

BAB 5

KESIMPULAN DAN SARAN

5.1 Kesimpulan

Berdasarkan penelitian mengenai korelasi nilai IP dengan potensi pengembangan, didapatkan kesimpulan sebagai berikut:

1. Berdasarkan penelitian dari 36 data yang dikumpulkan, adanya korelasi antara IP dengan potensi pengembangan baik untuk tanah asli dan tanah stabilisasi dengan peningkatan IP cenderung meningkatkan nilai potensi pengembangan tanah. Nilai potensi pengembangan tanah asli lebih besar daripada tanah stabilisasi dengan IP yang sama.
2. Persamaan korelasi antara IP dan potensi pengembangan pada tanah asli dan tanah stabilisasi cenderung bertolak belakang dengan Seed (1962) serta Chen (1983) dikarenakan adanya perbedaan geologi dari tanah yang ditinjau. Persamaan tersebut dapat digunakan baik untuk jenis tanah lempung dan tanah lanau.

5.2 Saran

1. Data dan parameter tanah yang dikumpulkan seharusnya lebih banyak agar didapatkan garis regresi yang lebih akurat.
2. Perlu dilakukannya penelitian berlanjut agar korelasi yang didapat tidak hanya dari parameter indeks plastisitas saja.
3. Terdapat keterbatasan-keterbatasan yang dilakukan pada penelitian ini sehingga dapat dilakukan penelitian lebih lanjut di laboratorium.

DAFTAR PUSTAKA

- Abdulaziz, E. S. M., Taha, Y. K., Kenawi, M. A., & Kamel, A. O. (2013). Treatment of expansive soil with chemical additives. *Journal of Engineering Science*, 41(5), 1765–1777.
- Aji, W. W. (2012). *Swelling Pressure of Ekspansif Soil Regarding its Water Content*.
- Al-Khashab, M. N., & Thafer, A.-H. M. (2008). Treatment of Expansive Clayey Soil with Crushed Limestone. *Civil Eng. Dept. Collage of Eng. Mosul University. Engineering & Technology Journal*, 26(January 2008), 376–386.
- Al-Rawas, A. A., & Goosen, M. F. . (2006). *Expansive Soils*.
- Al-Rawas, A. A., Hago, A. W., & Al-Sarmi, H. (2005). Effect of lime, cement and Sarooj (artificial pozzolan) on the swelling potential of an expansive soil from Oman. *Building and Environment*, 40(5), 681–687.
<https://doi.org/10.1016/j.buildenv.2004.08.028>
- Al-Soudany, K. (2018). Remediation of Clayey Soil Using Silica Fume. *MATEC Web of Conferences*, 162, 10–16.
<https://doi.org/10.1051/mateconf/201816201017>
- Alfian, R., Afriani, L., & Iswan. (2015). *Studi Analisis Daya Dukung Tanah Lempung Berplastisitas Tinggi yang Dicampur Zeolit*. 3(2), 221–236.
- Arbianto, R., Susilo, B., & Surjandari, N. S. (2016). *Studi korelasi indeks plastisitas dan batas susut terhadap perilaku mengembang tanah*. 1(2), 101–119.
- Barnat-Hunek, D., Góra, J., Suchorab, Z., & Łagód, G. (2018). Waste and Supplementary Cementitious Materials in Concrete: Characterisation, Properties and Applications. In *Waste and Supplementary Cementitious Materials in Concrete: Characterisation, Properties and Applications*.
<https://doi.org/10.1016/B978-0-08-102156-9.00005-5>

