un concio è fornito in generale dalla resistenza alla base, somma della componente del peso  $W$  ortogonale alla base moltiplicata per la tangente dell'angolo di resistenza al taglio  $\phi$  e della eventuale coesione  $c$ , moltiplicata per la lunghezza  $b/\cos\alpha$ , dove  $\alpha$  è l'inclinazione della base del concio rispetto all'orizzontale. Nell'ipotesi che il concio sia parzialmente immerso in acqua si ottiene:

$$M_s = \frac{c \times b + (W - u \times b) \times \text{tg} \phi}{m\alpha} \times r$$

dove:

$$m\alpha = \cos \alpha \times \left( 1 + \frac{\text{tg} \alpha \times \text{tg} \phi}{F} \right)$$

Il contributo al momento ribaltante  $M_r$  di un concio è fornito dalla componente del peso  $W$  parallela alla base del concio:

$$M_r = W \times \sin \alpha \times r$$

La stabilità globale, secondo quanto indicato nell'Eurocodice 7, può essere verificata utilizzando il "fattore di sicurezza globale"  $F$  e un fattore ausiliario definito ODF ("Over-design factor"), di seguito definito con riferimento all'approccio A2+M2+R2 indicato dalle NTC 2018:

- viene calcolato il fattore di sicurezza  $F$  come rapporto  $R/E$  utilizzando i parametri di resistenza dei terreni di progetto  $\phi_d$  e  $c_d$  e amplificando i carichi con i coefficienti parziali  $\gamma_{G1}$  e  $\gamma_{G2}$ ;
- viene calcolato ODF dividendo  $F$  per il coefficiente parziale sulle resistenze  $\gamma_R$ .

Affinché le verifiche siano soddisfatte deve quindi risultare:

$$ODF = \frac{F}{\gamma_R} = \frac{R(\phi_d, c_d)/E(\phi_d, c_d)}{\gamma_R}$$

Le verifiche in condizioni sismiche sono state condotte mediante l'analisi di tipo pseudo-statico che considera un sistema di forze orizzontali e verticali applicate ai volumi di terreno coinvolti.

Le forze orizzontali di inerzia, dovute alla azione sismica, sono state considerate con intensità pari a:

$$F_h = k_h \times W$$

con

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$$k_h = \beta_s \times \frac{a_{max}}{g}$$

dove:

- $\beta_s$  = coefficiente di riduzione dell'accelerazione massima al sito (pari a 0.38 nelle verifiche dello stato limite ultimo SLV);
- $a_{max}$  = accelerazione orizzontale massima attesa al sito;
- $W$  = peso del materiale;
- $g$  = accelerazione di gravità.

Le forze verticali sono state considerate pari a:

$$F_v = k_v \times W$$

con

$$k_v = \pm 0.5 \times k_h$$

dove

- $k_h = \beta_s \times \frac{a_{max}}{g} = 0.38 \times \frac{0.240g}{g} = 0.091$
- $k_v = \pm 0.5 \times k_h = \pm 0.5 \times 0.091 = 0.045$

Il codice di calcolo consente di tener conto della presenza di geogriglie di rinforzo del terreno, la geometria della loro maglia è costituita da bande perpendicolari sovrapposte e saldate, con angolo di attrito all'interfaccia fra i rinforzi ed il terreno pari a circa  $0.9 \varphi$ .

La resistenza di progetto delle geogriglie ( $R_d$ ), che interviene nel calcolo come forza stabilizzante, è stata ricavata da quella caratteristica longitudinale ( $T_{max}$ ) applicando una serie di coefficienti di sicurezza che tengono conto di possibili alterazioni di tale valore nominale; in particolare, la resistenza di progetto può essere definita attraverso l'espressione:

$$T_{a,d} = \frac{T_{ult}}{f_{Sdam} \cdot f_{Screep} \cdot f_{Schim} \cdot f_{Sbio}}$$

con:

- $f_{Sdam}$  coefficiente di sicurezza per tener conto dell'eventuale danneggiamento in fase d'installazione; è solitamente funzione del materiale del rilevato;
- $f_{Screep}$  coefficiente di sicurezza per tener conto degli effetti a lungo termine e dei fenomeni viscosi nel tempo;
- $f_{Schim}$  coefficiente di sicurezza per tener conto di attacchi chimici;
- $f_{Sbio}$  coefficiente di sicurezza per tener conto di attacchi biologici.

Per l'opera in oggetto è previsto l'utilizzo di geogriglie con valori di resistenza ultima pari a 80, 150 e 200 kN/m. Valutando cautelativamente un coefficiente di sicurezza complessivo pari a 1.7, si ottengono i valori di resistenza di progetto delle geogriglie rispettivamente pari a 47, 88 e 118 kN/m.

## 7. VERIFICHE OPERA DELLA TERRA ARMATA TRA PK 2+300 - 2+370

Le verifiche di stabilità globale e di stabilità interna sono state condotte per la sezione di altezza maggiore (H=25.0 m) rappresentata in **Errore. L'origine riferimento non è stata trovata.** con parametri geotecnici riportati in Tabella 4-2.

I parametri geotecnici del rilevato esistente sono stati assunti sulla base di risultati di una back-analysis dello stato di fatto del pendio esistente generalmente caratterizzato da condizioni di stabilità, come descritto nel capitolo 7 della relazione sulla terra rinforzata tra la pk 1+970 e 2+110. E di seguito riportata per completezza:

*“...La sezione di calcolo utilizzata per la back analisi presenta pendenze medie attorno ai 40° di inclinazione sull'orizzontale.”*

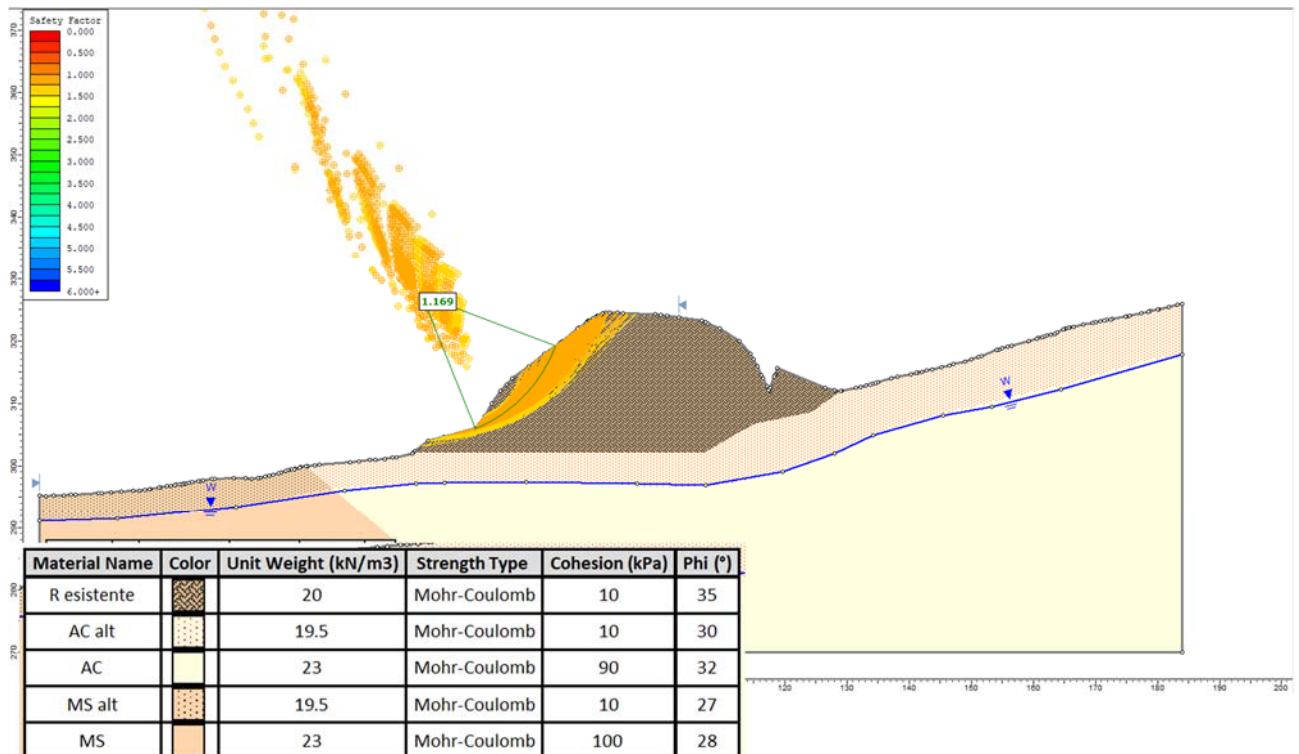


Figura 7-1 SDF per l'esecuzione della back analysis (Fattore di sicurezza minimo con parametri di resistenza caratteristici)

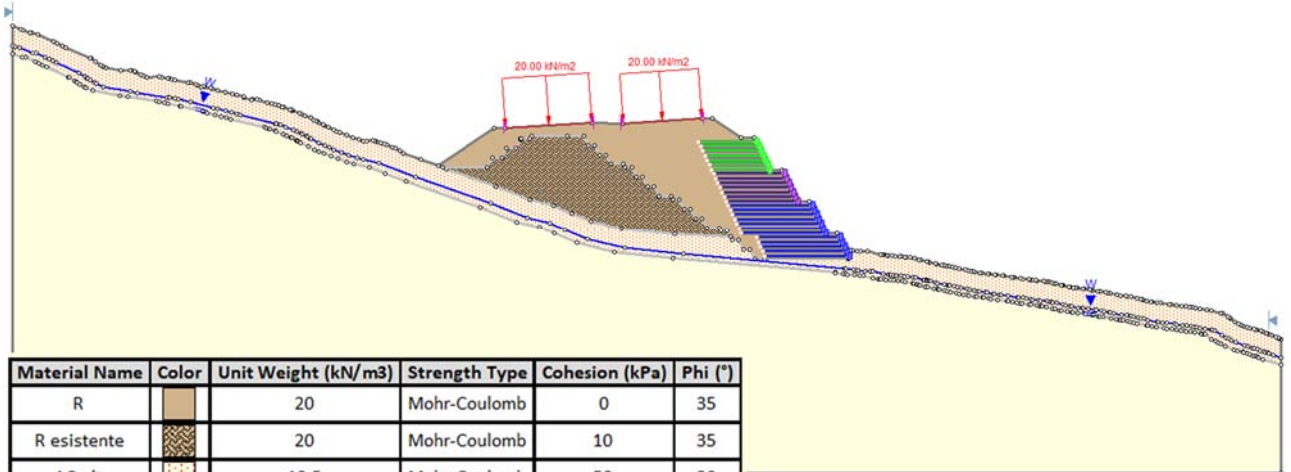
Nelle Figure seguenti si riportano lo schema del modello di calcolo e l'esito delle verifiche in condizioni statiche e sismiche. Le analisi sono state condotte considerando un sovraccarico variabile dato dal traffico pari a 20 kPa in condizioni statiche e pari a 6 kPa in condizioni sismiche. La Tabella seguente riassume l'esito dei calcoli in termini di ODF per le diverse analisi di stabilità eseguite. Dal momento che il valore ODF calcolato risulta maggiore di 1.0 le verifiche di stabilità globale del complesso opera di sostegno-reno e stabilità interna sono soddisfatte.

ODF	SLU	SLV kv>0	SLV kv<0
Stabilità globale	1.065	1.072	1.063

Stabilità interna	1.221	1.273	1.296
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Tabella 7-1 Risultati analisi di stabilità Opera pk 2+300 - 2+370

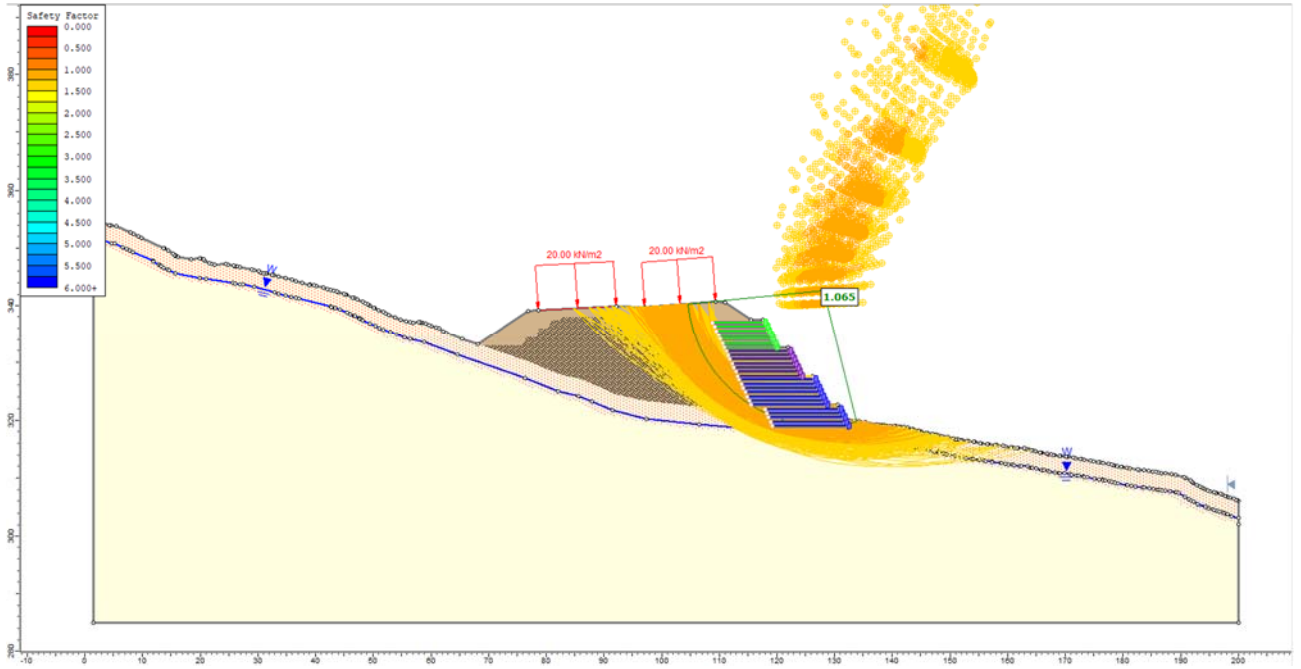
### 7.1. STABILITÀ GLOBALE



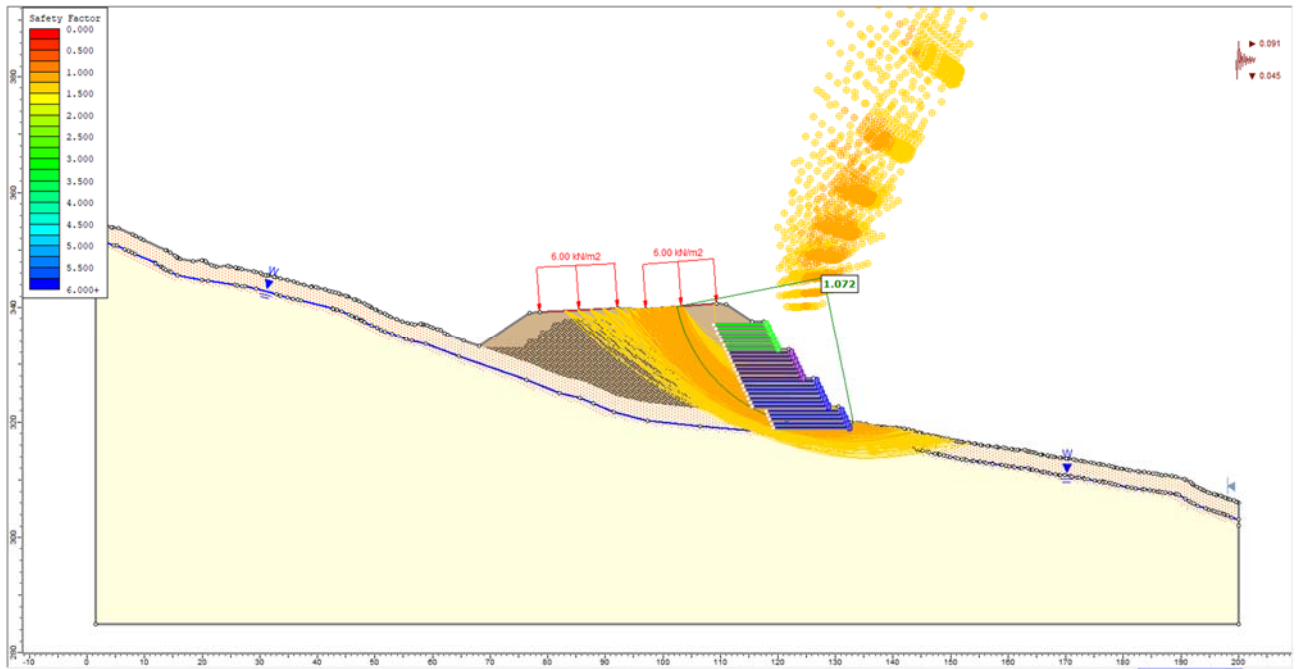
Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)
R		20	Mohr-Coulomb	0	35
R resistente		20	Mohr-Coulomb	10	35
AC alt		19.5	Mohr-Coulomb	50	30
AC		23	Mohr-Coulomb	90	32

Support Name	Color	Type	Force Application	Adhesion (kPa)	Friction Angle (°)	Strip Coverage (%)	Long Term Design Strength (kN/m)
200		Geosynthetic	Passive (Method B)	0	31.5	100	117.625
150		Geosynthetic	Passive (Method B)	0	31.5	100	88.2187
80		Geosynthetic	Passive (Method B)	0	31.5	100	47.05

Figura 7-2 Modello di calcolo terra rinforzata dalla pk 2+300 alla pk 2+370

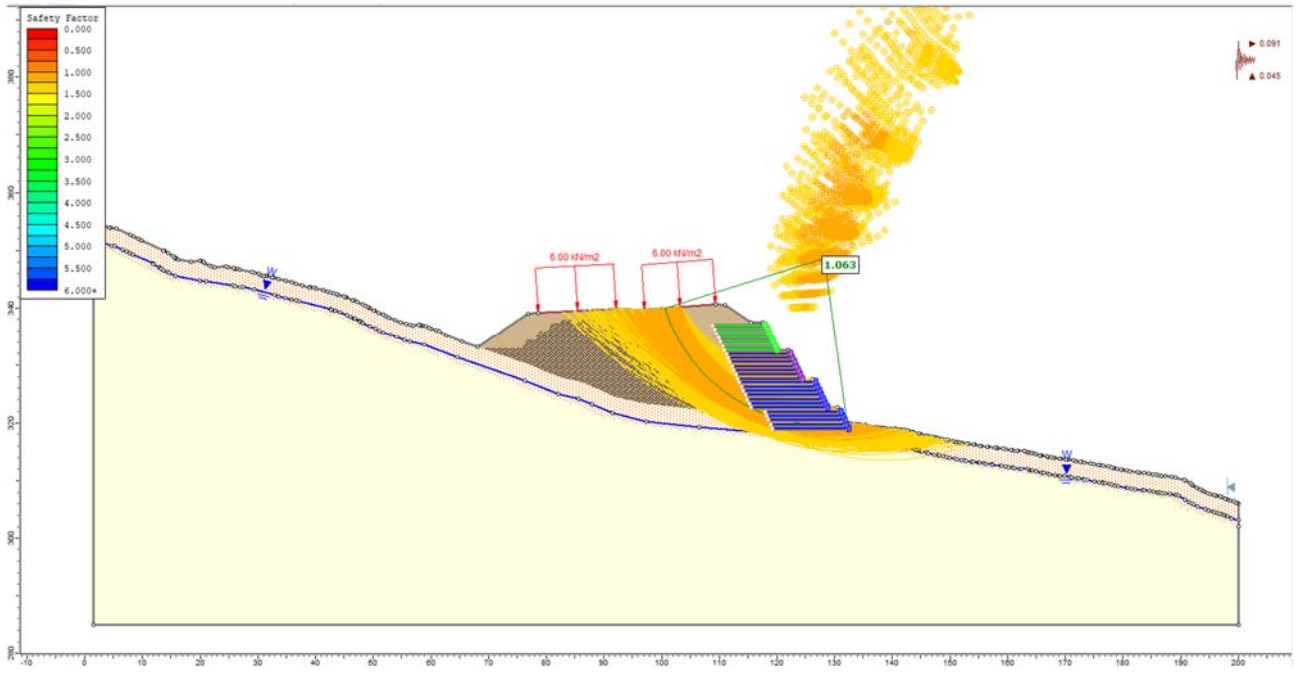


**Figura 7-3 Analisi SLU - ODF=1.065**



**Figura 7-4 Analisi SLV (kv>0) - ODF=1.072**

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**Figura 7-5 Analisi SLV (kv<0) - ODF=1.063**

