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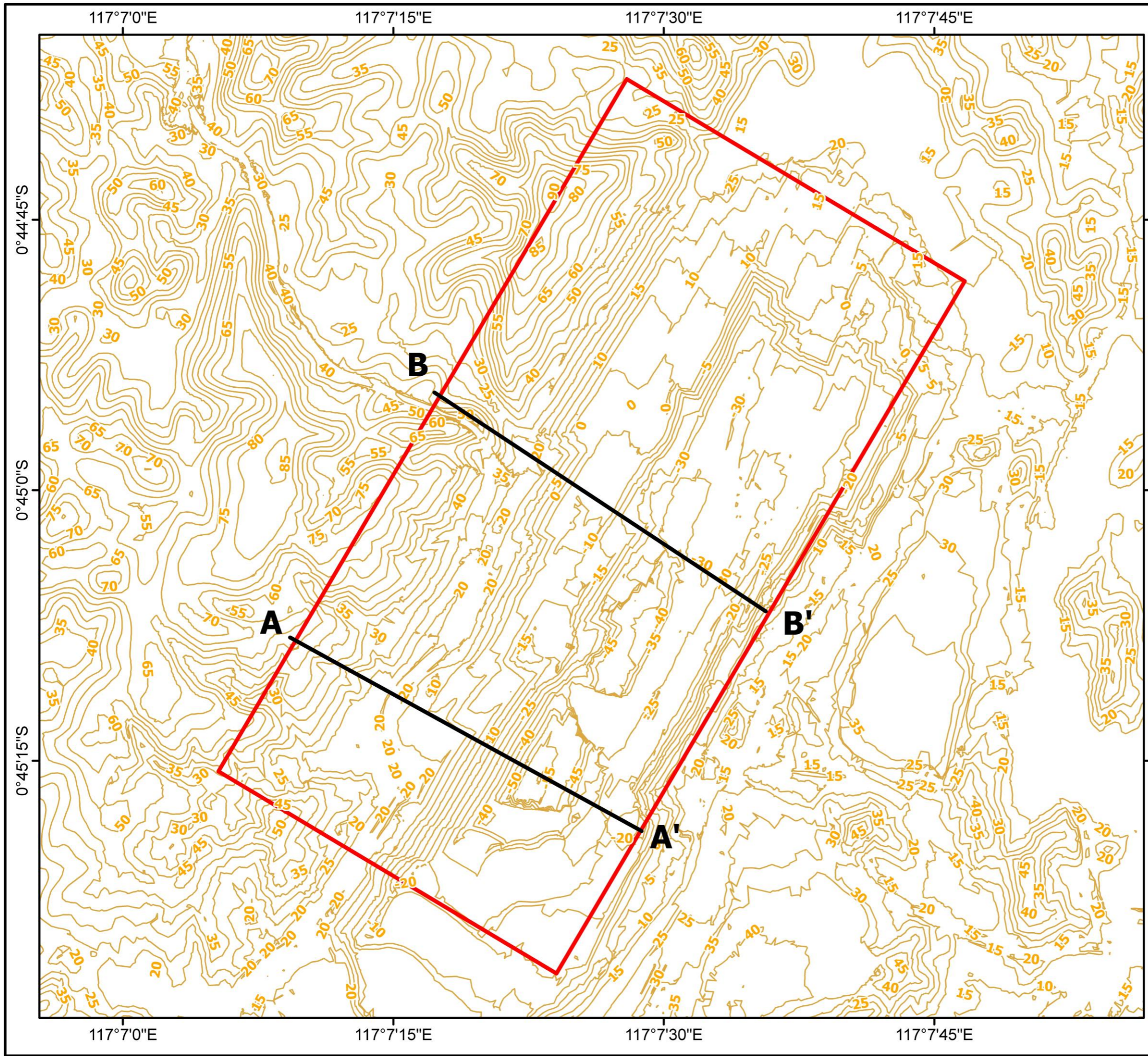
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# LAMPIRAN

GEOEKANIKA



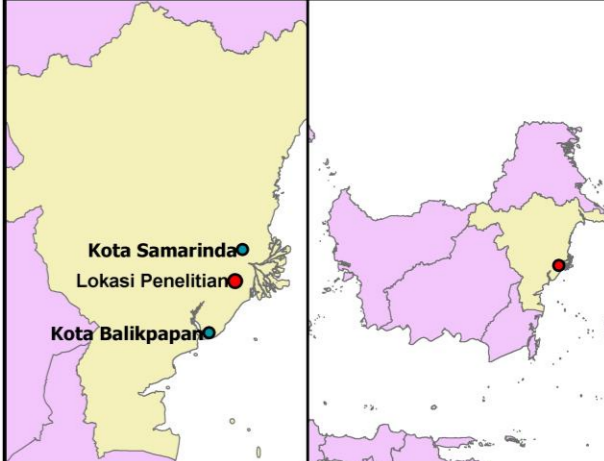
**PETA TOPOGRAFI  
DAERAH PENELITIAN**



**Legenda**

- Low Wall Pit HCV  
PT Kutai Energi
- Kontur
- Garis Penampang

Coordinate System: GCS WGS 1984  
Datum: WGS 1984  
Units: Degree



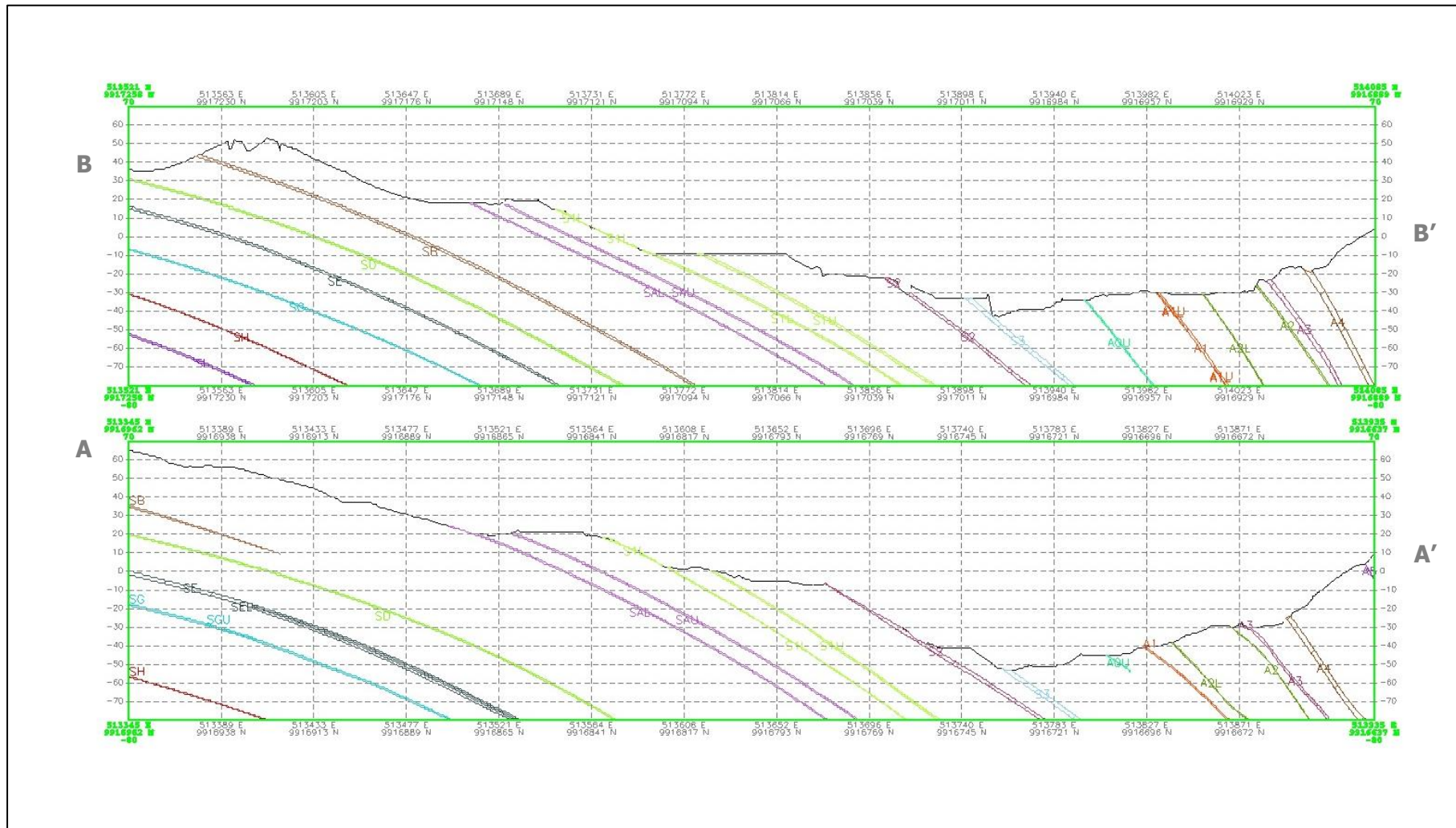
DEPARTEMEN TEKNIK PERTAMBANGAN  
FAKULTAS TEKNIK  
UNIVERSITAS HASANUDDIN

SKRIPSI  
ANALISIS PERBANDINGAN KESTABILAN LERENG  
JENUH DAN LERENG TIDAK JENUH YANG  
DIPENGARUHI INFILTRASI HUJAN

Digambar Oleh	Irsyad Ridho Rabani D111171015
Pembimbing	Dr.Eng. Purwanto, S.T., M.T. Asta Arjunoarwan Hatta, S.T., M.T.

Tahun 2022	Lampiran A	Halaman 76
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Lampiran B Litologi Material Penyusun Lereng



Lampiran C Data Sifat Fisik dan Mekanik Material

<b>NO</b>	<b>STRATIGRAFI</b>	<b>LITOLOGI DOMINAN</b>	<b>Bobot Isi (kN/m<sup>3</sup>)</b>	<b>Kohesi (kPa)</b>	<b>Sudut Gesek dalam (Derajat)</b>	<b>UCS (MPa)</b>	<b>Sn (%)</b>	<b>n (%)</b>	<b>e</b>	<b>Kode Sampel</b>
1	Seam A7	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
2	Interburden A7-A6	Batupasir	16,76	60	33,56	0,27	38,79	34,83	0,53	BG_10-3
3	Seam A6	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
4	Interburden A6-A5	Batupasir	16,76	60	33,56	0,27	38,79	34,83	0,53	BG_10-3
5	Seam A5	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
6	Interburden A5-A4	Batupasir	16,76	60	33,56	0,27	38,79	34,83	0,53	BG_10-3
7	Seam A4	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
8	Interburden A4-A3	Batupasir	16,76	60	33,56	0,27	38,79	34,83	0,53	BG_10-3
9	Seam A3	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
10	Interburden A3-A2	Batupasir	16,76	60	33,56	0,27	38,79	34,83	0,53	BG_10-3
11	Seam A2	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
12	Interburden A2-A2L	Batupasir	13,43	54	34,13	0,16	29,74	40,99	0,69	BG_10_20
13	Seam A2L	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
14	Interburden A2L-A1U	Batupasir	13,43	54	34,13	0,16	29,74	40,99	0,69	BG_10_20
15	Seam A1U	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
16	Interburden A1U-A1L	Batupasir	13,43	54	34,13	0,16	29,74	40,99	0,69	BG_10_20
17	Seam A1L	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
18	Interburden A1L-A0U	Batupasir	13,43	54	34,13	0,16	29,74	40,99	0,69	BG_10_20

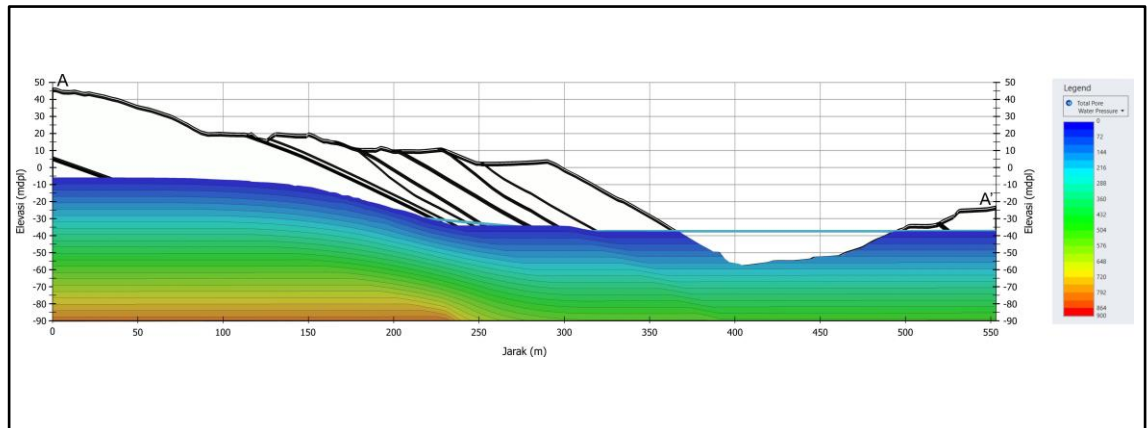
<b>NO</b>	<b>STRATIGRAFI</b>	<b>LITOLOGI DOMINAN</b>	<b>Bobot Isi (kN/m<sup>3</sup>)</b>	<b>Kohesi (kPa)</b>	<b>Sudut Gesek dalam (Derajat)</b>	<b>UCS (MPa)</b>	<b>Sn (%)</b>	<b>n (%)</b>	<b>e</b>	<b>Kode Sampel</b>
19	Seam A0U	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
20	Interburden A0U-A0L	Batupasir	13,43	54	34,13	0,16	29,74	40,99	0,69	BG_10_20
21	Seam A0L	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
22	Interburden A0L-S3	Batupasir	13,43	1.37	34,13	0,16	29,74	40,99	0,69	BG_10_20
23	Seam S3	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
24	Interburden S3-S2	Batulempung	16,17	80	27,68	0,67	52,55	34,34	0,52	BG_11A-3
25	Seam S2	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
26	Interburden SAU-SAL	Batupasir	18,42	50	29,67	2,17	49,21	30,58	0,44	BG_11A-5
27	Interburden S2-S1U	Batulanau	15,88	90	18,79	1,29	32,84	35,54	0,55	BG_11A-8
28	Seam S1U	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
29	Interburden S1U-S1L	Batupasir	14,60	51	34,97	1,54	28,41	38,68	0,63	BG_11A-11
30	Seam S1L	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
31	Interburden S1L-SAU	Batupasir	14,60	51	34,97	1,54	28,41	38,68	0,63	BG_11A-11
32	Seam SAU	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
33	Interburden SAU-SAL	Batulempung	16,86	60	23,99	1,76	23,78	34,53	0,53	BG_11A-10
34	Interburden SAU-SAL	Batupasir	19,99	75	28,62	3,34	80,56	26,80	0,37	BG_13-2
35	Seam SAL	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
36	Interburden SAL-SB	Batupasir	19,99	75	28,62	3,34	80,56	26,80	0,37	BG_13-2
37	Seam SB	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3



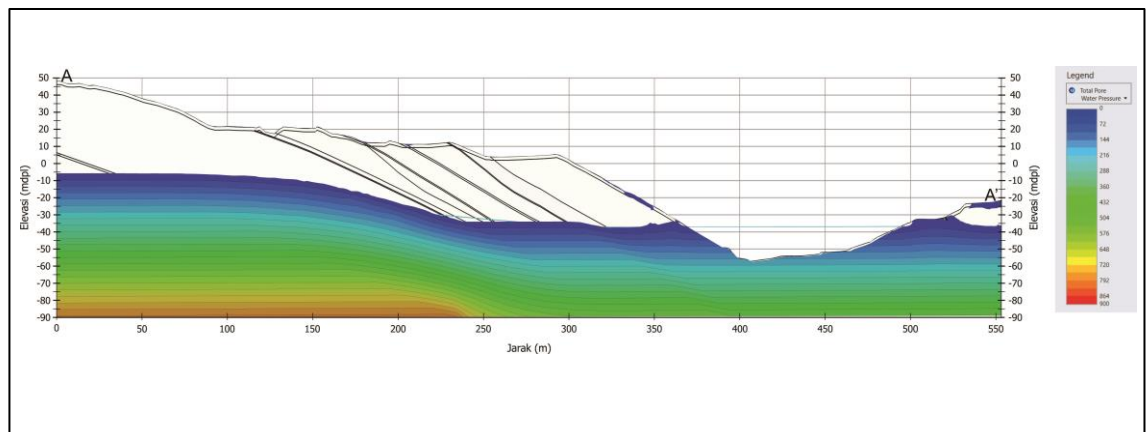
<b>NO</b>	<b>STRATIGRAFI</b>	<b>LITOLOGI DOMINAN</b>	<b>Bobot Isi (kN/m<sup>3</sup>)</b>	<b>Kohesi (kPa)</b>	<b>Sudut Gesek dalam (Derajat)</b>	<b>UCS (MPa)</b>	<b>Sn (%)</b>	<b>n (%)</b>	<b>e</b>	<b>Kode Sampel</b>
38	Interburden SB-SD	Batulempung	18,72	72	23,11	2,06	35,66	28,99	0,41	BG_13-3
39	Seam SD	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
40	Interburden SD-SE	Batupasir	12,17	108	16,35	1,10	51,58	24,05	0,32	BG_13-4
41	Interburden SD-SE	Batulempung	16,56	60	22,7	8,46	24,85	35,21	0,54	BG_13-7
42	Seam SE	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
43	Interburden SE-SG	Batulempung	16,56	60	22,7	8,46	24,85	35,21	0,54	BG_13-7
44	Seam SG	Batubara	13	300	25	0,16	72,32	43,60	0,77	BG_04-3
45	Interburden SG-SI	Batulempung	16,56	60	22,7	8,46	24,85	35,21	0,54	BG_13-7
46	Seam SI	Batubara	20,90	300	1.51	0,16	72,32	43,60	0,77	BG_04-3

