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MICROTREMOR ANALYSIS USING HVSR (HORIZONTAL TO VERTICAL SPECTRAL RATIO) FOR MICROZONATION MAPPING AND ZONIFICATION USE OF SHALLOW FOUNDATIONS WITH AND WITHOUT STRENGTHENING FOR EARTHQUAKE RESISTANT SIMPLE BUILDING IN KEJAWAN PUTIH TAMBAK VILLAGE SURABAYA

ABSTRACT

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Java island is in a subduction zone plate that has a high seismicity resulting in the risk of earthquakes. Earthquake damage is not only just by the strength of the earthquake epicenter, but also effect by local geological conditions or local site effects (local site effect).

Determination of the location of the point of measurement is done at the edge of the eastern coastal city of Surabaya, especially Kejawan Putih Tambak village because of the area prone to earthquakes and had never done mikrotremor measurement with 200 m grid. Due to the data of land on the white area of the pond is kejawan soft ground, the plan was simple type of earthquake resistant buildings. According to the Indonesian National Standard (SNI-03-1726-
2002) in Indonesian earthquake map, Surabaya lies in seismic zone 3 includes the area being earthquakes, earthquake area based on peak acceleration due to the influence of the earthquake bedrock plans with 500-year return period.

This measurement has been done in the Village Kejawan Putih Tambak Surabaya on 65 points with grid 200 m, measurements were performed to obtain data of natural frequencies and amplification, the data is analyzed using HVSR (Horizontal to Vertical Spectral Ratio) so that the resulting value of natural frequency between 1.00-2.65 Hz, amplification between 2.19-8.04, soil vulnerability index between 3.25-58.81 and thickness of sediments between 50-108 m. Values were analyzed to map the natural frequency, amplification, soil vulnerability index and the thickness of sediments using SURFER program.

Mikrotremor research results can be used as a parameter in the planning variety of forms the foundation of the palm under the influence of earthquake loads. Another parameter that is used to plan the data analysis of land divided into 4 zones, then carried out statistical analysis lands so that these data can be used. From the calculation of statistical analysis obtained $\gamma$ land of 1.4-1.6 t/m3, $C_u$ at 1-1.875 t/m2 and $\phi$ by 1°.

Variations foundation planned rectangular, square and circle. Obtained from the calculation of dynamic loading vertical load (P) at 10.74 ton, the moment direction $x$ (Mx) of 1.73 tm and $y$ directions moment (My) of 1.94 tm which is the result obtained from the dynamic load analysis program SAP 2000 v.14.20. Due to the dynamic loads are large enough, then the foundation reinforcement used in 4 zones, using concrete buis diameter between 0.8-1 m and a height of 1-1.5 m, while the variation of 4 zones form the
foundation for the foundation of a rectangle having a width dimension between 1-1,8 m and a length of between 1,2-2 m, for the foundation of a square has a width of between 1,2-1,8 m and the foundation between 1-1,5 m diameter circle. From the analysis stability of foundation can be reviewed settlement of foundation in the Kejawan Putih Tambak Village Surabaya.

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