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Model Indeks Likuifaksi Berbasis Standard Penetration Test Menggunakan Multi-Gene Genetic Programming = Liquefaction Index Model Based on Standard Penetration Test Using Multi-Gene Genetic Programming

Y. Bosco Hendro P., author

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Abstrak

Gempa dan rangkaian fenomena khusus di Palu dan berbagai belahan dunia mengakibatkan likuifaksi yang melibatkan korban jiwa dan kerugian ekonomi yang luar biasa. Evaluasi potensi likuifaksi berdasarkan data standard penetration test (SPT) menggunakan pendekatan deterministik telah digunakan secara luas. Model indeks likuifaksi diperlukan untuk penetapan kurva kondisi batas antara kasus likuifaksi dan non-likuifaksi dengan mempertimbangkan masalah bias dalam metode deterministik. Penelitian ini bertujuan untuk menetapkan model indeks likuifaksi sebagai relasi antara (N1)60 dan CSR7,5 menggunakan multi-gene genetic programming (MGGP) untuk penyusunan kurva kondisi batas dan perbandingannya dengan model dari penelitian terdahulu. Model indeks likuifaksi yang dibangun berdasarkan data SPT menggunakan MGGP menghasilkan performa keberhasilan prediksi 93% untuk testing datasets.
.....Earthquake and series of specific phenomena in Palu and any other parts of the world contributed to a liquefaction that was involving massive fatalities and economic loss. The evaluation of liquefaction potential based on standard penetration test (SPT) data using deterministic approach has been widely applied. A liquefaction index model is required for the determination of a limit state between liquefaction and non-liquefaction cases by the consideration of bias issues in deterministic method. This research is aimed at the determination of liquefaction index model in relating (N1)60 and CSR7.5 using multi-gene genetic programming (MGGP) to develop limit state curve and its comparison with previous studies. The developed liquefaction index model based on SPT data using MGGP resulted in a performance in terms of successful prediction of 93% for testing of datasets.