## Lampiran D Hasil Analisis Aliran Air Tanah

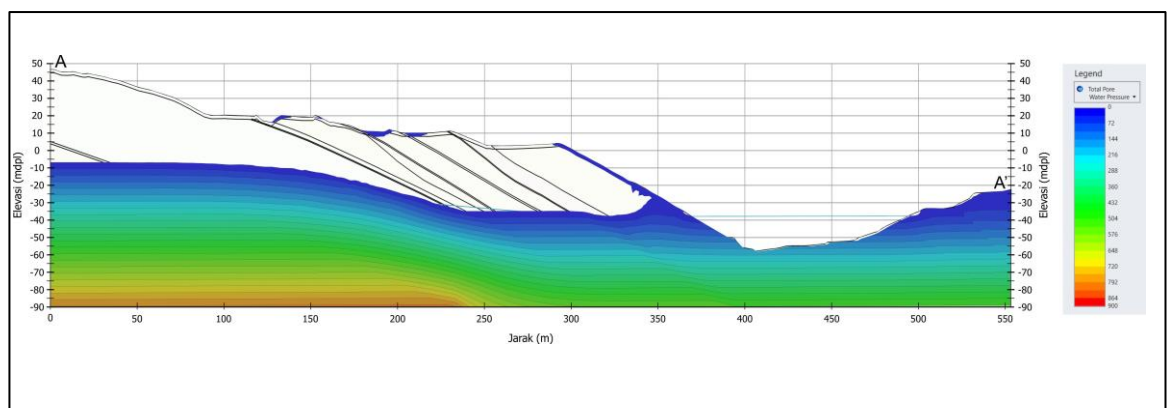
### 1. Kondisi tekanan air pori pada kondisi awal



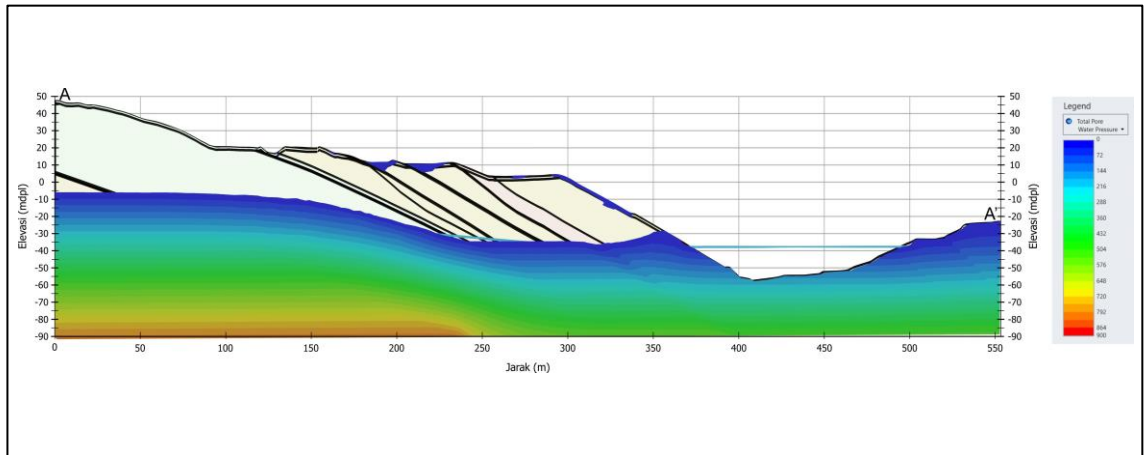
### 2. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 2 jam



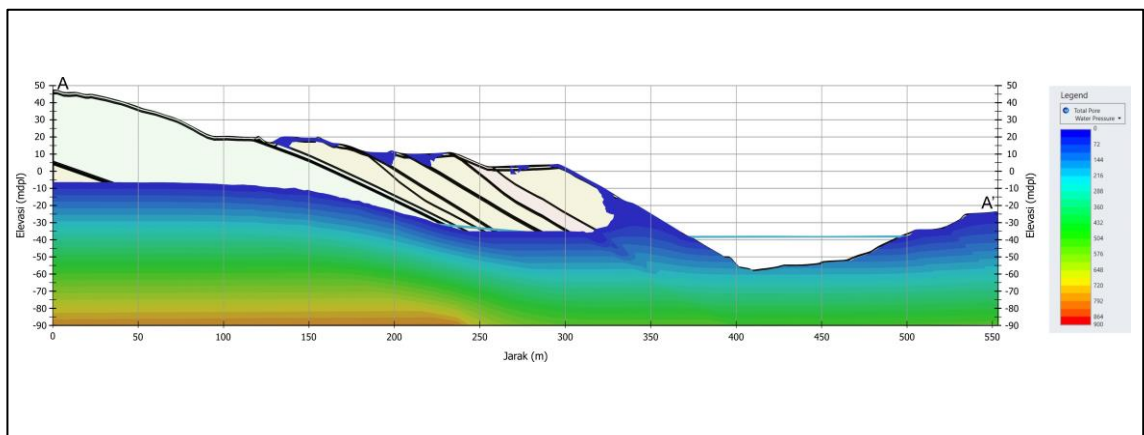
### 3. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 4 jam



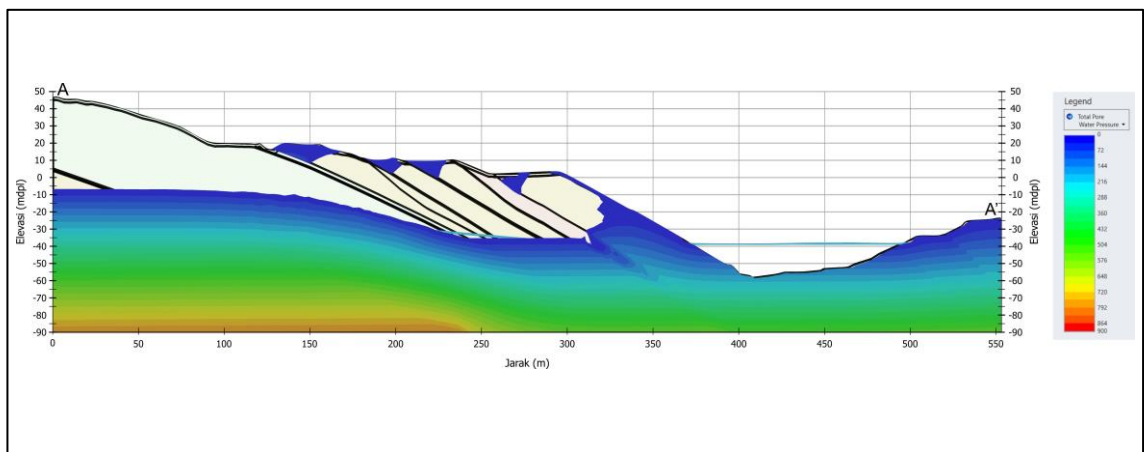
4. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 6 jam



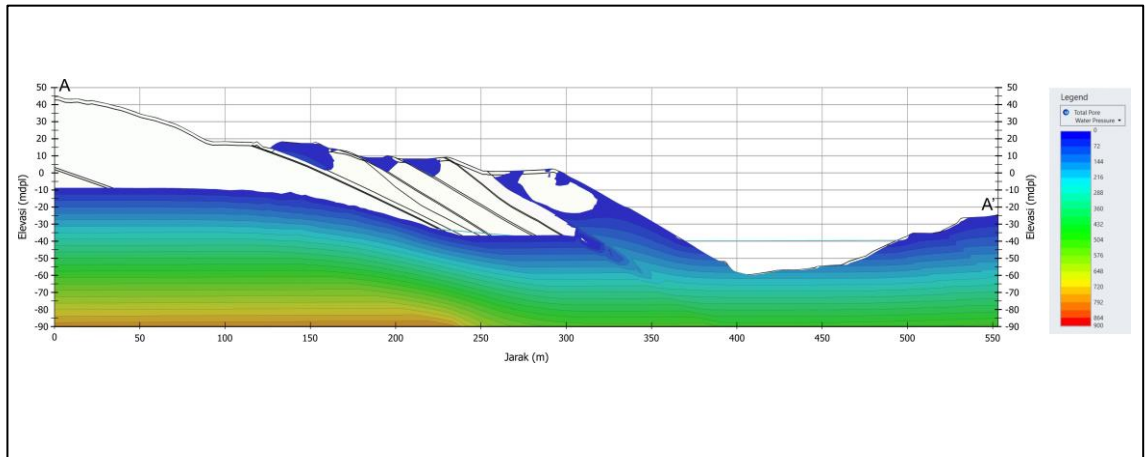
5. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 8 jam



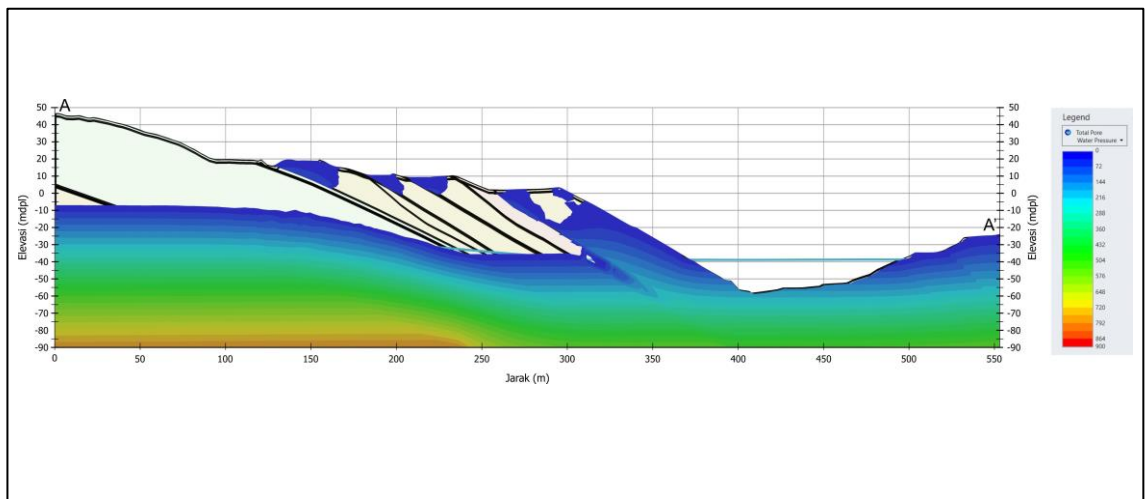
6. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 10 jam



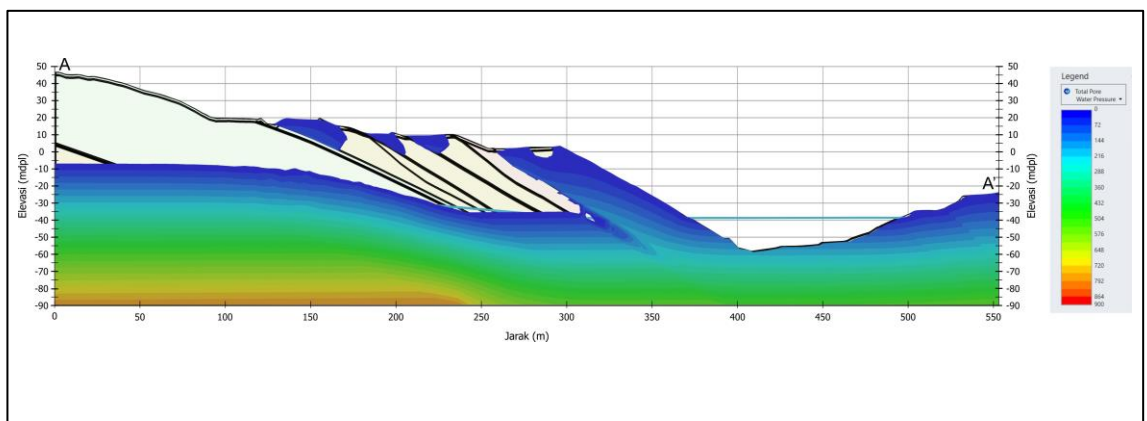
7. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 12 jam



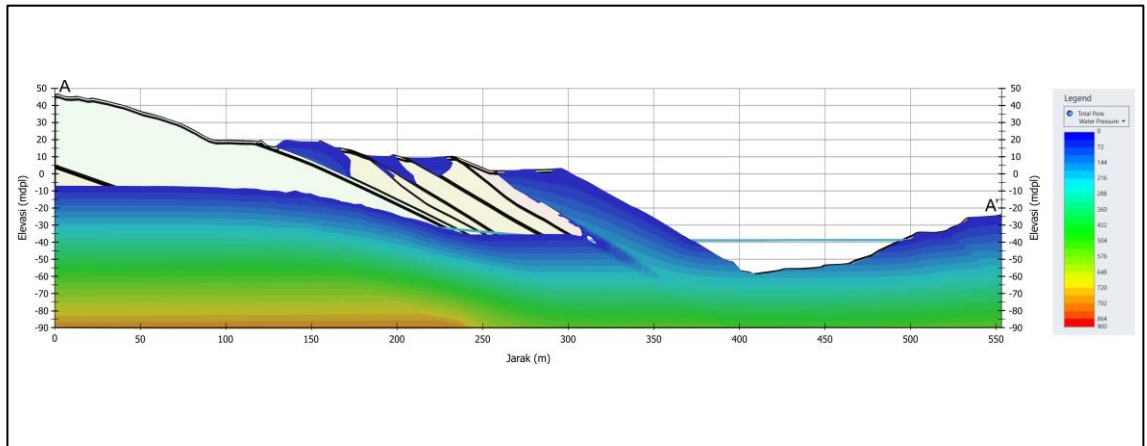
8. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 14 jam



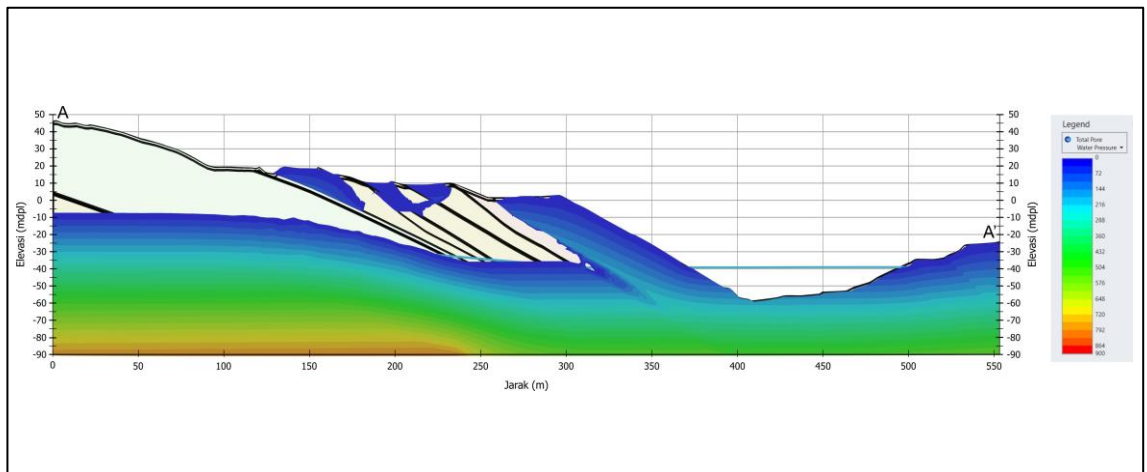
9. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 16 jam



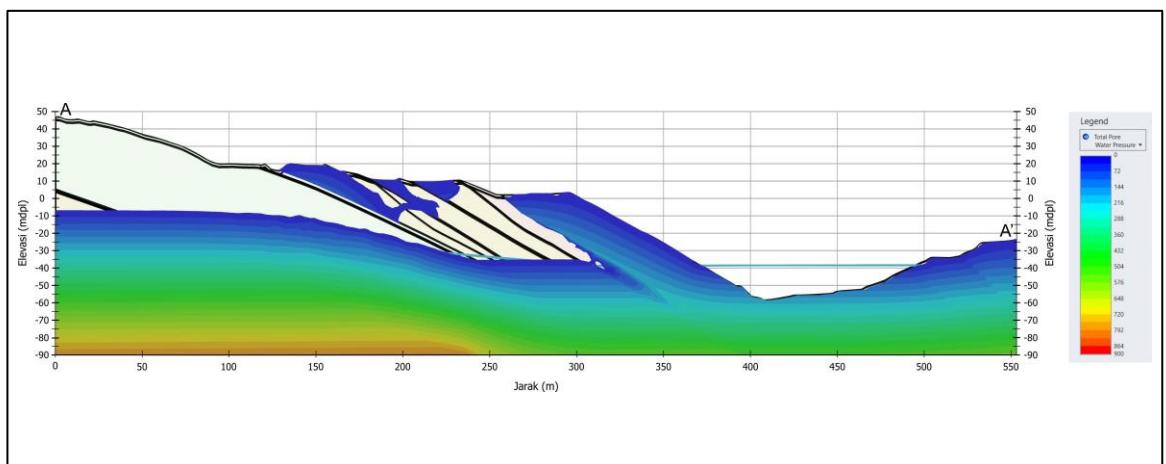
10. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 18 jam



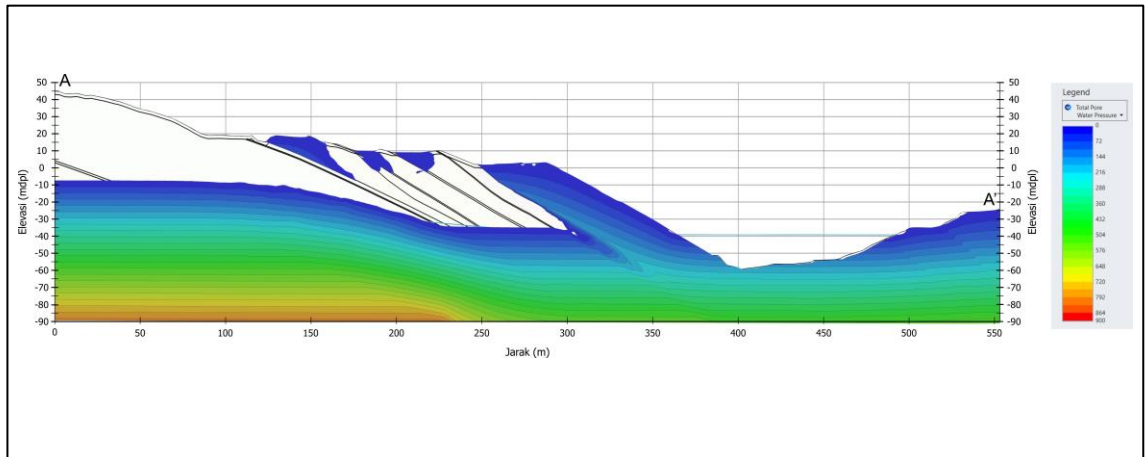
11. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 20 jam