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**7.2. STABILITÀ INTERNA**

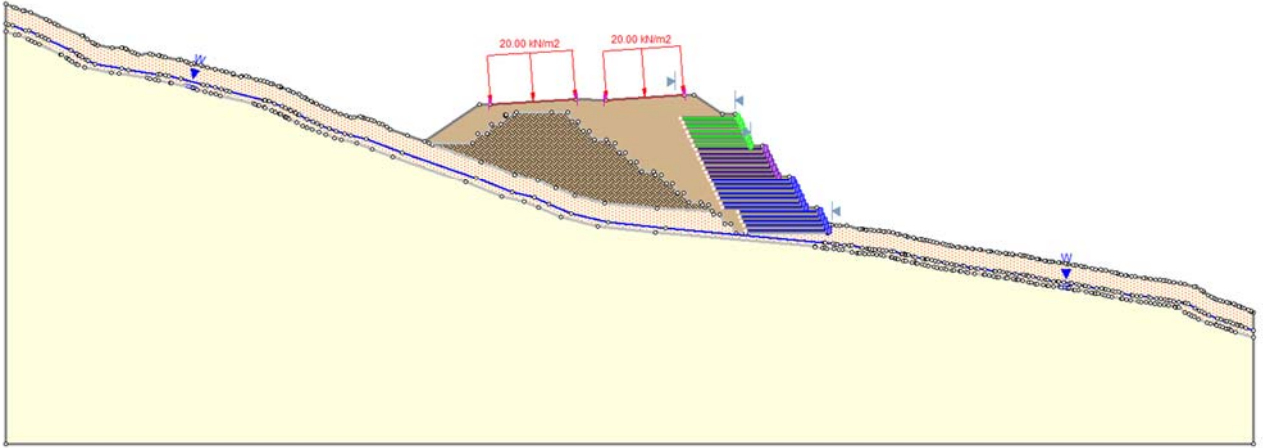


Figura 7-6 Modello di calcolo terra rinforzata dalla pk 2+300 alla pk 2+370 stabilità interna

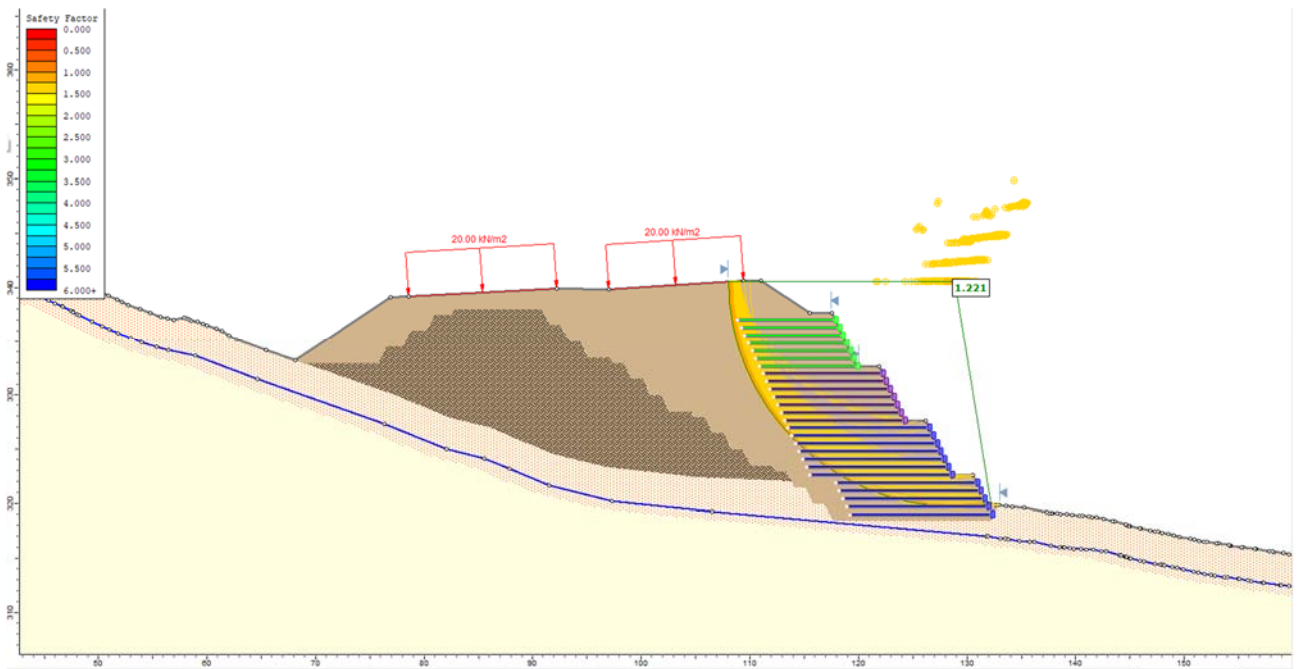
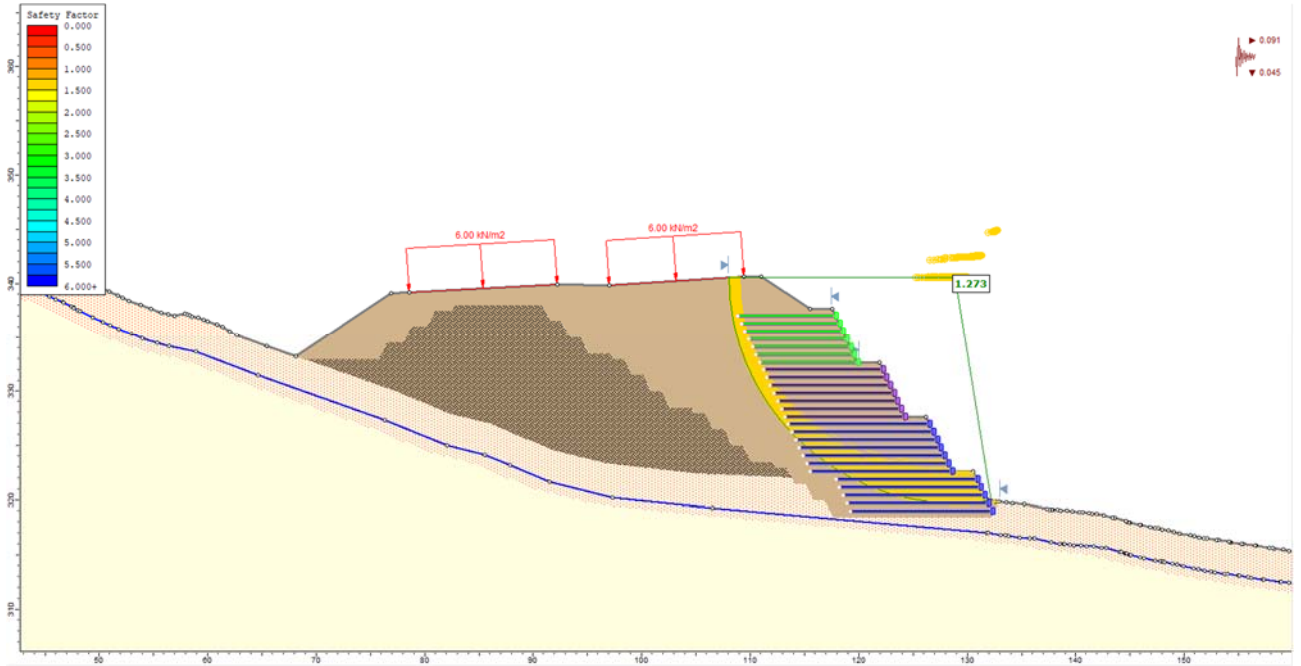


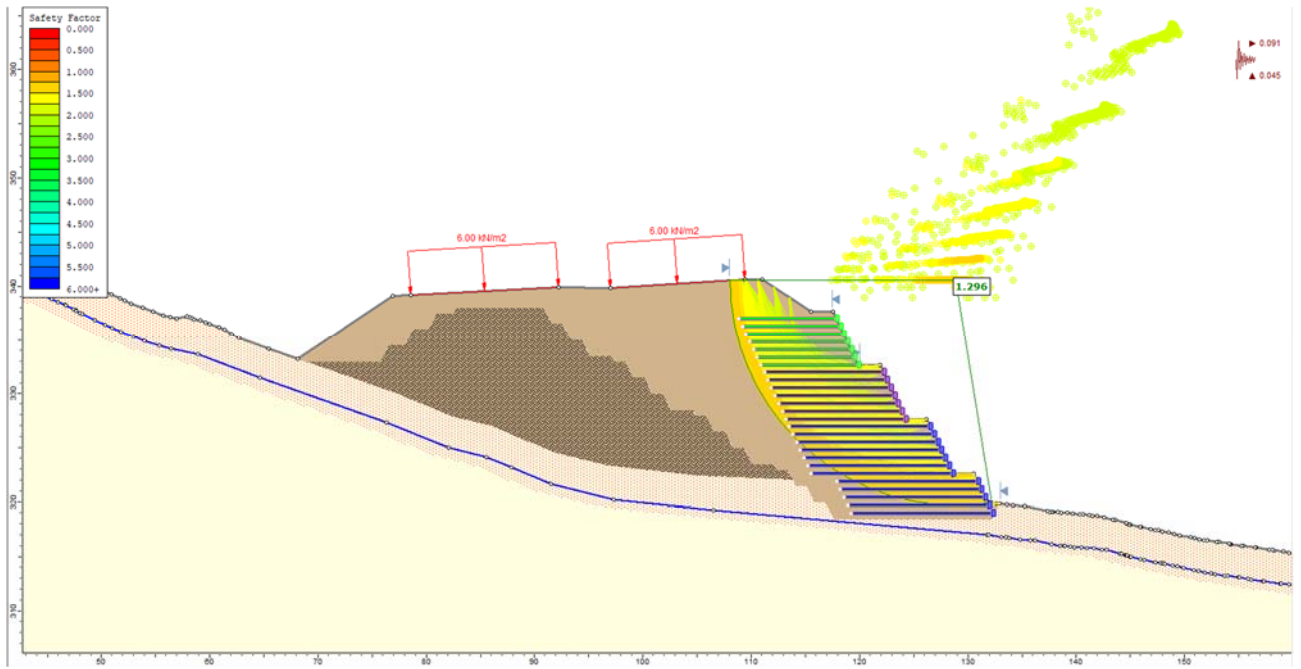
Figura 7-7 Analisi SLU - ODF=1.221

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**Figura 7-8 Analisi SLV kv>0 - ODF=1.273**



**Figura 7-9 Analisi SLV kv<0 - ODF=1.296**

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## **8. ALLEGATI**

### **8.1. TABULATI DI CALCOLO**

PROGETTAZIONE ATI:



23-09-07 BA

Slide2 - An Interactive Slope Stability Program

Date Created: 07/09/2023, 11:17:39

Software Version: 9.029

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# Slide2 Analysis Information

## 23-09-07 BA

### Project Summary

---

File Name:	23-09-07 BA.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.295s
Project Title:	Slide2 - An Interactive Slope Stability Program
Date Created:	07/09/2023, 11:17:39

## General Settings

---

Units of Measurement:

Time Units:

Permeability Units:

Data Output:

Failure Direction:

Metric Units

days

meters/second

Standard

Right to Left

## Analysis Options

---

Slices Type:	Vertical
<b>Analysis Methods Used</b>	
	Bishop simplified
	Janbu simplified
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:

Pore Fluid Unit Weight [kN/m<sup>3</sup>]:

Advanced Groundwater Method:

Water Surfaces

9.81

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

# Materials


## R esistente

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	35 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


## AC alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	30 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


## AC

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	90 kPa
Phi	32 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

## MS alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	27 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

**MS**

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	100 kPa
Phi	28 °
Water Surface	Water Table
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

# Global Minimums

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## Method: bishop simplified

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FS	1.169350
Center:	61.507, 327.370
Radius:	23.027
Left Slip Surface Endpoint:	70.084, 306.000
Right Slip Surface Endpoint:	83.058, 319.257
Resisting Moment:	13716.7 kN-m
Driving Moment:	11730.2 kN-m
Total Slice Area:	38.3269 m <sup>2</sup>
Surface Horizontal Width:	12.9735 m
Surface Average Height:	2.95425 m

## Method: janbu simplified

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FS	1.136020
Center:	61.902, 327.916
Radius:	23.392
Left Slip Surface Endpoint:	70.086, 306.002
Right Slip Surface Endpoint:	83.841, 319.800
Resisting Horizontal Force:	479.938 kN
Driving Horizontal Force:	422.474 kN
Total Slice Area:	43.5242 m <sup>2</sup>
Surface Horizontal Width:	13.7548 m
Surface Average Height:	3.16429 m

## Global Minimum Support Data

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No Supports Present

## Valid and Invalid Surfaces

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### Method: bishop simplified

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Number of Valid Surfaces: 12883

Number of Invalid Surfaces: 21

#### Error Codes

Error Code -112 reported for 21 surfaces

### Method: janbu simplified

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Number of Valid Surfaces: 12762

Number of Invalid Surfaces: 142

#### Error Codes

Error Code -108 reported for 46 surfaces

Error Code -111 reported for 96 surfaces

### Error Code Descriptions

The following errors were encountered during the computation:

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

-111 = Safety factor equation did not converge

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

# Slice Data

## Global Minimum Query (bishop simplified) - Safety Factor: 1.16935

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.259469	0.600062	22.2911	R esistente	10	35	7.98167	9.33336	-0.952055	0	-0.952055	2.32002	2.32002
2	0.259469	1.79157	22.9158	R esistente	10	35	10.1283	11.8435	2.63277	0	2.63277	6.91441	6.91441
3	0.259469	2.96469	23.6186	R esistente	10	35	12.2051	14.272	6.10103	0	6.10103	11.438	11.438
4	0.259469	4.11807	24.3251	R esistente	10	35	14.216	16.6235	9.45933	0	9.45933	15.8856	15.8856
5	0.259469	5.2514	25.0357	R esistente	10	35	16.1611	18.898	12.7077	0	12.7077	20.256	20.256
6	0.259469	6.36588	25.7504	R esistente	10	35	18.0432	21.0988	15.8507	0	15.8507	24.5539	24.5539
7	0.259469	7.76322	26.4694	R esistente	10	35	20.3993	23.8539	19.7854	0	19.7854	29.9425	29.9425
8	0.259469	9.36634	27.1929	R esistente	10	35	23.0821	26.9911	24.2658	0	24.2658	36.1248	36.1248
9	0.259469	10.9479	27.9212	R esistente	10	35	25.685	30.0347	28.6125	0	28.6125	42.2241	42.2241
10	0.259469	12.5075	28.6543	R esistente	10	35	28.2073	32.9842	32.8249	0	32.8249	48.2387	48.2387
11	0.259469	14.014	29.3927	R esistente	10	35	30.5961	35.7776	36.8142	0	36.8142	54.0491	54.0491
12	0.259469	15.3364	30.1365	R esistente	10	35	32.6282	38.1538	40.2076	0	40.2076	59.1493	59.1493
13	0.259469	16.6118	30.8859	R esistente	10	35	34.5435	40.3935	43.4065	0	43.4065	64.0688	64.0688
14	0.259469	17.8632	31.6412	R esistente	10	35	36.3823	42.5436	46.4771	0	46.4771	68.8957	68.8957
15	0.259469	19.09	32.4027	R esistente	10	35	38.1436	44.6032	49.4185	0	49.4185	73.6277	73.6277
16	0.259469	20.1983	33.1707	R esistente	10	35	39.6722	46.3907	51.9713	0	51.9713	77.9031	77.9031
17	0.259469	20.7563	33.9455	R esistente	10	35	40.2614	47.0797	52.9552	0	52.9552	80.0561	80.0561
18	0.259469	21.2059	34.7274	R esistente	10	35	40.6546	47.5395	53.612	0	53.612	81.7914	81.7914
19	0.259469	21.6281	35.5167	R esistente	10	35	40.9871	47.9283	54.1672	0	54.1672	83.4211	83.4211
20	0.259469	22.0273	36.314	R esistente	10	35	41.2663	48.2548	54.6337	0	54.6337	84.9623	84.9623
21	0.259469	22.418	37.1194	R esistente	10	35	41.5157	48.5464	55.05	0	55.05	86.4702	86.4702
22	0.259469	22.7808	37.9335	R esistente	10	35	41.7046	48.7673	55.3653	0	55.3653	87.8707	87.8707
23	0.259469	23.1126	38.7568	R esistente	10	35	41.8289	48.9126	55.573	0	55.573	89.1523	89.1523
24	0.259469	23.2238	39.5896	R esistente	10	35	41.596	48.6403	55.1842	0	55.1842	89.5827	89.5827
25	0.259469	23.1205	40.4326	R esistente	10	35	41.025	47.9726	54.2304	0	54.2304	89.1857	89.1857
26	0.259469	22.9828	41.2863	R esistente	10	35	40.3977	47.2391	53.183	0	53.183	88.6561	88.6561
27	0.259469	22.8093	42.1513	R esistente	10	35	39.7134	46.4389	52.0401	0	52.0401	87.9886	87.9886
28	0.259469	22.5986	43.0283	R esistente	10	35	38.9711	45.5708	50.8003	0	50.8003	87.1774	87.1774
29	0.259469	22.349	43.918	R esistente	10	35	38.1695	44.6335	49.4618	0	49.4618	86.2162	86.2162
30	0.259469	22.0587	44.8213	R esistente	10	35	37.3077	43.6258	48.0225	0	48.0225	85.0982	85.0982
31	0.259469	21.7259	45.7389	R esistente	10	35	36.3846	42.5463	46.4809	0	46.4809	83.8162	83.8162
32	0.259469	21.3485	46.6719	R esistente	10	35	35.3988	41.3936	44.8347	0	44.8347	82.362	82.362
33	0.259469	20.924	47.6212	R esistente	10	35	34.349	40.166	43.0814	0	43.0814	80.7263	80.7263
34	0.259469	20.4583	48.5882	R esistente	10	35	33.2451	38.8751	41.2381	0	41.2381	78.9315	78.9315
35	0.259469	19.9519	49.574	R esistente	10	35	32.09	37.5244	39.3089	0	39.3089	76.9798	76.9798
36	0.259469	19.3899	50.5802	R esistente	10	35	30.8655	36.0926	37.264	0	37.264	74.8138	74.8138
37	0.259469	18.7686	51.6083	R esistente	10	35	29.5697	34.5773	35.0999	0	35.0999	72.4187	72.4187
38	0.259469	18.0838	52.6603	R esistente	10	35	28.2005	32.9762	32.8135	0	32.8135	69.7788	69.7788
39	0.259469	17.331	53.7383	R esistente	10	35	26.756	31.2871	30.401	0	30.401	66.876	66.876
40	0.259469	16.5046	54.8447	R esistente	10	35	25.2338	29.5072	27.8591	0	27.8591	63.6897	63.6897
41	0.259469	15.5986	55.9824	R esistente	10	35	23.6318	27.6338	25.1837	0	25.1837	60.1961	60.1961
42	0.259469	14.6057	57.1546	R esistente	10	35	21.9473	25.6641	22.3706	0	22.3706	56.367	56.367
43	0.259469	13.5173	58.3652	R esistente	10	35	20.1779	23.595	19.4157	0	19.4157	52.1699	52.1699
44	0.259469	12.2665	59.619	R esistente	10	35	18.2557	21.3473	16.2056	0	16.2056	47.3454	47.3454
45	0.259469	10.8399	60.9215	R esistente	10	35	16.1823	18.9228	12.7431	0	12.7431	41.8426	41.8426
46	0.259469	9.28041	62.2797	R esistente	10	35	14.0239	16.3988	9.13846	0	9.13846	35.827	35.827
47	0.259469	7.56926	63.7023	R esistente	10	35	11.7792	13.774	5.38989	0	5.38989	29.2258	29.2258
48	0.259469	5.68227	65.2006	R esistente	10	35	9.44827	11.0483	1.49717	0	1.49717	21.9457	21.9457
49	0.259469	3.58764	66.7893	R esistente	10	35	7.03284	8.22385	-2.53661	0	-2.53661	13.8638	13.8638
50	0.259469	1.24193	68.4888	R esistente	10	35	4.53838	5.30695	-6.70236	0	-6.70236	4.81237	4.81237



