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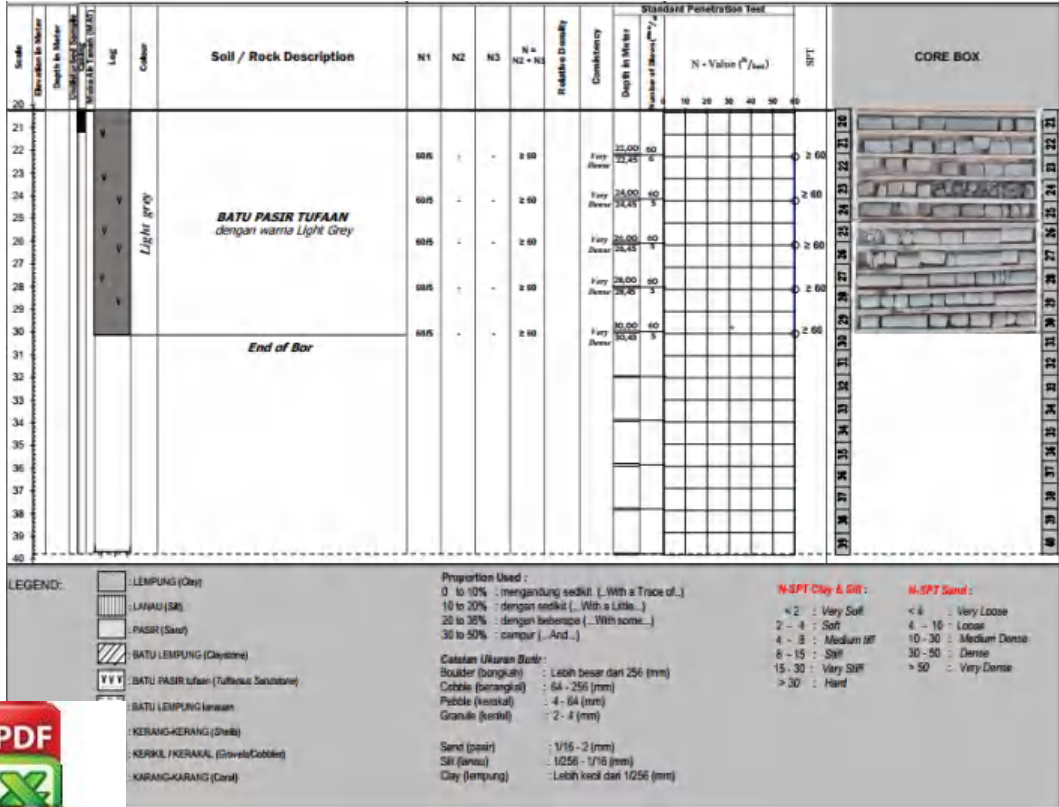
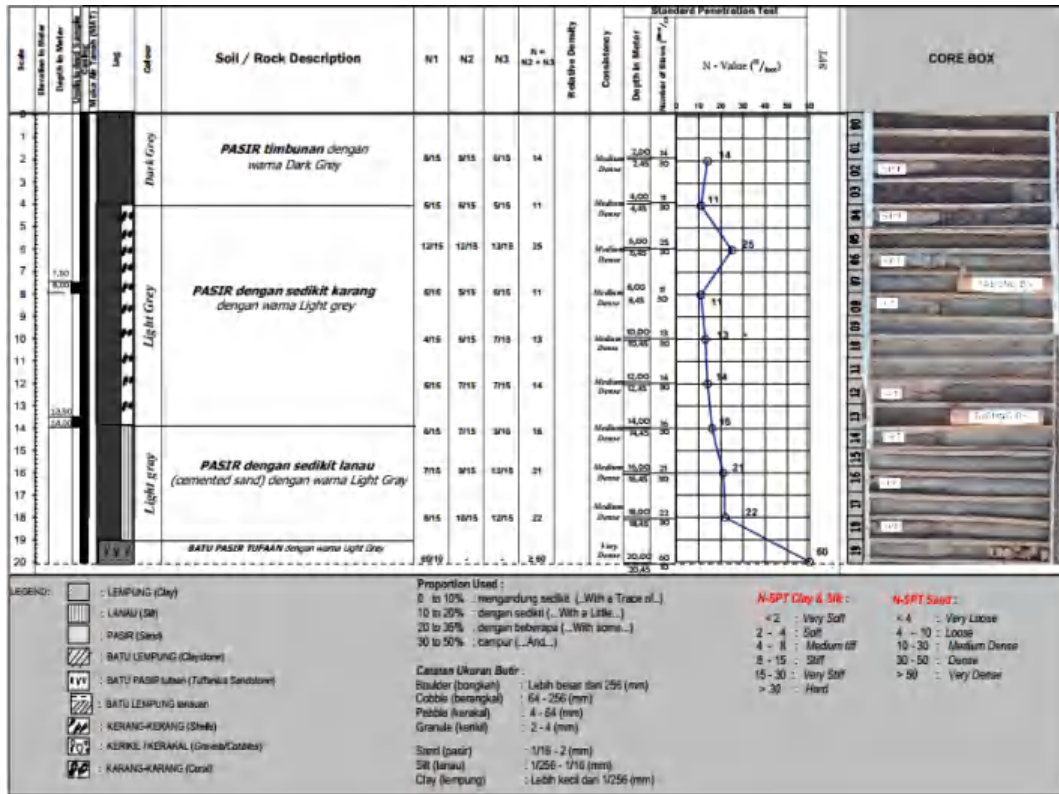
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