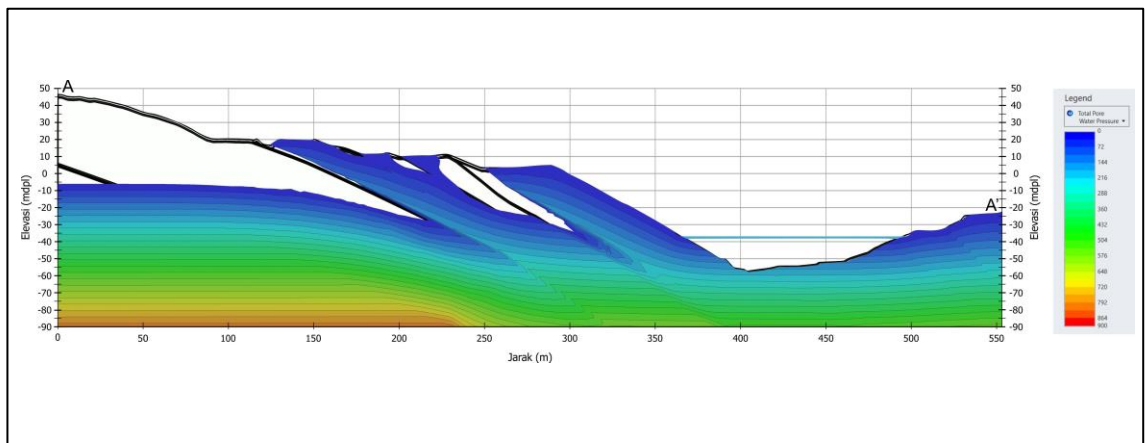
12. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 22 jam



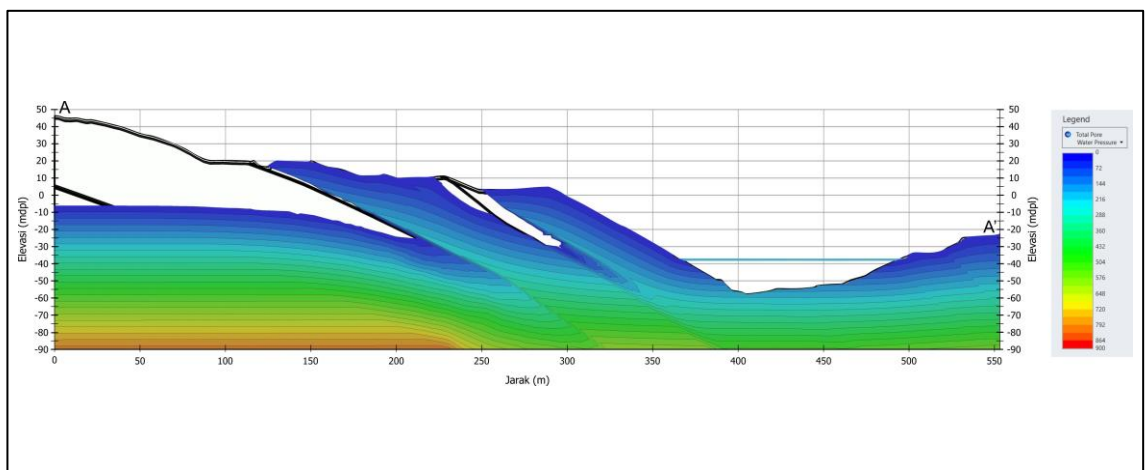
13. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 24 jam



14. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 48 jam

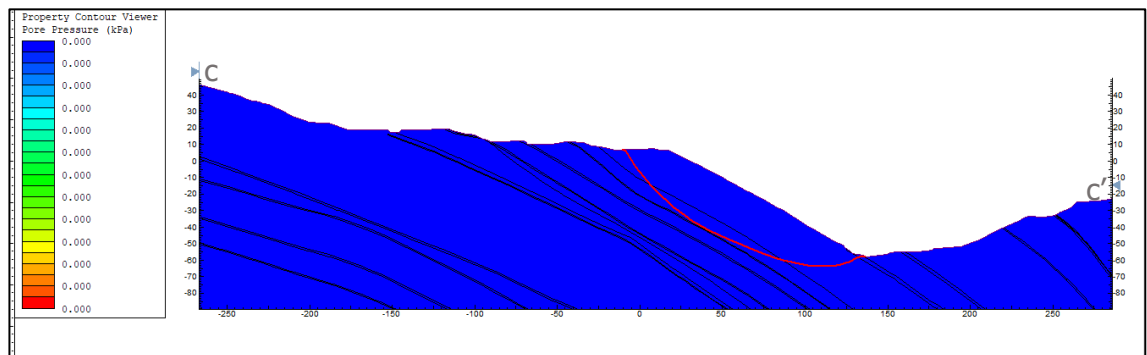
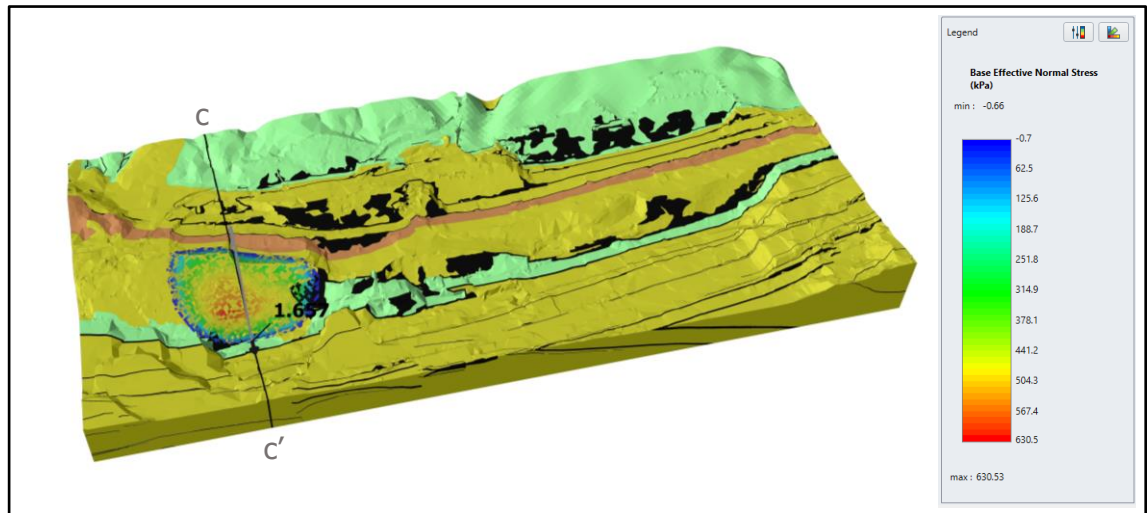


15. Kondisi tekanan air pori dengan durasi Infiltrasi hujan selama 72 jam



## Lampiran E Hasil Analisis Kestabilan Lereng Semua Kondisi

### 1. Kondisi Kering (*dry*)

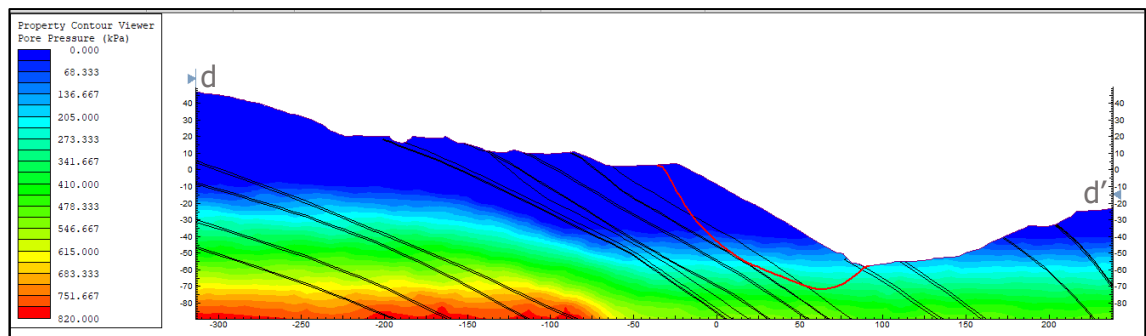
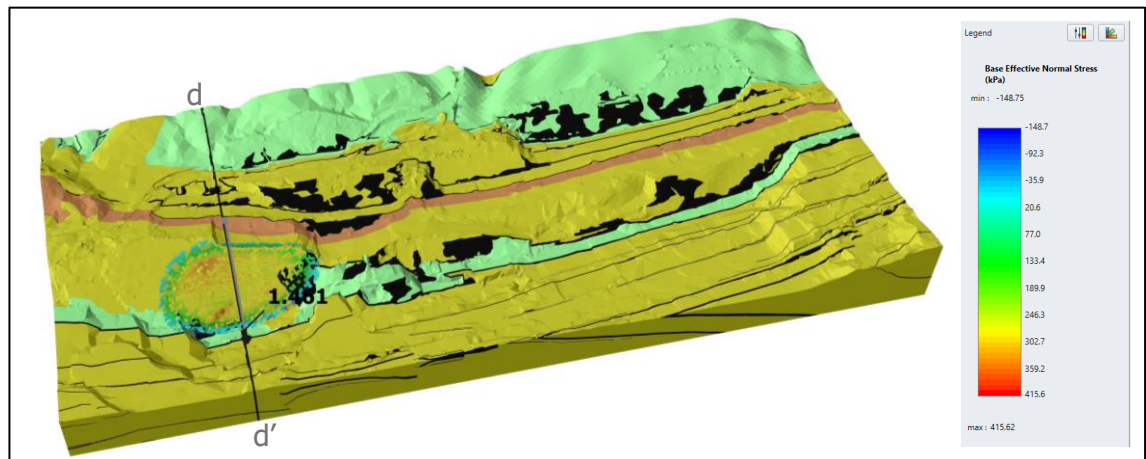


#### Faktor Keamanan

**1,65654**

Pusat Rotasi:	53,6639, -493,636, 202,239
Volume Longsoran (m <sup>3</sup> ):	567.704
Batulempung (BG_11A-3):	514.538,712
Batulanau (BG_11A-8):	51.594,615
Batubara (BG_04-3):	1.501,626
Batupasir (BG_10-20):	69,501
Berat Longsoran (kN):	10.317.800
Berat Longsoran (tonnes):	1.052.122,791
Arah Longsoran (deg):	118,5
LambdaX:	-0,406893
LambdaY:	0,214791
Total Gaya Penahan di X (kN):	6.830.050
Total Gaya Penahan di Y (kN):	-3.836.260
Total momen penahan dalam sumbu X (kNm):	922.695.000
Total momen penahan dalam sumbu Y (kNm):	-1.641.570.000
Total Gaya Penggerak di X (kN):	4.123.790
Total Gaya Penggerak di Y (kN):	-2.315.910
Total momen penggerak dalam sumbu X (kN):	556.827.000
Total momen penggerak dalam sumbu Y (kN):	-991.071.000

## 2. Kondisi Awal

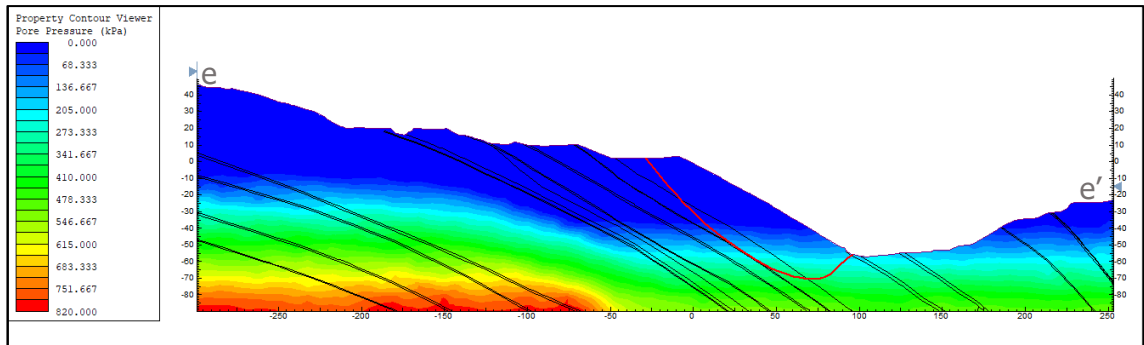
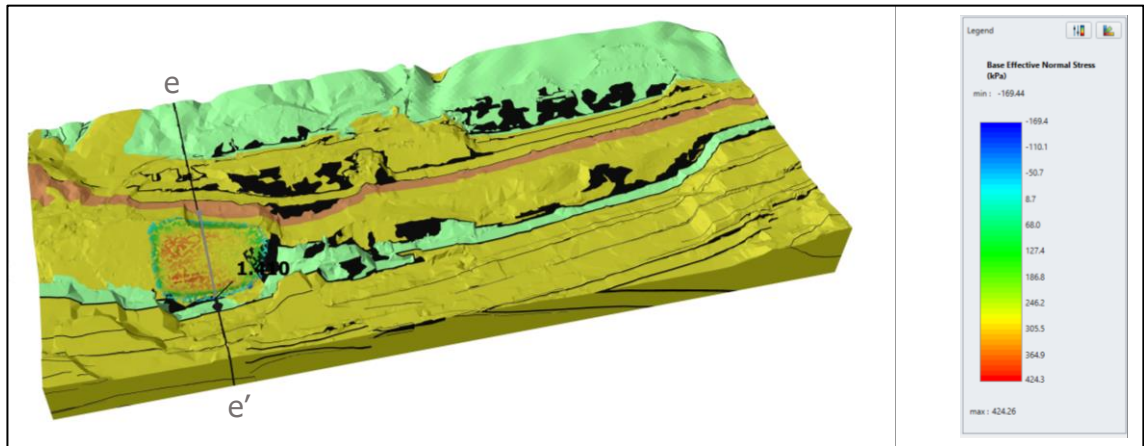


### Faktor Keamanan 1,46091

Pusat Rotasi:	69,6639, -493,636, 191,535
Volume Longsoran (m <sup>3</sup> ):	485.821
Batulempung (BG_11A-3):	4.453.44,419
Batulanau (BG_11A-8):	36.085,355
Batubara (BG_04-3):	2.557,728
Batupasir (BG_10-20):	1.833,741
Berat Longsoran (kN):	8.839.180
Berat Longsoran (tonnes):	901.345,513
Arah Longsoran (deg):	121,4
LambdaX:	-0,332598
LambdaY:	0,247184
Total Gaya Penahan di X (kN):	5.441.780
Total Gaya Penahan di Y (kN):	-3.260.520
Total momen penahan dalam sumbu X (kNm):	760.366.000
Total momen penahan dalam sumbu Y (kNm):	-1.268.380.000
Total Gaya Penggerak di X (kN):	3.724.570
Total Gaya Penggerak di Y (kN):	-2.228.940
Total momen penggerak dalam sumbu X (kN):	520.583.000
Total momen penggerak dalam sumbu Y (kN):	-869.235.000



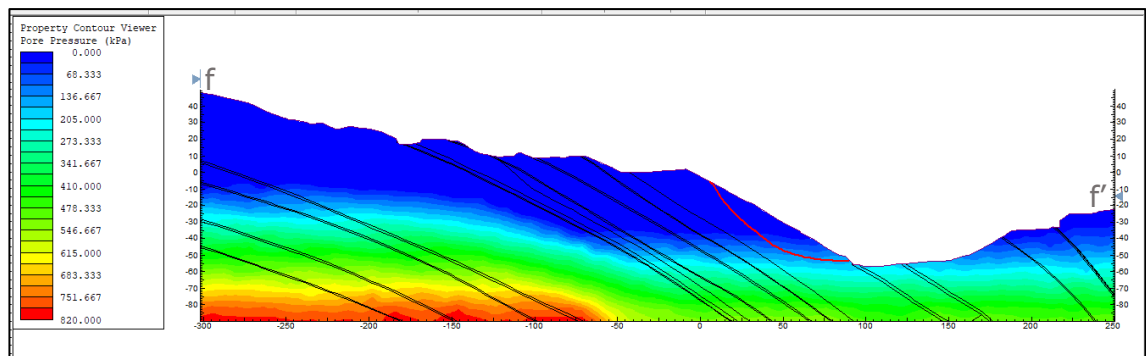
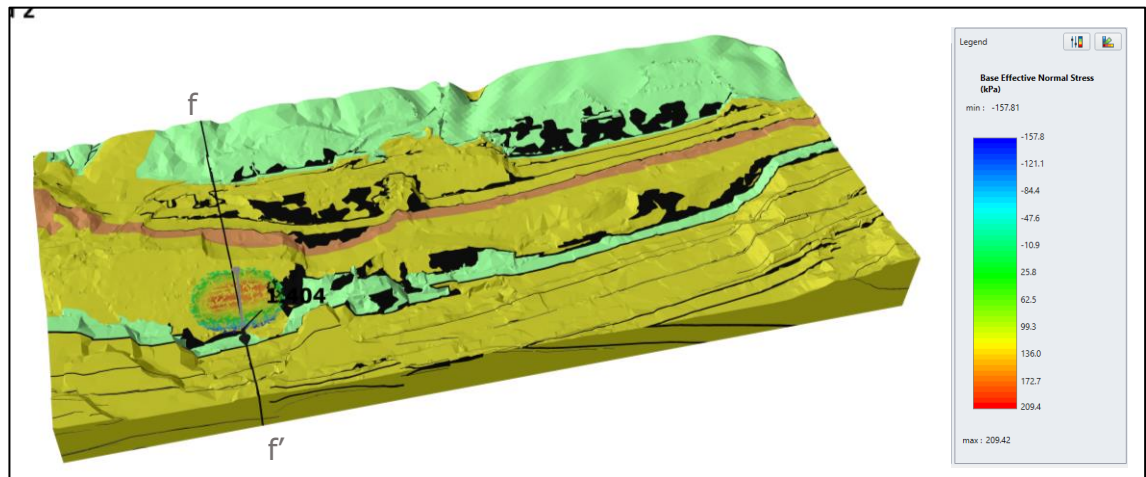
### 3. Kondisi dengan Durasi Hujan selama 2 Jam



