

## INTISARI

### ANALISIS MIKROTREMOR DALAM KAWASAN RENCANA PEMBANGUNAN BANDAR UDARA DI KABUPATEN KULON PROGO YOGYAKARTA

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Telah dilakukan penelitian mikrotremor di Kecamatan Temon Kabupaten Kulon Progo sebagai lokasi rencana pembangunan Bandar Udara. Penelitian ini dilakukan untuk mengetahui risiko akibat guncangan gempabumi melalui pemetaan sebaran nilai ketebalan lapisan sedimen, indeks kerentanan seismik ( $Kg$ ), *ground shear strain* ( $\gamma$ ) dan percepatan getaran tanah maksimum (PGA). Pengukuran data menggunakan seismometer tiga komponen, pengukuran dilakukan sebanyak 46 titik pengukuran. Data tersebut dianalisis dengan metode *Horizontal to Vertical Spectral Ratio* (HVSr). Perhitungan nilai PGA dengan menggunakan persamaan empiris Kanai untuk *event* gempabumi tanggal 27 Mei 2006 dengan  $M_w = 6,4$ .

Hasil penelitian menunjukkan bahwa di lokasi rencana pembangunan Bandar Udara di Kecamatan Temon memiliki nilai frekuensi natural berkisar antara 0,95 Hz sampai 8,22 Hz, ketebalan lapisan sedimen berkisar antara 5,7 meter sampai 49,6 meter, sebaran nilai indeks kerentanan seismik berkisar antara 1,2 sampai 15,5, sebaran nilai *ground shear strain* berkisar antara  $1,0 \times 10^{-4}$  sampai  $1,8 \times 10^{-3}$  dan sebaran nilai PGA lapisan tanah permukaan berkisar antara 44,4 gal sampai 118,4 gal. Peta tingkat risiko menunjukkan lokasi pembangunan Bandar Udara teridentifikasi memiliki tingkat risiko dengan skala rendah hingga tinggi. Tingkat risiko yang tinggi terletak pada lokasi yang rencananya menjadi terminal penumpang.

**Kata Kunci:** *Mikrotremor, Frekuensi Natural, ketebalan lapisan sedimen, PGA, Indeks Kerentanan Seismik, Ground Shear Strain, HVSr, Bandar Udara, Kecamatan Temon.*

## ABSTRACT

### MIKROTREMOR ANALYSIS IN THE AREA OF AIRPORT DEVELOPMENT PROJECT IN KULON PROGO YOGYAKARTA

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Microtremor research has been conducted in Temon District of Kulon Progo Regency as the location of the airport development project. This research was conducted to know the risk of earthquake shock through mapping of sediment layer thickness value, seismic susceptibility index ( $K_g$ ), ground shear strain ( $\gamma$ ) and Peak Ground Acceleration (PGA). Measurement data using three component seismometer, measurement done as much as 46 point measurement. The method to analyze data using Horizontal to Vertical Spectral Ratio (HVSR), to calculation PGA in ground surface layer value using Kanai empirical equations for earthquake event May 27, 2006 with a moment magnitude of 6.4.

The result of this research shows that in the location of the airport development plan in Temon subdistrict, the value of natural frequency ranges from 0.95 Hz to 8.22 Hz, the thick of sediment layers ranges from 5.7 meters to 49.6 meters, the distribution of seismic susceptibility index ranges from 1.2 to 15.5, the distribution of ground shear strain Ranging from  $1.0 \times 10^{-4}$  to  $1.8 \times 10^{-3}$  and the PGA surface layer surface distribution ranges from 44.4 gal to 118.4 gal. The risk level map shows the airport construction site identified as having a low to high-risk level. The high risk level lies in the location where it is planned to be a passenger terminal.

**Keywords:** *Mikrotremor, natural frequency, Thick of sediment layer, Peak Ground Acceleration, Seismic Vulnerability Index, Ground Shear Strain, HVSR, Airport, Kecamatan Temon.*