

DAFTAR PUSTAKA

- Abbasimaedeh, P. (2024). Soil liquefaction in seismic events: pioneering predictive models using machine learning and advanced regression techniques. *Environmental Earth Sciences*, 83(7). <https://doi.org/10.1007/s12665-024-11480-x>
- Adhitama, Y. A., Supriyadi, B., & Suhendro, D. B. (n.d.). *EVALUASI SEISMIK GEDUNG BERTINGKAT EKSISTING MENGGUNAKAN PROSEDUR ASCE 41-17*.
- Ali, A. M., Karkush, M. O., & Al-Jorany, A. N. (2023). Numerical modeling of connected piled raft foundation under seismic loading in layered soils. *Journal of the Mechanical Behavior of Materials*, 32(1). <https://doi.org/10.1515/jmbm-2022-0250>
- Allievi, L., Ferrero, S., Mussi, A., Persio, R., & Petrella, F. (2013). Structural and geotechnical design of a piled raft for a tall building founded on granular soil. *18th International Conference on Soil Mechanics and Geotechnical Engineering: Challenges and Innovations in Geotechnics, ICSMGE 2013*, 4, 2659–2661.
- Artanti. (2023). *Liquefaction Potential Using a State Parameter Approach Based on Earthquake Peak Ground Acceleration Generated From Codes, Deterministic and Probabilistic Seismic Hazard Analysis*.
- Asgari, A., Bagheri, M., & Hadizadeh, M. (2024). Advanced seismic analysis of soil-foundation-structure interaction for shallow and pile foundations in saturated and dry deposits: Insights from 3D parallel finite element modeling. *Structures*, 69. <https://doi.org/10.1016/j.istruc.2024.107503>
- Badan Standarisasi Nasional. (2019). Penetapan Standar Nasional Indonesia 1726:2019 Tata cara perencanaan ketahanan gempa untuk struktur bangunan gedung dan nongedung. *Badan Standarisasi Nasional*, 250.
- Bapir, B., Abrahamczyk, L., Wichtmann, T., & Prada-Sarmiento, L. F. (2023a). Soil-structure interaction: A state-of-the-art review of modeling techniques and studies on seismic response of building structures. *Frontiers in Built Environment*, 9(February), 1–17. <https://doi.org/10.3389/fbuil.2023.1120351>
- Bapir, B., Abrahamczyk, L., Wichtmann, T., & Prada-Sarmiento, L. F. (2023b). Soil-structure interaction: A state-of-the-art review of modeling techniques and studies on seismic response of building structures. *Frontiers in Built Environment*, 9(February), 1–17. <https://doi.org/10.3389/fbuil.2023.1120351>
- Barson, J. (2012). Chapter 6 : Overview Introduction to Environmental Geology , 5e Case History : Earthquake Selected Major Earthquakes in the U . S . Causes for Earthquakes Causes for Earthquakes Earthquake : Sudden release of strain energy Earthquake Intensity Scale Modif. *North*, 1–9.
- Bousfield, Paul. (2020). Section 1. *Pleasure And Pain*, 67–85. <https://doi.org/10.4324/9781315010335-12>
- Bray, J. D., & Dashti, S. (2014). Liquefaction-induced building movements. *Bulletin of Earthquake Engineering*, 12(3), 1129–1156. <https://doi.org/10.1007/s10518-014-9619-8>
- Byrne, M. P. (1991). A cyclic shear-volume coupling and pore pressure model for sand. *Second International Conference on Recent Advances in Geotechnical Engineering and Soil Dynamics*, 47–55.
- Chian, S. C., Tokimatsu, K., & Madabhushi, S. P. G. (2014). Soil Liquefaction–Induced Uplift of Underground Structures: Physical and Numerical Modeling. *Journal of Geotechnical and Geoenvironmental Engineering*, 140(10). [https://doi.org/10.1061/\(asce\)gt.1943-5606.0001159](https://doi.org/10.1061/(asce)gt.1943-5606.0001159)
- CİVELEKLER, E., & Afacan, K. B. (2022). *Effect of Site Specific Soil Characteristics on the Nonlinear Ground Response Analysis*. <https://doi.org/10.21203/rs.3.rs-2193831/v1>