### Faktor Keamanan 1,40998

Pusat Rotasi:	46,6639, -473,636, 143,321
Volume Longsoran (m3):	474.867
Batulempung (BG_11A-3):	419.064,574
Batulanau (BG_11A-8):	55.040,229
Batubara (BG_04-3):	762,267
Berat Longsoran (kN):	8.603.120
Berat Longsoran (tonnes):	877.274,092
Arah Longsoran (deg):	119,7
LambdaX:	-0,310282
LambdaY:	0,20708
Total Gaya Penahan di X (kN):	4.990.750
Total Gaya Penahan di Y (kN):	-2.843.200
Total momen penahan dalam sumbu X (kNm):	525.846.000
Total momen penahan dalam sumbu Y (kNm):	-919.457.000
Total Gaya Penggerak di X (kN):	3.539.720
Total Gaya Penggerak di Y (kN):	-2.021.930
Total momen penggerak dalam sumbu X (kN):	372.827.000
Total momen penggerak dalam sumbu Y (kN):	-650.544.000

#### 4. Kondisi dengan Durasi Hujan selama 4 Jam

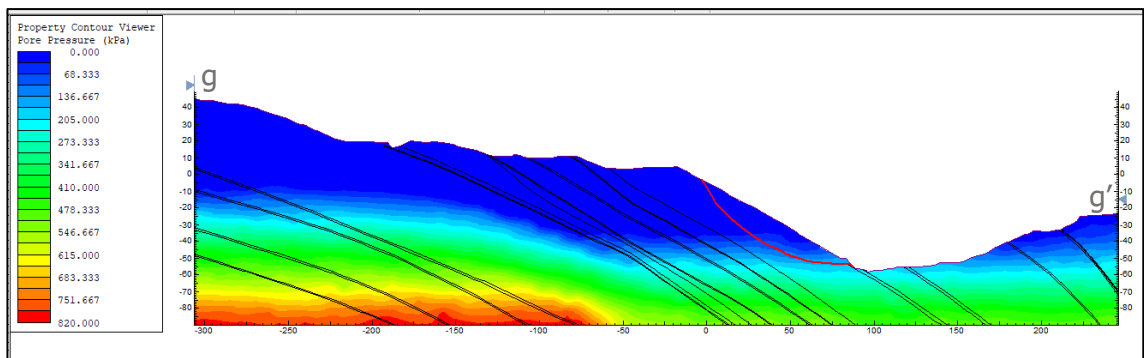
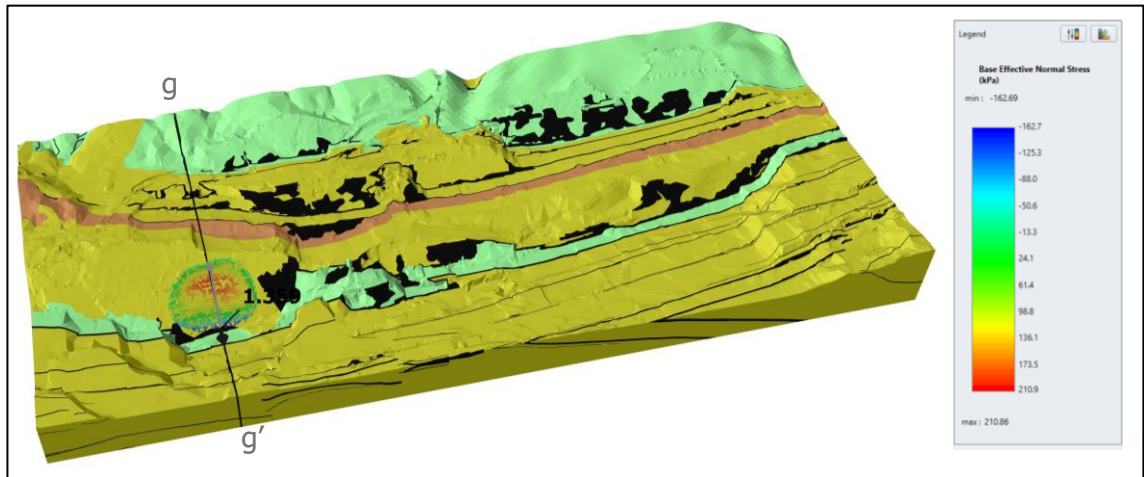


#### Faktor Keamanan

**1,40433**

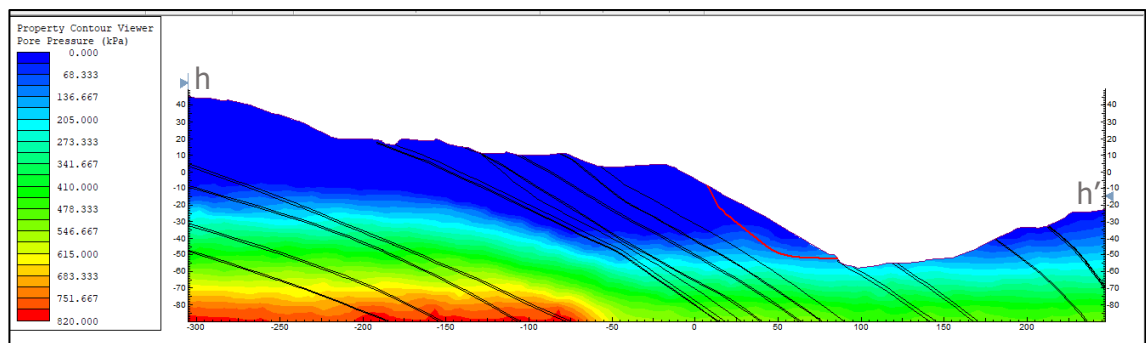
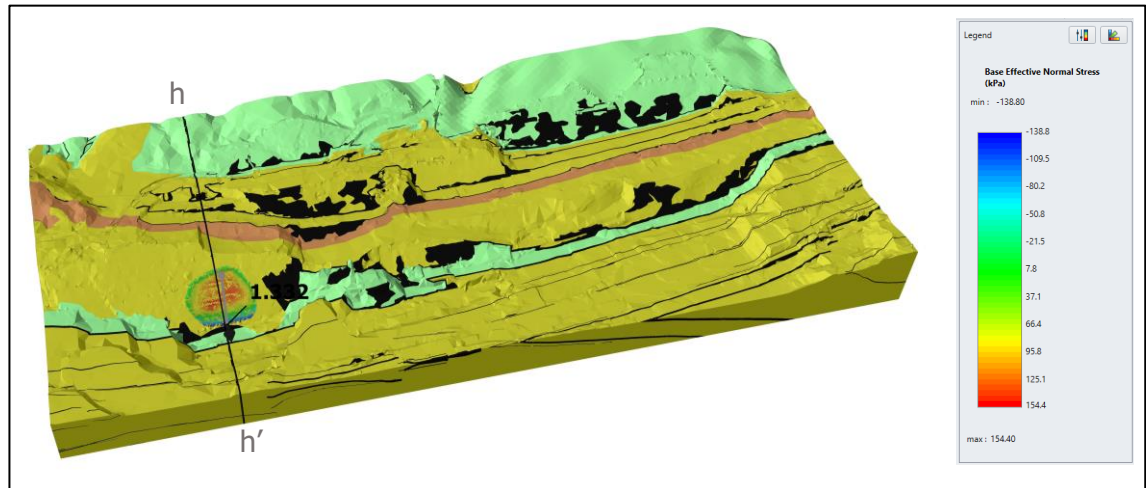
Pusat Rotasi:	62,6639, -463,636, 91,6736
Volume Longsoran (m <sup>3</sup> ):	95.744,3
Batulempung (BG_11A-3):	95.388,816
Batubara:	355,506
Berat Longsoran (kN):	1.761.680
Berat Longsoran (tonnes):	179.641,365
Arah Longsoran (deg):	120,7
LambdaX:	-0,143454
LambdaY:	0,0744844
Total Gaya Penahan di X (kN):	1.191.740
Total Gaya Penahan di Y (kN):	-722.136
Total momen penahan dalam sumbu X (kNm):	91.597.300
Total momen penahan dalam sumbu Y (kNm):	-151.297.000
Total Gaya Penggerak di X (kN):	849.690
Total Gaya Penggerak di Y (kN):	-514.661
Total momen penggerak dalam sumbu X (kN):	65.119.300
Total momen penggerak dalam sumbu Y (kN):	-107.684.000

## 5. Kondisi dengan Durasi Hujan selama 6 Jam



<b>Faktor Keamanan</b>		<b>1,35905</b>
Pusat Rotasi:	48,6639, -483,636, 85,7821	
Volume Longsoran (m <sup>3</sup> ):	93.675,6	
Batulempung (BG_11A-3):	93.672,302	
Batubara (BG_04-3):	3,248	
Berat Longsoran (kN):	1.725.490	
Berat Longsoran (tonnes):	175.951,012	
Arah Longsoran (deg):	119,9	
LambdaX:	-0,0730439	
LambdaY:	0,0386296	
Total Gaya Penahan di X (kN):	1.133.060	
Total Gaya Penahan di Y (kN):	-666.167	
Total momen penahan dalam sumbu X (kNm):	79.919.000	
Total momen penahan dalam sumbu Y (kNm):	-136.026.000	
Total Gaya Penggerak di X (kN):	833.832	
Total Gaya Penggerak di Y (kN):	-490.768	
Total momen penggerak dalam sumbu X (kN):	58.766.900	
Total momen penggerak dalam sumbu Y (kN):	-100.018.000	

## 6. Kondisi dengan Durasi Hujan selama 8 Jam

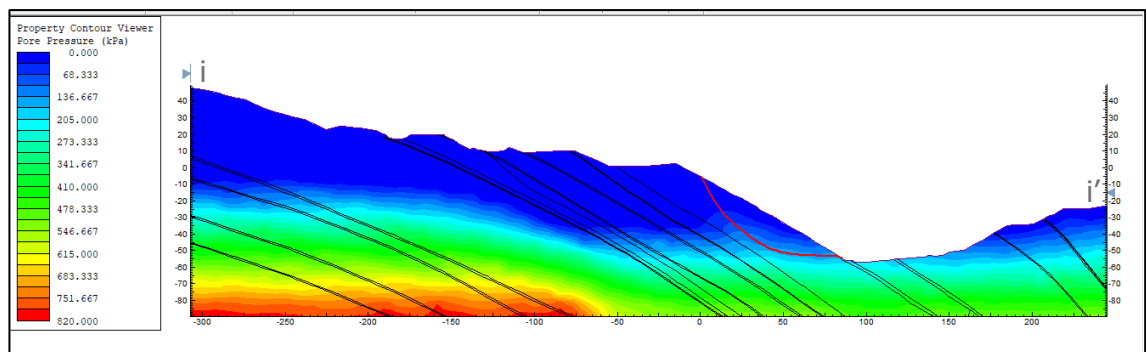
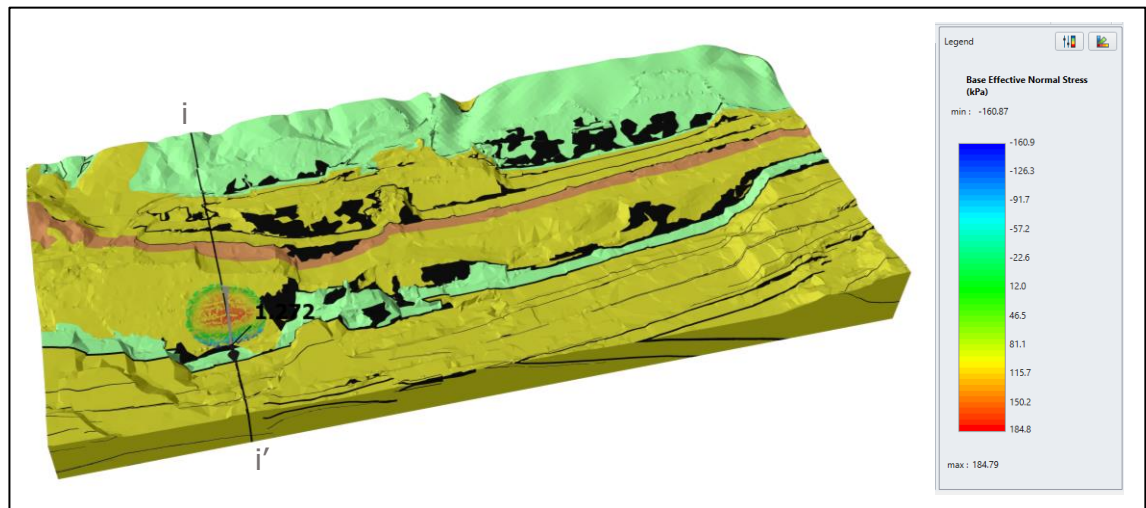


### Faktor Keamanan

**1,33226**

Pusat Rotasi:	41,6639, -473,636, 62,0874
Volume Longsoran (m <sup>3</sup> ):	62.141,7
Batulempung (BG_11A-3):	62.141,671
Berat Longsoran (kN):	1.144.650
Berat Longsoran (tonnes):	116.721,816
Arah Longsoran (deg):	119,4
LambdaX:	-0,175251
LambdaY:	0,0981889
Total Gaya Penahan di X (kN):	735.874
Total Gaya Penahan di Y (kN):	-427.113
Total momen penahan dalam sumbu X (kNm):	41.828.000
Total momen penahan dalam sumbu Y (kNm):	-72.177.100
Total Gaya Penggerak di X (kN):	552.651
Total Gaya Penggerak di Y (kN):	-320.461
Total momen penggerak dalam sumbu X (kN):	31.396.200
Total momen penggerak dalam sumbu Y (kN):	-54.169.000

## 7. Kondisi dengan Durasi Hujan selama 10 Jam

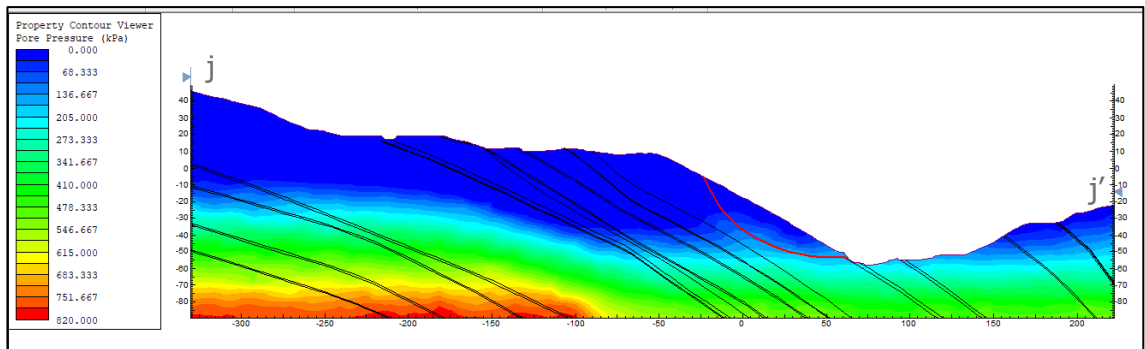
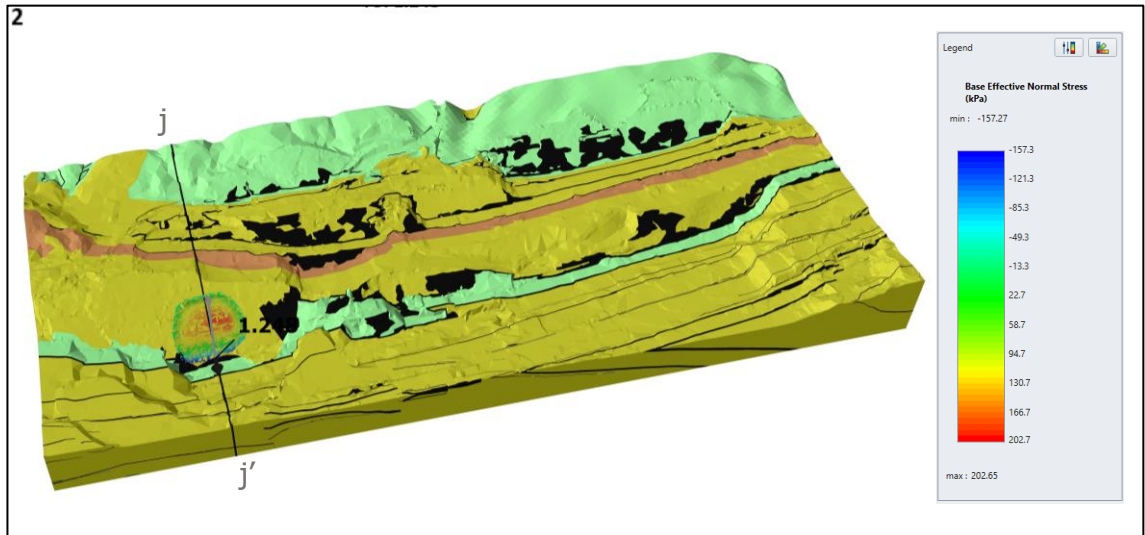


### Faktor Keamanan

**1,27187**

Pusat Rotasi:	49,6639, -463,636, 75,0911
Volume Longsor (m <sup>3</sup> ):	88.820,2
Batulempung (BG_11A-3):	88.804,896
Batubara (BG_04-3):	15,334
Berat Longsor (kN):	1.635.990
Berat Longsor (tonnes):	166.824,552
Arah Longsor (deg):	120,1
LambdaX:	-0,276463
LambdaY:	0,145572
Total Gaya Penahan di X (kN):	980.973
Total Gaya Penahan di Y (kN):	-588.597
Total momen penahan dalam sumbu X (kNm):	65.396.700
Total momen penahan dalam sumbu Y (kNm):	-109.300.000
Total Gaya Penggerak di X (kN):	771.388
Total Gaya Penggerak di Y (kN):	-462.680
Total momen penggerak dalam sumbu X (kN):	51.439.600
Total momen penggerak dalam sumbu Y (kN):	-85.908.600