- Baser, O. (2009). Stabilization of expansive soils using waste marble dust. *Middle East Technical University*, 1–116.
- Basma, A. A., & Tuncer, E. R. (1991). Effect of lime on volume change and compressibility of expansive clays. *Transportation and Research Record*, C(1295), 52–61.
- Belchior, I. M. R. M., Casagrande, M. D. T., & Zornberg, J. G. (2017). Swelling behavior evaluation of a lime-treated expansive soil through centrifuge test. *Journal of Materials in Civil Engineering*, 29(12), 1–12. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0002090](https://doi.org/10.1061/(ASCE)MT.1943-5533.0002090)
- Bin-Shafique, S., Rahman, K., Yaykiran, M., & Azfar, I. (2010). The long-term performance of two fly ash stabilized fine-grained soil subbases. *Resources, Conservation and Recycling*, 54(10), 666–672. <https://doi.org/10.1016/j.resconrec.2009.11.007>
- Bose, B. (2012). Geo-engineering properties of expansive soil stabilized with fly ash. *Electronic Journal of Geotechnical Engineering*, 17 J(2004), 1339–1353.
- Brooks, R., Udoeyo, F. F., & Takkalapelli, K. V. (2011). Geotechnical properties of problem soils stabilized with fly ash and limestone dust in philadelphia. *Journal of Materials in Civil Engineering*, 23(5), 711–716. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0000214](https://doi.org/10.1061/(ASCE)MT.1943-5533.0000214)
- Cheshomi, A., Eshaghi, A., & Hassanpour, J. (2017). Effect of lime and fly ash on swelling percentage and Atterberg limits of sulfate-bearing clay. *Applied Clay Science*, 135, 190–198. <https://doi.org/10.1016/j.clay.2016.09.019>
- Cokca, E. (2001). Use of Class C Fly ashes for the Stabilization of an Expansive Soil. *Journal of Geotechnical and Geoenvironmental Engineering*, 127(7)(July), 568–573. <https://doi.org/10.1017/CBO9781107415324.004>
- Dang, L. C., & Khabbaz, H. (2019). *Recent Advancements on Expansive Soils*. 64–78. <https://doi.org/10.1007/978-3-030-01914-3>
- Das, B. M. (2006). Principles of Geotechnical Engineering. In *Advanced*

Construction Technology.

Das, B. M. (2017). Advanced Soil Mechanics. In *CRC Press* (Vol. 53, Issue 9).
<https://doi.org/10.1017/CBO9781107415324.004>

Destamara, A. A. (2013). Pengaruh Penambahan Abu Ampas Tebu Terhadap Karakteristik Tanah Lempung Ekspansif Di Bojonegoro. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699.
<https://doi.org/10.1017/CBO9781107415324.004>

Fauziah, N., & Ridwan, M. (2017). *Pengaruh Penambahan Limbah Karbit Terhadap Potensial Swelling Pada Tanah Lempung Ekspansif di Daerah Driyorejo Gresik.*

Hatmoko, J. T., & Lulie, Y. (2007). Ucs Tanah Lempung Ekspansif Yang Distabilisasi Dengan Abu Ampas Tebu Dan Kapur. *Jurnal Teknik Sipil Universitas Atma Jaya Yogyakarta*, 8(1), 64–77.

Herman, & OP, S. (2018). *Terhadap Kembang Susut Tanah Lempung*. 5(1), 7–15.

Karimah, M. A. (2013). Pengaruh Penambahan Bahan Camuran dengan Komposisi 75% Fly ash dan 25% Slag Baja Pada Tanah Lempung Ekspansif Terhadap Nilai CBR dan Swelling. *Jurnal Teknologi*, 1(1), 69–73.
<https://doi.org/10.11113/jt.v56.60>

Khemissa, M., & Mahamedi, A. (2014). Cement and lime mixture stabilization of an expansive overconsolidated clay. *Applied Clay Science*, 95(June), 104–110.
<https://doi.org/10.1016/j.clay.2014.03.017>

Mitra, J., Sipil, T., Ng, A. I., Studi, P., Teknik, S., Tarumanagara, U., Studi, P., Teknik, S., Tarumanagara, U., Cement, W. P., & Cement, P. C. (2018). *Penggunaan White Portland Cement dan Portland Composite Cement Terhadap Kekuatan Tanah Ekspansif dengan Unconfined*. 1(1), 39–47.

Muntohar, A. S. (2002). Utilization of Uncontrolled Burnt Rice Husk Ash in Soil Improvement. *Civil Engineering Dimension*, 4(2), pp.100-105.
<https://doi.org/10.9744/ced.4.2.pp.100-105>

