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LAMPIRAN

Lampiran 1. Hasil Sondir Titik S.04

PT. BRANTAS KONSULTAN INDONESIA

• Arsitektur • Engenering • Konsultan • Perijinan
• Geoteknik • Uji Laboratorium • Topo grafi

PROJECT	Pembangunan Cretya Sunset		Page
SITE	Jl. Raya Bresela Payangan		
LOCATION	Gianyar		
ELEVATION ABOVE MSL(m)		Coordinate UTM	
BORE HOLE NO.	S.04	DEPTH OF GWL (m)	
Machine Type	GOUDA	Date	6 September 2023
Max. Capacity	2.5 Tons	Operator	
Manometer type	0-25,0-60,0-250 kg/cm2	Rate of Penetration(mm/second)	20
A_{pc}	1	(A_{ps})	0.09

Rod-Weight Corr. Factors	A-Factor	0.138	B-Factor	0.22	C-Factor	0.0124	D-Factor	0.023

Depth d (m)	qc (kg/cm2)	T_f (kg/cm2)	K_w T_w-C_w (kg/cm2)	q_c $C_w.A_{pc}$.98 (kPa)	f_s $K_w.A_{ps}$.98 (kPa)	q_{c-c} q_c+(A.d+B).98 (kPa)	f_{s-c} f_s+(C.d+D).98 (kPa)	L_f f_{s-c}X 0.2 (kN/m)	T_f Σf_{s-c} (kN/m)	R_f (f_{s-c}/q_{c-c}) X100 (%)
0.00	0.00	0.00								
0.20	10.00	15.00	5.00	980	43.961	1004.265	46.458	9.292	9.292	4.626
0.40	15.00	20.00	5.00	1470	43.961	1496.970	46.701	9.340	18.632	3.120
0.60	25.00	30.00	5.00	2450	43.961	2479.674	46.944	9.389	28.021	1.893
0.80	35.00	40.00	5.00	3430	43.961	3462.379	47.187	9.437	37.458	1.363
1.00	55.00	60.00	5.00	5390	43.961	5425.084	47.430	9.486	46.944	0.874
1.20	45.00	50.00	5.00	4410	43.961	4447.789	47.673	9.535	56.479	1.072
1.40	40.00	45.00	5.00	3920	43.961	3960.494	47.916	9.583	66.062	1.210
1.60	30.00	35.00	5.00	2940	43.961	2983.198	48.159	9.632	75.694	1.614
1.80	25.00	30.00	5.00	2450	43.961	2495.903	48.402	9.680	85.374	1.939
2.00	20.00	25.00	5.00	1960	43.961	2008.608	48.645	9.729	95.103	2.422
2.20	17.00	22.00	5.00	1666	43.961	1717.313	48.888	9.778	104.881	2.847
2.40	20.00	25.00	5.00	1960	43.961	2014.018	49.131	9.826	114.707	2.439
2.60	22.00	27.00	5.00	2156	43.961	2212.722	49.375	9.875	124.582	2.231
2.80	25.00	30.00	5.00	2450	43.961	2509.427	49.618	9.924	134.506	1.977
3.00	25.00	30.00	5.00	2450	43.961	2512.132	49.861	9.972	144.478	1.985
3.20	20.00	25.00	5.00	1960	43.961	2024.837	50.104	10.021	154.499	2.474
3.40	22.00	27.00	5.00	2156	43.961	2223.542	50.347	10.069	164.568	2.264
3.60	25.00	30.00	5.00	2450	43.961	2520.246	50.590	10.118	174.686	2.007
3.80	30.00	35.00	5.00	2940	43.961	3012.951	50.833	10.167	184.852	1.687
4.00	40.00	45.00	5.00	3920	43.961	3995.656	51.076	10.215	195.068	1.278

Remarks/Sketch

Approved by Engineer

Lampiran 1. (Lanjutan)

Depth d (m)	qc (kg/cm2)	T_f (kg/cm2)	K_w T_w-C_w (kg/cm2)	q_c $C_w.A_{pc}$.98 (kPa)	f_s $K_w.A_{ps}$.98 (kPa)	$q_{c\text{-}c}$ q_c+(A.d+B).98 (kPa)	$f_{s\text{-}c}$ f_s+(C.d+D).98 (kPa)	L_f $f_{s\text{-}c}$X 0.2 (kN/m)	T_f $\Sigma f_{s\text{-}c}$ (kN/m)	R_f $(f_{s\text{-}c}/q_{c\text{-}c})$ X100 (%)
4.20	35.00	40.00	5.00	3430	43.961	3508.361	51.319	10.264	205.331	1.463
4.40	25.00	30.00	5.00	2450	43.961	2531.066	51.562	10.312	215.644	2.037
4.60	30.00	35.00	5.00	2940	43.961	3023.770	51.805	10.361	226.005	1.713
4.80	40.00	45.00	5.00	3920	43.961	4006.475	52.048	10.410	236.414	1.299
5.00	45.00	50.00	5.00	4410	43.961	4499.180	52.291	10.458	246.873	1.162
5.20	50.00	55.00	5.00	4900	43.961	4991.885	52.534	10.507	257.379	1.052
5.40	55.00	60.00	5.00	5390	43.961	5484.590	52.777	10.555	267.935	0.962
5.60	30.00	35.00	5.00	2940	43.961	3037.294	53.020	10.604	278.539	1.746
5.80	32.00	37.00	5.00	3136	43.961	3235.999	53.263	10.653	289.191	1.646
6.00	45.00	50.00	5.00	4410	43.961	4512.704	53.506	10.701	299.893	1.186
6.20	30.00	35.00	5.00	2940	43.961	3045.409	53.749	10.750	310.643	1.765
6.40	40.00	45.00	5.00	3920	43.961	4028.114	53.992	10.798	321.441	1.340
6.60	95.00	100.00	5.00	9310	43.961	9420.818	54.235	10.847	332.288	0.576
6.80	85.00	90.00	5.00	8330	43.961	8443.523	54.478	10.896	343.184	0.645
7.00	70.00	75.00	5.00	6860	43.961	6976.228	54.721	10.944	354.128	0.784
7.20	60.00	65.00	5.00	5880	43.961	5998.933	54.964	10.993	365.121	0.916
7.40	40.00	45.00	5.00	3920	43.961	4041.638	55.207	11.041	376.162	1.366
7.60	45.00	50.00	5.00	4410	43.961	4534.342	55.451	11.090	387.252	1.223
7.80	50.00	55.00	5.00	4900	43.961	5027.047	55.694	11.139	398.391	1.108
8.00	55.00	60.00	5.00	5390	43.961	5519.752	55.937	11.187	409.579	1.013
8.20	65.00	70.00	5.00	6370	43.961	6502.457	56.180	11.236	420.814	0.864
8.40	70.00	75.00	5.00	6860	43.961	6995.162	56.423	11.285	432.099	0.807
8.60	55.00	60.00	5.00	5390	43.961	5527.866	56.666	11.333	443.432	1.025
8.80	55.00	60.00	5.00	5390	43.961	5530.571	56.909	11.382	454.814	1.029
9.00	60.00	65.00	5.00	5880	43.961	6023.276	57.152	11.430	466.244	0.949
9.20	50.00	55.00	5.00	4900	43.961	5045.981	57.395	11.479	477.723	1.137
9.40	65.00	70.00	5.00	6370	43.961	6518.686	57.638	11.528	489.251	0.884
9.60	60.00	65.00	5.00	5880	43.961	6031.390	57.881	11.576	500.827	0.960
9.80	75.00	80.00	5.00	7350	43.961	7504.095	58.124	11.625	512.452	0.775
10.00	85.00	90.00	5.00	8330	43.961	8486.800	58.367	11.673	524.125	0.688
10.20	75.00	80.00	5.00	7350	43.961	7509.505	58.610	11.722	535.847	0.780
10.40	80.00	85.00	5.00	7840	43.961	8002.210	58.853	11.771	547.618	0.735
10.60	90.00	95.00	5.00	8820	43.961	8984.914	59.096	11.819	559.437	0.658
10.80	85.00	90.00	5.00	8330	43.961	8497.619	59.339	11.868	571.305	0.698
11.00	65.00	70.00	5.00	6370	43.961	6540.324	59.582	11.916	583.221	0.911
11.20	55.00	60.00	5.00	5390	43.961	5563.029	59.825	11.965	595.186	1.075
11.40	50.00	55.00	5.00	4900	43.961	5075.734	60.068	12.014	607.200	1.183
11.60	65.00	70.00	5.00	6370	43.961	6548.438	60.311	12.062	619.262	0.921
11.80	70.00	75.00	5.00	6860	43.961	7041.143	60.554	12.111	631.373	0.860
12.00	60.00	65.00	5.00	5880	43.961	6063.848	60.797	12.159	643.533	1.003

Remarks/Sketch

Lampiran 1. (Lanjutan)

Depth d (m)	qc (kg/cm2)	T_f (kg/cm2)	K_w T_w-C_w (kg/cm2)	q_c $C_w.A_{pc}.98$ (kPa)	f_s $K_w.A_{ps}.98$ (kPa)	q_{c-c} q_c+(A.d +B).98 (kPa)	f_{s-c} f_s+(C.d +D).98 (kPa)	L_f f_{s-c}X 0.2 (kN/m)	T_f Σf_{s-c} (kN/m)	R_f (f_{s-c}/q_{c-c}) X100 (%)
12.20	50.00	55.00	5.00	4900	43.961	5086.553	61.040	12.208	655.741	1.200
12.40	70.00	75.00	5.00	6860	43.961	7049.258	61.283	12.257	667.997	0.869
12.60	145.00	150.00	5.00	14210	43.961	14401.962	61.527	12.305	680.303	0.427
12.80	125.00	130.00	5.00	12250	43.961	12444.667	61.770	12.354	692.657	0.496
13.00	80.00	85.00	5.00	7840	43.961	8037.372	62.013	12.403	705.059	0.772
13.20	65.00	70.00	5.00	6370	43.961	6570.077	62.256	12.451	717.510	0.948
13.40	50.00	55.00	5.00	4900	43.961	5102.782	62.499	12.500	730.010	1.225
13.60	60.00	65.00	5.00	5880	43.961	6085.486	62.742	12.548	742.558	1.031
13.80	90.00	95.00	5.00	8820	43.961	9028.191	62.985	12.597	755.155	0.698
14.00	115.00	120.00	5.00	11270	43.961	11480.896	63.228	12.646	767.801	0.551
14.20	130.00	135.00	5.00	12740	43.961	12953.601	63.471	12.694	780.495	0.490
14.40	110.00	115.00	5.00	10780	43.961	10996.306	63.714	12.743	793.238	0.579
14.60	165.00	170.00	5.00	16170	43.961	16389.010	63.957	12.791	806.029	0.390
14.80	200.00	200.00	0.00	19600	0.000	19821.715	20.239	4.048	810.077	0.102
15.00	250.00	250.00	0.00	24500	0.000	24724.420	20.482	4.096	814.173	0.083
15.20										
15.40										
15.60										
15.80										
16.00										
16.20										
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19.20										
19.40										
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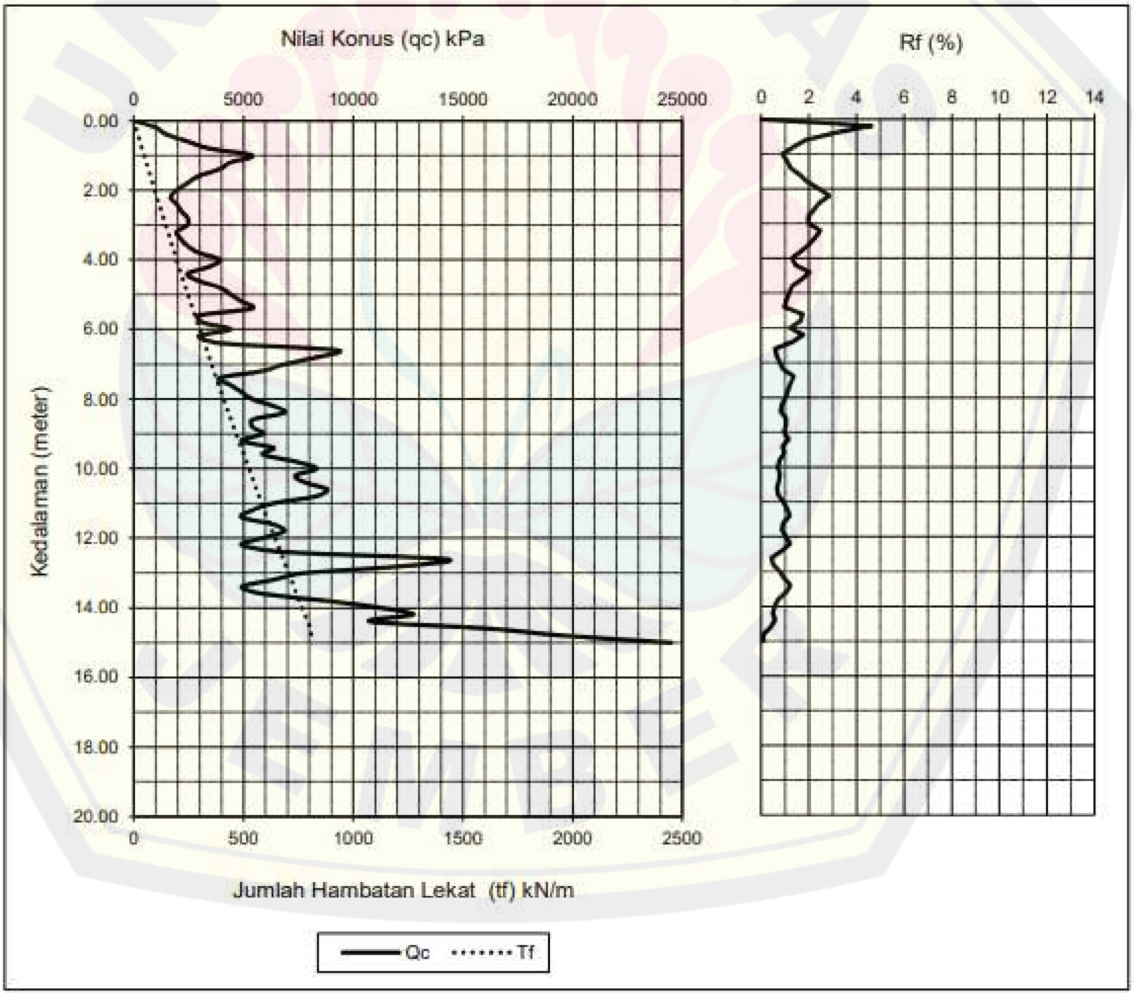
19.80										
20.00										
Remarks/Sketch										