## 8. Kondisi dengan Durasi Hujan selama 12 Jam

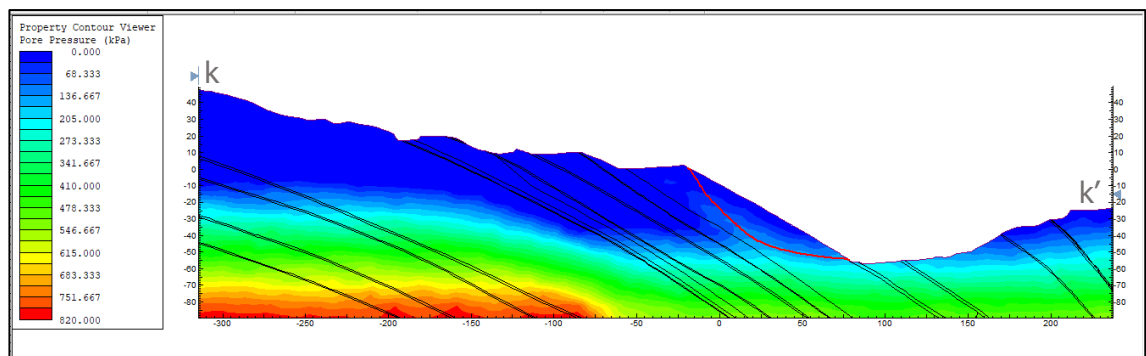
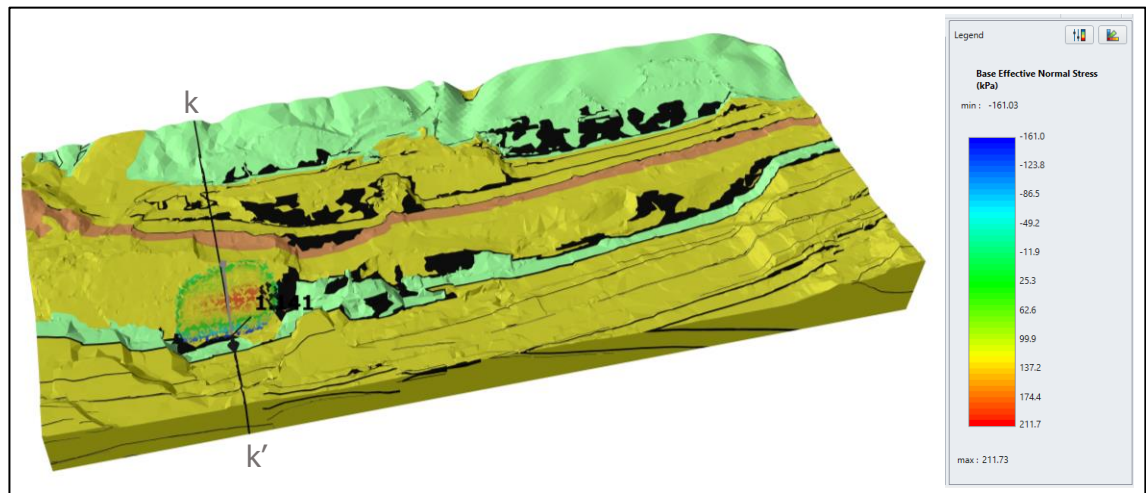


### Faktor Keamanan

**1,24788**

Pusat Rotasi:	34,6639, -483,636, 73,547
Volume Longsor ( $m^3$ ):	91.167,1
Batulempung (BG_11A-3):	91.141,212
Batubara (BG_04-3):	25,921
Berat Longsor (kN):	1.679.160
Berat Longsor (tonnes):	171.226,667
Arah Longsor (deg):	120
LambdaX:	-0,299975
LambdaY:	0,137031
Total Gaya Penahan di X (kN):	989.601
Total Gaya Penahan di Y (kN):	-565.643
Total momen penahan dalam sumbu X (kNm):	61.781.600
Total momen penahan dalam sumbu Y (kNm):	-108.315.000
Total Gaya Penggerak di X (kN):	792.844
Total Gaya Penggerak di Y (kN):	-453.168
Total momen penggerak dalam sumbu X (kN):	49.482.400
Total momen penggerak dalam sumbu Y (kN):	-86.889.500

## 9. Kondisi dengan Durasi Hujan selama 14 Jam

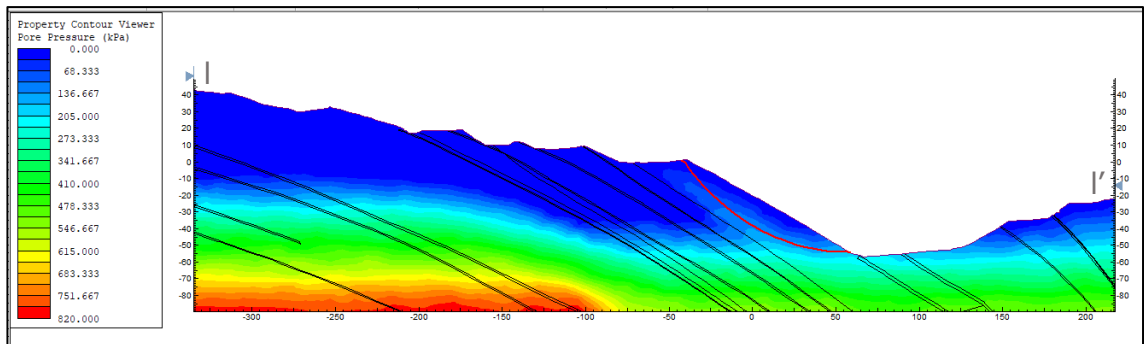
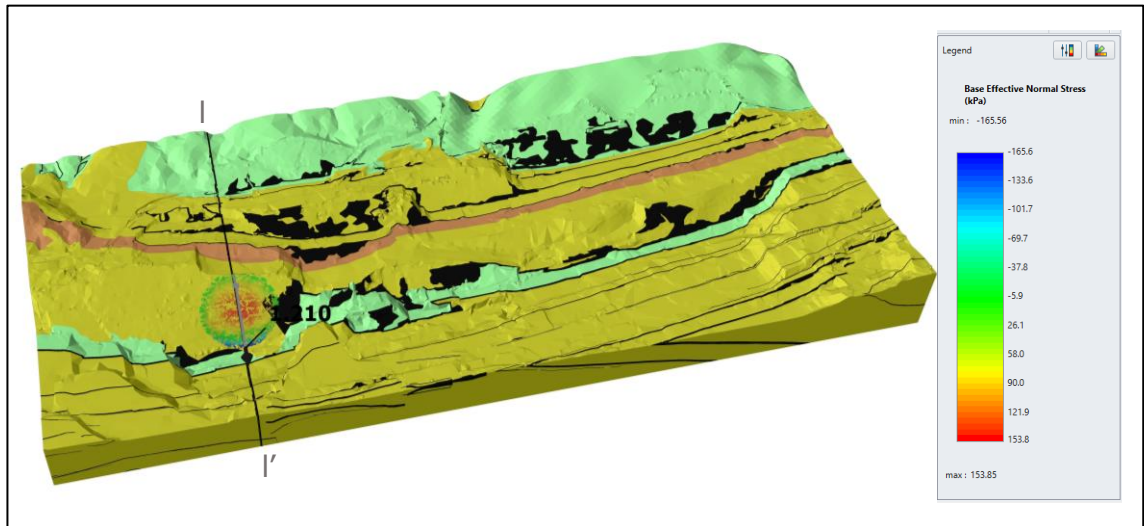


### Faktor Keamanan

**1,14066**

Pusat Rotasi:	65,6639, -473,636, 120,943
Volume Longsoran (m <sup>3</sup> ):	156.546
Batulempung (BG_11A-3):	156.141,772
Batubara (BG_04-3):	403,841
Berat Longsoran (kN):	2.881.380
Berat Longsoran (tonnes):	293.818,989
Arah Longsoran (deg):	122,1
LambdaX:	-0,353492
LambdaY:	0,25681
Total Gaya Penahan di X (kN):	1.521.060
Total Gaya Penahan di Y (kN):	-930.379
Total momen penahan dalam sumbu X (kNm):	144.406.000
Total momen penahan dalam sumbu Y (kNm):	-236.120.000
Total Gaya Penggerak di X (kN):	1.331.790
Total Gaya Penggerak di Y (kN):	-815.479
Total momen penggerak dalam sumbu X (kN):	126.778.000
Total momen penggerak dalam sumbu Y (kN):	-207.015.000

## 10. Kondisi dengan Durasi Hujan selama 16 Jam



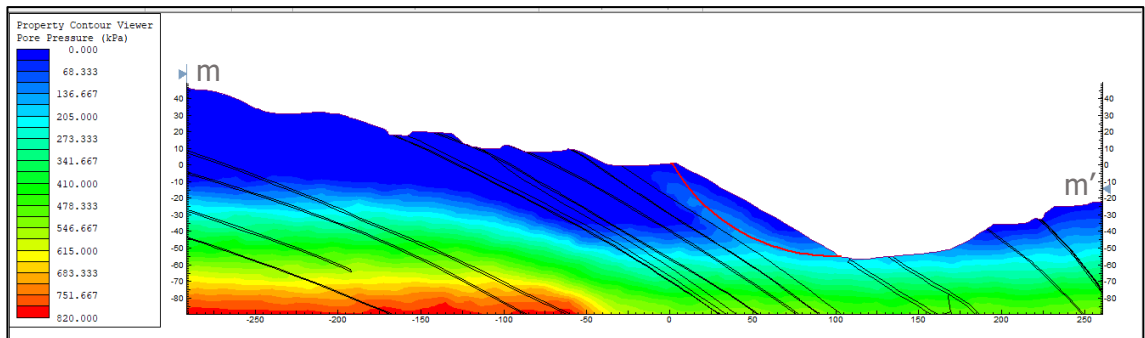
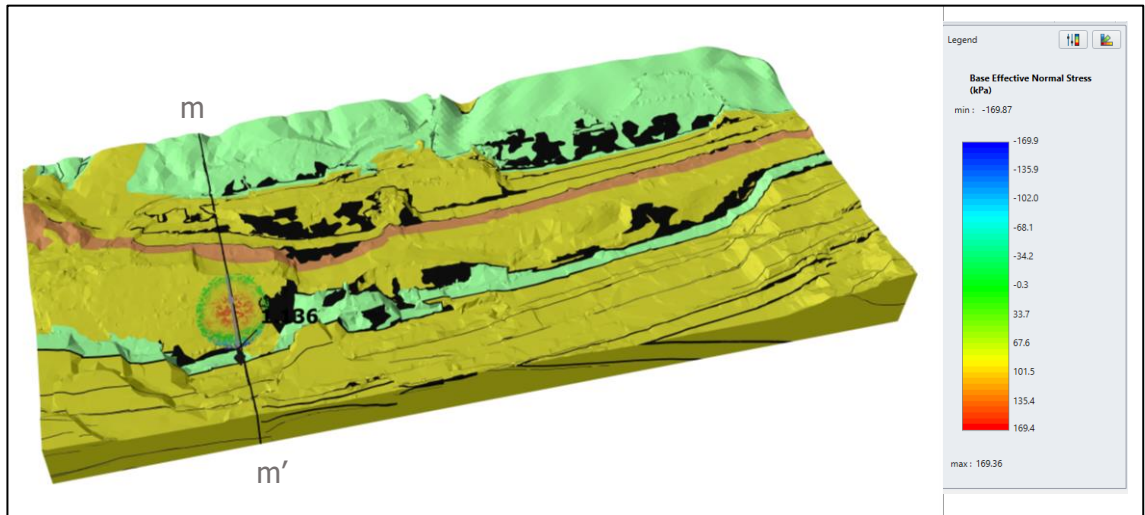
### Faktor Keamanan

**1,20988**

Pusat Rotasi:	42,6639, -443,636, 62,7376
Volume Longsor (m <sup>3</sup> ):	86.055,6
Batulempung (BG_11A-3):	857.79,845
Batubara (BG_04-3):	275,705
Berat Longsor (kN):	1.583.650
Berat Longsor (tonnes):	161.487,358
Arah Longsor (deg):	122,5
LambdaX:	-0,189223
LambdaY:	0,131026
Total Gaya Penahan di X (kN):	901.466
Total Gaya Penahan di Y (kN):	-575.430
Total momen penahan dalam sumbu X (kNm):	53.961.200
Total momen penahan dalam sumbu Y (kNm):	-84.560.800
Total Gaya Penggerak di X (kN):	745.033
Total Gaya Penggerak di Y (kN):	-475.621
Total momen penggerak dalam sumbu X (kN):	44.603.500
Total momen penggerak dalam sumbu Y (kN):	-69.890.700



## 11. Kondisi dengan Durasi Hujan selama 18 Jam

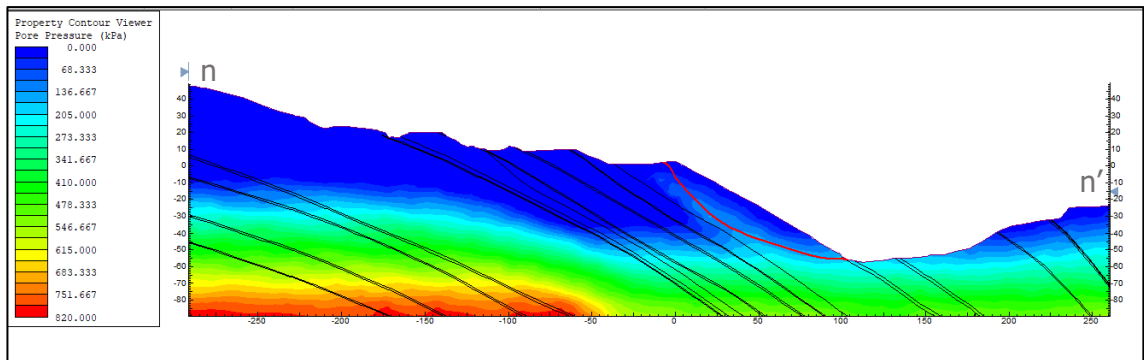
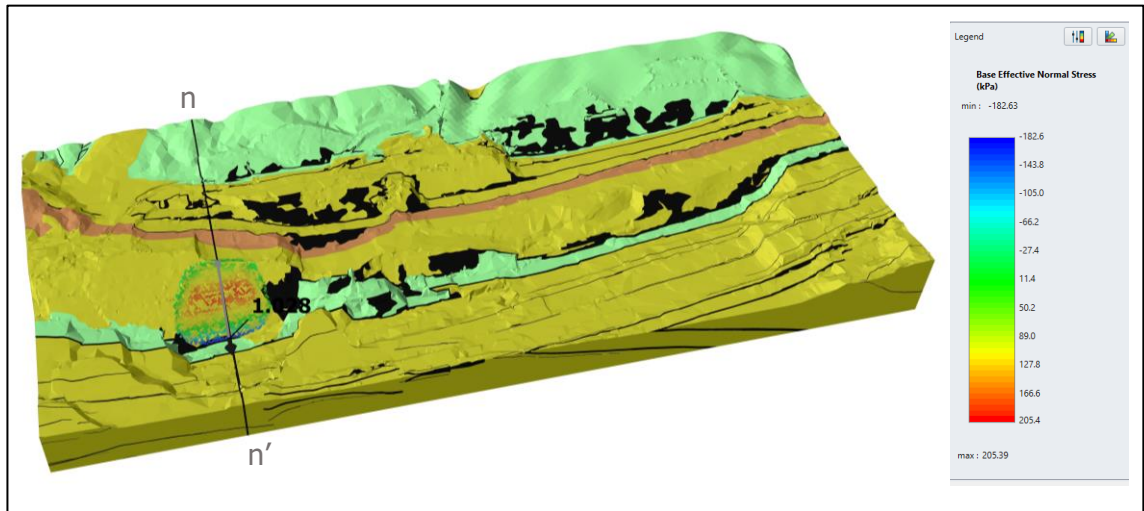


### Faktor Keamanan

**1,13609**

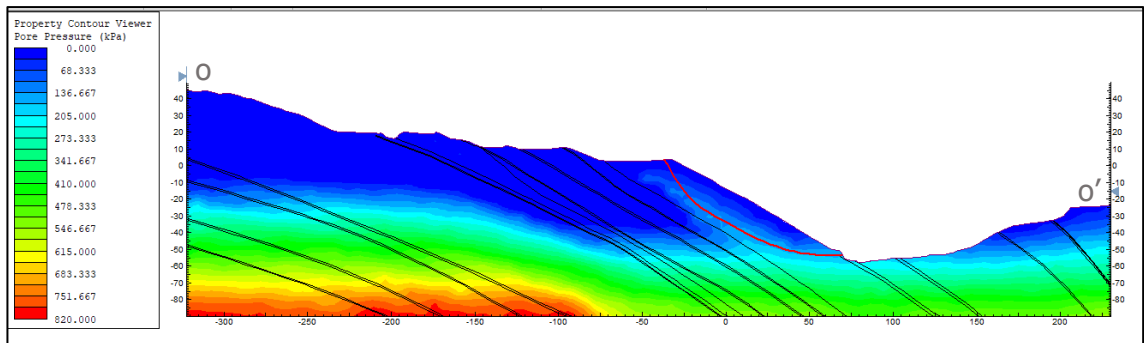
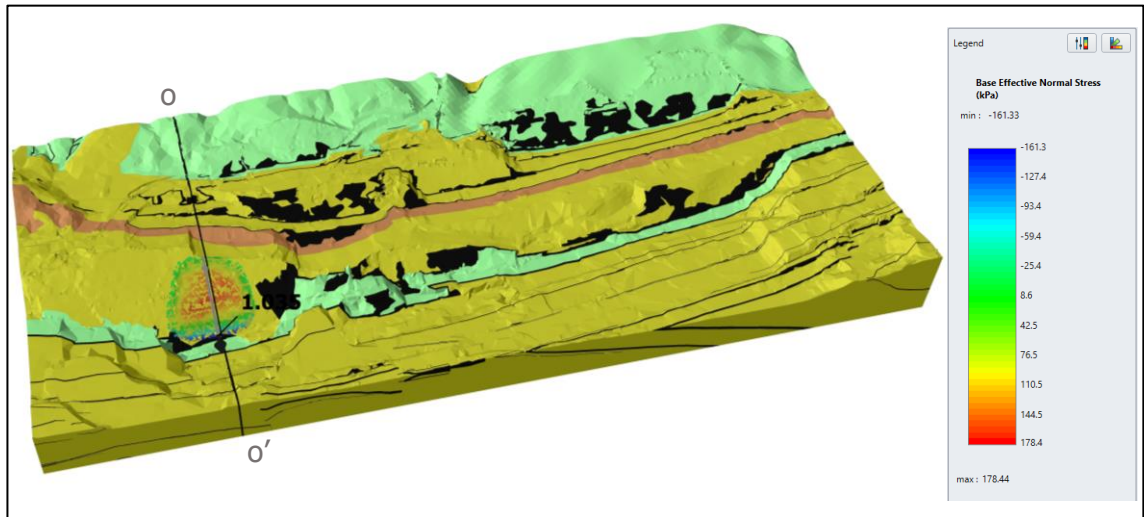
Pusat Rotasi:	51,6639, -453,636, 51,2009
Volume Longsoran (m <sup>3</sup> ):	91.467,1
Batulempung (BG_11A-3):	91.342,803
Batubara (BG_04-3):	124,288
Berat Longsoran (kN):	1.684.150
Berat Longsoran (tonnes):	171.735,506
Arah Longsoran (deg):	122,6
LambdaX:	-0,271011
LambdaY:	0,182724
Total Gaya Penahan di X (kN):	890.787
Total Gaya Penahan di Y (kN):	-566.034
Total momen penahan dalam sumbu X (kNm):	47.496.200
Total momen penahan dalam sumbu Y (kNm):	-74.758.800
Total Gaya Penggerak di X (kN):	783.327
Total Gaya Penggerak di Y (kN):	-498.245
Total momen penggerak dalam sumbu X (kN):	41.866.100
Total momen penggerak dalam sumbu Y (kN):	-65.771.400