## Global Minimum Query (janbu simplified) - Safety Factor: 1.13602

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.275096	0.696684	20.8397	R esistente	10	35	8.39561	9.53758	-0.660408	0	-0.660408	2.53545	2.53545
2	0.275096	2.07907	21.5625	R esistente	10	35	10.8264	12.299	3.28328	0	3.28328	7.56155	7.56155
3	0.275096	3.43932	22.2888	R esistente	10	35	13.1814	14.9744	7.10413	0	7.10413	12.5072	12.5072
4	0.275096	4.7771	23.019	R esistente	10	35	15.4609	17.5639	10.8024	0	10.8024	17.3713	17.3713
5	0.275096	6.09205	23.7531	R esistente	10	35	17.665	20.0678	14.3784	0	14.3784	22.1523	22.1523
6	0.275096	7.43644	24.4914	R esistente	10	35	19.8859	22.5908	17.9815	0	17.9815	27.0405	27.0405
7	0.275096	9.20196	25.2341	R esistente	10	35	22.8024	25.904	22.7133	0	22.7133	33.4599	33.4599
8	0.275096	11.0442	25.9813	R esistente	10	35	25.804	29.3139	27.5831	0	27.5831	40.1581	40.1581
9	0.275096	12.8618	26.7333	R esistente	10	35	28.7142	32.6199	32.3046	0	32.3046	46.7673	46.7673
10	0.275096	14.6524	27.4903	R esistente	10	35	31.5291	35.8177	36.8716	0	36.8716	53.2779	53.2779
11	0.275096	16.2683	28.2526	R esistente	10	35	34.0012	38.626	40.8821	0	40.8821	59.1535	59.1535
12	0.275096	17.7674	29.0203	R esistente	10	35	36.2333	41.1617	44.5037	0	44.5037	64.6049	64.6049
13	0.275096	19.24	29.7938	R esistente	10	35	38.3791	43.5994	47.985	0	47.985	69.9594	69.9594
14	0.275096	20.6852	30.5734	R esistente	10	35	40.4379	45.9383	51.3252	0	51.3252	75.2148	75.2148
15	0.275096	22.0389	31.3592	R esistente	10	35	42.3054	48.0598	54.355	0	54.355	80.137	80.137
16	0.275096	22.7817	32.1517	R esistente	10	35	43.146	49.0147	55.7189	0	55.7189	82.8385	82.8385
17	0.275096	23.3548	32.9511	R esistente	10	35	43.6908	49.6336	56.6026	0	56.6026	84.9228	84.9228
18	0.275096	23.8977	33.7578	R esistente	10	35	44.168	50.1757	57.377	0	57.377	86.8978	86.8978
19	0.275096	24.4177	34.5722	R esistente	10	35	44.5894	50.6545	58.0605	0	58.0605	88.7888	88.7888
20	0.275096	24.9276	35.3946	R esistente	10	35	44.9758	51.0934	58.6874	0	58.6874	90.6437	90.6437
21	0.275096	25.406	36.2255	R esistente	10	35	45.2934	51.4542	59.2029	0	59.2029	92.3837	92.3837
22	0.275096	25.8287	37.0654	R esistente	10	35	45.5064	51.6962	59.5482	0	59.5482	93.9212	93.9212
23	0.275096	25.9176	37.9146	R esistente	10	35	45.1951	51.3425	59.0433	0	59.0433	94.2453	94.2453
24	0.275096	25.8748	38.7738	R esistente	10	35	44.6769	50.7539	58.2026	0	58.2026	94.0902	94.0902
25	0.275096	25.7944	39.6435	R esistente	10	35	44.0971	50.0952	57.2618	0	57.2618	93.7985	93.7985
26	0.275096	25.675	40.5242	R esistente	10	35	43.4547	49.3654	56.2196	0	56.2196	93.3652	93.3652
27	0.275096	25.5151	41.4167	R esistente	10	35	42.7486	48.5633	55.0741	0	55.0741	92.7843	92.7843
28	0.275096	25.3129	42.3216	R esistente	10	35	41.978	47.6879	53.8237	0	53.8237	92.0498	92.0498
29	0.275096	25.0666	43.2397	R esistente	10	35	41.1416	46.7377	52.4669	0	52.4669	91.1551	91.1551
30	0.275096	24.7743	44.1719	R esistente	10	35	40.2383	45.7115	51.0012	0	51.0012	90.0929	90.0929
31	0.275096	24.4337	45.1191	R esistente	10	35	39.2667	44.6077	49.4249	0	49.4249	88.8552	88.8552
32	0.275096	24.0496	46.0823	R esistente	10	35	38.2352	43.4359	47.7514	0	47.7514	87.459	87.459
33	0.275096	23.6272	47.0626	R esistente	10	35	37.1526	42.2061	45.9951	0	45.9951	85.9237	85.9237
34	0.275096	23.1489	48.0612	R esistente	10	35	35.9972	40.8935	44.1205	0	44.1205	84.1854	84.1854
35	0.275096	22.611	49.0797	R esistente	10	35	34.7662	39.4951	42.1233	0	42.1233	82.2298	82.2298
36	0.275096	22.0096	50.1195	R esistente	10	35	33.4579	38.0089	40.0009	0	40.0009	80.0438	80.0438
37	0.275096	21.3406	51.1824	R esistente	10	35	32.0702	36.4324	37.7495	0	37.7495	77.6116	77.6116
38	0.275096	20.5992	52.2704	R esistente	10	35	30.6009	34.7632	35.3655	0	35.3655	74.9162	74.9162
39	0.275096	19.7799	53.3858	R esistente	10	35	29.0476	32.9986	32.8454	0	32.8454	71.9377	71.9377
40	0.275096	18.8766	54.5313	R esistente	10	35	27.4077	31.1357	30.185	0	30.185	68.6537	68.6537
41	0.275096	17.8691	55.7099	R esistente	10	35	25.6635	29.1543	27.3553	0	27.3553	64.9907	64.9907
42	0.275096	16.6653	56.9253	R esistente	10	35	23.7168	26.9428	24.1968	0	24.1968	60.6135	60.6135
43	0.275096	15.3317	58.1817	R esistente	10	35	21.6586	24.6046	20.8575	0	20.8575	55.7643	55.7643
44	0.275096	13.8762	59.4842	R esistente	10	35	19.5099	22.1636	17.3714	0	17.3714	50.4717	50.4717
45	0.275096	12.2841	60.8391	R esistente	10	35	17.2683	19.6172	13.7347	0	13.7347	44.6824	44.6824
46	0.275096	10.5373	62.2542	R esistente	10	35	14.9319	16.963	9.94416	0	9.94416	38.3302	38.3302
47	0.275096	8.61289	63.7394	R esistente	10	35	12.4994	14.1996	5.99758	0	5.99758	31.332	31.332
48	0.275096	6.48123	65.3073	R esistente	10	35	9.9706	11.3268	1.89486	0	1.89486	23.5798	23.5798
49	0.275096	4.10272	66.9752	R esistente	10	35	7.34793	8.3474	-2.36016	0	-2.36016	14.9297	14.9297
50	0.275096	1.4224	68.7669	R esistente	10	35	4.63831	5.26921	-6.75628	0	-6.75628	5.18152	5.18152

# Interslice Data

## Global Minimum Query (bishop simplified) - Safety Factor: 1.16935

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	70.0841	306	0	0	0
2	70.3436	306.106	2.1676	0	0
3	70.603	306.216	4.50087	0	0
4	70.8625	306.33	6.96836	0	0
5	71.122	306.447	9.53916	0	0
6	71.3814	306.568	12.183	0	0
7	71.6409	306.693	14.8703	0	0
8	71.9004	306.822	17.5952	0	0
9	72.1598	306.956	20.336	0	0
10	72.4193	307.093	23.0511	0	0
11	72.6788	307.235	25.6994	0	0
12	72.9383	307.381	28.2395	0	0
13	73.1977	307.532	30.63	0	0
14	73.4572	307.687	32.836	0	0
15	73.7167	307.847	34.8239	0	0
16	73.9761	308.012	36.5604	0	0
17	74.2356	308.181	38.0164	0	0
18	74.4951	308.356	39.1906	0	0
19	74.7545	308.536	40.0734	0	0
20	75.014	308.721	40.653	0	0
21	75.2735	308.911	40.9179	0	0
22	75.5329	309.108	40.8553	0	0
23	75.7924	309.31	40.4552	0	0
24	76.0519	309.518	39.7084	0	0
25	76.3114	309.733	38.636	0	0
26	76.5708	309.954	37.2674	0	0
27	76.8303	310.182	35.6086	0	0
28	77.0898	310.417	33.6671	0	0
29	77.3492	310.659	31.4524	0	0
30	77.6087	310.909	28.9759	0	0
31	77.8682	311.167	26.2514	0	0
32	78.1276	311.433	23.2952	0	0
33	78.3871	311.708	20.1267	0	0
34	78.6466	311.992	16.7682	0	0
35	78.906	312.287	13.2432	0	0
36	79.1655	312.591	9.57745	0	0
37	79.425	312.907	5.80527	0	0
38	79.6845	313.234	1.96634	0	0
39	79.9439	313.574	-1.89329	0	0
40	80.2034	313.928	-5.72006	0	0
41	80.4629	314.297	-9.4516	0	0
42	80.7223	314.681	-13.0149	0	0
43	80.9818	315.083	-16.3243	0	0
44	81.2413	315.504	-19.2782	0	0
45	81.5007	315.947	-21.7245	0	0
46	81.7602	316.413	-23.4809	0	0
47	82.0197	316.907	-24.3628	0	0
48	82.2791	317.432	-24.1433	0	0
49	82.5386	317.994	-22.538	0	0
50	82.7981	318.599	-19.1825	0	0
51	83.0576	319.257	0	0	0

**Global Minimum Query (janbu simplified) - Safety Factor: 1.13602**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	70.0859	306.002	0	0	0
2	70.361	306.107	2.37663	0	0
3	70.6361	306.216	4.99526	0	0
4	70.9112	306.329	7.817	0	0
5	71.1863	306.445	10.8038	0	0
6	71.4614	306.567	13.9182	0	0
7	71.7365	306.692	17.1303	0	0
8	72.0116	306.822	20.4526	0	0
9	72.2867	306.956	23.8468	0	0
10	72.5618	307.094	27.2626	0	0
11	72.8369	307.237	30.6501	0	0
12	73.112	307.385	33.9514	0	0
13	73.3871	307.538	37.1179	0	0
14	73.6622	307.695	40.1081	0	0
15	73.9373	307.858	42.8809	0	0
16	74.2124	308.025	45.3956	0	0
17	74.4875	308.198	47.6194	0	0
18	74.7626	308.377	49.5344	0	0
19	75.0377	308.56	51.1239	0	0
20	75.3128	308.75	52.3719	0	0
21	75.5879	308.946	53.2621	0	0
22	75.863	309.147	53.7796	0	0
23	76.1381	309.355	53.913	0	0
24	76.4131	309.569	53.6834	0	0
25	76.6882	309.79	53.1012	0	0
26	76.9633	310.018	52.1692	0	0
27	77.2384	310.253	50.8921	0	0
28	77.5135	310.496	49.2763	0	0
29	77.7886	310.746	47.3303	0	0
30	78.0637	311.005	45.0651	0	0
31	78.3388	311.272	42.4938	0	0
32	78.6139	311.549	39.6328	0	0
33	78.889	311.834	36.4993	0	0
34	79.1641	312.13	33.112	0	0
35	79.4392	312.436	29.4966	0	0
36	79.7143	312.753	25.684	0	0
37	79.9894	313.083	21.7098	0	0
38	80.2645	313.425	17.6163	0	0
39	80.5396	313.78	13.4524	0	0
40	80.8147	314.15	9.27568	0	0
41	81.0898	314.537	5.15359	0	0
42	81.3649	314.94	1.17124	0	0
43	81.64	315.362	-2.53118	0	0
44	81.9151	315.806	-5.82603	0	0
45	82.1902	316.272	-8.57157	0	0
46	82.4653	316.765	-10.5969	0	0
47	82.7404	317.288	-11.6935	0	0
48	83.0155	317.846	-11.6022	0	0
49	83.2906	318.444	-9.99557	0	0
50	83.5656	319.092	-6.4483	0	0
51	83.8407	319.8	0	0	0

## Discharge Sections

---

### Entity Information

---

#### ◆ Group 1

##### Shared Entities

Type	Coordinates (x,y)
	0, 270
	78.5713, 270
	184.033, 270
	184.033, 317.87
	184.033, 325.934
	183.185, 325.77
	181.792, 325.485
	180.23, 325.069
	180, 325.023
	178.836, 324.776
	178.5, 324.691
	177.341, 324.437
	175.507, 324
	175, 323.904
	174.859, 323.892
	172.668, 323.494
	172.394, 323.473
	171.815, 323.38
	171.496, 323.316
	170.849, 323.208
	170, 323.052
	169.499, 322.949
	168.039, 322.668
	166.512, 322.329
	165.809, 322.143
	165.7, 322.122
	165.265, 322
	165.227, 322
	165, 321.898
	164.907, 321.87
	163.782, 321.358
	163.433, 321.19
	162.804, 321.048
	162.176, 320.895
	161.79, 320.741
	161.44, 320.656
	160.811, 320.488
	160.545, 320.389
	159.257, 320.051
	156.483, 319.287
	155.807, 319.057
	155, 318.816
	154.411, 318.625
	154.15, 318.55

External Boundary






151.627, 317.635  
151.116, 317.481  
150.031, 317.1  
148.963, 316.748  
147.082, 316.278  
146.463, 316.131  
145.215, 315.821  
143.64, 315.466  
142.822, 315.248  
142.068, 315.074  
141.369, 314.932  
141.205, 314.887  
140.283, 314.674  
138.189, 314.243  
137.122, 314.005  
135, 313.411  
134.614, 313.311  
134.098, 313.145  
133.753, 313.065  
133.102, 312.867  
132.177, 312.699  
131.393, 312.48  
129.098, 312.029  
128.949, 312  
128.091, 312  
127.989, 312.114  
126.532, 312.523  
118.748, 315.643  
118.488, 314.721  
118.397, 314.577  
118.247, 314.271  
117.611, 312.523  
117.492, 312  
117.371, 312.204  
117.042, 312.811  
116.474, 314  
116.247, 314.492  
115.578, 316  
115, 317.051  
114.489, 318  
112.621, 320  
109.467, 322  
107.665, 322.842  
107.183, 323.033  
106.58, 323.303  
102.952, 323.748  
101.056, 324  
100, 324.16  
99.0783, 324.314  
93.8739, 324.454  
93.0681, 324.498  
91.8042, 324.539  
91.1293, 324.528  
91.085, 324.522  
90.7514, 324.414  
90.6812, 324.381  
89.687, 324  
89.6211, 323.948  
89.5757, 323.87

89.5451,	323.85
89.5233,	323.805
89.4707,	323.747
89.1214,	323.616
88.4012,	323.258
88.2121,	323.119
88.1011,	323.022
87.9648,	322.92
86.8596,	322.189
86.6088,	322
84.1179,	320
83.8329,	319.794
81.2423,	318
78.6712,	316
76.0493,	314
75.1155,	313.031
74.1016,	312
72.8,	310
71.6211,	308
70.0841,	306
65,	304.675
62.5255,	304
60.4215,	302.379
60.1415,	302.159
59.9398,	302
59.9164,	302
57.4119,	301.432
56.8676,	301.392
55.4929,	301.173
54.0276,	300.999
53.1603,	300.938
51.3633,	300.761
49.9168,	300.637
45.0549,	300.192
44.2251,	300.098
43.1654,	300
42.8906,	299.94
42.0304,	299.808
41.9166,	299.77
41.1284,	299.603
40.9294,	299.533
40.5199,	299.431
40.1064,	299.345
40,	299.308
39.5729,	299.182
38.8098,	298.947
38.4421,	298.859
37.6044,	298.612
36.9161,	298.42
36.2898,	298.291
35.5288,	298.098
35.1931,	298.045
34.086,	298
33.1797,	298.081
33.1322,	298.071
31.2488,	298.125
31.1994,	298.116
28.2449,	298.01
28.1271,	298

	27.679, 297.954 26.2666, 297.721 25.8324, 297.622 25.5242, 297.594 24.5563, 297.398 24.058, 297.35 23.4771, 297.209 23.1817, 297.152 22.8413, 297.122 22.4875, 297.058 22.0046, 297.011 21.6825, 296.964 21.0968, 296.846 20.4778, 296.765 19.419, 296.603 19.1473, 296.547 17.8487, 296.368 17.6833, 296.337 16.961, 296.244 15.9911, 296.107 15, 296.002 13.1538, 295.919 11.4784, 295.821 10, 295.708 9.45612, 295.655 5.8203, 295.468 5, 295.452 3.89765, 295.327 2.24766, 295.246 1.0033, 295.223 0, 295.272 0, 291.16
Material Boundary	42.8906, 299.94 47.1587, 296.358 78.5713, 270
Material Boundary	0, 291.16 4.45842, 291.436 14.1009, 291.436 25.2044, 292.531 35.7965, 293.918 41.4944, 295.305 47.1587, 296.358 47.7766, 296.473 60.0486, 297.359 91.8647, 297.013 100, 296.564 108.116, 296.789 111.549, 297.238 117.73, 298.809 127.686, 302.064 133.523, 304.757 140.322, 307.126 164.722, 312.847 178.743, 316.894 184.033, 317.87

Material Boundary	60.1415, 302.159
	107.036, 302.159
	115.076, 306.696
	124.345, 308.587
	129.098, 312.029

### Scenario-based Entities

Type	Coordinates (x,y)	Master Scenario
Water Table	-0.0946299, 291.076	Assigned to:
	12.4439, 291.523	 R esistente
	31.6217, 293.389	 AC alt
	49.13, 296.001	 AC
	60.5626, 297.226	 MS alt
	65.156, 297.337	 MS
	78.3976, 297.45	
	96.1797, 297.224	
	107.167, 296.885	
	119.651, 299.146	
	128.015, 301.987	
	134.209, 304.962	
	145.536, 308.105	
	153.314, 309.519	
	164.527, 312.244	
	184.033, 317.87	





23-09-13 TA 2

Slide2 - An Interactive Slope Stability Program

Date Created: 08/09/2023, 11:07:04

Software Version: 9.029

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# Slide2 Analysis Information

## 23-09-13 TA 2




### Project Summary

---

File Name: 23-09-13 TA 2.slmd  
 Slide2 Modeler Version: 9.029  
 Project Title: Slide2 - An Interactive Slope Stability Program  
 Date Created: 08/09/2023, 11:07:04

### Currently Open Scenarios

---

Group Name	Scenario Name	Global Minimum	Compute Time
SLU 	Master Scenario	Bishop Simplified: 1.065400	00h:00m:02.413s
SLV kv>0 	Master Scenario	Bishop Simplified: 1.071800	00h:00m:02.538s
SLV kv<0 	Master Scenario	Bishop Simplified: 1.062580	00h:00m:02.441s

## General Settings

---

Units of Measurement:

Time Units:

Permeability Units:

Data Output:

Failure Direction:

Metric Units

days

meters/second

Standard

Left to Right

## Design Standard

### ◆ SLU

Selected Type: Eurocode 7 (User Defined)  
Name: A2+M2+R2

Type	Partial Factor
Permanent Actions: Unfavourable	1.35
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1.5
Variable Actions: Favourable	0
Effective cohesion	1.25
Coefficient of shearing resistance	1.25
Undrained strength	1.4
Weight density	1
Shear strength (other models)	1
Earth resistance	1.1
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv>0

Selected Type: Eurocode 7 (User Defined)  
Name: SISMA

Type	Partial Factor
Permanent Actions: Unfavourable	1
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1
Variable Actions: Favourable	1
Effective cohesion	1
Coefficient of shearing resistance	1
Undrained strength	1
Weight density	1
Shear strength (other models)	1
Earth resistance	1.2
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv<0

Selected Type: Eurocode 7 (User Defined)

Name: SISMA

Type	Partial Factor
Permanent Actions: Unfavourable	1
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1
Variable Actions: Favourable	1
Effective cohesion	1
Coefficient of shearing resistance	1
Undrained strength	1
Weight density	1
Shear strength (other models)	1
Earth resistance	1.2
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

# Analysis Options

---

## All Open Scenarios

Slices Type:	Vertical
<b>Analysis Methods Used</b>	
	Bishop simplified
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

---

## All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [kN/m <sup>3</sup> ]:	9.81
Advanced Groundwater Method:	None

# Random Numbers

---

## All Open Scenarios

Pseudo-random Seed:

10116

Random Number Generation Method:

