

INTISARI

ANALISIS MIKROTREMOR UNTUK EVALUASI KETAHANAN BANGUNAN TERHADAP GEMPABUMI PADA GEDUNG C FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM, UNIVERSITAS GADJAH MADA

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INTISARI

Penulis melakukan penelitian tentang mikrotremor di Gedung C Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Gadjah Mada. Penelitian bertujuan untuk mengetahui tingkat ketahanan bangunan terhadap gempabumi. Analisis mikrotremor meliputi indeks resonansi bangunan terhadap gempabumi, analisis frekuensi natural bangunan, analisis simpangan horisontal bangunan dan analisis percepatan maksimum getaran bangunan. Penilaian terhadap ketahanan bangunan didasarkan pada Standard Nasional Indonesia tentang tata cara perencanaan ketahanan gempa pada bangunan gedung.

Akuisisi data dilakukan pada beberapa titik di setiap lantai bangunan dan di basement yang mewakili kondisi permukaan. Akuisisi data dilakukan pada bulan April 2016 dengan menggunakan seismometer buatan *Lennartz Elektronik* tipe LE-3D/20s 3 komponen. Analisis ketahanan bangunan dilakukan dengan metode FSR yaitu menghitung percepatan maksimum getaran bangunan. Adapun percepatan maksimum getaran bangunan didapatkan dari beberapa perhitungan seperti frekuensi natural bangunan, indeks resonansi bangunan, amplifikasi bangunan, simpangan horisontal lantai bangunan, dan indeks kerentanan bangunan.

Dari penelitian ini didapatkan nilai indeks kerentanan bangunan maksimum sebesar 198,4 1/gal, *story drift* maksimum sebesar 183,6 mm dan percepatan maksimum getaran bangunan Gedung C FMIPA UGM sebesar 7332,5 gal. Selain itu didapatkan juga Indeks resonansi tinggi dan simpangan horisontal maksimum sebesar 339,8 mm. Dengan demikian berdasarkan kriteria yang disebutkan dalam SNI-03-1726-2002 yang menjelaskan bahwa untuk wilayah 3 (Yogyakarta) nilai percepatan maksimum getaran tanah sebesar 230 gal maka dapat disimpulkan bahwa Gedung C FMIPA UGM termasuk dalam kategori aman

Kata Kunci : Mikrotremor, FSR, Gedung C FMIPA UGM

ABSTRACT

MICROTREMOR ANALYSIS FOR EARTHQUAKE RESISTANT BUILDING EVALUATION AT GEDUNG C FACULTY OF MATHEMATICS AND NATURAL SCIENCES, UNIVERSITAS GADJAH MADA

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ABSTRACT

The observer conducted a research on microtremor in Universitas Gadjah Mada at Gedung C of Faculty of Mathematics and Natural Sciences. The research aims to determine the building's resistance degree to earthquake. Microtremor analysis included the building's resonance index to earthquake, building's natural frequency, building's displacement, and building's tremor maximum acceleration. The evaluation of the building's resistance is established upon Indonesian National Standard on the system of designing earthquake resistant buildings.

The data acquisition was conducted on several spots in each floor of the building and in the basement, which represents the condition of the surface. The data acquisition conducted in April 2016 using a seismometer designed by *Lennarts Electronic* type LE-3D/20s of 3 components. An analysis of building's resistance was conducted by FSR method that is calculating the maximum acceleration of the building's tremor, which was obtained from several calculations, such as the building's natural frequency, resonance index, amplification, floor displacement, and fragility index.

From this research, the observer obtained a result of 198,4 1/gal as the maximum building's resistance index, 183,6 as the maximum story drift and 7332,5 gal as the building's tremor maximum acceleration in Gedung C of Faculty of Mathematics and Natural Sciences, UGM. Besides that the observer also obtained a result building's resonance index is high degree and 339,8 mm as the maximum displacement. Based on the criteria mentioned in SNI-03-1726-2002, which states that the maximum acceleration of the ground tremor in Region 3 (Yogyakarta) is 230 gal then it can be concluded Gedung C of Faculty of Mathematics and Natural Sciences in UGM the category of safe.

Keywords : Microtremor, FSR, Gedung C FMIPA UGM.