

Comparison of Apartment Planning Based on SNI 1726-2012 Using the 2010 and 2017 Earthquake Maps Case Study of Mataram City (Yudistira Apartment) 19 Stories, Palagan Street, Sleman, the Special Region of Yogyakarta

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ABSTRACT

Earthquake is a natural disaster that often occurs in Indonesia. Indonesia is a country with a high risk of earthquake, which is proven by the fact that there are three giant plates surrounding Indonesia, namely the Eurasian Plate, Pacific Ocean Plate, Indo-Australian Plate. The certain time and place of earthquake cannot be predicted, and the shock occurring on the surface of the earth will be greater if the pressure from the activity of the moving plate creates a pressure which cannot be resisted on the edge of the plate. Therefore, it is necessary to anticipate building structures in Indonesia which are able to withstand earthquake shock in order to minimize the impact of material losses, infrastructure damage, and casualties.

In the development of earthquake regulations in Indonesia, namely the Indonesian Load Regulation 1970, NI-8 PMI 1970 earthquake map only divides the territory of Indonesia into three earthquake regions. Thus, the latest Indonesian earthquake map was launched on September 27, 2017 known as the 2017 Earthquake Source and Danger Map consisting of 295 earthquake sources.

By implementing the standard changes regarding the current structure of the building, it is important to consider the time of planning based on the new regulation. The increase of the source of danger is very influential in structural planning. Therefore, this study applies a comparative study between the 2010 and 2017 Indonesian Earthquake Maps based on SNI 1726-2012. The object of research in this study is Mataram City (Yudistira Apartment) consisting of 19 stories located at Palagan Street, Sleman, Special Region of Yogyakarta.

The comparative result between the 2010 and 2017 Indonesian Earthquake Map analyzed using the Response Spectrum obtains differences in peak acceleration (S_a) increasing up to 33% with the difference in the value of S_s parameter increasing up to 20% and S_1 parameters increasing up to 42.86%. Analysis of inter-floor deviation for the 2010 and 2017 Indonesia Earthquake Maps shows a safe performance with a difference of 1.133% in the direction X and 1.191% in the direction Y. The analysis of beam and column portals shows different reinforcement requirements for each cross section. These differences occur due to earthquake load generated from each earthquake map are different in determining the spectral response of acceleration of earthquakes on the ground level, referring to rock acceleration parameters. Amplification factors related to short period vibrations (F_a) are in the period of 0.2 seconds and 1 second period.

Keywords: *Earthquake, Indonesia Earthquake Map, Spectrum Response, SNI 1726-2012.*

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ABSTRACT

Earthquake is a natural disaster that often occurs in Indonesia. Indonesia is a country with a high risk of earthquake, which has three giant plates surrounding Indonesia, namely the Eurasian Plate, Pacific Ocean Plate, Indo-Australian Plate. A certain time and place of earthquake cannot be predicted, and the pressure occurring on the surface will be greater, which cannot be resisted on the edge of the plate. Therefore, it is necessary to build buildings in Indonesia which are able to withstand shock in order to minimize the impact of material losses, damage infrastructure, and casualties.

In the development of earthquake regulations in Indonesia, namely the Indonesian Load Regulation 1970, NI-8 PMI 1970 earthquake maps are only divided into three earthquake regions. Thus, the latest Indonesian earthquake map was launched on September 27, 2017 known as the 2017 Earthquake Source and Danger Map consisting of 295 earthquake sources.

By implementing the standard changes, it is important to consider the time of planning based on the new regulation. The increase in the source of danger is very influential in structural planning. Therefore, this study applies a comparative study between the 2010 and 2017 Indonesian Earthquake Maps based on SNI 1726-2012. The city of Mataram is located in Palagan Street, Sleman, Special Region of Yogyakarta.

The comparative results between 2010 and 2017 are increasing up to 33% with the difference in the value of SS parameters increasing up to 20% and S1 parameters increasing up to 42.86 %. Analysis of the inter-floor deviation for the 2010 and 2017 Indonesia Earthquake Maps shows a safe performance with a difference of 1,133% in the direction X and 1,191% in the direction Y. The analysis of beam and column portals shows different reinforcement requirements for each cross section. This is a reference to the acceleration of earthquakes on the ground level, referring to rock acceleration parameters. Amplification factors related to short period vibrations (F_a) are in the period of 0.2 seconds and 1 second period.

Keywords: *Earthquake, Indonesia Earthquake Map, Spectrum Response, SNI 1726-2012.*

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