## 12. Kondisi dengan Durasi Hujan selama 20 Jam



<b>Faktor Keamanan</b>		<b>1,02773</b>
Pusat Rotasi:		51,6639, -473,636, 108,661
Volume Longsoran (m <sup>3</sup> ):		171.882
Batulempung (BG_11A-3):		171.708,406
Batubara (BG_04-3):		173,825
Berat Longsoran (kN):		3.165.130
Berat Longsoran (tonnes):		322.753,437
Arah Longsoran (deg):		121,6
LambdaX:		-0,348885
LambdaY:		0,341457
Total Gaya Penahan di X (kN):		1.485.450
Total Gaya Penahan di Y (kN):		-895.446
Total momen penahan dalam sumbu X (kNm):		127.255.000
Total momen penahan dalam sumbu Y (kNm):		-211.036.000
Total Gaya Penggerak di X (kN):		1.447.800
Total Gaya Penggerak di Y (kN):		-865.356
Total momen penggerak dalam sumbu X (kN):		124.147.000
Total momen penggerak dalam sumbu Y (kN):		-205.863.000

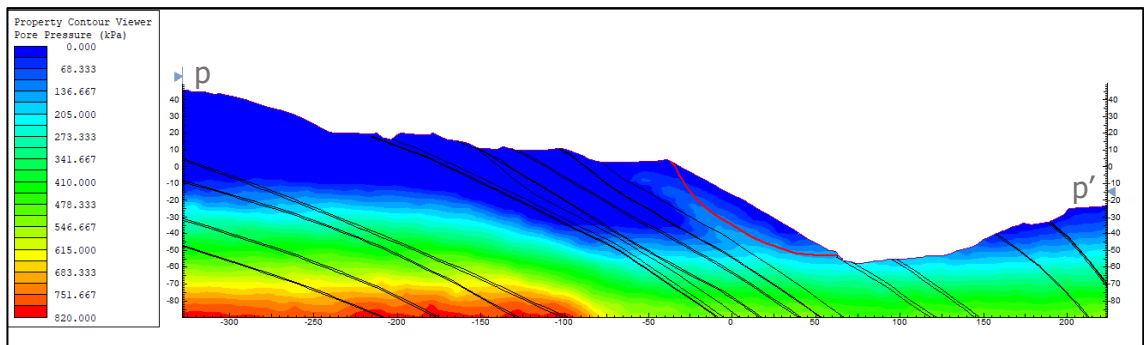
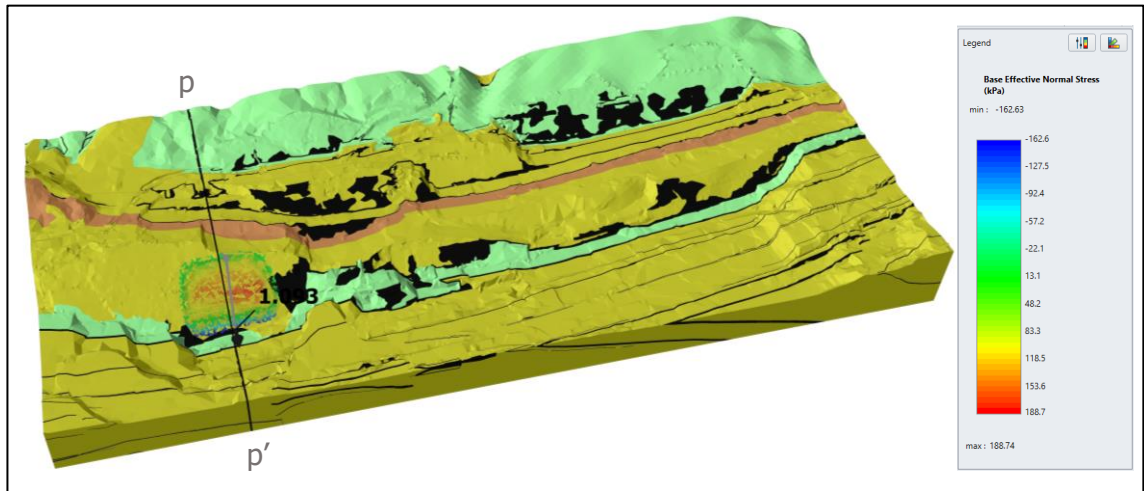
### 13. Kondisi dengan Durasi Hujan selama 22 Jam



### Faktor Keamanan 1,03504

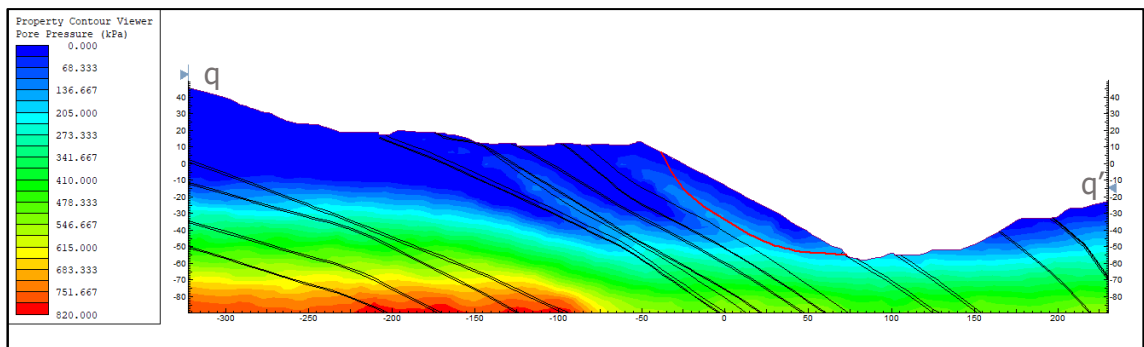
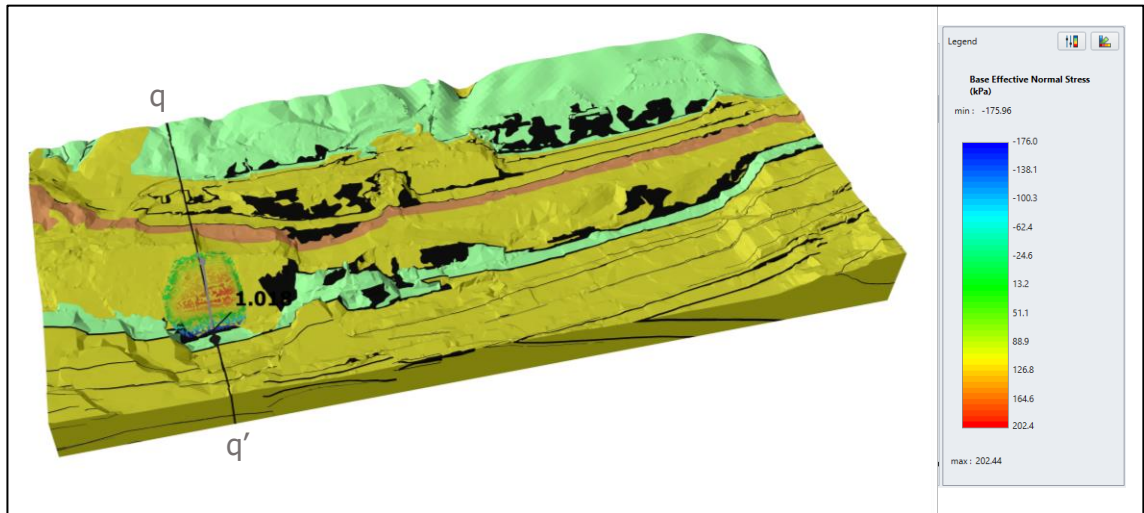
Pusat Rotasi:	43,6639, -483,636, 98,6615
Volume Longsor ( $m^3$ ):	142.524
Batulempung (BG_11A-3):	142.506,778
Batubara (BG_04-3):	17.394
Berat Longsor (kN):	2.625.200
Berat Longsor (tonnes):	267.695,899
Arah Longsor (deg):	120
LambdaX:	-0,183847
LambdaY:	0,196248
Total Gaya Penahan di X (kN):	1.263.280
Total Gaya Penahan di Y (kN):	-742.186
Total momen penahan dalam sumbu X (kNm):	97.621.900
Total momen penahan dalam sumbu Y (kNm):	-167.007.000
Total Gaya Penggerak di X (kN):	1.224.470
Total Gaya Penggerak di Y (kN):	-719.747
Total momen penggerak dalam sumbu X (kN):	94.551.200
Total momen penggerak dalam sumbu Y (kN):	-159.844.000

#### 14. Kondisi dengan Durasi Hujan selama 24 Jam



<b>Faktor Keamanan</b>		<b>1,069342</b>
Pusat Rotasi:	53,6639, -473,636, 107,174	
Volume Longsor (m <sup>3</sup> ):	149.873	
Batulempung (BG_11A-3):	149.795,842	
Batubara (BG_04-3):	76,861	
Berat Longsor (kN):	2.760.240	
Berat Longsor (tonnes):	281.466,147	
Arah Longsor (deg):	120,6	
LambdaX:	-0,292259	
LambdaY:	0,182634	
Total Gaya Penahan di X (kN):	1.405.800	
Total Gaya Penahan di Y (kN):	-848.933	
Total momen penahan dalam sumbu X (kNm):	118.858.000	
Total momen penahan dalam sumbu Y (kNm):	-197.247.000	
Total Gaya Penggerak di X (kN):	1.287.310	
Total Gaya Penggerak di Y (kN):	-777.374	
Total momen penggerak dalam sumbu X (kN):	108.613.000	
Total momen penggerak dalam sumbu Y (kN):	-180.095.000	

## 15. Kondisi dengan Durasi Hujan selama 48 Jam

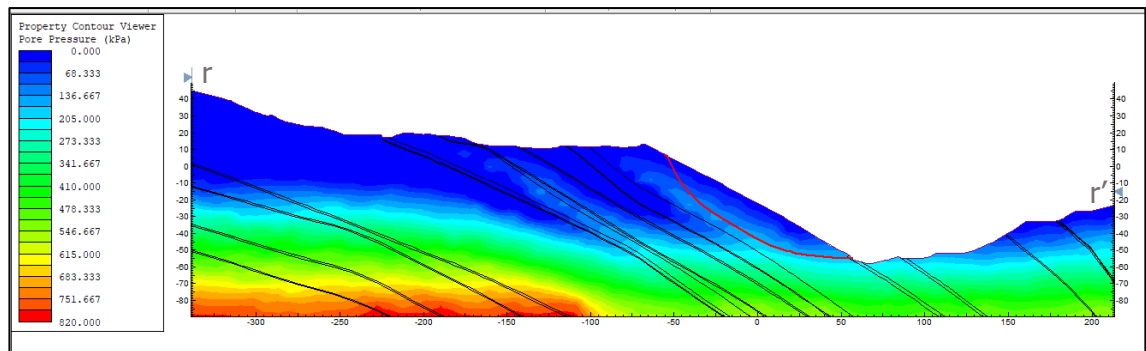
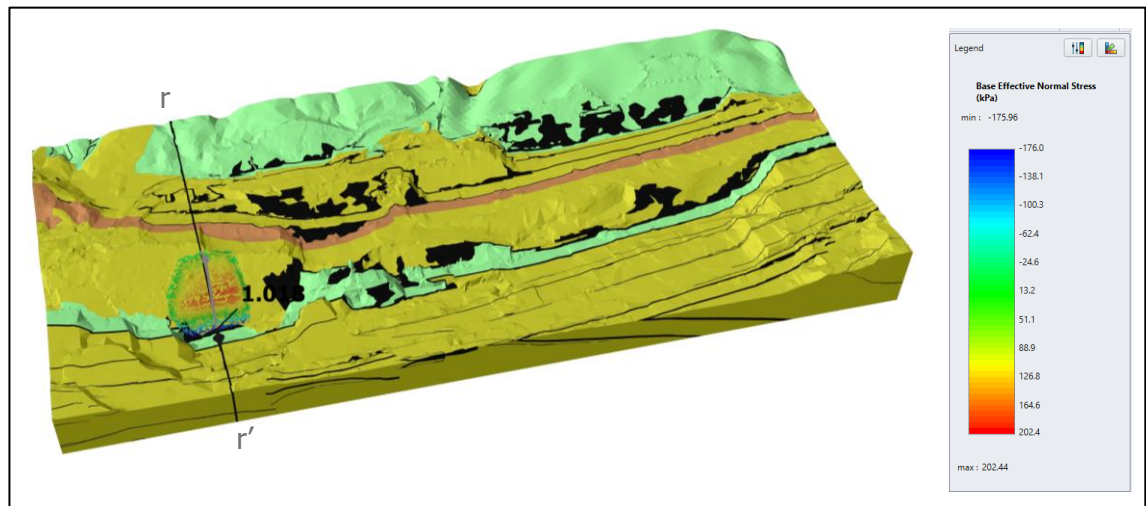


### Faktor Keamanan

**1,01755**

Pusat Rotasi:	37,6639, -493,636, 102,77
Volume Longsor ( $m^3$ ):	158.494
Batulempung (BG_11A-3):	1.582.82,081
Batubara (BG_04-3):	212,112
Berat Longsor (kN):	2.918.310
Berat Longsor (tonnes):	297.584,801
Arah Longsor (deg):	119,2
LambdaX:	-0,364217
LambdaY:	0,213351
Total Gaya Penahan di X (kN):	1.352.830
Total Gaya Penahan di Y (kN):	-787.079
Total momen penahan dalam sumbu X (kNm):	107.661.000
Total momen penahan dalam sumbu Y (kNm):	-185.719.000
Total Gaya Penggerak di X (kN):	1.332.590
Total Gaya Penggerak di Y (kN):	-774.024
Total momen penggerak dalam sumbu X (kN):	105.792.000
Total momen penggerak dalam sumbu Y (kN):	-181.993.000

## 16. Kondisi dengan Durasi Hujan selama 72 Jam

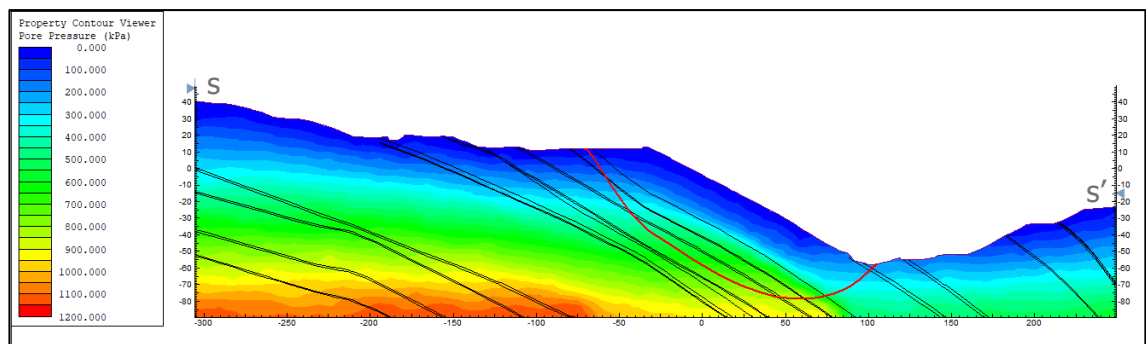
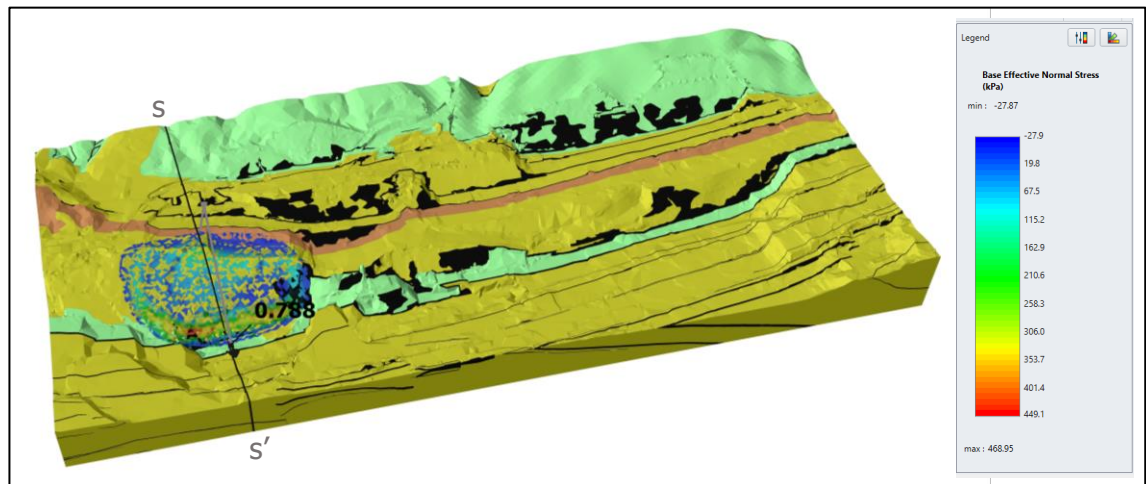


### Faktor Keamanan

**1,01755**

Pusat Rotasi:	37,6639, -493,636, 102,77
Volume Longsor ( $m^3$ ):	158.494
Batulempung (BG_11A-3):	158.282,081
Batubara (BG_04-3):	212,112
Berat Longsor (kN):	2.918.310
Berat Longsor (tonnes):	297.584,801
Arah Longsor (deg):	119,2
LambdaX:	-0,364217
LambdaY:	0,213351
Total Gaya Penahan di X (kN):	1.352.830
Total Gaya Penahan di Y (kN):	-787.079
Total momen penahan dalam sumbu X (kNm):	107.661.000
Total momen penahan dalam sumbu Y (kNm):	-185.719.000
Total Gaya Penggerak di X (kN):	1.332.590
Total Gaya Penggerak di Y (kN):	-774.024
Total momen penggerak dalam sumbu X (kN):	105.792.000
Total momen penggerak dalam sumbu Y (kN):	-181.993.000