Lampiran 1. (Lanjutan)

PT. BRANTAS KONSULTAN INDONESIA

• Arsitektur • Engenering • Konsultan • Perijinan • Geoteknik • Uji Laboratorium • Topo grafi

PROJECT	Pembangunan Cretya Sunset							Page
SITE	Jl. Raya Bresela Payangan							
LOCATION	Gianyar							
ELEVATION ABOVE MSL(m)			Coordinate UTM					
BORE HOLE NO.	S.04		DEPTH OF GWL (m)					
Machine Type	GOUDA		Date	6 September 2023				
Max. Capacity	2.5 Tons		Operator					
Manometer type	0-25,0-60,0-250 kg/cm2		Rate of Penetration(mm/second)				20	
Piston/Cone Area Ratio (A_{pc})		1	Piston/Sleeve Area Ratio (A_{ps})				0.09	
Rod-Weight Corr. Factors	A-Factor	0.138	B-Factor	0.22	C-Factor	0.0124	D-Factor	0.023



Lampiran 2. Hasil Sondir Titik S.05

PT. BRANTAS KONSULTAN INDONESIA

• Arsitektur • Engenering • Konsultan • Perijinan • Geoteknik • Uji Laboratorium • Topo grafi

PROJECT	Pembangunan Cretya Sunset		Page
SITE	Jl. Raya Bresela Payangan		
LOCATION	Gianyar		
ELEVATION ABOVE MSL(m)		Coordinate UTM	
BORE HOLE NO.	S.05	DEPTH OF GWL (m)	
Machine Type	GOUDA	Date	6 September 2023
Max. Capacity	2.5 Tons	Operator	
Manometer type	0-25,0-60,0-250 kg/cm2	Rate of Penetration(mm/second)	20
A_{pc}	1	(A_{ps})	0.09

Rod-Weight Corr. Factors	A-Factor	0.138	B-Factor	0.22	C-Factor	0.0124	D-Factor	0.023

Depth d (m)	qc (kg/cm2)	T_f (kg/cm2)	K_w T_w-C_w (kg/cm2)	q_c $C_w.A_{pc}$.98 (kPa)	f_s $K_w.A_{ps}$.98 (kPa)	q_{c-c} q_c+(A.d+B).98 (kPa)	f_{s-c} f_s+(C.d+D).98 (kPa)	L_f f_{s-c}X 0.2 (kN/m)	T_f Σf_{s-c} (kN/m)	R_f (f_{s-c}/q_{c-c}) X100 (%)
0.00	0.00	0.00								
0.20	10.00	15.00	5.00	980	43.961	1004.265	46.458	9.292	9.292	4.626
0.40	20.00	25.00	5.00	1960	43.961	1986.970	46.701	9.340	18.632	2.350
0.60	25.00	30.00	5.00	2450	43.961	2479.674	46.944	9.389	28.021	1.893
0.80	35.00	40.00	5.00	3430	43.961	3462.379	47.187	9.437	37.458	1.363
1.00	45.00	50.00	5.00	4410	43.961	4445.084	47.430	9.486	46.944	1.067
1.20	30.00	35.00	5.00	2940	43.961	2977.789	47.673	9.535	56.479	1.601
1.40	35.00	40.00	5.00	3430	43.961	3470.494	47.916	9.583	66.062	1.381
1.60	32.00	37.00	5.00	3136	43.961	3179.198	48.159	9.632	75.694	1.515
1.80	25.00	30.00	5.00	2450	43.961	2495.903	48.402	9.680	85.374	1.939
2.00	30.00	35.00	5.00	2940	43.961	2988.608	48.645	9.729	95.103	1.628
2.20	25.00	30.00	5.00	2450	43.961	2501.313	48.888	9.778	104.881	1.955
2.40	20.00	25.00	5.00	1960	43.961	2014.018	49.131	9.826	114.707	2.439
2.60	22.00	27.00	5.00	2156	43.961	2212.722	49.375	9.875	124.582	2.231
2.80	17.00	22.00	5.00	1666	43.961	1725.427	49.618	9.924	134.506	2.876
3.00	20.00	25.00	5.00	1960	43.961	2022.132	49.861	9.972	144.478	2.466
3.20	22.00	27.00	5.00	2156	43.961	2220.837	50.104	10.021	154.499	2.256
3.40	25.00	30.00	5.00	2450	43.961	2517.542	50.347	10.069	164.568	2.000
3.60	30.00	35.00	5.00	2940	43.961	3010.246	50.590	10.118	174.686	1.681
3.80	27.00	32.00	5.00	2646	43.961	2718.951	50.833	10.167	184.852	1.870
4.00	35.00	40.00	5.00	3430	43.961	3505.656	51.076	10.215	195.068	1.457

Remarks/Sketch

Approved by Engineer

Lampiran 2. (Lanjutan)

Depth d (m)	qc (kg/cm2)	T_f (kg/cm2)	K_w T_w-C_w (kg/cm2)	q_c $C_w.A_{pc}.98$ (kPa)	f_s $K_w.A_{ps}.98$ (kPa)	$q_{c\text{-}c}$ q_c+(A.d+B).98 (kPa)	$f_{s\text{-}c}$ f_s+(C.d+D).98 (kPa)	L_f $f_{s\text{-}c}$X 0.2 (kN/m)	T_f $\Sigma f_{s\text{-}c}$ (kN/m)	R_f ($f_{s\text{-}c}/q_{c\text{-}c}$) X100 (%)
4.20	35.00	40.00	5.00	3430	43.961	3508.361	51.319	10.264	205.331	1.463
4.40	25.00	30.00	5.00	2450	43.961	2531.066	51.562	10.312	215.644	2.037
4.60	30.00	35.00	5.00	2940	43.961	3023.770	51.805	10.361	226.005	1.713
4.80	50.00	55.00	5.00	4900	43.961	4986.475	52.048	10.410	236.414	1.044
5.00	45.00	50.00	5.00	4410	43.961	4499.180	52.291	10.458	246.873	1.162
5.20	50.00	55.00	5.00	4900	43.961	4991.885	52.534	10.507	257.379	1.052
5.40	55.00	60.00	5.00	5390	43.961	5484.590	52.777	10.555	267.935	0.962
5.60	35.00	40.00	5.00	3430	43.961	3527.294	53.020	10.604	278.539	1.503
5.80	30.00	35.00	5.00	2940	43.961	3039.999	53.263	10.653	289.191	1.752
6.00	45.00	50.00	5.00	4410	43.961	4512.704	53.506	10.701	299.893	1.186
6.20	65.00	70.00	5.00	6370	43.961	6475.409	53.749	10.750	310.643	0.830
6.40	55.00	60.00	5.00	5390	43.961	5498.114	53.992	10.798	321.441	0.982
6.60	60.00	65.00	5.00	5880	43.961	5990.818	54.235	10.847	332.288	0.905
6.80	75.00	80.00	5.00	7350	43.961	7463.523	54.478	10.896	343.184	0.730
7.00	50.00	55.00	5.00	4900	43.961	5016.228	54.721	10.944	354.128	1.091
7.20	40.00	45.00	5.00	3920	43.961	4038.933	54.964	10.993	365.121	1.361
7.40	35.00	40.00	5.00	3430	43.961	3551.638	55.207	11.041	376.162	1.554
7.60	45.00	50.00	5.00	4410	43.961	4534.342	55.451	11.090	387.252	1.223
7.80	50.00	55.00	5.00	4900	43.961	5027.047	55.694	11.139	398.391	1.108
8.00	65.00	70.00	5.00	6370	43.961	6499.752	55.937	11.187	409.579	0.861
8.20	70.00	75.00	5.00	6860	43.961	6992.457	56.180	11.236	420.814	0.803
8.40	50.00	55.00	5.00	4900	43.961	5035.162	56.423	11.285	432.099	1.121
8.60	55.00	60.00	5.00	5390	43.961	5527.866	56.666	11.333	443.432	1.025
8.80	50.00	55.00	5.00	4900	43.961	5040.571	56.909	11.382	454.814	1.129
9.00	55.00	60.00	5.00	5390	43.961	5533.276	57.152	11.430	466.244	1.033
9.20	45.00	50.00	5.00	4410	43.961	4555.981	57.395	11.479	477.723	1.260
9.40	60.00	65.00	5.00	5880	43.961	6028.686	57.638	11.528	489.251	0.956
9.60	75.00	80.00	5.00	7350	43.961	7501.390	57.881	11.576	500.827	0.772
9.80	70.00	75.00	5.00	6860	43.961	7014.095	58.124	11.625	512.452	0.829
10.00	80.00	85.00	5.00	7840	43.961	7996.800	58.367	11.673	524.125	0.730
10.20	65.00	70.00	5.00	6370	43.961	6529.505	58.610	11.722	535.847	0.898
10.40	80.00	85.00	5.00	7840	43.961	8002.210	58.853	11.771	547.618	0.735
10.60	90.00	95.00	5.00	8820	43.961	8984.914	59.096	11.819	559.437	0.658
10.80	85.00	90.00	5.00	8330	43.961	8497.619	59.339	11.868	571.305	0.698
11.00	55.00	60.00	5.00	5390	43.961	5560.324	59.582	11.916	583.221	1.072
11.20	60.00	65.00	5.00	5880	43.961	6053.029	59.825	11.965	595.186	0.988
11.40	70.00	75.00	5.00	6860	43.961	7035.734	60.068	12.014	607.200	0.854
11.60	65.00	70.00	5.00	6370	43.961	6548.438	60.311	12.062	619.262	0.921
11.80	85.00	90.00	5.00	8330	43.961	8511.143	60.554	12.111	631.373	0.711
12.00	105.00	110.00	5.00	10290	43.961	10473.848	60.797	12.159	643.533	0.580

Remarks/Sketch

Lampiran 2. (Lanjutan)

