

## **Evaluation of Change in Sectional Force Caused by an Opening at Side Walls of an Existent Open-cut Tunnel**

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In the renewal of railway stations, there are some cases where a part of existent side walls is opened in order to connect the newly constructed structures or to create a space. This paper investigates the influence of opening at side walls on the members of existent cut-and-cover tunnels by means of the 3D FEM. The calculation results obtained by the 3D FEM were compared with those by the 2D frame analysis provided that there is no opening at side walls. The influence of the opening was investigated based on the 3D FEM. The calculation results revealed the change of sectional force near the opening and the influence of the opening width on the values of sectional force. The effect of reinforcing beams in the longitudinal direction was also discussed in this paper.