

Improvement of Mechanical Rock Excavation with Abrasive Waterjet Assistance

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ABSTRACT

Abrasive waterjet is increasingly used for geotechnical purposes such as rock cutting and concrete destruction, and this method is suitable for use in various fields due to low noise and vibration. On the other hand, mechanical rock excavation is low in unit cost and simple in equipment, but it is difficult to use in urban areas due to its high noise and vibration. In the case of mechanical excavation, a free face is often required for rock splitting and excavation. In this case, abrasive waterjet rock cutting can be used. This study introduces a rock excavation method using mechanical equipment after forming a free face with an abrasive waterjet. For the optimum design of this rock excavation method, theoretical and numerical studies on the effects of abrasive waterjet cutting depth and cutting interval were evaluated. The results of this study can be used in the applicability estimation of auxiliary methods to improve the performance of the mechanical rock excavation method.

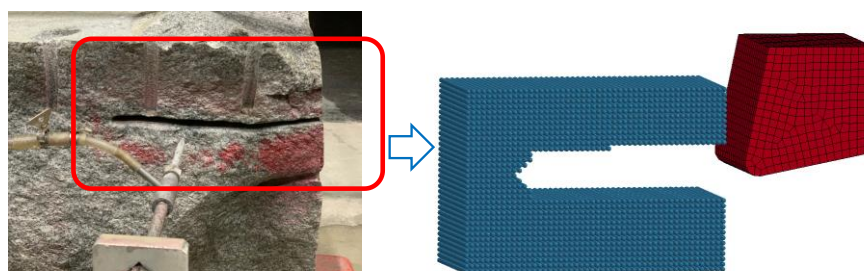


Fig. 1 Conceptual image of rock excavation

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