- Dash, S. R., Bhattacharya, S., & Blakeborough, A. (2010). Bending-buckling interaction as a failure mechanism of piles in liquefiable soils. *Soil Dynamics and Earthquake Engineering*, 30(1–2), 32–39. <https://doi.org/10.1016/j.soildyn.2009.08.002>
- Dashti, S., Asce, M., Bray, J. D., Asce, F., Pestana, J. M., Riemer, M., & Wilson, D. (n.d.). *Mechanisms of Seismically Induced Settlement of Buildings with Shallow Foundations on Liquefiable Soil*. <https://doi.org/10.1061/ASCEGT.1943-5606.0000179>
- Doğan, T. P., & Erkan, I. H. (2024). Evaluation of the Nonlinear Seismic Responses of High-Rise Reinforced Concrete Buildings with Different Foundations and Structural Plans—Considering Soil-Structure Interactions. *Buildings*, 14(6). <https://doi.org/10.3390/buildings14061686>
- Dwiyantoro, W., Fathani, T. F., & Adi, A. D. (2023). Influence of Groundwater Table Fluctuation on Liquefaction Potential Analysis Using Cyclic Stress Approach. *IOP Conference Series: Earth and Environmental Science*, 1184(1). <https://doi.org/10.1088/1755-1315/1184/1/012006>
- EERI Special Earthquake Report. (2006).
- Emad, S., Elsisy, A., Sharaf, E., Eraky, A., & Salama, A. (2026). Deep Evaluation of Structural Time Period Formulae Using Finite Element Modelling. *CivilEng*, 7(1), 1–22. <https://doi.org/10.3390/civileng7010010>
- Fadaei, S., Hamidi, A., & Soranzo, E. (2025). Predictive modeling of pore pressure build-up in vibratory pile driving through machine learning. *Geoscience Frontiers*. <https://doi.org/10.1016/j.gsf.2025.102209>
- Fallahzadeh, M., Haddad, A., Jafarian, Y., & Lee, C. J. (2019). Seismic performance of end-bearing piled raft with countermeasure strategy against liquefaction using centrifuge model tests. In *Bulletin of Earthquake Engineering* (Vol. 17, Number 11). Springer Netherlands. <https://doi.org/10.1007/s10518-019-00696-z>
- Farzana, Kh. A., Ansary, M. A., & Ahmed, K. S. (2025). Seismic behavior of spun precast concrete pile in liquefiable reclaimed soil of Suburban Dhaka. *Discover Civil Engineering*, 2(1). <https://doi.org/10.1007/s44290-025-00235-7>
- Finn, W. D. L., & Fujita, N. (n.d.). *Piles in liquefiable soils: seismic analysis and design issues*. Retrieved www.elsevier.com/locate/soildyn
- Gingery, E. & B. (2015a). *This preprint is a PDF of a manuscript that has been accepted for performance assessment of buildings*.
- Gingery, E. & B. (2015b). *This preprint is a PDF of a manuscript that has been accepted for performance assessment of buildings*.
- Hartono, N., & Fathani, T. F. (2022). The Using of GIS to Delineate the Liquefaction Susceptibility Zones at Yogyakarta International Airport. *Civil Engineering Dimension*, 24(1), 62–70. <https://doi.org/10.9744/ced.24.1.62-70>
- Hatmoko, J. T., & Suryadharma, H. (2015a). Prediction of liquefaction potential study at Bantul Regency the province of special region of Yogyakarta Indonesia. *Procedia Engineering*, 125, 311–316. <https://doi.org/10.1016/j.proeng.2015.11.068>
- Hatmoko, J. T., & Suryadharma, H. (2015b). Prediction of liquefaction potential study at Bantul Regency the province of special region of Yogyakarta Indonesia. *Procedia Engineering*, 125, 311–316. <https://doi.org/10.1016/j.proeng.2015.11.068>
- Hayden. (2015). *Centrifuge Modeling and Mitigation of Manhole Uplift due to Liquefaction*. (March), 458–469. [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0000769](https://doi.org/10.1061/(ASCE)GT.1943-5606.0000769)
- Irsyam, M., Sengara, W., Aldiamar, F., Widiyantoro, S., Triyoso, W., Hilman, D., Kertapati, E., Meilano, I., Asrurifak, M., & Ridwan, M. (n.d.). *Ringkasan Hasil Studi Tim Revisi Peta Gempa Indonesia 2010*.