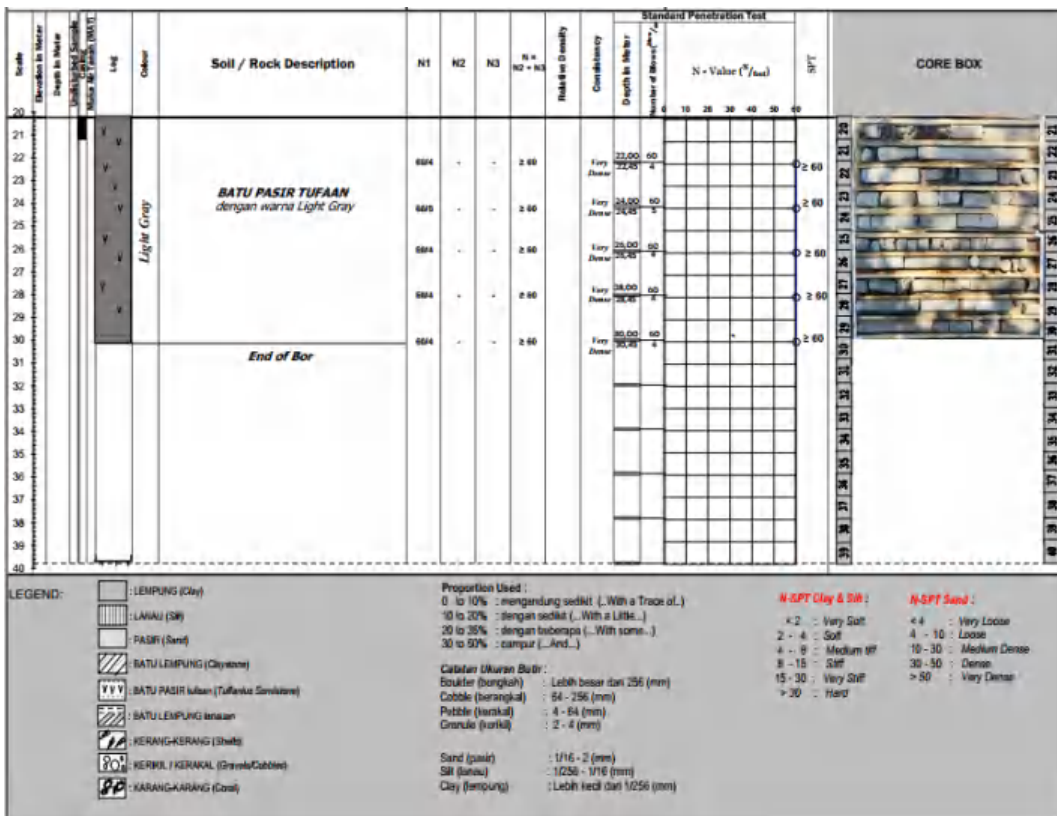
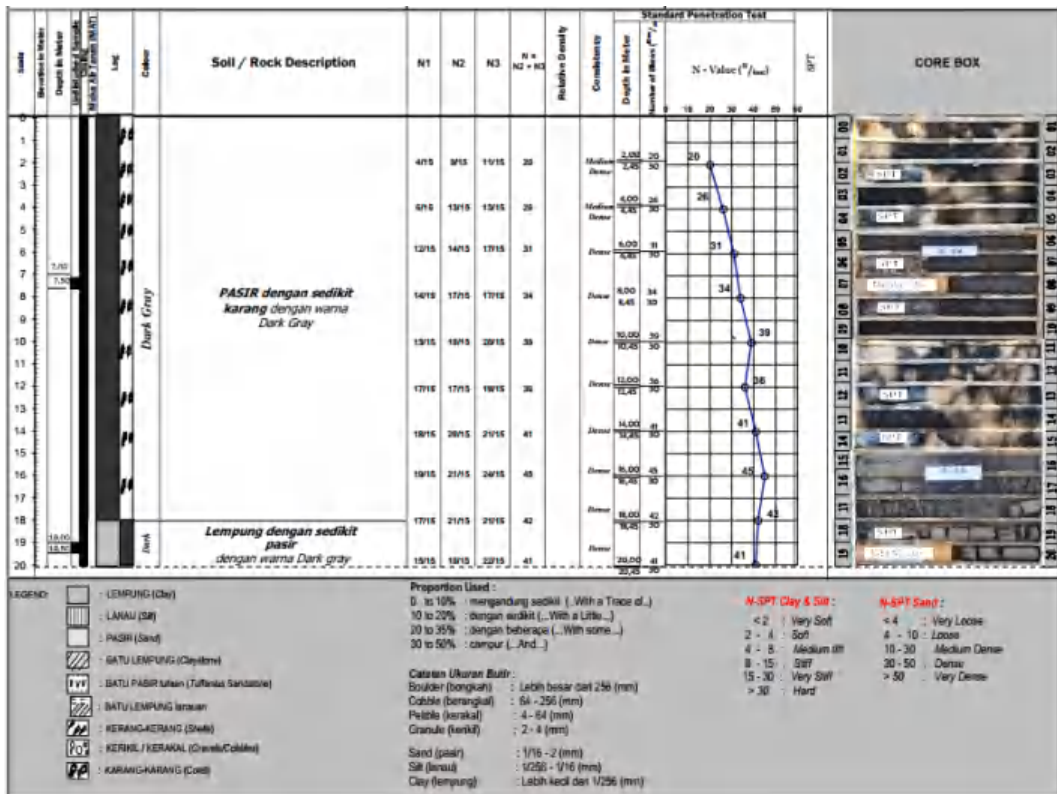
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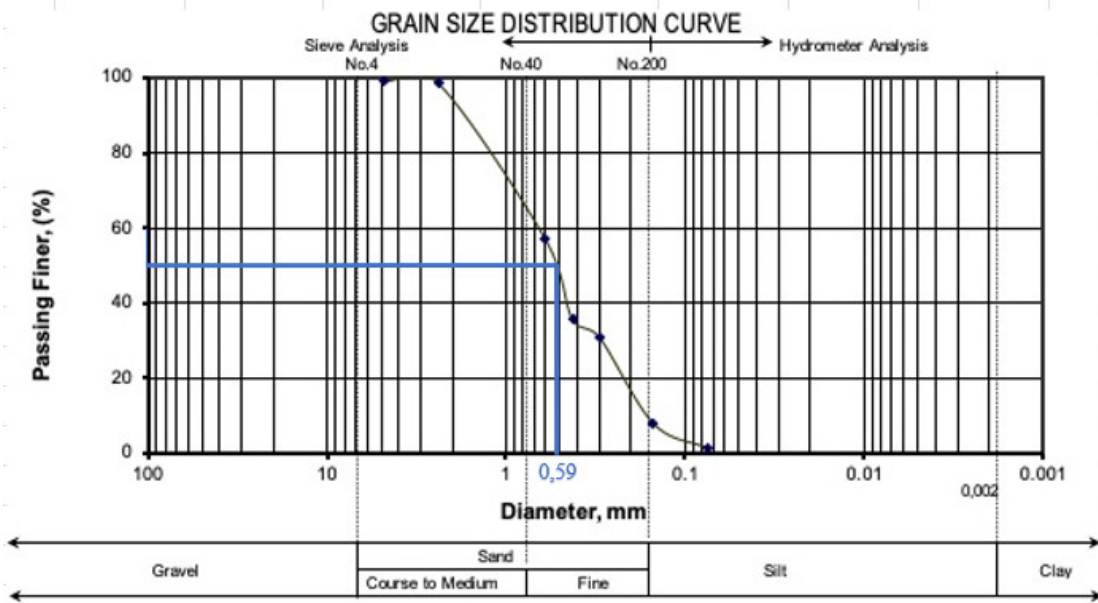
# LAMPIRAN

