

Feasibility of Building Structure Due to Decreased Concrete Quality of School Building in Banda Aceh City 19 Years after Tsunami

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Abstract : Banda Aceh is particularly susceptible to heightened vulnerability during natural disasters due to its concentrated exposure to multi-hazard risks. Despite urgent priorities during the aftermath of natural disasters, such as the 2004 Indian Ocean earthquake and tsunami, several public facilities, including school buildings, sustained damage yet continued operations without adequate repairs, even though they were submerged by the tsunami. This research aims to evaluate the consequences of column damage induced by tsunami inundation on the structural integrity of buildings. The investigation employs interaction diagrams for columns to assess their capacity, taking into account factors such as rebar deterioration and corrosion. The analysis result shows that one-fourth of the K1 columns on the first floor fall outside of the column interaction diagram, indicating that the column structure cannot handle the load above it, as evidenced by the presence of P_u and M_u , which are greater than the column's design strength. This suggests that the five columns of K1 should be cause for concern, as the column's capacity is decreasing. These results indicate that the structure of the building cannot sustain the applied load because the column cross-section has deteriorated. In contrast, all K2 columns meet the design strength, indicating that the column structure can withstand the structural loads.

Keywords : tsunami inundation, column damage, column interaction diagram, mitigation effort

Conference Title : ICCENHM 2024 : International Conference on Civil Engineering and Natural Hazard Management

Conference Location : Venice, Italy

Conference Dates : June 20-21, 2024