SUMMARY

***Naadiyah Widyadhana Pertiwi**, Department of Civil Engineering, Faculty of Engineering, University of Brawijaya, April 2018, Effect of Irregular Wall Openings on One-Storey Houses against Seismic Load Capacity, Academic Supervisor : Lilya Susanti and Wisnumurti.*

One of the home design that developed in Indonesia is a minimalist home design, which is usually has large window size and irregular window position. However, the installation of window widths that exceed the regulations, could potentially harm residents in the event of an earthquake. In the Technical Guidelines of Earthquake-Resistant Buildings The Department of Public Works, has stated the conditions for the construction of earthquake-resistant houses, including placement conditions and the percentage of regular door openings, and windows. By analyzing the percentage of openings on one-storey houses and calculating the seismic loads, it can be seen whether there are houses with irregular wall openings, as well as the relation between a house with irregular wall openings, with its ability to withstand earthquakes.

Seismic load analysis is determined by static equivalent method according to SNI 1726: 2012. The type of red brick that is used, is the red brick from Tulungagung. The object is the percentage of openings in one-storey residential buildings, and structure's ability to withstand earthquake loads. The analysis was done on the house plan type 46/90, 50/90, 54/105, and 70/135 located in Malang City.

The result of the analysis shows that there is irregular percentage of openings, on four samples plan of one-storey residential building construction in Malang City, with Technical Guidance. The irregular percentage of openings can be seen from the percentage ratio of wall openings area with wall area in each quadrant whose value does not meet the requirements of 11% -16% with an average of ± 14,73%. At 46/90 house type obtained an average value of 19.6%, 50/90 type house obtained value of 15.14%, home type 54/105 obtained value of 13.42%, and home type 70/135 obtained value of 16.79%. As for the percentage ratio of wall openings area with floor area, provided that the value should be beetween 20% -50%, and only 46/90 type houses that do not meet the requirements with a value of 53.4%. The 46/90 type house plan, has the largest percentage of openings out of the four samples and not meeting the requirements, the percentage value resulted in the displacement value of the 46/90 type house plan for the X direction wall not meeting the SNI standard with an average value of 36.31 mm> 30 mm. Whereas for house plan type 50/90, 54/105, and 70/135 the displacement value still meet the SNI regulation So it can be concluded that the house with regular width of openings in accordance with the requirements of technical guidelines, has a higher structure capability in withstanding the earthquake load.

***Keywords**: wall openings, masonry wall, stiffness, displacement.*

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