## Lampiran 1 Boring Log and SPT Test Result





## Lampiran 2 Hasil Perhitungan D50





### Lampiran 3 Tabel Perhitungan Potensi Likuifaksi pada Pesisir Kota Mamuju

**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 200 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar

Koordinat : X = 764589.148 ; Y = 9425317.051

Borhole No. : BH-02 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Safety Factor	Probability of Liquefaction PL(%)	
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		Youd & Noble	Cetin et al. 2004
2	0.99	0.99	41.22	41.22	1.40	14.00	0.75	1.47	15.00	57.90	0.08	0.08	0.17	0.17	0.24	0.19	2.28	2.29	3.00	2.52	33.10	0.00
4	0.97	0.96	82.44	62.83	1.40	11.00	0.86	1.10	10.00	47.60	0.11	0.11	0.11	0.12	0.17	0.14	1.20	1.33	1.78	1.43	37.60	33.30
6	0.96	0.94	123.67	84.44	1.40	25.00	0.93	0.97	22.00	69.90	0.12	0.12	0.25	0.24	0.25	0.25	2.37	2.39	2.40	2.39	14.80	0.00
8	0.94	0.90	164.89	106.05	1.40	11.00	0.96	0.92	10.00	45.90	0.12	0.12	0.10	0.12	0.13	0.12	0.97	1.11	1.21	1.10	31.90	97.20
10	0.91	0.87	206.11	127.65	1.40	13.00	0.98	0.87	11.00	49.00	0.12	0.12	0.11	0.12	0.13	0.12	1.06	1.19	1.23	1.16	28.20	94.00
12	0.86	0.84	247.33	149.26	1.40	14.00	0.98	0.83	11.00	49.90	0.12	0.12	0.12	0.13	0.13	0.12	1.10	1.23	1.20	1.18	25.40	92.60
14	0.79	0.80	288.55	170.87	1.40	16.00	0.99	0.79	13.00	52.30	0.11	0.12	0.12	0.13	0.13	0.13	1.24	1.33	1.27	1.28	22.40	76.40
16	0.73	0.77	330.56	193.26	2.50	21.00	1.00	0.76	16.00	58.70	0.11	0.11	0.15	0.16	0.16	0.16	1.63	1.63	1.72	1.66	18.70	8.80
18	0.67	0.73	372.57	215.65	2.50	22.00	1.00	0.73	16.00	58.90	0.10	0.11	0.15	0.16	0.15	0.15	1.72	1.69	1.77	1.73	17.20	4.20
20	0.62	0.70	414.57	238.05	2.50	60.00	1.00	0.70	42.00	95.40	0.09	0.10	0.67	0.76	0.26	0.56	3.00	3.00	3.00	3.00	1.50	0.00
22	0.58	0.67	456.58	260.44	2.50	60.00	1.00	0.67	40.00	93.60	0.09	0.10	0.65	0.76	0.24	0.55	3.00	3.00	3.00	3.00	2.10	0.00
24	0.55	0.65	498.58	282.83	2.50	60.00	1.00	0.64	39.00	91.90	0.08	0.10	0.64	0.76	0.23	0.54	3.00	3.00	3.00	3.00	2.80	0.00
26	0.53	0.62	540.59	305.22	2.50	60.00	1.00	0.62	37.00	90.20	0.08	0.09	0.62	0.75	0.21	0.53	3.00	3.00	3.00	3.00	3.80	0.00
28	0.52	0.60	582.60	327.61	2.50	60.00	1.01	0.60	36.00	88.70	0.08	0.09	0.61	0.75	0.20	0.52	3.00	3.00	3.00	3.00	4.90	0.00
30	0.50	0.59	624.60	350.01	2.50	60.00	1.01	0.58	35.00	87.20	0.08	0.09	0.60	0.75	0.19	0.51	3.00	3.00	2.91	2.97	6.30	0.00





