

ABSTRACT

Sulawesi Island has a Palu Koro Fault that actively moves with a high displacement magnitude but low seismicity. On 28 September 2018, at 18:02 local time, an earthquake occurred in Palu Koro Shear Fault. The field investigations along the Palu coast revealed new evidence regarding the extensive liquefaction in these areas, both inland and coastal land. This research's location is the Palu Bay coastal area, Central Sulawesi Province. Moreover, this research was conducted to determine the potential and mitigation liquefaction in the Palu Bay area.

The data used was in the form of the Standard Penetration Test of the area, and the simplified procedure method was carried out to analyze the potential liquefaction. Furthermore, to determine the level of liquefaction potential, Liquefaction Potential Index was applied. Mitigation effort on the liquefaction hazards comprised a stone column method that applied Priebe's calculation method. QGIS software was applied to map the results.

Geological observations showed that non-cohesive soil (sand) dominates the soil condition in the Palu Bay area. Based on the potential liquefaction analysis, most of the eastern region of the Palu Bay area showed no liquefaction potential. On the contrary, the western and southern parts were indicated to have liquefaction potentials. The Liquefaction Potential Index analysis results showed extremely high liquefaction potentials dominate the western and southern areas. Meanwhile, in the eastern area, it was extremely low. Low liquefaction potential was achieved through soil improvement based on the specified criteria. The mapping result indicated the design for stone columns with deeper and closer spacing distance on the western and southern areas than those in the eastern areas. Due to the wide variety of stone column designs resulting from the mitigation analysis, simplification was made to facilitate the construction implementation.

Keywords: liquefaction, simplified procedure, potential liquefaction index, Priebe method, stone column, coastal area