Depth d (m)	qc (kg/cm2)	T_f (kg/cm2)	K_w T_w-C_w (kg/cm2)	q_c $C_w.A_{pc}.98$ (kPa)	f_s $K_w.A_{ps}.98$ (kPa)	$q_{c\text{-}c}$ q_c+(A.d+B).98 (kPa)	$f_{s\text{-}c}$ f_s+(C.d+D).98 (kPa)	L_f $f_{s\text{-}c}$X 0.2 (kN/m)	T_f $\Sigma f_{s\text{-}c}$ (kN/m)	R_f ($f_{s\text{-}c}/q_{c\text{-}c}$) X100 (%)
12.20	125.00	130.00	5.00	12250	43.961	12436.553	61.040	12.208	655.741	0.491
12.40	85.00	90.00	5.00	8330	43.961	8519.258	61.283	12.257	667.997	0.719
12.60	80.00	85.00	5.00	7840	43.961	8031.962	61.527	12.305	680.303	0.766
12.80	65.00	70.00	5.00	6370	43.961	6564.667	61.770	12.354	692.657	0.941
13.00	55.00	60.00	5.00	5390	43.961	5587.372	62.013	12.403	705.059	1.110
13.20	60.00	65.00	5.00	5880	43.961	6080.077	62.256	12.451	717.510	1.024
13.40	85.00	90.00	5.00	8330	43.961	8532.782	62.499	12.500	730.010	0.732
13.60	90.00	95.00	5.00	8820	43.961	9025.486	62.742	12.548	742.558	0.695
13.80	100.00	105.00	5.00	9800	43.961	10008.191	62.985	12.597	755.155	0.629
14.00	125.00	130.00	5.00	12250	43.961	12460.896	63.228	12.646	767.801	0.507
14.20	135.00	140.00	5.00	13230	43.961	13443.601	63.471	12.694	780.495	0.472
14.40	200.00	200.00	0.00	19600	0.000	19816.306	19.753	3.951	784.446	0.100
14.60	205.00	208.00	3.00	20090	26.377	20309.010	46.373	9.275	793.720	0.228
14.80	210.00	212.00	2.00	20580	17.584	20801.715	37.823	7.565	801.285	0.182
15.00	250.00	250.00	0.00	24500	0.000	24724.420	20.482	4.096	805.381	0.083
15.20										
15.40										
15.60										
15.80										
16.00										
16.20										
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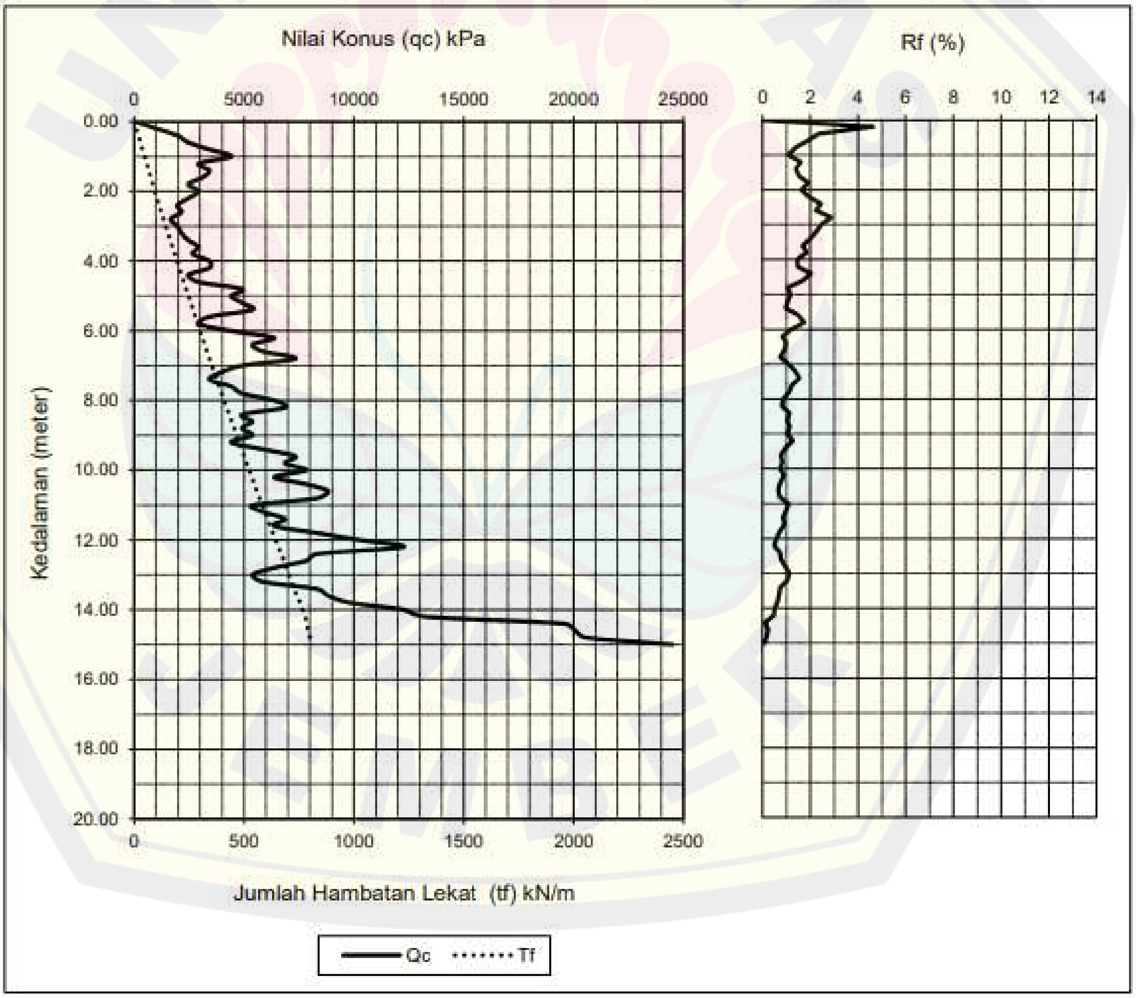
19.20										
19.40										
19.60										
19.80										
20.00										
Remarks/Sketch										

Lampiran 2. (Lanjutan)

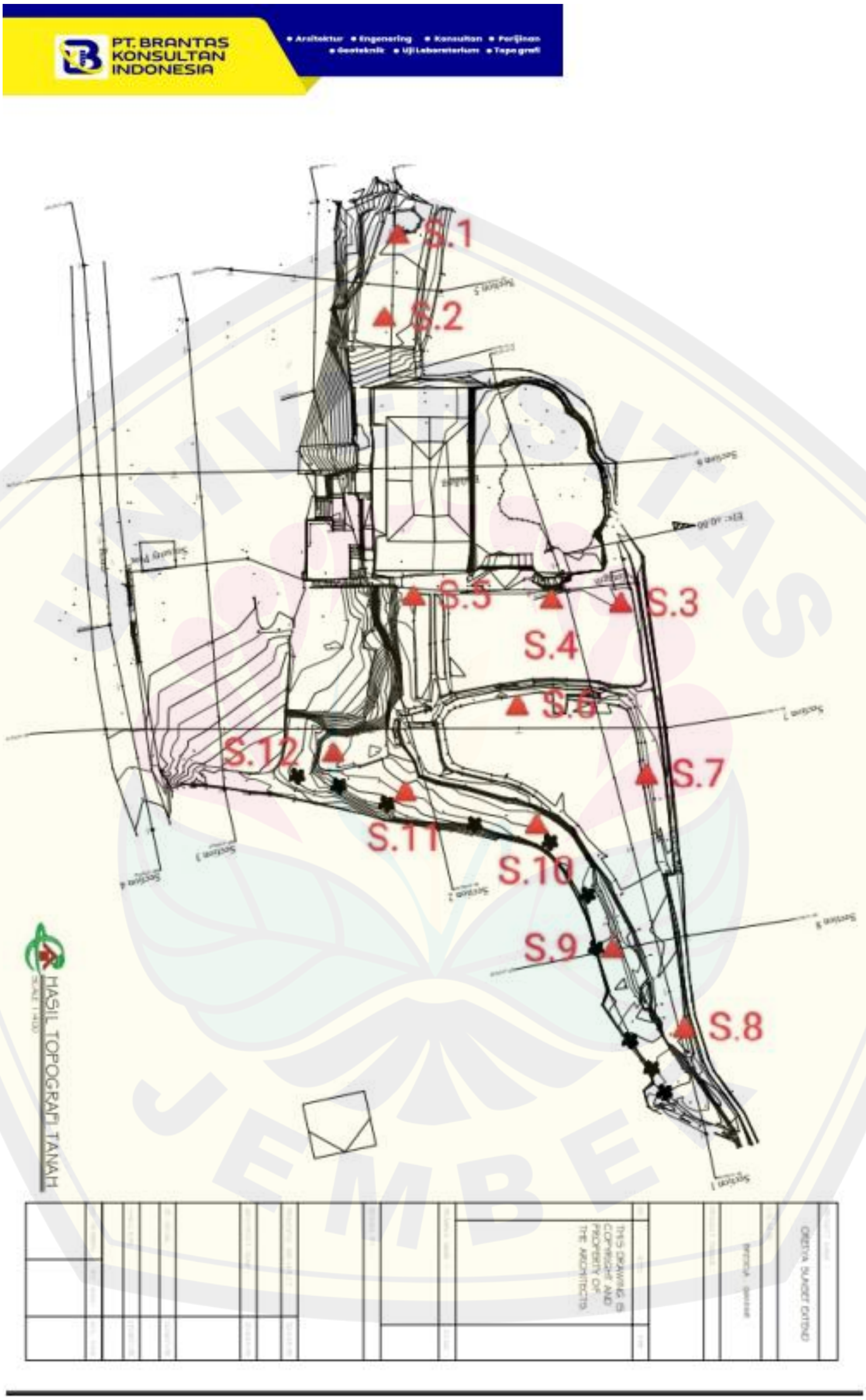
PT. BRANTAS KONSULTAN INDONESIA

● Arsitektur ● Engenering ● Konsultan ● Perijinan ● Geoteknik ● Uji Laboratorium ● Topo grafi

PROJECT	Pembangunan Cretya Sunset						Page
SITE	Jl. Raya Bresela Payangan						
LOCATION	Gianyar						
ELEVATION ABOVE MSL(m)		Coordinate UTM					
BORE HOLE NO.	S.05	DEPTH OF GWL (m)					
Machine Type	GOUDA	Date	6 September 2023				
Max. Capacity	2.5 Tons	Operator					
Manometer type	0-25,0-60,0-250 kg/cm2	Rate of Penetration(mm/second)				20	
Piston/Cone Area Ratio (A_{pc})	1	Piston/Sleeve Area Ratio (A_{ps})				0.09	
Rod-Weight Corr. Factors	A-Factor 0.138	B-Factor	0.22	C-Factor	0.0124	D-Factor	0.023