**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 200 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764582.003 ; Y = 9425628.088  
 Borhole No. : BH-08 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Probability of Liquefaction PL(%)		
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code	Safety Factor	Youd & Noble	Cetin et al. 2004
2	0.99	0.99	40.77	40.77	6.50	20.00	0.75	1.48	22.00	69.80	0.08	0.08	0.25	0.25	0.39	0.30	3.00	3.00	3.00	3.00	21.40	0.00
4	0.97	0.96	81.54	61.93	6.50	26.00	0.86	1.12	25.00	74.00	0.11	0.11	0.30	0.30	0.38	0.33	3.00	3.00	3.00	3.00	14.70	0.00
6	0.96	0.94	122.31	83.08	6.50	31.00	0.93	0.97	28.00	78.30	0.12	0.12	0.37	0.40	0.37	0.38	3.00	3.00	3.00	3.00	11.10	0.00
8	0.94	0.90	163.08	104.24	6.50	34.00	0.96	0.92	30.00	81.20	0.13	0.12	0.79	0.50	0.36	0.55	3.00	3.00	3.00	3.00	18.50	0.00
10	0.91	0.87	203.85	125.39	6.50	39.00	0.98	0.88	33.00	85.50	0.13	0.12	0.77	0.79	0.36	0.64	3.00	3.00	3.00	3.00	12.80	0.00
12	0.86	0.84	244.62	146.55	6.50	36.00	0.98	0.84	30.00	80.70	0.12	0.12	0.74	0.47	0.33	0.51	3.00	3.00	3.00	3.00	16.60	0.00
14	0.79	0.80	285.39	167.71	6.50	41.00	0.99	0.80	32.00	84.40	0.12	0.12	0.72	0.71	0.33	0.59	3.00	3.00	3.00	3.00	12.30	0.00
16	0.73	0.77	326.16	188.86	6.50	45.00	1.00	0.77	34.00	86.70	0.11	0.11	0.70	0.77	0.32	0.60	3.00	3.00	3.00	3.00	8.50	0.00
18	0.67	0.73	366.93	210.02	6.50	42.00	1.00	0.73	31.00	82.20	0.10	0.11	0.69	0.54	0.30	0.51	3.00	3.00	3.00	3.00	12.30	0.00
20	0.62	0.70	410.76	234.24	93.60	41.00	1.00	0.70	29.00	92.70	0.09	0.11	0.67	0.76	0.41	0.61	3.00	3.00	3.00	3.00	0.20	0.00
22	0.58	0.67	454.59	258.45	93.60	60.00	1.00	0.67	40.00	100.00	0.09	0.10	0.65	0.76	0.44	0.62	3.00	3.00	3.00	3.00	0.00	0.00
24	0.55	0.65	498.43	282.67	93.60	60.00	1.00	0.64	39.00	100.00	0.08	0.10	0.64	0.76	0.43	0.61	3.00	3.00	3.00	3.00	0.00	0.00
26	0.53	0.62	542.26	306.89	93.60	60.00	1.00	0.62	37.00	100.00	0.08	0.09	0.62	0.75	0.41	0.60	3.00	3.00	3.00	3.00	0.00	0.00
28	0.52	0.60	586.09	331.11	93.60	60.00	1.01	0.60	36.00	100.00	0.08	0.09	0.61	0.75	0.40	0.59	3.00	3.00	3.00	3.00	0.00	0.00
30	0.50	0.59	629.92	355.33	93.60	60.00	1.01	0.57	35.00	100.00	0.08	0.09	0.60	0.75	0.39	0.58	3.00	3.00	3.00	3.00	0.00	0.00



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**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 500 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764589.148 ; Y = 9425317.051  
 Borhole No. : BH-02 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Safety Factor	Probability of Liquefaction PL(%)	
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		Youd & Noble	Cetin et al. 2004
2	0.99	0.99	41.22	41.22	1.40	14.00	0.75	1.47	15.00	57.90	0.11	0.11	0.17	0.17	0.24	0.19	1.77	1.77	2.57	2.04	33.10	0.00
4	0.97	0.96	82.44	62.83	1.40	11.00	0.86	1.10	10.00	47.60	0.14	0.14	0.11	0.12	0.17	0.14	0.93	1.03	1.38	1.11	37.60	91.10
6	0.96	0.94	123.67	84.44	1.40	25.00	0.93	0.97	22.00	69.90	0.15	0.15	0.25	0.24	0.25	0.25	1.84	1.85	1.86	1.85	14.80	0.00
8	0.94	0.90	164.89	106.05	1.40	11.00	0.96	0.92	10.00	45.90	0.16	0.15	0.10	0.12	0.13	0.12	0.75	0.86	0.94	0.85	31.90	100.00
10	0.91	0.87	206.11	127.65	1.40	13.00	0.98	0.87	11.00	49.00	0.16	0.15	0.11	0.12	0.13	0.12	0.82	0.92	0.95	0.90	28.20	100.00
12	0.86	0.84	247.33	149.26	1.40	14.00	0.98	0.83	11.00	49.90	0.16	0.15	0.12	0.13	0.13	0.12	0.85	0.95	0.93	0.91	25.40	99.90
14	0.79	0.80	288.55	170.87	1.40	16.00	0.99	0.79	13.00	52.30	0.15	0.15	0.12	0.13	0.13	0.13	0.96	1.03	0.99	0.99	22.40	99.40
16	0.73	0.77	330.56	193.26	2.50	21.00	1.00	0.76	16.00	58.70	0.14	0.14	0.15	0.16	0.16	0.16	1.26	1.26	1.33	1.29	18.70	66.40
18	0.67	0.73	372.57	215.65	2.50	22.00	1.00	0.73	16.00	58.90	0.13	0.14	0.15	0.16	0.15	0.15	1.34	1.31	1.37	1.34	17.20	52.00
20	0.62	0.70	414.57	238.05	2.50	60.00	1.00	0.70	42.00	95.40	0.12	0.13	0.67	0.76	0.26	0.56	3.00	3.00	2.50	2.83	1.50	0.00
22	0.58	0.67	456.58	260.44	2.50	60.00	1.00	0.67	40.00	93.60	0.11	0.13	0.65	0.76	0.24	0.55	3.00	3.00	2.49	2.83	2.10	0.00
24	0.55	0.65	498.58	282.83	2.50	60.00	1.00	0.64	39.00	91.90	0.11	0.13	0.64	0.76	0.23	0.54	3.00	3.00	2.45	2.82	2.80	0.00
26	0.53	0.62	540.59	305.22	2.50	60.00	1.00	0.62	37.00	90.20	0.10	0.12	0.62	0.75	0.21	0.53	3.00	3.00	2.39	2.80	3.80	0.00
28	0.52	0.60	582.60	327.61	2.50	60.00	1.01	0.60	36.00	88.70	0.10	0.12	0.61	0.75	0.20	0.52	3.00	3.00	2.32	2.77	4.90	0.00
30	0.50	0.59	624.60	350.01	2.50	60.00	1.01	0.58	35.00	87.20	0.10	0.12	0.60	0.75	0.19	0.51	3.00	3.00	2.26	2.75	6.30	0.00



