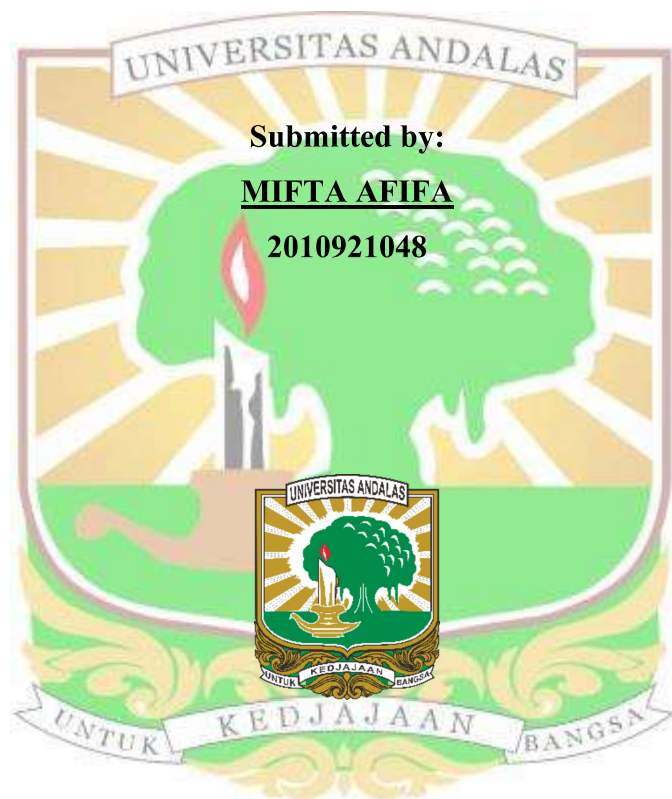


**LIQUEFACTION POTENTIAL ANALYSIS USING TSUCHIDA METHOD
AND CORRELATION OF RELATIVE DENSITY (D_r) – D_{50} ON THE
PADANG BEACH**

THESIS

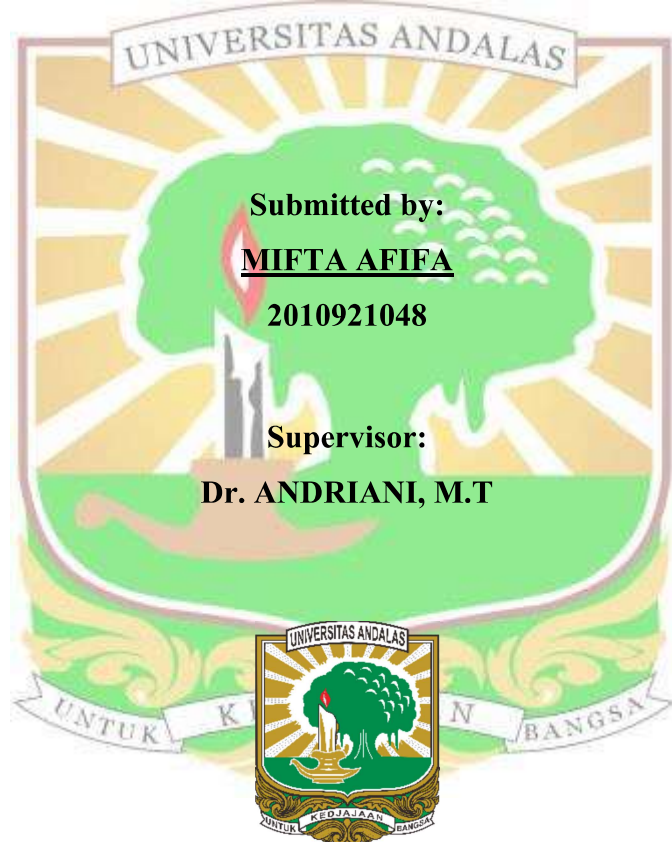


**DEPARTMENT OF CIVIL ENGINEERING – FACULTY OF ENGINEERING
UNIVERSITAS ANDALAS
PADANG
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**LIQUEFACTION POTENTIAL ANALYSIS USING TSUCHIDA METHOD
AND CORRELATION OF RELATIVE DENSITY (Dr) – D₅₀ ON THE
PADANG BEACH**

THESIS

*Proposed as a requirement to complete the bachelor's degree
in the Department of Civil Engineering Faculty of Engineering
Universitas Andalas*



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ABSTRACT

Indonesia has a high level of seismic activity. The risk of earthquakes must be considered in planning construction in Indonesia. The impact of this earthquake can cause other natural disasters, such as liquefaction, as happened in the 2009 Padang Earthquake. This liquefaction involves a lateral soil displacement followed by a splash of sand. The results of the investigation conducted on the 2009 earthquake caused sand to boil in several sites in Padang, as retrieved that liquefaction in Padang was caused by high sand content and water table along the coastal strip area. The test was carried out based on the gradation of soil grains through sieve analysis testing using the Tsuchida boundary and based on relative density testing by analyzing the correlation value between D_r and D_{50} . The accelerations used in this test are 0.3g (2009 earthquake acceleration of the city of Padang) and 0.6g (Indonesia regulation of Padang earthquake acceleration). Soil classification according to the AASHTO (American Association of State Highway and Transportation Officials) system, the type of sand on the beach is A-3 (fine sand), and according to the USCS (Unified Soil Classification System) system, all samples are classified as SP (Poorly-graded sand). With C_c (Coefisien Curvature) 2.436-1.975 and C_u (Coefisien Unifromity) 1.106-0.939. 0.3g Relative density ranges between 7-59%, and 0,6g ranges between 5-41%. Diameter passes 50% ranges between 0.187-0.408 mm. The Tsuchida boundary analysis and the D_r - D_{50} correlation retrieved similar results. Tsuchida analyzes grain gradation, while D_r - D_{50} examines cyclic load and settlement for specific grain size, affecting liquefaction potential. One sample liquefied at 0.3g, while all samples liquefied at 0.6g. Due to a smaller diameter at 50% pass, it was indicating higher liquefaction potential.

Keywords: *Earthquake, Liquefaction, Tsuchida Boundary, D_r vs D_{50} , Relative Density, Sieve Analysis*