Park and Miller v.3

# Surface Options

---

## All Open Scenarios

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 [m]:	1
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

# Seismic Loading

---

## ◆ **SLU**

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

## ◆ **SLV kv>0**

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	0.045

## ◆ **SLV kv<0**

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	-0.045

# Loading

---

## ◆ SLU

&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live
&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live

## ◆ SLV kv>0

&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live


## ◆ SLV kv<0

&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
&nbsp;	
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live


## Materials

---


### R

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	0 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


### R esistente

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	50 kPa
Phi	30 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	90 kPa
Phi	32 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


## Materials In Use

---


Material		SLU	SLV kv>0	SLV kv<0
R		✓	✓	✓
R esistente		✓	✓	✓
AC alt		✓	✓	✓
AC		✓	✓	✓

## Support

### 200/30


Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 200/30
Ultimate Tensile Strength	200 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	117.625 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	120 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

### 150/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 150/30
Ultimate Tensile Strength	150 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	88.2187 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	90 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes



**80/30**

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 80/30
Ultimate Tensile Strength	80 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	47.05 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	50 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

# Global Minimums

---

## ◆ SLU

**Method: bishop simplified**

	FS	1.065400
Center:	128.007, 342.575	
Radius:	23.547	
Left Slip Surface Endpoint:	104.568, 340.322	
Right Slip Surface Endpoint:	133.828, 319.759	
Resisting Moment:	94180.8 kN-m	
Driving Moment:	88399.8 kN-m	
Passive Support Moment:	5295.74 kN-m	
Maximum Single Support Force:	117.625 kN	
Total Support Force:	235.25 kN	
Total Slice Area:	282.259 m <sup>2</sup>	
Surface Horizontal Width:	29.2597 m	
Surface Average Height:	9.64668 m	

## ◆ SLV kv>0

**Method: bishop simplified**

	FS	1.071800
Center:	127.897, 345.266	
Radius:	25.978	
Left Slip Surface Endpoint:	102.423, 340.175	
Right Slip Surface Endpoint:	133.171, 319.829	
Resisting Moment:	91696.2 kN-m	
Driving Moment:	85553.7 kN-m	
Passive Support Moment:	5928.8 kN-m	
Maximum Single Support Force:	117.625 kN	
Total Support Force:	235.25 kN	
Total Slice Area:	303.021 m <sup>2</sup>	
Surface Horizontal Width:	30.7483 m	
Surface Average Height:	9.85491 m	

## ◆ SLV kv<0

**Method: bishop simplified**

<b>FS</b>	<b>1.062580</b>
Center:	128.197, 348.635
Radius:	28.934
Left Slip Surface Endpoint:	100.566, 340.048
Right Slip Surface Endpoint:	132.140, 319.970
Resisting Moment:	95643.4 kN-m
Driving Moment:	90010.7 kN-m
Passive Support Moment:	6549.6 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	235.25 kN
Total Slice Area:	312.688 m <sup>2</sup>
Surface Horizontal Width:	31.5735 m
Surface Average Height:	9.90348 m

## Global Minimum Support Data

### ◆ SLU

Method: bishop simplified

Number of Supports: 26

#### 200/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	9.46842	3.53158	9.46842	3.53158	117.625
131.564, 320.429	13	11.5515	1.44849	11.5515	1.44849	117.625
131.223, 321.159	13	Not Effective	Not Effective	Not Effective	Not Effective	0
130.883, 321.889	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.543, 322.619	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.202, 323.349	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.862, 324.079	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.521, 324.809	12.9998	Not Effective	Not Effective	Not Effective	Not Effective	0
127.181, 325.539	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 150/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 80/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

◆ **SLV kv>0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	8.59869	4.40131	8.59869	4.40131	117.625
131.564, 320.429	13	11.2753	1.72474	11.2753	1.72474	117.625
131.223, 321.159	13	Not Effective	Not Effective	Not Effective	Not Effective	0
130.883, 321.889	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.543, 322.619	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.202, 323.349	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.862, 324.079	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.521, 324.809	12.9998	Not Effective	Not Effective	Not Effective	Not Effective	0
127.181, 325.539	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0

123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

### ◆ **SLV kv<0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	9.80997	3.19003	9.80997	3.19003	117.625
131.223, 321.159	13	12.0907	0.909301	12.0907	0.909301	117.625
130.883, 321.889	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.543, 322.619	13	Not Effective	Not Effective	Not Effective	Not Effective	0
128.202, 323.349	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0
127.862, 324.079	12.9999	Not Effective	Not Effective	Not Effective	Not Effective	0

127.521, 324.809	12.9998	Not Effective	Not Effective	Not Effective	Not Effective	0
127.181, 325.539	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

## Valid and Invalid Surfaces

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### ◆ SLU

#### Method: bishop simplified

Number of Valid Surfaces:	11257
Number of Invalid Surfaces:	0

### ◆ SLV kv>0

#### Method: bishop simplified

Number of Valid Surfaces:	11026
Number of Invalid Surfaces:	0

### ◆ SLV kv<0

#### Method: bishop simplified

Number of Valid Surfaces:	11340
Number of Invalid Surfaces:	0



# Slice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.0654

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.587683	27.5215	-80.2737	R	0	29.2561	9.02958	9.62011	18.891	0	18.891	71.5708	71.5708
2	0.587683	71.1202	-73.5168	R	0	29.2561	25.9965	27.6967	54.388	0	54.388	142.245	142.245
3	0.587683	99.6637	-69.0004	R	0	29.2561	40.2607	42.8937	84.2304	0	84.2304	189.115	189.115
4	0.587683	122.584	-65.2939	R	0	29.2561	53.2244	56.7053	111.352	0	111.352	227.038	227.038
5	0.587683	142.148	-62.0569	R	0	29.2561	65.2674	69.5359	136.548	0	136.548	259.592	259.592
6	0.587683	159.379	-59.1369	R	0	29.2561	76.5917	81.6008	160.24	0	160.24	288.403	288.403
7	0.587683	174.851	-56.4492	R	0	29.2561	87.3261	93.0372	182.698	0	182.698	314.379	314.379
8	0.587683	188.925	-53.9406	R	0	29.2561	97.5605	103.941	204.108	0	204.108	338.096	338.096
9	0.587683	201.592	-51.5752	R	0	29.2561	100.477	107.048	210.211	0	210.211	336.868	336.868
10	0.587683	212.728	-49.3275	R	0	29.2561	107.346	114.366	224.581	0	224.581	349.503	349.503
11	0.587683	222.999	-47.1784	R	0	29.2561	115.724	123.292	242.11	0	242.11	366.986	366.986
12	0.587683	229.65	-45.1132	R	0	29.2561	122.256	130.252	255.776	0	255.776	378.516	378.516
13	0.587683	232.479	-43.1204	R	0	29.2561	126.705	134.992	265.085	0	265.085	383.738	383.738
14	0.587683	234.706	-41.1906	R	0	29.2561	130.743	139.294	273.531	0	273.531	387.95	387.95
15	0.587683	236.385	-39.3161	R	0	29.2561	134.397	143.187	281.176	0	281.176	391.242	391.242
16	0.587683	237.56	-37.4908	R	0	29.2561	137.691	146.696	288.067	0	288.067	393.686	393.686
17	0.587683	238.268	-35.709	R	0	29.2561	140.644	149.842	294.246	0	294.246	395.342	395.342
18	0.587683	238.541	-33.9663	R	0	29.2561	143.274	152.644	299.746	0	299.746	396.263	396.263
19	0.587683	238.721	-32.2586	R	0	29.2561	145.787	155.321	305.005	0	305.005	397.02	397.02
20	0.587683	242.977	-30.5825	R	0	29.2561	150.777	160.638	315.444	0	315.444	404.552	404.552
21	0.587683	248.31	-28.9349	R	0	29.2561	156.481	166.715	327.38	0	327.38	413.886	413.886
22	0.587683	253.295	-27.3131	R	0	29.2561	162.026	172.622	338.978	0	338.978	422.652	422.652
23	0.587683	249.563	-25.7148	R	0	29.2561	161.971	172.564	338.866	0	338.866	416.869	416.869
24	0.587683	233.972	-24.1376	R	0	29.2561	154.015	164.088	322.219	0	322.219	391.235	391.235
25	0.587683	218.004	-22.5797	R	0	29.2561	145.501	155.017	304.408	0	304.408	364.914	364.914
26	0.587683	201.74	-21.0392	R	0	29.2561	136.483	145.409	285.54	0	285.54	338.038	338.038
27	0.587683	194.179	-19.5145	R	0	29.2561	133.128	141.835	278.523	0	278.523	325.704	325.704
28	0.587683	197.32	-18.0041	R	0	29.2561	137.069	146.033	286.765	0	286.765	331.312	331.312
29	0.587683	200.217	-16.5065	R	0	29.2561	140.894	150.108	294.767	0	294.767	336.519	336.519
30	0.587683	199.88	-15.0204	R	0	29.2561	142.471	151.789	298.069	0	298.069	336.299	336.299
31	0.587683	184.331	-13.5446	R	0	29.2561	133.069	141.772	278.399	0	278.399	310.456	310.456
32	0.587683	166.459	-12.0779	R	0	29.2561	121.696	129.655	254.605	0	254.605	280.645	280.645
33	0.587683	148.338	-10.6192	R	0	29.2561	109.823	117.005	229.763	0	229.763	250.354	250.354
34	0.587683	133.297	-9.16746	R	0	29.2561	99.9362	106.472	209.079	0	209.079	225.207	225.207
35	0.587683	132.891	-7.72162	R	0	29.2561	100.893	107.491	211.081	0	211.081	224.761	224.761
36	0.587683	134.036	-6.28071	R	0	29.2561	103.053	109.793	215.601	0	215.601	226.943	226.943
37	0.587683	134.643	-4.84379	R	0	29.2561	104.839	111.696	219.338	0	219.338	228.222	228.222
38	0.587683	122.151	-3.40991	R	0	29.2561	96.3319	102.632	201.539	0	201.539	207.279	207.279
39	0.587683	102.597	-1.97817	R	0	29.2561	81.9569	87.3169	171.465	0	171.465	174.295	174.295
40	0.587683	82.8093	-0.547664	R	0	29.2561	67.0147	71.3975	140.203	0	140.203	140.844	140.844
41	0.587683	63.2105	0.882499	R	0	29.2561	51.8309	55.2206	108.437	0	108.437	107.638	107.638
42	0.587683	56.6373	2.31321	R	0	29.2561	47.0645	50.1425	98.4649	0	98.4649	96.5638	96.5638
43	0.587683	56.1438	3.74537	R	0	29.2561	47.2911	50.3839	98.9389	0	98.9389	95.8431	95.8431
44	0.587683	55.4159	5.17988	R	0	29.2561	47.327	50.4222	99.0142	0	99.0142	94.7239	94.7239
45	0.587683	48.0206	6.61765	R	0	29.2561	41.5936	44.3138	87.0191	0	87.0191	82.1936	82.1936
46	0.587683	27.218	8.05963	R	0	29.2561	23.9178	25.482	50.0391	0	50.0391	46.6523	46.6523
47	0.587683	11.0623	9.50676	R	0	29.2561	9.86587	10.5111	20.6407	0	20.6407	18.9885	18.9885
48	0.587683	7.37371	10.9601	R	0	29.2561	6.67704	7.11372	13.9692	0	13.9692	12.6762	12.6762
49	0.525455	3.78172	12.3428	AC alt	40	24.7913	40.8417	43.5128	17.0263	0	17.0263	8.08936	8.08936
50	0.525455	1.19597	13.6551	AC alt	40	24.7913	39.1514	41.7119	12.7374	0	12.7374	3.22575	3.22575

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.0718**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.621911	15.6464	-75.8851	R	0	35	4.88656	5.23742	8.97576	0	8.97576	28.4086	28.4086
2	0.621911	42.7705	-70.9681	R	0	35	14.6508	15.7027	26.9109	0	26.9109	69.3829	69.3829
3	0.621911	63.6703	-67.1016	R	0	35	24.1562	25.8906	44.3707	0	44.3707	101.561	101.561
4	0.621911	81.2132	-63.7859	R	0	35	33.3358	35.7293	61.2321	0	61.2321	128.937	128.937
5	0.621911	96.527	-60.826	R	0	35	42.1979	45.2277	77.5103	0	77.5103	153.095	153.095
6	0.621911	110.204	-58.1203	R	0	35	50.7657	54.4107	93.2476	0	93.2476	174.87	174.87
7	0.621911	122.604	-55.6073	R	0	35	59.0638	63.3046	108.49	0	108.49	194.774	194.774
8	0.621911	133.963	-53.2469	R	0	35	67.1149	71.9338	123.279	0	123.279	213.146	213.146
9	0.621911	144.451	-51.0105	R	0	35	74.9392	80.3198	137.65	0	137.65	230.227	230.227
10	0.621911	154.19	-48.8776	R	0	35	82.5538	88.4812	151.637	0	151.637	246.195	246.195
11	0.621911	163.274	-46.8322	R	0	35	89.9741	96.4342	165.267	0	165.267	261.188	261.188
12	0.621911	171.565	-44.862	R	0	35	95.5393	102.399	175.488	0	175.488	270.568	270.568
13	0.621911	178.876	-42.9573	R	0	35	101.75	109.056	186.898	0	186.898	281.64	281.64
14	0.621911	185.653	-41.1098	R	0	35	108.174	115.941	198.697	0	198.697	293.096	293.096
15	0.621911	188.916	-39.3131	R	0	35	112.595	120.679	206.817	0	206.817	299.017	299.017
16	0.621911	189.898	-37.5614	R	0	35	115.633	123.935	212.396	0	212.396	301.322	301.322
17	0.621911	190.507	-35.8501	R	0	35	118.396	126.897	217.473	0	217.473	303.02	303.02
18	0.621911	190.768	-34.1749	R	0	35	120.898	129.578	222.067	0	222.067	304.151	304.151
19	0.621911	190.702	-32.5324	R	0	35	123.145	131.987	226.195	0	226.195	304.746	304.746
20	0.621911	190.326	-30.9195	R	0	35	125.147	134.133	229.875	0	229.875	304.832	304.832
21	0.621911	189.657	-29.3333	R	0	35	126.913	136.025	233.117	0	233.117	304.434	304.434
22	0.621911	190.786	-27.7714	R	0	35	129.861	139.185	238.531	0	238.531	306.917	306.917
23	0.621911	194.701	-26.2317	R	0	35	134.742	144.417	247.499	0	247.499	313.893	313.893
24	0.621911	198.387	-24.7121	R	0	35	139.537	149.556	256.306	0	256.306	320.522	320.522
25	0.621911	197.971	-23.2109	R	0	35	141.475	151.633	259.864	0	259.864	320.532	320.532
26	0.621911	185.424	-21.7264	R	0	35	134.592	144.256	247.222	0	247.222	300.854	300.854
27	0.621911	171.804	-20.257	R	0	35	126.637	135.73	232.611	0	232.611	279.348	279.348
28	0.621911	157.961	-18.8014	R	0	35	118.212	126.7	217.136	0	217.136	257.382	257.382
29	0.621911	151.111	-17.3584	R	0	35	114.796	123.038	210.86	0	210.86	246.743	246.743
30	0.621911	153.385	-15.9266	R	0	35	118.27	126.762	217.243	0	217.243	250.993	250.993
31	0.621911	155.49	-14.5049	R	0	35	121.678	130.415	223.503	0	223.503	254.982	254.982
32	0.621911	153.132	-13.0924	R	0	35	121.609	130.341	223.375	0	223.375	251.658	251.658
33	0.621911	138.912	-11.6879	R	0	35	111.949	119.987	205.63	0	205.63	228.789	228.789
34	0.621911	123.83	-10.2904	R	0	35	101.269	108.54	186.014	0	186.014	204.4	204.4
35	0.621911	108.553	-8.89918	R	0	35	90.089	96.5574	165.477	0	165.477	179.583	179.583
36	0.621911	100.834	-7.5132	R	0	35	84.9253	91.0229	155.993	0	155.993	167.194	167.194
37	0.621911	101.75	-6.13163	R	0	35	86.9765	93.2214	159.761	0	159.761	169.104	169.104
38	0.621911	102.487	-4.75363	R	0	35	88.9239	95.3086	163.338	0	163.338	170.732	170.732
39	0.621911	98.3623	-3.37838	R	0	35	86.6399	92.8606	159.142	0	159.142	164.257	164.257
40	0.621911	82.6561	-2.00508	R	0	35	73.9223	79.2299	135.782	0	135.782	138.37	138.37
41	0.621911	66.2494	-0.632936	R	0	35	60.1699	64.4901	110.522	0	110.522	111.186	111.186
42	0.621911	49.6574	0.738847	R	0	35	45.8119	49.1012	84.1485	0	84.1485	83.5577	83.5577
43	0.621911	41.1882	2.11106	R	0	35	38.608	41.3801	70.9162	0	70.9162	69.4931	69.4931
44	0.621911	40.8101	3.48448	R	0	35	38.8789	41.6704	71.4139	0	71.4139	69.0465	69.0465
45	0.621911	40.2458	4.85991	R	0	35	38.9812	41.7801	71.6017	0	71.6017	68.2873	68.2873
46	0.621911	34.3835	6.23815	R	0	35	33.872	36.304	62.217	0	62.217	58.5145	58.5145
47	0.621911	17.2416	7.62003	R	0	35	17.2827	18.5236	31.7452	0	31.7452	29.4331	29.4331
48	0.621911	5.07571	9.00639	R	0	35	5.17941	5.55129	9.51367	0	9.51367	8.69274	8.69274
49	0.621911	2.40943	10.3981	R	0	35	2.50427	2.68408	4.59991	0	4.59991	4.14038	4.14038
50	0.274648	0.242455	11.4044	AC alt	50	30	44.0781	47.2429	11.5899	0	11.5899	2.69871	2.69871