**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 500 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764582.003 ; Y = 9425628.088  
 Borhole No. : BH-08 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Probability of Liquefaction PL(%)		
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code	Safety Factor	Youd & Noble	Cetin et al. 2004
2	0.99	0.99	40.77	40.77	6.50	20.00	0.75	1.48	22.00	69.80	0.11	0.11	0.25	0.25	0.39	0.30	2.69	2.66	3.00	2.78	21.40	0.00
4	0.97	0.96	81.54	61.93	6.50	26.00	0.86	1.12	25.00	74.00	0.14	0.14	0.30	0.30	0.38	0.33	2.43	2.49	3.00	2.64	14.70	0.00
6	0.96	0.94	122.31	83.08	6.50	31.00	0.93	0.97	28.00	78.30	0.16	0.15	0.37	0.40	0.37	0.38	2.78	3.00	2.78	2.85	11.10	0.00
8	0.94	0.90	163.08	104.24	6.50	34.00	0.96	0.92	30.00	81.20	0.16	0.16	0.79	0.50	0.36	0.55	3.00	3.00	2.60	2.87	18.50	0.00
10	0.91	0.87	203.85	125.39	6.50	39.00	0.98	0.88	33.00	85.50	0.16	0.16	0.77	0.79	0.36	0.64	3.00	3.00	2.58	2.86	12.80	0.00
12	0.86	0.84	244.62	146.55	6.50	36.00	0.98	0.84	30.00	80.70	0.16	0.15	0.74	0.47	0.33	0.51	3.00	3.00	2.40	2.80	16.60	0.00
14	0.79	0.80	285.39	167.71	6.50	41.00	0.99	0.80	32.00	84.40	0.15	0.15	0.72	0.71	0.33	0.59	3.00	3.00	2.54	2.85	12.30	0.00
16	0.73	0.77	326.16	188.86	6.50	45.00	1.00	0.77	34.00	86.70	0.14	0.15	0.70	0.77	0.32	0.60	3.00	3.00	2.69	2.90	8.50	0.00
18	0.67	0.73	366.93	210.02	6.50	42.00	1.00	0.73	31.00	82.20	0.13	0.14	0.69	0.54	0.30	0.51	3.00	3.00	2.67	2.89	12.30	0.00
20	0.62	0.70	410.76	234.24	93.60	41.00	1.00	0.70	29.00	92.70	0.12	0.14	0.67	0.76	0.41	0.61	3.00	3.00	3.00	3.00	0.20	0.00
22	0.58	0.67	454.59	258.45	93.60	60.00	1.00	0.67	40.00	100.00	0.11	0.13	0.65	0.76	0.44	0.62	3.00	3.00	3.00	3.00	0.00	0.00
24	0.55	0.65	498.43	282.67	93.60	60.00	1.00	0.64	39.00	100.00	0.11	0.13	0.64	0.76	0.43	0.61	3.00	3.00	3.00	3.00	0.00	0.00
26	0.53	0.62	542.26	306.89	93.60	60.00	1.00	0.62	37.00	100.00	0.10	0.12	0.62	0.75	0.41	0.60	3.00	3.00	3.00	3.00	0.00	0.00
28	0.52	0.60	586.09	331.11	93.60	60.00	1.01	0.60	36.00	100.00	0.10	0.12	0.61	0.75	0.40	0.59	3.00	3.00	3.00	3.00	0.00	0.00
30	0.50	0.59	629.92	355.33	93.60	60.00	1.01	0.57	35.00	100.00	0.10	0.11	0.60	0.75	0.39	0.58	3.00	3.00	3.00	3.00	0.00	0.00



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**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 2500 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764589.148 ; Y = 9425317.051  
 Borhole No. : BH-02 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Safety Factor	Probability of Liquefaction PL(%)	
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		Youd & Noble	Cetin et al. 2004
2	0.99	0.99	41.22	41.22	1.40	14.00	0.75	1.47	15.00	57.90	0.15	0.15	0.17	0.17	0.24	0.19	1.27	1.28	1.85	1.47	33.10	5.50
4	0.97	0.96	82.44	62.83	1.40	11.00	0.86	1.10	10.00	47.60	0.20	0.19	0.11	0.12	0.17	0.14	0.67	0.74	0.99	0.80	37.60	100.00
6	0.96	0.94	123.67	84.44	1.40	25.00	0.93	0.97	22.00	69.90	0.21	0.21	0.25	0.24	0.25	0.25	1.32	1.33	1.34	1.33	14.80	7.40
8	0.94	0.90	164.89	106.05	1.40	11.00	0.96	0.92	10.00	45.90	0.22	0.22	0.10	0.12	0.13	0.12	0.54	0.62	0.68	0.61	31.90	100.00
10	0.91	0.87	206.11	127.65	1.40	13.00	0.98	0.87	11.00	49.00	0.22	0.21	0.11	0.12	0.13	0.12	0.59	0.67	0.68	0.65	28.20	100.00
12	0.86	0.84	247.33	149.26	1.40	14.00	0.98	0.83	11.00	49.90	0.22	0.21	0.12	0.13	0.13	0.12	0.61	0.69	0.67	0.66	25.40	100.00
14	0.79	0.80	288.55	170.87	1.40	16.00	0.99	0.79	13.00	52.30	0.21	0.21	0.12	0.13	0.13	0.13	0.69	0.74	0.71	0.71	22.40	100.00
16	0.73	0.77	330.56	193.26	2.50	21.00	1.00	0.76	16.00	58.70	0.19	0.20	0.15	0.16	0.16	0.16	0.91	0.91	0.96	0.92	18.70	99.70
18	0.67	0.73	372.57	215.65	2.50	22.00	1.00	0.73	16.00	58.90	0.18	0.19	0.15	0.16	0.15	0.15	0.96	0.94	0.99	0.96	17.20	99.10
20	0.62	0.70	414.57	238.05	2.50	60.00	1.00	0.70	42.00	95.40	0.16	0.19	0.67	0.76	0.26	0.56	3.00	3.00	1.80	2.60	1.50	0.00
22	0.58	0.67	456.58	260.44	2.50	60.00	1.00	0.67	40.00	93.60	0.16	0.18	0.65	0.76	0.24	0.55	3.00	3.00	1.79	2.60	2.10	0.00
24	0.55	0.65	498.58	282.83	2.50	60.00	1.00	0.64	39.00	91.90	0.15	0.17	0.64	0.76	0.23	0.54	3.00	3.00	1.76	2.59	2.80	0.00
26	0.53	0.62	540.59	305.22	2.50	60.00	1.00	0.62	37.00	90.20	0.14	0.17	0.62	0.75	0.21	0.53	3.00	3.00	1.72	2.57	3.80	0.00
28	0.52	0.60	582.60	327.61	2.50	60.00	1.01	0.60	36.00	88.70	0.14	0.16	0.61	0.75	0.20	0.52	3.00	3.00	1.67	2.56	4.90	0.00
30	0.50	0.59	624.60	350.01	2.50	60.00	1.01	0.58	35.00	87.20	0.14	0.16	0.60	0.75	0.19	0.51	3.00	3.00	1.62	2.54	6.30	0.00