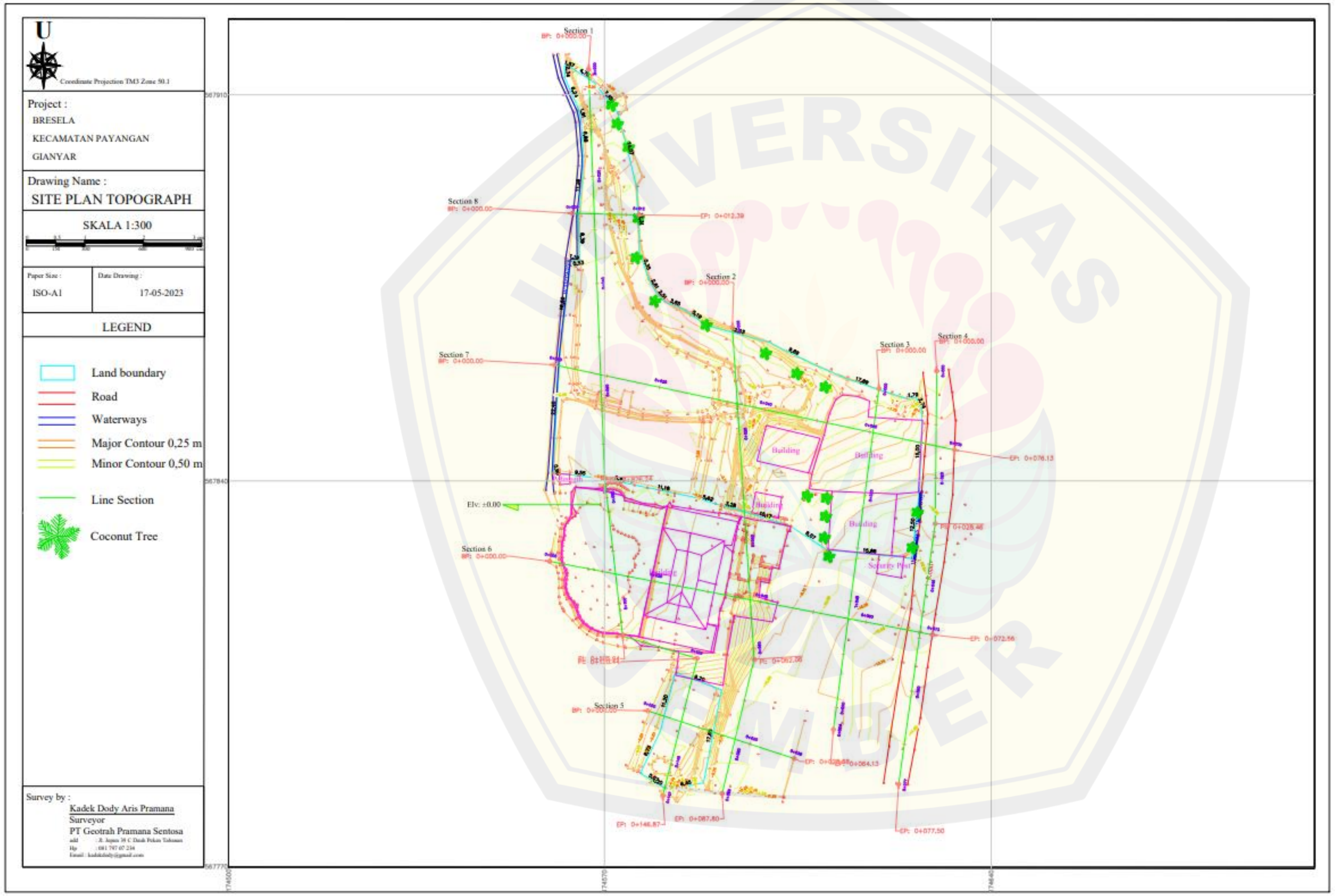


Lampiran 3. Layout Titik Sondir

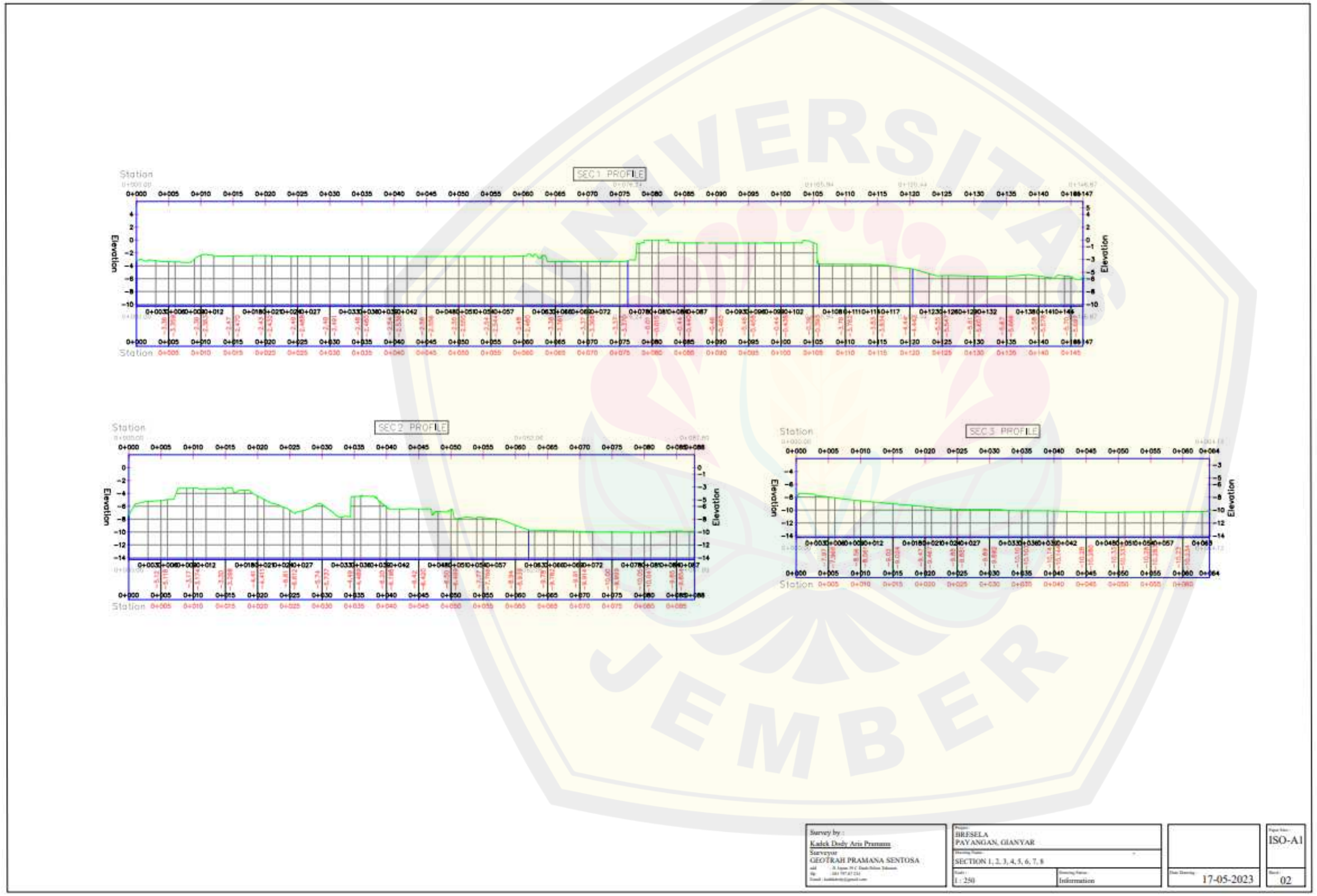


Lampiran 4. Site Plan Topografi

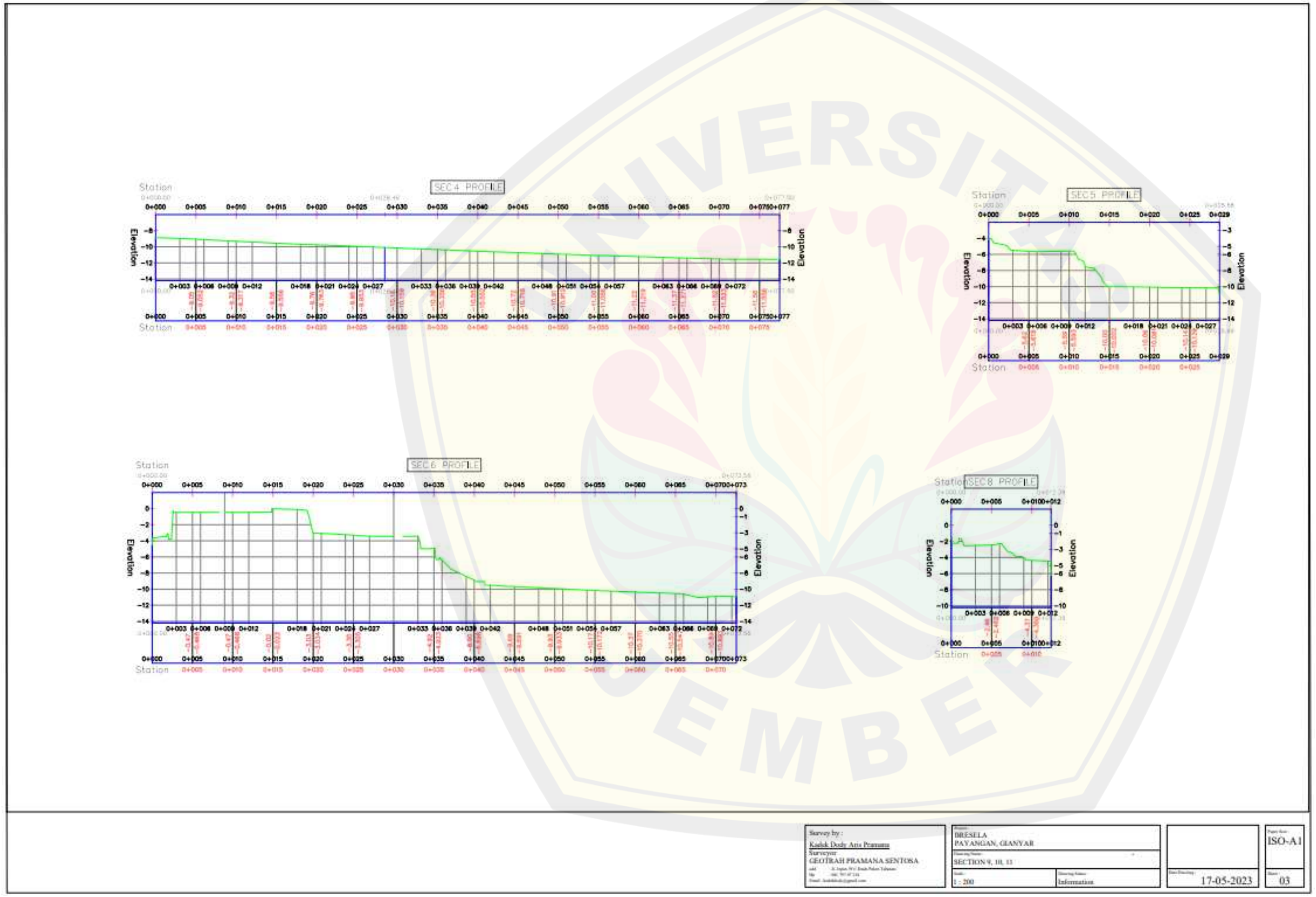
Lampiran 4. (Lanjutan)



Lampiran 5. Section Profile



Lampiran 5. (Lanjutan)



Lampiran 6. Perhitungan Korelasi Parameter Tanah Titik S.04

Local Friction (kg/cm2)	qc (kg/cm2)	Fr (%)	Jenis Tanah	Konsistensi Tanah
0,09	10,00	4,63	Lempung	Stiff
0,19	15,00	3,12	Lanau	Stiff
0,29	25,00	1,89	Lanau	Very Stiff
0,38	35,00	1,36	Lanau	Very Stiff
0,48	55,00	0,87	Lanau	Very Stiff
0,58	45,00	1,07	Lanau	Very Stiff
0,67	40,00	1,21	Lanau	Very Stiff
0,77	30,00	1,90	Lanau	Very Stiff
0,87	25,00	1,94	Lanau	Very Stiff
0,97	20,00	2,42	Lanau	Very Stiff
1,07	17,00	2,85	Lanau	Very Stiff
1,17	20,00	2,44	Lanau	Very Stiff
1,27	22,00	2,23	Lanau	Very Stiff
1,37	25,00	1,98	Lanau	Very Stiff
1,47	25,00	1,98	Lanau	Very Stiff
1,58	20,00	2,47	Lanau	Very Stiff
1,68	22,00	2,26	Lanau	Very Stiff
1,78	25,00	2,01	Lanau	Very Stiff
1,89	30,00	1,69	Lanau	Very Stiff
1,99	40,00	1,28	Lanau	Very Stiff
2,09	35,00	1,46	Lanau	Very Stiff
2,20	25,00	2,04	Lanau	Very Stiff
2,31	30,00	1,71	Lanau	Very Stiff
2,41	40,00	1,30	Lanau	Very Stiff
2,52	45,00	1,16	Lanau	Very Stiff
2,63	50,00	1,05	Lanau	Very Stiff
2,73	55,00	0,96	Lanau	Very Stiff
2,84	30,00	1,75	Lanau	Very Stiff
2,95	32,00	1,65	Lanau	Very Stiff
3,06	45,00	1,19	Lanau	Very Stiff
3,17	30,00	1,76	Lanau	Very Stiff
3,28	40,00	1,34	Lanau	Very Stiff
3,39	95,00	0,58	Pasir	Hard
3,50	85,00	0,65	Pasir	Hard
3,61	70,00	0,78	Pasir	Hard
3,72	60,00	0,92	Pasir	Hard

Local Friction (kg/cm2)	qc (kg/cm2)	Fr (%)	Jenis Tanah	Konsistensi Tanah
3,84	40,00	1,37	Lanau	Hard
3,95	45,00	1,22	Lanau	Hard
4,06	50,00	1,11	Lanau	Hard
4,18	55,00	1,01	Lanau	Hard
4,29	65,00	0,86	Lanau	Hard
4,41	70,00	0,81	Lanau	Hard
4,52	55,00	1,03	Lanau	Hard
4,64	55,00	1,03	Lanau	Hard
4,76	60,00	0,95	Lanau	Hard
4,87	50,00	1,14	Lanau	Hard
4,99	65,00	0,88	Pasir	Hard
5,11	60,00	0,96	Pasir	Hard
5,23	75,00	0,77	Pasir	Hard
5,35	85,00	0,69	Pasir	Hard
5,47	75,00	0,78	Pasir	Hard
5,59	80,00	0,74	Pasir	Hard
5,71	90,00	0,66	Pasir	Hard
5,83	85,00	0,70	Pasir	Hard
5,95	65,00	1,07	Pasir	Hard
6,07	55,00	0,99	Pasir	Hard
6,19	50,00	0,85	Pasir	Hard
6,32	65,00	0,92	Pasir	Hard
6,44	70,00	0,71	Pasir	Hard
6,56	60,00	0,58	Pasir	Hard
6,69	50,00	0,49	Pasir	Hard
6,81	70,00	0,72	Pasir	Hard
6,94	145,00	0,77	Pasir	Hard
7,07	125,00	0,94	Pasir	Hard
7,19	80,00	1,11	Pasir	Hard
7,32	65,00	1,02	Pasir	Hard
7,45	50,00	0,73	Pasir	Hard
7,57	60,00	0,70	Pasir	Hard
7,70	90,00	0,63	Pasir	Hard
7,83	115,00	0,51	Pasir	Hard
7,96	130,00	0,47	Pasir	Hard
8,00	110,00	0,10	Pasir	Hard
8,10	165,00	0,23	Pasir	Hard

Local Friction (kg/cm2)	qc (kg/cm2)	Fr (%)	Jenis Tanah	Konsistensi Tanah
8,17	200,00	0,18	Pasir	Hard
8,21	250,00	0,08	Pasir	Hard

Lampiran 7. Perhitungan Korelasi Parameter Tanah Titik S.05

Local Friction (kg/cm2)	qc (kg/cm2)	Fr (%)	Jenis Tanah	Konsistensi Tanah
0,09	10,00	4,626	Lempung	Stiff
0,19	40,00	1,183	Lanau	Very Stiff
0,29	35,00	1,357	Lanau	Very Stiff
0,38	25,00	1,901	Lanau	Very Stiff
0,48	20,00	2,377	Lanau	Very Stiff
0,58	30,00	1,601	Lanau	Very Stiff
0,67	45,00	1,077	Lanau	Very Stiff
0,77	40,00	1,215	Lanau	Very Stiff
0,87	60,00	0,817	Lanau	Hard
0,97	55,00	0,894	Lanau	Hard
1,07	50,00	0,987	Lanau	Hard
1,17	30,00	1,641	Lanau	Very Stiff
1,27	25,00	1,970	Lanau	Very Stiff
1,37	22,00	2,240	Lanau	Very Stiff
1,47	20,00	2,466	Lanau	Very Stiff
1,58	20,00	2,474	Lanau	Very Stiff
1,68	17,00	2,904	Lanau	Very Stiff
1,78	15,00	3,285	Lanau	Very Stiff
1,89	20,00	2,500	Lanau	Very Stiff
1,99	30,00	1,694	Lanau	Very Stiff
2,09	25,00	2,030	Lanau	Very Stiff
2,20	45,00	1,148	Lanau	Very Stiff
2,31	50,00	1,039	Lanau	Very Stiff
2,41	35,00	1,480	Lanau	Very Stiff
2,52	40,00	1,304	Lanau	Very Stiff
2,63	55,00	0,958	Pasir	Hard
2,73	60,00	0,883	Pasir	Hard
2,84	70,00	0,762	Pasir	Hard
2,95	65,00	0,823	Pasir	Hard
3,06	50,00	1,070	Pasir	Hard
3,17	45,00	1,190	Pasir	Hard
3,28	35,00	1,526	Lanau	Very Stiff
3,39	30,00	1,778	Lanau	Very Stiff
3,50	32,00	1,677	Lanau	Very Stiff
3,61	40,00	1,356	Lanau	Very Stiff
3,72	35,00	1,549	Lanau	Very Stiff
3,84	35,00	1,554	Lanau	Very Stiff
3,95	30,00	1,810	Lanau	Very Stiff

