

Development of Blast Vibration Equation Considering the Polymorphic Characteristics of Basaltic Ground

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Abstract : Geological structure formed by volcanic activities shows polymorphic characteristics due to repeated cooling and hardening of lava. The Jeju region is showing polymorphic characteristics in which clinker layers are irregularly distributed along with vesicular basalt due to volcanic activities. Accordingly, resident damages and environmental disputes occur frequently in the Jeju region due to blasting. The purpose of this study is to develop a blast vibration equation considering the polymorphic characteristics of basaltic ground in Jeju. The blast vibration equation consists of a functional formula of the blasting vibration constant K that changes according to ground characteristics, and attenuation index n. The case study results in Jeju showed that if there are clinker layers, attenuation index n showed a distribution of -1.11~-1.87, whereas if there are no clinker layers, n was -2.79. Moreover, if there are no clinker layers, the frequency of blast vibration showed a high frequency band from 30Hz to 100Hz, while in rocks with clinker layers it showed a low frequency band from 10Hz to 20Hz.

Keywords : blast vibration equation, basaltic ground, clinker layer, blasting vibration constant, attenuation index

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