

SUMMARY

Fajrina Zata Yumni Lovelia, Department of Civil Engineering, Faculty of Engineering, University of Brawijaya, February 2018, Comparison of Brick Wall Earthquake Strength from Kediri and Tulungagung for One-Storey House, Academic Supervisor : Agoes Soehardjono MD and Achfas Zacoeb.

Indonesia is located in an active seismic region. Because of earthquake intensity, building must safe againts to earthquake. Some studies suggest that the most crumbling buildings are in non engineered building structures of clay brick walls. Wall is part of building that often occurs damage one-storey house due to earthquake disaster because it is not planned properly. By using a dynamic simulation of one-storey house, it can be seen how the principal stress and shear stress occurring on the brick wall structure.

Analysis uses SAP2000 student version that modeled structure in 3D. Clay brick that used is from Kediri and Tulungagung. Parameters used to distinguish two types of clay brick are wall thickness, modulus elasticity, Poisson ratio and density. This analysis is done by using earthquake spectrum response with a combination by SNI 1727-2013. The object under study is a one-storey house with type 36/72 and located in Blitar City.

The results of this analysis indicate that maximum principal stress occurring as a result of combination $U = 1,2 D + 1 EQ_x + 0,3 EQ_y + L$ on brick wall from Tulungagung is bigger than brick wall from Kediri. While maximum shear stress on brick wall from Tulungagung is smaller than brick wall from Kediri. In detail, maximum principal stress of brick wall from Kediri is tensile stress $1,034 \text{ kg/cm}^2$ whereas maximum principal stress from Tulungagung is tensile stress $1,544 \text{ kg/cm}^2$. Maximum shear stress of brick wall from Kediri is $0,479 \text{ kg/cm}^2$ whereas maximum shear stress of brick wall from Tulungagung is $0,439 \text{ kg/cm}^2$. When compared with tensile strength $1,050 \text{ kg/cm}^2$ for clay brick from Kediri and $2,721 \text{ kg/cm}^2$ for clay brick from Tulungagung it was found that value of clay brick tensile strength is bigger than maximum principal stress. So, brick wall that uses clay brick from Kediri and Tulungagung still able to withstand the load.

Keywords: brick wall, principal stress, shear stress

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