Local Friction (kg/cm2)	qc (kg/cm2)	Fr (%)	Jenis Tanah	Konsistensi Tanah
4,06	25,00	2,161	Lanau	Very Stiff
4,18	35,00	1,571	Lanau	Very Stiff
4,29	35,00	1,577	Lanau	Very Stiff
4,41	40,00	1,391	Lanau	Very Stiff
4,52	42,00	1,332	Lanau	Very Stiff
4,64	55,00	1,029	Lanau	Very Stiff
4,76	45,00	1,255	Lanau	Very Stiff
4,87	55,00	1,037	Pasir	Hard
4,99	60,00	0,956	Pasir	Hard
5,11	65,00	0,888	Pasir	Hard
5,23	60,00	0,963	Pasir	Hard
5,35	70,00	0,832	Pasir	Hard
5,47	65,00	0,898	Pasir	Hard
5,59	80,00	0,735	Pasir	Hard
5,71	80,00	0,738	Pasir	Hard
5,83	85,00	0,698	Pasir	Hard
5,95	90,00	0,663	Pasir	Hard
6,07	95,00	0,631	Pasir	Hard
6,19	85,00	0,706	Pasir	Hard
6,32	60,00	0,995	Pasir	Hard
6,44	40,00	1,477	Lanau	Very Stiff
6,56	35,00	1,682	Lanau	Very Stiff
6,69	40,00	1,486	Lanau	Very Stiff
6,81	32,00	1,843	Lanau	Very Stiff
6,94	130,00	0,476	Pasir	Hard
7,07	160,00	0,389	Pasir	Hard
7,19	125,00	0,498	Pasir	Hard
7,32	120,00	0,521	Pasir	Hard
7,45	135,00	0,465	Pasir	Hard
7,57	170,00	0,372	Pasir	Hard
7,70	110,00	0,573	Pasir	Hard
7,83	100,00	0,632	Pasir	Hard
7,96	135,00	0,472	Pasir	Hard
8,00	150,00	0,132	Pasir	Hard
8,10	200,00	0,234	Pasir	Hard
8,17	202,00	0,189	Pasir	Hard
8,21	250,00	0,083	Pasir	Hard

Lampiran 8. Perhitungan Pembebanan, Tekanan Tanah Aktif dan Pasif

a. Gaya vertikal yang berasal dari berat sendiri dinding penahan tanah

$$\text{G1} = (7\text{ m x }0{,}48\text{ x}2{,}2\text{ton})\text{-}\big((0{,}5\text{ x }0{,}24\text{ x }7\text{ m x }2{,}2\text{ ton})\text{ x }2\big) = 3{,}692\text{ ton}$$

b. Gaya luar yang bekerja pada dinding penahan tanah

Nilai berat jenis tanah didapatkan melalui korelasi empiris dari hasil pengujian sondir di lokasi studi. Data tanah yang diperoleh adalah sebagai berikut :

- Berat jenis tanah = 1,95 ton/m^3
- Kohesi tanah = 0,174
- Sudut geser = 33^o

Perhitungan gaya luar yang bekerja pada dinding penahan tanah ditunjukkan sebagai berikut :

$$\text{G2} = 0{,}5\text{ x }7\text{ m x }0{,}24\text{ x }1{,}95 = 1{,}638\text{ ton}$$

c. Gaya akibat tekanan tanah aktif dan tekanan tanah pasif

$$\text{Ka} = \tan^2\left(45^o\text{-}\frac{\emptyset}{2}\right)$$

$$= \tan^2\left(45^o\text{-}\frac{33^o}{2}\right)$$

$$= 0{,}293$$

$$\text{Kp} = \tan^2\left(45^o + \frac{\emptyset}{2}\right)$$

$$= \tan^2\left(45^o + \frac{33^o}{2}\right)$$

$$= 3{,}389$$

- Tekanan tanah aktif akibat timbunan tanah di bagian belakang dinding penahan

$$\text{P1} = 7\text{ m x }0{,}397$$

$$= 2{,}779$$

$$\text{P2} = 0{,}5\text{ x }7\text{ m x }(4{,}397\text{-}0{,}397)$$

$$= 14$$

$$\text{Pa} = 2{,}779 + 14$$

$$= 16{,}779\text{ t/m}$$

Lampiran 8. (Lanjutan)

$$\bar{z} = 2{,}779 \text{ x } \left(\frac{7}{2}\right) + 14 \text{ x } \left(\frac{7}{3}\right)$$

$$= \frac{42{,}4685}{16{,}779}$$

$$= 2{,}53$$

- Tekanan tanah pasif pada dasar atau kaki dinding penahan

$$\text{P3} = 0{,}8 \text{ m x } 0{,}64$$

$$= 0{,}512$$

$$\text{P4} = 0{,}5 \text{ x } 0{,}8 \text{ m x } (5{,}92\text{-}0{,}64)$$

$$= 2{,}112$$

$$\text{Pp} = 0{,}512 + 2{,}112$$

$$= 2{,}624 \text{ t/m}$$

$$\bar{z} = 0{,}512 \text{ x } \left(\frac{0{,}8}{2}\right) + 2{,}112 \text{ x } \left(\frac{0{,}8}{3}\right)$$

$$= \frac{0{,}768}{2{,}624}$$

$$= 0{,}292$$

Lampiran 9. Perhitungan Stabilitas Dinding Penahan Tanah Eksisting

1. Perhitungan Pembebanan Eksisting

   $G1 = (7\ m\ x\ 0{,}5\ x 2{,}2 ton) = 7{,}70\ ton$

2. Perhitungan Stabilitas Eksisting

   Stabilitas terhadap guling

   $\Sigma M_w = M1$

   $= 1{,}93\ ton.m$

   $= 18{,}88\ kNm$

   $\Sigma M_{gl} = P1 + P2 + P3 + P4$

   $= 9{,}73 + 32{,}67 + (-0{,}20) + (-0{,}56)$

   $= 41{,}63\ ton.m$

   $= 408{,}34\ kNm$

   $F_{gl} = \frac{18{,}88}{408{,}34}$

   $= 0{,}05$ → Tidak aman terhadap guling

   Stabilitas terhadap geser

   $\Sigma R_h = W\ x\ f$

   $= \Sigma V\ x\ tan\delta$

   $= 7{,}7\ x\ 0{,}64$

   $= 4{,}928\ ton$

   $= 48{,}34\ kN$

   $\Sigma P_h = \Sigma H$

   $= 14{,}16\ ton$

   $= 14{,}16\ ton$

   $= 138{,}86\ kN$

   $F_{gs} = \frac{48{,}34}{138{,}86}$

   $= 0{,}35$ → Tidak Aman terhadap geser

   Stabilitas terhadap daya dukung

   $q_u = c.N_c + \gamma.D_f.N_q + {}^1/_2.\gamma.B.N_\gamma$

Lampiran 9. (Lanjutan)

$= 0{,}174.\,22{,}39 + 1{,}95.0{,}8.10{,}69 + {}^{1}/_{2}\,.\,1{,}95.0{,}5.6{,}32$

$= 23{,}65\,{}^{ton}/_{m2}$

$FS = 3$

$\sigma ijin \ = {}^{23{,}65}/_{3}$

$= 7{,}88\,{}^{ton}/_{m2}$

$\sigma \quad = {}^{P}/_{A}$

$= {}^{7{,}70}/_{0{,}5}$

$= 15{,}4$

15,4 > 7,88 → Daya dukung tanah tidak aman

Lampiran 10. Perhitungan Stabilitas Dinding Penahan Tanah Buis Beton

a. Stabilitas Terhadap Guling

$$\Sigma M_w = M1 + M2$$

$$= 0{,}89 + 0{,}39$$

$$= 1{,}28\ ton.m$$

$$= 12{,}55\ kNm$$

$$\Sigma M_{gl} = P1 + P2 + P3 + P4$$

$$= 9{,}73 + 32{,}67 + (-0{,}20) + (-0{,}56)$$

$$= 41{,}63\ ton.m$$

$$= 408{,}34\ kNm$$

$$F_{gl} = \frac{12{,}55}{408{,}34}$$

$= 0{,}03$ → Tidak aman terhadap guling

b. Stabilitas Terhadap Geser

$$\Sigma R_h = W\ x\ f$$

$$= \Sigma V\ x\ tan\delta$$

$$= 5{,}33\ x\ 0{,}64$$

$$= 3{,}41\ ton$$

$$= 33{,}46\ kN$$

$$\Sigma P_h = \Sigma H$$

$$= 14{,}16\ ton$$

$$= 14{,}16\ ton$$

$$= 138{,}86\ kN$$

$$F_{gs} = \frac{33{,}46}{138{,}86}$$

$= 0{,}24$ → Tidak aman terhadap geser

Lampiran 10. (Lanjutan)

c. Stabilitas Terhadap Daya Dukung

Berdasarkan tabel faktor daya dukung tanah menurut Terzaghi untuk kondisi *general shear failure*, diperoleh nilai faktor daya dukung tanah sebesar $N_c = 22{,}39$, $N_q = 10{,}69$, dan $N_\gamma = 6{,}32$. Selanjutnya, nilai faktor daya dukung tanah tersebut digunakan dalam perhitungan daya dukung ultimit tanah sebagai berikut.

$$q_u = c.N_c + \gamma.D_f.N_q + {}^1\!/_2.\gamma.B.N_\gamma$$

$$= 0{,}174.22{,}39 + 1{,}95.0{,}8.10{,}69 + {}^1\!/_2.1{,}95.0{,}48.6{,}32$$

$$= 23{,}53\ {}^{ton}\!/_{m2}$$

$$FS = 3$$

$$\sigma ijin = {}^{23{,}53}\!/_3$$

$$= 7{,}84\ {}^{ton}\!/_{m2}$$

$$\sigma = {}^P\!/_A$$

$$= {}^{5{,}33}\!/_{0{,}48}$$

$$= 11{,}10$$

11,10 > 7,84 → Daya dukung tanah tidak aman

Lampiran 11. Perhitungan Stabilitas Desain Alternatif Diameter 40 cm

1. Perhitungan Pembebanan Diameter 40 cm

$G1 = (7\ m\ x\ 0{,}48\ x2{,}2ton) - \left((0{,}5\ x\ 0{,}24\ x\ 7\ m\ x\ 2{,}2\ ton)\ x\ 2\right) = 3{,}70\ ton$

$G2 = 0{,}5\ x\ 7\ m\ x\ 0{,}24\ x\ 1{,}95 = 1{,}638\ ton$

$G3 = (7\ m\ x\ 0{,}48\ x2{,}2ton) = 7{,}396\ ton$

$G4 = (7\ m\ x\ 0{,}48\ x2{,}2ton) - (0{,}5\ x\ 0{,}24\ x\ 1\ m\ x\ 2{,}2\ ton) = 7{,}13\ ton$

$G5 = (6\ m\ x\ 0{,}48\ x2{,}2ton) - (0{,}5\ x\ 0{,}24\ x\ 1\ m\ x\ 2{,}2\ ton) = 6{,}07\ ton$

$G6 = (5\ m\ x\ 0{,}48\ x2{,}2ton) - (0{,}5\ x\ 0{,}24\ x\ 3{,}2\ m\ x\ 2{,}2\ ton) = 5{,}02\ ton$

$G7 = (4\ m\ x\ 0{,}48\ x2{,}2ton) - (0{,}5\ x\ 0{,}24\ x\ 1\ m\ x\ 2{,}2\ ton) = 3{,}96\ ton$

$G8 = (3\ m\ x\ 0{,}48\ x2{,}2ton) - (0{,}5\ x\ 0{,}24\ x\ 1\ m\ x\ 2{,}2\ ton) = 2{,}90\ ton$

$G9 = (2\ m\ x\ 0{,}48\ x2{,}2ton) - (0{,}5\ x\ 0{,}24\ x\ 1{,}2\ m\ x\ 2{,}2\ ton) = 1{,}80\ ton$

2. Perhitungan Stabilitas Diameter 40 cm

<u>Stabilitas terhadap guling</u>

$\Sigma M_w = M1 + M2 + M3 + M4 + M5 + M6 + M7 + M8 + M9$

$= 13{,}31 + 5{,}90 + 23{,}06 + 18{,}82 + 13{,}12 + 8{,}43 + 4{,}75 + 2{,}09 + 0{,}43$

$= 89{,}90\ ton.m$

$= 881{,}91\ kNm$

$\Sigma M_{gl} = P1 + P2 + P3 + P4$

$= 9{,}73 + 32{,}67 + (-0{,}20) + (-0{,}56)$

$= 41{,}63\ ton.m$

$= 408{,}34\ kNm$

$F_{gl} = \dfrac{881{,}91}{408{,}34}$

$= 2{,}15 \rightarrow$ Aman terhadap guling

<u>Stabilitas terhadap geser</u>

$\Sigma R_h = W\ x\ f$

$= \Sigma V\ x\ tan\delta$

Lampiran 11. (Lanjutan)

