

INTISARI

Kegiatan peledakan pada pekerjaan galian batu berpotensi menimbulkan getaran tanah yang dapat berdampak pada permukiman warga sekitar. Getaran pada tingkat tertentu berpotensi menyebabkan kerusakan struktur bangunan, khususnya pada pemukiman yang berada paling dekat dengan lokasi peledakan. Penelitian ini dilakukan untuk menganalisis pengaruh *Peak Particle Velocity* (PPV) pada hasil peledakan terhadap pemukiman sekitar Proyek Pembangunan Bendungan Bener.

Penelitian dilaksanakan di Proyek Pembangunan Bendungan Bener, Kabupaten Purworejo, Jawa Tengah. Data diperoleh melalui observasi lapangan dan wawancara teknis, sedangkan pengukuran getaran dilakukan selama dua minggu pertama bulan Maret 2025. Analisis dilakukan dengan perbandingan antara *Peak Particle Velocity* (PPV) aktual dan prediksi menggunakan metode USBM. Tahapan pelaksanaan peledakan yang diamati meliputi persiapan peralatan pengeboran, pengeboran lubang ledak (*drilling*), mobilisasi bahan peledak, pengisian lubang ledak (*charging*), penutupan lubang ledak (*stemming*), penyambungan rangkaian peledakan (*tie up*), persiapan pra-peledakan, penembakan (*firing*), dan pemeriksaan pasca peledakan.

Hasil analisis menunjukkan bahwa nilai *Peak Particle Velocity* (PPV) dapat dimodelkan dengan persamaan $PPV = 750(SD)^{-1,6}$. Dari hasil analisis yang diperoleh tingkat akurasi rata-rata sebesar 77,15%. Nilai *Peak Particle Velocity* (PPV) tertinggi tercatat sebesar 3,74 mm/s yang masih berada pada batas aman 5 mm/s sesuai SNI 7571:2023 untuk struktur bangunan kelas dua, sehingga peledakan di *spillway* Proyek Pembangunan Bendungan Bener masih aman untuk pemukiman warga.

Kata kunci: Peledakan, Getaran Tanah, *Peak Particle Velocity*, *Scaled Distance*, Bendungan

ABSTRACT

Blasting activities in rock excavation have the potential to generate ground vibrations that may affect nearby residential areas. At certain levels, these vibrations can cause structural damage, particularly to settlements located closest to the blasting site. This study was conducted to analyze the effect of Peak Particle Velocity (PPV) from blasting activities on residential areas around the Bener Dam Construction Project.

The study was conducted at the Bener Dam Construction Project, Purworejo Regency, Central Java. Data were obtained through field observations and technical interviews, while vibration measurements were carried out during the first two weeks of March 2025. The analysis was performed by comparing the actual Peak Particle Velocity (PPV) with predictions using the USBM method. The observed blasting stages included drilling equipment preparation, blast hole drilling, explosive mobilization, charging, stemming, tie-up, pre-blast preparation, firing, and post-blast inspection.

The analysis indicated that the Peak Particle Velocity (PPV) values can be modeled with the equation $PPV = 750(SD)^{-1.6}$. The average measurement accuracy reached 77,15%. The highest Peak Particle Velocity (PPV) recorded was 3.74 mm/s, which remains within the safe limit of 5 mm/s as stipulated in SNI 7571:2023 for class two structures. Therefore, blasting activities at the spillway of the Bener Dam Construction Project are still considered safe for nearby residential areas.

Keywords: *Blasting, Ground Vibration, Peak Particle Velocity, Scaled Distance, Dam*