- Ishihara, K., & Yoshimine, M. (1992). Evaluation of settlements in sand deposits following liquefaction during earthquakes. *Soils and Foundations*, 32(1), 173–188.
<https://doi.org/10.3208/sandf1972.32.173>
- Kang, G.-C., Tobita, T., Iai, S., & Ge, L. (2013). Centrifuge Modeling and Mitigation of Manhole Uplift due to Liquefaction. *Journal of Geotechnical and Geoenvironmental Engineering*, 139(3), 458–469. [https://doi.org/10.1061/\(asce\)gt.1943-5606.0000769](https://doi.org/10.1061/(asce)gt.1943-5606.0000769)
- Karamitros, D. K., Bouckovalas, G. D., Chaloulos, Y. K., & Andrianopoulos, K. I. (2013). Numerical analysis of liquefaction-induced bearing capacity degradation of shallow foundations on a two-layered soil profile. *Soil Dynamics and Earthquake Engineering*, 44, 90–101. <https://doi.org/10.1016/j.soildyn.2012.07.028>
- Kitayama, S., & Cilsalar, H. (2022). Seismic loss assessment of seismically isolated buildings designed by the procedures of ASCE/SEI 7-16. *Bulletin of Earthquake Engineering*, 20(2), 1143–1168. <https://doi.org/10.1007/s10518-021-01274-y>
- Kramer, S. L. (1996a). *PRENTICE-HALL INTERNATIONAL SERIES fN CIVIL ENGINEERING AND ENGINEERING MECHANICS*.
- Kramer, S. L. . (1996b). Site Amplification Is Common Site Effects on Ground Motions Soft Soils Commonly Amplify Motions Relative To Bedrock Effects of Local Soil Conditions. *Instructional Material Complementing FEMA*, 451, 653 pp.
- Kurniawandy, A., Aminsyah, M., Cahyadi, B. U., & Djauhari, Z. (2023). Comparative study of the simulation ground motion by amplitude scale and spectral matching. *E3S Web of Conferences*, 464, 1–8. <https://doi.org/10.1051/e3sconf/202346402007>
- Kyle Rollins, B. M., Member, A., Bolton Seed, H., & Member, H. (n.d.). *INFLUENCE OF BUILDINGS ON POTENTIAL LIQUEFACTION DAMAGE*.
- Lee, K. (n.d.). *User Manual*.
- Legg, C. (2010). Engineering philosophy. In *International Journal of Machine Consciousness* (Vol. 2, Number 1). <https://doi.org/10.1142/S1793843010000369>
- MA, F. (2017a). *Midas GTS NX: Seismic Stability Comparison of Embankment During Liquefaction*.
- MA, F. (2017b). *Midas GTS NX: Seismic Stability Comparison of Embankment During Liquefaction*.
- Magisano, D., Corrado, A., Madeo, A., & Garcea, G. (2022). A reduced order model for nonlinear time history seismic analyzes of elasto-plastic 3D frame structures. *Earthquake Engineering and Structural Dynamics*, 51(9), 2055–2076. <https://doi.org/10.1002/eqe.3653>
- Mali, S., & Singh, B. (2018). Behavior of large piled-raft foundation on clay soil. *Ocean Engineering*, 149(October 2017), 205–216. <https://doi.org/10.1016/j.oceaneng.2017.12.029>
- Mase, L. Z., Farid, M., Sugianto, N., & Agustina, S. (2020). The Implementation of Ground Response Analysis to Quantify Liquefaction Potential Index (LPI) in Bengkulu City, Indonesia. *Journal of the Civil Engineering Forum*, 6(3), 319. <https://doi.org/10.22146/jcef.57466>
- Mase, L. Z., Gustina, D., Zahara, A., Supriani, F., Chaiyaput, S., & Syahbana, A. J. (2025a). The Joint Method of Ground Response and Structural Dynamic Analyses for Building Inspection Under a Large Megathrust Earthquake. *Transportation Infrastructure Geotechnology*, 12(1). <https://doi.org/10.1007/s40515-024-00480-w>
- Mase, L. Z., Gustina, D., Zahara, A., Supriani, F., Chaiyaput, S., & Syahbana, A. J. (2025b). The Joint Method of Ground Response and Structural Dynamic Analyses for Building Inspection Under a Large Megathrust Earthquake. *Transportation Infrastructure Geotechnology*, 12(1). <https://doi.org/10.1007/s40515-024-00480-w>