$= 39{,}60\ x\ 0{,}64$

$= 25{,}34\ ton$

$= 248{,}63\ kN$

$\Sigma P_h = \Sigma H$

$= 14{,}16\ ton$

$= 138{,}86\ kN$

$F_{gs} = \dfrac{248{,}63}{138{,}86}$

$= 1{,}79$ → Aman terhadap geser

<u>Stabilitas terhadap daya dukung</u>

$q_u = c.N_c + \gamma.D_f.N_q + {}^1/_2.\gamma.B.N_\gamma$

$= 0{,}174.22{,}39 + 1{,}95.0{,}8.10{,}69 + {}^1/_2.1{,}95.3{,}84.6{,}32$

$= 44{,}23\ {}^{ton}/_{m2}$

$FS = 3$

$\sigma ijin = {}^{44{,}23}/_3$

$= 14{,}74\ {}^{ton}/_{m2}$

$\sigma = {}^P/_A$

$= {}^{39{,}60}/_{3{,}84}$

$= 10{,}31$

10,31 < 14,74 → Daya dukung tanah aman

Lampiran 12. Perhitungan Stabilitas Desain Alternatif Diameter 60 cm

3. Perhitungan Pembebanan Diameter 60 cm

$G1 = (7\ m\ x\ 0{,}48\ x2{,}2ton) - \big((0{,}5\ x\ 0{,}24\ x\ 7\ m\ x\ 2{,}2\ ton)\ x\ 2\big) = 3{,}69\ ton$

$G2 = 0{,}5\ x\ 7\ m\ x\ 0{,}24\ x\ 1{,}95 = 1{,}64\ ton$

$G3 = (7\ m\ x\ 0{,}72\ x2{,}2ton) - (0{,}5\ x\ 0{,}36\ x\ 1\ m\ x\ 2{,}2\ ton) = 10{,}69\ ton$

$G4 = (6\ m\ x\ 0{,}72\ x2{,}2ton) - (0{,}5\ x\ 0{,}36\ x\ 1\ m\ x\ 2{,}2\ ton) = 9{,}11\ ton$

$G5 = (5\ m\ x\ 0{,}72\ x2{,}2ton) - (0{,}5\ x\ 0{,}36\ x\ 1\ m\ x\ 2{,}2\ ton) = 7{,}52\ ton$

$G6 = (4\ m\ x\ 0{,}72\ x2{,}2ton) - (0{,}5\ x\ 0{,}36\ x\ 1\ m\ x\ 2{,}2\ ton) = 5{,}94\ ton$

$G7 = (3\ m\ x\ 0{,}72\ x2{,}2ton) - (0{,}5\ x\ 0{,}36\ x\ 2{,}2\ m\ x\ 2{,}2\ ton) = 3{,}88\ ton$

4. Perhitungan Stabilitas Diameter 60 cm

<u>Stabilitas terhadap guling</u>

$\Sigma M_w = M1 + M2 + M3 + M4 + M5 + M6 + M7$

$= 14{,}19 + 6{,}29 + 34{,}64 + 22{,}95 + 13{,}54 + 6{,}42 + 1{,}40$

$= 99{,}43\ ton.m$

$= 975{,}43\ kNm$

$\Sigma M_{gl} = P1 + P2 + P3 + P4$

$= 9{,}73 + 32{,}67 + (-0{,}20) + (-0{,}56)$

$= 41{,}63\ ton.m$

$= 408{,}34\ kNm$

$F_{gl} = \dfrac{975{,}43}{408{,}34}$

$= 2{,}38$ → Aman terhadap guling

<u>Stabilitas terhadap geser</u>

$\Sigma R_h = W\ x\ f$

$= \Sigma V\ x\ tan\delta$

$= 42{,}48\ x\ 0{,}64$

$= 27{,}18\ ton$

$= 266{,}69\ kN$

$\Sigma P_h = \Sigma H$

$= 14{,}16\ ton$

Lampiran 12. (Lanjutan)

$= 14{,}16\ ton$

$= 138{,}86\ kN$

$F_{gs} = \dfrac{266{,}69}{138{,}86}$

$= 1{,}92$ → Aman terhadap geser

<u>Stabilitas terhadap daya dukung</u>

$q_u = c.N_c + \gamma.D_f.N_q + {}^1/_2.\gamma.B.N_\gamma$

$= 0{,}174.22{,}39 + 1{,}95.0{,}8.10{,}69 + {}^1/_2.1{,}95.4{,}08.6{,}32$

$= 45{,}71\ {}^{ton}/_{m2}$

$FS = 3$

$\sigma ijin = {}^{45{,}71}/_3$

$= 15{,}23\ {}^{ton}/_{m2}$

$\sigma = {}^P/_A$

$= {}^{42{,}48}/_{4{,}08}$

$= 10{,}41$

$10{,}41 < 15{,}23$ → Daya dukung tanah aman

Lampiran 13. Perhitungan Stabilitas Desain Alternatif Diameter 80 cm

1. Perhitungan Pembebanan Diameter 80 cm

   $G1 = (7\ m\ x\ 0{,}95\ x2{,}2ton) - \left((0{,}5\ x\ 0{,}\ x\ 7\ m\ x\ 2{,}2\ ton)\ x\ 2\right) = 3{,}69\ ton$

   $G2 = 0{,}5\ x\ 7\ m\ x\ 0{,}24\ x\ 1{,}95 = 1{,}638\ ton$

   $G3 = (6\ m\ x\ 0{,}95\ x2{,}2ton) - (0{,}5\ x\ 0{,}475\ x\ 1\ m\ x\ 2{,}2\ ton) = 7{,}128\ ton$

   $G4 = (5\ m\ x\ 0{,}95\ x2{,}2ton) - (0{,}5\ x\ 0{,}475\ x\ 1\ m\ x\ 2{,}2\ ton) = 6{,}072\ ton$

   $G5 = (4\ m\ x\ 0{,}95\ x2{,}2ton) - (0{,}5\ x\ 0{,}475\ x\ 1\ m\ x\ 2{,}2\ ton) = 5{,}016\ ton$

   $G6 = (3\ m\ x\ 0{,}95\ x2{,}2ton) - (0{,}5\ x\ 0{,}475\ x\ 2{,}2\ m\ x\ 2{,}2\ ton) = 3{,}379\ ton$

2. Perhitungan Stabilitas Diameter 80 cm

   <u>Stabilitas terhadap guling</u>

   $\Sigma M_w = M1 + M2 + M3 + M4 + M5 + M6$

   $= 14{,}93 + 6{,}62 + 39{,}96 + 23{,}58 + 11{,}17 + 2{,}43$

   $= 98{,}69\ ton.m$

   $= 968{,}11\ kNm$

   $\Sigma M_{gl} = P1 + P2 + P3 + P4$

   $= 9{,}73 + 32{,}67 + (-0{,}20) + (-0{,}56)$

   $= 41{,}63\ ton.m$

   $= 408{,}34\ kNm$

   $F_{gl} = \dfrac{968{,}11}{408{,}34}$

   $= 2{,}37$ → Aman terhadap guling

   <u>Stabilitas terhadap geser</u>

   $\Sigma R_h = W\ x\ f$

   $= \Sigma V\ x\ tan\delta$

   $= 40{,}24\ x\ 0{,}64$

   $= 25{,}75\ ton$

   $= 252{,}62\ kN$

   $\Sigma P_h = \Sigma H$

   $= 14{,}16\ ton$

   $= 14{,}16\ ton$

Lampiran 13. (Lanjutan)

$= 138{,}86\ kN$

$F_{gs} = \dfrac{252{,}62}{138{,}86}$

$= 1{,}81 \rightarrow$ Aman terhadap geser

<u>Stabilitas terhadap daya dukung</u>

$q_u = c.N_c + \gamma.D_f.N_q + {}^1\!/_2.\gamma.B.N_\gamma$

$= 0{,}174.22{,}39 + 1{,}95.0{,}8.10{,}69 + {}^1\!/_2.1{,}95.4{,}28.6{,}32$

$= 46{,}94\ {}^{ton}\!/_{m2}$

$FS = 3$

$\sigma ijin = {}^{46{,}94}\!/_3$

$= 15{,}64\ {}^{ton}\!/_{m2}$

$\sigma = {}^P\!/_A$

$= {}^{40{,}24}\!/_{4{,}28}$

$= 9{,}40$

$9{,}40 < 15{,}64 \rightarrow$ Daya dukung tanah aman

Lampiran 14. Perhitungan Kebutuhan Buis Beton dan Volume Beton

Kebutuhan Buis Beton Diameter 40 cm				
Lebar DPT eksisting		=	10,08	
Kebutuhan DPT baru		=	21	per 1 baris
		=	714	
		=	714	Buah
Kebutuhan Beton				
Sisi Luar		=	0,025	
		=	1,040	per 1 baris
		=	31,832	m3
Sisi Dalam	0,4	=	0,126	
		=	89,678	
Total Kebutuhan Beton		=	121,51	m3

Kebutuhan Buis Beton				
Lebar DPT eksisting		=	10,08	
Kebutuhan DPT baru		=	14	per 1 baris
		=	350	
		=	350	Buah
Kebutuhan Beton Diameter 60 cm				
Sisi Luar		=	0,056	
		=	1,560	per 1 baris
		=	32,924	m3
Sisi Dalam	0,6	=	0,283	
		=	98,910	
Total Kebutuhan Beton		=	131,83	m3

Kebutuhan Buis Beton				
Lebar DPT eksisting		=	10,08	
Kebutuhan DPT baru		=	10,6105	per 1 baris
		=	190,989	
		=	191	Buah
Kebutuhan Beton Diameter 80 cm				
Sisi Luar		=	0,097	
		=	2,059	per 1 baris
		=	30,059	m3
Sisi Dalam	0,8	=	0,502	
		=	95,958	
Total Kebutuhan Beton		=	126,02	m3

