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# GEOTECHNICAL **ENGINEERING**

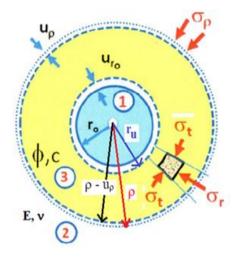


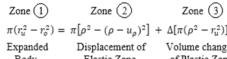


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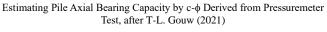


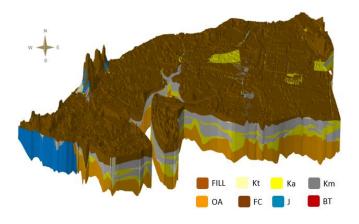


 $\pi(r_u^2 - r_o^2) = \pi[\rho^2 - (\rho - u_o)^2] + \Delta[\pi(\rho^2 - r_u^2)]$ Volume change Body Elastic Zone of Plastic Zone

× Epicenter Large landslide Small Landslide Faults Radius 11 km from epicenter Radius 64 km from epicenter

Volcanic Cohesive Soil Behaviour under Static and Cyclic Loading, after Sumartini et al. (2021)





New Solutions to Geotechnical Challenges for Coastal Cities, after Chu et al. (2021)



Jack-in Pile Design and Construction for High-rise Buildings - A Malaysian Consulting Engineer's Perspective, after C. M. Chow and Y.C. Tan (2021)

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# GEOTECHNICAL ENGINEERING

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- 3. The maximum length of papers in the print format of the Journal is 12 two-column pages in single-spaced in Times New Roman 9 including figures and tables. A Journal page contains approximately 1,040 words. Authors can approximate manuscript length by counting the number of words on a typical manuscript page and multiplying that by the number of total pages (except for tables and figures). Add word-equivalents for figures and tables by estimating the portion of the journal page each will occupy when reduced to fit on a 160 mm x 240 mm journal page. A figure reduced to one-quarter of a page would be 260 word-equivalents. When reduced, the figure must be legible and its type size no smaller than 6 point font (after reduction).
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#### 14. References

- American Petroleum Institute (API) (1993). Recommended Practice for Planning, Designing, and Constructing Fixed Offshore Platforms Working Stress Design, API Recommended Practice 2AWSD (RP 2A-WSD), 20th edition, 1993, p 191.
- Earth, J.B., and Geo, W.P. (2011). "Asian Geotechnical amongst Authors of Conference Publications," Proceedings of Int. Conference on Asian Geotechnical, publisher, city, pp 133-137.
- Finn WDL and Fujita N. (2002). "Piles in liquefiable soils: seismic analysis and design issues," Soil Dynamics and Earthquake Engineering, 22, Issues 9-12, pp 731-742.
- 15. Discussions on a published paper shall be made in the same format and submitted within six months of its appearance and closing discussion will be published within twelve months.

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