

DAFTAR PUSTAKA

- Al-huda, N. (2014). *Perilaku Tanah Dasar Fondasi Embankment dengan Perkuatan Geogrid dan Drainase Vertikal.* 21(1), 65–78.
- Anonim. (1979). Peraturan Kontruksi Kayu Indonesia NI-5 I 1961. Bandung. Yayasan LPMB Dep. PUTL
- Ariestadi, Dian. 2008. Teknik Struktur Bangunan jilid 3. Jakarta: Departemen Pendidikan Nasional.
- B., Arifin; Samang, L., Harianto, T., Muhiddin, A.C. (2019) Experimental Study Of Deformation And Pore Water Pressure For Embankment On Soft Soil Using Rapid Impact Compaction, Journal of Engineering and Applied Sciences, vol. 14, no. 18, pp.3264-3270
- Bowles, Joseph E. dan Johan K. Hanim.(1986). Sifat-Sifat Fisis Dan Geoteknis Tanah (Mekanika Tanah). Edisi Kedua. Penerbit Erlangga. Jakarta.
- Dandel, R., Sumampouw, J. E. R., & Sompie, O. B. A. (2017). Pengaruh Tekanan Air Pori Tanah Terhadap Perkuatan Tembok Penahan dan Geotextile. *Jurusan Teknik Sipil Fakultas Teknik Universitas Sam Ratulangi*, 15(67).
- Das, B. M. (1995). Mekanika Tanah (Prinsip-prinsip Rekayasa Geoteknik. *Penerbit Erlangga*, 1–300.
- Day, R. W. (2002). Earthquake engineering handbook. *Earthquake Engineering Handbook*, 1–1483. <https://doi.org/10.5860/choice.40-5239>
- Departemen Pekerjaan Umum. (1999). Tata Cara Pelaksanaan Pondasi Cerucuk Sebagai Peningkatan Pondasi Cerucuk Kayu Di Atas Tanah Lembek dan Tanah Gambut No. 029/T/BM/1999. Jakarta: PT. Mediatama Saptakarya (PT. Medisa).
- García-Torres, S., Madabhushi, G.S.P., (2019) Performance of vertical drains in liquefaction mitigation under structures. Bull Earthquake Eng 17, 5849–5866. <https://doi.org/10.1007/s10518-019-00717-x>
- H. Alsaleh, I. Shahrour, (2009) Influence of plasticity on the seismic soil-micropiles– structure interaction, Soil Dynamics and Earthquake Engineering 29 (2009) 574–578.
- Idriss, I. ., & R.W. Boulanger. (2008). Soil Liquefaction During Earthquakes. In

Earthquake Engineering Research Institute.

<https://doi.org/10.1109/MIA.2007.322261>

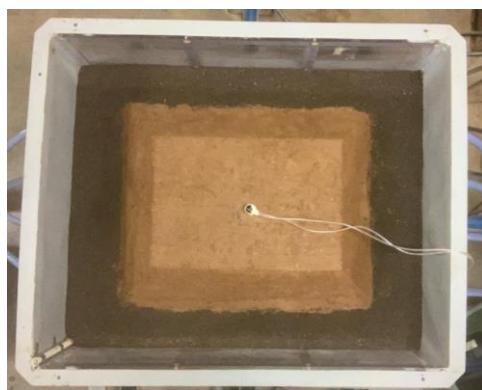
- Ishihara, K. (1985). Stability of natural deposits during earthquakes. *Proc. 11th International Conference on Soil Mechanics and Foundation Engineering, San Francisco, August 1985. Vol. 1, (Balkema)*, 321–376.
- Kololikiye, G. R., Zaika, Y., & Harimurti. (2021). Prefabricated Vertical Drain Improved Soft Soil Using Three-Dimensional Finite Element Method. *Rekayasa Sipil*, 15(2), 150–156. <https://doi.org/10.21776/ub.rekayasasipil.2021.015.02.10>
- Lumbangaol, B. (2020). Analisa Preloading Dengan Prefabricated Vertical Drain (PVD) Terhadap Perbaikan Tanah Lunak Pada Pembangunan Jalan Tol Tebing Tinggi - Indrapura. *JCEBT (Journal of Civil Engineering, Building, and Transportation)*, 4(2), 85–93.
- Nurimah, & Martini. (2003). Pengaruh Jumlah Cerucuk Kayu Sebagai Perkuatan Terhadap Daya Dukung Tanah Berpasir. *Jurnal Sains Dan Teknologi Tadulako*, 7(1), 1–16.
- Rizal, K., & Agustawijaya, D. S. (2016). Perubahan Tekanan Air Pori Tanah Akibat Beban Kejut Kendaraan Pada Jembatan Banyumulek. *Spektrum Sipil ISSN 1858-4896 Vol. 3, No 2 : 121 - 132, September 2016*, 3(2), 121–132.
- Rollins, Kyle M.; Goughnour, R. Robert; Anderson, J. K. S.; and Wade, Stacey F., (2004). "Liquefaction Hazard Mitigation by Prefabricated Vertical Drains" International Conference on Case Histories in Geotechnical Engineering. <https://scholarsmine.mst.edu/icchge/5icchge/session12/4>
- Salauwe, R., Manoppo, F. J., & Monintja, S. (2015). Analisa Perkuatan Tanah dengan Bambu Sebagai Micro Pile pada Tanah Liquefaction (Proyek PLTU Manokwari). *Jurnal Ilmiah Media Engineering*, 5(2), 351–361. <https://ejournal.unsrat.ac.id/index.php/jime/article/view/9963>
- Seed, H.B and Idriss I.M. (1971). Simplified procedure for evaluating soil liquefaction potential. *Jurnal of geotechnical Engineering, ASCE*, Vol.97, pp1249-1273.
- Seed, H.B., Idriss, I.M., Makdisi, F., and Banerjee, N. (1975). Representation of irregular stress time histories by equivalent uniform stress series in liquefaction

