

## INTISARI

Pada bulan September tahun 2018 lalu terjadi gempa bumi dan likuefaksi yang melanda kota Palu dan Kabupaten Sigi. Gempa Palu tahun juga 2018 memicu kejadian debris flow di Sungai Bangga. Sebagai penanggulangan potensi bahaya bencana serupa, direncanakan pembangunan bangunan pengendali sedimen pada bagian hilir Sungai Bangga. Struktur geologi pada daerah hilir Sungai Bangga mengindikasikan adanya potensi likuefaksi, namun penelitian terkait likuefaksi pada daerah ini masih sangat terbatas. Penelitian ini bertujuan untuk melakukan analisis potensi likuefaksi pada area bangunan pengendali sedimen Sungai Bangga, analisis pengaruh likuefaksi terhadap kestabilan bangunan di atasnya serta perencanaan metode mitigasi yang dapat digunakan untuk menanggulangi potensi likuefaksi yang ada.

Analisis kualitatif dilakukan dengan mempertimbangkan faktor geologi, gempa dan kedalaman muka air tanah. Potensi likuefaksi dihitung menggunakan Simplified Method dan Liquefaction Potential Index Method (LPI) berdasarkan pada 15 data bor yang mencakup SPT. Untuk melihat pengaruh likuefaksi terhadap kestabilan struktur di atasnya, dilakukan analisis post liquefaction effect. Analisis post-liquefaction effect dilakukan dengan menghitung potensi deformasi lateral serta penurunan yang dapat terjadi akibat likuefaksi dengan menggunakan persamaan Zhang (2004).

Hasil analisis menunjukan potensi likuefaksi ditemukan pada area bangunan Consolidation Dam. Berdasarkan hasil kajian LPI, potensi likuefaksi pada area bangunan Consolidation Dam termasuk dalam level menengah (Moderate) hingga tinggi (High). Sementara area Sabo dam berada pada level tidak terlikuefaksi (Non-liquefiable) hingga rendah (Low). Analisis post-liquefaction effect menunjukkan potensi likuefaksi di daerah Consolidation Dam dapat menyebabkan terjadinya lateral spreading dan settlement pada lapisan tanah yang menjadi tapak dari fondasi bangunan. Karena itu perlu direncanakan metode mitigasi untuk meminimalisir potensi likuefaksi yang ada. Metode mitigasi yang diusulkan yaitu metode pemadatan untuk meningkatkan ketahanan tanah terhadap likuefaksi. Daya dukung tanah yang lebih tinggi mampu mengurangi potensi lateral spreading dan settlement yang disebabkan oleh likuefaksi. Peningkatan daya dukung tanah dapat mengurangi potensi lateral spreading hingga 96% dan potensi settlement hingga 92%.

Kata Kunci : Liquefaction potential index, simplified method, sungai bangga, bangunan pengendali sediment, lateral spreading, settlement, compaction method.

## ABSTRACT

*In September 2018 there was an earthquake and liquefaction that hit the city of Palu and Sigi Regency. The Palu earthquake in 2018 also triggered a debris flow incident in the Bangga River. As a countermeasure for potential hazards of a similar disaster, it is planned to construct a sediment control structure in the lower reaches of the Bangga River. The geological structure in the lower reaches of the Bangga River indicates the potential for liquefaction, but research on liquefaction in this area is still very limited. This study aims to analyze the liquefaction potential in the area of the Bangga River sediment control building, analyze the effect of liquefaction on the stability of the building above it and plan mitigation methods that can be used to overcome the existing liquefaction potential.*

*Qualitative analysis was carried out by considering geological factors, earthquakes and the depth of the ground water table. Liquefaction potential was calculated using the Simplified Method and Liquefaction Potential Index Method (LPI) based on 15 drill data including SPT. To see the effect of liquefaction on the stability of the structure above, a post-liquefaction effect analysis was carried out. Analysis of post-liquefaction effect was carried out by calculating the potential for lateral deformation and the settlement that could occur due to liquefaction using Zhang's (2004) equation.*

*The results of the analysis show that the potential for liquefaction is found in the Consolidation Dam building area. Based on the results of the LPI study, the potential for liquefaction in the Consolidation Dam building area is included in the medium (Moderate) to high (High) level. Meanwhile, the Sabo dam area is at the level of non-liquefiable (Non-liquefiable) to low (Low). Post-liquefaction effect analysis shows that the potential for liquefaction in the Consolidation Dam area can cause lateral spreading and settlement of the soil layer that is the site of the building foundation. Therefore, it is necessary to plan a mitigation method to minimize the existing liquefaction potential. The proposed mitigation method is the compaction method to increase soil resistance to liquefaction. The higher soil bearing capacity can reduce the potential for lateral spreading and settlement caused by liquefaction. Increasing the bearing capacity of the soil can reduce the potential for lateral spreading up to 96% and the potential for settlement up to 92%.*

**Keywords :** Liquefaction potential index, simplified method, Bangga River, Sediment Control Structures, lateral spreading, settlement, compaction method.