

Evaluation of Deformation and Failure Behavior of Mountain Tunnel Linings on Their Materials

Kazuhide YASHIRO Noriyuki OKANO Yoshiyuki KOJIMA

Authors performed model tests of mountain tunnel linings which consist of various materials, and the following conclusions were obtained. The plain concrete lining does not show a decrease in the load until it receives quite large deformation, which means its good deformability, whereas compressive cracks occur on the inner side of the tunnel after it receives large deformation. The brick lining has smaller structural stiffness and bearing capacity than those of the plain concrete lining, and cracks occur between the two beds of bricks after it receives large deformation. The short-fiber-reinforced concrete lining has good anti-spalling ability, whereas its structural stiffness and bearing capacity are almost the same as those of the plain concrete lining. The reinforced concrete lining has the largest structural stiffness and bearing capacity, and it is able to support the load after the yielding of its rebars, whereas shear failure becomes easy to occur.