Lampiran 15. Perhitungan Estimasi Biaya Diameter 40 cm

1. Perhitungan Harga Buis Beton

Jumlah kebutuhan buis beton = 714 buah

Harga satuan buis beton = Rp115.121/buah

Total harga buis beton

= Jumlah buis × Harga satuan

= 714 × Rp115.121

= Rp82.196.394

2. Perhitungan Harga Beton

Volume beton = 121,51 m^3

Harga satuan beton = Rp1.063.250/m^3

Total harga beton

= Volume beton × Harga satuan

= 121,51 × Rp1.063.250

= Rp129.195.508

3. Perhitungan Total Biaya

Total biaya

= Total harga buis beton + Total harga beton

= Rp82.196.394 + Rp129.195.508

= Rp211.391.902

Lampiran 16. Perhitungan Estimasi Biaya Diameter 60 cm

1. Perhitungan Harga Buis Beton

Jumlah kebutuhan buis beton = 350 buah

Harga satuan buis beton = Rp170.509/buah

Total harga buis beton

= 350 × Rp170.509

= Rp59.678.150

2. Perhitungan Harga Beton

Volume beton = 131,83 m^3

Harga satuan beton = Rp1.063.250/m^3

Total harga beton

= 131,83 × Rp1.063.250

= Rp140.168.248

3. Perhitungan Total Biaya

Total biaya

= Rp59.678.150 + Rp140.168.248

= Rp199.846.398

Lampiran 17. Perhitungan Estimasi Biaya Diameter 80 cm

1. Perhitungan Harga Buis Beton

Jumlah kebutuhan buis beton = 191 buah

Harga satuan buis beton = Rp177.500/buah

Total harga buis beton

= 191 × Rp177.500

= Rp33.902.500

2. Perhitungan Harga Beton

Volume beton = 126,02 m^3

Harga satuan beton = Rp1.063.250/m^3

Total harga beton

= 126,02 × Rp1.063.250

= Rp133.990.765

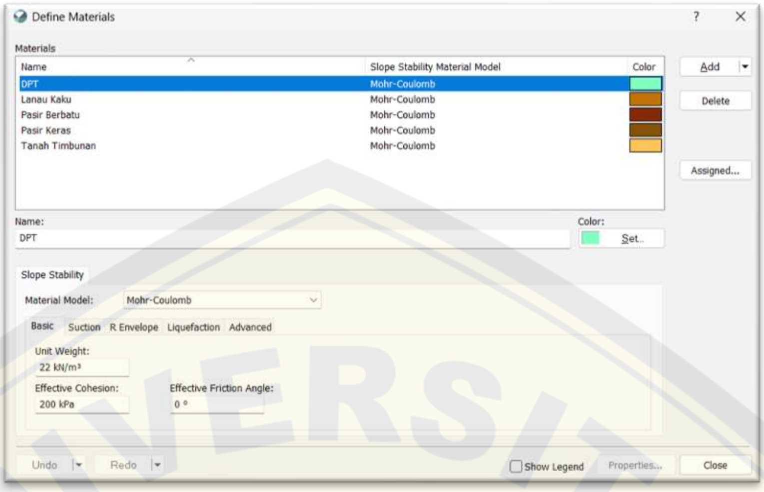
3. Perhitungan Total Biaya

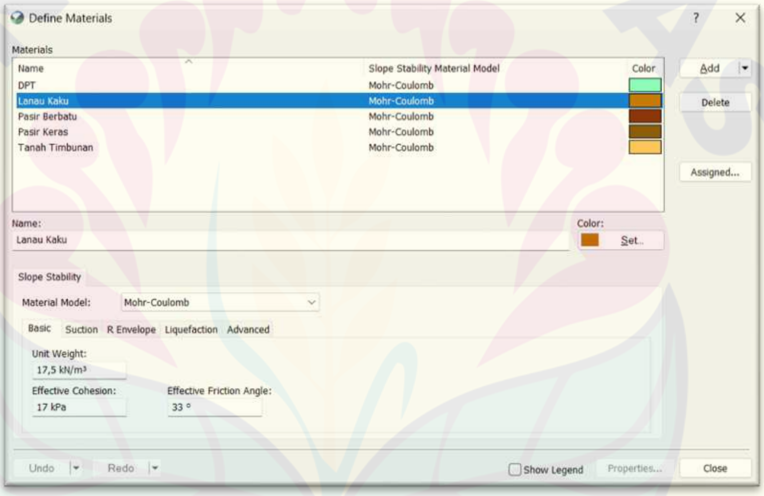
Total biaya

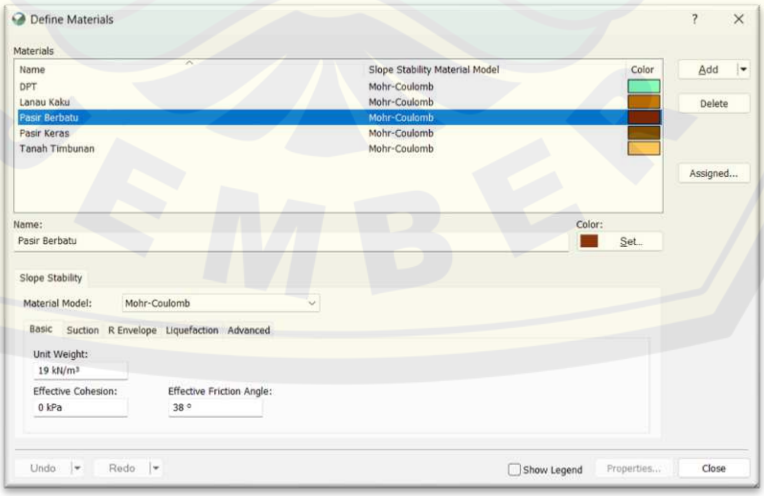
= Rp33.902.500 + Rp133.990.765

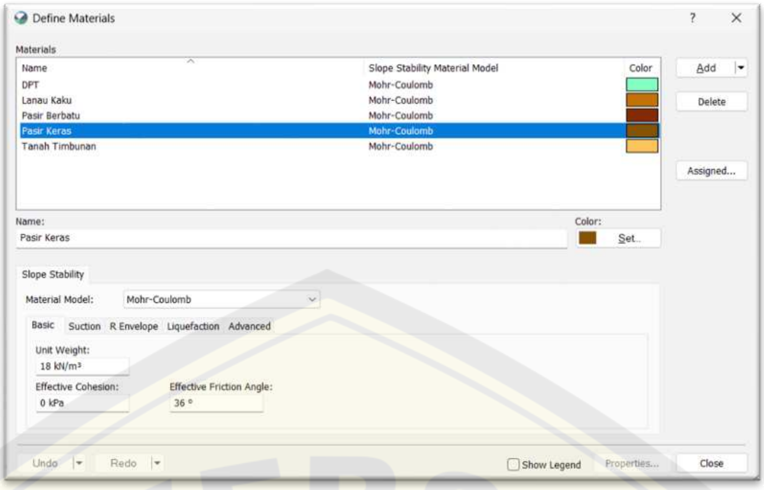
= Rp167.893.265

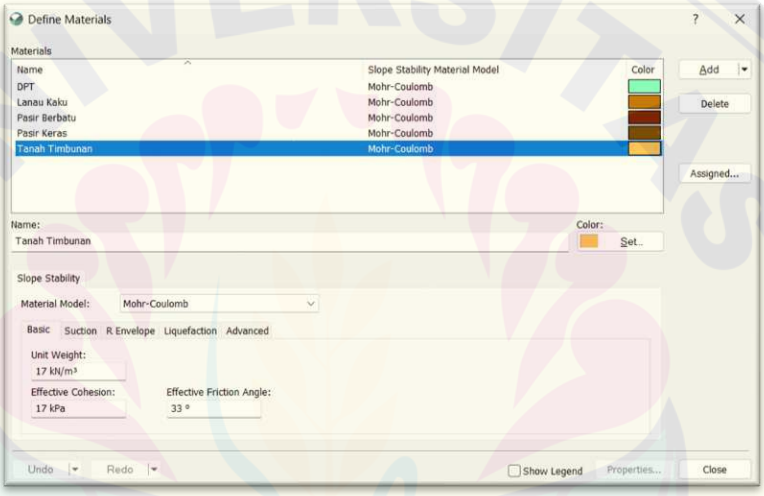
Lampiran 18. Input GeoStudio Parameter Tanah, Beban Gempa dan DPT Buis Beton

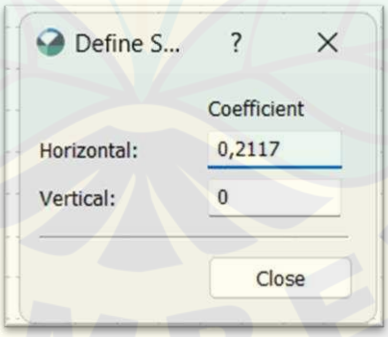




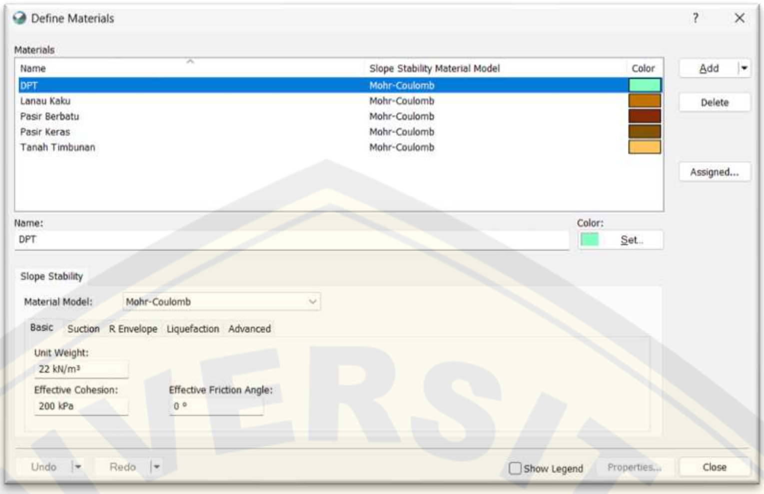


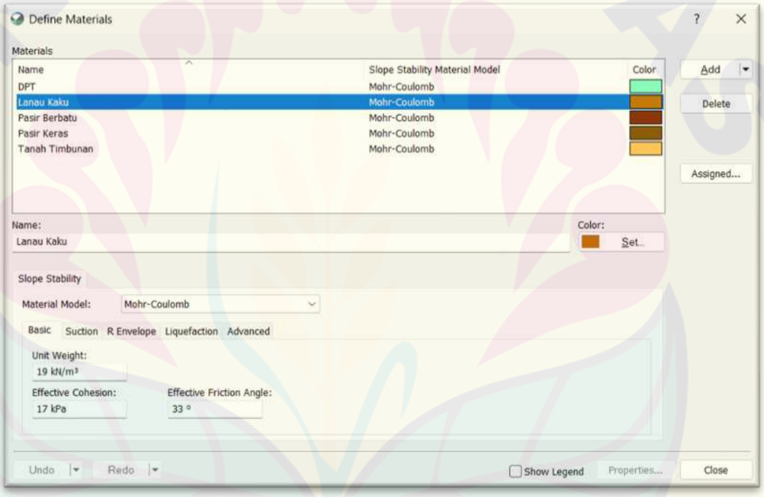

Define Materials
Materials
Name
Slope Stability Material Model
Color
DPT
Mohr-Coulomb
Lanau Kaku
Mohr-Coulomb
Pasir Berbatu
Mohr-Coulomb
Pasir Keras
Mohr-Coulomb
Tanah Timbunan
Mohr-Coulomb
Add
Delete
Assigned...
Name:
Pasir Keras
Color:
Set...
Slope Stability
Material Model:
Mohr-Coulomb
Basic
Suction
R Envelope
Liquefaction
Advanced
Unit Weight:
18 kN/m³
Effective Cohesion:
0 kPa
Effective Friction Angle:
36 °
Undo
Redo
Show Legend
Properties...
Close

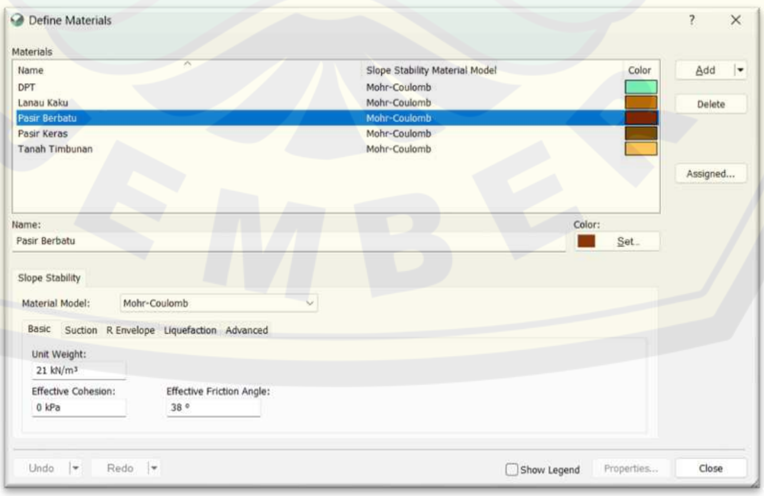

Define Materials
Materials
Name
Slope Stability Material Model
Color
DPT
Mohr-Coulomb
Lanau Kaku
Mohr-Coulomb
Pasir Berbatu
Mohr-Coulomb
Pasir Keras
Mohr-Coulomb
Tanah Timbunan
Mohr-Coulomb
Add
Delete
Assigned...
Name:
Tanah Timbunan
Color:
Set...
Slope Stability
Material Model:
Mohr-Coulomb
Basic
Suction
R Envelope
Liquefaction
Advanced
Unit Weight:
17 kN/m³
Effective Cohesion:
17 kPa
Effective Friction Angle:
33 °
Undo
Redo
Show Legend
Properties...
Close

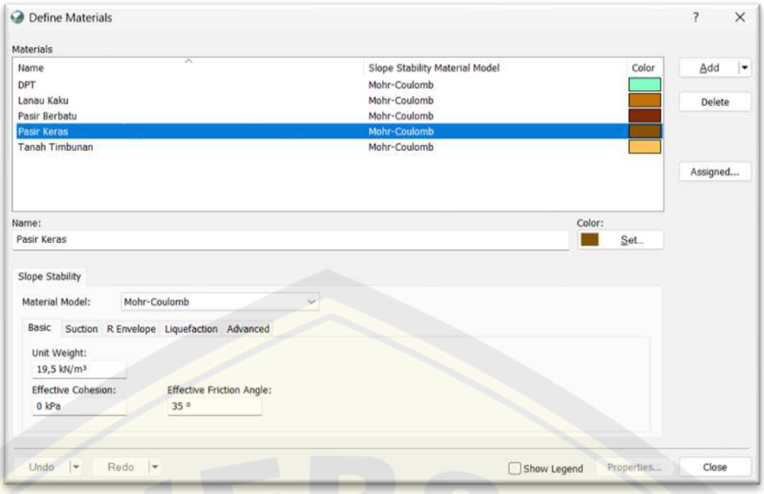

Define S...
Coefficient
Horizontal:
0,2117
Vertical:
0
Close

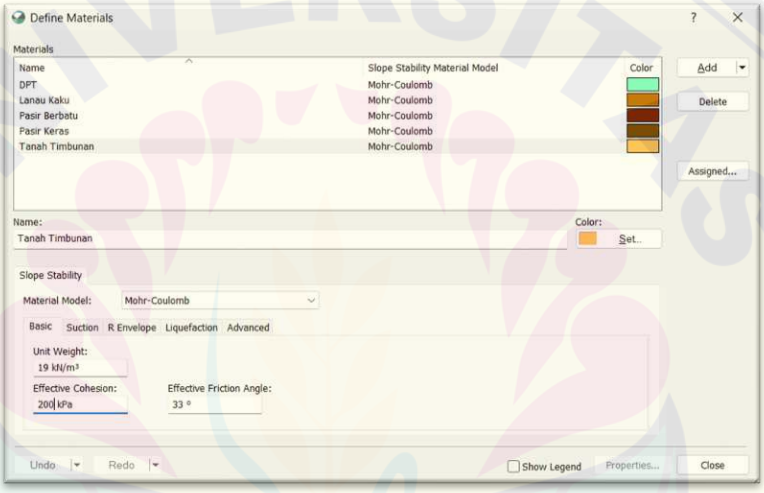
Lampiran 19. Input Geostudio Parameter Tanah, Beban Gempa dan DPT Batu Kali

