

## Abstract

### **SLOPE STABILITY STUDY ALONG THE STA: 08+500, EX-JAPAN ROAD SLOPE, SUCO FATISI, AILEU MUNICIPALITY**

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Timor-Leste is vulnerable to natural hazards including floods, strong winds, landslide, earthquakes, and tsunami. These hazards are common causing significant damages to the country. Therefore, it is necessary to evaluate these natural hazards and associated risks for the future development of the country (RMSI, 2015). It is observed and identified that, there were historical landslide activity, which causing the slope failures in the study area. The study area located along the Sta:08+500, ex-Japan road, Suco Fatisi, Aileu Municipality. Ex-Japan road is an important road, which links the Capital Dili to other Municipalities, like; Aileu, Ainaro, Manufahi, and Suai. This study is focuses on the Slope Stability Analysis (SSA), which includes the Factor of Safety (FoS) calculation of the road slope. From the analysis of the Rockfall Hazard Rating System (RHRS) resulted that the total computed value is greater than 300, therefore the result analysis and computation from RHRS indicated, the area is also vulnerable to rockfall hazard. The Factor of safety (FoS) analysis is done, through the Slide 2018 software program, the analysis also, using the multiple scenarios, where these types of condition, including: Dry/Natural condition, Saturated Condition, Seismic Condition and Seismic with saturated condition. The factor of safety (FoS), from different scenarios analysis, resulted that; the first scenario (dry or natural condition), the FoS calculated is 1.306, the second scenario or saturated condition has FoS of 0.908, third scenario, Seismic condition (dry) has 0.878 and fourth scenario, the saturated condition with the additional of seismic load/Peak Ground Acceleration (PGA) is 0.589. The probable mitigation for the slope failure in this slope is using the guideline from Romana, 1985, the measures considered are: Systematic reinforced shotcrete, Toe wall and/or concrete, deep drainage anchors, Toe wall and/or concrete, (Re-excavation) Drainage. Some other measures added are Geotextile and Bio-engineering. The Geotextile considers its Adhesion of 10kPa, friction angle value of  $\phi=40^\circ$ , the tensile strength of 40kN/m and the anchor capacity of 100kN. The FoS results computed for only Drainage Re-excavation and retaining wall is 0.979, the FoS result computation for Geotextile, retaining wall and Bioengineering methods are 0.934, for Retaining wall only is 0.909. The results computed for the Factor of Safety (FoS) after installing all the measures are 1.559 and 1.566, hence the slope is classified in a safe condition.

Keywords: Ex-Japan road, Slide 2018, Rockfall Hazard Rating System (RHRS), Slope Stability Analysis (SSA), Factor of Safety (FoS)