- Mawarti, R., G, L. C., Shulhan, M. A., & Yasin, I. (n.d.). *Kinerja Struktur Gedung Bertingkat Terhadap Beban Gempa Respon Spektrum (Studi Kasus : Zona 2 Apartemen Yogyakarta)*. Midas IT. (2020). *Midas IT*.
- Mujtaba, H., Farooq, K., Sivakugan, N., & Das, B. M. (2018). Evaluation of Relative Density and Friction Angle Based on SPT- N Values. *KSCEJ*, 22(2), 572–581. <https://doi.org/10.1007/s12205-017-1899-5>
- Ngab, A. S., & Attia, N. J. (2021). Effects of Reinforced Concrete Building Characteristics on the Fundamental Natural Period Using the Rayleigh Method. *International Journal of Engineering Research & Technology (IJERT)*, 10(11), 269–278.
- Ntritsos, N., & Cubrinovski, M. (2024). Ground-motion effects on liquefaction response. *Soil Dynamics and Earthquake Engineering*, 177(November 2023), 108392. <https://doi.org/10.1016/j.soildyn.2023.108392>
- Nurbani, G., & Yakin, Y. A. (2021). Analisis Potensi Likuefaksi pada Tanah Pasir Akibat Gempa (Studi Kasus Mataram, Nusa Tenggara Barat). *RekaRacana: Jurnal Teknil Sipil*, 6(3), 166. <https://doi.org/10.26760/rekaracana.v6i3.166>
- Oshiaki, Y., Osmmr, Y., & Tokimatsu, K. (1977). SETTLEMENT OF BUILDINGS ON SATURATED SAND DURING EARTHQUAKES. In *SOILS AND FOUNDATIONS* (Vol. 17, Number 1).
- Pandita, H., Sukartono, A., Isjudarto, S., Tinggi, T., & Nasional, Y. (2016). Geological Identification of. *Forum Geografi*, 30(1), 77–85. <http://Journals.ums.ac.id/index.php/fg/article/view/1508>
- Pena-Castellnou, S., Steinritz, V., Marliyani, G. I., & Reichert, K. (2021). Active tectonics of the Yogyakarta area (Central Java, Indonesia): Preliminary findings obtained from a tectonic-geomorphic evaluation. *IOP Conference Series: Earth and Environmental Science*, 851(1). <https://doi.org/10.1088/1755-1315/851/1/012005>
- Poulos, H. G. (2001). Methods of analysis of piled raft foundations: A report prepared on behalf of technical committee TC18 on piled foundations. *International Society of Soil Mechanics and Geotechnical Engineering*, (July), 46.
- Qodri, M. F., Anggorowati, V. D. A., & Mase, L. Z. (2022). Site-Specific Analysis to Investigate Response and Liquefaction Potential during the Megathrust Earthquake at Banten Province Indonesia. *Engineering Journal*, 26(9), 1–10. <https://doi.org/10.4186/ej.2022.26.9.1>
- Ramezani, B., Dehghan Khalili, H., Moradi, P., & Pourbagheri, A. (2025). Seismic Resilience with Deep Soil Mixing: Numerical and Experimental Insights into Liquefaction Mitigation. *Geotechnical and Geological Engineering*, 43(2), 1–19. <https://doi.org/10.1007/s10706-024-03041-7>
- Ren, J., Xu, Q., Chen, G., Yu, X., Gong, S., & Lu, Y. (2023). Seismic Performance of Pretensioned Centrifugal Spun Concrete Piles with Combined Steel Strands and Deformed Steel Bars. *Journal of Structural Engineering*, 149(11). <https://doi.org/10.1061/jsendh.steng-12339>
- Saputra, A., Gomez, C., Delikostidis, I., Zawar-Reza, P., Hadmoko, D. S., & Sartohadi, J. (2021). Preliminary identification of earthquake triggered multi-hazard and risk in Pleret Sub-District (Yogyakarta, Indonesia). *Geo-Spatial Information Science*, 24(2), 256–278. <https://doi.org/10.1080/10095020.2020.1801335>
- Setiadi, W. P., Faris, F., & Setiawan, H. (2024). Liquefaction potential hazard assessment and its effect on toll road construction in Seyegan Subdistrict, Yogyakarta. *IOP Conference Series: Earth and Environmental Science*, 1314(1). <https://doi.org/10.1088/1755-1315/1314/1/012120>

