

Pemodelan Zona Potensi Likuifaksi Menggunakan Metode Geolistrik 2D dan Analisis Factor of Safety di Wilayah Papua Barat = Modelling the Liquefaction Potential Zone Using the Geoelectric 2D Method and Analysis Factor of Safety in West Papua

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Abstrak

Papua barat merupakan daerah yang memiliki tingkat seismisitas tinggi, sehingga diperlukan perhatian khusus terkait dengan bahaya gempa bumi khususnya likuifaksi. Salah satu metode geofisika yang dapat digunakan untuk analisis potensi likuifaksi adalah metode geolistrik. Penelitian ini memanfaatkan metode geolistrik dengan konfigurasi Wenner-Schlumberger berjumlah 4 lintasan yaitu L16-L19, dan dilakukan pendekatan parameter nilai resistivitas ke dalam konsep geoteknik untuk mendapat nilai N-SPT berdasarkan persamaan empiris, serta menggunakan riwayat kegempaan daerah penelitian 50 tahun terakhir dari 1971-2021. Analisis zona potensi likuifaksi dilakukan dengan menggunakan dua variabel diantaranya Cyclic Stress Ratio (CSR) dan Cyclic Resistance Ratio (CRR), yang menganalisa hasil faktor keamanan (FS) terhadap potensi likuifaksi. Hasil penelitian pada penampang resistivitas memiliki empat jenis litologi diantaranya soil, pasir, batu gamping terbreksiasi dan batu gamping, dimana nilai resistivitas yang berpotensi likuifaksi bervariasi dari 23.3-662 .m dengan jenis litologi pasir, batu gamping terbreksiasi, dan batu gamping. Selain itu, memperoleh nilai Peak Ground Acceleration (PGA) yaitu percepatan batuan dasar yang mewakili seluruh kejadian gempa yang digunakan sebesar 0,449 g. Hasil perbandingan kedua variabel yaitu CSR dan CRR dilihat pada tabel 4.9-4.13, secara keseluruhan daerah penelitian memiliki potensi likuifaksi disajikan dalam bentuk peta zonasi potensi likuifaksi.

.....West Papua is an area that has a high level of seismicity, so special attention is needed regarding the danger of earthquakes, especially liquefaction. One of the geophysical methods that can be used for liquefaction potential analysis is the geoelectric method. This study utilizes the geoelectric method with the Wenner-Schlumberger configuration of 4 paths, such as L16-L19, and an approach to the resistivity value is made into the geotechnical concept to obtain the N-SPT value based on empirical equations, and uses the seismic history of the study area 50 last year from 1971-2021. Analysis of the potential liquefaction zone was carried out using two variables including Cyclic Stress Ratio (CSR) and Cyclic Resistance Ratio (CRR), which analyzed the results of the safety factor (FS).) to liquefaction potential. The results of the research on the resistivity cross section have four types of lithology such as soil, sand, breccia limestone and limestone, where the resistivity value with the potential for liquefaction varies from 23.3-662 .m with the types of lithology sand, brecciated limestone, and limestone. In addition, obtaining the Peak Ground Acceleration (PGA) value, namely the acceleration of the bedrock representing all earthquake events used, is 0.449 g. The results of the comparison of the two variables, namely CSR and CRR, are seen in table 4.9-4.13, overall the research area has a high liquefaction potential, which is presented in the form of a liquefaction potential zoning map.