

ABSTRACT

A dam is a structure built across a river to regulate water flow, which can be used for various purposes, such as irrigation and power generation. Based on its function, the building is divided into permanent buildings and temporary buildings. The D.I Kerasaan Dam, which was built in 1986 in Jawa Bah Jambi District, Simalungun Regency, is a permanent building that aims to increase the water level of the Bah Bolon River during the dry season to support agricultural activities. This research was conducted because the dam has been standing for 39 years, therefore the purpose of this study is to determine whether the building is still safe against the SNI Geotechnical requirements for overturning forces (overturning) $SF(\geq 2.00)$, sliding $SF(\geq 1.50)$, eccentricity $SF(\geq 3.5)$, soil bearing capacity $SF(\geq 3.00)$, underground erosion (Piping) $SF(\geq 1.6)$, when the water level is normal, New SNI Geotechnical requirements for overturning force (overturning) $SF(\geq 1.50)$, sliding $SF(\geq 1.30)$, eccentricity $SF(\geq 3.5)$, soil bearing capacity $SF(\geq 1.50)$, underground erosion (Piping) $SF(\geq 1.6)$, at the time of flood water level. The target to be achieved is determining the magnitude of self-gravity, mud pressure, hydrostatic pressure, uplift, soil pressure and earthquake force which are used as a reference for dam safety against overturning and sliding forces. Stability value at normal water conditions, stability against overturning ($SF = 8.972 \geq 2.00$), stability against shear ($SF = 2.078 \geq 1.30$), eccentricity of loading that occurs ($SF e = 1.95 \leq 3.5$), soil bearing capacity or soil stress that occurs ($\sigma_{max} = 5.488 \geq 3.00$), ($\sigma_{max} = 01.593 \geq 3.00$), stability against underground erosion (piping) ($C = 5.175 \geq 1.6$). Stability value during flood conditions, stability against overturning ($SF = 8,713 \geq 1.50$), stability against shear ($SF = 2,266 \geq 1.30$), eccentricity of loading that occurs ($e = 2,266 \geq 3.5$), soil bearing capacity or soil stress that occurs ($\sigma_{min} = 5,366 \geq 1.50$), ($\sigma_{max} = 1,593 \geq 1.50$), stability against underground erosion (piping) ($C = 3,881 \geq 1.6$). From the results of stability control calculations, some are unsafe and some still meet the safety requirements.

Keywords: Old Dam, Geotechnical SNI, Dam stability, Safety requirements