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.06258**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.63147	11.7442	-70.8311	R	0	35	4.50665	4.78868	8.2067	0	8.2067	21.1707	21.1707
2	0.63147	33.2972	-67.3059	R	0	35	12.016	12.768	21.8815	0	21.8815	50.615	50.615
3	0.63147	51.645	-64.2461	R	0	35	19.5226	20.7443	35.5511	0	35.5511	76.0185	76.0185
4	0.63147	67.8007	-61.4967	R	0	35	26.929	28.6142	49.0383	0	49.0383	98.6286	98.6286
5	0.63147	82.3203	-58.9734	R	0	35	34.1992	36.3394	62.2777	0	62.2777	119.135	119.135
6	0.63147	95.5496	-56.6237	R	0	35	41.3211	43.907	75.2468	0	75.2468	137.97	137.97
7	0.63147	107.722	-54.4127	R	0	35	48.2923	51.3144	87.9414	0	87.9414	155.427	155.427
8	0.63147	119.003	-52.3155	R	0	35	55.115	58.5641	100.366	0	100.366	171.716	171.716
9	0.63147	129.518	-50.3136	R	0	35	61.7937	65.6608	112.528	0	112.528	186.995	186.995
10	0.63147	139.36	-48.3928	R	0	35	68.3339	72.6102	124.438	0	124.438	201.385	201.385
11	0.63147	148.606	-46.5422	R	0	35	74.7406	79.4179	136.104	0	136.104	214.981	214.981
12	0.63147	157.314	-44.7527	R	0	35	81.0197	86.0899	147.539	0	147.539	227.862	227.862
13	0.63147	165.535	-43.0172	R	0	35	87.176	92.6315	158.75	0	158.75	240.092	240.092
14	0.63147	173.309	-41.3294	R	0	35	93.1823	99.0136	169.688	0	169.688	251.635	251.635
15	0.63147	180.308	-39.6843	R	0	35	96.8144	102.873	176.302	0	176.302	256.635	256.635
16	0.63147	186.581	-38.0776	R	0	35	102.198	108.594	186.105	0	186.105	266.175	266.175
17	0.63147	192.078	-36.5054	R	0	35	107.23	113.94	195.269	0	195.269	274.63	274.63
18	0.63147	193.419	-34.9646	R	0	35	109.966	116.848	200.252	0	200.252	277.15	277.15
19	0.63147	193.523	-33.4523	R	0	35	111.975	118.982	203.91	0	203.91	277.89	277.89
20	0.63147	193.326	-31.9659	R	0	35	113.775	120.895	207.188	0	207.188	278.188	278.188
21	0.63147	192.845	-30.5033	R	0	35	115.373	122.593	210.097	0	210.097	278.066	278.066
22	0.63147	192.09	-29.0623	R	0	35	116.772	124.08	212.645	0	212.645	277.539	277.539
23	0.63147	191.075	-27.6412	R	0	35	117.977	125.36	214.84	0	214.84	276.625	276.625
24	0.63147	190.013	-26.2384	R	0	35	119.12	126.574	216.919	0	216.919	275.632	275.632
25	0.63147	192.433	-24.8523	R	0	35	122.446	130.109	222.978	0	222.978	279.692	279.692
26	0.63147	196.012	-23.4816	R	0	35	126.56	134.48	230.47	0	230.47	285.451	285.451
27	0.63147	199.263	-22.1249	R	0	35	130.523	138.691	237.684	0	237.684	290.75	290.75
28	0.63147	192.081	-20.7813	R	0	35	127.614	135.6	232.387	0	232.387	280.816	280.816
29	0.63147	177.901	-19.4494	R	0	35	119.858	127.359	218.265	0	218.265	260.59	260.59
30	0.63147	163.513	-18.1285	R	0	35	111.7	118.69	203.41	0	203.41	239.98	239.98
31	0.63147	150.407	-16.8174	R	0	35	104.167	110.686	189.691	0	189.691	221.175	221.175
32	0.63147	149.811	-15.5154	R	0	35	105.178	111.76	191.532	0	191.532	220.731	220.731
33	0.63147	151.928	-14.2215	R	0	35	108.121	114.887	196.89	0	196.89	224.292	224.292
34	0.63147	153.322	-12.935	R	0	35	110.597	117.518	201.4	0	201.4	226.801	226.801
35	0.63147	142.776	-11.6551	R	0	35	104.387	110.92	190.093	0	190.093	211.625	211.625
36	0.63147	127.231	-10.3811	R	0	35	94.2837	100.184	171.693	0	171.693	188.965	188.965
37	0.63147	111.502	-9.11219	R	0	35	83.751	88.9921	152.513	0	152.513	165.946	165.946
38	0.63147	98.2403	-7.84782	R	0	35	74.7951	79.4758	136.204	0	136.204	146.513	146.513
39	0.63147	97.5686	-6.58729	R	0	35	75.3005	80.0128	137.124	0	137.124	145.82	145.82
40	0.63147	98.4011	-5.32996	R	0	35	76.9887	81.8067	140.198	0	140.198	147.381	147.381
41	0.63147	97.7618	-4.07519	R	0	35	77.5499	82.403	141.22	0	141.22	146.746	146.746
42	0.63147	84.3329	-2.82238	R	0	35	67.8342	72.0793	123.528	0	123.528	126.872	126.872
43	0.63147	67.5403	-1.57092	R	0	35	55.096	58.5439	100.331	0	100.331	101.842	101.842
44	0.63147	50.5733	-0.320214	R	0	35	41.8465	44.4653	76.2037	0	76.2037	76.4376	76.4376
45	0.63147	37.5754	0.930342	R	0	35	31.5435	33.5175	57.4416	0	57.4416	56.9293	56.9293
46	0.63147	36.5694	2.18134	R	0	35	31.1523	33.1018	56.7293	0	56.7293	55.5427	55.5427
47	0.63147	36.1783	3.43338	R	0	35	31.2823	33.2399	56.9658	0	56.9658	55.089	55.089
48	0.63147	33.2203	4.68707	R	0	35	29.1646	30.9897	53.1095	0	53.1095	50.7184	50.7184
49	0.63147	17.2768	5.94301	R	0	35	15.4049	16.3689	28.0526	0	28.0526	26.449	26.449
50	0.63147	2.34671	7.20183	R	0	35	2.12591	2.25895	3.87135	0	3.87135	3.60271	3.60271

# Interslice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.0654

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	104.568	340.322	0	0	0
2	105.156	336.894	60.6736	0	0
3	105.744	334.907	154.629	0	0
4	106.331	333.376	261.138	0	0
5	106.919	332.099	373.309	0	0
6	107.507	330.991	487.452	0	0
7	108.094	330.008	601.233	0	0
8	108.682	329.122	713.033	0	0
9	109.27	328.314	821.655	0	0
10	109.857	327.574	918.603	0	0
11	110.445	326.89	1009.12	0	0
12	111.033	326.256	1094.66	0	0
13	111.62	325.666	1173.73	0	0
14	112.208	325.115	1245.16	0	0
15	112.796	324.601	1309.02	0	0
16	113.383	324.12	1365.37	0	0
17	113.971	323.669	1414.32	0	0
18	114.559	323.246	1455.98	0	0
19	115.147	322.851	1490.46	0	0
20	115.734	322.48	1517.93	0	0
21	116.322	322.132	1538.89	0	0
22	116.91	321.807	1553.3	0	0
23	117.497	321.504	1560.98	0	0
24	118.085	321.221	1561.71	0	0
25	118.673	320.958	1556.06	0	0
26	119.26	320.713	1544.96	0	0
27	119.848	320.487	1529.31	0	0
28	120.436	320.279	1398.69	0	0
29	121.023	320.088	1372.92	0	0
30	121.611	319.914	1341.46	0	0
31	122.199	319.756	1304.75	0	0
32	122.786	319.614	1155.57	0	0
33	123.374	319.489	1116.07	0	0
34	123.962	319.378	1076.86	0	0
35	124.549	319.284	1037.97	0	0
36	125.137	319.204	995.501	0	0
37	125.725	319.139	948.891	0	0
38	126.313	319.089	898.211	0	0
39	126.9	319.054	848.664	0	0
40	127.488	319.034	803.986	0	0
41	128.076	319.029	765.396	0	0
42	128.663	319.038	733.959	0	0
43	129.251	319.061	703.966	0	0
44	129.839	319.1	672.371	0	0
45	130.426	319.153	639.287	0	0
46	131.014	319.221	608.914	0	0
47	131.602	319.304	590.695	0	0
48	132.189	319.403	582.867	0	0
49	132.777	319.517	577.354	0	0
50	133.302	319.632	553.938	0	0
51	133.828	319.759	0	0	0

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.0718**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	102.423	340.175	0	0	0
2	103.045	337.702	20.8403	0	0
3	103.667	335.899	64.3961	0	0
4	104.289	334.427	120.756	0	0
5	104.911	333.163	185.017	0	0
6	105.532	332.049	254.163	0	0
7	106.154	331.05	326.123	0	0
8	106.776	330.141	399.376	0	0
9	107.398	329.308	472.751	0	0
10	108.02	328.54	545.309	0	0
11	108.642	327.828	616.283	0	0
12	109.264	327.165	685.026	0	0
13	109.886	326.546	749.901	0	0
14	110.508	325.967	811.139	0	0
15	111.13	325.424	868.608	0	0
16	111.752	324.915	921.113	0	0
17	112.373	324.436	968.077	0	0
18	112.995	323.987	1009.52	0	0
19	113.617	323.565	1045.48	0	0
20	114.239	323.168	1075.99	0	0
21	114.861	322.796	1101.12	0	0
22	115.483	322.446	1120.93	0	0
23	116.105	322.119	1135.67	0	0
24	116.727	321.812	1145.45	0	0
25	117.349	321.526	1150.09	0	0
26	117.971	321.259	1149.45	0	0
27	118.593	321.011	1143.9	0	0
28	119.215	320.782	1134.18	0	0
29	119.836	320.57	1121.02	0	0
30	120.458	320.376	994.642	0	0
31	121.08	320.198	973.614	0	0
32	121.702	320.037	948.065	0	0
33	122.324	319.893	918.692	0	0
34	122.946	319.764	888.179	0	0
35	123.568	319.651	747.737	0	0
36	124.19	319.554	717.713	0	0
37	124.812	319.472	686.878	0	0
38	125.434	319.405	652.729	0	0
39	126.056	319.353	615.211	0	0
40	126.677	319.317	576.132	0	0
41	127.299	319.295	540.646	0	0
42	127.921	319.288	510.021	0	0
43	128.543	319.296	485.379	0	0
44	129.165	319.319	463.496	0	0
45	129.787	319.357	440.33	0	0
46	130.409	319.41	415.968	0	0
47	131.031	319.478	393.806	0	0
48	131.653	319.561	381.988	0	0
49	132.275	319.659	378.291	0	0
50	132.897	319.773	376.429	0	0
51	133.171	319.829	0	0	0

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.06258**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	100.566	340.048	0	0	0
2	101.197	338.231	13.3908	0	0
3	101.829	336.721	42.1353	0	0
4	102.46	335.412	81.3031	0	0
5	103.092	334.249	127.755	0	0
6	103.723	333.199	179.295	0	0
7	104.355	332.241	234.288	0	0
8	104.986	331.359	291.463	0	0
9	105.618	330.541	349.801	0	0
10	106.249	329.78	408.463	0	0
11	106.881	329.069	466.743	0	0
12	107.512	328.403	524.038	0	0
13	108.144	327.777	579.825	0	0
14	108.775	327.187	633.644	0	0
15	109.407	326.632	685.071	0	0
16	110.038	326.108	732.728	0	0
17	110.67	325.613	777.254	0	0
18	111.301	325.146	818.291	0	0
19	111.932	324.704	854.888	0	0
20	112.564	324.287	886.872	0	0
21	113.195	323.893	914.275	0	0
22	113.827	323.521	937.139	0	0
23	114.458	323.17	955.515	0	0
24	115.09	322.839	969.462	0	0
25	115.721	322.528	979.06	0	0
26	116.353	322.236	984.477	0	0
27	116.984	321.961	985.631	0	0
28	117.616	321.705	982.377	0	0
29	118.247	321.465	974.972	0	0
30	118.879	321.242	964.156	0	0
31	119.51	321.035	839.866	0	0
32	120.142	320.844	823.989	0	0
33	120.773	320.669	804.791	0	0
34	121.405	320.509	781.861	0	0
35	122.036	320.364	644.497	0	0
36	122.667	320.234	616.342	0	0
37	123.299	320.118	588.252	0	0
38	123.93	320.017	560.967	0	0
39	124.562	319.93	534.538	0	0
40	125.193	319.857	505.873	0	0
41	125.825	319.798	474.478	0	0
42	126.456	319.753	440.764	0	0
43	127.088	319.722	409.455	0	0
44	127.719	319.705	382.552	0	0
45	128.351	319.701	361.002	0	0
46	128.982	319.711	343.917	0	0
47	129.614	319.735	326.211	0	0
48	130.245	319.773	307.594	0	0
49	130.877	319.825	289.454	0	0
50	131.508	319.891	279.456	0	0
51	132.14	319.97	0	0	0

## Discharge Sections

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### Entity Information

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#### ◆ SLU

##### Shared Entities

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64
	180.625, 311.703
	179.812, 311.839
	179.723, 311.846

178.958, 312  
178.433, 312.137  
178.356, 312.154  
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155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52  
151.791, 316.568  
151.361, 316.642  
150.961, 316.72



External Boundary

150.563, 316.814  
149.573, 317.001  
149.066, 317.119  
148.57, 317.224  
147.953, 317.359  
147.598, 317.443  
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146.854, 317.583  
146.019, 317.733  
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126.21, 327.619  
124.21, 327.619  
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119.878, 332.619  
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115.547, 337.619  
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96.9967, 339.803  
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78.563, 339.14  
76.9128, 339.108  
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65.4218, 334.161  
62.7107, 335.219  
62.056, 335.55  
61.3599, 336  
60.905, 336.17

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43.1313, 342.638
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42.0121, 342.929
41.4108, 343.109
40.0761, 343.478
39.6983, 343.565
39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
35.8231, 344.472
34.8494, 344.749
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32.4141, 345.388
31.5581, 345.604
31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261
26.846, 346.693
26.3194, 346.778
25.8928, 346.872

	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978



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12.9744, 345.467
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25.1862, 343.086
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42.6609, 338.626
43.7908, 338.182
44.3444, 337.912
45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562

Material Boundary

136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC



Water Table

131.806, 317.053  
131.922, 317.01  
133.086, 316.845  
133.48, 316.793  
133.814, 316.742  
134.832, 316.614  
135.735, 316.555  
136.168, 316.534  
137.697, 316.2  
138.507, 316.038  
138.848, 316.012  
138.992, 315.99  
139.452, 315.959  
139.843, 315.901  
140.471, 315.874  
141.016, 315.802  
141.638, 315.784  
142.344, 315.664  
142.794, 315.643  
144.025, 315.286  
144.192, 315.277  
144.567, 315.163  
144.618, 315.145  
144.674, 315.131  
144.954, 315.046  
145.062, 315.033  
145.922, 314.816  
146.284, 314.721  
147.333, 314.533  
147.827, 314.432  
148, 314.403  
148.166, 314.364  
148.871, 314.211  
149.314, 314.116  
149.911, 313.978  
150.884, 313.794  
151.262, 313.705  
151.904, 313.58  
152.464, 313.484  
152.816, 313.428  
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153.968, 313.246  
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158.925, 312.531  
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161.102, 312.15  
162.121, 312.063  
162.398, 311.975  
163.373, 311.958  
163.815, 311.804  
164.095, 311.785

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv>0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
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161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
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157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52

	151.791, 316.568
	151.361, 316.642
	150.961, 316.72
	150.563, 316.814
	149.573, 317.001
	149.066, 317.119
	148.57, 317.224
	147.953, 317.359
	147.598, 317.443
	147.299, 317.493
	146.854, 317.583
	146.019, 317.733
	145.925, 317.758
	144.965, 318
	144.923, 318.015
	144.676, 318.09
	144.626, 318.096
	143.617, 318.401
	143.4, 318.414
	142.609, 318.643
	141.925, 318.797
	141.499, 318.812
	141.223, 318.825
	140.62, 318.927
	140.37, 318.959
	139.669, 318.979
	139.185, 319.043
External Boundary	138.625, 319.068
	138.322, 319.113
	137.879, 319.142
	137.769, 319.159
	137.61, 319.171
	137.352, 319.223
	135.236, 319.686
	134.2, 319.735
	133.61, 319.774
	132.936, 319.859
	132.623, 319.907
	132.182, 319.964
	131.931, 320
	131.729, 320.076
	131.721, 320.092
	130.543, 322.619
	128.543, 322.619
	126.21, 327.619
	124.21, 327.619
	121.878, 332.619
	119.878, 332.619
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	115.547, 337.619
	111.047, 340.62
	109.397, 340.653
	96.9967, 339.803
	92.206, 339.931
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	76.9128, 339.108
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	65.4218, 334.161
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62.056, 335.55
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	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
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	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978





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45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562

Material Boundary



136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt  
 AC

Water Table

131.806, 317.053  
131.922, 317.01  
133.086, 316.845  
133.48, 316.793  
133.814, 316.742  
134.832, 316.614  
135.735, 316.555  
136.168, 316.534  
137.697, 316.2  
138.507, 316.038  
138.848, 316.012  
138.992, 315.99  
139.452, 315.959  
139.843, 315.901  
140.471, 315.874  
141.016, 315.802  
141.638, 315.784  
142.344, 315.664  
142.794, 315.643  
144.025, 315.286  
144.192, 315.277  
144.567, 315.163  
144.618, 315.145  
144.674, 315.131  
144.954, 315.046  
145.062, 315.033  
145.922, 314.816  
146.284, 314.721  
147.333, 314.533  
147.827, 314.432  
148, 314.403  
148.166, 314.364  
148.871, 314.211  
149.314, 314.116  
149.911, 313.978  
150.884, 313.794  
151.262, 313.705  
151.904, 313.58  
152.464, 313.484  
152.816, 313.428  
153.706, 313.286  
153.968, 313.246  
154.96, 313.103  
155.062, 313.089  
155.865, 312.957  
156.182, 312.896  
157.23, 312.773  
157.292, 312.761  
158.805, 312.557  
158.925, 312.531  
159.624, 312.444  
160.195, 312.293  
160.861, 312.226  
161.102, 312.15  
162.121, 312.063  
162.398, 311.975  
163.373, 311.958  
163.815, 311.804  
164.095, 311.785

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv<0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52



External Boundary

151.791, 316.568  
151.361, 316.642  
150.961, 316.72  
150.563, 316.814  
149.573, 317.001  
149.066, 317.119  
148.57, 317.224  
147.953, 317.359  
147.598, 317.443  
147.299, 317.493  
146.854, 317.583  
146.019, 317.733  
145.925, 317.758  
144.965, 318  
144.923, 318.015  
144.676, 318.09  
144.626, 318.096  
143.617, 318.401  
143.4, 318.414  
142.609, 318.643  
141.925, 318.797  
141.499, 318.812  
141.223, 318.825  
140.62, 318.927  
140.37, 318.959  
139.669, 318.979  
139.185, 319.043  
138.625, 319.068  
138.322, 319.113  
137.879, 319.142  
137.769, 319.159  
137.61, 319.171  
137.352, 319.223  
135.236, 319.686  
134.2, 319.735  
133.61, 319.774  
132.936, 319.859  
132.623, 319.907  
132.182, 319.964  
131.931, 320  
131.729, 320.076  
131.721, 320.092  
130.543, 322.619  
128.543, 322.619  
126.21, 327.619  
124.21, 327.619  
121.878, 332.619  
119.878, 332.619  
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115.547, 337.619  
111.047, 340.62  
109.397, 340.653  
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92.206, 339.931  
78.563, 339.14  
76.9128, 339.108  
68.1212, 333.247  
65.4218, 334.161  
62.7107, 335.219

62.056, 335.55
61.3599, 336
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58.5731, 336.957
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58.1148, 337.114
57.8762, 337.206
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56.3362, 337.134
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50.9233, 339.223
50.1857, 339.596
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49.1144, 340.174
48.9611, 340.241
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46.6663, 341.333
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45.1988, 341.912
45.1668, 341.926
45.1352, 341.938
44.9566, 342
43.9785, 342.368
43.6906, 342.459
43.1313, 342.638
42.5615, 342.805
42.0121, 342.929
41.4108, 343.109
40.0761, 343.478
39.6983, 343.565
39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
35.8231, 344.472
34.8494, 344.749
33.553, 345.058
32.7793, 345.274
32.4141, 345.388
31.5581, 345.604
31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261

	26.846, 346.693
	26.3194, 346.778
	25.8928, 346.872
	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978



12.6593, 345.59
12.9744, 345.467
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35.5591, 340.54
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52.3768, 334.276
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54.8079, 333.528
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59.8091, 332.076
63.0044, 330.829
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80.4145, 324.407
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89.8846, 321.047
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134.55, 315.897
136.078, 315.562

Material Boundary

136.889, 315.4  
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190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC



Water Table

131.806, 317.053  
131.922, 317.01  
133.086, 316.845  
133.48, 316.793  
133.814, 316.742  
134.832, 316.614  
135.735, 316.555  
136.168, 316.534  
137.697, 316.2  
138.507, 316.038  
138.848, 316.012  
138.992, 315.99  
139.452, 315.959  
139.843, 315.901  
140.471, 315.874  
141.016, 315.802  
141.638, 315.784  
142.344, 315.664  
142.794, 315.643  
144.025, 315.286  
144.192, 315.277  
144.567, 315.163  
144.618, 315.145  
144.674, 315.131  
144.954, 315.046  
145.062, 315.033  
145.922, 314.816  
146.284, 314.721  
147.333, 314.533  
147.827, 314.432  
148, 314.403  
148.166, 314.364  
148.871, 314.211  
149.314, 314.116  
149.911, 313.978  
150.884, 313.794  
151.262, 313.705  
151.904, 313.58  
152.464, 313.484  
152.816, 313.428  
153.706, 313.286  
153.968, 313.246  
154.96, 313.103  
155.062, 313.089  
155.865, 312.957  
156.182, 312.896  
157.23, 312.773  
157.292, 312.761  
158.805, 312.557  
158.925, 312.531  
159.624, 312.444  
160.195, 312.293  
160.861, 312.226  
161.102, 312.15  
162.121, 312.063  
162.398, 311.975  
163.373, 311.958  
163.815, 311.804  
164.095, 311.785

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No



23-09-13 TA 2 interna  
Slide2 - An Interactive Slope Stability Program  
Date Created: 08/09/2023, 11:07:04  
Software Version: 9.029

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# Slide2 Analysis Information

## 23-09-13 TA 2 interna




### Project Summary

---

File Name: 23-09-13 TA 2 interna.slmd  
 Slide2 Modeler Version: 9.029  
 Project Title: Slide2 - An Interactive Slope Stability Program  
 Date Created: 08/09/2023, 11:07:04

### Currently Open Scenarios

---

Group Name	Scenario Name	Global Minimum	Compute Time
SLU 	Master Scenario	Bishop Simplified: 1.220660	00h:00m:02.21s
SLV kv>0 	Master Scenario	Bishop Simplified: 1.273090	00h:00m:01.965s
SLV kv<0 	Master Scenario	Bishop Simplified: 1.295540	00h:00m:01.953s

