

## 2. Development of High Speed Mucking System for Mountain Tunnels

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In recent years, there has been a growing need to construct mountain tunnels faster than in the past with the aim of reducing cost or achieving project goals earlier.

In a typical tunnel construction project carried out by the mountain tunneling method, mucking accounts for about 30% of the cycle time. Increasing the speed of mucking, therefore, is a major factor contributing to the attainment of the goal of faster construction.

In view of this situation, this study proposes a high-speed mucking system for long tunnel construction involving the use of a belt conveyor system for mucking.

The system has the following features: (1) having two serially connected crushers to perform two-stage crushing and (2) being equipped with an extendable belt conveyor so that the nearest crusher can be positioned at a distance of 20 m from the working face for mucking operation.

The newly developed mucking system has been experimentally validated and it has been confirmed that the proposed system performs as expected.

This paper briefly describes the proposed system and reports on the performance analysis and evaluation results obtained through the validation experiment.

**Key words:** mountain tunneling method, faster construction, mucking, extendable belt conveyor, crusher, two-stage crushing