- analyses. Report No. EERC 75- 29, Earthquake Engineering Research Center, University of California, Berkeley, Calif.
- Sudarminto. (1983). *Rumus-rumus dan Daftar-daftar untuk Perhitungan Konstruksi Beton*. Carya Remadya.
- Sunarjo, Gunawan, M. T., & Pribadi, S. (2012). *Gempa Bumi Edisi Populer*. Badan Meteorologi Klimatologi dan Geofisika.
- Susiazti, H., Widiastuti, M., Widyati, R., & Widayati, R. (2020). Analisis Penurunan Konsolidasi Metode Preloading Dan Prefabricated Vertical Drain (Pvd). *JURNAL TEKNOLOGI SIPIL Jurnal Ilmu Pengetahuan Dan Teknologi Sipil*, 4, 1–8.
- Tijow, K. C., Sompie, O. B. A., & Ticoh, J. H. (2018). Analisis Potensi Likuifaksi Tanah Berdasarkan Data Standart Penetration Test (SPT), Studi Kasus : Dermaga Bitung, Sulawesi Utara. *Jurnal Sipil Statik*, 6(7), 491–500.
- Yunianti, A. D., Syahidah, Agussalim, & Suhasman. (2020). *Buku Ajar Ilmu Kayu*. Fakultas Kehutanan Universitas Hasanuddin Anggota IKAPI No. 023/Anggota Luar Biasa/SSL/2019.

LAMPIRAN

Lampiran 1. Dokumentasi





Lampiran 2. Data Hasil Pengujian

Pembacaan Tekanan Air Pori (kPa)					
Z = 17 cm (Tanpa Perkuatan)	Z = 1 cm (Tanpa Perkuatan)	Z = 17 cm (Cerucuk Kayu)	Z = 1 cm (Cerucuk Kayu)	Z = 17 cm (Cerucuk Kayu+PVD)	Z = 1 cm (Cerucuk Kayu+PVD)
1.77	0.10	1.77	0.10	1.77	0.10
1.77	0.10	1.77	0.10	1.80	0.10
1.78	0.10	1.77	0.10	1.81	0.12
1.79	0.10	1.77	0.10	1.84	0.12
1.85	0.12	1.78	0.10	1.95	0.16
1.91	0.15	1.78	0.12	2.09	0.23
1.95	0.19	1.78	0.13	2.15	0.26
2.21	0.31	1.81	0.18	2.20	0.29
2.44	0.45	1.92	0.25	2.24	0.31
2.78	0.57	2.06	0.32	2.26	0.32
3.01	0.68	2.26	0.41	2.27	0.33
3.30	0.85	2.49	0.53	2.28	0.34
3.49	0.95	2.65	0.61	2.29	0.34
3.69	1.05	2.84	0.70	2.30	0.35
3.68	1.03	2.88	0.73	2.30	0.35
3.84	1.12	2.97	0.81	2.30	0.34
3.94	1.18	3.07	0.85	2.30	0.34
3.99	1.20	3.11	0.87	2.31	0.35
3.97	1.20	3.13	0.88	2.32	0.35
3.74	1.07	3.16	0.86	2.31	0.34
3.97	1.13	3.18	0.88	2.32	0.34
3.66	1.25	3.17	0.87	2.31	0.34
3.33	1.04	3.16	0.86	2.31	0.34
3.95	1.08	3.12	0.84	2.31	0.34
4.05	1.21	3.12	0.83	2.32	0.33
3.75	1.07	3.11	0.83	2.31	0.33
4.03	1.24	3.06	0.79	2.31	0.32
3.38	0.85	3.06	0.80	2.31	0.32
3.69	1.02	3.03	0.77	2.32	0.32
4.04	1.22	2.99	0.75	2.31	0.32
3.50	0.84	2.98	0.75	2.30	0.31
3.71	1.06	2.97	0.73	2.30	0.31
3.72	1.03	2.94	0.71	2.30	0.30