## General Settings

---

Units of Measurement:

Time Units:

Permeability Units:

Data Output:

Failure Direction:

Metric Units

days

meters/second

Standard

Left to Right



## Design Standard

### ◆ SLU

Selected Type: Eurocode 7 (User Defined)  
Name: A2+M2+R2

Type	Partial Factor
Permanent Actions: Unfavourable	1.35
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1.5
Variable Actions: Favourable	0
Effective cohesion	1.25
Coefficient of shearing resistance	1.25
Undrained strength	1.4
Weight density	1
Shear strength (other models)	1
Earth resistance	1.1
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv>0

Selected Type: Eurocode 7 (User Defined)  
Name: SISMA

Type	Partial Factor
Permanent Actions: Unfavourable	1
Permanent Actions: Favourable	1
Variable Actions: Unfavourable	1
Variable Actions: Favourable	1
Effective cohesion	1
Coefficient of shearing resistance	1
Undrained strength	1
Weight density	1
Shear strength (other models)	1
Earth resistance	1.2
Tensile and plate strength	1
Shear strength	1
Compressive strength	1
Bond strength	1
Seismic Coefficient	1

### ◆ SLV kv<0

Selected Type: Eurocode 7 (User Defined)

Name: SISMA

	<b>Type</b>	<b>Partial Factor</b>
Permanent Actions: Unfavourable		1
Permanent Actions: Favourable		1
Variable Actions: Unfavourable		1
Variable Actions: Favourable		1
Effective cohesion		1
Coefficient of shearing resistance		1
Undrained strength		1
Weight density		1
Shear strength (other models)		1
Earth resistance		1.2
Tensile and plate strength		1
Shear strength		1
Compressive strength		1
Bond strength		1
Seismic Coefficient		1

# Analysis Options

---

## All Open Scenarios

Slices Type:	Vertical
<b>Analysis Methods Used</b>	
	Bishop simplified
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

---

## All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [kN/m <sup>3</sup> ]:	9.81
Advanced Groundwater Method:	None

# Random Numbers

---

## All Open Scenarios

Pseudo-random Seed:

10116

Random Number Generation Method:

Park and Miller v.3

# Surface Options

---

## **All Open Scenarios**

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

---

## ◆ SLU

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

## ◆ SLV kv>0

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	0.045

## ◆ SLV kv<0

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.091
Seismic Load Coefficient (Vertical):	-0.045

# Loading

---

## ◆ SLU

Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live
Distribution:	Constant
Magnitude [kPa]:	20
Orientation:	Normal to boundary
Load Action:	Live

## ◆ SLV kv>0

Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live

## ◆ SLV kv<0


Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live
Distribution:	Constant
Magnitude [kPa]:	6
Orientation:	Normal to boundary
Load Action:	Live




## Materials

---


### R

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	0 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


### R resistente

Color	
Strength Type	Mohr-Coulomb
Unit Weight	20 kN/m <sup>3</sup>
Cohesion	10 kPa
Phi	35 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC alt

Color	
Strength Type	Mohr-Coulomb
Unit Weight	19.5 kN/m <sup>3</sup>
Cohesion	50 kPa
Phi	30 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No

### AC

Color	
Strength Type	Mohr-Coulomb
Unit Weight	23 kN/m <sup>3</sup>
Cohesion	90 kPa
Phi	32 °
Water Surface	Assigned per scenario
Hu Type	Custom
Hu	1
Specify alternate strength type above water surface	No


## Materials In Use

---


Material		SLU	SLV kv>0	SLV kv<0
R		✓	✓	✓
R esistente		✓	✓	✓
AC alt		✓	✓	✓
AC		✓	✓	✓

## Support


### 200/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 200/30
Ultimate Tensile Strength	200 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	117.625 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	120 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

### 150/30

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 150/30
Ultimate Tensile Strength	150 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	88.2187 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	90 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

**80/30**

Color	
Type	Geosynthetic
Force Application	Passive (Method B)
Force Orientation	Parallel to Reinforcement
Selected Manufacturer	Geosintex Edilgrid 80/30
Ultimate Tensile Strength	80 kN/m
Creep Reduction Factor (RFcr)	1.47
Installation Damage Factor (RFid)	1.02
Deterioration in Service Factor (RFd)	1.134
Factor of Safety (Fr)	1.1
Strip Coverage (%)	100
Long Term Design Strength	47.05 kN/m
Anchorage	Slope Face
Connection Strength Input	Constant
Connection Strength	50 kN/m
Input Type	Friction Angle & Adhesion
Shear Strength Model	Linear
Adhesion	0 kPa
Friction Angle	31.5 °
Material Dependent	No
Use External Loads in Strength Computation	Yes

# Global Minimums

---

## ◆ SLU

**Method: bishop simplified**

FS	1.220660
Center:	128.860, 340.558
Radius:	20.858
Left Slip Surface Endpoint:	108.002, 340.558
Right Slip Surface Endpoint:	132.177, 319.965
Resisting Moment:	76986.6 kN-m
Driving Moment:	63069.4 kN-m
Passive Support Moment:	15757.7 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	889.116 kN
Total Slice Area:	215.318 m <sup>2</sup>
Surface Horizontal Width:	24.1754 m
Surface Average Height:	8.90651 m

## ◆ SLV kv>0

**Method: bishop simplified**

FS	1.273090
Center:	128.860, 340.558
Radius:	20.858
Left Slip Surface Endpoint:	108.002, 340.558
Right Slip Surface Endpoint:	132.175, 319.965
Resisting Moment:	67117.3 kN-m
Driving Moment:	52720.2 kN-m
Passive Support Moment:	15758.9 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	889.19 kN
Total Slice Area:	215.31 m <sup>2</sup>
Surface Horizontal Width:	24.1734 m
Surface Average Height:	8.9069 m

## ◆ SLV kv<0

**Method: bishop simplified**

<b>FS</b>	<b>1.295540</b>
Center:	128.859, 340.558
Radius:	20.858
Left Slip Surface Endpoint:	108.001, 340.558
Right Slip Surface Endpoint:	132.178, 319.965
Resisting Moment:	62937.5 kN-m
Driving Moment:	48580 kN-m
Passive Support Moment:	15752.5 kN-m
Maximum Single Support Force:	117.625 kN
Total Support Force:	888.771 kN
Total Slice Area:	215.342 m <sup>2</sup>
Surface Horizontal Width:	24.1772 m
Surface Average Height:	8.90683 m

## Global Minimum Support Data

### ◆ SLU

Method: bishop simplified

Number of Supports: 26

#### 200/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	8.16762	4.83238	8.16762	4.83238	117.625
131.223, 321.159	13	10.0241	2.97589	10.0241	2.97589	117.625
130.883, 321.889	13	11.3238	1.67617	11.3238	1.67617	117.625
128.543, 322.619	13	10.323	2.67698	10.323	2.67698	117.625
128.202, 323.349	12.9999	11.1256	1.87435	11.1256	1.87435	117.625
127.862, 324.079	12.9999	11.7854	1.21449	11.7854	1.21449	117.625
127.521, 324.809	12.9998	12.3352	0.664636	12.3352	0.664636	117.625
127.181, 325.539	12.9997	12.7919	0.207838	12.7919	0.207838	65.7413
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 150/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

#### 80/30

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

◆ **SLV kv>0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	8.1663	4.8337	8.1663	4.8337	117.625
131.223, 321.159	13	10.0232	2.97678	10.0232	2.97678	117.625
130.883, 321.889	13	11.3233	1.67675	11.3233	1.67675	117.625
128.543, 322.619	13	10.3225	2.67749	10.3225	2.67749	117.625
128.202, 323.349	12.9999	11.1252	1.87472	11.1252	1.87472	117.625
127.862, 324.079	12.9999	11.7851	1.21479	11.7851	1.21479	117.625
127.521, 324.809	12.9998	12.3349	0.664879	12.3349	0.664879	117.625
127.181, 325.539	12.9997	12.7917	0.208071	12.7917	0.208071	65.8151
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0



123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

### ◆ **SLV kv<0**

**Method: bishop simplified**

Number of Supports: 26

**200/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
132.244, 318.966	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.904, 319.699	13	Not Effective	Not Effective	Not Effective	Not Effective	0
131.564, 320.429	13	8.16955	4.83045	8.16955	4.83045	117.625
131.223, 321.159	13	10.0257	2.97429	10.0257	2.97429	117.625
130.883, 321.889	13	11.3252	1.67481	11.3252	1.67481	117.625
128.543, 322.619	13	10.3243	2.67567	10.3243	2.67567	117.625
128.202, 323.349	12.9999	11.1268	1.87316	11.1268	1.87316	117.625
127.862, 324.079	12.9999	11.7865	1.21334	11.7865	1.21334	117.625

127.521, 324.809	12.9998	12.3363	0.663541	12.3363	0.663541	117.625
127.181, 325.539	12.9997	12.793	0.206745	12.793	0.206745	65.3958
126.84, 326.269	12.9997	Not Effective	Not Effective	Not Effective	Not Effective	0
126.5, 326.999	12.9996	Not Effective	Not Effective	Not Effective	Not Effective	0

**150/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
124.21, 327.619	10.9994	Not Effective	Not Effective	Not Effective	Not Effective	0
123.87, 328.349	10.9993	Not Effective	Not Effective	Not Effective	Not Effective	0
123.53, 329.079	10.9992	Not Effective	Not Effective	Not Effective	Not Effective	0
123.189, 329.809	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.849, 330.539	10.9991	Not Effective	Not Effective	Not Effective	Not Effective	0
122.508, 331.269	10.999	Not Effective	Not Effective	Not Effective	Not Effective	0
122.168, 331.999	10.9074	Not Effective	Not Effective	Not Effective	Not Effective	0

**80/30**

Support Type: Geosynthetic

Start (x, y)	Length (m)	L Inside SS (m)	L Outside SS (m)	Li (m)	Lo (m)	Force (kN)
119.878, 332.619	8.99883	Not Effective	Not Effective	Not Effective	Not Effective	0
119.538, 333.349	8.99881	Not Effective	Not Effective	Not Effective	Not Effective	0
119.198, 334.079	8.9988	Not Effective	Not Effective	Not Effective	Not Effective	0
118.857, 334.809	8.99878	Not Effective	Not Effective	Not Effective	Not Effective	0
118.517, 335.539	8.99876	Not Effective	Not Effective	Not Effective	Not Effective	0
118.176, 336.269	8.99874	Not Effective	Not Effective	Not Effective	Not Effective	0
117.836, 336.999	8.99873	Not Effective	Not Effective	Not Effective	Not Effective	0

## Valid and Invalid Surfaces

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### ◆ SLU

#### Method: bishop simplified

Number of Valid Surfaces:	7512
Number of Invalid Surfaces:	0

### ◆ SLV kv>0

#### Method: bishop simplified

Number of Valid Surfaces:	7245
Number of Invalid Surfaces:	0

### ◆ SLV kv<0

#### Method: bishop simplified

Number of Valid Surfaces:	7615
Number of Invalid Surfaces:	0

# Slice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.22066

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.483507	29.3611	-83.8196	R	0	29.2561	7.23315	8.82922	17.338	0	17.338	84.1333	84.1333
2	0.483507	70.7683	-75.0621	R	0	29.2561	27.0696	33.0428	64.886	0	64.886	166.351	166.351
3	0.483507	91.9374	-70.4956	R	0	29.2561	39.4056	48.1008	94.4556	0	94.4556	205.706	205.706
4	0.483507	108.31	-66.8189	R	0	29.2561	45.138	55.0981	108.196	0	108.196	213.607	213.607
5	0.483507	121.922	-63.6361	R	0	29.2561	54.6538	66.7137	131.006	0	131.006	241.28	241.28
6	0.483507	133.806	-60.7799	R	0	29.2561	63.4542	77.456	152.1	0	152.1	265.545	265.545
7	0.483507	143.396	-58.1605	R	0	29.2561	71.1844	86.8919	170.629	0	170.629	285.262	285.262
8	0.483507	149.079	-55.7224	R	0	29.2561	76.9095	93.8803	184.353	0	184.353	297.193	297.193
9	0.483507	153.753	-53.4286	R	0	29.2561	82.0015	100.096	196.559	0	196.559	307.089	307.089
10	0.483507	157.73	-51.2528	R	0	29.2561	86.6204	105.734	207.63	0	207.63	315.568	315.568
11	0.483507	161.106	-49.1759	R	0	29.2561	90.8214	110.862	217.699	0	217.699	322.827	322.827
12	0.483507	163.955	-47.1829	R	0	29.2561	94.6455	115.53	226.867	0	226.867	329.014	329.014
13	0.483507	166.336	-45.2622	R	0	29.2561	98.1289	119.782	235.216	0	235.216	334.248	334.248
14	0.483507	168.296	-43.4046	R	0	29.2561	101.297	123.649	242.81	0	242.81	338.617	338.617
15	0.483507	169.873	-41.6024	R	0	29.2561	104.175	127.162	249.708	0	249.708	342.207	342.207
16	0.483507	171.429	-39.8492	R	0	29.2561	106.986	130.594	256.448	0	256.448	345.741	345.741
17	0.483507	175.773	-38.1398	R	0	29.2561	111.524	136.133	267.323	0	267.323	354.895	354.895
18	0.483507	180.584	-36.4696	R	0	29.2561	116.384	142.065	278.975	0	278.975	364.999	364.999
19	0.483507	185.113	-34.8347	R	0	29.2561	121.095	147.816	290.266	0	290.266	374.539	374.539
20	0.483507	188.922	-33.2317	R	0	29.2561	125.362	153.024	300.494	0	300.494	382.627	382.627
21	0.483507	183.112	-31.6575	R	0	29.2561	123.182	150.363	295.268	0	295.268	371.22	371.22
22	0.483507	173.353	-30.1097	R	0	29.2561	118.166	144.24	283.244	0	283.244	351.769	351.769
23	0.483507	163.367	-28.5857	R	0	29.2561	112.789	137.677	270.357	0	270.357	331.815	331.815
24	0.483507	153.165	-27.0835	R	0	29.2561	107.062	130.686	256.629	0	256.629	311.376	311.376
25	0.483507	144.048	-25.6012	R	0	29.2561	101.908	124.395	244.276	0	244.276	293.105	293.105
26	0.483507	144.829	-24.1371	R	0	29.2561	103.671	126.547	248.5	0	248.5	294.955	294.955
27	0.483507	147.563	-22.6895	R	0	29.2561	106.846	130.423	256.113	0	256.113	300.785	300.785
28	0.483507	150.11	-21.2572	R	0	29.2561	109.92	134.175	263.48	0	263.48	306.242	306.242
29	0.483507	151.865	-19.8386	R	0	29.2561	112.441	137.252	269.521	0	269.521	310.087	310.087
30	0.483507	143.833	-18.4326	R	0	29.2561	107.658	131.414	258.057	0	258.057	293.938	293.938
31	0.483507	132.319	-17.038	R	0	29.2561	100.108	122.198	239.96	0	239.96	270.638	270.638
32	0.483507	120.638	-15.6537	R	0	29.2561	92.2427	112.597	221.108	0	221.108	246.955	246.955
33	0.483507	108.793	-14.2788	R	0	29.2561	84.0635	102.613	201.501	0	201.501	222.896	222.896
34	0.483507	98.3276	-12.9122	R	0	29.2561	76.7729	93.7136	184.026	0	184.026	201.626	201.626
35	0.483507	97.8473	-11.553	R	0	29.2561	77.1932	94.2266	185.033	0	185.033	200.813	200.813
36	0.483507	99.0603	-10.2004	R	0	29.2561	78.9602	96.3836	189.269	0	189.269	203.476	203.476
37	0.483507	100.12	-8.85354	R	0	29.2561	80.6299	98.4217	193.271	0	193.271	205.83	205.83
38	0.483507	100.242	-7.51158	R	0	29.2561	81.5622	99.5597	195.506	0	195.506	206.26	206.26
39	0.483507	90.4062	-6.17377	R	0	29.2561	74.3205	90.7201	178.147	0	178.147	186.187	186.187
40	0.483507	77.4818	-4.83932	R	0	29.2561	64.3564	78.5573	154.263	0	154.263	159.712	159.712
41	0.483507	64.4094	-3.5075	R	0	29.2561	54.0558	65.9838	129.573	0	129.573	132.886	132.886
42	0.483507	51.1899	-2.17758	R	0	29.2561	43.4117	52.9909	104.058	0	104.058	105.709	105.709
43	0.483507	39.636	-0.848834	R	0	29.2561	33.9686	41.4641	81.4232	0	81.4232	81.9264	81.9264
44	0.483507	38.0814	0.479457	R	0	29.2561	32.9844	40.2627	79.0639	0	79.0639	78.7879	78.7879
45	0.483507	37.9553	1.80801	R	0	29.2561	33.2299	40.5624	79.6524	0	79.6524	78.6035	78.6035
46	0.483507	37.6827	3.13753	R	0	29.2561	33.3519	40.7113	79.9448	0	79.9448	78.1166	78.1166
47	0.483507	36.2803	4.46875	R	0	29.2561	32.4669	39.631	77.8236	0	77.8236	75.2862	75.2862
48	0.483507	24.7718	5.80239	R	0	29.2561	22.4181	27.3649	53.7365	0	53.7365	51.4584	51.4584
49	0.483507	10.5228	7.13919	R	0	29.2561	9.63241	11.7579	23.089	0	23.089	21.8825	21.8825
50	0.483507	1.12305	8.47992	R	0	29.2561	1.04008	1.26958	2.49309	0	2.49309	2.33802	2.33802