## 17. Kondisi Jenuh



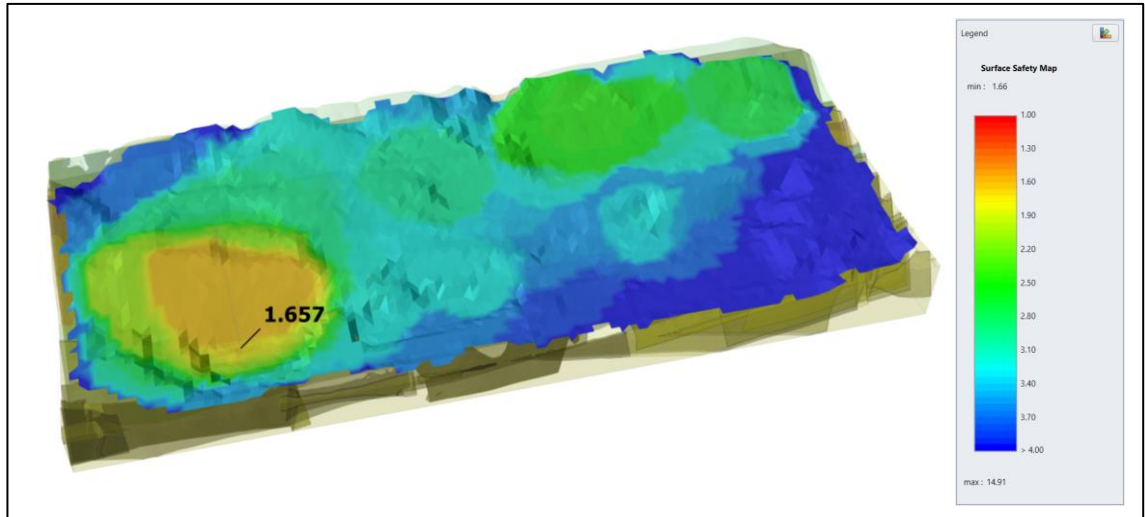
### Faktor Keamanan

**0,788105**

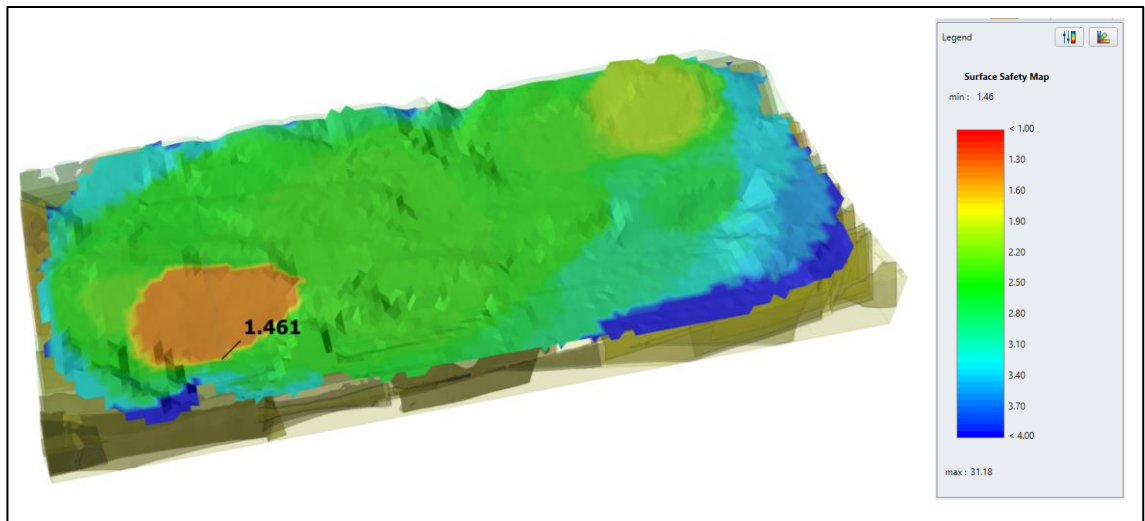
Pusat Rotasi:	37,6639, -493,636, 216,407
Volume Longsoran (m <sup>3</sup> ):	1.167.680
Batulempung (BG_11A-3):	743.888,246
Batulanau (BG_11A-8):	224.320,163
Batupasir (BG_11A-5):	168.652,313
Batubara (BG_04-3):	25.790,125
Batupasir (BG_10-20):	5.024,231
Berat Longsoran (kN):	20.143.500
Berat Longsoran (tonnes):	2054.065,348
Arah Longsoran (deg):	116
LambdaX:	-0,173992
LambdaY:	0,15372
Total Gaya Penahan di X (kN):	5.646.900
Total Gaya Penahan di Y (kN):	-2.894.440
Total momen penahan dalam sumbu X (kNm):	768.249.000
Total momen penahan dalam sumbu Y (kNm):	-1.492.110.000
Total Gaya Penggerak di X (kN):	7.198.830
Total Gaya Penggerak di Y (kN):	-3.690.080
Total momen penggerak dalam sumbu X (kN):	978.718.000
Total momen penggerak dalam sumbu Y (kN):	-1.868.270.000

## Lampiran F Peta Zonasi Faktor Keamanan Lereng

### 1. Kondisi Kering

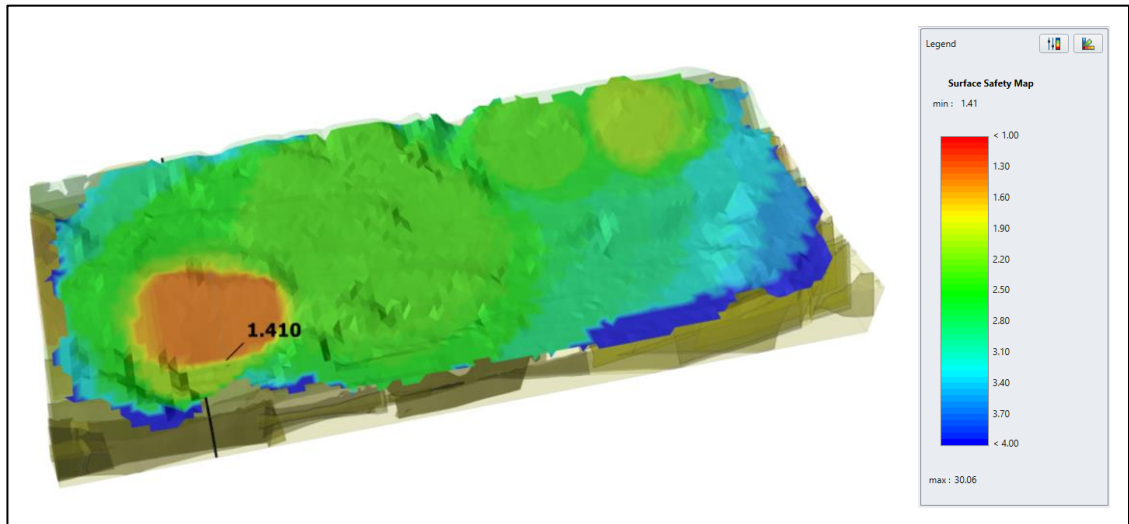


### 2. Kondisi Awal

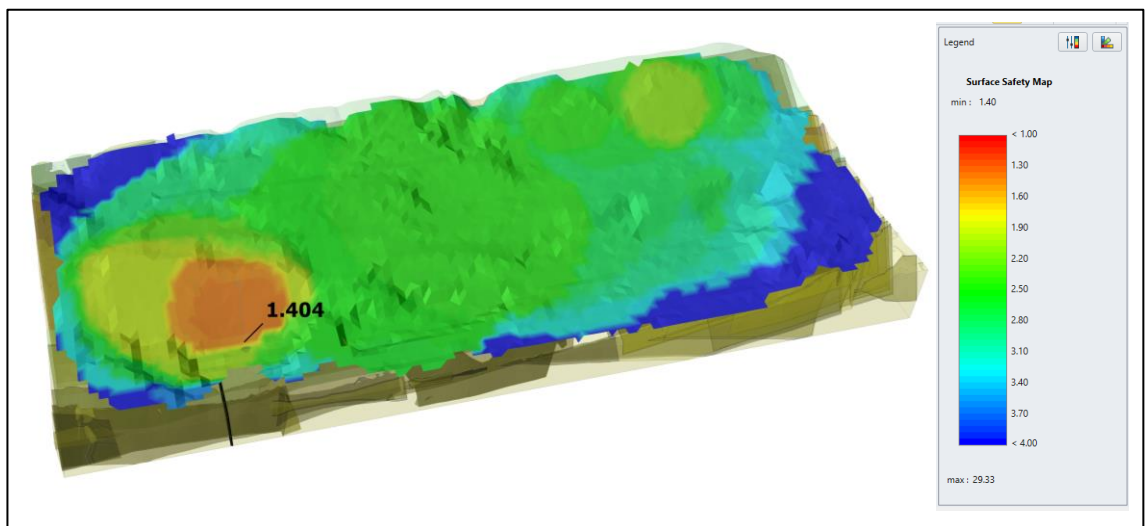




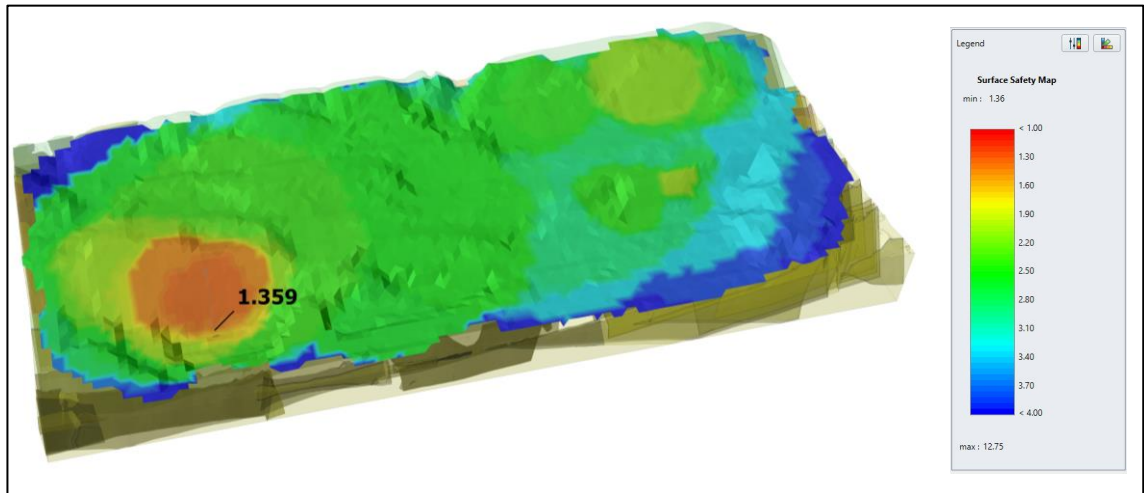
3. Kondisi dengan durasi infiltrasi hujan selama 2 jam



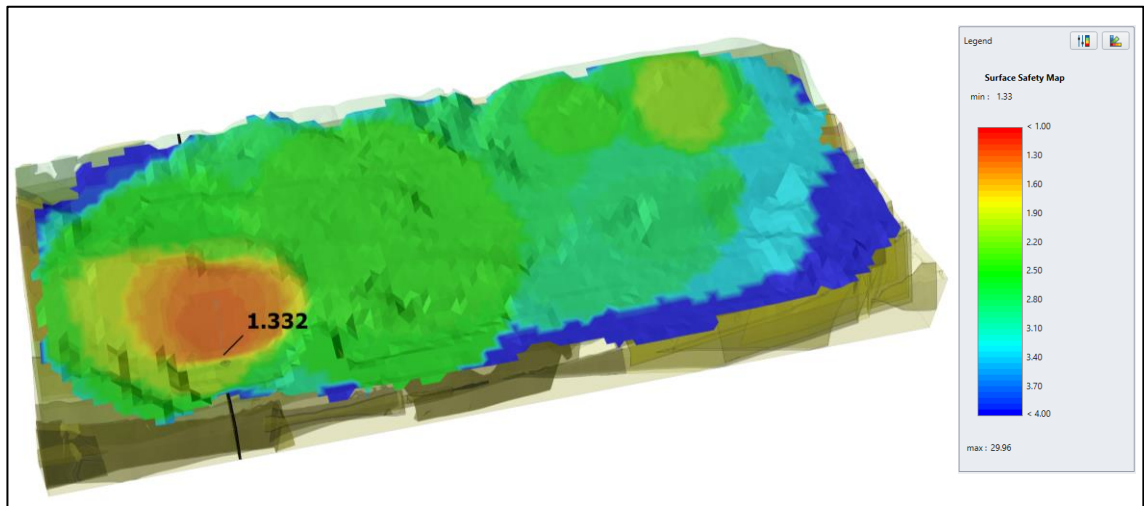
4. Kondisi dengan durasi infiltrasi hujan selama 4 jam



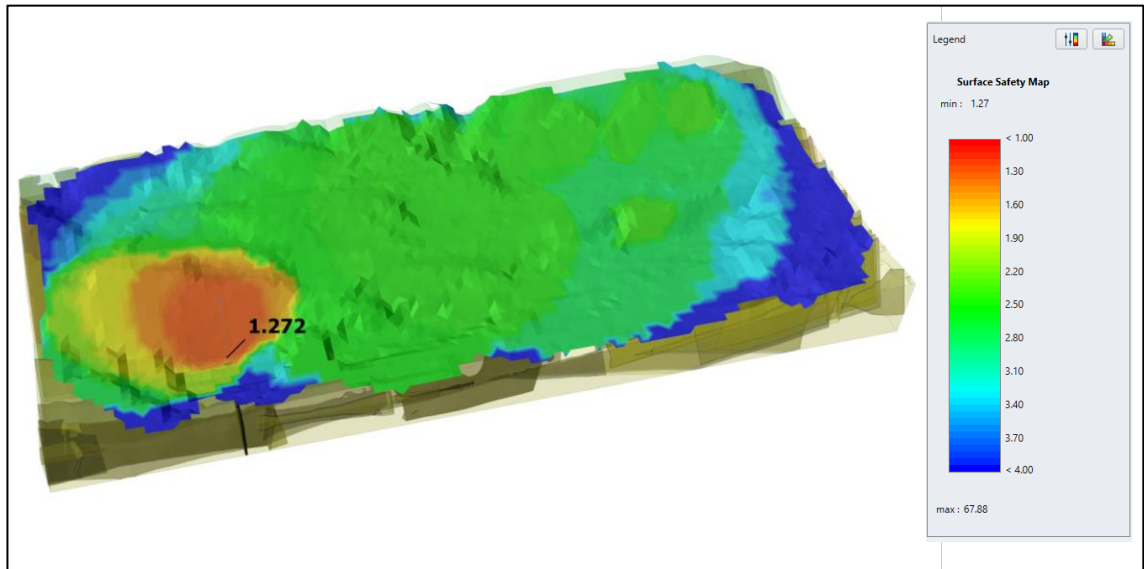
5. Kondisi dengan durasi infiltrasi hujan selama 6 jam



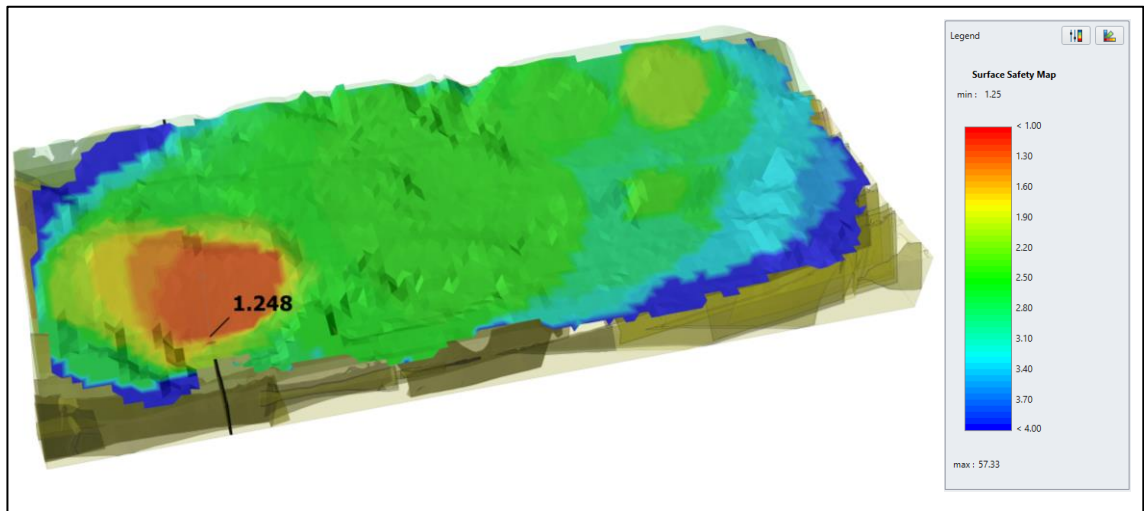
6. Kondisi dengan durasi infiltrasi hujan selama 8 jam



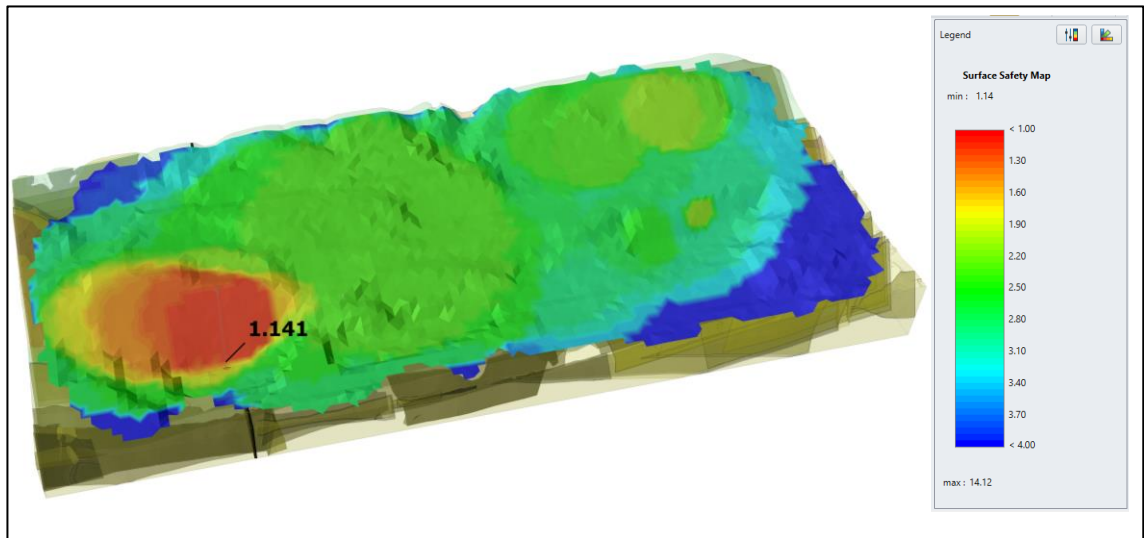
7. Kondisi dengan durasi infiltrasi hujan selama 10 jam