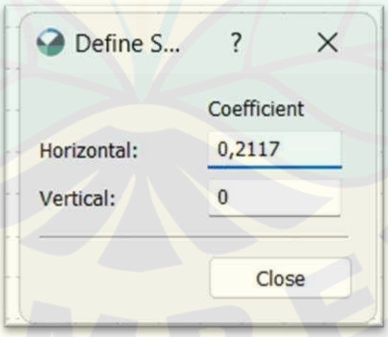




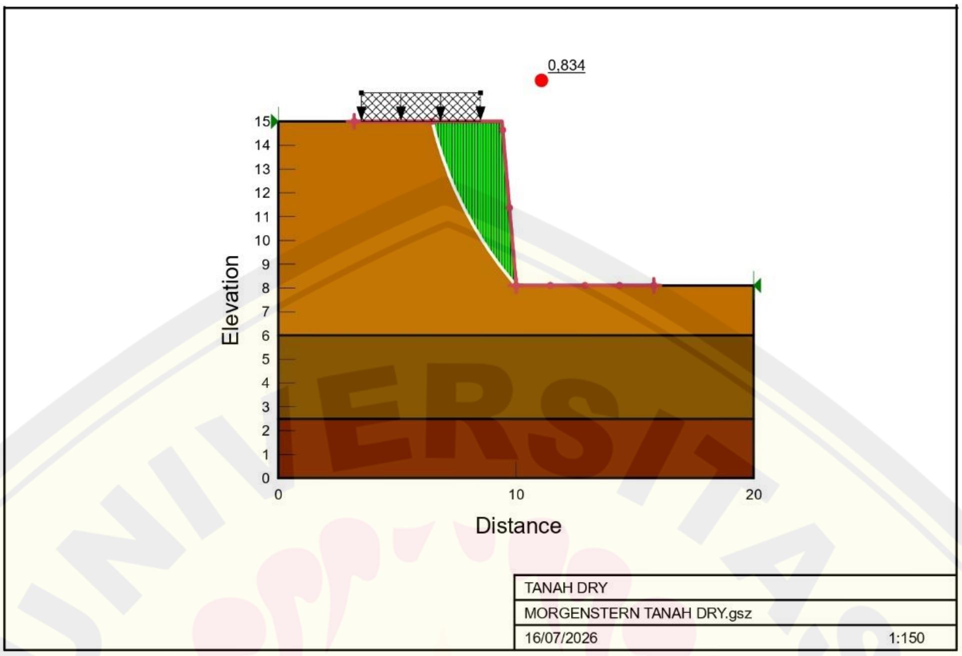


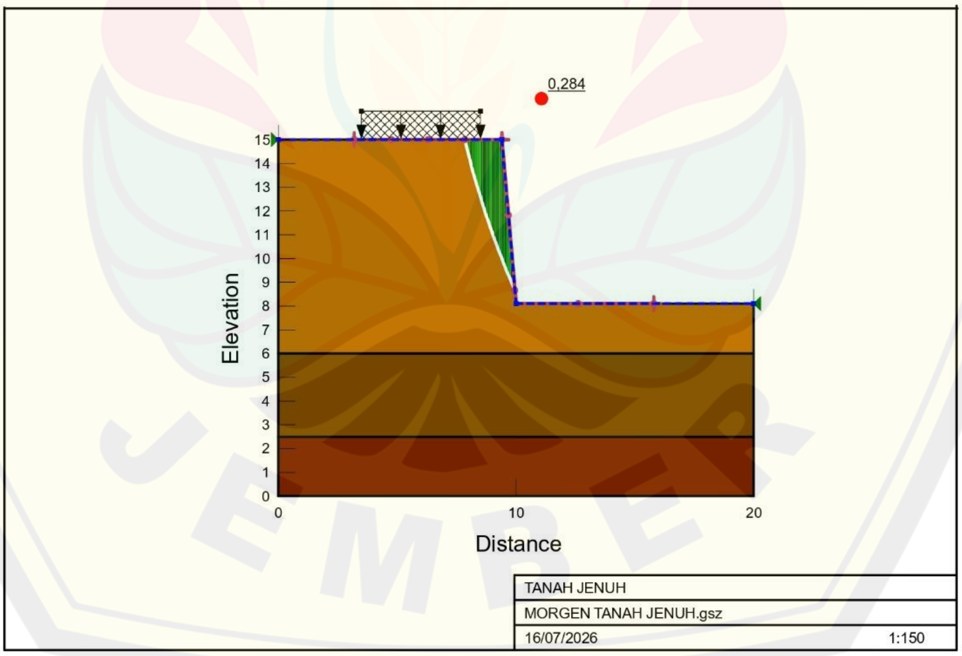

Define Materials
Materials
Name
Slope Stability Material Model
Color
DPT
Mohr-Coulomb
Lanau Kaku
Mohr-Coulomb
Pasir Berbatu
Mohr-Coulomb
Pasir Keras
Mohr-Coulomb
Tanah Timbunan
Mohr-Coulomb
Add
Delete
Assigned...
Name:
Pasir Keras
Color:
Set...
Slope Stability
Material Model:
Mohr-Coulomb
Basic
Suction
R Envelope
Liquefaction
Advanced
Unit Weight:
19,5 kN/m³
Effective Cohesion:
0 kPa
Effective Friction Angle:
35 °
Undo
Redo
Show Legend
Properties...
Close


Define Materials
Materials
Name
Slope Stability Material Model
Color
DPT
Mohr-Coulomb
Lanau Kaku
Mohr-Coulomb
Pasir Berbatu
Mohr-Coulomb
Pasir Keras
Mohr-Coulomb
Tanah Timbunan
Mohr-Coulomb
Add
Delete
Assigned...
Name:
Tanah Timbunan
Color:
Set...
Slope Stability
Material Model:
Mohr-Coulomb
Basic
Suction
R Envelope
Liquefaction
Advanced
Unit Weight:
19 kN/m³
Effective Cohesion:
200 kPa
Effective Friction Angle:
33 °
Undo
Redo
Show Legend
Properties...
Close

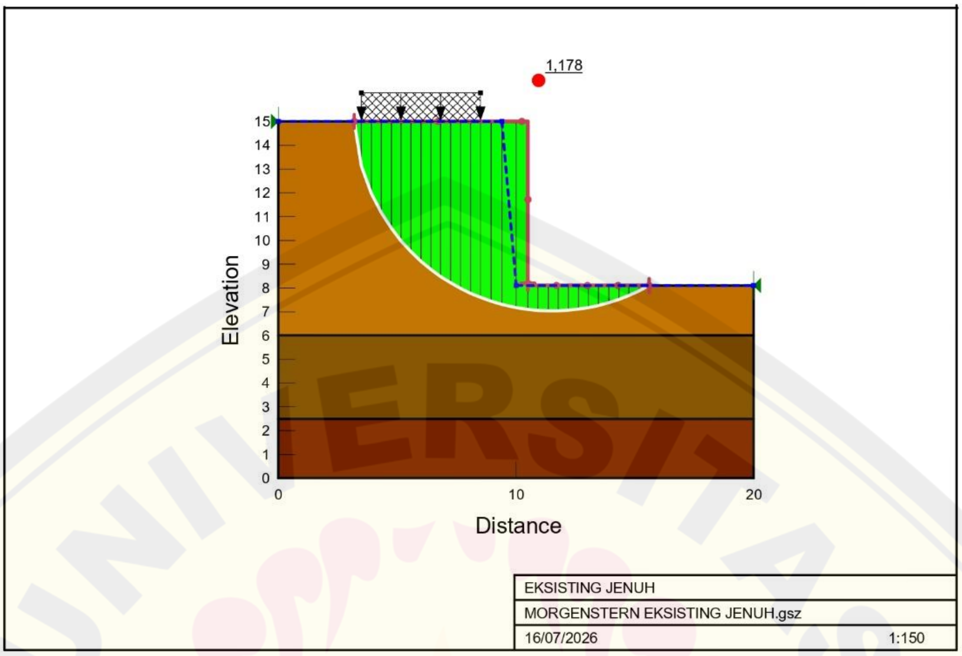

Define S...
?
Coefficient
Horizontal:
0,2117
Vertical:
0
Close

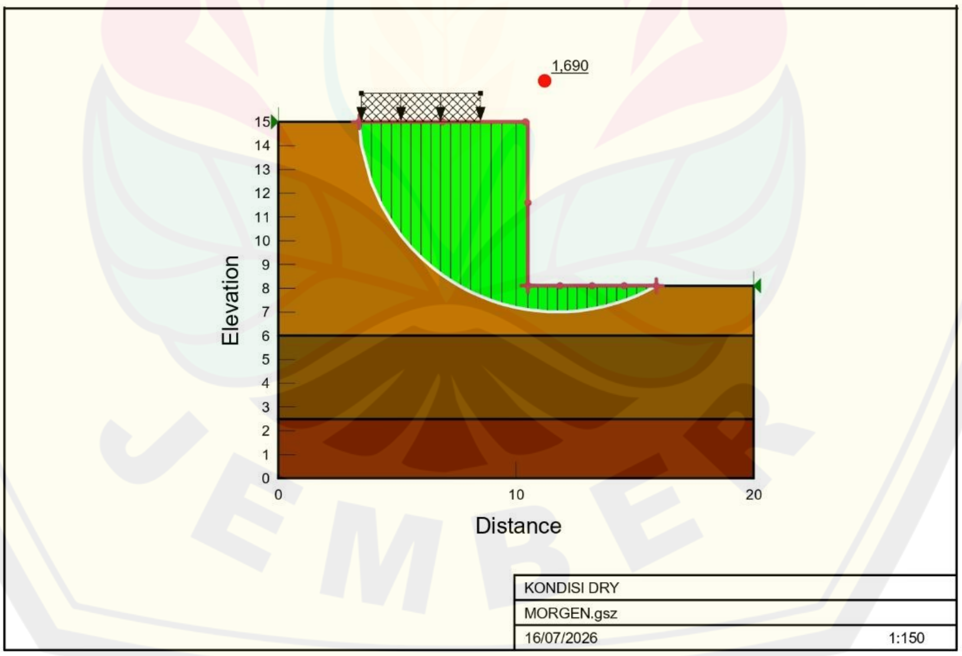
Lampiran 20. Hasil Stabilitas Global GeoStudio



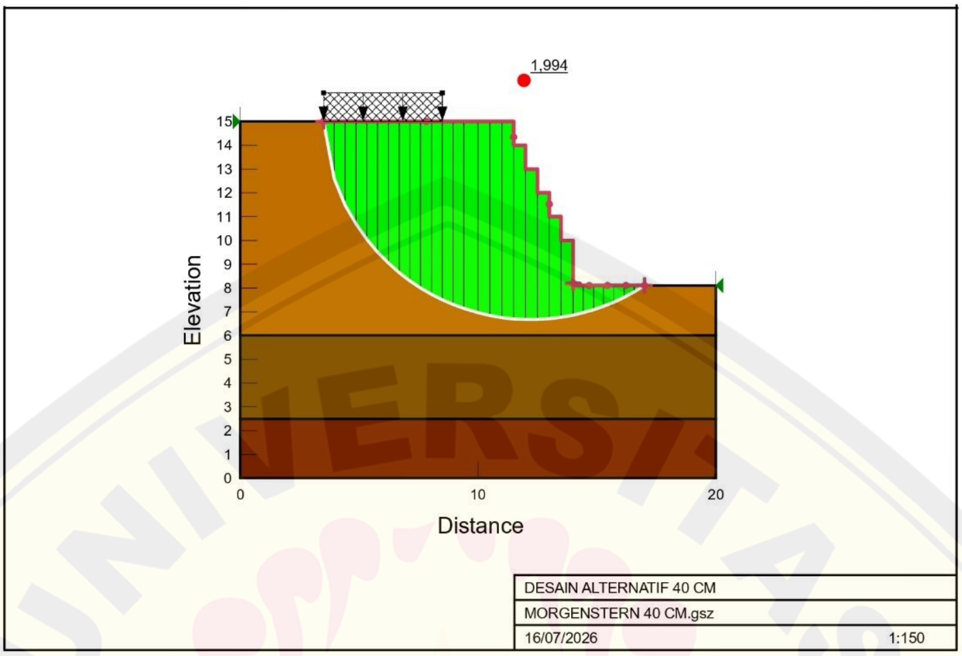


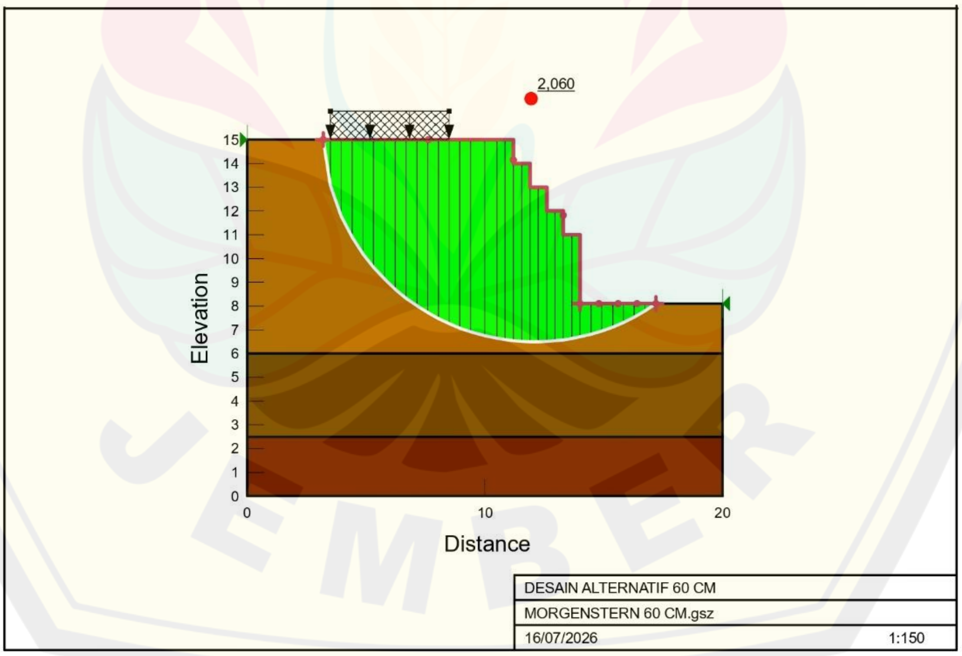
Lampiran 20. Lanjutan





Lampiran 20. Lanjutan





Lampiran 20. Lanjutan