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.27309**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.483468	21.7461	-83.8198	R	0	35	4.0024	5.09541	8.7324	0	8.7324	45.694	45.694
2	0.483468	52.4141	-75.0626	R	0	35	17.8808	22.7639	39.0122	0	39.0122	106.037	106.037
3	0.483468	68.0929	-70.4962	R	0	35	27.4092	34.8944	59.8013	0	59.8013	137.186	137.186
4	0.483468	80.2195	-66.8196	R	0	35	34.8246	44.3348	75.9799	0	75.9799	157.309	157.309
5	0.483468	90.3011	-63.6368	R	0	35	42.4444	54.0355	92.6047	0	92.6047	178.246	178.246
6	0.483468	99.1029	-60.7808	R	0	35	49.548	63.079	108.103	0	108.103	196.689	196.689
7	0.483468	106.207	-58.1614	R	0	35	55.8454	71.0962	121.843	0	121.843	211.778	211.778
8	0.483468	110.416	-55.7234	R	0	35	60.5865	77.1321	132.187	0	132.187	221.082	221.082
9	0.483468	113.879	-53.4296	R	0	35	64.8378	82.5443	141.462	0	141.462	228.86	228.86
10	0.483468	116.824	-51.254	R	0	35	68.7221	87.4894	149.938	0	149.938	235.576	235.576
11	0.483468	119.324	-49.1771	R	0	35	72.28	92.0189	157.7	0	157.7	241.37	241.37
12	0.483468	121.435	-47.1841	R	0	35	75.5431	96.1732	164.819	0	164.819	246.353	246.353
13	0.483468	123.198	-45.2635	R	0	35	78.537	99.9847	171.351	0	171.351	250.614	250.614
14	0.483468	124.65	-43.406	R	0	35	81.2825	103.48	177.341	0	177.341	254.223	254.223
15	0.483468	125.818	-41.6038	R	0	35	83.7977	106.682	182.829	0	182.829	257.238	257.238
16	0.483468	126.97	-39.8507	R	0	35	86.261	109.818	188.204	0	188.204	260.203	260.203
17	0.483468	130.185	-38.1414	R	0	35	90.1209	114.732	196.625	0	196.625	267.394	267.394
18	0.483468	133.748	-36.4713	R	0	35	94.2541	119.994	205.643	0	205.643	275.314	275.314
19	0.483468	137.102	-34.8364	R	0	35	98.2766	125.115	214.42	0	214.42	282.817	282.817
20	0.483468	139.928	-33.2334	R	0	35	101.952	129.794	222.438	0	222.438	289.238	289.238
21	0.483468	135.637	-31.6593	R	0	35	100.39	127.805	219.03	0	219.03	280.933	280.933
22	0.483468	128.409	-30.1115	R	0	35	96.492	122.843	210.524	0	210.524	266.485	266.485
23	0.483468	121.014	-28.5876	R	0	35	92.2802	117.481	201.336	0	201.336	251.622	251.622
24	0.483468	113.458	-27.0855	R	0	35	87.7621	111.729	191.478	0	191.478	236.36	236.36
25	0.483468	106.697	-25.6032	R	0	35	83.6877	106.542	182.59	0	182.59	222.692	222.692
26	0.483468	107.265	-24.1392	R	0	35	85.2838	108.574	186.072	0	186.072	224.291	224.291
27	0.483468	109.29	-22.6917	R	0	35	88.0582	112.106	192.124	0	192.124	228.944	228.944
28	0.483468	111.177	-21.2594	R	0	35	90.7563	115.541	198.012	0	198.012	233.322	233.322
29	0.483468	112.484	-19.8408	R	0	35	93.0115	118.412	202.931	0	202.931	236.492	236.492
30	0.483468	106.551	-18.4349	R	0	35	89.2301	113.598	194.682	0	194.682	224.425	224.425
31	0.483468	98.024	-17.0403	R	0	35	83.1237	105.824	181.36	0	181.36	206.837	206.837
32	0.483468	89.3726	-15.6561	R	0	35	76.7339	97.6891	167.417	0	167.417	188.923	188.923
33	0.483468	80.5999	-14.2813	R	0	35	70.0588	89.1911	152.854	0	152.854	170.687	170.687
34	0.483468	72.8367	-12.9147	R	0	35	64.0903	81.5927	139.832	0	139.832	154.528	154.528
35	0.483468	72.4671	-11.5556	R	0	35	64.5468	82.1739	140.828	0	140.828	154.025	154.025
36	0.483468	73.3657	-10.2031	R	0	35	66.1464	84.2103	144.318	0	144.318	156.223	156.223
37	0.483468	74.1506	-8.85629	R	0	35	67.6713	86.1516	147.645	0	147.645	158.189	158.189
38	0.483468	74.2513	-7.51441	R	0	35	68.5923	87.3242	149.654	0	149.654	158.702	158.702
39	0.483468	66.9872	-6.17666	R	0	35	62.6414	79.7482	136.671	0	136.671	143.45	143.45
40	0.483468	57.4153	-4.84228	R	0	35	54.3526	69.1958	118.586	0	118.586	123.191	123.191
41	0.483468	47.7339	-3.51053	R	0	35	45.7485	58.2419	99.8137	0	99.8137	102.62	102.62
42	0.483468	37.9435	-2.18068	R	0	35	36.8203	46.8755	80.3342	0	80.3342	81.7363	81.7363
43	0.483468	29.3691	-0.852005	R	0	35	28.8599	36.7412	62.9661	0	62.9661	63.3953	63.3953
44	0.483468	28.2014	0.476212	R	0	35	28.0668	35.7315	61.2358	0	61.2358	61.0025	61.0025
45	0.483468	28.1084	1.80469	R	0	35	28.3366	36.0751	61.8246	0	61.8246	60.9318	60.9318
46	0.483468	27.9067	3.13413	R	0	35	28.5036	36.2876	62.1889	0	62.1889	60.6282	60.6282
47	0.483468	26.8826	4.46527	R	0	35	27.825	35.4237	60.7083	0	60.7083	58.5354	58.5354
48	0.483468	18.3826	5.79883	R	0	35	19.2866	24.5536	42.0794	0	42.0794	40.1207	40.1207
49	0.483468	7.82976	7.13555	R	0	35	8.32926	10.6039	18.1726	0	18.1726	17.1299	17.1299
50	0.483468	0.836135	8.47618	R	0	35	0.902151	1.14852	1.96831	0	1.96831	1.83386	1.83386

 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.29554**

Slice Number	Width [m]	Weight [kN]	Angle of Slice Base [deg]	Base Material	Base Cohesion [kPa]	Base Friction Angle [deg]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]	Base Vertical Stress [kPa]	Effective Vertical Stress [kPa]
1	0.483544	21.7516	-83.8194	R	0	35	3.68709	4.77677	8.18632	0	8.18632	42.2341	42.2341
2	0.483544	52.4274	-75.0617	R	0	35	16.3284	21.1541	36.2534	0	36.2534	97.4553	97.4553
3	0.483544	68.1102	-70.495	R	0	35	24.9659	32.3443	55.431	0	55.431	125.913	125.913
4	0.483544	80.2403	-66.8182	R	0	35	31.5891	40.9249	70.1362	0	70.1362	143.904	143.904
5	0.483544	90.3243	-63.6352	R	0	35	38.4762	49.8474	85.4273	0	85.4273	163.057	163.057
6	0.483544	99.1283	-60.779	R	0	35	44.8916	58.1588	99.6712	0	99.6712	179.926	179.926
7	0.483544	106.236	-58.1595	R	0	35	50.5745	65.5213	112.289	0	112.289	193.729	193.729
8	0.483544	110.447	-55.7213	R	0	35	54.846	71.0552	121.772	0	121.772	202.238	202.238
9	0.483544	113.909	-53.4274	R	0	35	58.6726	76.0127	130.268	0	130.268	209.35	209.35
10	0.483544	116.855	-51.2516	R	0	35	62.1664	80.5391	138.026	0	138.026	215.488	215.488
11	0.483544	119.356	-49.1746	R	0	35	65.3644	84.6822	145.126	0	145.126	220.784	220.784
12	0.483544	121.467	-47.1815	R	0	35	68.2952	88.4792	151.634	0	151.634	225.338	225.338
13	0.483544	123.23	-45.2608	R	0	35	70.9823	91.9604	157.6	0	157.6	229.231	229.231
14	0.483544	124.682	-43.4031	R	0	35	73.4445	95.1503	163.066	0	163.066	232.527	232.527
15	0.483544	125.85	-41.6008	R	0	35	75.6978	98.0695	168.069	0	168.069	235.279	235.279
16	0.483544	127.002	-39.8476	R	0	35	77.905	100.929	172.969	0	172.969	237.987	237.987
17	0.483544	130.219	-38.1381	R	0	35	81.373	105.422	180.669	0	180.669	244.561	244.561
18	0.483544	133.783	-36.4679	R	0	35	85.0858	110.232	188.913	0	188.913	251.8	251.8
19	0.483544	137.138	-34.8329	R	0	35	88.6981	114.912	196.933	0	196.933	258.656	258.656
20	0.483544	139.96	-33.2298	R	0	35	91.9933	119.181	204.25	0	204.25	264.517	264.517
21	0.483544	135.658	-31.6556	R	0	35	90.5584	117.322	201.065	0	201.065	256.898	256.898
22	0.483544	128.428	-30.1076	R	0	35	87.0239	112.743	193.216	0	193.216	243.677	243.677
23	0.483544	121.03	-28.5836	R	0	35	83.2078	107.799	184.744	0	184.744	230.08	230.08
24	0.483544	113.471	-27.0813	R	0	35	79.1176	102.5	175.662	0	175.662	216.116	216.116
25	0.483544	106.717	-25.599	R	0	35	75.4353	97.7294	167.486	0	167.486	203.627	203.627
26	0.483544	107.296	-24.1348	R	0	35	76.8673	99.5846	170.666	0	170.666	205.106	205.106
27	0.483544	109.321	-22.6872	R	0	35	79.3522	102.804	176.183	0	176.183	209.356	209.356
28	0.483544	111.208	-21.2548	R	0	35	81.7682	105.934	181.547	0	181.547	213.353	213.353
29	0.483544	112.507	-19.8361	R	0	35	83.7782	108.538	186.01	0	186.01	216.232	216.232
30	0.483544	106.553	-18.43	R	0	35	80.3426	104.087	178.381	0	178.381	205.155	205.155
31	0.483544	98.0229	-17.0354	R	0	35	74.8283	96.943	166.139	0	166.139	189.066	189.066
32	0.483544	89.3684	-15.651	R	0	35	69.0604	89.4705	153.333	0	153.333	172.681	172.681
33	0.483544	80.5925	-14.276	R	0	35	63.0382	81.6685	139.962	0	139.962	156.002	156.002
34	0.483544	72.8428	-12.9094	R	0	35	57.6671	74.71	128.036	0	128.036	141.254	141.254
35	0.483544	72.4906	-11.5501	R	0	35	58.0808	75.246	128.955	0	128.955	140.824	140.824
36	0.483544	73.389	-10.1975	R	0	35	59.5083	77.0954	132.124	0	132.124	142.829	142.829
37	0.483544	74.1737	-8.85054	R	0	35	60.868	78.8569	135.143	0	135.143	144.621	144.621
38	0.483544	74.26	-7.50852	R	0	35	61.6724	79.8991	136.929	0	136.929	145.058	145.058
39	0.483544	66.9662	-6.17063	R	0	35	56.2864	72.9213	124.971	0	124.971	131.056	131.056
40	0.483544	57.3909	-4.83611	R	0	35	48.8231	63.2523	108.4	0	108.4	112.531	112.531
41	0.483544	47.7059	-3.50421	R	0	35	41.0792	53.2197	91.2068	0	91.2068	93.7223	93.7223
42	0.483544	37.9119	-2.17422	R	0	35	33.0471	42.8139	73.3735	0	73.3735	74.6282	74.6282
43	0.483544	29.3593	-0.845389	R	0	35	25.9099	33.5673	57.5269	0	57.5269	57.9092	57.9092
44	0.483544	28.2141	0.482984	R	0	35	25.212	32.6632	55.9774	0	55.9774	55.7649	55.7649
45	0.483544	28.1205	1.81162	R	0	35	25.4482	32.9692	56.5019	0	56.5019	55.697	55.697
46	0.483544	27.9182	3.14122	R	0	35	25.5916	33.155	56.8204	0	56.8204	55.4159	55.4159
47	0.483544	26.8722	4.47253	R	0	35	24.9566	32.3323	55.4104	0	55.4104	53.4583	53.4583
48	0.483544	18.335	5.80626	R	0	35	17.256	22.3558	38.3129	0	38.3129	36.5582	36.5582
49	0.483544	7.77823	7.14315	R	0	35	7.42057	9.61365	16.4757	0	16.4757	15.5457	15.5457
50	0.483544	0.829998	8.48397	R	0	35	0.802908	1.0402	1.78267	0	1.78267	1.6629	1.6629

# Interslice Data



## Global Minimum Query (bishop simplified) - Safety Factor: 1.22066

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	108.002	340.558	0	0	0
2	108.486	336.093	74.9158	0	0
3	108.969	334.28	180.433	0	0
4	109.453	332.915	291.22	0	0
5	109.936	331.786	391.59	0	0
6	110.42	330.811	493	0	0
7	110.903	329.946	593.836	0	0
8	111.387	329.168	692.314	0	0
9	111.87	328.458	785.951	0	0
10	112.354	327.806	874.451	0	0
11	112.837	327.204	957.717	0	0
12	113.321	326.644	1035.7	0	0
13	113.804	326.122	1108.38	0	0
14	114.288	325.634	1175.76	0	0
15	114.771	325.177	1184.02	0	0
16	115.255	324.748	1144.55	0	0
17	115.738	324.344	1196.38	0	0
18	116.222	323.965	1147.65	0	0
19	116.705	323.607	1191.14	0	0
20	117.189	323.271	1133.97	0	0
21	117.672	322.954	1168.62	0	0
22	118.156	322.656	1197.16	0	0
23	118.639	322.376	1123.15	0	0
24	119.123	322.112	1139.91	0	0
25	119.606	321.865	1055.3	0	0
26	120.09	321.633	1062.67	0	0
27	120.573	321.416	1066.45	0	0
28	121.057	321.214	1066.62	0	0
29	121.54	321.026	966.734	0	0
30	122.024	320.852	959.449	0	0
31	122.507	320.691	949.043	0	0
32	122.991	320.542	936.253	0	0
33	123.474	320.407	825.302	0	0
34	123.958	320.284	809.501	0	0
35	124.441	320.173	792.823	0	0
36	124.925	320.074	773.832	0	0
37	125.408	319.987	752.166	0	0
38	125.892	319.912	727.784	0	0
39	126.375	319.848	700.859	0	0
40	126.859	319.796	674.285	0	0
41	127.342	319.755	649.52	0	0
42	127.826	319.725	627.255	0	0
43	128.309	319.707	608.203	0	0
44	128.793	319.7	592.382	0	0
45	129.276	319.704	576.133	0	0
46	129.76	319.719	558.87	0	0
47	130.243	319.746	540.644	0	0
48	130.727	319.783	522.024	0	0
49	131.21	319.832	508.558	0	0
50	131.694	319.893	502.508	0	0
51	132.177	319.965	0	0	0

 **SLV kv>0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.27309**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	108.002	340.558	0	0	0
2	108.485	336.093	39.2346	0	0
3	108.969	334.281	106.274	0	0
4	109.452	332.916	181.048	0	0
5	109.936	331.787	257.33	0	0
6	110.419	330.811	335.403	0	0
7	110.903	329.947	413.954	0	0
8	111.386	329.168	491.535	0	0
9	111.87	328.459	566.115	0	0
10	112.353	327.807	637.38	0	0
11	112.837	327.205	705.181	0	0
12	113.32	326.645	769.417	0	0
13	113.804	326.123	830.017	0	0
14	114.287	325.635	886.938	0	0
15	114.771	325.178	888.456	0	0
16	115.254	324.749	845.563	0	0
17	115.737	324.345	891.438	0	0
18	116.221	323.965	842.051	0	0
19	116.704	323.608	882.23	0	0
20	117.188	323.272	827.035	0	0
21	117.671	322.955	861.033	0	0
22	118.155	322.657	890.229	0	0
23	118.638	322.376	821.985	0	0
24	119.122	322.113	841.511	0	0
25	119.605	321.866	764.434	0	0
26	120.089	321.634	776.059	0	0
27	120.572	321.417	784.98	0	0
28	121.056	321.215	791.271	0	0
29	121.539	321.027	702.445	0	0
30	122.023	320.853	703.199	0	0
31	122.506	320.691	701.21	0	0
32	122.99	320.543	696.892	0	0
33	123.473	320.408	598.287	0	0
34	123.956	320.285	590.625	0	0
35	124.44	320.174	581.827	0	0
36	124.923	320.075	571.194	0	0
37	125.407	319.988	558.509	0	0
38	125.89	319.913	543.723	0	0
39	126.374	319.849	526.924	0	0
40	126.857	319.796	509.942	0	0
41	127.341	319.756	493.795	0	0
42	127.824	319.726	479.023	0	0
43	128.308	319.707	466.187	0	0
44	128.791	319.7	455.385	0	0
45	129.275	319.704	444.162	0	0
46	129.758	319.72	432.103	0	0
47	130.242	319.746	419.242	0	0
48	130.725	319.784	405.969	0	0
49	131.208	319.833	396.269	0	0
50	131.692	319.893	391.862	0	0
51	132.175	319.965	0	0	0



 **SLV kv<0**
**Global Minimum Query (bishop simplified) - Safety Factor: 1.29554**

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [deg]
1	108.001	340.558	0	0	0
2	108.485	336.092	36.9528	0	0
3	108.968	334.28	99.7496	0	0
4	109.452	332.915	169.746	0	0
5	109.935	331.786	241.001	0	0
6	110.419	330.81	313.997	0	0
7	110.902	329.946	387.517	0	0
8	111.386	329.167	460.214	0	0
9	111.869	328.458	530.186	0	0
10	112.353	327.806	597.142	0	0
11	112.837	327.203	660.94	0	0
12	113.32	326.644	721.486	0	0
13	113.804	326.122	778.713	0	0
14	114.287	325.634	832.578	0	0
15	114.771	325.177	832.578	0	0
16	115.254	324.747	788.867	0	0
17	115.738	324.344	832.634	0	0
18	116.221	323.964	783.02	0	0
19	116.705	323.607	821.651	0	0
20	117.188	323.27	766.802	0	0
21	117.672	322.953	799.85	0	0
22	118.156	322.655	828.439	0	0
23	118.639	322.375	761.516	0	0
24	119.123	322.111	781.05	0	0
25	119.606	321.864	705.837	0	0
26	120.09	321.632	717.948	0	0
27	120.573	321.416	727.595	0	0
28	121.057	321.214	734.866	0	0
29	121.54	321.026	648.884	0	0
30	122.024	320.851	651.141	0	0
31	122.507	320.69	650.812	0	0
32	122.991	320.542	648.239	0	0
33	123.475	320.406	553.027	0	0
34	123.958	320.283	547.163	0	0
35	124.442	320.172	540.155	0	0
36	124.925	320.074	531.468	0	0
37	125.409	319.987	520.923	0	0
38	125.892	319.911	508.477	0	0
39	126.376	319.848	494.201	0	0
40	126.859	319.795	479.668	0	0
41	127.343	319.754	465.766	0	0
42	127.826	319.725	452.985	0	0
43	128.31	319.707	441.835	0	0
44	128.794	319.699	432.415	0	0
45	129.277	319.703	422.588	0	0
46	129.761	319.719	412.003	0	0
47	130.244	319.745	400.686	0	0
48	130.728	319.783	388.993	0	0
49	131.211	319.832	380.451	0	0
50	131.695	319.893	376.58	0	0
51	132.178	319.965	0	0	0

## Discharge Sections

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### Entity Information

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#### ◆ SLU

##### Shared Entities

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64
	180.625, 311.703
	179.812, 311.839
	179.723, 311.846

178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
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170.099, 313.693  
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169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
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163.136, 315.013  
162.828, 315.126  
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161.594, 315.188  
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160.667, 315.239  
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159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52  
151.791, 316.568  
151.361, 316.642  
150.961, 316.72

External Boundary

150.563, 316.814  
149.573, 317.001  
149.066, 317.119  
148.57, 317.224  
147.953, 317.359  
147.598, 317.443  
147.299, 317.493  
146.854, 317.583  
146.019, 317.733  
145.925, 317.758  
144.965, 318  
144.923, 318.015  
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144.626, 318.096  
143.617, 318.401  
143.4, 318.414  
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141.499, 318.812  
141.223, 318.825  
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133.61, 319.774  
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132.182, 319.964  
131.931, 320  
131.729, 320.076  
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128.543, 322.619  
126.21, 327.619  
124.21, 327.619  
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119.878, 332.619  
117.547, 337.619  
115.547, 337.619  
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109.397, 340.653  
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78.563, 339.14  
76.9128, 339.108  
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65.4218, 334.161  
62.7107, 335.219  
62.056, 335.55  
61.3599, 336  
60.905, 336.17

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59.1025,	336.84
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58.1148,	337.114
57.8762,	337.206
56.9205,	337.012
56.3362,	337.134
55.7206,	337.305
54.7744,	337.618
53.8336,	338
52.7348,	338.403
52.1842,	338.636
51.6937,	338.853
50.9233,	339.223
50.1857,	339.596
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49.1144,	340.174
48.9611,	340.241
48.6364,	340.414
48.1368,	340.701
47.2093,	341.067
46.6663,	341.333
46.4381,	341.424
45.2371,	341.895
45.1988,	341.912
45.1668,	341.926
45.1352,	341.938
44.9566,	342
43.9785,	342.368
43.6906,	342.459
43.1313,	342.638
42.5615,	342.805
42.0121,	342.929
41.4108,	343.109
40.0761,	343.478
39.6983,	343.565
39.0569,	343.696
38.8454,	343.553
37.7178,	343.965
37.6252,	344
36.5454,	344.291
35.8231,	344.472
34.8494,	344.749
33.553,	345.058
32.7793,	345.274
32.4141,	345.388
31.5581,	345.604
31.3936,	345.675
30.9158,	345.595
30.4833,	345.806
30.1441,	346
29.3156,	346.186
28.9408,	346.261
26.846,	346.693
26.3194,	346.778
25.8928,	346.872

	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
	68.8462, 332.955
	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978

12.6593, 345.59
12.9744, 345.467
14.0755, 344.967
18.2313, 344.215
19.4458, 343.988
24.0355, 343.318
24.456, 343.247
25.1862, 343.086
25.7646, 342.993
27.7091, 342.592
27.7591, 342.582
31.2928, 341.656
31.9142, 341.482
33.1927, 341.177
34.1211, 340.913
34.8964, 340.719
35.5591, 340.54
40.9307, 339.224
41.1563, 339.158
41.6309, 339.006
41.7252, 338.976
42.6077, 338.644
42.6609, 338.626
43.7908, 338.182
44.3444, 337.912
45.0241, 337.643
45.1292, 337.583
45.8435, 337.203
46.0244, 337.124
46.0631, 337.104
46.4397, 336.901
46.593, 336.803
47.7514, 336.218
48.7091, 335.758
49.3733, 335.464
50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562