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**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 2500 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764582.003 ; Y = 9425628.088  
 Borhole No. : BH-08 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Probability of Liquefaction PL(%)		
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code	Safety Factor	Youd & Noble	Cetin et al. 2004
2	0.99	0.99	40.77	40.77	6.50	20.00	0.75	1.48	22.00	69.80	0.15	0.15	0.25	0.25	0.39	0.30	1.94	1.91	2.98	2.28	21.40	0.00
4	0.97	0.96	81.54	61.93	6.50	26.00	0.86	1.12	25.00	74.00	0.20	0.19	0.30	0.30	0.38	0.33	1.75	1.79	2.24	1.93	14.70	0.00
6	0.96	0.94	122.31	83.08	6.50	31.00	0.93	0.97	28.00	78.30	0.22	0.21	0.37	0.40	0.37	0.38	2.00	2.16	2.00	2.05	11.10	0.00
8	0.94	0.90	163.08	104.24	6.50	34.00	0.96	0.92	30.00	81.20	0.22	0.22	0.79	0.50	0.36	0.55	3.00	2.69	1.87	2.52	18.50	0.00
10	0.91	0.87	203.85	125.39	6.50	39.00	0.98	0.88	33.00	85.50	0.23	0.22	0.77	0.79	0.36	0.64	3.00	3.00	1.86	2.62	12.80	0.00
12	0.86	0.84	244.62	146.55	6.50	36.00	0.98	0.84	30.00	80.70	0.22	0.21	0.74	0.47	0.33	0.51	3.00	2.54	1.73	2.42	16.60	0.00
14	0.79	0.80	285.39	167.71	6.50	41.00	0.99	0.80	32.00	84.40	0.21	0.21	0.72	0.71	0.33	0.59	3.00	3.00	1.83	2.61	12.30	0.00
16	0.73	0.77	326.16	188.86	6.50	45.00	1.00	0.77	34.00	86.70	0.19	0.20	0.70	0.77	0.32	0.60	3.00	3.00	1.94	2.65	8.50	0.00
18	0.67	0.73	366.93	210.02	6.50	42.00	1.00	0.73	31.00	82.20	0.18	0.20	0.69	0.54	0.30	0.51	3.00	3.00	1.92	2.64	12.30	0.00
20	0.62	0.70	410.76	234.24	93.60	41.00	1.00	0.70	29.00	92.70	0.17	0.19	0.67	0.76	0.41	0.61	3.00	3.00	2.84	2.95	0.20	0.00
22	0.58	0.67	454.59	258.45	93.60	60.00	1.00	0.67	40.00	100.00	0.16	0.18	0.65	0.76	0.44	0.62	3.00	3.00	3.00	3.00	0.00	0.00
24	0.55	0.65	498.43	282.67	93.60	60.00	1.00	0.64	39.00	100.00	0.15	0.17	0.64	0.76	0.43	0.61	3.00	3.00	3.00	3.00	0.00	0.00
26	0.53	0.62	542.26	306.89	93.60	60.00	1.00	0.62	37.00	100.00	0.14	0.17	0.62	0.75	0.41	0.60	3.00	3.00	3.00	3.00	0.00	0.00
28	0.52	0.60	586.09	331.11	93.60	60.00	1.01	0.60	36.00	100.00	0.14	0.16	0.61	0.75	0.40	0.59	3.00	3.00	3.00	3.00	0.00	0.00
30	0.50	0.59	629.92	355.33	93.60	60.00	1.01	0.57	35.00	100.00	0.14	0.16	0.60	0.75	0.39	0.58	3.00	3.00	3.00	3.00	0.00	0.00



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**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 5000 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764589.148 ; Y = 9425317.051  
 Borhole No. : BH-02 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Safety Factor	Probability of Liquefaction PL(%)	
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		Youd & Noble	Cetin et al. 2004
2	0.99	0.99	41.22	41.22	1.40	14.00	0.75	1.47	15.00	57.90	0.17	0.17	0.17	0.17	0.24	0.19	1.13	1.13	1.64	1.30	33.10	22.50
4	0.97	0.96	82.44	62.83	1.40	11.00	0.86	1.10	10.00	47.60	0.22	0.22	0.11	0.12	0.17	0.14	0.59	0.66	0.88	0.71	37.60	100.00
6	0.96	0.94	123.67	84.44	1.40	25.00	0.93	0.97	22.00	69.90	0.24	0.24	0.25	0.24	0.25	0.25	1.17	1.18	1.19	1.18	14.80	27.00
8	0.94	0.90	164.89	106.05	1.40	11.00	0.96	0.92	10.00	45.90	0.25	0.24	0.10	0.12	0.13	0.12	0.48	0.55	0.60	0.54	31.90	100.00
10	0.91	0.87	206.11	127.65	1.40	13.00	0.98	0.87	11.00	49.00	0.25	0.24	0.11	0.12	0.13	0.12	0.52	0.59	0.61	0.57	28.20	100.00
12	0.86	0.84	247.33	149.26	1.40	14.00	0.98	0.83	11.00	49.90	0.24	0.24	0.12	0.13	0.13	0.12	0.54	0.61	0.59	0.58	25.40	100.00
14	0.79	0.80	288.55	170.87	1.40	16.00	0.99	0.79	13.00	52.30	0.23	0.23	0.12	0.13	0.13	0.13	0.61	0.66	0.63	0.63	22.40	100.00
16	0.73	0.77	330.56	193.26	2.50	21.00	1.00	0.76	16.00	58.70	0.21	0.23	0.15	0.16	0.16	0.16	0.81	0.81	0.85	0.82	18.70	100.00
18	0.67	0.73	372.57	215.65	2.50	22.00	1.00	0.73	16.00	58.90	0.20	0.22	0.15	0.16	0.15	0.15	0.85	0.83	0.87	0.85	17.20	99.90
20	0.62	0.70	414.57	238.05	2.50	60.00	1.00	0.70	42.00	95.40	0.19	0.21	0.67	0.76	0.26	0.56	3.00	3.00	1.60	2.53	1.50	0.00
22	0.58	0.67	456.58	260.44	2.50	60.00	1.00	0.67	40.00	93.60	0.18	0.20	0.65	0.76	0.24	0.55	3.00	3.00	1.59	2.53	2.10	0.00
24	0.55	0.65	498.58	282.83	2.50	60.00	1.00	0.64	39.00	91.90	0.17	0.20	0.64	0.76	0.23	0.54	3.00	3.00	1.56	2.52	2.80	0.00
26	0.53	0.62	540.59	305.22	2.50	60.00	1.00	0.62	37.00	90.20	0.16	0.19	0.62	0.75	0.21	0.53	3.00	3.00	1.52	2.51	3.80	0.00
28	0.52	0.60	582.60	327.61	2.50	60.00	1.01	0.60	36.00	88.70	0.16	0.19	0.61	0.75	0.20	0.52	3.00	3.00	1.48	2.49	4.90	0.00
30	0.50	0.59	624.60	350.01	2.50	60.00	1.01	0.58	35.00	87.20	0.15	0.18	0.60	0.75	0.19	0.51	3.00	3.00	1.44	2.48	6.30	0.00