- Sharma, V., Shimizu, S., & Fujisawa, K. (2024). Space-time finite element method with domain reduction techniques for dynamic soil-structure interaction problems. *International Journal of Mechanical System Dynamics*, 4(2), 117–130. <https://doi.org/10.1002/msd2.12106>
- Skempton, A. W., & MacDonald, D. H. (1956). The allowable settlement of buildings. *Proceedings of the Institution of Civil Engineers*, 5(6), 727–768. <https://doi.org/10.1680/ipeds.1956.12202>
- Society, S. (1975). *A STUDY ON THE DURATION OF STRONG EARTHQUAKE GROUND MOTION*. 65(3), 581–626.
- Su, Q., Dong, Y., Guo, F., & Zhang, X. (2023). Acceleration spikes in strong earthquake ground motion induced by dilatancy cyclic mobility mechanism. *Vibroengineering Procedia*, 52, 60–66. <https://doi.org/10.21595/vp.2023.23715>
- Taufana, A. (2013). Pemetaan Kerentanan Daerah Potensi Likuefaction Akibat Gempabumi Tektonik Studi Kasus Daerah Desa Panjangrejo dan Sekitarnya, Kecamatan Pudong, Kabupaten Bantul, Daerah Instimewa Yogyakarta. *Universitas Diponegoro*.
- Tsaparli, V., Kontoe, S., Taborda, D. M. G., & Potts, D. M. (2016). Vertical ground motion and its effects on liquefaction resistance of fully saturated sand deposits. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 472(2192). <https://doi.org/10.1098/rspa.2016.0434>
- Tsuchida. (1970). Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils. *Journal of Geotechnical and Geoenvironmental Engineering*, 127(4), 297–313. [https://doi.org/10.1061/\(asce\)1090-0241\(2001\)127:4\(297\)](https://doi.org/10.1061/(asce)1090-0241(2001)127:4(297))
- Tsuji, T., Yamamoto, K., Matsuoka, T., Yamada, Y., Onishi, K., Bahar, A., Meilano, I., & Abidin, H. Z. (2009). Earthquake fault of the 26 May 2006 Yogyakarta earthquake observed by SAR interferometry. In *Earth Planets Space* (Vol. 61).
- Wicaksono, A. (2024). *TERHADAP PENGARUH LIKUEFAKSI PADA PEMBANGUNAN JALAN* Diajukan untuk memenuhi salah satu persyaratan memperoleh gelar Master of Engineering pada Program Magister Program Studi Teknik Pengelolaan Bencana Alam Tim Pembimbing menyetujui tesis Disusun oleh : Ar. 2, 29–31.
- Widjajanti, N., Pratama, C., Azizi, I. H., Lestari, D., Abiyyu, M. F., Rahman, S. A., & Kusumawardani, D. (2025). Geodetic slip rate and seismogenic depth of unmapped active faults in Yogyakarta, Indonesia, inferred from dense Global Navigation Satellite System campaign observation. *Geodesy and Geodynamics*. <https://doi.org/10.1016/j.geog.2025.04.008>
- Xiao-ling, Z., Hao, L., Cheng-shun, X., & Yan, H. (2024). Study on seismic response of liquefiable soil-pile group considering pile cap and soil contact. *Soil Dynamics and Earthquake Engineering*, 183. <https://doi.org/10.1016/j.soildyn.2024.108827>
- Yulianisa, Hardiyatmo, H. C., & Faris, F. (2023). Analysis of Liquefaction Potential in Solo-Yogyakarta-NYIA Kulon Progo Sta. 16+700 - 22+500. *IOP Conference Series: Earth and Environmental Science*, 1244(1). <https://doi.org/10.1088/1755-1315/1244/1/012025>
- Zakariya, A. (2022). *The Influence of Liquefaction Potential and Mitigation of Bored Pile Foundation System for Kretek 2 Bridge in Yogyakarta*.
- Zakariya, A., Nurdiansyah, F., Galag, C. T. S. A., & Situmorang, J. (2022). Analisis Kuantitatif dan Kualitatif Potensi Likuefaksi di Area Tanah Kepasiran Medium-Padat Dekat Sesar Opak. *Jurnal Jalan-Jembatan*, 39(2), 74–87.
- Zakariya, A., Rifa'I, A., & Ismanti, S. (2023). Ground Motion and Liquefaction Study at Opak River Estuary Bantul. *IOP Conference Series: Earth and Environmental Science*, 1244(1). <https://doi.org/10.1088/1755-1315/1244/1/012032>



UNIVERSITAS
GADJAH MADA

Evaluasi Kinerja Seismik Pada Bangunan Gedung Dengan Fondasi Spun Pile Terhadap Potensi Likuefaksi

Secara Non-Linear Time History Dan Direct Method

Suraida Nur Kumala, Dr. Eng. Ir. Sito Ismanti, S.T., M.Eng., IPM ; Prof. Ir. Iman Satyarno, M.E., Ph.D ; Dr. Eng. Ir. Fikri

Universitas Gadjah Mada, 2026 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Zalbuin, L., Della, M., Annisa, G., & Fepy, Z. (2025). The Joint Method of Ground Response and Structural Dynamic Analyses for Building Inspection Under a Large Megathrust Earthquake. In *Transportation Infrastructure Geotechnology*. Springer US. <https://doi.org/10.1007/s40515-024-00480-w>

Zalbuin Mase, L., Faisal Fathani, T., & Darmawan Adi, A. (2021). A SIMPLE SHAKING TABLE TEST TO MEASURE LIQUEFACTION POTENTIAL OF PRAMBANAN AREA, YOGYAKARTA, INDONESIA. In *ASEAN Engineering Journal* (Vol. 11, Number 3).