1. Development of the POWER-BOLTING SYSTEM (Part1) -Concept and Performance of the New Supporting Method-

Seiji Ebisu, Tomoaki Shimizu, Toyoaki Kitsutaka,
Hideki Nakamura, Yasuhiko Goto,Takeshi Kurita

The new supporting method named the POWER-BOLTING SYSTEM was developed for the purpose of the displacement reduction in the mountain tunnel. The POWER-BOLTING SYSTEM consists of a middle-length steel pipe (D=76.3mm, L=6m, t=4.2mm) and a short-length steel bar (D=25mm, L=1.5m) inserted from the rear end of the pipe. This composite structure makes it with high bearing capacity and high toughness as a support member. Setting the steel pipe to be the inclined arrangement toward ahead of a face, it is possible to form the thick and high strength reinforcement zone surrounding a tunnel. Moreover, it can be easily fixed steel pipe on a surface of a tunnel wall as same as a rock bolt. The functions and the effects of displacement reduction of the POWER-BOLTING SYSTEM were verified from in situ experimental construction.

Key words : squeezing rock mass, displacement reduction, supplementary construction method, steel pipe type rockbolt