Pembacaan Tekanan Air Pori (kPa)					
Z = 17 cm (Tanpa Perkuatan)	Z = 1 cm (Tanpa Perkuatan)	Z = 17 cm (Cerucuk Kayu)	Z = 1 cm (Cerucuk Kayu)	Z = 17 cm (Cerucuk Kayu+PVD)	Z = 1 cm (Cerucuk Kayu+PVD)
3.42	0.84	2.92	0.70	2.29	0.30
3.34	0.89	2.92	0.70	2.28	0.29
3.60	1.02	2.88	0.67	2.28	0.28
3.94	1.18	2.87	0.65	2.28	0.28
3.33	0.90	2.84	0.63	2.28	0.29
3.72	1.07	2.83	0.60	2.28	0.29
3.68	1.05	2.81	0.58	2.28	0.29
3.51	0.96	2.76	0.55	2.26	0.27
3.31	0.85	2.73	0.54	2.25	0.26
3.09	0.74	2.73	0.51	2.23	0.24
2.96	0.67	2.67	0.49	2.22	0.23
2.86	0.62	2.65	0.46	2.22	0.22
2.81	0.59	2.61	0.44	2.22	0.21
2.80	0.58	2.60	0.42	2.22	0.20
2.78	0.57	2.57	0.41	2.22	0.19
2.78	0.57	2.55	0.39	2.22	0.19
2.78	0.58	2.52	0.38	2.22	0.18
2.78	0.57	2.50	0.37	2.22	0.17
2.77	0.57	2.50	0.37	2.20	0.17
2.78	0.57	2.49	0.36	2.20	0.16
2.77	0.57	2.49	0.36	2.19	0.16
2.76	0.57	2.49	0.36	2.18	0.15
2.76	0.57	2.48	0.35	2.18	0.15
2.76	0.57	2.48	0.35	2.15	0.15
2.76	0.57	2.48	0.35	2.15	0.14
2.76	0.57	2.48	0.35	2.15	0.14
2.76	0.57	2.48	0.35	2.15	0.14

Lampiran 3. Spesifikasi PVD

CeTeau-Drain CT-D822

Drain Body

Extrusion profile of 100% polypropylene with the following important properties:

- environmental safe
- large water flow capacity
- flexible
- high tensile strength and toughness
- inert to natural occurring acids alkalis and salt
- workable and easy to handle at low temperatures
- no wet shrinkage or growth

Filter Jacket

Norwoven fabric of 100% polyester without any binders, with the following important properties:

- balanced strength in both directions
- high tensile strength and toughness
- no wet shrinkage or growth
- good resistance to rot, moisture and insects
- high water permeability
- inert to natural occurring acids, alkalis and salt
- excellent filtration characteristics
- tear, burst and puncture resistant
- environmental safe

Physical properties	Symbol	Test	Unit	CT-D822
Drain Body		Configuration	-	-
		Material	-	PP
		Colour	-	white
Filter Jacket		Material	-	PET
		Colour	-	grey
Assembled Drain		Weight	g/m	75
		Width	mm	100
		Thickness	mm	4

Mechanical properties	Symbol	Test	Unit	CT-D822
Filter Jacket				
Grab Tensile Strength	F	ASTM D4632	N	480
Elongation	ε	ASTM D4632	%	32
Tear Strength		ASTM D4533	N	120
Pore Size	O_d	ASTM D4751	μm	< 75
Permeability	k	ASTM D4491	m/s	$> 1.0 \times 10^{-4}$
Assembled Drain				
Tensile Strength	F	ASTM D4595	kN	2.75
Elongation at break	ε	ASTM D4595	%	40
Strength at 10% elongation	F	ASTM D4595	kN	2.2
Elongation at 1 kN tensile strength	ε	ASTM D4595	%	1.5
Discharge capacity at 100 kPa	q_c	ASTM D4716	m^3/s	158×10^{-4}
Discharge capacity at 150 kPa	q_c	ASTM D4716	m^3/s	157×10^{-4}
Discharge capacity at 200 kPa	q_c	ASTM D4716	m^3/s	155×10^{-4}
Discharge capacity at 250 kPa	q_c	ASTM D4716	m^3/s	150×10^{-4}
Discharge capacity at 300 kPa	q_c	ASTM D4716	m^3/s	141×10^{-4}
Discharge capacity at 350 kPa	q_c	ASTM D4716	m^3/s	135×10^{-4}

Transport details	Symbol	Test	Unit	CT-D822
Roll length			m	250
Outside diameter roll			m	1.10
Inside diameter roll			m	0.15
Weight roll			kg	20
40ft container			m	125,000

All information, illustrations and specifications are based on the latest product information available at the time of printing. The right is reserved to make changes at any time without notice.
All mechanical properties are average values. Standard variations in mechanical strength of 10% and in hydraulic flow and pore size of 20% have to be allowed for.

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