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**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 5000 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764582.003 ; Y = 9425628.088  
 Borhole No. : BH-08 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Probability of Liquefaction PL(%)		
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code	Safety Factor	Youd & Noble	Cetin et al. 2004
2	0.99	0.99	40.77	40.77	6.50	20.00	0.75	1.48	22.00	69.80	0.17	0.17	0.25	0.25	0.39	0.30	1.72	1.70	2.65	2.02	21.40	0.00
4	0.97	0.96	81.54	61.93	6.50	26.00	0.86	1.12	25.00	74.00	0.22	0.22	0.30	0.30	0.38	0.33	1.55	1.59	1.98	1.71	14.70	0.00
6	0.96	0.94	122.31	83.08	6.50	31.00	0.93	0.97	28.00	78.30	0.24	0.24	0.37	0.40	0.37	0.38	1.77	1.92	1.77	1.82	11.10	0.00
8	0.94	0.90	163.08	104.24	6.50	34.00	0.96	0.92	30.00	81.20	0.25	0.24	0.79	0.50	0.36	0.55	3.00	2.38	1.66	2.35	18.50	0.00
10	0.91	0.87	203.85	125.39	6.50	39.00	0.98	0.88	33.00	85.50	0.25	0.24	0.77	0.79	0.36	0.64	3.00	3.00	1.65	2.55	12.80	0.00
12	0.86	0.84	244.62	146.55	6.50	36.00	0.98	0.84	30.00	80.70	0.25	0.24	0.74	0.47	0.33	0.51	3.00	2.26	1.53	2.26	16.60	0.00
14	0.79	0.80	285.39	167.71	6.50	41.00	0.99	0.80	32.00	84.40	0.23	0.23	0.72	0.71	0.33	0.59	3.00	3.00	1.62	2.54	12.30	0.00
16	0.73	0.77	326.16	188.86	6.50	45.00	1.00	0.77	34.00	86.70	0.22	0.23	0.70	0.77	0.32	0.60	3.00	3.00	1.72	2.57	8.50	0.00
18	0.67	0.73	366.93	210.02	6.50	42.00	1.00	0.73	31.00	82.20	0.20	0.22	0.69	0.54	0.30	0.51	3.00	2.82	1.70	2.51	12.30	0.00
20	0.62	0.70	410.76	234.24	93.60	41.00	1.00	0.70	29.00	92.70	0.19	0.21	0.67	0.76	0.41	0.61	3.00	3.00	2.52	2.84	0.20	0.00
22	0.58	0.67	454.59	258.45	93.60	60.00	1.00	0.67	40.00	100.00	0.18	0.20	0.65	0.76	0.44	0.62	3.00	3.00	2.90	2.97	0.00	0.00
24	0.55	0.65	498.43	282.67	93.60	60.00	1.00	0.64	39.00	100.00	0.17	0.20	0.64	0.76	0.43	0.61	3.00	3.00	2.92	2.97	0.00	0.00
26	0.53	0.62	542.26	306.89	93.60	60.00	1.00	0.62	37.00	100.00	0.16	0.19	0.62	0.75	0.41	0.60	3.00	3.00	2.92	2.97	0.00	0.00
28	0.52	0.60	586.09	331.11	93.60	60.00	1.01	0.60	36.00	100.00	0.16	0.18	0.61	0.75	0.40	0.59	3.00	3.00	2.91	2.97	0.00	0.00
30	0.50	0.59	629.92	355.33	93.60	60.00	1.01	0.57	35.00	100.00	0.15	0.18	0.60	0.75	0.39	0.58	3.00	3.00	2.89	2.96	0.00	0.00