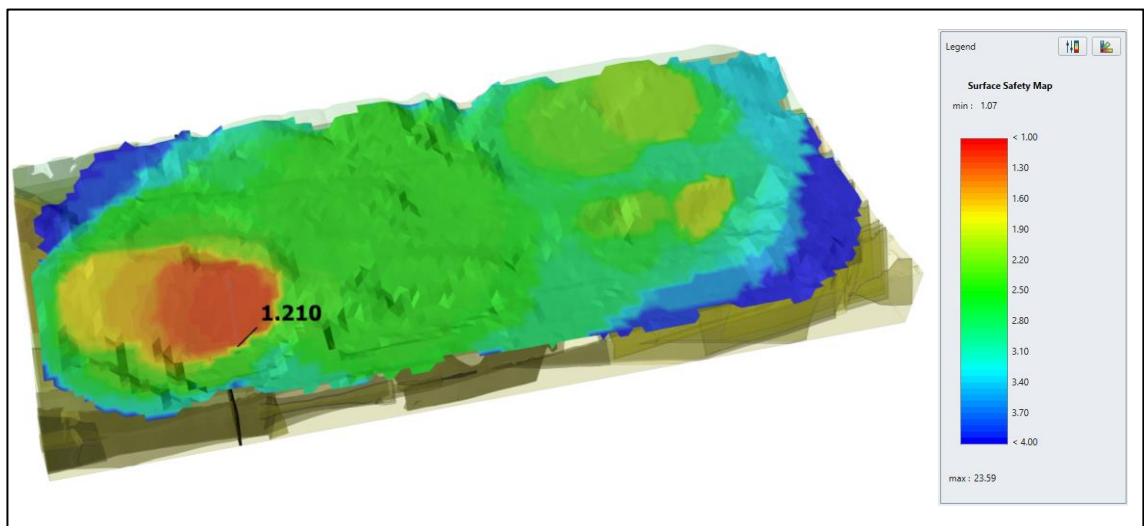
8. Kondisi dengan durasi infiltrasi hujan selama 12 jam



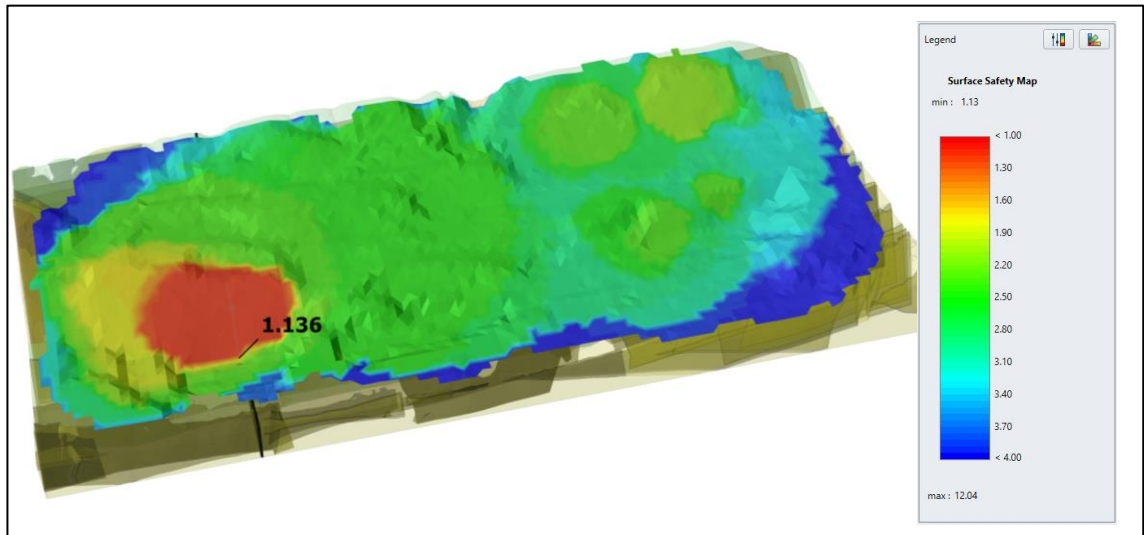
9. Kondisi dengan durasi infiltrasi hujan selama 14 jam



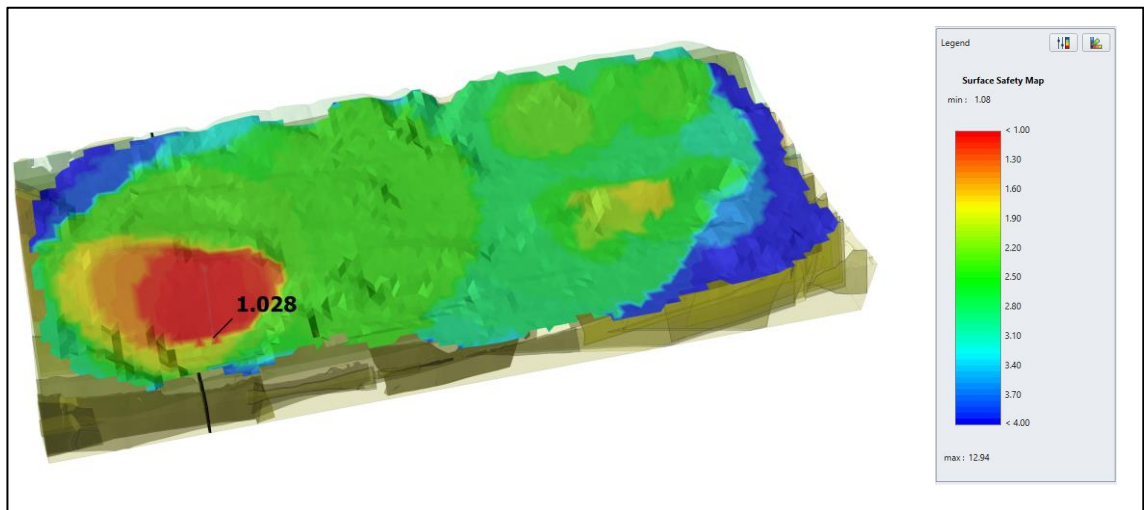
10. Kondisi dengan durasi infiltrasi hujan selama 16 jam



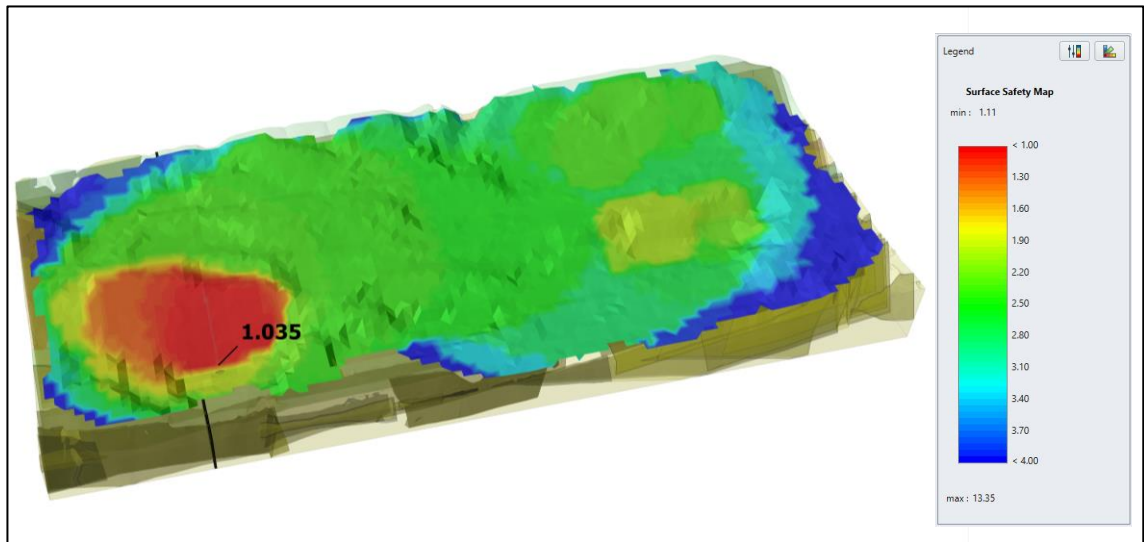
11. Kondisi dengan durasi infiltrasi hujan selama 18 jam



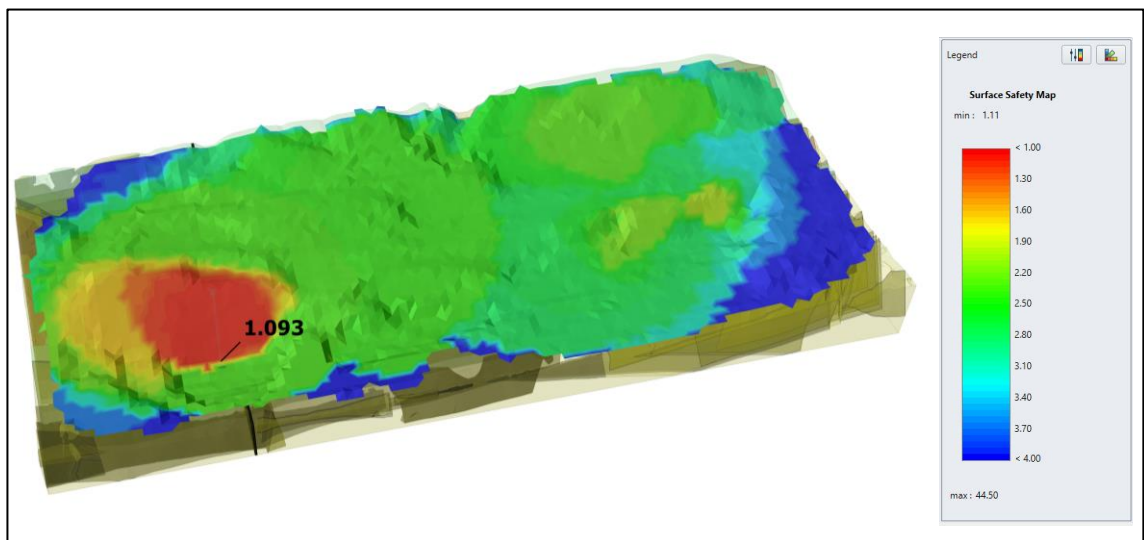
12. Kondisi dengan durasi infiltrasi hujan selama 20 jam



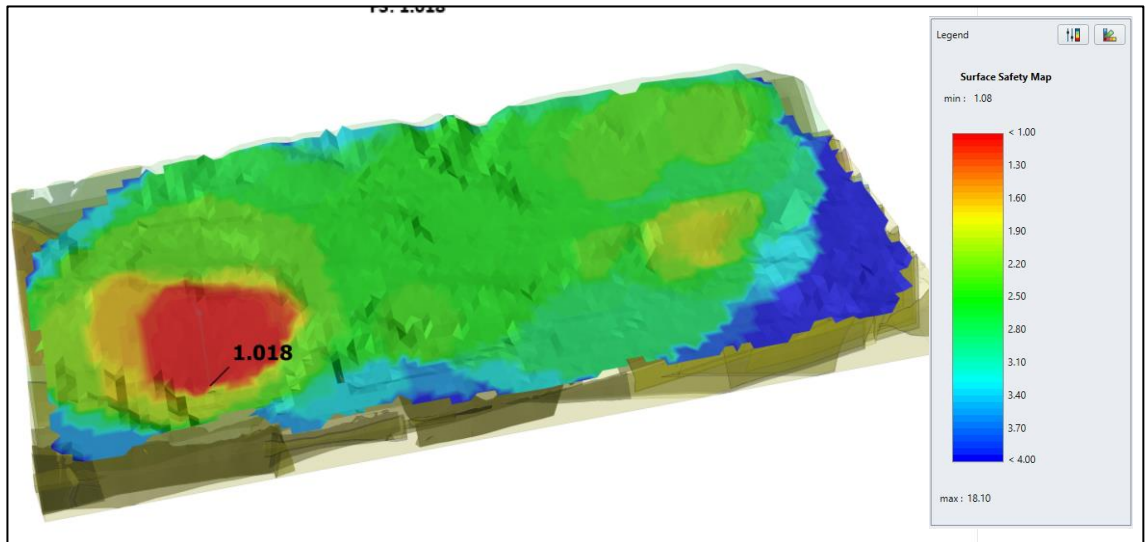
13. Kondisi dengan durasi infiltrasi hujan selama 22 jam



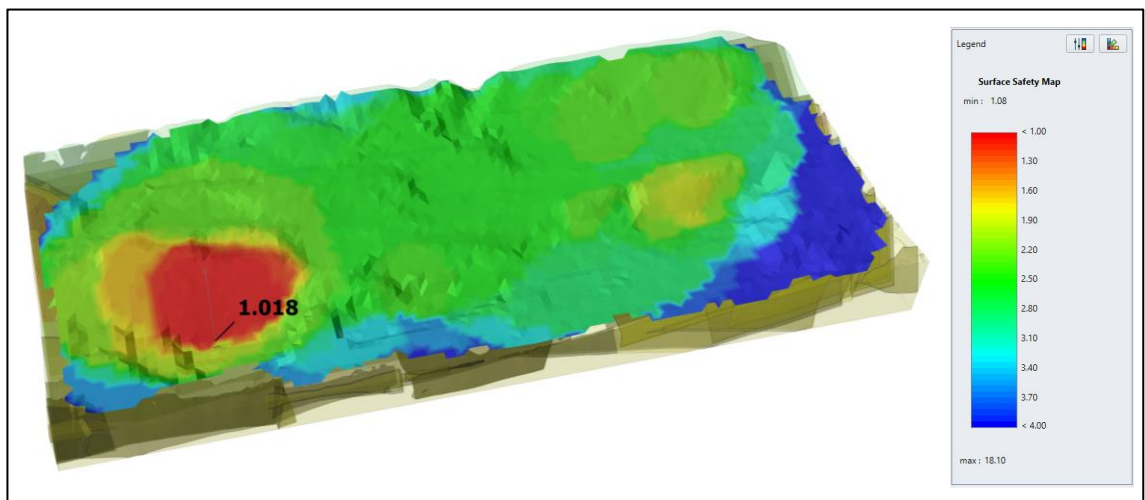
14. Kondisi dengan durasi infiltrasi hujan selama 24 jam



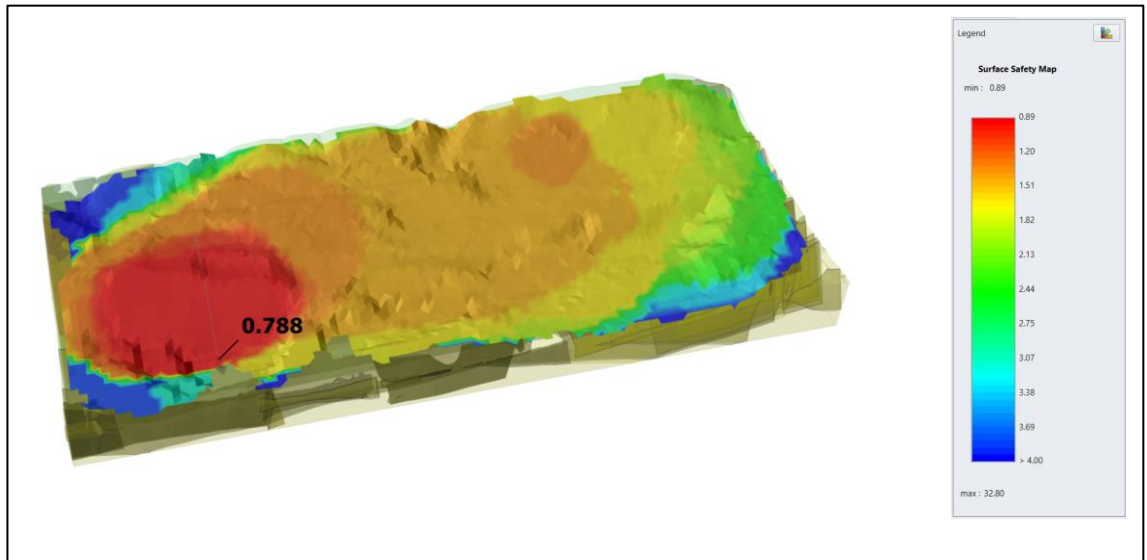
15. Kondisi dengan durasi infiltrasi hujan selama 48 jam



16. Kondisi dengan durasi infiltrasi hujan selama 72 jam



17. Kondisi Jenuh









## Lampiran G Kartu Konsultasi Tugas Akhir

### Lampiran B 10

#### Kartu Konsultasi Tugas Akhir

**JUDUL:** Analisis perbandingan kestabilan lereng jenuh dan lereng tidak jenuh yang dipengaruhi infiltrasi hujan

(Konsultasi minimal 8 kali)

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
7-Nov-22	<ul style="list-style-type: none"><li>Perbaikan penulisan</li><li>Tambahan pembahasan BAB IV</li><li>Kelengkapan artikel &amp; poster</li></ul>	
14-Nov-22	<ul style="list-style-type: none"><li>Perbaikan penulisan</li><li>Perbaikan penyajian gambar</li></ul>	
25-Nov-2022	<ul style="list-style-type: none"><li>Perbaikan Abstrak</li><li>Perbaikan penyajian kalimat yang informatif</li><li>Perbaikan salah ketik</li></ul>	
29-Nov-2022	<ul style="list-style-type: none"><li>Perbaikan isi/pembahasan</li><li>Perbaikan Draft keseluruhan</li><li>Kelengkapan poster &amp; artikel</li></ul>	

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
5 - Des - 2022	<ul style="list-style-type: none"> <li>• Artikel</li>   <li>• Bab I - Bab V</li> <li>• Artikel</li> </ul>	