Material Boundary

136.889, 315.4  
137.23, 315.375  
137.373, 315.353  
137.833, 315.322  
138.224, 315.264  
138.852, 315.236  
139.398, 315.165  
140.02, 315.147  
140.726, 315.027  
141.175, 315.005  
142.406, 314.649  
142.573, 314.639  
142.948, 314.526  
142.999, 314.508  
143.055, 314.494  
143.335, 314.409  
143.443, 314.396  
144.303, 314.179  
144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

	131.806, 317.053	
	131.922, 317.01	
	133.086, 316.845	
	133.48, 316.793	
	133.814, 316.742	
	134.832, 316.614	
	135.735, 316.555	
	136.168, 316.534	
	137.697, 316.2	
	138.507, 316.038	
	138.848, 316.012	
	138.992, 315.99	
	139.452, 315.959	
	139.843, 315.901	
	140.471, 315.874	
	141.016, 315.802	
	141.638, 315.784	
	142.344, 315.664	
	142.794, 315.643	
	144.025, 315.286	
	144.192, 315.277	
	144.567, 315.163	
	144.618, 315.145	
	144.674, 315.131	
	144.954, 315.046	
	145.062, 315.033	
	145.922, 314.816	
Water Table	146.284, 314.721	
	147.333, 314.533	
	147.827, 314.432	
	148, 314.403	
	148.166, 314.364	
	148.871, 314.211	
	149.314, 314.116	
	149.911, 313.978	
	150.884, 313.794	
	151.262, 313.705	
	151.904, 313.58	
	152.464, 313.484	
	152.816, 313.428	
	153.706, 313.286	
	153.968, 313.246	
	154.96, 313.103	
	155.062, 313.089	
	155.865, 312.957	
	156.182, 312.896	
	157.23, 312.773	
	157.292, 312.761	
	158.805, 312.557	
	158.925, 312.531	
	159.624, 312.444	
	160.195, 312.293	
	160.861, 312.226	
	161.102, 312.15	
	162.121, 312.063	
	162.398, 311.975	
	163.373, 311.958	
	163.815, 311.804	
	164.095, 311.785	

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 20 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv>0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

180.625, 311.703  
179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
164.733, 314.633  
164.426, 314.72  
164.07, 314.761  
163.694, 314.889  
163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
161.08, 315.204  
160.667, 315.239  
160.488, 315.295  
159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52

	151.791, 316.568
	151.361, 316.642
	150.961, 316.72
	150.563, 316.814
	149.573, 317.001
	149.066, 317.119
	148.57, 317.224
	147.953, 317.359
	147.598, 317.443
	147.299, 317.493
	146.854, 317.583
	146.019, 317.733
	145.925, 317.758
	144.965, 318
	144.923, 318.015
	144.676, 318.09
	144.626, 318.096
	143.617, 318.401
	143.4, 318.414
	142.609, 318.643
	141.925, 318.797
	141.499, 318.812
	141.223, 318.825
	140.62, 318.927
	140.37, 318.959
	139.669, 318.979
	139.185, 319.043
External Boundary	138.625, 319.068
	138.322, 319.113
	137.879, 319.142
	137.769, 319.159
	137.61, 319.171
	137.352, 319.223
	135.236, 319.686
	134.2, 319.735
	133.61, 319.774
	132.936, 319.859
	132.623, 319.907
	132.182, 319.964
	131.931, 320
	131.729, 320.076
	131.721, 320.092
	130.543, 322.619
	128.543, 322.619
	126.21, 327.619
	124.21, 327.619
	121.878, 332.619
	119.878, 332.619
	117.547, 337.619
	115.547, 337.619
	111.047, 340.62
	109.397, 340.653
	96.9967, 339.803
	92.206, 339.931
	78.563, 339.14
	76.9128, 339.108
	68.1212, 333.247
	65.4218, 334.161
	62.7107, 335.219



62.056, 335.55
61.3599, 336
60.905, 336.17
60.0061, 336.515
59.672, 336.622
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58.1148, 337.114
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56.3362, 337.134
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54.7744, 337.618
53.8336, 338
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46.4381, 341.424
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44.9566, 342
43.9785, 342.368
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41.4108, 343.109
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39.0569, 343.696
38.8454, 343.553
37.7178, 343.965
37.6252, 344
36.5454, 344.291
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34.8494, 344.749
33.553, 345.058
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32.4141, 345.388
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31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261

	26.846, 346.693
	26.3194, 346.778
	25.8928, 346.872
	25.7528, 346.909
	24.7913, 347.072
	24.3704, 347.186
	22.4462, 347.102
	21.9851, 347.273
	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
	15.696, 348.68
	15.6542, 348.703
	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
	9.82601, 351.721
	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
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	69.3841, 332.766
	77.168, 330.025
	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978



12.6593, 345.59
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134.55, 315.897
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Material Boundary

136.889, 315.4  
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144.666, 314.084  
145.715, 313.895  
146.208, 313.795  
146.382, 313.766  
146.547, 313.727  
147.252, 313.574  
147.696, 313.479  
148.292, 313.341  
149.266, 313.157  
149.643, 313.068  
150.286, 312.943  
150.845, 312.847  
151.197, 312.79  
152.087, 312.648  
152.349, 312.609  
153.341, 312.466  
153.444, 312.451  
154.247, 312.319  
154.563, 312.258  
155.611, 312.136  
155.673, 312.123  
157.186, 311.919  
157.306, 311.893  
158.005, 311.807  
158.576, 311.656  
159.242, 311.588  
159.483, 311.513  
160.502, 311.426  
160.779, 311.337  
161.754, 311.32  
162.196, 311.166  
162.477, 311.147  
162.67, 311.082  
163.267, 311.013  
164.287, 310.745  
164.65, 310.684  
165.4, 310.512  
165.572, 310.471  
166.616, 310.26  
167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
173.397, 309.184
174.272, 309.072
174.802, 308.999
174.867, 308.988
175.29, 308.904
176.026, 308.751
176.443, 308.643
176.957, 308.52
177.519, 308.373
178.97, 308.081
179.192, 308.063
179.85, 307.953
180.446, 307.881
181.692, 307.697
182.081, 307.636
182.958, 307.53
183.667, 307.422
184.375, 307.324
184.798, 307.267
185.188, 307.202
185.756, 307.113
186.505, 306.986
187.416, 306.863
187.649, 306.815
188.038, 306.721
188.083, 306.692
189.098, 305.998
189.818, 305.624
190.216, 305.389
190.609, 305.209
191.288, 304.831
192.652, 304.365
193.193, 304.199
193.947, 303.991
194.146, 303.912
194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
11.8665, 347.745  
11.8995, 347.722  
12.7816, 347.128  
13.0464, 346.953  
13.1646, 346.873  
13.5749, 346.616  
14.278, 346.227  
14.5931, 346.104  
15.6942, 345.604  
19.8501, 344.852  
21.0645, 344.625  
25.6543, 343.955  
26.0747, 343.884  
26.805, 343.724  
27.3833, 343.63  
29.3278, 343.23  
29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

	131.806, 317.053	
	131.922, 317.01	
	133.086, 316.845	
	133.48, 316.793	
	133.814, 316.742	
	134.832, 316.614	
	135.735, 316.555	
	136.168, 316.534	
	137.697, 316.2	
	138.507, 316.038	
	138.848, 316.012	
	138.992, 315.99	
	139.452, 315.959	
	139.843, 315.901	
	140.471, 315.874	
	141.016, 315.802	
	141.638, 315.784	
	142.344, 315.664	
	142.794, 315.643	
	144.025, 315.286	
	144.192, 315.277	
	144.567, 315.163	
	144.618, 315.145	
	144.674, 315.131	
	144.954, 315.046	
	145.062, 315.033	
	145.922, 314.816	
	146.284, 314.721	
Water Table	147.333, 314.533	
	147.827, 314.432	
	148, 314.403	
	148.166, 314.364	
	148.871, 314.211	
	149.314, 314.116	
	149.911, 313.978	
	150.884, 313.794	
	151.262, 313.705	
	151.904, 313.58	
	152.464, 313.484	
	152.816, 313.428	
	153.706, 313.286	
	153.968, 313.246	
	154.96, 313.103	
	155.062, 313.089	
	155.865, 312.957	
	156.182, 312.896	
	157.23, 312.773	
	157.292, 312.761	
	158.805, 312.557	
	158.925, 312.531	
	159.624, 312.444	
	160.195, 312.293	
	160.861, 312.226	
	161.102, 312.15	
	162.121, 312.063	
	162.398, 311.975	
	163.373, 311.958	
	163.815, 311.804	
	164.095, 311.785	



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164.886, 311.65
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167.191, 311.109
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168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
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173.792, 310.069
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175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
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178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No

◆ **SLV kv<0**

**Shared Entities**

Type	Coordinates (x,y)
	1.49335, 285
	200, 285
	200, 302.009
	200, 306
	199.691, 306.129
	199.673, 306.134
	199.625, 306.148
	199.178, 306.358
	198.475, 306.613
	198.143, 306.716
	197.829, 306.827
	197.685, 306.87
	197.165, 307.121
	196.838, 307.248
	196.15, 307.406
	196.07, 307.438
	195.776, 307.514
	195.067, 307.71
	194.755, 307.805
	194.186, 308
	193.859, 308.182
	193.561, 308.319
	193.334, 308.453
	192.849, 308.704
	192.153, 309.18
	191.906, 309.341
	191.626, 309.521
	190.913, 310
	190.626, 310.07
	189.03, 310.452
	188.403, 310.583
	187.345, 310.726
	186.677, 310.839
	186.1, 310.929
	185.621, 311.01
	185.087, 311.08
	184.455, 311.169
	183.676, 311.287
	182.811, 311.392
	182.524, 311.436
	181.145, 311.64

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179.812, 311.839  
179.723, 311.846  
178.958, 312  
178.433, 312.137  
178.356, 312.154  
178.011, 312.236  
177.477, 312.374  
176.515, 312.574  
175.979, 312.68  
175.677, 312.734  
174.954, 312.833  
174.336, 312.912  
173.282, 313.126  
172.785, 313.211  
172.617, 313.245  
171.806, 313.389  
171.388, 313.471  
170.463, 313.622  
170.281, 313.656  
170.099, 313.693  
169.135, 313.82  
169.04, 313.839  
168.012, 313.941  
167.981, 313.946  
167.954, 313.948  
167.495, 314  
166.921, 314.116  
166.851, 314.133  
165.862, 314.36  
165.813, 314.369  
165.603, 314.405  
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164.426, 314.72  
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163.445, 314.905  
163.136, 315.013  
162.828, 315.126  
161.727, 315.145  
161.594, 315.188  
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159.644, 315.381  
159.158, 315.509  
158.283, 315.618  
158.118, 315.654  
157.828, 315.686  
156.62, 315.849  
156.489, 315.875  
155.418, 316  
155.26, 316.03  
154.25, 316.196  
154.21, 316.201  
154.095, 316.217  
153.151, 316.353  
152.947, 316.384  
152.092, 316.52

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	151.361, 316.642
	150.961, 316.72
	150.563, 316.814
	149.573, 317.001
	149.066, 317.119
	148.57, 317.224
	147.953, 317.359
	147.598, 317.443
	147.299, 317.493
	146.854, 317.583
	146.019, 317.733
	145.925, 317.758
	144.965, 318
	144.923, 318.015
	144.676, 318.09
	144.626, 318.096
	143.617, 318.401
	143.4, 318.414
	142.609, 318.643
	141.925, 318.797
	141.499, 318.812
	141.223, 318.825
	140.62, 318.927
	140.37, 318.959
	139.669, 318.979
External Boundary	139.185, 319.043
	138.625, 319.068
	138.322, 319.113
	137.879, 319.142
	137.769, 319.159
	137.61, 319.171
	137.352, 319.223
	135.236, 319.686
	134.2, 319.735
	133.61, 319.774
	132.936, 319.859
	132.623, 319.907
	132.182, 319.964
	131.931, 320
	131.729, 320.076
	131.721, 320.092
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	128.543, 322.619
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	124.21, 327.619
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	119.878, 332.619
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	76.9128, 339.108
	68.1212, 333.247
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62.056, 335.55
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38.8454, 343.553
37.7178, 343.965
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34.8494, 344.749
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32.4141, 345.388
31.5581, 345.604
31.3936, 345.675
30.9158, 345.595
30.4833, 345.806
30.1441, 346
29.3156, 346.186
28.9408, 346.261

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	25.7528, 346.909
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	24.3704, 347.186
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	21.5583, 347.447
	20.7666, 347.852
	20.5248, 348
	20.016, 348.152
	19.9221, 348.171
	18.3632, 348.084
	16.113, 348.492
	15.7167, 348.672
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	15.5543, 348.766
	15.5095, 348.796
	15.2321, 348.979
	14.3962, 349.542
	13.721, 350
	13.6998, 349.99
	13.636, 350.023
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	9.27711, 352
	8.43499, 352.401
	7.82784, 352.643
	5.47372, 353.791
	4.43553, 353.949
	4.26198, 354
	4.2168, 354
	3.14408, 354.456
	2.64138, 354.58
	1.49335, 355.147
	1.49335, 350.79
Material Boundary	65.4218, 334.161
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	69.3841, 332.766
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	82.5149, 327.869
	86.1264, 326.978
	88.9874, 325.759
	92.0361, 324.493
	96.7263, 323.321
	105.122, 322.431
	113.817, 322.048

Material Boundary	68.8462, 332.955 75.7627, 332.955 76.5127, 334.455 78.0127, 334.455 78.7627, 335.955 80.2627, 335.955 80.9889, 337.408 81.0127, 337.455 81.0811, 337.455 82.5127, 337.455 82.7627, 337.955 88.3631, 337.955 90.8631, 337.955 91.6131, 336.455 92.6131, 336.455 93.3631, 334.955 94.3631, 334.955 95.1131, 333.455 97.1131, 333.455 97.3631, 332.955 98.3631, 332.955 99.1131, 331.455 100.113, 331.455 100.863, 329.955 101.863, 329.955 102.613, 328.455 104.613, 328.455 104.863, 327.955 105.863, 327.955 106.613, 326.455 107.613, 326.455 108.363, 324.955 109.363, 324.955 110.113, 323.455 112.113, 323.455 112.363, 322.955 113.363, 322.955 113.817, 322.048 114.113, 321.455 115.113, 321.455 115.863, 319.955 116.863, 319.955 117.613, 318.455 119.113, 318.455 132.283, 318.455 132.936, 319.859
	1.49335, 350.79 2.9529, 350.17 3.56353, 350.17 4.95414, 349.492 5.59709, 349.236 6.10907, 348.992 6.74629, 348.668 10.2478, 347.107 10.2807, 347.085 11.1629, 346.49 11.4277, 346.316 11.5459, 346.236 11.9562, 345.978

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42.6609, 338.626
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50.1607, 335.131
51.3162, 334.706
52.3768, 334.276
53.7591, 333.819
54.8079, 333.528
57.2601, 333.013
59.8091, 332.076
63.0044, 330.829
74.7078, 326.709
80.4145, 324.407
83.9503, 323.535
86.2518, 322.555
89.8846, 321.047
95.6937, 319.595
104.889, 318.619
130.187, 316.416
130.303, 316.372
131.467, 316.208
131.862, 316.156
132.195, 316.105
133.214, 315.976
134.116, 315.917
134.55, 315.897
136.078, 315.562





Material Boundary

136.889, 315.4  
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138.224, 315.264  
138.852, 315.236  
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167.281, 310.185  
167.358, 310.173

168.269, 310.083
169.149, 309.967
169.453, 309.911
170.338, 309.766
170.702, 309.695
171.493, 309.555
171.679, 309.517
172.174, 309.432
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174.802, 308.999
174.867, 308.988
175.29, 308.904
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176.443, 308.643
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184.798, 307.267
185.188, 307.202
185.756, 307.113
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188.038, 306.721
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190.609, 305.209
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194.657, 303.795
195.138, 303.563
195.711, 303.39
195.995, 303.29
196.29, 303.199
196.469, 303.134
197.189, 302.794
200, 302.009

**Scenario-based Entities**

Type	Coordinates (x,y)	Master Scenario
	1.49335, 352.012	Assigned to:  R  R esistente
	1.86228, 351.83	
	2.58786, 351.651	
	4.57162, 350.807	
	5.18225, 350.807	

5.18225, 350.807  
6.57286, 350.129  
7.21581, 349.873  
7.72779, 349.629  
8.36501, 349.305  
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11.8995, 347.722  
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29.3778, 343.22  
32.9115, 342.293  
33.5329, 342.119  
34.8115, 341.814  
35.7399, 341.551  
36.5151, 341.356  
37.1778, 341.177  
42.5494, 339.861  
42.775, 339.795  
43.2496, 339.643  
43.3439, 339.614  
44.2264, 339.281  
44.2796, 339.263  
45.4096, 338.82  
45.9631, 338.549  
46.6429, 338.281  
46.7479, 338.22  
47.4622, 337.84  
47.6431, 337.761  
47.6818, 337.741  
48.0585, 337.538  
48.2118, 337.441  
49.3701, 336.855  
50.3279, 336.395  
50.992, 336.101  
51.7795, 335.768  
52.9349, 335.344  
53.9955, 334.913  
55.3779, 334.456  
56.4266, 334.165  
58.8788, 333.65  
64.6231, 331.467  
76.3266, 327.346  
82.0332, 325.045  
85.569, 324.173  
87.8705, 323.192  
91.5033, 321.684  
97.3124, 320.232  
106.508, 319.257

 AC alt AC

	131.806, 317.053	
	131.922, 317.01	
	133.086, 316.845	
	133.48, 316.793	
	133.814, 316.742	
	134.832, 316.614	
	135.735, 316.555	
	136.168, 316.534	
	137.697, 316.2	
	138.507, 316.038	
	138.848, 316.012	
	138.992, 315.99	
	139.452, 315.959	
	139.843, 315.901	
	140.471, 315.874	
	141.016, 315.802	
	141.638, 315.784	
	142.344, 315.664	
	142.794, 315.643	
	144.025, 315.286	
	144.192, 315.277	
	144.567, 315.163	
	144.618, 315.145	
	144.674, 315.131	
	144.954, 315.046	
	145.062, 315.033	
	145.922, 314.816	
Water Table	146.284, 314.721	
	147.333, 314.533	
	147.827, 314.432	
	148, 314.403	
	148.166, 314.364	
	148.871, 314.211	
	149.314, 314.116	
	149.911, 313.978	
	150.884, 313.794	
	151.262, 313.705	
	151.904, 313.58	
	152.464, 313.484	
	152.816, 313.428	
	153.706, 313.286	
	153.968, 313.246	
	154.96, 313.103	
	155.062, 313.089	
	155.865, 312.957	
	156.182, 312.896	
	157.23, 312.773	
	157.292, 312.761	
	158.805, 312.557	
	158.925, 312.531	
	159.624, 312.444	
	160.195, 312.293	
	160.861, 312.226	
	161.102, 312.15	
	162.121, 312.063	
	162.398, 311.975	
	163.373, 311.958	
	163.815, 311.804	
	164.095, 311.785	

164.289, 311.719
164.886, 311.65
165.906, 311.383
166.268, 311.322
167.019, 311.149
167.191, 311.109
168.235, 310.897
168.9, 310.822
168.977, 310.81
169.888, 310.72
170.768, 310.604
171.072, 310.548
171.957, 310.404
172.321, 310.332
173.112, 310.192
173.298, 310.154
173.792, 310.069
175.015, 309.821
175.89, 309.709
176.42, 309.637
176.486, 309.625
176.909, 309.541
177.645, 309.388
178.062, 309.281
178.576, 309.157
179.138, 309.01
180.589, 308.718
180.811, 308.7
181.469, 308.59
182.065, 308.518
183.311, 308.334
183.7, 308.274
184.577, 308.167
185.286, 308.059
185.993, 307.961
186.417, 307.905
186.806, 307.839
187.375, 307.751
188.124, 307.624
189.035, 307.5
189.267, 307.452
189.657, 307.359
189.702, 307.33
190.717, 306.636
191.437, 306.261
191.835, 306.026
192.228, 305.846
192.907, 305.469
194.27, 305.002
194.812, 304.836
195.566, 304.628
195.765, 304.55
196.276, 304.432
196.757, 304.201
197.329, 304.028
197.614, 303.928
197.908, 303.836
198.088, 303.771
198.808, 303.432

	200, 303.099	
Distributed Load	92.206, 339.931 78.563, 339.14	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No
Distributed Load	109.397, 340.653 96.9967, 339.803	Constant DistributionOrientation: Normal to boundaryMagnitude: 6 kN/m2Creates Excess Pore Pressure: No