- Muzakki, A., & Setiawan, B. (n.d.). *Stabilisasi tanah ekspansif menggunakan kolom garam dengan pengaliran samping*. 189–194.
- Nalbantoğlu, Z. (2004). Effectiveness of class C fly ash as an expansive soil stabilizer. *Construction and Building Materials*, 18(6), 377–381. <https://doi.org/10.1016/j.conbuildmat.2004.03.011>
- Parker, J. C., Amos, D. F., & Kaster, D. L. (1977). An Evaluation of Several Methods of Estimating Soil Volume Change. *Soil Science Society of America Journal*, 41(6), 1059–1064. <https://doi.org/10.2136/sssaj1977.03615995004100060008x>
- Pastor, J. L., Tomás, R., Cano, M., Riquelme, A., & Gutiérrez, E. (2019). Evaluation of the improvement effect of limestone powder waste in the stabilization of Swelling Clayey Soil. *Sustainability (Switzerland)*, 11(3). <https://doi.org/10.3390/su11030679>
- Phani Kumar, B. R., & Sharma, R. S. (2004). Effect of fly ash on engineering properties of expansive soils. *Journal of Geotechnical and Geoenvironmental Engineering*, 130(7), 764–767. [https://doi.org/10.1061/\(ASCE\)1090-0241\(2004\)130:7\(764\)](https://doi.org/10.1061/(ASCE)1090-0241(2004)130:7(764))
- Ridwan, M. (n.d.). *Comparison Addition Cement and Lime*. 1–10.
- Seta, W. (2006). *Perilaku Tanah Ekspansif yang Dicampur dengan Pasir untuk Subgrade*. 1–80.
- Setyo Muntohar, A. (2006). Swelling characteristics and improvement of expansive soil with rice husk ash. *Expansive Soils*, June 2006. <https://doi.org/10.1201/9780203968079.ch30>
- Shalabi, F. I., Asi, I. M., & Qasrawi, H. Y. (2017). Effect of by-product steel slag on the engineering properties of clay soils. *Journal of King Saud University - Engineering Sciences*, 29(4), 394–399. <https://doi.org/10.1016/j.jksues.2016.07.004>
- Siregar, D. R., & Andajani, N. (2018). Pengaruh Penambahan Limbar Marmer

- Terhadap Potensial Swelling Pada Tanah Lempung Ekspansif di Daerah Driyorejo. *Jurnal Rekayasa Teknik Sipil*, 1(1), 186–194.
- Soltani, A., Taheri, A., Khatibi, M., & Estabragh, A. R. (2017). Swelling Potential of a Stabilized Expansive Soil: A Comparative Experimental Study. *Geotechnical and Geological Engineering*, 35(4), 1717–1744. <https://doi.org/10.1007/s10706-017-0204-1>
- Sudjianto, A. T. (2007). Stabilisasi Tanah Lempung Ekspansif dengan Garam Dapur (NaCl). *Teknik Sipil*, 8(1), 53–63.
- Suryawan, & Nur Andajani, M. (2013). *Pengaruh Penambahan Clean Set Cement terhadap Potential Swelling pada Tanah Lempung Kembang – Susut tanah dengan potential swelling tinggi , sedangkan untuk campuran 20 % clean set cement mendapat nilai 3 . 25 % termasuk tanah dengan potential swelling ka. 1–8.*
- Türköz, M., Savaş, H., & Tasci, G. (2018). The effect of silica fume and lime on geotechnical properties of a clay soil showing both swelling and dispersive features. *Arabian Journal of Geosciences*, 11(23). <https://doi.org/10.1007/s12517-018-4045-x>
- Utami, G. S. (n.d.). *Stabilisasi tanah dasar (subgrade) jalan darmahusada indah dengan pasir laut. 100, 1–10.*
- Utami, G. S. (2014). Clay soil stabilization with lime effect the value CBR and swelling. *ARNP Journal of Engineering and Applied Sciences*, 9(10), 1744–1748.
- Utami, G. S., MCA, T., & Andriani, L. D. (2015). Stabilisasi Tanah Dasar (Subgrade) dengan Menggunakan Pasir Untuk Menaikkan Nilai CBR dan Menurunkan Swelling. *Seminar Nasional Sains Dan Teknologi Terapan III 2015*, 587–594.
- Yilmaz, I., & Civelekoglu, B. (2009). Gypsum: An additive for stabilization of swelling clay soils. *Applied Clay Science*, 44(1–2), 166–172.

<https://doi.org/10.1016/j.clay.2009.01.020>

Yuliet, R. (2010). Identifikasi Tanah Lempung Kota Padang Berdasarkan Uji Klasifikasi Teknik Dan Uji Batas-Batas Konsistensi Atterberg. *Jurnal Rekayasa Sipil (JRS-Unand)*, 6(2), 19. <https://doi.org/10.25077/jrs.6.2.19-30.2010>

Yuliet, R., Hakam, A., & Febrina, G. (2011). Uji Potensi Mengembang Pada Tanah Lempung dengan Metoda Free Swelling Test (Studi Kasus: Tanah Lempung Limau Manih – Kota Padang). *Jurnal Rekayasa Sipil (JRS-Unand)*, 7(1), 25. <https://doi.org/10.25077/jrs.7.1.25-36.2011>

Zhang, J. R., & Cao, X. (2002). Stabilization of expansive soil by lime and fly ash. *Journal Wuhan University of Technology, Materials Science Edition*, 17(4), 73–77. <https://doi.org/10.1007/bf02838423>