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**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 10000 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764589.148 ; Y = 9425317.051  
 Borhole No. : BH-02 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Probability of Liquefaction PL(%)		
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code	Safety Factor	Youd & Noble	Cetin et al. 2004
2	0.99	0.99	41.22	41.22	1.40	14.00	0.75	1.47	15.00	57.90	0.20	0.20	0.17	0.17	0.24	0.19	0.98	0.99	1.43	1.13	33.10	58.00
4	0.97	0.96	82.44	62.83	1.40	11.00	0.86	1.10	10.00	47.60	0.25	0.25	0.11	0.12	0.17	0.14	0.52	0.57	0.77	0.62	37.60	100.00
6	0.96	0.94	123.67	84.44	1.40	25.00	0.93	0.97	22.00	69.90	0.28	0.27	0.25	0.24	0.25	0.25	1.02	1.03	1.03	1.03	14.80	63.60
8	0.94	0.90	164.89	106.05	1.40	11.00	0.96	0.92	10.00	45.90	0.29	0.28	0.10	0.12	0.13	0.12	0.42	0.48	0.52	0.47	31.90	100.00
10	0.91	0.87	206.11	127.65	1.40	13.00	0.98	0.87	11.00	49.00	0.29	0.28	0.11	0.12	0.13	0.12	0.46	0.51	0.53	0.50	28.20	100.00
12	0.86	0.84	247.33	149.26	1.40	14.00	0.98	0.83	11.00	49.90	0.28	0.27	0.12	0.13	0.13	0.12	0.47	0.53	0.52	0.51	25.40	100.00
14	0.79	0.80	288.55	170.87	1.40	16.00	0.99	0.79	13.00	52.30	0.27	0.27	0.12	0.13	0.13	0.13	0.53	0.57	0.55	0.55	22.40	100.00
16	0.73	0.77	330.56	193.26	2.50	21.00	1.00	0.76	16.00	58.70	0.25	0.26	0.15	0.16	0.16	0.16	0.70	0.70	0.74	0.71	18.70	100.00
18	0.67	0.73	372.57	215.65	2.50	22.00	1.00	0.73	16.00	58.90	0.23	0.25	0.15	0.16	0.15	0.15	0.74	0.73	0.76	0.74	17.20	100.00
20	0.62	0.70	414.57	238.05	2.50	60.00	1.00	0.70	42.00	95.40	0.21	0.24	0.67	0.76	0.26	0.56	3.00	3.00	1.39	2.46	1.50	0.00
22	0.58	0.67	456.58	260.44	2.50	60.00	1.00	0.67	40.00	93.60	0.20	0.23	0.65	0.76	0.24	0.55	3.00	3.00	1.38	2.46	2.10	0.00
24	0.55	0.65	498.58	282.83	2.50	60.00	1.00	0.64	39.00	91.90	0.19	0.23	0.64	0.76	0.23	0.54	3.00	3.00	1.36	2.45	2.80	0.00
26	0.53	0.62	540.59	305.22	2.50	60.00	1.00	0.62	37.00	90.20	0.19	0.22	0.62	0.75	0.21	0.53	3.00	3.00	1.33	2.44	3.80	0.00
28	0.52	0.60	582.60	327.61	2.50	60.00	1.01	0.60	36.00	88.70	0.18	0.21	0.61	0.75	0.20	0.52	3.00	3.00	1.29	2.43	4.90	0.00
30	0.50	0.59	624.60	350.01	2.50	60.00	1.01	0.58	35.00	87.20	0.18	0.21	0.60	0.75	0.19	0.51	3.00	3.00	1.25	2.42	6.30	0.00





**Hasil Analisis Potensi Likuifaksi pada Periode Ulang Gempa 10000 Tahun dari Software Novoliq**

Lokasi : Kelurahan Barombong - Tamalate - Makassar  
 Koordinat : X = 764582.003 ; Y = 9425628.088  
 Borhole No. : BH-08 (0,00 - 30,00 m)

Depth (m)	Rd	Rd_I&B	Overburden Stress (kPa)		Fines Content (%)	SPT Test				Relative Density Dr (%)	Simplified CSR	CSR_I&B	CRR7.5			CRR7.5 (ave)	Safety Factor			Probability of Liquefaction PL(%)		
			Total	Effective		N	Co	Cn	N1(60)				NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code		NCEER Workshop (1997)	Boulanger & Idriss (2014)	Japanese Highway Bridge Code	Safety Factor	Youd & Noble	Cetin et al. 2004
2	0.99	0.99	40.77	40.77	6.50	20.00	0.75	1.48	22.00	69.80	0.20	0.20	0.25	0.25	0.39	0.30	1.50	1.48	2.31	1.76	21.40	0.00
4	0.97	0.96	81.54	61.93	6.50	26.00	0.86	1.12	25.00	74.00	0.25	0.25	0.30	0.30	0.38	0.33	1.35	1.38	1.73	1.49	14.70	0.30
6	0.96	0.94	122.31	83.08	6.50	31.00	0.93	0.97	28.00	78.30	0.28	0.27	0.37	0.40	0.37	0.38	1.54	1.67	1.55	1.59	11.10	0.10
8	0.94	0.90	163.08	104.24	6.50	34.00	0.96	0.92	30.00	81.20	0.29	0.28	0.79	0.50	0.36	0.55	3.00	2.08	1.45	2.17	18.50	0.00
10	0.91	0.87	203.85	125.39	6.50	39.00	0.98	0.88	33.00	85.50	0.29	0.28	0.77	0.79	0.36	0.64	3.00	3.00	1.44	2.48	12.80	0.00
12	0.86	0.84	244.62	146.55	6.50	36.00	0.98	0.84	30.00	80.70	0.28	0.28	0.74	0.47	0.33	0.51	3.00	1.97	1.34	2.10	16.60	0.20
14	0.79	0.80	285.39	167.71	6.50	41.00	0.99	0.80	32.00	84.40	0.27	0.27	0.72	0.71	0.33	0.59	3.00	3.00	1.41	2.47	12.30	0.00
16	0.73	0.77	326.16	188.86	6.50	45.00	1.00	0.77	34.00	86.70	0.25	0.26	0.70	0.77	0.32	0.60	3.00	3.00	1.50	2.50	8.50	0.00
18	0.67	0.73	366.93	210.02	6.50	42.00	1.00	0.73	31.00	82.20	0.23	0.25	0.69	0.54	0.30	0.51	3.00	2.46	1.48	2.31	12.30	0.00
20	0.62	0.70	410.76	234.24	93.60	41.00	1.00	0.70	29.00	92.70	0.21	0.24	0.67	0.76	0.41	0.61	3.00	3.00	2.20	2.73	0.20	0.00
22	0.58	0.67	454.59	258.45	93.60	60.00	1.00	0.67	40.00	100.00	0.20	0.23	0.65	0.76	0.44	0.62	3.00	3.00	2.53	2.84	0.00	0.00
24	0.55	0.65	498.43	282.67	93.60	60.00	1.00	0.64	39.00	100.00	0.19	0.23	0.64	0.76	0.43	0.61	3.00	3.00	2.55	2.85	0.00	0.00
26	0.53	0.62	542.26	306.89	93.60	60.00	1.00	0.62	37.00	100.00	0.19	0.22	0.62	0.75	0.41	0.60	3.00	3.00	2.55	2.85	0.00	0.00
28	0.52	0.60	586.09	331.11	93.60	60.00	1.01	0.60	36.00	100.00	0.18	0.21	0.61	0.75	0.40	0.59	3.00	3.00	2.54	2.85	0.00	0.00
30	0.50	0.59	629.92	355.33	93.60	60.00	1.01	0.57	35.00	100.00	0.18	0.21	0.60	0.75	0.39	0.58	3.00	3.00	2.52	2.84	0.00	0.00



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